The Most Effective Leadership Style in Pursuit of Resilient Supply Chain: Sequential Mediation of Flexibility and Agile Supply Chain

Muhammad Imran Taseer (Corresponding author)
PhD Scholar, National College of Business Administration & Economics Lahore, Pakistan
Email: imrantaseer@ncbae.edu.pk

Alia Ahmed
National College of Business Administration & Economics Lahore, Pakistan
Email: dralia@ncbae.edu.pk

Abstract

This study investigates the most effective leadership style of supply chain (SC) management leaders in pursuit of resilient supply chain through the comparison of transformational and transactional leadership styles. Flexibility and agile supply chain are considered as a mechanism which can strengthen the impact of leadership styles on resilient supply chain. However, these phenomena are not addressed in prior studies. We also empirically teste cost-effective mechanism to SMEs for improving supply chain resilience. The constructs are adopted from existing literature to formulate four hypotheses to meet the study objectives. Primary data is collected by incorporating split survey method and time-lagged of two weeks from 317 supply chain professionals working in SMEs manufacturing enterprises of Pakistan via a pre-tested survey instrument. The PROCESS Macros is used to test the hypothesized model. The results reveal the positive significance of both leadership styles with resilient supply chain directly as well as the mechanism of flexibility and agile supply chain. However, the empirical investigation finds that the supply chain managers with transactional leadership style are more effective in pursuit of resilient supply chain directly and through the sequential mediation of flexibility and agile supply chain as compared with other leadership style. The results of this study empirically prove the significance of transformational and transactional leadership with resilient supply chain. The sequential mediation of flexibility and agile SC between leadership styles and resilient supply chain is also proved. The study tests the most effective leadership style which can more strongly influence the resilient supply chain through the comparison of transformational and transactional leadership styles. All of these relationships have not been previously tested. Thus, the study provides an important contribution to existing body of knowledge.

Keywords resilient supply chain, agile supply chain, flexibility, transformational leadership, transactional leadership, SMEs, manufacturing enterprises, Pakistan.

1. Introduction

COVID-19 pandemic has emerged as a challenge for many industries (Ketchen & Craighead, 2021) as it exposed the supply chain (SC) vulnerability at a global scale. Many organizations have experienced shortages in the procurement of raw materials (Wieland, 2021). Consequently, several organizations faced stock-outs as they were unable to match supplies with demand. The environmental uncertainties have been significantly related with demand (Song et al., 2018) and the organizations are fond of most effective approaches for dealing with uncertainties (Chen et al., 2018). Accordingly, many small enterprises failed to survive (Katsaliaki et al., 2021) due to their inability to respond to the dynamics of the environment. Specifically, small and medium sized enterprises (SMEs) are more vulnerable to SC disruptions due to their limited capital and expertise (Pal et al., 2014). A recent report of 'Small and Medium Enterprises Development Authority' (SMEDA) of Pakistan has reviled that 92% of the SMEs in Pakistan have experienced SC disruptions during COVID-19 (SMEDA, 2021). Although, catastrophic events have low probability of occurrence but they can anomalously disrupt the SCs (Katsaliaki et al., 2021). SC disruption not only effects the performance of SC rather it also upsurges the total cost of ultimate SC (Craighead et al., 2007). However, climate change and population growth upsurges the occurrences of disasters in the past few decades (FEMA, 2015). For instance, a country like Pakistan has spent $10 billion, since the last decade on disaster relief and recovery (GFDRR, 2019). Furthermore, Pakistan stands at the seventh position in the world's most affected countries by climate change (Ahmed et al., 2019). Whereas, the traditional risk management practices are not sufficient to deal with catastrophic events (Kamalahmadi & Parast, 2016). Similarly, Katsaliaki et al. (2021) emphasized that it is impossible to avoid SC disruptions completely. Hence, all these evidences highlight the need of resilient SC.

The significance of resilient SC in dealing with SC disruptions cannot be underestimated (Ambulkar et al., 2015) as it allows the firms to anticipate, adopt and quickly respond to SC disruptions (Blackhurst et al., 2005). SC resilience has the capability to quickly recover from disruption or even better than the original state (Ponomarov & Holcomb, 2009). Disruptions have a negative impact on costs and revenues of the SC (Craighead et al., 2007). Moreover, building resilience is less costly than recovering from a crisis (Jabbarzadeh et al., 2018). Flexibility and agile SC are amongst the most commonly cited strategies, which are critical for a resilient SC (Tukamuhabwa et al., 2015). Christopher & Peck (2004) stated that flexibility is an antecedent of SC resilience. Whereas, flexibility referees to the ability of SC managers to align internal processes quickly and efficiently in accordance with market demand (Srinivasan & Swink, 2018). Meanwhile, Swafford et al. (2006) and Chiang et al. (2012) proved that agile SC is also derived from flexibility. Since, Agile SC allows the firms to quickly align tactics and operations of their SC, according to market requirements (Gligor et al., 2015). Flexibility only focuses on the alignment of internal processes and agile SC deals with the alignment of SC in response to market requirements. Moreover, agile SC has been found as a significant predictor of resilient SC

(Aslam, Khan, et al., 2020). Although, the distinctive purpose differentiates flexibility, agile SC and resilient SC (Carvalho et al., 2012). However, the confusion is still persistent to understand the complexity in relationship of these constructs as none of the existing study investigates this phenomenon in a systematic manner. The theory on the effects of flexibility, agile SC and resilient SC remains fragmented and lacks grounding to established theoretical perspectives. An empirical investigation is required to develop a comprehensive understanding of these constructs. Therefore, the first objective of this study is to empirically investigate the significance amongst flexibility, agile SC and resilient SC.

Leadership has been considered as a key enabler of flexibility (Anning-Dorson, 2021), agile SC (Piya et al., 2020) and resilient SC (Kamalahmadi & Parast, 2016; Kochan & Nowicki, 2018). Barratt (2004) suggested that compatible leadership style can successfully drive the SC. The leadership style refers to the behaviour exhibits by a leader to influence subordinates towards the right direction (Certo & Certo, 2006). The effective leadership style ensures the innovative behaviour of employees (Afsar et al., 2014; Xu et al., 2017) and innovation allow organizations to building SC resilience (Ozdemir et al., 2022). Moreover, SC resilience literature suggested that strong commitment, decisional flexibility, proactive behavior, learning and innovation are important contributors of SC resilience (Ali & Gölgeci, 2019; Sawyerr & Harrison, 2020; Scholten et al., 2020). Meanwhile, the effective leadership style ensures the learning, creativity, innovation and commitment of the employees (Afsar et al., 2014; Atitumpong & Badir, 2018; Avolio & Bass, 1995; Breevaart et al., 2014; Jong & Hartog, 2007). However, in the presence of multiple leadership styles, which is the most compatible leadership style SC mangers have to adopt in pursuit of SC resilience? The current literature is silent about it. Although, a little work was done in the domain of leadership and SC but Prabhu & Srivastava (2022) indicate an upwards research trend in this domain. Thus, the current novel study will address this literature gap as the relationship between leadership styles and resilient SC has not been previously tested. Since, building SC resilience is not a mechanistic process (Ali & Gölgeci, 2019) as it depends on the decision making capabilities of SC managers (Leflar & Siegel, 2013). SC managerial leaders have to deal with multi-dimensional internal and external challenges of upstream and downstream to ensure the uninterrupted flows of SC, for the attainment of organizational objectives. Additionally, SC managers also have to deal with SC disruptions as they are responsible to minimize the impact of disruption and quick restoration of the SC. Remko (2020) suggested that COVID-19 is an opportunity for SC managers to strengthen the resilient capabilities of the SC, thus they can better deal with the crisis. Therefore, the behavioural aspects of the SC managers need to be investigated, as this perspective is ignored in current literature (Pettit et al., 2019; Polyviou, 2016). Similarly, this research gap is also highlighted by Scholten et al. (2020), Ali & Gölgeci (2019), Sawyerr & Harrison (2020) and Remko (2020); all of them suggested to investigate the behavioural aspects of SC managers in pursuit of SC resilience as this phenomena has not been addressed in existing literature. Therefore, the second objective of this explanatory study is to investigate the most effective leadership style of SC

managerial leaders in pursuit of resilient SC through the comparison of transformational and transactional leadership styles. This novel study will provide a vital theoretical contribution to current body of knowledge by exploring new phenomena which has not been addressed before. Hence, we selected the two most effective leadership styles in this study based on their significance: (1) Transformational leadership and (2) Transactional leadership. Further explanations are given in Section 2.

The literature reveals that SMEs are more vulnerable to SC disruptions (Pal et al., 2014) due to their inability to incorporate change (Ates & Bititci, 2011). The Federal Emergency Management Agency (FEMA, 2015) reported that 40% to 60% of the SMEs never reopen after confronted with a disaster. SMEs are one of the dominant contributors in national economies however most of the times SMEs were ignored in research, particularly in the context of resilient SC (Kamalahmadi & Parast, 2016). SMEs represents 70% of the world's production (Ates & Bititci, 2011). Since, the existing literature validates that the effect of economic crises on SMEs was diminished through compatible leadership (Mcmanus et al., 2008; Penrose, 2000). Furthermore, the current literature encourages to conduct empirical studies on how SMEs can improve SC resilience (Ali & Gölgeci, 2019; Kamalahmadi & Parast, 2016; Pal et al., 2014). Hence, the third object of our study is to propose a most cost effective mechanism to SMEs manufacturing enterprises for improving their resilient SC capabilities. Resilient SC ensures that the SMEs manufacturing enterprises efficiently pursue contemporary business in uncertain environmental conditions and it can also contribute to improved operational performance (Dabhilkar et al., 2016), SC performance (Truong & Hara, 2018), competitive advantage (Kwak et al., 2018), market performance (Wong et al., 2020) service performance (Liu & Lee, 2018) and ultimately firms performance (Gölgeci & Kuivalainen, 2020). Thus, the proposed mechanism in this study will provides an opportunity to SMEs manufacturing enterprises to efficiently pursue contemporary business by building resilient SC. SMEs have weak financial muscles (Pal et al., 2014) and we believe that most of the time costly resources are not necessarily required to attain challenging objectives but the compatibility, capability and competency of SC managerial leaders can do so.

All three objectives of the study have been achieved with the sample of 317 SC professionals working in the SMEs manufacturing enterprises of Pakistan, using structural equation modelling (SEM) for constructs reliability and validity and PROCESS Macros for hypotheses testing. The significance of flexibility, agile SC and resilient SC in a systemic manner have been proved. Moreover, the effective leadership style, which can directly contribute to resilient SC and through the indirect effect of flexibility and agile SC have also been explored. The mechanism for improving resilient SC of SMEs has also been proposed after empirical investigation.

This article is organized as follows. Section 2 contains the theoretical background and hypotheses development. Section 3 illustrates the research methodology. Section 4 in concludes the data analysis and results. Section 5 contains the results discussions, practical and theoretical implications, limitations and future research directions.

2. Literature Review and Hypotheses Development

2.1. Resilient Supply Chain

Resilient SC is defined by Christopher & Peck (2004) as "the capacity of the SC to return to its original state or move to a new, more desirable state after being disturbed". It highlights the immediate recovery of the SC from disruptive event(s) which can be caused by internal failure, or from SC partners or by the change in external environment of the focal firm. SC disruptions may occur because of climate change or human factors (Katsaliaki et al., 2021). However, fast recovery and restoration of the SC is critical to mitigate the impact of SC disruptions (Ivanov et al., 2018), as it contributes to the profitability and goodwill of the organization (Liu et al., 2020). The resilient SC is the need of current times when environmental uncertainties exposed the vulnerability of the SC. The risk of SC disruptions cannot be detached from current globalized multi-tier SCs. Thus, building SC resilience is the most effective way to manage risks and ensures the quick recovery from disruptions (Chopra & Meindl, 2014; Hora & Klassen, 2013; Jüttner & Maklan, 2011).

SC resilience was conceptualized on four principles (Christopher & Peck, 2004; Wilding, 2013). *1-SC reengineering:* refers to redesigning the SC by incorporating risk management for achieving resilience (Scholten et al., 2014). SC reengineering incorporates flexibility and redundancy. The significance of flexibility has been established with SC resilience (Yang & Yang, 2010). Whereas, redundancy has also been associated with resilience, by maintaining safety stock, surplus capacity, multiple suppliers and backups (Sodhi & Lee, 2007). *2-Collaboration*: has been considered as an important enabler of SC resilience (Soni et al., 2014). SC collaboration can enhance resilience through visibility, velocity and flexibility (Scholten et al., 2015). *3-Agility:* is the predictor of SC resilience (Carvalho & Cruz-Machado, 2011) and is ranked as a top enabler of SC resilience (Soni et al., 2014). *4-Corporate culture*: has the ability to strengthen the resilient SC (Christopher & Peck, 2004).

The SC resilience literature proposed a large number of drivers/enablers for building resilience for instance contingency planning, collaborative planning, dual sourcing or backup suppliers; SC technologies and information systems, SC visibility, redundancy, supplier development, innovation, knowledge management, empowerment, employee trainings, block-chain technologies, big data analytics (Ali & Gölgeci, 2019; Kamalahmadi & Parast, 2016; Kochan & Nowicki, 2018). Although, the current literature explicitly focuses on building and enhancing SC resilience (Karmaker et al., 2021) however the behavioral aspects of SC mangers were overlooked (Ali & Gölgeci, 2019; Pettit et al., 2019; Sawyerr & Harrison, 2020). After all, the resilient capability of the SC is determined by the expertise and capabilities of SC managerial leaders.

2.2. Leadership and Resilient Supply Chain

Leadership is a process of influencing individuals or groups for the attainment of stated objectives (Northouse, 2006). Accordingly, leadership has the potential to convert

challenges into opportunities (Warrick, 2017) and SC disruption is the most challenging task for SC mangers to deal (Remko, 2020). Leadership contributes up to 90 percent to the successful navigation for change (Kotter, 2007). Meanwhile, Ambulkar et al. (2015) referred SC resilience as 'the capability of the firm to be alert to, adapt to, and quickly respond to changes brought by a SC disruption'. SC resilience allows the firms to aligns their processes quickly according to the nature of SC disruption in order to ensure the uninterrupted flow of SC. A compatible leadership behavior of SC manager can proactively navigate the desired changes at operational level and SC level to minimize the impact of disruptions by making SC more resilient. Leadership ensures the alignment and understanding of change (Sarros & Santora, 2001) and resilient SC permits the firms to anticipate, adopt and quickly respond to SC disruptions (Blackhurst et al., 2005). Thus, compatible leadership style of SC managers can make SC more resilient by aligning, anticipating and responding to change. Consequently, leadership capabilities have been associated with SC resilience (Fiksel et al., 2015) as leadership drives departmental coordination and SC collaboration (Lago, & Verma, 2017). Moreover, Leadership has been categorized as a single most critical factor to the success or failure of any organization (Bass, 1990; Chatman & O'Reilly, 2016) as the root cause of most organizational problems is its culture and leadership (Quinn & Cameron, 2019). Building SC resilience is not a one-time thing, rather it is an ongoing process (Pettit et al., 2013). Thus, a compatible leadership style of SC managers can promote the resilient SC. In lines with it, Frederico et al. (2019) suggested that the leadership expertise are required to understand the complications of SC. Therefore, in this study we are investigating the significance of TFL and TRL with resilient SC.

2.3. Transformational Leadership and Resilient Supply Chain

Transformational leadership (TFL) was defined as "a style of leadership that transforms followers to rise above their self-interest by altering their morale, ideals, interests, and values, motivating them to perform better than initially expected" (Pieterse et al., 2009). TFL has been considered as the most effective leadership style due to its tendency to foster creativity and promotes a collaborative work environment (Le & Lei, 2019). Organizations have to embrace change to retain its competitiveness in an ever changing environment (Al-Haddad & Kotnour, 2015). Whereas, SC resilience is about responding to the dynamics of external environment by building survival capabilities to minimize the impact of disruptions (Ozdemir et al., 2022). The TFL has the relevant capabilities to endorse creativity and promotes collaboration amongst employees so, they can effectively deal with SC disruptions in an effective manner for building resilient capabilities of the SC. The existing literature empirically proves that the reaction of employees plays a critical role in change adoption (Bouckenooghe, 2010; Herscovitch & Meyer, 2002). Meanwhile, TFL has been identified as a strong enabler of change implementation and a critical predictor of employee's positive response to change (Bommer et al., 2005). Every disruption event is unique in nature, which requires a change adoptive behavior of employees. Moreover, in the context of SC resilience, employees learning and development contributors to minimizing the impact of disruptions and ensures a fast recovery (Sawyerr & Harrison, 2020). Similarly, the motivational perspective of TFL continually engages their

subordinates in ongoing learning and endorses a learning behaviour (Harvey et al., 2019). The learning from past disruptions can make employees more knowledgeable and it can contribute to minimizing the impact of future disruptive events. Since, employees who fail to learn are less effective (Bell et al., 2012) and organizations suffer when their employees do not learn (Wiese & Burke, 2019). SC disruption creates unique problems for SC managerial leaders (Scholten et al., 2020) and to deal with these unique problems, unique solutions are required. The subordinates of TFL are proactively prepared to deal with unique problems. Therefore, SC managers with the TFL style can more effectively control the impact of SC disruptions and they can also ensure the quick restoration of the SC after being disrupted. TFL encourages their subordinates to adopt and apply innovative tactics for problem resolution (Chi & Huang, 2014). Consequently, TFL enables employee empowerment, makes them creative and endorses learning and development, which can contribute to improve SC resilient. Meanwhile, Phung et al. (2022) empirically proved the significant positive influence of TFL on SC collaboration and risk management. Hence, TFL style of SC managers have the expertise to build and strengthen the resilient SC. Thus, the above discussions permit us to create the following hypothesis:

➢ **H₁:** Transformational leadership has a significant positive impact on resilient supply chain.

2.4. Transactional Leadership and Resilient Supply Chain

Transactional leadership (TRL) is the exchange of work and reward. Transactional leaders provide clear guidelines to employees about expectations and on meeting these expectations, employees will be rewarded (Walumbwa et al., 2008). TRL assigns the responsibilities to subordinates and outlines rewards for the attainment of goals (Bass, 1985). TRL promotes the desired behavior and eradicates undesirable behavior of subordinates, by giving rewards and penalties (Bass & Bass, 2008). Since, contingent reward is a core source of inspiration for employees (Raziq et al., 2018). Therefore, TRL are more capable to motivate their followers (Deichmann & Stam, 2015). SC resilience literature confirms that the high duration disruptions are more harmful as they can effect SC performance drastically, so the immediate recovery is essential (Dolgui et al., 2018; Katsaliaki et al., 2021). SC disruptions create a challenging situation as diversified activities need to be performed by the employees in a limited time period in order to minimize the effect of disruption and a quick restoration of the SC to its previous condition is also required. Thus, the dependence on the work force has been increased during disruption confrontation phase. If employees have been rewarded fairly for their contributions during disruption, then the impact of disruption can be reduced and quick restoration of the SC can also be ensured. Consequently, the TRL style of SC managers can be more effective in motivating their team during disruptive event through contingent rewards. Transactional leaders enable employees learning, creativity and innovation (Gong et al., 2009; Jia et al., 2018; Ma & Jiang, 2018). Similarly, innovation allows organizations to build SC resilience (Ozdemir et al., 2022). TRL generates employee commitment which derives a feel of obligation to contribute more and employees reinforce their energies for

the accomplishment of challenging goals (Afshari & Gibson, 2016). Likewise, a stronger employee commitment is required for building a resilient SC (Sawyerr & Harrison, 2020). Similarly, TRL has an inherent ability to attain challenging objectives (Podsakoff et al., 2006; Tavanti, 2016) and building resilient SC is a challenging task (Sawyerr & Harrison, 2020). Therefore, TRL of SC managers has the potential to influence resilient SC and it can be a stronger predictor of resilient SC. Hence, the following hypyhosis is being consived.

> **H₂:** Transactional leadership has a significant positive impact on resilient supply chain.

2.5. Flexibility and Agile Supply Chain as Mediators

Flexibility is the ability of an enterprise to adapt to the changing requirements of its environment and stakeholders with minimum time and effort (Erol et al., 2010). Similarly, organizational flexibility is the internal competence, which allows organizations to withstand market requirements, without suffering from any dysfunctions (Shukla et al., 2019). Organizational flexibility contributes to building survival capacity by aligning internal processes according to market requirements. Accordingly, flexibility has been considered as a critical organizational success factor (Shukla & Sushil, 2022). It enable the organizations to better deal with market uncertainties (Sreedevi & Saranga, 2017; Umam & Sommanawat, 2019) and contributes to competitiveness (Kwak et al., 2018). The operational flexibility improves cost control (van der Rhee et al., 2009) and strengthens the effectiveness of organizational operations and SC (Kurniawan et al., 2017). The literature provides the evidences about the significance of operational flexibility with SC resilience, for instance flexible production facilities, flexible capacity, flexible transportation, flexible supply base and flexible labour can influence SC resilience (Pettit et al., 2013; Tang & Tomlin, 2008, 2009; Yang & Yang, 2010). Traditionally, flexibility was observed as the single predictor of SC resilience (Colicchia & Strozzi, 2012). Therefore, flexibility is an antecedent of SC resilience (Christopher & Peck, 2004; Scholten & Schilder, 2015; Sheffi & Rice, 2005). Flexibility creates SC resilience through prompt adaptability during turbulence (Christopher & Holweg, 2011). Thus, the significance of flexibility in the attainment of agile SC and resilient SC cannot be under estimated. Meanwhile, leadership and culture were considered as a driver of organizational flexibility (Anning-Dorson, 2021). Therefore, flexibility can be a mechanism which can strengthen the relationship between leadership styles and resilient SC. A compatible leadership style can be a predictor of flexibility and through the mechanism of flexibility SC resilience can be improved. Moreover, flexibility can be applied to both firm and SC level (Stevenson & Spring, 2007). However, in this study we consider organizational flexibility.

Agile SC is defined as 'the ability of the SC as a whole and its partners to rapidly align the network and its operations to the dynamic and turbulent requirements of the demand network' (Ismail & Sharifi, 2006). SC agility enables an organization to respond quickly and effectively to the volatility and uncertainty of the marketplace. Agile SC is considered as flexible response towards the changing needs of the customers, by matching demand and supply (Carvalho et al., 2012; Dubey et al., 2019; Gunasekaran et al., 2008). The prior

studies emphasized flexibility as a driver of agility (Chiang et al., 2012). Swafford et al. (2008) and Braunscheidel & Suresh (2009) clarifies that flexibility is the internal ability of an organization, whereas, agile SC focuses on both internal and external perspectives. Similarly, Carvalho et al. (2012) differentiated resilient SC and agile SC: The agile SC specifically focuses on quick response to changes in markets and customer requirements, whereas, resilient SC handles the SC disruption in order to retain SCs competitiveness. Additionally, Blome et al. (2013) have demonstrated that agile SC mediates supply/ demand side competence and operational performance of the firm. Similarly, Ahmed & Huma (2021) empirically proved that agile SC mediates market orientation and resilient SC. In lines with it, Aslam et al. (2020) provides evidence that agile SC positively influences the relationship of SC ambidexterity and resilient SC. Therefore, SC agility has been derived from flexibility (Swafford et al., 2006) and contributes in enhancing SC resilience (Ahmed & Huma, 2021; Aslam et al., 2020). Thus, the existing evidences indicate agile SC as a mechanism for enhancing resilient SC. Furthermore, leadership has been considered as an important enabler of agile SC (Piya et al., 2020). Hence, agile SC can be a mechanism which can strengthen the influence of leadership styles and resilient SC.

2.6. Transformational Leadership, Flexibility, Agile Supply Chain and Resilient Supply Chain

SC agility and SC resilience are the two most important attributes of the world class SCs (Gligor et al., 2015). Although, both are multidimensional and multidisciplinary concepts (Gligor et al., 2019) but agile SC with its inherent characteristics can contribute in building SC resilience (Aslam, Khan, et al., 2020). Thus, resilient SC can be strengthening by improving agile SC. Similarly, flexibility has been considered as a vital enabler of resilient and agile SC (Gligor et al., 2019). Likewise, resilient SC and agile SC can be influenced by improving flexibility. Thus, flexibility can contribute to improving agile SC and resilient SC can be strengthened by the influence of agile SC. Flexibility allows the organizations to review their strategies and practices, so they can be adoptive to change (Tamayo-Torres et al., 2010). Similarly, the organizational flexibility helps organizations to operate effectively in a dynamic environment (Ozdemir et al., 2022; Srinivasan & Swink, 2018). Whereas, TFL encourages their followers to adopt and apply innovative tactics for problem resolution (Chi & Huang, 2014), which promotes innovative capabilities of the employees (Lei et al., 2020). Through the innovative enforcement capability of TFL can strengthen the flexibility. Moreover, TFL can effectively implement change as they can gain positive response from their subordinates regarding change (Chou et al., 2013). Since, 'adoptive to change' has been considered as a fundamental characteristic of SC agility, as it was consistently highlighted in agile SC literature (Christopher & Jüttner, 2000; Gligor et al., 2019; Gligor et al., 2015; Huang et al., 2002; Lin et al., 2006). Similarly, transformational leaders often realize the need for change (Bass, 1999) and they created a shared vision which encourages employees to learn from their mistakes (Bass, 1995). The foresightedness attribute of TFL enforced learning behavior in subordinates, which can contribute to improved organizational flexibility.

Consequently, under the supervision of TFL, employees consider change in a healthy way and expecting a positive outcome (Groves, 2020). Moreover, the negative reaction of employees against changes can be eliminated and a positive attitude can be generated through TFL (Bayraktar & Jiménez, 2020; Peng et al., 2021). Therefore, TFL has the relevant capabilities to align employee's behaviors to better respond to change by building flexibility and improving agile SC. Hence, TFL style of the SC managers can endorse flexibility to enhance SC agility for the attainment of SC resilience. Thus, we can conceive the following hypotheses:

➢ **H₃:** Flexibility and agile supply chain sequentially mediates the relationship between transformational leadership and resilient supply chain.

2.7. Transactional Leadership, Flexibility, Agile Supply Chain and Resilient Supply Chain

Leadership has been considered as a key enabler of flexibility (Anning-Dorson, 2021), agile SC (Piya et al., 2020) and resilient SC (Kamalahmadi & Parast, 2016). SC managers with compatible leadership style can enhance flexibility and agile SC for the attainment of resilient SC. However, a particular leadership style that can inflence them is still unexplored. Whereas, the ultimate objective of both, SC resilience and SC agility, have to improve SC performance to gain and retain a dominant position in the global markets (Gligor et al., 2019). Although, the agile SC focuses on changes in customer requirement and resilient SC handles the SC disruptions in order to retain the SC (Carvalho et al., 2012). The current literature highlights SC agility as a mechanism by which SC resilience can be enhanced (Ahmed & Huma, 2021; Aslam et al., 2020). The existing literature also highlights the positive significant influence of decision flexibility, structural flexibility and proactive practices with resilient SC (Sawyerr & Harrison, 2020; Tukamuhabwa et al., 2015). Similarly, flexibility has been considered as a fundamental contributor to agile SC (li et al., 2008). Flexibility facilitates the organization to better deal with market uncertainties (Umam & Sommanawat, 2019). Thus, flexibility and agile SC can be a mechanism for improving resilient SC. Meanwhile, transactional leaders create employee commitment, which generates a feeling of obligation to contribute more and employees reinforce their energies to accomplish more challenging goals (Afshari & Gibson, 2016). Therefore, TRL can be more effective in uncertain conditions due to their expertise to influence employee's performance at desired level. After all, reward is the primary source of motivation for people to work (Russell, 2001) and TRL influences their employees through contingent rewards (Pieterse et al., 2009). Although, Zsidisin & Wagner (2010) suggested that SC managers can mitigate the impact of SC disruptions by building flexibility. However, developing flexibility in its self is a challenging task whereas, in this study we are suggesting that by adopting TRL style, SC managerial leaders can build flexibility. As, TRL has the ability to obtain results (Podsakoff et al., 2006) and it is more effective when immediate results are required (Birasnav et al., 2015). Furthermore, TRL is capable to enhance employee performance at a desired level (Masa'deh et al., 2016) by which they can attain challenging goals (Afshari & Gibson, 2016). Consequently, leaders with transactional style have significant positive impact on discretionary (flexible) behavior of employees, organizational commitment and proactive behavior of the subordinates (Breevaart et al., 2014; Chiaburu et al., 2014; Jackson et al., 2013). So, TRL

with a committed work force equipped with proactive and discretionary behavior can contribute to improving resilient SC through the influence of flexibility and agile SC. Accordingly, under the leadership of a transactional leader, employees experience high empowerment (Pieterse et al., 2009). Similarly, individual and team empowerment are the fundamental elements of flexible organizations (Englehardt & Simmons, 2002) and flexibility is a key driver of SC agility (Chiang et al., 2012). Moreover, the current literature suggests that fostering trust between SC partners can make SCs more agile (Vitasek, 2016). Whereas, TRL successfully builds trusts, dependability, and consistency among subordinates by fair and consistent honoring of the agreements (Bass, 1998). Hence, on behalf of the above arguments, we can conceive that the TRL style exhibited by SC managers can promote flexibility to influence SC agility and this mechanism can contribute in the attainment of SC resilience. Thus, we can generate the following hypothesis:

> **H₄:** Flexibility and agile supply chain sequentially mediates the relationship between transactional leadership and resilient supply chain.

2.8. Theoretical Framework

The resilient SC has been considered as a dependent variable in this study. Transformational and transactional leadership are two independent variables. Where, flexibility is the first mediating variable and agile SC is the second mediating variable. Figure 1 represents the theoretical framework of the study.
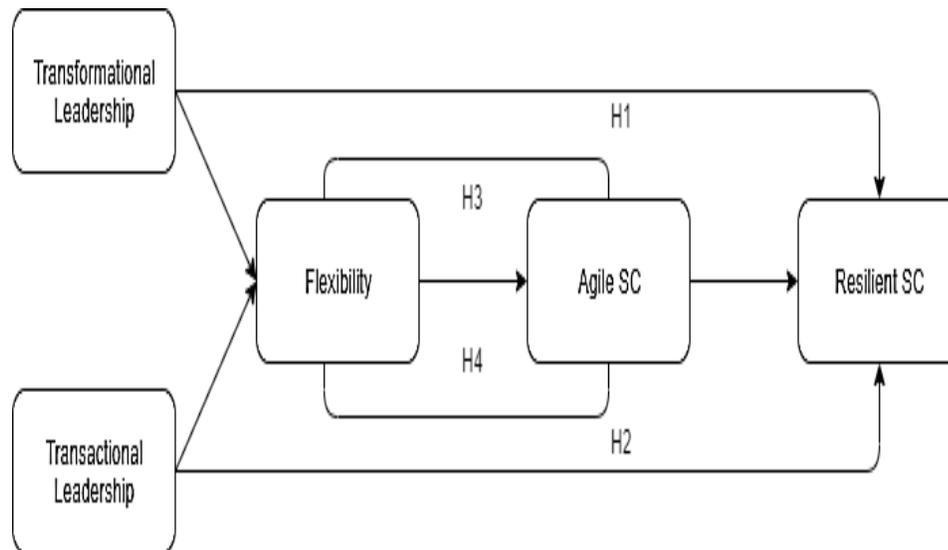
Figure 1: Theoretical Framework

3. Methodology

In this basic to applied research, variables are quantitatively measured by adopting deductive approach. As the study hypotheses is drawn from existing literature. So, we use

survey design to measure the significance of variables in this explanatory research. Moreover, prior studies in the domain of SC frequently uses the same approach (Blome et al., 2013; Eckstein et al., 2015). The further details of population, sampling and instrument are given below.

3.1. Population and Sampling Technique

The targeted population in this study is the SC professionals working in small and medium sized manufacturing enterprises of Pakistan. Since, SMEs are more vulnerable to SC disruptions (Pal et al., 2014). Moreover, 92% of SMEs in Pakistan have experienced SC disruptions during COVID-19 (SMEDA, 2021). Therefore, the proposed model is empirically tested on SMEs of Pakistan. According to SMEDA Pakistan, 5.2 million SMEs are currently operating in Pakistan. However, the details and total number of SMEs manufacturers is not available on any platform. The same problem was also highlighted by other researchers in same region (Aslam et al., 2020; Dubey et al., 2016; Ryan & Tipu, 2013). Therefore, we use convenience sampling technique instead of probability sampling because the sum of population is not available. Without a total number of the targeted population, a sampling frame cannot be generated as it is required for probability sampling. The literature also suggests that the convenience sampling technique is one of the most commonly used techniques if the targeted population is unknown (Acharya et al., 2013). Moreover, the same sampling technique was also adopted in prior researches in the same domain and same region (Ali et al., 2012; Aslam, Blome, et al., 2020; Malik & Kotabe, 2009; Russell, 2013). Therefore, 300 SMEs manufacturers were randomly targeted for the purpose of data collection.

The current literature and the council of SC professionals highlighted that; source, make and deliver are the most critical processes of SC in an organization (Huan et al., 2004; Macchion et al., 2018; Mccormack, 2004). Thus, 3 respondents from each 300 SMEs were targeted for data collection (300 x 3 = 900), as the unit of analysis in this study is SC professionals. 1st respondent belongs from the procurement department (source), 2nd respondent from the production department (make) and 3rd respondent is from distribution (deliver). The purpose of the adopted approach is to get the actual inside of SC and to avoid common method bias (CMB). A total of 900 questionnaires were physically distributed and 317 were received back. Meanwhile, the response rate is 35.22%.

3.2. Measures

The existing well-established measures have been adopted in this study. All the constructs were measured on a five-point Likert type scale, with anchors ranging from strongly disagree (1) to strongly agree (5) in order to ensure high statistical variability amongst survey responses (Chen et al., 2004). Further details of the measures are given in following section.

3.2.1 Transformational and Transactional Leadership

The two independent variables of our study. Transformational and transactional leadership was measured by using multifactor leadership questionnaire (MLQ), which was originally developed by Avolio et al. (1999). TFL was conceptualized with 20 items and TRL with16

items for instance 'Proud of him' and 'clarifies rewards'. The Cronbach's alpha values were 0.86 and 0.84.

3.2.2 Flexibility

The four items of flexibility were adopted (Gligor et al., 2013; Jüttner & Maklan, 2011). The sample item is 'our firm allocates resources for production based on market change'. Flexibility is considered as a first mediator in this study with the Cronbach's alpha value of 0.72.

3.2.3 Agile Supply Chain

The measure of agile SC with 5 items developed by Blome et al. (2013) has been used in our research. The example item includes 'reacting to new market developments quickly'. Agile SC is the second mediating variable of the study. The calculated alpha value was 0.79.

3.2.4 Resilient Supply Chain

The measure of Ambulkar et al. (2015) with 4 items has been adopted to measure resilient SC. In our study, resilient SC is the dependent variable. The sample item which belongs to resilient SC is 'we are able to cope with changes brought by the supply chain disruption'. The calculated alpha value of this construct was 0.87.

3.3. Study Constructs

The five constructs of this study have been adopted from existing literature to formulate the reflective model. All of these constructs are already operationalized as reflective constructs. For instance, Gligor et al. (2013) and (Ambulkar et al., 2015) operationalized agile SC and resilient SC as reflective constructs. Moreover, we follow the three empirical considerations for assessing the reflective model as suggested by Coltman et al. (2008). 1- the alpha values, AVE and CFA shows the high internal consistency and it represents the items inter-correlation (see table 2, 3 and 4). 2- the relationship of the items with their constructs as represented in table 4 shows that the items related to their latent variable converge with each other and deviate from the items of other latent variables. 3- the indices values of one factor model (see table 3) in which we combine all the items into one variable, illustrates poor fitness of the model. Similarly, the values of multi-collinearity test (VIF) are also within the acceptable threshold. Thus, the three empirical considerations indicate that the study constructs are reflective in nature.

3.4. Data Analysis Procedure

We used covariance-based SEM method for analysing the psychometric properties of the measurement model and PROCESS Macros has been used to analyse the structural model. CB-SEM is the most frequently applied data analysis technique in management research (Williams et al., 2009). It is a persuasive data analysis method and mostly used with reflective constructs for estimating common factors to assess the causal relationships (Zhang et al., 2021). CB-SEM has multiple appealing features as compared with other data analytical methods. For instance, it provides a holistic solution for several multivariate

techniques, such as CFA, path analysis and regression analysis (Cheung, 2015). Moreover, CB-SEM provides more accurate estimates of the psychometric properties (Cheung & Lau, 2008). Although, PLS-SEM is also an effective method for CFA (Hair et al., 2020) but Schuberth (2021) has some concerns regarding the effective of CFA with PLS-SEM. Thus, we used CB-SEM method for analyzing the psychometric properties of the measurement model.

3.5. Confirmatory Factor Analysis

To ensure the validity of the instrument, Confirmatory Factor Analysis (CFA) is being used in this current study, as suggested by Fornell & Larcker (1981). The alternative models have been developed along with the study measurement model to examine fit indices. All of the five latent variables and their indicators has been placed to correlate with each other. The results of the five-factor model indicate that the proposed model is a good fit $p<0.001$ as listed in table 1. The values specify the incremental fitness of the study model for instance, CFI, TLI and IFI has to be >0.90 and the analysis shows that the CFI=0.909, TLI= 0.904 and IFI=0.910 (Hu & Bentler, 1995, 1999; Kline, 2015). Similarly, absolute fitness measures also indicate that the values of the model are above the required threshold level, for instance the value of RMSEA<0.08 (Kline, 2015) and the analysis shows that the value of RMSEA=0.048. The value of CMIN/DF=1.273 and it has to be CMIN/DF<5 and the value of RMR<0.08 has been considered generally a good fit. Whereas, the current model value of RMR=0.048 (Hu & Bentler, 1999). Table 1 shows that when we move from five factor model towards one factor model, the substantial variation in the indices values were detected. Hence, the indices values in comparison with alternate nested models satisfied the required criteria for the fitness of the proposed mode.

Table 1: Confirmatory Factor Analysis

	CFI	TLI	IFI	CMIN/DF	RMR	RMSEA
Five Factor Model	0.909	0.904	0.910	1.273	0.048	0.029
Four Factor Model	0.786	0.776	0.789	1.636	0.034	0.045
Three Factor Model	0.757	0.747	0.761	1.719	0.035	0.048
Two Factor Model	0.737	0.727	0.741	1.775	0.036	0.050
One Factor Model	0.734	0.724	0.737	1.784	0.036	0.050

Note: Five factor model: all variables individually. Four Factor model: indicators of transformational and transactional leadership combined in one factor. Three factor model: transformational and transactional leadership are merged with agile. Two factor model is generated by combing resilient SC with flexibility. One factor model: all items are combined in one variable.

3.5. Common Method Bias

Specific initiatives have been taken in this study to avoid common method bias (CMB). *Firstly,* split survey method with two-wave (2 weeks' interval) time-lagged design has been incorporated by following the guidelines of Conway & Lance (2010) and Podsakoff et al.

(2003). At time-1 (T1), we collected the data of independent variables and after the interval of 14 days, at time-2 (T2), the data of remaining variables have been collected. Moreover, we also assured the anonymity of respondents by not asking for their names, contact numbers and organizational identity.

Secondly, we also used statistical techniques to identify CMB. For instance, Harman's single-factor test has been used to identify CMB. The results indicated that maximum variance explained by a single factor is 20.29%<50%. Hence, there is no threat of CMB in this study. The collinearity test was also conducted on all five variables of the model. The test result indicates that the variance inflation factors (VIF) of all the study variables were <10 (O'brien, 2007). Therefore, we can confidently claim that CMB is not an issue in this study.

4. Data Analysis

This section represents the analysis of the data and results. In this study we use three software's for data analysis. Descriptive analysis was conducted through SPSS-26. To analyze the reliability and validity of the constructs, we used AMOS structural equation modelling (SEM) and study hypotheses were tested through PROCESS Macros.

4.1. Assessment of Psychometric Properties

The constant variance, existence of outliers and normality has been tested to qualify the assumptions before analyzing the reliability and validity of the measurement items. Moreover, multi-collinearity was not an issue in this study as variance inflation factors (VIF) of this study are in between 1.59 and 2.4, which is far less than the recommended threshold of 10.0. The Tolerance>0.1 and in this study it is in between 0.416 and 0.627. Therefore, the assumption of multi-collinearity is adequately qualified as suggested by Hair et al. (1995).

4.1.1 Means, Standard Deviation and Correlations

Internal consistency needs to be computed in order to confirm the reliability of the questionnaire. As suggested by Nunnally & Bernstein (1994) and Bland & Altman (1997) Cronbach alpha has to be calculated to measure the reliability of the instrument. The alpha value has to be >0.70, which has been considered as a threshold value (Fornell & Larcker, 1981; Hair et al., 2010). Our study successfully qualified this assumption as the Cronbach's alpha value of all of the five study variables are >0.70 (see table 2). The mean and standard deviation of TFL=3.19(0.40), TRL=3.12(0.37), SC resilience=3.08(0.49), agile SC=2.89(0.49) and flexibility=3.22(0.48). Therefore, the standards of reliability have been qualified as indicated in table 2. Before testing the study hypothesis, we analyze Pearson correlation amongst study variables and p-value. The analysis highlighted the existence of correlation between all of the study variables. For instance, TFL is positively related with resilient SC, agile SC and flexibility (r=0.617, p<0.01), (r=0.574, p<0.01) and (r=0.518, p<0.01). Same is the case with TRL as it is also correlated with resilient SC, agile SC and flexibility (r=0.599, p<0.01), (r=0.513, p<0.01) and (r=0.416, p<0.01). Similarly, flexibility and agile SC are also related with resilient SC (r=0.587, p<0.01) and (r=0.622, p<0.01). Moreover, flexibility also has an impact on agile SC (r=0.433, p<0.01), details

are given in table 2. The overall results of the correlation analysis proved the positive relationship amongst all of the five study variables. Therefore, the positive significant correlation between study variables provide initial support to test the study hypothesis by using PROCESS Macros (Hayes & Preacher, 2014).

Table 2: Means, Standard Deviation and Correlations

	Variables	Mean	SD	1	2	3	4	5
1	Transformational Leadership	3.19	.40	(0.86)				
2	Transactional leadership	3.12	.37	.385**	(0.84)			
3	Resilient SC	3.08	.49	.617**	.599**	(0.70)		
4	Agile SC	2.89	.49	.574**	.513**	.622**	(0.79)	
5	Flexibility	3.22	.48	.518**	.416**	.587**	.433**	(0.72)

**. Correlation is significant at the 0.01 level (2-tailed).

4.1.2. Convergent and Discriminant Validity

The overall reliability and validity of the construct was assessed by using AMOS-SEM. Convergent validity explained the intimacy of indicators with latent variable and discriminant validity represents the deviation from each other (Cable & DeRue, 2002). In this study we evaluated the convergent validity of the measured model and discriminant validity of the structural model. Fornell & Larcker (1981) suggested method is being adopted to evaluate convergent and discriminant validity. The literature suggested that the values of composite reliability has to be >0.70 and average variance extracted (AVE) must be >0.50 (Santos & Cirillo, 2021; Farrell, 2010). The results (see table 3) indicate that the composite reliability (CR) and average variance extracted (AVE) of all the five latent variables are CR>0.7 and AVE>0.5. Thus, the study qualified the assumption of convergent validity. Similarly, the results of discriminant validity highlights that the square root of AVE> inter-construct correlations. As suggested by Fornell & Larcker (1981) the value of square root of AVE has to be > inter-construct correlations. Table 3 represents that the TFL (0.714), TRL (0.718), SCR (0.710), ASC (0.709) and FX (0.739) all are greater than the inter-construct correlations. Whereas, the maximum shared variance (MSV) of all the five study variables are < AVE. Therefore, the results indicate the existence of convergent validity as all the indicators of each latent variable collectively represents their latent variable and all the latent variables are discriminating from each other. Hence, the study successfully fulfills the requirements of convergent and discriminant validity.

Table 3: Reliability and Validity of the Constructs

		Convergent Validity			Discriminant Validity				
	Constructs	**CR**	**AVE**	**MSV**	**1**	**2**	**3**	**4**	**5**
1	TFL	0.953	0.510	0.380	**(0.714)**				
2	TRL	0.944	0.515	0.358	.385	**(0.718)**			
3	SCR	0.800	0.505	0.456	.617	.599	**(0.710)**		
4	ASC	0.834	0.503	0.390	.574	.513	.622	**(0.709)**	
5	FX	0.783	0.546	0.344	.518	.416	.587	.433	**(0.739)**

Note: The bold values in diagonal are the square root of AVE. TFL-Transformational leadership, TRL-Transactional leadership, SCR-supply chain resilience, ASC- Agile supply chain and FX- Flexibility.

4.2. Hypotheses Testing

4.2.1 Direct Path Analysis

The direct path analysis signifies the relationship between endogenous variables and exogenous variables (Gupta & Somers, 1996). We use PROCESS Macros by Hayes & Preacher (2014) with 5000 bootstrapping to test the path significance. The results in table 4 indicate the significance between endogenous and exogenous variables. Transformational leadership has a significant impact on resilient SC (β=0.318, P<0.05) with 95% CI (0.201, 0.434) in support of H1. Transactional leadership has an influence on resilient SC (β=0.386, P<0.05) with 95% CI (0.271, 0.500) thus, H2 is supported. Moreover, the lower limit of confidence intervals (LLCI) and the upper limit of confidence intervals (ULCI) of both two direct path coefficients does not contain zero, which explains the positive relationship (Hair et al., 2017; Hayes et al., 2017). Therefore, transactional leadership has the highest β=0.386, which is said to be a dominant predictor of resilient SC as compared with transformational leadership in SMEs manufacturing industry of Pakistan.

Table 4: The Direct Path Analysis

	Path Coefficient	BC (95% CI)	
Direct Effects		**LLCI**	**ULCI**
Transformational Leadership → Resilient SC	0.318***	0.201	0.434
Transactional Leadership → Resilient SC	0.386***	0.271	0.500
Flexibility → Resilient SC	0.303***	0.214	0.392
Agile SC → Resilient SC	0.335***	0.243	0.426

Note: N=317

4.2.2 Indirect Path Analysis

Mediation is the mechanism by which exogenous variable(s) influence endogenous variable(s). The results of the indirect effect are illustrated in table 5. The results reveal that the flexibility mediates the relationship between transformational leadership and resilient SC ($\beta=0.187$, P<0.05) with 95% CI (0.125, 0.264). Moreover, flexibility also mediates the influence of transactional leadership and resilient SC ($\beta=0.174$, P<0.05) with 95% CI (0.117, 0.255). However, the results reveal very interesting findings such as, when flexibility takes place as mediator than transformational leadership becomes more effective predictor of resilient SC. Similarly, Agile SC mediates the relationship amongst transformational leadership and resilient SC ($\beta=0.194$, P<0.05) by 95% CI (0.115, 0.286). The results also proved the significant mediation of agile SC between transactional leadership and resilient SC ($\beta=0.175$, P<0.05) through 95% CI (0.094, 0.285).

Table 5: The Mediating Effects

	Path Coefficient	BC (95%)	
Indirect Effects		**LLCI**	**ULCI**
Transformational Leadership → Flexibility → Resilient SC	0.187***	0.125	0.264
Transformational Leadership → Agile SC → Resilient SC	0.194***	0.115	0.286
Transactional Leadership → Flexibility → Resilient SC	0.174***	0.117	0.255
Transactional Leadership → Agile SC → Resilient SC	0.175***	0.094	0.285

Note: N=317, bootstrap 5000, 95% confidence intervals

4.2.3. Sequential Mediation Analysis

The sequential mediation analysis has been used to determine the collective impact of individual mediator while dealing with complex relationships (Zhang et al., 2016). We practice sequential mediation in this study to determine the collective impact of flexibility and agile SC, as mediators on leadership styles and resilient SC. The PROCESS model number 6 with 5000 bootstrapping and 95% of confidence interval have been applied to test the path significance. Moreover, the direct effect has been calculated by multiplying path (a), path (b) and path (c). Where, path-a: independent variable to dependent variable, path-b: first mediator to dependent variable and path-c: second mediator to dependent variable. The sequential mediation in this study has been conducted in two different path models. Table 6 represents the models summaries, both models have been found statistically significant with P-value<0.001 and mean squared error (MSE) of both models are between 0.1125 to 0.1276, which is >0.

Table 6: Model's Summaries

	Models Summery	R	R²	MSE	P-value
1	TFL→ FX → ASC →RSC	0.7430	0.5521	0.1087	0.000
2	TRL→ FX → ASC →RSC	0.7559	0.5713	0.1040	0.000

Note1: TFL-Transformational leadership, TRL- Transactional leadership, FX-Flexibility, ASC-Agile SC, RSC-Resilient SC.
Note 2: N=317, PROCESS model number 6, 5000 bootstrap, 95% of confidence intervals.

The study investigates the sequential mediating impact of flexibility and agile SC on the relationship between transformational leadership and resilient SC. The results shown a significant indirect effect of transformational leadership on resilient SC (β=0.0390, t=5.3522), supported H_3. Furthermore, the direct effect of transformational leadership on resilient SC in presence of the mediators was also found significant (β=0.0323, P<0.001). The 55.21% of the change in resilient SC (R^2=0.5521) is generated by transformational leadership, flexibility and agile SC. Hence, flexibility and agile SC partially mediated the relationship between transformational leadership and resilient SC. Sequential mediation analysis summery of model 1 is presented in table 7.

Table 7: Model 1 Sequential Mediation Analysis

Relationship	Total Effect	Direct Effect	Indirect Effect	Confidence Interval		t-statistic	Conclusion
				Lower Bound	Upper Bound		
TFL→ FX → ASC →RSC	0.0713	0.0323	0.0390	0.0162	0.0733	5.3522	Partial Mediation
P-value	(0.000)	(0.000)					

Note1: TFL-Transformational leadership, TRL- Transactional leadership, FX-Flexibility, ASC-Agile SC, RSC-Resilient SC.
Note 2: N=317, PROCESS model number 6, 5000 bootstrap, 95% of confidence intervals.

The study explores the sequential mediating impact of flexibility and agile SC on the relationship between transactional leadership and resilient SC. The results shown a significant indirect effect of transactional leadership on resilient SC (β=0.0481, t=6.6318), supporting H_4. Moreover, the direct effect of transactional leadership on resilient SC in presence of the mediators was also found significant (β=0.0391, P<0.001). The 57.13% of the change in resilient SC (R^2=0.5713) is represented by transactional leadership, flexibility and agile SC. Thus, flexibility and agile SC partially mediated the relationship between transactional leadership and resilient SC. Table 7 illustrates the sequential mediation analysis summery of model 2. All four study hypotheses have been supported; further discussions of the analysis are presented in next section of the study.

Table 8: Model 2 Sequential Mediation Analysis

Relationship	Total Effect	Direct Effect	Indirect Effect	Confidence Interval		t-statistics	Conclusion
				Lower Bound	Upper Bound		
TRL→ FX → ASC →RSC	0.0872	0.0391	0.0481	0.0233	0.0871	6.6318	Partial Mediation
P-value	(0.000)	(0.000)					

Note1: TFL-Transformational leadership, TRL- Transactional leadership, FX-Flexibility, ASC-Agile SC, RSC-Resilient SC.

Note 2: N=317, PROCESS model number 6, 5000 bootstrap, 95% of confidence intervals.

5. Results and Discussions

In lines with prior studies (Anning-Dorson, 2021; Kamalahmadi & Parast, 2016; Piya et al., 2020), leadership can influence flexibility, agile SC and resilient SC. However, the current novel study extends the scope of prior findings by empirically exploring that the SC managerial leaders can improve resilient SC by the adoption of both TFL and TRL styles. TFL and TRL have been identified as the predictors of resilient SC. Although, leadership was identified as an enabler resilient SC (Kochan & Nowicki, 2018) but a particular leadership style which can inlfuence resilient SC was unexplored in pervious literature. The results demonstrate that TRL is the most effective leadership style of SC managerial leaders due to its stronger positive significant influence on resilient SC as compared with TFL. Up till now, TFL was considered as the most effective leadership style (Le & Lei, 2019) however this is not in the case of SMEs manufacturing enterprises of Pakistan. The results of the study not only proved the direct positive impact of TRL on resilient SC but the indirect impact also shows the positive results. The indirect impact is generated through the sequential mediation of flexibility and agile SC. The flexibility and agile SC have also been proved as the mechanism which can strengthen the influence of TRL and TFL on the resilient SC. The results indicate that the TRL has more strong influence on resilient SC in the presence of flexibility and agile SC as compared with TFL. Since, these relationships were not previously tested. In lines with Birasnav et al. (2015) TRL is more effective in emergency situations, where immediate results are required. The prior studies (Podsakoff et al., 2006; Tavanti, 2016) also suggested that the TRL has the capability to attain challenge goals and our study also reveals that the SC mangers can more strongly influence resilient SC through the sequential mediation of flexibility and agile SC. Similarly, the existing literature also indicates that TRL is capable to enhance employee performance at a desired level (Masa'deh et al., 2016) and it helps them to attain challenging goals (Afshari & Gibson, 2016). Accordingly, building resilient SC is one of the most challenging task and TRL has the capability to strengthen the resilient SC by improving flexibility and agile SC. TRL influences their employees through contingent rewards (Pieterse et al., 2009) as financial rewards is one of the core source of motivation for employees (Russell, 2001). Specifically, for the individuals working in Pakistan, as this

country has experienced higher inflation rate, lower GDP and per capital income. Therefore, it is not surprising that TRL has the dominant ability to improve the resilient SC.

The prior study of Abbas & Ali (2021) also compared the influence of TFL with TRL and they found TFL as strongest predictor of project success as compared with TRL. Another comparison was conducted by Chua et al. (2022) in which they also revealed the effectiveness of TFL for improving creativity in contrast with TRL. The findings of this study suggest that TFL is also an effective leadership style which can influence flexibility and agile SC towards the attainment of resilient SC. The prior researches also indicate that TFL has been identified as a strong enabler of change implementation and a critical predictor of employee's positive response to change (Bommer et al., 2005; Chou et al., 2013). TFL endorses employee leaning (Harvey et al., 2019) and encourages their subordinates to adopt and apply innovative tactics for problem resolution (Chi & Huang, 2014). Thus, transformational leaders are capability to promote learning and innovative behavior of their subordinates, which contributes to improve overall organization flexibility and agile SC is strengthen by improving flexibility which ultimately influence resilient SC. Similarly, the findings of Phung et al. (2022) shown that the TFL can influence SC integration and SC risk management practices in the manufacturing firms of Vietnam. Whereas, our study also illustrates the consistent results regarding the influence of TFL but TRL has been found as a strongest predictor of resilient SC. In lines with our results, Young et al. (2021) relates TRL as a double-edged sword due to their ability to improve task and contextual performance of their subordinates. Similarly, our findings regarding the effectiveness of TRL has also been validated by Abdelwahed et al. (2022) as they proved that TRL has the capability to improve employee performance in SMEs of Pakistan. Although, TFL has been considered as the most popular leadership style and TRL fails to gain research attention (Prabhu & Srivastava, 2022). However, this study empirically proved the effectiveness of TRL towards the attainment of resilient SC in SEMs manufacturing enterprises of Pakistan.

The results of our study demonstrate the positive significant influence of flexibility with resilient SC and it validates the findings of Christopher & Peck (2004). The positive influence of flexibility on agile SC has also proved in this study and it is consistent with prior studies (Chiang et al., 2012; Swafford et al., 2006). In lines with prior studies of Ahmed & Huma (2021) and Aslam et al. (2020), results of this study also validates that agile SC can influence resilient SC. Thus, the findings of our study indicates that flexibility is the first step towards building SC resilience, as flexibility significantly contributes in building agile SC, and resilient SC has been strengthened by improving agile SC. Thus, SC mangers can adopt TFL style for building resilient SC through the mediation of flexibility and agile SC. However, the empirical investigation demonstrated that TRL style of SC mangers is the most effective leadership style in pursuit of resilient SC through the sequential mediation of flexibility and agile SC. Although, prior studies proposed capital intensive solutions for improving resilient SC. For instance, Irfan et al. (2022) suggested digital technologies for improving resilient SC and Ambrogio et al. (2022) proposed industry 4.0 technologies for building resilient SC. The generalizability of these studies in

the context of SMEs manufacturing sector could be an issue because SMEs have limited financial resources and these capital intensive technological centric investments may be not feasible for them. Moreover, most of the SC studies have been conducted in the context of large manufacturing sector of the developed countries. The emerging economies and SMEs were mostly ignored in SC and leadership studies, these issue have also been highlighted by Prabhu & Srivastava (2022). Similarly, the literature indicates that behavioral aspect of SC mangers in dealing with SC disruptions needs to be investigated (Remko, 2020; Sawyerr & Harrison, 2020; Scholten et al., 2020). Thus, this study addresses these gaps and suggested that SC managers of SMEs can improve resilient SC by the adoption of TRL style through the mechanism of flexibility and agile SC. Moreover, Jacobsen et al. (2022) empirically proved that TFL and TRL styles can endorsed and improved through trainings. Additionally, the proposed mechanism in this study provides an opportunity for the SC managerial leaders of SMEs manufacturing enterprises to efficiently pursue contemporary business, by building resilient SC without additional financial investments. Hence, all the study objectives have been achieved.

5.1. Practical Implications

The compatible and distinctive leadership style can successfully drive the SC (Barratt, 2004) as leaders can convert difficulties into opportunities (Warrick, 2017). Whereas, SC disruption is the most difficult and stressful situation for SC mangers (Dolgui et al., 2018). The internal competences permit the organizations to effectively deal with external complications. COVID-19 generated an opportunity for SC managers to move forward and strengthen the resilient capabilities of their SC, thus they can effectively deal with future crisis (Remko, 2020). Although, SC managers are mostly aware about the drastic impact of SC disruptions and the significance of a resilient SC (Scholten et al., 2020), therefore, the behavioral aspects of the SC managers needs to be explored (Pettit et al., 2019; Sawyerr & Harrison, 2020).

Since, leadership has been considered as a critical driver of resilient SC (Kamalahmadi & Parast, 2016; Kochan & Nowicki, 2018). Meanwhile, the current study empirically proves the significant positive impact of TRL on resilient SC. Therefore, we suggest that SC managers have to adopt the TRL style to improve the resilient capabilities of the SC. Moreover, the results also reveal that flexibility and agile SC is the mechanism which strengthens the influence of TRL on resilient SC. This pathway not only contributes in strengthening the resilient SC but also improves the flexibility along with an agile SC. Hence, the results recommend that SC mangers have to exhibit TRL style to retrieve the benefits of flexibility and agile SC in pursuit of a more resilient SC. Additionally, the other complementary mechanisms for improving SC resilience were also revealed in this research. For instance, SC managers can also improve SC resilience by the adoption of TFL style as TFL can significantly improve resilience SC by the mediating impact of flexibility.

SMEs are more vulnerable to disruptions because of their limited financial resources (Pal et al., 2014). The proposed mechanism in this study provides an opportunity for the SC managerial leaders of SMEs manufacturing enterprises to efficiently pursue contemporary business without additional financial investments. Building and improving SC resilience is not a mechanistic process (Ali & Gölgeci, 2019), rather it also depends on the compatibility

of the leadership style. The resource constrained organizations like SMEs can improve SC resilience with existing resources by adopting the recommended mechanism. Although, TRL style is critical for the attainment of SC resilience however leadership is a skill set and it can be taught (Miner, 2006) to SC mangers through trainings without much investment. Such a mechanism creates the avenue for enterprises to meet the challenges as they can be able to align strategies and leadership styles for the improvement of a more resilient SC.

5.2. Theoretical Contributions

This novel study provides multiple theoretical contributions. Firstly, this study is the first to empirical test the significance of TFL and TRL with resilient SC, as these relationships were not previously tested. Secondly, our study is the first to empirically investigate the sequential mediating role of flexibility and agile SC in link between leadership styles (TFL and TRL) and resilient SC. In the best of researcher's knowledge, these relationships were not investigated in prior researches. Thirdly, this study is the first to empirically explore the most effective leadership style of SC managerial leaders, which can strengthen the resilient capabilities of the SC. Fourthly, in this study we proposed a cost-effective mechanism to SMEs for improving SC resilience. Therefore, this study provides vital theoretical contributions by addressing the gaps highlighted in literature.

The existing literature proved that leadership is a critical driver of resilient SC (Kamalahmadi & Parast, 2016; Kochan & Nowicki, 2018) and we contribute by developing further understanding that TRL is the most effective leadership style for enhancing SC resilience. Similarly, the literature indicates that behavioral aspect of SC mangers in dealing with SC disruptions needs to be investigated (Remko, 2020; Sawyerr & Harrison, 2020; Scholten et al., 2020). This need was also addressed by this research. Moreover, the literature emphasized to conduct empirical studies on how SMEs can improve SC resilience, as little work was done in this domain (Ali & Gölgeci, 2019; Kamalahmadi & Parast, 2016; Pal et al., 2014). Similarly, our study contributes by proposing a mechanism to SMEs which can strengthen SC resilience. Additionally, our results also proved that flexibility contributes to agile SC, and this contribution influences resilient SC. Although, prior researches already proved the significance of flexibility with agile SC (Swafford et al., 2006), flexibility with resilient SC (Christopher & Peck, 2004), and agile SC with resilient SC (Aslam et al., 2020). Whereas, the results of this study prove the significance amongst flexibility, agile SC and resilient SC in a sequential manner. Thus, this study provides the vital theoretical contributions to existing body of knowledge.

5.3. Limitations and Future Directions

The domain of resilient SC research is broader in scope and complicated in nature, therefore, our study has its own limitations. The leadership styles are not the only predictors of resilient SC. Other factors also significantly contributes to influence resilient SC for instance: SC collaboration (Soni et al., 2014), SC reengineering (Scholten et al., 2014), corporate culture (Sheffi, 2005), technical abilities (Kumar & Rahman, 2016). Nevertheless, this study was quantitative in nature therefore the respondents have to choose their opinion only from given options. Moreover, this study also has contextual and cultural

limitations because the targeted population in this study was the SME manufacturers of Pakistan. Consequently, the findings of this study cannot be applied to the service sector. Pakistan is a developing country with weak economic conditions. Thus, generalizability of this study could be an issue. Even though, SC failures is a major issue of developing countries (Tukamuhabwa et al., 2015) however the organizations operating in developed countries also face this challenge.

Diversified future research directions have been generated through this study, for instance, different leadership styles (e.g., authentic and servant leadership) can be incorporated in future studies. Lean SC has been considered as an efficient SC strategy and the effective leadership style as a predictor of lean SC needs to be investigated. Moreover, very little work has been done in the area of services SCs. SC disruption is also a major issue of service sector and future studies need to incorporate it regarding how service-oriented organizations can improve resilient SC. Furthermore, organizational culture plays a dominant role in the success and failure of the organizations. In lines with prior studies (Ali & Gölgeci, 2019; Sheffi & Rice, 2005) the contribution of organizational culture in building and enhancing resilient SC cannot be ignored and this phenomena needs to be investigated. However, longitudinal qualitative studies could be helpful to develop a deeper understanding of this construct, regarding the influence of leadership style at the time of disruption confrontation and restoration of the SC.

Research Funding

REFERENCES

Abbas, M., & Ali, R. (2021). Transformational versus transactional leadership styles and project success: A meta-analytic review. *European Management Journal*. [in press], available online: 1 November 2021.

Abdelwahed, N. A. A., Soomro, B. A., & Shah, N. (2022). Predicting employee performance through transactional leadership and entrepreneur's passion among the employees of Pakistan. *Asia Pacific Management Review*. [in press] Online 28 April 2022.

Acharya, A. S., Prakash, A., Saxena, P., & Nigam, A. (2013). Sampling: why and how of it? *Indian Journal of Medical Specialities*, *4*(2), 3–7.

Afsar, B., Badir, Y., & Saeed, B. (2014). Transformational leadership and innovative work behavior. *Industrial Management and Data Systems*, *114*(8), 1270–1300.

Afshari, L., & Gibson, P. (2016). How to increase organizational commitment through transactional leadership. *Leadership & Organization Development Journal*, *37*(4), 507–519.

Ahmed, N., Thompson, S., & Glaser, M. (2019). Global Aquaculture Productivity, Environmental Sustainability, and Climate Change Adaptability. *Environmental Management*, *63*(2), 159–172.

Ahmed, W., & Huma, S. (2021). Impact of lean and agile strategies on supply chain risk management. *Total Quality Management & Business Excellence*, *32*(1–2), 33–56.

Al-Haddad, S., & Kotnour, T. (2015). Integrating the organizational change literature: A model for successful change. *Journal of Organizational Change Management*, *28*(2), 234–262.

Ali, & Gölgeci. (2019). Where is supply chain resilience research heading? A systematic and co-occurrence analysis. *International Journal of Physical Distribution & Logistics Management*, *49*(8), 793–815.

Ali, S., Peters, L. D., & Lettice, F. (2012). An organizational learning perspective on conceptualizing dynamic and substantive capabilities. *Journal of Strategic Marketing*, *20*(7), 589–607.

Ambrogio, G., Filice, L., Longo, F., & Padovano, A. (2022). Workforce and supply chain disruption as a digital and technological innovation opportunity for resilient manufacturing systems in the COVID-19 pandemic. *Computers & Industrial Engineering*, *169*, 108158.

Ambulkar, S., Blackhurst, J., & Grawe, S. (2015). Firm's resilience to supply chain disruptions: Scale development and empirical examination. *Journal of Operations Management*, *33–34*(1), 111–122.

Anning-Dorson, T. (2021). Organizational culture and leadership as antecedents to organizational flexibility: implications for SME competitiveness. *Journal of Entrepreneurship in Emerging Economies*, *13*(5), 1309–1325.

Aslam, H., Blome, C., Roscoe, S., & Azhar, T. M. (2020). Determining the antecedents of dynamic supply chain capabilities. *Supply Chain Management*, *25*(4), 427–442.

Aslam, H., Khan, A. Q., Rashid, K., & Rehman, S. (2020). Achieving supply chain resilience: the role of supply chain ambidexterity and supply chain agility. *Journal of Manufacturing Technology Management*, *31*(6), 1185–1204.

Ates, A., & Bititci, U. (2011). Change process: a key enabler for building resilient SMEs. *International Journal of Production Research*, *49*(18), 5601-5618.

Atitumpong, A., & Badir, Y. F. (2018). Leader-member exchange, learning orientation and innovative work behavior. *Journal of Workplace Learning*, *30*(1), 32–47.

Avolio, B. J., & Bass, B. M. (1995). Individual consideration viewed at multiple levels of analysis: A multi-level framework for examining the diffusion of transformational leadership. *The Leadership Quarterly*, *6*(2), 199–218.

Avolio, B. J., Bass, B. M., & Jung, D. I. (1999). Re-examining the components of transformational and transactional leadership using the Multifactor Leadership. *Journal of Occupational and Organizational Psychology*, *72*(4), 441–462.

Barratt, M. (2004). Understanding the meaning of collaboration in the supply chain. *Supply Chain Management: An International Journal*, *9*(1), 30–42.

Bass, B. M. (1985). Leadership: Good, better, best. *Organizational Dynamics*, *13*(3), 26–40.

Bass, B. M. (1990). From Transactional to Iransformational Leadership : Learning to Share the Vision. *Organizational Dynamics*, *18*(3), 19–32.

Bass, B. M. (1995). Theory of transformational leadership redux. *The Leadership Quarterly*, *6*(4), 463–478.

Bass, B. M. (1998). *Transformational leadership: Industrial, military, and educational impact. (1st ed.)*. Mahwah, NJ: Lawrence Erlbaum Associates.

Bass, B. M. (1999). Two Decades of Research and Development in Transformational Leadership. *European Journal of Work and Organizational Psychology*, *8*(1), 9–32.

Bass, B. M., & Bass, R. (2008). The Bass handbook of leadership : theory, research, and managerial applications. *Simon and Schuster*, *4th ed.*, Free Press.

Bayraktar, S., & Jiménez, A. (2020). Self-efficacy as a resource: a moderated mediation model of transformational leadership, extent of change and reactions to change. *Journal of Organizational Change Management*, *33*(2), 301–317.

Belhadi, A., Kamble, S., Jabbour, C. J. C., Gunasekaran, A., Ndubisi, N. O., & Venkatesh, M. (2021). Manufacturing and service supply chain resilience to the COVID-19 outbreak: Lessons learned from the automobile and airline industries. *Technological Forecasting and Social Change*, *163*, 120447.

Bell, B. S., Kozlowski, S. W. J., & Blawath, S. (2012). Team learning: A review and integration. In S. W. J. Kozlowski (Ed.), The Oxford Handbook of Organizational Psychology (vol. 2, pp. 859-909). Oxford, UK: Oxford University Press.

Birasnav, M., Mittal, R., & Loughlin, S. (2015). Linking leadership behaviors and information exchange to improve supply chain performance: A conceptual model. *Global Journal of Flexible Systems Management*, *16*(2), 205–217.

Blackhurst, J., Craighead, C. W., Elkins, D., & Handfield, R. B. (2005). An empirically derived agenda of critical research issues for managing supply-chain disruptions. *International Journal of Production Research*, *43*(19), 4067–4081.

Bland, J. M., & Altman, D. G. (1997). Statistics notes: Cronbach's alpha. *BMJ*, *314*(7080), 572–572.

Blome, C., Schoenherr, T., & Rexhausen, D. (2013). Antecedents and enablers of supply chain agility and its effect on performance: a dynamic capabilities perspective. *International Journal of Production Research*, *51*(4), 1295–1318.

Bommer, W. H., Rich, G. A., & Rubin, R. S. (2005). Changing attitudes about change: longitudinal effects of transformational leader behavior on employee cynicism about organizational change. *Journal of Organizational Behavior*, *26*(7), 733–753.

Bouckenooghe, D. (2010). Positioning Change Recipients' Attitudes Toward Change in the Organizational Change Literature. *The Journal of Applied Behavioral Science*, *46*(4), 500–531.

Braunscheidel, M. J., & Suresh, N. C. (2009). The organizational antecedents of a firm's supply chain agility for risk mitigation and response. *Journal of Operations Management*, *27*(2), 119–140.

Breevaart, K., Bakker, A., Hetland, J., Demerouti, E., Olsen, O. K., & Espevik, R. (2014).

Daily transactional and transformational leadership and daily employee engagement. *Journal of Occupational and Organizational Psychology*, *87*(1), 138–157.

Cable, D. M., & DeRue, D. S. (2002). The convergent and discriminant validity of subjective fit perceptions. *Journal of Applied Psychology*, *87*(5), 875–884.

Carvalho, H., Azevedo, S. G., & Cruz-Machado, V. (2012). Agile and resilient approaches to supply chain management: influence on performance and competitiveness. *Logistics Research*, *4*(1–2), 49–62.

Carvalho, H., & Cruz-Machado, V. (2011). Integrating Lean, Agile, Resilience and Green Paradigms in Supply Chain Management. In *Supply Chain Management,* 27-48, Edited by Pengzhong Li, InTech Publishers, Croatia.

Certo, S. C., & Certo, S. T. (2006). *Modern management* (10th ed.). Pearson Education.

Chatman, J. A., & O'Reilly, C. A. (2016). Paradigm lost: Reinvigorating the study of organizational culture. *Research in Organizational Behavior*, *36*, 199–224.

Chen, J., Jönsson, P., Tamura, M., Gu, Z., Matsushita, B., & Eklundh, L. (2004). A simple method for reconstructing a high-quality NDVI time-series data set based on the Savitzky–Golay filter. *Remote Sensing of Environment*, *91*(3–4), 332–344.

Chen, X., Kouvelis, P., & Biazaran, M. (2018). Value of operational flexibility in co-production systems with yield and demand uncertainty. *International Journal of Production Research*, *56*(1–2), 491–507.

Cheung, G. W., & Lau, R. S. (2008). Testing Mediation and Suppression Effects of Latent Variables. *Organizational Research Methods*, *11*(2), 296–325.

Cheung, M. W. L. (2015). *Meta-analysis: A structural equation modeling approach*. John Wiley & Sons.

Chi, N.-W., & Huang, J.-C. (2014). Mechanisms Linking Transformational Leadership and Team Performance. *Group & Organization Management*, *39*(3), 300–325.

Chiaburu, D. S., Smith, T. A., Wang, J., & Zimmerman, R. D. (2014). Relative importance of leader influences for subordinates' proactive behaviors, prosocial behaviors, and task performance: A meta-analysis. *Journal of Personnel Psychology*, *13*(2), 70–86.

Chiang, C. Y., Kocabasoglu-Hillmer, C., & Suresh, N. (2012). An empirical investigation of the impact of strategic sourcing and flexibility on firm's supply chain agility. *International Journal of Operations and Production Management*, *32*(1), 49–78.

Chopra, S., & Meindl, P. (2014). Supply Chain Management Strategy, Planning, and Operation. In *Igarss 2014* (Issue 1).

Chou, H.-W., Lin, Y.-H., Chang, H.-H., & Chuang, W.-W. (2013). Transformational Leadership and Team Performance. *SAGE Open*, *3*(3), 215824401349702.

Christopher, M., & Holweg, M. (2011). "Supply Chain 2.0": Managing supply chains in the era of turbulence. *International Journal of Physical Distribution and Logistics*

Management, *41*(1), 63–82.

Christopher, M., & Jüttner, U. (2000). Developing strategic partnerships in the supply chain: A practitioner perspective. *European Journal of Purchasing and Supply Management*, *6*(2), 117–127.

Christopher, M., & Peck, H. (2004). Building the resilient supply chain. *International Journal of Logistics Management*, *15*(2), 1–13.

Chua, R. Y. J., Lim, J. H., & Wiruchnipawan, W. (2022). Unlocking the Creativity Potential of Dialectical Thinking: Field Investigations of the Comparative Effects of Transformational and Transactional Leadership Styles. *The Journal of Creative Behavior*, *56*(2), 258–273.

Colicchia, C., Dallari, F., & Melacini, M. (2010). Increasing supply chain resilience in a global sourcing context. *Production Planning and Control*. 21(7), 680-694.

Colicchia, C., & Strozzi, F. (2012). Supply chain risk management: A new methodology for a systematic literature review. *Supply Chain Management*, *17*(4), 403–418.

Coltman, T., Devinney, T. M., Midgley, D. F., & Venaik, S. (2008). Formative versus reflective measurement models: Two applications of formative measurement. *Journal of Business Research*, *61*(12), 1250–1262.

Conway, J. M., & Lance, C. E. (2010). What reviewers should expect from authors regarding common method bias in organizational research. *Journal of Business and Psychology*, *25*(3), 325–334.

Craighead, C. W., Blackhurst, J., Rungtusanatham, M. J., & Handfield, R. B. (2007). The Severity of Supply Chain Disruptions: Design Characteristics and Mitigation Capabilities. *Decision Sciences*, *38*(1), 131–156.

Dabhilkar, M., Birkie, S. E., & Kaulio, M. (2016). Supply-side resilience as practice bundles: a critical incident study. *International Journal of Operations and Production Management, 36*(8), 948-970.

De Jong, J. P. J., & Den Hartog, D. N. (2007). How leaders influence employees' innovative behaviour. *European Journal of Innovation Management*, *10*(1), 41–64.

Deichmann, D., & Stam, D. (2015). Leveraging transformational and transactional leadership to cultivate the generation of organization-focused ideas. *Leadership Quarterly*, *26*(2), 204–219.

Dolgui, A., Ivanov, D., & Sokolov, B. (2018). Ripple effect in the supply chain: an analysis and recent literature. *International Journal of Production Research*, *56*(1–2), 414–430.

dos Santos, P. M., & Cirillo, M. Â. (2021). Construction of the average variance extracted index for construct validation in structural equation models with adaptive regressions. *Communications in Statistics - Simulation and Computation*, Published online: 09 Mar 2021.

Dubey, R., Altay, N., Gunasekaran, A., Blome, C., Papadopoulos, T., & Childe, S. J. (2018). Supply chain agility, adaptability and alignment. *International Journal of Operations & Production Management*, *38*(1), 129–148.

Dubey, R., Gunasekaran, A., & Childe, S. J. (2019). Big data analytics capability in supply chain agility: The moderating effect of organizational flexibility. *Management Decision*, *57*(8), 2092–2112.

Eckstein, D., Goellner, M., Blome, C., & Henke, M. (2015). The performance impact of supply chain agility and supply chain adaptability: The moderating effect of product complexity. *International Journal of Production Research*, *53*(10), 3028–3046.

Englehardt, C. S., & Simmons, P. R. (2002). Organizational flexibility for a changing world. *Leadership & Organization Development Journal*, *23*(3), 113–121.

Erol, O., Sauser, B. J., & Mansouri, M. (2010). A framework for investigation into extended enterprise resilience. *Enterprise Information Systems*, *4*(2), 111–136.

Farrell, A. M. (2010). Insufficient discriminant validity: A comment on Bove, Pervan, Beatty, and Shiu (2009). *Journal of Business Research*, *63*(3), 324–327.

FEMA. (2015). *Hazard Mitigation Assistance Guidance*. Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program; FEMA: Washington, DC, USA,

Fiksel, J., Polyviou, M., Croxton, K. L., & Pettit, T. J. (2015). From risk to resilience: Learning to deal with disruption. *MIT Sloan Management Review*, 56(2), 79-86.

Fornell, C., & Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research*, *18*(3), 382–388.

Frederico, G. F., Garza-Reyes, J. A., Anosike, A., & Kumar, V. (2019). Supply Chain 4.0: concepts, maturity and research agenda. *Supply Chain Management*, *25*(2), 262–282.

GFDRR. (2019). *Pakistan', global facility for disaster reduction and recovery*. Available at: https://www.gfdrr.org/en/region/pakistan (June 19th, 2022).

Gligor, D., Gligor, N., Holcomb, M., & Bozkurt, S. (2019). Distinguishing between the concepts of supply chain agility and resilience. *The International Journal of Logistics Management*, *30*(2), 467–487.

Gligor, D. M., Esmark, C. L., & Holcomb, M. C. (2015). Performance outcomes of supply chain agility: When should you be agile? *Journal of Operations Management*, *33–34*(1), 71–82.

Gligor, D. M., Holcomb, M. C., & Stank, T. P. (2013). A Multidisciplinary Approach to Supply Chain Agility: Conceptualization and Scale Development. *Journal of Business Logistics*, *34*(2), 94–108.

Gölgeci, I., & Kuivalainen, O. (2020). Does social capital matter for supply chain resilience? The role of absorptive capacity and marketing-supply chain management alignment. *Industrial Marketing Management*, *84* (September 2018), 63–74.

Gong, Y., Huang, J. C., & Farh, J. L. (2009). Employee learning orientation, transformational leadership, and employee creativity: The mediating role of employee

creative self-efficacy. *Academy of Management Journal*, *52*(4), 765–778.

Groves, K. S. (2020). Testing a Moderated Mediation Model of Transformational Leadership, Values, and Organization Change. *Journal of Leadership & Organizational Studies*, *27*(1), 35–48.

Gunasekaran, A., Lai, K. hung, & Edwin Cheng, T. C. (2008). Responsive supply chain: A competitive strategy in a networked economy. *Omega*, *36*(4), 549–564.

Gupta, Y. P., & Somers, T. M. (1996). Business strategy, manufacturing flexibility, and organizational performance relationships: a path analysis approach. *Production and Operations Management*, *5*(3), 204–233.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1995). *Multivariate data analysis* (4th ed.). Prentice-Hall, Englewood Cliffs, NJ.

Hair, J. F., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research*, *109*, 101–110.

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., & Thiele, K. O. (2017). Mirror, mirror on the wall: a comparative evaluation of composite-based structural equation modeling methods. *Journal of the Academy of Marketing Science*, *45*(5), 616–632.

Hair, J. F., Ortinau, D. J., & Harrison, D. E. (2010). *Essentials of marketing research*. McGraw-Hill Eduation/Irwin.

Harvey, J.-F., Johnson, K. J., Roloff, K. S., & Edmondson, A. C. (2019). From orientation to behavior: The interplay between learning orientation, open-mindedness, and psychological safety in team learning. *Human Relations*, *72*(11), 1726–1751.

Hayes, A. F., Montoya, A. K., & Rockwood, N. J. (2017). The analysis of mechanisms and their contingencies: PROCESS versus structural equation modeling. *Australasian Marketing Journal*, *25*(1), 76–81.

Hayes, A. F., & Preacher, K. J. (2014). Statistical mediation analysis with a multicategorical independent variable. *British Journal of Mathematical and Statistical Psychology*, *67*(3), 451–470.

Herscovitch, L., & Meyer, J. P. (2002). Commitment to organizational change: Extension of a three-component model. *Journal of Applied Psychology*, *87*(3), 474–487.

Hohenstein, N.-O., Feisel, E., Hartmann, E., & Giunipero, L. (2015). Research on the phenomenon of supply chain resilience. *International Journal of Physical Distribution & Logistics Management*, 45(1/2), 90-117.

Holmes-Smith. (2000). *Introduction to structural equation modelling using AMOS 4.0 and LISREL 8.30*. School Research, Evaluation and Measurement Services, Canberra.

Hooper, Coughlan, & Mullen. (2008). Structural Equation Modelling: Guidelines for Determining Model Fit. *Electronic Journal of Business Research Methods*, 6(1):53–60.

Hora, M., & Klassen, R. D. (2013). Learning from others' misfortune: Factors influencing knowledge acquisition to reduce operational risk. *Journal of Operations Management*,

31(1–2), 52–61.

Hu, & Bentler. (1995). Evaluating model fit. In *Structural equation modeling: Concepts, issues, and applications* (pp. 76–99). Sage Publications, Inc.

Hu, & Bentler. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55.

Huan, S. H., Sheoran, S. K., & Wan, G. (2004). A review and analysis of supply chain operations reference (SCOR) model. *Supply Chain Management*, *9*(1), 23–29.

Huang, S. H., Uppal, M., & Shi, J. (2002). A product driven approach to manufacturing supply chain selection. *Supply Chain Management: An International Journal*, *7*(4), 189–199.

Irfan, I., Sumbal, M. S. U. K., Khurshid, F., & Chan, F. T. S. (2022). Toward a resilient supply chain model: critical role of knowledge management and dynamic capabilities. *Industrial Management and Data Systems*, *122*(5), 1153–1182.

Ismail, H. S., & Sharifi, H. (2006). A balanced approach to building agile supply chains. *International Journal of Physical Distribution and Logistics Management*, *36*(6), 431–444.

Ivanov, D., Dolgui, A., & Sokolov, B. (2018). Scheduling of recovery actions in the supply chain with resilience analysis considerations. *International Journal of Production Research*, *56*(19), 6473–6490.

Jabbarzadeh, A., Fahimnia, B., & Sabouhi, F. (2018). Resilient and sustainable supply chain design: sustainability analysis under disruption risks. *International Journal of Production Research*, *56*(17), 5945–5968.

Jackson, T. A., Meyer, J. P., & Wang, X.-H. H. (Frank). (2013). Leadership, commitment, and culture: A meta-analysis. *Journal of Leadership and Organizational Studies*, *20*(1), 84–106.

Jacobsen, C. B., Andersen, L. B., Bøllingtoft, A., & Eriksen, T. L. M. (2022). Can Leadership Training Improve Organizational Effectiveness? Evidence from a Randomized Field Experiment on Transformational and Transactional Leadership. *Public Administration Review*, *82*(1), 117–131.

Jia, X., Chen, J., Mei, L., & Wu, Q. (2018). How leadership matters in organizational innovation: a perspective of openness. *Management Decision*, *56*(1), 6–25.

Jüttner, U., & Maklan, S. (2011). Supply chain resilience in the global financial crisis: An empirical study. *Supply Chain Management*, *16*(4), 246–259.

Kamalahmadi, M., & Parast, M. M. (2016). A review of the literature on the principles of enterprise and supply chain resilience: Major findings and directions for future research. *International Journal of Production Economics*, *171*, 116–133.

Karmaker, C. L., Ahmed, T., Ahmed, S., Ali, S. M., Moktadir, M. A., & Kabir, G. (2021). Improving supply chain sustainability in the context of COVID-19 pandemic in an emerging economy: Exploring drivers using an integrated model. *Sustainable Production*

and Consumption, *26*, 411–427.

Katsaliaki, K., Galetsi, P., & Kumar, S. (2021). Supply chain disruptions and resilience: A major review and future research agenda. *Annals of Operations Research*, Published: 08 January 2021.

Ketchen, D. J., & Craighead, C. W. (2021). Toward a Theory of Supply Chain Entrepreneurial Embeddedness in Disrupted and Normal States. *Journal of Supply Chain Management*, *57*(1), 1–3.

Kline, R. B. (2015). *Principles and practice of structural equation modeling*. Guilford Press, NY.

Kochan, C. G., & Nowicki, D. R. (2018). Supply chain resilience: a systematic literature review and typological framework. *International Journal of Physical Distribution and Logistics Management*, *48*(8), 842–865.

Kotter, J. P. (2007). Leading Change : Why transformation efforts fail. In *Museum Management and Marketing* (pp. 20–29). Routledge, UK.

Kumar, D., & Rahman, Z. (2016). Buyer supplier relationship and supply chain sustainability: empirical study of Indian automobile industry. *Journal of Cleaner Production*, *131*, 836–848.

Kurniawan, R., Zailani, S. H., Iranmanesh, M., & Rajagopal, P. (2017). The effects of vulnerability mitigation strategies on supply chain effectiveness: risk culture as moderator. *Supply Chain Management: An International Journal*, *22*(1), 1–15.

Kwak, D.-W., Seo, Y.-J., & Mason, R. (2018). Investigating the relationship between supply chain innovation, risk management capabilities and competitive advantage in global supply chains. *International Journal of Operations & Production Management*, *38*(1), 2–21.

Lago, C. F., & Verma, A. (2017). *In Search of Supply Chain Visibility: Transparency Via The Cloud | IndustryWeek*. [ONLINE] available at: https://www.industryweek.com/cloud-computing/article/22003754/in-search-of-supply-chain-visibility-transparency-via-the-cloud (May 31st, 2022).

Le, P. B., & Lei, H. (2019). Determinants of innovation capability: the roles of transformational leadership, knowledge sharing and perceived organizational support. *Journal of Knowledge Management*, *23*(3), 527–547.

Leflar, J. J., & Siegel, M. H. (2013). *Organizational Resilience: Managing the Risks of Disruptive Events - A Practitioners Guide*. CRC Press, Florida.

Lei, H., Leaungkhamma, L., & Le, P. B. (2020). How transformational leadership facilitates innovation capability: the mediating role of employees' psychological capital. *Leadership and Organization Development Journal*, *41*(4), 481–499.

li, X., Chung, C., Goldsby, T. J., & Holsapple, C. W. (2008). A unified model of supply chain agility: The work-design perspective. *The International Journal of Logistics Management*, *19*(3), 408–435.

Lin, C. T., Chiu, H., & Chu, P. Y. (2006). Agility index in the supply chain. *International*

Journal of Production Economics, *100*(2), 285–299.

Liu, C. L., & Lee, M. Y. (2018). Integration, supply chain resilience, and service performance in third-party logistics providers. *International Journal of Logistics Management, 29*(1), 5-21.

Liu, Yan, Si, Xie, & Wang. (2020). Effect of buyer-supplier supply chain strategic collaboration on operating performance: evidence from Chinese companies. *Supply Chain Management: An International Journal*, *25*(6), 823–839.

Ma, X., & Jiang, W. (2018). Transformational Leadership, Transactional Leadership, and Employee Creativity in Entrepreneurial Firms. *The Journal of Applied Behavioral Science*, *54*(3), 302–324.

Macchion, L., Da Giau, A., Caniato, F., Caridi, M., Danese, P., Rinaldi, R., & Vinelli, A. (2018). Strategic approaches to sustainability in fashion supply chain management. *Production Planning and Control*, *29*(1), 9–28.

Malik, O. R., & Kotabe, M. (2009). Dynamic Capabilities, Government Policies, and Performance in Firms from Emerging Economies: Evidence from India and Pakistan. *Journal of Management Studies*, *46*(3), 421–450.

Masa'deh, R., Obeidat, B. Y., & Tarhini, A. (2016). A Jordanian empirical study of the associations among transformational leadership, transactional leadership, knowledge sharing, job performance, and firm performance. *Journal of Management Development*, *35*(5), 681–705.

Mccormack, K. (2004). The development of a supply chain management process maturity model using the concepts of business process orientation. *Supply Chain Management: An International Journal*, *9*(4), 272–278.

Mcmanus, S., Seville, E., Vargo, J., & Brunsdon, D. (2008). Facilitated Process for Improving Organizational Resilience. *Natural Hazards Review*, *May*, 81–90.

Miner, J. B. (2006). Historical origins, theoretical foundations, and the future. In *Organizational behavior 3*. Routledge, New York, NY.

Northouse. (2006). Introduction to Leadership. *Leadership Defined*, *1989*, 1–14.

Nunnally, B., & Bernstein, I. R. (1994). *Psychometric Theory*. McGraw-Hill; 3rd Edition.

O'brien, R. M. (2007). A Caution Regarding Rules of Thumb for Variance Inflation Factors. *Quality & Quantity*, *41*(5), 673–690.

Ozdemir, D., Sharma, M., Dhir, A., & Daim, T. (2022). Supply chain resilience during the COVID-19 pandemic. *Technology in Society*, *68* (December 2021), 101847.

Pal, R., Torstensson, H., & Mattila, H. (2014). Antecedents of organizational resilience in economic crises - An empirical study of Swedish textile and clothing SMEs. *International Journal of Production Economics*, *147*(PART B), 410–428.

Peng, J., Li, M., Wang, Z., & Lin, Y. (2021). Transformational Leadership and Employees'

Reactions to Organizational Change: Evidence From a Meta-Analysis. *Journal of Applied Behavioral Science*, *57*(3), 369–397.

Penrose, J. M. (2000). The role of perception in crisis planning. *Public Relations Review*, *26*(2), 155–171.

Pettit, T. J., Croxton, K. L., & Fiksel, J. (2013). Ensuring Supply Chain Resilience: Development and Implementation of an Assessment Tool. *Journal of Business Logistics*, *34*(1), 46–76.

Pettit, T. J., Croxton, K. L., & Fiksel, J. (2019). The Evolution of Resilience in Supply Chain Management: A Retrospective on Ensuring Supply Chain Resilience. *Journal of Business Logistics*, *40*(1), 56–65.

Phung, T. B. P., Kim, S., & Chu, C. C. (2022). Transformational leadership, integration and supply chain risk management in Vietnam's manufacturing firms. *The International Journal of Logistics Management,* [ahead-of-print].

Pieterse, A. N., Knippenberg, D., Schippers, M., Stam, D., van Knippenberg, D., Schippers, M., & Stam, D. (2009). Transformational and transactional leadership and innovative behavior: The moderating role of psychological empowerment. *Journal of Organizational Behavior*, *31*(4), 609–623.

Piya, S., Shamsuzzoha, A., Khadem, M., & Al-Hinai, N. (2020). Identification of Critical Factors and Their Interrelationships to Design Agile Supply Chain: Special Focus to Oil and Gas Industries. *Global Journal of Flexible Systems Management*, *21*(3), 263–281.

Podsakoff, P. M., Bommer, W. H., Podsakoff, N. P., & MacKenzie, S. B. (2006). Relationships between leader reward and punishment behavior and subordinate attitudes, perceptions, and behaviors: A meta-analytic review of existing and new research. *Organizational Behavior and Human Decision Processes*, *99*(2), 113–142.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y. Y., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, *88*(5), 879–903.

Polyviou, M. (2016). *Essays on Supply Chain Disruptions: A Schema, Managerial Reactions, and Decision-Making* [Ohio State University].

Ponomarov, S. Y., & Holcomb, M. C. (2009). Understanding the concept of supply chain resilience. *The International Journal of Logistics Management*, *20*(1), 124–143.

Prabhu, M., & Srivastava, A. K. (2022). Leadership and supply chain management: a systematic literature review. *Journal of Modelling in Management,* [ahead-of-print].

Quinn, R. E., & Cameron, K. S. (2019). Positive organizational scholarship and agents of change. *Research in Organizational Change and Development*, *27*, 31–57.

Raziq, M. M., Borini, F. M., Malik, O. F., Ahmad, M., & Shabaz, M. (2018). Leadership styles, goal clarity, and project success: Evidence from project-based organizations in Pakistan. *Leadership and Organization Development Journal*, *39*(2), 309–323.

Remko, van H. (2020). Research opportunities for a more resilient post-COVID-19 supply

chain – closing the gap between research findings and industry practice. *International Journal of Operations and Production Management*, *40*(4), 341–355.

Russell, C. J. (2013). Is it Time to Voluntarily Turn Over Theories of Voluntary Turnover? *Industrial and Organizational Psychology*, *6*(2), 156–173.

Russell, R. F. (2001). The role of values in servant leadership. *Leadership & Organization Development Journal*, *22*(2), 76–84.

Ryan, J. C., & Tipu, S. A. A. (2013). Leadership effects on innovation propensity: A two-factor full range leadership model. *Journal of Business Research*, *66*(10), 2116–2129.

Sarros, J. C., & Santora, J. C. (2001). The transformational-transactional leadership model in practice. *Leadership & Organization Development Journal*, *22*(8), 383–394.

Sawyerr, E., & Harrison, C. (2020). Developing resilient supply chains: lessons from high-reliability organisations. *Supply Chain Management*, *25*(1), 77–100.

Scholten, K., Schilder, S., Kirstin Scholten, & Sanne Schilder. (2015). The role of collaboration in supply chain resilience. *Supply Chain Management: An International Journal*, *14*(3), 189–200.

Scholten, K., Scott, P. S., & Fynes, B. (2014). Mitigation processes - antecedents for building supply chain resilience. *Supply Chain Management*, *19*(2), 211–228.

Scholten, K., Stevenson, M., & van Donk, D. P. (2020). Dealing with the unpredictable: supply chain resilience. *International Journal of Operations and Production Managment*, *40*(1), 1–10.

Schuberth, F. (2021). Confirmatory composite analysis using partial least squares: setting the record straight. *Review of Managerial Science*, *15*(5), 1311–1345.

Sheffi, Y. (2005). Preparing for the big one [supply chain management]. *Manufacturing Engineer*, *84*(5), 12–15.

Sheffi, Y., & Rice, J. B. (2005). A supply chain view of the resilient enterprise. *MIT Sloan Management Review*, *47*(1), 41–48.

Shukla, S. K., & Sushil. (2022). Benchmarking the practices of flexibility with maturity models and frameworks of organizational capabilities. *Benchmarking*, *29*(2), 664–682.

Shukla, S. K., Sushil, & Sharma, M. K. (2019). Managerial Paradox Toward Flexibility : Emergent Views Using Thematic Analysis of Literature. *Global Journal of Flexible Systems Management*, *20*(4), 349–370.

SMEDA. (2021). Impact of COVID-19 on SMES survey report. *SMEDA Survey Report* (Vol. 19, Issue February).

Sodhi, M. S., & Lee, S. (2007). An analysis of sources of risk in the consumer electronics industry. *Journal of the Operational Research Society*, 58(11), 1430-1439.

Song, J. M., Chen, W., & Lei, L. (2018). Supply chain flexibility and operations optimisation under demand uncertainty: a case in disaster relief. *International Journal of*

Production Research, 56(10), 3699–3713.

Soni, U., Jain, V., & Kumar, S. (2014). Measuring supply chain resilience using a deterministic modeling approach. *Computers and Industrial Engineering*, *74*(1), 11–25.

Sreedevi, R., & Saranga, H. (2017). Uncertainty and supply chain risk: The moderating role of supply chain flexibility in risk mitigation. *International Journal of Production Economics*, *193*, 332–342.

Srinivasan, R., & Swink, M. (2018). An Investigation of Visibility and Flexibility as Complements to Supply Chain Analytics: An Organizational Information Processing Theory Perspective. *Production and Operations Management*, *27*(10), 1849–1867.

Stevenson, M., & Spring, M. (2007). Flexibility from a supply chain perspective: Definition and review. *International Journal of Operations and Production Management*, *27*(7), 685–713.

Swafford, P. M., Ghosh, S., & Murthy, N. (2006). The antecedents of supply chain agility of a firm: Scale development and model testing. *Journal of Operations Management*, *24*(2), 170–188.

Swafford, P. M., Ghosh, S., & Murthy, N. (2008). Achieving supply chain agility through IT integration and flexibility. *International Journal of Production Economics*, *116*(2), 288–297.

Tamayo-Torres, I., Ruiz-Moreno, A., & Verdú, A. J. (2010). The moderating effect of innovative capacity on the relationship between real options and strategic flexibility. *Industrial Marketing Management*, *39*(7), 1120–1127.

Tang, C., & Tomlin, B. (2008). The power of flexibility for mitigating supply chain risks. *International Journal of Production Economics*, *116*(1), 12–27.

Tang, C., & Tomlin, B. (2009). How much flexibility does it take to mitigate supply chain risks? *International Series in Operations Research and Management Science*, *124*, 155–174.

Tavanti, M. (2016). Transactional Leadership. In *Global Encyclopedia of Public Administration, Public Policy, and Governance* (pp. 1–4). Springer Int'l Publishing.

Truong Quang, H., & Hara, Y. (2018). Risks and performance in supply chain: the push effect. *International Journal of Production Research*, 56(4), 1369-1388.

Tukamuhabwa, B. R., Stevenson, M., Busby, J., & Zorzini, M. (2015). Supply chain resilience: definition, review and theoretical foundations for further study. *International Journal of Production Research*, *53*(18), 5592–5623.

Umam, R., & Sommanawat, K. (2019). Strategic flexibility, manufacturing flexibility, and firm performance under the presence of an agile supply chain: A case of strategic management in fashion industry. *Polish Journal of Management Studies*, *19*(2), 407–418.

van der Rhee, B., Verma, R., & Plaschka, G. (2009). Understanding trade-offs in the supplier selection process: The role of flexibility, delivery, and value-added services/support. *International Journal of Production Economics*, *120*(1), 30–41.

Vitasek, K. (2016). Strategic sourcing business models. *Strategic Outsourcing: An*

International Journal, *9*(2), 126–138.

Walumbwa, F. O., Wu, C., & Orwa, B. (2008). Contingent reward transactional leadership, work attitudes, and organizational citizenship behavior: The role of procedural justice climate perceptions and strength. *Leadership Quarterly*, *19*(3), 251–265.

Warrick, D. D. (2017). What leaders need to know about organizational culture. *Business Horizons*, *60*(3), 395–404.

Wieland, A. (2021). Dancing the Supply Chain: Toward Transformative Supply Chain Management. *Journal of Supply Chain Management*, *57*(1), 58–73.

Wiese, C. W., & Burke, C. S. (2019). Understanding Team Learning Dynamics Over Time. *Frontiers in Psychology*, *10*(JUN), 1417.

Wilding, R. (2013). Supply chain temple of resilience. *Logistics & Transport Focus*.

Williams, L. J., Vandenberg, R. J., & Edwards, J. R. (2009). 12 Structural Equation Modeling in Management Research: A Guide for Improved Analysis. *Academy of Management Annals*, *3*(1), 543–604.

Wong, C. W. Y., Lirn, T. C., Yang, C. C., & Shang, K. C. (2020). Supply chain and external conditions under which supply chain resilience pays: An organizational information processing theorization. *International Journal of Production Economics*, *226*(June 2018), 107610.

Xu, B. Da, Zhao, S. K., Li, C. R., & Lin, C. J. (2017). Authentic leadership and employee creativity: testing the multilevel mediation model. *Leadership and Organization Development Journal*, *38*(3), 482–498.

Yang, B., & Yang, Y. (2010). Postponement in supply chain risk management: A complexity perspective. *International Journal of Production Research*, 48(7), 1901-1912.

Young, H. R., Glerum, D. R., Joseph, D. L., & McCord, M. A. (2021). A Meta-Analysis of Transactional Leadership and Follower Performance: Double-Edged Effects of LMX and Empowerment. *Journal of Management*, *47*(5), 1255–1280.

Zhang, M. F., Dawson, J. F., & Kline, R. B. (2021). Evaluating the Use of Covariance-Based Structural Equation Modelling with Reflective Measurement in Organizational and Management Research: A Review and Recommendations for Best Practice. *British Journal of Management*, *32*(2), 257–272.

Zhang, Z., Zheng, C., Kim, C., Poucke, S. Van, Lin, S., & Lan, P. (2016). Causal mediation analysis in the context of clinical research. *Annals of Translational Medicine*, *4*(21), 425.

Zsidisin, G. A., & Wagner, S. M. (2010). Do perceptions become reality? The moderating role of supply chain resiliency on disruption occurrence. *Journal of Business Logistics*, *31*(2), 1–20.