Lean manufacturing and firms’ financial performance: the role of strategic supplier partnership and information sharing

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Abstract

Purpose – The purpose of this paper is to examine the mediating role of strategic supplier partnership and moderating role of information sharing (IS), in the relationship between lean manufacturing and firms’ financial performance (FP).

Design/methodology/approach – Utilizing the contingency approach, this study develops a research model to validate the proposition that a proper integration of supply chain (SC) practices enhances the financial performance of the firm. The study uses data from one hundred and fifty-seven manufacturing firms. The results are generated on structural equation modeling (SEM) using AMOS software.

Findings – The study finds that strategic supplier partnership partially mediates the relationship between lean manufacturing and FP, whereas, empirically, it could not demonstrate that IS significantly moderates the relationship between lean manufacturing and FP.

Practical implications – The paper theoretically develops logic for and empirically shows that strategic supplier partnership is an appropriate practice for mediating the impact of lean manufacturing on FP.

Originality/value – This strategic supply chain integration contributes to theory and demonstrates that SC practices’ correct synchronization and orchestration may realize superior FP. In addition, this research provides a sustainable strategic SC model that creates value and provides a competitive advantage for firms in the long term.

Keywords Lean manufacturing, Strategic supplier partnership, Information sharing, Financial performance, Firm performance

Paper type Research paper

1. Introduction

In today’s highly connected marketplace, we are witnessing the advent of the most advanced SC strategies, while the contemporary business environment is becoming practically borderless (Qrunfleh and Tarafdar, 2013). The key characteristic of a successful SC management stays in measuring and controlling information about its main operational parameters (Qrunfleh and Tarafdar, 2014). Because of the complex and dynamic environment, the paradigm of competition between entities has changed from competition firm-with-firm to competition supply chain-with-supply chain (Islami, 2021a; Li et al., 2006). And, managers have begun basing competitive strategies on supply chains, recognizing their competitive advantages among other resources (Baah et al., 2022). Nonetheless, the sheer magnitude of adversities firms face (Gölgeci and Kuivalainen, 2020) in integrating SC practices inside a firm makes relying on the SC not adequate for strong competition and a high increase of the firm performance. In this paper, the study focuses on lean manufacturing - the elimination of anything that does not add value to the production process (Islami and Topuzovska Latkovikj, 2022) - as a potential enabler of financial performance through the...
mediating means of strategic supplier partnership and under the contingency effect of the information sharing. In this way, this study link strategic supplier partnership and IS as critical factors that connect lean manufacturing to firms’ financial performance.

Lean manufacturing is widely accepted as an important SC practice for firms (Alefari et al., 2020; Islami, 2021a; Islami and Topuzovska Latkovikj, 2022; Li et al., 2006; Possik, 2019). However, based on the work evidence, research that has measured the link between lean manufacturing and FP has produced inconsistent findings (Fullerton and Wempe, 2009; Khalfallah and Lakhal, 2020). For example, Khalfallah and Lakhal (2020) could not find a significant relationship between several practices of lean manufacturing and FP. Whereas, Fullerton and Wempe (2009) highlight that the effect of lean manufacturing practices on net FP is an empirical question. However, they suppose that lean manufacturing practices reduce setup time and cost, which is increasingly necessary to serve customers on time and increase the firms’ profitably. Thus, the depth analysis of the relationship between lean manufacturing practices and FP is yet to be fully explored (Khalfallah and Lakhal, 2020), as both constructs are dynamic in nature. In particular, current knowledge is not enough to explain how lean manufacturing can be utilized in the market turbulence and what integration among the SC practices should exist so that its influence on FP is more pronounced. Furthermore, although extensive research on lean manufacturing is done (Buer et al., 2021; Islami, 2021b; Kamble et al., 2020), there is little empirical evidence for synchronization of the SC practices that lead to better FP. For that reason, there are many future research proposals for lean manufacturing available in the literature (Psomas, 2022).

Strategic supplier partnership (Li et al., 2006) refers to a long-term relationship between the firm and its suppliers (Islami, 2021b). It requires a high degree of coordination between the firm and its suppliers (Qrunfleh and Tarafärdar, 2013). Therefore, strategic supplier partnership alignment between a firm’s value-creating constructs and functions, such as encouraging mutual planning and problem-solving efforts, a direct association with suppliers, selection of a few suppliers, and continuous improvement programs (Gunasekaran et al., 2001), is needed. Key resources embedded in the firm’s relationships that enable effective deployment of such resources for continuous competitive advantage (Gölgeci and Kuivalainen, 2020) are capitalized on strategic supplier partnership. In this vein, a deeper understanding of the linkages between lean manufacturing, strategic supplier partnership, and FP, and the way that IS moderates these linkages to cope with market turbulences is needed. Literature shows that applying such SC practices is important for a firm (Qrunfleh and Tarafärdar, 2013) as to increase its performance.

Still, the literature reveals a number of important gaps on operation SC practices. First, mainly studies have examined the role of SC practices in organizational performance (including both non-financial and financial performance) (e.g. see Islami, 2021a; Islami and Topuzovska Latkovikj, 2022; Li et al., 2006; Qrunfleh and Tarafärdar, 2014), this kind of firm performance generalization cannot offer a clear mirror for firms’ financial aspect which is “the main” issue for owners. Second, studies inspect SC practices as a bundle (Bimha et al., 2020; Gorane and Kant, 2015), but they do not measure the reinforcing role that SC practices have on each other. Third, while is known that SC practices deployed in the SC should correctly support the strategic goal (Qrunfleh and Tarafärdar, 2013) of the firm performance uniquely, few studies can explain theoretically how this should be done.

Addressing these gaps then, the objective of this study is to investigate the mediating effect of strategic supplier partnership on the relationship between lean manufacturing and firms’ financial performance. We also look at the moderating role of the IS on this SC practices - FP relationship. Thus, this paper aims to create an “SC model” and analyze how firms should operate through integrating SC practices among themselves, which may enable firms to create value for customers. Effectively orchestrating SC practices offers firms a supply chain model as a viable strategy to compete in a competitive market. Proper synchronization of SC
practices may increase the FP of the firm. Therefore, to realize the objectives of this paper is needed to respond particularly to the following research questions:

1. What is the nature of the relationship between lean manufacturing and FP?
2. How strategic supplier partnership mediates the relationship between lean manufacturing and firms’ financial performance?
3. How are SC practices interrelated? and,
4. What is the role of IS in the relationship between lean manufacturing and firms’ FP?

2. Theoretical background
In the current literature, a number of theories are used to explore specific aspects of SC management (Islami, 2021b), such as associated transaction cost and industrial organization theory (Miles, 2012), resource-based and resource-dependency theory (Rungtusanatham et al., 2003) and competitive strategies (Adăscălătie and Guga, 2018; Islami et al., 2020a). To explain and measure the position of testable variables in an integrative SC model have mainly been used the following approaches: (a) behavioral perspective – which states that should be a direct link between SC practices and FP, and (b) contingency theory – which specifies that the link between SC practices and FP is conditioned by another SC practice that a firm pursues. It claims that firms should carefully harmonize SC practices with one another to enhance their performance. In this vein, this study argues for the complementarity of behavioral and contingency perspectives rather than competition. Thus, the research context is conceptualized through the lens of these perspectives.

It is worth mentioning that, recently, a number of prominent authors of the management scope are focused on creating sustainable SC management (e.g. see Dubey et al., 2017; Papadopoulos et al., 2017), through developing and testing models that provide insight into the relationship between SC integration and SC sustainability (Donkor et al., 2021). In this respect, an empirical investigation into data analytics capability and organizational flexibility as complements to SC resilience is realized by Dubey et al. (2021), who using variance-based structural equation modeling offers numerous valuable directions to SC managers. Due to its significant role in firm performance, SC practices and their integration are receiving increasing attention in research. Tiwari (2021) displays that SC integration “has played a significant role in enhancing supply chain performance and organizational performance” (p. 990). The following explains the meaning of the three SC practices used in this study.

2.1 Supply chain practices
Lean manufacturing - one of the main focuses that firms continuously make to realize is efficiency in operation and manufacturing i.e. lean manufacturing through pursuing a quality improvement program, reducing set-up time, reengineering the production processes, and using new process equipment or technologies (Islami, 2021a). Lean manufacturing is defined as “[...] an integrated socio-technical system whose main objective is to eliminate waste by concurrently reducing or minimizing supplier, customer, and internal variability” (Shah and Ward, 2007, p. 791). Lean manufacturing is composed of several practices (just-in-time delivery, elimination of waste, management of material flows, just-in-time capability, managing inventory investment in the chain, reducing inventory, total quality management, and total productive maintenance), which include different aspects (Khalfallah and Lakhal, 2020; Talib et al., 2011). Thus, it seeks to remove any activities that do not add value through continuous developments (Abolhassani et al., 2016).
Recent research views lean manufacturing as a tool and practice that improve manufacturing processes (Islami, 2021a; Islami and Topuzovska Latkovikj, 2022; Khalfallah and Lakhal, 2020). Using the lean manufacturing system framework helps implement lean principles in a structured manner in the manufacturing industry to achieve excellence in organizational functions (Jasti and Kodali, 2019). Lean manufacturing rests on several basic principles, such as pursuing continuous process improvement with employee involvement, eliminating wasteful activities, minimizing process variability, maintaining a synchronized flow of production through visual signals on the shop floor, and delegating duties such as quality inspections and periodic maintenance to line workers (Angelis et al., 2011).

In the context of financial performance, it should be noted that the evidence on lean manufacturing’s financial effects is mixed (Ahmad et al., 2004; Wayhan and Balderson, 2007). This inconsistency is attributed to the variation among researchers regarding on defining the components of lean manufacturing (Shah and Ward, 2007). For example, Nawani et al. (2018) provide nine valid and reliable constructs and sixty-four measurement items for lean manufacturing, which are complementary and mutually supportive of each other. Due to the adaptation of various lean manufacturing components, the variation in performance effects is shown (Cua et al., 2001). As a result of the unavailability of frameworks that support lean manufacturing implementation processes, only a few firms have effectively adopted lean manufacturing (Jadhav et al., 2014). Even though there is information from a large number of firms that report on the failures of having adopted lean manufacturing, as much as lean adoption faces several challenges that could hinder its implementation effectively (Dorota, 2014). Recently, because lean manufacturing factors have a strong relationship with prevention and appraisal costs (Shahin and Rezaei, 2018), many firms have documented an exemplary implementation of lean manufacturing and enjoyment of its benefits (Hence et al., 2019).

Information sharing – in an SC perspective refers to the extent to which proprietary and critical information are offered to members of the SC (Goswami et al., 2013), and can be tactical (e.g. operations scheduling, purchasing, logistics) or strategic (e.g. marketing and customer information, long-term corporate objectives) (Hsu et al., 2008). Where tactical IS allows partners to manage the flow of decision-making activities jointly in a manner that improves the decision quality (Lee and Whang, 2000), whereas strategic IS occurs when the information used by SC partners is in a strategic form that increases the competitive value and further creates a strategic impact of SC partners (as a whole) on industry (Wu et al., 2014). Thus, a serious aspect of successful SC management lies in monitoring and measuring information related to its key performance and operational parameters (e.g. delivery schedules, inventory and lead times) (Gunasekaran and Ngai, 2004). According to Zhou and Benton (2007) three major advantages IS offers to SC members: information senders and receivers become closer, information is distributed throughout the SC, and SC members can act on new information in a timely manner. Therefore, Hsu et al. (2008) define information sharing within an SC as the decision systems, integration of information systems, and business processes used to conduct information searches, monitor business details, manage business operations and perform other business activities.

While analyzing the supply chains cycle Huang et al. (2003) recommend two kinds of information roles; one role describes information as a factor that may impact the performance and IS advantages, while the other is concerned with IS with other firms. Information sharing between firms has been recognized as a competitive means that enhances their performance (Whipple and Russell, 2007), and an essential precondition for effective collaboration (Sandberg, 2007). While IS improves a firms’ performance, the lack of information capability adversely affects the overall competitive position. Thus, it can be said that information sharing is important to every functional area along the SC (Tan, 2002).

Strategic supplier partnership – is considered an essential SC practice in several studies (e.g. see Bimha et al., 2020; Islami, 2021a; Islami, 2021b; Islami and Topuzovska Latkovikj, 2022;...
Li et al., 2006; Talib et al., 2011), and creates relationships with the selected strategic suppliers by which all members of the SC may benefit (Jacobs and Chase, 2014). Strategic supplier partnership is beneficial for the supplier, buyer, and the ultimate user of products since it proactively manages the link between buyer and supplier (Scott et al., 2018). In this study, strategic supplier partnership is defined as a long-term relationship and effective integration between suppliers and buyers (focal firms) with the aim to create synergy as a result of complementary effects between partners and realize a sustainable competitive advantage in the market. The quality of supplier relationship has a significant effect on enhancing cooperation between exchange parties (Yang et al., 2021).

A strategic partnership with a supplier should be created based on the “win-win” partnership principles, where a win-win partnership should not be based only on price-based competition but mainly on sharing risks and benefits between partners (Oliver and Delbridge, 2002). Choosing potential suppliers always involves finding the optimal trade-off between a supplier’s ability to meet the firm’s needs consistently and an acceptable cost (Sachdeva et al., 2021). An effective strategic partnership emphasizes direct, long-term association and encourages mutual planning and problem-solving efforts (Gunasekaran et al., 2001). In setting long-term relationships and responding to firms challenges in a dynamic environment, SC management is considered an important model that makes the firm capable of dealing with its supply partner effectively (Sambasivan et al., 2013). A strategic supplier partnership consists of supplier quality management, supplier relationship, supplier involvement and collaboration between the leading organization and its supplier (Talib et al., 2011). Thus, strategic partnership with suppliers enables SC partners that are able to understand and anticipate better the focal firm and each other’s (partner) needs, to reduce uncertainty and facilitate a flexible response (Malhotra and Mackelprang, 2012).

2.2 Financial performance
Performance represents the difference between the cost of capital used by the firm to operate and its achieved results. FP aims to measure the financial aspect of the firm growth (Islami, 2021b). FP is focused on items that could be expressed in monetary terms (how well firms have extracted profits from the market) and directly reflects the financial value (Spencer et al., 2009). Hence, financial metrics serves as a tool for comparing firms among themselves to an industry average norm, benchmarking firms and evaluating a firm’s behavior over time (Holmberg, 2000).

3. Research model and hypotheses
The research model in Figure 1 describes that the relationship between lean manufacturing and firms’ FP would be moderated and mediated by an appropriate SC practice. Specifically, then, IS would moderate the relationship between lean manufacturing and firms’ FP; and second, strategic supplier partnership would mediate the relationship between lean manufacturing and firms’ FP.
manufacturing and firms’ FP. Following will be described the rationale for the research hypotheses. Figure 1 provides a summary of the relationship between H1A, H1B, H2, H3 and H4, as described below.

3.1 Lean manufacturing, strategic supplier partnership, and financial performance
Supplier integration strategy for lean enterprises is formed based on the capability of information exchange with suppliers, including inventory level and production planning decisions, forecast, demand, “e-business systems to improve collaborative communication and information sharing with suppliers, and policy-based supplier selection based on relevant measurements to help develop and manage long term supplier relationships” with ultimate purpose to meet customer needs (So and Sun, 2010, p. 475). In existing research, there is a lack of evidence that argues the relationship between manufacturing impacts and strategic supplier relationship, respectively how lean manufacturing impacts strategic supplier relationship. However, Hoque (2022) recently investigated the impact of the lean intervention on suppliers’ productivity. His study demonstrates that buyer-assisted lean intervention is a useful strategy for suppliers to enhance their productivity. But, to achieve that suggests that suppliers need to select the right lean tools, substantial involvement of top management and workers, ensure seriousness and commitment to lean initiatives, and nurture a learning culture to facilitate suppliers’ production capability development.

Building long-term relationships with suppliers based on trust enable the focal firm to realize the benefits of a lean strategy due to reductions in inventory levels and cost savings (McIvor, 2001). Indeed, lean manufacturing entails both cost and benefits (Fullerton and Wempe, 2009). Thus, lean manufacturing and its essential features can allow higher success for firms as they correctly identify their strategic supplier outside the firm boundaries. Since this relationship is yet unexplored in the literature of SC management, the effect of lean manufacturing on strategic supplier partnership is an empirical question. This discussion leads to the following hypothesis:

H1A. A firm’s lean manufacturing has a positive influence on its strategic supplier partnership.

Customers demand various and high-quality products. Therefore, manufacturers, with the purpose of reducing cost, have adopted initiatives related to quality improvement, cellular manufacturing, and setup time reduction to serve customers profitably and timely (Fullerton and Wempe, 2009). Several researches disclose that there is a relationship between lean manufacturing practices that can lead to different effects on business performance (Khalfallah and Lakhal, 2020), but recent studies highlight the complexity of the relationship among lean manufacturing practices, e.g. the relationship between lean manufacturing and organizational performance moderated by competitive strategies is evidenced by Islami and Topuzovska Latkovikj (2022).

Direct associations between lean practices and profitability are generally significant since several lean practices, such as quality improvement initiatives, cellular manufacturing, and setup time reduction, directly affect profitability (Fullerton and Wempe, 2009). Later research has also found a positive relationship between practices of lean manufacturing and firm performance, e.g. firm performance is found to be positively influenced by total quality management (TQM) (Shafiq et al., 2019), just-in-time (Bond et al., 2019), and total productive maintenance (TPM) (Habidin et al., 2018). In addition, the relationship between quality management implementations and FP was testified empirically by O’Neill et al. (2016). Lately, Susanty et al. (2022) confirms that a collective and comprehensive implementation of lean manufacturing practices has a direct effect on business performance. Therefore, we propose the following hypothesis:
3.2 The moderating role of information sharing

Information streams - the degree to which a firm offers information to its partners - coordinate and integrates the SC network (Durugbo, 2014). The effectiveness of information technology shows that lean manufacturing adoption has a strong relationship with the integration of information flows (Cagliano et al., 2006). Therefore, managing the firm’s IS capabilities to promote productive relationships with other SC practices is critical for managers to understand IS and firm performance (Hsu et al., 2008). There is evidence that integrated information technologies facilitate coordination and integration of SC (Vickery et al., 2003) and leads to improved firm performance (Qrunfleh and Tarafdar, 2014). The purpose of better assessing financial reliability is “data symmetry and transparency, which could be accomplished through the level of information sharing” (Ali et al., 2019, p. 725).

In this study, we expect that IS can enhance the influence of lean manufacturing on firms’ FP. Known for the information-sharing nature and the benefits argued above, IS can function as a catalyst in lean manufacturing effects into better financial performance. Information sharing helps to reduce the firm’s costs and enhance the coordination among SC members to achieve the SC goals (Panahifar et al., 2018). It may be that sharing information is a profitable incentive between the SC partners in difficult times. In this case, IS strengthens the relationship between lean manufacturing and FP. Better information flows, and exchanges that support operational processes (e.g. production planning and forecasting) contribute to firm performance (Zhang and Cao, 2018). Information sharing would positively moderate the relationship between lean manufacturing and FP because it could enable more knowledge to the SC partners due to the shared benefits of working together. As shown in Figure 1 and the literature discussed above, this study suggests that IS moderates the influence lean manufacturing on FP. Therefore, is proposed the following hypothesis:

**H2.** Information sharing strengthens the influence of lean manufacturing on firms’ financial performance.

3.3 The mediating role of strategic supplier partnership

A deliberate and purposeful practice that firms engage in to manage their interactions is supplier relationship management (Amoako-Gyampah et al., 2019). The ultimate desire of managers is for the strategic supplier partnership practice to lead to the firms’ success in terms of increased sales growth, market share, and profitability (Hartmann et al., 2012). Lack of information sharing among the supply chain partners may provide uncertainty and consequently diminish the firms’ profitability. Thus, through alliances with suppliers, firms can take advantage of supplier experiences to achieve superior performance, especially in periods of high business uncertainty (Amoako-Gyampah et al., 2019). For successful management of the SC firms must possess the capabilities to tap into resources from external partners and not only rely on their internal resources (Leuschner et al., 2013). For that reason, strategic supplier partnership increases the level of customer responsiveness and satisfaction (Power et al., 2001) and improves organizational performance (Li et al., 2006; Islami, 2021a). Agreeing to what precedes, the following hypothesis can be stated:

**H3.** A firm’s strategic supplier partnership has a positive influence on its financial performance.

Even though integration is very in vogue today, it cannot take as a postulate, Mitrega and Zolakiewski (2012) state that inter-organizational relationships can have both positive
and negative consequences. So, lean manufacturing does not inevitably produce the required performance results. Using strategic supplier partnership can help firms to achieve more optimistic results from lean manufacturing. Therefore, as a potential stock of perceptible and imperceptible relational assets (Gölgeci and Kuivalainen, 2020), lean manufacturing may require the mediating means of strategic supplier partnership to growth its possible impact on FP. In this respect, the lean SC strategy firstly requires the firms to make strategic choices of making cost-reduction and then to build long-term relationships with their suppliers (Qi et al., 2009). Strategic choice of a lean SC for firms can be accomplished by developing and accessing resources from SC partners (Qrunfleh and Tarafdar, 2013).

Suppliers are encouraged to be involved early in the product design process through coordination and collaboration of information across the SC. So, developing a strategic partnership with suppliers enables a better understanding between the focal firm and supply partners’ needs, thus reducing uncertainty and enabling a more flexible response (Malhotra and Mackelprang, 2012). The circumstances of supplier-manufacturer collaboration that influence lean manufacturing adoption may include past performance of suppliers, as well as their ability to share and disclose sensitive business information (like cost and design data) to help manufacturers in operations improvement (Cagliano et al., 2006; Cheng et al., 2016), which may cause an improvement on financial profitability.

The lean SC strategy impacts FP through strategic supplier integration to provide raw materials availability (Ariadi et al., 2021). Firms’ application of just-in-time (as a lean manufacturing dimension) requires synchronizing fast information exchange and strong relationships with strategic suppliers (Giri and Masanta, 2020). An enhanced integration process and information sharing among SC partners, including trust, partnership, and collaboration (Ariadi et al., 2021), can reduce waste and increase operational efficiency by considering the availability of maintenance time to minimize downtime cost, indirectly improving its FP (Duan et al., 2018). For that reason, strategic supplier partnership may improve the quality of manufacturing operations and indirectly improves the firm’s financial performance, such as sales growth and cost-effectiveness (Huo et al., 2016). Indeed, firms use strategic supplier partnerships as a key step in the lean manufacturing implementation strategy (Black, 2007). Therefore, based on the above discussion and arguments, it is proposed in the fourth hypothesis that lean manufacturing enhances firms’ FP through a strategic supplier partnership.

H4. A firm’s strategic supplier partnership mediates the link between lean manufacturing and financial performance.

4. Methods
4.1 Sampling and data collection
In this study, we chose: (a) Kosovo as a research context since firms in Kosovo frequently encounter a high degree of turbulence, uncertainties, complexity, volatility, and adverse conditions (Islami, 2021b). These circumstances make it necessary for firms to integrate their SC to survive or grow in the market. (b) Manufacturing firms are considered a national strategic industry that provides economic stability to develop and developing countries (Islami et al., 2020b). (c) To make the analysis more in-depth, which provides more realistic and reliable results, the research variables measured the usage of SC practices and the benefits from their relationships from March (2017–2020), while FP was measured for March (2019–2020). It was considered that the whole effect of using the independent (lean manufacturing), mediator (strategic supplier partnership), and moderator (information sharing) as SC practices on financial performance would be revealed after two years.
Based on the Podsakoff et al. (2003) requirements to alleviate common method variance (CMV) each survey package contained separate questionnaires administered to middle and high-level managers (dual respondents from each participant organization were required to be filled in), whereas, two months later financial managers were asked to answer only for financial aspects in a separate questionnaire. The data used in this study were gathered by the author for his doctoral dissertation. The sampling frame used the Kosovo Agency of Statistics (KAS), where, 600 firms that met our selection criteria were randomly selected among a total of 10,190 firms registered within KAS (Islami, 2021b). Of the 600 manufacturing firms randomly selected from the database, only 447 firms had updated contact information. Finally, 157 samples were used in our subsequent analyses, with an effective response rate of 35 percent of the contacted sample, deemed adequate for our study. The key characteristics of the sample firms are summarized in Table 1. The results show that over half of the responding firms had less than 49 employees, and about 43 percent had over 20 years of work experience.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>Percent (%)</th>
</tr>
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<tbody>
<tr>
<td><strong>Industry sector</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Food</td>
<td>31</td>
<td>19.7%</td>
</tr>
<tr>
<td>b) Textile</td>
<td>7</td>
<td>4.6%</td>
</tr>
<tr>
<td>c) Construction</td>
<td>63</td>
<td>40.2%</td>
</tr>
<tr>
<td>d) Wood</td>
<td>15</td>
<td>9.8%</td>
</tr>
<tr>
<td>e) Metal</td>
<td>11</td>
<td>7.1%</td>
</tr>
<tr>
<td>f) Plastic</td>
<td>6</td>
<td>3.9%</td>
</tr>
<tr>
<td>g) Chemical</td>
<td>5</td>
<td>2.6%</td>
</tr>
<tr>
<td>h) Other</td>
<td>19</td>
<td>12.1%</td>
</tr>
<tr>
<td><strong>Number of employees</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10–49</td>
<td>96</td>
<td>61.2%</td>
</tr>
<tr>
<td>50–249</td>
<td>57</td>
<td>36.3%</td>
</tr>
<tr>
<td>≥250</td>
<td>4</td>
<td>2.5%</td>
</tr>
<tr>
<td><strong>Firm age</strong></td>
<td></td>
<td></td>
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<tr>
<td>≤10</td>
<td>49</td>
<td>31.2%</td>
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<tr>
<td>11–20</td>
<td>41</td>
<td>26.1%</td>
</tr>
<tr>
<td>&gt;20</td>
<td>67</td>
<td>42.7%</td>
</tr>
<tr>
<td><strong>Annual revenue (2019 value)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤€1 million</td>
<td>71</td>
<td>45.5%</td>
</tr>
<tr>
<td>€1 million–10 million</td>
<td>80</td>
<td>51.3%</td>
</tr>
<tr>
<td>&gt;€10 million</td>
<td>5</td>
<td>3.2%</td>
</tr>
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Table 1. Characteristics of sample firms (N = 157)

4.2 Measurement
In this research are used the existing validated scales for measuring lean manufacturing (Islami, 2021a; Jayaram et al., 2014), strategic supplier partnership (Islami and Topuzovska Latkovikj, 2022; Li et al., 2006), information sharing (Islami, 2021b; Wu et al., 2014), and financial performance (Gölgeci and Kuivalainen, 2020; Huo et al., 2014; Islami, 2021a; Islami and Topuzovska Latkovikj, 2022; Qi et al., 2011). Respondents indicated this on a seven-point Likert-type scale ranging from 1 to 7. Cronbach’s alpha (α) value for each variable and the items scores of scale are provided in Table 2.
5. Analysis and results

5.1 Reliability and validity

A rigorous process is used to verify the dimensionality and reliability of the research constructs. According to Podsakoff et al. (2003) requests and based on previous practices used by Huo et al. (2014) and Islami (2021b) prior to data collection, content validity was established through a domain search of the literature, an iterative construct review by domain experts, careful synthesis and critical evaluation of existing constructs executive interviews, pre-pilot study and pilot study (see Islami, 2021a; Islami and Topuzovska Latkovikj, 2022). After data collection, several purification processes and analyses to test the reliability and validity of the constructs were conducted, including factor analysis, means, standard deviations, internal consistency analysis (Cronbach’s alpha) and correlation analysis (see Table 3). Additionally, the study addressed potential non-response bias during the data collection process using Harman’s

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Standardized loadings (a)</th>
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<tbody>
<tr>
<td><strong>Lean manufacturing</strong> ((a = 0.804))</td>
<td></td>
</tr>
<tr>
<td>Using new process equipment or technologies</td>
<td>0.886</td>
</tr>
<tr>
<td>Pursuing a continuous quality improvement program</td>
<td>0.910</td>
</tr>
<tr>
<td>Reducing set-up time</td>
<td>0.536</td>
</tr>
<tr>
<td>Reengineering the production processes</td>
<td>0.495</td>
</tr>
<tr>
<td><strong>Strategic supplier partnership</strong> ((a = 0.820))</td>
<td></td>
</tr>
<tr>
<td>Involving suppliers in the design of new products</td>
<td>0.883</td>
</tr>
<tr>
<td>Solving problems jointly with our suppliers</td>
<td>0.757</td>
</tr>
<tr>
<td>Using continuous improvement programs that include our key suppliers</td>
<td>0.682</td>
</tr>
<tr>
<td>Involving our key suppliers in business and strategy planning</td>
<td>0.588</td>
</tr>
<tr>
<td><strong>Information sharing</strong> ((a = 0.892))</td>
<td></td>
</tr>
<tr>
<td>Informing trading partners in advance of changing needs</td>
<td>0.611</td>
</tr>
<tr>
<td>We and our trading partners keep each other informed about events or changes that may affect the other partners</td>
<td>0.928</td>
</tr>
<tr>
<td>Our trading partners share proprietary information with us</td>
<td>0.846</td>
</tr>
<tr>
<td>Our trading partners keep us fully informed about issues that affect our business</td>
<td>0.760</td>
</tr>
<tr>
<td>Information exchange between our trading partners and us is timely, accurate, complete, adequate, and reliable</td>
<td>0.780</td>
</tr>
<tr>
<td><strong>Financial performance</strong> ((a = 0.878))</td>
<td></td>
</tr>
<tr>
<td>Return on investment (ROI)</td>
<td>0.689</td>
</tr>
<tr>
<td>Growth in return on investment</td>
<td>0.837</td>
</tr>
<tr>
<td>Growth in sales</td>
<td>0.658</td>
</tr>
<tr>
<td>Return on sales (ROS)</td>
<td>0.701</td>
</tr>
<tr>
<td>Growth in return on sales</td>
<td>0.680</td>
</tr>
<tr>
<td>Growth in market share</td>
<td>0.607</td>
</tr>
<tr>
<td>Growth in profit</td>
<td>0.722</td>
</tr>
</tbody>
</table>

Table 3. Descriptive statistics and inter-correlations

<table>
<thead>
<tr>
<th>Definition</th>
<th># Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Lean manufacturing</td>
<td>4</td>
<td>5.240</td>
<td>0.794</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Strategic supplier partnership</td>
<td>4</td>
<td>4.678</td>
<td>1.012</td>
<td>0.529**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Information sharing</td>
<td>5</td>
<td>4.552</td>
<td>0.632</td>
<td>0.598**</td>
<td>0.430**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Financial performance</td>
<td>7</td>
<td>5.130</td>
<td>0.736</td>
<td>0.430**</td>
<td>0.490**</td>
<td>0.353**</td>
<td></td>
</tr>
</tbody>
</table>

Note(s): N = 157. Correlation is significant at the 0.01 level (2-tailed). (\(^*\)\(p < 0.05\), \(^*\)\(p < 0.01\), \(^**\)\(p < 0.001\))
single-factor test where no single factor is found to explain more than fifty percent (>50%) of the variance. Consequently, there was no serious common-method bias in this study.

To estimate construct validity, ran a CFA measurement model. The measurement model results indicate a good model fit: \( \chi^2 (157) = 237.26; \text{df} = 159; p < 0.001; \text{NFI} = 0.877; \text{IFI} = 0.956; \text{TLI} = 0.946; \text{CFI} = 0.955; \text{RMSEA} = 0.056; \text{PCLOSE} = 0.241 \). For all measures, the average variance extracted (AVE) estimates and composite reliability (CR) were above the recommended thresholds of 0.5 and 0.7, respectively, which indicates convergent validity (Bagozzi and Yi, 2012). Also, evaluated discriminant validity, which showed that for all constructs the AVE values were higher than the shared variances. Hence, the CR values (>0.7) confirm reliably, AVE values (>0.5) confirm convergent validity, and maximum shared variance (MSV < AVE) and square root of AVE greater than inter-construct correlations confirm discriminant validity (Hair et al., 2010). In addition, to address potential multicollinearity issues, calculated the variance inflation factor (VIF). Results show that none constructs pose a multicollinearity problem, since the values are well below the recommended threshold of 4 (Pan and Jackson, 2008). Together, all these analysis are presented in Table 4. Finally, exploratory factor analysis (EFA) indicates that all item loadings are above the recommended cut-off value of 0.4 (Hair et al., 2010), and none of the items cross-loaded on other factors.

<table>
<thead>
<tr>
<th>Construct</th>
<th>CR</th>
<th>AVE</th>
<th>MSV</th>
<th>MaxR(H)</th>
<th>LM</th>
<th>SSP</th>
<th>IS</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lean manufacturing (LM)</td>
<td>0.896</td>
<td>0.635</td>
<td>0.282</td>
<td>0.914</td>
<td>0.741</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic supplier partnership</td>
<td>0.830</td>
<td>0.553</td>
<td>0.269</td>
<td>0.847</td>
<td>0.487</td>
<td>0.743</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information sharing (IS)</td>
<td>0.825</td>
<td>0.549</td>
<td>0.282</td>
<td>0.874</td>
<td>0.531</td>
<td>0.519</td>
<td>0.797</td>
<td></td>
</tr>
<tr>
<td>Financial performance (FP)</td>
<td>0.884</td>
<td>0.524</td>
<td>0.242</td>
<td>0.896</td>
<td>0.447</td>
<td>0.492</td>
<td>0.343</td>
<td>0.724</td>
</tr>
<tr>
<td>VIF(^{f})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.792</td>
<td>1.612</td>
<td>2.087</td>
<td></td>
</tr>
</tbody>
</table>

Note(s): \(^{a}\)Italicized values on the diagonal are the square root of the AVE values
\(^{b}\)Composite Reliability
\(^{c}\)Average Variance Extracted
\(^{d}\)Maximum Shared Variance
\(^{e}\)Maximum Reliability
\(^{f}\)Variance Inflation Factor. VIF for the variable “IS_x_LM” is 1.556

5.2 Hypothesis testing

In Figure 1 is depicted the theoretical model where this research is based on. This study by estimating a structural equation modeling (SEM) in AMOS 26 has tested the hypothesized relationships. SEM is a comprehensive technique that enables to analyses relationships of latent variables, time series data and test non-normal data (Gölgeci and Kuivalainen, 2020). Therefore, for this study SEM method is considered suitable, as the majority of constructs in conceptual framework are latent and it tests mediation and moderation effects within the whole model.

In the whole model, is tested the direct and moderating paths and then the mediating role of strategic supplier partnership. Where is applied the interaction terms in the model, using single-indicant estimation method to calculate them (Gölgeci and Kuivalainen, 2020). To diminish the multicollinearity problem and to measure the moderating effect the constructs were mean-centered. The fit statistics for the structural model are well within generally accepted limits (\( \chi^2 (157) = 274.05; \text{df} = 176; p < 0.001; \text{NFI} = 0.864; \text{IFI} = 0.947; \text{TLI} = 0.935; \text{CFI} = 0.946; \text{RMSEA} = 0.060; \text{PCLOSE} = 0.122 \)). The standardized parameter estimates and
the directional significance levels for the investigated structural paths are shown in Table 5. Whereas the whole relationships in the proposed model are presented in Figure A1 (see Appendix 1).

### Table 5. Structural model estimation results

<table>
<thead>
<tr>
<th>Path</th>
<th>Coefficient (t-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct effects</strong></td>
<td></td>
</tr>
<tr>
<td>(H1A) Lean manufacturing → Strategic supplier partnership</td>
<td>0.50 (4.52)***</td>
</tr>
<tr>
<td>(H1B) Lean manufacturing → Financial performance</td>
<td>0.25 (2.00)*</td>
</tr>
<tr>
<td>(H3) Strategic supplier partnership → Financial performance</td>
<td>0.31 (3.11)**</td>
</tr>
<tr>
<td><strong>Moderating effects</strong></td>
<td></td>
</tr>
<tr>
<td>(H2) Information sharing_ x_ Lean manufacturing → Financial performance</td>
<td>0.07 (0.71)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mediating effects</th>
<th>Total effects</th>
<th>Direct effects</th>
<th>Indirect effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>(H4) Lean manufacturing → Strategic supplier partnership → Financial performance</td>
<td>0.41 (&gt;2.58)** 0.25 (&gt;1.65)+ 0.16 (&gt;2.58)**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note(s):** Critical values of the $t$ distribution for $\alpha = 0.10$, $\alpha = 0.05$, $\alpha = 0.01$, and $\alpha = 0.001$ (two-tailed test) are $+1.65$, $*1.96$, $**2.58$, and $***3.30$, respectively. The coefficients are standardized regression coefficients.

5.2.1 Direct effects, moderation and mediation. In H1A and H1B, is argued that lean manufacturing is connected positively with strategic supplier partnership and firm’s financial performance. The results support these hypotheses ($\beta = 0.50; t = 4.52; p < 0.001$, and $\beta = 0.25; t = 2.00; p < 0.05$, respectively).

In H2, is expected that information sharing strengthens the impact of lean manufacturing on firm’s FP. Not supporting this hypothesis, findings demonstrate that the effect of lean manufacturing on firm’s FP is not contingent upon IS. Specifically, this study cannot argue that IS strengthens the relationship between lean manufacturing and firm’s FP, and the findings ($\beta = 0.07; t = 0.71; p > 0.10$) provide no support for this hypothesis.

To test mediation, initially was tested the direct associations between strategic supplier partnership and firm’s FP. Where in H3, was expected that strategic supplier partnership is positively linked with firm’s FP. In support of this hypothesis, the path between strategic supplier partnership and firm’s FP is significantly positive ($\beta = 0.31; t = 3.11; p < 0.01$). Then was analyzed indirect effect by setting the number of sampling iterations ($N$) to 5,000, using the bootstrapping method suggested by Hayes (2018). When testing the mediating effect of strategic supplier partnership, the direct effects between lean manufacturing and firm’s FP were found to be marginally significant at $p < 0.10$ with the mediation, whereas $p < 0.05$ without the mediation. Moreover, the bootstrapping method revealed that the indirect effect of lean manufacturing on firm’s FP through strategic supplier partnership was significant at $p < 0.01$ ($p = 0.003$). This result argument the partial mediation and supports H4.

6. Discussion and research implications
This study integrates several key SC practices in order to construct an applicable SC model which firms may use as a strategy to outperform competitors and increase their financial performance. It also utilizes SC strategy as a set of approaches to integrate suppliers, manufacturing, and stores so that merchandise is produced and distributed in the right quantities, place, and time to minimize system-wide costs while satisfying service level requirements (Simchi-Levi et al., 2008).
This study’s important finding is that the utilization of strategic supplier partnership mediates the association between lean manufacturing as an SC practice and FP. Results for the SEM depicted in Figure 1 and solved in Figure A1 indicate that lean manufacturing has a positive indirect effect (through strategic supplier partnership) on FP. This advocates that lean manufacturing means are effective when supported by a strategic supplier partnership dimension. This outcome of a mediating role for strategic supplier partnership is in harmony with modern manufacturing requests and undoubtedly has theoretical and practical implications where managers will think about how to link SC practices in the employment of lean manufacturing. Besides, the mediation finding may illuminate the inconsistent findings of earlier investigations that examine the relationships between lean manufacturing and FP without considering the contingency role of the strategic supply relationship and information sharing.

6.1 Theoretical contributions

Firms operate in increasingly unfriendly and disruptive environments that are difficult to deal with by relying solely on internal resources and strategies (Gölgeci and Kuivalainen, 2020). Therefore, firms’ lean manufacturing derived from its network ties with other SC practices might offer exclusive incomes that could influence their FP. Yet, little is known how and when the interactions among the SC practices lead to financial performance. This study place of interest the insufficient attention paid to inspecting the in-depth picture of the relationship between lean manufacturing and FP. It also takes out the dominant premise that strategic supplier partnership and IS can play a contributory role in explaining how firms can utilize lean manufacturing and improve their financial performance.

The findings of this study suggest that strategic supplier partnership can function as a linking pin between lean manufacturing and firms’ FP and clarify how lean manufacturing can be used to increase firms’ financial performance. For the reason that lean manufacturing is a vital resource, the link boundary-spanning capability of strategic supplier partnership is required to channel its potential toward strategic ends to realize its influence on the competitive market and FP. This finding advances the extant researches that examine the linkages between lean manufacturing and firms’ FP (Khalfallah and Lakhal, 2020; Shafiq et al., 2019; Susanty et al., 2022) but have overlooked mediating mechanisms that serve as a channel on the relationship between these constructs.

The results also reveal that lean manufacturing and strategic supplier partnership practices have positive and significant influence on firms’ FP. However, it could not provide significant evidence that lean manufacturing can be contingent upon IS practice. In this respect, the findings cannot give an account to the question of the connections between lean manufacturing, information sharing, and firms’ FP. Based on these results, IS cannot be said that is needed to successfully strengthen the direct role of lean manufacturing in firms’ FP. “The alignment process of the firm can include developing integrative objectives for the whole SC, evaluating performance based integrative objectives, rewarding cooperation, and synchronizing in cross-functional teams” (Gölgeci and Kuivalainen, 2020, p. 72).

This study makes three important contributions to operational and strategic management studies. First, it contributes to inquiries on how the dimension of lean manufacturing is put into use through strategic supplier partnership to materialize its potential impact in firms’ FP. Therefore, these findings on the role of lean manufacturing practice as a relational source of firms’ FP complement extant research, which has measured mainly the impact of SC practices on firm performance using behavioral perspectives and not contingency perspectives (e.g. see Duong et al., 2019; Islami, 2021a; Islami, 2021b, Islami and Topuzovska Latkovikj, 2022; Li et al., 2006; Quang et al., 2016; Truong et al., 2017).
Second, even this study could not provide significant evidence that IS can be a critical contingency for synergistic utilization and deployment of lean manufacturing for firms’ FP. It suggests that the utilization and application of lean manufacturing competences cannot be separated from sharing quality information with partners. Whereas the addition of strategic supplier partnership into the picture develops an indirect view of the role that lean manufacturing plays in firms’ FP. Hence, these findings indicate that strategic supplier partnership is an important condition for firms’ FP and organizational existence, since firms may face a higher chance to failure if they do not integrate their SC practices (e.g. lean manufacturing and strategic supplier partnership) strategically. This contribution can explain why some firms might have bad FP although they may possess a high level of lean manufacturing and help decompose paradoxical findings in research on lean manufacturing, supplier partnership, and firm performance.

Third, previous studies have mainly assumed lean manufacturing as a critical practice in volatile and turbulent environments (Bond et al., 2019; Habidin et al., 2018; Islami, 2021b; Islami and Topuzovska-Latkovikj, 2022; Khalfallah and Lakhal, 2020; Li et al., 2006; Shafiq et al., 2019), but paid little attention to the integration between SC practices by empirical tests. This study moves beyond a mere supposition that lean manufacturing is crucial for firm performance and empirically tests whether strategic supplier partnership and IS channel the potential impact of lean manufacturing, which leads to increased firms’ performance. This research provides empirical evidence to support the argument that strategic supplier partnership can underlie positive outcomes between lean manufacturing and firms’ FP.

6.2 Practical implications
Lean manufacturing implementation processes are not available in frameworks (Islami, 2021b), therefore, many firms have documented the failure to adopt lean manufacturing practices (Henao et al., 2019). Related to practical implications, the results of this study have two major managerial implications for firms that aim to implement SC practices and achieve higher performance in dynamic marketplace.

The first is to benefit from the firm’s lean manufacturing through strategic supplier partnership. Most firms have valuable resources and effective actions ingrained in their organization. But, some of these essential resources cannot realize their effect if they are not linked to inter-organizational partners. Therefore, firms should advance and stimulate their strategic supplier partnership and capitalize on their lean manufacturing in the pursuit of a better FP. Although high investments in strategic supplier partnerships are required in order to develop, keep, and operate it. It is a valuable attempt as it could play an important role in the firms’ performance in the long term.

Second, we highlight that strategic supplier partnership facilitates realizing the potential of lean manufacturing for firm performance, but we cannot statistically prove that IS strength the positive impact of lean manufacturing on FP, we still are convinced that sharing information with partners may be valuable for all partners that are involved in the SC. Therefore, maintaining organizational cohesion and harmony through the resources embedded in the firms’ relationships is advantageous to achieve better FP. Firms that as an objective have to increase the partnership and collaboration with other firms are likely to be in a better and more effective position to manage their lean manufacturing in order to improve their financial performance.

It is worth clarifying that the meaning of the term “lean” practices is “efficient” practices (Islami, 2021a), as lean practices seek to eliminate any activities that do not add value (Abolhassani et al., 2016) to the production process. In this vein, using rigorously the lean practices can lead to the economization of performance measures, which may increase firms’ FP. Following Womack and Jones (2003), this study presents a road map that manufacturers
may follow to implement the best lean practices that could lead to performance-related measures. It suggests that in terms of using SC practices (e.g. strategic supplier partnership, information sharing, and so forth), manufacturers need to implement the following five fundamental principles to eliminate waste and increase measures of FP: (a) identify all the steps necessary to design, order and produce the product across the whole value stream to highlight non-value-adding waste; (b) specify what does and does not create value from the customer’s perspective; (c) make actions that create value flow without interruption, detours, backflows, waiting or scrap; d) strive for perfection by continually removing successive layers of waste as they are uncovered; and (e) only make what is pulled by the customers just-in-time. Following these principles, internal lean practices may include set-up reduction, short lead times from suppliers, pull production, streamlining ordering, receiving and other paperwork and continuous quality improvement (Li et al., 2006).

7. Conclusions
This paper takes an integrative approach using structural equation modeling that systematically observes the effect of lean manufacturing on strategic supplier partnership, the direct effect of lean manufacturing and strategic supplier partnership on FP, the mediating effect of strategic supplier partnership on the relationship between lean manufacturing and FP, and the moderating role of IS on the relationship between lean manufacturing and FP. It answers four research questions: (1) do firms with high levels of lean manufacturing have high levels of FP; (2) do firms with high levels of strategic supplier partnership have high levels of FP; (3) do firms with the high level of lean manufacturing mediated by strategic supplier partnership have high levels of FP; and (4) do firms with a high level of lean manufacturing moderated by IS, have high levels of FP? A comprehensive, valid, and reliable model for evaluating lean manufacturing, strategic supplier partnerships, and IS practices was developed to address these measurements. In addition to convergent validity, discriminant validity, reliability, and validation of constructs, the model was examined by rigorous statistical testing.

This study provides empirical evidence that lean manufacturing has a positive and direct effect on strategic supplier partnership, that lean manufacturing, and strategic supplier partnership have positive and direct effects on FP, that strategic supplier partnership partially mediates the relationship between lean manufacturing and FP, whereas, empirically it could not demonstrate that IS significantly moderates the relationship between lean manufacturing and FP. These findings advance the existing knowledge about the SC practices and FP interface and provide significant practical guidelines for firm managers and SC and strategic managers. Additionally, it represents a significant contribution to the scientific and academic value (Islami, 2021a) regarding the relationship between SC practices as significant indicators and their impact on firms’ FP in the manufacturing industry in Kosovo, in the region, and beyond.

7.1 Limitations and future research
This study offered a relationship-based view of SC practices. It suggests that integration obtained through SC practices can be a critical source of firms’ FP. Still, a more in-depth approach is needed to analyze SC practices in order to specify how such practices can be utilized to support firms to be leaders in their industry. Since there might be a disparity between the perception and the reality of lean manufacturing as a SC practice, it is not clear how such disparity could influence strategic supplier partnership and firm performance. Future research can discover the role of more practices and aspects of SC management in firms’ FP. For example, the practices that are analyzed in this study do not present all SC
practices, therefore future research can explore the integration of additional practices on the model, such as logistics integration, customer relationship, JIT/lean capability, geographical proximity, cross-functional coordination (Islami, 2021a), which have been overlooked in this study. Also, future research can study this model with different industries, in different contexts, and conducting cross-cultural studies. Especially, the variance between different countries (e.g. a good point of comparing might be Western economies and emerging economies).

Furthermore, as the majority of existing researches are focused on the practices that have positive effect on firm performance, there is a need to explore what practices could hinder or discourage firm performance. For example, to find and explore the negative factors which can hinder lean manufacturing or strategic supplier partnership to be implemented effectively.

Finally, Tóth et al. (2017) highlight that qualitative comparative analysis allows a more thorough understanding of how different combinations of conditions/configurations lead to a specific outcome and the possibility that different paths produce the same outcome. Thus, from a methodological standpoint, research on SC management can benefit from methodologies beyond commonly adopted methods of case studies and survey-based research (Gölgeci and Kuivalainen, 2020). In turbulent and dynamic markets, qualitative comparative analysis can be implemented to discover different alternative paths or patterns to realize SC management strategies, as it allows researchers to interpret the interactive nature of underlying forces behind the integration of SC management. Since this research has only measured the upright relationship between SC management practices (lean manufacturing, strategic supplier partnership, information sharing) and financial performance. Other further studies could focus, for example, to examine the reverse causality to identify if FP has an impact on implementing lean manufacturing, strategic supplier partnership or IS practices. Meanwhile FP may influence the way of obtaining any of these three constructs and bring more information on the cause-effect link revealed in this study.

References


Appendix

The integration of supply chain practices

Figure A1. Proposed model

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