Conquering in emerging markets: critical success factors to enhance supply chain performance

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Abstract

Purpose – In the context of emerging economies, the purpose of this paper is to seek the critical success factors (CSFs) of supply chain and identify their relationships to enhance the supply chain performance (SCP) in a sample of Indian manufacturing firms.

Design/methodology/approach – On the basis of a comprehensive literature review, the authors conducted this study and proposed a new model of antecedent and outcomes for SCP in emerging markets. The empirical data for this study were drawn from a survey of 227 Indian firms, resulting in a response rate of 52 percent. The method of confirmatory factor analysis was applied to refine the CSFs and SCP scale for empirical analysis. The data were analyzed by employing the structural equation modeling technique.

Findings – The results reveal that all the identified CSFs, namely, agility, flexibility, flexible innovation, information and communication technology, collaboration among conglomerate divisions, process structure, and training and leadership programs, are positively associated with SCP. The empirical study of 227 Indian firms lent good support to the hypotheses and validates it by the data analysis. Consequently, these findings highlight the prominence of these factors of supply chain for gaining a sustainable competitive advantage in emerging market scenario.

Research limitations/implications – The study emphasizes on CSFs in emerging markets that will help to boost the organization's SCP through agility and flexibility in supply chain. This study is applicable for growing markets in which there is ample amount of resources.

Originality/value – As economic growth stagnates in developed economies, emerging markets grow at near double-digit rates. Somehow, this study is pioneer in terms of enhance SCP in emerging market scenario. Moreover, the outcome of the study could provide empirical evidence of the effects of CSFs on SCPs.

Keywords Performance management, Emerging markets, Critical success factors, Agility, Flexibility, Supply chain management

Paper type Research paper

1. Introduction

Volatile demand and high level of competition coupled with umpteen opportunities are the hallmarks of emerging markets along with dynamic business environment. In such scenario, managing the material and information flow in a supply chain is critical. Businesses try to design a supply chain that can provide the highest degree of customer satisfaction at the lowest possible cost. In such markets, the supply chain is centered on keeping the operations Lean in order to improve the overall performance. The study theorizes and tests a model of supply chain performance (SCP) in the emerging market context. Emerging markets are the growth harbingers for manufactured products and technology. For instance, the textile machinery industry in India, oil and gas exploration in Russia and agriculture in China have promoted the emergence of merchandizing and branding, cosmetics markets and fertilizer markets, etc., respectively. Avittathur and Jayaram (2016) reported that China is today the second largest economy in the world and it is also having the largest purchasing power parity. India has recently overtaken China as the fastest growing large economy.

Emerging markets have long served as platforms for manufacturing by multi-national enterprises. Historically, emerging markets are known to reside in the countries with low economies and high populations. Pelle (2007) explained "Emerging markets represent attractive markets and low-cost manufacturing bases; they also tend to have inadequate commercial infrastructure, evolving legal systems, and a high-risk business environment." In these markets, firms are always on the lookout for growth opportunities. Intense competition among the firms results in low elasticity of demand, leading to compromised quality of products and other malpractices. In addition, planning, forecasting and aligning end-to-end supply chain diligently are ways to gain competitive advantage in these markets (Leach, 2013). The survival of firms directly depends on efficiency and effectiveness of its supply chain. In order to be sustainable, firms need to continuously rethink, refocus, redesign, revaluate and recognize potential capabilities and operation of its supply chain. In this respect, Deman and Tuyishime (2009) have said "Emerging markets present major challenges like poor infrastructure, overstretched capacity, a highly fragmented supplier base, the lack of traditional retail channels and point-of-sales data, ineffective usage of information technologies and communication, a very complex system of taxes and restrictive government regulations, many logistics and distribution models." Jayaram et al. (2016) examined the key role of logistic service providers in the service supply chain management (SCM) in the emerging economy context. Hsu et al. (2016) showed the results of firms that implement sustainable supply chain initiatives can realize positive reverse logistics outcomes. Further, their study also provides new insights into eco-innovation and eco-reputation strategic orientations as theoretically important antecedents of sustainable supply chain initiatives.

Arnold and Quelch (1998) have said that emerging economies are different from developed economies in many ways. They can be defined as countries satisfying two criteria: a rapid pace of economic development, and government policies favoring economic liberalization and adoption of a free-market system. Due to the dynamic nature of this market, industry faces many hurdles like extreme competition, dominance of conglomerate divisions, rapid changes in technology and corruption.

Leach (2013) has stated that "Emerging markets come with huge opportunities but come with unique features and issues due to the constant for business growth, volatile demand and low maturity of supply chain processes." There are many researchers who have identified the success for the firms in emerging market, for instance Clive Geldard, a Group Vice President has emphasized on focusing three areas in retail and supply chain in emerging market, i.e. future-proofing distribution models, re-engineering traditional channels and building the triple A (agile, align, and adapt) rated supply network. Moreover, a recent report by Accenture (2014) cited four operational practices of supply chain in emerging markets, i.e. mix operational approaches, extensively deploying technology, focus on quality and market knowledge and aggressive investment. This report draws attention toward some emerging market issues such as wide range of consumer needs, high investment, cultural differences, volatile commodity prices and infrastructural challenges. There have been some initiatives taken for winning emerging markets, such as heavily investing in assets within the region (plants, distribution centers, suppliers, etc.), servicing emerging markets from existing established operations, hiring local talent to manage supply chain and coordinating operations, extending a strategic alliance with an existing player, setting up a joint venture or partnership with a local organization and acquisitions. In order to cope with the turbulence and risk in the present environment, concepts of supply chain flexibility (Prater et al., 2001; Jack and Raturi, 2002) and agility need attention of practitioners and researchers alike.

Despite the increasing interest in the developing economies and a surge in literature on these markets, the extant literature falls short in identifying a comprehensive list of critical success factors (CSFs) in the context of emerging markets. Through this study, we intend to

make three major contributions. First, by perusing the extant literature, we identified seven CSFs impacting on SCP. Second, we established conceptual linkages of the identified CSFs with the dynamics of emerging markets. A conceptual model is proposed in this regard. Finally, we tested the model and hypotheses employing structural equation modeling (SEM). We conclude with a discussion on implications of the results and future research directions are proposed.

2. Theoretical framework and research hypotheses
In this section, the theoretical framework and related literature have identified several arguments. All are positive, in postulating the nature of relationship the CSFs with agility, flexibility and SCP. We propose a theoretical model where the implementation of supply chain CSFs has positive influence on the agility, flexibility and SCP; and the empirical study was designed to decipher these relationships.

2.1 Agility, flexibility and SCP
In static conditions supply chain network, the operations work smoothly, but in the dynamic environment a slight disturbance can disrupt operations of the entire firm. The supply chain agility is considered as a key element of an organization's competitive strategy (Goldman *et al.*, 1995). In the extant literature, researchers have shared different viewpoints regarding flexibility and agility. For instance, Vickery *et al.* (1999) propose the different types of supply chain flexibility, namely, product, volume, launch and access and target market. Viswanadham and SrinivasaRaghavan (1997) describe flexibility as the ability of a business process to effectively manage or react to changes with little penalty in time, cost, quality or performance. They also outline volume, mix, routing, delivery time and new product flexibility. Though Lee (2004) treats agility as part of a broader concept of flexibility, most researchers treat agility as a distinct factor affecting SCP. It represents the ability of an organization's internal supply chain functions to provide a strategic advantage by responding to marketplace uncertainty (Arif and Pillania, 2008). It is also related to nimbleness, quickness, and dexterity; while flexibility is related to adaptability and versatility (Kidd, 2000). Agility is typically associated with overall organizational abilities (Goldman *et al.*, 1995), while flexibility is related to operational abilities (D'Souza and Williams, 2000). Flexibility and agility are thus related to the SCP.

Fayezi *et al.* (2016) identified the development of agility and flexibility in supply chain that will help academics to gain a better understanding as to maximize SCP. Agility increases the SCP in terms of faster response time, shorter delivery time, shorter cycle time, shorter time to market, lower backorder level, fewer stock outs and higher capacity utilization (Swafford *et al.*, 2000), whereas flexibility can understood as "the inherent ability, or characteristics of the SC and its partners to be sensitive to the minor or major disturbances in business environment, assess correctly the real situation, respond quickly by the way of adjustments and adaptation with little time, effort, cost and control effectively the organization with stable performance" (More and Subash Babu, 2007). Now, time has come to focus on flexible supply chain because supply chain has become complex and environment riskier (Prater *et al.*, 2001; Jack and Raturi, 2002). Thus, we propose that in the emerging markets, supply chain agility and flexibility are the key drivers of SCP. On the basis of these findings, we suggested the following hypotheses:

H1. There is a positive and significant relationship between agility and SCP.

H2. There is a positive and significant relationship between flexibility and SCP.

2.2 Information and communication technology (ICT)
In emerging markets, infrastructure is developing steadily, and technologically equipped labor force is getting ready. In order to survive in competition, it is imperative for firms to adapt

technology for speeding up their processes, lower wastage, increase efficiency and ensure better predictability. Mirkovski *et al.* (2016) found that firms who intend to leverage ICT to facilitate information sharing and collaboration with their SC partners will benefit from the findings of this study. Tripathy *et al.* (2016) analyzed the structural relations among information technology (IT), logistic effectiveness, operational effectiveness, customer relationship, supplier relationship and SCM competitive advantage in their research. Further the results indicate that IT holds the key to achieve the SCM competitive advantage in SCM practices of SMEs in India. According to Kodish *et al.* (1995), organizational agility requires a firm to be quick in assemble its technology, employees, and management with communication infrastructure in responding to changing customer demands in a market environment of continuous and unanticipated change. In addition, Lucas and Margrethe (1994) indicate that IT can have a significant impact on organizational flexibility. IT contributes to flexibility by changing the nature of organization boundaries and the time when work occurs, altering the nature and pace of work and by helping firms respond to the changing market conditions. Mirkovski *et al.* (2016) identified the insights which reveal that the institutional context (i.e. environmental uncertainty) has significant indirect influence on ICT use by SMEs from rule-based and relationship-based SCs through contractual and relational mechanisms (i.e. contracts and social bonds).

According to Auramo *et al.* (2005), the main essential reasons to use IT in SCM are to reduce the costs of operational processes, improve information quality by eliminating human errors and speed up the transfer of information among organizations. Several IT solutions are available that can be used in emerging markets are MRPII, RFID, internet, CAD/CAE, ERP, EDI, multimedia and e-commerce. For instance, Avittathur and Jayaram (2016) examined that the firms such as Nokia and Reuters are offering information services to farmers that will enable them to make informed decisions using market information supply chain coordination and collaboration in the organizations. Today, the mobile-based information system also plays a vital role.

These are the emerging technologies which can be used in the developing countries to gain competitive advantage to protect their technology and services. In Table I, there are some supply chain issues and their technological solutions that can enhance the SCP in an emerging market.

Some supply chain problems and their IT solutions	
Supply chain problem	IT solution
Linear sequence of processing is too slow	Parallel processing using workflow software
Waiting time between chain segment are excessive	Identify reason(using decision support software) and expedite communication and collaboration (intranets and groupware)
Existing of non-value added activities	Value analysis (SCM software), simulation software
Slow delivery of paper documents	Electronic documents and communication system (e.g. EDI, e-mail)
Repeat process activities due to wrong shipments, poor quality, etc.	Electronic verifications (software agents), automation, eliminating human errors, electronic control system
Lack of information or too slow flow	Internet/intranet, software agents for monitoring and alert, barcodes, direct flow from POS terminals
Lack of synchronization of moving materials	Workflow and tracking system, synchronization by software agents
Poor coordination, cooperation and communication	Groupware products, constant monitoring, alerts, collaboration tools
Delays in shipment from warehouse	Use robot in warehouse, and warehouse management software
Scheduling problems, manufacturing lack of control	Intelligent modeling for B2B modeling
Learn about delay after they occur or too late	Tracking system, anticipate delays, trend analysis, early detection (intelligent system)
Source: Turban *et al.* (2008)	

Table I.
Definitive guides
for supply chain
management
professionals

ICT is one of the most important enablers of effective SCM (Meredith and Mantel, 2006), firm's agility (Sambamurthy et al., 2003; Lu and Ramamurthy, 2011), and firm's flexibility (Lucas and Margrethe, 1994). Previous studies show a significant positive relationship between IT capability and firm's agility (Lu and Ramamurthy, 2011; Zain et al., 2005; Lucas and Margrethe, 1994). Agility in supply chain is dependent on information and, importantly, agile information systems (White et al., 2005; Christopher and Towill, 2000). White et al. (2005) suggest that new information systems and technologies, such as e-hubs and web services, can potentially help in system integration and flexibility. Research indicates that IT investments and capabilities influence firm's performance (Sambamurthy et al., 2003). Thus, the following hypotheses are proposed:

H3. There is a positive and significant relationship between ICT and agility in supply chain.

H4. There is a positive and significant relationship between ICT and flexibility in supply chain.

H5. There is a positive and significant relationship between ICT and SCP.

2.3 Flexible innovation (FI)

Most of the companies think that emerging market is a new field for products. Their sole focus is on producing products at a very low cost. However, there is a growing middle class in the emerging markets, which is an indicator of the potential of these markets. Demand of such a market is not uniform. Firms should emphasize on refocus and redesign of the products. Hence, FI is a key driver for the redesign and refocus of supply chain activities. For instance, GE (for ultrasound machine) and Nokia captured India and China markets because they were more flexible, willing to tailor products and services and to localize its workforce, while they were less responsive, low on flexibility and more self-centered in the USA. Flexibility and agility is the hallmark of the ability to adapt rapidly and efficiently (Duguay et al., 1997). Nowadays, organizations want to develop a flexible and agile organization system more than innovations and this system adapt quickly to rapidly developing trends and changing market conditions (Anderson, 2011). In the article, "Best practice for achieving high performance IT", emphasis is placed on the need of "FI" and "agility" to win the marketplace. Thus, flexible innovation and agility lead towards competitive advantage. Procter & Gamble talked about increasing our agility, improving cost efficiencies, improving our speed to market and relentlessly focusing on innovation in every part of our business, it suggests that there is a relationship between the agility and innovation.

Harraf (2012) stated "the entrepreneurial spirits of a business and its deep seated value system, constantly innovate and seek solution to improve upon customer welfare or innovate a pioneering process within the value chain cannot be achieved without an intentional and successful integration of culture of innovation and agility". Thus, the culture of innovation without corresponding agility cannot alter the competitive position of the business which explicitly explained the relationship between innovation and agility.

De Spiegelaere et al. (2014) divide three different types of labor flexibility, namely functional, contractual and wage flexibility; and also divide two categories of innovation, one is organization innovation and other is employee-driven innovation (EDI). EDI refers to innovations developed and implemented principally on employee initiatives and not necessarily with support or even knowledge of the management (Kesting and Ulhoi, 2010). Organizational innovation includes both managerial as EDI and encompasses product, process or organizational design (Damanpour, 1991). He concludes that functional flexibility has a positive relation with EDI. Moreover, according to Camisón and Villar López (2010), manufacturing flexibility is positively related to the

organization innovation and positively related to firm's performance. Adding on this, Altuzarra and Serrano (2010) investigated the relationship between manufacturing firm's innovation and activity (measured by product innovation, process innovation and R&D activity) and their numerical flexibility. Based on the above-mentioned literature, it is clear that innovation (FI) is related to flexibility, agility and overall SCP. Thus the following hypotheses are proposed:

H6. There is a positive and significant relationship between FI and agility in supply chain.

H7. There is a positive and significant relationship between FI and flexibility in supply chain.

H8. There is a positive and significant relationship between FI and SCP.

2.4 Collaboration among conglomerate divisions (CCD)

In emerging markets, there are number of authors who have shown the great interest in this area, namely, Jeon and Kim (2004) studied the conglomerate companies in emerging markets in terms of diversification; Khanna and Palepu (2004) studied the conglomerate companies in emerging markets; Chan-Olmsted and Chang (2003) studied the diversification strategy of conglomerates; and Daekwan and Cavusgil (2004) analyzed the emerging markets for western companies.

Conglomerates organizations represent companies engaged in different businesses (multi-industry concept). Conglomerate divisions are the group of different business units; collaboration has integrated well with other divisions. In emerging markets, collaboration among organizations is the key role in conglomerate firms to meet their strategic objectives. Managers seldom want high levels of collaboration among all departments in an organization (Cross and Parker, 2004). In the today's fast-paced knowledge-intensive economy, the organizations focus on collaboration to make their work important (Lesser and Prusak, 2004). From this point, we draw the attention that the need of collaboration is everywhere. Conglomerate organizations engage doing the business in two or more areas which are not related to each other. Here the need of collaboration among the division is too high. Collaboration among the conglomerates firms acts as a competitive advantage because inter-relationships of functions and activities achieve the cost reduction, high market shares. In addition, conglomerates have various competitive advantages like government protection and support, extensive network in various industries, superior network and access to capital. For the foreign market entry, a collaborative partnership with a family conglomerate can reduce risks as well as the time and capital required (Jeon and Kim, 2004).

Organizations that are open to collaborate with other conglomerates tend to be flexible in nature because more flexibility is related with collaboration and coordination. If the organization collaborates with large conglomerates, then it should enhance their process and functions, and quickly respond to the current market condition. If the small firms are collaborating with large conglomerates, then the firms are also able to meet the completive position in the marketplace; and consequently, they also enhance their performance. From these findings, collaboration is related to the flexibility and agility. Sometimes, work flexibility is also needed in the organization for its growth and expansions, mergers may also take place. The construct of conglomerates has received relatively scant attention from researcher, despite their economic dominance in many emerging markets (Jeon and Kim, 2004). Thus, we propose:

H9. There is a positive and significant relationship between CCD and agility in supply chain.

H10. There is a positive and significant relationship between CCD and flexibility in supply chain.

H11. There is a positive and significant relationship between CCD and SCP.

2.5 Process structure (PS)

An integrated supply chain structure intends to serve customers efficiently through a highly coordinated supply chain network (Frohlich and Westbrook, 2001). Similarly, an integrated structure is the internal integration of "organizational practices, procedures and behaviors into collaborative, synchronized and manageable processes in order to fulfill customer requirements" (Zhao *et al.*, 2011). SCM is collective efforts or activities and it includes different departments, i.e. finance, human resources, logistics, marketing, and IT; and the integration of these departments makes "PS." In other words, PS means "coherence among organization culture, structure and strategy" and integration between different departments like human resource, logistics, IT, R&D, order management, production, customer service and marketing. In the present scenario, manufacturers and retailers jointly work together to improve efficiencies across the value chain and such integration allows for inter-supply chain competition instead of inter-firm competition (Tan, 2001; Christopher, 1999).

In dynamic conditions, continuous restructuring is required. Due to such restructuring and refocusing, organization may need to redefine roles and responsibilities to focus on changed objective, reduce process complexity or develop new competencies and skills for newly required capabilities (Cohen and Roussel, 2006). The lack of coherence among supply chain departments, i.e. human resource, logistics, IT, R&D, order management, production, customer service and marketing typically lies at the root of the problem. In this competitive environment, the ultimate success of the single business will depend on management's ability to integrate the company's intricate network of business relationships (Christopher, 1999). So, supply chain offers the opportunity to capture the synergy of intra- and inter-company integration and management (Lambert and Cooper, 2000). Nowadays, executives are becoming aware of the emerging paradigm of inter-network competition. The successful integration and management of key business processes across the supply chain will determine the ultimate success of the enterprise (Lambert and Cooper, 2000).

For instance, in the firms, they have their process managers in different departments like purchasing, marketing, production and finance, etc. The responsibility of the process managers are governed by the different representatives of all the departments who are able to manage and report to the respective managers and the departments. The PS of the firm is more inclined to integrate activities of the business operations rather than the individual functions in the supply chain. Consequently, supply chain PS should be designed to increase process efficiency and effectiveness for the entire supply chain. So, there is a need to integrate activities across the firm in the supply chain. It is important that the PS is aligned with agility, flexibility and SCP for proper functioning of the focal firm in the supply chain network:

H12. There is a positive and significant relationship between PS and agility in supply chain.

H13. There is a positive and significant relationship between PS and flexibility in supply chain.

H14. There is a positive and significant relationship between PS and SCP.

2.6 Training and leadership program (TLP)

As the complexity of supply chain is increasing due to the dynamic nature of the environment and the inconsistencies in supply chain, literature can be attributed to a long disregard for human resources (Ellinger and Ellinger, 2014). The role of a supply chain manager for the job of integrating activities across the firm spectrum is being felt more than ever.

In recent years, researchers have realized that there is lacuna in the SC literature. Initial work in this direction can be attributed to Koulikoff-Souviron and Harrison (2007), although empirical work support to their work is in a nascent stage (Hohenstein and Kliegl, 2014).

As firm's performance is directly linked to the employee performance and governed by the HR practices of the firm (Ahmad and Schroeder, 2003). In addition, from a resource-based perspective of the firm, human capital is an intangible resource, which is difficult to imitate (Huo *et al.*, 2015) by competitors.

Behind every supply chain decisions or improvement actions, there is a human action or decision so in the organization should more emphasize development of TLP. The knowledge, skill and competency developed through these programs shall become an implicit source of competitive advantage (Batt, 2002; Richey *et al.*, 2006). Training of SC managers is of paramount importance especially in areas such as finance, IT, management and operations/SCM (Mangan and Christopher, 2005). Also, areas such as problem solving, teamwork, decision making, initiative and enterprise skills, legal skills, written and oral communication and negotiation are deemed important (Sohal, 2013). From a broader perspective, these skills can be divided into analytical, interpersonal, leadership, change management and project management competencies (Mangan and Christopher, 2005). Through appropriate training, requisite skill sets can be developed in a limited timeframe (Huber and Brown, 1991). Skills and competency contributes to SCM (Lorentz *et al.*, 2013).

Furthermore, a team-oriented approach to SC can improve performance (Fu *et al.*, 2012), so programs focusing on developing transformational, improvement, collaborative, customer-centric and sustainability leadership styles align well with the concepts of agility and flexibility in SCM. There is a consensus that flexibility and creativity among employees is necessary for turbulent environment (Snell and Dean, 1994). It is suggested that the flexibility of SC can be improved through leveraging human capital (Jin *et al.*, 2014). High correlation has been reported between SCM success and level of training (Gowen and Tallon, 2003).

Responsiveness and flexibility in SC calls for flexible inputs such as team-focused and cross-sectional workforce, capable of solving problems and making quick decisions may significantly improve flexibility (Suarez *et al.*, 1996; Gunasekaran, 1999). A significant advantage of multi-skilled and cross-trained workforce is their swiftness in times of need for ensuring volume and response flexibility (Skinner, 1969; Raturi and Jack, 2004). In terms of new product flexibility, a highly trained flexible workforce, well versed in teamwork, can be a boon for companies (Gunasekaran, 1999).

In emerging economies there are many companies who engage in training programs. For instance, HP has established a supplier and peer educator run program that provide training to large number of workers and technology. In addition, Srujan (2013) says in his article that localized decisions of the employees have a globalized impact in supply chain; so firms have to give the decision-making power to employees but after giving them the proper training and develop some leadership skills because ultimately the effectiveness of the decision depends on the amount of knowledge. Consequently, we see that the right training and leadership is very necessary step in the organization in emerging markets (Meredith and Mantel, 2006). Based on these findings, we proposed the following hypotheses:

H15. There is a positive and significant relationship between TLP and agility in supply chain.

H16. There is a positive and significant relationship between TLP and flexibility in supply chain.

*H17.* There is a positive and significant relationship between TLP and supply chain performance (Table II).

2.7 Hypothesized model
Based on the review of the extant literature, we propose a framework in which we define seven critical factors and their relationships to enhance SCP in Figure 1.

Supply chain factors in emerging markets	Key points
Agile and flexible supply chain	Improve assets utilization and cost reduction; flexible operations; respond quickly as market demand
Information communication technologies	Different supply chain problem solve through technologies; RFID and ERP implementation; intellectual property protection
Flexible innovation	Adjust in market condition; local knowledge; tailored products
Collaboration among conglomerates divisions	Low risk; achieve better growth opportunities; gain relationship with government; collaborate with diversified firm
Process structure	Formal and informal mechanism; redesign and refocus activities; coherence among organization culture, structure and strategy; integration among the organization functions
Develop training and leadership programs	Educate and aware about the business activities and process; employee binds together through leaderships; leadership: transformational, improvement, customer-centric, collaboration, corporate sustainability; better decision-making power

Table II.
Summary of key benefits of each CSF
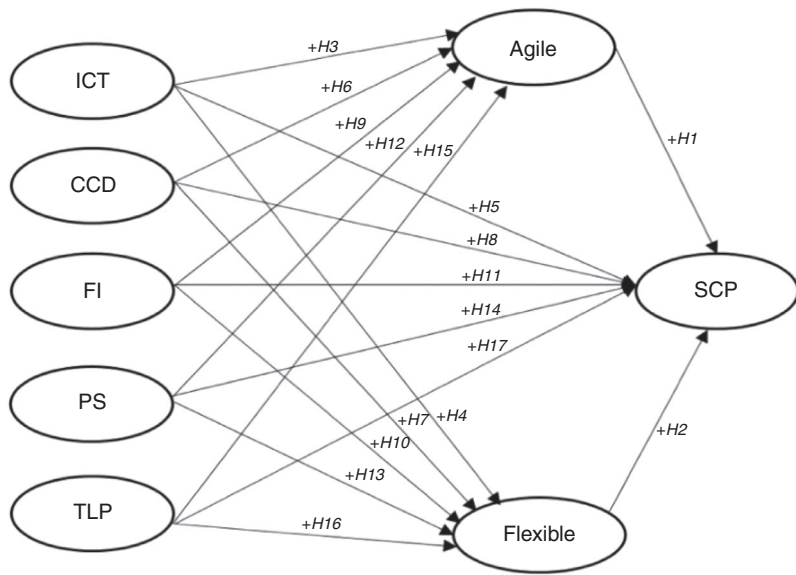
Figure 1.
Hypothesized model

3. Methodology

3.1 Data collection and measurement scale

In this section, we discuss data collection and measurement of all variables used in the study as well as the statistical tests used to evaluate the hypotheses. This study is an exploratory research design because we formulate the problems, clarify concepts and then form hypotheses. The study is questionnaire based and most of the responses were collected manually and online. The data were collected from top- and medium-level employees of various departments of Indian firms. A heterogeneous group of companies from the following industries were part of the survey, namely, automobile manufacturing, machinery, IT, pharmaceutical products, textile products manufacturer, refinery, oil and gas, etc.

In the present study, the convenience sampling technique is used, which comes under non-probability sampling techniques. Around 80 percent respondents were from different manufacturing firms so we focus mostly on manufacturing firms in this study. A total of 470 questionnaires were distributed. In total, 30 questionnaires were rejected due to largely missing values. We considered in total 440 questionnaires out of which 227 (consisting of 27 senior-, 145 middle-, and 55 lower-level managements) were returned showing response rate of 52 percent. For respondents, 93 percent were male, rest 7 percent were female, and the average age was 32 years. The age range of respondents was 24 to more than 50 years. There were 86 percent respondents belonged to a group of 24-35 years and rest 14 percent respondents belonged to more than 35 years age group. From the sample respondents, 12, 64 and 24 percent respondents were senior, middle, and lower level of management, respectively. From the respondents group, 31, 36, and 24 percent of respondents belonged to 0-5, 5-10 and 10-15 years of work experience, respectively, while only 9 percent of respondents belonged to more than 15 years' work experience years' group.

3.2 Variable measurement

A total of 43 items captured the seven independent variables under the investigation of SCP and seven items captured one dependent variable namely SCP. The questionnaires on supply chain dimensions were grouped into seven factors, namely, ASC, FSC, ICT, CCD, FI, PS, and TLP. We show the relationship of ASC and FSC with rest five factors and SCP. All the constructs were measured by a five-point Likert scale adopted from the different literature which are described below. These items were worded and assessed on a five-point Likert scale from 1 to 5 with "1" representing strongly disagree; "5" representing strongly agree.

3.3 Analysis of data

Reliability and validity measurement. The various statistical calculations were conducted using SPSS 21 and AMOS under Windows v8.0 OS. A reliable measure is one which repeatedly measures the same phenomenon with accuracy. Cronbach's α is by far the most popular measure of reliability (Iacobucci and Duhachek, 2003). It takes into account the effect of each item in estimating the overall reliability (Fried and Ferris, 1987). A measure is considered reliable if the Cronbach's α value is greater than 0.7 (Nunnally, 1978; Hair *et al.*, 2010). Moreover, α values greater than 0.9 are considered "excellent" and 0.8 as "very good" (Kline, 1998). The measured α values for all the factors were greater than 0.9, except for SCP, which was 0.833. Thus, the measures employed in the study can be considered reliable as presented in Table III.

Sampling adequacy is assessed using Kaiser-Meyer-Olkin (KMO) test (Field, 2009; Kaiser and Rice, 1974). Though a minimum value of 0.5 is recommended by Kaiser and Rice (1974), values greater than 0.9 are considered excellent (Field, 2009). In our case, the KMO value was 0.917. Another indicator of strength between variables used in the study was Bartlett's (1954) test of sphericity. In the present study, Bartlett's test was significant ($p < 0.01$) indicating the fitness of the sample for factor analysis.

To condense the information and arrive at a more parsimonious conceptual understanding of the set of measured variables, the principal component analysis with varimax rotation and Kaiser Normalization (Hair *et al.*, 2006) was employed. Factor loadings should be greater than 0.5 and were considered significant (Hair *et al.*, 1995). All the items were retained as none of the item reported factor loading less than 0.5 and there were no significant cross-loadings of items. Eight factors structure emerged. All the factors had eigenvalues greater than 1.0 and explained 72.3 percent variance, presented in Table III and Table AI for item descriptive statistics.

	TLP	FI	PS	ICT	CCD	FSC	ASC	SCP	Cronbach's α
TLP7	0.842								0.942
TLP2	0.839								
TLP1	0.838								
TLP6	0.829								
TLP3	0.829								
TLP4	0.822								
TLP5	0.812								
FI7		0.827							0.938
FI2		0.825							
FI1		0.817							
FI4		0.816							
FI3		0.805							
FI5		0.805							
FI6		0.801							
PS1			0.886						0.930
PS2			0.848						
PS5			0.839						
PS6			0.814						
PS4			0.803						
PS7			0.800						
PS3			0.600						
ICT1				0.860					0.941
ICT6				0.844					
ICT2				0.828					
ICT4				0.821					
ICT5				0.816					
ICT3				0.801					
CCD2					0.851				0.933
CCD3					0.832				
CCD4					0.824				
CCD5					0.819				
CCD1					0.807				
CCD6					0.799				
FSC1						0.848			0.921
FSC4						0.830			
FSC3						0.827			
FSC5						0.798			
FSC2						0.798			
ASC1							0.834		0.914
ASC3							0.828		
ASC2							0.815		
ASC5							0.812		
ASC4							0.801		
SCP15								0.641	0.833
SCP12								0.588	
SCP16								0.573	
SCP4								0.564	
SCP13								0.544	
SCP14								0.529	
SCP9								0.512	
Eigenvalues	14.943	4.201	3.736	3.483	3.112	2.855	2.484	1.361	
% of variance explained	10.91	10.59	10.42	9.50	9.38	7.70	7.66	6.20	
Cumulative %	10.91	21.50	31.92	41.42	50.80	58.50	66.10	72.30	

Table III.
Principal component
analysis

Confirmatory factor analysis (CFA). In the two-step SEM approach, development of the CFA measurement model is the first step (Schumacker and Lomax, 2004). A measurement model is used to examine the extent of inter-relationships and co-variation among latent constructs. The fitness of model is assessed by examining a variety of fit indices such as advised to report χ^2 statistic, CFI, RMSEA, CFI, GFI and NFI (Hair *et al.*, 2006). The recommended values of the fit indices are presented in Table IV which are considered appropriate and the results of the CFA indicate a satisfactory fit for the measurement model.

A notable benefit of CFA is its ability to assess of the reliability, convergent validity and discriminate validity of the measurement model (Hair *et al.*, 2006). The reliability of the measurement model is established if the measure of composite reliability (CR) is greater than 0.6 (Bagozzi and Yi, 1988; Hair *et al.*, 2010). Convergent validity indicates that the latent factor is well explained by its observed variables. For assessment of convergent validity, Fornell and Larcker (1981) have proposed two conditions, namely, the standardized loadings should be statistically significant and average variance extracted (AVE) for each of the dimensions should be greater than 0.50 (Bagozzi and Yi, 1988). Further, discriminant validity ensures that latent factor is not explained by other variables. This is established when maximum shared variance (MSV) and average shared variance (ASV) are both below AVE. Also, for each construct the square root of AVE is greater than inter-construct correlations (Hair *et al.*, 2010).

The results in Table V indicate that the CR for all the variables range between 0.942 and 0.834 (> 0.6), where the values of AVE for all the variables should be greater than 0.5 except for SCP, which is 0.42. However, convergent validity is still considered adequate when AVE is less than 0.5, but we have CR higher than 0.6 (Fornell and Larcker, 1981) as AVE is a more conservative measure than CR (Malhotra and Dash, 2011). Boccia and Sarnacchiaro (2014) and Rosebush (2011) considered AVE greater than 0.45 and 0.44, respectively, in their study, while Fan (2008) and Alumran *et al.* (2014) measured AVE was 0.40 and less than 0.40, respectively, in their study. MSV and ASV values for all the variables were found to be less than their AVE. Also, the inter-construct correlations for all the variables were less than the square root of their AVE. The entire factor loadings were statistically significant ($p = 0.001$) and none of the standardized factor loadings (standardized regression weights) were found to be less than 0.6, presented in Table V and Table AII.

Furthermore, we checked the CFA model for common method bias (CMB) (Podsakoff *et al.*, 2003). CMB may cause measurement error due to a systematic response bias, which may inflate or deflate responses resulting in either Type I or Type II error (Bagozzi and Yi, 1988; Podsakoff *et al.*, 2003). For the present study, we employed Harman's single factor test (Harman, 1976; Anderson and Katz, 1998; Aulakh and Gencturk, 2000). We constrained the number of factors extracted in exploratory factor analysis to just one and examined the

Fit Indicators	Recommended value	Observed value
CMIN/df	< 3.00	1.319
Normed fit index (NFI)	> 0.90	0.848
Goodness-of-fit index (GFI)	> 0.90	0.795
Standardized root mean square residual (SRMR)	< 0.09	0.043
Comparative fit index (CFI)	> 0.90	0.958
Tucker Lewis Index (TLI)	> 0.90	0.955
Incremental fit index (IFI)	> 0.90	0.959
Root mean square error of approximation (RMSEA)	< 0.08	0.038

Notes: $\chi^2 = 1,513.057$, degrees of freedom = 1,147, $p = 0.000$

Table IV.
Confirmatory
factor analysis

	SRW[a] (range)	CR	AVE	MSV	ASV	ASC	TLP	FI	PS	ICT	CCD	FSC	SCP
ASC	0.834-0.782	0.915	0.684	0.284	0.123	0.827							
TLP	0.857-0.820	0.942	0.700	0.274	0.108	0.256	0.837						
FI	0.862-0.805	0.939	0.687	0.301	0.132	0.344	0.295	0.829					
PS	0.907-0.827	0.934	0.673	0.326	0.130	0.262	0.285	0.307	0.820				
ICT	0.908-0.827	0.942	0.731	0.276	0.136	0.371	0.345	0.338	0.300	0.855			
CCD	0.835-0.797	0.934	0.704	0.308	0.128	0.244	0.236	0.352	0.375	0.296	0.839		
FSC	0.853-0.817	0.922	0.702	0.266	0.130	0.359	0.274	0.292	0.328	0.356	0.347	0.838	
SCP	0.730-0.606	0.834	0.420	0.326	0.291	0.533	0.523	0.549	0.571	0.525	0.555	0.516	0.648

Note: [a] standardized regression weights (standardized factor loadings)

Table V.
Reliability and
construct validity

un-rotated solution. The variance explained by the single factor was lower than 0.5 (Peng and Lin, 2006) which indicates no CMB.

Before specifying the structural model, we confirmed that the relationships under investigation are sufficiently linear by employing curve estimation test in SPSS. The model was also checked for multicollinearity issues by calculating tolerance and VIF statistics. The VIF values were less than 1.5, which is way below the thumb rule of less than 4.

SEM is regarded as a flexible yet comprehensive technique for testing theorized hypotheses (Hafeez *et al.*, 2006). The structural model specifies the relationships among latent variables as per theory (Schumacker and Lomax, 2004). Based on the extant literature, the model was specified as recursive in nature. TLP, CCD, FI, ICT and PS are proposed as exogenous variables, whereas ASC, FSC and SCP are treated as endogenous variables. A comprehensive set of model fit indices were examined for the assessment of structural model. Key indices of the structural model indicate a good fit since the $\chi^2 = 1519.804$, df = 1148, $p = 0.000$; CMIN/df = 1.324; GFI = 0.795; SRMR = 0.045; NFI = 0.848; CFI = 0.958; TLI = 0.955; IFI = 0.958; RMSEA = 0.038 (Hair *et al.*, 2006; Kline, 1998; Tucker and Lewis, 1973; Hu and Bentler, 1995, 1999).

Hypotheses testing. The simultaneous maximum likelihood estimation was employed using AMOS 21 for calculating path estimates. Path analysis specifies the predictive ordering of variables. It provides an estimation of the magnitude of the hypothesized effects in the model and also tests the model for consistency with the observed data. We show the summary of SEM results and hypotheses testing in Table VI.

4. Results and discussions

The results show that the "ICT" and "PS" variables have the greatest influence on the FSC and SCP (dependent variable), respectively, with both of them have the same β coefficient of 0.237 ($p = 0.001$ and < 0.001, respectively). Therefore *H3* and *H14* are supported. With a β coefficient 0.221, the variable "TLP" has the second largest influence on the SCP ($p = 0.001$). Subsequently, *H17* is supported. The results reveal that "CCD" (β coefficient = 0.217 and $p < 0.001$), "ASC" (β coefficient = 0.206 and $p < 0.001$), "FI" (β coefficient = 0.183 and $p = 0.002$), "FSC" (β coefficient = 0.131 and $p = 0.024$) and "ICT" (β coefficient = 0.131 and $p = 0.028$) have

Hypotheses	Path	Standardized regression weights (β)	p-value	Critical ratio	Result
H1	ASC→SCP	0.206	< 0.001	3.476	Supported
H2	FSC→SCP	0.131	0.024	2.259	Supported
H3	ICT→ASC	0.237	0.001	3.186	Supported
H4	ICT→FSC	0.196	0.007	2.693	Supported
H5	ICT→SCP	0.131	0.028	2.204	Supported
H6	FI→ASC	0.195	0.009	2.611	Supported
H7	FI→FSC	0.089	0.220	1.226	Not supported
H8	FI→SCP	0.183	0.002	3.081	Supported
H9	CCD→ASC	0.055	0.459	0.74	Not supported
H10	CCD→FSC	0.179	0.015	2.423	Supported
H11	CCD→SCP	0.217	< 0.001	3.598	Supported
H12	PS→ASC	0.087	0.236	1.184	Not supported
H13	PS→FSC	0.152	0.036	2.099	Supported
H14	PS→SCP	0.237	< 0.001	3.981	Supported
H15	TLP→ASC	0.081	0.261	1.125	Not supported
H16	TLP→FSC	0.097	0.171	1.368	Not supported
H17	TLP→SCP	0.221	< 0.001	3.818	Supported

Table VI.
Summary of SEM
results and
hypotheses testing

moderate explanatory power of SCP. Therefore these are positively and significantly related to SCP. However, *H11, H1, H8, H2* and *H5* are supported.

As evidenced by the analysis, "FI" (β coefficient = 0.195 and p = 0.009) has large influence on ASC. "ICT" (β coefficient = 0.196 and p = 0.007), "CCD" (β coefficient = 0.179 and p = 0.015) and "PS" (β coefficient = 0.152 and p = 0.036) variables having large influence on FSC are shown to have positive and significant relationship. Therefore *H6, H4, H10* and *H13* are supported. It means the adoption of these factors are driven by different variables and implementing it to achieve satisfactory SCP.

Meanwhile "FI" (β coefficient = 0.089 and p = 0.220), and "TLP" (β coefficient = 0.097 and p = 0.171) have no significant effect on FSC. Furthermore, "CCD" (β coefficient = 0.055 and p = 0.459), "PS" (β coefficient = 0.087 and p = 0.236) and "TLP" (β coefficient = 0.081 and p = 0.261) do not have significant effect on ASC. Subsequently, *H7, H16, H9, H12*, and *H15* are not supported.

The result suggests that all seven supply chain factors PS, TLP, CCD, ASC, FI, FSC and ICT have positive and significant relationship with SCP, it means they have the largest impact toward achieving the satisfactory SCP. These factors are characterized as the key factors, when we see relationship between all five factors with ASC and FSC. The two factors ICT and FI have positive and significant relationship with ASC, but other factors CCD, TLP and PS seem to have considerably less contribution toward achieving ASC. The three factors ICT, CCD, and PS have positive and significant relationship with FSC, but the other two factors FI and TLP seem to have considerably less contribution toward achieving FSC. The all seven independent variables together explain 66.10 percent of the variance of the dependent variable, SCP. It reveals that the regression variate that consists of the seven independent variables has a high explanatory power in explaining the dependent variable SCP.

The purpose of the study was to identify the CSFs of SCP in the context of emerging markets. This research tested the hypotheses based on data collected from Indian companies using the SEM technique. Unlike previous studies, this research is focused on supply chain in emerging markets, as these markets have already become manufacturing bases for majority of the world's leading firms. India presents a unique set of challenges in comparison to other developing countries. A qualified generalization of the results with respect to other emerging markets is necessary in this regard.

The study tested 17 hypotheses exploring the impact of identified CSFs with SCP. Overall 12 hypotheses were supported. The findings are consistent with the supply chain literature based on empirical data from the developed economies (e.g. Calantone and Dröge, 1999). Both flexibility and agility significantly impact SCP. This indicates a strategic focus to the concepts of agility and flexibility in these markets. As more and more manufacturing MNCs establish their manufacturing bases in these countries, competition is bound to grow manifold along with globalization of supply chain. Even established firms need to have agile and flexible supply chain to face shorter and more turbulent business cycles in the future.

ICT implementation emerged as an important contributor to SCP. Our findings corroborate the results of similar studies in other contexts (such as Sambamurthy *et al.*, 2003; Lu and Ramamurthy, 2011; Lucas and Margrethe, 1994; Zain *et al.*, 2005). This has a serious implication for firms who have a vast supply chain network in emerging markets. The rate of change with respect to ICT is very fast. In order to ensure a superior SCP, adoption of latest ICTs is a critical first step.

Interestingly, we found that FI is an important contributor to agility and SCP. In the past, very few studies have explicitly reported on FI. In the context of these markets, FI explains the reasons of success of many localized innovations. The experience and network of these conglomerates can be treated as a strategic resource from the resource-based view of the firm. Our findings in this respect are novel.

The findings of the study also supported the prior research that PS adds to the flexibility and superior supply chain performance (Aissa Fantazy *et al.*, 2009). This explains the need for firms to have a strategic focus on supply chain. Integration within the firm is the critical first step followed by whole network integration. Our findings recognized the importance of TLPs to SCP. Although, we did not find any support of the linkage of TLP with agility and flexibility. One plausible reason for such a finding can be attributed to the disregard for human resource in supply chain studies till recently (Ellinger and Ellinger, 2014), which reflects an attitudinal bias on the part of practitioners also.

5. Conclusion and implications

India is a developing country where shifting policies, unstable economics, lack of basic infrastructure and limited application of enterprise management technologies are the norms. In spite of these challenges and pitfalls, it has a huge potential to address the emerging needs of the people, and supply chain plays an important role (Singh, 2014). Based on this, the study tries to answer as: how to enhance SCP in emerging markets; and identify which factors play a conducive role to enhance its performance in emerging market scenario.

The study concluded the impact of seven CSFs on SCP in emerging market scenario. The proposed structural equation model acts as a favorable guideline to develop a relationship between SCP and critical factors. It investigated the relationship between the CSFs and SCP and the internal relationship of five factors with agility and flexibility in supply chain. The major findings of this study are that all seven factors have significant and positive relationships with the SCP in emerging market scenario. The study suggests that PS is the most contributing elements toward achieving SCP in emerging markets followed by TLP. It means that these factors lead growth in the emerging markets and their SCP depends on these critical factors and cannot get success without them. In such a way, from the empirical work we see that ICT is the most contributing; and element collaboration with conglomerate industry and PS seems to make more contribution to achieve agility and flexibility in supply chain while FI is the critical factor for only agility in supply chain. It can help managers to expand their new markets, improve technology and sales, flexible and generate larger customer bases to make the SCPs in the emerging markets. But from the empirical work, TLP, collaboration with conglomerate industry, FI and PS seem to make least contribution to achieve agility and flexibility in supply chain. This is not suggesting that these factors are not advantageous, but in this research their direct contribution is less than the contribution of other factors.

The findings obtained from this study provide valuable knowledge in the emerging markets. It further strengthened and supported the relevance of organization theory in explaining these CSFs and SCP. It is very important for all the manufacturing organizations to maximize the potential of the SCP. Our findings offer needed empirical support for investing in SCP and it is a strong evidence that the benefits obtained through agile and flexible manufacturing from other five CSFs. Managers can be confident that company get market competitive advantage by improving the SCP. It will lead to benefit their firms and create values.

6. Limitations and future research

Like every study, the present study has its own limitations, where the research study is carried out with some constraints such as the number of companies, available resources, areas of industry, etc. Some limitations of this study should be underscored, which can be taken care of in later studies. Further, verified the hypotheses; and this study lent good support to our hypotheses. It is difficult to say that our results generalize to different industries. Thus, we encourage further research to examine the applicability of our findings

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to service sectors. The study with the large sample size can possibly generalize our findings further and gives global solutions for the current organizations that provide good insights on the effectiveness of SCP. Moreover, the results would be verified with more accuracy. The sample size included only 80 percent manufacturing firms so we can consider this study for only manufacturing firms. However, no claim of generalizability can be made beyond that.

Due to the dynamic and complex conditions of emerging markets, industry must focus on operational and strategic perspectives to achieve better SCP in future. Further, we can also consider supply chain practices associated with various strategies to take competitive advantage and measure the performance of multi-group moderation for different sectors in future. We introduced these CSFs to help companies achieve long-term competitive advantage.

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Further reading

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Appendix 1

	Mean	SD	Skewness	Kurtosis		Mean	SD	Skewness	Kurtosis
A1	4.67	1.493	−0.659	−0.225	CCD3	4.66	1.764	−0.684	−0.374
A2	4.84	1.811	−0.734	−0.360	CCD4	4.84	1.713	−0.853	−0.121
A3	4.89	1.623	−0.747	−0.054	CCD5	4.84	1.575	−0.655	−0.185
A4	5.01	1.729	−0.744	−0.396	CCD6	5.03	1.621	−0.823	−0.164
A5	5.19	1.657	−0.905	−0.119	PS1	4.84	1.586	−0.973	0.071
F1	4.85	1.537	−0.853	−0.107	PS2	4.89	1.736	−0.787	−0.194
F2	4.85	1.772	−0.770	−0.370	PS3	4.78	1.623	−0.717	−0.117
F3	4.77	1.743	−0.719	−0.317	PS4	4.76	1.734	−0.610	−0.632
F4	4.87	1.712	−0.882	−0.079	PS5	4.86	1.698	−0.823	−0.187
F5	4.98	1.701	−0.729	−0.340	PS6	4.65	1.737	−0.557	−0.692
ICT1	4.81	1.641	−0.792	−0.356	PS7	5.02	1.704	−0.634	−0.615
ICT2	4.77	1.906	−0.691	−0.585	TLP1	4.91	1.513	−0.825	−0.099
ICT3	4.82	1.671	−0.591	−0.556	TLP2	4.99	1.698	−0.877	0.081
ICT4	4.82	1.690	−0.734	−0.340	TLP3	4.77	1.656	−0.708	−0.300
ICT5	4.82	1.731	−0.702	−0.296	TLP4	4.84	1.633	−0.706	−0.334
ICT6	5.10	1.782	−0.852	−0.335	TLP5	4.90	1.704	−0.676	−0.434
FI1	4.64	1.461	−0.694	−0.233	TLP6	4.96	1.596	−0.698	−0.324
FI2	4.92	1.749	−0.782	−0.284	TLP7	5.09	1.678	−0.860	−0.065
FI3	4.76	1.576	−0.749	−0.010	SCP4	5.22	1.305	−0.692	0.228
FI4	4.74	1.723	−0.677	−0.350	SCP9	5.11	1.324	−0.666	0.180
FI5	4.91	1.700	−0.639	−0.454	SCP12	5.27	1.217	−0.365	−0.571
FI6	4.93	1.634	−0.658	−0.369	SCP13	5.19	1.239	−0.535	0.194
FI7	4.97	1.657	−0.780	−0.321	SCP14	5.27	1.390	−0.770	−0.010
CCD1	4.78	1.522	−0.800	−0.317	SCP15	5.17	1.405	−0.859	0.577
CCD2	4.77	1.870	−0.687	−0.581	SCP16	5.37	1.200	−0.554	−0.240

Note: Valid $n = 227$

Table AI.
Descriptive statistics

Appendix 2

TLP		PS		CCD		ASC	
TLP7	0.856	PS1	0.907	CCD2	0.835	A1	0.834
TLP2	0.823	PS2	0.841	CCD3	0.843	A3	0.816
TLP1	0.863	PS5	0.849	CCD4	0.829	A2	0.782
TLP6	0.820	PS6	0.835	CCD5	0.797	A5	0.877
TLP3	0.838	PS4	0.827	CCD1	0.878	A4	0.823
TLP4	0.836	PS7	0.836	CCD6	0.849		
TLP5	0.821	PS3	0.832				
FI		ICT		FSC		SCP	
FI7	0.862	ICT1	0.908	F1	0.853	SCP15	0.630
FI2	0.827	ICT6	0.868	F4	0.836	SCP12	0.607
FI1	0.859	ICT2	0.840	F3	0.837	SCP16	0.677
FI4	0.811	ICT4	0.827	F5	0.846	SCP4	0.730
FI3	0.822	ICT5	0.852	F2	0.817	SCP13	0.609
FI5	0.816	ICT3	0.831			SCP14	0.668
FI6	0.805					SCP9	0.606

Table AII.
CFA factor loading (standardized regression weights)

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