THE MEDIATING ROLE OF SUPPLY CHAIN INTEGRATION AND AGILITY ON SMEs PERFORMANCE

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UNIVERSITI TEKNOLOGI MALAYSIA
THE MEDIATING ROLE OF SUPPLY CHAIN INTEGRATION AND AGILITY ON SMEs PERFORMANCE

MAHDI MOHAMMAD BAGHERI

A thesis submitted in fulfilment of the requirements for the award of the degree of Doctor of Philosophy (Management)

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DEDICATION

I dedicate this dissertation to my father and my mother. It was your influence that enabled me to pursue this journey and complete it. Through both of you, I learned to nurture an inquisitive mind, find great joy in learning, and have the determination to complete what you started. You are the foundation for my achievement, thank you.
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Anyone who has undertaken a study such as this knows that it is not possible to complete without the support and assistance of many individuals. I would like to dedicate this space to recognizing those who were instrumental in helping me finally finish this thesis.

I am deeply indebted to my supervisor, Prof. Abu Bakar Abdul Hamid. Without his guidance, support, and patience, this work would not have been completed. He taught me the knowledge, methods, and the research skills needed to help me survive in the academic world. Aside from my Ph.D. study, I am likewise extremely grateful for the concern he showed for my career and well-being.

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Lastly, I would like to thank the staff of UTM for their kind assistance. In addition, I would also like to thank all of my friends at UTM.
ABSTRACT

Supply chain management (SCM) is a major component of competitive strategy to enhance a firm’s performance. Effective firm performance through supply chain antecedents such as supply chain integration (SCI), supply chain agility (SCA), information technology (IT) infrastructure and trust has become a potentially valuable way of securing competitive advantage and improving the firm’s performance. Despite the fact that determining the performance through antecedents of SCM is considered a unique methodology especially in small and medium sized enterprises (SMEs), theoretical and comprehensive studies on a firm’s performance through the methodology are very limited. This study addressed the lack of empirical studies by developing a comprehensive model to examine relationships between some antecedents of SCM such as trust and IT infrastructure, and SCI and SCA on a firm’s performance. Quantitative methodology using questionnaires was adopted to collect data for the constructs proposed in the theoretical model. Using a cross-sectional survey method, data were collected from 265 suppliers in the Iranian automotive industry identified through the stratified sampling method. Hypothesized relationships in the study were examined using partial least squares structural equation modelling (PLS-SEM) technique. The results highlighted the positive effects of antecedents of SCM on a firm’s performance, and SCI and SCA have a mediating role between IT infrastructure and a firm’s performance. In addition, the results of the study have adhered to the resource-based theory (RBV) and resource dependence theory (RDT) underlining the role of trust as an intangible resource of a firm’s performance. Moreover, findings of this study have contributed theoretically to SCM by exhibiting additional evidence of the different effects of SCI and SCA on a firm’s performance. Finally, the study could be used as guide to encourage managers to focus on supply chain antecedents and intangible resources in organizations such as the Iranian automotive industry.
Pengurusan rantaian bekalan (SCM) adalah menjadi komponen utama strategi berdaya saing bagi meningkatkan prestasi firma. Prestasi firma yang berkesan melalui anteseden rantaian bekalan seperti integrasi rantaian bekalan (SCI), ketangkasan rantaian bekalan (SCA), infrastruktur teknologi maklumat (IT) dan kepercayaan telah menjadi cara berpotensi yang bernilai bagi mendapatkan kelebihan daya saing dan meningkatkan prestasi firma. Walaupun begitu, menentukan prestasi melalui anteseden dan pemboleh SCM dianggap kaedah yang unik terutama dalam perusahaan kecil dan sederhana (PKS), dan kajian-kajian teori serta komprehensif tentang prestasi yang kuku melalui kaedah ini adalah sedikit dan sangat jarang. Kajian ini menangani kekurangan kajian empirikal dengan membangunkan model yang komprehensif untuk mengkaji hubungan antara beberapa anteseden SCM seperti kepercayaan dan infrastruktur IT, dan SCI dan SCA ke atas prestasi firma. Kaedah kuantitatif dengan menggunakan soal selidik telah digunakan untuk mengumpul data untuk membina dicadangkan dalam model teori. Dengan menggunakan kaedah tinjauan keratan rentas, data dikumpulkan daripada pembekal dalam industri automotif Iran. Kaedah persampelan berstrata telah diterima pakai dan saiz sampel kajian ini adalah 265. Hubungan hipotesis telah diperiksa dengan menggunakan teknik pemodelan persamaan kuasa dua terkecil separa berstruktur PLS-SEM. Hasil kajian yang diserlahkan kesan positif dari latar belakang SCM prestasi firma dan SCI dan SCA mempunyai peranan perantara antara infrastruktur IT dan prestasi firma. Tambahan, hasil kajian ini yang selaras dengan teori berasaskan sumber (RBV) dan teori pergantungan sumber (RDT) menggariskan peranan beberapa sumber tidak ketara yang utama bagi pengukuhan seperti kepercayaan ke atas prestasinya. Selain itu, hasil kajian ini telah menyumbang secara teori untuk SCM dengan menunjukkan bukti tambahan kesan yang berbeza SCI dan SCA prestasi firma. Akhir sekali, kajian ini boleh digunakan sebagai panduan untuk menggalakkan pengurus untuk memberi tumpuan kepada latar belakang rantaian bekalan dan sumber tidak ketara dalam organisasi seperti industri automotif Iran.
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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Automotive sector is considered the second most active industry in Iran after the oil and gas industry, accounting for 10% of country’s gross domestic product (GDP) and 4% of the workforce (700,000 persons) (Washington Post, 2013). According to statistical centre of Iran (SCI) (www.sci.org.ir), Iran has become the largest vehicle producer in the region, producing 46% of all cars in Iran and its neighbouring countries. Throughout the previous decades, Iran’s automotive manufacturing had a tendency to grow, as evidenced by the expansion in output of about 44.5% from 1998-2008.

Likewise, According to international organization of motor vehicle manufactures (OICA) which is “the voice speaking on automotive issues in world forums”, Iran is the 18th largest automaker in the world and one of the largest in Asia with annual production of more than 1.6 million units (OICA, 2010). In 2009 Iran automobile production was ranked next to China, Taiwan, Romania and India in terms of growth (Fars News Agency, 2010). However, according to OICA statistics, production dropped dramatically to under 750,000 automobiles and commercial vehicles in 2013 (OICA, 2013).

Numerous novel automotive industrial corporations were built and there were several facilities regarding the Iranian administration’s protective strategies. In 2001-2002, Iranian automakers employed 16.8 workers per car produced. In 2007-2008, this rare dropped to 7.17 workers for each car produced. According to several databases, Iran will become the world’s sixteenth principal automaker by 2012. Iran’s fleet reached 11.5 million cars by 2010 and 14 million cars by 2014 (Iran Ranks, 2010; IranDaily, 2014).
Because of sanctions on spare parts by France’s Peugeot and Renault, car production in Iran dropped by as much as 40% in 2012 before recovering somewhat in 2014 following the Geneva interim agreement (Washington Post, 2013). Iranian car companies produced 1,090,846 cars and commercial vehicles by 2014, of which 925,975 were cars and 164,871 were other vehicles. OICA also predicted a global auto production increase of 3 percent to about 91 million vehicles in 2015 (Press TV, 2015). The development of car manufacturing typically refers to the strong request in the marketplace due to population increase and growth of Iran’s developing youth populace and the growth in attendance of female participation in the market etc. (Atiehbahar, 2008).

There are currently 13 public and privately owned automakers in Iran of which many have subsidiary companies producing various types of vehicles; there are 28 automotive manufacturing units throughout Iran. Iran Khodro and Saipa are the largest domestic vehicle manufacturing companies. The Iranian manufacturers currently produce six different types of vehicle, including passenger cars, 4WD, trucks, buses, minibuses, and pickup trucks. According to the latest statistics in 2014 provided by the Ministry of Industries and Mines, there are exactly 9,965,734 vehicles in the country. (Iran Daily, 2014; SAPCO, 2008).

Iran Khodro and Saipa has the biggest market share governing 96% of the total marketplace. The other car manufacturers are not specified as belonging to a particular manufacturing group such as the Bahman Group, Kerman Motors, Kish Khodro, Runiran, Traktorsazi, Shahab Khodro, etc. together produce only 3.7% (Iran Daily, 2014; SAPCO, 2008). Iran is also a large producer of automotive spare parts. The Iranian automotive parts industry consists of approximately 1200 companies, which include those affiliated to vehicle manufacturers as well as independent firms. The industry consists of two primary sectors, Original Equipment Manufacturing (OEM) suppliers, which produce parts for automakers, and After-Market Parts Manufacturers (AMPM), which produce replacement parts for vehicles (Atiehbahar, 2011). Therefore, based on International Organization for Standardization (ISO), suppliers for Iranian automotive industry consist of 849 SMEs that have ISO/TS 16949. All Iranian automotive suppliers have been classified as SMEs (http://www.iso.org/iso/home.html).

The growing role of SMEs in both advanced market economies and economies in transition and their considerable contribution to employment and economic dynamism in
most industrialized countries suggest that this experience can be used for sustainable development of developing countries. Meanwhile, due to changes in the international business environment, SMEs are experiencing increased competition as foreign firms again seek to access local markets. In the present world economy, this means that no market is forever safe from competition and no company can afford to stake its future on the assumption that it “owns” its home market. Therefore, due to increasing competitive pressure and reduction of the direct subsidies and protection they formerly received from their government, it is particularly necessary for SMEs in developing countries to maintain their share of the market. Lack of similar studies in Iran creates the foundation for the purpose of this research (Ghanatabadi, 2005). SMEs lack the benefit of massive resources when they become involved in a supply chain in the absence of diverse resources and the size that large firms enjoy, particularly in the technology and capital-intensive industries (Blackwell et al., 2006).

Traditionally, the forward flow of materials and backward flow of information were representative of supply chain management (SCM). Through a practical overview, the concept of supply chain emerges from some alterations in the area of manufacturing, such as increased costs, decreased resources and product life cycles (Beamon, 1998). Moreover, Meehan and Muir (2008) emphasized that in spite of emerging benefits from SCM some barriers prevent companies from successfully applying a supply chain. For example organizations which still consider themselves as individuals in a SCM cannot work effectively with other chains. Moreover, different companies in a supply chain desire to emphasize alternative features of supply chain which leads to problems in creating integration inter-organization. Conducting a survey across Swedish manufacturing firms (Olhager and Selldin, 2004) indicated that IT is the most common problem across those organizations when trying to apply SCM.

On the other hand, although correct and complete IT provides effective SCM among link partners, organization of IT tools is not free from problems in terms of SCM implementation (Manzouri et al., 2011). Furthermore, other researchers (DeGroote and Marx, 2013; Agarwal and Shankar, 2003) believed that lack of trust, differences in trading partners, capacities, and IT failure are the most important difficulties in using SCM across organizations. However, while these problems effect the IT process, other parts of the supply chain will be also affected by them. Therefore, it is essential for managers to understand which barriers are more deep-rooted and destructive than others, which are also called driving barriers, to be tackled appropriately on time (Jharkharia
and Shankar, 2005). Moreover, the size of organizations has an influence on implementing SCM. Thus this study has investigated SMEs as they have an essential effect on the economy. Thus, SCM is an important issue in SMEs in Iran.

In addition, there were some problems which might have prevented Iranian automotive organizations from applying SCM successfully including lack of trust to apply IT as investigated by Manzouri et al. (2011), who emphasize infrastructure in SCM in Iran, especially IT infrastructure. The most important problem for these organizations was the lack of information which was the highest rated value problem that caused serious difficulties during implementing SCM. Lack of information means not only the lack of proper information but also lack of visibility of appropriate information. For this reason integration between supply chain and partners is weak in Iran. SCM is based on the flow of material and information within and across firms. All tiers can plan and predict their future activities according to accurate and timely information which is shared across the chain. Inasmuch as organizations count on information as their power and status, they do not tend to share their data with other members of a chain. These results clearly revealed that Iranian automotive organizations are more concerned with technological problems than relational issues during implementing SCM. They highlighted the lack of trust as the second level of problems and the lack of proper equipment (infrastructure) as the third. This points to the fact that lack of integration in supply chain is another weakness in supply chain in Iran.

Even though technology provides many helpful instruments for organizations, they are very inadequate and harmful as a substitute for human resources. Although Iranian automotive organizations did not indicated that relational issues are a major difficulty in their supply chains, the fact is that the lack of information and lack of trust which were recognized as the highest ranking difficulties across these chains are the consequence of relationship problems. Indeed, trustworthy relations in a chain make it possible for partners to share their knowledge and information across the chain to cover many deficiencies in their organization. Iranian automotive organizations have reported that SCM implementation takes a lot of time and money to be implemented which cast SCM implementation as more expensive than expected. One clarification for this problem might be that these organizations are beginners in implementing SCM and thus have yet to recognize how expensive implementation may ultimately be (Manzouri et al., 2011).
Similar to Iranian automotive industries, Tanzanian, Scandinavian and Indian companies have faced problems when trying to implement SCM in their organizations. Moreover, financial problems impede organizations ability to prepare appropriate requirements such as new infrastructure, hiring expert employees, conducting training courses, and applying IT for implementing SCM successfully. This difficulty not only affects all aspects of SCM implementation from upstream to downstream in terms of flowing material but also affects the flow of information across the chain and the reason behind this logic is poor integration in the Iranian automotive industry (Kadambi, 2000; Ruteri and Xu, 2009).

In addition, the comparison between the rate of SCM implementation in Iranian automotive industries and the rate of problematic issues which are observed revealed that not only with an increase in the rate of SCM implementation but also with an increase in the size of organizations, the rate of problematic issues is increased across these organizations. However, it is noteworthy that the largest organizations have more experience in applying SCM than smaller organizations and they are more aware of the problems concerning SCM implementation. However, SMEs are less aware of it and they have to be concerned with IT in supply chain with attention to trust and integration by applying agility in supply chain (Manzouri et al., 2011).

1.2 Problems Statement

Conflict exists over to what extent SCM fits SMEs (Çalıpinar, 2007) and what initiatives SMEs can take to increase their performance by SCM activities (Arend and Wisner, 2005; Kraus et al., 2006). There are two paradoxical schemes about the implementation of SCM in SMEs. First, SCM can improve quality, decrease cost, increase customer satisfaction, and even mitigate risk. In addition, SCM exposes the SME to greater management and control hazards while reducing its private differentiation advantages (Arend and Wisner, 2005). Moreover, there are still some questions from adoption of SCM into SME context, include how SCM affects SME, and is it acceptable to implement the same SCM which is implemented in big enterprises on SMEs (Çalıpinar, 2007).
SCM literature has always focused on large organizations. Many SMEs have developed their own supply chain in a context different from the traditional supply chain of large organizations presented in literature. Based on the literature there are different issues in SMEs. First, the lack of an appropriate strategy for the implementation of SCM in relation to large companies (Arend and Wisner, 2005; Kraus et al., 2006). Second, the lack of SCM integration to create strategic advantage for the firm (Singh, 2006). Third, poor strategic vision to fit SCM into SME (Arend and Wisner, 2005; Thakkar et al., 2009).

The last, poor utilization of IT as a prerequisite of SCM implementation (Singh, 2006), led to poor transportation management, delays and wastage of material (Thakkar et al., 2009). Although there is a wide range of literature on SCM, the area needs further research due to the lack of evidence on the linkages between firm performance through the effect implementation of SCM (e.g. SCI) especially in SMEs context (Zolait et al., 2010). Moreover, there are few studies about the impact of the company's physical characteristics such as size on the effective implementation of SCM (Janvier-James, 2012). In addition, there were some problems which might have prevented Iranian automotive organizations from applying SCM successfully such as lack of trust in applying IT which has been investigated by Manzouri et al. (2011). The authors emphasized infrastructure in SCM in Iran especially IT infrastructure, and lack of empirical research in this field calls for further research.

Trust has been identified as one of the key factors contributing to the success of a strategic alliance. Trust leads to high integrity in supply chain (Chen et al., 2011). It reduces the perception of risk associated with opportunity (Krishnan et al., 2006) and encourages information flow (Nyaga et al., 2010), stability (Handfield and Bechtel, 2002) and performance (Zaheer and Zaheer, 2006) in supply chain partnerships. One of the primary reasons for unsuccessful relationships is the lack of trust between the partners (Su et al., 2008). Trust enables members of the supply chain team to rely on one another. Investigating trust as an antecedent of effective supply such as an agile supply chain and integrity in supply chain may provide a better understanding of the role of IT infrastructure in an effective SCM and its effects on firm performance (Chen et al., 2011; Chong et al., 2009; DeGroote and Marx, 2013).

Trust in intra-organizational constructs (partners in supply chain) have been the subject of very few studies, and analysis of inter-organizational relationships reveals that
the organization-centered aspects have generally not been investigated in any depth (Tejpal et al., 2013). Maintaining and building trust between supply chain partners relies on sharing information (Kwon and Suh, 2005; Myhr and Spekman, 2005). However, based on Rai et al. (2006), DeGroote and Marx (2013), Liu et al. (2013a) and Capaldo and Giannoccaro (2014), trust is a critical point for SCI, IT and SCA, and they suggested that future research examine trust. To fill this gap, this study used trust as antecedents for IT, SCI and SCA. Moreover, Tejpal et al. (2013) mentioned that future research should focus on trust in supply chain with dynamic capabilities and technology. Therefore, this study considered SCI and SCA as dynamic capabilities and IT infrastructure to improve firm performance.

Another key component of effective implementation of supply chain is IT infrastructure. IT infrastructure has the potential to manage the information flow and to provide links that support communication and collaboration along the supply chain. Implementation of IT in SCM enables integration and coordination of the flow of materials, information, and finance among suppliers, manufacturers, wholesalers, retailers and consumers (Sanders, 2008). Through embedding IT in a firm’s supply chain, the company is able to integrate its supply chain activities and achieve the sources of sustained competitive advantage (Bharadwaj, 2000). Few studies (Liu et al., 2013a; Rai et al., 2006; DeGroote and Max, 2013) have examined the effect of IT infrastructure on firm performance directly and through SCI and SCA simultaneously. Moreover, scholars have failed to address the effect of IT infrastructure on firm performance directly and through SCA. To have a fair judgment about the consequences of effective utilization of IT on the integration of supply chain activities and its agility, it is necessary to examine the effect of IT through SCA and SCI on firm performance (Liu et al., 2013a).

In addition, IT infrastructure will contribute to SCA. Organizational agility allows an organization to integrate and reconfigure internal and external resources to act on opportunities or respond to threats. At present, most organizations are IT enabled, especially in industries with rapid change in products and customers. Prior studies (Tiwana and Konsynski, 2010; Bush et al., 2010) have shown that IT infrastructure is a key factor for organizational agility and performance. IT infrastructure is a key enabler for timely integration and reconfiguration. Therefore, IT infrastructure can be a direct contributor to organizational agility (Chen, 2012).
Another component of an effective implementation of supply chain is SCA. SCA has been acknowledged as a promising strategy for firms in their endeavour to achieve superior performance and sustained competitive advantage (Li et al., 2008; Gligor and Holcomb, 2012). Nonetheless, it becomes clear from business practice and academic discourse that it is no longer enough for firms to develop capabilities to cope with short-term, temporary changes in supply and demand through SCA (Lee, 2004).

Agility is a capability; it is an organization’s capacity to respond rapidly and effectively to unanticipated opportunities and to proactively develop solutions for potential needs (Ganguly et al., 2009). It is also necessary for firms to develop capabilities to adapt their supply chains in order to cope with long-term, fundamental changes, such as structural shifts in key markets, radical advances in technology, and socio-political and demographic change (Lee, 2004). Even though research has broadly discussed characteristics and benefits of SCA, little rigorous empirical testing exists (e.g. Blome et al., 2013). Moreover, while some researchers have conceptually distinguished between SCA and other capabilities (i.e. IT infrastructure, supply chain responsiveness, SCI, etc.) no rigorous empirical testing of trust on SCA through IT and their distinct performance effects exists (Christopher, 2005; Rai, 2006; Degroote and Marx, 2013; Liu et al., 2013a).

To have an agile supply chain, an organization also needs some capabilities. One important factor is SCI (Yusuf et al., 2004). Integration between supply chain members will allow them to have an agile, seamless SC that can respond to rapidly changing and unpredictable markets (Chan et al., 2012; Chong et al., 2009; Huang et al., 2010). According to Janvier-James (2012), SCI can provide agility along the supply chain and SCA generates greater flexibility and greater levels of customer satisfaction. However, despite the advantages listed for SCA as well as the role of SCI in the creation of this advantage, few studies have theoretically and comprehensively examined the effect of SCA on firm performance directly and use SCI as antecedent to improve firm performance (DeGroote and Marx, 2013; Liu et al., 2013a; Zhao et al., 2011).

Furthermore, this study clarified the role of SCA on firm performance by SCI (the main high order capabilities to improve SCA must occur before agility and a firm, while agile and integrated inside the company must also be integrated with suppliers and customers) (Christopher, 2010; Christopher, 2005; Rai, 2006; Degroote and Marx, 2013; Liu et al., 2013a); and trust (the intangible antecedents for SCA through IT
infrastructure) which has not been investigated in previous studies as a SCA and SCI antecedent (DeGroote and Marx, 2013). This study makes a key contribution to the agility literature by offering more comprehensive understanding of the relationship between trust, SCI, IT infrastructure and firm performance.

The study by Ghanatabadi (2005) investigated the role of company size to achieve competitive advantage. It was mentioned that it is particularly necessary for SMEs in developing countries to pay attention in order to achieve competitive advantage in the market. Lack of similar studies in Iran creates the foundation for the purpose of this research. According to Baharanchi (2009), there are weaknesses in internal and external integration in the automotive industry in Iran. The result of the study (focused on product quality) shows that in order to obtain high product quality and to increase customer satisfaction, firms have to become more integrated internally and externally and should integrate with customers. This study also offered confirmation within a different context, as an empirical study of SCI in the automotive industry in Iran.

Another study by Manzouri et al. (2011) emphasized the lack of trust to apply IT in supply chain in Iranian automotive. Lack of infrastructure in IT in supply chain and lack of trust is a weakness in the automotive industry in Iran which has been previously investigated. Finally, the head of quality management in Iran (Entesarian, 2014) stated that supply chains in Iran are facing some problems. He mentioned that the after sale service of vehicles has problems and that problems make for a poor supply chain in the automotive industry. The main reason behind this logic is poor integration between partners in supply chain. It is important to investigate SCI in the automotive industry in Iran to remove some barriers to increase efficiency and effectiveness of supply chains.

Harvesting from the above discussion, it is imperative to directly investigate the effect of trust and IT infrastructure on SCA, integration and firm performance as well as the direct effect of SCI on SCA and firm performance. Finally, the effect of supply chain antecedents (higher order capabilities “agility and integration” and lower order capabilities “trust and IT infrastructure”) on firm performance must be investigated. The results of the study by a theoretical and comprehensive approach may clarify the role of an effective supply chain of firm achievement in Iran. Moreover, the results of this study may help Iranian SMEs in creating an effective supply chain by employing concepts such as trust, integration and agility.
1.3 Research Questions

In this study, dependent variable is firm performance and independent variables are trust, IT, SCI and SCA. In order to investigate the effect of independents variables on firm performance as dependent variable, the study addresses the following main research questions:

1. Does trust have a direct effect on firm performance, SCI, SCA and IT infrastructure?
2. Does IT infrastructure have a direct effect on firm performance, SCI and SCA?
3. Does SCI have a direct effect on firm performance and SCA?
4. Does SCA have a direct effect on firm performance?
5. Do SCI and SCA have the mediating roles on the relationship between IT infrastructure and firm performance?

1.4 Research Objectives

The purpose of this study is to develop and empirically test a model explaining how SCM capabilities affect and improve firm performance. This study has five main objectives:

1. To investigate whether trust has a direct effect on firm performance, SCI, SCA and IT infrastructure.
2. To investigate whether IT infrastructure has a direct effect on firm performance, SCI, SCA.
3. To investigate whether SCI has a direct effect on SCA and firm performance.
4. To investigate whether SCA has a direct effect on firm performance.
5. To investigate whether SCI and SCA have mediating role on the relationship between IT infrastructure and firm performance.
1.5 Significance of Study

A careful review of the literature suggests that SCM since its emergence as a solution for enhancing organizational performance has attracted the attention of many researchers. This study and its findings are considered important to provide insight into consequences of some antecedents of SCM on firm performance in the automotive industry in Iran. In terms of theoretical significance, this study was in line with RBV and RDT theory and with emphasis on the integration of tangible and intangible resources proposed to fill the gap in the body of knowledge on the impact of SCM on SMEs performance by addressing these issues:

The first issue lies in information on the importance of an intangible organizational resource, namely trust. Based on the literature SCM has become widespread in companies across of the world. However, there is still some debate among academics on how SCM can assist organizations in achieving their goals. At least part of the debate is related to some intangible assets of the organization such as trust and its effect on firm performance. The lack of trust in automotive industry in Iran to apply IT is the main issue that has created a series of problems. This study, with inspiration from RBV theory, attempted to theoretically and comprehensively facilitate a better understanding of the effect of trust on firm performance in the SCM context.

The second issue was linked to effective implementation of SCM by emphasizing the role of some elements of effective SCM such as agility, integration in supply chain and IT infrastructure. Lack of integration between the partners in Iranian automotive leads to weakness in the provision of after-sales services. This study is in line with the RBV and RDT by synthesizing some tangible organizational resources such as IT infrastructure as well as intangible resources such as trust and attempt to provide an innovative and new way for SCM implementation and effective utilization of organizational assets in SCM context. RDT is thus concerned with power, dependence, autonomy and constraint. In an important development, Casciaro and Piskorski (2005) sought to reformulate RDT, in particular criticising the original construct of interdependence in RDT for a lack of discrimination between mutual dependence (the sum of dependencies between the two organisations) and power imbalance (the power difference between two organisations). Therefore, the study opened new perspectives
into RBV and RDT theory as well as SCM implementation and indicated how innovative utilization of firm’s internal resources leads to its improved performance.

The third point was that the study investigated the mediating role of agility in the impact of IT infrastructure on firm performance. The examination of these relationships provides key insights to IT infrastructure and SCM and how firms can most effectively utilize IT infrastructure to achieve higher agility, improve firm performance and increase competitive advantage.

The last issue is related to implementation of SCM in SMEs in Iran. Usually SMEs follow a very simple SCM system. The system of these SMEs is characterized by partnership and informal networks with suppliers of resources. The results suggested a new way to build cooperative partnerships with stakeholders for small companies by providing an innovative way to apply SCM.

### 1.6 Scope of the Study

This study intended to examine the effect of trust and IT infrastructure on firm performance directly and through SCI and SCA. A quantitative empirical study was conducted in the automotive industry in Iran for two reasons. First, SCM is very common in the automobile industry and many companies across the industry have utilized the system in their supply chain. Second, according to Trade and Development Bank (2012) reports, in terms of the units produced, Iran's auto industries are ranked amongst the top five in the developing nations.

Moreover, this study selected this industry because, first, the automotive industry seems to be an indicator of the wealth of a nation (Childerhouse et al., 2003). Therefore, SMEs play a key role in the Iranian economy. Second, automotive supply chain literature had been well documented in previous research and there was a clear structure of the automotive supply chain (Bandyopadhyay and Sprague, 2003). Third, low firm performance in automotive industry in Iran is the main issue currently in SMEs and automotive industry in Iran (Entesarian, 2014). Finally, the automotive sector has been a leader in implementing SCM strategies in Iranian industries (Atiehbahar, 2011).
Many well-known international automakers are active in Iran such as Peugeot, KIA, Volvo, Benz, Scania, Nissan and Mazda. As a result, the sampling frame for the current study includes a variety of manufacturing SMEs in automotive industries in the country. The logistic managers are surveyed as respondents because they have significant information required by this study. The data for the study were obtained from three types of companies in the aforementioned industries namely metallic, electric and polymeric. The data were gathered during the period of December 2013 to April 2014.

1.7 Operational Definition

**Supply chain:** A structure composed of suppliers, producers, distributors, retailers and customers that are interconnected by material, financial, information and decisional flows (Fiala, 2005).

**Trust:** Trust in SCM can be defined as the willingness to rely on a supply chain partner in whom the firm has confidence. Trust is viewed as basic social capital that encourages helpful activities among supply chain partners (Yeung et al., 2009).

**Supply chain integration:** Formation of a network in which separate supply chain partners collaboratively manage intra and inter-organizational processes to arrive at mutually acceptable outcomes. SCI is defined as the degree to which a firm manages activities with customers and suppliers. It offers a level of organizational integration with its business partners (Kim and Cavusgil, 2009).

**IT infrastructure:** Infrastructure for IT in SCM consists of Internet connectivity, hardware and software including application system integration. Nevertheless, training and education for IT is important to fully utilize the IT for SCM (Sanders, 2008).

**Firm performance:** The ability of a firm to fulfil its market goals. Firm performance is the value the organization delivers to customers and other stakeholders and how well the organization is managed (Moullin, 2007).

**Supply chain agility:** The firm’s ability to sense changes in the market and respond to the changes based on the actions it takes or the ability of a supply chain to
rapidly respond to changes in market conditions and customer demands thereby enabling the attainment of competitive advantage (Vinodh and Prasanna, 2011).

1.8 Outline of the Thesis

Key concepts and objectives of the research were introduced in this chapter. Chapter 2 reviews the related literature on SCM, SMEs, trust, SCI, IT infrastructure and SCA and their effect on firm performance. The chapter also introduced underline theories (this study used resource based view “RBV” and resource dependent theory “RDT”) and theoretical framework of the study. The chapter ends with hypothesis development and a summary of the chapter.

Chapter 3, then, was designated to research methodology in terms of sample frame, research method, research instrument, data collection procedures, and determining data analysis method. In Chapter 4, an analysis of collected data and evidence with the initial model is presented. Finally, Chapter 5 contains discussion and conclusion of research findings.
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