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A Pain in the Chain – Supply Chain Management Challenges in Iranian Automobile Sector

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Abstract:

SCM and its related aspects are critical for the success of the organization. An organization can reduce its costs as well as increase the features of the products and services by improving its supply chain management practices. An important aspect of SCM is suppliers' selection. SCM and suppliers' selection issues are more prominent in manufacturing firms so it is important for firms to identify the factors that should be kept in mind while selecting a supplier. Automobile industry of Iran is the second largest sector of the economy (after oil and gas) and the annual contribution of it in gross domestic product of the country is around 10%. Iran is the 18th largest automaker in the world and one of the largest in Asia. Moreover, it has the largest production capacity in entire Middle East region. Automobile sector of Iran is facing huge losses because of supplier management. The main aim of this paper is to review the relevant scholarly literature on supply chain management and supplier selection and generate a list of factors that should be kept in mind by the Iranian automobile manufacturers. The findings of this paper identified problems of

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Iranian Automobile sector and based on these findings, several recommendations were made. It is suggested that Iranian automobile should become vertically integrated, enter into indemnity-based contracts with suppliers and attract FDI in Iranian Automobile sector. It is also suggested that existing suppliers in Iran should attempt to consolidate with each other and should also try to develop a partnership with foreign buyers and suppliers.

Key words: Supply Chain Management, Pain in the Chain, Automobile Sector, Iran

1. INTRODUCTION

In this section, background, problem statement, purpose and research questions, as well as limitations of research, will be presented.

1.1: Background:

Turker and Altuntas (2014) suggested that supply chain management (SCM) of an organization is related to streamlining a business and its activities in such a way that it may maximize value for the customers and may help organizations in generating competitive advantage. Organizations should develop such supply chains, which are effective and efficient and may assist it in achieving its mission and objectives. Fawcett, Ellram, and Ogden (2014) suggested that SCM is concerned with the flow of goods and services. It incorporates movement of goods from the suppliers of the organization to the end-user. In order to leverage its own resources as well as resources of its suppliers, organizations have to plan, design, execute, monitor and control its supplier with an aim to create value for all members of supply chain. Ellram and Cooper (2014) added that SCM is concerned with the management of both upstream as well as downstream

activities of an organization in such a way that it adds value for customers of the organization. Moreover, it also needs coordination between one or more functions of the organizations with its suppliers with an aim to improve some form of organizational performance.

Fawcett, Ellram, and Ogden (2014) suggested that present-day organizations are facing enormous competition and try to resort to such strategies through which they can optimize their value chains and create competitive advantage. Porter (2008) suggested that while developing competitive advantage, organizations may not limit to their own value chain rather they may go out of their own value chain and should look for the required value from their suppliers. He also highlighted that present day, organizations are not competing on the basis of their own resources rather competition is on the basis of the value network. It is, therefore, important that organizations should select their suppliers based on criteria. These criteria should support organizations in optimizing their supply chains as well as value generating activities. Arif-Uz-Zaman and Ahsan (2014) highlighted the case of US manufacturers and suggested that a typical manufacturer spends half of its revenues on obtaining goods and services from the suppliers so the success of such organizations depends on the kind of suppliers they have. It, thus, becomes imperative that procurement staff should exercise caution and adopt a systematic and objective approach in the selection of the suppliers as these suppliers have lots to do with organizational performance.

Pandya (2012) highlighted that an analysis of global automobile industry revealed that over the period of time, the level of internationalization of business would increase further. The automobile manufacturers would not only export their automobiles in international markets but also, in an attempt to increase their competitiveness, would start relying on

international vendors. This would lead to an international automobile industry structure whose supply chain linkages are not confined to one country. Porter (2008) and Stefan Schaltegger, Bai, and Sarkis (2014) suggested that organizations are trying to increase their level of competitiveness and in an attempt to do so they do not confine to their own value chain rather they try to identify a supplier which suits to its requirements and develop a long-term relationship with such supplier. This creates a situation in which level of resources and competencies of the organization increases and it becomes better able to serve its customers. Ingrassia and White (2013) highlighted that there are various factors which serve as the basis of development of international supply chain. Two such factors are cost optimization and quality of components. Zu and Kaynak (2012) suggested that keeping the quality of components/raw material constant, if a supplier offers low cost then organizations would prefer to purchase from those suppliers. Likewise, if a supplier offers better quality, then the organization would be inclined towards those and would switch to such suppliers.

Boudette (2014) highlighted that automobile industry of Iran is the second largest sector of the economy (after oil and gas) and the annual contribution of Iran in gross domestic product of the country is around 10 percent. The industry employs over 4 percent of the total workforce of the country. Over the period of time, Iran experienced exponential growth in its automobile sector. Jafarova (2014) highlighted that presently Iran is the 18th largest automaker in the world and one of the largest in Asia. Shahin, Javadi, and Shahrestani (2014) suggested that automobile sector of Iran has the largest production capacity in the entire middle east. The main car manufacturers in the sector are Iran Khodro, Saipa, Bahman Group and Kerman Automotive. In addition to these, there are other players who are also indulged in production and sales of

automobiles both within the country as well as exporting it other countries. Heidarzadeh Hanzaee and Sadeghian (2014) highlighted that in terms of production, Iran's automobile industry stands among top 13 industries of the region. The larger players in the sector have been selling their automotive parts using their own brand names whereas other are primarily engaged in assembling cars and other automobiles under the brand name of others (licensing arrangement). Such assembly arrangement is the result of conglomerates formed by different suppliers of the industry. Further to this, Karami et al. (2015) suggested that despite the fact that primarily investment made in the automotive industry of Iran is made by private local and foreign investors, Government of Iran and its officials also hold equity interest in large firms including Khodro and Saipa. Further to this, the local players have established a network of dealers all over the Iran. The smaller industries are quite fragmented yet now, the Ministry of Commerce and Industry of Iran had been working with these so that the contribution of these firms can be improved. The sale of automobiles in Iran is made by a very large network of dealers, which has exceeded 2500. Bozorgmehr (2014) highlighted that by the year 2009, production and sales of automobiles in Iran has surpassed the production of automobiles in China, Taiwan, Romania, and India. However, in 2013, production of automobiles in Iran dropped. The international relations of Iranian Government have resulted in sanctions on various sectors of Iran and automobile sector of Iran was one of those sectors. The nuclear program issue of Iran has resulted in a rift between Iran and the world. Because of sanctions, import of various automobile parts from French car producers to Iranian market has declined. Ottolenghi (2014) highlighted that because of supplier-related problems, around 30 percent of the automobile manufacturers had gone bankrupt. The reduction in the production of automobiles has resulted in the shortage of

automobiles in the country. Adding fuel to the fire, because of increase in inflation in the country, the cost, as well as price of automobiles, was increased which was coupled with a decrease in incomes of Iranian people.

Jafarova (2014) highlighted that as the US and its Western allies suspect that Iran is involved in the production of nuclear weapons. US President Obama approved sanctions against those companies who were carrying out businesses with Iran. Consequently, South Korean companies stopped taking any further orders from Iran for the procurement of Korean parts. This resulted in an estimated increase of around 40 percent in the cost of production. Likewise, PSA Peugeot Citroen, French Automobile company, observed largest ever annual loss, as because of western sanction's it was not allowed to sell automobile parts to Iran. In response to non-cooperation of foreign sellers, Iran also closed production line of six foreign brands that were produced by Nissan, Hyundai, and Kia. Hyundai refused to sell parts to Iran. Likewise, Kia refused to provide air bag system. Nissan decided to abandon further relations with the Iranian company. Boudette (2014) highlighted that as a result of international sanctions on Iran, lots of automobile suppliers that has their operations in Iran left Iran. These include Fiat, General Motors, PSA Peugeot Citroen, Hyundai, and Toyota. These suppliers were Italy, Germany, France, South Korea and Japan.

1.2: Problem Discussion:

Stefan Schaltegger, Bai, and Sarkis (2014) suggested that SCM is not a simple process as managers have to consider various interrelated factors for optimizing the organizational supply chains. So careful attention should be given to SCM related issues. The success or failure of one of the members of the supply chain may increase pressure on the other members of supply chain or may lead to overall failure. It is, therefore,

important for managers that they should become proactive and identify areas that could serve as preventive controls. Such proactive approach may help organizations in escaping from uncertainties and risks associated with SCM. An example of such issues came from the work of Marucheck et al. (2011) who highlighted the case of the automobile, food, medical devices, pharmaceuticals and consumer products where the manufacturers have to suffer huge penalties as well as losses because of a failure on the part of their suppliers. In most of the cases, these manufacturers fail to select a supplier which can perform according to the requirements of the organization which ultimately lead to failure of the organization. This also resulted in heightened public attention and bad publicity of the organizations which are involved in these issues.

Chen (2011) suggested that once an organization has decided about its production process and related inputs then the next step is to decide which components it would manufacture or already has and which components are to be purchased from outside vendors. The selection of suppliers is a complex and multi-factor issue so should be handled with care. Jia et al. (2015) suggested that best suppliers are the one that adds to the production process of a manufacturer in the creation of value for end-users. So, when selecting a supplier, organizations should identify certain criteria and should evaluate potential or even existing suppliers on those and then select a supplier.

Stefan Schaltegger, Bai, and Sarkis (2014) suggested that in modern day business situation, competition is not confined to organization level rather it has increased from business level to supply chain level. If one or more members of the supply chain would not perform well, it would influence effectiveness and efficiency of the other members of supply chain. Just like a chain whose strength depends on the strength of its weakest link, the competitiveness of a supply chain

depends on the resources, competencies, and strength of its weakest member. So, in order to build a robust supply chain, the organization should identify, select and build relations with those suppliers who are reliable and have the ability to overcome external environmental factors. Thun and Hoenig (2011) added that when an organization decides to rely on an external vendor then the strengths and weaknesses of supplier possibly becomes strengths and weaknesses of the organization. The success and failure of the organization are linked with success and failure of the supplier. It is, therefore, important that organization should pay considerable effort in suppliers' selection.

1.3: Research Question:

The discussion carried out in the preceding section asserts that SCM is an important business issue so organizations should pay attention to this area. An important aspect of SCM is suppliers' selection. SCM and suppliers' selection issues are more prominent in manufacturing firms so it is important to identify the factors that should be kept in mind while selecting a supplier. Automobile sector of Iran is facing huge losses because of supplier management. The research question for this paper is given below.

What are factors that should be kept in mind by an automobile manufacturer in Iran while selecting its suppliers for automobile components so that cost of production can be kept to a minimum?

1.4: Purpose of Research:

The main purpose of this paper is to review the relevant scholarly literature on supply chain management and supplier selection and develop a list of factors that should be kept in mind by the Iranian automobile manufacturers.

1.5: Limitations:

Following are some of the limitations of this research paper.

1- The data collected for this research was secondary in nature. Gravetter and Forzano (2011) suggested that secondary data may be less relevant and out-dated so should be used with care.

2- The list of critical success factors related to supplier selection is not exhaustive. More and more factors can be added to this list.

3- Critical success factors related to suppliers' selection were extracted through review of the literature. The selection of literature items could be subject to researcher's biases.

2. THEORETICAL PERSPECTIVE

In this section, theoretical perspective with reference to research paper will be discussed. This includes an account of the importance of supply chain management and factors that influence the suppliers' selection.

2.1: Supply Chain Management:

Barney (2012) suggested that SCM involves various activities which are related to overseeing the materials, information, and finances of the organization as these move from the suppliers of a manufacturer to the manufacturer himself and from the manufacturer to the wholesaler and from the wholesaler to the retailer and from the retailer to the final customer. The prime focus of SCM related activities it to ensure coordination and integration of activities both within the organizational boundary as well as among the members of the supply chain. Wisner, Tan, and Leong (2015) suggested that supply chain management involves active involvement of all the members of the supply chain so that final customer can obtain a higher value, as well as members of the supply chain, can earn the

competitive advantage over other members of the supply chain. For this, members of the supply chain have to be integrated with each other in such a way that flow of materials and information among the members of the supply chain can be enhanced. Zu and Kaynak (2012) highlighted that aim of supply chain management is to control different activities as well as interaction among the members in such a way that production, shipment, and distribution of products and services can be carried out in a smooth manner. According to Mansouri, Gallear, and Askariazad (2012), SCM is based on the idea that production of a successful product needs cooperation between the member of the supply chain and strength of the whole chain depends on the expertise of the weakest member in the supply chain.

2.2: Supplier Selection - Factors to be Considered:

Turker and Altuntas (2014) highlighted that the end of 20th century and the dawn of 21st century observed different types of challenges faced by the businesses. One such area where these challenges emerge is SCM. The competitiveness of a business depends on the strengths and competencies of members of its supply chain. It is, therefore, important that business should select its supplier with caution. The academic literature identifies a number of factors, which can be used for used selection of the supplier. A review of few of these is given under.

2.2.1: PEST Factors International Supplier:

Waters and Rinsler (2014) highlighted that in present times, in order to increase their level of competitiveness, businesses have developed international supply chains. They suggested that when selecting a supplier from another country, organizations should consider political, legal, economical, social and technological factors of the suppliers' country. At any point in time, one or more of these factors may have an adverse

influence on the relationship between buyer and supplier, which terminate the relationship of the two.

2.2.2: International Political Relations and SCM:

Wheelen et al. (2015) highlighted different ways through which government of a country can influence the supply chain management practices of businesses. They highlighted that Government can restrict exports and import of certain items to other countries. This can be done by imposition of tariffs, quotas, restrictive trade embargoes, etc. Unavailability of certain items would create problems for members of supply chain. Likewise, Government can also influence the international trade by fixing the exchange rate of local currency with the foreign currency. If local currency gets weaker then imports become expensive which would increase costs of production and makes the final product expensive for the customers. This leads to a reduction in the competitiveness of business. Ergur, Yamak, and Özbilgin (2015) highlighted a new trend in the international business trade where businesses are getting the influence of bad relations between/among the Government of the countries. They highlighted that if Government of the country does not find a political solution to a problem they start a war with each other. At the minimum, they put economic sanctions on the businesses, which may have the negative influence on the trade of businesses. This may lead to loss of sales, revenues, increase in stock levels of the business, which is exporting. At the same time, it also leads to production halt, production bottlenecks which create considerable supply chain management related problems.

2.2.3: Lead Times:

Charan (2012) suggested that due to the internationalization of business, supply chains are not confined to local levels. Where such internationalization of businesses has opened up new

opportunities for the business, these also have created problems for the businesses. One such problem is the increase in the lead times. Because of such increase in lead times, more and more money has to be tied up in the inventories, which has reduced the return on investment for the businesses. Likewise, because of increase in lead times, businesses have to wait for the receipt of stocks before the production of goods and services can be started. In addition to this, businesses also have to wait for inventories to arrive at the factory premises, which lead to a situation in which businesses have to keep higher buffer stocks. Consequently, businesses have to spend more money on keeping the higher level of buffer stocks. This also makes supply chain inefficient. Charan (2012) specifically highlighted the case of automobile industry where the production of automobiles is delayed due to late provision of parts and other related supplies.

2.2.4: Transportation Cost:

Seuring (2013) highlighted that globalization of SCM has also lead to increase in the cost of transportation. This makes supply chains less cost efficient, which is not the desired situation for organizations as well as for its customers. When importing from abroad, organizations should consider the cost of transportation as well as relative benefits of importing from abroad. If the benefits of importing from abroad are more as compared to the cost of importing then such import should take place. Likewise, Williamson (2008) suggested that an important determinant of moving out of the organizational value chain and selecting an external vendor is cost efficiency. An organization outsources one or more of its activities to an external supplier if the cost of production of the supplier is less than the cost of production of the organization. The organization can source cheaper supplies from the supplier and thus can reduce its cost and increase its profits.

2.2.5: Technical Capability:

Alaghehband et al. (2011) suggested that when an organization decides to outsource one or more of its functions to an outside vendor/supplier then it should analyze the technical capabilities of the supplier. If the organization does not possess required capabilities or if suppliers possess better capabilities as compared to the organization then it is plausible for the organization that it should outsource its activities to an external vendor. Reliance on such an external may also increase overall competence portfolio as well.

2.2.6: Quality of Product/Service:

Scheer, Miao, and Garrett (2010) suggested that technical capability and quality of products and services offered by the supplier are an important basis of suppliers' selection. They highlighted the case of security outsourcing among banks and reported that banks select such a security services supplier which has relevant equipment, experienced and trained staff as well as overall ability and experience in the provision of security services to banks. Likewise, Jia et al. (2015) highlighted the case of fashion industry where firms have selected suppliers on the basis of their ability to produce and provide a certain form of clothing which are to be used in the production of particular fashion range clothes.

2.2.7: Delivery:

Williamson (2008) highlighted another factor which becomes an important determinant of suppliers' selection. They said that certainty of delivery by the supplier will help the organization reduce its buffer stocks which would lead to increase in cost savings. If suppliers are not reliable then they would delay supply of goods and services which may lead to stocks out. This may disrupt production and consequently, delivery to customers

will be delayed and hence relations between organizations and its customers will be spoiled.

3. ANALYSIS AND DISCUSSION

In this section, analysis and discussion on related aspects of the research paper will be presented.

The automotive industry, in general, and automobile industry, in specific, are amongst the most global industries of the world (Bozorgmehr 2014). These two industries play a vital in the economic development of the country and always remain on the forefront of an economy in terms of its contribution to the economic development of a country. Iranian automobile industry is also not an exception to this. In the case of Iran, the major motivation for setting an international automobile supply chain was to earn profits as well as make the supply chain more effective and efficient. The inclusion of suppliers such as Fiat, General Motors, PSA Peugeot Citroen, Hyundai, and Toyota is giving lots of benefits to Iranian automobile industry. For instance, PSA Peugeot, the French automobile manufacturer provides high-quality engine and automobile parts. This adds to the quality of Iranian automobiles. Same is the case with the selection of Toyota and General Motors. Although, the location of General Motors (USA) is far which increases transportation cost. However, the overall delivery reliability and quality of supplies received from General Motors are high. Mainly suppliers of Iranian automobile were from Italy, Germany, France, South Korea and Japan. The selection of these suppliers was carried out while keeping in mind the transportation cost of supplies. As compared to American automobile manufacturers including General Motors and Ford which are very far from Iran, the supplies from Italy, Germany, France, South Korea and Japan did incur fewer transportation costs so Iran had selected suppliers from those countries where

it had to incur less transportation cost. Moreover, since the distance between these countries and Iran was comparatively less as compared to the distance between Iran and North America so lead time of supplies from selected countries was less as compared to lead time of supplies from North America.

Sailing on the international level, Iranian automobile manufacturers reap lots of benefits yet it has to face issues related to delivery reliability. In the wake of current nuclear sanctions, the international suppliers of Iran have terminated their relations with the Iranian automobile manufacturer. An important development was the sanctions imposed by the USA and its allies banning any form of relations with Iranian companies.

As Iranian automobile industry has been engaged in export of automobiles to foreign markets so Iran's automobile industry is designing such automobiles, which are suitable for both local as well as for international markets. The presence of suppliers and buyers in the international market is creating problems for Iranian automobile markets as such internationalization of businesses is adding to complexity and uncertainty of business. Iran's automobile industry is heavily relying on the imports of essential parts from its foreign counterparts. Prior to the nuclear program related sanctions, these parts were imported from the foreign producers. Since these foreign producers of parts have their production systems in their countries so these parts were produced away from Iran and were then imported to Iran. This adds to the transport cost of the automobiles which makes supply chains less cost efficient. Such cost inefficiency serves as the two-edged sword for the automobile industry and its stakeholders. For instance, cost inefficiencies lead to the reduction in shareholders' value as profit margins have reduced. Likewise, cost inefficiencies have resulted in an increase in the price of automobiles, which

has made Iranian automobiles expensive as well as less attractive for local and foreign buyers.

Over the nuclear program issue, Iranian Government has lots of conflict with the governments of other countries. Different countries, as well as United Nations, have imposed various types of sanctions on Iran for having nuclear facilities as well as for enrichment of Uranium. Since 1979, there are several rounds of sanctions which were imposed on Iran however recent sanctions were among the tougher ones. United Nations, UK, European Union and the USA have imposed the ban on trading with certain individuals and countries. A special group of sanctions was imposed on all those companies who or whose equipment, facilities, people may potentially involve or may assist in future in uranium enrichment. The European Union has imposed the ban on any transaction with Iranian banks and financial institutions. This is a hard penalty and has curb imports and exports of the country. Japan and South Korea also imposed similar types of bans on Iran. The ban on Iranian financial system has resulted in the devaluation of Iranian currency to lose two-third of its value against US dollar. This has resulted in an increase in inflation in the country as well as it made imports expensive. The US economic sanctions on Iran's currency and its automobile sector were imposed to put pressure on Iran and isolate Iran from the rest of the world. As a result of these sanctions, transactions among foreign banks in which Iranian currency was involved were ban. Foreign financial institutions were advised to refrain from swapping or developing derivatives in Iranian currency. The US assumed that Iran's automobile industry helps Iran in its nuclear program so it faced separate sanctions. There are a number of ways in which these sanctions harmed the supply chain of the automobile industry of Iran. To start with, devaluation of Iranian currency has made imports expensive as because of devaluation, Iran had to spend more Iranian

currency to obtain US dollars in which payments were made. When the restrictive embargo was placed on exports of automobile equipment to Iran, the supply chain broke down as the members of Iran's automobile sector did not find required parts and equipment for production of automobiles. This resulted in various forms of bottlenecks and industry recorded historical losses. Both Iran's automobile companies and its suppliers have increased stock levels. A classic example of that is French company Peugeot which was engaged in the provision of engines to Iran. Japanese and Korean suppliers faced similar problems. As a result of these sanctions, the Iranian automobile industry has suffered huge losses. The suppliers with whom it has been working for last many years backed up because of European Union, United Nations and American sanctions it was forbidden to trade with Iranian automobile industry. Although suppliers also suffered losses yet they were bound to abide by the sanctions.

An important thing to note is that in Iran supply chain, the suppliers were just like traditional members of supply chain. The supplier-buyer relationship was based on good customer-good supplier basis. There was no partnership among the members of supply chain. As a result of these sanctions, initially, suppliers of Iran suffered losses yet over the period of time, they did not produce more parts and equipment which helped them minimize their losses. However, such suppliers had to face the reduction in sales volumes. Had the members of supply chain maintain a partnership, they would have forced their Governments to refrain from putting sanctions.

It was also observed that Iran's automobile industry was not fully integrated. It not only sells different types of automobile parts in the international market but also is a major buyer of the automobile parts from the international markets. Unlike Ford Motors, which was one time, a fully integrated unit, more than 50 percent of the total cost of the

automobile which is made in Iran is of imported parts. As a result of sanctions, these parts were not imported and bottlenecks arise. Iran tried to manufacture these parts locally yet it took time. Moreover, the cost of production was higher as Iranian industry did not obtain economies of scale. Consequently, supply chain lost its competitiveness as because of increase in the cost of production, cost efficiency was lost. Likewise, the effectiveness of supply chain was also lost as imported parts are better than parts which were produced by the Iranian companies. It is important to highlight here that Iran tried to produce parts locally but the cost of production of parts was quite high as compared to the price on which these were previously obtained from the suppliers. One of the underlying reasons for this was that suppliers have been producing and selling those parts to the companies across the world so they had been producing at a large scale which reduced their overall cost of production. In the case of Iran, since it has to spend money on development of such facilities and it does not achieve the high level of production as compared to its foreign suppliers so per unit costs for parts produced locally was quite high. Consequently, the SCM of Iran lost its competitiveness.

4. CONCLUSION AND RECOMMENDATIONS

In this section, conclusion and recommendations related to research will be given.

4.1: Conclusion:

SCM and its related aspects are critical for the success of the organization. If an organization becomes successful in developing an effective and efficient supply chain then it will become the source of competitive advantage for the organization. An organization can reduce its costs as well as

increase the features of the products and services by improving its supply chain management practices. While developing their supply chain, organizations are not confined to the local levels rather they do explore international options and if organizations find a good option then organizations should include that organization in its overall supply chain. Involvement of an external vendor may help organizations in reducing their overall cost as there are chances that external vendor may provide services at lower cost. Likewise, there are chances that external vendor may have favorable access to resources which may reduce the cost of production of suppliers. Such benefits can also be shared with the organization by its suppliers.

Iran's automobile has developed local as well as international supply chain linkages. There are lots of foreign firms from various parts of the world that are providing different types of parts to the automobile industry of Iran. Moreover, a significant portion of demand of Iranian automobile sector is met from automobile parts produced by local suppliers. It has developed supply chain agreements with lots of international firms from across the world. By doing so, Iran has received lots of benefits. These benefits include benefits related to the speed of delivery, read lead times, better technical capabilities, quality of products and services and cost efficiency. The suppliers in close proximity of Iran deliver quickly which reduce overall lead times and Iran does not have to spend more money on keeping stocks. Likewise, Iran can gain benefits of world-class production facilities of suppliers and can produce better quality products and services. A number of these suppliers are producing at optimal costs and providing automobile parts to Iranian manufacturers at reduced prices. This has helped Iran in reducing costs of its automobiles and in improving overall competitiveness. Until recent sanctions on Iran, Iranian automobile manufacturers were maintaining

congenial relations with their international suppliers yet because of these sanctions these relations were compromised and suppliers including Fiat, General Motors, PSA Peugeot Citroen, Hyundai and Toyota refused to supply parts and equipment to Iran. These suppliers were from Italy, Germany, France, South Korea and Japan. Although these suppliers themselves suffer losses yet over the period of time, they managed to minimize their losses, which arise due to lost sales to Iran. Iran's supply chain was suffered from both sides. As a result of these sanctions, Iran was also not able to sell its parts and finished automobiles to international markets. This was because of wreckage in the supply chain of Iran which occurred because of the restrictive embargo on foreign suppliers related to sales of automobiles and related parts to Iranian firms. In order to overcome these problems, Iran should consider its relations with Governments of other countries. A solution to Iran's political battles will reduce wreckage in its supply chain. Likewise, Iran should also develop a strong, robust and reliable supply chain. There are a number of ways through which Iran can overcome these supply chain related problems. If all of the recommendations, which are presented in the next section will be adopted by Iranian automobile, it would reduce supply chain related risks of Iran.

4.2: Recommendations:

Following are recommendations based on this research.

4.2.1: Become Vertically Integrated:

Contrary to the popular belief that members of each member of the supply chain should focus on one activity so that it can develop economies of scale and offer products and services to other members, it is suggested that Iran's automobile sector should become vertically integrated. All the members of automobile sector should start cooperating with each other and

should adopt a position in the supply chain. By doing so, all types of equipment and parts, which are needed for automobile production will be manufactured locally. It would reduce reliance on foreign buyers. Moreover, since parts are not to be imported from abroad so reduce lead times and transportation cost can also be observed.

4.2.2: Indemnity Based Contracts with Suppliers:

It is suggested that Iran should develop the indemnity-based contract with its suppliers. If suppliers fail to provide goods, parts and/or services in time or refuse to provide such things then suppliers should pay damages to the company. Such indemnity based contracts will help Iranian automobile manufacturers in saving them from stock outs especially in the conditions where foreign Governments are putting the ban on trading with Iran.

4.2.3: Attracting FDI in Iranian Automobile Sector:

Iranian Government should encourage people to invest in Iranian automobile sector. At least, friends of Iran and its neighboring countries like China, Pakistan, and India can invest in Iran. When such investment is made in Iran's automobile sector then it would be possible for Iran to develop a local supply chain. Once it is developed then it would not face problems related to globalization of supply chain as well as of international sanctions.

4.2.4: Opportunity to Suppliers to Consolidate in Iran:

Iran should encourage its automobile industry to consolidate at the local level. Once they consolidate at the local level, the members of automobile industry may decide about their respective roles and based on that they would be in a position to decide about their respective roles in the supply chain. Such consolidation and cooperation among local members will lead to

the development of a local supply chain, which will help Iran in rescuing from sanctions.

4.2.5: Partnership with Foreign Buyers and Suppliers:

It is suggested that Iran should offer cross-company ownership to the members of supply chain. If its foreign suppliers have shares or ownership in Iran's automobile sector then they would not take any decision because of which they themselves have to suffer losses. In the case of sanctions, foreign suppliers may be able to convince their respective Governments to refrain from imposing sanctions as it would hurt foreign suppliers and their companies.

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