

A Work Project, presented as part of the requirements for the Award of a Master Degree in Management from the NOVA - School of Business and Economics.

Title:

The Effects of Follow Sourcing on Local Suppliers
An exploratory study of the automotive industry in Brazil

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26.05.2017

Abstract

Rapid changes in the area of supply chain management in the last twenty years formed a whole new approach towards doing business. As one of the most affected industries by those recent changes, the automotive industry adjusted its approach towards global supply chains and internationalization drastically. New opportunities in a global environment led to new sourcing strategies and Brazil as one of the youngest automotive markets integrated these changes quickly. One of the new arising sourcing practices in the automotive industry during the last two decades is a phenomenon named “follow sourcing”, which describes the parallel network establishment of supplier and manufacturer around the globe. Suppliers started to following manufactures to foreign markets and fight local suppliers in their own territory. This paper explores the effects of follow sourcing practices on local suppliers of the automobile industry in Brazil. Therefore, this study follows an exploratory qualitative approach in form of a single case study. In order to gather the necessary data a series of interviews were conducted with mainly CEOs of the industry or related businesses. The findings show the immediate and long-term effects differ drastically. Main effects of follow sourcing on competition and positioning of local suppliers in the Brazilian automotive industry were discovered and a theoretical framework was developed to clarify these effect during different periods in time.

Keywords: Supply Chain Management, Automotive, Brazil, Follow Sourcing

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1 Introduction

The automotive landscape in Brazil changed rapidly during the last two decades due to increased investment liberalizations and trade agreements. In the mid-90s established car companies started to build major new production facilities attracted by the investment liberalizations and a large domestic market potential. Ahead of the market liberalization the international automakers in Brazil produced by building a local supply network, which tailed the establishment of a domestic supplier industry up to the 90's (Humphrey, 2003). This changed rapidly when international suppliers poured into the Brazilian market attracted by existing contracts with manufacturers and growing market potential. In addition to that the approach to supply chain management (SCM) of the automakers changed and aimed towards a reduction of suppliers as well as a centralized development process for harmonized models in global development hubs. During this time limited number of qualified suppliers became common practice and those suppliers were required to provide globally (Burt, 1989; Helper, 1991). In the light of this recent changes Humphrey (2003) introduced the term "follow sourcing", which describes that suppliers establish parallel networks across the globe motivated by the manufacturer in order to provide for him the same part with the same technology and quality in every global location (Humphrey, 2003). This trend in supply chain management during the 90's explains most of the market entrances of international supplier in the Brazilian market.

Naturally this change of the market structure affected the domestic companies, which found themselves in direct competition with the follow source suppliers. As Kotabe & Murray (2004) already showed in their study one of the main effect of the brought in follow sources was an increase in competition during the time of entrance. Fleury (1999) also indicated that most of the suppliers reacted to this increased competition by focusing on their core business and rationalizing their activities. These findings represent only a partial picture of the immediate effect on the domestic market due to follow sourcing practices used in Brazil. Changing to a long term perspective, more than 15 years later there is still no evaluation of the effects of follow sourcing on local suppliers in the Brazilian automotive industry as well as no literature about the market development since the initial period 20 years ago. This study targets the identified literature gap of so far unexplored effects on local suppliers and market changes in the Brazilian automotive industry under a long term perspective due to the practice of follow sourcing. Due

to the young character of the Brazilian automotive market its high potential and the clearly identifiable period of follow sourcing it is perfectly suited for an analysis of the phenomenon as well as its consequences over time. This study will provide a starting point in order to encourage further research to target the identified literature gap as well as establish theory about how follow sourcing affects domestic suppliers in the long term and therefore shaped the automotive market in Brazil as it is today.

This study will contribute to existing literature by closing the identified gap using a qualitative research approach. It starts with an in-depth literature review about the development of supply chain management and its recent trends. It also maps the studied phenomena of follow sourcing in the broad area of SCM literature. Following the literature review and location of the phenomena in the broader context of SCM the applied methodology and the overall research design will be presented. This study uses a single case study, which represents the automotive market in Brazil including its suppliers, as the means to get in-depth understanding of the phenomenon and answer the question “how” this trend in SCM affected local suppliers and changed the landscape of the automotive industry in Brazil. A total amount of eight interviews with a diversity of views on the phenomena were conducted over a period of three months. The gathered data was then analysed with a template analysis and patterns as well as the differentiation of perspectives of the subgroups were identified. Followed by a profound discussion of the findings this article contributes to the existing literature as well as to managerial practices by exploring the consequences follow sourcing in the long run and shows the differences between several periods in the markets history.

An exploration of the long term effects for domestic suppliers as well as the development of the market in general due to follow sourcing is of great importance for a profound market understanding and strategy building for similar situations in the future. This study provides the starting point and the ability to learn from the past and close the identified literature gap.

2 Literature Review

The literature review will start with a general observation and introduction in the area of supply chain management. In order to narrow the field down towards the phenomenon and objective of this paper the literature review discusses a specific area of SCM, the field of Buyer-Supplier Relationships, which plays an important part when it comes to follow sourcing. Further this abstract provides a view on two

recent trends that occurred in buyer-supplier relationships, which are essential and predefining for the understanding of follow sourcing. In the end of this paragraph the review will shift towards the area of Sourcing, also part of SCM, and links it with the previous trends described. Finally, the literature review connects the developments in SCM with the central topic of this study, Follow Sourcing, and outlines the importance this practice has for the Brazilian automotive industry.

2.1 General Supply Chain Management

The area of supply chain management is a comparable new area of interest in literature and the term was first introduced by consultants in the early 80's (Oliver & Webber, 1992). The term "Supply Chain Management" is commonly used to describe and explain the planning of materials, information flows and logistic activities internally within one company as well as externally with other companies (Fisher, 2003). The awareness of collaboration benefits within and beyond one company steadily increased since the 1980's and a variety of definitions appeared in the literature (Lummus & Vokurka, 1999). Lambert and Cooper (2000) describe the emergence of Supply Chain Management as one of the most significant paradigm shifts in modern business management. The key in this new way of doing business is to recognize that individual businesses no longer compete as completely autonomous individuals but more as supply chains (Lambert & Cooper, 2000) and hence a network of different companies or departments. One reason why supply chain management became a focus in the 80's and 90's is the fact that less companies continued their strategy of vertical integration and became more specialized (Lummus & Vokurka, 1999). Furthermore, the demand for new products grew faster than ever before in the 80's what tailed the need to be increasingly flexible and responsive for manufacturers in order to meet continuously changing customer needs (Handfield & Nichols, 1999). These developments formed a construct that is referred to in literature as supply networks, reflecting "decentralized, horizontal and non-power based" linkages among the various members in a supply chain (Chen & Paulraj, 2004, p. 122). In the 90's, as manufacturing capabilities improved, businesses realized the importance and impact of service inputs of their suppliers in order to meet the needs of their customers. This awareness consequently led to a more conclusive approach and the definition of SCM as the function of a company that oversees materials, information and finances during their movement from initial supplier over manufacture down to the end consumer (Kahraman & Öztayşi, 2014).

Today’s main research interests in the area of supply chain management are summarized in Fig. 1 and provide a suitable framework to position this study’s purpose in recent literature.

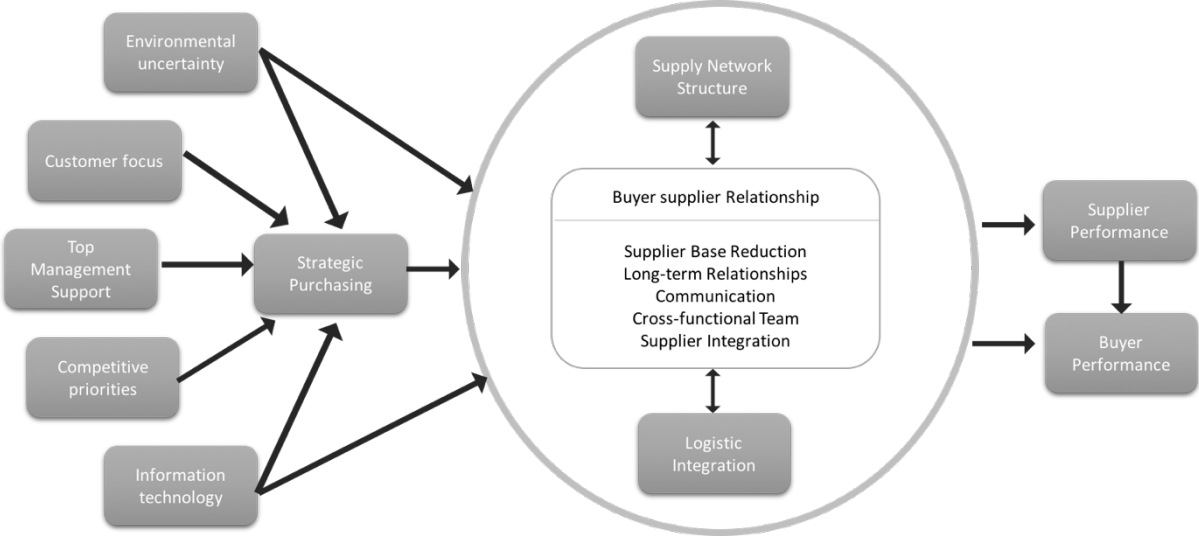


Fig. 1: Research framework and areas of interest in SCM literature (Adapted from Chen & Paulraj, 2004)

2.2 Buyer Supplier Relationships

Buyer supplier relationships can be seen as an own area in the complete framework of SCM. Within this category are rooted several sub topics like supplier reduction or long term relationships, which are discussed in depth later on (Chen & Paulraj, 2004).

The already described intense global competition in the 1980s forced companies to lower their costs and come up with new solutions for efficient processes. The area of a very cost focused approach with characteristics like multiple suppliers, cost-based information systems, short term contracts and centralized purchasing was over. This behaviour of manufacturers was fundamentally based on the view that suppliers are exchangeable and therefore they can be played against each other to lower purchasing prices (Spekman, Kamauff Jr. & Myhr, 1998). This approach was soon changed after manufacturers realized that cooperation with suppliers provide a higher advantage in the fierce competition they face than the exploitation of those partnerships. Manufacturers started to utilize e.g. just-in-time (JIT) and other management tools to rise their manufacturing efficiency what came along with a closer contact to suppliers of services and goods. In the new created fast-paced environment that relies on a concept of low inventory, manufacturers began to realize the advantage and crucial effect of strategic and cooperative buyer-supplier relationships (Choon Tan, 2001). Manufacturers nowadays are more likely to exploit the strength and technologic capabilities of suppliers in support of new product developments

than in the earlier age with a simple cost focus (Ragatz et al., 1997). This approach can also be described as the attempts of manufacturers to integrate and partnership with their suppliers (Wisner & Choon Tan, 2000). Furthermore, it was found that mutual identification between supplier and buyer strengthens informational exchange and therefore outlines the importance for the operational success of a company (Corsten et al., 2011). This vision of mutual buyer supplier relationships aims towards the improvement and consequently the more efficient and effective management of the supply and purchasing functions (Wisner & Choon Tan, 2000). These functions are crucial parts of industrial manufacturing companies since suppliers participate already from an earliest stage in the product design processes. They not only supply standardized parts but work together with manufactures in order to to render cost-effective design choices and consequently contributing to innovation in process and material technology to compete in the global market (Monczka et al., 1994).

2.3 Trends in Buyer Supplier Relationships

Due to the relative young history of SCM and the dynamic and liberal environment companies act in nowadays several trends and developments in supply chain management and further in buyer-supplier relationships can be detected during the last decades. The following two trends affect today's buyer-supplier relationships as well as general SCM and all the functions located within. This paragraph explores the two recent trends "globalization" and the "reduction of supplier bases" and shows their influence in today's SCM.

2.3.1 Globalization

Mentzer, Myers and Stank (2007) talk about "a current trend towards globalization of supply chains" (p.2). More specific the term of global supply chain management describes the cross-border movement of goods, emergence of global competitors and opportunities spread over different supply chains within an industry. This brings a higher complexity than companies face in a single country market simply due to the cross boarder operations (Mentzer, Myers & Stank, 2007). The fierce competition that companies face nowadays is caused by several advances in industrial technology, steadily increasing globalization of demand and supply sources, an explosion in information availability and creative business designs (Bovet & Sheffi, 1998). The supply chain and hence global supply chain management is a considerable source of competitive advantage and therefore often in the centre of a company's strategy (Mentzer,

Myers & Stank, 2007). Since in highly competitive markets the simple approach to dominate by market share is no longer profitable companies redefine their business approaches (Bovet & Sheffi, 1998). The trend is shifting from simple market share towards development and management of long term collaborative and cooperative partnerships (Gruen, 1997). Over the last 20 years the power in a wide area of supply chains has shifted downstream towards customers and end users what results in customer satisfaction been the ultimate goal of a company (LaLonde, 1997). Manufacturers need to be quick in terms of responsiveness in order to avoid a loss in market share caused by quickly shifting trends in demand (LaLonde, 1997). Today customers want products for low costs with high levels of service and customization and an all-time availability on a global scale (Bovet & Sheffi, 1998). Since today's companies compete in a global economy due to liberalisation of trade and accessibility of information, the scope of business analysis is a global one and not just a single country or region anymore (Mentzer, Myers & Stank, 2007).

2.3.2 Reduction of Suppliers

In the past companies relied on a large number of different suppliers with highly specified tasks. In the recent history a significant shift can be identified towards a reduction of the number of suppliers within a supply network and the use of a limited amount of qualified suppliers (Burt, 1989; Helper, 1991). This trend started early after the manufacturers realized the importance of a cooperative buyer-supplier relationship. Manufacturers started to trust supplier's quality control systems and got rid of non-value adding activities like e.g. routine inspections. This trust in quality was not generally given to all existing suppliers what led to the fact that manufacturers purchase only from a handful of qualified or certified suppliers (Inman & Hubler, 1992). The trend is not only indicating a preference for a smaller base of trusted and qualified suppliers but also long term collaborative and cooperative partnerships (Gruen, 1997). Suppliers are, as earlier described, not only the source of simple components or predefined manufacturing but get more and more engaged in the design process of crucial components and provide the manufacturer with valuable additional expertise and technology (Ragatz et al., 1997). This development shows that the preferred version of today's manufacturers is to have a limited amount of high quality suppliers that are active globally and tied to the manufacturer by a long term collaborative and cooperative partnership.

2.4 Sourcing as part of SCM

This part firstly describes the general sub-topic of SCM, “Sourcing”, and then continues with a profound analysis of the relevant subtopics such as global sourcing and follow sourcing.

The general function of sourcing can be located in Chen’s & Paulraj’s (2004) under the headline of “Strategic Purchasing” and basically describes the various approaches a company can use to purchase goods and services like e.g. single- vs. multiple-sourcing, in- vs. out-sourcing or local- vs. global sourcing.

2.4.1 Global Sourcing

Referring to Steinle & Schiele (2008) the topic of global sourcing has been one of the most discussed ones in the area of SCM research. Purchasing departments, as functional part of the SCM of a company find themselves more and more confronted with the expectation to source large volumes globally, mainly from low-wage countries. As the main reasons for global sourcing in the initial period of its usage, several aspects have been identified in the literature. Firstly, one aspect is the factor-cost advantage through low-wage country sourcing and thereby achieve competitive advantages or get rid of disadvantages connected to local-sourcing (Alguire et. al., 1994). This theory of cost saving has been outdated today by one of the most recent articles on the topic of Global Sourcing. Vos et al. (2016) showed that the factor cost advantage is not relevant due to the increased cost and risk factors of global supply chain logistics. Secondly, the aim lies in “global technology sourcing” that suggests that the company is in need of foreign suppliers, which offer quality or technology superior to what is available in the home country or the in-house facilities (Arnold, 1989). These reasons seem relatively obvious and easy to understand what makes it even more surprising that a series of studies have failed to detect any significant impact of the so commonly used and highly discussed global sourcing practices (Kotabe & Omura, 1989; Murray et al., 1995). This lack of impact proof or even the possibility of negative effects on a company’s performance can be explained by several reasons. Cannon & Homburg (2001) and Vos et. al. (2016) argue that the lower procurement costs can lose impact on the performance since global sourcing comes with higher acquisition costs such as delivery, monitoring, coordination and other administrative tasks. On top of that global sourcing has been found to be an important factor when it comes to supply chain vulnerability, thus increasing supply risk (Wagner & Bode, 2006). Global

sourcing is therefore a strategy that is not easy to evaluate but has a strong position in today's markets also due to the consequences of an ongoing globalization trend.

2.4.2 Follow Sourcing

The main objective of this study is the phenomena of follow sourcing as a relatively new and yet unexplored field of research. The phenomenon of follow sourcing describes that suppliers and assembler establish parallel networks across the globe. The supplier in the core-country works with the manufacturer on research and design and supplies these parts to every foreign market. In an ideally case the supplier provides the same part with the same technology, quality and same underlying channels of communication in every global location where the assembler is operating (Humphrey, 2003). This new sourcing strategy rises from several different trends analysed before. The globalization is one of the main contributors but also the reduction of supplier bases as well as the tighter connection between supplier and manufacturer contributes to this new strategy. Kotabe & Murray (2004) describe that the process of adding another international plant to a firm's network of existing plants creates the need of "sourcing components and other semi-processed goods" (Kotabe & Murray, 2004, p.9). This is either provided by an already existing plant and therefore called (company) internal sourcing or by independent suppliers. These independent suppliers are already connected to the manufacturer in another location, most likely the core country, and engaged in design and development activities. One of the most recent research papers about this topic show that follow source suppliers are mostly engaged since the earl beginning of the product development (Souza & Rachid, 2013). As previously described a reason for global sourcing is technology sourcing, what means that e.g. in low wage and less technological countries parts are sourced from the core country in case of liberal trade agreements between the two states, simply because it can't be purchased locally. In the case of high trade barriers, the need to locate and work with domestic supplier emerges to avoid the additional costs and risks of trade barriers. Trustworthy and highly technological domestic suppliers are not always given in emerging countries what leads to the effect of a parallel international network building of already established suppliers and manufactures, hence the concept of follow sourcing. In contrast to global sourcing and as a benefit for follow sourcing Porter (1990) stated that "having a competitive domestic supplier industry is far preferable to relying even on well-qualified foreign suppliers" (Porter, 1990, p.

103). Furthermore, most recent findings in the field of sourcing show that in terms of risk avoidance and sustainability the approach of locally embedded supply chains are preferred and in the end more efficient than global sourcing and importation (Vos et al., 2016). Even though of the negativities and risks connected with global sourcing, the automaker is only investing and building local supplier capability when it is expected to yield a reasonable return. For this investment decision technology transfers play a key role. When an automaker decides between using local and follow source supplier the risk and cost of technology transfers are of great importance (Ivarsson & Alvstam, 2005). Mainly there are two ways of technology transfers: 1) Internalized transfers, which describe the in-house transfer from e.g. headquarter to a subsidiary in a foreign country 2) externalized transfers, which describe the transfer to companies outside direct ownership e.g. supply agreements with local suppliers in a foreign country. In contrast to internalized transfers, externalized ones have a greater potential to facilitate technology upgrading of local companies (Ivarsson & Alvstam, 2005). The lately increasing demand for tech capabilities combined with economies of scale in production and design led to the boom of follow sourcing as manufacturers prefer to stay with their established suppliers when setting up manufacturing in newly emerging markets (Saggi, 2002). An empirical study by Ivarsson & Alvstam (2005) shows that more than 70% of the purchased parts by international manufacturer Volvo in Brazil are supplied by international suppliers, which further are defined as 100% follow sources suppliers. This dominant position is confirmed by various studies of the Brazilian market, which claims that especially in the automotive market “global sourcing and follow sourcing policies became predominant” (Fleur, 1999, p. 558). In this regards follow sourcing accounts for a major part today because of the advantageous positioning of international suppliers in terms of technology transfer with lower risk and cost for the automaker (Ivarsson & Alvstam, 2005).

3 Automotive Industry Brazil

This abstract will analyse the automotive industry in Brazil as description and explanation of the single case study, which is used in this paper. The single case used reflects the automotive industry in Brazil and explores how this industry was affected by follow sourcing and changed over time. Furthermore, this case description provides the necessary insights and framework to understand the important role

follow sourcing plays in the market changes over time and the crucial effect it has on the domestic suppliers.

This case study considers mainly the Brazilian automotive market as of the early 90's due to the major changes brought by increased investment liberalizations and trade agreements (Fleury, 1999). In the mid-90s established car companies started to build major new production facilities attracted by the investment liberalizations and large domestic market potential. Along twelve major players in the automotive manufacturing business entered Brazil between 1997 and 2001 (Humphrey, 2003). According to public company information some of the largest domestic auto part suppliers were acquired in the 90's by international companies such as e.g. Metal Leve in 1996 by Mahle (MAHLE GmbH, 2017). This aggressive entrance of international suppliers, which were almost entirely fit the definition of follow sources (Ivarsson & Alvstam, 2005) led to a situation where large segments were controlled by a few global suppliers by the end of the 90's (Santos & Pinhã, 2000). Ten years later Souza & Rachid (2013) state that overall only eight of the 50 largest auto part suppliers are not present in Brazil with production plants. Within a period of twenty years from the beginning of market liberalizations in Brazil the foreign capital in the auto parts industry more than tripled (Souza & Rachid, 2013) and the landscape shifted drastically towards denationalization.

One of the biggest changes during that period was the change in development collaborations between suppliers and manufacturers. In the beginning of the automotive industry engagement in Brazil the model of building cars was individualized and highly dependent on local suppliers and local development capabilities. When a transnational car assembler went into a new country they established a local supply chain network to best serve their needs (Humphrey, 2003). Nowadays assemblers follow a trend of a harmonized models and platform strategies so that the model of a car can be sold in a variety of different markets. This entails a decline in market differentiated products and hence the supply chain changed drastically. The subsidiaries in the past had a higher freedom to introduce design changes and domestic suppliers were directly involved in joint development projects with the assembler. During the last twenty years the design and development functions have become centralized in the core country and development hubs around the globe (Humphrey, 2003; Ivarsson & Alvstam, 2005; Fleury, 1999). This new strategy by the manufacturers resulted in a standardized international product range, which

influences also the suppliers. This general change in strategy combined with the already mentioned advantages of supplier reduction were strong factors for local suppliers of the core country to internationalize and follow the assembler to foreign markets. The research of Ivarsson & Alvstam (2005) explains the move of supplier to foreign markets as a combination of “growing demand for technological capabilities, reduced production costs, and increased delivery precision, together with economies of scale in production and design” (p.1327). Furthermore, the option of large imports to Brazil was not feasible during that period due to the fact that tariffs on vehicle imports stayed high and made it very expensive for manufactures. In addition to that a local content requirement of 60% was necessary for production in the entire Mercosur region (Argentina, Brazil, Paraguay and Uruguay) (Humphrey, 2003). This combination led to a situation in which manufacturers prefer to stay with their established suppliers in the case of building a manufacturing plant in a foreign market and incentives them to go with them. This new market entrances of suppliers natural increases the competition for domestic suppliers (Ivarsson & Alvstam, 2005). Katobe & Murry (2004) come to the same conclusion that the competition in the local market among suppliers increased rapidly due to the new market entrances of follow sources. The strategic reactions by local suppliers to this newly increasing competition was outlined by Fleury (1999) as a two way strategy. Firstly the suppliers focused on their core business and secondly they rationalized their activities. Both strategies were defined as “defensive and made in isolation” (Fleury, 1999, p. 560) in order to protect their competitive advantage in the early stage. Mukherjee & Sastry (1996) summarize the supplier strategy with a focus on “getting restructured for lean production and acquiring design capabilities” (p.77) what further supports the combination of inside orientated restructuring to improve production capabilities as well as outside orientated design seeking.

When looking at the automotive industry today it becomes clear that the main changes in terms of market structure and international influence occurred in the period between 1990 and 2000 as indicated by the market entrances as well as acquisitions of domestic suppliers by international follow sources (Mahle GmbH, 2017). The main period of follow sourcing until 2000 was then followed by a flourishing industry and continuous growth in production and sales. In 2015 Brazil ranked 8th in global passenger car production with 2.02 million units produced after a steady decline in production since the all-time high in 2013 of 3.7 million units (Statista, 2017). The main contributors to this number and largest players

are the large international car manufacturers, with Fiat-Chrysler (18% market share) leading ahead of GM (17%) and Volkswagen (12%) in Brazil (Statista, 2017). When analysing the suppliers market in Brazil current statistics arrive at a combined revenue of automotive suppliers in Brazil in 2017 of 38.75 billion US Dollar, decreasing from 43.65 billion three years ago (Statista, 2017). The local produced share of his number is approximately 86%, which includes the production of international follow sources in Brazil (Export. Gov., 2016). It is not clear how much of this statistic accounts for follow sources but it is estimated to be a major part since around 70% of the first and second tier suppliers are international/follow sources (Statista, 2017). A further indicator for the decreasing importance and qualification of the local supplier industry is the dominance of imports over exports of auto parts in Brazil with 13.150 to 7.560 million US Dollar (Export. Gov., 2016). These statistics indicate the dramatic change during the last 25 years from a once existing dominance and preference of domestic suppliers towards a denationalisation of the supplier industry in Brazil, especially in the upper supplier segments. Knowing about these changes and the newly existing market structure as well as the strategies of domestic supplier in the immediate period after the market entrance of follow sources, this study will explore how follow sourcing contributed to this market changes in the long-term and what exact effects follow sourcing had on domestic suppliers.

4 Research Question

The first steps of this research project and an essential one is the definition of a research question. Without a clear definition of research question the researcher can be distracted easily by the large amounts of data that is usually collected during the research project and risks to lose focus on the fundamental target (Eisenhardt, 1989). The research question of this study is to explore how follow sourcing affects local suppliers of the automotive industry in Brazil in the long-term. In order to answer this research question, the following sub-questions were developed to explore how follow sourcing contributed to the drastic changes in Brazil's automotive market and what are the exact effects follow sourcing had on the domestic suppliers. The sub questions were designed to ensure the coverage of main effects and provide a starting point for the framework used in data collection and data analysis.

SQ1: Which strategic reactions did local Brazilian suppliers introduce to deal with the consequences of follow sourcing?

SQ2: How did the role of local supplier change due to follow sourcing in the immediate period after entrance and in the long-term? (1. tier supplier vs. 2. or 3. tier supplier positioning)

5 Methodology

This part of the study explains the selected methodology and research design in order to show and justify how the chosen techniques will best serve the aim of this exploratory study.

5.1 Nature of the research

In order to answer the research question of this study a qualitative research approach is used due to the exploratory nature of the research. A qualitative research methodology is normally used to address research questions, which aim for an explanation or the understanding of a social phenomenon and its context. When it comes to the exploration of issues that contain a certain degree of complexity or processes that occur over time a qualitative approach is most appropriate (Ritchie & Lewis, 2003). Furthermore, a qualitative approach is used to “uncover and understand what lies behind a phenomenon about which little is known” (Strauss & Corbin, 1990, p.19). Since this paper aims towards exploring the effects of follow sourcing on the local suppliers of the automotive industry in Brazil over time a qualitative approach is used to capture best the question “how” and therefore the exploratory nature of the study. Furthermore, this study uses an inductive research approach in order to explore the consequences of a phenomena that is mentioned in existing literature but the outcome of that phenomenon is so far unexplored or outdated. The focus lies therefore in theory building rather than theory testing. The findings of this study will help to understand the effects of follow sourcing on local suppliers in Brazil in the long term and provides a starting point and pilot insights in order to enhance current theory. This strategy explains the strong focus on an exploratory objective in order to find out more about the effects of follow sourcing in a specific market over time and in an ideal case contributes to existing literature by closing the identified gap of long term consequences for local suppliers in Brazil. The questions that need to be answered is “how” follow sourcing affects the local suppliers and therefore no other objective than an exploratory one suits this study best with the aim to explore differences over time. To achieve this objective a single case study of a specific industrial market, which is the supplier market of the automobile industry in Brazil will be used.

5.2 Objective and Conclusiveness of the research

The objective of this paper is to focus on the outcome of a process in supply chain management. As shown in the literature review global supply chain management faces a constant development process and new trends arise in short timeframes. One of these trends or processes is the here analysed follow sourcing and therefore the paper focuses on the outcome of this particular process. The processes describe the shift from local supplier focus towards follow sourcing as well as the reduction of suppliers in general, which affects consequently the local supplier industry. These effects and adaptations of the local supplier base over time is the outcome of the process and therefore the objective of this study.

5.3 Research Strategy

The strategy of this research is a single case study of a specific industrial market, which is the supplier market of the automobile industry in Brazil. Due to the specific industry this case study deals with, the automotive industry, the single case study approach is used in order to be able to gain an in-depth understanding of the studied phenomenon. Case study research has been used in various occasions to explore management problems and study unknown phenomena (Eisenhardt, 1989). This research strategy is especially useful when answering the questions “how” and “why” and allows a deeper insight in new research areas about which little is known so far than a quantitative approach could possibly offer (Siggelkow, 2007). A case study methodology is also common practice when studying a phenomenon in a preliminary stage in order to provide hypotheses and therefore prepare further systematic testing and theory building (Flyvbjerg, 2006). Since the phenomena of follow sourcing in supply chain management is relatively unexplored, especially in the long, the case study’s pilot function, as mentioned by Flyvbjerg in 2006, is in line with the exploratory nature of this paper.

As defined in literature, one of the essential and primary defining features of a case study is the variety of perspectives, rooted in a specific context. These multiple perspectives can come from two different sources, multiple cases or multiple perspectives within one case. The one used in this paper is the method of using a single method of collecting data form sources with altering perspective on the observed phenomenon (Ritchie & Lewis, 2003). In order to provide this essential factor, the interviewees will come from several positions inside of the automotive industry in Brazil like manufacturers, domestic and international suppliers, consultancies and the association of auto part manufacturers in Brazil, called Sindipeças. Due to the different positions within the business environment of automotive suppliers the

author expects to capture different perspectives and opinions about the phenomenon and therefore a more reliable and less biased picture of the overall phenomenon and its effects on the local suppliers as of today. Appendix 2) shows the multiple perspective approach, which were used in this study's single case.

5.4 Sample Selection

Due to the qualitative nature of the research in this paper a non-probability sampling approach was seen as sufficient and therefore the sample is not intended to be statistical representative. The small scale, in-depth character of qualitative research aims for a reflection of particular features or groups within the sample population. The sample for the interviews will be a mixture of a convenient sample (Ritchie & Lewis, 2003) as well as criterion based or purposive sampling (Patton, 2002). The interview partners were all executives or even higher ranked employees of the automotive industry, suppliers of that industry, consulting firms engaged in supply chain management projects of the industry and the association of automotive manufactures in Brazil. Furthermore, all of the interviewees work or worked in the area of supply chain management in Brazil, for a company engaged in the automobile industry in Brazil and are able to provide relevant insights due to their senior management position and experience. These characteristics ensure that the interview partners have the necessary knowledge to understand the context of the questions and are able to provide insight knowledge about the industry and identify possible effects arising from the analysed phenomenon in a broader and more abstract context. On top of that during the sampling process attention was paid that the mentioned variety of perspectives as an essential part of the case study approach is balanced and the overall outcome is not biased by a too strong focus on one single position in that complex business environment. The mentioned characteristics of the sample ensure a stratified purposive sampling (Patton, 2002), which is a hybrid sampling method with the aim to identify groups that display variation in relation to a particular phenomenon. In addition to that, the method ensures at the same time fairly homogeneous sample so that subgroups can be compared (Ritchie & Lewis, 2003). A total of eight interviews with CEO's, directors and high ranked executives was defined as sufficient for the explorative and pilot purpose of this study. The high quality of the sources, combined experience and market insight as well as the strong collaboration with Sindipeças further improves the validity of this study. The sample structure is show in Fig. 2.

The selection of the participants was mainly determined by the first two interviews with highly experienced functionaries, which have conclusive knowledge of all different positions of the industry. One of the two experts was the president of Sindipeças and former CEO of a large auto part supplier in Brazil, with whom further contacts and necessary areas to cover were defined. This portfolio of interviews was complemented by the existing contacts of the researcher as well as newly created contacts due to the referrals of interview partners. In addition to the expert recommendations the sample was further defined by the criteria described previously like expertise, work field and industry sector to assure a valid, balanced and reliable sample design.

#	Perspective on Market	Position	Experience
1	Consulting Firm	Executive	Projects for automaker, 1. tier suppliers as well as Sindipeças and local Brazilian suppliers.
2	Sindipeças	President	Head of the association of auto part manufacturers in Brazil
3	Sindipeças	Director	Representative of small and medium size enterprises in the auto part industry in Brazil
4	Domestic Brazilian Supplier	Chairman of the board	Former CEO of a large international supplier founded in Brazil.
5	Domestic Brazilian Supplier	CEO	Mediums size local supplier of auto parts industry in Brazil
6	International Manufacturer in Brazil	Executive	Project coordinator for locally produced vehicles in Brazil and localization of national suppliers
7	International Supplier in Brazil	CEO	International machine supplier for the automobile industry with departments in Brazil
8	International Supplier in Brazil	Director	One of the earliest follow sources to come to Brazil and auto part supplier world wide

Fig. 2: Sample Structure

5.5 Data collection

The researcher chose to conduct semi-structured in-depth interviews in order to answer the research questions as well as generate primary data for the following analysis. The in-depth interview is an appropriate tool to “understand complex processes and issues e.g. impact and outcomes” (Ritchie & Lewis, 2003, p. 60). One of the key features of semi-structured in-depth interviews is the combination of structure and flexibility (Ritchie & Lewis, 2003). Due to the exploratory nature of this paper the flexibility is an important feature of the data collection method in order to allow unexpected new issues to emerge and be covered. On the other hand, the structure given by semi-structured in-depth interviews is equally important for the research design in order to have key topics and issues covered during the interview and steer the conversation towards the research question and sub topics that are aimed to be

explored (Ritchie & Lewis, 2003). The structured character was assured by a predefined and constantly adapted interview script, which covers the main points of research- and sub-questions. A first draft of the interview structure can be found in Appendix 1). The interview script was tailored for each of the different roles of the interviewee, hence the questions in the interview with the assembler were not exactly the same like in the interview with a supplier but covered both the main topics of the research question. Furthermore, the researcher will use a range of probes and other techniques to guarantee the sufficient depth of the answers in terms of “penetration, exploration and explanation” (Ritchie & Lewis, 2003, p.141). On top of that the data collection via interviews allows the researcher the opportunity for clarification of key issues and detailed understanding of the subject studies (Ritchie & Lewis, 2003). The first contact with the participants was made via email or phone call in order to set time and dates for the interview. The interviews were held in most of the cases face-to-face and if due to inconvenience that wasn't possible, they were conducted via skype. Furthermore, to ensure that the direction of the interview was clear from the beginning and the focus of the main aspect of follow sourcing was not lost the researcher gave a quick introduction presentation of the topic. The interviews were tape recorded and transcribed afterwards. The transcripts were then, in agreement with the interviewee, provided to double check the content and ensure that their opinion is displayed correctly. If necessary, the interviewees were given the chance to provide further information or correct certain parts if needed. The number of interviews conducted was limited by the ability to collect new information with any additional interview. As the researcher noticed the information became repetitive and the amount of new information decreased with each additional interview, the number of interviews was defined as sufficient and a satisfactory level of data saturation achieved.

5.6 Technique of data analysis

In order to analyse the generated data, the concept of a template analysis was used. The concept of template analysis emerged from approaches such as Grounded Theory and Interpretative Phenomenological Analysis (Waring & Wainwright, 2008). Template analysis uses coding in order to structure data in different categories even though it is not as prescriptive as grounded theory (King, 2004). This particular approach includes the coding of large amounts of texts, in this case the transcribed interviews, so that segments of each interview related to an identified topic (the code) can be collected

in one place in order to complete the interpretative process such as identifying patterns among the different interviews and be able to find a consensus.

The initial template of codes for the analysis was based on the research questions and sub-questions and then categorized in principal topic codes and secondary codes, which substitute and support the principal topics. This initial template of codes was then used to analyse the conducted interviews. After the first round of analysis all upcoming and unexpected issues in the interviews were transferred to new, additional codes and included in the final template (Fig. 3). On top of that the initial codes that were found as unhelpful or not necessary for the analysis were eliminated in order to get a more focused and pure output of the large amount of data. At the end of the analysis process the final template was created by keeping relevant initial codes, removing irrelevant codes and integrating newly emerged topic codes. With the final and conclusive template all eight interviews were analysed and sorted again in order to reduce the amount of data and filter the essence in a clear and structured way.

A) Competition		B) Role of Supplier		C) Strategic Reaction of Supplier	
I.	Market Structure	I.	Position in Supply Chain	I.	Internationalization
II.	Influence of International	II.	Main business Partners	II.	Local embeddedness
III.	Long term change	III.	Diversification of Supplier	III.	Sold to foreign company
IV.	Technology Access	IV.	Development Integration	IV.	Long term success of strategy

Fig. 3: Final template used to code the interview transcripts

In addition to the general effect on the market in Brazil, the collected data was analysed with the aim to identify differences over time and compare perspectives among the subgroups within the sample. The subgroups contained in this study are 1) local suppliers; 2) international suppliers (follow sources); 3) manufacturers (Appendix 2). The different effects and views on the phenomenon of follow sourcing in the immediate and long-term perspective will be analysed by comparing the statements of the different subgroups and and concluding the general developments by crossing the various perspectives on the phenomenon.

Overall the researcher uses illustrative quotes in order to display the interview outcomes better and enable the reader to see where he draws the conclusion from. A sufficient amount of “raw data” in terms of quotes will be provided in order to make sure that the reader will understand the relationship between

the data and the interpretation of the research and hence increase the transparency of the research (Murphy et. al., 1998). The used quotes are complemented with an explanation of how and why they were chosen and a statement of the source for identification of the subgroup. This analysis guarantees overall more transparent interpretation process and improves the visibility of the connection of raw data and findings.

6 Results

This paragraph represents the main findings of the study and links them with the raw data for explanation and transparency. The findings are structured according to the final codes used in the template analysis, which structures this paragraph into the three main sections: 1) Competition 2) Role of Supplier and 3) Strategic Reaction of Supplier. All the findings are presented in the light of differences between the period before follow sourcing started in Brazil, the immediate period after follow sourcing was established and the long term perspective that lacks exploration in the literature.

6.1 Competition

One of the main questions during the interviews targeted the exploration of the changes in competition and whether the market became more or less competitive due to the entrance of follow sources as well as capturing any changes regarding that topic, which were not foreseen. According to the majority of the respondents the competition in the Brazilian automotive industry needs to be analysed in a timely differentiated manner, as indicated by the following quote: “Competition changed immediately after the market entrance and then it changes during the last 20 years again drastically” (Interviewee 5, local supplier). The auto parts that were produced locally in the time of the market entrances also were produced by the follow sources and therefore the competition was increasing in the short term. Another respondent stated that “I think the competition increased due to follow sourcing. When you play local everyone is facing the same issues e.g. Tax and it gets muddy quickly” (Interviewee 4. Local Supplier (international)). This statements indicates that the follow sources were operating under the same circumstances as the local suppliers in the initial period after entrance and had no big advantage compared to the local companies hence competition increased. When the perspective of the analysis changed towards the long-term perspective and identified literature gap, the advantage of follow sources over local suppliers and their influence became clearer. The main advantage was identified by one of

the participants as “A lot of internationals here are surprisingly harmed by the same issues as the locals but just have a better stamina due to the international connections and support from other markets” (Interviewee 2, Sindipeças). The quoted “Stamina” explains the significant change in competition in the long term compared to the initial period. It led to the fact that follow sources, hence international suppliers, were more likely to survive the difficult market circumstances due to a better backup structure and ability to withstand the threatening changes in the market. One respondent stated “Today there is a situation without competition because Brazilian local suppliers lost their competitiveness over the years due to mainly four factors: 1) Lack of technology access 2) Low production volumes 3) Instability in raw materials 4) Increase in labour costs” (Interviewee 3, local supplier). This explains and names four crucial factors that influenced and changed the automotive industry in Brazil since the initial period. Combined with the previous quote it indicates why competition in the long term perspective decreased and an international dominance in the higher supplier segments was formed. The named factors harmed local suppliers significantly more than follow sources and this combination of better “stamina” of follow sources and harming market factors changed the industry drastically in the long term. A further proof of the competition decrease is a quote from the perspective of an automaker in Brazil. It describes the current situation as followed: “There is some competition left today in the market but in our segment (premium segment) there are simply not many left who have the capability to build what we need” (Interviewee 6, automaker). This insight shows that the automaker is often not able to find local suppliers with enough technical capability even though they want to source more demanding parts locally. This is also confirmed from the opposite viewpoint as one of the local suppliers participating in the study said: “The international companies often have difficulties to localize the parts they need because it is not easy to find someone capable of doing them due to the lack of technological capability” (Interviewee 3, local supplier). Both quotes from different perspectives of the supply chain show that there is one dominating factor when it comes to competitiveness, which is technological capability. The competition decreased to a large extent because there is a wide gap between the capability of local suppliers and international follow sources, which established in the period after market entrance.

6.2 Role of Supplies

The second main target topic of the interviews was the exploration of changes in the role of the local

suppliers from the period before follow sourcing until now. There is one main change to the period before the 90s where all interviewees agree on, the change of location where the development of the cars happened. This change in location affected mainly the role of local suppliers as the development hubs changed from locally integrated to centralized hubs in e.g. the core country. “When you are only local you are out of the big game, as simple as that” (Interviewee 4. Local Supplier (international)) means that the development capability of a company makes it important to the automaker and these functions are nowadays centralized. “They are local in a country where there is no development anymore so they are out of the development cycle” (Interviewee 1, Consultant) and “they (pure local suppliers) were not considered anymore because they are too far away from the development centre” (Interviewee 1, Consultant) shows that it became a precondition that a company is involved in the development to even be considered for the higher supplier segments. The quotes “You have to be 2. tier to be in the development cycle, if you are not it is just blue print production” (Interviewee 1, Consultant) and “There are still small Brazilians that supply directly to the manufacturer, mostly in the engines and axels arena. If you remove these areas it becomes very dramatic the non-presence of local companies” (Interviewee 2, Sindipecas) show that the landscape shifted drastically and comes down to today’s state where “about 70-80% of the local companies are in the lower tier business” and “it is an exception that local Brazilian companies are international and involved in development” (Interviewee 2, Sindipecas). This shows the shift of positioning in the supply chain from a former 1. or 2. tier suppliers positioning to a common position among local suppliers as 3. or 4. tier supplier when the development was centralized outside Brazil. The essence of this part of the analysis is that the positioning in the supply chain is mainly dependent on the integration in the development circle of the automaker and that Brazilian companies mainly lacked to stay in that circle once it became centralized. When differentiating these findings between the initial period and the long-term perspective it identifies a change due to the degree of exclusion. Fifteen years ago a supplier was able to get technology by just stepping down to a second tier position but in the last decade this isn’t enough anymore. “Today manufacturer or big 1. tier suppliers are all over the globe and they won’t invest much time with you when you are local. You don’t escape anymore the globalisation by being a 2. tier supplier” (Interviewee 4. Local Supplier (international))

indicates the increasing necessity of being global for domestic suppliers. As mentioned in the quote there is no way of escaping the process of globalisation anymore in the long term perspective.

After this point was clearly explored during the variety of interviews it was of further interest to explore how this change down the tier segments happened and according to one respondent it can't exactly be described as movement down: "companies didn't directly move down but rather are only those in the lower tier segments left because they were not exposed to direct competition of follow source" (Interviewee 1, Consultant). This statement indicated that the landscape of suppliers in Brazil today is basically due to what is left after a long period of increasing costs and threatening market factors (described in 6.1) and the fact that low segments were not attractive enough for follow sources.

Furthermore, the majority of the interviews revealed that it is not only the geographic location, as analysed before, that needs to be adjusted to the new global setting of the industry but also the focus and quality of a company. "You need to become the leader in the development of something to be relevant and supported. That was the main difference between our business and most of the other Brazilian suppliers" (Interviewee 4. Local Supplier (international)) shows that there is also the capability component that needs to be taken care of when a company wants to be considered as direct suppliers. "You need to excel in something in order to be considered by the manufacturer" (Interviewee 2, Sindipeças) is another statement that underlines this fact. When analysing these statements together it becomes clear that these two factors (proximity to the development hub, Quality of the product) are of great importance to stay in the upper tiers of the supply chain and be considered by the automaker as important business partner.

In addition to that it was explored during the interviews that one direct effect of follow sourcing and the increasing competition was the focus on a certain area of the business and a decrease in diversification. The situation before the follow sourcing was described by participant as followed: "We were used to be a more diverse company before the follow sourcing. Brazilian groups were doing all sort of parts and working more as independent companies" (Interviewee 4. Local Supplier (international)). The statement of one of the participants indicated clearly that there was a change in diversification of the product portfolio due to follow sourcing. "From that moment when follow sources came to Brazil we decided to focus on two parts, which we felt we had more conditions to compete. Follow sourcing influenced

our business in a very important way because it made us more focused on what we do best and made us go global” (Interviewee 4. Local Supplier (international)) according to this statement the local Brazilian supplier changed and reduced its business approach in terms of diversity down to only a selected range of products in order to be more competitive in the early years after the follow sourcing entrance.

6.3 Strategic Reaction of Suppliers

This introduces the next main topic to be explored as a purpose of this study. The reactions of local suppliers to the entrance of follow sources in the Brazilian market. During the interviews three different reaction of suppliers were identified. Firstly, there was the strategic move to go international to counteract the advantage of the international suppliers and avoid the risk of being left behind as described before. “If the development is e.g. Korea. If you are local regardless of how capable you are that is the first degree of separation” (Interviewee 2. Sindipeças) indicates clearly the necessity of going global to stay competitive but only a few companies realized it at the time. One respondent stated “Follow sourcing influenced our business in a very important way [...] made us go global. To go global was the toughest move we did but it came out of a survival instinct at the time of follow sourcing” (Interviewee 4. Local Supplier (international)). This argument further elaborates on the enormous pressure local companies faced due to follow sourcing and the importance of the strategic decisions local companies had to take during that time.

The second strategic reaction of suppliers, which was identified during the interviews is to focus on local embeddedness and the market potential in Brazil. This strategic reaction to follow sourcing was seen retrospective by most of the interviews as mistake and criticised e.g. “Player in Brazil are too focused on the domestic market and neglect the export and international opportunities” (Interviewee 2, Sindipeças). This strategic decision was a short term reaction by the suppliers but even today there can still be discovered that a more local focused mind-set is common among Brazilian companies as stated: “people have to stop to think of Brazil as an island and go outwards to develop their companies and survive” (Interviewee 4, local supplier (international)). Furthermore, one respondent said about the attitude of local suppliers “I often here: Oh no than I have to go to Stuttgart to the trade show, research everything and invest. That is too much” (Interviewee 2, Sindipeças) what indicated the lack of interest to internationalize and develop the company by opening up to foreign markets and opportunities. On

top of that, today companies have even stronger problems to survive regarding the current market situation in Brazil as well as the overall changes in the global supply chain management “Today the manufacturer and first tier wants to avoid the local influence more and more” (Interviewee 2, Sindipeças). This is confirmed by the perspective of an international manufacture stating “For us it is just easier to work with follow sources. If something doesn’t work we force them to send people and technology in-house to fix it. With local suppliers you can have just bad luck and need to write off your losses before starting over again. That will not happen with follow sources” (Interviewee 6, automaker). It shows that the trend to work with follow sources is still increasing and preferable for the manufacturer. The third strategic reaction due to the pressure of follow sources was to sell the current business in the 90’s due to the high demand of follow sources for local established companies as stepping stone to enter the market in Brazil. “Most of the companies that were acquired in Brazil, were acquired by follow source entering the market” (Interviewee 1, Consultant) this quote explains the way how follow sources came to the country and links that strategy as a direct effect of follow sourcing. One respondent describes the strategic move to sell the company even as “The most common” and further confirms the sale to market entrants as linkage to follow sourcing “What you saw during that time was the sale of Brazilian companies to international groups” (Interviewee 4. Local Supplier (international)). As described before, the sell-out of local companies cannot be applied to all segments but rather to the companies that were integrated in development and therefore more valuable and attractive. This selection crucially changed the local market landscape in the initial period as indicated by this quote: “Most of the good local companies were sold to internationals” (Interviewee 4. Local Supplier (international)). “You arrive at the point where the good ones are all bought already and then you are left because you are not important or attractive enough and likely to disappear” (Interviewee 2, Sindipeças) further confirms the findings of segmentation in the sell-out of local suppliers and set the path for the long term influence of follow sourcing on the Brazilian automotive industry.

7 Discussion and Concluding Remarks

The findings show that competition due to follow sources needs to be looked at with a timely differentiated view and hereby confirms the identified literature gap. The immediate effect of increased competition, as stated already in Kotabe & Murray (2004); Ivarsson & Alvstam (2005) is confirmed by

the findings of this study. However, the current literature lacks to explore the long term development of the competition where this study comes up with new findings and an attempt to close the existing gap. The collected data suggests that the long term effects of follow sourcing on competition in the Brazilian market differ from the already indicated effects of the initial period after the market entrance of follow sources. The long term effect of follow sourcing shaped today's situation of a dominant position of follow sources, quasi elimination of competition and denationalisation of the upper supplier segments. The finding of this study implicate that follow sources survived the decades of a hostile and threatening business environment due to their international support and subventions. The reduction of competition in the long term is not due to the entrance of follow sources in the market but various factors favoured drastically the position of follow sources and thereby changed the competition again. This advantageous position influenced the market structure much more in the long term than in the short term and is so far unexplored in literature. The main factors that destroyed the competitiveness of local supplier in Brazil but favoured the position of follow sources and therefore shaped the industry of today are: 1) Lack of technology access 2) Low production volumes 3) Unstable raw material prices and 4) Steep increase in labour cost.

Follow source suppliers where in a better position to withstand these factors and still provide attractive and competitive prices for the manufacturer what led to the competition decrease in the long term. One of the main factors of competitiveness as indicated by Ivarsson & Alvastam (2005) is the access to technology. Follow sources where able to maintain the higher technological standard due to in-house knowledge and technology transfer and their presence in the development hubs around the globe as well as joint projects with the automaker, whereas the local suppliers were more and more cut out and excluded as technology agreements were revoked and technology transfer switched from externalized to internalized. This trend continued in the long term in combination with the increasing demand for competitiveness by the manufacturer, for which the local suppliers need access to technology. A vicious circle started for local suppliers and decreased their competitiveness constantly until today. This restriction of technology was found as main contributor to the decrease of competition in the market and most influential effect of follow sourcing in the long term.

Analysing the other three factors, low production volumes as well as procurement of raw material was only a disadvantage for the local companies since international companies can shift production capacities around the globe in order to maintain the most efficient volumes in their plants or even import product if the market conditions favour it. The local Brazilian company didn't have these possibilities and were forced to act under the disadvantageous local conditions for the last decades what further contributed to the destruction of competitiveness between domestic and follow source suppliers.

The last factor, increase in labour cost, is a general factor that influences follow sources as well as local suppliers and therefore just displays a point of parity making it three out of four factors that directly favour follow sources.

When looking at the development of the positioning of local suppliers in Brazil a constant vanishing of local players among the upper supplier segment can be identified. This shift in positioning from first tier suppliers before the area of follow sourcing to mainly lower tier segments was found to go on in the long term. It was initially caused by a buy out of Brazilian capability and continued in the long term due to the failure to see the need to internationalize by local suppliers. The fact that local Brazilian supplier in the 90's focused on a strategy to focused on their core business and rationalize their activities to compete with follow sources, hence they valuation of the local market over global opportunities as described by Fleury (1999) was confirmed in this study. The long term perspective revealed that this strategy is one of the main factors, which led to the disappearance of most of the remaining domestic upper segment suppliers. In the initial period after follow sourcing companies wanted to protect themselves against the follow sources and focused on rationalization rather than investing and going global what in the long term had the exact counter effect and destroyed the competitiveness by losing connection to the development centres. In the long term the only way to stay competitive was to get access to technology and integration in the development cycle of the automaker, which moved out of Brazil and became centralized in the core country of the manufacturer.

For the manufacturer it is not worth to consider each country supplier separate when they can just demand from their supplier in the development hub to transfer the knowledge, processes etc. internally. In this terms the follow source provides a lower risk and higher harmonized quality that can only be countered by a local company if they are international and present where ever the development is

happening. Today about 70-80% of the local companies are in the lower tier business where almost no development is required or at least no joint development with the automaker is done.

The follow in figure (Fig. 4) presents the development in supplier positioning in Brazil and the factors that played a key role in this development. The first major changes were due to the market entrance as already described in existing literature. The long term perspective is what this study aims to explore and it shows that the combination of threatening market factors and international support for follow sources shaped the current and almost fully denationalized upper supplier segment in Brazil. The only exceptional examples of Brazilian suppliers in this segment today are due to the decision to internationalize as reaction to the entrance of follow sources and be able in the long term to support the domestic operation with the knowledge and technology the gained globally due to their integration in the development cycle with the automaker.

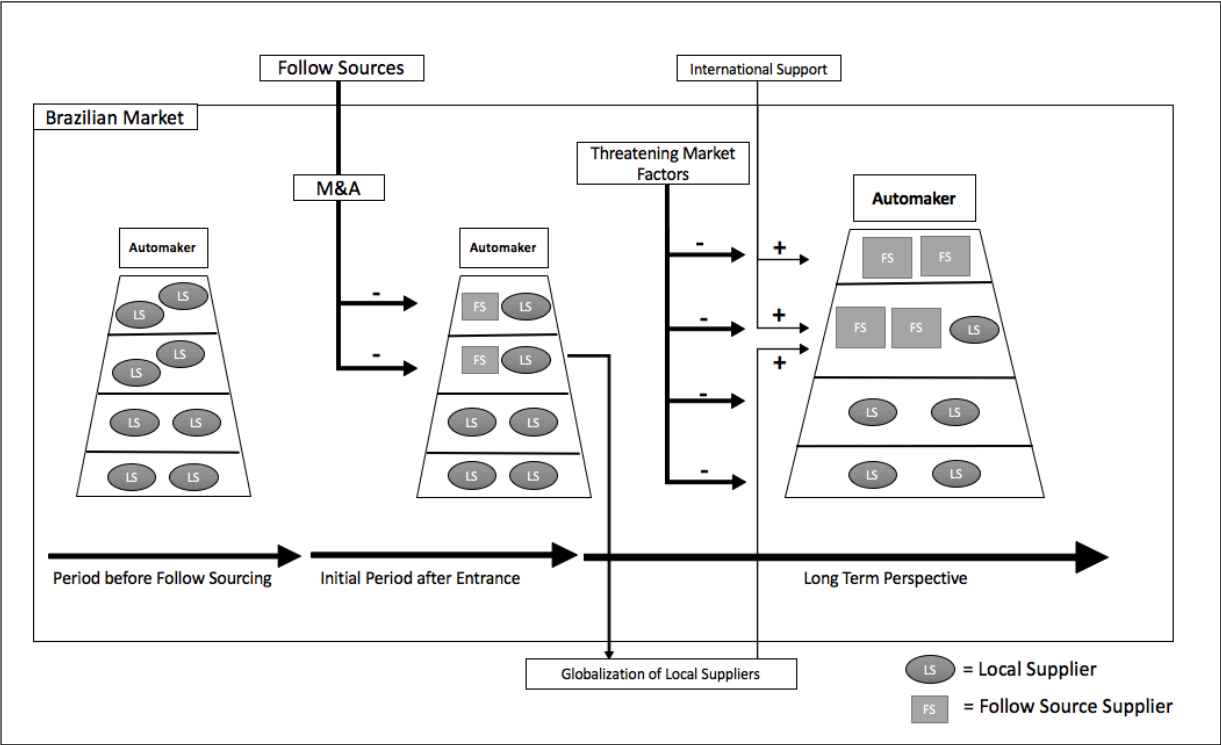


Fig. 4: Development of market structure and supplier positioning in Brazil over time

The few successful and Brazilian upper segment suppliers decided early in the area of follow sourcing that they can only compete with the increasing competition of internationals by focusing on their core business, hence decreasing their diversification as stated in Fleury (1999) but also stay close to the development. This combination of technological excellence and geographical proximity to the

development centres was discovered during this study as key to maintain in a position important enough to deal directly with the manufacturer, hence the upper supplier segments. In the long term this enabled the company to stay competitive and be integrated in the development circle what became most important to the survival in the long term.

The strategic reactions by local suppliers to this newly increasing competition was outlined by Fleury (1999) as a two-way strategy. Firstly, the suppliers focused on their core business and secondly they rationalized their activities. This study goes further and explores a more extensive approach to strategic reactions of suppliers and their effect in the long term. The strategic reaction of local suppliers to follow sources coming to Brazil was found to be consistent of three different reactions 1.) Internationalization 2.) Local embeddedness and 3.) Sell out.

As mentioned before the international movement of suppliers was a direct reaction to the incoming follow sources during the 90's in Brazil. It was seen by local companies as a necessary strategic move in order to secure the long term positioning as an import supplier and maintain the integration in the development circle and hence their competitiveness. This was an action how to counter the advantageous position of a follow source and mirror the favoured positioning. As a fully local and not yet as important player in the auto part landscape there was an opportunity during that time to develop international manufacturing capacity and stick to the plan of being close to the automaker wherever they are. Only few managed to do so and those who managed are today in the position to be brought to even other countries as follow source and work alongside with the manufacturer on new developments and therefore are still positioned in the development circle that is so essential for an important stance of the supplier.

The exact opposite to this strategic reaction was to focus on the local market, which looked at the time very promising and attractive. Local suppliers saw their position and already existing market knowledge as more favourable than the risky and expensive internationalization plans. The majority of the Brazilian suppliers didn't see the necessity to go international and stay in the development in order to compete with the follow sources and consequently neglected the long term consequences in terms of positioning and relevance to the automaker. This finding is in line with Fleury (1999) and further confirms the

majority strategic reaction to follow sourcing in the initial period. Followed by the factors already explained that accounted for the loss in competitiveness this strategy now was found to be unsuccessful in securing their position in Brazil in the long term and therefore this study firstly evaluated the know and direct effect of follow sourcing in an extended timeframe.

The third type of reaction was among the well-established local companies with development capability the most common during the time of follow sourcing. This direct reaction and very commonly observed phenomena was the sell-out of a capable local Brazilian company. Follow sources were coming to Brazil and preferable they came with an acquisition. Many local companies that were able and capable of development and therefore relevant were simply sold to foreign follow sources. When explaining the long term development of the market this is another major factor and effect of follow sourcing. Reducing the domestic capability and access to technology set the ground for the further development explained in 7.2.

The limitations of this study are mainly based in the single case study approach and therefore lack of possible generalization of the findings. As Flyvbjerg (2003) outlined a theory building approach of the study cannot be fully fulfilled by using as single case study. This approach lacks the comparison with other environments and cross-case analysis of other industries in order to provide a conclusive analysis of the phenomenon and be able to generalize the findings. In order to do so further research of different industries in Brazil or other countries will be necessary and this study only provides a starting point for future research. Furthermore, the study is limited by the sample even though it was designed in order to capture most perspectives on the phenomena from different positions within the industry. Nevertheless, the sample was based on accessibility, which can display a limitation since the accessible sources could be not the most suitable sources and possible insights and effects could be missed. On top of that the discovered effect can be caused by unknown factors or global trends apart of follow sourcing. The researcher took care of analysing the effect under the isolated influence of follow sourcing but it can also be a bundle of different factors causing the analysed changes. It is not an exclusive effect but most certainly follow sourcing was the dominant force behind the changes. Lastly the subjective perspective of the research design and informal data collection can be a limiting factor for the research. The

researcher's limited experience in qualitative data collection and interview techniques was attempted to be compensated for by including experts in the research design. Nevertheless, this limited experience may have introduced bias to the results.

Despite all limitations this study sheds light on the so far untouched gap in literature of long term effect of follow sourcing on local suppliers of the automotive industry in Brazil. On top of that it firstly shows the differences and links between the immediate and long term consequences for local suppliers after follow sources entered the Brazilian market. Secondly the results outline that technology access plays a major role when it comes to the explanation of the market development in Brazil as well as the competition decrease between local and international suppliers. This study provides and starting point for further empirical studies by laying the ground for hypotheses and comparison with other case studies of different industries or markets. Taking the results of this study further research should aim to conduct a multiple case analysis with other manufacturing industries that faced the same phenomenon in SCM. This would enhance the findings and might be a step towards a generalization and theory building in the future. Furthermore, this study can contribute to practitioner's decisions on reactions when faced by rapid changes in the market due to follow sourcing. This will be most relevant for practitioners in another industry or market where follow sourcing is still in development and gives them the chance to learn from the findings of this study of the Brazilian automotive market and its suppliers.

8 References

- Alguire, M.S., Frear, C.R. & Metcalf, L.E. (1994). An examination of the determinants of global sourcing strategy. *Journal of Business & Industrial Marketing* 9 (2), 62–74.
- Arnold, U. (1989). Global sourcing—an indispensable element in world- wide competition. *Management International Review* 29 (4), 14–28.
- Burt, D.N. (1989). Managing suppliers up to speed. *Harvard Business Review* 67 (4), 127–135.
- Bovet, D. & Sheffi, Y. (1998). The Brave New World of Supply Chain Management. *Supply Chain Management Review* 2 (Spring), 14-22.
- Cannon, J.P. & Homburg, C. (2001). Buyer–supplier relationships and customer firm costs. *Journal of Marketing* 65 (1), 29–43.
- Chen, I. J., & Paulraj, A. (2004). Towards a theory of supply chain management: the constructs and measurements. *Journal of operations management* 22(2), 119-150.
- Choon Tan, J. (2001). A framework of supply chain management literature. *European Journal of Purchasing & Supply Management* 7, 39-48
- Corsten, D., Gruen, T., & Peyinghaus, M. (2011). The effects of supplier-to-buyer identification on operational performance—An empirical investigation of inter-organizational identification in automotive relationships. *Journal of Operations Management* 29(6), 549-560.
- Eisenhardt, K. (1989). Building Theories from Case Study Research. *The Academy of Management Review* 14 (4), 532-550.
- Export. Gov. (2016). Brazil - Automotive Industry. Retrieved from
< [https://www.export.gov/article?id=Brazil -Automotive-Industry](https://www.export.gov/article?id=Brazil-Automotive-Industry)> 10.05.2017
- Fisher, M. L. (2003). What is the right supply chain for your product. *Operations management: critical perspectives on business and management* 4, 73.
- Fleury, A. (1999). The changing pattern of operations management in developing countries: the case of Brazil. *International Journal of Operations & Production Management* 19(5/6), 552-564.
- Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative inquiry* 12(2), 219-245.
- Gruen, T.W. (1997). Relationship Marketing: The Rout to Marketing Efficiency and Effectiveness. *Business Horizons* 6 (40), 32.
- Handfield, R. B., & Nichols, E. L. (1999). *Introduction to supply chain management* (Vol. 183). Upper Saddle River, NJ: prentice Hall.

- Helper, S.R. (1991). How much has really changed between US automakers and their suppliers. *Sloan Management Review* (Summer), 15–28.
- Humphrey, J. (2003). Globalization and supply chain networks: the auto industry in Brazil and India. *Global Networks* 3, 121–141.
- Inman, R.A. & Hubler, J.H. (1992). Certify the process, not just the product. *Production and Inventory Management Journal* 33 (4), 11-14.
- Ivarsson, I. & Alvstam, C. G. (2005). Technology Transfer from TNC's to Local Suppliers in Developing countries: A Study of AB Volvo's Truck and Bus Plans in Brazil, China, India and Mexico. *World Development* 33 (8), 1325-1344.
- Kahraman, C. & Öztayşi, B. (2014). Supply Chain Management Under Fuzziness: Recent Developments and Techniques. Heidelberg, Germany: Springer Verlag.
- King, N. (2004). Using template analysis in the qualitative analysis of text. 2004) *Essential guide to qualitative methods in organisational research*. London, UK: Sage Publications.
- Kotabe, M. & Murray, J.Y. (2004). Global sourcing strategy and competitive advantage. *Industrial Marketing Management* 33, 7-14.
- Kotabe, M. & Omura, G.S. (1989). Sourcing strategies of European and Japanese multinationals: a comparison. *Journal of International Business Studies* 20 (Spring), 113–130.
- LaLonde, B.J. (1997). Supply Chain Management: Myth or Reality?. *Supply Chain Management Review* 1 (Spring), 6-7.
- Lambert, D.M. & Cooper, M.C. (2000). Issues in supply chain management. *Industrial Marketing Management* 29, 65–83.
- Lewin, A.Y. & Volberda, H.W. (2011). Co-evolution of global sourcing: the need to understand the underlying mechanisms of firms-decisions to offshore. *International Business Review* 20, 241-251.
- Lummus, R. R., & Vokurka, R. J. (1999). Defining supply chain management: a historical perspective and practical guidelines. *Industrial Management & Data Systems* 99(1), 11-17.
- Mahle GmbH (2017). 1991—1999: De parceiro de sistemas a líder tecnológico. Retrieved from <<http://www.br.mahle.com/pt/company/mahle-chronicle/1991-1999/>> 10.05.2017
- Mentzer, J.T., Myers, M.B. & Stank, T.P. (2007). Handbook of Global Supply Chain Management. Thousand Oaks, California: Sage Publications.
- Monczka, R.M., Trent, R.J. & Callahan, T.J. (1994). Supply base strategies to maximize supplier performance. *International Journal of Physical Distribution and Logistics* 23 (4), 42-54.

- Mukherjee, A. & Sastry, T. (1996). Automotive Industry in Emerging Economies: A Comparison of South Korea, Brazil, China and India. *Economic and Political Weekly* 31(48), 75-78.
- Murphy, E., Dingwall, R., Greatbatch, D., Parker, S., Watson, P. (1998). Qualitative research methods in health technology assessment: a review of the literature. *Health Technology Assessment* 2 (16).
- Murray, J.Y., Wildt, A.R. & Kotabe, M. (1995). Global sourcing strategies of US subsidiaries of foreign multinationals. *Management International Review* 35 (4), 307–324.
- Oliver, R.K. & Webber, M.D. (1992). Supply Chain Management: Logistics Catches up with Strategy. Outlook Cit. Christopher, M.G.: Logistics, The strategic issue. London, UK: Chapman and Hall.
- Patton, M. Q. (2002). Qualitative research & evaluation methods (3rd ed.). Thousand Oaks, California: Sage Publications.
- Porter, M. E. (1990). The competitive advantage of nations. *Harvard Business Review* 2, 73-107.
- Ragatz, G.L., Handfield, R.B. & Scannell, T.V. (1997). Success factors for integrating suppliers into new product development. *Journal of Production Innovation Management* 14, 190-202
- Ritchie, J. & Lewis, J. (2003). Qualitative research practice: a guide for social science students and researchers. London, UK: Sage Publications.
- Saggi, K. (2002). Trade, foreign direct investment, and international technology transfer: A survey. *The World Bank Research Observer* 17(2), 191–235.
- Santos, A. M. M. M., & Pinhão, C. M. D. A. M. (2000). Panorama geral do setor de autopeças. *BNDES Setorial, Rio de Janeiro*, (11).
- Saunders, M., Lewis, P. & Thornhill, A. (2012) “Research Methods for Business Students” 6th edition, Edinburgh Gate, England: Pearson Education Limited.
- Siggelkow, N. (2007). Persuasion with case studies. *Academy of Management Journal* 50 (1), 20-24.
- Souza, C. L. & Rachid, A. (2013). Internationalization and geographical relocation of Brazil’s auto parts industry. *Brazilian Journal of Operations & Production Management* 10(2), 23-32.
- Spekman, R.E.; Kamauff Jr., J.W. & Myhr, N. (1998). An empirical investigation into supply chain management: a perspective on partnerships. *Supply Chain Management: An International Journal* 3 (2), 53 – 67.
- Statista (2017). Statistics and facts about the Automotive Industry in Brazil. Retrieved from <<https://www.statista.com/topics/1902/automotive-industry-in-brazil/>> 10.05.02017

- Steinle, C. & Schiele, H. (2008). Limits to global sourcing? Strategic consequences of dependency on international suppliers: Cluster theory, resource-based view and case studies. *Journal of Purchasing & Supply Management* 14, 3–14.
- Strauss, A., & Corbin, J. (1990). Basics of qualitative research – Grounded theory, procedures and techniques. London: Sage.
- Vos, F. G., Scheffler, P., Schiele, H., & Horn, P. (2016). Does global sourcing pay-off? A competitive dynamics perspective. *Journal of purchasing and supply management* 22(4), 338-350.
- Wagner, S.M. & Bode, C. (2006). An empirical investigation into supply chain vulnerability. *Journal of Purchasing and Supply Management* 12, 301–312.
- Waring, T. & Wainwright, D. (2008). Issues and Challenges in the Use of Template Analysis: Two Comparative Case Studies from the Field. *The Electronic Journal of Business Research Methods Volume* (1), 85 – 94.
- Wisner, J. D. & Choon Tan, K. (2000). Supply Chain Management and its impact on purchasing. *Journal of Supply Chain Management* 36 (4), 33-44.

Appendix:

1) Sample Interview Script for Interview with Supplier:

General Questions about company	<ul style="list-style-type: none">• What is the origin of your company?• For how many years are you already in the automotive business?• How would you describe your positioning in the global automotive supply chain?• How would you describe your role in Brazil?• Would you describe your company as international or local company?• Was there a change in recent years towards local or internationalization?
Which adaptations did the Brazilian suppliers introduce to deal with the recent trend of follow sourcing?	<ul style="list-style-type: none">• Do you feel pressure to be in Brazil due to your role as supplier?• How do you provide your service in Brazil?• Did you change crucial parts of your business in the last years to better serve the requirements of the assembler?• Which business model do you use to achieve your goal in Brazil?

	<ul style="list-style-type: none"> • Are there connection points with local companies? • What is the role of the local company in that relationship? • Do you feel that the competition increased due to new market entrances of international players in the last years?
<p>How did the functions of local suppliers change due to follow sourcing?</p>	<p>Where do you see your company in terms of its supplier role? 1. Tier etc.?</p> <p>Where are your main buyers located in terms of position in the supply chain?</p> <p>Did your role change in the last years and how?</p> <p>How would you describe the current market situation in Brazil and competition among suppliers?</p> <p>Would you define local or international firms as your strongest competitors?</p> <p>Did your relationship with the assembler change in recent years?</p> <p>Can you think of factors others than the assembler's requirements that led to these changes?</p>

2) Multiple perspective approach for single case study

