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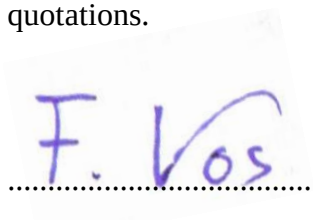

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List of abbreviations

AMC ..... Awareness-Motivation-Capability
ANOVA ..... Analyses of Variance
CD ..... Competitive Dynamics
CLT ..... Central Limit Theorem
EU ..... European Union
H ..... Hypothesis
IC ..... Industrialised-country
GS ..... Global Sourcing
LPI ..... Local procurement index
n.s. ..... Not significant
OEM ..... Original equipment manufacturer
R&D ..... Research and Development
RBV ..... Resource Based View
SPSS ..... Statistical package for the social sciences
TCO ..... Total cost of ownership
TMT ..... Top management teams

1 The need to investigate Competitive Dynamics in the Global Sourcing context

1.1 Global Sourcing often showing ambivalent results and Competitive Dynamics as a promising new avenue for assessing indirect effects of Global Sourcing

Already in 1851 Prince Albert of England was aware of the fact that the world is living in times of global change, which were induced by the mechanisms of globalisation.[1] In his speech at the Great Exhibition of the Works of all Nations in London, Hyde Park (1851), he acknowledged that:

> *"The distances which separated the different nations and parts of the globe are gradually vanishing before the achievements of modern invention, and we can traverse them with incredible ease; the language of all nations are known and their acquirements placed within the reach of everybody; thought is communicated with the rapidity and even by the power of lightning (...) no sooner is a discovery or invention made, than it is already improved upon and surpassed by competing efforts: the products of all quarters of the globe are placed at our disposal, and we have only to choose what is cheapest and best for our purposes."*[2]

Since 1851, a lot has changed in the world's industrial and economic landscape. Companies engage increasingly more in international sourcing activities and have the expectation to reap substantial competitive advantages from it.[3] During the last decades, global business transactions have been reported to grow three times stronger than domestic economies, and the trend continues.[4] Nevertheless, in contrast to domestic supply chains, the complexity of global supply chains is often underrated.[5]

This complexity has important performance implications for manufacturing companies in industries like electronics, metal and automotives, since 60-70% of the revenues are directly passed through to suppliers.[6] Therefore, operating results are strongly influenced

[1] See Short (2012), p. 188.
[2] Reeves (2008), pp. 21-22.
[3] See Horn et al. (2013), p. 27.
[4] See Kusaba et al. (2011), p. 73.
[5] See MacCarthy/Atthirawong (2003), p. 784.
[6] See Ortner et al. (2011), p. 2; Wallner/Schweiger (2012), p. 350.

by sourcing decisions and the purchasing of components reached strategic importance for companies.

Despite its importance for firm success in many industries, Global Sourcing (GS) is still considered an "under-researched" topic.[7] As it will be shown throughout this paper, even though direct performance implications of GS often remain ambivalent, indirect effects could be reaped from it. This effect is believed to be due to increased competition induced by GS. Therefore, the concept of Competitive Dynamics (CD) will be applied in this research in order to assess indirect effects of GS.

Generally, the main objective of CD research is to understand and assess the dynamics of competition and their impact on firm performance.[8] It is assumed that competitive moves have substantial influence on firm performance and that firms only possess temporary competitive advantages in their ongoing struggle for survival.[9] Thereby, companies exchange actions and responses, which determine their survival & (long-term) performance.[10] In this vein, it will be argued that GS can serve as a means to increase the competitive pressures on industrialised-country suppliers, which in turn, is expected to result in favourable performance effects for the buying firm.

In order to apply the CD perspective in GS, this paper is structured as follows: First, general purchasing strategies (levers) will be discussed, including the lever of international sourcing. Second, deeper insights into the broad notion of international sourcing are presented and the concept of "GS" will be explained. Thereby, antecedents of GS, its definition, and performance implications (in particular for the automotive industry) as well as the often ambivalent results of GS will be presented. Then, CD will be offered as a suitable perspective to assess the indirect effects of GS. This includes descriptions of its origins, definitions, key research areas, evolutionary tendencies (in terms of scientific approaches) and its major findings, as well as the application to this research context. Fourth, the concepts of GS and CD are combined into testable hypotheses. Fifth, a general overview of research approaches in CD will be given, as well as the research approach of this study, including descriptions of data collection, statistical methods and analyses. Sixth, the results will be presented and assessed in relation to whether the hypotheses have been supported by the data. Seventh, a discussion of the results will be presented in relation to

[7] See Kaufmann/Carter (2006), p. 653.
[8] See Hitt et al. (2004), p. 3.
[9] See Chen et al. (2010), p. 1527.
[10] See Ferlic et al. (2008), p. 6; Chen/Miller (2012), p. 137.

theoretical and practical implication for researchers and buying firms. Eighth, recommendations for the focal automotive original equipment manufacturers (OEM) will be outlined, along with limitations of this research and future research directions. The paper closes with a final conclusion, in which the results are comprehensively summarised and the broad implications of this research are presented.

To create a solid foundation and a leitmotif for the reader, a set of guiding questions was derived, setting the scope of this research. This scope is summarised in the following questions:

(1) What are the direct performance effects (cost-savings) of GS?
(2) How can indirect performance effects be derived from GS?
(3) What are the mechanisms and outcomes behind possible indirect effects of GS?

The answer to these questions will be provided in the concluding chapter at the end of this paper. In order to arrive at these answers, the rest of the paper will be arranged around these questions. In order to have a proper point of departure, the next section will give a brief introduction into the concept of sourcing levers and describes the characteristics of international respectively GS in this context.

1.2 Sourcing and its most prominent levers: International sourcing as one out of a plenitude of sourcing levers

First of all, this thesis takes the position of a buying firm's perspective in regards to the effects that stem from sourcing decisions. In this context, sourcing refers to: *"(…) the process used to identify user requirements, evaluate the need effectively and efficiently, identify suppliers, ensure payment occurs promptly, ascertain that the need was effectively met, and drive continuous improvement."*[11]

Companies have various possibilities, called levers, in order to improve their sourcing performance. Levers are defined as *"…a set of similar measures that are used to improve the firm's sourcing performance in a commodity group."*[12] Literature has shown that activities facilitating sourcing performance can be clustered into discrete groups. Scientists gradually refined these clusters and ultimately encompassed seven main levers.[13] These seven levers include:

[11] Monczka et al. (2008), p. 89.
[12] Schiele (2007), p. 279.
[13] See Schuh/Bremicker (2005), p. 67; Schiele (2007), p. 279; Schumacher et al. (2008), p. 36; Schiele et al. (2011), p. 322.

(1) **Volume bundling and pooling of demand.**[14] Pooling of demand can be performed by a company by bundling its purchasing needs internally as well as through temporary alliances with similar companies in order to increase their buying power towards suppliers.[15] Most frequently, these (temporary) alliances are formed by a parent company with its subsidiaries.[16]

(2) **Price evaluations** entail price regression analyses and application of game theoretic models in negotiation designs. It evolved in recent years and is applied to manifold sourcing situations. In this lever, various complex auction designs[17] as well as cost/price regression analyses[18] all fall under the umbrella term of 'negotiation' and can facilitate sourcing success.[19]

(3) **Product optimisation** is a cross-functional tool and useful when classical sourcing levers are already exploited. The idea behind product optimisation mainly entails target-costing considerations. Target-costing has its origin in the automotive industry and was aimed at reducing costs through reconfiguration of product properties. In the process of product optimisation, cross-functional teams can collaborate to assess cheaper substitutes to existing product components, in order to save costs and, at the same time, generate equal- or improved-quality products.[20]

(4) **Process optimisation** is an often internally focussed lever to increase efficiency of sourcing systems and processes.[21] It is aimed at reducing costs or increasing speed of actions. For example, the implementation of electronic data interfaces (EDI) has been shown to significantly reduce transaction costs between companies and improve companies' internal processes.[22]

(5) **Supplier integration** focuses on the interactions between buyers and suppliers. At its heart lies mutual interdependence between both sides of the supply chain. Increasingly, manufacturing firms are integrating their suppliers more closely, since suppliers leverage the vast amount of innovative initiatives.[23] Integration strategies

[14] See Schuh/Bremicker (2005), p. 69; Schiele et al. (2011), p. 322.
[15] See Arnold (1999), p. 173.
[16] See Schiele et al. (2011), p. 322.
[17] See Krishna (2009), p. 151.
[18] See Soellner et al. (2007), p. 353.
[19] See Schiele et al. (2011), p. 322.
[20] See Sakurai (1989), p. 39; Schuh/Bremicker (2005), p. 93; Schiele et al. (2011), p. 323.
[21] Schiele et al. (2011), p. 322.
[22] See Trent (1998), p. 46; Schuh/Bremicker (2005), p. 89; Schiele et al. (2011), p. 322.
[23] See Tan et al. (1999), p. 1034; Wagner et al. (2002), p. 253; Cousins (2005), p. 410.

can include innovative contracts enclosing early supplier involvement and profit-sharing clauses[24] as well as open book policies[25], including bidirectional high frequency cost-information exchanges between buyer and seller[26]. Related to supplier integration, the concept of "preferred customer"[27] was coined to describe situations in which one or more buying-firms receive more favourable treatment than other buying firms.[28]

(6) **International sourcing** is understood as purchasing of goods from suppliers that are located in foreign countries. It is related to the creation of international supplier networks (sourcing networks) and has been argued to yield competitive advantages.[29] Generally, there are many reasons to engage in international sourcing, like lower costs, higher flexibility, access to certain technology and improved quality.[30] This paper aims at shedding light on the complex nature of GS and its possible indirect effects. As will it be further outlined in the subsequent sections, the concept of GS goes beyond the concept of international sourcing and addresses more complex international supply structures.[31] For this reason, the background of this lever and in particular of GS will be discussed (in depth) in the following chapters.

(7) **Commodity spanning** levers include considerations of possible trade-offs between different materials or services, to improve effectiveness and efficiency of interventions. Therefore, the commodity spanning lever seeks to improve sourcing success through analyses of interactions between different sourcing strategies as well as between different commodities, services and processes.[32]

Even though, each lever on its own is considered beneficial to sourcing performance, research indicates that there are varying interactions between different levers. On the one hand, sourcing levers can impair each other. For example, there is a supposed trade-off when international sourcing is combined with intensification of relationships[33] or product

[24] See O'Neal (2008), p. 2.
[25] See Agndal/Nilsson (2008), p. 154.
[26] See Ellram (1996), p. 11; Christopher (1999); Schuh/Bremicker (2005), p. 85; Schiele et al. (2011), p. 322.
[27] See Schiele et al. (2011), p. 269; Baxter (2012), p. 1249; Schiele (2012), p. 44; Schiele et al. (2012), p. 133.
[28] See Schiele et al. (2011), p. 1; Schiele et al. (2012), p. 133.
[29] See Gutierrez/Kouvelis (1995), p. 165
[30] See Gutierrez/Kouvelis (1995), p. 165; Horn et al. (2013), p. 28.
[31] See Schuh/Bremicker (2005), p. 80; Schiele et al. (2011), p. 322.
[32] See Schiele et al. (2011), p. 322.
[33] See Nellore et al. (2001), p. 101.

improvement.[34] On the other hand, sourcing levers can also form powerful positive combinations.[35] As indicated by Schiele et al. (2011), buying-firms can pursue two main strategies.[36] (1) A **differentiation strategy** that focuses on improvements of the product and inner-firm characteristics.[37] It increases attention to quality and development. This entails a combination of supplier integration levers, product optimisation and process improvement.[38] (2) A **cost-leadership strategy** is mainly focussed on prices[39] and costs of sourcing. Sourcing levers applied in this sourcing lever include a mix of price evaluation, international sourcing and pooling of demand with other business units.[40] Within the context of this study, this research seeks to identify effects of the international sourcing lever, or more precisely direct as well as indirect price-effects of GS. The reader has to be aware of the fact that international sourcing may impair other sourcing strategies and that this research does not account for these trade-offs. In order to advance the paper, the next chapter presents an introduction into the lever of international sourcing, or more precisely, into the more complex concept of GS. GS has its origins in globalisation and will be viewed (throughout this paper) as an umbrella term for international purchasing activities.

2 Global Sourcing: Its antecedents, definition as well as benefits, pitfalls and performance implications

2.1 Antecedents of Global Sourcing: Globalisation and factor costs as main driver to engage in Global Sourcing

In contrast to the vague descriptions of globalisation of prince Edward at the Great Exhibition of the Works of all Nations in London[41], the process of globalisation can be characterised more precisely by the growing fragmentation of production and the organisation of firms' activities on a global scale and increased sourcing from emerging economies.[42] For example, with focus on the European Union (EU), within the last 15 years, imports from industrialised countries declined whereas emerging economies

[34] See Schiele et al. (2011), p. 324.
[35] See Schiele et al. (2011), p. 330.
[36] See Schiele et al. (2011), p. 330 .
[37] See Porter (1991), p. 101.
[38] See Schiele et al. (2011), p. 330.
[39] See Porter (1991), p. 101.
[40] See Schiele et al. (2011), p. 330.
[41] See Short (2012), p. 188.
[42] See Arndt/Kierzkowski (2001), p. 7; Thelen/Botschen (2012), p. 748.

increased their exports to the EU. Vivid examples for this trend are the imports from USA and China. On the one side, imports from the USA declined steadily from 19% in 1995 to 11% in 2010, whereas on the other side, imports from China increased from 5% in 1995 to 20% in 2010.[43]

As shown in Figure 1, the vast majority of EU imports stem from countries that do not belong to the G7 (which sum up to approximately 26%).[44] Thus, on the macro-level of economies, there is a steady trend towards imports from emerging economies.

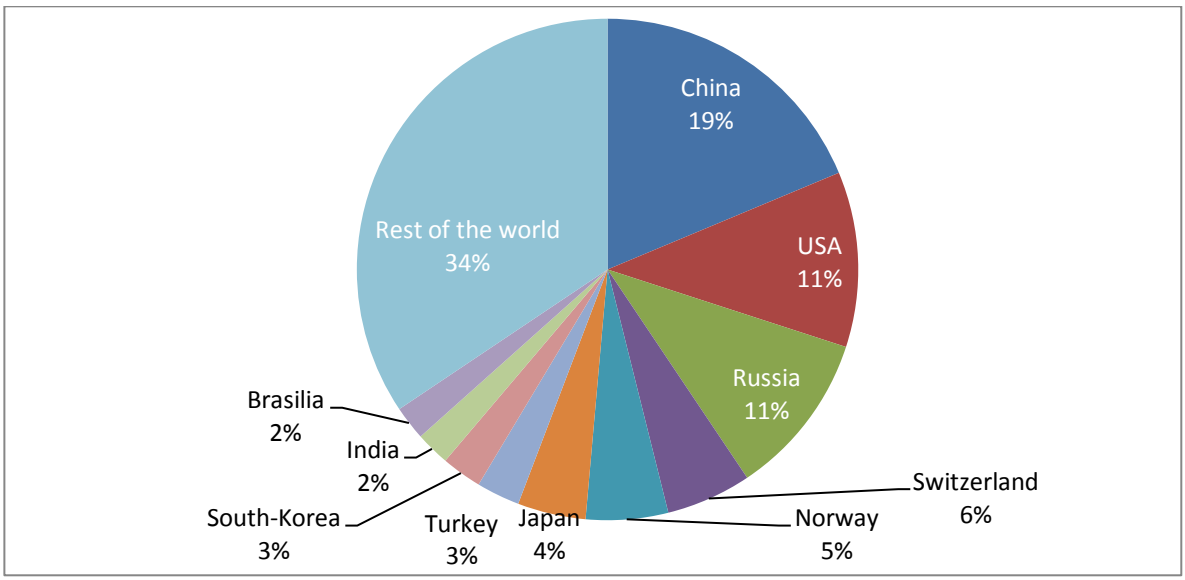

Figure 1: Main Trade Partners of the European Union (Imports in 2010)
Source: Thelen & Botschen (2012), p.748

On the meso-level of the economic landscape, companies are increasingly under cost- and quality pressures to satisfy the needs of their customers. Thereby, many multinational companies struggle to compete with local firms in low-cost-countries (LCCs) such as China.[45] More specifically, within the automotive industry, customer demands in the triad-markets, namely North America and Europe, are nearly satisfied and global overcapacities of approximately 20% increase pressures on manufacturers worldwide.[46] Therefore, manufacturers seek to increase quality, optimise the fulfilment of customer needs and lower costs.[47] However, in this context, customers are not willing to pay higher prices for

[43] See Thelen/Botschen (2012), p. 748.
[44] See Thelen/Botschen (2012), p. 748.
[45] See Chang/Park (2012), p. 1.
[46] See Göpfert et al. (2012), p. 11.
[47] See Diez/Reindl (2005), pp. 106-107; Garcia Sanz (2007), p. 4; Göpfert et al. (2012), p. 12.

increased quality or improved services.[48] Additionally, global competitors from LCCs intrude markets and rely on their lower factor costs in order to offer a better price-quality ratio than manufactures from industrialised countries do.[49] In sum, globalisation accentuates the focus on customers and their needs as well as increases competitive pressures between companies. In turn, the heightened attention to the needs of the customers, as well as the pressure from globally operating firms, lead to more GS activities, in most cases used to benefit from lower cost-levels than in domestic markets.[50]

Generally, the complexity and dynamism of global markets emphasise the need to focus on a global scale and facilitate global supply chain management.[51] As indicated by various scholars[52], the importance of international purchasing and especially GS is steadily rising in both, business and scholarly research. Even though globalisation facilitates the process of international procurement, the concept of international sourcing is not a new phenomenon. Dating back to ancient times, already kingdoms and colonial empires utilised international supply chains and created world-wide spanning networks to access raw materials or sell their goods internationally.[53] Despite its ancient roots, international purchasing is still a popular avenue for researchers nowadays.[54] Not only corporate international sourcing activities rise steadily[55], but also global, respectively international sourcing, has been used to improve competitive advantages. Therefore it has been called *"…an automatic expectation to respond to competition."*[56]

As can be seen in Figure 2, countries diverge regarding the factor costs within their economic landscape.[57] From the view of a industrialised globally operating company, there are many countries where factor costs (e.g. for materials, labour, tax rates, etc.) are lower than in its respective home-country. Essentially, lower factor costs in certain markets play an important role in globalisation and have effects on market dynamics. As shown in Figure 2, companies that engage in international purchasing, respectively GS, do often belong to the second type of country (industrialised countries). In these countries, labour is

[48] See Matthews/Syed (2004), p. 31; Piller (2006), pp. 47-49; Göpfert et al. (2012), p. 13.
[49] See Göpfert et al. (2012), p. 13.
[50] See Kogut (1985), p. 19; Göpfert et al. (2012), p. 19.
[51] See Cambra-Fierro/Polo-Redondo (2008); Thelen/Botschen (2012), p. 749.
[52] See Trent/Monczka (2003), p. 608; Steinle/Schiele (2008), p. 3; Trautmann et al. (2009), p. 58; Horn et al. (2013), p. 27.
[53] See Gereffi (1999), p. 41.
[54] See Trent/Monczka (2003), p. 26 ;Steinle/Schiele (2008), p. 3; Schiele et al. (2011), p. 318.
[55] See Lewin/Volberda (2011), p. 241.
[56] Carter/Rogers (2008), p. 225.
[57] See Kogut (1985), p. 19.

expensive, but capital is relatively cheap. As the graph indicates, globally operating firms can decouple their activities from their country of origin or regional economies to facilitate the usage of worldwide distributed resources, like lower labour costs, in order to achieve competitive advantages.[58]

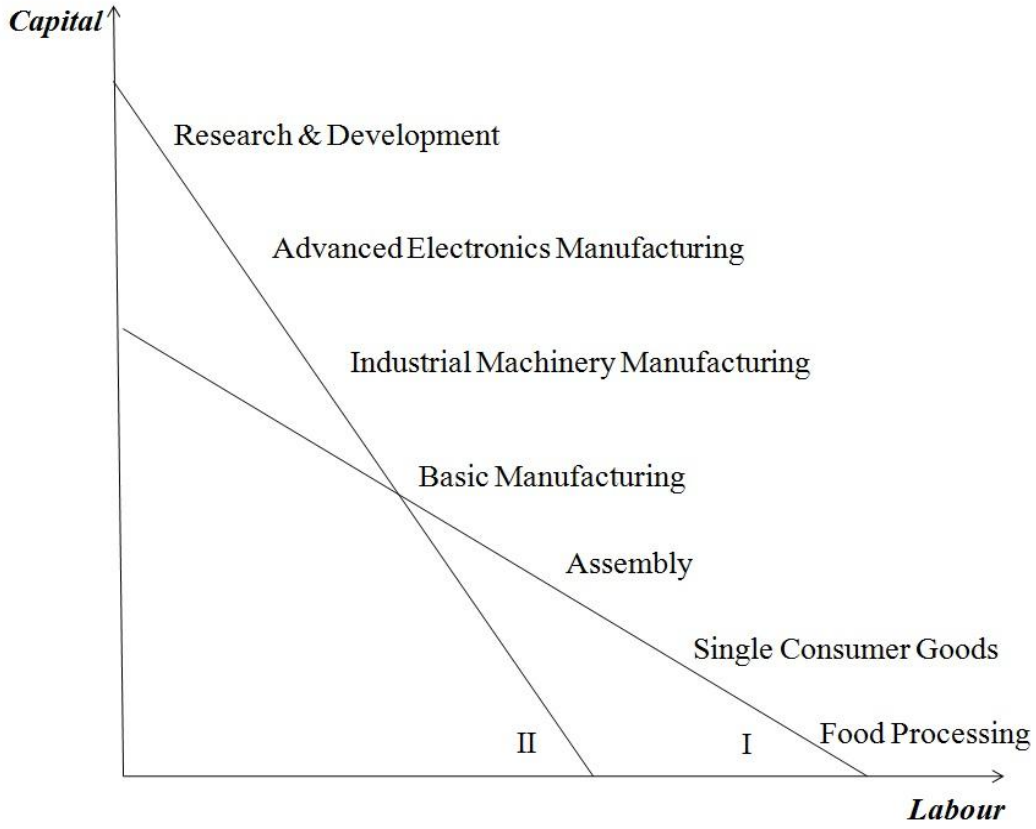

Figure 2: Value-Added Chain of Comparative Advantages
Source: based on Kogut (1985) p.19 .

After clarifying the antecedents of and reasons for international procurement and its rising importance in an increasingly globalising world, the next chapters will dive deeper into the more sophisticated concept called "Global Sourcing" and give critical insight into this topic.

[58] See Birou/Fawcett (1993), p. 28.

2.2 Shedding light on Global Sourcing: Definition of Global Sourcing, as well as its benefits and risks

2.2.1 Definition and clarification of Global Sourcing: Global Sourcing comprises functional integration as well as a coordination of dispersed activities

With respect to sourcing, this paper discusses the concept of GS. Originally, there has been confusion about conflicting terms for describing similar purchasing phenomena.[59] Approximations towards the topic of international sourcing included "GS"[60], "offshore sourcing"[61], "worldwide sourcing"[62], "import sourcing"[63], "international purchasing"[64], "low-cost-country sourcing"[65], "international procurement"[66] and "low-wage-country sourcing"[67]. All these terms have often been used interchangeably.[68] Recently, based on the work of Trent and Monczka (2003), the term "GS" became more differentiated in comparison to the other terms.[69] In their view, GS reflects the final stage in sourcing strategy evolution.[70] In particular, it entails a focus on a worldwide integration of supply sources in the purchasing strategy as well as in the supply chain.[71] *"It implies the functional integration and coordination of internationally dispersed activities."*[72] Therefore, GS has become an umbrella term for all of these (international) sourcing activities.[73]

In essence, next to its general emergence through globalisation and increased customer needs, four main reasons why companies tend to source globally have been identified in literature. These include:

(1) Sourcing of highly innovative and technological complex products that are otherwise not available in domestic markets.[74]

[59] See Quintens et al. (2006), p. 170.
[60] See Kotabe (1998), p. 107;Kotabe et al. (1998), p. 10.
[61] See Frear et al. (1992), p. 2.
[62] See Monczka/Trent (1992), p. 9.
[63] See Swamidass (1993), p. 193.
[64] See Motwani/Ahuja (2000), p. 172.
[65] See Scully/Fawcett (1994.
[66] See Schiele et al. (2011), p. 7.
[67] See Schiele et al. (2011), p. 7.
[68] See Holweg et al. (2011), p. 335.
[69] See Trent/Monczka (2003), p. 30.
[70] See Holweg et al. (2011), p. 333.
[71] See Hahn/Kaufmann (2002); Holweg et al. (2011), p. XX; Thelen/Botschen (2012), p. 747.
[72] Gereffi (1999), p. 41.
[73] See Lockström (2007), p. 3.
[74] See Horn et al. (2013), p. 28.

(2) International sourcing as a first foothold in a new market, in order to start further expansion in foreign markets.[75]

(3) Lower factor costs in other countries are exploited: In developed countries, labour costs are high compared to value added[76], therefore it is assumed that this would lead to lower prices of low cost country products.[77]

(4) Companies are also prone to imitation behaviours, which guide GS initiation. It has been argued that GS is often a collective mindset of firms, representing a "dominant logic" or "industry recipe"[78], resulting in bandwagon effects[79] and psychological leader-follower isomorphism[80].[81]

However, companies mostly focus on reductions of price-per unit costs.[82] A survey administered by Lionbridge (2006) revealed a clear accentuation of cost saving reasons among companies, with 56% of all survey-participants engaging in international procurement for only this reason.[83] Also within literature, many scholars argue in favour of the procurement of goods from LCCs due to lower factor costs as compared to industrialised countries.[84] Thus, GS from a industrialised perspective is strongly driven by the proposition that lower factor costs can become exploited by allocating activities from the supply chain to regions with lower comparative price levels.[85]

Additionally, within the supply and commodity chain literature, two main types of international economic networks are described, which differ in the dependencies between buying-firms and their suppliers.[86] On the one hand, buyer driven commodity chains include industries that are characterised by globally decentralised factory systems with low barriers to entry in production and relatively low capital investment as well as low technological requirements for suppliers. Such buyer driven commodity chains include companies like large retailers, branded marketers and branded manufacturers. On the other

[75] See Horn et al. (2013), p. 28.
[76] See Kotabe/Mudambi (2009), p. 122.
[77] See Horn et al. (2013), p. 28.
[78] See Spender (1989), p. 1.
[79] See Abrahamson/Rosenkopf (1993), p. 487; Schweller (1994), p. 72.
[80] See Kotabe/Mol (2006), p. 393; Horn et al. (2013), p. 28.
[81] Lewin/Volberda (2011), p. 247.
[82] See Schiele et al. (2011), p. 316.
[83] See Lionbridge (2006), p. 2.; Schiele et al. (2011), p. 316.
[84] See Beugelsdijk et al. (2009), p. 126; Ghoshal (1987), p. 428.
[85] See Kogut (1985), p. 19; Porter (1990), p. 2; Hartmann et al. (2008), p. 32; Steinle/Schiele (2008), p. 3.
[86] See Gereffi (1999), pp. 41-44.

hand, producer-driven commodity chains consist of mostly large and transnational manufacturers that produce capital- and technology-intensive products, such as airplanes and automotives. These manufacturers fulfil a central role in controlling and coordinating production and supply-chain networks. Therefore, in producer-driven commodity chains, companies like the focal OEM have much larger buying-power and are more central to the whole supply chain than in buyer-driven commodity chains.[87]

As a consequence in this study GS is applied in the context of a producer-driven commodity chain, in which the focal OEM plays a crucial role in controlling the highly dynamic environment of its suppliers and the supply chain.[88] As it will be further outlined in a later chapter (2.3), suppliers in this situation depend highly on sourcing decisions of manufacturers and these sourcing decisions are expected to have high impacts on market dynamics of suppliers.

Moreover, in relation to the terminology used in this paper, within the concept of GS, this paper will steer special attention to the concept of low-cost-country (LCC) sourcing. As stated by Monczka and Trent (1991) and Ruamsook et al. (2009) , the concept of LCC is related to lower comparative price levels of suppliers compared to the home country of the buying firm.[89] In this vein, this research aims at comparing LCC sourcing with sourcing from countries with the same or higher comparative price levels as the buying firm. The reference point for this classification is the price-level in Western European countries (namely Belgium, Germany, France, Great Britain, Ireland, Liechtenstein, Luxembourg, the Netherlands, Austria, Switzerland and Spain). Summarised, this research will use the umbrella term industrialised-country (IC) suppliers for suppliers from countries with equal or higher price-levels as Western Europe as well as the term "LCC" suppliers for those from countries with lower comparative price-levels. After clarifying GS and the context of this research, the next chapter will shed light on the two edged sword of GS.

[87] See Gereffi (1999), pp. 41-44.
[88] See Quintens et al. (2006), p. 887.
[89] See Monczka/Trent (1991), p. 2; Ruamsook et al. (2009), p. 79.

2.2.2 Benefits and risks of Global Sourcing: Exploitation of lower comparative factor costs as most important benefit, researchers often overlook the difficult-to-assess risks, like lower security of delivery

As already indicated earlier, nowadays, companies engage increasingly in GS and facilitate LCC sourcing in order to reap benefits from it.[90] Despite its various opportunities, GS also possesses several trade-offs and risks. In this vein, practitioners and scholars suggest that engaging in GS is beneficial when chances and risks are equally taken into account.[91] Within literature, mainly five benefits of engaging in GS are stated (as indicated in the previous chapter, three of the five benefits presented here do also belong to companies' main drivers to engage in GS), these include:

(1) GS can open the **access to new markets** and establish contact points with new stakeholders.[92] Consequently, companies often allocate purchasing volumes to special regions they want to access.[93] As Arnold (1989) argues, "*by establishing a presence in the market through purchasing activities, a company can systematically and carefully prepare an entry into the sales market at a later stage*."[94]

(2) As already stated before, GS can also facilitate the **exploitation of low factor costs** in other countries. This can lead to increased price-margins and eventually to higher profits for buying firms.[95]

(3) Manufacturers can also gain **access to other product and process technologies** as well as to know –how of a broader range of suppliers. By this means, GS offers the opportunity to participate in knowledge transfers, not only locally, but extents it to an international level.[96]

(4) GS can also be a means to **fulfil local-content requirements** of certain countries. In order to enter domestic markets, several governments require a certain local-content degree of the products sold in their respective markets. In this way, is GS offers the chance to fulfil governmental restrictions and serves as a prerequisite to enter certain markets .[97]

[90] See Horn et al. (2013), p. 27.
[91] See Krokowski/Sander (2009), p. 16.
[92] See Colsman (2000), p. 228;Beckmann/Schwarz (2008), p. 23.
[93] See Spekman (1991), p. 6; Handfield (1994), p. 242; Bozarth et al. (1998), p. 241; Barney (1999), p. 137; Trent/Monczka (2003), p. 624.
[94] Arnold (1989), p. 22.
[95] See Piontek (1997), p. 27;Kerkhoff (2005), p. 39.
[96] See Kerkhoff (2005), p. 41; Stölzle/Kirst (2007), pp. 61-62.
[97] See Kohler (2009), p. 54.

(5) Finally, certain **sourcing risks can be minimised** in a global context.[98] In this sense, GS can be used as a valuable tool to reduce dependency on certain supply markets, spread the risk[99] and eventually put higher pressures on local suppliers[100]. Also, GS could especially increase competition when IC and LCC suppliers do not know each other well, since competitors with limited information about each other face the problem of having to rely on less precise general constructs, such as reputation, when making their decisions how to compete.[101]

Next to the various benefits of GS, also eight broad risks can be identified in literature, these include:

(1) Risks exist in relation to **security of delivery**, respectively supply guarantee[102] and **transport costs**.[103] In particular **macro-economic liabilities**, political as well as social instabilities can threaten the reliability of global supply chains.[104] Moreover, GS can induce import and export taxes, additional import requirements and transport costs to cover the distance between suppliers and the purchasing companies.[105] Also, just in time or just in sequence production methods are believed to become more complex or create larger warehouse costs.[106] In detail, the long distances that are often a characteristic of global supply chains increase the costs as well as the risk of failed or delayed delivery. As a result, GS activities often require relatively early sourcing decisions and risk management activities, in order to increase the chances of secure delivery and punctuality.[107]

(2) There are also **cultural risks and communication costs** associated with GS. These are often related to national or regional communities and cultural differences[108] as well as to differences in languages, business practices and corporate cultures[109]. Like indicated by Hofstede (2001)[110], different business practices are applied in

[98] See Colsman (2000), pp. 231-232.
[99] See Piontek (1997), p. 27.
[100] See Kerkhoff (2005), p. 39.
[101] See Ketchen et al. (2004), p. 784.
[102] See Krokowski et al. (1998), p. 16; Krokowski et al. (1998); Bogaschewsky (2007), p. 224.
[103] See Piontek (1997), p. 31.
[104] See Krokowski et al. (1998), p. 18; Thelen/Botschen (2012), p. 755.
[105] See Piontek (1997), p. 31; Quer et al. (2007), p. 74; Thelen/Botschen (2012), p. 755.
[106] See Bichler et al. (2010), pp. 37-38.
[107] See Thelen/Botschen (2012), p. 753.
[108] See Krokowski et al. (1998), pp. 14-15; Monczka et al. (2005), pp. 430-431; Schwenk/Thyroff (2011), p. 46.
[109] See Quer et al. (2007), p. 74; Thelen/Botschen (2012), p. 755.
[110] See Hofstede (2001), p. 373.

different cultural contexts. As a result, culture differences may impair sourcing efficiency, its outcomes and increase costs of communication.

(3) **Quality problems** can also emerge in GS. It has been acknowledged in literature, that especially when engaging in GS, the quality of delivered products does not always match quality standards of purchasing companies or its customers.[111]

(4) **Fluctuations in currencies and foreign exchange** pose another threat to the success of GS. Countries with different currencies and high fluctuation increase risks of high-volume purchases of internationally operating firms, since often large amounts of money are involved.[112]

(5) In recent years **environmental issues as well as sustainability** gained increasing attention of researchers and practitioners. Especially the responsible care for the nature, prevention of child labour, workers' rights[113] and carbon dioxide emissions throughout supply chains[114] received public attention. This increases the risks for endangering the reputation of companies when misconducts of suppliers are attributed to the buying firm. A famous example for this threat is the negative public awareness that emerged towards Apple, after one of its suppliers was attacked for it business practices.[115]

(6) Finally GS may create possible **conflicts with other sourcing levers and organisational strategies.**[116] As already indicated in chapter 1.2, GS can impair other sourcing levers, like supplier integration or product innovation. Researchers also proposed conflicts with lean supply and sourcing of complex parts.[117]

Despite the various benefits as well as risks that are associated with GS, the potential positive effects often outweigh in the perception of companies and their management.[118] Therefore, GS has become more and more popular when compared to local/IC sourcing.[119] As indicated earlier, the most popular reason, out of the many opportunities listed before, is the exploitation of lower factor costs.[120] Even though many practitioners and scholars

[111] See Krokowski et al. (1998), pp. 16-17.
[112] See Krokowski et al. (1998), p. 18; Kerkhoff (2005), p. 47; Thelen/Botschen (2012), p. 755.
[113] See Sethi (2003), p. 56; Mamic (2005), p. 97.
[114] See Curtis (2007), p. 385.
[115] See Frost/Burnett (2007), pp. 103-108.
[116] See Nellore et al. (2001), p. 101; Steinle/Schiele (2008), p. 7.
[117] See Nellore et al. (2001), p. 101.
[118] See PwC (2008), p. 8; Thelen/Botschen (2012), p. 756.
[119] See Kummer et al. (2006), p. 108.
[120] See Carter et al. (2008), p. 225.

argue that LCC sourcing can yield substantial financial benefits[121], there is an on-going debate in literature about the overall effects of GS.[122] This debate will be further addressed in the chapter 2.4. The next chapter will dive deeper into the context of this research and describe the importance of GS in the automotive industry.

2.3 Global Sourcing and the automotive industry: Increasing importance of Global Sourcing in the automotive sector, due to lower depth of value added and supplier consolidations

As stated before, this study takes the perspective of a European automotive OEM that engages in GS activities throughout the world. The automotive industry was chosen because it *"...encompasses a wide variety of products (e.g., stamped metal, seating systems, and steering assemblies) and a diversity of processes (job shop, manufacturing cell, continuous flow, etc.)*"[123] and is therefore considered to be more generalisable than other industries.[124] Also, the automotive sector is of pivotal importance to the global economy. Its continuing trend towards globalisation received growing attention from operations management researchers.[125]

Within the last decades, the automotive industry underwent several substantial changes. Prices for resources increased drastically and strengthened the need for extending the search for cheap resources globally.[126] Resulting from these growing cost-pressures, the automotive industry has become a highly competitive environment, including intense price-wars between automotive companies.[127] Moreover, as indicated in chapter 2.1, the increased expectations of customers create additional pressures. As a result, it becomes gradually more difficult for OEMs to sustain a competitive advantage and differentiate in the eyes of their customers.[128] Furthermore, automotive companies have been moving steadily from being manufacturers of goods, towards being assemblers of supplied products.[129] For instance, in the last decades, the depth of value added decreased strongly in the automotive industry.[130] Due to increased complexity of products and technologies,

[121] See Horn et al. (2013), p. 27,
[122] See Horn et al. (2013), p. 28.
[123] Droge et al. (2004), p. 558.
[124] See Horn et al. (2013), p. 39.
[125] See Taylor/Taylor (2008), p. 486; Horn et al. (2013), p. 39.
[126] See Becker (2007), p. 134.
[127] See Richter/Hartig (2007), p. 251.
[128] See Richter/Hartig (2007), p. 251.
[129] See Kotabe (1998), p. 108.
[130] See von Corswant/Fredriksson (2002), p. 741; Horn et al. (2013), p. 39.

many firms choose to focus on their core competencies[131], which resulted in lower vertical integration and increased outsourcing.[132] In this vein, the depth of value added in the automotive industry decreased from 80% in the 1980s[133], 49% in 1993, 31% in 2000[134], 25% in 2002[135] to about 20%[136] today. As a result, in most cases the costs for purchasing and procurement of materials and services exceed 50% of total turnover of automotive companies.[137] .Therefore, improvements in the sourcing performance of automotive companies can have substantial strategic benefits and yield substantial competitive advantages.[138] For illustration, within the automotive industry, researchers have pinpointed a potential of 20% increase of profit when 1% cost-savings of materials can be achieved.[139] Thus, even small cost-savings pose a major motivation for automotive OEMs to engage in GS.[140]

From this viewpoint, there are many countries where factor costs (e.g. materials, labour, tax rates, etc.) are lower than in its respective home-country. Essentially, lower factor costs in certain markets play an important role in competitive advantages of nations and companies. As indicated earlier, in industrialised countries, factor costs are relatively expensive. Consequently, there is an on-going trend in favour of procurement of goods from LCCs.[141] In this vein, scholars have argued that especially globally operating firms can decouple their activities from their regional economies and use worldwide distributed resources like lower labour costs more efficiently.[142] Hence, GS from a industrialised perspective is often driven by the exploitation of lower factor costs, through allocating activities from the supply chain to regions with lower comparative price levels.[143] Even though total cost reductions may appear ambiguous, at least unit price reductions are believed to be the primary outcome realised from global purchasing activities,[144] since

[131] See Voegele/Backhaus (1999), p. 491.
[132] See Bettis et al. (1992), p. 7; Quinn/Hilmer (1994), p. 43.
[133] See Heberling (1993), p. 47.
[134] See Pfefferli (2002), p. 2.
[135] See Pfefferli (2002), p. 2; Verband der Automobilindustrie (2004), p. 1.
[136] See Kinkel et al. (2009), p. 53.
[137] See Pfefferli (2002), p. 2.
[138] See Pfefferli (2002), p. 2.
[139] See Arnold (1997), p. 15; Wannenwetsch (2006), p. V.
[140] See Wannenwetsch (2006), p. V.
[141] See Ghoshal (1987), p. 428; Beugelsdijk et al. (2009), p. 126.
[142] See Birou/Fawcett (1993), p. 28.
[143] See Kogut (1985), p. 19; Hartmann et al. (2008), p. 32; Steinle/Schiele (2008), p. 3.
[144] See Petersen et al. (2000), p. 29.

these activities have been shown to yield substantial cost-saving potential.[145] In this way, it is expected that that contrasted to cost-savings realised with IC suppliers, the focal firm's sourcing performance (defined as cost-savings for ex-work prices of items) is significant higher when goods are purchased from LCC suppliers (due to lower comparative factor costs in LCC countries).

H1: Sourcing items from low-cost-country suppliers leads to significant higher savings than sourcing parts from IC suppliers.

2.4 Global Sourcing performance: Global Sourcing often failing to reap the expected benefits

As explained before, GS is viewed in terms of the integration of worldwide supply sources in the purchasing strategy as well as in the supply chain. Mostly, it is used to benefit from lower factor costs of LCC suppliers, when compared to suppliers from industrialised countries.[146]

Though, the concept of lower factor costs is generally accepted in literature, it is argued that favourable factor costs do not necessarily translate into total cost reductions from GS. In detail, as indicated by Horn et al. (2013), actual savings from GS vary greatly from negative or zero[147] to up to 20%[148]. Some consultancy companies even claimed expected benefits of up to 60% for certain products and commodities.[149] However, their calculations have been doubted by researchers.[150] Moreover, even when GS yields positive savings, lower prices per part do not necessarily translate into lower costs for companies.[151] For illustration, as already indicated before, it has been argued that GS and especially LCC sourcing can impede other sourcing tactics, like lean supply [152] and intensifying relationships with suppliers.[153] Moreover, as shown by Horn et al. (2013), higher saving expectations in GS can negatively correlate with operational performance of international

[145] See Petersen et al. (2000), p. 31; Weber et al. (2010), p. 13; Horn et al. (2013), p. 28.
[146] See Ghoshal (1987), p. 428; Beugelsdijk et al. (2009), p. 126.
[147] See Horn et al. (2013), p. 28.
[148] See Kotabe/Omura (1989), p. 113; Murray et al. (1995), p. 195; Horn et al. (2013), p. 28.
[149] See Hemerling/Lee (2007), p. 4.
[150] See Schiele et al. (2011), p. 316.
[151] See Stuart/McCutcheon (2000), p. 35; Thelen/Botschen (2012), p. 756.
[152] See Nellore et al. (2001), p. 101; Steinle/Schiele (2008), p. 7.
[153] See Steinle/Schiele (2008), p. 3; Schiele et al. (2011), p. 1;Schiele et al. (2011), p. 269;Schiele et al. (2012), p. 7.

sourcing projects.[154] In particular, they found that products from China were often not delivered as expected and ultimately almost ¾ of GS projects in their sample did not reap the anticipated benefits. Also, Kinkel and Maloca (2009)[155] indicated that in their sample (including German manufacturing companies), one out of four offshoring activities was followed by a backshoring intervention within the following four years of project implementation. In support of the ambivalent picture of GS in literature, a study of PwC (2008) indicated that companies tend to accentuate the easy to access costs for taxes, transportation, logistics and warehousing, but tend to ignore costs that emerge from complains, delays, out-of-stock situations and quality problems, since they are rather hard to identify and quantify.[156] Therefore, even when researchers with the same cultural backgrounds or from similar industries within the same time frame assessed the performance effects of GS[157], the overall benefits of GS remain ambivalent.

Because research indicated that direct effects of GS remain ambivalent, this research aims at pinpointing indirect positive effects of GS. As indicated by Petersen et al. (2000)[158], GS also offers several soft (indirect) benefits, next to its hard (direct) opportunities. As one of the main indirect benefits, it reduces dependency on certain supply markets, spread the risk[159] and is believed to put higher pressures on local suppliers[160]. In this vein, this research tries to empirically assess in how far the additional evaluation of international suppliers (through LCC supplier participation) can be used to enhance overall market dynamics/competition and create more competitive contact points between IC and LCC suppliers.[161] The goal of this approach is aimed at minimising the purchasing costs for buying firms through an extended consideration of multiple (IC and LCC) suppliers and the resulting competition.[162]

In order to assess these indirect competitive effects of GS, the next chapters will describe and explain the concept of CD. It illustrates the origin, defining aspects, evolutionary tendencies and empirical findings of CD. Then, this introduction into CD is followed by an

[154] See Horn et al. (2013), p. 33.
[155] See Kinkel/Maloca (2009), p. 154.
[156] See PwC (2008), p. 28.; Thelen/Botschen (2012), p. 756.
[157] See Frear et al. (1992), p. 2;Kotabe (1998), p. 116.
[158] See Petersen et al. (2000), p. 31.
[159] See Piontek (1997), p. 27.
[160] See Kerkhoff (2005), p. 39.
[161] See Steinle/Schiele (2008), p. 7.
[162] See Friedl/Wagner (2012), p. 3066.

integrative attempt to further address (from a CD perspective) the underlying positive mechanisms of GS with regard to market dynamics and competition. More precisely, CD will be applied to assess the importance of competition between suppliers and how the competition in the IC supply base can be increased through the means of GS and LCC supplier participation.

3 Competitive Dynamics: Origins, definition, evolutionary tendencies and state of the art

3.1 The origins of Competitive Dynamics: Originated from Schumpeter's theory of creative destructions and further developed by the Austrian School of Economics

As stated by McNulty (1968) *"there is probably no concept […] that is at once more fundamental and pervasive, yet less satisfactorily developed, than the concept of competition"*[163]. In this vein, past research often struggled to develop a clear understanding of competition.[164] Over the years, three broad streams of competitive research emerged.[165] First, the **philosophical assessment** of competition aimed at finding the underlying reasons and antecedents for competition.[166] Secondly, the **structural analyses** stream viewed competition as an on-going struggle between sellers and buyers, which leads to temporary equilibrium-states between these two powers.[167] Finally, the **competition-as-process stream** considered competition as a continuous progression of actions and responses between actors and reactors. It stressed the importance of dynamism in competitive environments and its implications for firm performance.[168] With focus on scholarly application of competition in business environments, strategic management scholars mainly engaged in the latter research stream and considered competition as a process. Through this angle, they developed concepts like CD.[169]

Just like GS, CD by itself is not a new concept. Its application has been ranging from research concerning the competition between species for survival and reproduction, to

[163] McNulty (1968), p. 639.
[164] See McNulty (1968), p. 639.
[165] See Blaug (2001), p. 37; Budzinski (2008), pp. 2-3.
[166] See Stigler (1957), p. 1; Snow (2002), p. 9.
[167] See Walker (2005), p. 21.
[168] See Young et al. (1996), p. 243; Chen et al. (2009), p. 1289.
[169] See Chen (2009), p. 5.

studies applying organisational models and assessing rivalry between firms in their respective markets.[170] The organisational application of CD has its intellectual roots in Schumpeter's (1950)[171] conception of creative destruction. Schumpeter's micro-level focus on organisational behaviour has put emphasis on the dynamic process of firms competing with each other to exploit market opportunities.[172] As Chen and Miller (2012) stated, "*creative destruction was defined as the eventual—and inevitable— decline of firms through the process of competitive action and reaction*"[173], which determines survival and long-term performance of companies. In particular, Schumpeter's approach attempted to uncover why some firm-interactions turn out beneficial while others are detrimental to firm performance.[174]

Also, the Austrian School[175] had its influence on the development of CD research and extended Schumpeter's theory of creative destruction.[176] It asserted that competition is a dynamic market process rather than a static condition. From this viewpoint, the market is constantly moving away and towards a state of equilibrium. Like in Schumpeter's theory, companies only possess temporary competitive advantages and constantly strive for dominance within their market-environments.[177] With regard to scientific papers, the emergence of CD took place in the late 1980s. Generally, competition itself has been a long ranging focus of organisational and industrial scholars, structural analyses[178] population ecology[179] strategic groups and configurations[180], game theory[181] and network theory[182].

Consequently, as Chen and Miller (2012) state, CD emerged for the first time in the 1980s and relied on approaches like industry– structure analyses[183].[184] Early work in the field of

[170] See Chen/Miller (2012), p. 137.
[171] See Schumpeter (1950), pp. 82-83.
[172] See Smith et al. (1991), p. 60.
[173] Chen/Miller (2012), p. 137.
[174] See Schumpeter (1950), pp. 82-83.; Ketchen et al. (2004), p. 780; Ferlic et al. (2008), p. 3.
[175] See Jacobson (1992), p. 782; Young et al. (1996), p. 244.
[176] See Young et al. (1996), p. 244; Ferrier et al. (1999), p. 372; Ferlic et al. (2008), p. 6.
[177] See Thomas (1996), p. 221; Roberts/Eisenhardt (2003), p. 345; Chen et al. (2009), p. 1289; Thomas/D'Aveni (2009), p. 387; D'Aveni et al. (2010), p. 1371; Chen/Miller (2012), p. 137.
[178] See Porter (1991), p. 102; Chen/Miller (2012), p. 137.
[179] See Freeman et al. (1983), p. 692.
[180] See Cool/Schendel (1987), p. 1102; Nair/Kotha (2001), p. 221; Zúñiga-Vicente et al. (2004), p. 1378.
[181] See Camerer (1991), p. 137; Saloner (1991), p. 119; Basuroy/Nguyen (1998), p. 1396; Vilcassim et al. (1999), p. 499; Ketchen/Giunipero (2004), p. 783.
[182] See Tsai (2002), p. 179.
[183] See Porter (1991), p. 101.

CD included a small-sample study in the banking sector assessing innovation[185] as well as Bettis & Weeks' (1987) study of competitive interactions between Kodak and Polaroid, the largest photographic equipment producers during that time[186]. These studies were two of the few (at that time) that emphasised the temporal aspects of competitive advantage and marked the beginning of CD research.[187]

Subsequently, research became increasingly complex and CD established itself as an own branch in the strategic-management field, which included the study of top management teams (TMTs), resource-based view (RBV) and the dynamic capabilities perspective.[188] Like with GS, in the beginning phase, different terms were often used interchangeable to describe the same phenomena. For CD, these terms included "interfirm rivalry", "competitive interaction", or "competitive engagement".[189] In order to give deeper insights into the concept of CD, the next chapter further defines CD and presents its defining features. After that, CD will be further assessed in terms of applicability to assess indirect effects of GS and its applicability in this research setting.

3.2 Defining elements of Competitive Dynamics research: Assessing (longitudinal) organisational actions & responses, interrelations and their underlying mechanisms

Until today, CD research gained increasingly importance in strategic management research. As Chen and Miller (2012) stated[190], in recent years, CD flourished for several reasons. (1) First, it is used to analyse how companies interact **on the micro-level** and assesses how firms compete with each other. (2) Moreover, it is one of the few research streams which are **quintessential longitudinal** and can therefore capture the dynamism of constantly changing market conditions and competitor behaviours. (3) Thirdly, it **covers the interaction of companies** and not just their actions. Therefore, it is considered more complex and comprehensive than other research streams. (4) Finally, CD **can also explain how** companies can gain mutual benefits from cooperation and how a balance between competition and cooperation can be achieved. In sum, CD flourished because it studies the

[184] See Chen/Miller (2012), p. 137.
[185] See MacMillan et al. (1985), p. 75.
[186] See Bettis/Weeks (1987), p. 547.
[187] See Chen/Miller (2012), pp. 137-138.
[188] See Hambrick/Mason (1984), p. 193; Barney (1991), p. 99; Teece et al. (1997), p. 509; Chen/Miller (2012), p. 137.
[189] See Chen (2010), p. 177.
[190] See Chen/Miller (2012), pp. 136-137.

dynamic competitive actions of firms. Thereby, unlike many theoretical models, CD research aims at investigating issues empirically, objectively and closely related to reality.[191]

In relation to a clarification of the CD concept, CD is defined as "*the study of interfirm rivalry based on specific competitive actions and reactions, their strategic and organisational contexts, and their drivers and consequences*."[192] Several defining features of CD research can be identified in literature:

(1) The CD perspective **focuses on real behaviours** of firms in the market place, with special attention to action and response from an external perspective. Thereby, CD research uses precise and concrete analyses and methods to interpret the dynamic and interactive actions exchanged by firms.[193]

(2) It sets out to **unveil the underlying reasons** for certain actions and responses and also assesses the effects of these behaviours. Each firm is seen as unique case, which reacts contingent on external as well as internal factors.[194]

(3) CD is **not only about interactions but also interrelation** between companies and groups of companies. As Chen and Miller (2012) state, relativity is an essential premise in CD research.[195]

(4) Finally, CD research **unveils long-term interactions and its effects**. Therefore it is described as one of the few research areas that are quintessential longitudinal.[196]

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Within the general conception of CD, competitive action is defined as "*externally directed, specific, and observable competitive move initiated by a firm to enhance its relative competitive position*"[197]. It asserts that engaging in competitive actions can improve a company's relative market position in relation to its competitors and result in higher overall firm-performance. In sum, connected to D'Aveni's (1994) theory of hypercompetition, CD research poses three competitive assumptions:[198]

[191] See Chen/Miller (2012), p. 137.
[192] Chen/Miller (2012), p. 137.
[193] See Ferlic et al. (2008), p. 6; Chen/Miller (2012), p. 138.
[194] See Ferlic et al. (2008), p. 6; Chen/Miller (2012), p. 134.
[195] See Smith et al. (1991), p. 60; Young/Varble (1997), p. 36; Ferlic et al. (2008), p. 6; Chen/Miller (2012), p. 138.
[196] See Bergh (1993), p. 683; Ferlic et al. (2008), p. 7; Hutzschenreuter/Israel (2009), p. 421.
[197] Smith et al. (2001), p. 321.
[198] See D'Aveni (1994), p. 1371; Ferlic et al. (2008), p. 7.

(1) First, only temporary competitive advantage exists and the competitive position of firms can erode.
(2) Second, companies constantly seek to establish new bases of competitive advantage.
(3) Third, those companies that are more dynamic and engage in more competitive actions are expected to show higher performance than those that do not constantly seek to recreate their competitive advantage. In this research, the focus lies on the favourable effects of CD in the automotive industry. As will be outlined later, the automotive industry is prone to hypercompetition and favourable effects from a buying-firm's perspective can be derived from application of CD.

Further, after reviewing the gross of CD research, Chen and Miller (2012) identified several distinctive purposes for conducting research in this area.[199] As outlined, CD helps to predict competitive behaviours and explains how firms react internally to actions of competitors.[200] Furthermore, it is a useful tool in capturing the asymmetric relationships between different firms and how these asymmetries affect competition.[201] It also connects strategy to the behaviour of firms and links (internal and external concerns of) depth and quality of a company's knowledge (of its competitors) to organisational behaviours.[202] It was also used to determine the underlying reasons for competition and strategy, like leadership and human agency.[203] Therefore, CD serves as a powerful tool for "*linking strategy content (or formulation) and process (or implementation), and macro-competitive and micro-actor viewpoints.*"[204] In this context, strategy is seen as pattern in the stream of decisions, where "pattern" implies a certain degree of thematic consistency.[205] In this way, CD has frequently been used to show how strategies influence organisational behaviours and firm-performance.

In order to present the full picture of CD research and arrive at a suitable application to the GS context, the next chapters address evolutionary tendencies in CD, key research areas

[199] See Chen/Miller (2012), p. 140.
[200] See Chen/Miller (1994), p. 86; Chen/Miller (2012), p. 140.
[201] See Desarbo et al. (2006), p. 101; Chen/Miller (2012), p. 140.
[202] See Greve (1996), p. 29; Barnett (1997), p. 128; Chen/Miller (2012), p. 140.
[203] See Hambrick/Mason (1984), p. 193; Montgomery (2008), p. 54; Chen/Miller (2012), p. 138.
[204] Chen/Miller (2012), p. 140.
[205] See Mintzberg et al. (1976), p. 246; Mintzberg (1978), p. 934; Chen/Miller (2012), p. 134.

and findings. Finally, a suitable theoretical link to combine GS with the CD perspective is presented.

3.3 Evolutionary tendencies and trends in Competitive Dynamics: Progressing from a pattern of actions to a set of interconnected actions among market players

As already stated in chapter 3.2, CD research has flourished within the last decade. Like other scientific streams, also CD experienced several evolutionary tendencies over the course of its existence. This chapter seeks to give an overview over the incremental changes in CD research.

The first evolutionary tendency, which has been identified in CD research, includes a development from action/response dyads to a set of interrelated actions and responses of market players. Whereas the beginning studies concentrated on competitive rivalry between two entities (either market actions or firms) and action/response dyads served as basic unit of research interest[206], recent research focussed increasingly on interconnections of various market members and antecedents and consequences of organisational moves.[207] Repertoire studies have become a useful tool in assessing interconnections of moves as well as assessing the characteristics of moves[208], including their inertia[209] and conformity to overall industry practices.[210] Additional, CD research increasingly focussed on "follow-the-leader" behaviours of international businesses[211], which is comparable to the evolutionary tendencies in GS.[212]

Furthermore, there has been a progression from objective assessments of CD to perceptual ones. On the one hand, research that used objective considerations was focussed on e.g. number, type and market scope of competitive moves[213], the aggressiveness and investments needed for specific moves[214], and time between action of one company and response of another.[215] On the other hand, an increasing number of researchers use the

[206] See Smith et al. (1991), p. 60; Smith et al. (1992); Chen/Miller (2012), p. 159.
[207] See Barnett (1993), p. 249; Ingram/Baum (1997), p. 75; Chen/Miller (2012), p. 159.
[208] See Ferrier/Lyon (2004), p. 317.
[209] See Chen/Miller (1994), p. 88.
[210] See Miller/Chen (1996), p. 1209; Chen/Miller (2012), p. 160.
[211] See Knickerbocker (1973), p. 8.
[212] See Horn et al. (2013), p. 30.
[213] See Chen et al. (1992), p. 439; Yu/Cannella Jr (2007), p. 665.
[214] See Ferrier (2001), p. 858.
[215] See Chen/Miller (2012), p. 161.

extended version of the expectancy-valence framework[216], namely the Awareness-Motivation-Capabilities (AMC) model[217], to find the underlying antecedents and motivations of observable organisational behaviours.[218] These researchers consider human agency as pivotal factor in determining organisational behaviours. In this vein, another trend has been towards the underlying behavioural and organisational drivers of competitive moves.[219] Researchers seek to find how specific groups and alliances in companies are influencing these behaviours. For example, it has been found that human resource management and related practices[220], as well as the heterogeneity and integration of the TMT[221] determines the nature of inter-firm rivalry, in terms of aggressiveness and responsiveness[222].

Moreover, several other trends can be observed in CD research. Even though research became wider in considering interaction beyond action/response patterns, a trend has been from comprehensive studies of various type of actions of firm[223] to the assessment of specific types of competitive moves.[224] In this regard, initial public offerings (IPO)[225], Research and Development (R&D), innovation[226], mergers and acquisitions[227] and new product introduction[228] have been examined. Also, competitive moves have been put into more sophisticated contexts.[229] This also includes a switch from the U.S. settings[230] to a global environment, from a one-firm to a "rivalcentric" centred approach[231] and from dyads to multiple actors/ groups level approaches[232]. Moreover, there has been a trend towards studying hybrid forms of cooperation and competition and the resulting

[216] See Vroom (1964); Chen/Miller (1994), p. 85.
[217] See Chen (1996), p. 100.
[218] See Chen/Miller (2012), p. 161.
[219] See Chen/Miller (2012), p. 161.
[220] See Gardner (2005), p. 237; Sirmon et al. (2008), p. 919.
[221] See Hambrick et al. (1996), p. 659; Chen/Miller (2012), p. 21.
[222] See Chen/Miller (2012), p. 161.
[223] See Chen/Miller (1994), p. 85; Miller/Chen (1994), p. 1; Miller/Chen (1996), p. 1209.
[224] See Chen/Miller (2012), p. 162.
[225] See Certo et al. (2009), p. 1340.
[226] See Katila/Chen (2008), p. 593; Chen et al. (2010), p. 1527; Semadeni/Anderson (2010), p. 1175;.
[227] See Haleblian et al. (2012), p. 1037; Chen/Miller (2012), p. 162.
[228] See Krider/Weinberg (1998), p. 1; Lee et al. (2000), p. 23; Lee et al. (2003), p. 753; Srivastava/Lee (2005), p. 459.
[229] See Derfus et al. (2008), p. 61; Zhang/Gimeno (2010), p. 743; Upson et al. (2012), p. 93
[230] See Yu/Cannella Jr (2007), p. 665; Di Gregorio et al. (2008), p. 970; Hermelo/Vassolo (2010), p. 1457.
[231] See Tsai et al. (2011), p. 761.
[232] See Smith et al. (1997), p. 149; Madhavan et al. (2004), p. 918; Rowley et al. (2004), p. 453; Chen/Miller (2012), p. 162.

interdependencies between companies.[233] Additional, a major tendency in CD research has been the trend from studying simple and specific characteristics of action/response to more sophisticated combinations. As indicated by Chen and Miller (2012)[234], these sophisticated analyses consist of considerations of actions/responses in relation to institutional characteristics, like conformity to institutional contexts[235], their consistency over time[236] as well as their strategic alignment with the overall competitive repertoire of a firm[237].

In sum, the constant progression and development of CD over the course of the last decades, has formed a considerable research stream. As stated by Chen and Miller (2012), CD forms the nexus between an organisation and its environment.[238] It has the potential to bridge the macro–micro-integration of action and response of firms and its underlying reasons, in particular those related to factor markets.[239] However, in the light of the past advancements, it is argued that research in the field of CD utilises connections to new theories, innovative empirical approaches and methods that enable researchers to better capture competition.[240] Emerging from these evolutionary tendencies, several key research areas emerged in CD research. These research areas will be explained in the next section.

3.4 Key research areas in Competitive Dynamics: Action-, business- & corporate-level studies, integrative competitor analysis and competitive-perception approaches as main focus areas

Generally, CD research has witnessed a lot of scientific attention within the last 10 years, including several literature reviews.[241] During the course of recent years, evolutionary tendencies flourished and several key research areas have been identified.[242] Consequently, as Chen and Miller (2012) state, five key areas can be distinguished:[243]

[233] See Gnyawali/Madhavan (2001), p. 918; Silverman/Baum (2002), p. 791; Gimeno (2004), p. 820; Gnyawali/He (2006), p. 507; Chen (2008), p. 288; Chen/Miller (2012), p. 163.
[234] See Chen/Miller (2012), p. 160.
[235] See Miller (1996), p. 505; Podolny (1993), p. 829; Miller/Chen (1996), p. 1209.
[236] See Barnett (1993), p. 249; Ferrier (2001), p. 858; Lamberg et al. (2009), p. 46.
[237] See Miller/Chen (1996), p. 1209.
[238] See Chen/Miller (2012), p. 164.
[239] See Markman et al. (2009), p. 423.
[240] See Chen (2009), pp. 18-19; Daems/Thomas (1994), p. 103.
[241] See Ketchen et al. (2004), p. 799; Smith et al. (2001), p. 315; Chen et al. (2009), p. 5; Chen/Miller (2012), p. 141.
[242] See Chen/Miller (2012), p. 141.
[243] See Chen/Miller (2012), p. 141.

(1) **Action level studies** of competitive interaction. This research area focuses on detectable market moves of firms and the responses from other competitors.[244] The beginning of this research area was based on the classic work of MachMillan et al. (1985).[245] In contrast to the focus on broad aggregates of strategic group[246], the industry level[247] and community or population levels[248], this action level research was the first one that took a deeper insight into the micro-perspective of organisational behaviours.[249] The most popular theoretic approaches of this stream included game theoretic models and the expectancy-valence theory.[250]

(2) S**trategic competitive behaviour and repertoire studies**, respectively business level studies. Competitive antecedents and outcomes lie at the heart of the business level studies in CD.[251] In this area, the main focus of researchers has been on organisational characteristics as well as the behaviour of important organisational actors. The most prominent theories that have been utilised within the business level studies include information-processing theory[252], institutional theory[253] and upper-echelons theory[254]. Additionally, the competitive repertoire of firms and its utilisation has been a major focus in this research stream. In detail, the competitive repertoire research aims at the assessment of a broad range of competitive moves (e.g. major price initiatives, new market entries).[255] From this viewpoint, a competitive repertoire can be viewed as micro-competitive behaviour, which forms the overall competitive strategy of a firm.[256] Repertoire studies look at the entire configuration of competitive actions and not just at action/response dyads.[257] Thereby, these studies link firm-level variables (e.g. age and size) to market-level variables (e.g. diversity and growth).[258] However, despite the focus on micro-antecedents of firm behaviours (e.g. diversity and growth) and the multi-level approaches in business

[244] See Chen/Miller (2012), p. 142.
[245] See MacMillan et al. (1985), p. 75.
[246] See Cool/Schendel (1987), p. 1102.
[247] See Porter (1980), p. 10.
[248] See Freeman et al. (1983), p. 692.
[249] See Chen/Miller (2012), p. 142.
[250] See Chen/Miller (2012), p. 142.
[251] See Chen/Miller (2012), p. 144.
[252] See Smith et al. (1991), p. 60.
[253] See Chen/Hambrick (1995), p. 453; Hermelo/Vassolo (2010), p. 1457.
[254] See Hambrick/Mason (1984), p. 193; Hambrick et al. (1996), p. 659; Ferrier/Lyon (2004), p. 317; Chen/Miller (2012), p. 144.
[255] See Chen/Miller (2012), p. 145.
[256] See Miller/Chen (1994), p. 1; Miller (1996), p. 505; Miller/Chen (1996), p. 1209; Ferrier (2001), p. 858; Ferrier/Lee (2002), p. 162.
[257] See Chen/Miller (2012), p. 146.
[258] See Chen/Miller (2012), p. 145.

level studies, it has been argued that frequently these studies were "under contextualised".[259]

(3) M**ultimarket and multi-business competition**, respectively corporate-level studies. This research area in CD research aims at interrelations of competing firms in multiple markets. As indicated by Chen and Miller (2012)[260], the theory of multimarket (or multipoint) competition covers a wide range of fields.[261] The theory that forms the foundation of most corporate level studies in CD research is called mutual forbearance.[262] In essence, mutual forbearance postulates that companies which compete with each other in multiple markets are aware of interdependencies between two firms. As a result, companies tailor their competitive interactions to those of the competing ones.[263] The main reason for the increased attention to competitors is attributed to the awareness of possible reconciliation behaviours of competitors, because a competitor, which is represented in many markets, can retaliate within different markets and affect overall firm performance stronger than competitors in only one market.[264]

(4) C**ompetitive perception**. Human perception has been argued to be the most important factor in business contexts and organisational behaviour.[265] The CD research that is concerned with human perception contends that organisational behaviour takes place only through human agency and that this agency is filtered by human perception.[266] The beginning of this research area was marked by the work of Chen and Miller (1994)[267], who presented the expectancy-valence-framework[268]. Within recent years, concepts like competitive tension[269], identity domains[270], and competitive acumen[271] have been developed to capture the full range of business-related effects of human perception. Also, Chen and Miller (2012)[272] argued that perceptual studies can be useful in bridging micro-

[259] See Chen/Miller (2012), p. 147.
[260] See Chen/Miller (2012), p. 147.
[261] See Karnani/Wernerfelt (1985), p. 87; Bernheim/Whinston (1990), p. 1; Evans/Kessides (1994), p. 341; Gimeno/Woo (1996), p. 323; Baum/Korn (1999), p. 251; Haveman/Nonnemaker (2000), p. 232; Greve (2008), p. 476; Tieying et al. (2009), p. 127; Chen/Miller (2012), p. 147.
[262] See Edwards (1955), p. 344.
[263] See Chen/Miller (2012), p. 147.
[264] See Chen/Miller (2012), p. 147.
[265] See Miller/Dröge (1986), p. 539.
[266] See Staw (1991), p. 805; Chen/Miller (2012), p. 371.
[267] See Chen/Miller (1994), p. 85.
[268] See Vroom (1964), p. 334; Chen/Miller (1994), p. 85.
[269] See Chen et al. (2007), p. 101.
[270] See Livengood/Reger (2010), p. 48.
[271] See Tsai et al. (2011), p. 761.
[272] See Chen/Miller (2012), p. 152.

and macro-perspectives, since "*the perceptions and inclinations of leaders of firms*[273] *and their interactions with other top team members*"[274] may shape competitive actions[275].

(5) **Integrative competitor analysis**. Integrative competitor analysis consists of three underlying research areas, namely market-resource concerns, the AMC framework and competitive asymmetry.[276] Market resource-concerns are aimed at market commonality and resource similarity between firms. These firm specific analyses are based on resource-based theory[277] and strategic similarity[278]. As an example, Sirmon et al. (2008)[279] linked the RBV to CD by resource considerations to company's behaviour in the market place.[280] Secondly, the AMC framework postulates that CD and organisational behaviour is contingent on three characteristics.[281] **(I)** Firstly, awareness is related to a firm's awareness of the competitive landscape and the market. **(II)** Secondly, motivation is related to the degree to which a firm is motivated to respond to competitive moves of other companies. Finally, capability is related to the extent to which a company possesses resources to enact in, and respond to, competitive moves. In general, the AMC framework is often used to predict the levels of inter-firm competitive tension that firms, and in particular managers, perceive.[282] **(III)** Finally, analyses that go beyond industry and market boundaries are also an important direction of integrative competitor analyses.[283] For example, these include assessing CD between competitors in factor markets or in differing upstream/downstream industries.[284]

In sum, all research areas formed promising avenues for researchers and created more awareness for the ways companies interact with each other. After this broad categorisation of research areas, the next chapter is dedicated to present the main findings attained from research in the field of CD.

[273] See Miller/Dröge (1986), p. 539.
[274] Chen/Miller (2012), p. 21.
[275] See Dutton/Jackson (1987), p. 76; Chen/Miller (2012), p. 154.
[276] See Chen (1996), p. 101; Desarbo et al. (2006), p. 101.
[277] See Barney (1991), p. 99.
[278] See Gimeno/Woo (1996), p. 323; Chen/Miller (2012), p. 149.
[279] See Sirmon et al. (2008), p. 919.
[280] See Chen/Miller (2012), p. 150.
[281] See Livengood/Reger (2010), p. 49.
[282] See Chen et al. (2007), p. 101; Chen/Miller (2012), p. 151.
[283] See Chen/Miller (2012), p. 151.
[284] See Chen/Miller (2012), p. 151; Markman et al. (2009), p. 423.

3.5 Findings of Competitive Dynamics: Intense competitive rivalry as means to induce "competitive wars" among market players

Over the past years, CD research accumulated various empirically supported findings, which help researchers and practitioners to get a deeper insight into inter-firm interactions.[285] Consequently, this chapter gives a comprehensive overview over the main research findings so far.

CD papers on strategy found that competitive moves of firms routinely evoke countermoves from rivals within the market.[286] It was shown that the more rivalry within the market increases, the more companies increase their competitive moves and alter the content of these moves.[287] Indeed, changes in the competitive landscape, like acquisitions, diversifications or technological change have been shown to steer companies to change their own strategy.[288] Thus, strategic actions significantly change the conditions and the intensity of rivalry between firms. Subsequently, nowadays, more and more companies face radically changing market environments and the number of stable markets decreases.[289] Firms are increasingly aware of the fact that their strategic behaviour and competitive advantage is prone to change, including changing key characteristics of their competitive strategies[290] or breaking up strategic group-memberships[291].

Next to these comprehensive strategic viewpoints, research also gave deeper insight into the two edged sword of CD. CD can be divided into the streams of competitive rivalry and competitive actions research, which both still remain relatively isolated from each other.[292] Despite their isolation, an integrative assessment of these two streams indicated that there is an optimal level of competition among market players. On the one hand, research in competitive actions showed that enhanced competition is useful to firm performance.[293] More precisely, it was found that faster execution of competitive moves, high complexity

[285] See Smith et al. (2001), p. 315; Ketchen et al. (2004), p. 577; Hutzschenreuter/Israel (2009), p. 421; Chen/Miller (2012), p. 135.
[286] See Smith/Wilson (1995), p. 143; Hutzschenreuter/Israel (2009), p. 426.
[287] See Miller/Chen (1994), p. 1; Craig (1996), p. 302; Hutzschenreuter/Israel (2009), p. 426.
[288] See Hitt et al. (1996), p. 1084; Zúñiga-Vicente et al. (2004), p. 1379; Hutzschenreuter/Israel (2009), p. 441.
[289] See Zúñiga-Vicente et al. (2004), p. 1378; Hutzschenreuter/Israel (2009), p. 444.
[290] See Baird et al. (1988), p. 425; Olusoga et al. (1995), p. 153.
[291] See Nair/Kotha (2001), p. 221; Hutzschenreuter/Israel (2009), p. 448.
[292] See Ketchen et al. (2004), p. 788; Ferlic et al. (2008), p. 4.
[293] See Chen/Hambrick (1995), p. 453; Young et al. (1996), p. 243; Ferrier et al. (1999), p. 372; Ferrier (2001), p. 858; Ferlic et al. (2008), p. 9.

and a broad repertoire of competitive actions as well as higher competitive action levels increase firm performance.[294] For instance, Ketchen et al. (2004) indicated that the base of market leaders deteriorates (faster) when challengers show more aggressive behaviours and perform more competitive moves[295]. Especially when challengers' moves appear to be unpredictable and tenacious, market-leaders had problems to counter-steer.[296] On the other hand, in correspondence to competitive rivalry research, Rindova et al. (2004) presented evidence that competitive actions, which erode the distance between market positions of two competitors, can even result in lower performance of the attacker.[297] Eventually, firms can run into "red queen traps."[298] In this way, intensified competition can lead towards a "competitive war" between market players.[299] Within these "competitive wars", competitors may only engage in competitive moves to stay in the game, rather than enhancing their performance.[300]

With respect to this research, it is proposed that the focal OEM can exploit GS as a means to induce increased competition or even "competitive wars" between its suppliers, in order to reap benefits from it. In this context, especially the difficulty to predict behaviours of new market entrants (like suppliers from LCC markets) is supposed to have major effects on IC suppliers' competitive behaviours. However, in order to arrive at these propositions, the next chapter will describe theories in the field of CD. Afterwards, one of these theories will be chosen and applied to the context of this research.

3.6 Application of Competitive Dynamics: Calculations similar to game theoretical considerations as analysis-tool for this research

As postulated by organisational studies, the way firms act and react is crucial for their economic performance.[301] For this reason, competitor analyses became one of the most crucial tools for organisational and industrial research.[302] With focus on the application of the CD, scholars delineate theoretical boundaries in CD research and examine various competitive interactions among firms[303] through employing various other models and

[294] See Ferrier (2001), p. 859; Ketchen et al. (2004), p. 781; Ferlic et al. (2008), p. 9.
[295] See Ferrier et al. (1999), p. 372; Ketchen et al. (2004), p. 782.
[296] See Ketchen et al. (2004), p. 783.
[297] See Chen/Miller (1994), p. 87; Rindova et al. (2004), p. 671; Ferlic et al. (2008), p. 10.
[298] See Barnett/Hansen (1996), p. 139.
[299] See Rindova et al. (2004), p. 671.
[300] See Ferlic et al. (2008), p. 10; Chen/Miller (2012), p. 159; Haleblian et al. (2012), p. 1037.
[301] See Smith et al. (1991), p. 60.
[302] See Chen et al. (2007), pp. 101-102; Hitt et al. (2012), p. xix.
[303] See Ketchen et al. (2004), p. 783.

theories.[304] Thus, in order to apply a theoretical lens to this research, a supporting conceptualisation must be chosen (For a discussion whether CD is a theory on its own, see Annexure, pp. A8-A13). In this context, Furrer and Thomas (2000)[305] proposed their "rivalry matrix" to determine the appropriate conceptual lens for research in the field of CD. They distinguished two defining factors, namely predictability of the environment and the number of decision variables focal firms have to face. Following Furrer and Thomas (2000)[306], a narrow scope in decision variables is applicable when the content of behaviours of market players is predictable. In contrast, a broad scope is applicable when the scope of these behaviours can be manifold and complex. In relation to predictability of the environment, predictable environments show a certain degree of stableness or incremental change of the market equilibrium. Unpredictable environments are prone to "Schumpeterian shocks", which can rearrange market configurations. For illustration, situations of unexpected technological changes or new market entrants fall into this category.[307] In sum, these two dimensions distinguish four broad analytical approaches of CD research, which encompass competitor analyses:

(1) Firstly, when an environment is considered as relatively stable and few decision variables exist, Furrer and Thomas (2000)[308] propose that conclusive approaches like game theoretic considerations are the best tool for analysing CD. Game theoretic approaches facilitate mostly mathematical models which consider various strategic choices with regard to possible payoffs of various action and response possibilities.[309] Despite its proposed utility, many game theoretic models have been criticised of being too simplistic and focussing overly on rational decisions.[310] However, more recent research has tackled this problem by better quantifying optimal reactions, applying it to market share models and developing models that better reflect reality.[311]

(2) Secondly, in situations in which firms face few decision variables and the environment is uncertain, scenarios, simulations, and system dynamic modelling can be used to apply CD research.[312] On the one hand, Scenarios are used to predict different futures and say

[304] See Furrer/Thomas (2000), p. 619.
[305] See Furrer/Thomas (2000), p. 620.
[306] See Furrer/Thomas (2000), p. 620.
[307] See Furrer/Thomas (2000), p. 620.
[308] See Furrer/Thomas (2000), p. 620.
[309] See Camerer (1991), p. 137; Saloner (1991), p. 119; Ketchen et al. (2004), p. 783.
[310] See Ketchen et al. (2004), p. 783.
[311] See Basuroy/Nguyen (1998), p. 1396; Oster (1999), p. 250; Vilcassim et al. (1999), p. 499; Ketchen et al. (2004), pp. 783-784.
[312] See Furrer/Thomas (2000), p. 620.

something about probabilities that certain things are about to occur. Scenarios use narrative or script-like approaches to analyse CD.[313] On the other hand, simulations and system models try to uncover the consequences of different actions as well as assess cause-effect relations of dynamic interactions, including feedback-loops.[314] In sum, all these approaches are aimed at determining long-term implications of certain strategies in uncertain environments and can even uncover paradox forces or non-linear relationships between incidents.[315]

(3) Thirdly, warfare models and multipoint competition are most applicable when the firm's environment is predictable and many decision variables exist.[316] Most basically, models in the field of multipoint competition and business-warfare[317] frequently include references to military strategies.[318] For example, studies on multipoint competition asses situations in which competitors face each other in multiple markets and discuss market conditions like motivations of market players, reaction and response behaviours among these firms and movement towards new market equilibriums.[319] These studies are often comprised of considerations for resource allocations, which can reconfigure and modify competitive structures within industries.[320]

(4) Finally, within situations in which firms are facing an uncertain environment and many decision variables, frameworks are considered to be the most appropriate tools to study CD.[321] Frameworks can identify most crucial factors and their interactions. Thereby it encompasses various variables and captures actual competition.[322] For example, the most prominent framework is Porter's five forces framework. The five forces framework postulates that firms are under continuous pressures from five distinct forces, namely from buyers, suppliers, direct competitors, possible product substitutes and potential new entrants.[323]

In relation to this research, it surfaced that a conclusive approach (similar to game theoretic considerations) would be most suitable. On the one hand, the decision variable which are

[313] See Schoemaker (1993), p. 193;Furrer/Thomas (2000), p. 620.
[314] See Warren (1995), p. 10; Furrer/Thomas (2000), p. 621.
[315] See Lengnick-Hall/Wolff (1999), p. 1109; Furrer/Thomas (2000), p. 620.
[316] See Furrer/Thomas (2000), p. 621.
[317] See Karnani/Wernerfelt (1985), p. 87; Ries/Trout (1986), p. 77; Smith et al. (1991), p. 60; Lengnick-Hall/Wolff (1999), p. 1109; Haveman/Nonnemaker (2000), p. 232; Furrer/Thomas (2000), p. 621.
[318] See Tzu (2003), p. 10.
[319] See Karnani/Wernerfelt (1985), p. 1096; Furrer/Thomas (2000), p. 621.
[320] See Baum/Korn (1996), p. 255; McGrath et al. (1998), p. 724; Furrer/Thomas (2000), p. 621.
[321] See Furrer/Thomas (2000), p. 621.
[322] See Porter (1991), p. 95; Furrer/Thomas (2000), p. 621.
[323] See Furrer/Thomas (2000), p. 621.

assessed are the ex-work prices of items. On the other hand, in the context of the focal OEM, the market environment was considered to be relatively stable and controllable, since in producer-driven commodity chains, the control of supply chains is attributed to the manufacturers and changes are often induced by them.
Subsequently, as proposed by Furrer and Thomas (2000)[324], an approach similar to game theoretic models[325] was applied for analysing CD. As will be outlined (more precisely) in chapter 5.3, the approach utilised within this research incorporates the calculation of price-dispersions of price-offers, since price-dispersions have been argued to be negatively related to the degree of market dynamics and competitive tensions between competitors (See chapter 5.3).

In order to make the general assumptions of this research testable (concerning the beneficial indirect effects of GS), the next section proposes the hypotheses of this research and argues that the cost pressures stemming from GS, through the means of LCC suppliers participation, are believed to lead increased competitive pressures on the IC supply base.

4 Hypotheses emerging from a systematic integration of Global Sourcing and Competitive Dynamics in the automotive sector

4.1 The indirect effects of Competitive Dynamics: Low-cost-country-supplier participation in price negotiations increasing competitive pressures on industrialised-country suppliers

As already indicated earlier, several studies highlight ambivalent effects of GS.[326] Particularly for products with rapid changing designs and modifications, GS causes increased efforts due to the high requirements on cross-functional integration between different departments, such as R&D, manufacturing, and marketing.[327] Furthermore, scholars like Horn et al. (2013) created awareness for the phenomenon, that GS projects may promise exceptional high savings, but often these projects cause costly back-sourcing efforts.[328] Therefore, this chapter argues for positive indirect effects of GS on price-levels of suppliers through a CD lens.

[324] See Furrer/Thomas (2000), p. 621
[325] See Camerer (1991), p. 137; Saloner (1991), p. 119; Ketchen et al. (2004), p. 783.
[326] See Horn et al. (2013), p. 27.
[327] See Kotabe/Murray (2004), p. 7.
[328] See Horn et al. (2013), p. 27.

Generally, the optimal configuration of the supplier base is a central issue in supply chain management.[329] Prior research mainly focused on aspects such as number of suppliers, lot sizes, or supplier relationships.[330] In contrast, more recent research also took the requirements of an increasingly globalised business environment into consideration, implying the need to build up an international set of suppliers.[331] In this context, the additional evaluation of international suppliers could be used to create competitive contact points between IC and LCC suppliers.[332] The goal of this approach is to minimise the purchasing costs through the consideration of multiple suppliers and the resulting competition.[333] It has been argued that competitive environments and high cost pressures are the main opportunities to save substantial costs.[334] This research asserts that the postulated effects of increased competition are particularly likely to affect the pricing behaviour of IC suppliers. One important reason is the trend towards supplier consolidation[335], especially in industrialised countries. Eventually this could lead to a change of balance of power between buyers and suppliers. In this context, GS is considered to be an appropriate means to counter steer the effects of consolidation of suppliers and their increased market power.

Already Petersen et al. (2000)[336] acknowledged that GS can induce competition in the IC supply base. On the one hand, in markets with many suppliers and strong competition, price reductions can be achieved because the involved suppliers face the risk of not finding a buyer to do business with.[337] Put in another way, from a game theoretical perspective, the higher the number of suppliers as well as their heterogeneity in a market, the closer are the offered prices to the economic welfare maximising equilibrium price.[338] On the other hand, suppliers from LCCs usually face the problem that in established industrialised markets, long lasting business relationships exist between buying organisations and their suppliers.[339] In order to create successful relationships with industrialised organisations

[329] See Agrawal/Nahmias (1997), p. 291; Gadde/Snehota (2000), p. 305; Wagner/Johnson (2004), p. 3066.
[330] See Gadde/Snehota (2000), p. 305.
[331] See Wagner/Johnson (2004), p. 717.
[332] See Steinle/Schiele (2008), p. 7.
[333] See Friedl/Wagner (2012), p. 3066.
[334] See Krieger (2003), p. 1.
[335] See MacNeill/Chanaron (2005), p. 92.
[336] See Petersen et al. (2000), p. 31.
[337] See Grossman/Helpman (2002), p. 85.
[338] See Oi (1961), p. 58; Bresnahan (1982), p. 87.
[339] See Cannon et al. (2010), p. 507; Faust/Yang (2012), p. 37.

themselves, LCC suppliers are expected to offer their products at significant lower prices as compared to IC suppliers.[340] This aggressive pricing behaviour can be seen as a competitive action provoking a response from established suppliers, due to the fear to lose shares of their businesses.[341] As a consequence, it can be expected that particularly industrialised suppliers reduce their prices if actors from LCCs enter the market.[342] Additionally, even though factor-costs are lower in LCCs[343], chiefly industrialised suppliers possess the financial resources and technologies that allow them to remain competitive in a global environment.[344] Therefore it is assumed, that CD are significant stronger when LCC-suppliers are involved in price-negotiations with IC suppliers, since suppliers from IC suppliers possess the financial and technological resources as well as the competitive pressure that are necessary to compete with those prices offered by LCC-suppliers. Therefore it is proposed that:

H2: In price-negotiations with LCC-supplier participation, the price pressures on IC suppliers are significant higher than in price-negotiations without LCC-supplier participation.

4.2 Distinctive effects of Competitive Dynamics: Positive effects for initially negotiated items weakening for repeatedly negotiated parts

In correspondence to earlier chapters, two main types of international economic networks can be distinguished, namely producer-driven and buyer-driven commodity chains. In this context, producer-driven commodity chains consist mostly of large and transnational manufacturers that produce capital- and technology intensive products, such as the automotive industry.[345] Within the automotive sector, OEMs fulfil a central role in controlling and coordinating production and supply-chain networks. They possess strong market power and suppliers are more dependent on them than producer-driven commodity chains.[346] Additional, as indicated before, the decreased depth of value added of OEMs and

[340] See Holweg et al. (2011), p. XX; Narasimhan et al. (2009), p. 374; Hamel/Prahalad (2012), p. 5.
[341] See Lamberg et al. (2009), p. 48.
[342] See Lacity/Rottman (2006), p. 59.
[343] See Ghoshal (1987), p. 428; Kogut (1985), p. 19; Hartmann et al. (2008), p. 32; Steinle/Schiele (2008), p. 3; Beugelsdijk et al. (2009), p. 126; Horn et al. (2013), p. 28.
[344] See Kogut (1985), p. 19; Barney (1991), p. 99.
[345] See Gereffi (1999), p. 14.
[346] See Gereffi (1999), p. 14.

increased supplier-consolidation[347] changed the interdependencies between both sides. As indicated in the CD literature, companies (suppliers) can gain substantial competitive benefits by engaging in first mover activities in new markets.[348] The first mover advantages arise through learning curve effects, control of scarce resources, or the creation of buyer switching costs.[349] As in most producer-driven markets, suppliers in the automotive sector can benefit substantially from learning curve effects and the creation of interdependencies, due to buyer switching costs when gaining access to newly developed markets or products.[350] Therefore, initial sourcing decisions of OEMs are expected to have high impacts on market dynamics of suppliers, since suppliers are expected to benefit substantially from first mover benefits (when gaining access to newly developed products), this research assumes that the effects postulated in hypothesis 2 are especially existent for initially negotiated products. Consequently, next to the general proposition that IC suppliers reduce their prices if actors from LCCs enter the market (H2)[351], this research proposes that these competitive pressures are particularly apparent in first negotiations of new items, since succeeding in these negotiations can yield substantial competitive advantages for suppliers, due to first-mover benefits.[352]

H3: The assumed effects that significant higher competitive pressures are evoked when IC suppliers are confronted with competition from low-cost-countries are particularly apparent in the context of initially negotiated items.

In contrast to the assumption that CD are especially apparent in situations involving initially negotiated items, ambivalent results for items that have already been negotiated before (repeatedly negotiated items) are expected. Over the span of the product life-cycle, it is expected that repeatedly negotiated items moved already towards the economic equilibrium price through earlier price-competition between suppliers.[353] Potential profits for suppliers are relatively low, undermining the supplier's motivation to engage into price competition. Subsequently, suppliers which already delivered a certain item in the past, created first-mover advantages, such as learning effects, economies of scale and the

[347] See Milligan (1999), p. 60; Chang/Park (2012), p. 1.
[348] See Ketchen et al. (2004), p. 784.
[349] See Lieberman/Montgomery (1988), p. 41; Boulding/Christen (2001), p. 20.
[350] Humphrey (2001), p. 20
[351] See Kerkhoff (2005), p. 39; Rottman/Lacity (2006), p. 56.
[352] See Lieberman/Montgomery (1988), p. 41; Boulding/Christen (2001), p. 20.
[353] See Oi (1961), p. 58; Bresnahan (1982), p. 87.

creation of buyer switching costs.[354] Even though, those first-mover advantages can be eroded, late-entry suppliers would have substantial problems in catching up to the competitive advantages of established suppliers.[355] Thus, even though competitive pressures stemming from LCC-suppliers are still believed to influence price-levels of IC suppliers, this effect is assumed to be weaker than for initially negotiated items. Consequently, hypothesis 4 states that:

H4: The assumed effects that significant higher competitive pressures are evoked when IC suppliers are confronted with competition from low-cost-countries is less systematic in the context of repeatedly negotiated items, as compared to initially negotiated items.

5 Methodology

5.1 Methodological approaches in Competitive Dynamics research: Mostly archival records and perceptual data as bases for past research

Within the field of CD, there is a vast amount of approaches and concepts. Consequently, until today there is no generally accepted consensus on the operationalisation of CD.[356] However, a common interpretation is that competitive pressure on rivals is created through initiative actions, inviting or provoking competitors to respond.[357] Through the course of the years, CD research studied a broad range of industries, including banking, photography, high tech, computer, airline, brewing, telecommunications, software and many more industries.[358] For a thoroughly assessment of competitive studies researched, see Smith (2001)[359].

With respect to methodological approaches, there have been several analytical attempts, like qualitative studies [360], simulation [361] or more quantitative and econometric

[354] See Lee et al. (2000), p. 23; Boulding/Christen (2001), p. 20.
[355] See Lee et al. (2000), p. 23.
[356] See Lamberg et al. (2009), p. 46.
[357] See Chen et al. (1992), p. 440; Chen/Miller (1994), p. 86; Lamberg et al. (2009), p. 48.
[358] See Smith et al. (2001), p. 76.
[359] See Smith et al. (2001), p. 75.
[360] See Jones (2001), p. 311.
[361] See Park/Zhou (2005), p. 531; Kunc/Morecroft (2006), p. 1146.

approaches[362]. However, empirical research based on e.g. large scale objective data is rare.[363] As Chen and Miller (2012)[364] state, most often CD research relied on archival records of firm-actions from third-sources[365], response-questionnaires from industry experts or managers[366] and field interviews[367]. Resulting from previous research, several promising constructs for measuring CD can be identified:

(1) Firstly, move frequencies, which are measured by the number of competitive actions taken by a firm over the span of certain periods.[368]
(2) Secondly, CD as a change in market shares between competitors.[369]
(3) Thirdly, focussing on the relative market-positions of companies.[370] This approach was mainly based on benchmarks, like the Fortune 500 companies benchmark. This comparison also included considerations for changes in annual sales of firms relative to their major rivals.[371]
(4) Finally, constructs assessing repertories, configurations of actions, response speed and their impact on overall firm performance.[372]

With regard to evolutionary tendencies in terms of methodology, following Chen and Miller (2012)[373], there has been a methodological progression from empirical and quantitative research to case/qualitative analyses[374], formal modelling[375] and more theoretical approaches[376]. However, despite the trend towards more qualitative and theoretical approaches, this research found that CD is from an empirical viewpoint "under-researched", since most research until now gathered data solely through questionnaires and archival records rather than objective empirical measures.[377] Therefore, this research is one of the few studies in the CD environment that makes an impoartant step backwards and

[362] See Ferrier (2001), p. 858; Chen/Miller (2012), p. 157.
[363] See Wade (1995), p. 111; Audia et al. (2000), p. 837 ; Chen et al. (2010), p. 1529.
[364] See Chen/Miller (2012), p. 157.
[365] See Smith et al. (1991), p. 61; Yu/Cannella Jr (2007), p. 665.
[366] See Hambrick/Mason (1984), p. 193; Desarbo et al. (2006), p. 101; Marcel et al. (2011), p. 115.
[367] See Lamberg et al. (2009), p. 46; Chen/Miller (2012), p. 157.
[368] See Young et al. (1996), p. 243; Ferrier et al. (1999), p. 372; Chen et al. (2010), p. 1538.
[369] See Ferrier et al. (1999), p. 372; Ferrier (2001), p. 372; Chen et al. (2010), p. 1536.
[370] See Ferrier (2001), p. 858.
[371] See Ferrier (2001), p. 858; Ferlic et al. (2008), p. 16.
[372] See Miller/Chen (1994), p. 1; Miller (1996), p. 505; Miller/Chen (1996), p. 1209.
[373] See Chen/Miller (2012), p. 162.
[374] See Lamberg et al. (2009), p. 53.
[375] See Park/Zhou (2005), p. 539.
[376] See Chen (1996), p. 100; Gnyawali/Madhavan (2001), p. 918.
[377] See Smith et al. (2001), p. 46; Chen et al. (2010), p. 1543.

seeks to go beyond analyses of simple action-response dyads, repertoires[378], streams of competitive moves[379] or interaction histories[380] which are based on subjective perceptions of journalists, researchers or managers.[381] Hence, the use of secondary data of real-market behaviours allows this study to capture a firm's dynamics market environment from a more objective standpoint than human perceptions.

Like in the work of Gerardi and Shapiro (2009)[382], this study focuses on how low-cost competition can increase rivalry and lead to a lower degree of price-dispersion in the market. A further explanation of the data, independent variables and dependent measures will be given in the next sections.

5.2 Procedure: Secondary data representing the data source of this study, because it mirrors real organisational behaviour

In CD and GS, there has been a call for research facilitating *"(...) objective and ex-post, nonetheless comparable data, reflecting actual achievements"*[383], more fine-gained analytical approaches[384] and considerations for how firms behave over time from a long-term perspective[385]. It has been acknowledged that competitive actions can cover a wide range of activities such as investments in R&D activities[386] or the entrance in new market segments[387]. Additionally, economic calculations and offered market prices have been argued to be reliable measures of market power of competitors[388] and signals of competitive action[389].

Following these suggestions, secondary sourcing data from a large European automotive OEM was collected and analysed. The data covered requests for (productive) car-materials as well as the respective quotations from suppliers. In detail, for each part, the requested suppliers, the awarded suppliers, the offered prices, the volumes, and the sourcing date was included in the dataset. Additionally, depending on whether the items have been purchased

[378] See Miller/Chen (1996), p. 1209.
[379] See Ferrier (2001), p. 858.
[380] See Kilduff et al. (2010), p. 943; Chen/Miller (2012), p. 158.
[381] See Ferrier (2001), p. 858.
[382] See Gerardi/Shapiro (2009), p. 31.
[383] Schiele et al. (2011), p. 319.
[384] Easton et al. (2002), p. 126.
[385] Hutzschenreuter/Israel (2009), p. 421; Lamberg et al. (2009), p. 46.
[386] Katila et al. (2012), p. 127; Chen et al. (2010), p. 1527.
[387] Katila et al. (2012), p. 127.
[388] Gerardi/Shapiro (2009), p. 31.
[389] Lamberg et al. (2009), p. 48.

in the past, cost-saving information was included in the dataset. Summarised, the dataset consisted of 20.923 requests for quotation.

Data has been gathered over the extent of five consecutive years, from 2008 to 2012. As stated by Haenecke (2002) and Horn et al. (2013), this sort of longitudinal design is favourable for controlling for effects of particular years and to avoid misinterpretations. [390] For each item, two distinctive databases have been assessed. One contained the annual % cost-savings of delivered items and the other included information about price-negotiation and suppliers. In contrast to the first database, which included data of all items sourced by the focal company, the latter price-negotiation database only included sourcing projects (a sourcing project included purchasing a combination of items that are needed for manufacturing a particular product, like a certain car-model) that exceeded a total turnover of 125.000 Euros per sourcing-project or 50.000 Euros per item-quotation. This limitation had company-specific reasons. Therefore, the two databases varied considerably with respect to the total number of cases included. More precisely, the database including information about savings consisted of approximately 2.200.000 cases and the dataset including price-negotiations included about 600.000 cases. Through consolidation of price-offers per year and matching repeatedly negotiated items, about 30.000 primary cases have been identified. Ultimately, after cleaning for outliers (with a standard deviation >|3|) and "restricted items" (items automatically excluding competition, like e.g. innovative items that were only negotiated with certain suppliers), the final dataset consisted of 20.923 cases, respectively 10.148 cases for initially negotiated items (i.e. those which are sourced for the first time, because the end-product to which they contribute is new to the market) and 10.775 cases for repeatedly negotiated items (i.e. those with renegotiated prices for parts built into running series).

Concerning the groups that were compared in this research, five distinctive negotiation-groups got identified through the information given in the price-negotiation database. Every constellation of suppliers that made a quotation to a request was assigned to a discrete group in dependence upon the countries the suppliers were located in (see Table 1). The countries were assigned to either the LCC or IC group of suppliers. The assignment was made on basis of the local procurement index (LPI). The LPI was a

[390] Haenecke (2002), p. 170; [Horn, 2013 #1140@31}

construct of the focal OEM, which aims at determining factor-costs within different countries. In essence, the LPI was an empirically guided tool that assessed prices of in-depth localised and technical comparable parts on basis of common project exchange rates and macro-economic data, thereby also adjusting for exchange rates and other factor costs in each country. Countries with lower LPI, respectively lower factor-costs than Western Europe (Belgium, Germany, France, Great Britain, Ireland, Liechtenstein, Luxembourg, the Netherlands, Austria, Switzerland and Spain) were classified as LCCs.

Table 1: Post-Defined Supplier Groups in this Research

Group	Description of supplier constellation	Type
A	- Quotations only from industrialised suppliers	Uniform
B	- Quotations only from low-cost country suppliers	Uniform
C	- Quotations from industrialised as well as low-cost country suppliers - Sourcing from industrialised country suppliers	Mixed/ uniform
D	- Quotations from industrialised as well as low-cost country suppliers - Sourcing from low-cost country suppliers	Mixed/ uniform
E	- Quotations from industrialised as well as low-cost country suppliers - Sourcing from industrialised as well as low-cost country suppliers	Mixed/ mixed

Following this idea (see Table 1), there were constellations in price-negotiations, in which only suppliers from ICs made quotations (group A). Similarly there were also constellations in which only suppliers from LCCs made quotations (group B). Moreover, for those situations in which suppliers from LCCs as well as IC suppliers were involved, further groups were distinguish based on the distinction to which supplier the project was granted. Consequently group C covered the cases in which a mixed group of suppliers (LCC and IC) made quotations but the project was finally assigned to an IC supplier. Group D reflected the opposite, a situation where a mixed group of suppliers made offerings, but a supplier from a LCC was granted to deliver. The final group (group E) covered a mixed group of suppliers. Quotations from LCC as well as ICs, and both, LCC and IC suppliers were awarded with an order as first and second (third etc.) sources.

After assigning the groups, a threshold of at least 50 cases per year per group was handled in order to assure a reliable sample sizes[391]. Therefore, the groups including only LCC suppliers (group B) and those in which delivery of items was granted to both, LCC as well as IC suppliers (group E), were excluded from further analyses (For the descriptive data see Annexure, p. A1-A2). Ultimately, the statistical analyses were based on groups A, C & D.

In addition, the databases also contained variables that were used as control variables in the research design. Firstly, research has shown that demand can have strong effects on the realisation of cost-savings, because a higher purchasing volume can enhance economies of scale of the suppliers.[392] Hence, in this research, the demand per item was used as control variable. Secondly, also the characteristic of an item has been shown to have effects on sourcing performance, for example, it was found that especially electric components can yield increased cost-reductions, through on-going innovation efforts.[393] Consequently, also the commodity-group of the analysed items was taking into account. The commodity-groups were based on the focal company's a-priori categorisations, namely either power-train, exterior, interior, electric or metal components.

Subsequently, after presenting the characteristics of the databases, the independent variables, the classifications of the competitive groups and control variables, the next chapter gives a deeper insight into the dependent variables and their measurement.

5.3 Dependent variables: Cost-savings reflect profitability, whereas the price-differences between the best and the second best offers reflect the intensity of competition

Concerning the first hypothesis (*H1: Sourcing items from low-cost-country suppliers leads to significant higher savings than sourcing parts from IC suppliers)*, the analyses aimed at comparing the cost-savings of items. Comparable to the study of Schiele et al. (2011)[394], the savings of items were calculated relative to the total number of items purchased and not just as price-differences between the focal and the previous year. For example, when a supplier offered a 20% price reduction for all items, but delivered only a fourth of the total

[391] See VanVoorhis/Morgan (2007), p. 48
[392] See Ettlie/Sethuraman (2002), p. 349.
[393] See Zhang/Gimeno (2010), p. 743.
[394] See Schiele et al. (2011), p. 327.

material needed, then the savings were recorded as 5%. As indicated by Schiele et al. (2011)[395], this calculation offers a realistic picture for analyses and interpretation.

Since it is supposed that GS does not always lead to exceptional savings[396], in relation to the other hypotheses, the indirect effects of GS were measured under a CD lens. As indicated before, a common interpretation of CD is that competitive tension, respectively pressure on rivals, is created through initiative actions, inviting or provoking competitors to respond.[397] These actions can cover a wide range of activities such as investments in R&D activities[398], entrance in new market segments[399] and change in offered market prices[400]. Accordingly, the prices that suppliers ask for their products are argued to be important signals in the market, particularly due to the fact that prices are well observable competitive actions.[401] Thus, in relation to hypotheses H2, H3, H4 and H5, the pricing behaviour of suppliers was used as an indicator of CD and competition. This is also in line with Livengood and Reger (2010), who describe a competitive action as a detectable move, which can be a price change that a company initiates in order to improve or defend its competitive position.[402] Hence, this research tried to uncover competitive tensions between suppliers through the means of mathematic calculations of price-dispersions among offers of different suppliers. Within CD research, competitive tensions are defined as "*the strain between a focal firm and a given rival that is likely to result in the firm taking actions against the rival.*"[403] These tensions, respectively often called intensity[404] or threat[405], can also include concepts like reciprocal threat[406], multimarket contacts[407] and market commonalities.[408] "*Tension defines the forces that build up and tend to pull a static interfirm relationship into dynamic behavioural interplay between rivals.*"[409] Even though tension was often conceptualised as psychological phenomenon, this research tries to capture tension through mathematical calculations.

[395] See Schiele et al. (2011), p. 327.
[396] See Schiele et al. (2011), p. 3.
[397] See Chen et al. (1992), p. 440; Chen/Miller (1994), p. 86; Lamberg et al. (2009), p. 48.
[398] See Katila et al. (2012), p. 127.
[399] See Katila et al. (2012), p. 127.
[400] See Ferrier et al. (2002), p. 310; Lamberg et al. (2009), p. 48.
[401] See Lamberg et al. (2009), p. 48.
[402] See Livengood/Reger (2010), p. 50
[403] Chen et al. (2007), p. 102.
[404] See Barnett (1997), p. 128.
[405] See Mitchell (1989), p. 208.
[406] See Gimeno (1999), p. 101.
[407] See Evans/Kessides (1994), p. 341; McGrath et al. (1998), p. 724.
[408] See Chen (1996), p. 100; Chen et al. (2007), p. 103.
[409] See Chen et al. (2007), p. 103.

More precisely, for the study at hand, an approach utilising price calculations (similar to mathematical game theoretic considerations) assessed the convergence of offered prices. Based on the classical price competition model (also called Arrow Model of perfect competition[410]), negotiated prices are believed to converge towards the marginal costs when competition is perfect.[411] Gerardi and Shapiro (2009)[412] argued that traditional economic theories postulate that price-dispersion is negatively affected by competition, since companies are generally considered to be price-takers. Therefore, theoretical approaches of this matter often hypothesised that the more a market moves towards perfect competition, price-dispersions will decrease and a convergence of offered prices will appear.[413] In support of this theoretical notion, the empirical work of Gerardi and Shapiro (2009) and Baron et al. (2004) showed that increased competition significantly forced market players to decrease price dispersion[414], as long as companies did not engage in extended efforts of cultivating brand loyalty among its customers[415] or buyer's market-knowledge was sufficient[416]. Similar results have also been found for research assessing duopolies in internet markets[417] and city-level competition of gasoline stations[418].

It was shown that price-dispersion does not only reflect competition but also the market power of competitors.[419] Therefore, this research chose to conceptualise CD as price-dispersions between competitors and not as subjective perceptions of tensions between market players, as has been done in past research[420]. Since price-dispersions have been shown to objectively reflect competitive pressures and rivalry among market players[421], this research argues that the convergence of negotiated prices indicates the extent of competitive pressures among different configurations in the supply market. Subsequently, with regard to the measurement of price-dispersion in this research, firstly, the weighted accepted price per item was calculated. The price offered by each supplier was weighted relative to the demand of the buying firm. For example, when one accepted supplier

[410] See Arrow/Hurwicz (1958), p. 523
[411] See Dufwenberg/Gneezy (2000), p. 7.
[412] See Gerardi/Shapiro (2009), p. 1.
[413] See Dufwenberg/Gneezy (2000), p. 7; Gerardi/Shapiro (2009), p. 2.
[414] See Barron et al. (2004), p. 1041, Gerardi/Shapiro (2009), p. 30;.
[415] See Borenstein (1985), p. 380; Holmes (1989), p. 244; Borenstein/Rose (1994), p. 676; Gerardi/Shapiro (2009), p. 2.
[416] See Lach (2002), p. 434.
[417] See Chevalier/Goolsbee (2003), p. 213.
[418] See Lewis (2008), p. 656.
[419] See Chevalier/Goolsbee (2003), p. 213.
[420] See Chen et al. (2007), p. 101.
[421] See Chevalier/Goolsbee (2003), p. 213; Gerardi/Shapiro (2009), p. 2.

offered 100 items for 1 Euro and another 10 items for 1.10 Euros, the weighted average mean was 1.01 Euros. After calculating the weighted mean of accepted offers, the difference between the weighted accepted offers and the declined offers was calculated. The offer that was closest to the weighted accepted offer was used as reference point for this calculation. Then, this price-difference was divided by the weighted accepted offers to create the final price-difference measure, which is expressed in percentages. The reason for calculating the price-dispersion in reference to the closest declined offer (and not in reference to all declined offers) is based on the characteristics of the data. As indicated by experts within the focal company, some of the declined offers within the database were considered "trial and error" offers of suppliers, rather than reflecting real competitive offers. Since identification of the "trial and error" offers was not possible, the closest declined offer was chosen as basis for calculating price-dispersion. The comprehensive formulas of the calculations are presented below:

Calculations of % price-dispersion per item:
Weighted accepted price: $(P_{a1}*D_1+ P_{a2}*D_{2+}\ldots+P_{an}*D_{an}) / D_{total}= P_{wa}$
% Price-dispersion= $(P_{wa}-P_d) / P_{wa}$

P_a = Accepted offer D_a = Demand per accepted offer
D_{total} = Sum of all demands P_{wa} = Weighted accepted price
P_d= declined offer with lowest distance to P_{wa}

5.4 Data analyses: Contrast-modelling including multiple contrast analyses as a suitable methodological approach for this research setting

Subsequently, after clarifications of the procedure as well as the independent and the dependent variables of this research, this section describes the applied statistical analyses.
In relation to statistics, researchers have the choice between two broad branches of inferential statistic procedures to answer their hypotheses, namely parametric and non-parametric tests. [422] Essentially, parametric tests are considered to be more accurate and contain more information / use higher-order measurements than non-parametric tests.[423] In this context, "more accurate" refers to a higher probability that the procedure will report

[422] See Wolfowitz (1942), p. 264; Rubin (2012), p. 157.
[423] See Vaughan (2001), p. 6; Langdridge/Hagger-Johnson (2009), p. 189.

that two variables are related to each other, when (in fact) they truly are related. Additionally, the interpretation of nonparametric procedures is often considered more difficult, since non-parametric tests operate on ranks or numbered positions and not on actual data points.[424] Thus, the advantage of parametric tests is that results are often more straightforward to interpret and of more practical relevance.[425] Therefore, statisticians tend to prefer parametric over non-parametric tests.[426] However, parametric tests require assumptions of data distributions and data characteristics to be met, whereas non-parametric tests require fewer assumptions and are often called "distribution free" tests.[427] Hence, in order to enable valid analyses, parametric tests require ratio/interval data as well as a certain assumptions concerning data-distribution.[428] These assumptions include that the data follows a normal distribution pattern, that the variances are approximately the same in each group, and that the observations are independent of each other.[429]

In this context, especially the difficulty to acquire normal distributed data in scientific practice appeared to be a main discussion point among scholars.[430] Basically, the assumption of a Gaussian distribution (normal distribution) in statistics is due to the implications of the Central Limit Theorem (CLT) from probability theory.[431] The CLT proposes that no matter what the original population distribution function is, the data-points in a sample always approach the sampling distribution of the sampling mean.[432] In other words, with a sufficient sample size, the mean of a sample always moves towards the mean of the overall population and the data-points keep allocating around this mean (creating a normal distribution).[433] More precisely, the CLT proposes that the higher the sample size, the curve becomes more normal-distributed, the standard deviation decreases and the sample mean approaches the true population mean. The CLT has been argued to be applicable to virtually all contexts[434], from electrical engineering[435] to insurance and

[424] See Lindsey (1996), p. 21; Feigelson/Babu (2012), p. 106.
[425] See Vickers (2005), p. 11.
[426] See Langdridge/Hagger-Johnson (2009), p. 246.
[427] See Dytham (2011), p. 33.
[428] See Dytham (2011), p. 33; Rubin (2012), p. 157.
[429] See Festing/Altman (2002), p. 252.
[430] See Geary (1947), p. 241; Hartl/Clark (1989), p. 434; Dunning (1993), p. 63.
[431] See Denny/Gaines (2000), pp. 82-83; Mlodinow (2008), p. 144; Mandal (2009), p. 31; Gregersen (2010), p. 295.
[432] See Gregersen (2010), p. 295.
[433] See Denny/Gaines (2000), pp. 82-83.
[434] Cramer (1974), p. 231.
[435] See Leon-Garcia (2008), p. 369.

finance [436] . In relation to the scientific discussions about the different attitudes experimentalists and mathematicians have in relation to the normality (in reality) of normal distributions, Cramer (1974) responded: "It seems appropriate to comment that both parties are perfectly right [about their differing assumptions of normal distribution], provided that their belief is not too absolute: mathematical proof tells us that, under certain qualifying conditions, we are justified in expecting a normal distribution, while statistical experience shows that, in fact, distributions are often approximately normal." [437] Hence, the assumption of normal distribution is seldom 100% fulfilled in real empirical research settings.

With respect to this research, on the one hand, several formal requirements for parametric tests were already fulfilled before analysing the data, since the observations of this study were independent from each other (the different items and their attributes were not interrelated) and savings as well as price-dispersions were measured in a scale-format. On the other hand, in order to fully determine the applicability of either parametric or nonparametric tests, the degree of normal distribution and homogeneity of variances also needed to be assessed. [438] **(1)** In relation to normality of distribution, Kim (2013) recommended that data exceeding N=300 should be tested by performing a visual assessment with the Mk1 Eyeball Test and by calculating its absolute screw and kurtosis values. [439] Among all groups, the Mk1 Eyeball test revealed a good fit to normal distribution in the histograms and the P-P Plots in SPSS. Furthermore, the screws (between .03 and .04) and kurtosis (between .05 and 0.07) of the groups were in the acceptable range. [440] **(2)** Additionally, it was determined, whether the groups' ratios of largest to smallest variance was > 4, since this would have been a strong violation of the assumption of homogeneity of variances. [441] The analyses revealed no extreme variances (altogether ranging from 347.93 to 242.41), which resulted in a maximum ratio of 1.43:1 in the variance between the groups. Summarised, the test of normal distribution as well the assessment of variances revealed that all formal requirements for parametric testing have been fulfilled.

[436] See Bening/Korolev (2002), p. 36.
[437] See Cramer (1974), p. 23.
[438] See Howell (2010), p. 334.
[439] The Shapiro-Wilks test as well as the K-S and Levene's tests were not applied, since the sample size exceeded N=300, for further descriptions see West et al. (1995), p. 74; Kim (2013), p. 52.
[440] The acceptable parametric-test range of screw and kurtosis for N>300 is between 2 and -2, see Kim (2013), p. 53.
[441] As indicated by Howell (2010), p. 334, a violation of heterogeneity can be handled up to a ratio of 4:1.

In order to give answers to the research questions, statistical analyses consisted of multiple application of contrast testing. In detail, in SPSS, the option "Contrasts" in the sub-menu General Linear Models → Univariate Analyses of Variance (ANOVA) was the point of departure. Within the context of the general ANOVA, Type III sum of squares method was chosen. Firstly, it was considered as a preferable analyses approach for including control variables in the design. Secondly, type III sum of squares are invariant with respect to the cell frequencies and therefore useful for applying it to the unbalanced group sizes of this research. With respect to contrast testing, the pre-coded contrast type "simple" was chosen in SPSS. It allows contrasting one focal group to the means of the other groups.[442] Thereby, the analyses used Bonferroni(-Dunn)-type simultaneous confidence intervals based on Student's t-distribution for the contrast differences across all dependent variables.[443] The Bonferroni adjustment is applicable when the analyses are based on the premise that comparisons within a research design are pre-planned, which means that the analyses must be guided by underlying research questions and hypotheses.[444] Additionally, the Bonferroni adjustment has been generally argued to be a favourable method for comparing groups in various circumstances, even when contrasts are both, orthogonal and non-orthogonal.[445] With respect to other statistical comparison methods, in essence, all (multiple) comparison procedures are concerned with a trade-off between risks of Type I and Type II errors.[446] In this research, the Bonferroni adjustment was particularly chosen (rather than other procedures like Pillai's trace, Wilks' lambda, Hotelling's trace, or Roy's largest root criteria, available in SPSS[447]) because it is attributed to be the most conservative method, since it controls robust for Type I errors.[448] More precisely, it is the best contrast-method to reduce the chance that a result indicates that a given condition is present when it actually is not present (Type I error).

Furthermore, in relation to the 'simple' contrast type option (in the sub-menu "Contrast" in SPSS), always the mean of one focal group was compared to the means of the other groups. Concerning hypotheses testing this meant, that for hypothesis 1 "Only IC participation" and for hypothesis 2-4, "LCC & IC participation, LCC sourcing" were used

[442] See IBM-Corporation (2012), p. 7 .
[443] See IBM-Corporation (2012), p. 6.
[444] See Ingersoll (2010), pp. 36-37.
[445] See Harris (1994), pp. 95-103.
[446] See Sato (1996), p. 293; Cribbie (2003), p. 252 .
[447] See IBM-Corporation (2012), p. 6.
[448] See Caldas de Castro/Singer (2006), p. 180; Narum (2006), p. 783.

as constant contrast (respectively comparison) groups. Also, the Control variables Commodity and Demand were included in the ANOVA and Contrast test, in order to account for possible covariances. Subsequently, the data was analysed in a cross-sectional panel design for each year apart. An alpha level of .05 (one-tailed) was handled for significance testing.

After clarifying the procedures, analyses and tools for answering the research questions, the next chapter will present the findings of the contrast testing and discusses them in relation to the hypotheses stated in chapters 2.3 and 4.

6 Results

6.2 Findings concerning Savings: Cost-savings stemming from Global Sourcing remain ambiguous

This as well as the following chapter present the findings of this research, related to the hypotheses stated before. On the one hand, general F-tests were applied to obtain a first indication whether groups had significantly differing group means. On the other hand, in order to receive more fine-grained information and test the specific hypotheses, contrast-tests using Bonferroni adjustments were applied. These contrast tests determined the differences between group-means and only indicated significant findings when the group-mean differences appeared systematically and strong enough. Each sub-section within both chapters (6.2 and 6.3) begins with a repetition of one of the five research-hypotheses, followed by a discussion of the statistical findings related to it. Subsequently, a final conclusion whether a certain hypothesis is supported by the data, is located at the end of each sub-section.

H1: Sourcing items from low-cost-country suppliers leads to significant higher savings than sourcing parts from IC suppliers.

In relation to hypothesis 1, the results in Table 2a & 2b oppose the hypothesis that sourcing from LCC suppliers leads to higher savings when compared to sourcing from IC suppliers. More precisely, first ANOVA analyses (Table 2a) indicated no differences between the

groups (2008: $F_{(2,1967)}$= 0,84, not significant (n.s.); 2009: $F_{(2,1632)}$= 1,20, n.s.; 2010: $F_{(2,1821)}$= 1,69, n.s.; 2011: $F_{(2,1276)}$= 1,71, n.s.; 2012: $F_{(2,759)}$= 1,52, n.s.). A further contrast assessment (Table 2b) revealed that, in 2011, savings were 0.77% higher in the group containing "LCC & IC participation, IC sourcing" in contrast to the comparison group "LCC & IC participation, LCC sourcing". Also, in 2012, savings in the group "Only IC participation" were 0.97% higher than in the group containing "LCC & IC participation, LCC sourcing". In sum, as shown in Figure 3, the data ranging from 2008-2012 shows no systematic higher savings for parts being sourced from LCC suppliers as opposed to parts being sourced IC suppliers. Thus, hypothesis 1 is rejected.

Additionally, not only that the hypothesis is rejected, the results also show contradictory results to hypothesis 1. As shown in Table 2 and Figure 3, 2011 and 2012 significant higher savings were realised in the groups which included IC sourcing, when compared to "LCC & IC participation, LCC sourcing" (indicated by the circles in Figure 3).

Table 2a: Results of ANOVA of Savings for Repeatedly Negotiated Items (Controlled for Commodity & Demand)

Year	df	df (Error)	Mean square (Error)	F
2008	2	1967	12.82	0.84
2009	2	1632	14.02	1.20
2010	2	1821	19.18	1.69
2011	2	1276	19.05	1.71
2012	2	759	23.83	1.52

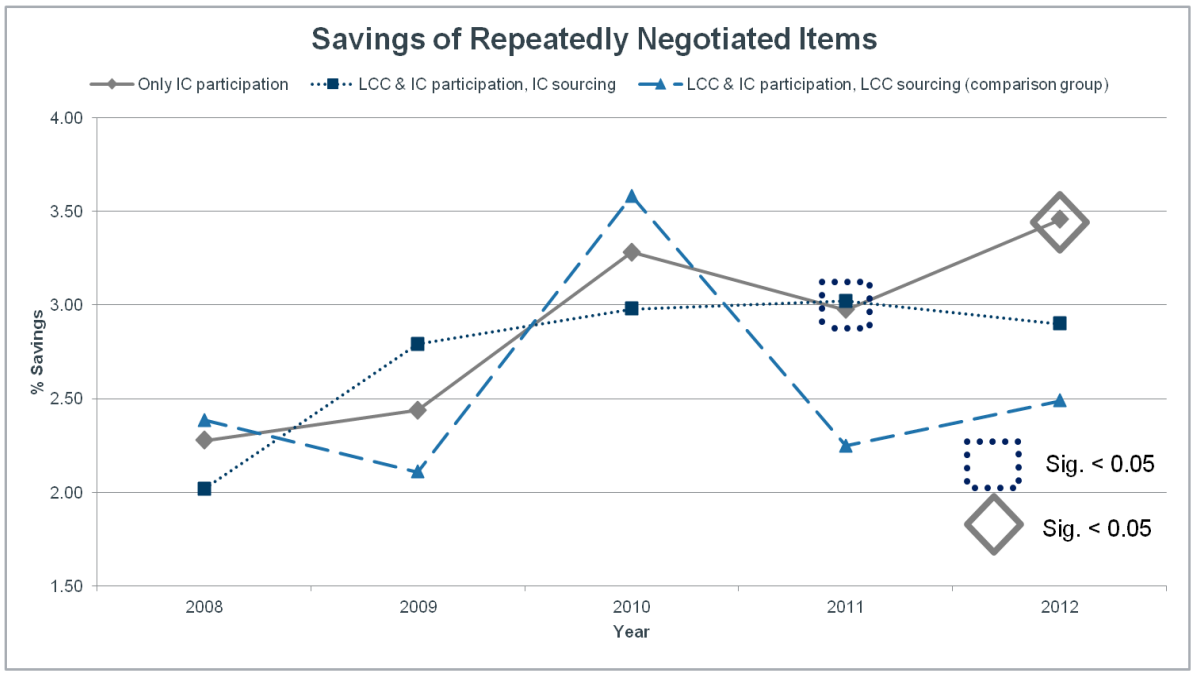
Note: no significant findings

Table 2b: Results of Contrast-Analyses of Savings for Repeatedly Negotiated Items (Controlled for Commodity & Demand)

Year	Mean of % Savings (per group)			Differences (between group-means)	
	Group D (LCC & IC participation, LCC sourcing)	Group A (Only IC participation)	Group C (LCC & IC participation, IC sourcing)	Group A – Group D	Group C – Group D
2008	2.39	2.28	2.02	-0.11	-0.37
2009	2.11	2.44	2.79	0.33	0.68
2010	3.58	3.28	2.98	-0.30	-0.60
2011	2.25	2.98	3.02	0.73	0.77*
2012	2.49	3.46	2.90	0.97*	0.41

*Note: *= sig. difference at a p<.05 level*

Figure 3: Savings of Repeatedly Negotiated Items, Adjusted for Effects of Commodity and Demand



Legend: Savings= Price-savings in comparison to the previous year, LCC = Low-Cost-Country supplier, Exclusion of cases when SD >|3| , N=10.058.

6.2 Findings concerning price-differences: Competitive pressures on industrialised-country suppliers through global sourcing appear systematically higher mostly in the context of initially negotiated items

H2: In price-negotiations with LCC-supplier participation, the price pressures on IC-suppliers are significant higher than in price-negotiations without LCC-supplier participation.

With focus on the full dataset and hypothesis 2, indirect effects of LCC-supplier participation on IC suppliers are apparent in four out of five consecutive years (see Table 3a & 3b as well as Figure 4). Overall F-tests (Table 3a) reveal that in 2008-2011 differences between groups exist (2008: $F_{(2,3245)}= 9.86$, $p<.025$; 2009: $F_{(2,3122)}= 4.72$, $p<.025$; 2010: $F_{(2,4112)}= 14.88$, $p<.025$; 2011: $F_{(2,2501)}= 15.16$, $p<.025$; 2012: $F_{(2,3109)}= 0.38$, n.s.). Hence, a closer look through contrast testing (Table 3b) indicates that the participation of LCC-suppliers significantly lead to lower price-differences between offers in 2008-2011. More specifically, the group "only IC participation" yielded in four out of five years significant lower price-differences than the group including "LCC & IC participation, IC sourcing"(the distances (with $p<,05$) between these two groups was 2.88% in 2008, 1.96% in 2009, 3.37% in 2010 and 5.84% in 2011). Only year 2012 poses an exception to this trend, since the price-difference in "only IC participation" was only 0.17% lower than in "LCC & IC participation, IC sourcing" and thus not significant.

Hence, hypothesis 2 is supported in four out of five consecutive years. More precisely, in the presence of LCC suppliers (Groups C and D) the difference of prices between the average awarded contract(s) and the best non-awarded offer was 8.70%, in the absence of LCC suppliers it was 10.20% in the mean over the five analysed years (See Table 3b). Hence this significant difference lends support to H2, assuming that a small price difference reflects a highly competitive situation and a nearer to perfect market.

Table 3a: Results of ANOVA of Price-Differences for Initially and Repeatedly Negotiated Items (Controlled for Commodity & Demand)

Year	df	df (Error)	Mean square (Error)	F
2008	2	3245	348.25	9.86**
2009	2	3122	241.53	4.72**
2010	2	4112	246.53	14.88**
2011	2	2501	342.69	15.16**
2012	2	3109	290.79	0.38

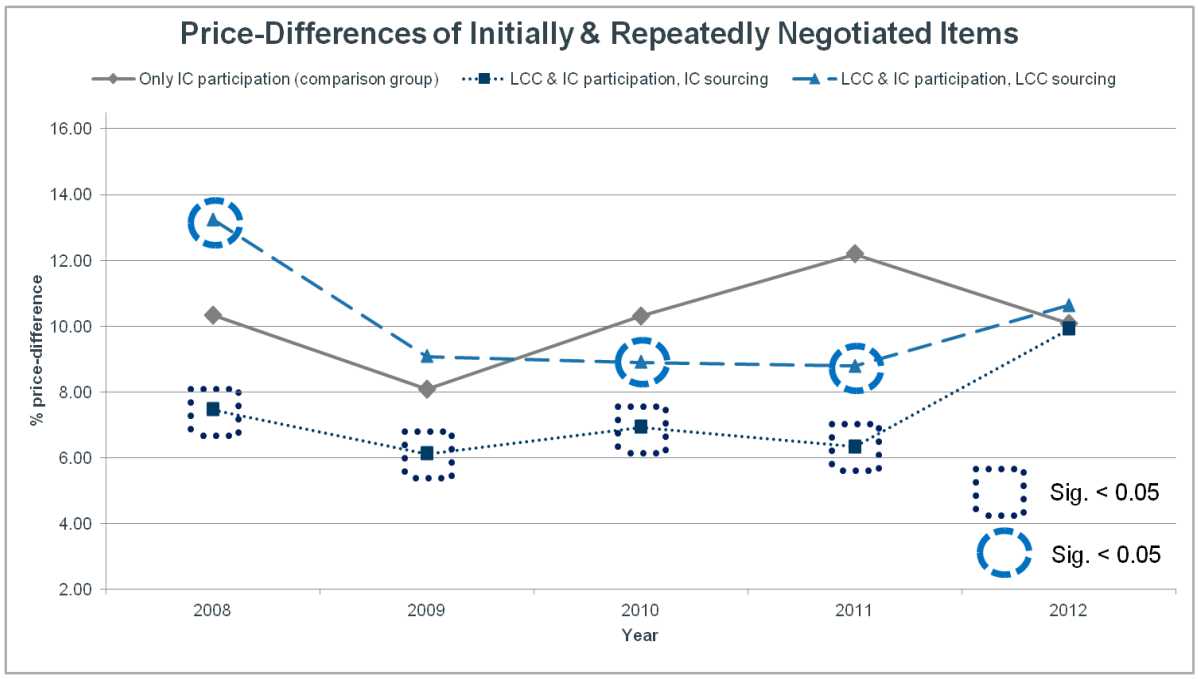
*Note: *= p<.05, **= p<.025*

Table 3b: Results of Contrast-Analyses of Price-Differences for Initially and Repeatedly Negotiated Items (Controlled for Commodity & Demand)

Year	Mean of % price-differences between offers (per group)			Differences (between group-means)	
	Group A (Only IC participation)	Group C (LCC & IC participation, IC sourcing)	Group D (LCC & IC participation, LCC sourcing)	Group C – Group A	Group D – Group A
2008	10.34	7.46	13.24	-2.88**	-2.90**
2009	8.08	6.12	9.08	-1.96**	-1.00
2010	10.30	6.93	8.90	-3.37**	-1.40*
2011	12.18	6.34	8.42	-5.84**	-3.76**
2012	10.08	9.91	10.64	-0.17	-0.55

*Note: *= sig. difference at a p<.05 level; **= sig. difference at a p<.025 level*

Figure 4: Price-Differences of Initially and Repeatedly Negotiated Items, Adjusted for Effects of Commodity and Demand



Legend: Savings= Price-savings in comparison to the previous year, LCC = Low-Cost-Country supplier, Exclusion of cases when SD >|3|, N= 19.699.

In the next steps of analyses, the total sample was split into two groups: repeated purchases (i.e. those with renegotiated prices for items built into running series) and initially negotiated items (i.e. those which are sourced for the first time, because the end-product to which they contribute is new to the market), in order to allow more fine-grained analyses and answer hypotheses 3 and 4.

H3: The assumed effects that significant higher competitive pressures are evoked when IC suppliers are confronted with competition from low-cost-countries are particularly apparent in the context of initially negotiated items.

In relation to hypothesis 3, the results presented in Table 4a & 4b as well as Figure 5 show full support for the proposition that especially in negotiations including initially negotiated parts, indirect effects of LCC-supplier participation exist. Even though overall F-tests (Table 4a) show significant differences in only four of five years (2008: $F_{(2,1262)}$= 8.56, p<.025; 2009: $F_{(2,1474)}$= 6.43, p<.025; 2010: $F_{(2,2275)}$= 17.16, p<.025; 2011: $F_{(2,1209)}$= 4.58, p<.025.; 2012: $F_{(2,2334)}$= 1.63, n.s.), a further assessment through the a-priori contrast comparisons (Table 4b) yield full support of hypothesis 3. More detailed, the contrast analyses of "only IC participation" compared with "LCC & IC participation, IC sourcing" revealed that pure IC negotiations have indeed higher price-differences between offers

(since the contrasts between these two groups appeared significant by 3.75% in 2008, 3.05% in 2009, 4.89% in 2010, 4.31% in 2011 and 1.87% in 2012). Hence, especially in initial negotiations, LCC participation induces a more competitive environment and a nearer to perfect market. Additionally, in 2008, 2010 and 2011 the price-differences between offers were also significant lower in scenarios with "LCC & IC participation, LCC sourcing" when compared to "only IC participation" (6.94% lower in 2008, 2.42% lower in 2010 and 2.58% lower in 2011), indicating also direct price-effects of LCC supplier participation.

Table 4a: Results of ANOVA of Price-Differences for Initially Negotiated Items (Controlled for Commodity & Demand)

Year	df	df (Error)	Mean Square (Error)	F
2008	2	1262	236.35	8.56**
2009	2	1474	179.48	6.43**
2010	2	2275	219.30	17.16**
2011	2	1209	287.79	4.58**
2012	2	2334	281.75	1.63

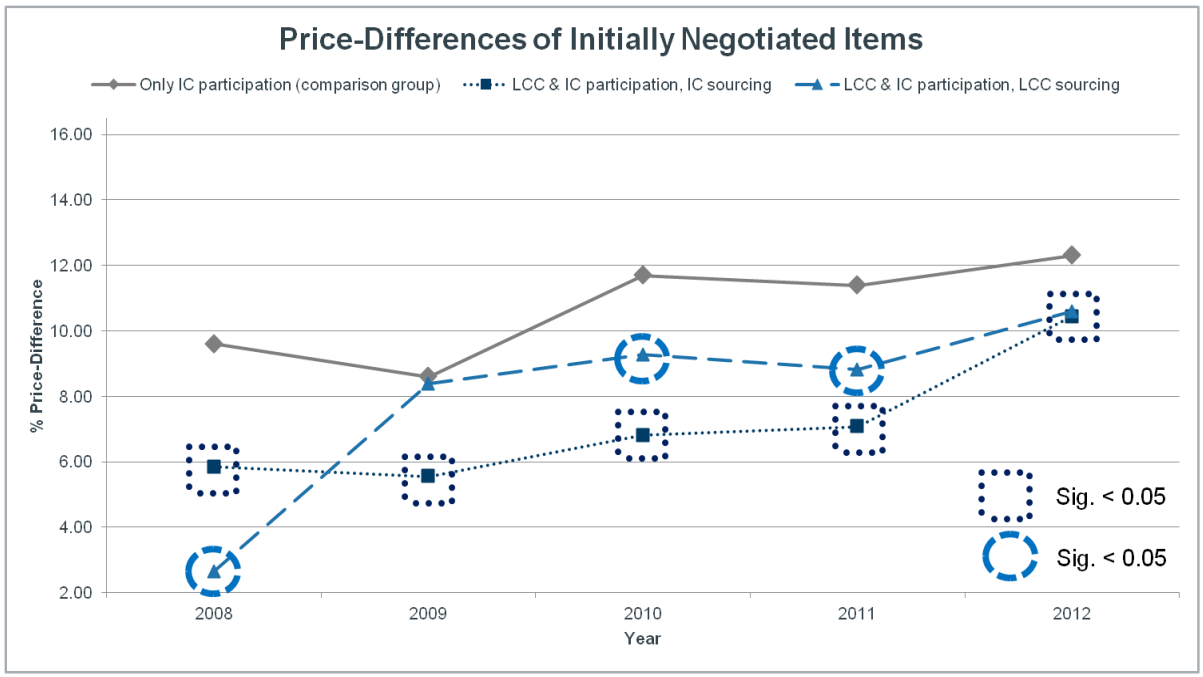
*Note: *= p<.05, **= p<.025*

Table 4b: Results of Contrast-Analyses of Price-Differences for Initially Negotiated Items (Controlled for Commodity & Demand)

Year	Mean of % price-differences between offers (per group)			Differences (between group-means)	
	Group A (Only IC participation)	Group C (LCC & IC participation, IC sourcing)	Group D (LCC & IC participation, LCC sourcing)	Group C – Group A	Group D – Group A
2008	9.59	5.84	2.65	-3.75**	-6.94**
2009	8.60	5.55	8.37	-3.05**	-0.23
2010	11.69	6.80	9.27	-4.89**	-2.42**
2011	11.39	7.08	8.81	-4.31**	-2.58*
2012	12.31	10.44	10.59	-1.87*	-1.72

*Note: *= sig. difference at a p<.05 level; **= sig. difference at a p<.025 level*

Figure 5: Price-Differences of Initially Negotiated Items, Adjusted for Effects of Commodity and Demand



Legend: Savings= Price-savings in comparison to the previous year, LCC = Low-Cost-Country supplier, Exclusion of cases when SD >|3|, N=9.641.

H4: The assumed effects that significant higher competitive pressures are evoked when IC suppliers are confronted with competition from low-cost-countries is less systematic in the context of repeatedly negotiated items, as compared to initially negotiated items.

With focus on the last hypothesis 4, results in Table 5a & 5b as well as Figure 6 show that the positive effects of LCC-supplier participation are not systematically apparent in the case of repeatedly negotiated parts. F-tests (Table 5a) were only significant in three out of four years (2008: $F_{(2,1967)}$= 8.58, p<.025; 2009: $F_{(2,1632)}$= 1.88, n.s.; 2010: $F_{(2,1821)}$= 1.04, n.s.; 2011: $F_{(2,1276)}$= 9.06, p<.025; 2012: $F_{(2,759)}$= 2.63, p<.05) and also contrast testing (Table 5b) revealed that only in one out of five years an indirect LCC effect on price-dynamics was apparent (7.51% difference in 2011). Therefore, hypothesis 4 is only weakly supported. Thus, in the case of repeatedly negotiated parts, the indirect effects of LCC-participation were not as systematic as in initial negotiations. Therefore, the results show that the indirect effects of LCC-supplier participation found in the overall data (as indicated in hypothesis 2) is foremost attributable to initial negotiated parts (hypothesis 3).

A comprehensive overview of the descriptive data can be found in the Annexure (p. A1-A2).

Table 5a: Results of ANOVA of Price-Differences for Repeatedly Negotiated Items (Controlled for Commodity & Demand)

Year	df	df (Error)	Mean Square (Error)	F
2008	2	1967	405.00	8.58**
2009	2	1632	286.72	1.88
2010	2	1821	278.33	1.04
2011	2	1276	386.61	9.06**
2012	2	759	285.07	2.63*

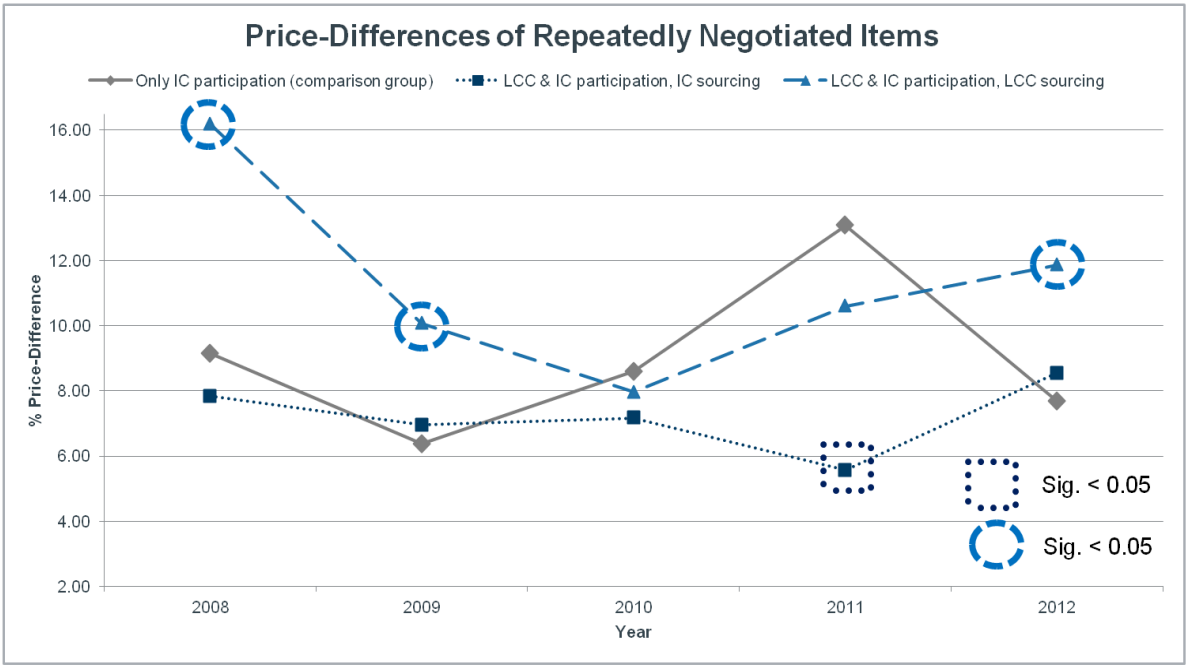
*Note: *= p<.05, **= p<.025*

Table 5b: Results of Contrast-Analyses of Price-Differences for Repeatedly Negotiated Items (Controlled for Commodity & Demand)

Year	Mean of % price-differences between offers (per group)			Differences (between group-means)	
	Group A (Only IC participation)	Group C (LCC & IC participation, IC sourcing)	Group D (LCC & IC participation, LCC sourcing)	Group C – Group A	Group D – Group A
2008	9.14	7.84	16.20	-1.30	7.06**
2009	6.38	6.96	10.08	0.58	3.70*
2010	8.61	7.17	7.96	-1.44	-0.65
2011	13.08	5.57	10.61	-7.51**	-2.47
2012	7.69	8.54	11.87	0.85	4.18**

*Note: *= sig. difference at a p<.05 level; **= sig. difference at a p<.025 level*

Figure 6: Price-Differences of Repeatedly Negotiated Items, Adjusted for Effects of Commodity and Demand



Legend: Savings= Price-savings in comparison to the previous year, LCC = Low-Cost-Country supplier, Exclusion of cases when SD >|3|, N=10.058.

After presenting the results of this research, the following chapter will pose a thoroughly discussion of these findings and apply them to theory and practice.

7 Discussion: The results of the study and their consequences for theory and practice

7.1 Discussion of the findings: Competition from low-cost-countries as a means to induce higher competitive pressures on industrialised-country suppliers

On the one hand, the extent of global sourcing activities rises steadily and can yield substantial benefits.[449] In this way, many scholars argued that international operating firms can benefit from lower factor costs in foreign countries as compared to their domestic price-levels.[450] In line with the proposition that global sourcing from a industrialised perspective is mostly executed because of exploitation of lower factor[451], it was expected

[449] See Lewin/Volberda (2011), p. 241.
[450] See Lewin/Volberda (2011), p. 241.
[451] See Kogut (1985), p. 19; Porter (1990; Hartmann et al. (2008), p. 32; Steinle/Schiele (2008), p. 3.

that the focal OEM's sourcing performance (cost-savings) is significant higher when goods were purchased from LCC suppliers. However, the findings do not support the proposition that LCC suppliers outperform IC suppliers in terms of cost-saving potentials. Thus, investigating direct GS success remains ambivalent and complex.[452] This study adds support to disillusioning research in the field of GS, since LCC sourcing appears complex and actual savings from GS can vary from negative to zero.[453]

On the other hand, even though direct effects of GS seem ambivalent, there is a variety of reasons to assume that indirect beneficial effect of GS can be facilitated, particularly under a CD lens. Already Petersen et al. (2000)[454] acknowledged that the effects of GS go beyond purely cost oriented benefits, arguing that GS can give access to new markets or induce increased competition in the IC supply base. In line with Birkinshaw et al. (1995), this study assumed that one reason for the internationalisation of businesses is the existence of CD in a certain industry.[455] This is argued to be based on the innovative power of individual firms, the pursuit of benefiting from favourable international structural conditions and the pressure to react on businesses that threaten a firm's international market shares.[456] In this context, also within large industries, such as the automotive industry, dynamic competitive forces are believed to shape corporate strategies and behaviours.[457] Therefore it was proposed that GS usually takes place in a dynamic environment and can lead to increased competition.[458] Since it is known that competitive action and response can also be expressed through pricing behaviour[459], the idea emerged that buying organisations could benefit from dynamic competitive actions between suppliers through increased competition. As a consequence, CD was proposed to answer the central questions concerning whether GS may have indirect price effects through increased competition.

It is argued that one of the reasons that GS leads to increased competition is the trend towards supplier consolidation[460], especially in industrialised countries. In markets with

[452] See Horn et al. (2013), p. 27.
[453] See Kotabe/Omura (1989), p. 113; Murray et al. (1995), p. 195; Horn et al. (2013), p. 28.
[454] See Petersen et al. (2000), p. 31.
[455] See Birkinshaw et al. (1995), p. 637.
[456] See Vernon (1966), p. 190; Birkinshaw et al. (1995), p. 637.
[457] See Livengood/Reger (2010), p. 52.
[458] See Quintens et al. (2006), p. 887.
[459] See Lamberg et al. (2009), p. 48.
[460] See Milligan (1999), p. 60.

many suppliers and strong competition, price reductions can be achieved because the involved suppliers face the risk of not finding a buyer to conduct business with.[461] However, in markets with few and heterogeneous suppliers this effect can be lost and the additional beneficial effects of multiple supplier participation, like reduction of supplier dominance or achieving independence vanishes.[462] Another argument in favour of taking into consideration suppliers from different countries is that the suppliers from different countries are often not very familiar with each other. Earlier research suggested that competitors with limited information about each other face the problem of having to rely on less precise general constructs, such as reputation, when making their decisions on how to compete.[463] This lack of information is likely to lead to uncertainty when IC suppliers compete with their foreign counterparts. This is supported by the insight that many multinational companies struggle to compete with local firms in low-cost countries such as China[464]. In this regard, the results indicate that the indirect effects of GS can become facilitated. In detail, the participation of LCC suppliers in price-negotiations induced significant competitive pressures on IC suppliers, in particular, when items were purchased for the first time. However, in the case of repeatedly negotiated items, the indirect effect of GS appeared less systematic or even vanished. The underlying reason for these differing trends was attributed to two arguments. (A) Firstly, for initially negotiated items companies try to facilitate first-mover benefits, which emerge through learning curve effects and economies of scope.[465] (B) Secondly, the prices for repeatedly negotiated items already moved towards the equilibrium price and competitive pressures were already applied.

Summarised, even though the direct effect of GS remains ambivalent, the results indicate that especially initially negotiated items benefit systematically from LCC-participation, through escalation of increased competitive pressures on IC suppliers. The implications of these findings in relation to to theory as well as to general practice will be further discussed in the following chapters.

[461] See Grossman/Helpman (2002), p. 85.
[462] See Cox (2001), p. 42.
[463] See Ketchen et al. (2004), p. 784.
[464] See Chang/Park (2012), p. 1.
[465] See Lieberman/Montgomery (1988), p. 41; Boulding/Christen (2001), p. 20.

7.2 Theory implications: Competitive Dynamics broadens the knowledge about the indirect effects of Global Sourcing

Next to the practical implications, the study at hand provides a number of new insights for theory. Firstly, it was hypothesised that the savings generated through GS from LCCs will exceed those savings generated through sourcing from IC suppliers. Researchers argued that lower factor costs can yield competitive advantages for suppliers and buying firm can exploit these cost-benefits.[466] However, within the context of the focal automotive OEM, this research failed to find empirical support for an extraordinary cost-saving potential of GS. Some results even pointed into the opposite direction. Hence, lower factor costs do not automatically translate into cost-savings, and the reliance on solely factor-cost considerations as means to realise sourcing-cost reductions, has to be taken with caution. Consequently, this finding could be a point of departure for a more critical assessment of GS in literature. Future research should become more critically in addressing the (widely accepted) proposition of the (direct) positive price saving effects and dive deeper into a more complex assessment of GS performance. Only recently, the potential negative side-effects have been discussed, leading to a somewhat ambivalent picture of GS.[467]

Moreover, despite the vast amount of literature that discusses the effects of GS, research on its indirect effects has mostly been neglected.[468] In this context, another contribution of the research at hand is that an indirect cost-saving effect of international sourcing has been assessed. Furthermore, GS literature was linked to the perspective of CD, which served as a suitable foundation. Ultimately, CD research was used for demonstrating that the potential selection of LCC suppliers can be seen as a means to induce intensified competition, in particular with regard to the IC supply base.

Additionally, this research extended the assessment of the indirect effects of GS in terms of a new measure of CD. In contrast to past CD research, which often facilitated archival records of firm-actions from third-sources[469], response-questionnaires from industry experts or managers[470] and field interviews[471], this research used objective pricing-data to

[466] See Kogut (1985), p. 19; Ghoshal (1987), p. 428; Petersen et al. (2000), p. 31; Hartmann et al. (2008), p. 32; Steinle/Schiele (2008), p. 3; Beugelsdijk et al. (2009), p. 126; Weber et al. (2010), p. 13; Horn et al. (2013), p. 28.
[467] See Horn et al. (2013), p. 27.
[468] See Petersen et al. (2000), p. 31.
[469] See Smith et al. (1991), p. 61; Yu/Cannella Jr (2007), p. 665.
[470] See Hambrick/Mason (1984), p. 193; Desarbo et al. (2006), p. 101; Marcel et al. (2011), p. 115.

capture competition. Hence, prices have been argued to be well observable competitive actions[472] and believed to mirror dynamics within markets.[473] As prior research in the domain of game theoretical / mathematical approaches has shown[474], increased competition is reflected in a lower dispersion of prices offered by competitors. Subsequently, this research used price-dispersions as indicator for competitive tensions between suppliers. Still, as it will be further outlined in the next chapter, additional (qualitative) research is recommended to assure that the measure of price-dispersion is indeed a valid means to capture competitive tensions, especially in the automotive industry. Furthermore, by facilitating long-term secondary research, which is assumed to deliver findings with high credibility[475], this research adds another methodological contribution to supply chain management and CD literature. Consequently, this research seeks to combine theory and practice in a systematic manner, which is relevant to both sides.

7.3 Future steps & limitations: A further assessment of total costs of ownership and focus on item-characteristics in multiple industries as promising avenues for future research

The future steps and limitations will be discussed in relation to three categorisations, namely issues about the measurements of dependent variables, characteristics of items & synergies, as well as the overall generalisability of the findings.

The first limitation is concerned with the measure of cost-savings and competitive pressures. Like in the research of Schiele et al. (2011) "*the exact size of the savings reported here, however, depends on each situation and point in time and might not be transferable*"[476]. In detail, the ex-work prices used in this research may not reflect the full picture, since they lack information about additional costs, like logistics or taxes. Consequently, a TCO[477] perspective can pose a promising route for future research. Especially a focus on costs with regard to the life cycle of products can give deeper

[471] See Lamberg et al. (2009), p. 46; Chen/Miller (2012), p. 157.
[472] See Lamberg et al. (2009), p. 48.
[473] See Livengood/Reger (2010), p. 50.
[474] See Chevalier/Goolsbee (2003), p. 213; Barron et al. (2004), p. 1041; Lewis (2008), p. 656; Gerardi/Shapiro (2009), p. 1.
[475] See Cantalone/Vickery (2009), p. 94.
[476] Schiele et al. (2011), p. 332.
[477] See Ellram (1993), pp. 3-11; Ellram (1993), p. 49; Platts/Song (2010), p. 320.

insights into inefficiencies and possibilities to reduce costs.[478] With regard to the measurement of CD, future research needs to assess whether the indirect effects of GS that were induced through LCC-supplier participation do indeed result in cost-savings. Even though, literature indicated that higher competitive pressures result in price-reductions, especially qualitative research may give a deeper insight into possible causalities of this effect. Further, future studies could further mix the approach used in this research with other complex approaches, like rigorous sequencing methods[479], assessment of long-term path characteristics[480] and perceptual group approaches to competitor mapping[481] in order to increase the knowledge about causalities in patterns of competitive moves over time.[482] As acknowledged by Matthyssens (2007) "*the triangulation of methodology will be the best for the development of P&SM [purchasing and supply management] theory*." [483] Therefore, incorporating paradigmatic tolerance and pluralism[484] as well as methodological and theoretical triangulation, could yield further detailed insights into the causes and consequences of CD in GS and help to further advance the knowledge-base of science and practice.

Besides, a promising avenue for future research can be seen in a more fine-grained assessment of product characteristics and their interactions with the proposed sourcing activities. In GS, labour intensive products are believed to yield more cost-saving potential than those with a lower degree of labour costs. One example for labour intensive products is cast iron, which consist normally of more than 50% labour costs.[485] Also, certain product may have limitation concerning resources or other limiting factors and need to be sourced from certain regions.[486] Therefore, in line with Horn et al. (2013)[487], it is proposed that future research could also apply further differentiation of the findings in relation to material categories and groups.

[478] See Semmler/Mahler (2007), p. 30.
[479] See Abbott (1990), p. 375; Abbott (1995), p. 93; Chen (2008), p. 288; Katila/Chen (2008), p. 593.
[480] See Hutzschenreuter/Israel (2009), p. 453.
[481] See Dutton/Jackson (1987), p. 76; Porac/Thomas (1990), p. 224; Reger/Huff (1993), p. 103.
[482] See Chen/Miller (2012), p. 137.
[483] See Matthyssens (2007), p. 221.
[484] Matthyssens (2007), p. 221; Karlsson (2009), p. 6.
[485] See Faust/Yang (2012), p. 49.
[486] See Kerkhoff (2005), p. 41; Stölzle/Kirst (2007), pp. 61-62.
[487] See Horn et al. (2013), p. 36.

Finally, it has to be acknowledged that the research at hand focussed only on one industry and on the secondary data from one source. More precisely, this research focussed on one industry. In detail, this research took the perspective of a industrialised -based automotive buying-firm, which may reduce transferability to other contexts. However, the automotive industry has been argued to be among the most generalisable industries for research practice.[488] Hence, to increase external validity, future research should take multiple industries and multiple sources of data into account to further elaborate on the findings of this study. For instance, this could include the assessment of public databases for assessing additional secondary data[489], data from other (non-)automotive companies, assessment of upstream/downstream markets as well as data from second-tier and third-tier suppliers. Since local content issues and globalisation are increasing rapidly in emerging economies[490], future research could try to take the perspective of a LCC-based buying firm and assess competitive antecedents and outcomes of supplier competition in multiple contexts.

8. Conclusion: The ambivalent direct benefits as well as the beneficial indirect effects of Global Sourcing as most important findings

In most cases, assemblers directly pass a large amount of their income through to the suppliers, which can be up to 70% of turnover.[491] This underpins the strategic role that purchasing takes for corporate success.[492] The conclusions of this paper will be described in relation to the three main research questions postulated in the Introduction, namely:

(1) What are the direct performance effects (cost-savings) of GS?

(2) How can indirect performance effects be derived from GS?

(3) What are the mechanisms and outcomes behind possible indirect effects of GS?

(1) What are the direct performance effects (cost-savings) of GS?

[488] See Horn et al. (2013), p. 39.
[489] See Hutzschenreuter/Israel (2009), p. 453.
[490] See Kohler (2009), p. 54.
[491] See Ortner et al., p. 2; Wallner/Schweiger (2012), p. 350.
[492] See Kraljic (1983), p. 109; Schiele et al. (2011), p. 3.

As stated by Birkenshaw et al. (1995)[493], one reason for the internationalisation of businesses is the existence of CD and globalisation in certain industries. This is argued to be based on the innovative power of individual firms, the pursuit of benefiting from favourable international structural conditions, and the pressure to react on numerous other businesses that threaten a firm's international market shares.[494] Besides, these institutional forces to globalise organisational activities, also purchasing globalised. Overall, there has been a trend to favour a positive evaluation of GS among researchers[495] as well as practitioners[496]. Therefore, at some firms, the top management even imposed international sourcing quotas, "*which often means that the companies source to achieve budget goals.*"[497] Contrary to this view, the positive valuation of GS was not reflected by the results of this research. The outcomes indicated that sourcing from LCC suppliers does not necessarily lead to higher cost-savings. Consequently, in correspondence with the recommendations of Schiele et al. (2011)[498] this research challenges the virtues of such overly positive evaluations and organisational sourcing quotas, because of their potentially negative trade-offs.

(2) How can indirect performance effects be derived from GS?

In contrast to the direct cost-saving potentials that were proposed to stem from international sourcing[499], this study focussed its attention at possible indirect price-effects. Accordingly, the CD perspective was applied to the context of GS. From the perspective of CD, researchers aim at understanding how rivals act and react in situations of competition.[500] Earlier research has shown that in certain industries, CD cause situations in which even large firms find themselves in battles for market positions with smaller companies.[501] Therefore, changes in the competitive landscape, like acquisitions, new market entries, diversifications or technological change have been argued to steer companies to change their own strategy.[502] In this way, CD was chosen as an appropriate

[493] See Birkinshaw et al. (1995), p. 637.
[494] See Vernon (1966), p. 191; Birkinshaw et al. (1995), p. 637.
[495] See Petersen et al. (2000), p. 31; Weber et al. (2010), p. 13; Faust/Yang (2012), p. 39; Horn et al. (2013), p. 28.
[496] See Hemerling/Lee (2007), p. 4.
[497] Fredriksson/Jonsson (2009), p. 228.
[498] See Schiele et al. (2011), p. 330.
[499] See Schiele et al. (2011), p. 4.
[500] See Ketchen/Giunipero (2004).
[501] See Wilbon (2002).
[502] See Hitt et al. (1996), p. 1084; Zúñiga-Vicente et al. (2004), p. 1379; Hutzschenreuter/Israel (2009), p. 441.

tool for assessing the possible effects of GS on competitive tensions within the automotive market. In this vein, an approach similar to game-theoretical considerations, namely the calculation of price-dispersions between offers, was used to capture competitive tensions between suppliers (see chapter 5.3).

(3) What are the mechanisms and outcomes behind possible indirect effects of GS?

It has been argued that one of the indirect effects of GS could be an increased competition in the IC supply base. Since it is known that competitive action and response can also be expressed through pricing behaviour[503], the idea emerges that buying organisations could benefit from price reductions stemming from dynamic competitive actions between suppliers. More precisely, GS was believed to induce increased competitive tension in the IC supply base through enhanced LCC supplier involvement, which influences overall price-levels. Subsequently, it was proposed that IC firms are especially motivated to succeed in initial negotiations of items, since substantial potentials for learning curve effects and buyer switching costs are involved.[504] Subsequently, the results indicated support for this notion. As a consequence, it was proposed that buying organisations could use GS as a means to support IC sourcing activities through the induction of CD in the supply market.

Generally, researchers and practitioners have argued that business management research should not only be thoroughly administered but also applicable and relevant to practice[505]. As stated by Karlsson (2009),"*the connection to practice makes relevance a major criterion for good operations management research*"[506]. Consequently, this research tried to connect theory and practice by combining longitudinal organisational data with the concepts of GS and CD. In conclusion, even though it was argued that GS is a collective mindset for firms, representing a "industry recipe"[507] or psychological leader-follower isomorphism[508], this research proposes that GS must become a more context-specific activity. Especially the direct effects of GS remain ambivalent and should be evaluated with caution. However, it has been shown to induce increased competition in the (IC) supplier base of the buying firm. Consequently, this research sets the foundation for future

[503] See Lamberg et al. (2009), p. 48.
[504] See Lieberman/Montgomery (1988), p. 41; Boulding/Christen (2001), p. 20; Ketchen et al. (2004), p. 784.
[505] See Matthyssens (2007), p. 219; Starkey et al. (2009), p. 547; Hoffmann (2012), p. 100.
[506] Karlsson (2009), p. 13.
[507] See Spender (1989), p. 1.
[508] See Schweller (1994), p. 72; Kotabe/Mol (2006), p. 393; Horn et al. (2013), p. 28.

research in the interception between GS and CD. Future research can further expand these findings by assessing interactions and synergies with other organisational functions like development, quality management, logistics and production [509], further apply methodological and theoretical triangulations[510] as well as assess the interactions of CD with item characteristics.

[509] See Faust/Yang (2012), p. 40.
[510] See Matthyssens (2007), p. 221; Karlsson (2009), p. 6.

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Annexure

Table A1: Descriptive Statistics of Savings of Repeatedly Negotiated Parts, Adjusted for Effects of Commodity and Demand

Adjusted savings of repeatedly negotiated parts (GS)									
	Only IC participation			LCC & IC participation, IC sourcing			LCC & IC participation, LCC sourcing		
Year	Mean	Sd.	N	Mean	Sd.	N	Mean	Sd.	N
2008	2,28	0,13	1056	2,02	0,18	599	2,39	0,32	328
2009	2,44	0,14	1020	2,79	0,26	363	2,11	0,40	265
2010	3,28	0,18	701	2,98	0,19	751	3,58	0,29	385
2011	2,97	0,30	480	3,02	0,27	464	2,25	0,35	348
2012	3,46	0,39	316	2,90	0,37	234	2,49	0,40	225
Total			3573			2411			1551

Table A2: Descriptive Statistics of Price-Differences of Initially Negotiated Parts, Adjusted for Effects of Commodity and Demand

Adjusted price-differences of initially negotiated parts (FS)									
	Only IC participation			LCC & IC participation, IC sourcing			LCC & IC participation, LCC sourcing		
Year	Mean	Sd.	N	Mean	Sd.	N	Mean	Sd.	N
2008	9,59	0,55	877	5,85	1,07	344	2,65	2,21	57
2009	8,60	0,46	907	5,55	0,73	372	8,38	1,01	211
2010	11,69	0,68	582	6,80	0,51	1041	9,27	0,64	668
2011	11,39	1,01	402	7,08	1,02	427	8,81	1,10	396
2012	12,30	0,87	631	10,44	0,68	809	10,59	0,68	910
Total			3399			2993			2242

Table A3: Descriptive Statistics of Price-Differences of Repeatedly Negotiated Parts, Adjusted for Effects of Commodity and Demand

Adjusted price-differences of repeatedly negotiated parts (GS)									
	Only IC participation			LCC & IC participation, IC sourcing			LCC & IC participation, LCC sourcing		
Year	Mean	Sd.	N	Mean	Sd.	N	Mean	Sd.	N
2008	9,14	0,74	1056	7,84	1,01	599	16,21	1,78	328
2009	6,38	0,64	1020	6,96	1,17	363	10,07	1,80	265
2010	8,61	0,70	701	7,17	0,71	751	7,96	1,09	385
2011	13,08	1,33	480	5,57	1,21	464	10,60	1,60	348
2012	7,68	1,34	316	8,54	1,26	234	11,87	1,38	225
Total			3573			2411			1551

Table A4: Descriptive Statistics of Price-Differences of Initially & Repeatedly Negotiated Parts, Adjusted for Effects of Commodity and Demand

Adjusted price-differences of initially & repeatedly negotiated parts (GS & FS)									
	Only IC participation			LCC & IC participation, IC sourcing			LCC & IC participation, LCC sourcing		
Year	Mean	Sd.	N	Mean	Sd.	N	Mean	Sd.	N
2008	10,33	0,45	1933	7,46	0,71	943	13,24	1,26	385
2009	8,08	0,39	1927	6,12	0,64	735	9,08	0,90	476
2010	10,30	0,46	1283	6,93	0,42	1792	8,90	0,57	1053
2011	12,18	0,77	882	6,34	0,74	891	8,42	0,91	744
2012	10,08	0,73	947	9,91	0,60	1043	10,64	0,62	1135
Total			6972			5404			3793