

Understanding Directed Sourcing in Triadic Supply Networks

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Abstract

Firms experience that an increasingly complex supply base is a costly investment. In order to keep specialized suppliers but to reduce the effort of managing it, OEMs contract second-tier firms and direct them to first-tier suppliers. We conduct four embedded case studies in the international automotive industry to record types and possible motivations of directed sourcing. Our findings show that directed sourcing triads may be set up to achieve operational efficiencies but also for strategic reasons such as to gain access to foreign markets. This research contributes to literature on triadic supply chains in general and network buyer-supplier relationships specifically.

Keywords: Directed Sourcing, Triadic Supply Networks, Case Research

Purpose

Decades of research have highlighted the role of strategic relationships between buyers and suppliers and their impact on firms' performance and competitive advantage (Yan et al., 2015). However, the challenges related to managing these relationships cannot be overstated. The number of suppliers and their relative importance and tier position are constantly changing, driven by firms' strategic notion of focusing on core competencies and increasing the variety of products offered (Choi and Hong, 2002). Interestingly enough, literature states different, partially contradictory notions on how to respond to these challenges, in particular regarding the number of suppliers a buying firm should directly manage. For example, there are advantages to reducing the number of suppliers a buyer has direct contact with (e.g., strategic suppliers), including lower costs and higher quality (Dyer and Ouchi, 1993). Contradictory, Yan et al. (2015) and Choi and Linton (2011) contend that companies should reconsider their tendency to both, reduce the number of managed suppliers, and focus on direct top-tier suppliers. Instead, alternative

actions should yield better control over costs, visibility into technology developments, and control over sustainability upstream of the supply chain.

A real world phenomenon in line with the latter notion is so called “directed sourcing” where buying firms attempt to (re-)gain control beyond their first-tier suppliers by selecting and even contracting second-tier or higher suppliers and directing a first-tier supplier to them as their approved source of supply, for example (Park and Hartley, 2002; Kim et al. 2011; ISO, 2002).

Directed sourcing relationships are of particular interest for various reasons. Firstly, they fall into a theoretical divide in terms of defining the ‘correct’ or ‘ideal’ number of suppliers a firm should have in its supply base and directly managed. Second, they relate to the very recent notion of the theory of the nexus supplier (Yan et al. (2015) which accounts for the observation that suppliers may be of high strategic importance to the buying firm because of their position and role in the wider supply network. Finally, they encompass at least three actors in a triadic relationship, which many consider an under-researched area in the literature.

Sparked by anecdotal evidence, our initial research for real world examples of directed sourcing relationships promises a variety of distinct types and underlying motivations. In order to lay ground for a differentiated analysis of this phenomenon, this paper provides first steps towards a systematic overview of directed-sourcing archetypes. Furthermore, this paper intends to provide starting points for further theory-based elaboration on multiple levels of the issue at hand (Carter et al., 2015). Thus, the following research questions are explored:

- 1) What types of distinguishable directed sourcing relationships can be observed and how can they be characterized/classified?
- 2) What effects are associated with these relationships compared to other governance alternatives of distant suppliers?

In order to address our two research questions, this paper relies on a multiple embedded case study design with data collected in the automotive industry. To enhance the explanatory power of our findings and support dialogue between research and practice, the observations are discussed from the theoretical perspectives of Organizational Buying Behaviour (OBB) (e.g., Sheth, 1973) and Transaction Cost Economics (TCE) (e.g. Williamson (1975)).

Theoretical Background

The Supply Network and Triads

A supply system is a network of organizations that engage in business together. The buying firm in a supply network coordinates and controls the activities of its supply base (Choi and Krause, 2006). The multitier supply network is made up of a buyer and tiered suppliers who collectively bring products to consumers markets (Yan et al. 2015). Management of the supply network is critical to ensure efficient and effectiveness operations (Mentzer, et al. 2001). This broader multilevel perspective of supply chain management is useful for scholars who seek to better understand the dynamics and complexities inherent in triadic buyer-supplier-supplier relationships (Wu and Choi, 2005; Dubois and Frederiksson, 2008; Wu et al. 2010; Carter et al. 2015). Triads shift the unit of analysis away from single-level, dyads to one that represents a concise part of the multitier supply network (Dubois and Frederiksson, 2008).

The types of relationships among the members of the triad network depends to some extent on the structural embeddedness of the organizations, measured by both the strength of individual relationships (e.g. buyer to tier 1 supplier) and the overall relationship of the

triad (Autry and Griffis, 2008). Yet, all of the firms in the triad attempt to use strong and weak relationships to their advantage, regardless of their position and power (Holma, 2012). Wu et al. (2010) explain that buyer-supplier-supplier relationships can often be cooperative, competitive, and co-opetitive at any given time, depending on the strategy of the companies involved and their power-dependency with one another. For example, Japanese automakers often force competitor suppliers to cooperate with each other, and then among themselves and the OEM (Asanuma, 1985). Yet, this too can eventually create a new dynamic, one in which two firms in the triad, sensing greater power asymmetry between them and the third firm, create a “two against one” situation (Wu et al., 2010).

Directed Sourcing

The triadic relationship literature is still emerging with researchers agreeing that different triadic structures exist, yet taking different approaches to describe the structures (e.g. Wu and Choi, 2005; Choi and Wu, 2009; Mena et al., 2013; Holma, 2012). Some are more traditional buyer-supplier-supplier relationships. Others such as Guo et al. (2010) consider triads from a slightly different perspective of buyer-contract manufacturer-supplier. Researchers have used triads to examine the characteristics and relative importance of different supply networks. Much of this research has sought to extend the literature on strategic suppliers. Strategic suppliers are often first-tier suppliers whose performance significantly impacts the buying firm’s operations and ultimately, performance and success.

An emerging area of the supply network literature is the theory of the nexus supplier (Yan et al., 2015). A key premise behind the nexus theory is that suppliers do not have to be a first-tier supplier to be a critical, strategic partner to the buying firm. Instead, a supplier can be structurally embedded in the supply network and its ties to other suppliers may determine its criticality and hence, its strategic importance to the buyer (Yan et al., 2015). The nexus supplier phenomenon may be best observed through the triad to help explain how embeddedness affects network relationships (Choi and Wu, 2009; Wu et al., 2010).

Using the theory of the nexus supplier as a springboard, our investigations also look at another specific type of triadic relationship in the supply network, in this case, directed sourcing. This type of triad also considers the strategic importance of suppliers at different tiers in the network, but emphasizes the relationship between the OEM and the second tier. Directed sourcing is generally described as purchasing strategy, typically used by OEMs, to direct top-tier suppliers to source from specific, predetermined lower-tier suppliers (Park and Hartley, 2002; Choi and Hong, 2002; Choi and Linton, 2011). There are few directed sourcing examples in the literature, with some exceptions (e.g. Choi and Hong, 2002; Choi and Linton, 2011).

Missing from much of this already limited literature is that directed sourcing strategies lead to complex and sometimes contentious relationship situations for firms and their suppliers. Furthermore, the dynamic nature of directed sourcing relationships can create ongoing confusion and strife in the supply network. For example, long time first-tier supplier may lose or be forced to cede some control to a second or third-tier supplier, a supplier which has now has direct contact and agreements with the OEM (Choi and Linton, 2011). We focus this research on directed sourcing strategies and their dynamic tendencies as an attempt to describe and explain the different structures that make up common and often used, but under-researched phenomenon of supply chain management.

Theoretical explanations for Directed Sourcing

The buying strategies of organizations change over time, even in the most rigid of organizations (Rajala and Tidstrom, 2017). In addition, there is a rational side to purchasing behavior, there is also an emotional aspect as well. Understanding the combination of the dynamic nature and the rational / emotional motivation of directed sourcing strategies is a path to addressing our research questions (e.g. why and how do directed sourcing relationships form and evolve, compared to other buyer-supplier relationships). Explaining directed sourcing strategies are a particularly interesting phenomenon given the inherent complexities and challenges of directed sourcing to firms and their suppliers, placed in the context of, and in contrast to, other multi-level buyer-supplier relationships (Kaufmann, et al., 2017). Therefore, we turn to transaction cost economics (TCE) and organization buying behavior (OBB) theories to help address the research questions. The following discusses why we chose these theories and how they are applicable to this research.

TCE has been used to help explain purchasing behavior in the supply chain management literature for decades. Williamson (1975) used the tenants of TCE initially to explain why firms integrate some activities internally, and source others to their supply network. In more recent years, researchers have extended TCE to better understand differences in what motivates buying behavior by contrasting the rational-perspective of TCE to other theories which help explain more intuitive perspectives of behavior. This latter point is where OBB is helpful.

OBB was developed to help explaining the factors that affect organizational buying behavior (Webster and Wind, 1972; Johnson and Lewin, 1996). Like TCE, these include more transactional factors and processes such as cost and are task-oriented. Yet OBB moves beyond the rational factors to include characteristics of the buying organization, and in particular the purchasing group within the organization (Webster and Wind, 1972). We use OBB in this research because of its multilevel perspective in the supply network, its focus on inter-organizational relationships, and its ability to describe behavior of multilevel relationships as they change over time (Johnson and Lewin, 1996; Rajala and Tidstrom, 2017). OBB is also relevant to helping explain the emotional (intuitive) motivation for buying firms to initiate directed sourcing decisions. This is because not all buying behavior is guided by rational motivators, but often times related to emotional factors that are not always easily explained rationally (Williamson, 1975; Kaufmann, et al. 2017). Thus, OBB helps bridge the gap between explaining why some OBB is more rational in nature and why some is more emotional in nature.

Research Methodology

Research design

In order to address our three research questions, this paper relies on a multiple embedded case study design, where four directed sourcing relationships are investigated drawing on interview data on OEM-level, directed Tier 1 supplier-level, and directing Tier 2 supplier-level. Hence, the supply chain triad is our prime observational unit of analysis. We opted for a case study design for several reasons. First, case studies are often the method of choice when investigating phenomena related to decision making and managerial motivation. Second, case studies can explain and aid in constructing theory in areas of research that are little investigated, such as directed sourcing (Dubois and Araujo, 2007; Quintens et al., 2006). Third, the case study method fits with the overall aim of the study of illustrating and understanding a practical phenomenon in supply chain management (Meredith, 1998). Finally, cases are most suitable to generate managerially

valuable insights since real-life situations and managers' views can be analyzed directly (Gibbert et al., 2008).

We were able to identify three directed sourcing triads with unique motivations and furthermore documented a special directed triadic relation with a tier 1 joint venture of the buying OEM and the tier 2 supplier. Notably, this study does not aim at creating an exhaustive inventory of all possible directed sourcing triads but rather takes initial steps towards exploring directed sourcing triads to motivate more recognition of these yet unobserved constellations. During our analyses, we ensured validity and reliability, a thorough connection of findings to extant literature, and the theoretical focus by application of measures proposed by Gibbert et al., (2008) and Yin (2003). Please find all details on the measures taken in Table 1.

Table 1: Validity and reliability measures taken during the study

	Research design	Case selection	Data gathering	Data analysis
Internal validity	Thorough embedding of case studies into evidence and theory on organizational buying behavior	Purposeful sampling criteria: (1) supply chain complexity, (2) buying firm size, and (3) internationalization	Multiple respondents; Corporate experts on directed sourcing projects interviewed	Verification of critical findings with case respondents Pattern matching
External validity	Comparative multiple case-study design enabling cross-case analysis	Focused selection criteria based on company and part characteristics	Gathering data in real corporate best-practice project	n.a.
Reliability	Development of case study protocol and case database Verification of unclear information with respondents	Well-documented and transparent selection criteria	Semi-structured interview guidelines to reduce bias and unwanted stimuli during data gathering	Discussion to unify divergent understandings during coding procedures to reach inter-rater agreement

Empirical Context and Case Selection

We carefully selected the empirical context of our case studies and subsequently followed a purposeful multi-step sampling approach. Our case studies reside in the automobile industry, which can be characterized as technologically complex, dynamic in nature, and developed in terms of supply base complexity and value chain disaggregation (Novak and Eppinger, 2001; Thun and Hoenig, 2011).

We were able to identify several directed sourcing triads originating from a major automotive supplier as tier 2, four different tier 1 suppliers, and several international automotive OEMs. The international OEMs include but are not restricted to major automotive firms in China, Europe (east and west), and Japan. The selection of buying firms hence mirrors the internationality of the industry and the ever rising importance of Asia and particularly China as market for automotive products (KPMG, 2017).

We distributed our sampling across (1) the size of tier 1 in terms of sales and number of employees, (2) the sales volume between tier 1 and tier 2, and (3) the type of purchase. Two large tier 1s from Germany and the Netherlands, one small Japanese tier 1 and one medium-sized Chinese Tier 1 were selected based on diversity concerning the above criteria and a significant number of components to ensure awareness of the triadic relation within the firm (see Table 2). The tier 2 supplier is a multinational automotive company

with revenue and sales well beyond the 1 bn€ threshold. Tier 2 supplies parts and components to international passenger and commercial vehicle OEMs on different tier-levels and is part of directed sourcing relations for several supply chains. Tier 2's headquarters are situated in central Europe, while manufacturing and logistics are carried out in a global web of plants and warehouses. We report on four supply chain triads whose participants are engaged into a directed sourcing triad. Please see Table 2 for an overview of tier 1 demographics.

In particular, the four triads are diverse not only in quantitative facts but also in their supply market complexity and purchasing decision type. ALPHA, for instance, concerns a module that is not technologically high-end, yet essential for the assembly and operation of the vehicle (see Table 2 & 3).

Table 2: Case demographics

Tier 1	ALPHA	BETA	GAMMA	DELTA
Headquarters location	Germany	Netherlands	Japan	China
Ownership structure	100% subsidiary	100% subsidiary	100% subsidiary	Tier 2 majority
Number of employees	5,000-10,000	1,000-5,000	1,000-5,000	5,000-10,000
Sales volume (2015)	1,000-5,000 m€	1,000-5,000 m€	500-1,000 m€	500-1,000 m€
Sales tier 2 → tier 1 (2015)	10-500 m€	500-1,000 m€	10-500 m€	10-500 m€
Number of components via directed sourcing with Tier 2	7	32	12	25
Number of OEMs supplied	12	3	5	47
Number of tier 1 informants	9	7	5	17
Supply market complexity	Medium	High	Low	High
Product complexity	Medium	Medium	Low	High
Task novelty	Low	Medium	Low	Medium
Purchase importance	Medium	High	Low	High

Data Collection and Analysis

The case study data was collected between April 2015 and December 2016 in the course of a corporate-level project designed to raise internal awareness and develop best practices to deal with directed supply relations at the focal tier 2 supplier. In order to draw a multi-dimensional picture of directed sourcing triads, all three participants of the supply chain triad were included. Semi-structured interviews were conducted with Tier 2 project leaders, who were each directly allocated to one directed sourcing triad, to subsequently establish connections to the respective tier 1 and OEM representatives. We ensured complete confidentiality to our tier 2 interview partners (as to all others) to limit social desirability bias in project leader's attempts to establish said connections. In the following, several managers at tier 1 suppliers and OEM representatives were interviewed. Questions targeted employees' (1) awareness of outsourcing and directed sourcing in their company to verify their expertise on the issue, (2) benefits and risks associated with directed sourcing for their organization, and (3) motivations and lessons learned from conducting directed sourcing. We assumed theoretical saturation to be reached when no new aspects emerged from the conversation (Eisenhardt, 1989; Glaser and Strauss, 2009; Strauss and Corbin, 1998).

We followed the approach of open coding of the interviews by grouping similar information into codes and themes (Strauss and Corbin, 1998). The following section presents the identified themes representing some motivations to do directed sourcing business briefly due to the preliminary nature of our findings and due to the length restrictions of EUROMA full papers.

Preliminary results

Dependency & reversibility

Informants in cases ALPHA and DELTA express comparably high dependency and low willingness and ability to reverse the directed sourcing relationship. Interviews reveal that OEMs as well as tier 2 have shifted resources towards other activities (ALPHA) or need the triad to remain present in foreign markets (DELTA). Conversely, GAMMA shows high dependency on tier 1, partly due to comparably low technological complexity (Table 2 & 3).

Focus on core competences

All cases consistently report that tier 2 (explicitly in GAMMA) and OEMs (ALPHA, BETA, DELTA) can reduce the scope of their own activities and focus on core competences, such as the upper class in BETA (Table 2).

Direct costs

ALPHA and BETA report significant efficiencies since tier 1 is able to build knowledge and specialized capabilities to assemble modules (ALPHA) or even entire finished products (BETA). In collaboration with the comparably large tier 2 and OEMs, tier 1 companies are able to quickly enhance learning. Finally in DELTA, local stocks enable cheap and flexible deliver to Asian customers (see Table 3).

Product quality

The theme of product quality goes along with learning and shows that ALPHA and GAMMA have had early problems with product quality but were able to transfer knowledge and processes to from tier 2 to tier 1 in order to quickly improve quality conditions. In GAMMA, the trilateral forecasting and planning assures enough time to deal with quality problems. DELTA illustrates that quality problems may even dissolve the triad (see Table 3).

Lead time

All cases consistently report that the triad serves to reduce lead time either downstream to suppliers (BETA), or upstream towards the OEM (all other). The triad reduces transport distances but is also beneficial from the supply chain perspective such as the consolidation of Asian orders at GAMMA tier 1.

Control

ALPHA reports that the OEM, as in other outsourcing relationships, loses control over capacity planning, while DELTA is more complex. Tier 1 managers report intensive learning, which partly induces transfer of technological know-how. This transfer cannot be prohibited, tier 2 managers say, due to the dependency that the gate keeping character of tier 1 creates.

Market access

Tier 1 is a gate keeper for tier 2 towards the Chinese market. This has significant implications for dependency and the ease of protecting intellectual property (control).

Risk allocation

ALPHA and BETA illustrate that risk is allocated from the OEM towards lower tier levels. Foremost, capacity planning is mentioned as transferred risk towards tier 1.

Table 3: Motives for Directed Sourcing

Inductive themes	ALPHA	BETA	GAMMA	DELTA
<i>Dependency & reversibility</i>	„It is for us unimaginable to reserve the [...] production back to [OEM].“ – OEM manager	n.a.	If tomorrow, [tier 1] were no longer there, we [...] would find a second [tier 1].“ – Tier 2 manager	[Tier 1] is like a child that gets everything that it wants, but we from [tier 2] cannot tell it what is allowed to do and what it is not” – Tier 2 manager
<i>Focus on core competences</i>	“Production of [part] is considered as core activities, [...] but is not considered as main focus of the OEM.” – OEM manager	“[Tier 1] supports us to produce cars of this platform, so we can increase the production of the upper class in the next years” – OEM manager	“Without [tier 1], it makes no sense for us to deliver the [parts] to Japanese OEMs. We have no capacity to make the adjustment.” – Tier 2 manager	“It is better to apply the proven knowhow of [tier 2]. They know it better.” – OEM manager
<i>Direct costs</i>	„The OEMs provide us their planning data in advance, so we can plan together with [tier 2] about the delivery, production as well as optimize our purchasing“ – Tier 1 manager	„We are the best choice for [OEM] to extend their production. The amount is not so high for [OEM] to set up a new assembly line“ – Tier 1 manager	[The adjustment is realized in low cost countries to keep the cost low.]	“We have a clear plan for localization of the parts to optimize cost. It is inevitable.” – Tier 2 manager
<i>Product quality</i>	“They [tier 1] have improved significantly; they simply applied the process with quality gates of [Tier 2]” – Tier 2 manager	n.a.	„A key success of our business is the communication with [tier 2] and OEMs. [...] If we operate well, we have enough time to check the parts carefully to reduce quality issues“ – Tier 1 manager	If the [parts] do not meeting the market expectation, than the Chinese companies will try to develop and produce the parts by themselves.“ – Tier 2 manager
<i>Lead time</i>	“[Tier 1] now for example has a fabrics in Poland, they supply the tanks to [several OEMs] on site” – Tier 2 manager	“The most important reason why we choose [tier 1] to produce the [...] car for us instead of extending the capacity in [OEM location] is that [tier 1] is quite near from the automotive suppliers” – OEM manager	“They [tier 1] have a stock of reserved [parts] in Thailand. In case of emergency, they can send the [parts] within 36 hours.” – Tier 2 manager	[Tier 1] has established a great [logistical] network in China. That helps our business much.” – Tier 2 manager
<i>Control</i>	„For two years, [tier 1] had to reject our order. They were out of product capacity.” – OEM manager	n.a.	n.a.	„We learn many things from [tier 2]; not only the technology but also the facility management, logistics, and quality control system.” – Tier 1 manager Intellectual property protection [...] depends on the government and is applied in a very flexible way in China.” – Tier 2 manager
<i>Market access</i>	n.a.	n.a.	n.a.	“There are some rules you have to know [...]. [Tier 1] is well-known in China. Any support from the government brings us only advantages.” – Tier 2 manager
<i>Risk allocation</i>	„If the market demand for diesel vehicles decreases, we simply order less from [tier 1]. We don't have to take care of increasing or decreasing the production “	“The sales volume of [product] increased the last year but not so fast. There is no hurry to make any change and risk to set up an own production line” – OEM manager	n.a.	n.a.

Preliminary conclusion/ contribution

With this research we expect to expand the current literature on triadic supply chains in general and network buyer-supplier relationships specifically. In this respect, we expect to provide a differentiated look into the various directed sourcing situations and under which circumstances they are beneficial for the involved parties. Again, we do not attempt to map out all existing directed sourcing types but enter the field by illustrating some examples that we were able to detect in our analyses.

We identify two broad types of directed sourcing triads from our interview data. First, ALPHA, BETA, and GAMMA are directed at achieving operational efficiencies and overall cost improvements. While ALPHA aims at assembling close to OEM lines, BETA aims at flexibly handing over assembly to tier 1, and GAMMA aims at technical adaptations close to the customer, DELTA appeared fundamentally different in our analyses. DELTA, as the second identified type, does not primarily aim at achieving efficiencies but the second-tier supplier is selected because of its strategic role for complying with local content regulations of a major Asian market. DELTA hence has a strategic relevance for tier 2 to be able to serve Asian customers while other cases report less or even no dependence on tier 1 such as in GAMMA.

Finally, our study suffers from its narrow scope that was necessary to assess the motivations of conducting directed sourcing in depth. Providing high internal validity while compromising on external generalizability, we hope to trigger attention to directed sourcing triads in the future. We hope that our preliminary findings can motivate future research to begin creating an extensive inventory of all possible motivations that may drive practice to establish such specialized supply relations.

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