



## Supply chain-based category strategies for global supply networks

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**Abstract.** From a supply chain perspective, often big differences exist between global raw material suppliers' approaches to supply their respective local markets. The progressing complexity of large centrally managed global supply networks and their often-unknown upstream ramifications increase the likelihood of undetected bottlenecks and inefficiencies. Supply-chain-based segmentation of global supply network structures can effectively reduce the complexity, firms face when aiming to strategically align their supply chains on a holistic level.

The interface of the polymer and the automotive supply chains bears great potentials for success achievable through systematic and strategic optimization of the upstream supply chain. This is particularly true for polyamide 6 and 66 ETPs, due to their paramount importance for the automotive supply chain and their complex global and partially oligopolistic upstream supply chains. The critical intermediates of these supply chains are identified as CPL, ADN, and HMD, which are polymerized and then compounded to customized ETPs throughout the different stages of the supply chain. The mentioned potentials for success and strategic optimization are particularly big in the Chinese market, since local availability differs between intermediates, with the polyamide 6 ETP supply chain being less critical and complex than the polyamide 66 supply chain. This background provides the empirical basis in the form of identified real-life problems the conceptual framework for supply chain-based category strategy development this research derives aims to solve. It further delimits the context of this research, and provides the basis for the empirical investigation of the relevant supply markets and a global supply network, as well as the motivation for the selection of its setting and design.

The central paradigm of SCM is the strategic alignment of interconnected firms by configuring the relationships between them to optimally leverage their individual resources and capabilities from a holistic supply chain perspective. Potentials for success lying in the supply base become accessible through the formation of strategic partnerships that aim at collaboratively increasing the competitiveness of the supply chain as a whole. The alignment of competitive priorities throughout the supply base represents the key to unlocking these strategic potentials. Strategic sourcing aims to implement this alignment by managing the relationships to the firm's suppliers in a way that matches their individual resources and capabilities to the firm's requirements depending on market conditions and overall business strategy. Category strategies refer to sets of goals and implementable measures regarding specific material categories and their respective supply markets, and allow for a differentiated approach to strategically configure, manage, and align the firm's supply base and upstream supply chain as a whole. The framework for supply chain-based category strategy development this research develops builds on the theoretical basis of the prescriptive strategy development approach, and the conceptual basis of contemporary category strategy development

approaches. It combines the general category strategy development approach with the conceptual foundations regarding supply chain management, supplier integration, and strategic sourcing based on the relational view. It furthermore aims to solve the problems empirically observed in the research context of this thesis. It additionally uses contingency theory as a theoretical basis that supports the match between supply chain structures, competitive priorities, and regional supply market conditions the developed framework aims to establish throughout global supply networks. The developed approach systematically extends the dyadic perspective of most contemporary approaches to category strategy development to a holistic supply chain perspective. It incorporates the use of supply market-specific supply chain strategy patterns as a segmentation base, in order to provide differentiated strategy recommendations for the configuration of the supply base in the different regional markets of global supply networks. This initial conceptual framework further serves as the theoretical counterpart to the conducted empirical investigation within the stage of theory matching and systematic combining in the context of the abductive reasoning process followed by this research. After introducing case study research as the methodology selected for the empirical part of this research, the design and process of the conducted embedded multiple and single case studies is presented. Based on the synthesized approach for category strategy development and the developed conceptual framework, the key success factors in the investigated supply market are identified as production scale, process ownership, and having a short supply chain. Based on these factors, short integrated, transitional, and compounding supply chains are identified as different types according to which supply chains supplying regional markets in global networks can be segmented. Each of these supply chain types imply different competitive priorities of the suppliers operating them, which can be of different relevance throughout the different regional markets of the buying firm. Using this supply chain-related segmentation base, the global supply network of a leading automotive supplier is analyzed, while different regional demand patterns regarding the different supply chain types are identified. Even though most of the volume is sourced through short integrated and compounding supply chains, within individual regions priorities shift depending on local upstream market complexity, presence of strategic partners' operations, and differences regarding requirements in flexibility and other competitive priorities. In the wider context of this research, the conducted empirical investigation serves as part of the abductive reasoning process for the generation of theories regarding supply chain-based category strategy development. The case study analysis is based on the developed conceptual framework, and

aims at the identification of meaningful segmentation bases and strategic options in the investigated research context. The resulting findings are used to further develop the conceptual framework and derive new theories through a process of theory matching and systematic combining.

As the first result of the research, which answers the first research question, the use of strategic groups of supply chains as a segmentation base for the supply base in the context of supply market analysis and segmentation in the category strategy development process is presented. It effectively extends the existing approaches' segmentation bases' dyadic perspective to a holistic supply chain perspective, and enables firms to base their category strategies on potentials for cost and risk reduction that lie further upstream the supply chain. It uses mobility barriers in supply markets, which refer to different degrees of vertical integration and inter-regional distributions of production assets in the investigated context, as dimensions for the segmentation. The identified groups of supply chains in the investigated context are linked to specific competitive priorities regarding leanness and flexibility, which are of different relevance depending on specific regional situational factors. As the second result of this research, which answers the second research question, a set of prioritization schemes for different strategic groups of supply chains depending on several regional situational factors in global supply networks of the investigated context is presented. The identified groups of supply chains are evaluated and classified based on their strategic fit to contingencies regarding upstream and downstream uncertainty, different competitive priorities regarding leanness and agility, and different requirements in flexibility. The creation of such a fit through category strategy implementation can enable firms to collectively exploit potentials for cost and risk reduction in the supply market through the integration of their individual resources and capabilities through strategic partnerships. Extending the supply chain perspective to a network perspective, the presence of key strategic partners' upstream production assets in a specific regional market is identified as a further situational factor critical for the exploitation of the bundling advantages of network sourcing strategies.

The results of this research are summarized in a proposed theoretical model for supply chain-based category strategies for global supply networks based on contingency theory, the relational view, strategic group theory, and the market- and resource-based views of the firm. The model results from the transformation of the proposed conceptual model by systematically combining it with the results of the empirical analysis, matching it to existing theory and empirical literature, and applying it to the investigated research context.

