The Resource Orchestration Theory as contributor to Supply Chain Management: an assessment on its applicability

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ABSTRACT

In this article an emerging research stream, resource orchestration, will be discussed via a purchasing and supply chain management perspective. The Resource Orchestration Theory can be seen as an extension on the Resources Based View and explicitly considers the role of the manager during the process of *structuring* a firm's resources, *bundling* them into capabilities, and, eventually, *leveraging* from those capabilities. First, the article will conduct a literature review on the theory and consider whether it is actually a real scientific theory. Then, empirical evidence must be sought for in order to strengthen the fundament of the theory. Finally, the article will especially evaluate the theory according to four key decision points in purchasing and supply chain management: 'the make or buy decision', 'sourcing strategies', 'supplier strategies', and 'contracting'. At the end, the article will try to contribute to the still young theory by formulating a framework that enables businesses to see the path way of the Resource Orchestration Theory and the potential benefits involved.

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1. AN INTRODUCTION TO RESOURCE ORCHESTRATION IN THE LANDSCAPE OF SUPPLY CHAIN MANAGEMENT

Creating and maintaining value is at the bottom-line of almost every business (Connor, 1991, p. 121), and therefore seeking ways to create and maintain competitive advantage are of great importance too. According to Ketchen and Hult (2007, p. 537), nowadays, managers use more and more Supply Chain Management (SCM) tools as a source of value creation and competitive advantage. Thomas and Griffin (1996, p. 1) approve this by saying that over the last decades SCM has received a great deal of attention in the business community. In their book, Monczka, Handfield, Giunipero, and Patterson (2015, pp. 6-7) explain why this is a logical development. They argue that SCM tools are a major source of savings, and "supply chain issues are naturally at firm's core, since every firms usually buys goods and/or services as well as sells such". To put it differently, and nota bene the definition used in this paper "SCM is the process which includes the sourcing of goods and services from suppliers aimed at achieving a sustainable competitive advantage" (Handfield, Petersen, Cousins, & Lawson, 2009, p. 101)

Evidently, the concept of "*resources*" is of great importance in SCM. Hence, it is understandable that resource related theories (especially the Resource Based View, RBV) are used frequently to ground supply chain management research (Hunt & Davis, 2008, p. 16). Clifford Defee, Williams, Randall, and Thomas (2010, p. 413) agree upon this statement and add that "over a 6-year period (2004-2009) the RBV was the second most used theory in SCM". Only the Transaction Costs Economics (TCE) theory was used more often. It goes without mentioning that a theory specifically focussing on the process of managing a firm's resources in such a way that value is created is a compelling topic to study. The Resource Orchestration Theory (or in short, ROT) elaborates on this process. However, according to (Ketchen, Wowak, & Craighead, 2014, p. 6) "little is known about how managers position their firms for future success by closing resource gaps and resolving resource orchestration shortfalls within supply chains". Moreover, Clifford Defee et al. (2010, p. 407), who generated an overview of the top 25 theories used in SCM, do not mention such a theory in their review. This underlines the fact that the landscape of managing resources, and a related theory like the ROT, have not yet been studied extensively. This paper will shed light on this emerging research area.

Thus, nowadays researchers have a great deal of SCM related theories to choose from. Due to this variety, researchers struggle to choose the most appropriate ones (Vos & Schiele, 2014, p. 2). This paper will not only contribute to literature by extensively elaborating on the ROT, but also will it determine whether the ROT actually qualifies as a scientific theory according to an evaluation tool developed by Vos and Schiele (2014). Finally, this paper will stress out the ROT against some critical purchasing decision making points and so how reveal whether the theory adds to the quality of literature in purchasing and SCM. The first decision point will be the *make-or-buy* decision. Secondly, *sourcing strategies* will be addressed, whereas the third decision point points out *supplier strategies*. The fourth and last purchasing decision point relates to *contracting*. At the end, the reader of this paper will be able to answer the question whether the ROT meets the requirement for a scientific theory and what the ROT contributes to field of purchasing and SCM.

2. RESOURCE ORCHESTRATION THEORY: AN EMERGING THEORY THAT BROADENS THE RESOURCE-BASED PERSPECTIVE

2.1 From the Resource Based View to the Resource Orchestration Theory by explicitly considering the effect Managers have on gaining Resource Based Competitive Advantage

The RBV is a well-known supply chain theory which was first initiated by Penrose in 1959. Barney, who is also considered as an important contributor to the RBV, says the RBV "examines the link between a firm's internal characteristics and performance" (J. Barney, 1991, p. 101). From here we can say that the essence of the RBV is to develop and maintain a competitive advantage through managing its resources and capabilities. The ROT expands upon the RBV and addresses the actual role of the manager during the process of managing resources strategically (Sirmon, Hitt, Ireland, & Gilbert, 2011, p. 1390).

The ROT was first explicitly mentioned in literature in 2011 by Sirmon et al. However, the roots of the theory go back to 2007 when Helfat developed two frameworks that would later form the foundation of the ROT: In his 2009 book, he describes the *asset orchestration* framework and the *resource management* framework. *Asset orchestration* refers to two processes: first, *search/select*; here managers identify and invest in assets. And the second process is *configuration/deployment*; here a vision on- and coordination of the assets is required. Whereas the *resource management* framework focusses on the fit among these processes (Helfat et al., 2009, pp. 24-30). In 2007 Sirmon, Hitt, and Ireland contributed to the *resource management* framework by reformulating it into "the comprehensive process of *structuring, bundling,* and *leveraging* a firm's resource portfolio" (2007, p. 273). From there, various scholars interpreted Resource Orchestration (RO) differently. Hitt (2011, p. 9) simply said that RO was originally termed *resource management* and nowadays the two terms are simply used synchronically. Retrospectively, Sirmon et al. (2011, p. 1394) did split-up RO by saying that "resource orchestration draws upon both *resource management* and *asset orchestration*". This statement is a bit more comprehensive and is supported by most scholars (Ndofor, Sirmon, and He (2015); Chirico, Sirmon, Sciascia, and Mazzola (2011); Chadwick, Super, and Kwon (2015); Lanza, Simone, and Bruno (2016)). The two frameworks combined form the foundation the ROT and both have the underlying essence of gaining resource-based competitive advantage through managerial activities. Subsequently, the most complete definition of the ROT, and the definition used in this paper, reads as follows: "The ROT describes and examines the roles of managerial actions in the process of *structuring* a firm's resource portfolio, *bundling* the resources to build relevant capabilities and *leveraging* these capabilities to eventually realize a competitive advantage" (Hitt, Ireland, Sirmon, & Trahms, 2011, p. 64). In the next chapter *structuring, bundling,* and *leveraging* will be discussed more thoroughly.

But first it is important to clarify a few concepts which will frequently return in this paper and are directly linked to the ROT. To begin with resources, obviously this is one of the most important concepts to understand: "Firm's resources include all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (J. Barney, 1991, p. 100). So resources do not only have to do with tangible assets but also concern intangible assets like patents. A resource portfolio can be seen as "the sum of all the firm's controlled resources (i.e., tangible and intangible assets)" (Sirmon et al., 2007, p. 274). Competitive advantage is also an important concept which is used frequently within this paper and in management theories anyway. According to J. Barney (1991, p. 102) "a firm is said to have sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy". Regarding the ROT, it would be interesting to find out if there are specific ROT implication tools or whether a supporting framework can be developed which helps to obtain sustainable competitive advantage. In this paper this type of strategy is sought for.

2.2 Managing firm's resources to create value: Assumptions of the Resource Orchestration Theory

As the previous section of the paper already voiced, when the *resource management* framework and the *asset orchestration* framework are integrated with each other, RO is created (please see figure 1 for a visualization of this integration). In figure 1 *structuring* from the *resource management* framework is associated with the *search/selection* sub-process of the *asset orchestration* framework. The *bundling* and *leveraging* sub-processes of the *resource management* framework together are associated with the *configuration/deployment* sub-process of the *asset orchestration* framework. This results in the ROT with three main assumptions: *structuring, bundling,* and *leveraging*. Yet again these assumptions are divided in sub-processes which will be discussed below.

2.2.1 Structuring a firm's resource portfolio

"Structuring the resource portfolio is the process by which firms *acquire*, *accumulate* and *divest* resources" (Sirmon et al., 2007, p. 278). These three sub processes determine the degree of structure of a resource portfolio. So first on *acquire*: *acquiring* simply refers to purchasing resources from strategic factor markets. Strategic factor markets refer to the fact that firms will need to purchases specific resources in order to execute their strategy, they will do this in strategic factor markets (J. B. Barney, 1986). The second step in the process is *accumulating* and refers to the internal development of resources (Sirmon et al., 2007, p. 279). *Accumulating* is of great importance since it is unlikely that suppliers of resources will continuously provide a firm with its required resources. Therefor enhancing their internal mechanisms is relevant. Obviously, accumulating goes hand in hand with learning. Increasing the employees' specific knowledge will help the firm to achieve its goals (Sirmon et al., 2007, p. 279). Yet, in some cases the firm may not possess the needed tacit knowledge. In these cases, the firm might form strategic alliances with companies with desired knowledge (Lane & Lubatkin, 1998, p. 473). The third and last step in the structuring process is the *Divesting,* which refers to the shedding of firms controlled resources (Sirmon et al., 2007, p. 280). Firms can divest less-valued resources that are not likely to add the required value to the firm, so an opportunity is generated for higher valued resources which can be more profitable.

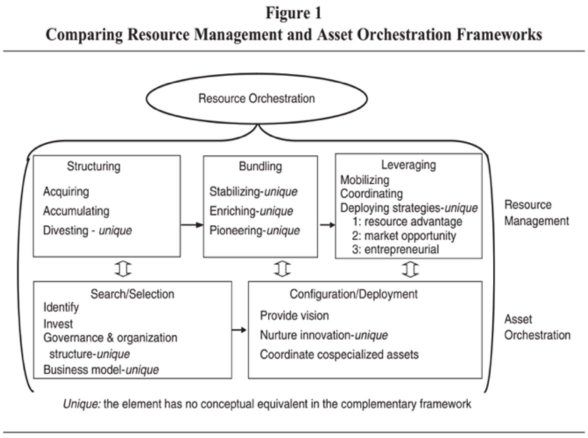

Figure1: Resource Orchestration as viewed by Sirmon et al. 2011 (2011)

2.2.2 Bundling resources to build relevant capabilities

Bundling resources refers to "resources within the firm's resource portfolio that are integrated (i.e., bundled) to create capabilities, with each capability being a unique combination of resources allowing the firm to take specific actions that are intended to create value for customers" (Sirmon et al., 2007, p. 281). There are three different bundling process: *Stabilizing*, *Enriching* and *pioneering*. The *stabilizing bundling* process' intention is to make minor additional improvements in existing capabilities, such as requiring that employees attend a X-amount of training hours per year to keep their skills up to date. The second bundling process is *enriching*. The goal of *enriching* extends keeping skills up to date, as it also tries to enhance a current capability (Sirmon et al., 2007, p. 281). So, capabilities can be *enriched* by learning new skills that broaden the range of current skills or by adding a complementary resource to the current bundle. Despite the fact that it is possible to gain competitive advantage due to *enriching* tactics, it is regularly regarded as only an extension on capabilities. To not only extend upon capabilities, but develop unique and new capabilities the *pioneering* process is designed. According to Sirmon et al. (2007, p. 282) and Ahuja and Morris Lampert (2001, p. 529), *pioneering* may involve the integration of recently acquired new resources. Often, value- creative *pioneering* requires managers with experience and extensive skills. A manager should seek to implement *pioneering bundling* as a routine operation since it enables them to gain and maintain competitive advantage (Sirmon et al., 2007, p. 282).

2.2.3 Leveraging these capabilities to eventually realize competitive advantage

When resources in firm are owned, controlled and even bundled in such a way that they can potentially create value, they do not yet create value for the firm. In order to do so, they need to be used/levered effectively to create value for customers and wealth for its owner eventually (Sirmon et al., 2007, p. 283). Leveraging involves three processes: *mobilizing*, *coordinating*, and *deploying*. *Mobilizing* tries to design the leveraging strategy. More specifically, it identifies the capabilities needed to exploit opportunities in the market and gain a competitive advantage. Subsequently, it designs the composition of these capabilities (Prahalad & Hamel, 1994, p. 87). Then *coordinating,* which aims to "integrate *mobilized* capabilities in an effective yet efficient manner so as to create capability configurations" (Sirmon et al., 2007, p. 285). According to Chatzkel (2002, p. 104) the goal of *coordination* is to integrate in such a way that competitors cannot easily imitate your integration process. Eventually this can lead to unique value creation. The third and final process is *deploying*. *Deploying* is the actual usage of capabilities compositions or configurations to support the chosen leveraging strategy (Sirmon et al., 2007, p. 285). So, *deploying*, is where a "resource advantage, market opportunity, or entrepreneurial strategy is used to exploit capability configurations formed by the coordinating sub-process" (Sirmon et al., 2011, p. 1392).

Summarizing, it is obvious that each element of the resource management process is individually important, but in order to fully utilize RO and bolster performance, they must be synchronized (Sirmon et al. 2007, p. 287). Thus, creating synchronization is key to success when managing your resources. According to Sirmon et al. "creating synchronization requires top-level managers to be simultaneously involved in all stages of the resource management process while consistently scanning the external environment for salient cues about important change" (2007, p. 287). In practice this means that executives must be fully committed to resource management. Only when they do this accordingly, value can be created. Importantly, executives must continuously try to improve the process of synchronization. Whenever they receive feedback from the market or the resource management process itself they must anticipate on it by adjusting the sub-processes accordingly.

2.3 Resource Orchestration actions are affected by three variables: Breadth, Depth, and Life-cycle: a competitive advantage perspective?

So far, managers' activities during the resource management process have been taken into account. According to Wowak, Craighead, Ketchen, and Hult (2016, p. 68), the ROT suggests that these managerial activities are affected by three key elements: *breadth* (scope of the firm), *life cycle,* and *depth* (levels within the firm). These three elements can also be seen as areas in a firm where RO is applicable. To expand the interpretation on RO, the three elements will be discussed in more detail in the following paragraphs.

2.3.1 Breadth as the scope of the firm: Horizontal Integration of Resource Orchestration across the firm

Breadth refers to the level that RO is integrated across the scope of the firm or in other words, the impact RO has on the breadth of/or spread across a firm. In this paper it will also be referred to as horizontal integration of RO across the firm. When horizontal integration of RO across the firm is accomplished, competitive advantage should be created eventually. However, since competitive environments are seldom static, and thus continuously adjust over time, competitive advantage as sketched above, is temporary in general. To master this issue, Arregle, Beamish, and Hebert (2009, pp. 87-90) say, that firms should, for example, employ a regional strategy in which they locate subsidiaries in particular countries and so how drive business more hands-on locally. In this regard, different corporate- and business level strategies require "a unique set of capabilities to effectively implement them […] As such, RO actions are required to develop those capabilities" and create competitive advantage sooner or later (Sirmon et al. 2011, p. 1407). Helfat et al. (2009) describe this same phenomenon by saying that managers must know the type of resources required for different strategies across the firm. To clarify the concept of breadth and its relationship with RO, a brief example is used: A globally operating oil company might need totally different resources and capabilities for exactly the same production outcome in different regions in the world. RO can help the firm to recognize e.g. that in some countries in South-East Asia, they are not allowed to globally buy material's because the authorities legally require firms to locally construct/buy these. Moreover, RO will make sure that the right resources are bundled to still accomplish the same outcome i.e., ensuring contracting expert of the firm will effectively negotiate the best deal with local contractors in South-East Asia.

2.3.2 How resources are orchestrated in different stages of a firm's Life-Cycle

As said before, firms' competitive advantage is temporary in general. This can be explained due to several reasons. One of the major reasons considers the different life cycle stages a firm enjoys: *the start-up stage, the growth stage, the mature stage*, and *the decline stage* (Sirmon et al. 2011, p. 1400). In each stage different resources orchestration processes are dealt with. To begin with the *start-up stage,* in which an entrepreneur concentrates on *structuring* the firm's resource portfolio and *bundling* resources to form capabilities on which the business model will operate. Thus, this stage is a phase wherein opportunities for the venture business-model is examined and stability for the organization is sought for. The second stage, *the growth stage,* is an important stage for managing resources since firms that inadequately manage their resources during this stage often fail (Gilbert, McDougall, & Audretsch, 2006, pp. 941-945). Therefore, in *the growth stage,* managers must *acquire* or develop enhanced skills to help drive growth (Gilbert et al., 2006, p. 942). As a result of this enhancing process, managers will use stricter procedures to structure the organization during the *growth stage.* The goal is to overcome early inadequacies or weaknesses (Sirmon et al. 2011, p. 1401). In conclusion, these activities in the *growth stage* "permit a growing firm to mobilize and leverage its resource portfolio to support competitive advantage" (Sirmon et al. 2011, p 1402). Next, in *the mature stage,* the strategies and operating procedures used are obviously more mature. According to Sirmon et al. (2011, p.1402) maintaining a competitive advantage in this stage requires firms to hire and maintain experienced human capital in order to enhance the resource portfolio's and build capabilities that assist in seeking innovations. Seeking for innovation is important to stay strategic in comparison to competitors (Miller & Friesen, 1984). In the final stage, the *decline stage, "*firms must conserve resources through careful divestment followed by judicious investment of the remaining resources" (Sirmon et al. 2011, p. 1403).

2.3.3 Depth: Resource Orchestration implemented at different levels in management hierarchy; an indicator of Vertical Integration

Depth relates to the different levels within the firm where RO takes place. In this paper *depth* will also be referred to as the degree of vertical integration of RO within the firm. According to Sirmon et al., "a firm's resource orchestration actions can begin at any level within a firm" (2011, p. 1406). An important concept in *depth* is the synchronization of RO actions. In order to create value, RO actions must be known and implementable for managers across the organizational hierarchies, so operational-, middle-, and top level managers should collaborate regarding RO actions. When doing so, managers' awareness of RO activities taking place in the firm increases and moreover, managers become informed of what other level mangers do. However, Helfat et al. (2009) and Sirmon et al. (2007); (2011) still struggle to accurately conclude what kind of RO integrations are most effective hierarchy wise. They plead that "more empirical focus on the role of managerial levels in synchronization is needed" (Sirmon et al., 2011, p. 1406). They do find that middle managers have a critical role in supporting high level managers with *structuring, bundling,* and *leveraging* practices. Moreover, regardless whether the firm is relatively flat, or the firm has many levels of hierarchy, synchronization stays important (Sirmon et al., 2011, p. 1406). Thus, despite the fact that real substantiated conclusions cannot yet be made due to poor empirical evidence, the assumption is made that RO practices must be addressed by synchronization between all-level managers.

2.4 The Resource Orchestration Theory does not yet qualify as scientific theory according to Vos & Schiele's Theory Evaluation Tool

In their paper, Vos and Schiele (2014, p. 2), state that due to the broad variety of management and organizational theories in today's scientific world, it becomes "more and more difficult for researchers and practitioners to choose the most suitable theories, let alone to evaluate their quality". As a result of this difficulty, they developed a comprehensive theory evaluation tool which tries to overcome this difficulty. When applying the ROT to this issue, the question arises whether the ROT can actually be called a theory? Since the ROT is still an emerging theory, the afore questioned quality of the theory is still ambiguous. Hence, in the following paragraph the ROT will be evaluated based on the paper of Vos and Schiele (2014) and the question will be resolved whether the ROT is a legit theory.

According to Vos and Schiele (2014, pp. 3-7), a theory can be called a theory when it meets several requirements. Not only should it have *units, laws, boundaries, system states,* and *explanations,* also theories should be testable and contain the following elements; *propositions, hypotheses, empirical indicators,* and *empirical research.* "Only when a theory possesses all the above mentioned elements and characteristics it can be considered to be an organisational theory" (Vos & Schiele, 2014, pp. 6-7). To begin with *units*, which should address the question of *what* is described in the theory and mentions related variables, constructs, and concepts, the ROT focuses on the role of managers in the process of creating a resource-based competitive advantage (Sirmon et al. 2011, p. 1394). Thus, important is the central role of the resource portfolio in the theory and the influence the manager can have on the process to create competitive advantage. This causality is the *law* of the theory. In practice, the most efficient leverage method of the theory will result in higher turnover (*value boundary).* Despite the fact that ROT considers interesting sub-processes as *structuring*, *bundling*, and *leveraging*, these are not applicable across the entire firm (*space boundary).* Furthermore, RO has a *time boundary* in the sense of resources that can expire. Also a theory should address *system states* by explaining conditions under which the theory is operational. Here the ROT shows some shortcomings because the theory does not explicitly consider consequences of units interacting with each other. Moreover, the theory does not yet provide a measurement tool and also consistency is not yet proved empirically.

Then, research operation criteria must be considered in order to decide whether the ROT is applicable to practice and refutable. Sirmon et al. (2007) and Ndofor et al. (2015, pp. 1657-1658) centrally state that in order to create resource-based competitive advantage, several sub-processes of the ROT must be synchronized (*proposition)*. However, other *hypothesis* and *propositions*, are not explicitly mentioned in literature. Sirmon et al. (2011, p. 1392) do state that the ROT has "the potential to extend our understanding on the RBT […] Yet additional theory development and empirical testing is required to more fully identify and understand the actions managers take to manage a firm's resources". Therefor the goal of their literature on the ROT seems to be stimulating and guiding future research. Until now, limited *empirical research* has been conducted on the ROT, in section 2.6 the empirics found will be shown.

Unfortunately, the ROT fails to fulfil each required quadrant in theory evaluation tool. Especially, the ROT still lacks to confirm its applicability in practice and does not yet sufficiently explain why certain events occur. The ROT has developed a good foundation for future research but cannot yet be called a legit theory according to Vos and Schiele's evaluation tool.

2.5 Main Statements on Resource Orchestration: Horizontal Integration, Vertical Integration and Synchronization are key to success

Empirical research has already shown that resources influence firm performance substantially (Crook, Ketchen, Combs, & Todd, 2008, p. 1141). Moreover, research has shown that this influence is not only because of possessing resources, but also involves managerial action regarding the resource portfolio. This is where the ROT, which focusses on the role of managers while structuring, bundling, and leveraging a firm's resource portfolio, comes in. While each sub-process of the RO process is important, synchronization of these processes is essential when value creation is the goal (Sirmon, Gove, & Hitt, 2008, p. 922). Thus, creating synchronization is key to success when managing your resources. According to Sirmon et al. (2007), creating synchronization requires top-level managers to be concerned with all the RO process stages. Moreover, they say that managers must continuously try to enhance the RO process by scanning external environments. Also, simultaneous involvement in the different stages of resource management is necessary, because feedback from the market regarding customer needs influences the sub-processes employed in each component.

Breadth, *depth,* and *life cycle* influence the ROT. These three elements have a close relationship to the competitiveness of a firm and it pleads that managers must know the type of resources required for different strategies across the firm. So acknowledging *breadth* will create awareness and enable firms to anticipate more rapidly and effectively on different strategies resource and capability wise. Moreover, different *life- cycle* stages across a firm (*the start-up stage, the growth stage, the mature stage* and *the decline stage)* have different RO related characters. In chronologic sequence, it is important to seek for stability in *the start-up stage*. Next, in *the growth stage* managers must acquire or develop enhanced skills to help spur growth. In *the mature stage,* maintaining a competitive advantage enquires hiring experienced human capital in order to refresh and improve a firm's resource portfolio's. Moreover, seeking innovation is important to stay strategic in comparison to competitors. Finally, in *the decline stage,* firms must conserve resources through careful divestment, yet the remaining resources should be invested carefully. Finally, *depth*, or *vertical integration* relates managerial hierarchy with RO and finds that all level managers must be involved in RO matters in order to enhance performance.

When the discussed findings are synthesized a few things stand out: First of all, *breadth* (*horizontal integration* of RO) has the most intensified relationship with RO. *Structuring,* for example is, is highly influenced by the degree of *horizontal integration* of RO because it can prevent unnecessary purchases due to better inter-firm resource portfolio management and for *bundling*, *breadth* can help to build capabilities faster and more economically due to information symmetry. Regarding *depth,* or *vertical integration,* RO has impact on *structuring, bundling,* and *leveraging* because of the better alignment between organization hierarchy's. So both *horizontal*- and *vertical integration* and also synchronization are elements that help to gain a better understanding of how RO is currently implemented in the firm and how it's related actions enhance the resource-based competitive advantage.

2.6 Empirical research on the Resource Orchestration Theory: an assessment via a literature review approach

According to (Blumberg, Cooper, & Schindler, 2014) "empirical research attempts to describe, explain, and make predictions by relying on information gained through observations". In this paper, it means, that the empirics will be used to collect factual information about the hypothesized relationships from the previous parts in the paper. Eventually, the outcomes of these empirics will be used to determine whether more research on the ROT is needed.

2.6.1 Methodology of the literature review approach

Empirics on the ROT were found by searching via the common search engines like: Google Scholar, Jstor, Scopus, ScienceDirect, Emerald Insight, Research Gate, the UTwente Library search engine, and Wiley Online Library (what gives access to The Strategic Management Journal and The Journal of Supply Chain Management etc.). The most frequent used search terms, obviously, were 'resource orchestration' and 'resource management', but also terms like 'strategic resources', 'resource allocation', 'resource portfolio', 'resource portfolio management', 'resource based view', 'resource based theory', 'asset orchestration', and 'competitive advantage through resources' were frequently used in the search engines.

When the search term 'resource orchestration' was used in Scopus, 747 hits were found, in Google Scholar 52.600 hits were found, and in Jstor 601 hits were found. To narrow down the findings, Scopus gives the opportunity to work with several filters likes *subject areas,* and *type of document,* while Google Scholar only filters on *year of publication.* In more specific search engines like Wiley Online Library, where you can specifically search in Management Journals*,* 31 results were found. Moreover, during the process of searching for case studies that could be used for part 2.6.2. similar search tactics were used. Because the amount of content generated from these search tasks was not substantial, the broadness was extended. For example, also search query's like 'case study resource decision making' or 'resource management in practice' were used. Overall, the amount of published and relevant content still was not considered as strong.

2.6.2 General empirical findings: synchronization and vertical integration bolster Resource Orchestration performance in practice

Several researchers elaborate on the importance of RO or resource management, however, most of them contributed to literature via conceptual research. For instance, Sirmon et al. (2007); (2011), contributed a considerably amount of literature on RO, but did not base assumptions on empirical evidence per se. Clearly, the importance and awareness of specific managerial actions during the process of managing resources is growing, but empirics miss out at first sight. The following case studies did show empirical findings related to the ROT.

When looking at RO in practice, it is found that in order to bolster firm performance, resources should be set up by managers in such a way that it matches with the firm's strategy (Sirmon & Hitt, 2009, p. 1388). This might look like an obvious statement but must be taken into account carefully in order to improve firm performance sustainably. In their case study Holcomb, Holmes Jr, and Connelly (2009) use data from professional football teams (UFL) to test theory regarding managerial ability and managers' actions on resource value creation. They found that "the effects of managing resources are contingent on the quality of the resources held and on the synchronization of the processes used to manage the resources" (Holcomb et al., 2009, p. 478). Thus, differences in managers' abilities can help explain why some firms create more value from their resource in comparison to other firms and, moreover, that managers with superior abilities can effect resources with more impact. Furthermore, the finding that managerial ability is positively related with performance through resource synchronization actually says that managers influence performance and one of the most effective tools to do so is by synchronizing a firm's resources (Holcomb et al., 2009, p. 478). Concluding, this study proves previous assumptions made in this paper that synchronization processes are important antecedents for firm performance advantages.

The case study of Chadwick et al. (2015) pleads for engagement of managers from all levels of an organisation in resource management. In their study, which has a human resource management perspective, they examined 190 Korean firms and their management teams via a survey in 2006. The purpose of the survey was "to examine the relationship between management practices and firm performance" (Chadwick et al., 2015, p. 336). There findings gave "a double-sided view of strategic resource development, emphasizing the contribution of top managers' strategic emphasis along with middle managers' role in operationalizing that emphasis" (Chadwick et al., 2015, p. 374). In other words, the researchers emphasize that vertical integration of resource management within the firm's managerial hierarchy's is an important element to bolster performance. Also, the role of middle manger's to support top management's strategic point of views is of great concern. They say that this is the essence of RO success. Thus, this case study proves the assumption that vertical integration is an important performance indicator in RO practices.

In the case study of Lanza et al. (2016), RO is viewed via yet another perspective. The researchers took a look at RO in the context of knowledge resources acquisition and divestment and used empirical evidence from the Italian Serie A football league to come up with conclusions. The goal of the study is to "investigate how resource orchestration affects performance at the firm level in the context of decisions concerning the management of knowledge resources" (Lanza et al. 2015, p.

145). They collected data from player's performances and club performances regarding two Serie A seasons: 1960-1961 and 1991-1992. Lanza et al. (2015, p. 149) say that the Italian Serie A league is a competitive setting which is comparable with common business settings. They conducted a regression- and correlation analysis and this resulted into several conclusions with regard to RO. First of all, they found that, in order to fully contribute from knowledge resources (i.e., the players and other employees of the clubs), managers/ executives of the club must pay attention to the overall experience of the knowledge resources. So, managers must always take into account what will happen to the overall knowledge resource when hiring new employees or when firing them. When linking this to the Serie A football, managers must, for instance, carefully consider if they release old routine players from the team or that they offer them a new contract. This can bring the club's performance in jeopardy but also reinforce it. Moreover, they say that uncertainty for the receiving unit (i.e., an existing team, or firms, and so on) about the contribution of possible new incoming employees always has a bad influence on performance. In other words, the greater the experience a newcomer has with joining new environments, the better the performance. This case study highlights a topic not yet focussed on and extends our scope on RO. The most important lesson learned is that managers must keep in mind what effects possible transactions of (knowledge-) resources have on the composition of the current resource portfolio. Ad hoc releasing or contracting of knowledge resources should be avoided.

Next, Wales, Patel, Parida, and Kreiser (2013, p. 93), conducted a research involving 258 small firms from Sweden. In their research they found that, drawing upon the ROT, information and communication technology capabilities have a positive influence on firm performance and especially on entrepreneurial orientation. This underlines the importance of information symmetry in organizations and that this can lead to orchestrating the resource base more effectively. Chirico et al. (2011, p. 320) conducted a comparable case study focussing on family firms, they found that, with the help of synchronization practices, RO enables managers to better understand how and when to turn resources into positive outcomes. These studies confirm that RO can help to enhance performance due to information symmetry and synchronically utilizing resources.

Finally, in the paper of Sirmon and Hitt (2009), the possible affects resource investments can have on firm performance are emphasized. The results, based on a sample of banking firms in the United States, indicate that deviating your investment strategy in comparison to those of rivals, regardless whether it is higher or lower, negatively affects performance (Sirmon & Hitt, 2009, p. 1390). So, these outcomes suggest that conformity in resource investments decisions to the benchmark of rivals leads to best performance. However, the results also show that "investments decisions alone do not produce the best results [...] highest performance outcomes were achieved when resource investment and deployment decisions 'fit,' regardless of the investment level." (Sirmon & Hitt, 2009, p. 1390). Thus, concentrating on the fit between the investment decision and the deployment decision actually bolsters firms' performance.

Summarizing, less than 10 useful empirical papers related to RO were found, what is not considered as a substantial amount of empirics. However, the papers found were interesting and broadened the RO perspective. In sum, the empirics state that all-level managers should be simultaneously involved in all RO processes while top level managers should also optimize internal cross-functional relations and seek to improve external issues. Moreover, middle-level managers are crucial with regards to supporting the top-level managers' point of view. This empirically underlines the importance of vertical integration. Moreover, synchronization is also a recurring performance indicator for RO practices in the empirics. Only horizontal integration is not yet empirically tested. In sum, the empirics show that indeed vertical integration and synchronization positively influence RO practices and, thus, from now on will be called Key Performance Indicators (KPI's) in this paper.

2.6.3. Findings Related to Purchasing & Suppliers: lack of Purchasing and Supply Management related empirics results in non-substantiated conclusions

In this section, specific empirical findings related to purchasing and SCM were sought for. Unfortunately, such empirics were not found at all. Therefore, this section will focus on the general findings in the paper so far and try to look for assumptions made about purchasing and SCM in these papers. After all, in order to possess resources, they also have to be acquired or purchased first. From here there are several interesting findings related to purchasing and supply chain management to mention.

One of the major components in the ROT is the step of *structuring* the resource portfolio (with *acquiring* being one of its sub-processes). Sirmon et al. (2007, p. 278) claimed that *acquiring* refers to purchasing resources from strategic factor markets. An interesting finding is that strategic factor markets are massively incomplete regarding information on resources what leads to uncertainty sooner or later (Denrell, Fang, & Winter, 2003, p. 981). Eventually, this uncertainty leads to mispricing of resources, what subsequently leads to opportunities for buyers to purchase resources below its true value. Thus, most likely managers engaged in the process of purchasing resources from strategic factor markets, can buy resources for more competitive prices than previously thought. Sirmon et al. (2011, p. 1398) followed up on this idea by emphasising the importance of cost leadership strategies in order to maintain lower costs relative to competitors. Furthermore, they also indicate that in the recent years, more and more firms outsource several business functions to external suppliers who can conduct these activities more cost-effective. The development of consciously considering prices paid for resources and moreover considering an outsourcing possibility is also known as the make or buy decision, an important purchasing decision point. In section 3.1 there will be a more extensive elaboration on this topic.

As said by Sirmon et al. (2007, p. 287), "managers should be simultaneously involved in all stages of the resource management process while consistently scanning the external environment for salient cues". Henceforth, the conclusion can be made that managers have the responsibility to continuously sustain and improve the relationships with existing suppliers (i.e., supplier relationship management). In general, this statement is supported by Oghazi, Rad, Zaefarian, Beheshti, and Mortazavi (2016, p. 1), who say that, in order to obtain a higher competitive advantage, firms in the current market seek to establish strategic long-term relationships with suppliers. Moreover, Sirmon et al. (2011, p. 1398) approve and even widen this perspective by adding that in the ROT the purpose of supplier management is ensuring that external suppliers provide products which meet with requirements of the buyer and give the firm additional advantage over competitors. These requirements vary from delivery-time demands to firm's quality standards. Essentially, these advantageous sketched by

Sirmon et al. are indicators of a preferred customer status. Literature shows that a firm has a preferred customer status when (i.e.,) their supplier dedicates its best personnel to joint activity, or customizes its products according to customer's wishes, or when a customer can use a supplier's innovations (Steinle & Schiele, 2008, p. 11). Supplier relationship management and the preferred customer status principle already have a shared goal with the ROT; gaining competitive advantage in buyer-supplier environment. Despite the fact that the concept has not yet been explicitly mentioned before in literature, it is important to mention it here. For now, it can be seen as a possible extension on the assumption in the RO framework and an interesting area for further research. At the end, the findings in this part proves that RO has close connection with some fundamental of purchasing and SCM. Despite the fact that no real empirics were found, the papers and scholars do indicate the relevancy of chapter three.

2.6.4 Classification in the life-cycle approach of theories: The Resource Orchestration Theory proves to be an emerging theory by representing most virtues but still lacking empirical validity and external consistency

Building upon section 2.4, a closer look at the virtues will be displayed with the empirics taken into account. According to Vos and Schiele (2014, p. 7) virtues for good predictive theories are identified by criteria which distinguish theories from each other. Subsequently, they categorize virtues in *internal*- and *external virtues*, which will be discussed below.

Internal virtues represent the internal properties of theories and consists of two sub-categories. Regarding *internal consistency* and *coherence*, scholars of the ROT are broadly *coherent* regarding point of views on the origin of the theory. Only Sirmon et al. (2011, p. 1392) and Ndofor et al. (2015, p. 1658) plead that ROT is developed out of the *asset orchestration framework* by Helfat (2009) and the *resource management framework* from Sirmon et al. (2007) and so how formulate RO more extensive in comparison to Hit (2011) who pleads that RO is simply a synonym for *resource management*. But in general this is a minor difference and it can be concluded that the virtue of *coherence* is supported in the ROT. In the empirics of this paper a variety of case studies are exhibited and test RO in different business contexts. However, the overall quantity is not yet substantial and some of the most general propositions were not yet empirically tested (i.e., whether implicating RO actually increases turnover). Thus, the ROT still lacks internal *empirical validity*. Fortunately, scholars acknowledge this by saying that the dynamic RO environment still requires additional research and their contribution only adds to the richness of the theory so far (Sirmon et al. 2011, p. 1409).

Next, for *external virtues*, the ROT broadly covers all the criteria sufficiently due to the paper of Sirmon et al. (2011) where *breadth, depth,* and *life-cycle* of the ROT are discussed extensively. Regarding *scope and unity,* the ROT came up with *breadth* to determine the impact RO has on the *breadth* of- or spread across a firm (Sirmon et al. 2011, p. 1395). Despite the fact that the main focus is on the internal *breadth*, the theory also elaborates on competitive dynamics and thus addresses external relationships (2011, p. 1399). Moreover, the existing body of theory on the ROT builds upon the Sirmon et al. (2011) paper and do not necessarily contradict to it (*external consistency*). Contradicting point of views would contribute to the richness of the ROT. Further, indicators of *conservatism* are not seen per se. Obviously, the RBV could not be ignored since it forms the foundation the ROT, however, further comparisons are negligible. Finally, regarding the *fruitfulness* of the ROT, the theory sufficiently states the usefulness, relevance (*practical importance)*, and also generates enough fertile new questions (*theoretical fecundity*). Overall the ROT does not disappoint in addressing external virtues. And, thus, is not ambiguous per se. Nevertheless, the theory should continuously enhance its virtues and operationalization in order to develop a more sustainable foundation for the theoretical perspective.

Summarizing, being in a dynamic environment, and given the fact that resource-based competitive advantage is an emerging concept, the ROT is still in its start-up phase. The ROT proves potential by fulfilling most external virtues, however, the internal virtues and especially the empirical validity still needs improvement and broader considerations in order to establish itself as theory among other resource-based theories.

2.7 A critical assessment of The Resource Orchestration Theory: insignificant amount of contributors and the absence of empirical validity brings the theory's status in jeopardy

So far, the ROT approved that creating resource-based competitive advantage does not end after the right resources are possessed by a firm, the process continues with managing those resources accordingly. The developed RO framework by Sirmon et al. (2007); (2011) gives proper managerial actions to guide managers through this process, but when the theory is critically analysed, can the theory as a whole actually be seen as a serious contribution to RBT?

The theory is satisfying in terms of clearly providing guidance during the process of managing resources with 3 process stages of managerial actions. Moreover, the theory extensively addresses upon these actions and its sub-processes in the paper of Sirmon et al. (2007). The theory sheds light on the question "how" resources can be used to create competitive advantage. According to many scholars this was a point of view missing out in RBT until now. For example, Priem and Butler (2001, p. 33) say that the RBT focusses too much on issues like "generic characteristics of rent-generating resources" and does not sufficiently focus on "how" resources must be used in order to create value. So, regarding this research gap, the ROT comes with new insights. Furthermore, the ROT was extended by Sirmon et al. with an elaboration on horizontal- and vertical integration of RO and its related life-cycle. This contributes to the external virtues of the theory and so how enhances its foundation.

Nevertheless, the ROT also has its serious shortcomings too. First of all, concepts within the ROT, like *breadth* and *depth* are addressed abstractly by scholars of the theory. For example, literature about *breadth* (or horizontal integration) mentions several strategies (i.e., corporate strategy, business strategy, and competitive dynamics) which are then associated with particular implications like *product diversification*. However, the majority of these strategies and its associated implications focus on the formulation of the relationship but do not specifically mention how to effectively implement such strategies. Also, the scholars neglect to illustrate this process via a framework. Subsequently, due to the insignificant amount of empirical findings on the ROT, reasoning upon the theory and statements made by Sirmon et al. (2011) becomes even more abstract in this paper. This evolves in assumptive reasoning what is a major drawback in an academic theory. This is confirmed in the section 2.4 and 2.6.4 where the theory was said to lack *empirical validity* and *practical applicability* according to the evaluation tool of Vos and Schiele (2014).

Furthermore, the concept of RO is addressed upon by only few scholars in general and moreover, the papers which form the fundament of the ROT are developed by the same group of scholars: Sirmon, Hitt, and Ireland. Due to their exclusiveness, it is debatable whether these scholars are objective in their formulations and critical enough when evaluating their own theory. Also the abstract explanations of particular concepts in the theory might be kept vague intentionally because ambiguity in these fields still prevails. Hence, it would be preferable that some different distinguished scholars would critically evaluate the theory and come up with some contrasting point of views.

In sum, the ROT is still an emerging theory and does a good job in closing the knowledge gap of what role managers have in creating resource-based competitive advantage. Importantly, more scholars should critically evaluate the content of the theory and extensive empirical testing is needed to strengthen the theory's bottom-line. Fortunately, Sirmon et al. (2011, p. 1409) do acknowledge that future research is still needed to evaluate the further context and influencers of RO. Thus, in general the findings in this paper regarding the ROT are fruitful but not easy to implement and understand yet. Moreover, the actual contribution of the ROT to purchasing and SCM is still not clear as well. Therefore, section three will take a closer look at this contribution and a more applicable framework on RO in sought for.

2.8 Differentiation and evolution tendencies: The Resource Orchestration Theory relates with other distinguished theories and is expected to gain more attention in the Resource Based Theory

The main purpose of this paper is to develop a more sophisticated opinion about the ROT, therefore solely focussing on the ROT would not give a satisfying view of the context of the theory. Previously, this paper showed that there are a lot of theories that relate to the concept of resources. The RBV, TCE and resource dependence theory can be seen as the cornerstones of this theoretical perspective. In this paragraph the relationship between these theories and the ROT will be focussed on.

Since the ROT can be seen as an extension on the RBV, it is obvious that they have a lot in common. The RBV considers whether there is a linkage between internal characteristics and performance in a company (J. Barney, 1991, pp. 100-101). The ROT attempts to sketch a more precise understanding of managers' role within RBV. According to J. B. Barney, Ketchen, and Wright (2011, pp. 1300-1303), the RBV was initiated in 1959 by Penrose. Until today an extensive amount of research on the RBV was published. One of the most interesting developments regarding the RBV is the Dynamic RBV (DRBV), which is based on the capability life cycle. According to Helfat and Peteraf (2003, p. 998), the DRBV tries to explain and incorporate the evolution of resources and capabilities into the RBV. The main difference between the ROT and the (D)RBV, obviously, is that the ROT especially focusses on the role of managers while the (D)RBV focusses on more internal characteristics which influence firm performance. Moreover, according to Hitt (2011, p. 10), the RBV reasons from capability strengths, where the ROT extends on this by also considering resource and capability weaknesses. Yet, all firms have weaknesses and can use strategies to cope with it, which are provided by the ROT. The DRBV and the ROT are more comparable to each other that the RBV and the ROT since the DRBV has as goal to formulate an understanding of what will happen with resources and capabilities when competitive advantage is the goal, the ROT tries to formulate this process with *structuring, bundling* and *leveraging.*

The resource dependence theory (RDT) is another related theory and already differs more to the ROT in comparison to the RBV. According to Hillman, Withers, and Collins (2009, p. 1), the RDT "recognizes the influence of external factors on organizational behaviour". They plead that managers can act to reduce uncertainty and dependence in situations where external influence has its impact. This statement already leads to a similarity since the ROT also tries to help managers to empower their position in a buyer-supplier relationship. Thus, the RDT and ROT both seek to find solutions on managerial level. However, the RDT primarily considers firms to be dependent on contingencies from external environments, like uncertainty in the business environment or fierce competition. In retrospect, the ROT focusses more on the internal scope of the firm, like ability to *acquire* and *accumulate* the right resources. In this respect, the ROT can help the RDT to, for example, *acquire* and maintain the right resources and so to how eliminate uncertainty.

The transaction cost economics (TCE) theory is another important theory in the RBT's. In brief, the TCE theory seeks to govern negotiation processes during transactions between firms (Shelanski & Klein, 1995, p. 336). According to them, the possible unforeseen costs of a transaction are, obviously, inconvenient for firms, so eliminating or reducing them via governance is favourable. Basically this theory tries to understand the nature and purpose of transactions. An important element of TCE is deciding whether or not to choose for alignments with suppliers. Such decisions are based on potential cost resolving from such a decision. At first sight, the ROT does not directly contribute to such decision making, however, the ROT does lead to better resource portfolio management (*structuring, bundling,* and *leveraging)* what could lead to better considered decision making eventually. Concluding, the TCE focusses more on actual costs evolving from transactions like policy costs, costs due to uncertainty and bargaining costs. On the other hand, the ROT looks at the role of the manager during the process of managing the resource portfolio and considers possible costs evolving from their actions.

Summarizing, the ROT is unique in the sense of mainly focussing on the field of managerial actions instead of providing an interdisciplinary view. Maybe because the ROT focuses on this niche, the theory is not yet addressed upon by many scholars. At the same time, due to the growing importance and awareness of the impact of resources on firm performance, it would be likely that the ROT would gain more attention (Crook et al., 2008, p. 1141). However, the ROT was first mentioned in literature in 2011 and it roots go back to 2007. Hence, it can be considered as a relatively young theory, especially when comparing it with theories like the TCE, which was founded in 1973 by Williamson. From there, it is expected that the ROT will enjoy more attention from scholars in the following years and thus, the theory is still in its start-up phase. So, with respect to evolutionary tendencies and the relevance of the ROT, future in depth research is likely to be conducted.

3 THE RESOURCE ORCHESTRATION THEORY EVALUATED THROUGH A PURCASING PERSPECTIVE: AN ANALYSIS OF FOUR KEY PURCHASING DECISION POINTS

As (supply-) managers continuously look for ways to reduce expenses, companies also seek for innovative models that do not only reduce costs but also improve services (Vanpoucke, Vereecke, & Wetzels, 2014, p. 446). Whether the ROT can be such a model is investigated in this section of the paper. More specifically, the identification of the ROT with the key purchasing decision making points will be elaborated on. The key results and managerial actions of the findings are displayed in figure 2 on this page.

3.1 Decision point 1: 'Make or Buy decision': The Resource Orchestration Theory as capability analysis tool to simplify decision making

When a company finds itself in the situation where it must design and produce a new product, or a part of a product, it faces the consideration whether it should *make* the product 'in-house' or whether it should *buy* the product externally, form another company. This phenomenon is called *the make or buy decision* (Platts, Probert, & Canez, 2002, p. 247). In general, this decision making point generates some obstacles. On the one hand, making the product internally may require the firm to fully deploy an according strategy what can limit other functions within the firm. Fully committing resources to this strategy and high potential costs to reverse are fall-backs of the make decision (Leiblein, Reuer, & Dalsace, 2002, p. 817). On the other hand, outsourcing can lead to "the hollowing of corporations, resulting in the depreciation of existing capabilities" (Leiblein et al., 2002, pp. 817-818). As previously mentioned in this paper, it is important to guide resource related processes within the firm with resource related theories. Since the ROT is a resource related theory, it is likely to be a contributor to the make or buy decision with its extensive scope on managing the resource portfolio.

According to Ettlie, Bridges, and O'keefe (1984, p. 638), managers will handle radical innovations, which require totally new knowledge and resources, differently in comparison to incremental innovations, which build upon existing knowledge and resources in a decision making context. Building upon this, different managers, with other abilities, behave differently in particular scenarios of the make or buy decision. In general, managers make biased decisions. The ROT can bring routine in the decision-making process and moreover can eliminate the biased character of the decision-making process. The ROT process, especially *bundling* and *leveraging*, should support managers to build and use capabilities more effectively and so how help the manager to make the best decision in the make or buy consideration. *Bundling* resources could imply that a firm brings together a forecast analyst and a procurement specialist, together they achieve to proof that a buying option is 10% more economical in the long run in comparison to make decision. Eventually, this contributes to a manager's level knowledge and thus to the level of confidence when deciding between the make or buy option. Retrospectively, the same capability can be built for a research and development (R&D) department what could lead to reasoning in favour of the make decision. Information asymmetry between the managers and their departments can be seen as a major source of inefficiency in purchasing and SCM decision-making (Fiala, 2005, p. 420). Removing information asymmetry can lead to making better decisions. RO process emphasizes that cross-functional managers should synchronically be involved in RO actions like *acquiring* resources or *accumulating* them. Logically, due to this collaboration and integration, RO enhances information exchange in the firm. Sirmon et al. (2011, p. 1395) confirm this by saying RO practices require horizontal integration what "facilitates the flow of information, encourages joint decision-making, and attempts to build trust between managers in each of the units represented". Thus, the ROT provides a handhold for more unbiased, thought-through, and representative decision making.

In sum, managers can use the ROT as an analysis tool to determine which capabilities a firm has with regard to resource management. When the analysis is conducted, the firm will be able to see what the strengths are and what are still weaker functions in the firm. The results of this analysis will enable a manager to make an appropriate decision in the make or buy consideration.

3.2 Decision point 2: 'Sourcing Strategies': breadth and depth enable the selection of the best sourcing strategies

According to Tayles and Drury (2001, p. 619), a firm needs a sourcing strategy to ensure that the decision is in line with the strategic scope of the firm. Different scholars discuss a lot of different sourcing strategies, Kotabe and Omura (1989, pp. 120-122) identified 64 different sourcing strategies in their paper and suggest that multiple sourcing strategies are often used simultaneously by firms. In another paper Kotabe and Murray (2004, pp. 7-10) argue that the major sourcing strategies are distinguished by locational characteristics (i.e., domestic/local sourcing and international/ offshore sourcing) and by volume.

Kotabe and Murray (2004, p. 9) say that during the process of developing sourcing strategies, companies must consider resources, capabilities and its potential costs thoroughly. Moreover, they add that sourcing strategies require "a close coordination among R&D, manufacturing, and marketing activities" within the firm (2004, p. 8). In other words,

'Make or Buy' Decision	'Sourcing Strategies'	'Supplier Strategies'	'Contracting'
"The ROT as capability analysis tool to simplify decision making"	"*Breadth* and *depth* enable the selection of best sourcing strategies"	"RO as essential feature in order to strengthen buyers competitive position in a buyer-supplier relationship"	"The ROT as in-house evaluation tool to determine content of contracts"
Managerial actions and impact:	**Managerial actions and impact:**	**Managerial actions and impact:**	**Managerial actions and impact:**
1. Use ROT to conduct an analysis of capabilities within the firm 2. Overview of strong and weak capabilities regarding resource management provided 3. Results enable manger to argument make or buy decision: eliminating biased decision making	1. ROT enhances horizontal integration: broad-based RO awareness and knowledge across the frim (*breadth)* 2. ROT enhances vertical integration (*depth)* and encourages *synchronization:* internal collaboration improves due to all organizational hierarchy's involvement 3. Knowing which broad supported sourcing strategy to conduct	1. ROT used as in-house capability builder/ enhancer: i.e., better NPD, supplier development programs, contracting, supplier involvement etc. • For *alignment strategy*: better performance= supplier satisfaction: reinforces the buyers competitive position in a buyer-supplier relationship • For *quick supplier switching strategy:* knowing how and when to switch to alternative suppliers	1. Conduct check-list evaluation on strengths and weaknesses 2. Use results to determine what kind of contract is desired 3. When setting up contracts, implement those findings

Figure 2: An overview of what the ROT contributes to the four key Purchasing decision point: managerial actions and impact

successfully selecting and executing of a sourcing strategy depends on knowing what kind of resources and capabilities are required and also depends on strategic collaboration between departments within the firm. The *Breadth* concept of the ROT, describes how ROT practices like *acquiring* resources and *mobilizing* them are horizontally integrated within a firm and pleads to enhance this integration. Due to this horizontal integration of resource portfolio management, managers will know what kind of resources are already in-house and which still need to be sourced to "support capability configurations necessary to exploit opportunities in the market" (Sirmon et al. 2007, p. 277). For example, this could result in a company realizing it needs to source specific technological components offshore in a low cost country like China in order to exploit strategic opportunity. Retrospectively, managers may also know better which resources are not likely to contribute to a strategy and therefore must be divested or outsourced (Sirmon et al. 2007, p. 280). Concluding, the ROT improves a firm's sourcing strategy decision making by enhancing internal collaboration due to involvement of all organizational hierarchy's in decision making (*depth and synchronization)* and due to broad-based RO awareness and knowledge of the resource portfolio across the firm (*breadth)*.

3.3 Decision point 3: 'Supplier Strategies': Resource Orchestration as essential feature in order to strengthen buyers competitive position in a buyer-supplier relationship

After an organization has chosen an appropriate sourcing strategy, it should decide how to actually cope with its suppliers: a supplier strategy has to be chosen. From a buyers perspective, the buyer-supplier relationship seeks to "obtain the best resources from sellers by striving to become more attractive to suppliers" (Schiele, Calvi, & Gibbert, 2012, p. 1178). In general, this relationship is associated with reducing costs and creating value for both parties. According to Ivens and Pardo (2007, p. 470), the quality of relationships is based on satisfaction, trust, and commitment.

Firms have the possibility to choose from different supplier strategies. For example, a firm might seek an alignment strategy with the goal of building a sustainable buyer-supplier relationship. On the other hand, supplier strategies can also have a more unattached character. Here the goal is to "terminate supplier relationships and switch to alternative suppliers if they offer lower prices" (Wagner & Friedl, 2007, p. 701). They add that knowing 'how' and 'when' to switch to alternative suppliers still seems to be a problem for the majority of firms coping with such a strategy. The *accumulating* sub-process in the ROT enables firms to develop resources internally. *Accumulating* often requires learning and thus enhancing skills, and can lead to the strengthening of a firm's isolation mechanisms (Sirmon et al. 2007, p. 279-280). In other words, *accumulating* can decrease the threat of competitor's imitating a firm's resources or capabilities since resources are uniquely developed internally. So, when linking *accumulating* with the supplier switching strategy, the ROT can help to develop resources required to set-up special contracts that enable quick supplier switching, i.e., enhancing employees' knowledge regarding contracts via learning new skills (*accumulating)*. So how, the firm will know 'how' and 'when' to switch to alternative suppliers. Moreover, due to the in-house development, competitors will not benefit from this knowledge what evolves in maintaining the advantage of the resource.

Regarding the alignment strategy, increased strategic benefit due a sustainable buyer-supplier relationship is the main objective. However, "competitive advantage is not a self-evident result from such relationships" says Pulles, Schiele, Veldman, and Hüttinger (2016, p. 138). An explanation for this statement is the fact that competing buyers often seek for the same benefits from the same supplier, hence the supplier has more control in the buyer-supplier relationship in comparison to the buyer. This was empirically proved by Caniels and Gelderman (2005) who found that in a buyer-supplier relationship supplier dominance is much bigger than buyer dominance. Although the power imbalance does not need to be eliminated at first sight, it is essential to reinforce the position of the buyer and so how balance the actual power distribution again. Moreover, the buyers' power reinforcement should gain competitive advantage over competitor buyers. In practice, RO can reinforce the buyers power position by enhancing the attractiveness of a buyer towards a supplier and improving its satisfaction towards the supplier in terms of performance. Eventually, this process should increase the buyers chance to become a (preferred) customer. But how can the ROT help to achieve this? First, RO can "*acquire* and *accumulate* new sources of knowledge that contribute to the development of new innovations" this can lead to enhanced supplier development programs which contribute to the attractiveness of a buyer/ customer towards a supplier (Sirmon et al. 2011, p. 1402). Moreover, Sirmon et al. (2011, p. 1401) add that RO *bundles* resources to build capabilities that enrich buyers' technologies and products. In the long-run, RO can provide the buying firm with a good reputation which makes them more attractive to suppliers. Thus, the ROT can stabilize the position of the buying firm in competitive environment by enhancing its in-house technologies and innovative attractiveness what leads to buyer attractiveness and supplier satisfaction.

Furthermore, another way of the ROT to intensify the buyer-supplier relationship in favour of the buying firm is by involving suppliers in the new product development (NPD) process. NPD is a complex process where ideas for innovations are developed and subsequently, are transformed into potential products in the execution-oriented back end. Supplier involvement in NPD leads to advantage for the suppliers in the form of shared innovations and information. On the other hand, as cited by Wowak et al. (2016, p. 67), Brown (2005) says, that buyers benefit by an 18 percent decrease in product development costs, a 20 percent improvement in product quality, and a 10-20 percent decrease in time-to-market. Thus, the added value of involving suppliers in NPD is obvious for both parties. According to Wowak et al. (2016, p. 73), the ROT sheds light on how firms should orchestrate their own resources, its supplier's resources, and how these resources can be used more effectively during the NPD. In practice, this statement supposes that RO can help an organization in the NPD process to find required key resource owned by one of its suppliers due to inter-firm resource management. Also, NPD has to do with tight timelines. The ROT coordinates resources across levels of the firm (i.e., depth) and across functions of the firm (i.e., breadth) what eliminates time issues and leads to higher quality products. Summarizing, the ROT contributes to the extensiveness of a supplier relationship by enhancing supplier's involvement in the NPD and fully enabling to benefit from suppliers' resources.

Concluding, the ROT has a comprehensive impact on supplier strategies. Importantly, the ROT continuously facilitates managers to strengthen their in-house capabilities what stabilizes their competitive position on the market, regardless of the type of supplier strategy chosen. Especially, for the alignment strategies, ROT can reinforce the buyers competitive position what can lead to a preferred customer status eventually. Moreover, the ROT stimulates supplier involvement in NPD and, subsequently, benefits from suppliers' resources. Thus, RO is an influential feature to gain and maintain competitive advantage in a buyer-supplier relationship and so how contribute to supplier strategies' quality.

3.4 Decision point 4: 'Contracting': The Resource Orchestration Theory as in-house evaluation tool to determine content of contracts

After a firm has successfully chosen a sourcing- and supplier strategy, an actual contract will be set up defining al relational agreements on legal basis. According to Monczka et al. (2015, p. 336), the nature of the market, the degree of trust, and the total value of the purchase determine what kind of contract is used in SCM. No specific literature on the relationship between contracting and the ROT was found, so recommendations are mainly based on assumptions. First of all, when the ROT is linked to the contracting concept, it can be imagined that the ROT's view on resource portfolio management somehow must be of added value for contracting. The ROT has an extensive scope on a firm's resource portfolio and related management actions, therefor it can be used as an evaluation tool to determine what are well performing components and what are components performing less well. Due to such a check-list approach, the firm can determine what kind of contract it should desire. For example, the evaluation could conclude that the firm is good in *bundling* resources, but lacks ability to properly *acquire (structure)* resources. This could emerge in a long-term contract with a specialized commodity buying firm. Furthermore, the ROT can bolster in-house performance through, for example, *bundling* the right resources to build capability. In general, these kind of benefits contribute to the overall performance and reputation of the firm. With regard to contracting, this improved reputation can lead to the situation where suppliers are willing to set-up lucrative contracts in order to do business with you. In sum, the ROT serves as an in-house capability evaluation tool to determine what kind of arrangements need to be incorporated into the contract. Also, it can help a firm to obtain a desired contract type. However, literature describing the relationship between RO and contracts, or comparable concepts does not exist. Therefore, more literature is needed to develop a more sophisticated opinion about this relationship.

4. DISCUSSION AND CONCLUSION

4.1 A recapitalization on The Resource Orchestration Theory: a capability builder in competitive environments, expanding the perspective in Supply Chain Management

Many years ago, empirical research already showed that resources influence firm performance substantially (Crook et al., 2008, p. 1141). Consequently, RBT has become an extensive stream of research with a substantial amount of theories. However, Sirmon and Hitt (2009, p. 1390) argue that literature emphasizing the specific role of managers from a resource-based perspective has been left out in literature unjustified until now. Hence, Sirmon et al. (2011) decided to develop the Resource Orchestration Theory to explicitly explain the role of mangers in the context of the RBV and so how develop a better understanding of how managers create competitive advantage.

The ROT assumes that managers can "*structure* a firm's resource portfolio, *bundle* the resources to build relevant capabilities and *leverage* these capabilities to eventually realize a competitive advantage" (Hitt et al., 2011, p. 64). Moreover, Sirmon et al. (2011) add to this that three key elements: *breadth* (scope of the firm), *depth* (levels within the firm), and *life cycle* affect the three aforementioned assumptions. Despite the fact that these three elements improve our understanding of the ROT, they are addressed rather abstractly in current literature. Therefore, this paper added the concepts of horizontal- and vertical- integration for *breadth* and *depth* respectively to clarify these phenomena. Further, empirics show that to bolster RO performance, firms must create *synchronization* between RO practices and moreover, all-level managers should be simultaneously involved in all stages of the RO process. Empirics also showed that implementing RO evolves in information symmetry within the organization which leads to better inter-firm relationships and performance. However, literature dealing about the ROT in general is still limited due to the relatively recent development of the theory, consequently, only few scholars have yet empirically tested the theory of Sirmon et al. (2011) and no critical reviews have been published until now.

To add richness to the current scope of the ROT, this paper focussed on the relationship between the ROT and four key decision points in purchasing and SCM. Firstly, the ROT' contribution to the 'make or buy decision' was analysed. The most important finding was that the ROT can be used as a capability analysis tool to determine which capabilities are sufficiently possessed and which are still underqualified in a firm. Based on this analysis, a firm can determine better whether to make or to buy a product. Regarding the 'sourcing strategies', the ROT enhances collaboration within the firm due to involvement of all organizational hierarchy's in the decision making (*depth and synchronization)* and due to broad-based RO awareness and knowledge of the resource portfolio across the firm (*breadth)*. As a result of the improved internal collaboration and interfirm portfolio management, the ROT provides assistance in making a decision whether to, for example, source locally or offshore. Next, regarding 'supplier strategies', the ROT continuously facilitates managers to enhance their in-house capabilities (i.e., NPD, supplier development programs, contracting, supplier involvement and so on), ultimately this leads to better performance and supplier satisfaction what reinforces the buyers competitive position in a buyer-supplier relationship. Finally, for 'contracting' the ROT can be used as a check-list tool to determine what the key performing business components are and what are less performing components in the business. For example, a firm can conclude that *acquiring* is not a firm's speciality, and to set-up long-term contracts with specialized commodity-buying firms.

Thus, the ROT's recurring and fundamental contribution to the field of purchasing and SCM is that it organizes the resource-based managerial environment and provides the firm with potential building blocks to convert resource-based issues into applicable actions. This extends our understanding of RO and the RBT and at the same time, it provides a road map for future research since most relationships within the theory are not yet addressed upon by scholars. Thus, future research on the ROT is necessary since this paper also revealed that the ROT cannot yet be considered as a scientific theory according to Vos and Schiele's (2014) theory evaluation tool. The most important shortcomings were lack of applicability and empirical validity.

4.2 A promising Resource Orchestration Implementation Framework: a critical assessment tool for Key Performance Indicators of the theory

Building upon these shortcomings, the ROT would further benefit from a framework explicitly mentioning indicators/tools that simplify the process of applying RO in business and thus illustrates the building blocks of the ROT. Such a framework should not only provide a total understanding of the concept of RO, also it should form a pathway for managers to refer to when resource related issues have to be coped with. In Figure 3, the new ROT framework can be seen. After carefully examining the empirics of this paper, and after considering the key contributions of the ROT to the field of purchasing and SCM, several findings recur. These findings are referred to as Key Performance Indicators (KPI's) since they are important benchmarks for assessing whether RO is implemented appropriately in a firm: *breadth* (or horizontal integration), *depth* (or vertical integration), and *synchronization.*

The ROT framework starts by assuming that firms that use this framework have implemented purchasing and SCM practices centrally in their organisations. Moreover, *the resource management framework* from Sirmon et al. (2011) as illustrated in figure 1 is assumed to be known by heart by people who use the ROT framework from figure 3. Thus, *structuring* and *bundling* resources to build capabilities and *leveraging* from these capabilities is essential knowledge before using this framework. From there the goal of the framework is to guide managers in the process of creating and maintaining competitive advantage through RO. The first KPI that enables this is *breadth* or horizontal integration, as seen in this paper, proper horizontal integration can lead to cross-functional teams what leads to benefits like information symmetry and shared innovations. The second KPI is *depth* or vertical integration and the empirics in this paper showed that substantial advantageous evolve from implementation. Finally, the last KPI is *synchronization* what ensures harmony between departments, RO components and managerial hierarchies. More in depth benefits are already mentioned in this paper and will not be repeated here. This section tries to synthesises these findings by emphasizing that the three KPI's need to be considered each in order to create value. Furthermore, one of the most important contributions of this framework is to bring structure to the relatively abstract level of literature regarding the ROT. Such a framework brings clarity to abstract statements made in papers from Sirmon et al. (2007); (2011) and so how makes his work better applicable in practice as well.

In sum, this frameworks intention is to help practitioners of the ROT better understand what the important performance indicators are of the ROT and thus where to focus on when implementing the ROT in business. At the end, the framework shows that, only if the three KPI's are taken into account, capability building can lead to reduced costs and improved in-house quality what eventually leads to resource-based competitive advantage.

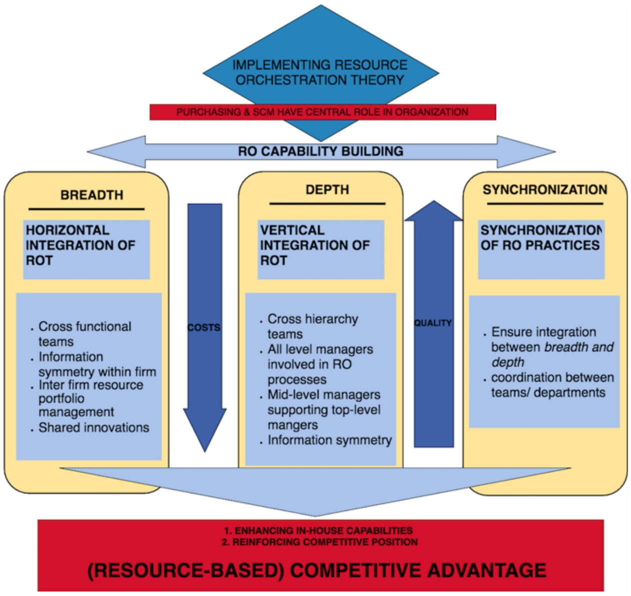

Figure 3: The Resource Orchestration Implementation Framework: a critical assessment tool for key performance indicators of the ROT

4.3 Limitations and future research

In order to develop a better understanding of what the actual purpose of the ROT is and what it contributes to SCM and purchasing literature, a literature review was conducted in this paper. An important shortcoming in this literature review on the ROT was that only few scholars have actually contributed to the specific concept of RO itself. Sirmon, Hitt, and Ireland are major contributors and also in this paper they are referred to (cited) frequently. Logically their dominant presence is seen as a limitation since it gives a less objective point of view. Moreover, due to the limited amount of empirical research on RO and due to almost no existence of literature on its relationship with key purchasing decision points, this paper struggles to adequately prove ROT's contribution to purchasing and SCM since it remains difficult to factually state its added value per facet. Obviously, still more conceptual and empirical literature is needed to enhance the current scope on the ROT. Especially, a critical literature review on the existing fundamental literature by Sirmon et al. (2011) would enhance the body of the theory. Moreover, empirical evidence on the applicability of the ROT is necessary to still further prove its relevancy. Furthermore, regarding the key purchasing decision points, scientific literature still lacks but is required in order to ground reasoning in from this paper. Concluding, it is obvious that the ROT, compared to other RBT's, is still a theory in the initial stages of its life-cycle. Research by Sirmon, Hitt, and Ireland have provided an important fundament but still extensive future research is needed before the ROT can be called a cornerstone theory of the RBT.

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