The performance effect of dynamic capabilities in servitizing companies

ABSTRACT
As an increasing number of companies operates in international markets characterized by global competition, many traditional manufacturers augment their product offerings with services to gain competitive advantage. As servitization needs change throughout the company, many companies struggle on the transition from a product- to a service centric business model. The dynamic capabilities view analyses capabilities in changing environments and could therefore be an interesting theoretical lens for servitization research. Building on existing case research of dynamic capabilities in a servitization context, we analyze the impact of dynamic capabilities and especially of sensing, seizing and reconfiguration capabilities on firm performance in a servitization context. Additionally, we analyze the moderating role of environmental turbulence. The results, which are based on 206 manufacturing companies, show that dynamic capabilities are an essential factor for the performance of a firm in the context of servitization. We find a significant impact of sensing and reconfiguration on firm performance, whereas seizing has no significant impact. We fail to confirm a significant moderating impact of environmental turbulence, which indicates that dynamic capabilities are important in a servitization context indifferent of environmental turbulence. However, we find indication that reconfiguration is more important in relatively stable contexts, whereas sensing is more important in turbulent environments. We contribute to the literature on servitization and dynamic capabilities by creating evidence that dynamic capabilities have an impact on firm performance in a servitization context. This has practical implications as well: Managers in servitizing companies should assess their dynamic capabilities and should especially focus on reconfiguration in relatively stable environments and on sensing on turbulent environments.

1 INTRODUCTION

An increasing number of companies operates in international markets characterized by global competition, which requires continuous change throughout the organization. In such circumstances, it is hard to achieve sustained competitive advantage. One way for traditional manufacturing companies to escape the zero-profit tendency is to augment their offering with services (Vandermerwe and Rada 1988). According to Oliva and Kallenberg (2003) this transition is due to financial and competitive reasons as well as changing customer demands. However, many manufacturing companies struggle to manage the transition from a product-centric to service-centric business model (Martinez et al. 2010; 2017). The research field on servitization (Vandermerwe and Rada 1988), service infusion (Kowalkowski, Witell, and Gustafsson 2013) or service growth (Kowalkowski, Gebauer, and Oliva 2017) has increased steadily, as evidenced by numerous literature reviews (Baines et al. 2007; Baines et al. 2009; Baines et al. 2017; Fließ and Lexutt 2018). However, Kowalkowski, Gebauer, and Oliva (2017), analyzing the field of servitization, conclude that it is still in a nascent phase, as there are only a few quantitative studies. Eloranta and Turunen (2015) analyze the strategic management concepts used in servitization literature and conclude that these concepts are not applied in a rigorous manner. Additionally, they show an overemphasis on competitive forces

and the resource-based view. Therefore, they call for studies using the dynamic capabilities view and the relational view to develop the field of servitization. Especially the application of the dynamic capabilities view seems imperative, as it was developed for highly dynamic environments (Teece, Pisano, and Shuen 1997). The studies that used the dynamic capability framework in a servitization context were usually case studies. Answering the call for applying the dynamic capabilities framework and for quantitative studies in servitization research, this paper explores the performance effect of dynamic capabilities in servitizing companies through a quantitative analysis. Our research question can be stated as follows: How do dynamic capabilities effect performance in servitizing companies?
To answer this research question, the paper is structured as follows: First, the concept of dynamic capabilities and especially its role in servitization literature are explained. Then the methodology of this study is been described, followed by the results. Then these results are discussed, limitations are mentioned and an outlook for further research avenues is provided.

2 THEORETICAL BACKGROUND AND HYPOTHESES

2.1 Dynamic capabilities

The dynamic capabilities view (DCV) was formally introduced by Teece, Pisano, and Shuen (1997) and is an extension of the resource based view (RBV) (Barney 1991; Wernerfelt 1984). In contrast to the competitive forces framework, RBV and DCV explain competitive advantage through internal capabilities. The RBV has been criticized for being static and not able to explain competitive advantage in rapidly changing environments, as the focus is on operational capabilities (Kraaijenbrink, Spender, and Groen 2010). Therefore, Teece, Pisano, and Shuen (1997) define dynamic capabilities as the subset of the competences and capabilities that allow the firm to create new products and processes and respond to changing market circumstances. Winter (2003) shows the difference between ordinary (operational) capabilities and dynamic capabilities by defining ordinary capabilities as “zero level” capabilities, that “permit a firm to make a living in the short term”, and dynamic capabilities as higher order capabilities that operate to extend, modify or create ordinary capabilities. However, Helfat and Winter (2007) conclude that it is sometimes hard to differentiate between ordinary and dynamic capabilities. According to Teece (2007), dynamic capabilities can be disaggregated into sensing, seizing and reconfiguration processes. As dynamic capabilities are not observable, Teece (2007) focuses on the microfoundations of dynamic capabilities, the “distinct skills, processes, organizational structures, decision rules and disciplines” that undergird these capabilities. These microfoundations are important in empirical analyses of the dynamic capabilities framework, especially if the scope of the study is to analyze the relation of dynamic capabilities and performance, according to Barreto (2010) the most important as well as the most discussed relation in the DCV. Helfat and Peteraf (2009) summarize this discussion by analyzing the basic chain of logic in core dynamic capabilities articles. They conclude in line with Barreto (2010) that there is a direct effect as well as an indirect effect through resource configuration.

2.2 Dynamic capabilities and servitization research

As analyzed by Eloranta and Turunen (2015), the RBV is the most prominent strategic management concept in servitization research. However, the process of servitization is a change process as manufacturing companies add service to their product range and as a conse-

quence need other capabilities (Baines et al. 2017). Capabilities needed for offering service in manufacturing companies already identified in servitization research are organizational culture, organizational processes, organizational structures, management, new service development and service pricing. In order to understand how to develop these operational capabilities for offering services successfully, a dynamic capabilities perspective can be a fruitful approach. We agree with Fischer et al. (2010) that the capabilities of sensing, seizing and reconfiguration have been mainly neglected in servitization research. However, there are a few case studies that use the DCV in a servitization context. Fischer et al. (2010) explore the impact of sensing, seizing and reconfiguration on service business development in capital goods industries. They describe exploration and exploitation as two options to grow the service business and show that the dynamic capabilities needed for these two options are different. They conclude that dynamic capabilities are necessary for a move towards a service oriented business model. They call for further qualitative and quantitative research in this area, highlighting the opportunity to study the effect of dynamic capabilities on the success of the service business. Kanninen et al. (2017) identify 14 capabilities within a multiple case in the process industry and link them to servitization steps. They highlight the importance of dynamic capabilities that can transform operating capabilities to quantify and communicate the value for the customer as well as sales and marketing capabilities. They call for an assessment of the effects of the identified capabilities on performance in a quantitative setting. Saul & Gebauer (2018) investigate the dynamic capabilities for offering solutions in the market development phase, focusing on the microfoundations of these capabilities. They identify 10 dimensions and relate them to sensing, seizing and reconfiguration processes. As they focused on companies in developing markets, they call for application of their dynamic capabilities in product firms in the growth or maturity phase. Kindström, Kowalkowski, and Sandberg (2013) study the microfoundations that enable product centric firms to build the dynamic capabilities that can facilitate service innovation. As they define service innovation more general, the results of their study are transferable to servitizing companies in general. Within their multiple case study they found ten microfoundations of dynamic capabilities, that were linked to sensing (customer linked service sensing, service system sensing, internal service sensing, technology exploration), seizing (service interactions, managing the service delivery process, structuring the service development process, adopting new revenue mechanisms) and reconfiguration (orchestrating the service system, balancing product- and service-innovation related assets). Kindström, Kowalkowski, and Sandberg (2013) call for research that evaluates the performance of the microfoundations that they have identified, highlighting the need to assess the effect on overall corporate performance.

2.3 Hypotheses development

One of the main assertions of the DCV is that dynamic capabilities lead to competitive advantage and to enhanced performance. Pezeshkan et al. (2016) report that the level of support for a positive effect of dynamic capabilities on performance across different contexts is 60 %. Research has analysed dynamic capabilities and their microfoundation in a servitization context, but the link to performance in this context has not been examined (Kindström, Kowalkowski, and Sandberg 2013, Saul and Gebauer 2018). Therefore, we develop our hypotheses concerning the link between dynamic capabilities and performance in a servitization context, as well as the role of environmental dynamism. In line with Wilden and Gudergan (2015), we distinguish between the effects of sensing and reconfiguration, but assess seizing

as well, to capture all of the classes of dynamic capabilities according to the framework of Teece (2007).

Sensing capabilities

Sensing refers to the search and exploration for opportunities (Wilden and Gudergan 2015). This search encompasses the exploration of technological opportunities, opportunities across different markets and the learning about customer needs (Teece 2007). Strong customer relationships, collaboration with suppliers and universities as well as benchmarking and collaboration in clusters and professional associations can foster sensing capabilites (Wilden and Gudergan 2015). As many companies have a narrow search horizon, one main challenge is to sense options that are beyond the usual business of the firm (Teece 2007). Sensing involves a learning process, especially about the firms environment. According to Jaworski and Kohli (1993) and Narver and Slater (1990), enhanced market knowledge should benefit overall performance.

H1: The greater the sensing capabilities, the higher the performance of the firm.

Seizing capabilities

The organizational response to sensed opportunities through new products, services and processes is called seizing (Teece 2007). It encompasses the selection of the appropriate business model and investment decisions. Therefore, the focus is on managerial decisions. One main challenge relates to overcome dysfunctional decision rules.

H2: The greater the seizing capabilities, the higher the performance of the firm.

Reconfiguration capabilities

After opportunities in the environment have been discovered (sensing) and a decision has been made where to invest and which business model should be used (seizing), the company's assets and organizational structures have to be reconfigured accordingly. This should lead to evolutionary fitness (Helfat and Peteraf 2009). Reconfiguration encompasses the adaptation of structures, processes, human resource management, incentive systems, knowledge assets and governance mechanisms. The alignment within the company is of particular importance.

H3: The greater the reconfiguration capabilities, the higher the performance of the firm.

The moderating role of environmental turbulence

Environmental turbulence (or environmental dynamism) is mentioned in literature as a potentially important contextual variable in DCV research. However, there are different opinions on the moderating effect of environmental turbulence on the link between dynamic capabilities and performance (Schilke 2014). Some propose that environmental turbulence enhances the link (Drnevic and Kriauciunas 2011; Winter 2003), others suggest the contrary effect, that dynamic capabilities are less effective in turbulent environments (Eisenhardt and Martin 2000; Schreyögg and Kliesch-Eberl 2007). Following the argument of Winter (2003) that investment in dynamic capabilities is costly and that investing in dynamic capabilities is only advisable if there is a need to change, we expect that environmental turbulence positively moderates the relationship between dynamic capabilities and firm performance.

H4: The higher the degree of environmental dynamism, the higher the influence of (a) sensing, (b) seizing and (c) reconfiguration capabilities on firm performance.

3 METHODOLOGY

Measures

In conceptualizing the constructs used in this study as formative or reflective, we build on Jarvis, MacKenzie, and Podsakoff (2003). The conceptualization of the constructs then guided the selection of the methods for data analysis and assessment (Diamantopoulos and Winklhofer 2001). According to Schilke (2014), dynamic capabilities manifest themselves in identifiable and specific business processes. Therefore, he advises in line with others (Helfat and Peteraf 2009; Helfat and Winter 2011) that researchers should carefully select a set of relevant business processes in which these capabilities exist to test their hypotheses. Through theoretical induction, such empirical analyses shed light on the generalized nature of dynamic capabilities (Eisenhardt and Martin 2000). Therefore, we develop measures for sensing, seizing and reconfiguration in servitizing companies based on the work of Kindström, Kowalkowski, and Sandberg (2013) and focus especially on the dynamic capabilities needed for servitizing manufacturers that enable them to build their service business. The measures are based on the classification of Teece (2007) in sensing, seizing and reconfiguration. As we focus on the dynamic capabilities that are important for servitizing manufacturers, the microfoundations identified by Kindström, Kowalkowski, and Sandberg (2013) are used as a classification scheme within these general dynamic capabilities processes. For each of these microfoundations we developed one to four items. As the specific microfoundations form the different types of dynamic capabilities and because the items are chosen for theoretical rea-

Table 1. A measurement of dynamic capabilities in servitizing manufacturers based on Kindström, Kowalkowski & Sandberg (2013)

DC process	microfoundations	Items
Sensing	Customer linked service sensing	Know the customer's business
		Information sharing with customer
		Listening to the customer's needs
	Service system sensing	Search for external partners
		Active networking
	Internal service sensing	Interdepartmental collaboration in new service development
Seizing	Service interactions	Service quality measurement
		Personal talks with customer about service quality
	Managing the service delivery process	Analyse customer feedback
		Develop actions based on customer feedback
		Implement actions
	Structuring the service development process	Develop services for the whole customer lifecycle
		Engage customer in new service development
		Formal procedures for new service development
	Adopting new revenue mechanisms	Price services separately
		Value-based pricing
Reconfiguration	Orchestrating the service system	Analyse partnerships
		Personal relationships with service-partners
		Local presence
	Balancing product- and service-innovation related assets	Interdepartmental communication
		Interdepartmental cooperation
		Interdepartmental processes
	Creating a service oriented mental model	Customer service training
		Managers are role models
		Support employees for customer service
		Reward service oriented behavior

sons based on Kindström, Kowalkowski, and Sandberg (2013), we conceptualize sensing, seizing and reconfiguration as formative constructs (Jarvis, MacKenzie, and Podsakoff 2003). To develop the items we screened the servitization literature as well as the literature on dynamic capabilities. We further conducted 26 interviews in manufacturing companies and two focus groups. Based on this research we developed items, using existing items from literature where possible (Churchill 1979). As there are no quantitative studies on dynamic capabilities in servitizing companies, most of the items are based on case research or on studies from other fields. After the items have been developed, they were fine-tuned within a pretest (n=28). Table 1 provides an overview on the measurement of dynamic capabilities for servitizing manufacturers in this study.

There is some discussion about how performance should be measured in dynamic capabilities studies. Some researchers argue for the use of performance measures on the business process level, other for performance measures on the firm or business unit level. In this study, we use performance measures on the firm level, as we are interested in the effect on the whole company. The focus of this study is on the service business in manufacturing companies, but we have to account as well for the effects on the product business. Also, the effect of environmental conditions are of interest in this study, which calls for the use of performance measures on the firm level (Drnevic and Kriauciunas 2010). Following Schilke (2014) we operationalize performance as a multidimensional construct, consisting of a qualitative and a quantitative dimension. To measure the quantitative dimension, we use financial performance. The qualitative dimension is measured as non-financial performance (eg customer satisfaction, trust). Both of these dimensions refer to the service business, as growing the service business is the primary goal of servitization. Additionally, the influence on the product business is measured, as it is important that changes throughout the company to strengthen

Table 2. Reflective measurements

Construct	*indicators*	*Mean*	*SD*	*Loadings*	*AVE*	*CR*	*α*
Financial performance of the service business	The service we offer are profitable	5,451	1,320	0,880	0,751	0,900	0,834
	Our service business contributes to financial business success.	5,553	1,584	0,879			
	How would you rate the performance of the service business	3,684	0,739	0,840			
Non-financial performance	Our service customers are satisfied with the quality of our services	5,728	0,972	0,909	0,763	0,941	0,922
	The collaboration with the customer in the service business is very good.	5,796	1,023	0,899			
	We are able to retain most of our customers.	5,830	1,100	0,826			
	Our service customers have great confidence in us.	5,835	1,080	0,905			
	Our service customers think of us as experts in the service business.	5,733	1,098	0,825			
Enabler for service business	Services help us to retain our product customers	5,981	1,115	0,914	0,812	0,928	0,885
	Services enable our success in the product business.	5,903	1,158	0,905			
	Through services we can win new product customers.	5,597	1,437	0,884			
Environmental turbulence	Preferences of our customers change substantially.	4,597	1,513	0,796	0,764	0,865	0,714
	Customers ask for services, they have never bought before.	4,316	1,684	0,945			

the service business should not have a negative impact on the product business. Many companies in our interviews and in the focus groups highlighted that the service business should be an enabler for the product business. Therefore, we measure the enabling effect of dynamic capabilities on the product business as well. This means that we operationalize performance on the firm level as a second-order construct with the first order dimensions of financial performance of the service business, non-financial performance of the service business and enabler for the product business.
Following Schilke (2014) and building on Miller and Friesen (1982), we operationalize environmental dynamism as encompassing volatility as well as unpredictability, describing a situation of high environmental dynamism as one that changes rapidly and in an unpredictable way.
Validity and reliability of the reflective measures were assessed in multiple ways. We used cronbachs alpha, average variance extracted (AVE), factor loadings and composite reliability. As summarized in Table 2, all of these criteria are above the recommended thresholds. To demonstrate construct validity of the formative measures, we tested for multicollinearity using the variance inflation factor (VIF) (Diamantopoulos & Winklhofer 2001). The values were below the cut-off value of five with values of 2.427, 2.323 and 2.565 for sensing, seizing and reconfiguration. Multicollinearity thus seems to be no problem. Expert validity was reached through comprehensive pretests.

Sample
We draw on a sample of manufacturing companies from Austria and Bavaria. We choose the sample from these regions as these regions have a high proportion of manufacturing companies that are product focused. Therefore, servitization is a viable option for many of these companies. As no archival data can give adequate information on dynamic capabilities, we used a key informant approach. We choose service managers, sales managers and senior managers as our key informants, as they are most likely to be able to assess the capabilities needed for this study. We contacted key informants in 1625 companies via mail and asked them to participate in the survey. To give them an incentive to participate in the survey, we promised them a report of the results. In order to increase the response rate, reminders for participation were sent via mail after one and two weeks. Companies that didn't participate in the survey after sending the second reminder were further contacted by phone. 206 companies completed the survey for a response rate of 12.7%. This was higher than reported in similar studies (Wilden and Gudergan 2015).

Analytic procedures
To analyze the impact of dynamic capabilities on performance in manufacturing companies, we use a PLS-SEM approach using Smart-PLS 3. PLS-SEM uses a non-parametric approach and was chosen because it works with formative as well as reflective constructs (Hair, Ringle, and Sarstedt 2011). As sensing, seizing and reconfiguration are conceptualized as formative in this study the usage of PLS-SEM is recommendable.

4 RESULTS

Main effects
We first analyzed the direct effects of the model without moderation. To assess the effects of sensing, seizing and reconfiguration on performance, we use the coefficient of determination,

which is 0.61. This is acceptable and higher than in other studies reported (Hair et al. 2012; Wilden and Gudergan 2015). Then we examined the path coefficients and their significance values to test the hypotheses. To determine the significance, we used bootstrapping with 500 samples. We found a positive relationship between sensing and performance (β=0.223, $p<0.01$). Therefore, H1 is supported. Testing H2, we found a positive, but non-significant relationship between seizing and performance (β=0.153, $p=0.056$). The strongest relationship identified in the analysis was the relation between reconfiguration and performance (β=0.471, $p<0.001$). Therefore, H3 is supported.

Moderating analysis

To test for moderating effects of environmental turbulence, we first analyzed a model with the hypothesized moderating effects and compared this model with the original model without moderation. Although the analysis indicated a small influence of environmental turbulence on the relationship between sensing, seizing and reconfiguration on performance, no significant moderating effects were discovered. Additionally, we use multi-group analysis (Sarstedt, Henseler, and Ringle 2011) to analyze the differences between companies in highly turbulent environments (environmental turbulence 5 or higher on the 7-point Likert scale) and in relatively stable environments (environmental turbulence lower than 5 on the 7-point Likert scale). The analysis reveals some difference, indicating that sensing and seizing are more important in dynamic environments and reconfiguration is more important in relatively stable environments. However, these differences are not significant. Therefore, H4 is not supported.

5 DISCUSSION/IMPLICATIONS/OUTLOOK

This study tries to contribute to literature on servitization and DCV by analyzing the effect of dynamic capabilities on performance in a servitization context. We use the classification of Teece (2007) and analyze the effects of sensing, seizing and reconfiguration capabilities separately. This allows a more fine-grained analysis. One main finding is that dynamic capabilities are important in a servitization context. We find a significant and positive relationship for sensing and reconfiguration on performance. However, the relation between seizing and performance is not significant, and the effect of reconfiguration is higher than the effect of sensing. This shows that it is important to analyze the effects of sensing, seizing and reconfiguration separately. We did not find a significant difference between companies that operate in highly turbulent environments compared with companies in relatively stable environments. However, the data indicates that sensing and seizing are more important in turbulent environments, reconfiguration is more important in relatively stable environments. We therefore conclude that dynamic capabilities are relevant for servitizing manufacturers indifferent of environmental turbulence, but the kind of relevant dynamic capabilities may differ. Further research could analyze the moderating effect of environmental turbulence in detail, eg by assessing a quadratic effect (Schilke 2014). As we draw on a sample from Austria and Bavaria, the effect of dynamic capabilities on performance in a servitization context should be analysed in different regions, especially in developing countries.

The implication for practitioners are threefold: First, managers in servitizing companies should be aware of their dynamic capabilities, as they have an effect on performance. Second, they should focus especially on reconfiguration, as the effect is higher than for other kinds of dynamic capabilities. Practitioners can draw on existing literature concerning how reconfiguration can be implemented successfully in servitizing companies. Third, in turbulent

environments all the kinds of dynamic capabilities are relevant, whereas in relatively stable environments the focus should be on reconfiguration.

6 ACKNOWLEDGEMENTS

The work described in this document has been conducted as part of the project ISEM (Industrial Service Excellence Monitor), a research project funded by the European Fund for Regional Development through Interreg Austria-Bavaria 2014-2020.

REFERENCES

Baines, T. S., H. W. Lightfoot, S. Evans, A. Neely, R. Greenough, J. Peppard, R. Roy, E. Shehab, A. Braganza, A. Tiwari, J. R. Alcock, J. P. Angus, M. Bastl, A. Cousens, P. Irving, M. Johnson, J. Kingston, H. Lockett, V. Martinez, P. Michele, D. Tranfield, I. M. Walton, and H. Wilson (2007), "State-of-the-art in product-service systems*," Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, 221 (10), 1543–52.

Baines, Tim, Ali Ziaee Bigdeli, Oscar F. Bustinza, Victor G. Shi, James Baldwin, and Keith Ridgway (2017), "Servitization. Revisiting the state-of-the-art and research priorities," *International Journal of Operations & Production Management*, 37 (2), 256–78.

Barney, J. (1991), "Firm Resources and Sustained Competitive Advantage," *Journal of Management*, 17 (1), 99–120.

Barreto, Ilídio (2009), "Dynamic Capabilities. A Review of Past Research and an Agenda for the Future," *Journal of Management*, 36 (1), 256–80.

Churchill, Gilbert A. (1979), "A Paradigm for Developing Better Measures of Marketing Constructs," *Journal of Marketing Research*, 16 (1), 64.

Diamantopoulos, Adamantios and Heidi M. Winklhofer (2001), "Index Construction with Formative Indicators. An Alternative to Scale Development," *Journal of Marketing Research*, 38 (2), 269–77.

Drnevich, Paul L. and Aldas P. Kriauciunas (2011), "Clarifying the conditions and limits of the contributions of ordinary and dynamic capabilities to relative firm performance," *Strategic Management Journal*, 32 (3), 254–79.

Eisenhardt, Kathleen M. and Jeffrey A. Martin (2000), "Dynamic capabilities. What are they?," *Strategic Management Journal*, 21 (10-11), 1105–21.

Eloranta, Ville and Taija Turunen (2015), "Seeking competitive advantage with service infusion. A systematic literature review," *Journal of Service Management*, 26 (3), 394–425.

Fliess, Sabine and Eva Lexutt (2017), "How to be successful with servitization – Guidelines for research and management," *Industrial Marketing Management.*

Baines, T. S., H. W. Lightfoot, O. Benedettini, and J. M. Kay (2009), "The servitization of manufacturing," *Journal of Manufacturing Technology Management*, 20 (5), 547–67.

Fischer, Thomas, Heiko Gebauer, Mike Gregory, Guangjie Ren, and Elgar Fleisch (2010), "Exploitation or exploration in service business development?," *Journal of Service Management*, 21 (5), 591–624.

Hair, Joe F., Christian M. Ringle, and Marko Sarstedt (2011), "PLS-SEM. Indeed a Silver Bullet," *The Journal of Marketing Theory and Practice*, 19 (2), 139–52.

Hair, Joe F., Marko Sarstedt, Christian M. Ringle, and Jeannette A. Mena (2012), "An assessment of the use of partial least squares structural equation modeling in marketing research," *Journal of the Academy of Marketing Science,* 40 (3), 414–33.

Helfat, Constance E. and Margaret A. Peteraf (2009), "Understanding dynamic capabilities. Progress along a developmental path," *Strategic Organization*, 7 (1), 91–102.

Helfat, Constance E. and Sidney G. Winter (2011), "Untangling Dynamic and Operational Capabilities. Strategy for the (N)ever-Changing World," *Strategic Management Journal*, 32 (11), 1243–50.

Jarvis, Cheryl B., Scott B. MacKenzie, and Philip M. Podsakoff (2003), "A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research," *Journal of Consumer Research*, 30 (2), 199–218.

Jaworski, Bernard J. and Ajay K. Kohli (1993), “Market Orientation. Antecedents and Consequences,” *Journal of Marketing*, 57 (3), 53.
Kanninen, Tiina, Esko Penttinen, Markku Tinnilä, and Kari Kaario (2017), “Exploring the dynamic capabilities required for servitization,” *Business Process Management Journal*, 23 (2), 226–47.
Kindström, Daniel, Christian Kowalkowski, and Erik Sandberg (2013), “Enabling service innovation. A dynamic capabilities approach,” *Journal of Business Research*, 66 (8), 1063–73.
Kowalkowski, Christian, Lars Witell, and Anders Gustafsson (2013), “Any way goes. Identifying value constellations for service infusion in SMEs,” *Industrial Marketing Management*, 42 (1), 18–30.
Kowalkowski, Christian, Heiko Gebauer, and Rogelio Oliva (2017), “Service growth in product firms. Past, present, and future,” *Industrial Marketing Management*, 60, 82–88.
Kraaijenbrink, Jeroen, J.-C. Spender, and Aard J. Groen (2009), “The Resource-Based View. A Review and Assessment of Its Critiques,” *Journal of Management*, 36 (1), 349–72.
Martinez, Veronica, Marko Bastl, Jennifer Kingston, and Stephen Evans (2010), “Challenges in transforming manufacturing organisations into product-service providers,” *Journal of Manufacturing Technology Management,* 21 (4), 449–69.
Martinez, Veronica, Andy Neely, Chander Velu, Stewart Leinster-Evans, and Dav Bisessar (2016), “Exploring the journey to services,” *International Journal of Production Economics*.
Miller, Danny and Peter H. Friesen (1982), “Innovation in conservative and entrepreneurial firms. Two models of strategic momentum,” *Strategic Management Journal*, 3 (1), 1–25.
Narver, John C. and Stanley F. Slater (1990), “The Effect of a Market Orientation on Business Profitability,” Journal of Marketing, 54 (4), 20.
Oliva, Rogelio and Robert Kallenberg (2003), “Managing the transition from products to services,” *International Journal of Service Industry Management*, 14 (2), 160–72.
Pezeshkan, Amir, Stav Fainshmidt, Anil Nair, M. Lance Frazier, and Edward Markowski (2016), “An empirical assessment of the dynamic capabilities–performance relationship,” *Journal of Business Research*, 69 (8), 2950–56.
Sarstedt, Marko, Jörg Henseler, and Christian M. Ringle, (2011), Multigroup Analysis in Partial Least Squares (PLS) Path Modeling: Alternative Methods and Empirical Results, in Marko Sarstedt, Manfred Schwaiger, Charles R. Taylor (ed.) Measurement and Research Methods in International Marketing (Advances in International Marketing, Volume 22) Emerald Group Publishing Limited, pp.195 - 218
Saul, Caroline J. and Heiko Gebauer (2018), “Born solution providers – Dynamic capabilities for providing solutions,” *Industrial Marketing Management*.
Schilke, Oliver (2014), “On the contingent value of dynamic capabilities for competitive advantage. The nonlinear moderating effect of environmental dynamism,” *Strategic Management Journal*, 35 (2), 179–203.
Schreyögg, Georg and Martina Kliesch-Eberl (2007), “How dynamic can organizational capabilities be? Towards a dual-process model of capability dynamization,” *Strategic Management Journal*, 28 (9), 913–33.
Teece, David J., Gary Pisano, and Amy Shuen (1997), “Dynamic Capabilities and Strategic Management,” *Strategic Management Journal*, 18 (7), 509–33.
Teece, David J. (2007), “Explicating dynamic capabilities. The nature and microfoundations of (sustainable) enterprise performance,” *Strategic Management Journal*, 28 (13), 1319–50.
Vandermerwe, Sandra and Juan Rada (1988), “Servitization of Business: Adding value by adding services,” *European Management Journal*, 6 (4), 314–24.
Wernerfelt, Birger (1984), “A resource-based view of the firm,” *Strategic Management Journal*, 5, 171–80.
Wilden, Ralf and Siegfried P. Gudergan (2015), “The impact of dynamic capabilities on operational marketing and technological capabilities. Investigating the role of environmental turbulence,” *Journal of the Academy of Marketing Science*, 43 (2), 181–99.
Winter, Sidney G. (2003), “Understanding dynamic capabilities,” *Strategic Management Journal*, 24 (10), 991–95.