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Service transition: A viable option for manufacturing companies with deteriorating financial performance?

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ABSTRACT

When manufacturing firms venture into services, they often do so either in reaction to deteriorating performance or to further enhance their financial position. While extant literature argues that firms are most likely to succeed with strategic change processes out of a healthy position, the majority of manufacturers have started their service maneuver in reaction to deteriorating performance. To date, no empirical studies examine whether a healthy financial situation is a necessary requirement for successful service transition. Drawing on configuration theory and employing qualitative comparative analysis, the present study demonstrates that an increasing focus on services can lead to success for both types of firms. However, depending on their financial situation, firms should tap different resource and knowledge sources to implement the service transition: Whereas healthy companies should focus on customers as a knowledge source, companies in an inferior financial situation need strong links with suppliers to turn their services transition into financial success.

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1. Introduction

In recent years, many practitioners and researchers have promoted manufacturing companies' move toward service and solution providers (Evanschitzky, Wangenheim, & Woisetschlaeger, 2011; Ulaga & Reinartz, 2011). As a result, manufacturers increasingly pursue a service transition, that is, they move from an emphasis on products to an emphasis on services (Eggert, Hogreve, Ulaga, & Muenkhoff, 2014; Visnjic & Van Looy, 2013). This becomes evident in a growing share of manufacturers' revenues stemming from the services business (Fang, Palmatier, & Steenkamp, 2008). For example, Fang et al. (2008) found that the average share of service revenues increased from 8.9% in 1990 to 42.2% in 2005, indicating a strong prevalence of service transitions among manufacturing firms.

Manufacturing firms often regard services as an effective means to compensate for declining performance in their traditional product business (Penttinen & Palmer, 2007), and Cusumano, Kahl, and Suarez (2006, p. 18) observe that the majority of firms "migrate toward service[s] not by choice but because their product business begins to deteriorate." Several market developments in their traditional product business put manufacturers under increasing pressure; among them, commoditization, intensified international competition, and market saturation (Gebauer, 2008; Wise & Baumgartner, 1999). Against this background, manufacturing companies' transition to services seems to be a promising way to compensate for competitive pressure, react to declining financial performance, and realize future growth potential.

In contrast to many companies' tendency of venturing into services in reaction to deteriorating performance, literature on strategic change argues that deteriorating profits and financial decline is not the best point of departure for a successful change process (Haveman, 1993). Firms need sufficient resources and knowledge to successfully implement a strategic change in their business strategies, such as the service transition (Kowalkowski, Brehmer, & Kindström, 2009). In line with this notion, Fang et al. (2008) observe the importance of slack resources for turning industrial services into firm value. Resources enable the necessary alignment of capabilities and organizational structures within the firm. Because companies in a promising financial situation are more likely to allocate sufficient resources to strategic change than their counterparts that suffer from financial pressure, Salonen (2011) assumes that the service transition works best for manufacturing companies in a healthy financial situation.

To date, no empirical study examines whether a healthy financial situation is a necessary ingredient for successful service transition, an important question given that manufacturing companies often turn to services in response to declining revenues, profits, or demand in their core product business. Are these companies residing in a challenging financial situation likely to fail with their strategic move? Can differences in the financial starting position explain why manufacturing companies observe mixed results from their service transitions (Kohtamäki, Partanen, Parida, & Wincent, 2013; Visnjic & Van Looy, 2013)?

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This study explores whether a healthy financial situation, characterized by previous growth in revenues, profits, and customer demand, is a necessary precondition for a successful service transition. The research is based on configuration theory, which assumes that sets of conditions (i.e., configurations) rather than a single condition determine the outcomes of strategy initiatives (Meyer, Tsui, & Hinings, 1993). In addition to a firm's financial situation, this study accounts for three other context factors that influence service transition outcomes: firm size, customer links, and supplier links. These factors were chosen according to research on strategic change, which identifies sources of resources (i.e., financial situation, firm size) and knowledge (i.e., customer links, supplier links) as important requirements for successful strategy implementation (Haveman, 1993). Large companies tend to have more slack resources and can better manage the necessary alignments of organizational capabilities and structures (Gebauer, Paiola, & Edvardsson, 2010b; Kowalkowski, Witell, & Gustafsson, 2013; Neely, 2008). Links with external partners might also affect the success of the service transition (Eggert, Hogreve, Ulaga, & Muenkhoff, 2014; Ceci & Masini, 2011; Finne & Holmström, 2013; Turunen & Finne, 2014); manufacturing firms with strong links to their customers and suppliers may have access to resources, skills, or information needed to successfully grow their service business (Kohtamäki et al., 2013). Taking these conditions into consideration, this research investigates the resources and knowledge sources that need to be combined to achieve revenue growth with service emphasis.

This study offers three important contributions. First, it demonstrates that service emphasis is a viable option for both companies in a healthy financial situation and those suffering from financial weakness. This result contrasts previous literature that repeatedly emphasizes the importance of a solid financial situation to cope with the resource requirements of service transitions (Fang et al., 2008; Salonen, 2011). Second, we consider sets of conditions (configurations) that promote a service emphasis, providing a more comprehensive and realistic picture of the requirements that companies must meet to successfully promote this service emphasis. Apart from some notable exceptions (e.g., Ceci & Masini, 2011; Gebauer, Edvardsson, Gustafsson, & Witell, 2010a), previous literature mainly analyzes net effects of single variables, thereby ignoring the interplay among context factors. Yet, our results confirm that resources and knowledge sources are not relevant per se, but become important only in specific context situations, e.g., in a challenging financial situation. Third, the study employs fuzzy set qualitative comparative analysis (fsQCA). Although fsQCA coincides well with the assumptions of configuration theory (Greckhamer, Misanagyi, Elms, & Lacey, 2008) and is increasingly used in the strategy domain (see e.g., Fiss, 2011), only a few applications in marketing and especially service research exist to date (for some notable exceptions, see Ordanini & Maglio, 2009; Ordanini, Parasuraman, & Rubera, 2014). The current research thus further promotes this methodology in the marketing and service domain.

The remainder of this article is structured as follows: We begin with an overview of existing literature on service transition in manufacturing firms. Then, we present the theoretical framework and discuss the role of different resources and knowledge sources for successful service transitions. After introducing the methodology and describing the sample and measures, we report the results of fsQCA and discuss the findings and implications. The article concludes with limitations and directions for further research.

2. Conceptual background

2.1. Service transition in manufacturing firms

Industrial services are an increasingly important topic in business-to-business and service marketing fields (Jacob & Ulaga, 2008; Ostrom et al., 2010). At the beginning of the service dialogue, studies mainly focused on the competitive, economic, and customer-based explanations of how industrial services improve firm performance (e.g., Mathieu, 2001a; Oliva & Kallenberg, 2003). Another research stream explores the transformation from a manufacturing-oriented to a service- or solution-oriented approach (e.g., Kowalkowski, Windahl, Kindström, & Gebauer, 2015; Raddats & Easingwood, 2010), together with the organizational rearrangements needed to manage a service transition successfully (Davies, Brady, & Hobday, 2006; Reinartz & Ulaga, 2008). With a few exceptions, most of these studies are conceptual in nature or limited to exploratory research based on case studies or in-depth interviews (Jacob & Ulaga, 2008).

More recent research empirically examines the link between industrial services and firm performance (Antioco, Moenaert, Lindgreen, & Wetzels, 2008; Eggert et al., 2014; Fang et al., 2008). Yet these studies provide mixed results regarding the performance outcomes of service strategies. Some studies establish positive effects of service strategies on company outcomes, such as product sales, revenues, and profits (e.g., Homburg, Fassnacht, & Guenther, 2003; Antioco et al., 2008). Other researchers instead reveal a more complex relationship between industrial services and firm performance (e.g., Eggert, Hogreve, Ulaga, & Muenkhoff, 2011; Eggert et al., 2014; Suarez, Cusumano, & Kahl, 2013; Visnjic & Van Looy, 2013). For example, Fang et al. (2008); Kohtamäki et al. (2013), and Suarez et al. (2013) confirm a negative effect of industrial services at the beginning of the service transition. This effect becomes positive once the firm's service business reaches a considerable size – for example, if the firm's service share exceeds 20–30% of its total sales (Fang et al., 2008).

Empirical studies also test different context factors that support or hinder the success of industrial service strategies. They find that the success of service transitions depends on supporting organizational and environmental characteristics (Ceci & Masini, 2011; Gebauer et al., 2010a, b; Turunen & Finne, 2014; Windahl & Lakemond, 2006). With regard to *organizational characteristics*, Fang et al. (2008) identify the availability of slack resources as a supporting context factor of the service transition-performance link. Moreover, research confirms the critical role of inter-organizational relationships for profitably growing with industrial services (Eggert et al., 2014; Finne & Holmström, 2013; Kohtamäki et al., 2013; Pawar, Beltagui, & Riedel, 2009). Another context factor that receives some research attention is the organizational structure of the service business (Gebauer, Fleisch, & Friedli, 2005; Gebauer et al., 2010a). Few other studies concentrate on *environmental characteristics* (Ceci & Masini, 2011; Fang et al., 2008; Suarez et al., 2013). For example, Fang et al. (2008) demonstrate that the outcomes of industrial services are highest when the industry is turbulent and exhibits low market growth. Success with industrial services further depends on the degree of heterogeneity in the market (Ceci and Masini, 2011) and the industry lifecycle phase (Suarez et al., 2013).

The literature review on industrial services reveals two main research gaps. First, previous research has not explored the potential role of firms' financial situation when transitioning toward services. Doing so will provide actionable managerial guidance on whether and under what circumstances companies can successfully pursue a service transition when facing financial pressure. Second, we need to gain a better understanding of the interplay between different conditions that form a company's context situation. Extant research mostly considers the contingency variables of the service transition–performance link in isolation, without paying attention to their co-occurrence (for some notable exceptions, see Ceci & Masini, 2011; Gebauer et al., 2010a). However, variables that are causally related in one configuration can be unrelated or inversely related in another (Meyer et al., 1993). In our study, we focus on two types of factors that likely influence a manufacturer's service transition success: resources (from financial situation and firm size) and knowledge sources (from customer links and supplier links). We investigate whether these context conditions always need to be present to create revenue growth with service emphasis or whether they complement or substitute each other. Such insights can

help managers to decide on whether and when to invest in specific resources or knowledge sources for their service endeavor.

2.2. Configuration theory as theoretical lens

We draw on configuration theory to analyze the context conditions under which service emphasis leads to revenue growth for manufacturing firms. Configuration theory represents a common theoretical lens to study the multi-faceted outcomes of strategic change. An increasing service emphasis represents a major strategic change for manufacturing companies; it encompasses changes in the extent to which industrial services are part of manufacturers' market offerings and to which competitive advantages are based on services (Homburg et al., 2003).

According to configuration theory, the analysis of strategic change and its performance implications demands the simultaneous observation of salient characteristics constituting a company's complex situation (Vorhies & Morgan, 2003). The specific constellation of multiple characteristics (i.e., set of conditions), including a firm's strategy and its resources and knowledge, is called "configuration" (Meyer et al., 1993). The fundamental proposition of configuration theory is that phenomena of interest can best be understood by analyzing configurations rather than searching for universal relationships between variables that hold true across all companies (Ketchen et al., 1997; Miller, 1986). This is because the arrangement of company characteristics determines whether a company can implement its strategy (Vorhies & Morgan, 2003). Superior performance depends on the coherence between firm's strategy and its organizational characteristics (Van de Ven & Drazin, 1985). The greater the fit between the firm's strategy and the various organizational characteristics (i.e., the greater the consistency of a configuration), the higher the performance achieved with the strategy (Vorhies & Morgan, 2003). Consequently, companies with more coherent characteristics outperform their counterparts with less coherent characteristics (Meyer et al., 1993). However, no one ideal set of organizational characteristics always yields superior performance. To accommodate this limitation, configuration theory allows multiple configurations to lead to superior performance as long as their individual conditions are aligned (Doty, Glick, & Huber, 1993).

Consistent with configuration theory, extant research indicates that service transition success depends on the presence of a supportive organizational environment (e.g., Eggert et al., 2014; Gebauer et al., 2010a; Turunen & Finne, 2014). Furthermore, researchers suggest that it is not the presence of individual characteristics but the alignment among the strategy and a set of organizational characteristics that matters for service success (Gebauer, 2008; Gebauer et al., 2010a). Researchers also agree that usually more than one configuration is suited to achieve performance with industrial service strategies (Ceci & Masini, 2011). Hence, configuration theory represents a promising theoretical lens to analyze the outcomes of service transitions, thereby accounting for the interplay between different conditions that form a company's context situation.

2.3. Resources and knowledge sources for service transition

According to configuration theory, undergoing strategic change is not sufficient to enhance company performance (Kraatz & Zajac, 2001); in other words, strategic reorientation to services does not lead to revenue growth per se. Rather, changes in strategy only result in improved financial performance if they match the organizational context (Rajagopalan & Spreitzer, 1996). To realize necessary alignments of organizational factors and ensure a successful implementation of strategic shifts, companies need both the *resources* for implementing strategic change and the *knowledge* to apply these resources appropriately (Haveman, 1993). Thus, to be successful, a service emphasis must be supplemented by necessary resources and knowledge sources to form a coherent configuration of strategy, resources, and knowledge (Gebauer, 2008; Gebauer et al., 2010a). Fig. 1 provides an overview of the conceptual model and the resource and knowledge sources that can help firms successfully implement a service emphasis.

Resources for strategic change can stem from two sources. On the one hand, necessary resources for service transitions can result from a healthy financial situation; firms that perceive themselves as successful, e.g., because their performance is increasing, are typically more likely to allocate sufficient resources to strategic change than unsuccessful firms (Argote & Greve, 2007; Cyert & March, 1963). These resources help firms adjust to environmental developments and experiment with different strategies, such as introducing new products and/or services (Bourgeois, 1981). It also enables them to attain the necessary organizational alignments for strategic change and provides them with more flexibility to do so (Bourgeois, 1981). Although firms in financial crises are more likely to initiate strategic change (Boeker, 1989; Levinthal, 1991), they often do not assign the necessary resources to successfully implement it compared to their more successful counterparts.

On the other hand, firm size can be an important source of resources for strategic change toward services (Kowalkowski et al., 2013). Compared with small firms, large companies typically have more managerial and financial resources and greater market power (Ginsberg & Buchholtz, 1990). Consequently, larger firms are more likely to have access to resources and devote them to a change process (Gordon,

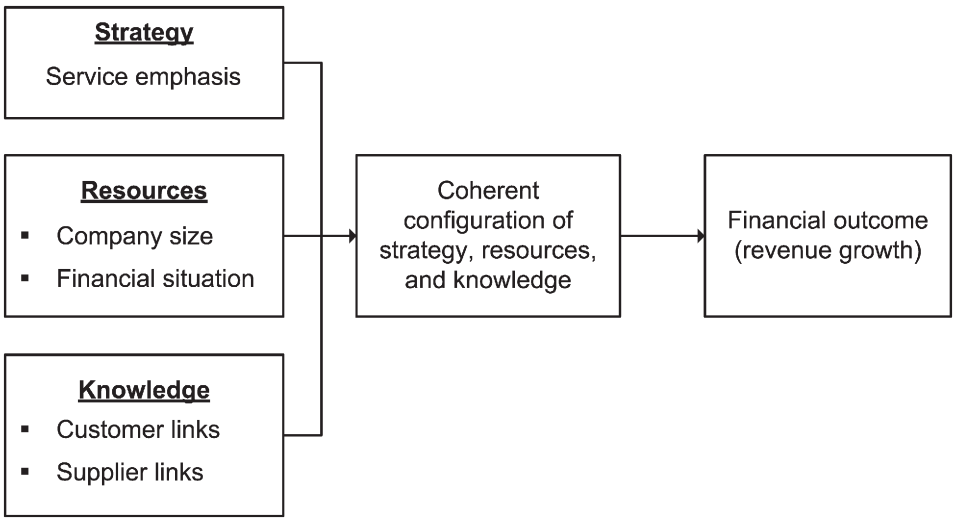

Fig. 1. Conceptual framework.

Steward, Sweo, & Luker, 2000). In a similar vein, Grimm, Corsi, and Smith (1993) note that large companies tend to have more knowledge about the "correct" and "best" way to implement strategic change, so their strategic changes are more likely to result in improved performance.

Managers must also acquire *knowledge* for strategic change toward services. That is, they must learn how to allocate and use resources when implementing strategic change. In the context of strategic change toward services, resources and capabilities should be directed toward increasing the effectiveness and efficiency of the service business (Ceci & Masini, 2011). Knowledge of how to successfully implement strategic change originates from different sources. First, customers can be an important knowledge source that helps companies implement service strategies successfully (Finne & Holmström, 2013; Windahl & Lakemond, 2006). Manufacturing firms with strong activity links to their customers are more likely to design service offerings and delivery processes that fit customers' needs (Kindström & Kowalkowski, 2009; Raddats, 2011). Second, a company's suppliers can help implement the strategic change (Pawar et al., 2009). If suppliers are closely linked to the company's business, their service offerings likely encompass suppliers' products, so the company can offer integrated solutions that satisfy broader customer needs (Raddats, 2011; Windahl & Lakemond, 2006).

In sum, companies are more likely to succeed with service transitions if they possess necessary resources and knowledge. For three of the aforementioned context factors – firm size, customer links, and supplier links – previous literature already suggests that they can influence a companies' ability to successfully pursue service transitions (Eggert et al., 2014; Fang et al., 2008; Finne & Holmström, 2013; Kohtamäki et al., 2013). However, it remains unclear whether all of the aforementioned conditions need to be present simultaneously, or whether a few of them are sufficient. To contribute to this research gap, this study investigates the different configurations (i.e., sets of conditions) in which service emphasis leads to revenue growth for manufacturing firms.

3. Empirical analysis

3.1. Methodology

To investigate how different sets of conditions relate to future revenue growth, we employ fsQCA. Originally developed in the political and social sciences, fsQCA has recently gained increasing attention among management (e.g., Fiss, 2011; Grandori & Furnari, 2008; Schneider, Schulze-Bentrop, & Paunescu, 2010) and marketing (e.g., Cheng, Chang, & Lin, 2013; Ganter & Hecker, 2014) scholars as a means to analyze complex, interrelated causal relationships. With a few notable exceptions (Ordanini & Maglio, 2009; Ordanini et al., 2014), fsQCA has rarely been applied in service research.

QCA is based on the assumption that complex causal relationships are best understood in terms of set memberships (Fiss, 2007, 2011). Observations (i.e., cases) can belong more or less to a specific set of conditions and have varying degrees of memberships in a configuration (Ordanini & Maglio, 2009). Using membership values, fsQCA determines configurations that consistently lead to a particular outcome and generates a reduced set of logic statements describing these configurations (e.g., Ragin, 2006, 2008). Thereby, fsQCA enables researchers to determine whether single conditions or sets of conditions are necessary or sufficient for an outcome to occur (Fiss, 2011).

This method differs from conventional statistical methods in four important ways. First, conventional statistics methods usually treat conditions as competing in explaining the outcome (Ordanini & Maglio, 2009). In contrast, fsQCA shows how combinations of causal conditions (i.e., configurations) rather than isolated conditions are linked to an outcome (Rihoux, 2004; Woodside, 2013). Second, unlike correlation-based approaches, fsQCA acknowledges the concept of equifinality (Fiss, 2007, 2011). Thus, the methodology supports the discovery of multiple paths that can lead to an outcome (Woodside, 2013). Third, fsQCA allows for an investigation of asymmetric relationships of conditions (Ragin, 2000). Conditions that appear related in one configuration can be unrelated or inversely related in another (Meyer et al., 1993). Similarly, the opposite of conditions leading to the outcome might not necessarily lead to low performance (Jackson & Ni, 2013). Fourth, fsQCA enables researchers to distinguish necessary and sufficient conditions for a given outcome (Rihoux & Ragin, 2009). Conventional regression-based approaches cannot make this distinction, because a high correlation always indicates a condition is both necessary and sufficient.

Because fsQCA incorporates different elements of causal complexity, that is, conjunctural causation, equifinality, and asymmetric causal relationships, it is most suitable for testing configurational arguments (Greckhamer et al., 2008; Wagemann & Schneider, 2010). In particular, it allows us to (1) consider several context factors simultaneously, (2) identify different configurations that all lead to the same outcome, and (3) account for the fact that one condition might have different effects depending on its co-occurrence with other conditions. Modeling these relationships would not have been possible using conventional statistical methods, like regression analysis or SEM (Wagemann & Schneider, 2010). In turn, fsQCA represents a promising methodology to complement existing research on industrial services, which is mainly limited to the analysis of symmetrical, net-effect relationships using conventional statistical methods. In addition, fsQCA has further advantages compared to other non-traditional methods such as cluster analysis. Although fsQCA and cluster analysis produce very similar results, major differences exist between these two methods (Cooper & Glaesser, 2011). For example, in fsQCA, a case's membership in a particular configuration is only driven by its memberships in the respective conditions. In contrast, membership in a specific cluster is also driven by the distribution of variables among a particular sample. In this sense, fsQCA can be considered explicitly theoretical, while cluster analysis is more inductive (Cooper & Glaesser, 2011).

3.2. Sample

We rely on panel data gathered from an annual, national mail survey in the German mechanical engineering industry (Beck & Walgenbach, 2005). The mechanical engineering industry represents the largest industry sector in Germany, with roughly a million employees and overall sales of € 212 billion in 2014 (German Engineering Federation, 2015). The primary aim of the survey was to investigate the development of the German mechanical engineering industry, e.g., in terms of performance, strategies, technologies, and environmental conditions. The survey was sent to all firms with at least 20 employees – a total population of approximately 5000 firms. In each firm, a member of the top management was asked to fill out the questionnaire or pass it on to someone with in-depth knowledge on the respective topics. The next year, the questionnaires were addressed to same persons whenever possible. The respondents mainly represent top decision makers in their respective company, such as chief executive officers, chief operating officers, or heads of administration.

We analyze data from two consecutive survey waves, thus ensuring that the causal conditions are captured with a sufficient time lag before the resulting outcome variable. Information on the service emphasis of the participating companies was available in the 1997 and 1998 annual waves only. The first wave contains 1724 usable questionnaires (return rate = 25.9%), and the second wave comprises 1643 responses (return rate = 24.5%). We limit the analysis to cases with data for both survey waves (n = 887) and, because fsQCA requires complete data sets, to cases with no missing values, leaving a final sample of 294 cases with complete data for both survey waves.

Because of the relatively high difference between the initial data set and final sample, we test for potential sample selection biases. *t*-Tests

comparing dropped and retained observations with regard to key firm characteristics such as company size, revenues, and capacity however reveal no significant differences between the two groups (company size: $t = 0.57$, $p = 0.57$; revenues: $t = 0.97$, $p = 0.33$; capacity utilization: $t = 1.06$, $p = 0.29$). Accordingly, sample selection bias is not a serious problem in this study.

On average, sampled firms report annual revenues of €20.4 million and 139 employees. The sample includes 128 small companies (those with up to 49 employees), 126 medium-sized companies (between 50 and 249 employees), and 40 large companies (>250 employees). Overall, the sample is characteristic for the German mechanical engineering industry, which is dominated by small and medium-sized companies (Beck & Walgenbach, 2005).

3.3. Measurement

The initial survey wave contains data for the five conditions. First, to capture the increase in service emphasis, respondents indicated the degree to which the service division gained responsibility over the past three years on a five-point, Likert-type scale. With responsibility, we refer to the service division's influence over activities important to the success of the firm, relative to other divisions (Homburg, Workman, & Krohmer, 1999). Second, we captured total number of employees, which represents firm size. Third, to measure the strength of links with customers, respondents evaluate the level of influence their customers have on manufacturing companies' core processes (e.g., product development, sales planning, quality control). The final data set includes the summed scale of the eight customer links items (Cronbach's $\alpha = 0.82$). Fourth, the strength of supplier links refers to the degree to which suppliers influence the companies' core processes, and we included the summed scale of the eight items ($\alpha = 0.72$). Fifth, the financial situation of the company captures the development of company's past performance with regard to revenue and profit streams and customer demand ($\alpha = 0.83$). A summed scale encompassing the three items, measured on a five-point, Likert-type scale, represents the firms' financial situation.

To measure the outcome of interest (i.e., revenue growth), respondents indicated, in monetary terms, their companies' overall annual revenue in both waves. We captured revenue growth by calculating the percentage change in revenue from period 1 to period 2. Using this measure, we include a time lag of one year between the strategic shift toward services and the outcome measure, thereby accounting for lagged performance effects of service strategies. Fig. 2 provides a graphic representation of the measurement waves and the data points used to measure the specific variables. Appendix A reports all measurement items and scales.

3.4. Calibration

In fsQCA, original variables must be transformed into fuzzy set scores ranging from 0 to 1 (Cheng et al., 2013; Ganter & Hecker, 2014). To calibrate the raw data, three qualitative anchors must be specified first (Ragin, 2008): the threshold for full non-membership (fuzzy set score of 0), the threshold for full membership (fuzzy set score of 1), and the crossover point (fuzzy set score of 0.50), defined as the value with maximum membership ambiguity – that is, when the particular case is neither in nor out of the set (Ragin, 2008; Schneider et al., 2010). These anchors enable transformation of the initial variables into fuzzy set variables (Fiss, 2011). This is done by using the software fs/QCA 2.5 and applying the log-odds method for automatic calibration procedure. Table 1 summarizes the fuzzy set calibration rules for this study.

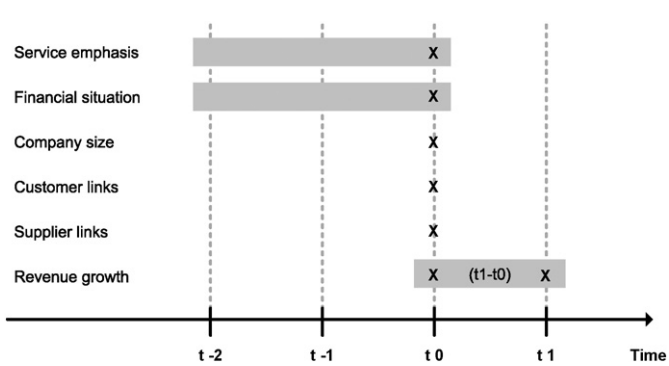

Fig. 2. Timeline of measures.

A fuzzy set variable of above-average revenue growth serves as the outcome (see Fiss, 2011); therefore, we choose a revenue growth score of approximately 0 as the crossover point. The 10th percentile (−0.115) and the 90th percentile (0.285) serve as thresholds for non-membership and membership respectively. Thus, the outcome set encompasses firms experiencing a high revenue growth.

We use four values to specify increase in service emphasis. A strong increase in service emphasis receives a membership score of 1.00 (full membership). A moderate increase corresponds to a score of 0.67, firms with no changes in service emphasis receive a value of 0.33, and the remaining companies with decreasing service emphasis receive a score of 0.00 (full non-membership).

For the other four conditions, we use analogous calibration rules to create fuzzy sets; that is, for each variable, the approximate mean serves as the cross-over point. The threshold for non-membership is the 5th percentile, and for full membership it is the 95th percentile. For example, for firm size, the cross-over point is 61.0, the full membership score is 500.5, and the non-membership score is 17.5.

4. Results

4.1. Analysis of necessary conditions

In a first step, we test whether any condition or its negation is necessary for the outcome (i.e., future revenue growth). A condition is necessary if it is always present (or absent) when the outcome exists (Fiss, 2007; Ragin, 2006). Consistency measures are available to quantify the degree to which conditions conform to this strict rule. A single condition is necessary if the consistency score exceeds the threshold of 0.90 (Schneider et al., 2010; Wagemann & Schneider, 2010). In this study, none of the conditions exceeds the required threshold (see Table 2), indicating no necessary condition to generate revenue growth. In particular, neither service emphasis nor a promising financial situation is a necessary condition for future revenue growth. Manufacturing firms can increase revenue streams without moving toward services, and future success is not bred by past success. These results are in line with configuration theory, which assumes that no strategy can be considered a best practice in isolation (Jackson & Ni, 2013).

4.2. Analysis of sufficient conditions

In a second step, we construct a truth table to identify sufficient conditions, listing all logically possible configurations of the five causal conditions (Ragin, 2008). Based on their membership scores, we assign cases to one of the different configurations in the truth table. Cases with a membership score >0.5 receive a value of 1 for the respective configuration; otherwise, they receive a value of 0 (Fiss, 2011; Ragin, 2006). The initial truth table (Table 3) consists of 32 configurations (2^k; k = number of causal conditions). In this study, we observe all logically possible configurations, reflecting the variety of organizational configurations in the sample. Hence, there were no logical remainders in our study.

Next, we identify meaningful configurations that consistently lead to the outcome (Fiss, 2011), which entails determining the minimum number of cases and the minimum consistency level of a configuration. In line with prior studies, a frequency threshold of five observations per

Table 1
Fuzzy set calibration rules.

Construct	Original scale	Calibration rule	
Revenue growth (RG)	Continuous scale (in %)	If RG < −0.115	0 (non-membership)
		If RG = 0.055	0.5 (cross-over point)
		If RG > 0.285	1 (full membership)
Service emphasis (SE)	Five-point scale (−2 to 2)	If SE = −2; −1	0 (non-membership)
		If SE = 0	0.33
		If SE = 1	0.67
		If SE = 2	1 (full membership)
Financial situation (FS)	Summed scale (−6 to 6)	If FS < −4.5	0 (non-membership)
		If FS = 1.5	0.5 (cross-over point)
		If FS > 4.5	1 (full membership)
Company size (CS)	Continuous scale	If CS < 17.5	0 (non-membership)
		If CS = 61.0	0.5 (cross-over point)
		If CS > 500.5	1 (full membership)
Customer links (CL)	Summed scale (0 to 16)	If CL < 0.50	0 (non-membership)
		If CL = 4.50	0.5 (cross-over point)
		If CL > 12.50	1 (full membership)
Supplier links(SL)	Summed scale (0 to 16)	If SL < 0.50	0 (non-membership)
		If SL = 3.50	0.5 (cross-over point)
		If SL > 7.50	1 (full membership)

Table 2
Necessary conditions for presence of revenue growth.

Condition	Consistency	Coverage
Service emphasis	0.72	0.60
~ Service emphasis	0.59	0.68
Financial situation	0.64	0.65
~ Financial situation	0.65	0.60
Company size	0.56	0.66
~ Company size	0.72	0.59
Customer links	0.61	0.61
~ Customer links	0.65	0.60
Supplier links	0.53	0.64
~ Supplier links	0.71	0.58

~ indicates the absence of a condition.

configuration and a consistency score of 0.8 serve as these minimums (e.g., Cheng et al., 2013; Fiss, 2011; Ganter & Hecker, 2014). As a result, 13 configurations consistently lead to revenue growth (see Table 3). An initial exploration of these configurations reveals that configurations with and without service emphasis lead to revenue growth, for both financially strong and financially weak companies. In other words, a successful service transition contributing to future revenue growth can result from positions of financial growth and decline.

Using Boolean algebra, and more specifically the Quine-McCluskey algorithm (Fiss, 2007; Ragin, 2008), we further reduce the set of configurations to simplified combinations of conditions by eliminating redundant information. Table 4 presents the results of the intermediate solution (Fiss, 2011; Ragin, 2008), which consists of six configurations.[1]

Using consistency and coverage measures, we determine whether all configurations are informative. *Consistency* indicates the extent to which a configuration is associated with the outcome (Ragin, 2006) and refers to the proportion of cases with an identical set of conditions that consistently leads to the outcome (Fiss, 2011). Extant literature indicates that consistency scores should not fall below 0.75 (Ragin, 2006; Woodside, 2013). The data in this study fulfill solution consistency (0.75) and individual consistency (scores ranging between 0.79 and 0.83). Thus, all configurations are sufficient for the outcome.

Coverage assesses the proportion of cases following a configuration and captures the empirical relevance of a configuration (Fiss, 2007; Ragin, 2006). Raw coverage quantifies the proportion of memberships in the outcome explained by a specific configuration. In contrast, unique coverage measures the proportion explained solely by one configuration, excluding memberships already covered by other configurations (Ragin, 2006). High raw coverage but small unique coverage thus implies an overlap between one configuration and at least one other configuration in the solution (Cooper & Glaesser, 2012). In this study, the overall solution coverage is 0.48, indicating that the six identified configurations together explain a substantial proportion of future revenue growth. In addition, each individual configuration is informative, as raw coverage values fall between 0.21 and 0.30. The unique coverage of the individual configurations is >0, such that they all contribute to the explanation of the outcome (e.g., Ragin, 2006; Schneider et al., 2010).

Following Schneider and Wagemann (2010) and Woodside (2013), we further created fuzzy set plots to visualize the relation between configurations and outcome. Fig. 3 presents exemplary fuzzy set plots for configurations 1 to 3. In all plots, a large number of cases is located in the upper left triangle, while very few cases appear in the lower right triangle. This pattern of results supports our finding that the configurations are sufficient but not necessary for the outcome (Ganter & Hecker, 2014; Woodside, 2010). Cases with low membership in the configuration show both low and high values of the outcome, indicating that other paths can also lead to the outcome. In contrast, most of the cases with high membership in the configuration also show high membership in the outcome, pointing to the sufficiency of the configuration (Ganter & Hecker, 2014).

4.3. Summary of findings

Table 4 describes the six sufficient configurations (causal recipes) associated with revenue growth. We adopt the notation of Ragin and Fiss (2008) for the representation of the results: Black circles indicate the presence of a condition, cross-out white circles the absence of a condition, and blank spaces the irrelevance of a condition.[2]

In line with the explorative analysis of the truth table, the final solution includes sufficient configurations with and without service emphasis. In configurations 1–3, an increase in service emphasis pays off in terms of revenue growth. In contrast, configurations 4–6 indicate that also the absence of a service emphasis is linked to revenue growth. That is, a service transition is not imperative for all manufacturing companies to increase future revenue streams. Manufacturers can achieve revenue growth without increasing their service emphasis, as long as

[1] We performed post hoc sensitivity analyses to check for the stability of our results. In particular, we conducted several alternative fsQCAs in which we varied the calibration thresholds for our conditions and/or the outcome. For example, for the conditions, we used the 10th and the 90th percentile (instead of the 5th and the 95th percentile) as thresholds for non-membership and membership. All analyses lead to similar results.

[2] For a Boolean algebra representation of the results, please see Appendix B.

Table 3
Truth table.

Configuration	Service emphasis	Financial situation	Company size	Customer links	Supplier links	Number of cases	Outcome
1	0	1	1	1	0	3	1
2	0	1	1	0	1	3	1
3	0	1	1	0	0	12	1
4	0	0	1	1	0	9	1
5	1	1	1	1	0	10	1
6	0	0	1	1	1	3	1
7	0	1	1	1	1	5	1
8	0	1	0	0	1	2	1
9	1	1	1	0	1	3	1
10	1	1	1	1	1	8	1
11	0	1	0	1	0	6	1
12	1	0	1	0	1	6	1
13	0	0	1	0	1	3	1
14	1	1	0	0	1	4	0
15	1	0	1	1	0	11	0
16	0	0	1	0	0	15	0
17	0	1	0	0	0	11	0
18	0	0	0	1	1	6	0
19	1	1	1	0	0	16	0
20	0	1	0	1	1	7	0
21	1	0	1	0	0	11	0
22	1	1	0	1	0	7	0
23	0	0	0	1	0	5	0
24	0	0	0	0	1	6	0
25	1	1	0	0	0	13	0
26	1	0	1	1	1	20	0
27	1	1	0	1	1	16	0
28	1	0	0	0	1	11	0
29	1	0	0	1	0	16	0
30	1	0	0	1	1	13	0
31	1	0	0	0	0	13	0
32	0	0	0	0	0	16	0

contextual factors align. Because this study focuses on the conditions for a successful service transition, the subsequent discussion centers on configurations 1–3.

Configuration 1 contains service emphasis together with a healthy financial situation, large firm size, and strong customer links. This configuration indicates that service emphasis results in revenue growth, given the simultaneous presence of a healthy financial situation, large firm size, and strong customer links. The strength of supplier links is not of concern in these situations where all other conditions are present. In *configuration 2*, service emphasis, deteriorating financial performance, large firm size, weak customer links, and strong supplier links lead to revenue growth. Hence, when financial performance is shrinking, service emphasis can solely create future revenue growth given the presence of company size and supplier links and the absence of customer links. Manufacturing companies in *configuration 3* achieve revenue growth with or without an increase in service emphasis. These firms enjoy a positive financial situation, large firm size, and strong customer and supplier links.

In sum, our results show that service emphasis can lead to future revenue growth for firms in positions of financial strength (configurations 1 and 3) or weakness (configuration 2). To be sufficient for revenue growth, a service emphasis must be supplemented by necessary resources and knowledge sources. The adequacy of specific resources and knowledge sources depends on a firm's financial situation (see Fig. 4). Companies in a position of financial strength need strong customer links but also must be large to achieve revenue growth with service emphasis (see configurations 1 and 3). In addition to strong customer links, strong supplier links may exist but are not required for financial success (see configuration 3). For companies suffering from financial crisis, service emphasis only leads to future revenue growth when they are large and when they can access strong supplier links (see configuration 2). Moreover, weak customer links must also be present to achieve revenue growth in these situations.

Table 4
Sufficient conditions for presence of revenue growth.

	Configurations					
	1	2	3	4	5	6
Service emphasis	●	●		⊗	⊗	⊗
Financial situation	●	⊗	●	●	●	⊗
Company size	●	●	●	●	⊗	●
Customer links	●	⊗	●	⊗	●	●
Supplier links		●	●	⊗	⊗	⊗
Raw coverage	.30	.21	.24	.27	.23	.23
Unique coverage	.02	.02	.01	.06	.04	.02
Consistency	.81	.80	.79	.83	.81	.83
Solution coverage	.48					
Solution consistency	.75					

Note: Black circles indicate the presence of a condition, cross-out white circles the absence of a condition, and blank spaces the irrelevance of a condition.

5. Conclusion

5.1. Discussion and implications

Over the first decade of the twenty-first century, various manufacturers have shifted their focus from a goods-based strategy toward one based on products and services (Fang et al., 2008; Ulaga & Reinartz, 2011). Whereas many manufacturing firms have started their service maneuver in reaction to deteriorating financial performance (Cusumano et al., 2006), theory argues that strategic change processes, such as service transitions, are most likely to succeed from a healthy financial position (Salonen, 2011). However, no extant empirical study examines whether a healthy financial situation is necessary for successful service transitions. In addition, extant research does not

indicate whether specific organizational context factors must be in place for a successful service transition that emerges from a position of financial strength or weakness. In line with this notion, Sawhney (2006, p. 378) points to the challenge of identifying "the contextual factors that separate winners from losers in migration to a [service] approach." The current study adds to this point and provides an understanding of the requirements that companies must meet to successfully implement a service emphasis in different financial situations.

From a substantive point of view, we demonstrate that service emphasis is a viable option for manufacturers in situations of both financial strength and financial decline. In other words, a healthy financial situation is not a necessary requirement for successful service transition. This result is particularly notable; previous literature repeatedly emphasizes the importance of a solid financial background to cope with the resource requirements for the service business (Fang et al., 2008; Salonen, 2011). The more fine-grained perspective adopted with a configurational view provides hope for manufacturers faced with deteriorating customer demand and profits, for which an increase in service emphasis can be a feasible strategy to increase overall revenue streams. Nevertheless, future success occurs more often when service transitions start from a position of financial strength than financial decline, as indicated by the larger raw coverage of configurations 1 and 3 (service emphasis and healthy financial situation) compared with configuration 2 (service emphasis and inferior financial situation) and by findings of Neely (2008). Hence, although satisfactory financial positions often reinforce firms' current ways of doing business, ultimately leading them to stay with familiar, successful strategies (Cyert & March, 1963; Greve, 2003), firms are well advised to pursue service strategies while financially healthy. Itami and Roehl (1987, p. 54) reinforce this advice, noting that "the time to search out and develop a new core resource is when the current core is working well."

In addition, our results support the notion that service emphasis alone does not lead to revenue growth per se but instead should be combined with the presence (or absence) of other causal conditions. In this respect, our findings are consistent with previous research that also highlights the context-specific nature of industrial service strategies (e.g., Eggert et al., 2014; Gebauer et al., 2010a; Turunen & Finne, 2014). However, in contrast to previous research, our results reveal that resources and knowledge sources are not helpful per se. Instead, we can show that firms need different combinations of resource and knowledge sources, depending on their financial situation (see Fig. 4). Hence, before increasing their service emphasis, manufacturers need to analyze if the set of appropriate resources and knowledge sources is in place to master the service transition.

First, regardless of the financial situation, firm size is an important precondition for a successful strategic change to services; all three configurations with successful service emphasis include large firm size. While previous literature provides contradictory results with regard to the role of firm size (e.g., Neely, 2008; Fang et al., 2008), our findings highlight the importance of this organizational precondition. The service transition is a resource-intensive endeavor, and firms must allocate financial, managerial, and personnel resources to the service business (e.g., Mathieu, 2001a). Large firms are more likely to have the slack resources and market power to provide and realize required organizational adjustments (Ginsberg & Buchholtz, 1990; Gordon et al., 2000). In turn, we could only identify sufficient configurations to revenue growth for large firms. For small firms, it seems much more difficult to find a general recipe for service success. To increase their chance of growing with services, small firms should anticipate and guarantee the allocation of adequate resources to the service business.

Second, our results reveal both bright and dark sides of customer links, depending on companies' financial situation. When manufacturing companies pursue a service transition in reaction to a deteriorating financial situation, the absence of strong customer links emerges as an important condition. To the best of our knowledge, we are the first to show this potential negative effect of customer relationships in service transitions. When faced with strong financial pressure, companies should refrain from heavily involving their customers in their core processes. Intensive collaboration with customers can be a time consuming and costly undertaking (Lau, Tang, & Yam, 2010), for which the companies do not possess the necessary resource endowment. In contrast, for manufacturing firms in a healthy financial situation, strong customer links are particularly important. For these firms, close collaboration with their customers seems to be the best way to design services to fulfill customer needs. Customers may share insights and knowledge about service improvements, new service offerings, assessment of prototypes, and future market trends (Melton & Hartline, 2010, 2013). At the same time, resources stemming from the firm's financial situation and large size allow firms to absorb the costs of customer involvement.

Third, our results extend previous research on external networks by showing that the importance of supplier relationships also depends on companies' financial background. For firms facing a challenging financial situation, supplier links represent a necessary knowledge source. These companies should ensure strong links with suppliers to gain necessary resources and knowledge for the strategic change toward services. Suppliers can offer additional insights on customers (Homburg, 1998) and serve as a substitute for customer involvement. In addition, financially weak firms might not be able to manage the service transition process alone and must rely on a network of suppliers for offering additional services to their customers (Mathieu, 2001a; Kowalkowski et al., 2013; Pawar et al., 2009). In contrast, strong links with suppliers can but need not be present to ensure a successful strategic change toward services in a healthy financial situation. Thus, firms that already possess the necessary resources and market power for a strategic change should focus on customers as a primary knowledge source.

From a methodological perspective, the present article further demonstrates the suitability of fsQCA to study strategy implementation in the light of companies' complex context situation, as is the case with service transition strategies. Previous research frequently emphasizes the inability of traditional methodologies to account for configurational arguments (e.g., Fiss, 2007; Short, Payne, & Ketchen, 2008). Multivariate approaches (e.g., moderated regression analyses) can only assess relationships involving a few variables (Vorhies & Morgan, 2003) and may be too general and simplistic (e.g., Dess, Newport, & Rasheed, 1993; Doty et al., 1993), without an adequate link between theory building and theory testing. In contrast, fsQCA adequately represents a complex, holistic view of configuration theory (Greckhamer et al., 2008). Rather than treating conditions as competing in explaining the outcome, fsQCA investigates how conditions combine to create an outcome (Ragin, 2006). At the same time, fsQCA allows for the identification of various alternative paths to success, as well as the configuration of asymmetric relationships (Woodside, 2013). Consequently, fsQCA can be viewed as a complement to traditional statistical methods that provides a more fine-grained perspective on causal relationships (Fiss, 2011). Noting the limited number of fsQCA studies in marketing and service research (e.g., Ganter & Hecker, 2014), more research adopting a configurational perspective and applying fsQCA would benefit the field.

5.2. Limitations and further research

This study is subject to several limitations, which provide fruitful avenues for research. First, we analyze configurations among five key conditions expected to jointly cause revenue growth. By analyzing financial situation, firm size, customer links, and supplier links in addition to service emphasis, we consider the role of resources and knowledge sources for successful service transitions. Theory has revealed these two categories as important internal prerequisites for strategic change (Haveman, 1993). In addition to considering these internal prerequisites, future research could study the influence of environmental conditions, e.g., political regulations or technological developments (e.g., Turunen & Finne, 2014; Ceci & Masini, 2011). Another important factor to look at is the organizational structure of the service business and the

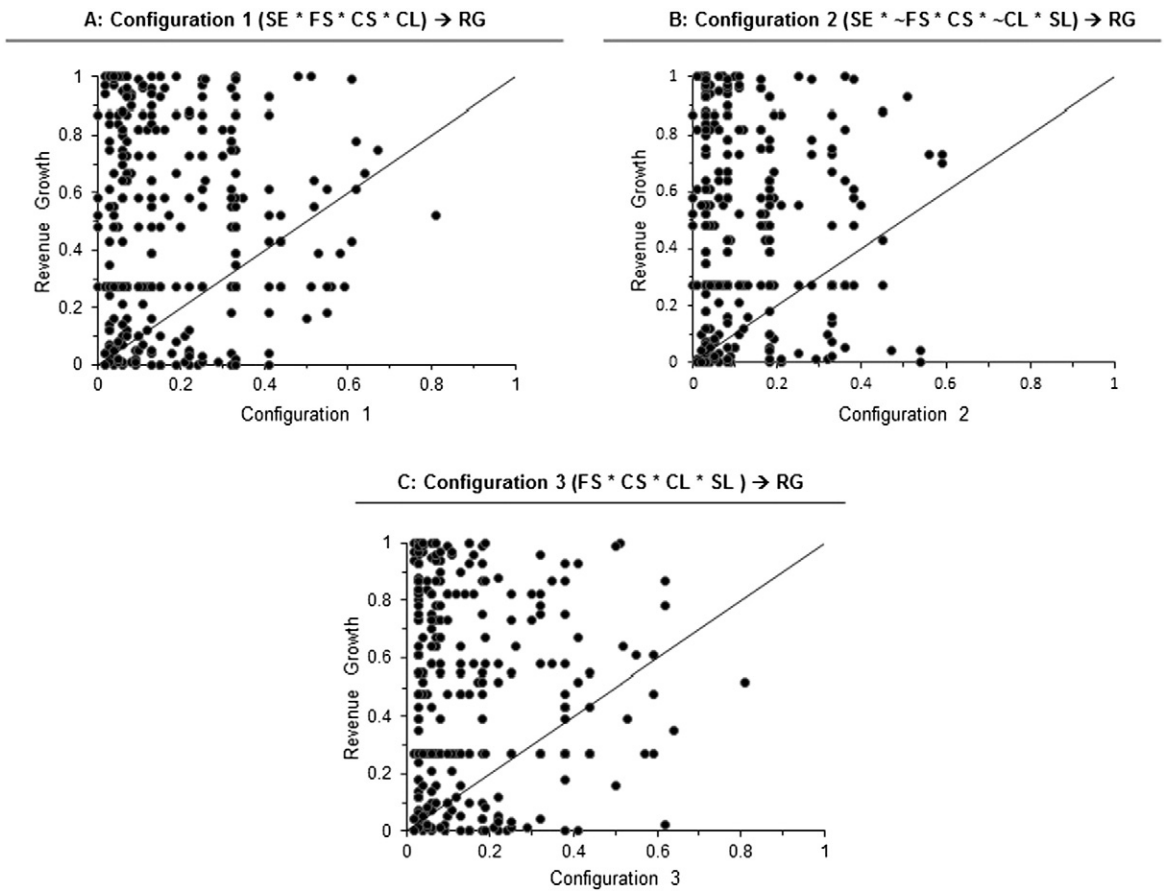

Fig. 3. Fuzzy-set plots for configurations 1, 2, and 3.

question whether product and service businesses should be structurally separated or integrated (Gebauer et al., 2005; Gebauer et al., 2010a). While our data does not provide information on these aspects, future research could probe the stability of the identified configurations by adding these conditions to the analysis or choosing others.

Second, we focus on the question whether and when companies facing different financial situations can succeed with service emphasis. Other researchers might investigate the circumstances under which service emphasis itself causes deteriorating performance. In a similar vein, it would be worthwhile understanding the conditions under which companies decide to reduce their service emphasis, causing deservitization (Kowalkowski et al., 2015). Empirical studies have almost exclusively tested conditions that render servitization; deservitization is not well understood. Yet anecdotal evidence reveals that many firms decide to abandon from services or entrust partners to provide the services on their behalf (Cusumano, Kahl, & Suarez, 2015). By analyzing the drivers and outcomes of these strategic decisions, researchers could further enhance our understanding of service-driven developments in product firms. We welcome future research that addresses these interesting research questions.

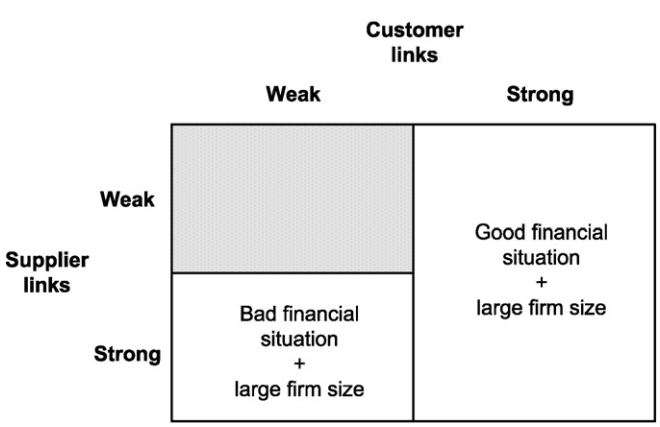

Fig. 4. Successful approaches to service emphasis.

Third, this study considers service emphasis as a homogeneous entity. However, according to Gebauer et al. (2010a), service emphasis can be achieved in different ways, by focusing on specific service types. Previous research developed several classification schemes for industrial services and differentiates for example between services supporting the product and services supporting the customer (Antioco et al., 2008; Mathieu, 2001b) or base, intermediate, and advanced services (Baines & Lightfoot, 2013). Additional research could analyze whether the successful implementation of specific service types requires the presence of different organizational characteristics. A configurational approach would make possible a study investigating the various configurations of service strategies and context characteristics that lead to future revenue growth. Therefore, research can develop a more detailed understanding of service emphasis using fsQCA.

Fourth, we operationalize service emphasis in terms of the increase in responsibility of the service divisions, as this provides major evidence for a growing importance of services, i.e., a service transition. However, this measurement is restricted to service transitions that become apparent in the organizational structure of an organization. Thus, we did not consider less mature service transitions that do not involve a separate service division. Future studies could broaden the conceptualization of service emphasis by also capturing the outcomes of less apparent service transitions.

Fifth, we investigate relations between service emphasis and firms' overall revenue growth, thereby ignoring the process through which

service emphasis affects firm performance. Complementing our research, future studies might disentangle the effects of service emphasis on different sources of revenues (e.g., service revenues, product revenues) or might consider non-financial performance outcomes in addition to financial performance measures (e.g., customer loyalty, willingness to pay). Thereby, future research could provide further insights into the mechanisms behind service transitions and help understand *why* service emphasis contributes to firms' revenue growth.

Finally, being collected almost two decades ago, our data clearly does not allow a descriptive state-of-the-art analysis portraying the current importance of industrial services in German manufacturing companies. However, it is a unique and useful source of data for researching causal relationships that are predominantly time invariant, such as the need for financial and other resources to successfully manage a strategic change process such as the service transition of manufacturing companies that began in the early 1990s.

Appendix A. Measurement scales and items

Construct	Items
Revenue	What was the overall revenue of the company in year X?
Service emphasis	Compared to other departments, did the responsibility of the service division vary over the last three years? (*five-point scale*; -2 = *strong decrease*, 2 = *strong increase*)
Financial situation	Indicate the financial situation of your company in the past three years in terms of… (*five-point scale*; -2 = *strong decrease*, 2 = *strong increase*) 1. Revenues 2. Profitability 3. Customer demand
Company size	How many employees did your company have in year X?
Customer links	Determine the extent to which your customers influence the following activities of your company: (*three-point scale*; 0 = *no influence*, 2 = *strong influence*) 1. Personnel/staff 2. Investment decisions 3. Operational procedures 4. Organizational structures 5. Manufacturing methods 6. Sales planning 7. Product development 8. Quality management
Supplier links	Determine the extent to which your suppliers influence the following activities of your company: (*three-point scale*; 0 = *no influence*, 2 = *strong influence*) 1. Personnel/staff 2. Investment decisions 3. Operational procedures 4. Organizational structures 5. Manufacturing methods 6. Sales planning 7. Product development 8. Quality management

Note: *The original questionnaire was in German. Items were translated and back-translated by two English and German experts.*

Appendix B. Boolean algebra representation of the overall solution.

We can represent the overall solution using formal Boolean notation, which leads to the following solution formula:

SE * FS * CS * CL + SE * ~FS * CS * ~CL * SL + FS * CS * CL * SL+
~SE * FS * CS * ~CL * ~SL + ~SE * FS * ~CS * CL* ~SL+
~SE * ~FS * CS * CL* ~SL → RG

Note: * *indicates the logical 'and'*; + *represents the logical 'or'*; ~ *indicates the absence of a condition*; *RG is revenue growth*; *SE is service emphasis*; *FS is financial situation*; *CS is company size*; *CL is customer links*; *SL is supplier links.*

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