

A history-based framework of servitization and deservitization

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A History-Based Framework of Servitization and Deservitization

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Abstract

Purpose – To develop a history-based framework of servitization and deservitization.

Design/methodology/approach – The study draws on three history-based management theories, i.e., industry lifecycle, strategic pivoting, and strategy restoration, to develop a conceptual framework of how servitization and deservitization pivots influence firm performance in different stages of the industry lifecycle. A series of examples involving configurations and reconfigurations in production illustrate the theoretical propositions.

Findings – The proposed framework predicts that servitization pivots positively influence firm performance in the ferment phase, but this effect gradually diminishes as industries advance into transition and mature phases. In contrast, the framework predicts that deservitization pivots negatively influence firm performance in the ferment phase; this effect, too, becomes negligible in the transition phase but positive in the mature phase. Moreover, the proposed framework predicts that deservitization pivoting outperforms servitization pivoting in mature servitized industries to the extent that such pivots are restorative in nature, thereby suggesting that deservitization may represent a strategic opportunity for firms in mature industries.

Originality - This study highlights the role of history-based management theories in enhancing our understanding of servitization and deservitization.

Keywords - Servitization, Deservitization, History-based management theory, Industry lifecycle, Strategic pivoting, Strategy restoration.

Paper type - Conceptual paper.

1. Introduction

Servitization refers to the transition from selling products and after-sale services to providing more advanced services in the form of integrated total solutions (Rabetino *et al.*, 2018). It has also been referred to as product-service systems (Baines and Lightfoot, 2013; Rabetino *et al.*, 2015; Sousa and da Silveira, 2017), service infusion (Brax, 2005), or the provision of industrial services (Matthyssens and Vandembemt, 1998), and has been identified as a critical innovation in production strategy (i.e., product-service innovation; Bustinza *et al.*, 2018; 2019a). At the same time, these insights have primarily been informed by knowledge accumulated from problem-driven research rather than theoretical foundations. As a result, many scholars agree that servitization remains a theoretically nascent field (Kowalkowski *et al.*, 2017). Scholars from various disciplines have aimed to fill this gap by framing servitization within a range of well-established management theories, such as the knowledge-based view of the firm (Valtakoski, 2017), paradox lenses (Kohtamäki, Eionala and Rabetino, 2020a), dynamic capabilities (Coreynen *et al.*, 2020), and ambidexterity (Bustinza *et al.*, 2020). Despite these efforts, however, prominent servitization scholars continue to issue calls for more theory-driven research (Rabetino *et al.*, 2020). In particular, extant literature lacks a theoretical framework for understanding the conditions under which firms engage in servitization versus deservitization and, importantly, the conditions under which such activities result in improvements in firm performance.

This paper aims to respond to such calls by highlighting a conspicuously missing perspective from the servitization literature: history. The development of a history-based framework of servitization – and deservitization – stands to benefit academics and practitioners alike in at least three ways. First, the examination of firms' historical experiences through “research that uses remote sensing and a contextualist approach to explanation” (Ingram, Rao and Silverman, 2012, p. 249) enables scholars to identify the conditions under which servitization is indeed a source (or not) of competitive advantage (Helfat and Lieberman 2002; Moeen 2017; Pillai, Goldfarb and Kirsch, 2020). Second, the use of rhetorical history by firms for strategy-making (Kaplan and Orlikowski, 2013; Miller, Gomes and Lehman, 2019; Suddaby and Foster, 2017) may help us not only understand how firms increase servitization levels over time, but also when and how they may decrease servitization levels through engaging in deservitization (e.g., Valtakoski, 2017). Third, an historical approach enables scholars to gain a more nuanced understanding of the industry heterogeneities observed in the adoption levels and success rates of servitization and deservitization (Bustinza *et al.*, 2019b;

Kowalkowski *et al.*, 2015). In this sense, an historical approach allows us to better contextualize how firms learn, innovate, and make decisions regarding their level of servitization as well as the outcomes of these decisions.

This paper thus draws on three specific theoretical perspectives in management to develop a history-based framework of servitization and deservitization. First, it builds on industry lifecycle theory to differentiate the way product firms engage with service offerings as a function of the industry evolution (Cusumano, Kahl and Suarez, 2015). Second, it draws on the notion of strategic pivoting to consider how an industry constructs dominant strategic approaches or strategic pivots (see Pillai *et al.*, 2020); servitization as well as deservitization pivots are considered. Third, it draws on the notion of strategy restoration to consider how these pivots may represent strategic opportunities for firms to engage in constructive change and realize performance enhancements by recontextualizing previous operational and production activities in a current environment (see Miller *et al.*, 2019). Taken together, this framework offers a series of testable propositions regarding the impact of (de)servitization pivoting on firm performance as moderated by industry lifecycle. Specifically, it predicts that servitization pivoting positively influences firm performance in the ferment phase, but this effect gradually diminishes as industries advance into transition and mature phases of servitized industries. In contrast, it predicts that deservitization pivoting negatively influences firm performance in the ferment phase; this effect, too, becomes negligible in the transition phase but positive in the mature phase. Moreover, it posits that deservitization pivoting outperforms servitization pivoting in mature servitized industries to the extent that such pivots are restorative in nature.

This study contributes to strategy and servitization scholarship in various ways. First, it highlights an important but missing perspective from the servitization literature: history. By searching among their historical past, organizations reflect on their identities and re-evaluate their current strategies and market positioning (Argyres *et al.*, 2020). Our integrative framework incorporates these reflective elements in servitization theorizing. Second, it sheds new light on the influence of the industry lifecycle in servitization. Prior work has traditionally focused on analyzing how manufacturing companies can take advantage of services during the product lifecycle (Brax and Visintin, 2017), especially during the product lifespan (Vendrell-Herrero *et al.*, 2021). Even though some prior servitization studies have considered product lifecycles (Rabetino *et al.*, 2015), this work has generally not examined the influence of industry lifecycle on the impact of servitization decisions (c.f., Cusumano *et al.*, 2015). The framework presented here extends this prior work by offering propositions on the moderating

role of industry lifecycle in the relationship between changes in the level of servitization and firm performance. Third, it points to deservitization as a possible form of strategy restoration (see Miller *et al.*, 2019). Prior studies have typically understood deservitization as the attempt to merely reverse failing servitization efforts and return to production strategies (Forkmann *et al.*, 2017; Kowalkowski *et al.*, 2015; 2017; Valtakoski, 2017). In contrast, we suggest that deservitization pivoting may represent a strategic opportunity for firms in mature industries to engage in constructive change and realize performance enhancements by recontextualizing previous strategies in a current environment. Fourth, it offers a more nuanced understanding of the relationship between levels of servitization and firm performance. In general, prior studies have not considered the potentially dynamic nature of this relationship (for a recent review, see Wang *et al.*, 2018). We seek to fill this gap by theorizing about the impact of changes in servitization levels on firm performance. Finally, the proposed framework stands to inform not only scholars but managers as well.

The rest of the paper is structured as follows. We first introduce the three theoretical underpinnings for the proposed framework: industry lifecycle, strategic pivoting, and strategy restoration. We then draw on these three perspectives to discuss how history can inform servitization research. We then outline a set of propositions regarding the impact of servitization and deservitization pivoting on firm performance. We conclude with a discussion of the implications of this framework for theory and practice.

2. Background literature

2.1. Industry lifecycle

The management literature identifies different phases of an industry characterized by different levels of competition, investment in innovation, and technological development and design alternatives that lead to different rates of sales growth (Anderson and Tushman, 1990). The extant literature provides a variety of lifecycle models dating back nearly a half century (e.g., Day, 1981: introduction, growth, maturity, decline). We adopt here Cusumano *et al.*'s (2015) interpretation of industry lifecycles as it is particularly appropriate for firms that provide integrated product-service offerings, which is the context of our study. This model includes three phases: ferment, transition, and maturity.

In the initial 'ferment' phase, producer uncertainty and costs tend to be high because firms need to explore and make strategic trade-off resource commitments and invest in certain potential alternative production techniques, technologies, and designs that compete for

acceptance. Because technology and customer needs are in constant flux, firms are more likely to experiment with different technologies, product-service features, and designs as they search for best solutions from a variety of possible trajectories. Customer costs and uncertainty are high because of the initial limited understanding about the new technology, its technical characteristics and functionality, and performance. Such uncertainty, which is normally coupled with higher initial prices, increases the risk and reluctance for customers to purchase and implement new products. Hence, a variety of complementary services, such as technical training or consulting, may induce customers to adopt novel products. As such services help customers become more familiar with the new products (Cusumano *et al.*, 2015).

As industries evolve over time and production scale increases, they go through a 'transition' phase, characterized by the emergence of more stable and dominant product-service designs as well as lower levels of uncertainty and costs. Uncertainty and costs are reduced because product-service offerings become more understood, standardized, and reliable. Before reaching the maturity stage, the increasing levels of product-service standardization and awareness enhance market demand and production scale. Thus, at this stage, competition tends to shift strategies from product innovation and differentiation to process innovation and low cost (Anderson and Tushman, 1990).

As industries reach a 'mature' phase, product-service offerings and market uncertainty levels continue to decrease and cost-based competition continues to increase. The remaining competitors are able to reach similar technological standards by following the dominant product-service designs. As customers conform to the dominant use instead of seeking novel uses, firms shift their focus towards process innovation and production efficiency (Rogers, 2003). As mature products tend to be kept in operation for longer periods, customers are more likely to favor complementary service offerings such as maintenance and repairs. Some firms may even combine this type of offering with a higher degree of servitization such as outcome-based contracts.

2.2. Strategic pivoting

Strategic pivots are new strategies or business models resulting from economic experimentation that require firm commitments not easily reversible (Pillai *et al.*, 2020). Greenstein (2007) identifies economic experimentation as a learning mechanism derived from direct market participation that facilitates the accumulation of knowledge about the market value of a product or service and that is conducive to changes in the firm's operations and

organizational procedures that transform technological innovation into market value (Greenstein, 2007). As such, economic experiments facilitate learning that cannot be known before implementation or deduced from some set of established principles or developed through laboratorial prototype experiments, but rather takes place through real market participation (Rosenberg, 1994). As such, the development of new manufacturing technologies or products is of an economic and not of a purely technical nature (Pillai *et al.*, 2020).

Strategic pivots thus emerge from a process of learning by economic experimentation through which firms learn across several dimensions simultaneously. As other forms of learning, learning from economic experimentation enables the development of tacit and explicit knowledge bundles, which enrich firm competitiveness (Valtakoski, 2017). Yet, unlike other forms of learning that are focused on productivity improvements (learning by doing), technology assimilation (absorptive capacity), or user feedback (learning by using), learning from economic experimentation takes into account the complex interdependencies between design, production, and marketing (Pillai *et al.*, 2020). Therefore, whilst other forms of learning are more focused in scope, learning by economic experimentation encompasses the overall structure of the firm, the strategic position of the firm within the industry, and its viability in relation to competitors' positioning, and market preferences.

By following a process of learning by economic experimentation, strategic pivots are identified ex-post as the outcome of each experiment is unknowable ex-ante. They are identified via a backward-looking sensemaking process through which firms evaluate patterns of long-term strategic decisions and experimental actions. Therefore, to undertake certain experiments, firms are required to make costly and often irreversible resource commitments, carrying out important trade-off implications without knowing the ultimate outcomes. As such, firms engaging in such experimentation "run the risk of incurring significant opportunity costs from the process of experimentation itself, potentially foreclosing them from other strategic alternatives" (Gans, Stern and Wu, 2019, p. 738). Thus, only firms that have the necessary resources are able to benefit from economic experimentation as it requires a combination of strategic organizational and technological decisions and actions involving market participation. As argued before, since strategic pivots are identified ex-post, firms must often implement a broad range of experiments, which exacerbates the need for a strong resource base.

2.3. *Strategy restoration*

Strategy restoration refers to “an organization’s reinterpretation and reenactment of discontinued aspects of its own history for present use and for the sake of enhanced future performance” (Miller *et al.*, 2019, p. 2). Strategy restoration includes both content and process in that it encompasses changes in current organizational practices, processes, products, structure or strategy. Strategy restoration can therefore be understood as an iterative temporal process involving a relationship between the past, present and future, in which organizations attempt to understand who they were and where they come from as well as who they are and who they want to be. Taken together, strategy restoration can be understood as a strategic pivot in which past organizational attributes and activities are reinterpreted and reenacted.

In this way, it is a dialectical process in which the historical past, the ongoing present, and the emerging future are in constant interplay. Strategy restoration shapes the present inasmuch as the past is accessible. In this sense, restorative processes involve searching among previous strategic pivots that may be embedded in an organization’s memory bins such as individuals, official archives, organizational culture, and the like (Walsh and Ungson, 1991). Historical accounts are thus interpretations of past pivots that had been abandoned and forgotten and are now remembered, retrieved, and reinterpreted through a contemporary lens (Suddaby and Foster, 2017).

Though restoration involves retrieving the past, it is done for the sake of future performance. Because the future can only be imagined today (Weick, 1995), restoration requires a forward-looking imagination of possible futures (Kaplan and Orlikowski, 2013) that can be conducive to innovation and differentiation (Chiles *et al.*, 2010). In this sense, restoration is not simply a reversion back to a previous pivot. Instead, it involves the creative and innovative reenactment of history with a view toward an imagined future (Miller *et al.*, 2019). The remembered past is reinterpreted and contextualized in the present and in light of current concerns as organizational members engage in retrospective reconstruction (Suddaby, 2014; Weick, 1979) and prospective sensemaking (Wiebe, 2010) by projecting into the future a reenactment of history as they reinterpret it in the present. Altogether, returning to a previous strategic pivot via strategy restoration can be a source of differentiation and competitive advantage as other industry players continue competing on the basis of current pivots.

2.4. Integrative theoretical underpinning for servitization

The theoretical perspectives outlined above provide the underpinning that helps us gain a better understanding of servitization. Table 1 provides a summary of interrelationships between

industry lifecycles, strategic pivoting, and strategy restoration. It also points to three different levels of analysis. On an industrial level, it shows that industrial characteristics influence how firms learn. In the ferment phase, firms may learn from their own experience by experimentation; in the transition phase, firms may learn from others by vicarious learning; and, in the mature phase, firms may learn from history by memory. Of course, the possibilities of learning in these phases are not mutually exclusive and are subject to competitive and cognitive environments. For example, vicarious learning might not be attainable in environments dominated by tacit knowledge (Valtakoski, 2017). Similarly, learning by memory will only be feasible if organizations are able to access existing memory bins either from within (e.g., human and artifactual sources such as employees and archives) or outside the organization (e.g., former employees or other firms) (see Walsh and Ungson, 1991). On a strategic level, it shows that successful experiments form the strategic pivots that lead to a more robust development of the industry but also increase competitive intelligence. Finally, at a firm level, it suggests that firms can learn from the past once business opportunities begin to run out. As such, firms can develop, adopt, abandon, and readopt strategic pivots.

This summary enables the analysis of two key aspects of servitization. First, we incorporate strategic pivoting in an effort to better understand servitization development in each phase of the industry lifecycle. Second, we draw on strategy restoration to consider how firms might return to previous strategic pivots related to servitization, which we define as deservitization pivots. These are important questions that remain unanswered to date and that we attempt to resolve in the next section.

Table 1. Summary of theoretical underpinnings

Lifecycle	Ferment	Transition	Mature
Strategic orientation	Economic experimentation	Strategic pivoting	Strategy restoration
Primary type of learning	Learning by experimenting	Vicarious learning	Learning by memory
Sources of learning	Emerging technology and design, production and operations, sales and customer behavior	Competitors, industry standards, and customers	Own past history

3. Toward a history-based framework of (de)servitization

3.1. Servitization as strategic pivoting

Though the servitization literature began in the eighties (Vandermerwe and Rada, 1988), there are acknowledged cases of servitization since the sixties. An iconic example of this is the Rolls-Royce servitization strategy named “Power by the Hour” through which, in 1962, the business

model began emphasizing the sales of engine service rather than the engines themselves (Hou and Neely, 2018; Ng *et al.*, 2012). Over time, many other manufacturing firms from a variety of industries started integrating services into their product offerings by launching all sorts of different servitization variants. These developments in industry caught the attention of scholars who have sought to make sense of the servitization phenomenon. As a result, several scholars have suggested that the degree of service integration varies along a continuum in which base products support a growing infusion of associated services (Kowalkowski *et al.*, 2012; 2015; 2017; Oliva and Kallenberg, 2003). Importantly, servitized manufacturing firms frequently move in either direction along this continuum by embarking on various servitization experiments. Hence, we refer to substantial movements along the product-service continuum as strategic pivots, specifically, as servitization and deservitization pivots.

Table 2 summarizes the various servitization levels identified in the literature. Early work by Porter and Millar (1985) acknowledged that some manufacturing firms adopted product support and after-sales services in their value chain. Over time, other scholars have identified six additional relation-based service levels that manufacturers have pursued in attempts to escape the product commoditization trap for companies operating in industries that had reached the maturity phase. These levels range from complementary services to user-oriented services and potentially reaching result-oriented services. For instance, Oliva and Kallenberg (2003) identified servitization levels according to transaction- and relational-based categories. Tukker (2004), Baines and Lightfoot (2013), and Kowalkowski *et al.* (2015) later identified servitization levels that included complementary services to product support and after-sales services, referred to as base or product-oriented services, and divided the relational-based services into two categories: user-oriented and result-oriented services. It is important to note that the adoption of these various types of service offerings changed along the industry lifecycle (Cusumano *et al.*, 2015; Huikkola, Kohtamäki and Rabetino, 2016; Rabetino *et al.*, 2015, 2017). More recently, Brax and Visintin (2017) attempted to provide a more comprehensive categorization of servitization levels adopted by manufacturing firms over time and across different industries. These authors identified eight levels, including those identified by previous authors, reflecting a product-service continuum ranging from manufacturing firms offering products with limited support to providing total solutions. Finally, Porter and Heppelmann (2014) have identified an additional ninth possibility – autonomous solutions – wherein algorithms favor product enhancement and self-diagnosis.

Movements toward greater levels of servitization can be understood as strategic pivoting because they tend to result in the development of new business models for the firm and for the industry. Such pivotal developments require economic experimentation and substantial resource commitment (Pillai *et al.*, 2020). Hence, moving to more advanced levels of servitization require an important organizational transformation that might not be easily reversible (Zhang and Banerji, 2017).

Table 2. Product-service continuum and (de)servitization pivots

Key pivots Key articles	Product-service Continuum and (De)Servitization Pivots								
	I	II	III	IV	V	VI	VII	VIII	IX
Brax and Visintin (2017)	Product with limited support	Installed and supported products	Complementary service	Product-oriented solutions	System leasing	Operating services	Managed service solutions	Total solutions	
Porter and Millar (1985) Porter and Heppelmann (2014)	Product with after sales service		X			Connected products			Autonomous solutions
Oliva and Kallenberg (2003)	Transaction-based services (e.g., transport, repair and spare parts).		Relationship-based services (e.g., preventive maintenance, condition monitoring, or full maintenance contracts).						
Tukker (2004)	Product-oriented services, needed during the use phase of the product as maintenance or to improve their use as logistic services.			Use-oriented services as product lease, renting, sharing, or pulling services.		Result-oriented services, including activity maintenance, pay per service unit, or functional result services.			
Baines and Lightfoot (2013)	Base services are associated to an effective provision of the product (e.g., warranty product and spare parts provision).			Intermediate services guarantee that product is properly maintained, therefore focused on product conditions (e.g., scheduled maintenance, repairs, operator training, condition monitoring).			Advanced services are focused on providing capabilities that arise from the performance of the product. (e.g., customer support agreement, revenue and risk sharing contracts).		
Kowalkowski <i>et al.</i> (2015)	Product oriented: Manufacturer			User oriented customization based Availability provider: growing from product-oriented to use-oriented		Performance provider Growing from use-oriented to result-oriented			
				User oriented scale based Industrializer?: standardizing and scaling down previously used-oriented offerings.					

3.2. Deservitization as strategy restoration

Servitization pivoting can exist along a continuum reflecting a range of levels of service infusion. Importantly, some scholars argue that such movements are not unidirectional but, instead, multidirectional (Finne, Brax and Holmström, 2013; Kowalkowski *et al.*, 2015). That is, it may be possible to return to a previous level of servitization by reducing the level of services and thus moving from advanced services to more basic ones. In fact, recent studies show that some manufacturing firms have moved back on the product-service continuum, with some even abandoning their service business altogether (Finne *et al.*, 2013; Gebauer and Kowalkowski, 2012; Kowalkowski *et al.*, 2015, 2017; Valtakoski, 2017). This phenomenon has been termed deservitization, a process whereby a company shifts from a service-centric to a product-centric business model and logic, thus encompassing service dilution or a reduction in the relative importance of service offerings (Kowalkowski *et al.*, 2017). Finne *et al.* (2013) suggest that by servitizing, manufacturing firms move forward and extend their levels of servitization along the servitization continuum; through deservitization, however, they move backward and restrict or withdraw completely from services. In this way, deservitization involves retrieving past strategic pivots and, as such, is more likely in mature stages of the lifecycle when firms opt to withdraw from certain service initiatives after perhaps having overextended themselves in moving toward services.

Prior studies have typically understood deservitization as the attempt to merely reverse failing servitization efforts and return to product-based transactional production strategies (Forkmann *et al.*, 2017; Kowalkowski *et al.*, 2015, 2017; Valtakoski, 2017). For instance, some scholars have argued that increasing levels of servitization can overstretch the organization's core business and result in the loss of strategic direction and identity (Kindström and Kowalkowski, 2014; Wang, Lai and Shou, 2018). By shifting manufacturing firms' focus and attention from products, distributors, and integrators to services and end users (Holmström, Brax and Ala-Risku, 2010), excessive servitization risks damaging the perceived authenticity of an organization's offerings and identity.

In contrast, we suggest that deservitization may also represent a strategic opportunity for firms to engage in reconstructive change and realize performance enhancements by recontextualizing previous strategic pivots in a current environment. This framing of deservitization as strategy restoration assumes that the motivation to engage in restorative change – including, but not limited to deservitization – emerges from aspirations to enhance strategic performance informed by the recognition that drawing upon history can confer

legitimacy that supports competitive advantage. Hence, we suggest that the concept of strategy restoration provides a theoretical foundation for offering a fuller understanding of why organizations might deservitize and the potential implications for firm performance.

Central to the argument is the notion of authenticity. A growing body of research shows that clients favor organizations as well as products and services deemed “genuine” and “real” (for a recent review, see Lehman *et al.*, 2019). In industries with tangible products that are readily imitable, perceived authenticity can be an enduring source of competitive advantage. Indeed, the interrelationship between identity and authenticity seems to be mutually influencing (Beverland, 2005). That is, authenticity is not a property of organizations but, instead, an attribution that it “[is] what they appear to be or claimed to be” (Trilling, 1972, p. 72). In other words, an organization is deemed authentic to the extent that its offerings are consistent with its proclaimed identity (Carroll and Wheaton, 2009). This is particularly relevant in today's fast-changing and hypercompetitive global markets, characterized by increasing technological complexity, shorter product lifecycles, and constant changes in the product-service portfolio, where success depends, to a great extent, on the ability of projecting the authenticity of its product-service offerings (Huikkola *et al.*, 2020). Manufacturing firms suffering from a loss of perceived authenticity due to extensive servitization might resort to a restorative strategy with the aim to regain it. This is the case because considerations of “who we are” or “who we want to be” may require an understanding of “who we have been” (Gioia *et al.*, 2000). In doing so, manufacturing firms must reexamine their current product-service strategy and attempt to define their future intended identity by revising their history and reevaluating their interpretation of the past.

Movements toward lower levels of servitization can also be understood as strategic pivoting because they represent a restorative reinterpretation of past business models involving substantial organizational transformation and resource commitments. For instance, moving back to basic levels of servitization might require a de-investment in technology, renegotiations with suppliers and partners, and a redefinition of the value proposition (Kowalkowski *et al.*, 2017). Importantly, however, some deservitization efforts can also be understood as a form of strategy restoration. Such efforts involve a search process and a “hermeneutical circle” (see Miller *et al.*, 2019) of reinterpreting past strategies and reenacting them in the present in a contextualized manner and for the sake of future performance. That is, a past strategic pivot is reinterpreted and contextualized via retrospective reconstruction (Suddaby, 2014; Weick, 1979) and prospective sensemaking (Wiebe, 2010). In this way, deservitization can be

understood as a possible mechanism by which to restore an organization's identity and the authenticity attributed to its offerings.

3.3. Servitization and de-servitization pivoting: A comparative analysis

Table 3 shows examples of servitization and deservitization pivots – from products with limited support to autonomous solutions – contextualized within the three main industry lifecycle phases: ferment, transition and mature.

For illustrative purposes, we outline pivotal strategies that have occurred in the following three currently mature industries: automotive, printer, and elevator industries. The automotive industry provides many examples of servitization pivots. The first such pivot took place during the ferment phase in 1908 when Ford developed the Model T. This strategic pivot was later acknowledged as the foundation for the mass production low-cost strategy. At that stage, an initial servitization pivot was implemented, i.e., a product with limited support (SP I). As the industry moved on to the mature phase, various car manufacturers started offering complementary services as consultancy and R&D-related offerings (SP III). For instance, in the early 2000's Volvo developed "soft product" business models offering uptime, fleet operation, support, and financial complementary services to product offerings (Wikhamn, Ljungberg and Styhre, 2013). From here, an entire set of services offerings were incorporated by other players to consolidate more complex SCS business models as managed service solutions (SP VII) or total solutions (SP VIII). Audi eTron is an example of a managed service solutions business model in which the car manufacturer designed, implemented, and supported electrical charger stations in the countries where their cars are sold, offering them as system payment services based on outcomes (i.e., electricity loadings).

Printer manufacturing, in contrast, helps to illustrate both servitization and deservitization pivots. A pivotal servitization strategy was developed in the 1960s when Xerox started offering monthly payments for installed and supported products (SP II). Various additional pivots were introduced over time until the most complex servitization pivot, total solutions (SP VIII), was adopted by various players during the last decade. Total solutions (SP VIII) consists of system payments based on outcome where the ownership is not transferred to the customer (i.e., pay-per-copy business models). However, the transition across the different levels of servitization is not necessarily linear or unidirectional; some firms push to return to previous levels of servitization. One deservitization effort took place in 1972 when Xerox returned to the pre-1959 'razor and razor blades' business model due to an antitrust lawsuit (Visintin, 2012; 2014). Such restoration strategies have occurred in other manufacturing

industries such as the elevator industry as some firms returned to previous levels of servitization. For instance, in 2020 Thyssenkrupp sold their industrial solutions business unit (SP VI) and moved to a previous servitization pivot (SP III). Similarly, KONE deservitized from modular solutions (SP VII) to restore a previous strategic pivot to supply chain modularity business model (SP V) in 2013 (Kowalkowski *et al.*, 2017).

Examples from the smartphone industry illustrate pivotal servitization strategies in the transition phase. The smartphone industry began in 1994 when IBM developed its Simon Personal Communicator. When it reached the transition phase of the industry lifecycle, Nokia and Apple launched their respective N95 and iPhone models in 2006 (SP IV), while other new entrants, such as Google and Windows, decided to compete at first by developing the operating systems –Android and Windows OS – to support the products (SP VI). In some cases, firms such as Apple and Google were able to transition throughout the service continuum by developing increasingly complex service offerings such as the app-store business model (SP VII); in other cases, however, firms adopted restorative deservitization strategies by returning to levels of servitization. For instance, Windows discontinued the support to their Windows OS and launched their own Windows smartphone supported by Android system in 2020 (moving back to SP IV stage).

Finally, the case of Tesla illustrates a particular type of pivotal servitization strategy developed during the ferment phase of the industry lifecycle. The company developed the most advanced servitization pivot available to date (SP IX) when, in 2012, it began offering autonomous robotic solutions. Products operate with complete autonomy and in coordination with other products and systems, software is upgraded continuously, and repairs are automatically suggested. As a result, capabilities can grow exponentially based on the connections between system and customers as well as on the elimination of channel intermediates (Porter and Heppelmann, 2014). The development of this servitization business model resulted in the creation of an entirely new industry and is reflected in the market capitalization of the company (Wayland and Kolodny, 2020).

Table 3: Examples of servitization and deservitization pivots

Key pivots	Servitization and Deservitization Pivots								
	I	II	III	IV	V	VI	VII	VIII	IX
	Product with limited support (Manufacturer offers break-fix, maintenance and customer-support)	Installed and supported products (Manufacturers is responsible of installation and maintenance)	Complementary service (Consultancy and R&D related services)	Product-oriented solutions POS (solution design, implementation, and support)	System leasing (same that POS but ownership is not transferred)	Operating services (same than POS but manufacturer receive a payment for operating the system)	Managed service solutions MSS (same than POS but operating system payment are based on outcomes)	Total solutions (same than MSS but ownership is not transferred)	Autonomous solutions (products operate with complete autonomy in coordination with other products and systems)
Car industry (Mature) 3-4 puntos	^a First car accessible to masses (Ford Model T, 1908 →)		^a Soft products: uptime, fleet operation, support, and financial services (VOLVO, early 2000's →)				^a Electric cars plus charging services (Audi eTron, 2019 →)	^a Mobility services: cars and motorbikes (BIPI, 2020 →)	
Printer industry (Mature) 3-4 puntos	^b Antitrust suit against Xerox: Return to the pre-1959 'razor and razor blades' business model (1972 ←)	^a Haloid (Xerox, 1960s →). Monthly payments		^a Solution ensuring the optimization of the digital processes (Xerox, second half of the 1990s →)				^a Managed print solutions (most important manufacturers, early 2010 →)	
Elevator industry (Mature)	^a KONE MonoSpace (1996 →)		^b Thyssenkrupp sell out Industrial Solutions (2020 ←)	^a KONE Integrated solutions (2006 →)	^b KONE Supply Chain modularity (2013 ←)		^a KONE Modular solutions (2011 →)		
Smartphone industry (Transition)	^a IBM Simon Personal Communicator (1994 →)			^a Nokia N95, Apple Iphone (2006 →) ^b Windows buy NOKIA and later discontinues support (2017 ←) ^a Windows smartphone (2020 →)		^a Google Android (2005 →) ^a Windows OS (2005 →)	^a Google App Store (2008 →)		
Autonomous robots (Ferment)									^a Tesla Model S and superchargers (2012 →) ^a Komatsu Joy Global Mining System (2014 →)

^a Servitization pivoting (→); ^b Deservitization pivoting (←)

4. The effects of (de)servitization pivots on firm performance

4.1. Theoretical foundations

The preceding sections outlined how pivots are formed and how market changes prompt managers to decide whether to continue in the direction of the current pivot, develop a new pivot for the industry through learning by experimentation, adopt an existing pivot through vicarious learning, or restore previous pivots through learning by memory. In a competitive environment where managers maximize shareholder return, these decisions of when and how to pivot must be evaluated in relation to their impact on future firm performance. This section aims to develop a framework that identifies the optimal pivot trajectory throughout industry lifecycles in an environment where firms might adopt a higher or lower level of servitization in their service strategy.

Several previous studies have analyzed the relationship between the level of servitization and firm performance (for reviews, see Bustinza *et al.*, 2018; Wang *et al.*, 2018). Evidence from most studies shows a positive relationship between the level of servitization and financial performance (for a recent example using longitudinal data, see Crozet and Millet, 2017). Despite the reported benefits of servitization, however, previous studies also acknowledge the existence of nonlinearities. Most studies have reported a U-shaped relationship such that firms in initial (SP I-III) and advanced (SP VII-VIII) servitization pivots have higher performance than firms in intermediate pivots (SP IV-VI) (Fang *et al.*, 2008; Kohtamäki *et al.*, 2013; Suarez *et al.*, 2013; Zhan and Banerji, 2017). There is also evidence that the relationship between servitization and performance exhibits an S-shaped curve (Visnjic and Van Looy, 2013). Moreover, previous studies have compared the relationship between the level of servitization and firm performance across industries. For instance, Vendrell-Herrero *et al.* (2021) report that firms in industries selling products with longer lifespans (e.g., trains) can extract more value from advanced servitization pivots (SP VII-VIII) and firms in industries selling products with shorter lifespan (e.g., fridges) can extract more value from initial servitization pivots (SP I-III). In sum, the majority of prior research suggests a positive relationship between the level of servitization and financial performance even as some studies point to a more nuanced relationship.

This prior work, however, has largely neglected the role of industry lifecycles. One notable exception is Cusumano *et al.*'s (2015) framework of service adoption, which posits that firms will offer different types of services at different phases of the industry lifecycle. During the ferment phase, firms will generally tend to offer adapting services in order to offset

for customers some of the uncertainty risks and costs inherent in new products; some firms will offer substitution services under conditions of extreme uncertainty and high cost. During the transition phase, firms will tend to offer smoothing services in an effort to aid in customer acquisition and retention. Finally, during the mature phase, some firms will continue to offer smoothing services whereas others will revert to substitution services. This foundational framework offers two implications relevant here. First, the evolution of an industry lifecycle is associated with servitization pivots; such movements are presumably driven by expected improvements in firm performance. Second, the assumption of service offerings along the industry lifecycle raises the questions of when firms opt to pursue deservitization pivots. These two underlying implications are the starting point for the propositions outlined below.

The propositions build on the prior research noted above in two ways. First, they consider both servitization and deservitization pivots. Second, they consider whether the outcomes associated with such pivots, which arise from different forms of learning, depend on the stage of the industry lifecycle in which the firm operates. Taken together, these theoretical propositions shed new light on when servitization pivoting may be most beneficial as well as when deservitization pivots may, instead, be more fruitful.

4.2. Theoretical propositions

The starting point for the theoretical propositions outlined here is the baseline assumption of prior research, that is, that there is a positive relationship between the level of servitization and financial performance (Bustinza *et al.*, 2018; Crozet and Millet, 2017; Wang *et al.*, 2018). In other words, pivots to higher levels of servitization tend to be associated with higher levels of performance. These performance benefits of servitization, however, hinge on the stage of the industry lifecycle.¹

Within the ferment phase, organizations tend to develop servitization strategies by seeking the generation of new pivots from a trial-and-error process of learning by experimentation. It is about looking for new ways of offering services to the users of the products that generate value and offer opportunities to improve their competitive advantage (Baines and Lightfoot, 2013; Eloranta and Turunen, 2015). However, such experiments do not take place in laboratory conditions or through pre-launch trials. Instead, they represent high

¹ One important assumption of our argument is that we consider servitization in the context of already servitized industries in which servitization is present across all stages of the lifecycle. This seems to be appropriate given that nearly all firms tend to engage in at least some form of servitization in today's business environment led by digital technologies.

levels of resource commitment as firms learn through product and technology development and real market participation and engagement with customers, suppliers, and competitors (Rabetino *et al.*, 2017). These operations require investments of non-recoverable resources, and therefore carry high risks, but at the same time, can bring a high return if competitors have not yet established similar pivots (Benedettini *et al.*, 2015). That is, experimentation generates high potential value as long as opportunities remain to create new pivots or to adapt advanced pivots that have rarely been adopted in other industries; this naturally happens in ferment industries (Cussumano *et al.*, 2015). Accordingly, we offer the following proposition.

Proposition 1 (P1): *Pivots to higher levels of servitization are positively associated with firm performance in servitized industries in the ferment phase.*

Once an industry moves to a transition phase, however, various levels of service infusion can be identified. At this stage, the competitive advantage of generating a new pivot will last for a shorter period of time because competitors have the resources and the technological capacity to replicate successful pivots in a relatively short time (Pillai *et al.*, 2020). This implies that the advantage of experimenting is lost once the competitors can imitate successful pivots in the industry via vicarious learning (Rogers, 2003). Since the timeframe to benefit from a monopolistic advantage in a successful pivot reduces, we consider that the advantage of servitization pivoting weakens but remains largely positive in transition industries. Moreover, very few, if any, opportunities to create new pivots or redefine current pivots exist in mature industries; as such, the opportunities to differentiate through servitization pivoting are scarce (Cussumano *et al.*, 2015). The benefits obtained from servitization pivoting will thus be negligible in mature industries; in other words, the capacity to capture value through new pivots does not compensate the underlying uncertainties and costs. Based on these arguments we propose the following proposition.

Proposition 2 (P2): *The performance-enhancing effect of pivoting to higher levels of servitization weakens in servitized industries in the transition phase and becomes negligible in servitized industries in the mature phase.*

In contrast, prior research suggests that lower levels of servitization are negatively associated with financial performance (Bustinza *et al.*, 2018; Crozet and Millet, 2017; Wang *et al.*, 2018). Of course, this work has typically suggested that poor performance is an antecedent of movements to lower levels of servitization; that is, these studies have presented deservitization as an attempt to reverse failing servitization efforts (Forkmann *et al.*, 2017; Kowalkowski *et al.*, 2015, 2017; Valtakoski, 2017). We build on this work to posit that

deservitization is generally associated with subsequent performance decrements. However, these performance decrements also hinge on the stage of the industry lifecycle.

In ferment industries, companies do not have previous referents and models to adopt within the short-lived industry. The only avenue for doing so is through reconverting models adopted in the past by the organization when it operated in other (related or unrelated) industries (Kowalkowski *et al.*, 2017). Instead, firms tend to focus during the ferment phase on understanding, predicting and adapting to future trends rather than on searching, retrieving, and adapting past strategies from other industries. Moreover, the difficulty associated with adapting pivots from other industries to a ferment industry suggests that such practices would be short-lived (Pillai *et al.*, 2020). We, therefore, offer the following proposition.

Proposition 3 (P3): *Pivots to lower levels of servitization (i.e., deservitization) are negatively associated with firm performance in servitized industries in the ferment phase.*

As industries evolve, however, organizations encounter new opportunities for restoring past pivots (Miller *et al.*, 2019). Deservitization pivots thus become increasingly valuable (Finne *et al.*, 2013). As discussed earlier, Cussumano *et al.* (2015) proposes that in transition and mature industries, companies need to increasingly adopt more standardized forms of services. As such, firms may deservitize more in mature servitized industries, and to a lesser extent in transition industries. More specifically, learning by memory and restored pivots used in the past might be a form of differentiation within mature industries (Miller *et al.*, 2019; Suddaby, 2014). In a scenario in which all (or most) competitors are adopting current servitization pivots, a movement to lower levels of servitization might provide opportunities in standardization and might become a unique offering in the industry (Kowalkowski *et al.*, 2015). Taken together, we offer the following proposition.

Proposition 4 (P4): *The performance-diminishing effect of pivoting to lower levels of servitization (i.e., deservitization) weakens in servitized industries in the transition phase and becomes positive in servitized industries in the mature phase.*

Finally, we consider the relative effects of servitization versus deservitization pivots in mature servitized industries. As outlined above, pivots to higher levels of servitization will be most strongly associated with enhanced performance in ferment industries. In contrast, pivots to lower levels of servitization will be most strongly associated with diminished performance in the same context due, in part, because restorative deservitization efforts will be less feasible due to the lack of history to draw upon. In mature industries, however, the gains due to

servitization will be minimal whereas the losses due to deservitization will be potentially significant. Importantly, to the extent that a deservitization pivot is restorative in nature – that is, it represents a retrospective reconstruction of the past and prospective sensemaking by projecting into the future – it stands to restore an organization's identity and the authenticity attributed to its offerings (Miller *et al.*, 2019; Suddaby, 2014). As a result, we posit that the performance effects of deservitization pivots will be more favorable than those of servitization pivots in mature servitized industries. We, therefore, offer the following proposition.

Proposition 5 (P5): *The performance effects of pivoting to lower levels of servitization (i.e., deservitization) will be more favorable than those of pivoting to higher levels of servitization in servitized industries in the mature phase to the extent that such pivots are restorative in nature.*

Figure 1 summarizes the aforementioned propositions. In the top portion of the figure, the relationship between servitization and firm performance is expected to be positive (P1⁺), but this relationship is moderated by the effect of the industry lifecycle (P2⁻). In the bottom portion of the figure, the relationship between deservitization and firm performance is expected to be negative (P3⁻); this relationship is also moderated by the effect of the industry lifecycle (P4⁺). This positive moderation effect of industry lifecycle is stronger to the extent that the firm is returning to a servitization level used in the past via a restorative approach to deservitization (P5⁺). Importantly, the framework posits that industry lifecycle moderates the effects of servitization and deservitization pivoting trajectories in opposite directions.

Figure 1. Theoretical framework

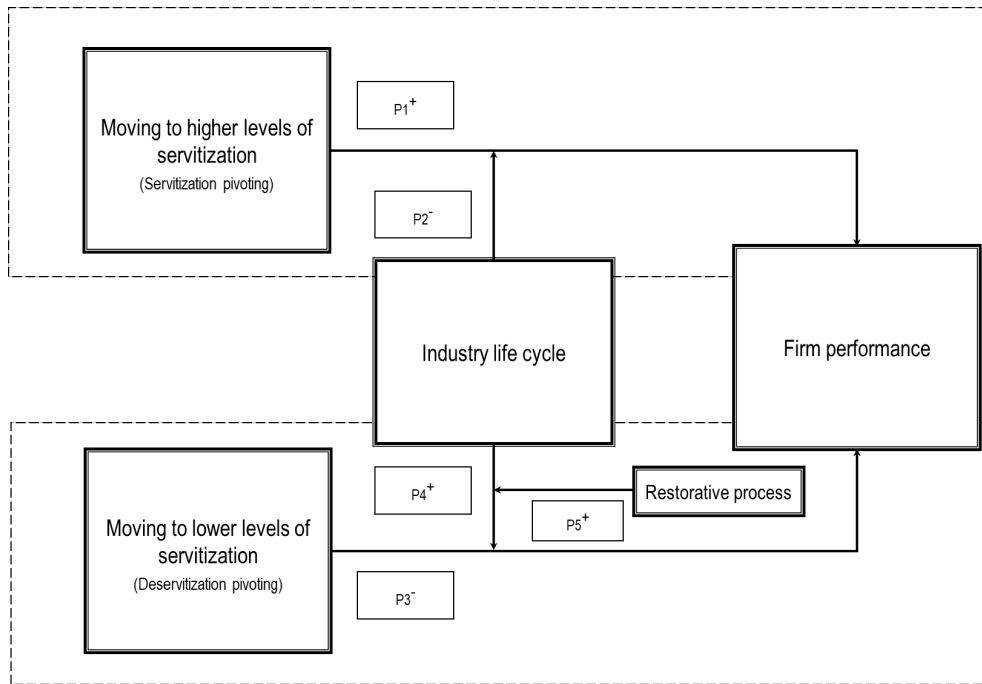
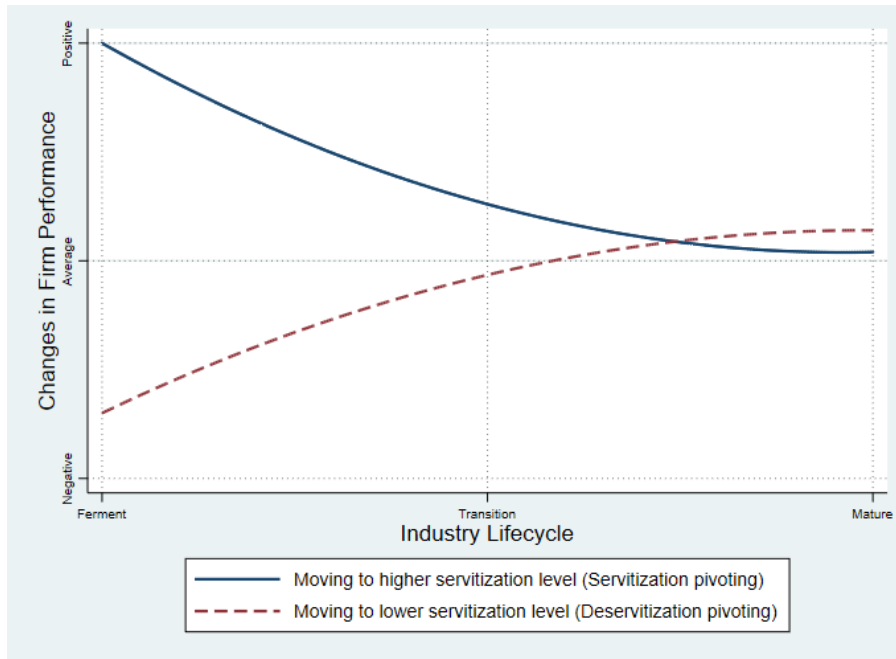


Figure 2 depicts how the propositions envision the rate of change in firm performance across industry lifecycles. In ferment industries, moving to higher levels of servitization is expected to have a significant positive impact on firm performance; however, this advantage will be significantly reduced in transition industries. In contrast, in ferment industries, moving to lower levels of servitization is expected to have a significant negative impact on firm performance; however, this disadvantage will be significantly reduced in transition industries. Finally, the performance-enhancing effect of deservitization efforts can potentially outperform the performance enhancing effect of servitization efforts in mature industries.

Figure 2. Expected performance implications of servitization and deservitization pivoting by industry lifecycle stage.



5. Discussion and conclusions

We drew on three history-based management theories, i.e., industry lifecycle, strategic pivoting, and strategy restoration, to develop a conceptual framework of how servitization and deservitization pivots influence firm performance in different stages of the industry lifecycle of servitized industries. Specifically, we posited that servitization pivots positively influence firm performance in the ferment phase, but this effect gradually diminishes as industries advance into transition and mature phases. In contrast, we posited that deservitization pivots negatively influence firm performance in the ferment phase; this effect, too, becomes negligible in the transition phase but positive in the mature phase. Importantly, we also posited that deservitization pivoting potentially outperforms servitization pivoting in mature industries.

5.1. Theoretical implications

This framework has important implications for several issues that are relevant for theory development and research on servitization. It offers a rare cross-pollination of insights for understanding the conditions under which firms engage in servitization versus deservitization and, importantly, the conditions under which such activities result in improvements in firm performance. An historical approach enabled us to provide a more nuanced contextual explanation about the heterogeneities observed during the various phases of the industry lifecycle, and explain how firms learn, innovate, and make decisions regarding their level of adoption of services. While previous studies have primarily focused on the implications of the product lifecycle (Brax and Visintin, 2017) and product lifespan (Vendrell-Herrero *et al.*, 2021)

to servitization, this is the first study to make extensive use of the industry lifecycle theory to shed light on both servitization and deservitization (c.f., Cusumano *et al.*, 2015). In sum, the framework presented brings together work on industry lifecycle theory (Cusumano *et al.*, 2015), strategic pivoting (Pillai *et al.*, 2020), and strategy restoration (Miller *et al.*, 2019) in order to offer new insights into the antecedents and outcomes of (de)servitization. In addition to these insights, this framework alters current perspectives in two specific ways.

First, the use of strategic pivoting to understand servitization and deservitization contributes to the servitization literature as it points to a strategic view of (de)servitization and challenges the widely accepted product-service continuum argument. The existing literature suggests that the service continuum represents a constant and gradual adoption of services. Such a view presupposes that firms engage in ex-ante rational strategic choices on what level of servitization to adopt. Instead, our use of the strategic pivoting theory indicates that such choices are not necessarily based on a clear understanding of the strategic choices available a priori. In line with Rosemberg (1994), we argue that servitizing firms follow a more emergent strategy approach during the ferment and transition phases by engaging in economic experiments through market participation. By following a process of economic experimentation, strategic pivots are identified ex-post. As such, new business models are identified through a backward-looking sensemaking exercise in which firms evaluate a pattern of long-term strategic decisions and experimental actions.

Second, the combination of strategy restoration and industry lifecycle theory further challenges the prevailing assumption that servitization occurs along a continuum in a unidirectional fashion. Most research on servitization assumes a unidirectional service infusion continuum wherein servitizing manufacturing firms increasingly move from basic products with limited support services to integrating total and autonomous service solutions. Though some recent studies started reporting cases of servitized manufacturing firms that fully or partially abandon their service businesses (Finne *et al.*, 2013; Gebauer and Kowalkowski, 2012; Kowalkowski *et al.*, 2015, 2017; Valtakoski, 2017), they understand deservitization as an attempt to merely reverse failing servitization efforts (Forkmann *et al.*, 2017; Kowalkowski *et al.*, 2015, 2017; Valtakoski, 2017). In contrast, we argue that as industries reach the mature phase, deservitization may represent a viable alternative for increasing levels of service infusion. The past is a potential source of reinnovation and differentiation, and deservitization may represent a strategic opportunity for firms in mature industries to engage in reconstructive

change and realize performance enhancements by recontextualizing previous business models in a current environment.

These theoretical implications lay the groundwork for future research endeavors. For example, future research might make more extensive use of organizational learning theory to explore in detail the role of learning in facilitating servitization and deservitization efforts (see Argote and Miron-Spektor, 2011; Pillai *et al.*, 2020; Valtakoski, 2017). Of particular interest would be the possibility of investigating vicarious learning, not from peer competitors operating in same industry, but rather from other industries. Doing so, could open up a novel approach and shift the current focus from inter-organizational to inter-industry vicarious learning. Such endeavors may be particularly useful for firms entering into newly emerging industries currently going through intensive and expensive economic experimentation. Empirical work on newly emerging industries may also be particularly beneficial because such industries may not follow the patterns of the traditional lifecycle theory. By combining the industry lifecycle theory with the theory of strategy restoration, we have argued that as industries reach the mature phase, firms are more likely to deservitize.

Future research also stands to benefit from building on the early work on deservitization (e.g., Finne *et al.*, 2013; Gebauer and Kowalkowski, 2012; Kowalkowski *et al.*, 2015, 2017; Rabetino *et al.*, 2020; Valtakoski, 2017) to better understand the processes and outcomes of deservitization. With respect to process, future work could investigate whether deservitization can be understood as a mechanism to restore the authenticity attributed to the firm's offerings by re-orientating and adjusting service offerings to more closely complement the base products and thereby strengthen the company's identity. We suggest that servitized manufacturers that integrate services not related to their core products increase the risk of overstretching their core business and, in the process, diluting their authenticity and harming their identity. Indeed, recent findings show that service offerings tend to be most effective to the extent that these offerings are more closely related to the base products (Benedettini and Neely, 2017). Hence, deservitization may be an avenue through which to gain a competitive advantage to the extent that it is restorative in nature. The framework presented here lays the groundwork for future research to offer a broader theory of the process, content, and outcomes of such restorative deservitization strategies.

With respect to outcomes, we discussed the performance implications of (de)servitization in broad strokes and posited that higher or lower levels of service infusion across the various stages of the lifecycle may influence performance. Previous studies have used a diverse set of

performance measures such as, Tobin's Q (Fang, 2008), profit margin (Visnjic and Van Looy, 2013; Suarez *et al.*, 2013) and revenue growth (Kohtamäki *et al.*, 2013). Since there is no consensual agreement on how to measure servitization-related performance, future studies would do well to test our propositions by using different performance measures. Doing so may help unveil some of the nuances and specificities of (de)servitization outcomes across the various stages of the industry lifecycle and also across a variety of industries.

5.2. Managerial implications

The proposed framework also carries at least two important implications for managers. First, it suggests that servitization is not a panacea. Prior research has rightfully highlighted the benefits of integrating a range of services into firm offerings. However, the advantages afforded such servitization may vary along the various phases of the industry lifecycle. As such, managers should explore opportunities for service infusion early on and, at the same time, be careful not to overestimate the benefits of such servitization later on; indeed, servitization efforts in mature servitized industries may even carry some nonobvious risks related to organizational identity. Second, it suggests that deservitization may offer more potential advantages than previously understood. Prior research has typically viewed deservitization efforts as responses to servitization failures. However, deservitization may actually offer a competitive advantage in later phases of the industry lifecycle to the extent that such efforts are restorative in nature. With this in mind, managers in servitized industries should consider carefully whether the continuation of service offerings is indeed advantageous or if, instead, a reinterpretation and reenactment of the past – i.e., with less service infusion – may counterintuitively stand to restore the organization's identity and the authenticity attributed to its offerings. In short, the proposed framework suggests that managers must attend to the context in which they operate as well as the unique identity of the firm when making decisions about (de)servitization.

5.3. Conclusions

In sum, we have integrated three history-informed theories – industry lifecycle, strategic pivoting and strategy restoration – to explain the antecedents and outcomes of servitization and deservitization strategies. In doing so, we identified different types of organizational learning (learning-by-experimenting, vicarious learning, and learning-by-memory) underpinning such

shifts. Moreover, we have identified the conditions under which servitization and deservitization pivots are more (or less) likely to favorably impact firm performance. Taken together, the historical perspective provided here allows us to better contextualize how firms learn, innovate, and make decisions regarding their level of adoption of services as well as the outcomes of these decisions.

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