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THEORY/CONCEPTUAL

Incumbent inertia, innovativeness, and performance (dis)advantages: A demand-side learning perspective

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Abstract
Strategies of incumbent firms have received considerable attention in marketing and across business disciplines, but findings regarding performance (dis)advantages and innovativeness are mixed. Prior studies on supply-side sources (factors internal to the firm) of incumbent inertia disadvantages are more prevalent than those on demand-side factors, which relate to a firm's customers and may explain potential incumbent advantages. We introduce an integrated demand-side framework to incumbent inertia, recognizing how the supply- and demand-side factors interrelate through learning mechanisms. On the one hand, incumbent firms learn and develop various routines and assets that influence their product strategies, typically reflecting inertia and incremental innovation. At the same time, customers learn about products in the market, forming preferences that reflect switching costs and network externalities (demand-side factors). Although an incumbent can gain advantages from demand-side effects, this could accelerate the onset of supply-side disadvantages. We present a set of research propositions that specify critical effects, and examine implications for incumbent strategies.

Keywords Incumbent inertia · Product innovation · Switching costs · Network externalities · Preference formation

Strategies (and their effectiveness) of incumbent firms have received considerable attention in marketing and across business disciplines. Factors that affect incumbent performance and survival are managerially relevant, to say the least, and examples of ultimately unsuccessful incumbents are widespread. Early social media platforms, such as Friendster and MySpace, were supplanted by later entrants. First-mover incumbents often fail to survive or maintain market leadership (Bohlmann et al., 2002), and can suffer from higher costs and lower profits (Boulding & Christen, 2003). Over time, organizations can develop an inability to change their current forms, processes, and routines (Hannan & Freeman, 1984) or otherwise fail to stretch their capabilities (Wang & Chen, 2018). Some of the explanations posited by researchers for this inaction include a firm's competencies and organizational learning (Rumelt, 1995; Vlaar et al., 2005), with scholars having explored a variety of marketing mix responses by incumbents across a diverse set of contexts (see Table 1). Ranging from retail (Ailawadi et al., 2010) to video game settings (Allen et al., 2022), extant research indicates that incumbent responses (including lack of or late responses) are heterogeneous.

One literature stream explores incumbents' responses to new products, which is also the focus in our research. Importantly, mixed findings on incumbent (dis)advantages continue to motivate research. For example, incumbents are thought to be predominantly incremental in their new product introductions, but this is not always the case (Chandy & Tellis, 2000). Incumbents are also said to be at a survival disadvantage, yet this may not apply to an incumbent diversifying into other markets (Bayus & Agarwal, 2007; Robinson & Min, 2002). Indeed, pioneering incumbents can secure long-term advantages, but not necessarily in industries characterized by rapid technological progress (Bohlmann et al., 2002). In addition, the organizational processes

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Table 1 Illustrative marketing studies on incumbent response strategies across contexts

Authors (Year), Journal	Context and Marketing Mix Responses Examined	Main Finding(s) on Incumbent Response (In)action
Ailawadi et al. (2010), *JMR*	Marketing mix responses by 90 stores belonging to six retail chain incumbents to seven first-time Wal-Mart entries between 2000–2002 (46 product categories).	Majority of incumbent stores showed no response across the marketing mix (i.e., promotion, assortment, price), with incumbent inaction ranging between 30-83% across retail formats and product categories examined.
Debruyne and Reibstein (2005), *MktgSci*	Product (i.e., online offering) responses by 70 incumbent retail brokerages during 1996–2000 reacting to the emergence of the online brokerage market.	Incumbents were less likely and slower to introduce online brokerage accounts if other, similar incumbents did not enter the new market segment.
Mukherji et al. (2011), *JM*	Product mix (i.e., loan portfolio) responses by incumbent banks after entry by larger banks into their markets via 839 acquisition between 1995–2003.	Large incumbents are more likely to respond by making their product mix more similar to the acquirer-entrant, with negative effects on performance.
Ramani and Srinivasan (2019), *JM*	Marketing mix (advertising, product, promotions, and distribution) responses by incumbent Indian firms to foreign entrants during 1989–2000 after liberalization (16,636 firm-year observations).	Incumbent firms increased product and promotions in response to liberalization, with firms holding greater foreign market knowledge decreasing some marketing mix elements.
Shankar (1999), *JMR*	Marketing spending responses by 59 incumbent prescription drug companies in the 1970s and 1980s to 23 new product introductions.	Incumbents are less likely to respond and increase total marketing spending substantially if the new drug's entry spending is high and there are multiple markets in which the incumbent is in contact with the new entrant.

Notes: *JMR* = Journal of Marketing Research, *JM* = Journal of Marketing, *MktgSci* = Marketing Science

and asset advantages that help (or hinder) incumbent performance and innovation continue to be studied because the inherent trade-offs for short- versus long-term success are not well understood (Atuahene-Gima, 2005). In sum, extant studies demonstrate that the causes and effects of incumbent inertia still contain open questions (Allen et al., 2022; König, Graf-Vlachy and Schöber 2021; Priem et al., 2012; Ramani & Srinivasan, 2019; Stanko et al., 2013). A more comprehensive perspective is necessary to improve our understanding of incumbent advantages and disadvantages.

The seminal work of Lieberman and Montgomery (1988, 1998) noted several mechanisms of performance (dis)advantages in the context of first-movers. Theoretical foundations, such as the resource-based view of the firm (Rumelt, 1984; Wernerfelt, 1984), make critical contributions to understanding incumbent inertia, focusing on the stock of resources available to firms for deploying responses to new market entries. As a result, supply-side mechanisms internal to the firm constitute the bulk of prior research, demonstrating that organizational routines and capability rigidities (Hannan & Freeman, 1984) restrict organizational responses to marketplace changes. However, prior research on organizational inertia does not address how the behaviors and preferences of customers (i.e., demand-side factors) affect incumbents' responses to marketplace change (e.g., Ailawadi et al., 2010). Indeed, the conceptual and empirical literature on incumbent inertia lacks an integrative treatment of the demand-side factors pertaining to customer preferences and behaviors, with Henderson et al. (2021) calling for a better understanding of customer-based inertia dynamics.

Our goal is to bring the demand-side perspective into focus via a framework that explicitly considers demand-side factors and recognizes how supply- and demand-side factors interrelate. To do so, we explicate learning mechanisms that influence incumbent decisions and the decisions of customers they hope to serve, integrating customer and organizational learning explanations. On the one hand, incumbent firms learn and develop various routines and assets (supply-side factors) that influence their product strategies (Walter et al., 2016), typically reflecting inertia and incremental innovation. At the same time, customers learn about the benefits of products in the market and form preferences (demand-side factors). Informed by such learning mechanisms, we examine how the supply- and demand-side effects interrelate to influence incumbent performance and innovativeness. Only through an integrated framework can research comprehensively address the strategic decisions of incumbent firms and any inertia that may limit incumbent innovativeness or performance (Priem et al., 2012).

We see three contributions to integrating an often overlooked demand-side learning perspective into the extant literature on incumbent inertia. First, we explicate a series of research propositions that specify critical demand-side effects and, importantly, their relationships with supply-side factors. The propositions highlight key aspects of a new integrated framework, drawing upon the effects of learning by firms and customers, and provide specific directions for future empirical work. Second, our proposed framework allows us to examine strategic implications for incumbent firms in a more comprehensive manner when compared to an exclusive supply-side focus. Finally, we bring together research from marketing, strategy, economics, and organizational behavior to provide a necessary multi-disciplinary foundation, yielding future research directions across these domains.

Our discussion does not purport to represent an encompassing review of the inertia literature. Rather, we ask two overarching questions about incumbent inertia: (1) What role do demand-side factors play in strategies and performance of incumbent firms? and (2) How do supply- and demand-side factors interact to influence performance and innovativeness of incumbent firms in a dynamic marketplace? Our primary aim is to develop a framework and research propositions that create novel insights into the domain of incumbent inertia.

The remainder of this article is organized as follows. First, we define incumbent inertia and its key characteristics and determining factors and describe a learning perspective that guides the framework development. We then examine the demand-side perspective of incumbent inertia and note the relative paucity of demand-side studies. Key empirical findings are discussed along the way, and research propositions are presented with respect to the demand-side factors' effects on innovativeness and performance to provide guidance for future research. Supply-side factors are then outlined briefly, noting relevant learning processes, followed by discussing specific (and hitherto ignored) interaction effects between supply- and demand-side factors that arise from a learning perspective. We conclude with strategic implications for incumbent firms.

Incumbent inertia perspectives

Incumbent inertia: Definitional issues

At its broadest level, incumbency can include firms that may possess relevant knowledge, skills, or assets even if a product is not yet commercialized by the firm in a defined market. More typically, an *incumbent* is defined as *a firm with prior selling experience in a given product-market* (Helfat & Lieberman, 2002). Such definitions, of course, depend on the relevant scope of the product-market being studied. For example, in 1997 Minolta had been manufacturing cameras for decades, but had not yet introduced a digital camera. Thus, in 1997 Minolta was an incumbent in cameras, but a non-incumbent in digital cameras. A market entry timing perspective can further distinguish between incumbents who are product-market pioneers, early entrants, or late entrants (Robinson & Chiang, 2002).

Inertia represents the tendency towards inactivity, or the *"strong persistence of existing form and function"* (Rumelt, 1995, p. 103) relating to an organization's skills and capabilities bound up in its routines for accomplishing tasks. Firms can only do what they have routines for doing, and inertia becomes manifest in the organization's accomplished tasks, such as investment decisions or new product development. Importantly, inertia is change which is slow (and often incremental) relative to the environment (including competition), such that a firm that is considered flexible in one setting might be too slow to compete effectively in an industry with rapid change (Hannan & Freeman, 1984). For instance, retail investment brokers responded at very different speeds in launching online investment platforms: while Charles Schwab was the first major U.S. brokerage to offer online trading in 1996, approximately half of investment brokers did not have online trading available four years later (Debruyne & Reibsten, 2005).

Based on these perspectives, *incumbent inertia* is defined as (or refers to) *a firm that currently sells a product in a given market reacting more slowly than other firms in the market to environmental change*. Note that incumbent inertia (1) is relative to competitive actions, (2) manifests in actions of the firm, and (3) involves some type of environmental change. Taking each point in turn, consider first that the scope of the competitive market serves as a reference for a firm's relative inertia (e.g., the Minolta example). Incumbency is also a matter of degree and timing within the context of the relevant industry and speed of the market (see Table 1 for the variety of incumbencies examined in the marketing literature). For example, if we take the viewpoint of Warby Parker entering online eyeglass retailing in the U.S. in 2010, Zenni Optical (2003 entry) could be considered "more incumbent" (an incumbent for a longer time) than Eyebuydirect (2006 entry).

Second, inertia manifests in actions of the firm that can be slow and incremental. The incumbent actions most frequently examined in inertia research are related to new product development and introduction (Chandy & Tellis, 2000; Ghemawat, 1991; Mukherji et al., 2011; Shankar, 1999), since product innovation relates most closely to the general notion of change embodied in the inertia concept. Ultimately, inertia affects an incumbent's overall performance in terms of market share, survival, or profit. We note that observed incumbent inertia may be the result of an intentional strategic decision ("strategic inertia"), such as not entering a market with high technological uncertainty. In other cases, an incumbent may be incapable of action when faced with market or technological change ("non-adaptable inertia"), such as lacking the capability to enter a new market. Although the incumbent actions are similar under strategic or non-adaptable inertia (i.e., the firm does not enter), the underlying reasons may differ.

Third, incumbent inertia involves some type of environmental change, such as technological shifts or other market dynamics. Inertia may be characterized by a slowness or resistance to change (Rumelt, 1995), by change that may be more incremental even if quickly implemented (Ghemawat, 1991; Henderson, 1993), or by the pursuit of a path determined more by established routines than by events in the market or technological environment (Hannan & Freeman, 1984; Tripsas & Gavetti, 2000). Inertia

can be benign and even beneficial if the firm's current organizational state is well suited to the market and technological dynamics (Rumelt, 1995). For example, large incumbents in the banking industry performed better if staying the course with a product mix strategy when it differed from that of the entrant (Mukherji et al., 2011). However, under rapid technological and market change, inertia is often detrimental to incumbent performance (Bohlmann et al., 2002). These environmental dynamics are often considered in terms of technological or market turbulence. Technological turbulence relates to the pace of technological change for products or process technology; market turbulence relates to the pace of market evolution or growth, including changes in customer preferences or the mix of customers a firm serves (Hanvanich et al., 2006; Suarez & Lanzolla, 2007).

Primary factors of incumbent inertia

The dynamic or time-based aspect to incumbent inertia concerns changes that affect the firm's ability to respond relative to competitors. Some of these changes relate to the firm's routines and assets that may become more entrenched over time and unsuitable to meet new competition or technological challenges. These factors are the typical supply-side mechanisms that frequently characterize incumbent inertia. Lieberman and Montgomery (1988) identify three primary supply-side causes of incumbent inertia: (1) lock-in of specialized assets, (2) fear of cannibalization, and (3) inflexibility of organizational routines. We expand the supply-side discussion by adding aspects of the firm's learning activities that may contribute to inertia over time, specifically its customer orientation and knowledge bases. Examples of empirical studies incorporating supply-side factors include Rothaermel and Hill (2005), Govindarajan and Kopalle (2004), Ramani and Srinivasan (2019), and Chen et al. (2012).

Demand-side dynamics are also relevant, since customer preferences may vary over time as more products are introduced with varying benefits. Despite past acknowledgement of the demand side to incumbent inertia, research on demand-side factors remains relatively sparse (Adner & Zemsky, 2006; Henderson, 2006; Priem et al., 2012). Lieberman and Montgomery (1998) extended supply-side aspects of first-mover advantage to identify three categories of "less widely recognized" customer-centric factors (p. 1113): (1) customer preference formation, (2) customer switching costs, and (3) network externalities. Theoretical studies that consider a demand-side perspective also outline the same demand-side categories (Mueller, 1997; Suarez & Lanzolla, 2007). Despite the supply-side prevalence, several demand-side empirical studies demonstrate a mix of incumbent performance advantages and disadvantages (see Table 2). An

Table 2 Selected empirical studies relating incumbent inertia demand-side factors to performance and innovation

Study	Empirical Sample	Dependent Variables	Independent Variables (selective)	Main Findings of Incumbent Advantage or Disadvantage
Stanko et al. (2013)	279 predominantly business-to-business Spanish firms	Market and technological innovativeness and financial new product performance	Switching costs, customer preference stability and network externalities	*Advantage*: Early entrants are able to leverage switching costs to improve technological innovativeness, and to leverage network externalities to improve both technological and market innovativeness. Early entrants better convert market innovativeness into financial performance. *Disadvantage*: Early entrants are less able to convert technological innovativeness into financial performance.
Wang et al. (2010)	45 office and consumer durables products	Survival	Network externalities, Within- and across-generation product incompatibility	*Advantage*: Pioneering survival increases with within-generation incompatibility under strong network effects. *Disadvantage*: Pioneering survival decreases for cross-generation incompatibility under strong network effects.
Srinivasan et al. (2004)	45 office and consumer durables products	Survival	Network externalities	*Advantage*: For larger pioneering firms, network externalities increase survival rates. Pioneer of more radical products survives longer in networked market. *Disadvantage*: Network externalities have a negative main effect on pioneer survival. Incumbent pioneers have lower survival rates than non-incumbents.
Boulding and Christen (2003)	363 consumer-market SBUs and 858 industrial-market SBUs	ROI, net income, average cost	Customer learning related to purchase frequency and amount	*Advantage*: Initial profit advantage which weakens over time; profit advantage under limited customer learning, strong market share position, and patent protection. *Disadvantage*: Pioneer disadvantage in long-term ROI, net income, and average cost.
Bohlmann et al. (2002)	36 product categories	Survival, market share	Customer values for quality and variety	*Advantage*: Pioneer advantage when customer importance of variety is high. *Disadvantage*: Pioneer disadvantage when quality is important and technology vintage favors later entrants.

example of an empirical study of demand-side factors can be found in Stanko et al. (2013).

A learning perspective to incumbent inertia

A single unifying theory of incumbent inertia has been elusive since supply- and demand-side characteristics are usually treated separately by different scholarly communities. However, a learning perspective may help clarify research gaps. Learning is an important underlying process in both supply- and demand-side factors. Organizations learn how to better utilize assets, implement routines, and understand customers as they become more experienced in a given product-market. On the demand side, customers learn about preferred products based on usage experiences and information available in the market. Importantly, these learning experiences influence incumbent decisions (resource allocation, market entry, etc.) and customer decisions (which products to buy, and when). If an incumbent has developed a greater ability to learn based on its past experiences with changing markets and technologies, its performance may benefit (Balasubramanian, 2011; Chen et al., 2012). However, established routines or a focus on current customers may lead an incumbent to misplace its learning efforts (Atuahene-Gima, 2005). Hanvanich et al. (2006) show that when the firm faces changing product preferences and new sets of customers (i.e., market turbulence), organizational experience has no effect on innovativeness, but a learning orientation significantly improves innovativeness.

A learning perspective therefore reflects the type of dynamic process inherent in the formation of incumbent inertia, and the potential types of interrelationships between the demand- and supply-side factors. Several studies have recognized the role of manager cognition in firm strategy and technological innovation (Eggers & Kaplan, 2009; Kaplan & Tripsas, 2008). Particularly in dynamic and uncertain markets, cognition and action combine to drive various learning processes ("strategizing by doing," Furr & Eisenhardt, 2021; Jung et al., 2023). A learning framework allows us to draw on the learning paradigm in organizational studies and marketing while still capturing the cognitive perspective.

The new framework and associated propositions highlight the demand-side factors and the associated learning effects. Figure 1 depicts the framework, noting the research propositions we develop. The framework incorporates the demand- and supply-side factors, their effects on incumbent

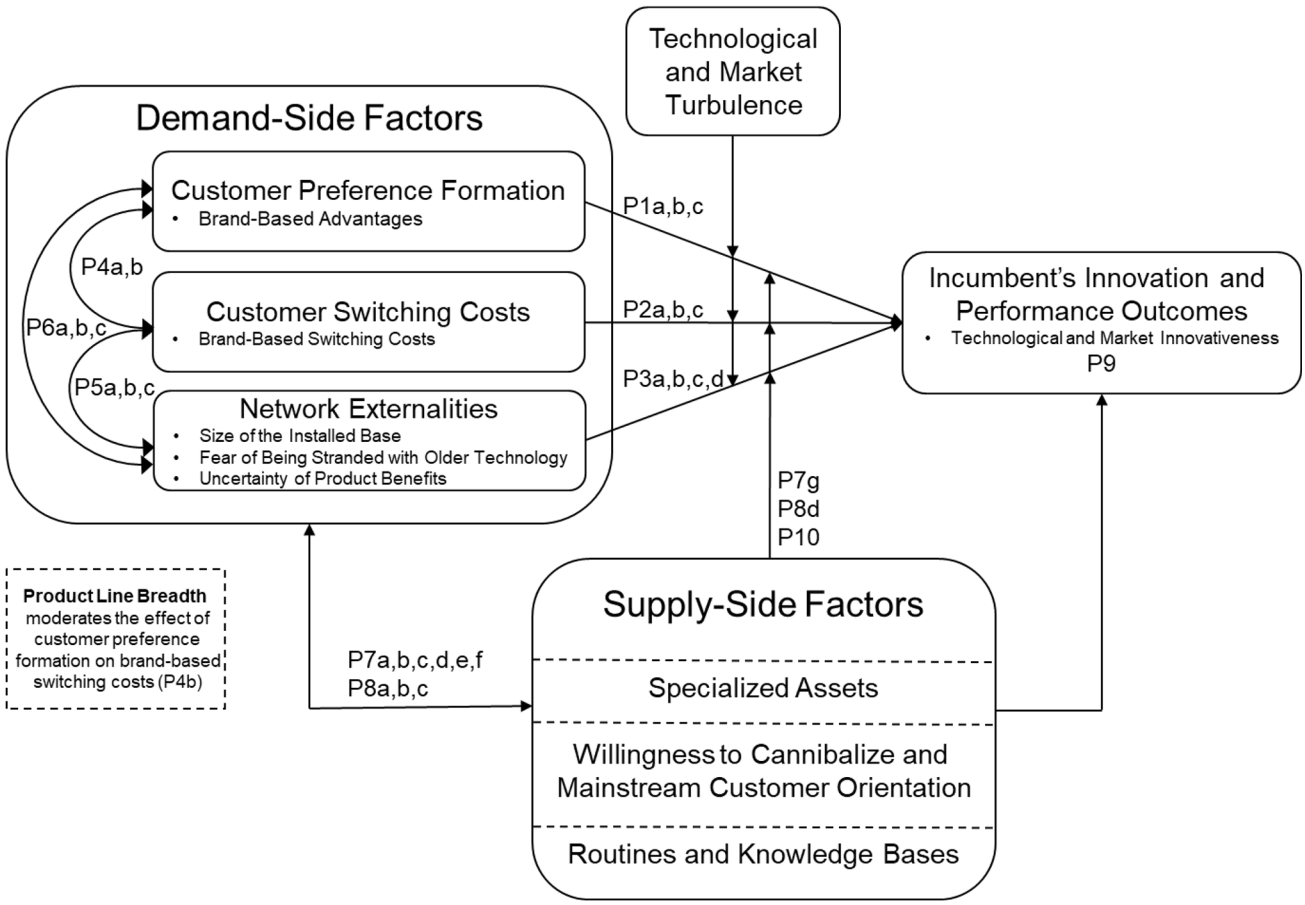

Fig. 1 Incumbent inertia framework linking demand-side and supply-side factors, with associated research propositions

performance and innovation, and potential moderating effects of technological or market turbulence. Consistent with prior research, we consider two dimensions of product innovativeness (Stanko et al., 2013; Zhou et al., 2005), i.e., technological and market innovativeness. Technological innovativeness draws upon new technologies or sets of development activities such as engineering and design. Market innovativeness relates to new sets of marketing activities, such as new distribution channels or attempting to access new customer markets. In Table 3 we present the supply- and demand-side factors noting the learning-based issues for each, including selected illustrative studies of relevant learning mechanisms. Construct definitions and indicative operationalizations are also included in Table 3.

When plausible, the propositions make distinctions in expected technological or market innovativeness under incumbent inertia, but supporting empirical evidence remains sparse and firms can vary significantly in their technological or market-based innovation focus. For example, technological innovativeness does not always generate direct performance benefits for the firm (Kock et al., 2011; Stanko et al., 2013). We delineate implications for technological and market innovativeness when suggested by the theory, and incorporate moderating effects of technological and market turbulence (Stanko et al., 2013). Note that incumbents need not be merely passive. The proposed framework recognizes relevant dynamics, including the reactive propensities of incumbents to market dynamics and their capabilities for product innovativeness.

Through a learning-based perspective, the propositions elaborate on the various supply- and demand-side factors and their potential interactions, highlighting implications for incumbent (dis)advantage. Mueller (1997) conjectures that supply-based inertia is more devastating to incumbent performance than demand-based inertia (Bohlmann et al., 2002 demonstrates similar implications). If so, a more comprehensive perspective may suggest incumbent strategies that differ from supply-sided prescriptions, and our propositions generate several strategic implications arising from the interplay between the supply and demand sides to incumbent inertia. Note that our goal is not to comprehensively review specific learning mechanisms, but rather to apply a learning perspective to incumbent inertia in order to develop a more integrated framework and the implications for incumbent performance.

Demand-side factors

Our research propositions examine a rich set of interrelationships as Fig. 1 displays. In this section we first examine the demand-side factors' main effects on incumbent innovation and performance, propositions P1 through P3. We then formulate several propositions that convey important interactions among the demand-side factors, P4 through P6.

Customer preference formation

As noted by Lieberman and Montgomery (1998), incumbents can mold the cost structures and expectations of customers into the future. Once an incumbent has established customer expectations, it will be less likely to take actions which counter these expectations (e.g., pursuing disruptive innovations). By contributing negatively to an incumbent's tendency to change strategies, inertia is fostered. Indeed, it becomes difficult for a firm to operate under high market turbulence, characterized by changes in customer preferences and a customer base that increasingly demands new products (Hanvanich et al., 2006). Consider Facebook's inability to effectively respond to customer preferences shifting towards short form "snackable" content (content that lends itself to being passively consumed on a mobile device) through their Reels offering, which was viewed as being an unimpressive response to the market share gains made by TikTok and accompanying customer preference shifts.

Disruptive innovation represents an important research stream related to preference formation and incumbent inertia (Christensen, 2006; Danneels, 2004). In brief, a disruptive innovation's new attributes initially appeal to an emerging customer segment, but over time performance improvements hold appeal for more mainstream customers. A distinguishing demand factor in disruptiveness is the varied importance customers place on different product attributes, and the dynamics behind such preference formation. Adner (2002) demonstrates how preference heterogeneity across customer segments enables disruptive dynamics (see also Adner & Levinthal, 2001; Adner & Zemsky, 2006). Although focused on demand heterogeneity and not preference dynamics per se, Adner's work highlights the importance of demand-based factors on competition and incumbency.

A more endogenous and dynamic perspective seems appropriate, whereby firm strategies influence customer preference formation as customers learn about what they value. Henderson (2006) highlights the role of preference shifts in disruptive innovation, attaching incumbent inertia to a failure "first to sense and then to act on precisely these kinds of shifts" (p. 6). However, preference shifts can work to the advantage of incumbents when it is the incumbent that influences the formation of customer preferences. Customers learn about pioneering brands and form preferences according to the pioneer's product positioning (Carpenter & Nakamoto, 1989). In essence, early incumbents determine the attributes customers learn to prefer.

Table 3 Learning Perspectives on Incumbent Inertia with Construct Definitions and Indicative Operationalizations

Supply-Side Factors with Construct Definitions and Operationalizations[b]	*Learning Perspective, Selected Illustrative Studies*[a]
Specialized Assets *An asset that is more valuable in its current usage, innovation context, or environmental setting than if used for a different purpose.* (Helfat & Lieberman, 2002; Tripsas, 1997) 1. "Switching to the new technology involves losing a lot of the investment in the established technology." 2. "Much of our technical expertise cannot be applied to the new technology." (Chandy & Tellis, 1998)	Value of assets develop with an incumbent's experience in applying these assets in specific product-markets. Helfat and Lieberman (2002) Nerkar and Roberts (2004) Zuo et al. (2019)
Willingness to Cannibalize *The extent to which a firm is willing to cannibalize sales of an existing product or reduce the value of its investments by developing and introducing a new product.* (Chandy & Tellis, 1998; Govindarajan & Kopalle, 2004) 1. "This SBU supports projects even if they could potentially take away from sales of existing products." 2. "We are very willing to sacrifice sales of existing products in order to improve sales of our new products." (Chandy & Tellis, 1998)	Incumbents often rely on established learning and experiences with current customers, but learning about future market trends may increase willingness to cannibalize. Atuahene-Gima (2005) Chandy et al. (2003) Joshi (2016)
Mainstream Customer Orientation *A firm's ability to identify, understand, and respond to customer needs. A mainstream customer orientation is a focus on the firm's current customer market.* (Gatignon & Xuereb, 1997; Narver et al., 2004) 1. "This SBU pursues ideas that mainstream customers value." 2. "Market research efforts in this SBU are aimed at obtaining information about the needs of mainstream customers." (Govindarajan et al., 2011)	
Organizational Routines & Knowledge Bases *The firm's routines, processes, capabilities, and knowledge as related to its activities and patterns of actions.* (Atuahene-Gima, 2005; Leonard-Barton, 1992) Organizational Routines: 1. Facing economic shifts and market changes, we are reluctant to change our current business routines 2. Facing economic shifts and market changes, we are not able to seek new development capabilities (*adapted from* Zhen et al., 2021) Organizational Knowledge Bases: 1. "We are highly familiar with this industry." 2. "We have acquired a great deal of experience about this industry." (Zhou & Li, 2012)	Past experiences and learning lead to current routines and establish an incumbent's knowledge bases. Chen et al. (2012) Lavie (2006) Michael and Palandjian (2004)

Table 3 (continued)

Demand-Side Factors with Construct Definitions and Operationalizations[b]	*Learning Perspective, Selected Illustrative Studies*[a]
Customer Preference Formation *Product preferences are formed over time based on customer learning through product usage experience and information available in the market.* (Carpenter & Nakamoto, 1989) 1. "Customer preferences change very frequently." 2. "Our clients look for new products very often." (Stanko et al., 2013)	Customers learn about preferred products and characteristics based on past product experiences and observations. Henderson et al. (2021) Moreau et al. (2001) Wood and Lynch (2002)
Brand-based Advantages *Preferences that view a firm's brand more favorably than brands of other firms, resulting in higher brand equity.* (Aaker & Jacobson, 2001; de Figueiredo & Kyle, 2006) 1. Brand attitude measure of the percentage of buyers with a positive opinion of the brand less the percentage of buyers with a negative opinion. (Aaker & Jacobson, 2001)	
Customer Switching Costs *"A switching cost results from a customer's desire for compatibility between his current purchase and a previous investment."* (Klemperer, 1995, p. 517) 1. "The effort devoted by the customers to adopt the product make it less probable they will change to a similar product in the future." 2. "Customers need considerable advance planning to buy the product." (Stanko et al., 2013)	Switching costs arise from customer experiences and product-specific learning that generate lock-in. Dubé et al. (2009) Zauberman (2003)
Brand-based Switching Costs *Switching costs that benefit a firm's brand through brand loyalty effects.* (Klemperer, 1987; Wernerfelt, 1991) 1. Unless I became very dissatisfied with this brand, changing to a new one would be a bother 2. I would find it difficult to stop using this brand (*adapted from* Anderson & Srinivasan, 2003)	
Network Externalities *Customer preference is larger with the greater number of others who also adopt the product (direct), or with the greater availability of complementary products (indirect).* (Farrell & Klemperer, 2007) 1. "The number of users using the product have increased the utility of the product." (direct) 2. "The services offered by other companies relating to our product (such as training and support) have increased with the size of our installed base." (indirect) (Stanko et al., 2013)	Network effects can influence customer learning processes through behavior of the installed base. Dubé et al. (2010) Tellis et al. (2009)
Size of the Installed Base *The current or cumulative number of product users.* (Fuentelsaz et al., 2015) 1. Installed base size measured as a product's number of users relative to main competitor(s). (Schilling, 2002)	
Fear of Being Stranded with Older Technology *A customer may be more likely to adopt a new product technology if other users will also adopt and abandon the older technology.* (Farrell & Saloner, 1986) 1. Measure based on open-ended responses from social media users about why they use a particular platform, coded for how often the fear of missing out was mentioned. (Bursztyn et al., 2023)	
Uncertainty of Product Benefits *Consumers may be uncertain, less knowledgeable or less confident of a product's benefits or net value.* (Varadarajan et al., 2008) 1.Measure based on perceived confidence of a consumer's brand evaluations. (Kardes & Kalyanaram, 1992)	

Table 3 (continued)

Innovation and Performance Outcomes	*Environmental Turbulence and Product Line Breadth*
Incumbent Technological and Market Innovativeness *Technological innovativeness adopts new technologies or sets of development activities such as engineering and design. Market innovativeness relates to new sets of marketing activities, such as new distribution channels or attempting to access new customer markets.* (Stanko et al., 2013; Zhou et al., 2005). 1. "The engineering and design activities were new to the firm." (technological) 2. "The new product development activities were new to the firm." (technological) 3. "The market the product was sold in was new to the firm." (market) 4. "The distribution channels were new to the firm." (market) (Stanko et al., 2013)	Technological and Market Turbulence *Technological turbulence relates to the pace of technological change for products or process technology. Market turbulence relates to the pace of market evolution or growth, including changes in customer preferences or the mix of customers a firm serves.* (Hanvanich et al., 2006; Suarez & Lanzolla, 2007). 1. "The technology in our industry is changing rapidly." (technological) 2. "Technological developments in our industry are fairly major." (technological) 3. "In our kind of business, customers' product preferences change quite a bit over time." (market) 4. "We have demand for our products from customers who never bought them before." (market) (Hanvanich et al., 2006)
Incumbent Performance *An incumbent's performance outcome based on market share, profit, survival, or other quantitative metric associated with market outcomes.* Examples of incumbent performance measures: • Boulding and Christen (2003) – Net Income and ROI • Robinson and Min (2002) – Survival • Bohlmann et al. (2002) – Market Share	Product Line Breadth *The number of different products marketed by the firm within a particular category.* 1. Measure based on breadth of the firm's product line relative to product lines of largest competitors. (Robinson & Chiang, 2002)

[a]Learning perspectives inform the effects of supply- and demand-side factors, which drive the noted outcomes moderated by environmental turbulence

[b]Operationalizations of the constructs include suggested indicative items only, taken or adapted from the noted citations which can be consulted for item scales

Though incumbents may shape customer learning, incumbent dominance is sustainable only when customer learning and preference formation become relatively inert or stable, meaning that customers have little motivation to learn about untried products (Boulding & Christen, 2003). Greater knowledge of current products can translate into preferences for more incremental innovations, since the new product's benefits are more readily understood, although prior knowledge effects are complex (Moreau et al., 2001; Wood & Lynch, 2002). Customer preferences and information processing strategies are particularly influenced by incumbent actions when preferences are ambiguous or unstable, meaning that customer preferences are still being formed via a learning process, often accompanied by uncertainty about product benefits (Carpenter & Nakamoto, 1989; Kardes & Kalyanaram, 1992). Although these effects often benefit an early incumbent that can influence customer preference formation for a longer time period, later entrants can gain advantage through superior differentiation on product attributes important to and recognizable by customers (Bohlmann et al., 2002; Zhang & Markman, 1998).

Over time, customer preference formation influenced by an incumbent may generate brand-based advantages. Brand equity persists even through times of technological turbulence and industry shakeups, and serves to attach customers to the producing firm's products, especially if viewed as innovative (e.g., Aaker & Jacobson, 2001). De Figueiredo and Kyle (2006) find that firms possessing strong brands tend to introduce fewer products, but those products which are introduced tend to remain on the market substantially longer than do those of competitors with weaker brands. Consumer trial of a new product can also be higher for a stronger brand, especially if the product is innovative (Sinapuelas et al., 2015).

Preference formation that favors an incumbent may even reach the point of habituation. An inertia mindset within a customer reflects minimal consideration for alternative products and favors status quo consumption (Henderson et al., 2021). New product usage may occur when customers can readily integrate the product into existing habits (Labrecque et al., 2017), as may occur for more incremental innovation. Although brand-based effects may help generate incumbent advantage, it is not clear whether the incumbent will more slowly introduce incremental innovation to facilitate customer learning and preference formation, or instead speed incremental new products to an expectant customer base. Regardless, as customer preference formation reaches more stable (or relatively inert) preferences, an incumbent may become more incremental in technological and market innovativeness (Stanko et al., 2013; Zhou et al., 2005).

Research proposition 1

a) Customer preference formation is positively associated with the performance of an incumbent.

b) Brand-based advantages arising from customer preference formation are positively associated with the performance of an incumbent; this effect is greater under higher technological turbulence.
c) Customer preference formation is positively associated with the technological innovativeness and market innovativeness of an incumbent.

Note how an incumbent's performance advantage due to customer preference formation may potentially increase with the incumbent's ability to first understand and then shape customer preferences. The question is whether the incumbent has the capability or incentive to do so, and whether more incremental or radical innovation will be the result during different stages of preference formation ranging from rapidly changing or unstable to more stable preferences.

Customer switching costs

A customer's experience with a product may make the product more valuable. Stated formally, a "switching cost results from a customer's desire for compatibility between his current purchase and a previous investment" (Klemperer, 1995, p. 517). Switching costs are often portrayed in terms of brand loyalty effects (Klemperer, 1987; Wernerfelt, 1991), and numerous types of switching costs have been studied (for overviews, see Burnham et al., 2003; Farrell & Klemperer, 2007; Klemperer, 1995). Customers who have invested in complementary equipment or developed skills in learning to use a product incur a cost to switch when such investments are not perfectly transferable. As an illustration, consider the many sources of switching costs for users of Microsoft's Xbox console. Beyond the financial cost of switching hardware platforms, and the compatibility of already purchased software titles, users have also built skill sets that may not perfectly transfer to other consoles, as well as becoming embedded in a social network of other gamers through Xbox Live Gold. Finally, gamers are awarded redeemable Gamerscore points for activities across titles (but not across platforms).

Transaction costs (in terms of fees, time, or effort) to switch products or services often exist, as do contractual conditions (e.g., early termination fees) or incentives for continued purchase (e.g., loyalty programs). Behavioral or psychological effects also generate perceived switching costs as customer preferences form around currently used brands. Switching costs that benefit an incumbent may be stronger under technological turbulence since the uncertainties in technology can discourage customers from considering unfamiliar products (Suarez & Lanzolla, 2007). When technological turbulence renders customers uncertain regarding the future of networked gaming, this may favor customers staying with a familiar brand such as Xbox.

While often favoring an incumbent (Wernerfelt, 1991), switching costs may make new entry easier under rapid market growth or influx of new customers. Essentially, an incumbent firm faces difficulty simultaneously charging high prices to existing customers and low prices to attract new customers (and lock them into future sales), suggesting that an incumbent's initial market share dominance will decrease (Farrell & Shapiro, 1988). This logic suggests that in the previous Xbox example, Microsoft's need to serve current customers with established reference prices may make it more vunerable (as the size of their installed base grows) to competitors serving emerging segments at lower price points, such as Amazon's Luna low priced cloud gaming platform launched in 2022. However, incumbents will generally perform better with switching costs than without (Wang & Wen, 1998).

Switching costs of various forms can thus be a powerful incentive for incumbents to focus on current strategies and customers to cultivate such advantages. One implication is that incumbents may favor less differentiated (or more incremental) product lines. Switching costs may enable firms to have higher profits under more limited and relatively undifferentiated product variety (Klemperer, 1995). Consider Xbox's hesitancy to launch a virtual reality product. An increased tendency towards incremental innovation in incumbents might not lead to significant negative performance. Indeed, incremental product innovation creates value for firms by generating normal profits (i.e., profits that financial markets expect) at relatively low risk (Sorescu & Spanjol, 2008). Since normal profits are essentially outcomes from zero NPV (net present value) projects, an increased tendency in incumbents towards incremental innovation would ensure survival over the long-term, but not growth. However, we note that innovativeness may offer more benefits to an incumbent firm if it enjoys greater switching costs based on brand loyalty (brand-based switching costs), especially for technology-based innovations whose benefits can be communicated to willing customers (Chen & Hitt, 2002; Stanko et al., 2013).

Research proposition 2

a) Customer switching costs are positively associated with the performance of an incumbent; the strength of this effect diminishes over time.
b) The positive effect between customer switching costs and an incumbent's performance is stronger under technological turbulence than under market turbulence.
c) Customer switching costs are negatively associated with the technological innovativeness and market

innovativeness of an incumbent; this effect is stronger for market innovativeness than for technological innovativeness.

Network externalities

Network externalities pertain to a customer's net utility from a product increasing with the number of others who also consume the product. Network externalities are similar to switching costs in that both involve value from compatibility, either from one purchase to the next (switching costs) or from the purchases of other customers (network externalities). Farrell and Klemperer (2007) give a comprehensive overview of both network externalities and switching costs. Direct externalities are those arising from the number of other purchasers on the value of the product, while indirect effects relate to the availability of complementary products (Farrell & Saloner, 1986; Katz & Shapiro, 1985). For example, the value of the career oriented social media platform LinkedIn is clearly higher when more people use it (a direct effect), and DVD players become valuable when there are more DVDs to play (an indirect effect).

Network externalities and the installed base (the set of existing customers) affect incumbent strategies and customer adoption decisions (Fuentelsaz et al., 2015). Firms may stay committed to current (and even inferior) technologies or standards that inhibit innovation (Farrell & Saloner, 1986). Customers may recognize the potential benefits of a new product or technology, but are afraid to be the first to switch given the costs and uncertainties of doing so (the "penguin effect," Farrell & Saloner, 1986). An early incumbent who develops an installed base with a particular product or technology thus has a status quo incentive to maintain this advantage over later entrants (Choi, 1997). Glassdoor, which focuses on allowing employees to anonymously review their companies, offers value to many community members, though has thus far been unable to overcome the value of LinkedIn's more developed network.

There is evidence that network externalities may cause incumbents to generate new products or technologies more frequently, rather than being incremental or inactive (Stanko et al., 2013). An incumbent may increase benefits from externalities through a variety of complementary products or product line extensions (Gupta et al., 1999; Sun et al., 2004). Again consider the LinkedIn platform, which has developed (and acquired) numerous complementary offerings, such as LinkedIn Learning, LinkedIn Events and LinkedIn Recommendations.

Farrell and Saloner (1986) discuss "excess momentum," where a new technology is adopted too eagerly because the current installed base fears being stranded with the old technology. The radicalness of an innovation may signal (to customers and competitors) a rational fear of being stuck in an inferior, older technology. Tellis et al. (2009) find that network effects are not as important as product quality in determining market leaders (a result similar to Berndt et al., 2003), but network effects can help present the quality product to less informed customers.

A later entrant may be able to overcome an incumbent's network-based advantage if customers recognize the new product as sufficiently superior, or if rapid market growth (greater market turbulence) degrades the strategic value of the installed base (Berndt et al., 2003; Farrell & Saloner, 1986). Returning to LinkedIn, the presence of relatively constant market growth keeps the value of their installed base intact. Srinivasan et al. (2004) find that network externalities decrease pioneer survival in two product classes, presumably due to initially slow market growth. They show that incumbent pioneers (those who participate in the previous product generation) have lower survival rates than non-incumbents, although pioneer survival is better with more radical products in a networked market. Wang et al. (2010) extend this work, finding that product incompatibility across product generations hurts pioneering incumbent survival when network effects are strong, given market uncertainty surrounding the new generation product. Overall, incumbents are not always able to capitalize on potential advantages of network externalities.

Research proposition 3

a) Network externalities are positively associated with the performance of an incumbent; this effect is weaker under greater market turbulence.
b) Network externalities are positively associated with the technological innovativeness and market innovativeness of an incumbent; the effects are weaker under greater market turbulence.
c) The positive effects between network externalities and an incumbent's performance and innovativeness are stronger for a larger installed base.
d) The positive effects between network externalities and an incumbent's performance and innovativeness are stronger under the installed base's greater fear of being stranded with older technology.

Demand-side factor interactions

The demand-side factors derive from customer preferences and behaviors related to existing and newly introduced products. Therefore, we would expect interactions among

the factors as customers learn about products and their own preferences over time.

The psychological aspects of switching costs relate to a wide literature on preference formation and decision theory. Consistent with our earlier discussion of customer preference formation, psychological switching costs will often favor an incumbent over a new product since customers tend to overvalue the benefits of their currently used products and undervalue those of a new product. A status quo bias from loss aversion (Chernev, 2004) generates a perceived switching cost. Since these psychological switching costs often "lock in" a customer to the currently used product (Dubé et al., 2009), more dominant incumbents will be favored. Products that enter later will be considered and evaluated less frequently, resulting in lower market share. Zauberman (2003) examines information cost structure and time-based preferences to explain lock-in. Customers tend to underestimate the magnitude of future switching costs, reducing the propensity to search and switch.

At the same time, switching costs arising from customer learning or user skills are more favorable to the firm when customers cannot easily transfer this learning to other brands (Wernerfelt, 1991). Within a firm's product line, the benefits of using umbrella branding to leverage brand loyalty across multiple products will likely be stronger when the products are more similar (Sappington & Wernerfelt, 1985; Wernerfelt, 1988). Of course, higher switching costs may prompt customers to remain with the firm longer. This allows for more opportunity to increase customer loyalty over time (further increasing switching costs). Incumbents may also pursue new customers and try to achieve lock-in via switching costs (Villas-Boas, 2015), or take advantage of a broad product line that can satisfy a variety of evolving customer needs (Chen & Hitt, 2002).

Research proposition 4

a) Customer preference formation is positively associated with brand-based switching costs for an incumbent.
b) The positive effect between customer preference formation and brand-based switching costs is stronger under greater product line breadth for an incumbent.

Network externalities are linked to switching costs and preference formation. As mentioned, both network externalities and switching costs involve beneficial compatibility in some form. Customer learning and information costs not only create switching costs, but may also lead to herd behavior by customers not wanting to be stranded with an unpopular or incompatible product (Choi, 1997). When new products are difficult to evaluate or have uncertain value, early adopters may hold a disproportionately large influence as later adopters copy their actions as sufficient evidence of product benefits (Choi, 1997). In contrast, when customers adopt a "wait and see" attitude towards a new product category, limited early sales provide opportunities for newcomers; brands are not yet established, customer preferences are not yet shaped and channel relationships are not strongly formed (Varadarajan et al., 2008). Building an early market share lead may thus help an incumbent through establishing brand-based advantages and developing an installed base that grows and influences future adopters (Fuentelsaz et al., 2015), potentially spawning an ecosystem of customers and partners to aid incumbents under network effects and switching costs (Brem & Nylund, 2022). An initial advantage may be crucial in helping an incumbent's product appear more attractive to customers under indirect market effects (Dubé et al., 2010). In one example, with indirect network effects, Netflix (relative to competitors) developed an early market share lead in the streaming market. Netflix's larger customer base allowed for the development of a deep library of content, eventually producing high profile original content, which helped to define customer preferences for streaming services. This larger base of early adopting customers also acted to spread word of mouth regarding Netflix's content, helping future growth, particularly in a context where some customers were initially uncertain of competing offerings and their ability to develop compelling content libraries.

Research proposition 5

a) Network externalities are positively associated with customer switching costs.
b) The positive effect between network externalities and customer switching costs is stronger for an incumbent with a larger installed base.
c) The positive effect between network externalities and customer switching costs is stronger under greater uncertainty of product benefits.

Research proposition 6

a) Network externalities are positively associated with customer preference formation.
b) The positive effect between network externalities and customer preference formation is stronger for an incumbent with a larger installed base.
c) The positive effect between network externalities and customer preference formation is stronger under greater uncertainty of product benefits.

Interrelationships of demand- and supply-side factors

Having examined the demand-side perspective, we now incorporate supply-side factors and explore possible interrelationships in propositions P7 and P8. We first briefly extend the classic supply-side narrative by incorporating a learning perspective. In particular, we add a firm's customer orientation as a critical contributor to cannibalization phobia and inertia, and incorporate a firm's knowledge bases into our understanding of organizational routines that develop within an incumbent firm.

Supply-side learning relationships

The resource-based view (RBV) of the firm (Rumelt, 1984; Wernerfelt, 1984) posits that firms have limited valuable resources. As such, firms devote substantial effort toward developing their physical, human, and organizational resource bases. Specialized complementary assets, such as sales, service and delivery networks, have been shown to positively impact incumbents' performance when faced with substantial technological changes (Hill & Rothaermel, 2003; Tripsas, 1997). Incumbent firms are better able to adapt to radical technological change if they possess downstream complementary assets critical to the commercialization of the technology (Hill & Rothaermel, 2003; Rothaermel, 2001). Even when faced with technological change, an incumbent can still have an innovation advantage arising from its market-specific capabilities and knowledge (Sosa, 2009; Zhou et al., 2005).

The exact nature of a firm's resources, and the firm's knowledge and experience in using those resources for new projects, determine whether the assets induce disadvantageous inertia (Leonard-Barton, 1992). Unabsorbed slack resources (readily deployable to support innovation efforts) can enhance a firm's proactive learning efforts in creating novel innovations (Zuo et al., 2019). A firm's knowledge and experience with its strategic resources vary in their flexibility, making them potentially valuable for broader product lines or innovation that diversifies into related or unrelated markets (Adner & Zemsky, 2016; Boulding & Christen, 2003).

Even if an incumbent's assets are suitable for innovation, the incumbent must be willing to utilize assets for new product development and entry, often at the expense of existing products. A lack of willingness to cannibalize existing products' revenue is a driver of incumbent inertia. Chandy and Tellis (1998) find that incumbents who are willing to cannibalize existing product sales are more likely to successfully develop radical new products. Chandy et al. (2003) show that managers who expect a radical innovation to render a current technology obsolete tend to invest more in the radical innovation (motivated by their perceived insecurity in the current market), compared with those managers who do not expect the new technology to affect current products. An organization which focuses exclusively on customers' expressed needs and ignores customers' latent needs may tend to make minor product improvements which can be easily duplicated by competitors (Narver et al., 2004).

How a firm learns about customer needs is thus a critical contributor to willingness to cannibalize and incumbent innovation. A stronger orientation toward current (or "mainstream") customers leads to less radical product innovations, particularly when demand uncertainty is low (Gatignon & Xuereb, 1997). A stronger customer orientation may also enable the firm to identify effective ways to achieve competitive advantage through greater differentiation (Zhou et al., 2009). Greater information provision from customers may further increase responsiveness to needs and speed to market, although innovativeness may suffer (Fang, 2008; Kraft & Bausch, 2016). Firms engaged in generative learning, whereby current understanding of customers and technologies is questioned, can lead to more radical innovation (Baker & Sinkula, 2007; Kraft & Bausch, 2016), especially if the firm takes a long-term strategic perspective to its innovation efforts (Joshi, 2016).

In part to efficiently use specialized assets and execute customer-orientated behaviors, firms develop organizational routines, both internally and co-operatively with other firms. Though at times efficient, routines often work against beneficial change. A firm's experience with an embedded network of suppliers and other stakeholders can constrain the development and pursuit of new business models because previous success has been based on the current network (Hill & Rothaermel, 2003; Vlaar et al., 2005). When faced with a changing environment or competitive landscape, this network may inhibit learning and needed change (Henderson, 1993; Rothaermel, 2001). Though knowledge building is imperative, the buildup of inappropriate knowledge stores or intellectual capital can lead to inflexibility and the inability to radically innovate (Subramaniam & Youndt, 2005). New product survival may be jeopardized if a firm "stretches" its knowledge base into unfamiliar territory, such as when developing a new product (Wang & Chen, 2018). Interestingly, rapidly changing markets may not allow incumbents enough time to learn potentially harmful routines that could otherwise become entrenched within the firm (King & Tucci, 2002). Incumbents may also have more experience in successfully dealing with the challenges of change and innovation, potentially leading to more effective

learning and performance (Balasubramanian, 2011; Chen et al., 2012).

A learning perspective applied to the supply-side factors as a whole reveals several important interrelationships. Results in Chandy and Tellis (1998) show that willingness to cannibalize mediates the effect of specialized assets on radical innovation. Experience tied to less flexible assets lowers willingness to cannibalize and increases inertia. Chandy and Tellis (1998) also find that a greater focus on future (as opposed to current) customers increases willingness to cannibalize. Incumbents tend to rely on established understandings in light of their experiences with current customers, such that the process for gathering market information may tend to deemphasize opportunities for new learning, absent an organizational culture for innovation (Adams et al., 1998; Weber et al., 2019). In particular, the routines an incumbent utilizes to integrate market knowledge into product development efforts can influence product performance (De Luca & Atuahene-Gima, 2007). Organizational learning does not always result in improved performance, depending critically on the particular learning activities (e.g., searching vs. codifying knowledge) and the degree of exploration related to new capabilities (Walter et al., 2016).

Demand- and supply-side interrelationships

Market knowledge and orientation effects on willingness to cannibalize, and the subsequent effects on inertia and incumbent innovativeness, strongly point to the need for a demand-side perspective. What is occurring in the customer market around which an incumbent gains experiences and develops routines, knowledge, and assets? While the demand-side factors take shape within individual customers, we can consider the aggregate effect of each demand-side factor on the firm, which enables us to examine interrelationships between demand- and supply-side factors. Of course, demand-side factors such as customer preference formation, brand-based advantages, and switching costs accumulate to an incumbent's current products. As this generates repeat purchases, incumbents will have less strategic incentive to orient themselves to new customers and uncertain markets that may jeopardize current sales. Willingness to cannibalize and mainstream customer orientation may thus dynamically interact with customer preference formation and switching costs. Although incumbents may try to achieve early lock-in of new customers (Villas-Boas, 2015), greater switching costs may incentivize more incremental product innovation through a more mainstream customer orientation, leaving an incumbent prone to disruptive innovation. A similar effect is likely for network externalities since a stronger network may motivate an incumbent to reduce willingness to cannibalize and foster a mainstream customer orientation to reap benefits from its installed base. More generally, processes whereby customers construct preferences point to a complex endogeneity between firm actions and customer behavior towards incumbents (Bohlmann et al., 2013).

We also note an important dynamic interaction between supply- and demand-side effects on incumbent inertia arising from brand loyalty effects accruing to incumbents. Brand loyalty is a particular form of customer lock-in, inhibiting switching behaviors and forming the basis of a sustainable competitive advantage (Wernerfelt, 1991). In a longitudinal study of customers in Spain, a strong customer-brand identification was more effective in inhibiting customers switching to the newly introduced original iPhone than the perceived functional value of their current cell phone brand (Lam et al., 2010). Particularly in the consumer goods industry, a firm's desire to maintain or increase brand loyalty is a critical driver of competitive responsiveness. Stronger brands can see an increased consumer response from a more innovative new product (Sinapuelas et al., 2015).

On the other hand, when firms command a loyal customer base with high customer-brand identification, this may allow firms to explore their response alternatives more fully and allow them to innovate more confidently, lowering the likelihood of incumbent inertia. Customer orientation can also enhance competitive differentiation through better customer service innovations (Zhou et al., 2009) and improve performance as the incumbent better understands the competitive landscape (Perry & Shao, 2002). In essence, strong customer-brand identification provides greater freedom for competitive response and counteracts the inertia effect from specialized assets. Whether the brand-based switching costs arising from brand loyalty will enhance or diminish incumbent inertia depends critically on the firm's willingness to cannibalize, although this distinction may be more critical for technology-based innovation that replaces older technologies than for market-based innovation. Under greater willingness to cannibalize, brand-based switching costs will reduce incumbent inertia, while under lower willingness to cannibalize, brand-based switching costs will increase incumbent inertia.

Research proposition 7

a) Customer preference formation is positively associated with an incumbent's mainstream customer orientation.
b) Customer preference formation is negatively associated with an incumbent's willingness to cannibalize.
c) Customer switching costs are positively associated with an incumbent's mainstream customer orientation.
d) Customer switching costs are negatively associated with an incumbent's willingness to cannibalize.
e) Network externalities are positively associated with an incumbent's mainstream customer orientation.

f) Network externalities are negatively associated with an incumbent's willingness to cannibalize.
g) The positive effects between brand-based switching costs and the technological innovativeness and market innovativeness of an incumbent are stronger under greater willingness to cannibalize; this effect is weaker for market innovativeness than for technological innovativeness.

Specialized assets, routines, and knowledge bases also interact with preference formation and switching costs. Assets and capabilities determine the mechanisms through which an incumbent influences customer preferences and switching costs. If such efforts are successful, the incumbent will likely continue its current path and become further committed to its existing capabilities. As executives (especially in smaller entrepreneurial firms) engage in strategizing-by-doing and seek to find which strategies work through trial-and-error, positive feedback encourages persistence with what worked (Ott et al., 2017). This further reduces the incentive or effectiveness of any organizational learning activities such that the firm may become more focused on its current markets, competitors, and capabilities (Perry & Shao, 2002; Walter et al., 2016). This may, however, enable the firm to achieve greater technological innovativeness, while limiting its ability to engage in market innovativeness (Zhou et al., 2005). Consider another possible set of interrelationships: exploiting current knowledge and skills benefits incremental product innovation (Atuahene-Gima, 2005) which strengthens brand effects and aids customer preference formation (Moreau et al., 2001). At the same time, product innovation may be more successful if the firm's knowledge base cuts across multiple markets, due to a wider access to external knowledge (Wang & Chen, 2018). Future research is needed to disentangle the many possible interrelationships as they relate to specific types of assets, routines, and knowledge.

Potential relationships between network externalities and supply-side factors are also likely to be complex. Specialized assets and routines may be further developed to better exploit network-related sales, although not always to an incumbent's long-term advantage (Berndt et al., 2003). The benefits of technology-based innovation may be particularly problematic if held back by the incumbent's organizational capabilities (Kock et al., 2011). An important complexity is that investments in relevant assets and new product decisions are made based on expected sales growth, which may be inaccurate (Gupta et al., 1999) or provide insufficient incentive for new market entry given the incumbent's existing sales (Min et al., 2017). When customer preference formation is characterized by greater stability in preferences, the incentive for market-based innovation may especially decline (Zhou et al., 2005).

Research proposition 8

a) Customer preference formation is positively associated with an incumbent's specialized assets, routines and knowledge bases.
b) Customer switching costs are positively associated with an incumbent's specialized assets, routines and knowledge bases.
c) Network externalities are positively associated with an incumbent's specialized assets, routines and knowledge bases.
d) The positive effects between customer preference formation and network externalities and an incumbent's technological and market innovativeness are weaker under greater specialized assets, routines and knowledge bases.

Strategic implications for incumbent firms

Given the paucity of incumbent inertia research that integrates supply-side and demand-side factors, our research propositions are necessarily somewhat broad, but sufficiently specific to inform future empirical work. Many strategic implications of how to improve incumbent innovation and performance remain for future research, such as those we specify in our final propositions P9 and P10. Overall, our discussion does indicate that supply-side factors carry many dangers to incumbent performance, while some demand-side factors may work in an incumbent's favor, at least for a time (see Table 2). For example, if customer preference formation occurs quickly to an incumbent's short-term benefit, will this result in more incremental innovation to the incumbent's long-term disadvantage? Customer preference formation (and particularly the pace at which preferences stabilize) may foster or combat the incumbent's inertia and the degree to which its performance implications are benign (Boulding & Christen, 2003; Varadarajan et al., 2008). Similarly, network effects may strengthen quickly as a flock of users "rapidly leads to the supremacy of a single option" (Schilling, 2002, p. 388), which also has implications for switching costs. While incumbents welcome this growth, it may render an incumbent firm unable to escape a mainstream customer orientation as it struggles to satisfy existing demand. A quicker pace in marketing or technological evolution may make it more difficult for an incumbent to maintain any competitive advantage (Suarez & Lanzolla, 2007). Rapid changes may also make learning more difficult for an incumbent, such that it will take longer for any potential benefits to be realized. For example, more nimble smaller entrants may pursue a design iteration approach in

order to overcome resource constraints (Chen et al., 2021), which might not be as salient in larger incumbents. Taking P7 and P8 together, an incumbent's greater accumulation of demand-side inertia advantages may actually accelerate the onset of detrimental supply-side inertia. This highlights the need for an incumbent to be diligent about forestalling negative trends in the supply-side factors. Such temporal performance implications represent another opportunity for future research.

Research proposition 9

> The speed with which demand-side inertia advantages accrue to an incumbent is positively associated with the pace of growth of supply-side factors and their negative effects on performance and innovation.

Even with these important issues not yet fully explored, we can highlight the critical role of demand-side factors as suggested by the propositions and the limited number of empirical demand-side studies thus far. Failing to include demand-side factors provides an inadequate lens on incumbent performance or strategies. An incumbent will face high supply-side inertia if it possesses relatively high levels (overall) of specialized assets, established routines, knowledge bases, mainstream customer orientation, and fear of cannibalization. Incumbents with high supply-side inertia likely struggle to change deeply entrenched behaviors within the organization, being slow to shift away from past investments. An incumbent will face high demand-side inertia if network externalities and switching costs are relatively strong and customer preference formation favors the incumbent's products. Based on our framework, there can be substantial differences in likely incumbent performance across inertia conditions, with concomitant variations in incumbent strategies that managers could utilize to enhance advantages or mitigate disadvantages.

A high level of supply-side inertia is often seen as an incumbent disadvantage. However, this need not be the case if an incumbent is also accruing advantages due to high demand-side factors. If an incumbent locks-in valuable customers, then specialized assets and routines can make the incumbent more efficient and effective at meeting the needs of a large installed base of customers. The caveat is that this advantage may be short-lived if competitors can effectively engage in product improvements or disruptive product innovations that cause a break-down in the demand-based advantages (Berndt et al., 2003). Guarding against this possibility requires diligence against both cannibalization phobia and a purely mainstream customer orientation (Govindarajan & Kopalle, 2004). This could mean that an incumbent's innovation efforts are best accomplished by an autonomous incubator organization away from the influence of current customers and established routines and knowledge bases (Christensen & Raynor, 2003). Also, an incumbent with promising emerging customer markets may foster innovation via partnership or acquisition. A rather extreme possibility to counter both forms of inertia is to divest those products with mature customer bases in order to focus on emerging customer segments.

If an incumbent cannot benefit from customer lock-in due to a low level of demand-side inertia, supply-side inertia is often detrimental to performance. For example, Bohlmann et al. (2002) demonstrate pioneering incumbent disadvantage when supply-side inertia does not allow the inclusion of recent technology in product offerings. Several approaches can help managers in incumbent firms mitigate such supply-side disadvantages. First, encouraging R&D projects which draw upon emerging technology outside of the firm's competence can establish new organizational routines and diversify the firm's knowledge base (Ahuja & Lampert, 2001). Investing in rival technologies (and promoting internal rivalry) can also diversify the knowledge base and build acceptance to cannibalization. The managerial challenge in dealing with high levels of supply-side inertia is that implementing these strategies usually works against the firm's established resources, competencies and routines.

An incumbent with little demand- or supply-side inertia is not hampered in its ability to make swift changes as opportunities arise, but also lacks customer lock-in due to low switching costs, a lack of beneficial preference formation, or no way to leverage a customer base given low externalities. Customer loyalty becomes hard to develop in this situation, so an incumbent will want to create a stronger bond to customers by investing in brand building. An incumbent firm may also develop organizational routines to achieve efficiencies and build up specific capabilities over time, recognizing the trade-offs from becoming too entrenched or rigid. An appropriate level of supply-side inertia can allow an incumbent to achieve innovation leadership, such as through building the specialized assets and knowledge bases necessary for an R&D competence and a clear understanding of customer needs (Govindarajan & Kopalle, 2004). The potential for an incumbent performance advantage exists, depending on whether assets and capabilities become beneficial over time and customer loyalty is earned.

Low supply-side inertia with high demand-side inertia enables an incumbent to benefit from customer lock-in and adapt to technological or market changes. This could generate performance advantages, particularly if demand-side benefits can be leveraged across several markets. For example, an umbrella branding strategy would potentially expand

customer lock-in to multiple product lines and reduce inertia that would focus on any one customer segment. Also, diversifying to a non-related market would be potentially enabled by low supply-side inertia and would reduce long-term risks from disruptive innovation in the current market. Aside from diversifying brand resources, it is important to examine new and potentially valuable market segments and be willing to cannibalize current products as new opportunities arise (Chandy & Tellis, 1998). Again, some degree of supply-side capabilities may be beneficial, but an incumbent should remain nimble and be quick to enter new markets consistent with its capabilities to reap sustained performance advantages (Bayus & Agarwal, 2007; Rothaermel & Hill, 2005). Incumbent performance implications can be summarized as follows:

Research proposition 10

> The effect of demand-side inertia on incumbent performance is moderated by supply-side inertia. This functions as follows: Incumbents will have high (low) performance under a combination of high (low) demand-side inertia and low (high) supply-side inertia conditions.

Conclusions

Conceptually, both incumbency and inertia have some degree of ambiguity. Inertia can relate to observed outcomes and the underlying organizational processes which drive performance. Observed inertia may be the result of a strategic decision (e.g., when the threat of an entry is not deemed large enough or a strong response could increase direct competition, Ailawadi et al., 2010), or an inability to change (e.g., if lacking a particular type of market knowledge, Ramani & Srinivasan, 2019). Incumbency can be broad or narrow, depending on the market scope of interest.

We have followed the lead of most incumbent inertia studies and characterized inertia as evident from product innovation strategies and performance. A more basic perspective of an organization's routines and structures points to inertia in processes—especially decision making. For example, if cannibalization phobia contributes to an incumbent's inertia and impedes performance, what specific organizational processes can lead to an optimum degree of willingness to cannibalize? How can an incumbent make better investment decisions for specialized assets that improve long-term performance in an uncertain market? These and similar questions require a comprehensive "big picture" understanding as we outline in Fig. 1, responding to the call to "integrate the demand-side approach" (Priem et al., 2012, p. 368) with supply-side factors in an inertia framework. Further research needs to disentangle a more detailed analysis of the processes that occur within each supply-side and demand-side factor. This is particularly important in understanding when inertia has a differential impact across contexts or performance measures. For instance, inertia may be more damaging to performance under turbulent market conditions, so identifying processes more suitable to turbulent environments is critical (Lavie, 2006). The broader marketing literature on incumbent responses across the marketing mix (e.g., Ailawadi et al., 2010; Mukherji et al., 2011; Shankar, 1999) provides further evidence on the contingent nature of the relationship between incumbent responses and performance effects. Although we have concentrated on primary factors of inertia, research should continue to unravel the layers of organizational processes involved, since these processes fundamentally dictate the experience and knowledge the firm acquires. Given the various learning mechanisms that inform our propositions, studies examining specific learning processes, both within incumbent firms and their customer markets, would make valuable contributions.

We have included in Table 3 some indicative construct items that could operationalize the main variables in our framework (Fig. 1). However, there continue to be interesting measurement challenges that would be imposed by attempting to empirically test a model similar to Fig. 1. For instance, there are several possible approaches to measuring the fear of being stranded with older technology. It seems plausible that this could be assessed using a Delphi study drawing on experts familiar with both existing and emerging technologies (cf. Jiang et al., 2017). More traditional customer surveys could also be employed. Some of our research propositions invoke shifts over time, such as the pace of change of supply- and demand-side factors (Proposition 9). Establishing the length of these time periods is an open area of inquiry that could likely be investigated via secondary data given that measurements over time would be needed. There are also interesting questions regarding which metrics of incumbent performance to best utilize when studying inertia. Prior research has often focused on market share as a signal of market leadership (e.g., Bohlmann et al. 2002), though different metrics such as profitability can suggest different effects (Boulding & Christen, 2003). Considering customer satisfaction among a set of performance metrics may also provide useful insights and help differentiate effects related to customer orientation towards mainstream versus future customers and the associated impact on innovativeness.

Identifying an incumbent firm depends on the market scope. The spectrum ranges from firms being incumbents in a narrow product-market to firms with relevant assets and capabilities that are potential entrants in a broadly-defined

industry or market. The issue is that, both theoretically and empirically, more research is needed to examine broad vs. narrow views of incumbency, since firms make new product decisions both within their narrow product lines and for more diversifying entry opportunities. In general, a multi-market perspective to incumbency is needed, recognizing that incumbents often operate in multiple product markets. As stated by Helfat and Lieberman (2002, p. 752), "the winning firms often are diversifying entrants from another industry that bring resources and capabilities relevant to the new product generation." New insights can be generated with a multi-market perspective, since the supply-side and demand-side factors are not isolated to narrow product-markets. Recent literature on market shaping, with its explicit focus on firm agency within a multi-layered market system (Nenonen et al., 2019; Nenonen & Storbacka, 2021), might provide a suitable lens for such future inquiries.

In summary, incumbent firms face complex strategic tensions between the various supply-side and demand-side factors of inertia. Assets and capabilities can benefit an incumbent as it builds switching costs or takes advantage of installed base externalities, but innovation may become incremental and willingness to cannibalize may decrease to the incumbent's long-term detriment. Even if an incumbent can gain advantages from demand-side effects, this could accelerate the onset of supply-side disadvantages. Future research on inertia will determine how the supply- and demand-side factors interrelate to determine incumbent performance and the resulting implications for managers. Furthermore, perspectives focusing on markets as systems and broadening the set of market actors engaged in innovation (e.g., Randhawa et al., 2022) could provide a useful lens for future research on the dynamics we have highlighted. Our incumbent inertia framework and research propositions thus create a starting point for a broader learning perspective that recognizes often overlooked demand-side dynamics and their interactions with supply-side factors.

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