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Marketing ecosystem: An outside-in view for sustainable advantage

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ABSTRACT

In the modern business environment, consumers are increasingly influenced by megatrends involving marketplace, technology, socioeconomics, geopolitics, and natural environment. Simultaneously, the data and insights that can inform consumer attitudes and behaviors often reside outside of firms' direct control. Consciously incorporating these interdependent factors into firms' decision-making is essential for adaptability and sustainable profitability.

Building on the "outside-in" perspective, we propose that firm strategies should be informed through the lens of the *marketing ecosystem* that considers the interrelated and dynamic megatrends. By leveraging advances in data and technology, firms can sense-make the marketplace by extracting insights from massive amounts of diverse consumer data with modern-day analytics. By mapping out the megatrends with marketing analytics, firms can 1) more accurately predict consumers' changing preferences and formulate appropriate strategies to engage with them; and 2) become more market-adaptable and competitive in the present and the future.

To deliver sustainably compelling value to customers, firms should adopt an ecosystem mindset and cooperate with various stakeholders. A broad-thinking, agile, and humble firm culture can enable the development of more robust outside-in capabilities. We elaborate on the megatrends in the interconnected world of the marketing ecosystem, and propose emerging research directions in each area.

1. Introduction

Marketing as an academic and managerial discipline is fundamentally concerned with understanding consumers and enabling firms to leverage consumer insights to deliver value and sustainably achieve efficient marketplace outcomes (Day & Moorman, 2010; Vargo & Lusch, 2014). However, the preferences and behaviors of consumers are not solely defined by their focal transactions and commercial relationships often observed through the narrow lens of a single stylized construct (Houston, 2016; McAlister, 2016). Consumption and consumers are interwoven with contemporary society, and consumers are complex living entities that are constantly evolving under the influence of macro factors beyond that of their immediate commercial environments.

As technological, business-model, and socioeconomic changes continue to accelerate and influence market structures, consumer experiences, and competitive forces, the ability for firms to understand, anticipate, and adapt to these changes is paramount for sustainable success. In the past decade, marketing has proposed new organizational perspectives for thriving in the presence of these forces. A significant theoretical development is the concept of the "outside-in" perspective of the firm, which has enjoyed increasing popularity in recent years (Day & Moorman, 2010; Hunt & Madhavaram, 2019; Moorman & Day, 2016; Mu, 2015; Mu, Bao, Sekhon, Qi, & Love, 2018; Musarra & Morgan, 2020; Quach, Thaichon, Lee, Weaven, & Palmatier, 2019; Rust, 2019). The outside-in perspective shifts managerial focus outside the traditional boundaries of the firm to facilitate understanding of external forces that may significantly influence firm performance and expand knowledge of how different participants inside and outside the firm interact to create value. The benefits of the outside-in perspective are improved market-sensing, customer engaging, and partner-linking.

The extant outside-in perspective is often focused on marketplace factors such as technological trends and competitive activities. However, as consumers are more informed and influenced by megatrends in the external environment, we believe that modern firm strategies should consider a broader set of macro factors beyond these marketplace forces. We build upon the outside-in perspective by examining the substantial developments in the macro contexts as well as their trajectories into the future, and consider how these megatrends affect consumer behaviors and firms' abilities to market-sense in both short and long-term.

Our proposed *marketing ecosystem* perspective expands on the marketplace lens of the existing outside-in view, and broadens it to

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consciously incorporate five interrelated macro factors that differ in scale and in the speed in which they shape consumer behaviors and firm strategies. The marketing ecosystem perspective recognizes that marketing is a bigger "open system" than previously conceptualized, and calls for firms to harbor an open-minded mindset and to collaborate with a broader set of stakeholders and partners.

We examine five significant emerging megatrends that will have a lasting influence on marketing theory and practice over the next decade and beyond: 1) marketplace developments influencing the rise of new business models and market dynamism; 2) technological developments fueling consumer privacy and surveillance concerns; 3) socioeconomic developments relating to increasing income inequality; 4) geopolitical developments and heightened levels of international protectionism; and 5) environmental developments on natural resources sustainability. Fortunately, the same technological advances that have contributed to the rise of these challenges also provide the means to address them, principally through the availability and use of increasingly rich data and emerging analytical technologies. Considering that these shifting market dynamics shape consumer behaviors which in turn shape markets, firms that pay significant attention to outside developments, technologies, consumer concerns, and diverse data will be the most adaptable.

Along with these megatrends, the data and insights that can inform consumer attitudes and behaviors often reside outside firms' direct control and decision-making. Consciously incorporating these interdependent factors into firms' strategies is essential for adaptability and sustainable profitability. By leveraging advances in data and technology, firms can sense-make the marketplace by extracting insights from massive amounts of consumer data from various sources with modern-day analytics technologies. By mapping out the megatrends with marketing analytics, firms can 1) more accurately predict the changing preferences of consumers and formulate appropriate strategies to engage with them; and 2) become more market-adaptable and competitive in the present and the future. Accordingly, this paper discusses recent advances in data and its analysis within the context of the five external developments to arm researchers and practitioners with contexts to thrive in the markets of the future.

The marketing ecosystem is an open and interconnected system. This perspective emphasizes that business functions are interrelated and not siloed by academic disciplines. Marketing can be enriched by synthesizing insights from other academic disciplines and by involving diverse stakeholders (MacInnis et al., 2020). To deliver compelling offerings to customers and to maintain sustainable competitive advantages, firms should adopt an ecosystem mindset of cooperating with actors traditionally viewed as outside of the realm of marketing. A broad-thinking, agile, and humble culture can endow firms with more robust outside-in capabilities, which then allow them to better sense market, seize opportunities, and quickly develop specific capabilities that fit into future market needs.

Consistent with this boundary-breaking perspective, we conduct our investigation by examining a diverse set of literature and assessing how other domains can enrich marketing theory and practice. After an introduction to the marketing ecosystem, we offer a discussion of the recent technology-driven data developments that continue to have a profound impact on consumers and businesses of all types. We delineate bourgeoning substantive domains with implications for consumers and firms and provide an overview of the rise of massive unstructured data that is increasingly prevalent. Complimenting this discourse, we highlight developing methodological disciplines adjacent to the marketing field whose spillover is shaping marketing through three broad roles: the need to gather and source, store and protect, and learn and use data effectively.

With this technology and data context established, we identify emergent trends in each of the five macro factors in the marketing ecosystem, informed by the priorities of the Marketing Science Institute (MSI), the Boston Consulting Groups and McKinsey & Co., the Pew Research Foundation, the Brookings Institution, and the United Nations. We track the trajectories of each macro factor through developments across both Financial Times 50 (FT50) business journals and impactful marketing journals over the past few decades, identify the gaps between research focus and real-world challenges in each emergent area, and offer directions for future research.

The marketing ecosystem perspective contributes to marketing theory and practice through a structured, outside-in view focused on a better understanding of the evolving consumers. First, the ecosystem framework expands the existing outside-in perspective to a macro level and guides firms to monitor and internalize the megatrends that influence consumers, thereby improving firms' abilities to understand and predict their preferences and needs. Second, we discuss how firms can market-sense through emergent, data-rich, yet unstructured environments where consumer and marketplace data often do not reside within the firm. Third, by identifying the megatrends that shape consumers into the future, future marketing strategy research can incorporate these factors to provide a fuller and more nuanced view of consumers and to help firms make market-adaptable decisions.

2. The marketing ecosystem perspective

We define the marketing ecosystem as an interconnected system of coevolving actors and forces that affect firms' abilities to sense-make the market and seize opportunities. In addition to competitors' and collaborators' actions that directly affect the firm's business, the marketing ecosystem contains five macro factors: 1) marketplace factors, 2) technological factors, 3) socioeconomic factors, 4) geopolitical factors, and 5) natural environmental factors. The marketing ecosystem perspective expands the existing lens of outside-in view in marketing to include a set of structured macro factors and associated megatrends that influence consumers and have profound implications for firm strategies. The marketing ecosystem perspective explicitly recognizes that marketing is an "open system," and that the firm can be thought of as an organism that is embedded in the broad ecosystem with which it needs to develop a symbiotic relationship to survive and prosper. Therefore, this perspective calls for a proactive and broad mindset of adaptability, exploration, and collaboration to improve firms' abilities for market-sensing and market-seizing.

The marketing ecosystem has many elements. In this paper, we primarily focus on the megatrends occurring within the five macro factors, which are often ignored in previous outside-in perspectives. Fig. 1 highlights the five macro factors as well as the megatrends occurring in each that we identify later in Section 4. The five factors are portrayed as concentric circles reflecting their specificity and the immediacy of their influences on consumer behaviors and, consequently, firms' decision-making. This broadened outside-in perspective provides a stable structure in that the five macro factors encompass the vast majority of the influence that consumers face, but also allows for flexibility and dynamics through the identification and updating of trends within each factor.

The ecosystem framework builds on the strength of the outside-in view, which stresses using outside factors to improve market-sensing, customer-engaging, and partner-linking (Day & Moorman, 2010; Mu et al., 2018). While the outside-in view is theoretically rich and thought-provoking, given its infancy in the literature, it is not yet fully developed and thus offers a fertile ground for frameworks. We build on the theoretical foundation of the outside-in perspective by crystalizing the various macro factors and discussing how they influence consumers and, consequently, firms' profitability, business models, and sustainable competitive advantage.

In the past, many of these macro factors might have received cursory looks, and some were excluded from the scope and mission of profit-oriented firms. However, as the business environment becomes increasingly dynamic and consumers become increasingly empowered, we argue that these outside-in factors are more important than ever. We

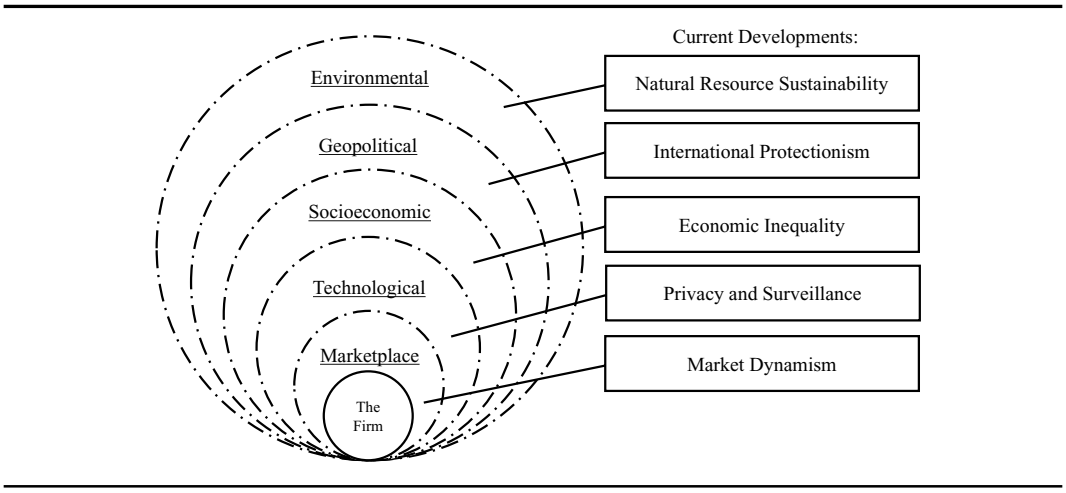

Fig. 1. Marketing Ecosystem: An Outside-in View for Sustainable Advantage.

recommend that firms should consciously incorporate these ecosystem factors into their decision-making and firm culture, as these factors will enable firms to be more adaptive and will likely determine the competitive advantages of the future.

The ecosystem perspective offers the following benefits for broadening firms' strategic thinking while grounded in the profit-orientation logic. First, the broad and anticipatory perspective enables firms to focus not only on current customer needs and current value for exploitation (Fader, 2012) but also on future customer needs and future value for exploration (Mu 2015). Markets change, and hence customers change. Current unprofitable customers and segments might evolve to become profitable in the future, and strategies that have worked in the past might not work in the future. The ecosystem perspective hence encourages firms to have a constant awareness of emergent segments and new needs. This perspective is consistent with the philosophy that organizations of all sizes need to promote entrepreneurial thinking and structure, and to promote experimentation for exploration and adaption, to overcome "the innovator's dilemma" (Christensen, 2013; Christensen, Bartman, & Van Bever, 2016; Christensen & Raynor, 2013). Firms need to be aligned with the marketplace (Day, 2006), and the marketing ecosystem framework explicitly describes the macro factors in the interconnected environmental factors that firms should consciously incorporate, beyond the previously considered factors such as technologies and competitive actions.

Second, by examining each macro factor, the ecosystem perspective helps to identify external stakeholders such as policymakers and tastemakers that influence consumers. Whereas the traditional stakeholder theory (Freeman, 2010) focuses on business ethics and corporate social responsibility, the ecosystem perspective offers a marketing lens from an outside-in perspective. It focuses on customer value creation by extracting market insights from data in various sources in the broad environment to meet the needs of both current and potential customers, so that firms can build sustainable competitive advantage. As the needs for ethical behaviors and social responsibility are internalized by consumers, the corresponding actions by the firm would also provide superior value to its customers in terms of goodwill, brand warm glow, customer loyalty stemming from increased customer-brand identification, and potential "attitudinal insurance" against the firm's future mistakes (Flammer, 2013; Godfrey, Merrill, & Hansen, 2009; Kang, Germann, & Grewal, 2016) .

When thinking about the five macro factors, it is imperative for firms always to adopt a global view. With today's rapid rate of information and capital flow, compelling developments in the technological, marketplace, and cultural arenas in one corner of the world can quickly spill over to the other regions.

Environments always change, and thus consumers always change (Zhang & Chang, 2020). The concentric-circle "radar" design of the marketing ecosystem framework can guide firms on a concentric-level of "outside-in" thinking, focusing on factors that have more immediate effects while keeping an eye on the radar to simulate what-if scenarios on how changes in other factors could impact consumers and markets. This broadened view of the marketing environment can enhance the firms' outside-in capabilities, their abilities to experiment, and their abilities to deliver compelling offerings to customers in the long run.

At a firm culture level, the marketing ecosystem perspective can synthesize the two dominant perspectives on market orientation – one focused on processing marketplace information (Kohli & Jaworski, 1990) and the other focused on a market-oriented culture (Narver & Slater, 1990). The ecosystem thinking promotes a firm culture that is open-minded, agile, mindful of diverse stakeholders, and boundary-breaking – factors that make the firm more dynamic (Teece, 2007). This culture embracing dynamism can, in turn, facilitate the rapid development of specific capabilities to gather, process, and benefit from marketplace information.

Data are paramount to understanding consumers. Therefore, before we dive into the megatrends in each of the five macro factors, we first discuss how marketplace and technology trends over the past two decades have contributed to increasingly richer data and more in-depth understanding of consumers. Data are becoming increasingly complex, and more and more relevant data now resides in the ecosystem outside of the firm's immediate control. Understanding how diverse data and analytical technologies can be leveraged will enable firms to understand the marketing ecosystem factors empirically and quantitatively.

3. Leveraging data from the marketing ecosystem

3.1. Evolution of marketing data from "inside" to "outside"

Data environments have evolved significantly over the past two decades from ones that were relatively controllable and often resided within the firm, to ones that are massive and growing but also scattered in the marketing ecosystem. We briefly describe this evolution in the following section for context. Table 1 and Fig. 2 provide an overview of this history.

3.1.1. Discrete era: Pre-1995s

Before the proliferation of the internet and PCs, the availability of consumer and industry data and firms' analytic capabilities were relatively limited. Much of the data and corresponding analysis focused on making the most of discrete and crude data such as scanner panel data

Table 1
From "Internal" to "Ecosystem" - The Evolution of Customer Data and Implications: 1995-Present.

Era	Data	Prevailing Methods	Domains	Implications	Representative Papers
Discrete Era: Pre-1995	Aggregate data Scanner data Surveys	Classical statistics Forecasting of aggregate marketing performance	Retail Consumer Packaged Goods Marketing Channels Supply Chain Management	Marketers employed statistical techniques adapted to "limited" information, heterogeneity, and sample bias.	Guadagni and Little (1983); Winer (1986); Allenby (1989); Oliver and Swan (1989); Blair and Burton (1987); Armstrong and Overton (1977); Schmittlein et al. (1987)
Continuous Era: 1995–2005	Page views Clickstream Paid-search auctions Detailed transaction data	Bayesian statistics and individual heterogeneity VAR and dynamic linear models Structural modeling	eCommerce Paid-search advertising Customer relationship management Digital marketing	Broader availability of behavioral data enabled more customer-centric approaches such as CLV, with emphasis on micro-level customer dynamics and predictive abilities.	Bolton (1998); Mittal et al. (1999); Blattberg and Deighton (1996); Berger and Nasr (1998); Anderson et al. (1994), Ganesan (1994), Reinartz and Kumar (2003)
Big Era: 2005–2010s	Mobile In-app behavior Location Two-sided platforms	Hidden markov models Endogeneity corrections A/B testing and field experiments	Social Networks Digital communications Mobile e-commerce Mobile apps	Ability to link omni-channel touch points across customers provided foundation for strategic decisions that were previously impractical, such as dynamic pricing, online-offline user experience.	Zhang et al. (2014); Manchanda et al. (2006); Pauwels, Silva-Risso, Srinivasan, and Hanssens (2004); Shi and Zhang (2014); Netzer, Lattin, and Srinivasan (2008)
Massive Unstructured Era: 2015 and beyond	Voice Content Picture Video Real-time from smart devices	Supervised & unsupervised ML Customer-facing AI (AR) Deep-Learning Blockchain Automation	Human-machine interface Personalized user-experience	Large amounts of unstructured data and continued development in machine learning techniques to place structures on novel data types to uncover complex relationships and improve predictive performance.	Rutz, Sonnier, and Trusov (2017); Liu, Singh, and Srinivasan (2016); Li et al. (2019); Balducci and Marinova (2018)

(e.g., Allenby, 1989; Guadagni & Little, 1983; Winer, 1986) and primary data such as periodic surveys (e.g., Blair & Burton, 1987; Oliver & Swan, 1989). Considering the sparsity of data types, marketers adapted statistical techniques or corrections to make use of this relatively "limited" information, such as non-response bias (Armstrong & Overton, 1977), or estimation of customer churn through limited information such as data on recency, frequency, and average monetary spending (e.g., Schmittlein, Morrison, & Colombo, 1987).

3.1.2. Continuous era: 1995–2005

With extensive adoption of internet communications beginning in the early 1990s through the launch of the first smartphones, the substantial amounts of detailed consumer data available laid the foundation for the modern era of data-driven marketing. Large amounts of detailed transaction panel data provided new opportunities for firms to examine and understand not only customer segments but also customer dynamics and behavioral changes (Zhang & Chang, 2020). This data development resulted in a more customer-centric research focus such as satisfaction (e.g., Bolton, 1998; Mittal, Kumar, & Tsiros, 1999), customer equity (e.g., Blattberg & Deighton, 1996), and customer lifetime value (e.g., Berger & Nasr, 1998). The better attitudinal and behavioral individual-level data coupled with more sophisticated statistical models led to a rich set of customer-centric research such as understanding and predicting customer profitability, repurchase, and relationship trajectories (Anderson, Fornell, & Lehmann, 1994; Ganesan, 1994; Reinartz & Kumar, 2003; Zhang, Watson, & Palmatier, 2018; Zhang, Watson, Palmatier, & Dant, 2016).

3.1.3. "Big" era: 2005-present

The introduction of smartphones in the late 2000s brought a new level of data granularity that led to an unexpected challenge: data overload. Mobile location data, real-time app usage, page views, and the ability to link omni-channel touchpoints not only for a single consumer but also across consumers and competitors, created opportunities to provide better consumer experiences. Granular data capture (e.g., clickstream tracking in e-commerce) combined with cloud storage capabilities have enabled firms to synchronize analysis across data resources beyond their immediate internal availability (e.g., augmenting firm's internal data with social media posts and user online reviews). With sufficiently detailed data, firms in both B2C and B2B domains could implement previously difficult personalization tasks such as targeted pricing (Zhang, Netzer, & Ansari, 2014), personalized product recommendations (Ansari, Li, & Zhang, 2018), advertising timing (Trusov, Ma, & Jamal, 2016), managing marketing-mix exposure (Du et al., 2015), and optimizing the multichannel retail experience (Chang & Zhang, 2016; Zhang, 2020).

During this time, we also began to see relevant data moving from firms' internal CRM databases to external environments - a development that requires firms to consider diverse sources for market-sensing such as social media, review sites, and forums. For example, the emergence of large-scale textual data generated by current and potential customers in online forums and review sites can reflect consumer sentiments and scale-up qualitative market research insights (Melumad, Inman, & Pham, 2019; Netzer, Feldman, Goldenberg, & Fresko, 2012). The textual data can also be generated by institutions and society at large. For example, data from the Google Book corpus, news media, government reports, song lyric websites, and movie script databases can provide a wealth of information. Although these text generators are not the firm's customers, they could nevertheless shed light on broad consumer cultural trends such as tastes in movies (Toubia et al., 2019) and music (Berger & Packard, 2018).

3.1.4. Massive unstructured era: Present and beyond

As technological developments accelerate, consumers' interaction with mobile and smart devices generate massive amounts of data through social media posts, location-based photo and video uploads, as

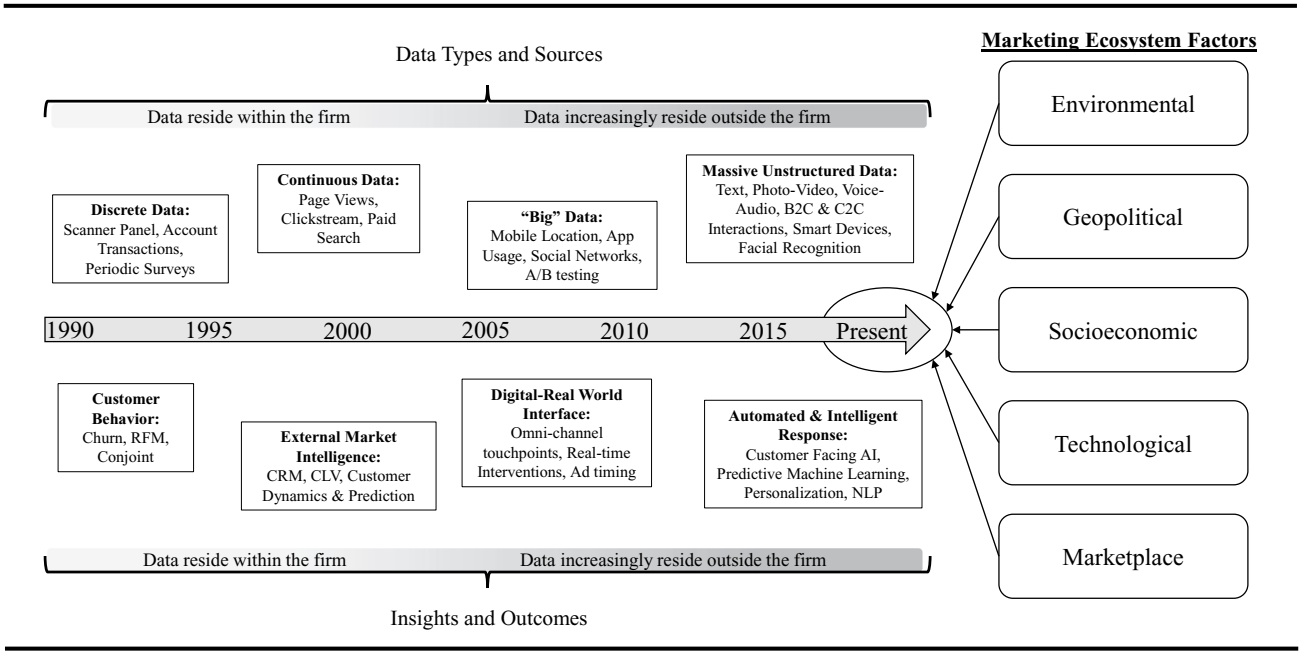

Fig. 2. Evolution of Technology, Data, and Insights.

well as in-use data and living habits through sensors from IoT devices. Balducci & Marinova (2018, p.558) define unstructured data as "a data unit in which the information offers a relatively concurrent representation of its multifaceted nature without predefined organization or numeric values." Data resides on a continuum from highly structured data (e.g., numeric data such as sales transactions) to highly unstructured such as non-verbal data (e.g., facial cues), images, and videos. Increasingly, text, audio, auditory, and video data co-occur in marketing communications across advertising, social media, product offerings, and numerous other touchpoints. Large amounts of unstructured data (e.g., from brand communities, product reviews, smart devices) and continued development in data-summarizing techniques can enable structures on these novel data types that could allow for the ability to scale up qualitative research and identify consumer conversations and emotions to facilitate market-sensing.

The ever-increasing sources of data offer the enormous potential to firms to learn deeply about consumers and markets and formulate strategies from an outside-in perspective. However, they challenge firms' analytic capabilities. These challenges have necessitated new disciplines to take advantage of these technological and data developments to adapt to a business environment that is unforgiving of data ignorance. The marketing field continues to evolve from its roots in the analysis of in-house numerical transactional data to incorporate vast troves of unstructured data from often disparate origins. On the one hand, this development allows for a more in-depth understanding of consumers. On the other hand, it necessitates capabilities for firms not only to model the complex data but also to look for relevant data that reside outside of the firm – emphasizing marketing analytic capabilities as well as outside-in ecosystem thinking.

Creative ways to source these unstructured data in the ecosystem can be enormously insightful. For example, to understand how disruptive companies such as Uber or Airbnb navigate resistance to market changes, one might study transcript of town hall meetings and other public documents in which citizen input is heard. As exogenous shocks in the forms of social movements such as #MeToo, #MAGA, and #FarmToTable can affect brand images and firms' marketing communication strategies, one can study how different groups of people define and advocate for certain meanings in the marketplace. At a broader level, firms can analyze texts, images, and photos in the ecosystem to assess how their brands fit into the cultural fabrics of current societal meanings and norms (Arvidsson & Caliandro, 2016).

To make the most of this data opportunity, marketers are looking to other emerging disciplines in data science, artificial intelligence, and machine learning to process non-structured data (Chintagunta, Hanssens, & Hauser, 2016). In the following section, we examine marketers' responses to these accelerating developments through emergent disciplines' use of massive unstructured data. For a more in-depth review of marketing analytics in data-rich environments and associated substantive topics, we direct the reader to Wedel and Kannan (2016).

3.2. Emergent disciplines in data roles and analysis

We center our discussion on what we view as the three critical roles of data for marketing in the coming years. Table 2 provides an overview of emergent disciplines in data roles and analysis. The first is the need to gather and source data from often disparate origins to generate the structure for analysis. The second is that firms must store and protect the data they have collected to ensure their proper use and accessibility for decision-making. This role is most likely to be overlooked but is of vital importance to prevent malicious attacks and ensure consumer privacy. The final part is the use of data for learning and decision-making, for which there are developing methodological disciplines in the domains of artificial intelligence. Firms can extract market insights from the iterative process of data analytics to create unique value for customers.

3.2.1. Gather and source

User-generated content, such as online comments and product reviews (Ansari et al., 2018; Lee & Bradlow, 2011; Tirunillai & Tellis, 2012), social media posts (Nam, Joshi, & Kannan, 2017; Nam & Kannan, 2014), blogs and forums (Netzer et al., 2012), photo and video uploads (Klostermann, Plumeyer, Böger, & Decker, 2018), and other unstructured data sources provide marketing research with a trove of potentially candid and useful data about firms and their market offerings. This unstructured data can often be accessed directly through an application programming interface (API) from social media platforms, scraped manually from webpages, or internally from firm-owned

Table 2
Leveraging Data in the Marketing Ecosystem - Gather and Source, Store and Protect, Learn and Use.

Role	Disciplines	Implications	Software & Algorithms	Representative Papers
Gather and source	Text Voice Image and video Data stream from smart and connected devices Behavioral meta-data	Massive unstructured data makes human coding unfeasible, but researchers can implement machine learning algorithms to inductively classify input and observe patters without the requirement of manually coded rules.	LIWC, VADER Natural Language Took Kit (NLTK) Pandas/NumPy (Python) Scrapy for Web scraping (Python) Google Cloud Vision API, Microsoft's Computer Vision API, OpenCV	Hartmann et al. (2019); Batra and Keller (2016); Lee and Bradlow (2011); Tirunillai and Tellis (2012); Nam and Kannan (2014); Nam et al. (2017); Hennig-Thurau, Wiertz, and Feldhaus (2015); Villarroel Ordenes, Ludwig, De Ruyter, Grewal, and Wetzels (2017); Mazloom et al. (2016)
Store and protect	Blockchain Cryptography Cloud data warehouse Datalake	Highly detailed data underwrites public concerns about accessibility, privacy, confidentiality, and ownership. These concerns lead customers to counter with technology (e.g., VPNs, adblockers, deep web) and governments to implement regulations (e.g., GDPR) that impact data utility and the future roles of data in business models.	blockchain.info (Python) PyPI (Python) rockchain (R) Sodium (R) PyCryptodome (Python) Cryptography (Python) Simple Crypt (Python)	Martin et al. (2017); Fung et al. (2010); Xu et al. (2014); Chen, Fung, Mohammed, Desai, and Wang (2013); Zyskind and Nathan (2015); Christidis and Devetsikiotis (2016)
Learn and use	Supervised, Unsupervised, and Reinforced Machine Learning (ML) Customer-facing AI (e.g., retail) Virtual reality (VR) and Augmented reality (AR) Deep learning Application-specific AI hardware Natural Language Processing (NLP) for text data	Modern data environments can cover 100's+ variables with quickly changing values (e.g. via IoT). ML and AI can effectively accommodate highly complex relationships to address correlational or predictive analysis, but at the cost of potential difficult interpretation or low generalizability to other data sets. Firms should accordingly use the intelligent machines in conjunction with analysis grounded in theories of psychology, economics, and sociology to understand the underlying phenomena.	Scikit-Learn (Python) XGBoost (Python) TensorFlow (Python) Keras (Python) e1071 (R) randomForest (R) nnet (R)	Syam and Sharma (2018); Li et al. (2019); Tirunillai and Tellis (2012); Chen, Borth, Darrell, and Chang (2014); Klostermann et al. (2018); Krizhevsky et al. (2012); Abadi et al. (2017)

marketing communications, such as image and video advertisements and corresponding meta-data.

Although the multi-terabyte scale data makes human coding unfeasible, interest among marketing researchers in classifying large amounts of unstructured data and linking it to marketing outcomes continues to grow (Hartmann, Huppertz, Schamp, & Heitmann, 2019). Fortunately, automated procedures for gathering unstructured data are becoming more accessible. For example, supervised machine learning methods such as artificial neural networks (Juan, Hsu, & Xie, 2017; Timoshenko & Hauser, 2019), k-Nearest Neighbors (Dzyabura, Jagabathula, & Muller, 2019), naive Bayes (Hartmann et al., 2019), and random forests (Hoornaert, Ballings, Malthouse, & Van den Poel, 2017) inductively classify textual input based on observed patterns without the requirement of manually coded rules from the researcher (Dumais, Platt, Heckerman, & Sahami, 1998). Image classification approaches that have recently made their way into marketer's toolboxes include the use of openly available computer vision packages such as Google's Cloud Vision API, Microsoft's Computer Vision API, OpenCV, Amazon's Rekognition, and IBM's Watson Visual Recognition (Mazloom, Rietveld, Rudinac, Worring, & Van Dolen, 2016). These programs have the advantage of not needing to specify parameters, and their openly available nature allows replication of results and utilization in firms with moderate technical ability.

Data now flows from connected consumer devices such as Nest's thermostats, smart running shoes and athletic wearables, virtual personal assistants (e.g., Amazon's Alexa, Microsoft's Cortana), smart electrical plugs and LED lighting, door locks, and security cameras, and health monitoring devices (Cross, 2018). In addition to understanding consumer preferences and behaviors, in the B2B space, IoT-connected equipment can improve maintenance prediction, inventory, supply chain efficiencies, and the ability to share in-use information from customers with suppliers for tighter partner-linking and service guidance (Russo & Albert, 2018; Zhang & Hon, 2020a). In these environments, each IoT object generates static information (e.g., operational, warnings, repair, build information) and customer in-use information (e.g., input changes, user interaction monitoring, biosensors), which provides real-time data flow for later analysis (Ng & Wakenshaw, 2017).

There is also a wealth of offline consumer activities such as customer participation and engagements in firm-sponsored or user-community events that have been traditionally overlooked. Many firms begin to realize the power of brand communities and the deep consumer engagements stemming from offline social interactions. Capturing activities such as event attendance and behaviors during the events in the CRM system through advancements in video capture, computer vision, and hand-held POS devices and examining how these activities affect search and purchases can offer a complete picture of the drivers of consumer behavior in offline and group settings (Zhang, 2019a; Zhang, 2019b).

3.2.2. Store and protect

The same detailed and wide-ranging data that provide firms with insights can underwrite an increasing public concern about the accessibility, privacy, confidentiality, and the potential for misuse (Martin, Borah, & Palmatier, 2017). Outside-in perspective places the interests of customers in the center (Mu, 2015), and protecting customers from harm should be a central focus of the firm. Firms must handle the obligation to effectively store and protect the data to reduce vulnerabilities to consumers and themselves, while still maintaining the usefulness of the data. This places emphasis on privacy-preserving data publishing (PPDP), which represents data stewardship that balances privacy preservation with utility loss (Fung, Wang, Chen, & Yu, 2010). In addition to collection and storage safeguards, firms should also be mindful of security and privacy when mining data for business insights (Xu, Jiang, Wang, Yuan, & Ren, 2014). It is the firms' responsibility to modify or remove potentially sensitive information from the raw data

upon collection, and to ensure potentially sensitive information does not appear in the results of the analysis. As data types become more complex, applying suitable ways to implement and quantify privacy can be challenging. However, promising technical developments in the use of blockchain and cryptography are beginning to make their way into data practice (Christidis & Devetsikiotis, 2016; Zyskind & Nathan, 2015).

Consumer concern is not always about actual harm from a privacy breach, but also about the vulnerability of potential harm, which makes many people reluctant to participate or share their data with the firm (Martin & Murphy, 2017). Because of the increasing role and value of data in all facets of modern society as well as its potential downsides for consumers, governments have increasingly intervened in industry data practices through regulation. For example, the European Union's General Data Protection Regulation (GDPR) went into effect in May of 2018 and made substantial changes to how an organization can collect, use and transfer personal data within its jurisdiction. Its regulatory goal is to ensure that individuals have greater control over their data and how it is shared. Businesses that handle data of EU data subjects (e.g., an individual residing in the EU) all share the same regulative obligations and face the same consequences and enforcement (European Commission, 2018). These regulations require 1) clear and common language about data usage for customers, 2) affirmative customer consent for opt-in, 3) greater transparency as to transfer, purpose-in-use, and automated use, 4) stronger rights on granting access, data breach informing obligations, and data erasure, and 5) imposition of fines for organization found in violation of GDPR rules. Similar regulations are currently enacted or are in process in Brazil (Lei Geral de Proteçao de Dados), in Australia as the Australian Privacy Act 2018 Amendment, the US State of California's Consumer Privacy Act, Japan's Protection of Personal Information 2017 Amendment, South Korea's 2011 Personal Information Protection Act, and Thailand's 2020 Personal Data Protection Act. These six regulatory acts alone cover close to one billion people and $32 trillion in GDP (International Monetary Fund, 2018; US Bureau of Economic Analysis, 2018). As the trend of global consumer and regulatory data mindfulness continues, firms (especially those that operate in multiple jurisdictions) will need to ensure compliance with data protection laws and adapt their marketing and business practices such as direct marketing and communication to fit these requirements.

3.2.3. Learn and use

Recent developments in machine learning are well adapted to many of the characteristics of the massive unstructured data. In data environments where researchers face substantial uncertainty, machine learning techniques provide an advantage over more structured statistical or econometric analysis because they do not require strong assumptions to model relationships within the data. This modeling approach mitigates risks associated with improperly specified models or assumption-violating data. Research has demonstrated that applying machine learning techniques to user-generated content can reveal unseen information about the firm's offerings such as consumer quality perceptions (Ansari et al., 2018; Netzer et al., 2012; Tirunillai & Tellis, 2012) or its competitive landscape (Lee & Bradlow, 2011) – issues would be otherwise difficult to address using internal resources and traditional market research approaches. Other goals for data use are the abilities to introduce new products with higher chances of success, personalize offerings, improve transactional experiences, and increase customer acquisition conversion – areas that align with the primary functions of marketing and business operations. Although the vast majority of the approaches used for textual analysis rely on bag-of-words methods and currently have limited ability to capture the true linguistic relationships among words beyond their co-occurrences, we expect to see developments in areas such as natural language processing (NLP) and deep learning that can better capture semantic relationships.

Image and video classifications remain the focus of cutting-edge research where deep learning convolutional neural networks can accomplish tasks in hours more accurately than would take humans days and weeks (He, Zhang, Ren, & Sun, 2016; Kwak & An, 2016; Sermanet et al., 2013). As researchers have increasing access to off-the-shelf or open-source libraries such as ImageNet, PASCAL VOC, and TensorFlow to facilitate image analysis in quick timeframes for additional analysis (Abadi, Isard, & Murray, 2017; Klostermann et al., 2018; Krizhevsky, Sutskever, & Hinton, 2012), these methods can be applied more widely by more substantively focused researchers. While current work has become proficient at object recognition in visual data (You, Luo, Jin, & Yang, 2015), many conventional approaches still have difficulties recognizing and extracting more abstract information such as emotions and sentiments, which is admittedly tricky even for humans coders due to subjectivity (Wang & Li, 2015). Machine learning techniques can work around this subjective task by pairing with textual data like reviews or social media posts (Chen, Yang, Feng, & Gu, 2017; You, Luo, Jin, & Yang, 2016), and advancements in bio-informatics technology such as facial recognition and eye-tracking have yielded insightful results in this domain (Teixeira, Wedel, & Pieters, 2012; Venkatraman et al., 2015). While machine learning can accommodate highly complex relationships, it can be difficult to interpret its output as well as generalize it to other contexts (Li, Shi, & Wang, 2019). Furthermore, counterfactual analysis and policy change examination may not be as feasible as with more structured and theory-rich approaches. Therefore, we envision that future analytical excellence relies on two approaches - while firms should embrace the predictive abilities of intelligent machines, they should not indiscriminately abandon formal models grounded in theories of economics, psychology, and sociology, in order to understand the underlying phenomena and to articulate and extrapolate the strategies.

The abundance of unstructured data is not without pitfalls and limitations. One caveat is the potential for self-selection bias. Observed data, whether it is in the forms of product reviews, forum discussions, or twitter posts, could reflect strong motivations such as extreme satisfaction or dissatisfaction, political correctness, herding mentality, or trolling behaviors. Those consumers without strong sentiments and motivations for posting could be the “silent majority” that constitute the mainstream of the economy. Firms, when extracting insights from data in the ecosystem, need to be cognizant of the various sources and magnitude of bias. Even in the era of big data and AI, blind reliance on data and algorithms could lead to unintended and undesirable consequences. Therefore, data and the associated algorithms should be used in tandem with traditional market research approaches to ensure representative samples. The findings should then be triangulated with intuitions, institutional knowledge, and first principles.

The success of marketers and firms relies not only on the ability to leverage new data effectively but also on the identification and business-model adaptability of emerging developments in the ecosystem, which we will discuss next.

4. Emergent trends and future research directions in the marketing ecosystem

Recognizing emerging and accelerating trends is not a straightforward task. We argue that these aspects can be addressed by understanding the macro forces as gleaned from the deployment of an ecosystem mindset. To triangulate forces and trends with substantial influence on marketing practice going forward, we leverage the work from several worldwide leading organizations that study business and societal shifts. Based on concentric levels of outside-in thinking related to 1) marketplace, 2) technological, 3) socioeconomic, 4) geopolitical, and 5) environmental domains, we examine seismic shifts from a marketing-specific lens with guidance from the thought leadership of the Marketing Science Institute (MSI) which bridges marketing academics with practitioners, a broader business strategy perspective via leading global consulting firms McKinsey & Co. and the Boston

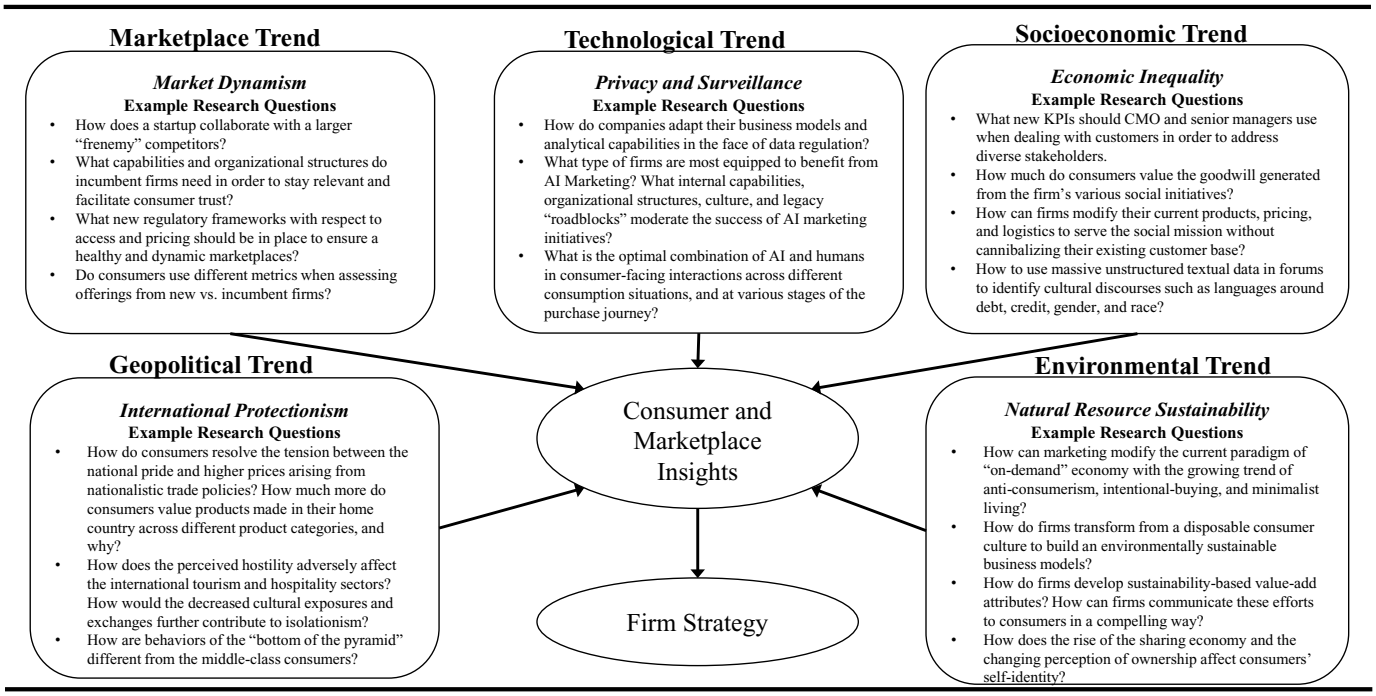

Fig. 3. Megatrends and Directions for Future Research from a Marketing Ecosystem Perspective.

Consulting Group (BCG), a US domestic view via the Pew Research Foundation, and an international view via the Brookings Institution and the United Nations. The role of data in facilitating an ecosystem perspective is our key focus for this paper and is consistent with MSI's recent 2018–2020 Research Priorities titled "Capturing Information to Fuel Growth." MSI's No. 4 priority puts forth that academic research should focus on "approaches to ingesting and analyzing data to drive marketing insights" (Marketing Science Institute, 2018). Using these leading authorities as a guide, we trace five interrelated key developments that are influencing marketing theory and practice at an accelerating rate, summarized in Fig. 3.

4.1. Research publication analysis of the five emergent trends from 1990 to 2018

To underscore growth and opportunities for research pertaining to the five megatrends mentioned earlier, we provide a keyword analysis of the extant research in business literature, as the proportions of articles dedicated to a topic reflect the share-of-thought in a given academic discipline. Obtained from Reuter's Web of Science database and coded using the keywords, titles, and abstracts provided by the authors of published works, we determine the annual proportion of articles published for a given topic by dividing the number of articles about that topic published in a given year across a journal set by the total number of all articles published. Our approach is similar to the procedure examining keywords employed in prior studies of trends and meta-analysis (e.g., Mela, Roos, & Deng, 2013; Watson IV, Worm, Palmatier, & Ganesan, 2015). We organically determined a set of twenty-one keywords for each topic beginning with "business model," "sustainability," "globalization," "data privacy," and "economic inequality," respectively, for each of the trends, and grew the keyword list by noting co-occurring keywords from author-provided keywords, titles, and abstracts (please refer to the complete list of keywords for a topic under its corresponding figure). Based on this analysis for each identified development, we provide a visual representation of their trajectory changes since 1990 in Figs. 4-8 across two sets of publications. The first includes 87,613 articles published in the Financial Times Top 50 journals (FT50) that are representative of influential academic business literature in general. The second represents marketing-specific literature comprised of 16,663 articles across 14 scholarly journals with a 5-year Journal Citation Report Impact Factor greater than 3.0, which we label MKTG3.0. The set of MKTG3.0 journals includes *Journal of Marketing, Marketing Science*, *Journal of Marketing Research, Journal of Consumer Research, Journal of the Academy of Marketing Science*, *Industrial Marketing Management, Journal of Consumer Psychology, Journal of Interactive Marketing*, *Journal of Service Research*, *Journal of Retailing*, *Journal of Product Innovation Management*, *Journal of International Marketing*, *Journal of Advertising*, and *International Journal of Research in Marketing*. By comparing the research focus across general business journals vs. marketing journals over time, we hope to identify 1) gaps between practical relevance and academic focus, and 2) gaps between focus in marketing and general business academies. We subsequently identify influential developments, track their "share-of-thought" trajectory, and discuss implications and future research directions.

4.2. Marketplace trends

The internet and digitization over the past two decades have facilitated significant changes and possibilities in business models – developments that have made the market more dynamic as well as entrenched. As McKinsey notes in their executive summary titled *The Age of Analytics: Competing in a Data-Driven World*, "Data and analytics are changing the basis of competition. Leading companies are using their capabilities not only to improve their core operations but to launch entirely new business models" (Henke et al., 2016, p.3). Likewise, BCG highlights that marketplace opportunity often arises from innovative business models that rely "less on the physical movement of goods and fixed investments in markets, and more on leveraging digital connectivity and ecosystems to expand across borders" (Bhattacharya, Reeves, Lang, & Augustinraj, 2017, p.1). In this vein, the authors identify seven recent business models that alter the global competitive landscape: 1) cross-border servitization, 2) asset-light market entry, 3) value-add through software, 4) global digital ecosystems, 5) global personalization, 6) multilocal manufacturing, and 7) developing multiple national identities.

The network effects of digital platforms are "creating a winner-take-

most dynamic in some markets" (Henke et al., 2016, p.4), which lead to the rise of tech giants that enjoy increasingly large influence on the economy. Newly established companies have access to market intelligence, global market research (e.g., advertising on Facebook and Google), affordable and scalable HR and IT services (e.g., many SaaS programs, cloud computing via Amazon Web Services and Microsoft Azure), diversified startup funding via crowdsourcing (e.g., Kickstarter), and the global explosion of venture capital funding (Brown, Mawson, & Rowe, 2019; Zvilichovsky, Danziger, & Steinhart, 2018). However, the same incumbent providers of these entrepreneurial ecosystems have increasingly concentrated power and thus create an uneven playing field for start-ups. This power asymmetry, in turn, kills overall market dynamism and likely reduces innovative investment in the aggregate (Ofek & Turut, 2008). In response to these developments, rising anti-monopoly sentiments popularly labeled as a "Techlash" are already reflected in the proposed regulations and popular discourse (Scott, 2020, p.1). We label this changing marketplace trend "Market Dynamism."

4.2.1. Publications: market dynamism

Nearly 3 in 10 articles (~30%) published in MKTG3.0 journals are related to market dynamics and changing business models (Fig. 4), which is seven percentage points higher than academic business literature in general (FT50). This topic has experienced steady growth since 1990, with MKTG3.0 journals exhibiting ten-percentage points higher share of published papers than FT50 journals. Attention is warranted, considering that evolving consumer behaviors and market structures have direct implications for marketing practice.

quality applications, which have a relatively high rate of turning into job-creating businesses, have fallen roughly 20% from 400,000 per quarter in 2006 to 300,000 per quarter in 2017 (US Census, 2018). Relatedly, the number of initial public offerings (IPOs) in the United States has declined sharply since its peak in 1996 (Doidge, Kahle, Karolyi, & Stulz, 2018), the cause of which has received considerable attention both in academic and policy circles (Ewens & Farre-Mensa, 2019; Farrell, 2016). At the end of 2017, the roughly 3600 publicly traded companies were half the number listed in 1997 (Ritter, 2018). However, the average size of listed companies had grown considerably. Compounding this is the trend of venture-backed companies exiting via mergers and acquisitions, where just 15% of venture-capital exits involved IPOs, down from 88% in 1991 (Ritter, 2018). The power concentration is further reflected geographically - much of venture funding remains in tech-hubs such as San Francisco, New York, and Seattle. Consequently, the US has experienced higher degrees of industry concentration and fewer numbers of competitors, which reduces market dynamism.

Increasingly, powerful incumbents can undermine or acquire promising start-ups and are beginning to draw the ire of government regulators in industries such as media (Ip, 2018) and tech (Goldstein, 2019). This trend in part has attracted the attention of investors aimed at promising entrepreneurs located outside of Silicon Valley establishments, such as the "Rise of the Rest" $150m venture fund from Revolution Investors (Loizos, 2019). These funds are starting to directly address data disparities among new companies through products and services for small business owners. For instance, ZenBusiness, an Austin, Texas-based SaaS provider, consolidates essential operational services like banking, lending, and tax preparation to those starting

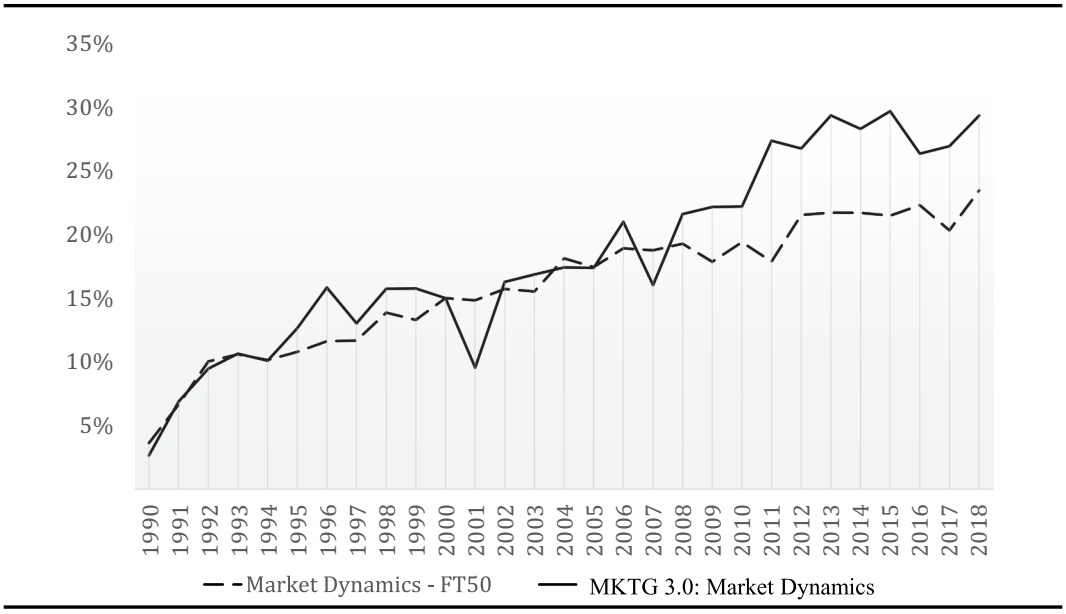

Fig. 4. Proportion of Published Papers by Year: Market Dynamism.
Topic Keywords: "Business model*" or "Business model innovation" or "Business innovation" or "Emerging technology" or "Innovation adoption" or "Innovation management" or "Innovation" or "Business entities" or "Dynamic*" or "Dynamic behaviors" or "Corporate strategy*" or "Market learning" or "Disruptive technolog*" or "Disruption" or "Sharing economy" or "Peer-to-peer" or "Market mak*" or "Open business model" or "New business enterprise*" or "Stakeholder value" or "New product development".

4.2.2. Directions and future research: market dynamism

Despite easier access to data, technology, and funding for entrepreneurs, which all contribute to lowering startup costs, the US self-employment rate (a measure of entrepreneurial activity) has decreased by over 30% over the past two decades (US Bureau of Labor Statistics, 2016). While total business applications gleaned from IRS filings recovered from its lows during the Great Recession, quarterly high-small businesses. Coalescing efforts to recognize the atrophying market dynamism and address competitive disparities raise the following questions:

1. How do start-ups compete with larger incumbents? Given that incumbents have more resources and better access to market intelligence, what capabilities do entrepreneurial ventures need to

develop to compete in the same marketplace as the incumbents?
2. How do startups collaborate with incumbents in "frenemy" situations in order to access the incumbents' channels or use their technology platforms, while avoiding asymmetric dependence?
3. For incumbents, what capabilities, organizational structures, and cultures do they need to embrace to stay relevant, be agile to sense and seize the market, and to engender the trust of consumers who are increasingly aware and wary of monopolistic powers?
4. For policymakers, in addition to anti-trust approaches, given that many startups rely on incumbents' technology and logistics networks, what new regulatory frameworks for access and pricing should be in place to ensure a healthy and dynamic marketplace?
5. Do consumers use different metrics when assessing product and service offerings from start-up vs. incumbent firms? For instance, while large firms offer brand recognition, quality consistency, and often lower prices due to economies of scale, are consumers more forgiving towards small and local businesses?

4.3. Technological trends

The second development reflects the need for firms in competitive environments to gather and use as much detailed consumer data as possible to understand and react to marketplace trends. The advent of wearable, IoT, facial, and voice recognition technologies can generate real-time lifestyle, emotional, and biometric data. However, this big data revolution and the corresponding marketing advancements have also brought about a dark side of data use. Numerous data breaches along with outright corporate misuse of customer data have generated push-back from consumers and regulators. As more and more customer-firm interactions move away from face-to-face into digital interfaces, consumers have become wary of real and perceived data privacy concerns, corporate surveillance, and general human-computer relationships (Martin et al., 2017). According to the Pew Research Center, most Americans (93%) said that "being in control of who can get information about them" is important (Madden & Rainie, 2015, p.5). 86% of internet users have "taken steps online to remove or mask their digital footprints, but many say they would like to do more or are unaware of tools they could use" (Rainie, Kiesler, Kang, & Madden, 2013, p.1). This trend has grown in reaction to the swift growth in data-centric business models and holds significant implications for marketing practices in the future. We label this technological trend "Privacy and Surveillance."

4.3.1. Publications: privacy and surveillance

Despite their regular headline appearances in recent years, consumer privacy and corporate surveillance concerns are surprisingly understudied in both marketing and business literature, with fewer than 3% of recent articles published in MKTG3.0 or FT50 journals (Fig. 5). Whether this is a product of willful ignorance or research myopia, academic research lags both industry and public concerns considerably.

4.3.2. Directions and future research: privacy and surveillance

Considering the consumer reaction to frequent reports of data breaches and corporate mismanagement of private data, it is of little surprise that consumers increasingly utilize counter-surveillance technologies such as ad-blockers, encryption protocols, and virtual private networks (VPNs) that conceal their footprints from data capture. From a policy perspective, the frequency and the magnitude of data breaches warrant significant attention from government regulators, as evidenced by the enactment of the EU's GDPR. Nevertheless, in other parts of the world, governments such as China have used digital technologies to increase the monitoring and tracking of their citizens not only through web and mobile histories but with real-time geolocation and facial recognition to reinforce desired worldviews (Mozur, 2018). Furthermore, we expect that the expanded use of artificial intelligence to marketing contexts will reshape the relationships consumers have with businesses in both the digital and physical domains by reshaping consumer experiences. For example, AI-assisted interactions may facilitate smoother access of customer details with front line salespeople, hyper-individualized recommendations in public retail environments, and autonomous retail (e.g., Amazon Go stores). These innovations could shatter long-held consumer beliefs and habits, result in unintended consequences, and bring to salience the role of humans in an AI-assisted world.

Future questions that address technological development and

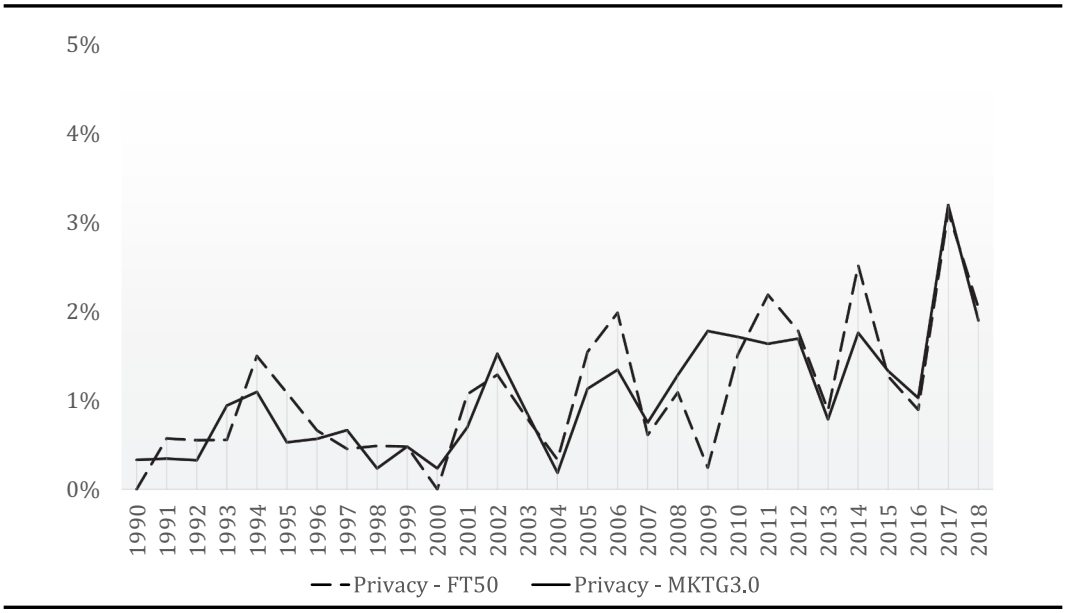

Fig. 5. Proportion of Published Papers by Year: Privacy and Surveillance.
Topic Keywords: "Data privacy" or "Privacy" or "Customer privacy" or "Consumer privacy" or "Surveillance" or "Data breach" or "Privacy rights" or "Right of privacy" or "Personal information" or "Consumer information" or "Customer information" or "Information privacy" or "Data protection" or "Digital privacy" or "Computer privacy" or "Computer surveillance" or "Electronic surveillance" or "Data security" or "Customer data" or "Data security failures" or "Cybersecurity".

privacy concerns include:

1. How do companies adapt their business models and analytical capabilities in the face of data regulation? What is the proper data stewardship for different types of business models? What are novel approaches to obtaining the same customer insights with limited data? What new capabilities must firms develop in the direct and interactive marketing domain, which has heavily relied on rich customer behavioral data?
2. How do tech platforms' privacy encryption initiatives exacerbate criminal behaviors cloaked in anonymity such as child exploitation and hate speech (New York Times 2019a)? How do policymakers weigh the social cost trade-off between privacy protection and potential crimes?
3. How do firms integrate AI-for-marketing technologies (AIM) into their business processes? What type of firms are most equipped to benefit from AIM? What internal capabilities, organizational structures and culture, and legacy roadblocks moderate the success of AIM initiatives?
4. As the customer-firm relationship is traditionally viewed as a concept between human decision-makers, how are relationships different when consumers form relationships with firms based on their interactions with chatbots and algorithms? How do “human-computer relationships” compare with “human-human relationships”? How and when is AI better than human interactions?
5. Research on the phenomenon of “digital detox” and the renaissance of analog products and analog experiences across many product categories (e.g., vinyl records, mechanical watches, the resurgence of print catalogs (Zhang, 2020)). Under which conditions do consumers prefer analog vs. digital offerings, and why?

4.4. Socioeconomic trends

As marketplace shifts facilitated by technological developments have accelerated over the last decade, increasingly substantial economic gains have flowed to concentrations of innovative industries such as tech, finance, and media (Aghion, Akcigit, Bergeaud, Blundell, & Hémous, 2019). Likewise, increasing wage growth has been confined mainly to the fewer, more highly educated workers as the technical skills required to work in finance and tech sectors increased beyond many current levels of worker training (Adler, Florida, King, & Mellander, 2019). Consequently, the US and other developed economies exhibit an increasing bi-furcation of powerful, data-rich and tech-savvy firms and their highly compensated workers, and many more data-poor legacy firms and the shared waning fortunes of their workforce. Part of this can be seen in the ongoing “retail apocalypse” and the continued struggles of traditional manufacturing and heavy industry (Al-Muslim, 2019; Caliendo, Dvorkin, & Parro, 2019).

The Pew Center notes that the wealth gap between America's richest 5% of families increased their wealth level in 1989 from 114 times as much as families in the second quintile to 248 times in 2016 (Horowitz, Ingielnik, & Kochhar, 2020). To attempt to keep up with more affluent peers, both business and consumers have taken on record levels of debt over the past decade - $15.5 trillion in US Non-financial corporate debt, up 52% from its last peak the third quarter of 2008 and worth roughly 48% of US GDP (Rodriguez-Valladares, 2019), and more than $13.8 trillion in US household debt, exceeding its 2008 peak (Federal Reserve Bank Of New York, 2018). This pressing issue is listed as one of the 17 Sustainable Development Goals of the United Nations, which aims to reduce inequality within and among countries (United Nations, 2015, Goal No. 10). We label this socioeconomic trend “Economic Inequality.”

4.4.1. Publications: economic inequality

Published articles related to economic (income and wealth) inequality across both marketing and business academic journals are limited with slow growth. Fewer than 2% of MKTG3.0 journals' recently published articles touch on the topic, which is below the 3% of articles in FT50 journals (Fig. 6). There is a myriad of under-researched consumer and firm implications, including shrinking and shifting consumer segments, product and brand substitution patterns given new budget constraints, changes in consumer self-identity, political polarization and the consequent lack of trust in social interactions and towards certain brands and industries. Given the growing importance of these trends in all areas of business and society, there are enormous research opportunities for both marketing and business academics.

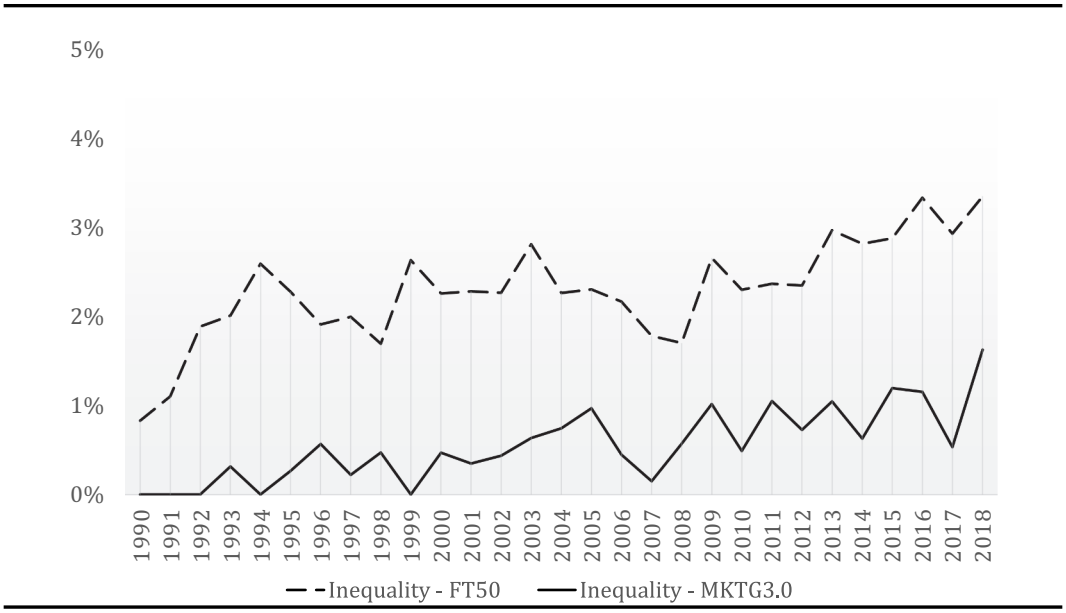

Fig. 6. Proportion of Published Papers by Year: Economic Inequality.
Topic Keywords: "Income inequality" or "Wealth inequality" or “Wealth concentration” or "Corporate monopoly" or "Monopoly power" or “Inclusive growth” or “Gini coefficient” or “Income redistribution” or “Income distribution” or “Social stratification” or “Household savings” or “Wealth” or “Wealth distribution” or “Distribution of wealth” or “Inheritance” or “Bequest*” or “Wealth accumulation” or “Economic inequality” or “Economic justice” or “Economic fairness” or “Poverty”.

4.4.2. Directions and future research: economic inequality

As economic gains flow to an increasingly smaller share of the population, a significant populist backlash has become prevalent in recent years in the United States and around the world. In the US, economic inequality recently reached its highest level since the Census Bureau started tracking it 50 years ago (Semega, Kollar, Creamer, & Mohanty, 2019). In response, there has been growing movement for firms to shift perspectives to a more macro-level stakeholder lens, which accounts for the outside forces that influence their businesses rather than focus only on traditional firm-level concerns. For instance, the, 2019 US Business Roundtable, chaired by JPMorgan Chase CEO Jamie Dimon, released its "Statement on the Purpose of the Corporation" in which maximizing shareholder value was no longer the number one priority, but instead that they shared a "fundamental commitment to all…stakeholders" (Murray, 2019, p.1). Behavioral data can be used to address economic inequality directly (e.g., financing) or indirectly (e.g., EdTech open-source training and personalized education). Marketers can accordingly focus on broadening the data spectrum for their decision-making that takes in macro-level consequences beyond shareholder value, augmenting and rethinking measurements of customer lifetime value (CLV) and profit-maximization with ecosystem-level consequences in mind (e.g., early education in the community, investing in the continued education of their employees to promote upward mobility).

Future research for marketing in the domain of economic inequality can address:

1. What new performance measures should firms use to augment the current profit-maximization objective to satisfy diverse stakeholders? Accordingly, what KPIs should CMO and other marketing managers use when interfacing with customers?
2. What consumer-facing capabilities and structural changes to traditional CRM frameworks should firms develop to achieve a new set of socially-conscious and purpose-driven objectives?
3. As many traditional identities are threatened with waning economic prospects, how do consumers in these situations gravitate towards products and consumption situations to bolster their identity?
4. How much do consumers value firms' various socially-conscious practices (e.g., equitable wage practices, poverty alleviation efforts, and various other CSR efforts)? Do consumers appreciate certain firm CSR initiatives more than others?
5. How should firms build sustainable business models to serve the "bottom of the pyramid" consumers and improve their economic prospects at the same time? How can firms modify their current products, pricing, and logistics to serve the social mission without cannibalizing their existing customer base?
6. How should firms to use unstructured data in the ecosystem to identify cultural discourses such as languages around debt, credit, gender, and race? These insights would enable firms and policy-makers to understand how consumers react to messages from a diverse set of writers and to formulate corresponding strategies for diversity and inclusion.

4.5. Geopolitical trends

As global market access increased, developing economies experienced significant boosts in living standards and market power. This development leads to the rise of global companies from emerging economies (e.g., Alibaba, Tata, Huawei). There is also greater attention to consumers in youthful and dynamic markets such as China, India, Southeast Asia, and Africa, which has challenged incumbent firms in developed economies.

However, rising levels of inequality in the US and other developed economies has led, at least in part, to rising anti-globalization sentiments across numerous populaces, particularly among those who did not experience the promised benefits of globalization. Increasingly, the world is "de-globalizing" as a reaction to the past economic integration of the 1990s and early 2000s and can be seen from the UK's Brexit vote, the US's global trade tensions, France's Yellow-Vest protests, the failure of the Trans-Pacific Partnership, and the rise of China's One-Belt-One-Road initiatives, and most recently, the shutting-down of national borders and the high-profile "finger-pointing" during the 2020 coronavirus pandemic. All of these developments certainly do not bode well for the future of globalization and international cooperation.

Furthermore, these trends reinforce consumer values-based sentiments such as "Made in America" claims or current Korean-Japanese "national security" trade disputes (Balabanis & Diamantopoulos, 2004; Pak, 2019; Varman & Belk, 2009). This global populist trend has risen to a level such that it warranted inclusion in the opening address of UN Secretary-General António Guterres at the 2018 UN General Assembly in which he noted that "the world is suffering from a bad case of 'Trust Deficit Disorder.' People are feeling troubled and insecure. Trust is at a breaking point… Within countries, people are losing faith in political establishments, polarization is on the rise and populism is on the march. Among countries, cooperation is less certain and more difficult" (Guterres, 2018). These shifts in consumer, firm, and government level attitudes have significant implications for marketing. We accordingly label this geopolitical trend "International Protectionism."

4.5.1. Publications: international protectionism

Geopolitical tensions and protectionism have seen a marked increase in both domestic and international policies of the United States, China, Europe, and much of developing world since the Great Recession of 2008 and have accelerated since, 2015, but remain relatively understudied in both general business and marketing literature - these topics are mentioned in 5–8% of total studies in both fields (Fig. 7). In particular, marketing research in this subject has lagged that of general business in the last decade between two to five percentage points. These gaps present an opportunity for marketers to understand both firm-level implications of these developments (e.g., trade disputes, supply chain disruptions and reversals, quality inconsistencies, and incentive structures to engage in long-term planning and international market-entry decisions) as well as consumer-level disruptions (e.g., multiple and incompatible technology formats, nationalistic brand preferences).

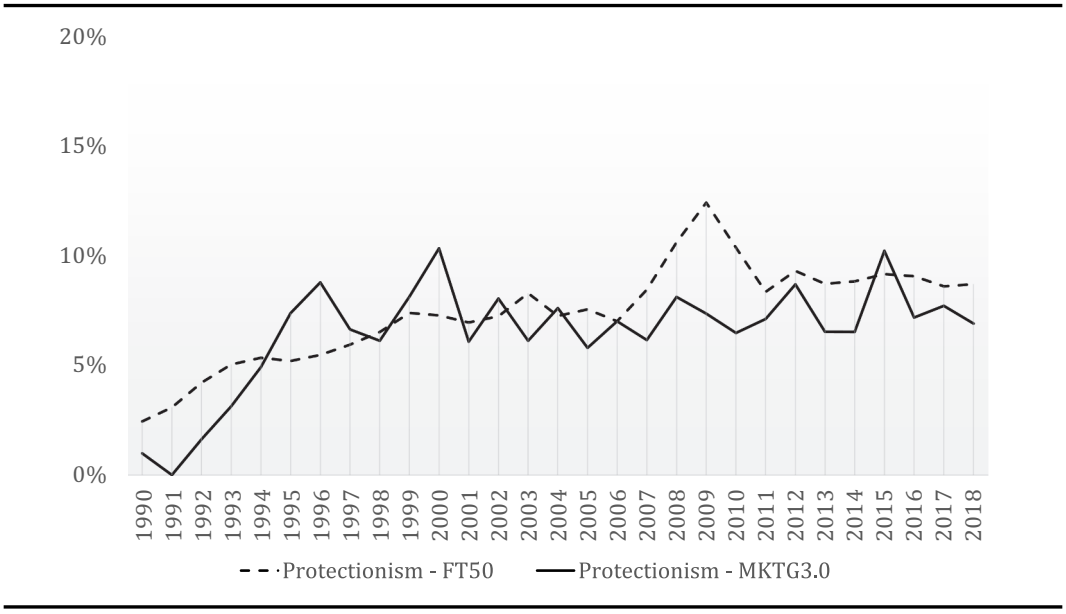

Fig. 7. Proportion of Published Papers by Year: International Protectionism.
Topic Keywords: "Globalization" or "Emerging markets" or "Emerging economies" or "Developing countries" or "Developing economy" or "Developing markets" or "Cultural identity" or "Country-of-origin effect" or "International" or "Ethnocentrism" or "Political ideologies" or "Ideologies" or "Nationalism" or "Nationhood" or "Protest movements" or "Political discourse" or "Social movements" or "Resistance movements" or "Local–global identity" or "Multinational" or "Glocalization".

4.5.2. Directions and future research: international protectionism

Domestic and multinational businesses face the same environment of shifting brand preferences and regulatory disruptions to global supply chains, as governments of advanced economies have responded to each other with increased protectionist policies and reevaluations of trade alignments. The Brookings Institution notes that from 2017 to 2018, worldwide governments introduced over 1000 new policies that "harmed foreign commercial interests," an increase of about 67% from 2016. Compounding this development, the number of new trade reforms during the same period declined by more than 20% percent, reflecting a movement away from the paradigm of global free trade (Evenett & Fritz, 2019). The de-globalization trend is strengthening regional spheres of influence in ways that significantly hinder global commerce, cooperation, and understanding.

Simultaneously, these protectionist movements also coincide with the emergence of the "bottom of the pyramid" consumers newly connected on digital platforms that may add billions of participants to the global economy. Enabled by recently affordable mobile technology, millions of newly empowered consumers emerge to join international trade and market offerings, and their behaviors have rarely been observed and studied before in marketing on such a large scale. However, the deepening balkanization of goods and information can cut off potentially life-changing exchanges for many in the bottom rung to improve their economic, political, and health standings.

Balancing domestic pressures in the face of increasing international protectionism will yield impactful research for marketing strategy and policy implementations for firms operating in the inevitably connected world. Future research questions for marketing in the geopolitical arena can address:

1. How does the media's negative political portrayal of a foreign country affect consumer perception of this country's products? What are the relative effects and the effect duration of different types of news?
2. As higher tariffs make consumer goods more expensive, how do consumers resolve the tension between their nationalist pride and the higher prices arising from protectionist trade policies? Relatedly, how much more do consumers value products made in the home country across different product categories, and why?
3. How does the perceived hostility adversely affect the international tourism and hospitality sectors? Consequently, how would the decreased cultural exposures and exchanges further contribute to isolationism?
4. How are the behaviors of the "bottom of the pyramid" consumers, which constitute a significant portion of the world's population, different from the middle-class consumers often studied in marketing? For instance, what are the product substitution patterns with resource constraints, and media and entertainment consumption patterns? How would these behaviors evolve with higher income?
5. How should firms leverage cost-efficient digital technologies such as mobile apps and IoT devices to remove the cognitive load faced by the "bottom of the pyramid" consumers, reduce the upfront cost of their future-oriented behaviors, and improve their decision making?

4.6. Environmental trends

As living standards increase globally, and as the population continues to grow at regionally uneven rates, counteracting forces exert influences in different parts of the world. On the one hand, increased middle-class consumption and robust population growth in emerging economies (e.g., India, Africa), and on the other, slowing growth and aging population in many developed economies (e.g., Japan, Germany), have taxed thought leaders on corporate sustainability to recognize how business must respond to global natural resource sustainability challenges.

These developments are emphasized by business and international communities. In, 2015, McKinsey partnered with the United Nations to develop the UN Global Partnership for Sustainable Development Data (United Nations, 2015), which in part led to the development of UN's 17 Sustainable Development Goals after the recent addition of "Environmental Sustainability" as one of McKinsey's 13 core business consulting functions. These types of partnerships have resulted in greater awareness of environmental concerns as expressed at the UN's, 2019 Climate Action Summit, which aimed to "deliver new pathways and practical actions to shift global response into higher gear" (United Nations, 2019). The population is expected to increase over the next several decades, albeit unequally across the globe, so we anticipate this trend will only increase in importance going forward. We accordingly label this environment-based trend "Natural Resource Sustainability."

4.6.1. Publications: natural resource sustainability

Over the last decade, between 10 and 15% of articles in MKTG3.0 journals are related to environmental/resource sustainability and are roughly reflective of the trend within general business journals (Fig. 8). However, growth seems to have plateaued since 2008, despite the increased public discourse on climate change related topics. Furthermore, much of the extant research is focused on the firm's production perspective, leaving opportunities to examine customer-centric implications stemming from ecosystem-level factors.

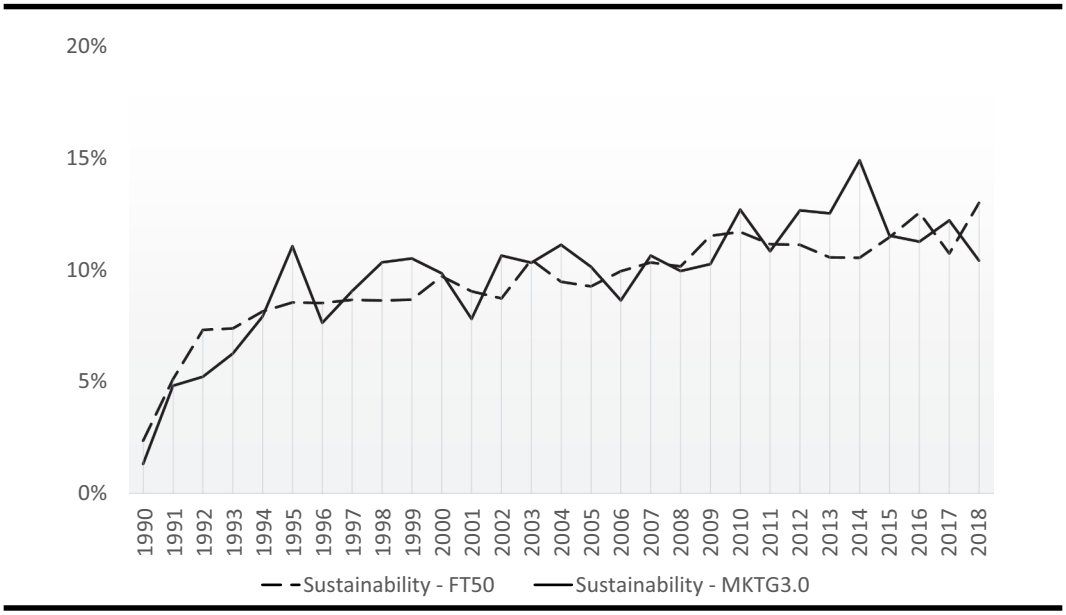

Fig. 8. Proportion of Published Papers by Year: Natural Resource Sustainability.
Topic Keywords: "Sustainability" or "Corporate sustainability" or "Environmental sustainability" or "Environmental management" or "Environmental responsibility" or "Environmental activism" or "Sustainable development" or "Environment*" or "Sustainable innovation" or "Green*" or "Green marketing" or "Green business" or "Green movement" or "Conservation" or "Customer-centric sustainability" or "Ecological sustainability" or "Socio-technical transitions" or "Sociotechnical transitions" or "Climate change" or "Mindful consumption" or "Renewable*".

4.6.2. Directions and future research: natural resource sustainability

Consumers' evolving relationships and expectations for firms and their operational practices are moving beyond "green" marketing to include environmental considerations such as materials and energy sourcing (e.g., wind, solar) and preferences for local products in B2B and B2C spaces that minimize transportation-related environmental impacts. These consumer preferences reflect the growing sentiment in the US, where approximately two-thirds of US adults say that the federal government is doing too little to reduce the effects of climate change, to protect air, and to protect water quality (Funk & Hefferon, 2019). Values-based consumers, especially those from Gen-Z, are demanding greater environmental stewardship from both regulators and corporations.

However, firms face difficulties overcoming collective action for sustainability due to self-interest, economic reasoning, weak actor bonds, and differing perceptions of the issues (Finke, Gilchrist, & Mouzas, 2016). Reflecting on this reality of balancing both consumer adoption of sustainable practices and business implementation difficulties, *Industrial Marketing Management* dedicated a 2014 special issue to "Integrating Marketing and Operations for Business Sustainability" in order to prompt continued work in this area of accelerating importance (Gupta et al., 2014). Nevertheless, areas of inquiry that can effectively address marketing issues related to finite natural resources by leveraging diverse data resources remain substantially underdeveloped. Considering consumer concerns towards resource depletion and the pressing needs for firms to innovate around these concerns, future research in this domain can address:

1. How should firms resolve the cultural tension between the current marketing and business paradigm of minimizing purchase frictions to achieve instant gratification, and the growing trend of anti-consumerism, intentional buying, and minimalist living?
2. What does the term "sustainability" mean for consumers, and how do they value sustainability across various B2B and B2C products and services?
3. How do firms develop sustainability-based value-add attributes (i.e., beyond price, functionality, and quality commonly studied in marketing) such as materials and sourcing? How should firms quantify different sustainability attributes and communicate these efforts to consumers in a compelling way?
4. How do firms innovate in their branding and product strategies to migrate from the disposable consumer culture to building environmentally sustainable business models?
5. As consumers own less and share more, how does the rise of the sharing economy and the changing perception of ownership affect consumers' self-identity, as physical possessions have traditionally been considered as "extensions of the self" (Belk, 2013)?
6. How should firms and policymakers design communication and nudging strategies to encourage consumers to alter their consumption patterns and reduce carbon footprints?

5. Concluding remarks: a call for agile, growth-minded, and epistemologically-modest organizational culture

As the world evolves quickly along many interrelated dimensions, firms' strategies are challenged to expand beyond the immediate technological and competitive factors in the marketplace. Accordingly, firms need to develop capabilities to meet the current need of the market as well as to anticipate how megatrends shape future consumer preferences, market structures, and their competitive standings.

In this paper, we build upon the view of outside-in marketing to propose a holistic and structured perspective for formulating marketing strategy - the "marketing ecosystem" perspective. It explicitly recognizes that marketing as an open and interconnected system of

coevolving actors and forces that affect firms' abilities to sense-make the market and seize opportunities. We have emphasized on the megatrends in the ecosystem that is less studied in marketing. By doing this, we extend the view of outside-in marketing from being micro-focuses to encompass both micro and macro focus.

As we have shown throughout the paper, although the macro factors are conceptually distinct, their developments can be interrelated, and the resulting influence on consumers is often a confluence of multiple factors. Like any ecosystem in nature, the marketing ecosystem should be viewed as a "living" thing, with complex and interdependent parts, and in perpetual motion (Scheffer, Carpenter, Foley, Folke, & Walker, 2001; Walther et al., 2002). It would be difficult, if not impossible, to truly isolate the effects of a single factor (Hooper et al., 2005). For instance, the interrelationships of the various factors ranging from firms' organizational, marketplace, technological, environmental, cultural, to geopolitical, are at full display during the 2020 COVID-19 pandemic and are affecting firms and consumers in all industries worldwide. Whereas in the past many of these ecosystem factors might have been relegated to the domains of corporate social responsibility and goodwill and have been viewed as truly "outside" of the core scope and mission of profit-oriented firms, we argue that consciously incorporating these outside-in ecosystem factors into firms' decision-making will be essential for adaptability and sustainable profitability in an increasingly interlinked and dynamic business environment.

Marketing has long stressed the importance of long-term firm strategy. However, grand multi-year strategy formulations are becoming less and less relevant in the inherently and increasingly volatile and complex environments and can limit adaptability. The management theorist Peter Drucker once said, "culture eats strategy for breakfast." Culture represents the values, customs, beliefs, and symbolic practices that men and women within an organization live and breathe day in and day out (Eagleton, 2016). A resolutely embraced firm culture is as close as it gets to a set of "organizational DNA" that can be reproduced and passed down in the development and sourcing of the next generation of leaders.

Accordingly, the fast-moving and unpredictable characteristics of the marketing ecosystem calls for an organizational culture of agility, humility, and nonlinear thinking. Firms should keep a constant pulse on the ecosystem but also acknowledge and embrace uncertainty in the market, avoid ideological rigidity, and be ready to admit mistakes and adjust or reverse course. Managers should embody the growth mindset as described by the social psychologist Carol Dweck (Dweck, 2008) and a humble attitude of what the writer David Brooks calls "epistemological modesty" (Brooks, 2011) – that society is a complex organism and we cannot fully understand and predict all of its forces. An epistemologically modest attitude also acknowledges that past successes are a combination of sound strategy as well as favorable market conditions and serendipity, and that strategies that worked in the past might not work in the future. As the Nobel-winning psychologist Amos Tversky once said – "he who sees the past as surprise-free is bound to have a future full of surprises."

As digital transformation becomes increasingly democratized, and technological barriers for business excellence continues to drop (Zhang & Hon, 2020a), culture and mindset will play a more significant role than specific technical capabilities which have generated competitive advantages of the past. An agile, broad-thinking, and humble culture can enable firms to develop a more robust outside-in capability which allows them to better market-sense and seize opportunities, and quickly develop specific capabilities that fit into future market needs.

Understanding megatrends often requires decision-makers with different backgrounds, training, and viewpoints. Thus, the ecosystem perspective calls for a management culture of interdisciplinary formulation of marketing strategies. Likewise, future marketing and business leaders should be exposed to liberal arts in addition to possessing technical and business skills, in order to harbor a humanistic and holistic view of the consumer and of the marketplace, informed by history.

One open question is why so many modern organizations with strong analytical abilities and outside-in perspective are still surprised and sidestepped by missed market opportunities and unexpected events. This puzzle presents a limitation of the current research and suggests that the market success of an organization cannot be solely determined from a marketing lens. Within an organization, marketing is just one function with its limited resources and boundaries. Factors such as reward structure, organizational structure, the power of the various executives, and the integration and collaboration of different functional units all contribute to whether a marketing ecosystem mindset can be adopted successfully and executed coherently. These are important areas of future research. It calls for "boundary-breaking" research programs and the involvement of scholars from diverse disciplines as well as multiple research stakeholders such as managers and policymakers - a sentiment echoed by the marketing academic community (Moorman, van Heerde, Moreau, & Palmatier, 2019; Simonson, Carmon, Dhar, Drolet, & Nowlis, 2001; Zeithaml et al., 2020).

Finally, we once again emphasize that as the world becomes wealthier (Brookings, 2018; Forbes, 2015; O'Toole, 2013), as inequality widens, and as natural resources become depleted, a daunting challenge for firms of all types is how to balance the profit-maximization mantra of capitalism with responsible growth and meaningful impacts on society (Zhang & Hon, 2020b). Consumers demand it, the world needs it, and businesses' continued relevance and survival depend on it. Marketing and business communities need to deeply reflect on their worldviews – how they comprehensively see and envision the world across economic, social, and political borders, and think about the purpose of their existence beyond profit, growth, and shareholder value. Solutions to this challenge require cultural and policy paradigm shifts (Aragon-Correa, Marcus, & Vogel, 2020) informed by the outside-in, an awakening to "enlightened capitalism" (O'Toole, 2019) beyond idealistic and theoretical discussions, and sustained and concerted efforts from society's multiple stakeholders. This process will not be easy, but there needs to be no tension between the various objectives. Reconciling social benefits with consumers' interests in mind and with growing profits for the firm is only a matter of the right mission and values.

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