

Too much of a good thing? An assessment of the effects of competitive and cooperative action repertoires on firm performance

Action
repertoires and
firm
performance

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Abstract

Purpose – The purpose of this study is to integrate research on competitive and cooperative repertoires and to simultaneously assess the direct, indirect and curvilinear effects of competitive and cooperative action repertoires in relation to firm performance.

Design/methodology/approach – The analyses are conducted using a longitudinal dual-industry sample of publicly traded firms, including over 6,500 competitive actions and 750 cooperative actions. The authors use fixed effects (FE) regression models to test the diminishing returns of action volume on firm performance as well as the moderating effects of action diversity.

Findings – The results suggest that increasing competitive and cooperative actions yields diminishing returns in relation to firm performance. Furthermore, in the context of competitive action repertoire diversity, increased diversity magnifies the diminishing returns of competitive action volume on firm performance.

Originality/value – The study provides a firm-level conceptualization of overall competitive and cooperative repertoires to extend the literature on competition and cooperation beyond dyadic interactions or structural determinants of competitive and cooperative actions.

Keywords Competitive repertoires, Alliance portfolio, Competitive dynamics, Attention-based view

Paper type Research paper

1. Introduction

Strategic management scholars have spent considerable time investigating the performance implications of competitive and cooperative action repertoires (Ketchen *et al.*, 2004; Smith *et al.*, 1995). Competitive actions are directed at or in response to rivals, including new product launches, marketing campaigns and pricing changes (Ferrier *et al.*, 1999). Firms in the mobile device industry, for example, invest in technologies, pricing plans and initiatives and other services to gain or protect markets from rivals. Cooperative actions, in contrast, refer to forming and maintaining interorganizational relationships (IORs), such as distribution agreements, partnerships and alliances between firms (Wassmer, 2010). These cooperative actions occur across a variety of contexts and can focus on increasing market share, entering new markets or gaining new knowledge in different markets and industries.

As research has investigated competitive and cooperative action repertoires, two largely separate streams of inquiry have emerged. The stream involving competitive action repertoires traditionally draws from theory on competitive dynamics to assert that the more firms engage in competitive actions, the stronger the chances that they will outperform rivals (Chen and Miller, 2015). The evidence largely supports this assertion; firms with more



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voluminous repertoires or aggressive competitive activity—especially when actions are complex and harder for rivals to understand—tend to outperform rivals (Connelly *et al.*, 2017; Ferrier *et al.*, 1999). The stream involving cooperative action repertoires draws from a variety of theoretical perspectives to describe key implications of engaging in IORs (Parmigiani and Rivera-Santos, 2011), such as revenue growth, accelerated technological development and cost reductions (Geyskens *et al.*, 2006; Jiang *et al.*, 2010). Further research on alliances and cooperative activity has found that a firm's volume and structure of its overall alliance portfolio, as well as the managerial skills and abilities focused on managing alliance portfolios, also shape performance (Luvison and de Man, 2015; Wassmer, 2010). This shift in focus from individual IORs to addressing a firm's overall cooperative action repertoire parallels the similar shift in analysis from individual competitive actions to competitive action repertoires.

Despite progress in these two streams of inquiry, one key issue is that extant action repertoire research primarily investigates competitive *or* cooperative action repertoires independently and how these repertoires shape performance as direct and linear relationships (Chen, 2008). While these findings provide insight into the independent performance implications of these actions, recent research has suggested that the effects of such actions have boundary conditions (Lahiri and Narayanan, 2013) and are complex (e.g. Connelly *et al.*, 2017). Yet integrative research that models competitive and cooperative action repertoires simultaneously at the firm level and assesses nonlinear relationships among these key actions of interest has been limited. Second, extant research often focuses on whether action volume *or* action diversity shapes performance; however, it typically does not investigate whether volume *and* diversity within action repertoires have contingent performance effects. Thus, it is unknown whether firms perform better when they engage in fewer or more actions when actions are also diverse. Considering the majority of empirical research has examined competitive and cooperative action repertoires independently and largely focuses on the direct effects of portfolio characteristics (Chen, 2008), the existing literature provides only a partial view of how competitive and cooperative action repertoires influence firm performance where these seemingly contradictory actions are often simultaneously deployed. Furthermore, whereas coepetition research has primarily examined the interactive effects of competitive and cooperative actions within dyadic relationships and structural networks (Bengtsson and Kock, 2014), research examining competitive and cooperative action repertoires simultaneously has seen less attention.

Given these opportunities for further clarity regarding the performance implications of competitive and cooperative action repertoires, this study seeks to make two key contributions. First, the empirical model simultaneously assesses the independent effects of competitive and cooperative action repertoires to investigate curvilinear and contingent performance effects in relation to two key action repertoire characteristics – action volume and action diversity. The curvilinear assessment of distinct competitive and cooperative action repertoires serves to integrate and extend the independent findings in competitive and cooperative action repertoire research, while also assessing indirect effects to examine interactions among action volume and diversity. Second, the empirical model is conceptually derived from the resource management literature (Penrose, 1959) and the attention-based view (ABV) of the firm (Ocasio, 1997). The ABV suggests that managers possess, focus and direct finite physical and cognitive resources, which enables theorizing of why these actions have nonlinear effects (i.e. diminishing returns) and explains why action volume and diversity have contingent performance effects. In doing so, the present study offers a new theoretically grounded perspective explaining how physical and cognitive constraints present boundary conditions when engaging in actions and why engaging in competitive and cooperative actions might only enhance firm performance up to a point.

2. Theory and hypotheses

2.1 *Competitive and cooperative action repertoire limitations*

Although prior research provides evidence that competitive and cooperative actions independently influence performance (Chen and Miller, 2015; Lee *et al.*, 2017), a more inclusive and nuanced model that examines competitive and cooperative action repertoires simultaneously can provide a more holistic view of how such repertoires concurrently influence performance (Chen and Miller, 2012). One research stream that has examined competition and cooperation integratively is found in the literature on cooptition. Cooptition researchers have provided valuable insight regarding when, how and with what effects firms engage in competitive and cooperative actions, the relational constraints of a dyadic interaction and the network-based structural determinants of actions among specific rivals and peers (Bengtsson and Kock, 2014). However, there has been limited focus on the firm's holistic repertoires of competitive and cooperative actions across all markets and relationships (Andrevski *et al.*, 2016). Considering competitive and cooperative action repertoires often span multiple markets and diverse relationships, research simultaneously assessing competitive and cooperative action repertoires characteristics is necessary beyond existing structural and relational assessments in the extant cooptition literature (Huang and Chang, 2019). At present, however, a firm-level conceptualization of competitive and cooperative action repertoires as concurrently managed and leveraged repertoires has yet to be fully developed.

As organizations engage in increasingly voluminous and diverse repertoires of competitive and cooperative actions, it is likely that managerial resources within the firm will become strained and potentially misappropriated (de Leeuw *et al.*, 2014; Kilduff, 2019; Penrose, 1959). While competitive aggressiveness is often viewed favorably, engaging in competitive actions that exceed the managerial capabilities and resource availabilities within the firm is likely to lead to lower levels of performance due to these constraints (Connelly *et al.*, 2017). Similarly, while alliances often open up new opportunities for firms, the ability to devote and structure resources for value creation and appropriation within alliances is likely contingent on the quality and availability of resources devoted to managing alliances (Jiang *et al.*, 2010). As these competitive and cooperative actions increase, firms that fail to increase their commitment of physical and cognitive resources toward these actions are likely to experience poorer performance. While resource constraints may limit performance when actions are voluminous and diverse, knowledge and skills gained in specific competitive and cooperative actions are likely valuable in highly related contexts; however, as the volume and diversity of actions increase, the ability of managers to effectively take individual actions is likely to become strained due to an incongruence of contexts, increased coordination costs and lack of resource alignment (Weick and Sutcliffe, 2008). As such, it is important for firms to assess situations for contextual similarity and direct managerial attention toward enhancing the utilization of finite resources within the firm.

2.2 *The attention-based view of the firm*

At its core, the ABV aims to clarify how organizations and individuals manage, direct and focus the finite resource of attention (Ocasio, 2011; Ren and Guo, 2011). Within the ABV literature, scholars have emphasized the importance of the focus of attention – the explicit identification of factors important to the firm (Nadkarni and Barr, 2008), the extent to which attention is focused on one or multiple factors (Bouquet and Birkinshaw, 2008) and the ability of firms to adapt the focus of attention to suit the changing demands of the organization and environment (Ocasio *et al.*, 2018; Salvato, 2009). In relation to the selection, management and enactment of competitive and cooperative action repertoires, attention represents a relatively flexible – yet finite – resource that is available to engage in a variety of competitive and

cooperative opportunities. Drawing from research focused on the management of physical and cognitive resources when engaging in competitive and cooperative actions, we integrate the relatively independent competitive dynamics and alliance portfolio literature to further examine the simultaneous impacts of focused and situated resources in the context of competitive and cooperative actions.

While the ABV literature has traditionally emphasized attention toward issues (e.g. problems, opportunities and threats) (Ocasio, 1997), the focus and management of available attention is important in the way in which firms take competitive and cooperative actions. Managerial attention shapes, for example, how new technology can be deployed in the implementation and commercialization of related products (Eggers and Kaplan, 2009; Kaplan, 2008). Similarly, the availability and focus of managerial attention has recently been proposed as an important determinant of a firm's ability to identify and respond to the actions of direct and indirect rivals in the market (Kilduff, 2019). In the context of cooperative actions, attentional constraints have been suggested to limit the innovation outcomes associated with a firm's alliance portfolio, implying managerial attention is often strained when presented with multiple diverse opportunities (de Leeuw *et al.*, 2014). We assert that although the relationships between attention and competitive and cooperative actions have been previously investigated independently, the ABV sheds additional light on the extent to which these actions simultaneously impact firm performance. At present, research examining the effects of attention on competitive and cooperative actions simultaneously has been limited.

While the ABV has been leveraged to assess the impact of attention on competitive and cooperative actions independently, the effects of attentional constraints are likely to be magnified when both action types are taken into consideration simultaneously. Indeed, competitive dynamics research has suggested that the availability and direction of attention within an organization affects how firms identify and respond to rivals and also the types of actions enacted based on the attention of managers within the firm (Kilduff, 2019; Ridge *et al.*, 2017). Similarly, researchers interested in cooperative actions have found that while alliance management capabilities increase with experience, attentional constraints limit the extent to which the firm is capable of maximizing value across a larger alliance portfolio (Moghaddam, *et al.*, 2016). Considering the attentional demands of competitive and cooperative actions, along with the potential for conflicting demands for attention within the firm, the ABV provides a foundation for understanding how attentional constraints within the firm are likely to impact the effectiveness of a firm's competitive and cooperative action repertoire management.

2.3 The diminishing returns effect of action volume on firm performance

Extant research suggests that competing aggressively via numerous competitive actions provides firms with additional market opportunities and can thwart rivals (Nadkarni *et al.*, 2016). Similarly, engaging in additional cooperative relationships offers firms new market entry and learning opportunities that might not exist outside of these relationships (Dyer and Singh, 1998). Within the competitive dynamics literature, for example, it has been argued that firms that fail to engage in similar volumes of competitive actions relative to peers risk becoming obsolete (Derfus *et al.*, 2008). Similarly, cooperative action research has suggested that increasing the number of relationships with other firms will yield positive performance outcomes for the focal firm (Ahuja, 2000).

While both streams of inquiry note the positive outcomes of competitive and cooperative actions, a firm's ability to effectively manage voluminous repertoires of actions might be limited for a variety of reasons. Drawing from earlier work on bounded rationality (Simon, 1991), the ABV proposes the focus and the situated nature of attention impact how well firms

are able to effectively engage in actions or address issues (Ocasio, 1997). Because of this, the firm's ability to effectively focus on actions and issues is largely limited by the availability and quality of attention within the firm (Levinthal and Rerup, 2006; Weick and Sutcliffe, 2006). The effects of focus and situated attention appear important when a firm is engaging in high volumes of competitive activity. Indeed, recent competitive dynamics research suggests that competitive actions or responses to rivals are often a trade-off due to attentional constraints (Kilduff, 2019). While a firm may want to engage in limitless competitive actions, the ABV suggests an upper limit on a firm's ability to effectively manage these actions due to the finite nature of attention within the firm.

Regarding cooperative actions, firms identify, assess and manage IORs to maximize the value associated with their ties to other firms. While firms may be able to improve IOR outcomes by focusing attention, a firm's limited capacity of attention would suggest that engaging in too many cooperative actions may have the opposite effect (Lahiri and Narayanan, 2013) by increasing coordination costs (Gulati *et al.*, 2012) and, ultimately, shaping the relationship between cooperative action volume and performance (Rothaermel, 2001). Furthermore, as volume of cooperative actions increases, a lack of attention leads to routinization and an overreliance on heuristics such that it hinders a firm's ability to capture value from new and existing cooperative IORs (Heimeriks, 2010; Moghaddam *et al.*, 2016; Siggelkow, 2001). The challenges and risks associated with individual IORs are likely to be further amplified when they are examined holistically at the firm-level among a larger repertoire of cooperative IORs.

While focused resources and attention are likely to help improve performance of competitive and cooperative action repertoires, when the number of competitive and cooperative actions that a firm takes exceeds its physical and attentional resources, the benefits from additional actions are likely to yield diminishing returns. As a firm directs attention toward high volumes of actions, with each action situated in unique contexts with its own distinct characteristics, it creates resource limitations and challenges for focusing sufficient attention. Not surprisingly, the insufficient attention, in turn, constrains the firm's ability to effectively manage the volume of actions. Following this logic, as a firm simultaneously increases the number of competitive or cooperative actions, the positive performance benefits reach a point at which there are diminishing returns. Stated formally,

- H1. The effects of competitive actions on firm performance are characterized by diminishing returns, such that, at higher volumes of activity, the positive performance implications of action volume decrease.
- H2. The effects of cooperative actions on firm performance are characterized by diminishing returns, such that, at higher volumes of activity, the positive performance implications of action volume decrease.

2.4 Moderating effects of action repertoire diversity

When firms engage in higher volumes of actions, they often continue using the same or related actions that have been used in the past. This similarity allows firms to leverage prior knowledge as well as aligning actions with the firm's existing resources and capabilities, thus improving processes and resource management (Ndofor *et al.*, 2011). Furthermore, heuristics that have been developed in similar contexts increase the effectiveness with which firms are able to address and leverage related actions (Bingham *et al.*, 2007). At high levels of action diversity, however, firms may fail to adapt their processes and management to align with the new types and compositions of actions. From an ABV perspective, an increase in diversity or new contexts may result in a failure to accurately assess the unique challenges associated with effectively leveraging distinct issues, situations or action types based on existing, rather than previously defined and experienced, contexts and frameworks (Bingham *et al.*, 2007).

More recently, managerial attention has been found to play a significant role in shaping how organizations leverage prior experiences and learning to determine actions in highly competitive environments (Vecchiato, 2020). Based on attentional constraints and challenges, highly diverse actions in the context of high volumes of activity may amplify the diminishing returns effect due to the potential for managers to fail to devote attention to the unique action characteristics and market contexts.

Despite lower levels of performance at high levels of diversity and volume of activity, action diversity may lead to higher performance at lower action volumes. By engaging in a low volume of diverse competitive actions, firms appear better equipped to focus sufficient resources and attention and thus develop and capitalize on resource and managerial competencies (Ndofo et al., 2011). Apple's focus on a consolidated portfolio of integrated products represents a stark contrast to the traditionally fragmented market approach of many large-scale technology competitors. Rather than engaging competitors on multiple fronts with dozens of product lines, Apple's relatively consolidated product portfolio offers them more control, better managerial knowledge of existing markets and a more focused scope for higher performance. Considering the challenges of managing both voluminous and diverse actions, the action volume–performance diminishing returns relationships described above might be amplified at high levels of competitive action diversity, such that higher levels of action diversity will lead to greater diminishing returns at high levels of action volume. Stated formally, we predict that

- H3.* The diminishing returns effect of competitive action volume on performance will be moderated by the diversity of competitive actions, such that the diminishing effects will be amplified when competitive actions are diverse.

Diverse alliance portfolios offer firms a number of performance-enhancing benefits, such as new market entry, improved product development and the integration of new knowledge into the firm (Deeds and Hill, 1996; Vasudeva and Anand, 2011). While firms with a small number of similar alliances may benefit from similarity of context and focus, these benefits may lead to incremental growth in existing related markets rather than entering new markets with greater growth potential. Mixed findings in the existing research (e.g. Jiang et al., 2010; Wassmer, 2010) suggest that the benefits of cooperative action diversity are limited to situations where cooperative actions are fewer, thus allowing the firm to effectively focus attention, manage scarce resources and maximize the value of the overall set of cooperative actions without exhausting cognitive resources within the firm. Thus, the performance effects of cooperative repertoire diversity are likely contingent on the level or volume of overall cooperative activity.

As firms engage in higher volumes of diverse cooperative actions, however, the diminishing effects of cooperative action volume may be amplified by the increasing diversity of the action repertoire. While learning increases effectiveness of cooperative engagements (Anand and Khanna, 2000), prior learning in such engagements is most valuable when applied to similar cooperative relationships in a relatively smaller and homogeneous repertoire of relationships (Reuer et al., 2002). This would indicate that, in voluminous cooperative repertoires characterized by diverse industry partners, the resources and attention gained from prior IORs may be nontransferable when the alliance contexts are dissimilar. Indeed, prior research examining the direct effect of building alliances outside of a firm's primary industry suggests that the cognitive distance between industries creates additional attentional demands, potentially yielding lower levels of performance due to the dissimilarity of experiences and contexts (Filiou and Massini, 2018).

Furthermore, whereas learning helps improve performance when the cooperative actions are similar, it is also possible that the "lessons learned" are less transferable to dissimilar contexts due to an overall asymmetry of resources, demands and needs across situations

(Bingham *et al.*, 2007; Heimeriks, 2010). Increasing the volume *and* diversity of cooperative actions creates additional coordination and integration costs, making it more challenging to extract value from the firm's overall cooperative action repertoire (White and Siu-Yun Lui, 2005). At high volumes, physical and cognitive resources are stretched thin under the demands from multiple alliances, while also being pulled away from core functions of business to managing IORs with partners (Lahiri and Narayanan, 2013; Rothaermel, 2001). These challenges are likely further amplified in repertoires characterized by voluminous, unrelated IORs.

In summary, when firms engage in low levels of cooperative action, a diverse repertoire of cooperative actions allows the firm to enter new markets and gain new knowledge to improve overall performance and outperform firms with fewer, homogenous, actions. As cooperative action repertoire volume increases, however, more diverse actions make it difficult to effectively transfer prior learning and minimize coordination costs. Thus,

- H4. The diminishing returns effect of cooperative volume on performance will be moderated by the diversity of cooperative actions, such that the diminishing effects will be amplified when cooperative actions are diverse.

3. Methods

3.1 Sample

We leverage a stratified random sample of 15 medical device manufacturing and 15 oil and gas field services; all firms are in the United States and publicly traded. These industries were selected due to the diversity of firms, the voluminous and diverse nature of competitive and cooperative actions within these industries and their relationship to previously studied industries in related research. Similar to the steel industry examined in previous research on competitive and cooperative actions (Madhavan *et al.*, 2004), the oil and gas field service industry is characterized by established firms with extensive cooperative alliances and competitive actions. Furthermore, the medical device industry was selected as an extension of the thoroughly researched biopharmaceutical industry often tested in related research (Rothaermel, 2001). Taken together, the sample contains over 6,500 competitive actions and over 750 cooperative actions from 2004 to 2012 for an initial sample of 270 firm-year observations.

3.2 Dependent variable

Because researchers have suggested that competitive and cooperative actions are positively related to profitability measures of *firm performance* (Chen and Miller, 2012; Wassmer, 2010), we use annual return on assets (ROA) as the measure of firm performance. This is in line with extant measures in competitive and cooperative action research (Dermis *et al.*, 2008; Lavie, 2007; Ndofo *et al.*, 2011).

3.3 Independent variables

Considering our primary focus on a holistic assessment of competitive and cooperative actions, we assess two key measures – action volume and diversity – associated with a firm's competitive and cooperative action repertoires. Extant research in both competitive and cooperative contexts has suggested the importance of a holistic repertoire or portfolio view of competitive and cooperative actions (Connelly *et al.*, 2017; Wassmer, 2010). This repertoire view of firm actions examines a firm's competitive and cooperative actions in totality and provides a unique view of the summation and composition of a firm's competitive and cooperative actions across various distinct contexts, markets and types. Rather than viewing

the independent effects of individual actions, the repertoire view suggests the importance of a firm's overall actions in relation to firm performance. Below we discuss the operationalization of our measures of action repertoire volume and diversity.

Our measure of *competitive actions* is taken from the RavenPack database, which tracks over 30,000 entities and businesses in the media and collects firm actions down to the millisecond. Early research leveraging RavenPack has mainly been conducted in finance and accounting assessing the extent to which media reports of firm actions influences investor actions (Shroff *et al.*, 2014); however, recent research in strategic management has also leveraged the dataset to assess competitive action repertoires of firms (Connelly *et al.*, 2017). Research has shown a strong correlation of RavenPack data with the news reports found in Factiva – a more common data source in management research – at 94.7% for press releases (Shroff *et al.*, 2013). RavenPack data continuously scans over 19,000 publications and trade journals, including Dow Jones Newswires and the *Wall Street Journal*, and codifies these articles for both content and uniqueness. Competitive action types include new product releases, production expansion, executive changes and acquisitions, among a variety of other competitive actions. Similar to the categorization of action types in extant research (Connelly *et al.*, 2017; Ferrier and Lyon, 2004), our measure of competitive actions is a count of headlines/articles referencing unique competitive actions across nine categories for a given firm year: acquisitions, capacity, executive changes, legal, market-growth, pricing, marketing, product development and signaling efforts. For example, the introduction of a new car model by Ford, Amazon's acquisition of Whole Foods or Starbucks entering a new international market would all be examples of competitive actions. While prior research efforts relied heavily on hand coded headlines and articles for competitive actions, RavenPack algorithms code and categorize articles based on the nature of the firm's actions reported in the article.

Cooperative actions were also assessed based on prevailing measures in extant research and supplemented by identifying actions from news reports of cooperative behavior. The SDC Platinum database captures measures of formal and official cooperative agreements between firms, specifically joint ventures and alliances. For example, Ford and Google developing a joint venture to develop and test autonomous vehicles would represent a formal partnership between firms captured by the database. While this database captures most of the firms' cooperative activity, it fails to capture the entirety of such activities. Similar to earlier alliance research (Lavie, 2007), the SDC data were supplemented by collecting and analyzing news reports from the Lexis-Nexis database over the sampling period. Reports are coded as cooperative activities if they referenced engagements between a focal firm and another firm or group of firms. For example, references to a distribution agreement between two firms or joint research and development projects are coded as cooperative actions, as are other situations where two or more firms are working together. Given this, the measure of cooperative actions is a count of cooperative actions of the firm in the sample for each firm-year observation.

For *competitive action diversity*, a Shannon Index was calculated for each firm-year observation to assess the extent to which a firm engages in similar or diverse competitive action types. Originally a measure of information entropy when analyzing strings of text (Shannon, 1948), the Shannon Index has been used within the strategic management literature as a measure of diversity that captures the breadth and distribution of a firm's overall competitive action repertoire (Connelly *et al.*, 2017). The Shannon Index is calculated as follows:

$$\text{Shannon Index} = - \sum_{i=1}^S p_i \ln p_i$$

where S represents the total possible number of categories of competitive actions and p_i is the ratio of competitive actions belong to the i th competitive action category (Connelly *et al.*, 2017). Considering the measure captures not only the range and count of competitive action types in a repertoire but also the relative homogeneity or heterogeneity of the overall repertoire, the Index is particularly useful for assessing diversity of a firm's overall competitive repertoire and comparing these levels of diversity across different volumes of overall competitive activity. For example, a firm with a high volume of pricing actions but few other action types would have lower competitive action portfolio diversity than a firm with a moderate volume of overall competitive activity spanning multiple competitive action categories such as pricing, acquisitions, marketing and product development. A high Shannon Index indicates a highly diverse repertoire of competitive actions, whereas a low Shannon Index indicates a homogenous repertoire of similar actions.

For *cooperative action diversity*, cooperative relationships were coded based on SIC code overlap to assess the industry diversity associated with the cooperation actions of the firm. Paralleling the definition of competitive actions as identifiable actions, we seek to understand how the market diversity of cooperative actions manifests as an overall repertoire of such activities. To capture the industry diversity of partners, the overlap of SIC codes of the firms were collected and coded in the cooperative agreements. A total of five categories were created based on the level of overlap, ranging from partners sharing zero to four digits on the firm's primary four digit SIC codes (Collins, 2013; Jiang *et al.*, 2010; Tao *et al.*, 2015). Firms sharing four digits of their primary industry SIC code would indicate a highly related cooperative action, whereas firms sharing zero digits of their primary industry SIC code would indicate a highly unrelated cooperative action. Paralleling our measure of diversity in competitive actions, we calculated the Shannon Index to assess the diversity of a firm's overall cooperative action repertoire for each firm-year observation. A low Shannon Index suggests cooperation with mostly market peers or partnerships with highly related firms, whereas a high Shannon Index suggests a firm's cooperative action portfolio is characterized by alliances with firms in both similar and different industries.

3.4 Controls

Our empirical analysis is conducted using standard panel-data methods, with firm-level fixed effects (FE). While some potential confounding factors such as industry and year effects are controlled by leveraging a dual industry sample, within industry and firm-level factors still need to be controlled (Deephouse, 2000). Available resources are suggested to influence the competitive and cooperative actions of a firm (Chen and Hambrick, 1995). Consistent with extant competitive action research (Connelly *et al.*, 2010), *firm size* is measured as the log of total employees, and the availability of *slack resources* is measured as the log of the firm's current ratio, calculated as current assets over current liabilities (Sheaffer *et al.*, 2009). As a firm's prior performance may also influence the volume and diversity of the firm's action repertoire, the analyses also control for prior firm performance (Miller and Chen, 1996) by the FE model in the analyses (Wooldridge, 2010).

As executive backgrounds can impact competitive and cooperative actions (Hambrick *et al.*, 1996), the analyses control for the size, characteristics and diversity of top management team (TMT) members. TMT characteristics have been suggested to have a significant impact on the availability and allocation of attention within the firm (Ridge *et al.*, 2017), thus we control for these effects when examining the relationship between actions and firm performance. *TMT size* is measured (the number of reported TMT members) and controlled due to the potential for larger TMTs to have more attention to devote to competition and cooperation (Haleblian and Finkelstein, 1993). TMT firm tenure and TMT age diversity are calculated using the coefficient of variation (SD divided by the mean) (Carpenter and

Fredrickson, 2001). Due to the categorical nature of functional background and the traditional measurement of TMT characteristics in the existing literature, a Blau index was calculated to assess the diversity of functional domains of TMT members (Ferrier and Lyon, 2004; Nadkarni *et al.*, 2016). Blau index scores range from 0 to 1, with a high Blau index suggesting a diverse range of TMT functional backgrounds. In sum, *TMT diversity* is measured as diversity across the following individual TMT characteristics: firm tenure, age and functional background heterogeneity.

4. Results

4.1 Hypothesis testing

Due to the longitudinal nature of the dataset, the relationships of interest are tested using FE regression models. In line with extant research involving the analysis of interactions and indirect effects across various scales and measures, standardized coefficients are reported for the variables in the analysis (Ferrier and Lyon, 2004; Rindova *et al.*, 2010). After accounting for missing data and ensuring appropriate measurement across all variables of interest for each firm-year observation, the final sample consisted of 238 firm-year observations. The descriptive statistics and correlations are presented in Table 1. As a broad summary, the average ROA of firms in the sample is 6.08%, and the average competitive and cooperative actions of firms show relatively voluminous and diverse repertoires of competitive and cooperative action.

While firm size and slack resources have often been suggested to predict firm performance (Carnes *et al.*, 2019), the results from the control model suggest that these variables are not significantly related with ROA. This is consistent with findings in similar studies assessing competitive and cooperative action diversity, suggesting that the possession of slack resources and scale are insufficient means for generating higher levels of performance (Ferrier and Lyon, 2004; Luvison and de Man, 2015). Organizations seeking to capitalize on resources and size are dependent on their ability to transform and apply these resources through competitive actions to generate higher levels of performance (Ndofof *et al.*, 2011). This ability is also contingent on the TMT's ability to coordinate, focus and allocate attention to effectively manage actions for higher levels of performance (Ridge *et al.*, 2017). We also find that TMT tenure diversity is the only significant control variable of the TMT characteristics we examined, suggesting a TMT with a greater diversity of firm tenure negatively impacts firm performance. This suggests that TMT conflict arises and hinders performance when there are conflicting perspectives provided by long-tenured TMT members and more recently appointed TMT members. In essence, whereas a diverse TMT likely provides a broader range of attention, insight and capabilities when engaging in strategic actions, this type of diversity may also create additional challenges when selecting, coordinating and implementing strategies among a diverse group of TMT members (Hughes-Morgan, *et al.*, 2018).

To test the direct curvilinear and moderated relationships, we utilize Stata's time series regression tools. These results are presented in Table 2. When testing the diminishing returns, it is necessary to test both linear and quadratic terms of the independent variable to determine if there is a significant fit between the data and a curvilinear model (Dawson, 2014). In analyzing the curvilinear relationships, an additional model is necessary to test whether or not the squared coefficients significantly improve the model fit over the existing linear relationships (Dawson, 2014). As such, our analysis includes five models: a control model, a linear model, a curvilinear model, a model with independent and moderator variables, and a full model with linear, curvilinear and interaction effects. Hypotheses 1 and 2 predicted that (1) competitive and (2) cooperative actions are positively related to firm performance but as action volume increases, these benefits diminish. As shown in Model 5 by the positive linear

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
ROA	6.08	9.43										
Competitive volume	25.10	18.08	0.03									
Competitive diversity	1.37	0.40	-0.06	0.59								
Cooperative volume	3.01	4.10	0.20	0.54	0.45							
Cooperative diversity	0.20	0.26	0.09	0.47	0.44	0.66						
Size	0.81	2.12	0.16	0.63	0.45	0.49	0.39					
Slack	1.04	0.92	0.07	-0.18	-0.38	-0.11	-0.08	-0.11				
TMT functional diversity	0.70	0.09	-0.11	-0.04	0.04	-0.00	-0.02	-0.14	-0.16			
TMT age diversity	0.12	0.05	-0.12	-0.32	-0.34	-0.24	-0.26	-0.27	0.18	0.07		
TMT tenure diversity	0.68	0.35	-0.32	0.08	0.12	-0.11	-0.05	0.04	-0.02	0.05	0.06	
TMT size	5.20	1.14	-0.07	0.28	0.34	0.12	0.14	0.14	-0.28	0.43	-0.10	0.32

Note(s): Correlations with an absolute value above 0.12 are significant at the $p \leq 0.05$ level

Table 1.
Descriptive statistics
and correlations

	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Independent variables</i>					
Competitive (comp) action		-0.99 (0.74)	0.09 (1.11)	-0.24 (1.30)	0.55 (1.63)
Comp action squared			-0.38 (0.29)	-0.31 (0.32)	-1.51** (0.68)
Comp action diversity				0.41 (1.02)	-1.48 (1.46)
Cooperative (coop) action		3.20* (1.66)	6.55* (3.25)	6.58* (3.54)	6.54* (3.52)
Coop action squared			-1.20 (0.70)	-1.19 (0.80)	-1.49* (0.82)
Coop action diversity				0.04 (0.69)	-0.10 (0.75)
<i>Interactions</i>					
Comp action × action diversity					-2.49* (1.36)
Comp action squared × action diversity					1.45** (0.57)
Coop action × action diversity					-2.00 (2.23)
Coop action squared × action diversity					1.02 (0.80)
<i>Control variables</i>					
Size	2.24 (5.68)	3.96 (4.67)	3.40 (4.55)	3.46 (4.45)	2.07 (4.69)
Slack	3.00 (1.96)	2.96 (1.84)	2.92 (1.77)	2.97 (1.75)	3.46** (1.68)
TMT functional diversity	-0.07 (1.35)	-0.61 (1.29)	-0.62 (1.26)	-0.58 (1.29)	-0.47 (1.22)
TMT age diversity	-0.21 (1.03)	0.78 (1.05)	0.77 (0.96)	0.78 (1.00)	-0.09 (1.19)
TMT tenure diversity	-2.43* (1.35)	-2.19 (1.45)	-2.34 (1.44)	-2.39* (1.38)	-2.14* (1.30)
TMT size	0.44 (1.59)	0.72 (1.33)	0.82 (1.19)	0.81 (1.20)	0.87 (1.14)
Fixed effects	Included	Included	Included	Included	Included
Model <i>F</i>	3.19***	1.99*	1.87*	2.30**	6.72***
Df	14	16	18	20	24
	<i>n</i> = 247	<i>n</i> = 238	<i>n</i> = 238	<i>n</i> = 238	<i>n</i> = 238
Note(s): Robust standard errors in parentheses. *, ** and *** represent significant at 0.10, 0.05 and 0.01 levels, respectively					

Table 2.
Competitive and
cooperative action
effects on
performance (ROA)

term and the significant negative squared terms in competitive actions (linear $\beta = 0.55$, $p > 0.10$; quadratic $\beta = -1.51$, $p \leq 0.05$), [Hypothesis 1](#) is supported. In the case of cooperative actions, we find a positive linear term ($\beta = 6.54$, $p \leq 0.10$) and a negative squared term ($\beta = -1.49$, $p \leq 0.10$), suggesting that cooperative action volume increases yield diminishing returns. Thus, [Hypothesis 2](#) is marginally supported.

[Hypothesis 3](#) predicted that the competitive action volume-performance relationship will diminish more rapidly when the actions are also diverse. The interaction between the quadratic term of competitive actions and the moderator of competitive action similarity is found to be significant and in the direction hypothesized ($\beta = 1.45$, $p \leq 0.05$), supporting [Hypothesis 3](#). [Hypothesis 4](#) predicted that the diminishing returns of cooperative action volume will be more rapid for firms with more diverse cooperative actions. The interaction between cooperative action diversity and the curvilinear term ($\beta = 1.02$, $p > 0.10$) is not significant; thus, [Hypothesis 4](#) is not supported.

[Figures 1](#) and [2](#) provide further clarity to the nature of the effects for both competitive and cooperative action. With respect to cooperative actions, [Figure 1](#) provides a graphical representation of the direct effects of action volume on firm performance. These findings suggest that, as firms increase their volume of cooperative actions, the positive effects of cooperative action on firm performance begin to flatten out, and, as noted above, there is only marginal support for the diminishing returns proposed in [Hypothesis 2](#). The moderating effects of competitive action diversity on the curvilinear relationship between action volume and firm performance are shown in [Figure 2](#). Specifically, it suggests that when firms engage in a lower number of competitive actions, a more diverse repertoire of competitive actions helps firms outperform others with a more homogeneous repertoire of competitive actions. At high levels or volumes of competitive actions, however, this relationship is reversed, suggesting that when action volume is high, firms with a more focused repertoire of

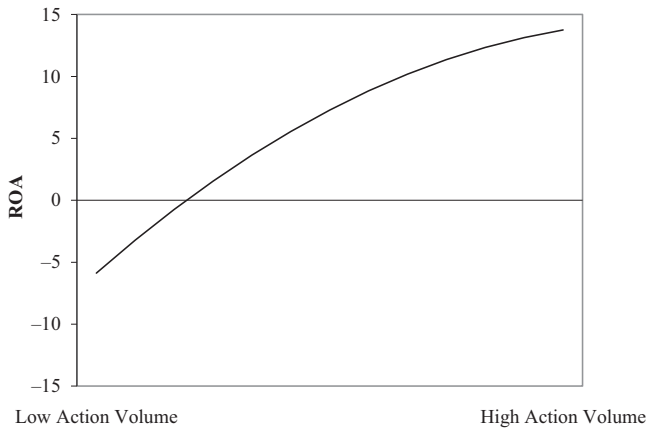


Figure 1.
Cooperative action
volume and firm
performance

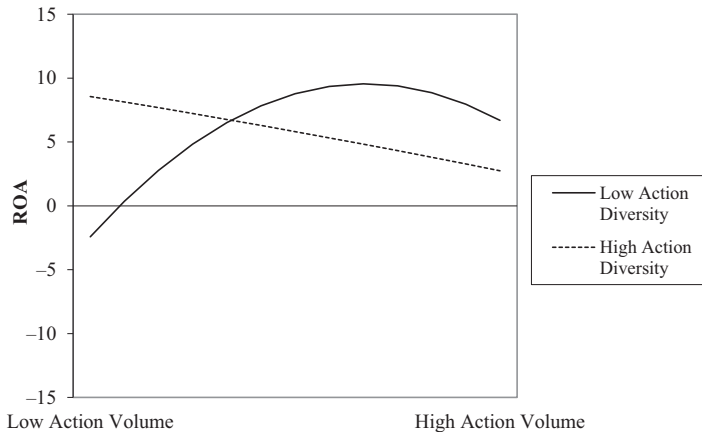


Figure 2.
Competitive action
volume and firm
performance
moderated by action
diversity

competitive actions will outperform firms seeking to engage in voluminous and diverse repertoires of competitive actions simultaneously.

Consistent with prior research examining curvilinear effects (Haans *et al.*, 2015; Rothaermel *et al.*, 2006), we examined the optimal levels of competitive and cooperative action. For competitive actions, the standardized optimal level of competitive action is found at $0.55/(2 \times 1.51) = 0.18$. To transform this standardized value to a practicable nonstandardized optimal, we calculated $x = \text{mean} + (\text{standardized } z\text{-score} \times \text{SD})$ or $x = 25.10 + (0.18 \times 18.07) = 28.35$ competitive actions in a year. For cooperative actions, the standardized optimal level of cooperative action is found at $6.54/(2 \times 1.49) = 2.19$. Transformed into nonstandardized terms, the optimal level of cooperative actions is found at $x = 3.01 + (2.19 \times 4.10)$ or engaging in 11.99 cooperative actions in a given year, suggesting that the effects are diminishing at a rate such that performance is generally higher with higher levels of cooperative actions; however, the moderate curvilinear effect is indicative of a diminishing returns relationship between cooperative actions and firm performance.

4.2 Robustness tests

To test the robustness of our results, we analyze additional models to account for alternative nonlinear specifications and the potential effects of time. First, extant research suggests testing for potential S-shaped, rather than U-shaped, relationships when examining nonlinear effects (Haans *et al.*, 2015). Consistent with extant research, we test an additional model that includes a cubic term for both competitive and cooperative actions (Li *et al.*, 2009; Mihalache *et al.*, 2012). This model yielded a significant quadratic term for competitive action volume; however, the cubic terms for both competitive and cooperative action volume are nonsignificant. These findings suggest that a quadratic model better fits the data when compared to alternative nonlinear specifications.

Furthermore, examining the relationships at high and low levels of the independent variable provides an additional view of the nature of the relationship between the variables of interest and the dependent variable. To assess these relationships, we mean split the data and examine the relationships between competitive and cooperative actions and firm performance when the firm's competitive or cooperative actions are above or below the mean, respectively (Madison *et al.*, 2018). In these additional models, we found a positive and significant linear relationship between competitive actions and firm performance for firms with competitive actions below the mean ($\beta = 7.30, p \leq 0.01$); however, we found a negative and significant effect ($\beta = -2.45, p \leq 0.05$) above the mean, offering further evidence that the relationship being tested fits a diminishing returns relationship. In the context of cooperation, we found no significant direct effect for firms with lower than average cooperative actions; however, we found a positive and significant effect of cooperation on firm performance for firms above the mean ($\beta = 1.97, p \leq 0.05$). Considering our marginal findings in relation to the hypothesized curvilinear relationship between cooperation and firm performance, the additional results in relation to cooperative actions are exploratory.

Second, because there is a potential that the positive performance effects of competitive and cooperative actions may not occur immediately (Connelly *et al.*, 2017; Lahiri and Narayanan, 2013), we test a model that examines our hypothesized relationships when competitive and cooperative actions are lagged by one year. In other words, we measure performance at time "*t*" and our predictor variables at "*t*-1." These models largely mirror our findings, such that the quadratic effect of both competitive ($\beta = -0.91, p \leq 0.05$) and cooperative action ($\beta = -1.44, p \leq 0.10$) is again negative and marginally significant, thus suggesting a diminishing returns function on the following year's performance. In terms of moderating effects, the diversity of competitive actions is found to increase the negative effects of competitive action volume ($\beta = 0.99, p \leq 0.05$). In contrast to the lack of significance in the moderation of cooperative action diversity on cooperative action volume in our hypothesis testing, we find a marginally significant moderating effect when the actions are lagged by one year ($\beta = 1.32, p \leq 0.10$), suggesting that a diverse repertoire of actions in the prior year is beneficial at low levels of cooperative actions; however, this diversity negatively impacts performance at higher levels of action volume. It is possible that cooperative action diversity requires more time to impact a firm's performance due to the nature of developing relationships and managing alliances (Connelly *et al.*, 2018). Whereas competitive actions yield comparatively quick performance responses due to market and rival responses to competitive actions, the results suggest that impacts of cooperative action characteristics take more time to develop and manifest in improved performance outcomes (see Table 3).

5. Discussion

The present study contributes to the existing literature by theorizing and testing a model that simultaneously examines the direct effects of competitive and cooperative action repertoire volume, as well as the contingent effects of action repertoire diversity, on firm performance.

	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Independent variables</i>					
Competitive (comp) action		-1.20* (0.32)	-0.35 (0.90)	-1.40 (0.96)	-0.72 (0.89)
Comp action squared			-0.28 (0.28)	-0.03 (0.29)	-0.91** (0.43)
Comp action diversity				1.22 (0.79)	-0.18 (0.93)
Cooperative (coop) action		3.23*** (1.02)	6.61* (2.87)	6.50** (3.06)	6.59** (2.99)
Coop action squared			-1.25 (0.81)	-1.16 (0.87)	-1.44* (0.84)
Coop action diversity				0.26 (0.92)	0.31 (1.00)
<i>Interactions</i>					
Comp action × action diversity					-1.25** (0.59)
Comp action squared × action diversity					0.99** (0.37)
Coop action × action diversity					-2.89 (2.18)
Coop action squared × action diversity					1.32* (0.73)
<i>Control variables</i>					
Size	-2.50 (6.05)	-0.51 (4.88)	-0.88 (4.69)	-0.63 (4.60)	-2.18 (4.81)
Slack	-0.01 (1.75)	0.32 (1.68)	0.32 (1.61)	0.40 (1.60)	0.27 (1.51)
TMT functional diversity	0.03 (0.79)	-0.50 (1.08)	-0.48 (1.05)	-0.35 (1.08)	-0.37 (1.04)
TMT age diversity	0.31 (0.79)	0.99 (0.90)	1.03 (0.84)	1.14 (0.89)	0.70 (1.02)
TMT tenure diversity	-1.43* (0.82)	-1.16 (0.81)	-1.28 (0.83)	-1.37* (0.79)	-1.33 (0.81)
TMT size	0.80 (1.36)	1.18 (1.19)	1.26 (1.05)	1.27 (1.06)	1.18 (1.05)
Fixed effects	Included	Included	Included	Included	Included
Model <i>F</i>	2.13**	5.22***	8.59***	9.53***	36.65***
df	15	17	19	21	25
	<i>n</i> = 267	<i>n</i> = 256	<i>n</i> = 256	<i>n</i> = 256	<i>n</i> = 256

Note(s): Robust standard errors in parentheses. *, ** and *** represent significant at 0.10, 0.05 and 0.01 levels, respectively

Table 3.
Competitive and
cooperative action
lagged effects on
performance (ROA)

Drawing insights from the resource management and ABV literature, it is argued that the ability of firms to improve performance via their competitive and cooperative action repertoires is limited due to the finite and context-specific nature of resources and attentional limitations. Overall, the findings suggest that resource constraints, both physical and attentional, hinder a firm's ability to effectively leverage high volumes of competitive and cooperative actions, and these challenges are increased for competitive action volume when competitive actions are diverse. The present study contributes to the existing literature addressing competitive and cooperative action repertoires, while also providing managerial insight regarding how to effectively leverage competitive and cooperative action repertoires simultaneously.

5.1 Research implications

The present study extends the existing literature by making a number of conceptual and empirical contributions. These contributions include an extension of the ABV framework to examine how competitive and cooperative action repertoires yield diminishing returns in relation to firm performance and an assessment of the interactive, rather than independent, effects of action repertoire volume and diversity on firm performance.

First, whereas other studies have suggested curvilinear performance effects as a result of volume *or* diversity of actions (Jiang *et al.*, 2010; Wuyts and Dutta, 2014), the present findings are consistent with the ABV to suggest both an interactive and curvilinear effect when simultaneously assessing volume *and* diversity. The findings also align with and extend recent research challenging the typical linear assumptions in prior research (Connelly *et al.*,

2017; Park *et al.*, 2018) to suggest that, when assessed in a concurrent model, competitive and cooperative actions yield diminishing returns, and these effects are moderated by action diversity for competitive actions. While previous research examining independent competitive and cooperative action repertoires has applied the ABV framework to understand attentional constraints in relation to actions of the firm (Filiou and Massini, 2018; Kilduff, 2019), the present study extends these findings to assess a more holistic model of firm actions by empirically assessing both action types in an integrative model. In the context of competitive actions, the diminishing returns relationship between action volume and firm performance suggests that organizations are less capable of leveraging additional competitive actions as the volume of actions increases. While only marginally supported, we find a similar diminishing returns relationship between cooperative action volume and firm performance. In this case, it suggests that additional cooperative actions may require additional time and resources to realize positive performance outcomes.

Second, our findings also shed light on how attention is not only important in relation to diminishing returns but also that the diversity – or breadth of actions firms engage in – is also likely to take a cognitive toll on organizational members and result in lower performance at high levels of action volume. Aligning with recent research examining how firms manage attention in relation to new issues (Joseph and Wilson, 2018), our findings suggest that attentional focus may diminish when juggling multiple diverse actions and lead to poorer performance outcomes. The significant results associated with the interaction between competitive action volume and diversity suggest that simultaneously increasing both competitive action volume and diversity may overwhelm the firm's attentional and physical resources. This breaks from the traditional view of competitive dynamics research that suggests volumes of actions (i.e. aggressiveness) are the foundation for performance to instead assert that these actions are contingent on their strategic fit with the broader repertoire of actions of the firm and the resources – and the quality of resources – that are available. Rather than viewing the benefits of actions based on a certain type or number of actions, our findings align with a more configurational or resource orchestration perspective to suggest the management and leveraging of these actions plays a key role in determining performance (Sirmon *et al.*, 2011). Our lack of significant findings in relation to the interaction between cooperative action volume and diversity suggests that having a diverse range of industry partners does not significantly alter the relationship between cooperative action volume and firm performance. Future research examining this relationship utilizing alternative measures and forms of diversity may provide additional clarity to this relationship.

In terms of conceptual contributions, the results on the simultaneous enactment and management of competitive and cooperative repertoires also align with and extend the literature on cooptation. While definitions vary, cooptation is most often defined as the simultaneous enactment of competitive and cooperative actions among multiple actors in a specific relationship or defined network of peers (Bengtsson and Kock, 2014). Considering the present assessment of competitive and cooperative actions extends beyond specific dyadic relationships or networks, our study is related to, yet distinct from, the traditional view of cooptation. While the present study's focus does not assess relationship dynamics within dyadic IORs or structural network factors, this study's focus on the firm's overall action repertoires, rather than the firm's actions in specific relationships or networks, may serve to bridge the broader competitive dynamics and alliance portfolio literature with the more specific domain of cooptation research.

Furthermore, future research could examine the interactive effects associated with a firm's competitive and cooperative action repertoires. Whereas the present study examines the independent effects of competitive and cooperative action repertoires in a concurrent model, future research could examine the interplay and interdependencies between competitive and

cooperative action repertoires. Paralleling the development of other research streams defining orientations based on firm characteristics and actions (Calantone *et al.*, 2002; Lumpkin and Dess, 1996; Mentzer *et al.*, 2001), future developments of an interactive view of competitive and cooperative action repertoires may strengthen the existing competition literature by addressing overall competitive activity as a firm-level construct of competitive orientation. This could lead to insights regarding how a firm's competitive orientation, defined by the firm's integration of competitive and cooperative action repertoires, influences decisions among rivals and partners and the extent to which these actions – and the reputations associated with these actions – impact future activities and performance.

Finally, recent research integrating competitive and cooperative actions has suggested the importance of behavioral and cognitive antecedents of competitive and cooperative actions (Czakon *et al.*, 2020). Whereas the present study focuses on the effects of action repertoires on firm performance, recent research has suggested the importance of attention and cognitive structures as predictors or antecedents of organizational actions (Frankenberger and Sauer, 2018). As managers assess the need to balance competitive and cooperative actions, the decisions are likely based on an assessment of potential benefits associated with simultaneously engaging in both forms of actions; however, they are also likely to weigh the risks and attentional costs associated with both action types (Czakon *et al.*, 2020). Future research examining the cognitive structures and allocation of finite resources, such as attention, in the selection and enactment of competitive and cooperative action repertoires would likely provide valuable insights.

5.2 Managerial implications

The majority of extant research and prevailing norms in the business press would suggest that aggressive competitive actions and higher levels of cooperation yield only positive outcomes for the firm; however, the present findings suggest boundary conditions associated with both competitive and cooperative action repertoire volume and diversity. The diminishing returns associated with both competitive and cooperative action repertoires suggest a need for strategic focus when engaging in high levels of competitive and cooperative actions to minimize the potential for inertial, rather than strategic, decision-making when selecting and engaging in competitive and cooperative actions (Miller and Chen, 1994). Indeed, rather than more voluminous actions, it is the strategic enactment of an appropriate number and diversity of actions that yields the highest levels of firm performance. For the average firm in our sample, after around 28 competitive actions in a given year, additional competitive actions yielded negative performance effects. Similarly, after firms engage in more than 12 cooperative actions, further actions diminish, rather than improve performance. These findings suggest that firms should focus on identifying and enacting a manageable portfolio of competitive and cooperative actions that maximize, rather than overextend, the physical and attentional capabilities of the firm.

In the context of competitive action repertoires, the present study suggests that firms that selectively engage in a smaller number of actions are likely better off utilizing a diverse repertoire of actions, whereas firms using higher volumes of overall activity are better off focusing on a more homogenous set of competitive actions. This extends the traditional view of competitive dynamics assessing competitive volume or diversity in relation to performance to suggest the performance implications of competitive actions are contingent on their fit with the broader repertoire of actions of the firm and the resources – and the quality of resources – that are available. Indeed, at lower levels of overall competitive activity, diversity allows firms to develop competitive advantages through the management of an inimitable competitive action repertoire; however, firms need to ensure they maintain appropriate focus when competitive action volume increases. Our findings suggest

identifying a “sweet spot” of cooperative action that provides enough activities to extend beyond what the firm could do independently but also preventing it from becoming too voluminous to manage effectively. We also asserted that it is difficult for firms to effectively engage in a diverse repertoire of actions when the volume of competitive action is also high; however, the diversity of actions is advantageous at low volumes of competitive action. These findings suggest that competitive actions have positive but diminishing returns in relation to firm performance, and diversity of actions moderates this relationship such that firms are generally better off when they pursue less diverse actions when their volume of actions is high.

Finally, the contingent effect of cooperative action repertoire diversity is found to be marginally significant when performance is measured one year after the cooperative actions, suggesting cooperative actions may take longer than competitive actions to manifest in performance outcomes. These results suggest that the value and impact of cooperative actions may require additional time and attention for the resources and relationships to develop into value-creating activities. Furthermore, the resources and competencies developed from cooperative actions may require competitive actions as the means through which value can be realized as a result of a firm’s cooperative actions. Lastly, rather than seeing immediate performance outcomes similarly to competitive actions, cooperative actions may require additional attention and management before they impact firm performance.

5.3 Limitations

While the present findings advance research in some important ways, our study is not without limitations. The first potential limitation is the nature and reporting of competitive and cooperative actions. While previous competitive dynamics research has leveraged content analysis and hand coding of actions, the present study builds off of more recent research that has applied the RavenPack database ([Connelly et al., 2017](#)). In doing so, we are not able to examine the comparative magnitude of competitive and cooperative actions nor are we able to differentiate between strategic and tactical competitive actions ([Karagozoglu and Fuller, 2011](#)). For example, InBev acquiring Anheuser-Busch for more than \$50 billion (one competitive action) is likely to have a more significant impact on firm performance than eliminating a single product line from their product portfolio (another competitive action). While our focus is on the overall actions at the firm-level, future work examining the relative performance implications associated with specific action types would likely be beneficial.

A second potential limitation is that the study assesses competitive and cooperative actions as firm-level aggregations. Related research addressing the simultaneous effects of actions is often assessed at the relationship or network level to dissect the interplay and sequencing effects of competition and cooperation among firms ([Wilhelm, 2011](#)). However, research assessing repertoires of actions tends to focus on a firm-level conceptualization to assess the contingencies and outcomes associated with these actions ([Andrevski et al., 2016](#)). The use, timing and impacts of competitive and cooperative actions are likely to ebb and flow, and additional research addressing the appropriate timing or sequencing of these actions will likely shed additional light on ways to leverage multiple actions integratively ([Ferrier and Lee, 2002](#); [Rindova et al., 2010](#); [Zhang and Sun, 2019](#)). Although competition and cooperation are not assessed in the context of dyadic rivalry or network positioning, the perspective provided in the present study extends research focusing on understanding action repertoires holistically rather than as a result of relationship or structural dynamics ([Hsieh and Hyun, 2016](#)). In doing so, we build on early efforts toward assessing firm-level competition and cooperation to confirm the presence and directionality of these relationships in the presence of one another, which appears to be increasingly important in competition and cooperation research ([Chen and Miller, 2012](#)).

6. Conclusion

Based on insights from prior research on resource and attentional constraints, the present study shows that resource limitations within firms restrict the extent to which competitive and cooperative action repertoires can enhance performance. The findings suggest that engaging in more competitive and cooperative actions generally yields positive effects; however, these effects yield diminishing returns at higher levels of action volume. The findings also suggest that firms are generally better off when they engage in less diverse competitive actions when they engage in higher levels of action volume, but higher levels of action diversity yield higher levels of performance when action volume is low in the context of competitive actions. Taken together, the findings provide a more nuanced view of the performance effects of competitive and cooperative action repertoires. We hope that future research continues to define and integrate various action characteristics when examining the simultaneous effects of competitive and cooperative action repertoires on firm performance.

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