THE PARADOX OF ASYMMETRIC COMPETITION: ASYMMETRIC RIVALRY AND ASYMMETRIC COMPETITIVE ANALYSIS

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ABSTRACT

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The literature on asymmetric competition has largely portrayed asymmetry to be a competitive advantage. However, this assertion has been made on the basis of studies that assume perfect rationality and ignore cognitive limitations of firms. The salience of assuming cognitive limitations becomes evident when we decompose the concept of asymmetric competition into its individual components of interfirm rivalry and competitive analysis (Chen 1996). At the action level of interfirm rivalry, asymmetry captures the one-sided, action-response dynamic between competing firms, and denotes the competitive advantage of attacking your rivals with impunity. Seen from a focal firm's point of view, asymmetry at the cognitive level of competitive analysis implies a dangerous situation, indicating the firm's inability to recognize or respond to competitive threats from outwardly insignificant competitors (Chen 1996; Desarbo, Grewal, and Wind 2006).

The purpose of this study is to develop a theoretical understanding of the paradoxical phenomenon of asymmetric competition and provide insight into why such contradicting outcomes occur. Furthermore, we consider that competitive experience is embedded within the larger context of institutional norms, political systems, and social network structures (Desarbo, Grewal and Wind 2006; Grewal and Dharwadkar 2002).

Using data from 41 publicly traded firms in the U.S. retail industry observed over a ten-year period (2003-2012), we examined the paradoxical nature of asymmetric competition. Our results strongly suggest that while strategic adaptations to a context's logic of competition lead to the favorable consequence of asymmetric rivalry, some of the same strategic adaptations lead to the adverse effect of asymmetric competitive analysis. We found that firms' defensive manipulation of political logics in the form of money spent on campaign finance and lobbying is significantly and positively related to the focal firm's ability to carry out greater number of competitive actions relative to rivals. However, defensive manipulation of political logics was also found to be significantly and positively related to the focal firm's market share erosion, indicating impaired awareness that characterizes asymmetric competitive analysis.

Similarly, we found that when firms had a hierarchical distribution of positional embeddedness among their key decision-makers, they were able to perform more competitive actions compared to their rivals. However, we also found that a hierarchical distribution of positional embeddedness among key decision-makers to also be positively and significantly related to the firms engaging in a narrow repertoire of competitive actions, indicating exploitative behaviors associated with asymmetric competitive analysis.

Our results bear important implications for future research, managerial practices, and public policy, on a topic that has been largely overlooked in the marketing strategy literature.

To Sean, I love you.

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Chapter 1: Introduction

"And how many hours a day did you do lessons?" said Alice, in a hurry to change the subject.

"Ten hours the first day," said the Mock Turtle: "nine the next, and so on."

"What a curious plan!" exclaimed Alice.

"That's the reason they're called lessons," the Gryphon remarked: "because they lessen from day to day."

Lewis Carroll*, Alice's Adventures in Wonderland (1865, p. 145)*

Studies have demonstrated that decision-makers in organizations have certain innate cognitive and inferential limitations, which makes extracting lessons from experience to be both challenging and unreliable. Scholars have attributed these cognitive limitations to psychological factors of bounded rationality, heuristics and biases, as well as sociological factors pertaining to decision-makers' tacit beliefs regarding interpersonal interactions. These limitations demonstrate their corresponding effect on reducing organizational efficiency and responsiveness (Levinthal and March 1988; Simon 1955; Tversky and Kahneman 1983; Edmondson 1999). While cognitive processes of strategists have been shown to impact how firms identify competitors and why firms get blindsided by seemingly unknown competitors (Porac and Thomas 1990; Zajac and Bazerman 1991; Zahra and Chaples 1993), existing research has fallen short of incorporating such cognitive limitations into studies of dynamic competition, particularly those competitive encounters that are asymmetric in nature. Competition is

asymmetric when a focal firm competes more intensely with its rival, compared to the intensity with which the rival competes with the focal firm (Desarbo, Grewal and Wind 2006; Chen 1996). The salience of cognitive limitations become evident when we decompose the concept of asymmetric competition into its individual components of interfirm rivalry and competitive analysis (Chen 1996). At the action level of interfirm rivalry, asymmetry captures the one-sided, action-response dynamic between competing firms, and denotes the competitive advantage of attacking your rivals with impunity. On the other hand, seen from a focal firm's point of view, asymmetry at the cognitive level of competitive analysis implies a dangerous situation, indicating the firm's inability to recognize or respond to competitive threats from outwardly insignificant competitors (Chen 1996; Desarbo, Grewal, and Wind 2006). The purpose of this study is to develop a theoretical understanding of the paradoxical phenomenon of asymmetric competition and provide insight into why such contradicting outcomes occur.

While scholars in marketing and strategy have acknowledged the problem of asymmetric competitive analysis, theoretical development, as well as empirical research of this phenomenon, has been scarce. Furthermore, existing research discounts the cognitive bounds and biases of decision-makers, reducing asymmetric competitive analysis to a simplistic problem that occurs due to the misidentification of competitors. Instead, research has been mostly limited to defining competitors along the parameters of strategic group membership or benchmarking rivals along certain supply-side and demand-side factors (Carpenter, Cooper, Hanssens, and Midgley 1988; Desarbo, Grewal, and Wind 2006; Chen, Su and Tsai 2007). Additionally, while scholars have acknowledged the presence of blind spots and biases that make competitive analysis subjective, empirical studies of competitive interaction assume

rational choice in their models of competitive analysis, with firms analyzing and attacking rivals on the basis of objective criteria such as market overlap, multimarket contact, and resource similarity (Chen 1996; Upson, Ketchen, Connelly and Ranft 2012).

In reality, competitive analysis goes beyond simply identifying competitors, and includes a cognitive component that draws lessons from competitive experience, and occurs in a complex reality that is shaped by contextual factors that enable a focal firm to formulate an appropriate course of action against competitive threats (Porter 1980; Zahra and Chaples 1993; Barnett 2008). Insights from organizational learning theory suggest that boundedly rational organizations seek to simplify competitive experience by drawing lessons from recent competitors and from competitive encounters that occur on home turfs (Levinthal and March 1993). Organizations also tend to specialize in a narrow set of competencies by frequently exploiting tried and tested strategies, thereby simultaneously gaining competence in a narrow repertoire of competitive actions and reducing the incentive to develop alternative strategies. Thus, although the tendency to simplify and specialize lessons of competitive experience are an efficient way to deal with complexity for boundedly rational firms, these processes also lead to myopia (Levinthal and March 1993), because simplifying competitive experience by treating current competitors and immediate market environment with relevance puts the focus on a narrow range of competitors, which compromises competitor identification, a precursor to competitive analysis. Additionally, specializing in a narrow niche of competitive actions leads to *competence traps*. Strategies that were successful in their original contexts trap firms into reutilizing them until they are no longer effective, and reduce the incentive to develop alternate adaptive responses (Cohen and Levinthal 1994).

Furthermore, competitive experience is embedded within the larger context of institutional norms, political systems, and social network structures that determine the validity and legitimacy of competitive actions (Desarbo, Grewal and Wind 2006; Grewal and Dharwadkar 2002). At the same time, firms are known to be more than just passive conformists of institutional norms, and are known to act entrepreneurially to manipulate the institutional environment to their advantage (Oliver 1991). The existence of multiple institutional logics in markets, make markets inefficient and costly for firms to adapt to each logic. Firms are known to circumvent the problem of multiple institutional logics by initiating innovative change that prevail over multiple logics, and building legitimacy for the innovative product or service with the help of branding or trademarks (Suchman 1995; Mendonca, Pereira and Godinho 2004). Likewise, studies on corporate political activity have shown firms to manipulate political logics in order to defend their self-interests and enhance their competitive advantage (Stigler 1971). Such manipulation of political logics by firms involves using specific tactics to create resource asymmetries and increase their rivals' costs, such as lobbying and political campaign contributions (Hillman and Hitt 1999; Oliver and Holzinger 2008; Capron and Chatain 2008). Lastly, firms are known to strategically embed themselves into the surrounding social network to gain access to network resources and reduce a rival's ability to respond to competitive actions (Gnyawali and Madhavan 2001). Although, the importance of context in competitive structures is evident from the aforementioned research, there is a gap in the literature with respect to the context-specificity of asymmetric competition.

This study aims at addressing the gaps that have been identified in the literature with respect to the context-specificity and the cognitive, inferential limitations of asymmetric

competition. More specifically, our goal is to address these gaps in the literature to understand the contradictory implications of asymmetric competition with respect to the positive outcome of asymmetric rivalry and the negative outcome of asymmetric competitive analysis. Evolutionary theories of adaptive learning such as the *Red Queen theory* of competition may offer an answer as to why such opposing competitive asymmetries exist (Barnett and Hansen 1996; Barnett 2008). The Red Queen refers to competition as a self-reinforcing race, in which organizations adapt to their context's logic of competition, making them stronger competitors, which trigger attempts in rivals to respond to a focal firm's competitive moves, evolving into a process of reciprocal causality. While successful adaptations to competition generate lessons that inform future courses of action in firms, over time, these lessons are overexploited, turn obsolete and trap the firm into using the same competencies, leading to asymmetric competitive analysis and the erosion of competitive gains (Barnett 2008).

A key assumption of the Red Queen theory is the context specificity of competition, where inter-firm rivalry is assumed to vary considerably across contexts. Thus, what it takes to create asymmetric rivalry in one context could turn into a losing strategy once the context changes over time or space. Achieving asymmetric rivalry depends on how well adapted the focal firm is to the specific competitive logic that prevails in its context. This competitive logic, also known as the *logic of competition*, details the formal and informal rules or principles that determine who can compete, how they compete, on what criteria they succeed or fail, and what are the consequences of success or failure (Barnett 2008). However, logics of competition vary over time and space and while strategic alignment with the context's logic of competition creates favorable asymmetries with rivals, once the context's logic of competition changes, the

same strategic adaptations affect the competitive analysis of the boundedly rational focal firm, making it difficult for the firm to anticipate and respond to competitive threats from unknown rivals (Levinthal and March 1993; Barnett 2008).

Advocating the application of multiple theories to explain complex phenomena, Weick (2007, p. 16) asserts that "It takes richness to grasp richness". Accordingly, we use the Red Queen as our model's overarching theory, and apply multiple theoretical insights to understand the complexity of asymmetric competition. To resolve the paradox of asymmetric competition, we follow Poole and Van De Ven's (1989) recommendation and situate the paradox at two different levels of the firm, at the level of competitive analysis and at the level of competitive rivalry.

The main argument in our paper is as follows: Asymmetric rivalry occurs when, relative to its competitors, the focal firm strategically adapts to the logics of competition, prevailing in the institutional, political and social context of the market structure. However, paradoxically, some of the same strategic adaptations create systematic errors in the focal firm's lessons of competition, leading to the unintended consequence of asymmetric competitive analysis. For example, strategically adapting to the context's political logic of competition, by way of financing political campaigns and government lobbying, enables the focal firm to carry out a greater number of competitive actions compared to its rivals. The rationale being, currying political favors allows the firm to enact legislation, pass laws and set industry standards, without having to worry about adapting to market contingencies. However, the power of being able to influence the market rather than adapt to its contingencies, reduces the firm's incentive to develop new adaptive capabilities. The strategy of manipulating the political logics is

exploited and refined into a skill, leading to the atrophy of capabilities necessary in responding to change.

Our study modeled asymmetric competition in terms of the action-response dynamic of firms, by using methodology from competitive dynamics theory (Smith, Grimm and Gannon 1992). To that end, we defined asymmetric rivalry as the total number of competitive actions taken by the focal firm, relative to rival firms. In line with competitive dynamics methodology, an action was defined as "externally directed, specific and observable competitive moves initiated by the firm to enhance its relative competitive position" (Smith, Ferrier and Ndofor 2001; p. 321). We conceptually defined asymmetric competitive analysis as the reduced ability in the focal firm in responding to competitive threats. We operationalized the construct of asymmetric competitive analysis in two ways. First, in terms of *action repertoire simplicity* that measures the extent to which firms engage in only a narrow set of repetitive actions, typical of exploitative learning behaviors of asymmetric competitive analysis. And second, we use the metric of *market share erosion*, to capture impaired awareness associated with asymmetric competitive analysis (Ferrier, Smith and Grimm 1999).

The context's institutional, political and social logics of competition were operationalized in the following ways: we measured the proactive manipulation of the context's institutional logic of competition by the number of active registered trademarks and service-marks filed annually by the firm each year; and we operationalized the defensive manipulation of political logics by the total amount spent on campaign finance and lobbying by firms annually.

Adaptation to the context's social logics is captured at two conceptual levels: positional and structural embeddedness. Scholars have proposed board interlocks to be indicators of firms' network embeddedness (Mizruchi 1996; Granovetter 1985). A board interlock occurs when a board director affiliated with one company sits on the board of directors of another company, joining the two companies into an interlock. Positional embeddedness highlights the informational benefits that accrue from network centrality, i.e., the extent to which firms occupy a central position in the network by virtue of being connected to many significant ties (Wasserman and Faust 1994). Positional embeddedness is operationalized in two ways, first, using *degree centrality*, expressed in terms of the number of corporate boards that the focal firm is connected to via interlocks. Secondly, networks of interlocking board directors represent a particular type of network known as affiliation or two-mode networks that have two distinct sets of nodes or social entities (corporate boards and directors), where ties occur between corporations as well as between directors serving on the corporation's board (Borgatti and Everett 1997; Robins and Alexander 2004; Opsahl 2013). In network research, a distinction is made between two-node sets based on which node set is more responsible for the embeddedness of the firm (more responsible for tie creation). Scholars consider both nodes of directors and corporate boards as primary nodes (Mizruchi 1996; Shropshire 2010; Opsahl 2013). Therefore, we also captured positional embeddedness among board members of focal firm by using a metric of inequality, such as the *Gini coefficient*, to gauge the impact of having board members that vary in embeddedness (degree centrality) on the focal firm's board. Since research suggests that a lopsided distribution of positional embeddedness among board

directors influences group dynamics and decision-making in firms, we model its impact on asymmetric competition (He and Huang 2011).

Structural embeddedness refers to the structure and configuration of a firm's network of ties, which help organizations gain access to unique information through indirect ties, to monitor competitors, and to enjoy reputation effects of being associated with high status partners (Burt 2010). Structural embeddedness is operationalized by the number of Fortune 1000 firm directors on a focal firm's corporate board, indirect corporate board ties to rival firms, and the representation of financial institution representatives on the focal firm's board.

Our study sets forth to answer the question: Why are firms their own worst enemies? Specifically, why do strategic adaptations made by firms to the context's logic of competition create favorable asymmetries with rivals, and why do some of those same strategic adaptations create the unfavorable consequences of asymmetric competitive analysis? Unlike previous studies we: (a) consider the cognitive and inferential limitations of firms in dynamic competitive encounters that are asymmetric in nature; and (b) take into account the context-specificity of competitive interaction.

Our results strongly suggest that while strategic adaptations to a context's logic of competition lead to asymmetric rivalry, some of the same adaptations lead to the adverse effect of asymmetric competitive analysis. We found that firms' defensive manipulation of political logics is significantly and positively related to the focal firm's ability to carry out greater number of competitive actions relative to rivals. However, defensive manipulation of political logics was also found to be significantly and positively related to its market share erosion, indicating impaired awareness of asymmetric competitive analysis. Similarly, we found that

when firms had a hierarchical distribution of positional embeddedness among its key decision-makers they were able to perform more competitive actions compared to their rivals. However, we also found that a hierarchical distribution of positional embeddedness among its key decision-makers to be positively and significantly related to the firms engaging in a narrow repertoire of competitive actions, indicating exploitative behaviors associated with asymmetric competitive analysis. Our results have important implications for the concept of asymmetric competition, a topic that has been largely overlooked in the marketing strategy literature.

Our findings challenge existing conceptualizations of asymmetric competitive analysis. Namely, asymmetric competitive analysis has been attributed to reduced awareness that occurs due to firms ignoring rivals who are not similar in resources or share common markets, meaning firms are very vigilant of rivals that are similar to them in terms of resources and market commonality (Chen 1996; Upson, Ketchen, Connelly and Ranft 2012). However, in our study we found compelling evidence of asymmetric competitive analysis in firms that were similar in resources and had sufficient market overlap, demonstrating that these factors alone are not sufficient determinants of competitive analysis. By explicitly modelling the cognitive limitations of firms and the context-specificity of competition in our study, we offer a better understanding of the complex phenomenon of asymmetric competition.

This thesis proceeds as follows. The next section reviews the literature on asymmetric competition, and outlines the theoretical framework for the relationship between strategic adaptation by firms to context's logic of competition and asymmetry at the levels of rivalry and competitive analysis. In the third section we use the theoretical framework as a guide for developing specific hypotheses that relate strategic adaptation of firms to asymmetric rivalry

and asymmetric competitive analysis. In the fourth section we describe our data, measures, and methods, and in the fifth section we provide our results. Next, we discuss our findings, considering how our results extend theory and extant literature. We also offer the managerial and policy implications of our findings. Finally, we conclude with limitations and suggestions for future research.

Chapter 2: Conceptual Development

2.1 Asymmetric Competition: Asymmetric Analysis and Asymmetric Rivalry

Theoretical perspectives from the Resource-Based View (RBV) theory have acknowledged that the existence of asymmetry in the vector of resources possessed by firms is a source of sustainable economic rent (Amit and Schoemaker 1993). It is implied that the asymmetry in resources possessed by each firm influences competitive analysis, and causes firms to form a unique approach toward each of their competitors (Collis 1991). Extending the idea of asymmetric resources from the RBV to the Dynamic Capabilities View theory (DCV), Miller (2003) argued that asymmetries refer to the distinctive capabilities of firms that are developed sequentially through path-dependent learning. Distinctive capabilities are found in the firm's executive talent, social ties and tacit knowledge, and which enable the firm to stay ahead of its competitors.

However, the identification of such asymmetries is not a perfect recipe for success, because path-dependent, incremental learning tends to have some inherent flaws (Miller 2003). For instance, bounds on the rationality of decision-makers prevent firms from making accurate connections between capabilities and outcomes, especially when the causal linkages are complex and convoluted, and outcomes are far removed from the original source (Miller 2003). When firms experience success, they are compelled to turn the successful event into a learning moment. However, this learning experience may become problematic when success is attributed to an incorrect or flawed capability. This phenomenon, known as *superstitious learning* reinforces the defective connections between capabilities and outcomes, and as a

result faulty capabilities are repeatedly employed because they are wrongly believed to have led to success in the past (Levitt and March, 1988). Although Miller (2003) acknowledged the cognitive limitations involved in the identification of asymmetric capabilities, his work did not elaborate on the consequences of such faulty learning. Furthermore, the studies on the asymmetry of resources and capabilities from the RBV and DCV perspective do not explain how relative differences in competitive advantage affect competitive behavior between firms in the market context.

The earliest evidence of asymmetric competitive behavior in the marketing literature is a study done by Carpenter, Cooper, Hanssens, and Midgley (1988), who described the competitive structure of a market to be asymmetric in terms of the differential effect a focal firm's marketing actions had on the market share of other firms competing in the market. The source of asymmetric competition is attributed to the unique features of a focal firm's marketing mix strategy such as exclusive distribution rights or branding that either protected a firm from their competitors' marketing actions or made them particularly vulnerable to their competitor's actions. For example, the authors found a firm's profitability to be dependent upon the cross-price elasticity of two similar brands, such that a price decrease by a substitutable brand decreased the profitability of its closest rival (Carpenter et al. 1988). Additionally, they also found that some asymmetries could offer only temporary advantage due to the periodic tweaking of marketing mix elements such as price and advertising dollars to match competitors (Carpenter et al. 1988). However, while this study demonstrates the presence of asymmetric competition in market structures, it offers a rather static view of competitive behavior. Competitive situations in the real world are dynamic, firms feel the

effects of each other's moves and are prone to retaliating against competitive attacks (Porter 1980). Asymmetric competition, as seen from a purely situational perspective, as a setting in which resources of a focal firm create a situation of asymmetry in the distribution of profits in the rest of the firms in the market, underemphasizes the relational aspect of competitive behavior, and by extension, the rivalry that exists between competing firms (Kilduff, Elfenbein, and Staw, 2010). Understanding asymmetric competition can be enhanced by considering the relational context of competition, also known as rivalry since competing firms share a history of repeated competitive interactions as opposed to a single isolated competitive interaction. The relational aspect of understanding asymmetric competition is critical because it implies that no two firms within an industry analyze competitive threat symmetrically, and consequently no two firms will engage in actions symmetrically. Additionally, while Carpenter et. al (1988) demonstrated that marketing actions that improved firm performance could also make the firm vulnerable to competitive attacks, their study is rooted in a rational choice model that excludes the bounds of human decision-making, and the biases inherent in human perception that affect competitive analysis (Porac and Thomas 1990).

In the strategy literature, Chen's (1996) Competitive Dynamics Theory uses elements from game theory to conceptualize competitive asymmetry in terms of a sequence of moves and countermoves between rival firms along the dimensions of market commonality and resource similarity. Each firm's awareness of a competitive threat, its motivation to attack (or respond) to a threat, and its capability to attack (or retaliate) a rival firm, depend upon the degree of difference in the similarity of resources, overlapping markets, and multimarket contact shared with its competitors (Chen 1996; Upson, Ketchen, Connelly and Ranft, 2012).

Consequently, smaller rivals are considered an insignificant threat and allowed wider latitude of actions without retaliation from the larger firm. As such the competitive dynamics theory demonstrates both favorable and unfavorable implications of competitive asymmetry depending on which firm is the focal firm under consideration (Chen 1996). For example, from a focal firm's point of view, asymmetric rivalry is advantageous because it provides a wide leeway of competitive actions against larger rivals (Chen, 1996). Conversely, the inability to recognize and respond to competitive threats from seemingly small competitors exposes a deep flaw in the competitive analysis of the larger firm.

However, while it is true that size may play a role in competitive analysis, firms may also not react to rival actions because they lack information or have not developed a sufficiently sensitive information system to detect a change in the marketing mix actions of their rivals (Carpenter et al.,1988). Most firms do not collect information about competitors in a systematic, organized manner, but act on the basis of informal assessments, conjectures and intuition gained through scraps of piecemeal intelligence gained through the course of competitive experience (Porter 1980). Additionally, a theoretical model that assumes rational choice in the perception of competitive threat purely along the dimensions of market overlap and resource similarity is highly restrictive and simplistic, because evidence suggests that identification of competitive threats is heavily influenced by the inherent biases of human cognition that create blind-spots into managerial attempts of analyzing their competitive landscape (Bazerman 2002). Furthermore, competitive actions are also influenced by factors that extend beyond the market components (competitors, customers, suppliers) of their task environment, to include nonmarket factors (political agents, regulatory bodies, network

associations). The nonmarket factors that populate firms' task environment may not directly participate in the market transactions of firms but wield enough authority to affect the outcome of competition through positive endorsement, withdrawal of support, or sanctions on firms, and evidence suggests that firms are aware that their strategic actions are contingent upon the effective management of nonmarket factors from their task environment (Boddewyn 1988).

In addition to the gaps identified in the literature, the single recurring theme that cuts across the current literature depicts asymmetric competition as a paradoxical phenomenon. On one hand, competitive asymmetry leads to favorable outcomes (superior competitive advantage relative to rivals for focal firm, attack without retaliation). However, on the other hand there is an implication that asymmetry can also create vulnerabilities in the focal firm under consideration. Our aim is to reconcile these contradicting themes to explain this paradox as it occurs within the context of the bounded rationality of firms and their key decision-makers, as well as the broad context of the task environment of firms.

The current literature on asymmetric competition has singularly focused on competitive outcomes to the exclusion of the larger context of the firm's task environment. While the former captures the configuration of firms that compete with one another at a given level of the value chain, the latter includes the competitive structures among firms as well as the broad context of social networks, institutional framework and regulatory agencies that frame the competitive structures of firms (Desarbo, Grewal and Wind 2006; Thompson 1967). Rivalry is also a function of the market structure or the environmental context in which firms compete. Competitive moves are often made with attention to their implications for not only each of the

firm's rivals but also with keeping the context in mind (Chen 1996). Furthermore, consideration of managerial, social and cognitive factors into competitive analysis has been strongly supported by scholars in the strategic groups literature (Porac and Thomas 1990; Zajac and Bazerman 1991). Accordingly, a theoretical explanation of competitive asymmetry would be lacking if it did not extend the contextual considerations of a firm's environment to the dynamics of competitive rivalry.

With this in mind, and on the basis of the gaps identified in the current literature with respect to the contradictory nature of asymmetric competition, the assumption of perfect rationality, and the absence of context in the extant literature on asymmetric competition, we extend the Red Queen theory as a general theory of competition to understand asymmetric competition as it occurs at the level of interfirm rivalry and at the level of competitive analysis. Using theoretical insights from organizational learning, institutional theory, social network theory, resource dependence, and group dynamics, we postulate a paradox of asymmetric competition, where strategic adaptations by firms lead to favorable asymmetries with rival firms, effectively reducing the action capability of rivals. At the same time, some of the same strategic adaptations create unfavorable asymmetries with respect to the competitive analysis of firms, reducing their ability to assess competitive threats effectively.

2.2 The Red Queen

The Red Queen is a dynamic theory of competition that uses a synthesis of organizational learning theory (Levitt and March 1988) and organizational ecology (Hannan and

Freeman 1989), to explain why some organizations are more competitive compared to others and why such competitive advantage is temporary (Barnett and Hansen 1996; Barnett 2008). The theory is named after the character of the Red Queen in Lewis Carroll's *Through the Looking Glass*, and is inspired by a dialogue between the Red Queen and Alice, where the exhausted Alice complains to the Red Queen that although she seems to be running as fast as she can, she is still under the tree where she started. The Red Queen answers: "Now, here, you see, it takes all the running you can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that." (Carroll 1872, p.36). In an influential article, evolutionary biologist Van Valen (1973) used this metaphor to describe the survival of species as an evolutionary *arms-race* between coevolving species. According to Van Valen, the best a species can do to survive is to quickly and tirelessly keep up with an adversary's adaptations (Martin 2010).

In the business context, Barnett and Hansen (1996) introduced the coevolutionary theory of the Red Queen to explain the competitive one-upmanship between firms in an industry. Organizations adapt to the constraints of their market context, which consist of key elements of their task environment, including competitors for markets and resources, suppliers of capital, goods and labor, customers or clients, and stakeholders such as government agencies, trade associations and regulatory bodies (Thompson 1967). The successful adaption to the task environment improves the organization's performance and becomes a learning moment for the firm, but at the same time also increases the pressure faced by other firms in its competitive context, who aspire to catch-up to the firm's success and are motivated to carry out their own adaptive strategies in response to the original firm's strategic actions (Cyert and

March 1963). The improvements made by the responding firms in turn trigger a self-accelerating process of reciprocal competition that goes back and forth between competing firms (Barnett and McKendrick 2004). In addition to these baseline effects, the Red Queen theory also considers the undesirable consequences of the lessons learned from adapting to competitive constraints (Barnett and Hansen 1996). Drawing on Levitt and March's (1988) concept of "competency traps", the theory states that competitive experience has a tendency to stagnate into outdated lessons, which can lead to myopia and failure in firms. This occurs because organizations have a tendency to simplify experience by confining lessons to recent events and on competitive encounters that occurred on the firm's home turf, and by specializing in those select few lessons of competition that the firm believes led to success in the past (Levitt and March 1988).

Studies of Red Queen competition have demonstrated that these flawed methods of learning reduced the viability (Barnett and Hansen, 1996) and founding rates of firms (Barnett and Sorenson 2002), competitiveness in the global industry (Barnett and McKendrick 2004), and have led to hazardous change (Barnett and Pontikes 2008). Barnett and McKendrick (2004) found that contrary to Porter's (1980) hypothesis, organizations did not benefit from facing strong competitors in their country of origin because their adaptive responses had become specialized to the market in which they originally operated in. As a result, lessons learned from competing in one's home country did not carry over into a foreign market. Using logic from organizational learning theory, the authors argued that when firms successfully adapt to a particular market's context, they develop capabilities that are well suited for that particular context, and the successful adaption leads to a continuation in the exploitation of those

capabilities to the detriment of exploring new capabilities (Barnett and McKendrick 2004). Structural inertia associated with size and past performance, also reduced the ability of firms to develop new responses to combat new rivals in the foreign market (Barnett and McKendrick 2004). Barnett and Pontikes (2008) also found evidence of biases in organizations that had survived a history of Red Queen competition, particularly when this competitive experience was recently acquired (Barnett and Pontikes 2008). Specifically, they found sampled firms overestimated their ability to succeed in new ventures based on recent success in competitive markets. This so-called "success bias" made organizations more likely to engage in risky actions related to market entry, which ultimately resulted in failure (Barnett and Pontikes 2008).

The theorization of the Red Queen competition describes a dynamic process in which firms adapt to competition in ways that create a competitive pressure on other firms to catch-up, causing them to retaliate and so on. However, the empirical strategy for the Red Queen competition theory is based on a population-ecology model (Barnett and Hansen 1996; Barnett 2008; Hannan and Freeman 1989). Therefore, the methodology of what appears to be a self-exciting theory of competitive action and response between firms has been consigned to a rather static investigation in the form of survival rates and failure rates of firms exposed to competition (Swaminathan 2009).

This missing link of organizational action has been modeled by Derfus, Maggitti, Grimm and Smith (2008) in their test of the dynamic Red Queen process to demonstrate that a focal firm's actions increased their own performance and at the same time also increased the number and speed of rivals' actions, which in turn negatively affected the focal firm's performance. Although their study modeled the dynamic process of the theory, it offered a

rather sanitized view of the negative effects of Red Queen. For instance, contrary to Derfus et al.'s (2008) assertion, negative consequences of Red Queen competition do not simply refer to the reduced performance of the focal firm on account of rival actions. Under the Red Queen theory, a firm's competitiveness evolves through the process of competitive moves and countermoves, where the very strengths that make organizations good at adapting to the constraints of competition in the short run, backfire in the form of a "competency trap" leading to negative consequences in the long run (Barnett, 2008). Firms form competitive repertoires that place them ahead of their close rivals, but on the downside, these repertories are limited, as they have been developed keeping a certain set of rivals in mind. Consequently, this makes the firm vulnerable to threats from unfamiliar rivals. Additionally, the study by Derfus et al. (2008) also ignores the impact of the wider context that determines the rules or principles on which firms compete, the so-called "logics of competition" that we discuss in the following section.

2.3 Strategic Adaptation to Logics of Competition

In the Red Queen theory, logics of competition refer to a system of principles that determine who can compete, how they compete, on what criteria they succeed or fail, and what the consequences are of success or failure are (Barnett 2008). Competiveness requires that a firm perform better than its rivals, according to the context's logic of competition, and adaptation to the context's logic of competition determines what it takes to win in a particular context. Logics of competition can be formal or informal, and can cut across various political,

social, institutional and technological contexts. For instance, government regulations can determine who is allowed to compete in a given context, while in other instances, a firm's connections in a social network determine its access to network-related resources and information. Therefore, firms in a Red Queen competitive scenario will strategically adapt to the context's logic of competition to create favorable asymmetries with rivals. These logics of competition fall under the institutional, political and social spheres of influence in the firms' task environment, and are respectively known as institutional logics, political logics and social logics of the Red Queen competition (Barnett 2008).

2.3.1 Institutional Logics

The Red Queen's conceptualization of firms as strategic actors in their environment is consistent with Oliver's (1991) extension of the institutional framework to explain the strategic actions of firms in response to institutional demands and expectations. Whereas earlier research on institutional theory focused on the organization's categorical conformity to institutional pressures, the adoption of a limited range of socially sanctioned organizational structures, and the rigidity and persistence of institutional norms for legitimacy (DiMaggio and Powell 1983; Meyer and Rowan 1977; Scott 1995), later research has acknowledged the role of actors' self-directed agency in envisioning and enacting changes to the contexts in which they are embedded in (Oliver 1991; Dacin, Goodstein and Scott 2002; Misangyi, Weaver, and Elms 2008; Greenwood and Suddaby 2006).

This second movement of research in institutional theory has a strategic focus that adopts the decision-maker's perspective and puts emphasis on the deliberate attempts by firms

at proactively manipulating logics by implementing evocative symbols to garner legitimacy from stakeholders (Suchman 1995). Although for most organizations, conformity to institutional pressures is seen as the path to legitimacy, for some firms, conformity is insufficient, inefficient and even costly (Suchman 1995; Barnett 2008). For instance, the Red Queen theory argues that competitive landscapes are often inundated with multiple, competing institutional logics. These institutional logics may, for example, take the form of competing services, competing products or a new logic of transacting with suppliers and customers. Existence of multiple, competing logics requires the firm to adapt to each logic, which is inefficient for the firm due to constraints of time and cost (Barnett 2008). For these reasons, firms often attempt to drive out competing institutional logics and actively manipulate which institutional logics come to prevail in an industry (Barnett, 2008). Firms engage in manipulation, i.e. they purposefully and opportunistically attempt to influence the institutionalized values, beliefs, or definitions, and criteria of acceptable practices or performance standards in an industry (Oliver, 1991). Additionally, such manipulation is a proactive initiative because decision-makers have a predefined strategy that they want seen as the dominant logic in the environment. Firms that engage in the proactive manipulation of the institutional logics are originators of innovative practices, products and services that depart from existing practice. Innovative activities that diverge from the norm also necessitate active mobilization of resources in order to build legitimacy for the divergent change. This can be achieved with the help of trademarks and branding to convey quality, credibility and purpose to the end-user. This exercise often leads to a gain in pragmatic legitimacy, which refers to legitimacy given to a firm by its most immediate audience members (e.g. consumers) based on the innovative logic's expected value (Suchman

1995). Legitimacy gained from manipulating institutional logics enhances the supply of resources to the firm, but more importantly, it ensures stability and continuity of organizational activities (Parsons 1960).

2.3.2 Political Logics

Actors' self-directed agency in adapting to the logics of competition can also occur when government policy alters logics of competition (Barnett 2008). The government can be a source of tremendous uncertainty because it has the power to impact the economic decisions of firms, to grant or withdraw legitimacy, to enact laws that raise the cost of product substitutes, to sanction economic conduct, and alter the competitive structure of the market (Boddewyn, 1988; Hillman and Hitt, 1999). Firms that perceive a high dependence on government policy and those that perceive the need to defend their tangible and intangible resources are more likely to engage in corporate political activity (Hillman and Hitt 1999). Managing the political environment also allows firms to leverage the power of the government to defend their relative market positions. As noted by Stigler (1971), public policy is designed for the industry's benefit, and all industries with sufficient political power strive to manipulate the state into obtaining governmental favors.

Politically motivated strategies are built on the premise that the political logics of a given context operate as centers of exchange, where firms seek to secure objectives of private gain in exchange of agreed-upon monetary contributions or sensitive information to draft policy reform (Keim and Zeithaml 1986; Buchanan 1987; Hillman and Hitt 1999). Due to the coercive and beneficial powers of the government, many firms formulate strategies that are specifically

geared toward affecting the political logics of their market structure (Oliver and Holzinger 2008). Often these politically motivated strategies involve specific tactics such as government lobbying or financial contributions to candidates and political action committees. Scholars suggest that manipulation of political logics is a long-term strategy that evolves into a dynamic capability, enabling firms to quickly exploit political opportunities and eliminate rivals by raising their cost of competing in the industry (Hillman and Hitt 1999; Oliver and Holzinger 2008).

2.3.3 Social Logics

Firms also display entrepreneurship and strategic action in their social logics of competition. Social network theory states that competing firms are embedded in a network of ties that influences their competitive behavior and strategic outcomes (Gnyawali and Madhavan 2001; Baum and Dutton 1996; Dacin, Ventresca and Beal 1999; Burt 1992; Granovetter 1985). Inherent in embedded networks is a type of competitive advantage known as social capital, which includes benefits such as timely and novel information, tacit knowledge, tangible resources, greater control and maneuverability (Moran 2005). In the strategy literature, the network of board interlocks has been widely used to test the embeddedness perspective on interfirm network ties (Davis, 1991; Mizruchi, 1996; Shrophsire 2010; Haynes and Hillman 2010; Beckman, Schoonhoven, Rottner and Kim 2014).

A board interlock occurs when a board director from one firm also sits on the board of another firm, and creates an interlock or tie between the two firms (refer to **Figure 1** for an illustration of a board interlock) (Mizruchi 1996). In the literature, board interlocks have been cited as an important indicator of network embeddedness (Mizruchi 1996; Burt 1991) and are

associated with a type of competitive advantage known as board capital. Board capital constitutes both social capital from the directors' ties to external organizations, as well as human capital, which refer to directors' qualifications, expertise, knowledge, and skills (Hillman and Dalziel 2003; Haynes and Hillman 2010).

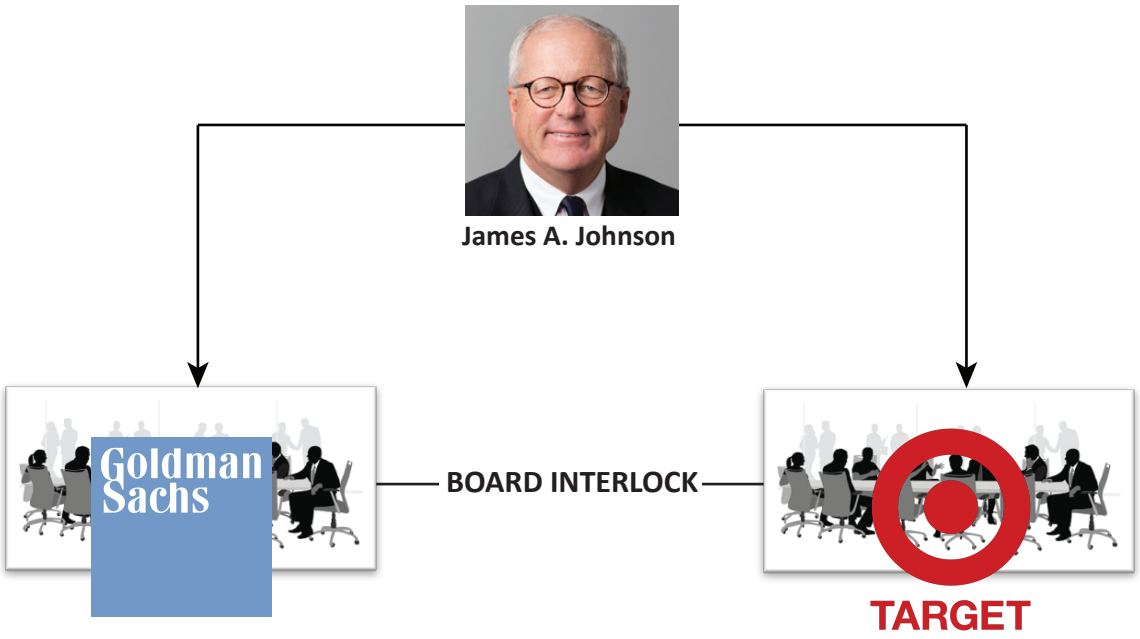

Figure 1: *An example of a board interlock.* A board interlock exists between the firms Target Corporation and Goldman Sachs because board director, James A. Johnson is a board member of both firms, connecting the two firms into an interlock.

The literature identifies structural embeddedness and positional embeddedness as mechanisms of social capital that influence interfirm behavior and competitive advantage (Gulati and Gargilio 1999; Burt 1992; Granovetter 1992). Structural embeddedness refers to the structure and configuration of an actor's network ties, and emphasizes the role that network structure plays in attracting social capital and competitive advantage through strategic ties. Structurally embedded organizations gain access to unique, restricted information through

indirect ties, and benefit from reputation effects by being associated with high status partners (Burt 2010). The resource-dependence theory states that board directors perform an important function of resource provision that encompasses a wide range of specific duties that include, for instance, granting legitimacy or enhancing the reputation of the firm (Selznick 1949), aiding strategy formulation, providing expertise, advising top management on important firm decisions (Lorsh and MacIver 1989; Mintzberg, 1983), establishing relations with important stakeholders (Burt 1980; Hillman, Cannella and Paetzold, 2000), and facilitating access to financial capital (Mizruchi and Stearns 1988). Moreover, firms strategically form indirect board interlocks as a monitoring mechanism or to signal collusion with rival firms in the industry (Mizruchi 1996). Section 8 of the Clayton Act of 1914 specifically prohibits board interlocks between firms competing in the same markets (Mizruchi 1996). However, indirect board interlocks, which occur when directors from two companies sit on the board of the third, host firm, are legal and prevalent among competitors (Burt, 1980; Vance, 1983).

Positional embeddedness highlights the informational benefits that accrue from occupying particular positions in the network. For example, network centrality, which refers to the position of an individual actor in the network, denotes the extent to which the actor occupies a strategic position in the network by virtue of being involved in many significant ties (Wasserman and Faust, 1994). The more central an organization's network position, the more likely it will have better access to a wide range of information from a large number of connections in the network (Gulati and Gargiulo 1999). Directors with high network centrality, as seen in the high number of board appointments to other firms, are in a unique position to have access to a multiple sources of information (Davis 1991). Holding multiple directorships

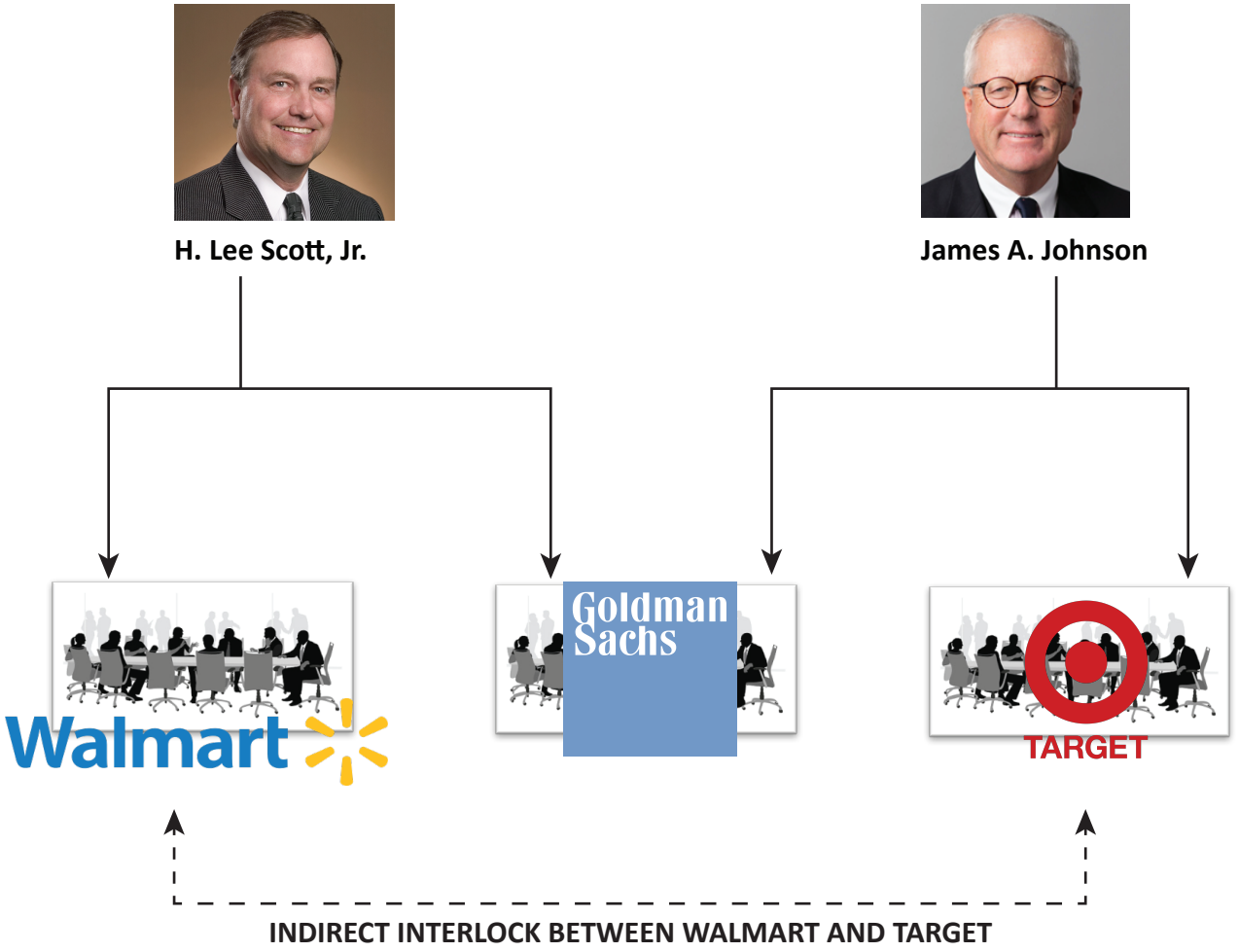

Figure 2: *An example of an indirect board interlock*. Director H. Lee Scott Jr. is a board member of Walmart Inc., and director James A. Johnson is a board member of Target Corporation. Target and Walmart cannot form a board interlock due to regulations of the Clayton Act of 1914 which prohibits interlocks between industry rivals. However, both directors also sit on the board of Goldman Sachs. Therefore, Walmart and Target are connected through an indirect board interlock, which is legal.

expands the pool of knowledge, broadens experience and enables firms to vicariously learn about the implementation and outcome of strategies at other firms (Useem 1988; Shrophsire 2010).

2.4 Problems of Strategic Adaptation to Logics of Competition

While positional embeddedness, as seen in the form of multiple director ties to outside firms, brings a wealth of information to the corporation, studies have also warned about the potential problems of poor knowledge transfer and diminished engagement in firm strategy due to multiple board appointments taking up the time and resources, which are necessary for directors to contribute adequately to each firm (Shropshire 2010; Ferris, Jagannathan and Pritchard 2003). A firm's receptivity to additional sources of information diminishes as the focal board's network centrality in the interlocking directorate increases (Shropshire 2010). A firm's board is more likely to be receptive and attentive to a small, manageable source of information. Given the challenges of weighing a large amount of information from multiple embedded ties, even when multiple directors bring pertinent information to the boardroom, information overload may prevent the firm from reaping the benefit of directors with high network centrality (Shropshire 2010)

Evidence suggests that decision-makers rely on a variety of simplifying strategies or rules of thumb, called heuristics, when making decisions (Tversky and Kahneman, 1974). As the implicit guidelines that direct our judgment, heuristics serve as a mechanism for coping with the complex environment surrounding our decisions. Information overloaded actors often engage in a decision-making heuristic known as *satisficing*, which means that they settle for a

satisfactory choice instead of searching till they reach the most optimal solution (Simon 1955). In general, heuristics are helpful because they provide managers in a time-crunch a simple way of dealing with a complex world. However, they are often misused which can lead to serious errors or biases in judgments (Tversky and Kahneman, 1974; Bazerman and Moore 2012).

Competitive Dynamics theory suggests that the problem of bias in competitive analysis is not a trivial one. Awareness is a key precursor to organizational action and motivates the firm to respond to a competitive threat (Chen 1996). If the knowledge transfer due to high positional embeddedness (high network centrality of interlock ties) is poor, then managers will have a reduced ability in identifying competitive threats and will find themselves blindsided by a surprise attack. Recent studies on boardroom interaction have acknowledged the importance of using group dynamics theory to understand boardroom decision styles and its effect on firm outcomes (He and Huang, 2011; Beckman, et al., 2014). Furthermore, the distribution of the network centrality of individual directors on a focal firm's board has been associated with creating a lopsided power-dynamic in the board room, and has been shown to have an adverse effect on decision-making, firm performance and the firm's ability to attract financial resources (He and Huang, 2011; Beckman, et al., 2014).

Additionally, while strategic adaptation to the context's logic of competition allows firms to have relative competitive advantage, some of the same adaptations create problems in the way firms process lessons learned from competitive experience (Barnett, 2008; Barnett and Hansen 1996). Organizational learning presumes interpretation of experience, and involves drawing lessons from memory and pooling personal experience with knowledge gained through the experiences of others (Levinthal and March 1993). However, bounded rationality, coupled

with problems arising from competing against the backdrop of a complex and changing context, makes it difficult to extract perfect lessons from experience and to retain them (March, Sproull, and Tamuz, 1991). Organizational learning theory states that organizations try to cope with the problems of learning from experience through the process of simplification, by reducing adaptation in one part of an organization in order to make learning more efficient in another part (Lounamaa and March, 1987). As a result of simplifying experience, organizations tend to focus attention and narrow their competence, becoming increasingly specialized in a narrow repertoire of adaptive responses.

Initially, the simplification of experience and specialization of adaptive response improves organizational performance, but this eventually leads to "traps of learning" by simultaneously reducing the incentive for exploring new strategies or achieving competency by exploring new capabilities (Levinthal and March 1993). One such trap of learning is known as a "competency trap" where the firm that excels at a particular strategy, tends to engage in that strategy with greater frequency, resulting in gaining more competency with that strategy but at the cost of exploring better alternatives. Gaining competency with a particular strategy is self-reinforcing, meaning, firms tend to engage in the strategies at which they have greater competency more frequently compared to strategies with which they are less competent at. This results in the firm gaining greater experience with that particular strategy. Becoming more experienced with a particular strategy translates into becoming more competent at that strategy over others and invites further utilization and prioritization of that strategy over others. This self-reinforcing feedback loop of learning makes it attractive for the organization to continue with this distinctive competency (Levinthal and March 1993). While this

specialization leads to an immediate competitive advantage, it is rarely sustainable. The organization becomes essentially trapped in the exploitation of the same competency, alienating itself from acquiring other forms of experience, and eventually becomes susceptible to environmental change (David, 1985).

Perspectives from structural inertia theory state that stakeholders both demand and reward organizational leadership that demonstrates the ability to reproduce successful capabilities repeatedly and consistently. There is pressure and incentive on organizational leadership to maintain the status quo and to resist having to frequently adapt to environmental demands. Successful competencies become institutionalized into standardized routines, which lower the cost of reproducing these competencies over and over again. However, the same factors that make competencies reproducible make it resistant to change (Hannan and Freeman 1984). As a result, organizational leadership becomes increasingly unresponsive to environmental contingencies.

Another trap of learning from experience occurs when organizations that wield power in their market environments lack the incentive to develop their adaptive skills. For example, firms that pursue a strategy of defensively manipulating the political logics of their market environment impose their policies, products, and strategies over other firms, instead of learning to adapt to a dynamic environment (Levinthal and March 1993). The continued usage of political power by firms using tactics such as campaign financing and government lobbying changes a short-term asset into a long-run liability. In the short-term, the ability to dictate an environment makes it attractive for the organization to maintain this strategy because it reaps profits from defending its strategic interests, without having to worry about adapting to

competition from other firms. Over the course of time, when the environment undergoes economic, political, or demographic changes that are beyond the firm's control, the organization pays a heavy penalty due to the atrophy of adaptive skills that are necessary to prevent being blindsided by new competition (Levinthal and March 1993).

To summarize, there is a gap in the literature with respect to competitive scenarios that are asymmetric in nature. Adopting a dynamic view of competition indicates that asymmetry has contradicting implications for firms when we decompose the static concept of competition into its dynamic parts: the action part of rivalry and the cognitive component of analysis. When asymmetric competition is studied at the level of asymmetric rivalry, where one firm competes with little to no retaliation from its rivals, asymmetry is a competitive advantage. However, when asymmetry occurs at the cognitive level of competitive analysis, wherein one firm is unaware or unable to neutralize the other firm's threat, it turns into a destructive liability.

To explain this paradox, we enlist the aid of the theory of Red Queen competition, which provides a context for asymmetric competition, and is flexible enough to allow a multi-theoretical explanation of the favorable and unfavorable consequence of asymmetric rivalry and asymmetric competitive analysis. Strategic adaptation to the context's logic of competition leads to favorable asymmetric rivalries for the focal firm. Specifically, proactive manipulation of institutional logics (by way of legitimizing innovations through trademarking) that challenges existing institutional logics, and the defensive manipulation of the political logics (safeguarding corporate interests by engaging in a political activity) by the focal firm, create favorable asymmetric rivalry, enabling the focal firm to engage in a greater number of competitive actions relative to its rivals. Similarly, firms that strategically adapt to the social logics of

competition, by increasing their positional and structural embeddedness within the network of interlocking director ties improve their asymmetric rivalry with rival firms.

However, some of these same strategic adaptations to logics of competition also lead to unfavorable asymmetries for the focal firm. We assume that firms are boundedly rational, which creates the potential for cognitive biases to occur during competitive analysis. Asymmetric competitive analysis occurs because organizations fail to adapt rationally, because the cognitive biases of boundedly rational firms trap firms into exploiting existing strategies over alternative routines. Problems in competitive analysis arise depending on how firms choose to respond to the constraints of their competitive environment. More specifically, we argue that defensive manipulation of political logics creates competency traps and biases in the focal firm, and leads to asymmetric competitive analysis, as evidenced by the erosion of market share in the focal firm and a simple repertoire of competitive actions. In addition to the limits on the cognitive capacity, we also assume that adaptive learning in firms is constrained by decision-makers' tacit norms of group dynamics, thereby reducing the effectiveness of embedded ties. Citing the problems identified in the literature we argue that greater positional embeddedness leads to the unfavorable consequence of asymmetric competitive analysis. We formally present these arguments and the theoretical rationale behind the relationships identified in the conceptual model (Figure 3), in the following chapter where we develop specific hypotheses based on our theoretical framework.

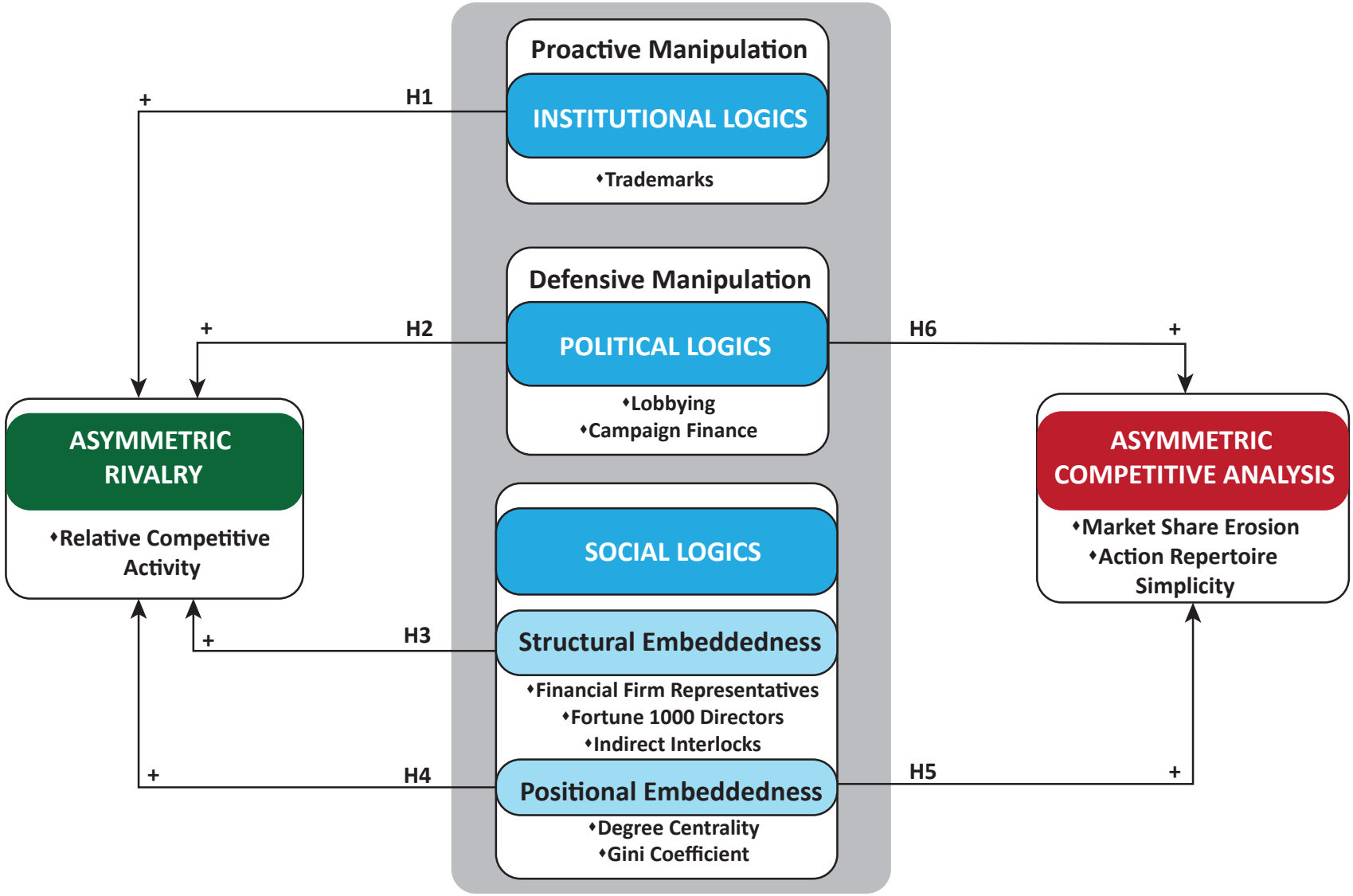

Figure 3: *The paradox of asymmetric competition*. Strategic adaptation to logics of competition leads to asymmetric rivalry and asymmetric competitive analysis.

Chapter 3: Hypotheses Development

We now develop arguments based on the theoretical framework discussed in the previous chapter to predict relationships between logics of competition and asymmetric competition. Specific hypotheses are developed to predict relationships between logics of competition and asymmetric competition. We begin by stating hypotheses related to strategic adaptation to institutional, political and social logics of competition and asymmetric rivalry in Sections 3.1 –3.4. Next, we argue why strategic adaptations to the political and social logics (positional embeddedness) of competition lead to asymmetric competitive analysis in Sections 3.5 and 3.6.

3.1 Institutional Logics and Asymmetric Competitive Rivalry

Institutional logics are defined by Thornton and Ocasio (1999, p. 804) as "the socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality". They refer to the "organizing principles", which are supplied by higher order social institutions such as organizations, the government, and professional affiliations, and shape actors' world view and interpretation of the organizational field (Friedland and Alford 1991, p.258). These higher order institutional logics inform the cognition of decision-makers, and determine how actors within organizations come to interpret and share an understanding of which strategic interests to pursue and which decisions to execute (DiMaggio 1997; Jackall 1988). For instance, changes in institutional logics affect which

economic forces gain the attention of firms, which ones are deemed problematic, and whether they are addressed with a corresponding change in the strategy and structure of the responding organization (Fligstein 1990; Thornton and Ocasio 1999).

The theoretical perspective of institutional logics incorporates the traditional viewpoint of institutional theory, wherein the institutional environment comprised of regulatory structures, normative pressures, and cultural-cognitive systems shape organizational and managerial activity (Zucker 1977; DiMaggio and Powell 1983). While the definition of institutional logics acknowledges the meaning and importance of institutions, it differs from the classical institutional theory assumption of the perfunctory pursuit of legitimacy by firms and the resulting isomorphism of firms in the organizational field (DiMaggio and Powell 1983; Thornton and Ocasio 2008). In the classical institutional theory view, survival and performance depends largely on firms passively embracing legitimacy by conforming to institutional pressures, instead of actively pursuing strategies to bend the institutional pressures to their advantage (DiMaggio and Powell 1983; Meyer and Rowan 1977). The institutional logics view assumes that managerial practices and outcomes are a product of the individual actor's interpretation of their institutional structure and that individual agency is embedded in the institutional environment (Friedland and Alford 1991; Thornton and Ocasio 1999). Under this view, organizations are perceived to be agents of change, that behave in an entrepreneurial manner to shape and alter the outcome of institutional logics rather than take institutional pressures for granted for the end goal of legitimacy (Thornton 2004; Barnett 2008). Additionally, instead of assuming that a single, dominant institutional logic overruns organizational fields and constrains firms to adopt similar coping strategies (isomorphism), the

institutional logics view assumes the organizational field of firms to have simultaneously occurring multiple, fragmented, and competing logics (Friedland and Alford 1991; Schneiberg 2007). Furthermore, evidence suggests that firms respond to the multiplicity of institutional logics in market settings differently, indicating that isomorphism is not the main response to institutional pressures (Greenwood, Diaz, Li and Lorente 2010).

To illustrate, in the Red Queen theory, institutional logics refer to a special type of logic of competition that determines the industry's barriers to entry, industry rivalry, the criteria on which rivals compete, their stratagems, and the outcome of competition (Barnett 2008). Consequently, institutional logics orchestrate a meta-competition of sorts between firms contesting one form of institutional logic over another. For instance, contests between firms could occur between firms competing over unique rights to a distribution system, over alternative modes of payment, or competing standards for certifying quality of goods and services. The winner of the meta-competition between multiple institutional logics sets the tone for the context's logic of competition and therefore dictates what rules, practices or procedures will prevail in the industry that other firms are obligated to follow. Furthermore, institutional environments have been characterized as being pluralistic and fragmented environments in which various organizations and stakeholders make conflicting demands on their constituent organizations (Meyer and Rowan, 1977). D'Aunno, Sutton and Price (1991) argue that organizations, when met by conflicting, plural demands from their institutional environment, are constrained in their ability to respond to these demands individually. For example, strategically adapting to each of the competing logics is a costly proposition when there are high fixed costs for doing so. Thus, actors are motivated to act as agents of

institutional change not only for strategic reasons of market dominance, but also for practical reasons of ease and efficiency, and more importantly because adjusting to competing institutional logics is a cost prohibitive affair (Barnett 2008).

For these reasons, firms often attempt to rule out certain institutional logics and actively try to manipulate which institutional logics come to prevail in an industry (Barnett 2008). Manipulation refers to the purposeful and opportunistic attempt to influence the institutionalized values, beliefs, or definitions, and criteria of acceptable practices or performance standards in an industry (Oliver 1991). Social actors seek to achieve their efficiency-related objectives by creating or transforming an existing institutional logic with the help of the resources available to or created by them (DiMaggio 1988; Maguire, Hardy, and Lawrence 2004; Seo and Creed 2002). According to Oliver (1991), motivation to manipulate institutional logics by firms is high when there is multiplicity of constituents and constraints on the organization. An onslaught of heterogeneous institutional arrangements is likely to make actors question these arrangements. Instead of taking these heterogeneous institutional arrangements for granted, actors are motivated to differentiate themselves from them, and if necessary, diverge from competing logics (Emirbayer and Mische 1998; Seo and Creed 2002; Sewell 1992; Battilana, Leca and Boxenbaum 2009). The Red Queen theory states that entrepreneurial organizations revolutionize industries by introducing innovative approaches that imply a new logic of competition (Barnett 2008). This involves manipulating market environments by creating practices, services or products that others are motivated to follow for the purpose of redefining the legitimacy of extant institutional rules, norms, or practices (Suchman 1995; DiMaggio and Powell 1983).

Organizations that initiate calculated, interest-driven changes that transform existing or create new institutional logics are termed as institutional entrepreneurs in the institutional theory literature (DiMaggio 1988; Greenwood and Suddaby 2006). Institutional entrepreneurship involves initiating innovative changes within the boundaries of an organization or within the broader institutional context in which an actor is embedded in, that diverge from the prevailing logic of a market's institutional context (Battilana, Leca and Boxenbaum 2009). Extant research illustrates trademarks as indicators of innovative activity in service firms, standing in as surrogates for strategic change, in addition to reinforcing the differentiation of the product or service offerings (Schmoch, 2003; Mendonca, Pereira and Godinho 2004; Hipp and Grupp 2005).

Implementing divergent change is challenging and resource-intensive because of the "liability of newness" associated with innovations (Misangyi, Weaver and Elms 2008; Aldrich and Fiol 1994). Therefore, financial resources are used during early stages of the process to bypass challengers of a proposed change (Greenwood, Suddaby, and Hinnings, 2002). Resource commitments are also made to build legitimacy for the new innovative change (Greenwood and Suddaby 2006). The manipulation of institutional logics to promote an innovative idea involves building *pragmatic legitimacy* with the organization's immediate audience (Suchman 1995). Pragmatic legitimacy, which refers to the legitimacy conferred upon the organization by its most immediate audience (e.g. customers), involves support for an organization based on the innovation's practical use and its expected value to its audience. Because pragmatic legitimacy refers to the direct exchange between a focal organization and its specific constituents, its manipulation involves investing in a strategy that requires persuading consumers to value

certain offerings over others (Suchman 1995). Additionally, institutional theory views companies and their brands as being embedded in the institutional environment, which consists of the cultural meanings, ideals and accepted social norms that serve as guidelines to which companies conform to signal legitimacy to key audiences (DiMaggio and Powell 1983; Suchman 1995). For example, the registration of a trademark for a new product or service confers pragmatic legitimacy because brands facilitate consumer choice and frame the new product or service offering as having credibility. Trademarks also convey significant and sustained resource commitments because a history of investment in research and development precedes the product or service being trademarked. Additionally, unlike patents and copyrights, trademarks need to be renewed indefinitely, as firms would not be able to justify sustaining a trademark (with its associated costs of renewal fees, filing legal documents, etc.) if their products had no distinguishing advantages or attributes in relation to other offerings in the market (Mendonca, Pereira and Godinho 2004). Securing legitimacy is important because in addition to being a catalyst to obtaining resources, legitimacy also ensures that firms can introduce innovative change relatively smoothly (Parsons 1960).

Thus, proactive manipulation of institutional logics is a strategic action that involves mobilizing resources, and making an irreversible commitment to implement divergent change. Porter's general strategy theory argues that rivals are less motivated to attack and less likely to immediately respond to strategic actions for two main reasons (Porter 1980). One, if there is uncertainty surrounding the effectiveness of strategic actions, it is highly likely that rivals will not deploy resources to retaliate or intimidate the firms to retreat (Porter 1980; Chen, Smith and Grimm 1992). Accordingly, rival firms will wait to respond or respond slowly to strategic

actions (Smith, Grimm, Gannon and Chen 1991). Secondly, as manipulating logics involves mobilizing significant resources, rivals will be hesitant to commit resources to an unproven strategy (Chen, Smith and Grimm 1992). Additionally, since innovative actions diverge from the prevailing institutional norm, rivals may not be able to anticipate the extent or the threat potential of such actions. For example, the technology of RFID is a revolutionary method for managing supply chain and distribution of goods in the retail industry. However, when Walmart adopted RFID for inventory management in 2003, other retailers were hesitant and slow to commit to a brand new technology that required a major investment in infrastructure and involved a high level of coordination with suppliers (Sliwa 2005).

To summarize, competing on multiple institutional logics creates constraints in the efficiency-related goals of firms. Firms try to overcome this constraint by manipulating institutional logics in order to shape the outcome of the meta-competition between logics of competition. The manipulation of institutional logics is a strategic action that is innovative and resource-intensive, which deters retaliation from rivals and creates favorable competitive asymmetries for the focal firm.

Therefore, we hypothesize:

H1: Proactive manipulation of institutional logics is positively related to focal firm asymmetric rivalry with rival firms.

3.2 Political Logics and Asymmetric Competitive Rivalry

Logics of competition are also shaped by the institutional gatekeepers and policy makers in the political environment of firms (Barnett 2008; Zuckerman 1999). Porter (1980) acknowledges the government as one of the critical forces that shape industry competition, and recognizes government policy as potentially influencing most, if not all, aspects of industry structure either directly or indirectly. The task environment of firms comprised of regulatory bodies that include various government agencies are a source of considerable environmental uncertainty to firms (Thompson 1967). For instance, government policy can alter the size of an industry through antitrust legislation, and regulatory agencies can enact laws that determine the entry and exit barriers of an industry and indirectly create de facto competitors overnight (Porter 1980). Legislation pertaining to employment practices, environmental standards and taxation guidelines can raise the cost structures of firms and consequently alter demand for products and services through substitutes (Hillman and Hitt 1999; Stigler 1971). The government wields considerable power to intervene in economic transactions and issue sanctions that grant or withdraw legitimacy, and is ultimately a source of tremendous environmental uncertainty to firms (Pfeffer and Salancik 1978; Jacobson, Lenway and Ring 1993; Boddewyn 1988; Porter 1980; Williamson 1979). Theoretical perspectives from resource-dependence theory suggest that a perceived high dependence on government policy motivates firms to reduce dependence by pursuing political action strategies (Stigler 1971; Pfeffer and Salancik 1978). Firms that perceive environmental uncertainty and a high dependence on government policy will follow a relational, long-term approach to political action, rather than a discrete, transactional one (Hillman and Hitt 1999).

As opposed to complying with government forces, firms will engage in defensive political activity to preemptively thwart undesirable policies that challenge the status quo or threaten to constrain competitive advantage (Oliver and Holzinger 2008). As such, corporations will seek to manipulate the government through specific strategies to obtain special political favors with government officials (Stigler 1971). Scholars have compared political institutions to markets of exchange, consisting of suppliers of public policy (elected officials, candidates, regulatory bodies) and demanders of policy (firms vying for public policy) (Buchanan 1987; Hillman and Keim 1995; Hillman and Hitt 1999). According to these theorists, corporations use incentives such as campaign contributions and constituent-specific information in exchange of public policy that benefits corporate interests (Hillman and Hitt 1999; Stigler 1971). To that end, exchange theory states that corporations will engage in specific relational strategies based on the nature of resources exchanged. For instance, firms will engage in relational political strategies that provide policy makers with analytical information pertaining to the pros and cons of specific issues related to their constituency, with the aim of aiding elected officials in framing policies (Aplin and Hegarty 1980).

A particularly common tactic associated with the political strategy of providing information to policy makers by individuals representing the firm's interest is government lobbying. Yet another corporate political strategy involves the use of financial incentives to appeal to nonelected and elected state officials (Hillman and Hitt 1999). Evidence suggests that financial favors extended by corporate CEOs in France were reciprocated by elected officials in the form of privileged access to government subsidy programs (Bertrand, Kramarz, Schoar and Thesmar 2004). For political decision-makers, especially in the United States, campaign

financing is a very important resource that affects the candidate's chance of getting elected to office (Glass 2012). Thus, corporations also use tactics that directly support political candidates through campaign donations or indirectly through Political Action Committee (PAC) contributions to support their relational approach to political strategy (Hillman and Hitt 1999).

Resource-dependence theory argues that reducing government dependence increases a firm's power (Pfeffer and Salancik 1978). Through their use of defensive political strategies, firms reduce dependence on the political logics, and in exchange harness their increased political power to improve their market position, hinder rivals' ability to compete, influence policy makers to pass legislation favorable to the firm, increase the cost of substitutes and complements, and lobby to maintain protective price controls (Capron and Chatain 2008; Stigler 1971; Keim and Zeithaml 1986). A focal firm that defensively manipulates the political environment does not necessarily improve its own adaptive skills, instead they restrict a rival's ability to compete. Defensive political strategies such as lobbying are pursued to undermine the legitimacy of rivals' products and services to consumers, clients or other stakeholders in the institutional environment (Oliver and Holzinger 2008; Capron and Chatain 2008). The resulting market power enables politically connected firms to impose their products, policies and standards on the market context, and carry out their strategies without having to worry about environmental contingencies (Levinthal and March 1993). The ability to control rival's resources through political power is a source of competitive advantage to firms (Capron and Chatain 2008).

Additionally, a defensive political strategy that involves cultivating relationships with elected officials through lobbying tactics leads to the creation of *political social capital*, defined

as “benefits that firms secure through direct or indirect social ties to policy agents that facilitate government lobbying in favor of current firm interests” (Oliver and Holzinger 2008, P.510). Similar to social capital, *political social capital* promotes trust between parties engaged in a relational political strategy (corporations and policy makers). It enhances the ability of the firm to exert influence over the other party and ensures mutual benefit and cooperation (Oliver and Holzinger 2008; Hillman and Hitt 1999). More importantly, political social capital is a dynamic capability, which when deployed enables firms to defend their current market position and strategic assets to maintain competitive advantage (Teece, Pisano and Shuen, 1997; Blyler and Coff 2003; Oliver and Holzinger 2008). Firms that enjoy superior political connections tend to deploy a greater number of competitive actions relative to other firms in the market (Capron and Chatain 2008).

The defensive manipulation of political logics represents a strategic action that is designed to cope with the constraints of political intervention, to create a defendable position in the industry, and consequently accrue superior competitive advantage for the firm. In the strategic management literature, strategic actions involve a long-term commitment of considerable resources, high sunk costs, an overhaul of organizational structure and radical realignment of the organization-environment fit (Thompson 1967; Porter 1980; Galbraith and Kazanjian 1986; Chen, Smith and Grimm 1992). Industry leaders such as Walmart have overhauled their organizational structure to strategize public policy and pursue government relations (Wilson 2015). Chen, Smith and Grimm (1992) found evidence that strategic actions are less likely to invite countervailing actions from rival firms, thereby allowing firms to attack with impunity (Chen, Smith and Grimm 1992).

Their findings are rooted in Schelling's (1960) thesis on competitive interaction, which argued that the likelihood of a rival's retaliation is dependent upon the extent to which the focal firm can convince its opponent about their commitment to a strategic action. Thus, firms that signal a continued commitment of substantial resources to manipulate the contingencies of public policy are able to thwart their rival's progress and ability to compete (Capron and Chatain 2008).

A relational approach to the political strategy using specific tactics such as lobbying requires special expertise, commitment of substantial resources and a dedicated team of lobbyists for cultivating political relationships (Hillman and Hitt 1999; Capron and Chatain 2008). Political social capital accrued through connections with elected officials is tacit know-how and therefore is not something that can be easily imitated by other firms. Capabilities that are rare, inimitable and non-substitutable offer an asymmetric advantage over other firms (Barney 1991; Miller 2003). From an outsider's perspective, the connection between the capability and favorable performance outcomes is not immediately recognizable. Schelling (1960) notes that the lack of knowledge surrounding the expected effectiveness of certain strategies, especially those that require considerable implementation, puts another restraint on a countervailing response. Scholars have deemed corporate political activity to have tremendous causal ambiguity due to the multiplicity of constituents, institutional constraints, and the information asymmetry between actors in the political process. And, unlike several market strategies which can be evaluated, there is no metric for assessing the effectiveness of a political strategy (Hart 2004; Baumgartner, Berry, Hojnacki, Kimball, and Leech 2009; Hansen 1991). The time constraints involving reallocation of resources, realignment of organizational

processes and the lack of familiarity associated with an unproven strategy are associated with fewer and delayed responses from rivals (Chen, Smith, and Grimm 1992). Due to the costs of political organization, many firms do not have dedicated personnel for organizing and formulating political strategies (Capron and Chatain 2008). Consequently, it is possible that only a fraction of a firm's competitors has resources dedicated to influence political markets, thereby allowing the firm to have a free reign over the market.

In conclusion, firms differ in their ability to influence their political environment because of their differing political connections and resource endowments. Firms that have strong political connections are more likely to intervene in political markets to shape policy pertaining to their resource environment in their favor. Firms that enjoy superior political connections are more likely to deploy competitive actions relative to its rivals. Taking these various arguments together, we hypothesize:

H2: Defensive manipulation of political logics is positively related to focal firm asymmetric rivalry with rival firms.

3.3 Social Logics (Structural Embeddedness) and Asymmetric Competitive Rivalry

The Red Queen theory views competition as a constraint operating on firms in an industry. Firms stay one step ahead of rivals by overcoming the constraints of the logics of competition in their market environment (Barnett and McKendrick 2004). Constraints of

competition are often embedded into the structural configuration of the social network surrounding firms. Economic behavior of firms is said to be embedded in the structure of network ties, and firms' purposeful competitive actions and outcomes of those actions are impacted by their structural embeddedness in the network (Gynawali and Madhavan 2001). Overcoming the structural constraints of the social logics of competition provides access to a unique source of competitive advantage, known as social capital, which consists of unique benefits such as access to assets, access to status, and access to unique information. Social capital includes tangible assets such as financial capital, equipment, as well as intangible or tacit knowledge that flows between connected firms in a network (Madhavan, Koka and Prescott 1998; Gnyawali and Madhavan 2001). Status-related benefits of social capital refer to the legitimacy, prestige, and recognition that flow from high-status firms to low status firms (Podolny 1993; Gnyawali and Madhavan 2001). Network constraints present in the structure of networks deny access to social capital. For instance, we cite two forms of network constraints that prevent firms from gaining access to asset and status benefits—*network closure* and *network constraints due to regulatory framework*—and discuss how firms overcome such constraints of the social logics of competition by strategically embedding themselves into the network structure (Burt 1992; Burt 2010; Mizruchi 1996).

In structural embeddedness theory, *network closure* refers to a network that is marked by dense, interconnected and close ties, where membership is closed off to outsiders that do not belong to the network (Burt 2010). Burt's (1992) structural holes theory argues that firms navigate around the constraint of network closure (missing holes) by pursuing a type of "Tertius strategy" that involves structurally embedding such closed networks into a second relationship

(Burt 2010). For example, a focal firm trying to gain access to capital and wanting to mitigate its outsider status to potential investors, invites top level executives of investment banks or venture capitalists to join the rank of its board of directors. The resulting tie produces two effects: *framing* and *endorsement*.

Framing effect occurs when meaning derives in some part from the context in which a person or entity is viewed (Burt 2010). In a frame-oriented society, every entity is set in an environment or a frame of reference and the entity is evaluated within this frame of reference (Sternquist 2007). Affiliation with an established insider frames the outsider firm as a favorable business associate to potential investors or business partners. Signaling theory further explains how structurally embedded organizations tied to a common partner utilize reliable information about each other from that partner (Baker 1990; Gulati 1995; Spence 1973). Outside parties often lack firsthand knowledge about the inner workings of a firm and must turn to visible signs for indicators of reliability (DiMaggio and Powell 1983). Sharing common ties with a potential partner signals that the partner is regarded as reliable and trustworthy, and will be as cooperative with the focal firm as with the other organizations that the partner is affiliated with (Gulati and Gargulio 1999). Secondly, the affiliation is also an implicit *endorsement*, and carries a reputation cost for the endorsing entity. If the relations with the focal firm fails, then it reflects badly on the party that endorsed the focal firm to the closed network (Burt 2010). By appointing directors with ties to other reputable organizations to their corporate board, the firm signals to potential investors and stakeholders that it is a reputable and legitimate enterprise, worthy of their endorsement (Mizruchi 1996). Consequently, financial institutions

are more likely to lend capital to a firm that has well-known, reputable directors on its board (DiMaggio and Powell, 1983; Mizruchi, 1996).

In addition to assets, status-related benefits are also embedded in the structure of interfirm network ties. Status is a function of an individual's personal social capital that is supplied by the individual's personal network and connections with elite institutions (Belliveau, O'Reilly and Wade 1996; Certo 2003). In general, high status organizations are favored in competitive races (Barnett 2008). Because tie-related status produces a "Mathew Effect" of sorts where high status firms continue gaining advantage relative to peers, in the form of preferential access to resources, faster organizational growth, and access to capital (Merton, 1968; Podolny, Stuart and Hannan 1996; Podolny 1993; Benjamin and Podolny 1999; Barnett 2008). The social capital from board directors network connections also includes sensitive information pertaining to the competitive environment of firms, including updates on strategies and policies at rival firms (Davis 1991; Haunschild 1993). Additionally, director's networks also supply firms with knowledgeable and highly qualified managerial talent (Rosenstein, Bruno, Bygrave, and Taylor 1993). Directors that have ties to strategically related organizations are able to provide better advice and counsel to the focal firm, and increase firm performance (Carpenter and Westphal 2001; Westphal, 1999).

We now turn our attention to another kind of network constraint that is artificially created through stakeholder intervention and impacts competitive behavior. Network ties are known to reduce uncertainty, improve market intelligence, and enable collusive behavior through improved coordination among industry peers (Mizruchi 1996; Burt 1992). Following this rationale, regulatory constraints on tie formation between industry firms will also alter the

context's logic of competition and contribute to competitive uncertainty. Due to the questionable legality of collusive behavior between industry firms, direct ties among close rivals are usually prohibited by regulation (Mizruchi 1996; Burt 1992). For example, Section 8 of the Clayton Act of 1914 specifically prohibits direct interlocks between firms competing in the same markets (Mizruchi 1996). However, indirect interlocks, which occur when directors from two firms sit on the board of the third, host firm, are legal and prevalent among competitors (Burt 1980; Vance 1983).

Structural embeddedness involves actors' reliance on indirect channels of communication for information on other actors, and applies more generally to structurally equivalent firms that are indirectly connected through a common tie such as indirect interlock (Gulati and Gargiulo 1999). This indirect channel of communication serves as a search and monitoring mechanism for rival strategies and actions, and for evaluating each other's relative progress (Burt 1987). Indirect interlocks with rival firms resemble Granovetter's (1973) concept of "weak ties", where weak ties are the indirect ties initiated by actors in a network to manipulate constraints of network structure and gain socially distant information and ideas. When the regulatory framework poses constraints on network structure, indirect interlocks have the dual advantage of being legal, and at the same time avoiding the redundancy of information that comes with direct ties (Granovetter 1973).

Through such strategic embeddedness, firms also gain the unique opportunity to learn about decision-making styles at rival firms when their own directors interact with rival firm directors as they jointly serve on corporate boards of a third firm (Carpenter and Westphal 2001). Evidence suggests that knowledge obtained from weak ties is even more useful when it

is obtained from such a trusted and competent source as a board director (Levin and Cross 2004). Boards are often composed of highly competent individuals such as bankers, financial representatives, retired government officials, and top management of Fortune 1000 firms, who bring along with them expertise, experience, and skills to provide advice and counsel to the boards they serve on (Baysinger and Butler 1985; Gales and Kesner 1994). Competence is a critical dimension of trust and amplifies the perceived usefulness and the likelihood of mobilizing the information received through these indirect ties between firms into a concrete plan of action (Mayer, Davis and Schoorman 1995; Levin and Cross 2004).

To sum up the above arguments, structural embeddedness by the focal firm overcomes network constraints of regulatory framework and network closure to give access to competitive advantage in the form of social capital. Structural embeddedness occurs when firms circumvent network constraints by inviting directors from reputable institutions to serve on their board. Similarly, firms can also structurally embed regulatory constraints on tie formation through indirect ties with rivals as a noisy channel of communication that relays rival strategies and actions. Structural embeddedness gives access to competitive advantage called social capital, making firms more likely to carry actions and enables the focal firm to carry out competitive actions with impunity.

Therefore, we hypothesize:

H3: Structural embeddedness is positively related to focal firm asymmetric rivalry with rival firms.

3.4 Social Logics (Positional Embeddedness) and Asymmetric Competitive Rivalry

Firms also use their position in the inter-organizational network to alter the logics of competition (Barnett 2008). Positional embeddedness refers to the overall position of a focal firm in its social network of ties, which gives access to resources that ultimately help the focal firm in gaining competitive advantage over rivals. Positional embeddedness refers to the construct of *network centrality*, which describes the notion of being connected to many significant ties that put the focal firm in a position of strategic advantage (Freeman 1979; Gulati and Gargiulo 1999). The resulting strategic advantage includes access to salient information such as market intelligence on rivals in the industry, including nuanced details about the competitive intent, strategic posture and resources of other firms in the competitive space (Harrigan 1986; Gnyawali and Madhavan 2001). Therefore, positional embeddedness can influence an organization's ability to access fine-grained information about the competitive environment.

Evidence supports the view that by virtue of being involved in several ties, central actors have a more accurate picture of the neighboring network (Krackhardt 1990), and have access to a large web of market intelligence (Gulati 1999; Powell, Koput and Smith-Doerr 1996). Central organizations are also more embedded in the flow of information and resources in the network compared to non-central or peripheral actors (Cook and Emerson 1978), which gives them early access to novel information (Rogers 1995; Valente 1995). We assert that positional embeddedness gives firms a competitive advantage, and a firm's network centrality serves as a

resource of market intelligence and guides the focal firm in adapting to context's logic of competition.

An example of how positional embeddedness is demonstrated at the inter-firm level of network centrality is the specific case of direct board interlocks. A board interlock occurs when a director or a top-level executive from the focal firm also serves as a director on another firm's board, joining the two firms into an interlock (Shropshire 2010). The focal firm's network centrality is based on the number of interlocked ties formed with other firms in the intercorporate board network (Mizruchi 1996). Consequently, when a firm has directors that serve on multiple boards, the firm accrues benefits related to network centrality such as social capital, early access to information, technology, capital, and prestige (Davis 1991). In terms of information flows via board interlocks, research suggests that it is important to consider flow of information not only at the network level between interlocked firms, but also at the level of the individual nodes (interpersonal ties of directors serving on the board) (Shropshire 2010; Chen, Dyball and Wright 2009; Kang 2008). This distinction is important because, networks of interlocking directors represent a particular type of network known as affiliation, bipartite or two-mode networks (Borgatti and Everett, 1997; Robins and Alexander, 2004). An affiliation network represents two distinct sets of nodes or social entities, and each tie represents a social actor's affiliation with a group. In the case of board directors, a director on a corporation's board simultaneously links firms in the interlock (focal firm interlocked with other firms) as well as to other directors on the board they serve on (See **Figure 4**).

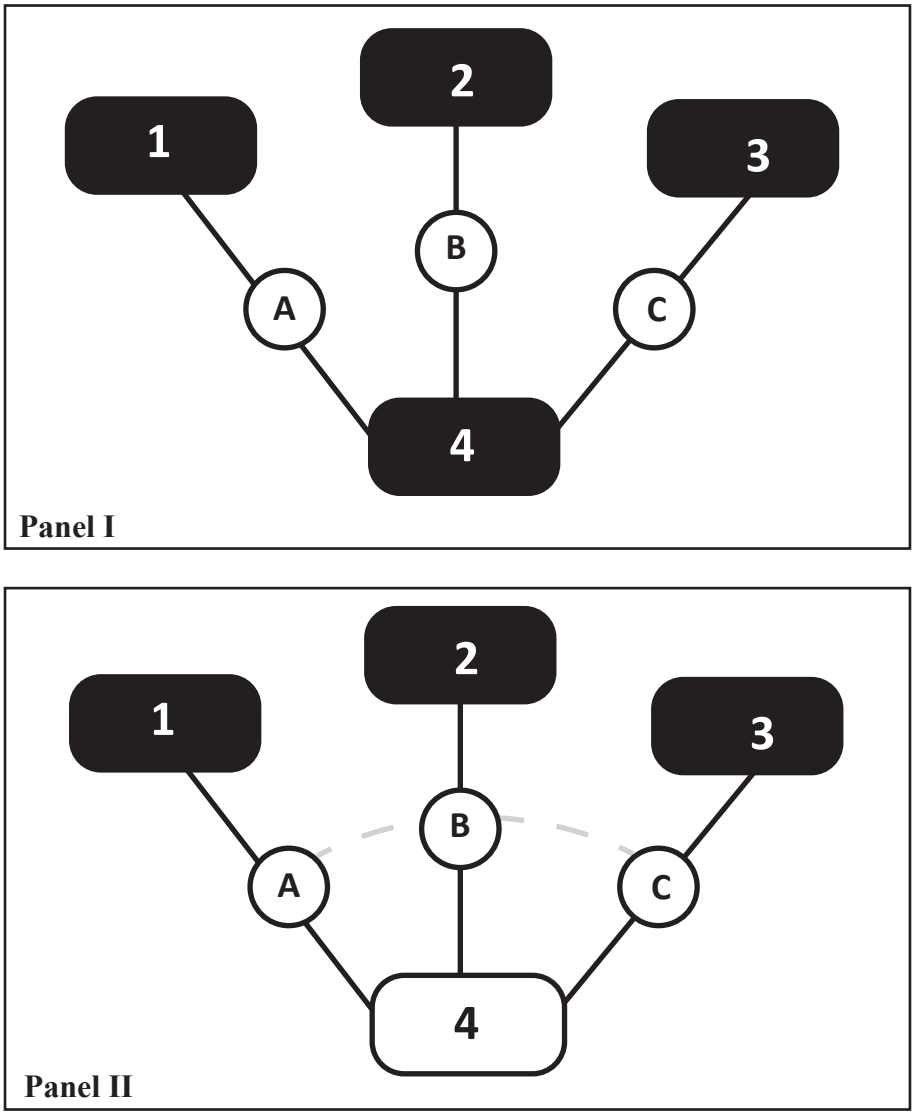

Figure 4: *The affiliation two-mode network of board interlocks*. A board interlock occurs when a director simultaneously sits on the boards of two (or more) firms, connecting the firms into an interlock. Because the affiliation network is two-mode, we can view the interlocks in two, equally-important ways:

- Panel I: Firm-Firm network. Firm 4 is connected to firms 1, 2, and 3 through board interlocks via individual directors A, B and C.
- Panel II: Director-Director network. Directors A, B and C are also connected to each other as board members of Firm 4.

The duality and intertwining of linkages in affiliation structures implies that neither node should be considered in isolation, and scholars in the bipartite interlocking directorate network literature advocate considering both nodes in research (Mizruchi 1996; Shropshire 2010; Opsahl 2013). Bearing this in mind, we extend the discussion of positional embeddedness to the distribution of network centrality of individual directors on the focal firm's board.

Boardroom interactions are germane to understanding how information flows from network centrality are used to advise strategic action by firms. For instance, similar to He and Huang (2011), we recognize that corporate boards are composed of people, and that as humans, elements of interpersonal group relations such as conflict, teamwork, and social hierarchy would affect decision-making in the boardroom. A large body of research on small group dynamics indicates that people are naturally prone to guiding their interactions with each other on the basis of an informal hierarchical order, which is formed due to our tendency to use social cues as a guide to draw inferences of each other's status and authority (Magee and Galinsky 2008). Centrality at the director level indicates the number of firms whose boards an individual director serves on. Being invited to serve on a board is considered prestigious. It also expands an individual director's pool of available sources of information, provides broader exposure to and awareness of current strategies at other firms. These benefits, among others, allow directors with high network centrality to be acknowledged as being competent, influential, and respected by peers on the board. Therefore, directors will use the number of board directorships concurrently held by their co-directors as a social cue to deduce the social hierarchy or ranking in the boardroom. The greater the degree of such inequality in distribution

of directorships across the board, the easier it becomes for directors to perceive an informal hierarchy in the boardroom (Blau 1977; He and Huang 2011).

We argue that informal hierarchy in the boardroom due to some directors having more centrality compared to others, will affect the focal firms' ability to make use of the information sourced from the intercorporate board network. Directors develop repositories of knowledge after witnessing first-hand the implications of strategic decisions made at other firms (Carpenter and Westphal 2001). However, transforming this knowledge into strategic actions requires an organizational structure that facilitates its translation into a definitive plan. Research from social hierarchy literature argues that people default to an informal hierarchical order, as opposed to a more egalitarian group structure, because hierarchy provides clear guidelines for group interaction and coordination (Magee and Galinsky 2008).

The informal hierarchy among board directors facilitates coordination among directors and promotes consensus building for approving strategic decisions (He and Huang 2011). This is important for several reasons. First, time-crunched directors need effective ways to facilitate important decisions in a very limited amount of time, given that board meetings are infrequent and short in duration. Second, the absence of clear rules or procedures to guide expectations and involvement in boardroom discussions necessitates clear leadership to provide guidance on the rules of engagement and discussion, for example, when to speak, with whom speak, and how to make board interactions smoother and more effective (He and Huang 2011). An ostensible hierarchy in the boardroom helps directors interact more productively, enables better decision-making, and ultimately results in better financial performance for the firm (Finkelstein and Mooney 2003; He and Huang, 2011).

Board directors with high positional embeddedness are key to executing good decisions, and work as catalysts in the boardroom to persuade other directors and executive leadership to adopt a particular line of action. Directors differentiate in the level of deference given to fellow board members on the basis of the number of board memberships held by each director, with highly connected board directors commanding more authority in the boardroom compared to those that don't hold many directorships (He and Huang 2011). To have a functioning board, you need a style of leadership that discourages dysfunctionality and promotes consensus building while drawing meaningful lessons from competing viewpoints. The resolution of conflict in groups involves the exercise of authority and status (Sell, Lovaglia, Mannix, Samuelson, and Wilson 2004). Task-related conflicts, defined as mild disagreement over differences in ideas, viewpoints, and opinions pertaining to the group's task, are likely to be reduced, because less central (and thus lower ranking) directors cooperate with and defer to more central (higher ranked) fellow directors to handle matters of greater strategic importance (Amason and Sapienza 1997). Directors who have high centrality on the focal firm's board tend to also leverage their position to act as arbitrators to resolve deadlocked ideas or to endorse good ideas proposed by lower ranking directors (Leblanc and Gillies 2005).

Evidence suggests that a firm's embeddedness in a rich network of ties is what makes it more likely to develop competitive capabilities compared to others that are not as well positioned to access new ideas, information and opportunities (McEvily and Zaheer 1999). By explicitly modeling the bipartite structure of the board interlock in our theoretical framework, we are able to derive a more nuanced understanding of how positional embeddedness works as a two-pronged strategy for acquiring asymmetric competitive advantage. Positional

embeddedness at the firm level provides access to market intelligence, while distribution of positional embeddedness at the focal firm board level, facilitates decision-making and responsiveness to act upon network-sourced intelligence.

To sum up the previous arguments, in comparison to rival firms, greater positional embeddedness of the focal firm in the form of network centrality, creates a competitive advantage due to the enhanced access to market information. Additionally, the distribution of positional embeddedness on the focal firm's board, facilitates the interpretation of the market information to inform strategic decisions. The improved decision-making capability enables the focal firm to carry out a greater number of competitive actions relative to rival firms.

Therefore, we hypothesize:

H4: Positional embeddedness is positively related to focal firm asymmetric rivalry with rival firms.

3.5 Social Logics (Positional Embeddedness) and Asymmetric Competitive Analysis

Prior research shows that corporate boards are more likely to be influenced to strategically adapt when presented with unique information that cannot be accessed through other sources (Haunschild and Beckman 1998). However, focal firms with a high number of interlocks due to their central position in the network, may be inundated with vast amounts of information, making them susceptible to information overload (Porter and Donthu 2008;

Simmel 1950). Ferris, Jagannathan and Pritchard (2003) assert that directors who have upwards of three interlocks lack the time and resources to devote adequate attention to each firm. Hence, even if the firm has access to unique and relevant information through its board interlocks, the boardroom may not reap the benefits of centrality due to the onerous task of evaluating a large amount of information from multiple sources. Firms cope with information overload by practicing the heuristic of *satisficing* when it comes to making decisions (Shropshire 2010). *Satisficing* is a rational theory of choice that describes the process by which boundedly rational actors, facing time and computation costs, search for alternatives until a "satisfactory" solution is found (Simon 1955; Simon 1956; Winter 2000). Satisficing contrasts with optimization theory, wherein a firm concludes a search upon finding the most optimal solution as opposed to settling for a solution that is adequate or satisfactory.

Organizational learning theory states that diverse interpretations of information improves learning and increases the organization's capability of undertaking a broad range of actions. However, it also states that the interpretation of information, i.e. giving meaning to information or developing shared understanding of information, is affected when information exceeds processing capacity (Huber 1991). This implies that over-embeddedness of directors may compromise the ability to generate meaningful lessons from market intelligence and consequently compromise the ability to engage in a wide range of competitive actions.

Similarly, insights from team and organizational learning theory, indicate that over embeddedness in terms of multiple board interlocks could lead to exploitative, as opposed to exploratory, behaviors at both director and corporation levels of the affiliation network level (March 1991; O'Leary, Mortensen and Woolley 2011). When individuals concurrently belong to

multiple teams, the group faces difficulties in sharing and integrating information to generate new knowledge and ideas (Wilson et al. 2007). In contrast, individuals working on a smaller number of teams are able to allocate more time per team, resulting in active experimentation, creative problem solving and the ability to appreciate nuanced information mindfully (DeMarco 2002).

Team learning theory states that learning gets undermined when individuals serve on multiple teams simultaneously because multiple concurrent team membership sets time limits on how well teams give attention to, and how well they integrate novel information successfully. This leads to the prioritization of only those tasks that are critical and time-sensitive (O'Leary, Mortensen and Woolley 2011). Therefore, individuals will prefer exploiting the same action repertoires that have been utilized in the past, and are less likely to deviate from the past actions. (Soda and Bizzi 2012). Repeated exploitation of the adaptive processes is likely to be effective in the short run but becomes self-destructive over time (Huber 1991). The frequency with which an action is used leads to gaining competency with that particular action. And, the more competent the firm becomes at using the same actions, the more likely they use that same set of actions or behaviors. Thus, a firm develops competency traps that prevent it from engaging in exploratory behaviors or from developing new competencies with which to attack rivals (Levinthal and March 1993).

A varied interpretation of information is also necessary to inform competitive analysis. When centrality is unevenly distributed on the corporate board of the focal firm, directors with high status tend to dominate boardroom discussions, while the perspectives of other board members receive less attention. As a result, the firm is not able to draw on the expertise of the

entire board (Wittenbaum and Bowman 2005; Beckman et al. 2014). Also, Mannix and Sauer (2006) argue that group hierarchy interacts with the dissemination and exchange of information to create group discussion bias. The propensity to introduce and consider commonly held information at the expense of exchanging and considering information uniquely possessed by members creates discussion bias and poor group decisions (Stasser, Taylor, and Hanna 1989; Stasser and Titus 1985; Stasser and Stewart 1992).

Earlier, we discussed how the distribution of network centrality creates an informal hierarchy in the boardroom structure (He and Huang 2011). We argued that this informal hierarchy on a corporation's board facilitates decision-making, and allows the firm to undertake more competitive actions compared to rival firms that have a more egalitarian boardroom structure. However, differences in the distribution of director ties have a tendency to create a power dynamic in the boardroom, which leads to differences in the power wielded by each director in boardroom interactions (Beckman et al. 2014; Emerson 1962; Ibarra and Andrews 1993). In essence, such power imbalances between directors of a firm are likely to result in principal-principal problems rather than the traditional principal-agent problems because conflicts are likely to occur between the various principal board members (Garg 2013).

Additionally, Emerson's (1956; 1964) theory of power relations, states that the inherent instability of power hierarchies set into motion *balancing operations* by less powerful entities to reduce the power dynamic in the relationship to a more equitable level. For example, recent research demonstrates that hierarchies, whether earned or arbitrarily assigned, make individuals less inclined to cooperate due to a decreased investment by lower ranked individuals (Cronin, Acheson, Hernandez and Sanchez 2015). This low inclination to cooperate

on the part of less powerful entities can be explained with the help of the balancing operation *motivational withdrawal*, which refers to decreased motivational investment on the part of the less powerful member. The lower ranking director might lose some interest in cooperation due to the impact of frustrations and demands imposed by the higher-ranking directors. *Motivational withdrawal* is one of the *balancing operations* by which the tensions in an unbalanced hierarchy situation are reduced by the lower ranking director. The lower ranking director's motivational orientations and commitment toward different aspects of director duties will intimately reflect this process (Emerson 1962).

Additionally, the theory of signal detection explains that a person's success at identifying a potential threat is not only dependent on the person's competence or perceptual ability, but also on the anticipated consequences of the relayed responses. This implies that the willingness to relay a threat detection response may stem from a conservative criterion that leads the person to withhold the detection of the threat (Natsoulas 1967; Wickens and Huey 1993). And indeed, research shows that when a low-status group member relays unique information, it is likely to be viewed with more cynicism than when a high-status member shares unique information (Stewart and Stasser 1995; Wittenbaum 2000). As a result, low status members learn that communicating shared information is more rewarding and leads to an improvement of status, compared to communicating unique information (Wittenbaum and Bowman 2005).

Emerson argues that because status is universally perceived as a prized commodity, a low-status individual could engage in another kind of balancing operation. By giving status (deference) to the high-status individual, the low status individual restores the balance of

power and creates dependent hierarchies (Emerson 1964). Additionally, a director's concern for self-preservation, coupled with a desire for status and aspirations to scale the corporate board hierarchy to gain additional outside directorships, will lead to ingratiatory behaviors (Shropshire 2010). Deference, flattery, and downplaying one's opinions to give validity to others are examples of ingratiatory behaviors (Gordon 1996; Westphal and Stern 2006).

As agents of shareholders, board directors are obligated to scrutinize, evaluate, and monitor the way management operates, ensuring the best interests of the shareholders (Hillman and Dalziel 2003). Conscientious execution of monitoring and resource provision duties may create tension for a director who wishes to capitalize on opportunities in the board directors' labor market (Hillman and Dalziel 2003; Westphal and Khanna 2003). However, provision of advice and counsel may create a conflict of motivation for directors, known as the *ingratiator's dilemma*, which may diminish the likelihood that a director will share relevant knowledge or if they do share it that the information will be presented influentially (Jones 1964; Shropshire 2010). This mirrors the classic agency problem of the misalignment of goals between the agent and the principal.

Agency theorists see the primary function of board directors as monitoring agents who are appointed to protect the best interests of principals (shareholders) (Eisenhardt 1989; Jensen and Meckling 1976; Mizruchi 1983). Board directors are obligated to ensure that the management operates in the best interests of the shareholders—an obligation that is met by scrutiny, evaluation, and regulation of the actions of the top management by the board directors (Hillman and Dalziel 2003). Conscientious execution of this role may create an internal conflict for a director who wishes to capitalize on opportunities of gaining multiple

directorships (Hillman and Dalziel 2003; Westphal and Khanna 2003). According to agency theory, misalignment between the goals of the agent and principal results in the classic agency problem of moral hazard. *Moral hazard* refers to a lack of effort on the agent's part and implies that the *agent is shirking* and behaving in a self-interest seeking manner (Eisenhardt 1989). Directors who are motivated by their own career prospects have less incentive to monitor management, because flattery and favors as opposed to honest advice may help a director garner invitations to additional outside boards (Shropshire 2010; Westphal and Stern 2007).

High centrality may also have a negative effect on a firm's willingness to deviate from the past and contribute to competitive inertia, resulting in asymmetric competitive analysis. External network ties carry positive referrals from those that they are connected to, and build a favorable reputation of actors as being dependable and reliable individuals (Wong and Boh 2010). Social judgment of actors is rarely made on the basis of a rational explanation such as a specific attribute that links to past performance, and is almost entirely based upon actors' connections or network ties to other parties (Anderson and Shirako 2008; Benjamin and Podolny 1999; Bitektine 2011; Fombrun and Shanley 1990; Rao 1994; Rindova, Williamson, Petkova and Sever 2005). This means that directors who are concerned about their favorable social judgment, reputation and reliability, will be less inclined to sign-off on strategic actions that deviate from what has worked before. Deviating from established actions carries the risk of being ambiguous, distorting perceptions and jeopardizing their favorable social judgment (Anderson and Shirako 2008; Bromley 1993; Deephouse and Carter 2005; Pfarrer, Pollock and Rindova 2010; Phillips and Zuckerman 2001).

In conclusion, positional embeddedness leads to firms adopting a satisficing approach to problem solving due to the volume of information from having multiple ties. As a result, firms engage in exploiting a narrow repertoire of tried and tested strategic actions. When action repertoires are versatile as opposed to being simple, managers are challenged to monitor rival responses and to respond adaptively to those responses. In contrast, a narrow repertoire of actions reduces the firm's knowledge base because firms get to experience and act on fewer challenges (Miller and Chen 1993; Miller 1993; Levitt and March 1988). Simplicity of action repertoires blindsides managers and confines firms to a narrow set of skills and experiences, and prevents the firm from keeping up with the competitive environment (Miller 1993). Additionally, a lopsided power dynamic in the boardroom, that stems from having a few directors with more positional embeddedness than others, also contributes to poor competitive analysis. Lower ranking board members are less likely to participate in discussions or share unique information. As a result, the firm is not able to draw on the expertise of its entire board.

Therefore, we hypothesize:

H5: Positional embeddedness is positively related to asymmetric competitive analysis in focal firm.

3.6 Political Logics and Asymmetric Competitive Analysis

By pursuing a defensive political strategy, a focal firm is able to reduce its dependence over the regulatory framework, and at the same time leverage the power of the government to

influence its task environment (Hillman and Hitt 1999; Santos and Eisenhardt 2005). By using tactics such as government lobbying and campaign contributions, firms acquire political power to meet their strategic goals. Firms that gain power through defensive and manipulative political actions, essentially have a free reign over the market environment since they are able to dictate their market actions, products, services and strategies to the task environment consisting of customers, clients and other firms, instead of learning to adapt to an exogenous environment (Levinthal and March 1993; Oliver and Holzinger, 2008).

While this may sound like an ideal situation from the politically-connected firm's perspective, it is essentially walking into a "trap of power" (Levinthal and March 1993, p. 102). Traps of power occur when firms, exploit their power to impose environments instead of developing adaptive skills to their task environment, resulting in the atrophy of adaptive capabilities (Levinthal and March 1993). Political power kills the incentive to adapt, learn, innovate, and breeds complacency, because the firm can force its standards, products, services and strategies on the market context instead of adapting to change (Deutsch 1966). Thus, although a defensive political strategy may enhance a firm's performance, it is unlikely to generate sustainable competitive advantage, because the defensive firm's dynamic capabilities reside not in seeking new areas for improvement, but in retaining and rehashing the same strategic assets and competencies it already specializes in. Doing so protects the firm's current position, but does not necessarily improve its capabilities (Oliver and Holzinger 2008). Moreover, having the power to influence your peers means that there are no genuine learning moments. During good times, only exceptionally mediocre actions result in failed outcomes, so firms may inaccurately infer sub-optimal actions to be a cause of success. Learning becomes

superstitious because firms assume that their actions genuinely lead to positive outcomes, when in reality it was their ability to control the political environment that led to a successful outcome (Levitt and March 1988).

Acquiring political social capital by manipulating the political environment occurs over the long term, and as a dynamic capability, is embedded in a set of established and institutionalized routines within organizations (Hillman and Hitt 1999). The political activity of lobbying and contributing to campaigns is described as a routinized, standard operating procedure in firms, which is institutionalized and developed over time to deal with the uncertainty of the political environment (Hadani and Schuler 2013). Consequently, the more an organization responds to competitive forces by playing a defensive political strategy, the greater its competence will center on defensive political strategy. By comparison, an organization that rarely or never responds to competition by manipulating the political logics will only have the option of improving when confronted by competitive threats. Thus, organizations with a history of defensive strategy are less likely to have developed routines for improving in the face of competition because they were busy exploiting their capability of influencing the market (Barnett 2008).

Overreliance on exploiting the successful capabilities is self-reinforcing by nature. The better the firm is at influencing its environment using a defensive strategy, the more likely they will continue using it. The more frequently a firm employs a defensive political process the more experience they have with it. Experience with the capability results in fine tuning it into a competency (Levinthal and March 1993). Theory from organizational learning states that when firms exploit a proven solution, they abandon exploring other options that help in coping with

the challenges of competition. Knowledge and experience with old competencies inhibit effort to change because firms learn about alternative strategies through direct involvement. Since manipulating political logics alienates the firm from gaining experience with alternative strategies it makes them more vulnerable to change (Levinthal and March 1993; Cohen and Levinthal 1994). Eventually the firm's ability to influence the environment is likely to be overwhelmed by economic, political, or demographic changes beyond its control. Competitive advantage acquired through a defensive political strategy is fleeting, because changes in the task environment, including political upheaval, stakeholder action and more importantly, the Schumpeterian creative destruction brought about by innovative actions of new challengers, will expose the focal firm's lack of adaptive skills (Oliver and Holzinger 2008; Barnett 2008; Levinthal and March 1993; Schumpeter 1950).

This atrophy of adaptive capabilities resulting from a controlled competitive experience is similar to the deprivation of trial-and-error learning which is common among children of overprotective parents. Parental overprotectiveness serves simultaneously to reinforce dependency and prevent the child from developing independent, autonomous behaviors (Bornstein 1992). Dependency occurs because children quickly learn that being dependent on others (with minimal effort on their own part) is highly rewarding. Similarly, firms that engage in protectionism reinforce their dependency on governmental regulations at the cost of developing their competitive skills.

We argue that firms manipulate the political logics to defend their market position against competitors. Firms achieve this by lobbying for regulation that limits new entrants or by raising the cost of substitutes and complementary products to make competitor offerings

undesirable (Stigler 1971; Oliver and Holzinger 2008; Hillman and Hitt 1999; Capron and Chatain 2008). By reducing their competitive experience to a small, restricted pool of rivals, firms become more vulnerable to cognitive biases (Barnett 2008). This occurs because experience derived from a restricted sample size of competing firms challenges the validity of lessons learned, since they lack the complete range of experiences for making meaningful inferences (March, Sproull and Tamuz 1991; Lounamaa and March 1987; Levitt and March 1988). Firms that lack multiple events of competitive engagement will use whatever information they can extract from this limited sample of competitive encounters to inform competitive analysis (March, Sproull and Tamuz 1991). Limiting competitive experience to a narrow range of industry rivals, makes firms myopic because their adaptive responses are specialized and tailored to a select group of rivals, and therefore poorly adapted to other possible forms of competition (Barnett 2008; Levinthal and March 1993). They may suffer from a bounded awareness problem, where firms become blindsided to the changing competitive landscape around them and become susceptible to a type of cognitive bias known as the *focusing illusion* (Bazerman and Chugh 2005). The focusing illusion refers to the tendency of people to make judgments based on their attention to only a subset of available information, to overweigh that information and to underweigh unattended information. For example, firms may engage in political activity due to mimetic pressures from other firms, or for reasons of managerial self-aggrandizement, all of which are unrelated to firms' outcomes. Furthermore, there is no clear metric of measuring the impact of political logics on firms' performance, and with the political process being notoriously fickle, there is considerable causal ambiguity between manipulation of political logics and its effect on firms' competiveness (Hart 2004)

Taking these various arguments together, we conclude that although defensive manipulation of political logics has clear benefits in terms of reduced competition, this strategy also makes the organization vulnerable to being blindsided by competition and having its competitive gains eroded away.

Based on the preceding rationale, we hypothesize:

H6: Defensive manipulation of political logics is positively related to asymmetric competitive analysis in focal firm.

Chapter 4: Methodology

4.1 Sample and Data

To ensure that our hypothesized firm-level strategic responses to logics of competition and their impact on asymmetric competition can be traced to the same context, our sampling procedure established screening guidelines (Derfus et al. 2008). First, to give context to our study, we selected the U.S. retail industry because of its long history of well-recognized rivalry between firms, a known set of industry rivals, a clearly defined boundary between strategic groups within the industry, and the prominent documentation of competitive actions by retail firms in the media. Second, we defined the domestic retail industry on the basis of the North American Industry Classification System (NAICS) classification code of firms listed under the 44-45 NAICS industry codes for the retail industry. Third, from this industry classification system, we selected firms that were publicly traded and that were classified as competing in the industry under a distinct strategic group or market segment, as defined by the six-digit NAICS code classification, and compared it to the National Retail Federation's system of classifying firms on the basis of the percentage of sales from a particular category. This ensured that we could trace the effect of the predicted strategic actions of a focal firm on asymmetric rivalry with its closest rivals within the industry.

Nine strategic groups met our criteria: general merchandisers, supermarkets, drugstores, department stores, sporting goods, hardware and lumber stores, home ware retailers, office supply, and footwear retailing.

Fourth, we included only those firms that represented at least forty percent or more of the industry group sales generated by firms that were publicly traded in the year 2012, or firms with net sales equal to or greater than 10 per cent of the sales of the strategic group leader (in terms of sales), had distinct operations in the U.S. market, and reported performance in the specific U.S. market.

Error! Reference source not found. lists all the firms sampled in the study, their NAICS code, strategic group and the average percentage of sales accounted for by the strategic group for the year 2012. Additionally, we sampled our firms over time so that we could make causal inferences about the relationship between our predictors and our dependent variables. This approach resulted in a sample of 41 U.S retail firms observed over a sampling period of ten years from 2003-2012. We have a balanced panel data consisting of 410 firm-year observations.

Firm and firm group information

Firm Name	NAICS Code	Strategic Group	Sales %
Kroger Co. Safeway Inc. Supervalu Inc. Whole Foods Market Inc. Delhaize Group Koninklijke Ahold	445110	Supermarkets	45.16
Walmart Inc. Target Corp. Dollar General Corp. Family Dollar Stores Dollar Tree Inc. Amazon.com Inc.[a]	452990	General Merchandise	82.66
Macy's Inc. Sears Holdings Corp. JC Penney Co. Kohl's Corp. Belk Inc. Dillards Inc.	452111	Department Stores	50.64
Sports Chalet Inc. Hibbet Sports Dicks Sporting Goods Cabelas Big 5 Sporting Goods	451110	Sporting Goods	50.52
Pier 1 Imports Williams Sonoma Bed Bath & Beyond Home Goods Inc.	442299	Housewares	56.11
Genesco Inc. Foot Locker Inc. DSW Inc. Finish Line Inc. Collective Brands Inc. Shoe Carnival Inc.	448210	Footwear	42.01

Table 1: *Firm and industry group information*. Note that Sales % is the percentage of the total industry group sales represented by the selected firms (e.g. the summed sales of Kroger, Safeway, Supervalu, Whole Foods Market, Delhaize, and Koninklijke comprise 45.16% of the total industry sales.

Table 1: (cont'd).

Rite Aid Corp. Walgreens Co. CVS Caremark Corp.	446110	Drugstores	88.74
Office Depot Inc. Officemax Inc. Staples Inc.	453210	Office Supply Stores	59.86
Home Depot Inc. Lowe's Inc.	444110	Building Supplies	47.61

[a] Amazon.com is treated as its own industry group. It represents 16.53% sales in the non-store retailers group.

4.2 Competitive Actions of Retailers

Consistent with the theoretical framework of the Red Queen theory regarding the effect of strategic responses to the logics of competition within a specific environment, we focused on actions that were specific and observable to firms in the retailing industry. We followed the methodology from previous research on competitive dynamics to code our dependent variable of asymmetric competitive rivalry (Derfus et.al. 2008; Smith et al. 1992). The methodology known as structured content analysis uses content analysis to draw relevant information from published newspaper and magazine articles (Jauch, Osborn and Martin 1980).

Our main argument underlines competitive actions as deliberate announcements that focal firms want to signal to their rivals. Since actions and responses that are observable to customers, competitors, and other industry watchers tend to be reported in the business press, past research captured such observable actions through structured content analysis of newspaper and trade magazine articles (Derfus et al. 2008; Basdeo et al. 2006; Ferrier et al.,

1999; Miller and Chen 1994; Smith, Grimm, Gannon and Chen 1991; Young, Smith and Grimm 1996). The structured content analysis (Jauch, Osborn and Martin 1980) was conducted by coding actions into categories on the basis of a content analysis schedule (See Appendix A).

Therefore, we only searched reputable and widely circulated news sources that were easily available to retailers competing in the US retail industry. We relied on two primary sources for retailer competitive actions: company websites for press releases and announcements, and Infotrac's General Business File ASAP database. The latter covers activities of companies and industries from over 4,000 leading business and trade publications, and offers a wide selection of US and regional news publications and services such as the Wall Street Journal, The NY Times, PR Newswire, PR News, as well as retail trade publications such as Progressive Grocer, Women's Wear Daily, Chain Store Age and Drug Store News, to name a few.

We searched for each of the forty-one firms listed in our study in the search function of the Infotrac's General Business File ASAP database and set the search limits to the period 2003-2012. To capture the full extent of competitive actions in the retail industry, we coded competitive actions under quintessential retailing action categories (See Table 2 and Table 3 for definitions of action categories and examples of action coding). The categories were: assortment mix, services strategy, supply chain management, pricing, promotion, and geographic expansion (Levy and Weitz 2012). We coded a total of 34,058 actions for all years (Table 4 for breakdown of actions under each category).

Definitions of Action Categories

Action Category	Definition
Assortment Mix	Actions pertaining to the development of an assortment plan, including the breadth and depth of merchandise that the focal retail firm offers in a merchandise category.
Promotion	Any form of persuasive marketing communication activities designed to inform customers about a product or service, and to influence them with incentives or excitement-generating programs to purchase those products or services.
Pricing Strategy	Actions pertaining to the pricing of the good or service offered by the retailer to convey optimal customer value and perceived benefits over price paid.
Services Strategy	Activities and programs designed by the retailer to make the shopping experience convenient and rewarding for the customer.
Supply Chain Management	The set of activities employed by the retailer to seamlessly and efficiently integrate their suppliers, warehouses, stores and transportation intermediaries to deliver the right quantity of merchandise, at the right time and right location.
Geographic Expansion	Number of new stores opened in a calendar year, minus renovated stores. Obtained from company annual reports.

Table 2: Competitive actions of retailers announced in news media articles were coded under the above retail industry-specific action categories.

Examples of Action Coding

Action Category	Article Title	Excerpt	Publication Source	Citation Date
Assortment Mix	Macy's is Lagerfeld's Latest Fashion Project	Karl Lagerfeld aims to give Macy's contemporary business a kick come fall…The multitasking designer is the latest to design an exclusive capsule collection for the department store group, which will launch Aug. 31 in 235 of Macy's 800-plus stores, and on macys.com.	Women's Wear Daily	July 21, 2011
Promotion	Whole Foods Debuts Weekly Online Cooking Show	Natural and organic grocer Whole Foods Market, based here, yesterday launched "Secret Ingredient," its first-ever weekly online cooking show.	Progressive Grocer	May 8, 2007
Pricing Strategy	Staples Debuts 'Dollar Deals'	Taking a page out of McDonald's marketing book, Staples has launched its own "dollar deals." The program, which will run for the month of January, offers Sharpies, Bic pens, writing pads, paper clips and other items for $1.	InformationWeek	November 7, 2005
Services Strategy	Wal-Mart Launches New Online Mail Order Service for Diabetic Supplies	Wal-Mart Pharmacy Mail Services, a mail order pharmacy provided by Wal-Mart Stores, Inc., has added a new cost-effective and convenient way to order diabetes maintenance medications online.	PR Newswire	July 25, 2003
Supply Chain Management	Home Depot To Increase Use Of SAP	The Home Depot, which already has spent $1 billion over the last three years to overhaul its IT infrastructure, will deploy SAP for Retail merchandising and supply-chain applications.	InformationWeek	May 18, 2005

Table 3: *Examples of action category coding*. Excerpts from articles that contained retailers' competitive actions and the action category they were coded under.

Competitive Action Statistics

	Geographic Expansion	Assortment	Service	Promotion	Pricing	Supply Chain
Sum	30802	1038	692	945	420	192
Pct. of Total	90.44	3.05	2.03	2.77	1.23	0.48
Mean	75.13	2.53	1.69	2.30	1.02	0.40
Std. Dev.	128.61	4.15	3.35	3.66	2.44	0.84
Min.	0	0	0	0	0	0
Max.	937	24	23	24	16	6

Table 4: Competitive action statistics itemizing the number of actions of a particular type and the statistics of those actions.

4.2.1 Interrater Reliability

To verify the reliability of our coding for competitive actions, two coders independently recoded a random subsample of the total actions collected from the news media sources (*n* = 320) into each of the five[1] action categories of assortment mix, services strategy, supply chain management, pricing and promotion. We tested for coding reliability using Perreault and Leigh's (1989) reliability index (I_r), which is used for assessing the reliability of judgment-based qualitative data found in marketing studies. The Perreault-Leigh I_r index is a widely accepted tool for accessing reliability of marketing actions and is more rigorous than simple percentage agreement measures of reliability (Ferrier, Smith and Grimm 1999; Grayson and Rust 2001). This test yielded a value of $I_r = 0.93$, which indicates a high degree of coding reliability (Ferrier,

[1] Actions pertaining to geographic expansion were collected from annual reports, in terms of the total number of new stores opened in a calendar year, minus renovated stores.

Smith and Grimm 1999).

4.3 Dependent Variables

We now discuss the operationalization of our dependent variables, asymmetric rivalry and asymmetric competitive analysis. We operationalized asymmetric rivalry in terms of relative competitive activity of the focal firm, compared to rivals.

We operationalized the construct of asymmetric competitive analysis in two ways. First, in terms of *action repertoire simplicity*, which measures the extent to which firms engage in a narrow set of actions, typical of exploitative learning behaviors of asymmetric competitive analysis. And second, we used the metric of *market share erosion* to capture impaired awareness associated with asymmetric competitive analysis (Ferrier, Smith and Grimm 1999). We explain these measures in greater detail in the following sub sections and specify the measures for all variables in our model (Figure 5).

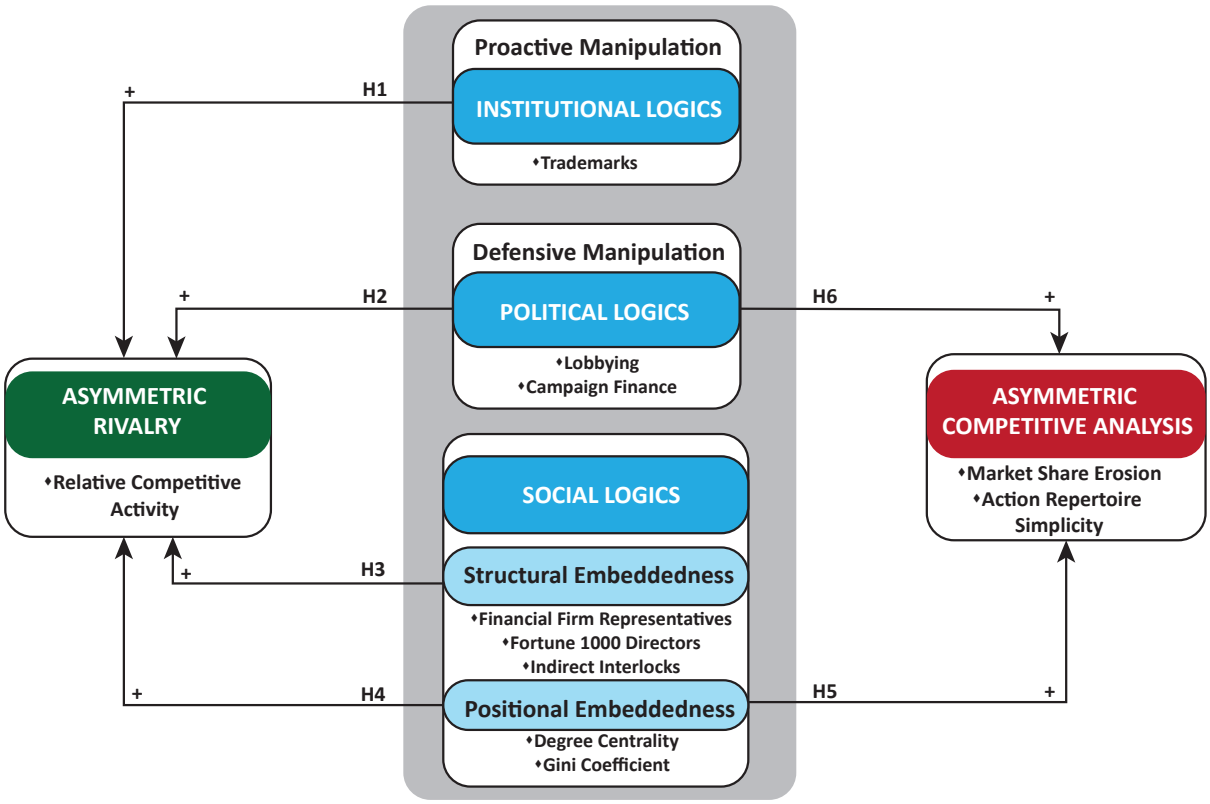

Figure 5: *The paradox of asymmetric competition*. Operationalization of measures for independent variables (institutional, political and social logics of competition) and dependent variables (asymmetric rivalry and asymmetric competitive analysis) are shown.

4.3.1 Asymmetric Rivalry with competitors

Asymmetric rivalry is defined as the total number of competitive actions taken by the focal firm, relative to rival firms. We operationalize asymmetric rivalry using a method similar to the competitive dynamics literature for relative competitive activity (Chen 1996; Ferrier et al., 1999; Smith, Grimm, Gannon and Chen 1991; Young, Smith and Grimm 1996). Specifically, asymmetric rivalry is measured by subtracting a focal firm's i total number of actions in a given year n_i^t from the average total number of actions taken by all competitors in a focal industry

group. This is given by

$$\mathrm{RCA}_i^t = n_i^t - \frac{1}{N-1}\sum_{j \neq i} n_j^t ,$$

where *RCA* is the relative competitive activity and N is the total number of firms under consideration.

Positive values indicate asymmetric rivalry (greater number of actions relative to rival others in industry group). For example, in the Drugstore group (NAICS 446110), relative competitive activity was computed with CVS Pharmacy as the focal firm, and Rite Aid and Walgreens Pharmacy as the rival firms. When Walgreens Pharmacy was the focal firm, CVS and Rite-Aid were rival firms.[2]

4.3.2 Asymmetric Competitive Analysis in the focal firm

Asymmetric competitive analysis in the focal firm is defined as the reduced ability in responding to competitive threats relative to rival firms. We used *action repertoire simplicity* and *market share erosion* of the focal firm as proxy measures for asymmetric analysis in the focal firm (Chen et al, 1999).

[2] For the purpose of this study we included Amazon inc. in the General Merchandise category for a number of reasons. First, its strategic orientation and target market are closely aligned with general merchandisers as opposed to other online retailers, which tend to have a more niche focus. Second, from press reports we gleaned that general merchandise retailers such as Walmart and Target are paying close attention to and competing with Amazon as a rival.

4.3.2.1 Action Repertoire Simplicity

Action repertoire simplicity captures the competency trap dynamic of asymmetric competitive analysis. We reasoned that firms that have a diminished perception of competitive threat will not be motivated to launch a wide variety of competitive actions. Following extant research on competitive dynamics this variable will be operationalized using a Herfindahl action concentration index (Ferrier et al. 1999; Miller and Chen 1996), and will be calculated as follows:

$$H = \sum_{a} \left(\frac{n_a}{N_A}\right)^2$$

where N_A is the total number of actions ($N_A = \sum_a n_a$) and n_a/N_A is the share or proportion of competitive actions for action category a. A firm with a high action simplicity score favors just a few action types. Conversely, a firm with a low action simplicity score deploys a broad range of action types in its competitive repertoire (Ferrier et al. 1999).

4.3.2.2 Market Share Erosion

Individual market shares were calculated for both focal and industry group rivals using total sales reported in the business and geographic segment files of the WRDS Compustat database, and the industry segment sales from the U.S. Census website (http://www.census.gov). We use the method of Ferrier et al. (1999) of calculating market share erosion as follows. First, we calculated the market share for each firm within its industry group (as denoted by the six-digit NAICS code). Next, we calculated the market share gap, which is the difference between the market share of a focal firm and all its rivals within the

competing retail segment. From then, we calculated the market share erosion, i.e. the difference in market share from year $t-1$ to year t. Our measure of relative market share is derived from the ratio of focal firm's market share to rival's market share, which reduces to a market share difference score for each time period (Ferrier et al., 1999)

$$\text{Gap} = \text{MS}_i - \sum_{j \neq i} \text{MS}_j,$$

where MS_i represents the focal firm's i market share and $\sum_{j \neq i} \text{MS}_j$ represents the market share of all rivals in the industry group. Next, we calculated the rate of erosion of the market share gap as the change in the market share gap from year to year as

$$\text{Erosion} = \text{Gap}_{t-1} - \text{Gap}_t$$

where positive values indicate a narrowing gap (market share erosion) and negative values represent a widening gap.

4.4 Independent Variables

We now discuss the operationalization of the independent variables in our model. We begin with the independent variable of proactive manipulation of institutional logics. Next, we discuss the independent variables of defensive manipulation of political logics and the independent variables pertaining to social logics (structural embeddedness and positional embeddedness) in the subsequent subsections.

4.4.1 Proactive manipulation of the institutional logics by focal firm

Based on our rationale, the proactive manipulation of institutional logics construct refers to innovative actions by the firm that diverge from the prevailing institutional logics of the industry, and the firm's effort in gaining pragmatic legitimacy for such actions. Accordingly, we operationalize proactive manipulation of institutional logics as the number of active trademarks filed by the focal firm with the US patents and trademarks office (http://uspto.gov).

Extant research illustrates trademarks as indicators of innovative activity in service firms, signaling changes in strategy or changes in corporate identity as well as a means of reinforcing the differentiation of their product and service offerings (Schmoch 2003; Mendonca, Pereira and Godinho 2004; Hipp and Grupp 2005; Gotsch and Hipp 2012). Secondly, trademarks involve resource commitments. Unlike patents and copyrights, once trademarks are registered they need to be renewed indefinitely. More importantly, firms would not be able to justify sustaining a trademark (with its associated costs of renewal fees, filing legal documents, etc.) if their products had no distinguishing advantages or attributes in relation to other offerings in the market (Mendonca et al., 2004). Lastly, institutional theory views companies and their brands as embedded in the institutional environment, which comprises of the cultural meanings, ideals and accepted social norms that serve as guidelines to which companies must conform in order to maintain legitimacy with key audiences (DiMaggio and Powell 1983; Suchman 1995). The registration of a trademark for a new product or service confers pragmatic legitimacy since brands facilitate consumer choice and frame the new product or service offering as having credibility (Suchman 1995).

4.4.2 Defensive manipulation of political logics by focal firm

Defensive manipulation of political logics was operationalized in terms of the sum of total dollars spent on political lobbying, and Political Action Committee (PAC) contributions to federal and state politics by individual firms (excluding industry group PACs or industry association lobbyists) in a calendar year. Information on dollars spent on campaign finance and lobbying was obtained from the Sunlight Foundation's Influence Explorer and TransparencyData Project[3], The Center f0or Responsive Politics' web site Opensecrets.org (for federal data), and Followthemoney.org (for state and local data). The Followthemoney.org database provides historical information on campaign finance, lobbying and includes a donor lookup feature to track individual political activity. We verified the data with the Federal Election Commission (FEC) online database.

4.4.3 Structural Embeddedness

On the basis of our theoretical rationale, we operationalized structural embeddedness for the focal firm using three measures: 1) Total number of board directors who serve on Fortune 1000 firms. 2) Total number of board directors serving on boards of capital investment firms such as banks, venture capitalists and insurance companies (Stearns and Miruchi 1993), and 3) Focal firm indirect ties (indirect board interlocks) with firms that share the same six-digit NAICS codes as focal firm. For example, an indirect board interlock in the general

[3] TransparencyData was a resource that combined data from OpenSecrets.org and FollowTheMoney.org, along with a few other sources. This service was terminated in January 2016. Data is still available from OpenSecrets.org and FollowTheMoney.org websites.

merchandising strategic group (NAICS code 452990), occurs when a board member from Walmart and a board director from Target together serve on the board of The Goldman Sachs Group. In this case, both Target and Walmart are said to be in an indirect interlock (See Figure 6 and Figure 7 for an illustration of indirect board interlocks in our data).

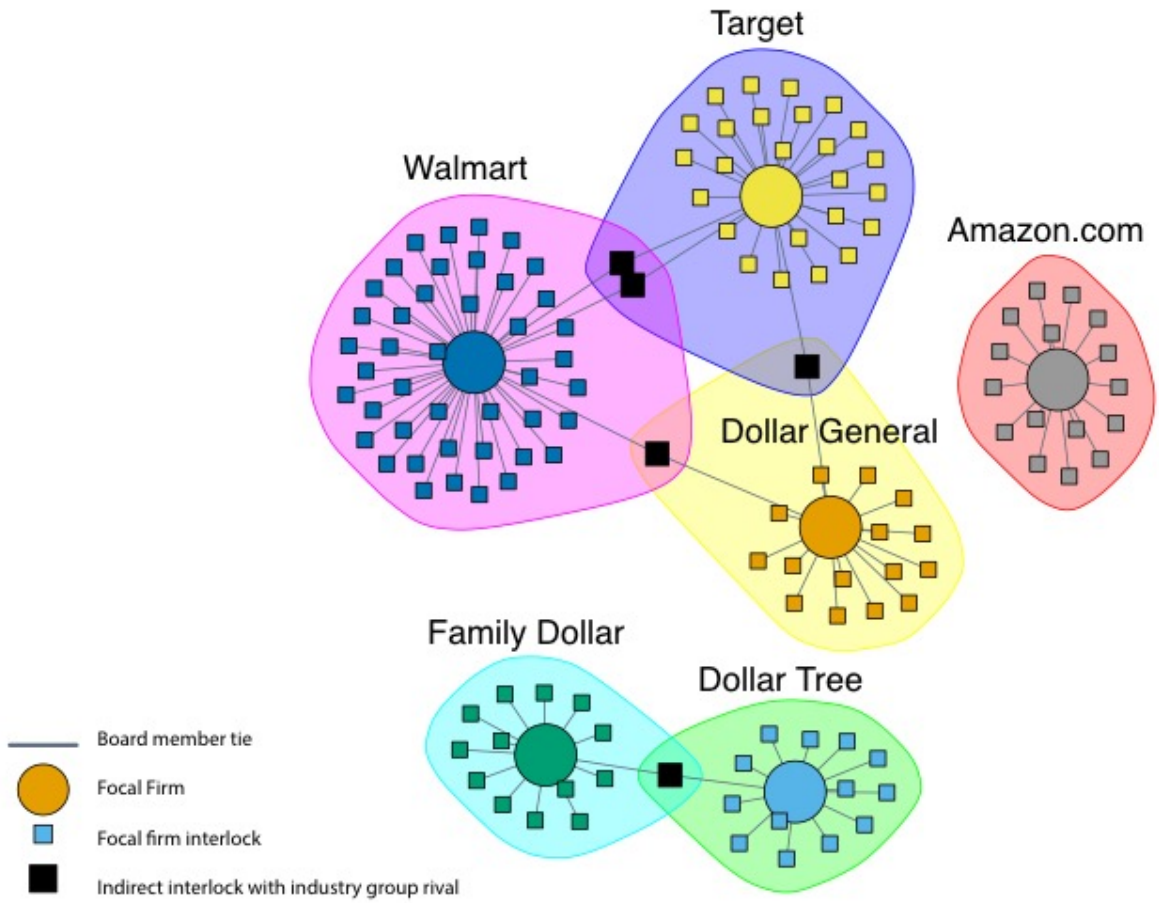

Figure 6: *Indirect board interlocks among general merchandisers in 2012*. Industry rivals Walmart, Target and Dollar General are connected through at least one indirect board interlock each. Indirect board interlocks also occur between close rivals- Family Dollar and Dollar Tree.

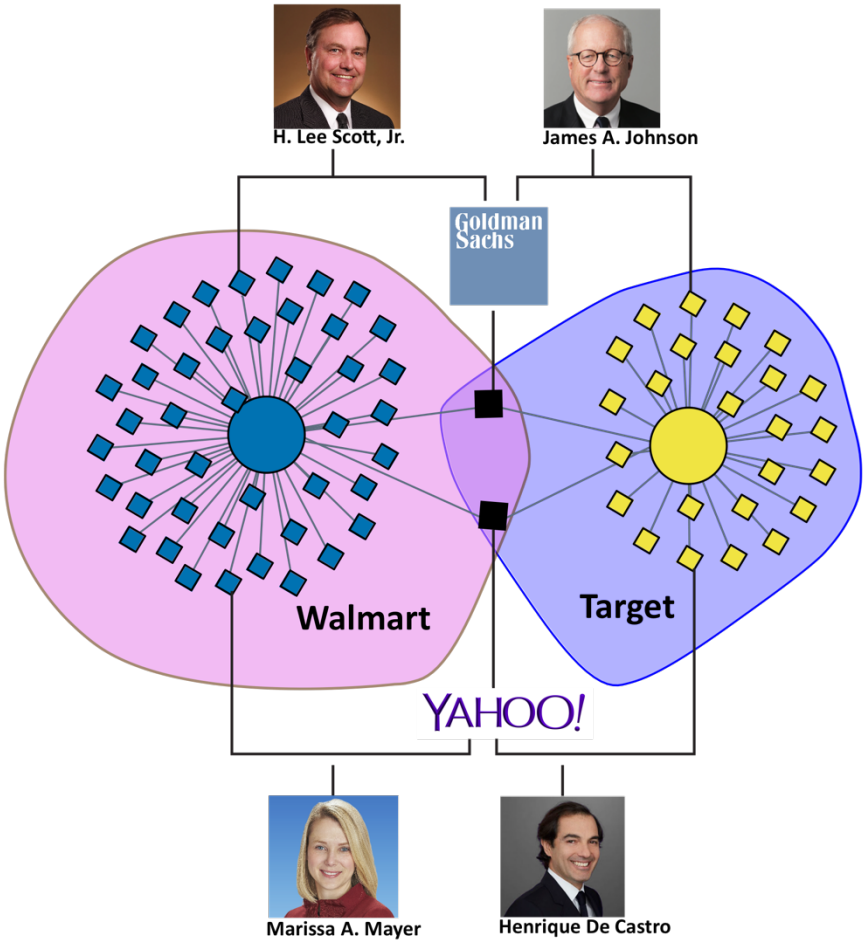

Figure 7: *A closer look at the two indirect board interlocks between Target and Walmart from the year 2012*. The first indirect board interlock occurs through Yahoo (Target board director, Henrique De Castro and Walmart board director, Marissa Mayer jointly serve on Yahoo's board), and the second indirect board interlock occurs through Goldman Sachs (Target board director, James A. Johnson and Walmart board director, H. Lee Scott, Jr. both serve on the Goldman Sachs board).

We collected information on the board interlocks from a wide-range of resources, with the primary resource being annual proxy statements (Form DEF 14A) filed by companies with the Securities and Exchange Commission (SEC). We performed multiple checks to verify the board ties of individual directors using multiple sources, starting with corporate websites, Lexis-

Nexis' Corporateaffiliations.com, Bloomberg executive profiles, LinkedIn profiles of individual directors (if available), or personal websites of directors.

Information on the Fortune companies was obtained from the archived data on Fortune magazine's website. We verified financial institutions using Bloomberg business news and company websites.

4.4.4 Positional Embeddedness

We operationalized positional embeddedness using the network analysis construct of network centrality. Network centrality is a measure of how many ties one node (firm) has to other nodes (firms). Firms that are connected to many other firms via board interlocks have access to multiple sources of information. Our theory argues that the greater access to a large number of information sources enables firms to launch high-magnitude competitive actions against rivals. We follow the method used by extant studies that measure network centrality in terms of degree centrality, i.e. by counting the number of interlock ties to other firms minus the focal firm (Haunschild, 1993; Haunschild and Beckman 1998; Freeman 1979). We measured degree centrality using the igraph package in R program.

Previously, we mentioned that board directors represent a special type of network known as affiliation, two-mode or bipartite network (Borgatti and Everett 1997; Robins and Alexander 2004). Affiliation networks represent two distinct sets of nodes or social entities (corporate boards and directors in our case), where each tie represents a director's affiliation with a board and with other directors serving on the board (Opsahl 2013). The duality and intertwining of linkages in affiliation structures implies that neither set of nodes can be

considered in isolation, and literature on the bipartite interlocking directorate network stresses the importance of considering both nodes in empirical research (Mizruchi, 1996; Shropshire, 2010; Opsahl, 2013). To capture the two-mode nature of interlocking directors, we measured the Gini coefficient of board interlocks for each corporate board. The Gini coefficient is a measure of statistical dispersion, and is used to quantify inequalities in the distribution of centrality among nodes within a network, including informal hierarchy in corporate boards (Gini 1921; Blau, 1977; He and Huang, 2011; Crucitti, Latora and Porta, 2006). In our study, the Gini coefficient captured the inequality in the distribution of board ties on a corporate board and presented a more nuanced view of positional embeddedness of the focal firm.

The metric of inequality was calculated per year and firm, and was applied to a vector of the number of additional boards (ties) that each board director was a part of. A company where one board director is on many boards but other board directors are on few boards is considered unequal. The Gini coefficient ranges from a minimum value of 0.00, where all directors have equal number of ties, to a theoretical maximum of 1.00, indicating a situation of absolute inequality, where every board director with the exception of one has zero board ties.

Gini Formula: Given a collection of values, the Gini coefficient can be interpreted as the mean (average) of the absolute value of every possible pairwise difference, divided by the mean of the original collection of values. If one can order the collection of values from lowest to highest (n_i, the number of interlocks per director in our case) the formula takes the following form,

$$G = \frac{2}{N} \frac{\sum_{i=1}^{N} i \cdot n_i}{\sum_{i=1}^{N} n_i} - \frac{(N+1)}{N}$$

where G denotes the Gini coefficient; N, the total number of directors on the board; n_i , the number of interlocks for director i; and factor i denotes the director's rank in the number of interlocks among all board members. We used the "Gini" function from the *ineq* package for R.

Descriptive Statistics

Conceptual Variables	Operationalized Variables	Mean	Std. Dev.	Min.	Max.
Asymmetric Rivalry	Relative Competitive Activity	0.000	128.1	-508.0	858.5
Asymmetric Competitive Analysis	Market Share Erosion [a]	0.039	0.297	-0.848	1.116
	Action Repertoire Simplicity	0.751	0.245	0.188	1.000
Control Variables	Net Sales	23.04E3	40.34E3	0.101E3	274.5E3
	Slack Resources	0.661	0.522	-1.630	2.284
	Debt Ratio	2.012	0.685	0.676	4.163
	Citizens United vs. FEC	0.300	0.459	0.000	1.000
	Board Size Total	10.00	2.320	4.000	17.00
	Industry Concentration	3.891E6	8.298E6	0.018E6	41.29E6
	Industry Growth	3.170	10.77	-13.03	197.0
Proactive Manipulation of Institutional Logics	Trademarks	24.21	31.20	0.000	188.0
Defensive Manipulation of Political Logics	Political Logics	0.828E6	2.339E6	0.000	20.76E6
Structural Embeddedness	(Number of) Fortune 1000 Directors	5.795	4.438	0.000	20.00
	(Number of) Financial Institution Directors	3.793	2.648	0.000	15.00
	Indirect Interlocks	0.502	0.846	0.000	3.000
Positional Embeddedness	Degree Centrality	17.278	9.371	1.000	48.00
	Gini Coefficient	0.427	0.152	0.125	0.909

a - Includes Amazon.com Inc.

Table 5: Variable descriptive statistics.

Descriptive statistics are presented in **Table 5**. The average Gini coefficient of centrality distribution of board directors is 0.43 (indicating moderate inequality in distribution of centrality for a particular firm's board. This is a board where social hierarchy is not clearly obvious (See **Figure 8** below). The maximum Gini coefficient is 0.91 (showing high inequality in

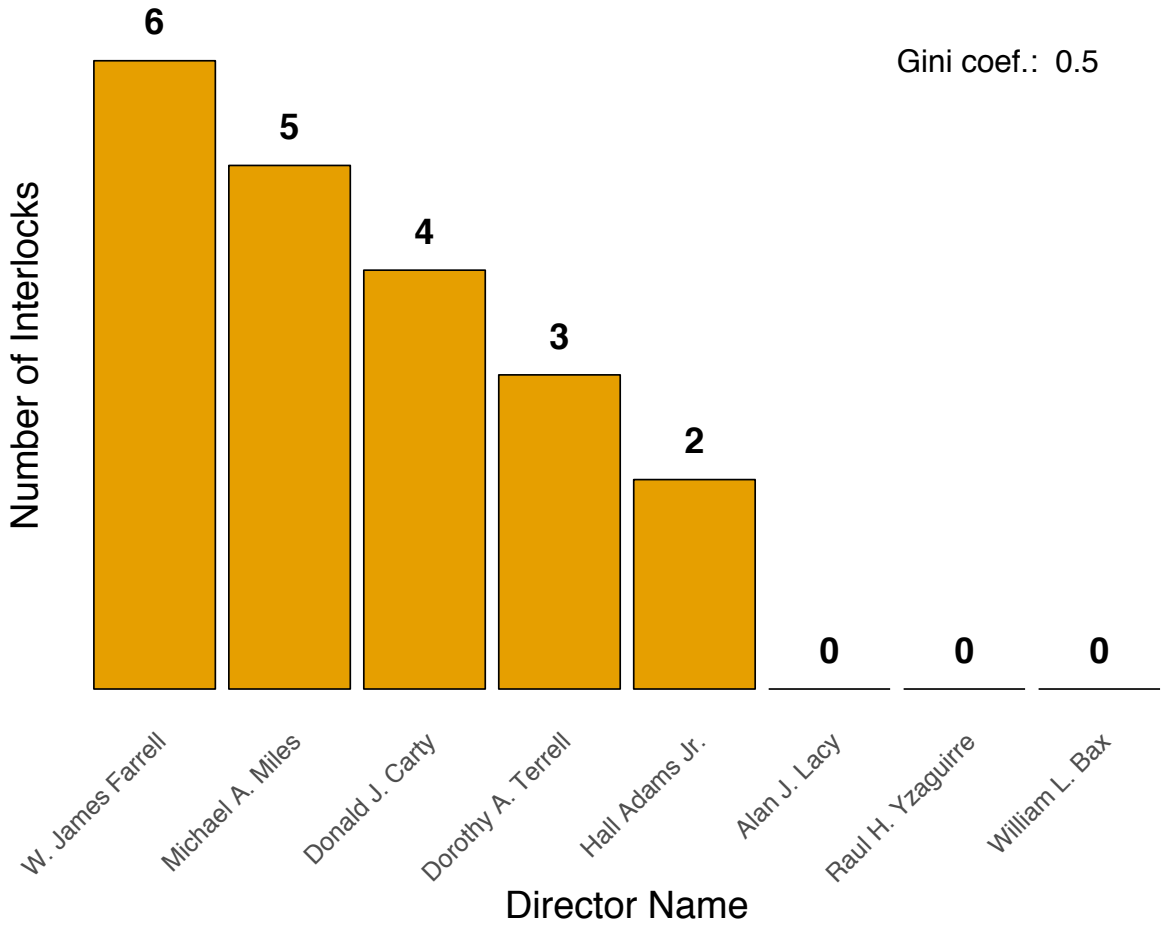

Figure 8: *Histogram of the number of board interlocks for each director serving on the board of Sears department stores in 2004*. This gives an idea of the boardroom structure with respect to how positional embeddedness (number of board interlocks) is distributed across the board. In this case, positional embeddedness is neither concentrated among a few board directors who have interlock ties to other companies, nor is it equally distributed across all board members having interlocks. The Gini coefficient at 0.5 indicates that there is no clear social hierarchy in the boardroom but neither is it perfectly equitable.

the distribution of centrality scores for the board). This is a board where only few directors have multiple interlocking ties and there is an obvious social hierarchy in the boardroom (See **Figure 9** below).

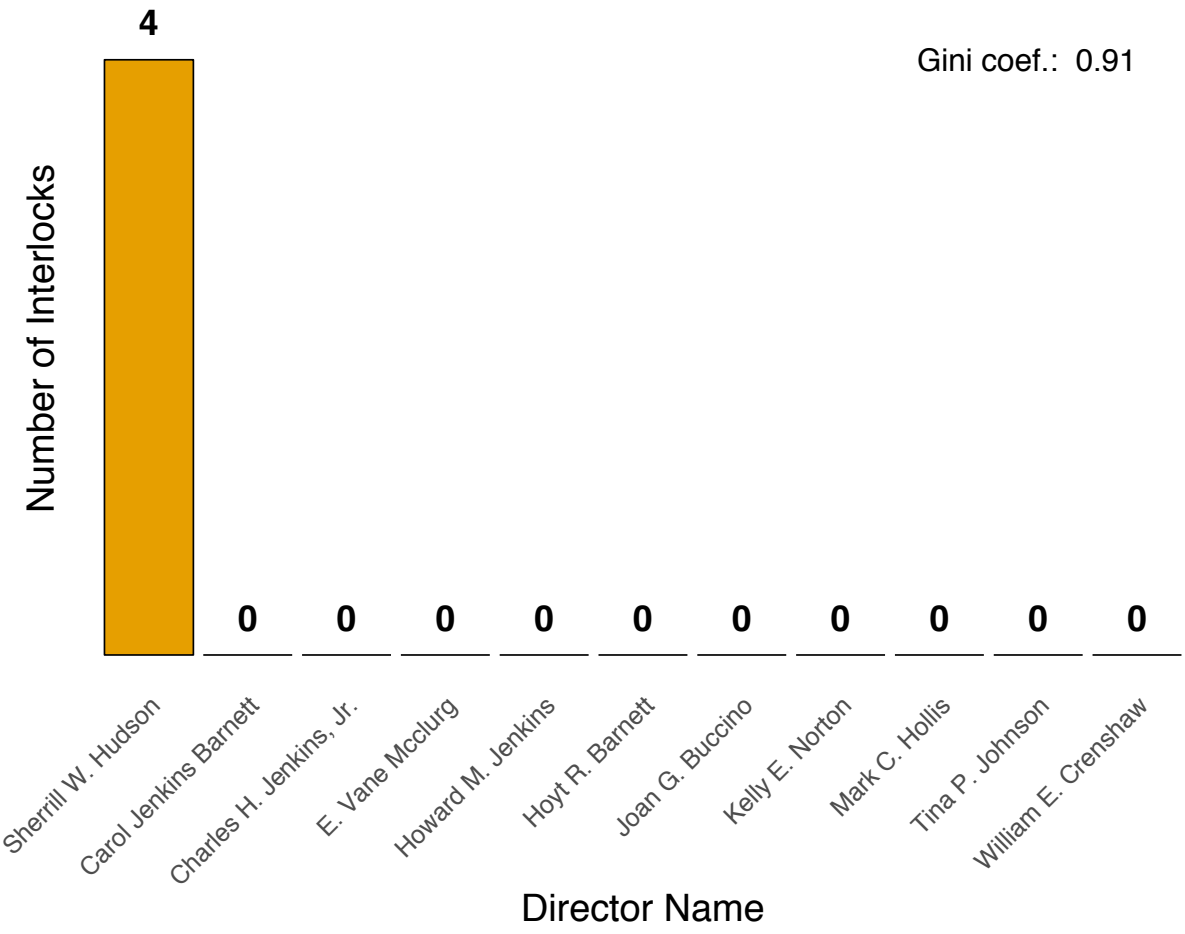

Figure 9: *Histogram from Publix chain of supermarket stores indicating the number of board interlocks for each director serving on the board of Publix in 2004*. In this case we see a boardroom that has an extremely lopsided distribution of positional embeddedness, where only one board member (Sherrill W. Hudson) has interlocks with other firms, while the rest have none. The Gini coefficient at 0.91 is approaching perfect inequality in the distribution of board interlocks across the boardroom. We infer from the Gini coefficient that this boardroom has a clear social hierarchy situation because there is only one high ranking director (with four interlocks).

And the minimum Gini coefficient is 0.12 (showing low inequality of centrality of directors on a board. This board has a majority of directors with multiple outside ties and denotes an equitable and nonexistent boardroom hierarchy (See Figure 10). These values demonstrate that our sampled firms had a considerable range in the distribution of director centrality.

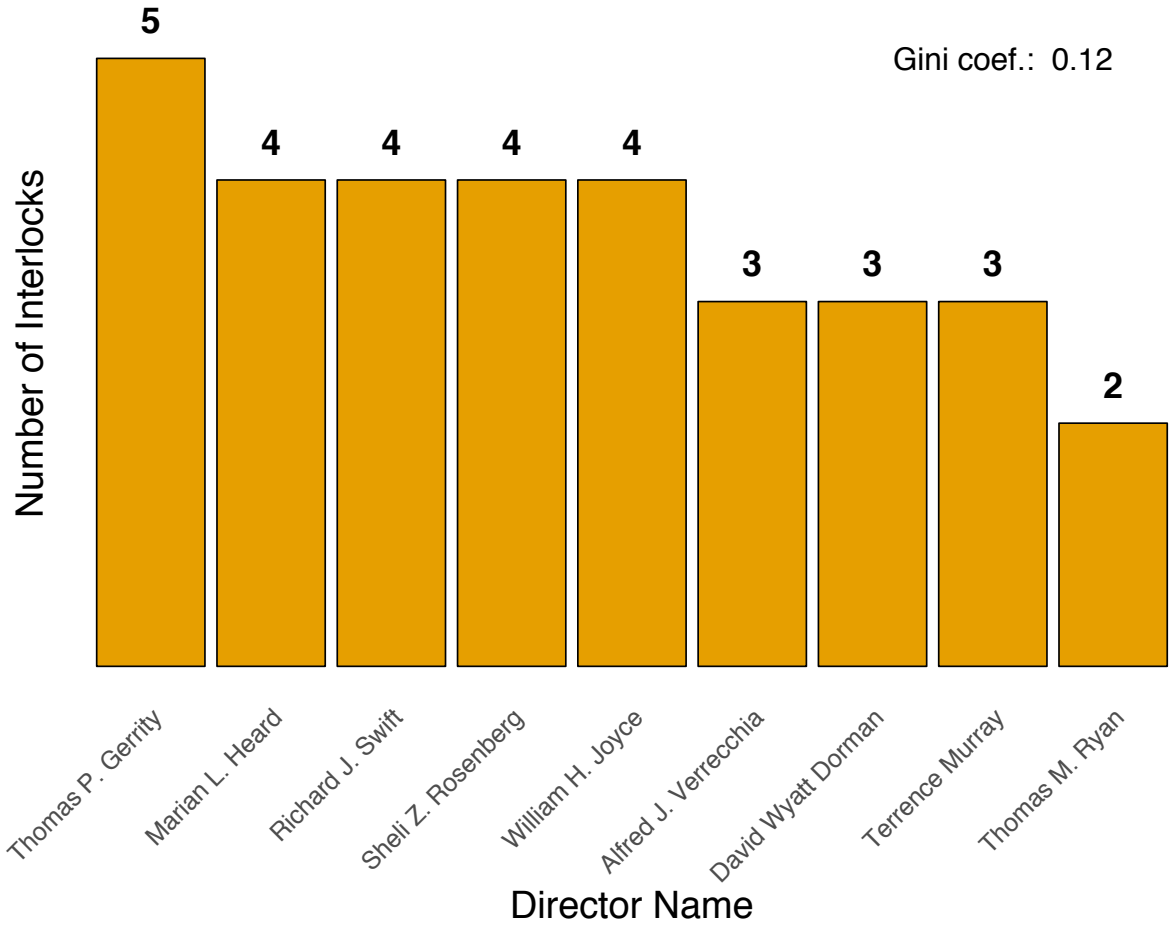

Figure 10: *Histogram of number of board interlocks from the CVS Pharmacy Drugstores in 2004*. We see a boardroom that has an almost equitable distribution of positional embeddedness across the boardroom. All of the board members have board interlocks and the relative difference in the number of interlocks from one director to another is not that extreme. This is demonstrated by the very low Gini coefficient at 0.12 indicating this boardroom has high equality (in terms of number of board interlocks per director). The Gini coefficient also indicates that there is no social hierarchy in the boardroom. This appears to be an 'All Stars' boardroom.

4.5 Control Variables

We used control variables in our study to rule out alternative interpretations of our results. Control variables reduce omitted variable bias and provide a more conservative test of the predicted relationships. The selection of the control variables in our empirical models was motivated by theoretical evidence found in the extant literature, which demonstrated their influence on potentially confounding the results of our predicted relationships.

4.5.1 Firm Size

Prior research has demonstrated that firm size influences each of our dependent variables and may also confound the effect of our independent variables on our dependent variables. Firm size as measured by net sales is said to influence competitive actions since large firms have the capability to undertake more actions (Smith, Ferrier and Ndofor 2001; Derfus et al. 2008). Large firms are also able to attract well-connected directors, as well as directors who serve on prestigious boards. Larger firms are also likely to invest in protecting their turf, and are therefore more likely to spend money in politics to protect their interests. Additionally, larger firms are more likely to exhibit action repertoire simplicity as a form of competitive inertia compared to small firms (Miller and Chen 1996; Ferrier, Smith and Grimm 1999). Therefore, we included firm size as control variable in all our models. Net sales were obtained from the WRDS Compustat database and verified with company annual reports.

4.5.2 Slack Resources

In line with previous research on competitive dynamics, we used quick ratio as a measure for slack resources due to its effect on competitive actions (Derfus, Maggitti, Grimm and Smith 2008). Slack resources were used as the control for the models testing the effect of institutional logics on asymmetric rivalry. The logic behind using slack resources as a control variable was that firms with excess resources are more likely to invest in developing innovations that get trademarked than firms with low slack resources (Nohria and Gulati 1997). Quick ratio was measured using the ratio of current assets (minus inventories) to current liabilities. We obtained raw data from the WRDS Compustat database and verified it with company annual reports.

4.5.3 Citizens United v. FEC

The 2010 Citizens United Supreme Court decision ruled that corporations and unions have a First Amendment right to spend unlimited funds on campaign advertisements, provided that these communications are not formally "coordinated" with any candidate (Citizens United v. FEC, 130 S. Ct. 876, 915, 2010). Spending by corporations and outside groups has swollen during the three federal election cycles since this landmark ruling (Vandewalker 2015). The Supreme Court decision has been associated with competitive advantage and firm performance (Coates 2012; Burns and Jindra 2014). To capture the effect of this ruling, we used a dummy variable coded 1 for years after its passage. We controlled for the Supreme Court decision in all hypotheses that had Political Logics as the independent variable.

4.5.4 Debt Ratio

We controlled for a firm's debt ratio in models of structural embeddedness because research on financial representation in corporate boards indicates that a firm's indebtedness reduces the likelihood that the financial representative on the board provides a legitimizing role to potential lenders of the firm. Additionally, financial representatives on a board will see high debt ratio as a risk that needs to be lowered and will be less likely to lend funds to highly leveraged firms (Stearns and Mizruchi 1993).

Furthermore, debt imparts discipline upon decision-makers and motivates them to engage in actions that are in the best interest of the firm. However, the presence of debt also negatively effects action-taking as it makes decision makers less likely to explore new business strategies (Barnett and Salomon 2012). Debt ratio was measured using the ratio of total assets to total liabilities. Raw data was obtained from the WRDS Compustat database and verified with company annual reports.

4.5.5 Board Size

We controlled for board size in our models of positional embeddedness and structural embeddedness because individual directors might not get an equal opportunity to make a contribution to decision-making and strategy in a large sized group (Carpenter and Westphal 2001). Filtering vital information may also become arduous with respect to board size. Larger boards are also seen as being less cohesive and therefore limited in their ability to monitor decision-making effectively and may therefore affect action taking ability (Johnson, Hoskisson and Hitt 1993).

4.5.6 Industry Growth

We calculated industry growth as the percentage change in sales from the previous year to the current year, using data for each six-digit NAICS industry subgroup[4] (Ferrier, Smith and Grimm 1999; Derfus, Maggitti, Grimm and Smith 2008). Industry growth has shown to minimize the impact of Red Queen competition, due to the fact that in an environment that is marked by high industry demand, firms will be less threatened by rival actions and therefore less likely to respond to competitive threats (Derfus, Maggitti, Grimm and Smith 2008). Additionally, studies show that high-growth industries experience less market share stability and greater market share erosion than low growth industries (Gort, 1963; Caves and Porter, 1978; Mueller, 1986; Ferrier, Smith and Grimm 1999). We controlled for industry growth in models that had market share erosion as the dependent variable. We obtained raw data on company sales from the WRDS Compustat database and the industry segment sales from the U.S. Census website (http://www.census.gov).

4.5.7 Industry Concentration

Studies have shown that high levels of industry concentration are positively correlated with market share stability among leading firms (Gort 1963; Caves and Porter 1978), and competitive actions (Young, Smith and Grimm 1996; Ferrier, Smith and Grimm 1999; Derfus, Maggitti, Grimm and Smith 2008). We calculated industry concentration by aggregating the market shares of the two largest firms in each industry for each year. We obtained raw data on company sales from the WRDS Compustat database and the industry segment sales from the

[4] Amazon.com is treated as its own industry group.

U.S. Census website (http://www.census.gov). We controlled for industry concentration in models that had market share erosion as the dependent variable. All operationalized variables are summarized in Table 6.

Operationalization of Variables

	Conceptual Variable	Operationalized Variable	Measure	Source
Dependent	Asymmetric Rivalry	Relative Competitive Activity	Asymmetric rivalry is measured by subtracting a focal firm's $\boldsymbol{i}$ total number of actions in a given year $\boldsymbol{n_i^t}$ from the average total number of actions taken by all competitors in a focal industry group. $$\mathrm{RCA}_i^t = \boldsymbol{n_i^t} - \frac{\boldsymbol{1}}{\boldsymbol{N-1}} \sum_{\boldsymbol{j \neq i}} \boldsymbol{n_j^t},$$ RCA is the Relative Competitive Activity and $\boldsymbol{N}$ is the total number of firms under consideration. Note: Positive values indicate asymmetric rivalry (greater number of actions relative to rival others in industry group).	Competitive actions used in the formula were obtained from Infotrac's General Business File ASAP database
	Asymmetric Competitive Analysis	Action Repertoire Simplicity	Herfindahl action concentration index: $$\boldsymbol{H} = \sum_{\boldsymbol{a}} \left(\frac{\boldsymbol{n_a}}{\boldsymbol{N_A}} \right)^{\boldsymbol{2}}$$	Competitive actions used in the formula were obtained from Infotrac's General Business File ASAP database

Table 6: Summarization of all operationalized variables.

Table 6: (cont'd)

	Conceptual Variable	Operationalized Variable	Measure	Source
			where $\boldsymbol{N_A}$ is the total number of actions ($\boldsymbol{N_A} = \sum_{\boldsymbol{a}} \boldsymbol{n_a}$) and $\boldsymbol{n_a}/\boldsymbol{N_A}$ is the share or proportion of competitive actions for action category *a*. *Note*: A firm with a high action simplicity score favors just a few action types. Conversely, a firm with a low action simplicity score deploys a broad range of action types in its competitive repertoire.	
	Asymmetric Competitive Analysis	Market Share Erosion	$$\text{Gap} = \text{MS}_{\boldsymbol{i}} - \sum_{\boldsymbol{j \neq i}} \text{MS}_{\boldsymbol{j}},$$ Where $\text{MS}_{\boldsymbol{i}}$ represents the focal firm's $\boldsymbol{i}$ market share and $\sum_{\boldsymbol{j \neq i}} \text{MS}_{\boldsymbol{j}}$ represents the market share of all rivals in the industry group. Next, calculate the rate of erosion of the market share gap as the change in the market share gap from year to year as: $$\text{Erosion} = \text{Gap}_{\boldsymbol{t-1}} - \text{Gap}_{\boldsymbol{t}}$$ *Note*: Positive values indicate a narrowing gap (market share erosion) and negative values represent a widening gap.	WRDS Compustat database. U.S. Census website.

Table 6: (cont'd)

	Conceptual Variable	Operationalized Variable	Measure	Source
Independent	Proactive Manipulation of Institutional Logics.	Trademarks	Number of active trademarks filed by the focal firm annually.	US Patents and Trademarks Office website.
	Defensive Manipulation of Political Logics	Political Logics	Sum of total dollars spent on political lobbying, and Political Action Committee (PAC) contributions to federal and state politics by individual firms (excluding industry group PACs or industry association lobbyists) in a calendar year.	Sunlight Foundation's Influence Explorer and TransparencyData Project. The Center for Responsive Politics' web site Opensecrets.org (federal data). Followthemoney.org (state and local data). Federal Election Commission online data base (fec.gov)
	Structural Embeddedness	Fortune 1000 Directors	Total number of board directors who serve on Fortune 1000 firms. Updated Annually.	Fortune Magazine Website (Fortune.com)
		Financial Institution Directors	Total number of board directors serving on boards of capital investment firms such as banks, venture capitalists and insurance companies for each year.	Form DEF 14A annual proxy statements.

Table 6: (cont'd)

	Conceptual Variable	Operationalized Variable	Measure	Source
				Securities and Exchange Commission database (http://sec.gov). Lexis-Nexis (Corporateaffiliations.com) Bloomberg executive profiles (Bloomberg.com) LinkedIn
	Structural Embeddedness	Indirect Interlocks	Total number of focal firm indirect ties (indirect board interlocks) with firms that share the same six-digit NAICS codes as focal firm for each year.	ibid.
	Positional Embeddedness	Degree Centrality	Total number of interlock ties to other firms, minus the focal firm.	ibid.
		Gini Coefficient	Given a collection of values, the Gini coefficient can be interpreted as the mean (average) of the absolute value of every possible pairwise difference, divided by the mean of the original collection of values. If one can order the collection of values from lowest to highest ($\boldsymbol{n_i}$,	ibid.

Table 6: (cont'd)

	Conceptual Variable	Operationalized Variable	Measure	Source
			the number of interlocks per director in our case) the formula takes the following form, $$G = \frac{2}{N}\frac{\sum_{i=1}^{N} i \cdot n_i}{\sum_{i=1}^{N} n_i} - \frac{(N+1)}{N}$$ where G denotes the Gini coefficient; N, the total number of directors on the board; n_i , the number of interlocks for director i; and factor i denotes the director's rank in the number of interlocks among all board members. *Note:* Gini coefficients closer to one denote high inequality (clear social hierarchy) in the distribution of positional embeddedness in the boardroom.	
Control Variables	Size	Net Sales	Total net sales reported annually.	WRDS Compustat database Annual reports (Form 10-K)
	Slack Resources	Quick Ratio	Quick Ratio= (Current Assets - Inventories) / Current Liabilities	ibid.
	Debt Ratio	Debt Ratio	Debt Ratio = Total Assets / Total Liabilities.	ibid.

Table 6: (cont'd)

	Conceptual Variable	Operationalized Variable	Measure	Source
	Citizens United vs. FEC	Citizens United vs. FEC Supreme Court Ruling	Dummy variable coded 1 for years after its passage in 2010.	Citizens United v. FEC, 130 S. Ct. 876, 915, 2010
	Board Size	Board Size	Total count of all board directors serving a focal firm's board for each year.	Form DEF 14A annual proxy statements. Securities and Exchange Commission database (sec.gov). Lexis-Nexis (Corporateaffiliations.com)
	Industry Concentration	Industry Concentration	Calculated by aggregating the market shares of the two largest firms in each industry for each year.	Census.gov WRDS Compustat database
	Industry Growth	Industry Growth	Percentage change in sales from the previous year to the current year, using data for each six-digit NAICS industry subgroup.	ibid.

Chapter 5: Results

We analyzed our data using the R language (ver. 3.2.2) within the RStudio (ver. 0.99.473) Integrated Development Environment (IDE). R is a free programming language and visualization environment for statistical computing and graphical display that is widely used by statisticians and data analysts. RStudio is a free and open source IDE for R language, with an interface that improves ease of analysis and development (RStudio Team, 2015). Furthermore, unlike most free versions of statistical software packages in the market, R allows users to perform complex data analysis without any restrictions (R Core Team, 2015). Table 13 in Appendix B shows the versioning information for R, R Studio, and the R libraries used in this work.

Multicollinearity in our variables was not deemed to be problematic for several reasons. Correlations between independent variables were less than the standard 0.80 cut off point (**Figure 11**). Furthermore, the inherent structure of panel data reduces multicollinearity problems as it creates more variability in the data, combines variation across micro units with variation over time, and enables more efficient estimation through informative data (Kennedy 2008; Baltagi 2012).

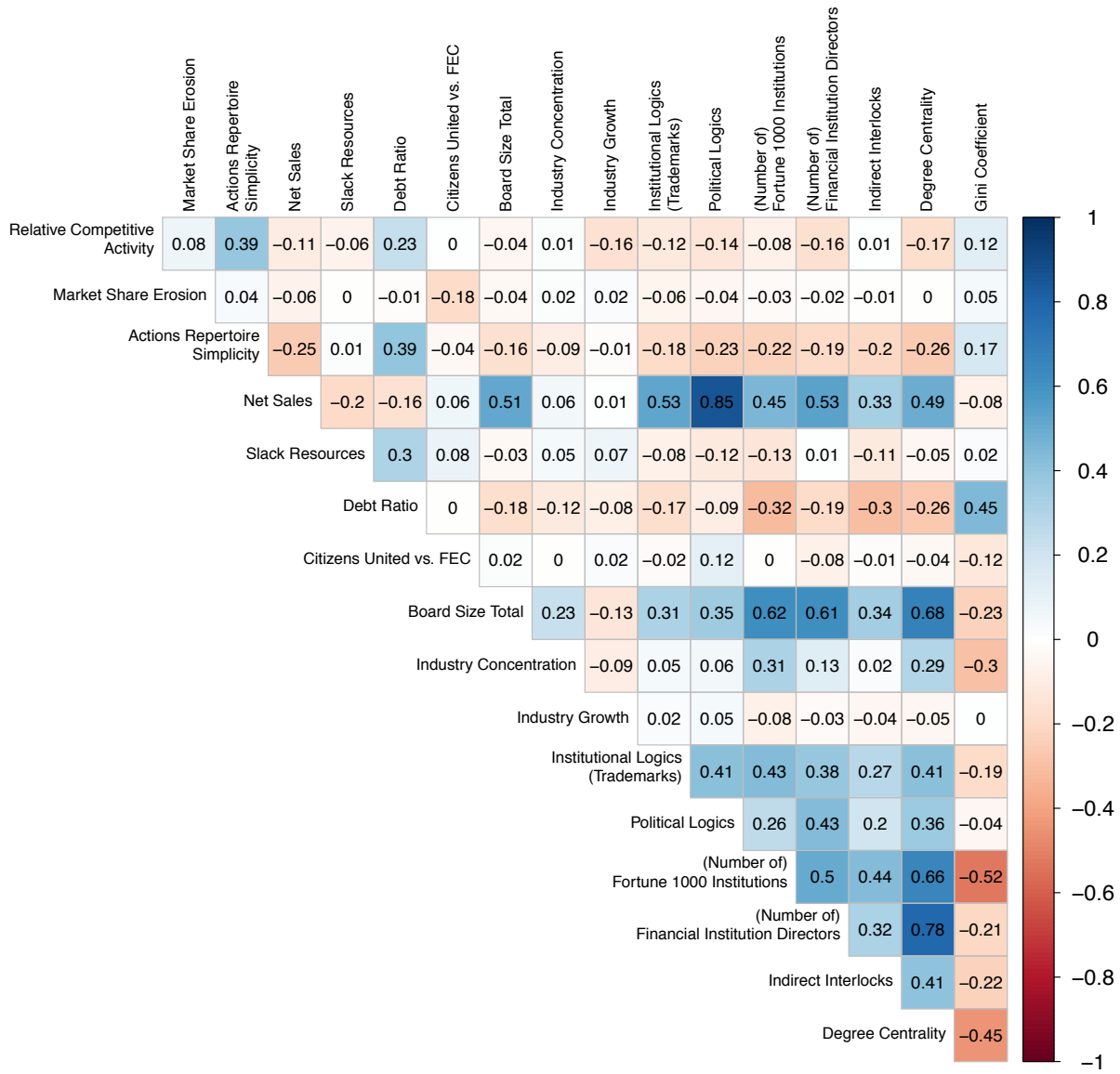

Figure 11: *Correlation matrix*. Correlations between independent variables is below the .80 threshold.

5.1 Panel data analysis procedure

Panel data consists of observations of the same units (firms) over several time periods. If we were to ignore the nature of panel data and run a pooled Ordinary Least Squares (OLS) regression, then it would lead to biased results because OLS makes unrealistic assumptions about panel data.

For example, pooled OLS assumes that all unit-specific heterogeneity can be controlled for by the independent variables in the model, so that the remaining unexplained variance is simply "white noise". Panel data and social science theories rarely fulfill this assumption. Therefore, pooled OLS estimates are often biased because of correlated unobserved heterogeneity. Even if unobserved heterogeneity is independent of the variables in the model, it causes the error term to be serially correlated, and therefore OLS standard errors will underestimate the true standard errors. The nature of panel data requires special estimation techniques to ensure that this bias is eliminated (Kennedy 2008).

We followed Kennedy's procedure for panel data modeling (Kennedy 2008) as seen in Figure 12. We began by running Chow tests of poolability on both the baseline and the full model hypotheses. If the Chow test null of equal intercepts was not rejected, then we pooled the data and performed ordinary least squares regression (Pooled OLS) on those models. If the null of the Chow test was rejected then, we applied a Hausman test to test whether the random effects estimator was unbiased. If this null was not rejected, then we used the random effects estimator. If this null was rejected then we used the fixed effects estimator (Baltagi 1995). The results of the Chow and Hausman tests indicated that random-effects models were preferred in all except for two cases. The Chow test (Table 7 for Chow test results) indicated that Hypothesis

5 (Positional embeddedness variables—Degree centrality and Gini Coefficient—as independent variables, and Market Share Erosion as the dependent variable) failed to reject the null of the Chow test. Therefore, we analyzed hypothesis 5 using pooled OLS. We proceeded with the Hausman test for the rest of the hypotheses. The Hausman test indicated that random-effects models were preferred in all except one case (Table 8 for Hausman test results). Hypothesis 2 (Structural embeddedness independent variables and Relative Competitive Activity as the dependent variable) rejected the null of the Hausman test. Thus, hypothesis 2 was analyzed using a fixed-effect model.

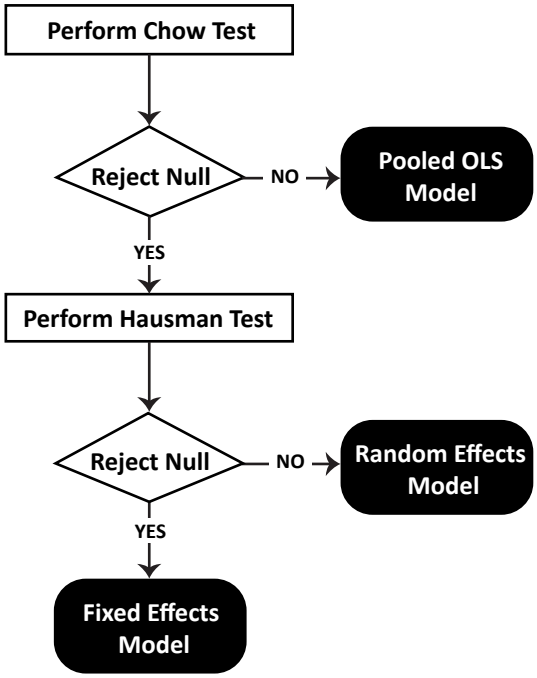

Figure 12: Panel data procedure

Panel Procedure Test: Chow Test of Poolability

Hypotheses	*F-Value*	*DF1*	*DF2*	*P-Value*	*Reject Null*
H1	8.35	160	246	2.12E-48	YES
H2	15.55	160	246	4.30E-75	YES
H3	8.39	200	205	5.82E-45	YES
H3 & H4	7.34	123	280	2.20E-16	YES
H5	3.20	200	205	3.39E-16	YES
H5	1.08	280	123	3.09E-01	NO
H6	3.92	160	246	3.47E-22	YES
H6	2.06	240	164	5.92E-07	YES

Table 7: *Chow test of poolability*. If the null of the Chow test is not rejected, then proceed to Pooled OLS Models. If null of Chow test is rejected then proceed to Hausman Test.

Panel Procedure Test: Hausman Test

Hypotheses	**Chi. Sq.**	**DF**	**P-Value**	**Reject Null**
H1	1.082	3	0.781	NO
H2	9.814	3	0.020	YES
H3	1.497	4	0.827	NO
H3 &H4	1.565	6	0.955	NO
H5	0.852	4	0.931	NO
H6	1.052	3	0.789	NO
H6	3.888	5	0.566	NO

Table 8: *Hausman test results*. If null of Hausman test is not rejected, then proceed to Random Effects Models. If null of Hausman test is rejected, then proceed to Fixed Effect Models.

5.2 Diagnostic Checks

We also ran diagnostic checks to test for heteroscedasticity and unit root in our panel data (Croissant and Millo, 2008). We ran the Breusch-Pagan test against heteroscedasticity in R, which tests the null of homoscedasticity (Table 9 Breusch-Pagan test of heteroscedasticity). We detected heteroscedasticity in our models for Hypothesis 5 and in Hypothesis 6 (with Market Share Erosion as the dependent variable), which we treated using robust covariance matrix estimators.

Diagnostic Checks: Breusch-Pagan Test of Heteroscedasticity

Hypotheses	Breusch-Pagan	DF	P- Value	Heteroscedasticity Present
H1	1.955	3	0.582	NO
H2	2.388	3	0.496	NO
H3	1.554	4	0.817	NO
H3 &H4	3.116	6	0.794	NO
H5	11.055	4	0.026	YES
H5	16.346	6	0.012	YES
H6	5.063	3	0.167	NO
H6	32.280	5	5.23E-06	YES

Table 9: *Breusch-Pagan Test of Heteroscedasticity*. If p-value is < 0.05 then heteroscedasticity is present.

We also ran the Augmented Dickey-Fuller test to test the null of non-stationarity/unit-root in our panel data. We did not detect unit root in our dependent variables, indicating that our data was stationary, with no presence of stochastic trends, thereby justifying the use of our panel estimation methods in our paper (Table 10 for test of unit root/stationarity).

Testing for Unit Roots/Stationarity

Dependent Variable	Dickey-Fuller	Lag order	P-Value	Unit Root Present
Relative Competitive Activity	-7.37	2	0.01	FALSE
Action Repertoire Simplicity	-6.47	2	0.01	FALSE
Market Share Erosion	-11.44	2	0.01	FALSE

Table 10: *Results of Augmented Dickey-Fuller test for Unit Roots/Stationarity*. If p-value is < 0.05 then no unit roots present.

5.3 Tests of Hypotheses- Asymmetric Rivalry

We report the results for the hypotheses on asymmetric rivalry in Table 11[5]. Hypothesis 1 states that the proactive manipulation of the institutional logics is positively related to focal firm asymmetric rivalry with rival firms. We tested hypothesis 1 by entering trademarks as the predictor for relative competitive activity, and slack resources and firm size as our control variables. The results of our random effects model for Hypothesis 1 were not significant. We also conducted Wald tests of model fit comparison to confirm that the inclusion of the predictor variables significantly improved the model fit with only control variables. The results showed that inclusion of predictor variables did not have a significantly better fit than the model with only control variables.

Hypothesis 2 states that the defensive manipulation of political logics is positively related to focal firm asymmetric rivalry with rival firms. Model 2 reports the results from the

[5] We report the results for the hypotheses without Amazon.com in Appendix III and IV. The minor differences in the calculated values do not change the conclusions of our study.

fixed-effects regression for Hypothesis 2. We test the effect of the defensive manipulation of political logics on relative competitive activity of the focal firm, while controlling for Firm Size and the Citizens United v. FEC Supreme Court decision. Hypothesis 2 is supported ($p < .05$) with a positive sign for the Political Logics coefficient ($\beta = 9.570$). The results of the Wald test confirmed that the inclusion of the predictor variables significantly improved the model fit (p < .001) compared to model fit with only control variables. In terms of effect size ($\beta = 9.570$), the results suggest that, all else being equal, on average, a firm that spends a million dollars on the defensive manipulation of political logics increases its relative competitive activity by about 9 actions. In other words, all else being equal, on average spending a million dollars on campaign finance and lobbying combined, enables the focal firm to carry out approximately 9 more competitive actions relative to its industry group rivals.

Hypothesis 3 states that structural embeddedness is positively related to focal firm asymmetric rivalry with rival firms. Structural embeddedness was tested using Models 3 and 4 in Table 11. We first ran random-effects regression of financial institution representation on relative competitive activity, with debt ratio, board size and firm size as control variables. As seen in Model 3, we did not find support ($p < .05$) for financial institution representation on boards ($p < .10$), however the slope for financial institution representation was in the opposite sign of the proposed hypothesis ($\beta = -4.550$). The results also showed the Wald test statistic to not be significant. We tested the remaining two variables of structural embeddedness: representation of Fortune 1000 firms and the number of indirect interlocks with industry group rivals, and Hypothesis 4 using Model 4.

Hypothesis 4 states that positional embeddedness is positively related to focal firm asymmetric rivalry with rival firms. Model 4 includes degree centrality and Gini coefficient as proxies for positional embeddedness, and Fortune 1000 firms and indirect interlocks as our predictors for positional embeddedness in our model. We controlled for board size and firm size in the random effects regression of Model 4. The results of Model 4 showed no support for the structural embeddedness variables in the model, i.e. the presence of Fortune 1000 directors on the focal firm's board, indirect interlocks and relative competitive activity. Therefore, hypothesis 3 was not supported.

Model 4 supports our hypothesis for positional embeddedness; both degree centrality ($p < .001$, $\beta = -4.236$), and Gini coefficient ($p < .05$, $\beta=100.14$), were significantly related to focal firm's relative competitive actions. The Wald test statistic was significantly better ($p < .001$) with the inclusion of the predictor variables to the model. The slope coefficient for degree centrality was in the opposite sign of the predicted relationship, however as predicted the Gini coefficient of the board's distribution of positional embeddedness was positively related to relative competitive activity. The effect size for the Gini coefficient ($\beta=100.14$) indicates that all else being equal, on average for every one percent increase in the inequality of positional embeddedness (degree centrality) distribution in the boardroom, relative competitive activity for focal firm increases by about 100 more competitive actions compared to other firms. In other words, all else being equal, on average for every one percentage increase in the inequality of director ties for a given firm's board, the focal firm is able to carry out about 100 more competitive actions compared to its industry group rivals.

Results of Panel Data Random-Effects Analyses for Asymmetric Rivalry (Relative Competitive Activity)
N = 410

Category		Model 1 (H1)		Model 2 (H2)[c]		Model 3 (H3)		Model 4 (H3/H4)[a]	
		Coef.	*Std. Err.*	*Coef.*	*Std. Err*	*Coef.*	*Std. Err.*	*Coef.*	*Std. Err.*
Control Variables	Firm Size	-1.206E-4	2.835E-4	-1.129E-3*	0.606E-3	1.072E-5	29.48E-5	5.527E-5	29.26E-5
	Slack Resources	-1.293	10.35	-	-	-	-	-	-
	Citizens United vs. FEC	-	-	0.450	7.160	-	-	-	-
	Debt Ratio	-	-	-	-	26.29***	9.835		
	Board Size	-	-	-	-	1.922	2.916	7.214**	3.276
Proactive Institutional Logics	Trademarks	-0.127	0.168	-	-	-	-	-	-
Defensive Political Logics	Political Logics	-	-	9.570**	4.011	-	-	-	-
Structural Embeddedness	Fortune 1000 Directors	-	-	-	-	-	-	3.387*	1.983
	Financial Institution Directors	-	-	-	-	-4.550*	2.538	-	-

Table 11: Panel data results for random-effects models of asymmetric rivalry (relative competitive activity). Data includes Amazon.com. Variables that are not present in a particular model are indicated by a dash (-). Hypothesis numbers are listed after the model number in parenthesis, e.g. H1, H2, H3, or H3/H4.

Table 11: (cont'd)

	Indirect Interlocks	-	-	-	-	-	-	5.649	5.857
Positional Embeddedness	Degree Centrality	-	-	-	-	-	-	-4.236****	1.004
	Gini Coefficient	-	-	-	-	-	-	100.1**	43.38

	Value	Std. Err.	Value	Std. Err.	Value	Std. Err.	Value	Std. Err.
Constant	6.697	20.55	-	-	-55.11	36.06	-65.47*	36.41
Wald Test Chi-Square	0.565	-	5.694****	-	3.214	-	25.26****	-

a	Model 4 combines Hypotheses 3 and 4. See Results section for additional information.
c	Fixed effects model
*	$p < 0.10$
**	$p < 0.05$
***	$p < 0.01$
****	$p < 0.001$

5.4 Tests of Hypotheses- Asymmetric Competitive Analysis

Hypothesis 5 states that positional embeddedness is positively related to asymmetric competitive analysis in focal firm. Models 1 and 3 in Table 12 show the effect of positional embeddedness on the dependent variables, *action repertoire simplicity* and *market share erosion respectively*. We ran a random-effects model to test the effect of positional embeddedness variables on action repertoire simplicity, while controlling for board size and firm size. As seen in Model 1, the Gini coefficient is significantly related to action repertoire simplicity ($p < .05$, $\beta = 0.240$). An increase in the inequality of director ties for a given firm's board increases the likelihood of engaging in only a few types of actions. A change in Gini index equal to the change in Gini index between companies with a low inequality in ties to a company with a high inequality in ties leads to a change in action repertoire simplicity of 9%, everything else being equal.[6] The Wald test statistic for Model 1 was also significantly better ($p < .05$) after the inclusion of the predictor variables to the model. The pooled OLS results of Model 3 were not significant, we did not find support for positional embeddedness and market share erosion, controlling for firm size, board size, industry concentration and industry growth.

Hypothesis 6 states that defensive manipulation of political logics is positively related to asymmetric competitive analysis in focal firm. Models 2 and 4 in Table 12 show the effect of money spent on manipulating political logics on action repertoire simplicity and market share

[6] A difference of 0.30 in the Gini index, as measured by the difference of one standard deviation above and below the mean Gini index) leads to a change in Action Repertoire Simplicity (ARS) of 0.072. This change in ARS is 9% of the full ARS scale (As seen in *Table 12*, the ARS goes from 0.188 to 1.000, yielding a range of 0.812).

erosion, respectively. The random effects model (as seen in Model 2) tests the effect of Political Logics on Action Repertoire Simplicity, controlling for Firm Size and the Citizen's United v. FEC ruling. This relationship was not significant.

As seen in Model 4, the random-effects model tests the effect of Political logics on Focal firm market share erosion, while controlling for firm size, the Citizen's United v. FEC ruling, industry concentration, and industry growth, was significant ($p < .05$). The Wald test statistic confirmed that adding the predictor variables significantly improved ($p < .05$) the model fit compared to when the model only had control variables. To illustrate the effect of the slope coefficient in Model 4 ($\beta = 0.019$), on average, a million dollars spent on defensive manipulation of political logics leads to an increase in market share erosion in focal firm by 0.02 percent (effect size of 0.019 rounded up to two decimal places). This is substantial, considering that the average market share erosion in our sample is nearly 0.04 percent. It implies that a company with an average market share erosion rate of 0.04 percent would increase their rate of market share erosion by 50 percent, if they were to spend a million dollars to pursue political interests.

Results of Panel Data Random-Effects Analyses for Asymmetric Competitive Analysis
N=410

Category	Variables	Action Repertoire Simplicity				Market Share Erosion			
		Model 1 (H5)		**Model 2 (H6)**		**Model 3 (H5)[c]**		**Model 4 (H6)**	
		Coef.	*Std. Err.*	*Coef.*	*Std. Err.*	*Coef.*	*Std. Err.*	*Coef.*	*Std. Err.*
Control Variables	Firm Size	-1.227E-6 ***	0.443E-6	-9.662E-7	8.415E-7	-3.856E-7	4.350E-7	-1.125E-6 ****	0.329E-6
	Board Size	1.007E-2	6.982E-2	-	-	4.443E-3	8.952E-2	-	-
	Citizens United VS. FEC	-	-	-1.133E-2	1.911E-2	-	-	-0.127 ****	0.038
	Industry Concentration	-	-	-	-	1.09E-9	1.87E-9	6.180E-10	11.50E-10
	Industry Growth	-	-	-	-	5.861E-3 ****	1.360E-3	5.539E-3 ****	0.500E-3
Positional Embedded-ness	Degree Centrality	-3.184E-3	2.790E-3	-	-	2.196E-3	2.394E-3	-	-
	Gini Coefficient	0.240**	0.120	-	-	0.112	0.110	-	-
Defensive Political Logics	Political Logics	-	-	-5.313E-3	8.995E-3	-	-	0.019**	0.008

Table 12: Panel data results for random-effects regression of asymmetric competitive analysis. Data includes Amazon.com. Variables that are not present in a particular model are indicated by a dash (-). Hypothesis numbers are listed after the model number in parentheses, e.g. H5 or H6.

Table 12: (cont'd)

	Value	Std. Err	Value	Std. Err	Value	Std. Err.	Value	Std. Err.
Constant	0.631****	0.103	0.782****	0.031	-1.672E-2	9.231E-2	6.682E-2**	2.925E-2
Wald-Test Chi-Square	6.849**	-	0.353	-	1.353	-	6.468**	-

c Pooled panel model analysis

* $p < 0.10$

** $p < 0.05$

*** $p < 0.01$

**** $p < 0.001$

Chapter 6: Discussion and Conclusions

The literature on asymmetric competition has largely portrayed asymmetry to be a competitive advantage. However, this assertion has been largely made on the basis of theories that assume perfect rationality in firms. In reality, we know that firms have bounded rationality and have inferential limitations. Additionally, decision-makers have tacit beliefs regarding interpersonal interaction that constrains learning behavior and cause firms to be ineffective.

These inefficiencies create blind spots in firms, making them vulnerable to competitive attacks from rivals. Therefore, when we assume these inherent limitations in the cognition of firms and the way it informs their competitive analysis, the favorability of asymmetry that dominates extant research becomes questionable. Our study explores these contradicting implications of asymmetric competition and provide a contextual explanation of why asymmetry leads to favorable consequences and why it can also lead to unfavorable consequences. But so far, the explanation and acknowledgement of this paradox had been lacking.

Using data from 41 publicly traded firms in the U.S. retail industry observed over a ten-year period, we examined the paradoxical nature of asymmetric competition. At a general level, our study contributes to the literature on competitive asymmetry by extending the Red Queen theory to understand why strategic adaptations to the context's logic of competition lead to favorable asymmetric rivalries for the focal firm, and why some of the same strategic adaptations lead simultaneously to unfavorable asymmetric competitive analysis in the focal firm. Understanding the implications of this paradox of asymmetry is critical from the

standpoint of decision-makers who seek to evaluate existing strategic programs and assess future competitive threats.

6.1 Discussion

This study began with the aim to addresses the gap in extant literature pertaining to how cognitive limitations of firms effect competitive encounters that are asymmetric in nature. We chose to highlight this particular gap in the literature which assumes competitive analysis to be a rational choice, where firms have perfect information to make the most optimal decisions regarding competitive analysis.

However, insights from organizational learning theory point to the fact that firms tend to fall into the so-called traps of learning—managers tend to satisfice as opposed to choosing the most optimal course of action. We consider the impact of this assumption regarding the limits of decision-making ability in the case of a specific situation that confronts firms almost universally, that of asymmetric competition.

As scholars have noted, creating asymmetric rivalries with industry rivals is a competitive advantage because it enables the focal firm to engage in a wide latitude of actions with minimal retaliation from other firms (Chen 1996). Extant studies in competitive dynamics have limited the role of firm's agency to the action and response aspect of competitive dynamics. However, the literature has not extended the agency of firms with respect to their task environment.

Using the framework of the Red Queen theory, with its roots in organizational learning and emphasis on the context-specificity of competition, we were able to address these gaps in the literature. Specifically, we were able to establish that strategic adaptation to the context's logic of competition leads to favorable consequences in terms of asymmetric rivalry. The same adaptations, however, also lead to the disastrous consequence of asymmetric competitive analysis in firms.

In particular, we examined how defensive manipulation of the political logics of the context's logic of competition influenced asymmetric rivalry and asymmetric competitive analysis. Asymmetric rivalry, which was defined in terms of the total number of actions carried out by the focal firm relative rivals, increased when firms engaged in the defensive manipulation of political logics using specific tactics such as government lobbying and campaign finance. Our finding supports theoretical evidence from resource-dependence theory and exchange theory, which argue that firms engage in tactics such as lobbying and campaign finance to reduce dependence on the task environment, and gain power to improve their competitive advantage relative to other firms that are less politically involved (Hillman and Hitt 1999; Capron and Chatain 2008). Our study also supports the long-standing view held by scholars that firms engage in political activity because they believe that influencing public officials is a pathway to gain competitive advantage over others (Stigler 1971; Peltzman 1976). We make this inference based on the increased competitive activity of firms and also on the basis of the strong upward trend seen in firms engaging in influencing political logics, marked by the sharp increase post the supreme court ruling in 2008, which relaxed laws related to political contributions by corporations (**Figure 13**).

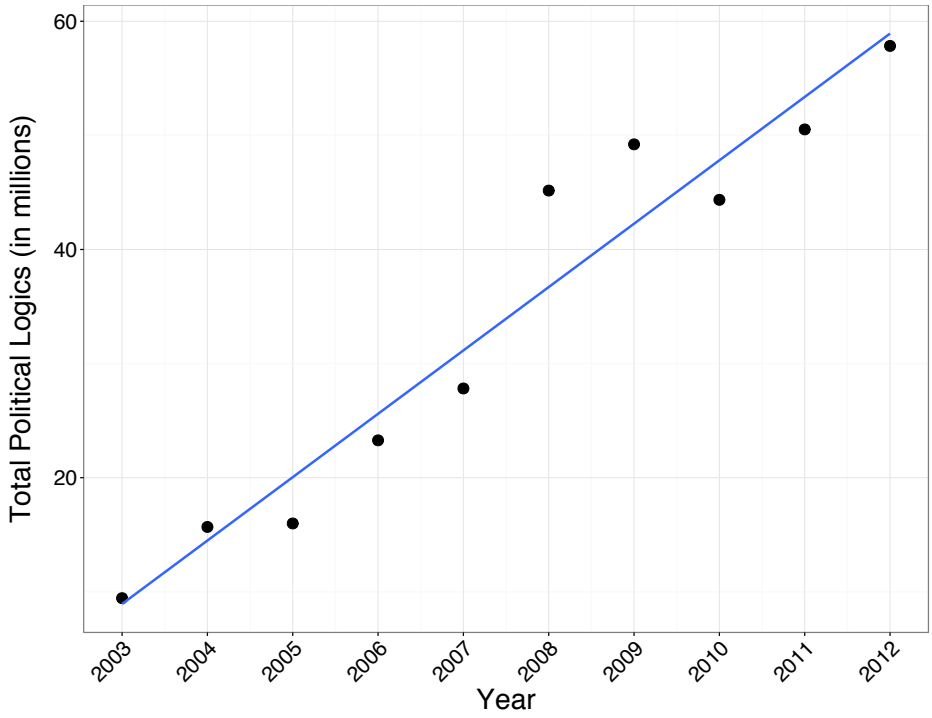

Figure 13: *Money spent by firms on campaign contributions and lobbying*. The amount rose sharply during the 2008 election year and continued to rise after the Citizens United ruling in 2010, spiking once again during the election year of 2012.

This sustained commitment of resources to the strategy of political logics and the resulting enhancement of relative competitive activity provides additional support to Porter's (1980) argument, and Chen, Smith and Grimm's (1992) finding regarding strategic actions that have a high resource commitment, and their associated immunity to other competitors. Our results also support theoretical studies which have argued that strategic political management by firms leads to improved performance (Hillman and Hitt 1999; Oliver and Holzinger 2008; Capron and Chatain 2008).

Our study also found the competitive advantage gained from the defensive manipulation of political logics to be unsustainable. The same strategy leads to asymmetric competitive analysis in the focal firm. Our results also enhance (by inference) the

understanding of how asymmetric competitive analysis occurs in firms. Weitz (1985) noted that studies of competitive interaction have paid insufficient attention to how contextual factors affect cognition in firms. Asymmetric competitive analysis has been attributed to reduced awareness due to firms ignoring rivals who are not similar in resources, or do not share common markets (Chen 1996; Upson, Ketchen, Connelly and Ranft 2012). However, in our study we found compelling evidence of asymmetric competitive analysis in firms that were similar in resources and had sufficient market overlap, demonstrating that these factors were not sufficient determinants of asymmetric competitive analysis.

We discussed that by reducing their dependence on political logics, firms gain the ability to impose their actions, products, services and strategies on the market instead of adapting to an exogenous environment. Organizational learning theory argues that the power of being able to influence the environment puts a firm into a power trap, because it prevents the firm from developing alternative strategies, as it is more convenient to manipulate the political logics instead. Power also reduces the incentive to develop adaptive capabilities, to learn and counter rival strategies. Firms in a power trap are characterized by complacency and are caught off guard by a changing competitive landscape (Levinthal and March 1993). We infer a power trap in our study on the basis of the high rate of market share erosion, a surrogate measure of impaired awareness that is characteristic of asymmetric competitive analysis in the firms that defensively manipulated political logics (Ferrier et al. 1999; Levinthal and March 1993).

Our observation of asymmetric competitive analysis in firms that manipulate political logics also confirms what several recent empirical studies have found regarding the negative effects of political activity on performance (Hadani and Schuler 2013; Aggarwal, Meschke and

Wang, 2012; Coates, 2012; Faccio 2006). Specifically, those studies have found corporate political activity reduced share value and profitability in firms. Our study extends these findings to show that political strategy also leads to the adverse effect of asymmetric competitive analysis in firms. This contradicts theory and empirical evidence from previous studies that show corporate lobbying and campaign finance to have a favorable effect on a firm's outcome, and demonstrates that the relationship between a firm's efforts at influencing the political logics of their environment and its outcomes to be complex and insufficiently understood.

Our theoretical framework of Red Queen competition may answer why the relationship between political activity and outcomes is contradictory. Previous studies that established a positive relationship between political activity by firms and financial returns relied on the theory of industrial-organization economics and resource-dependence theory as the primary lens for explaining how corporate political activity affects firms (Hadani and Schuler 2013). Both of these theories assume rational choice on the part of firms, and argue that decision-makers within firms have perfect information and are able to scan and gather information to make the most optimal and rational decisions. However, we argue that the theoretical assumption of rationality is tenuous due to the reason that key decision-makers often lack intimate knowledge of government policy and the political process that government affairs representatives and lobbyists are aware of. At the same time, decision-makers are the only ones who are knowledgeable about the firm's strategic course, but may face political pressure within the firm to pursue political activity (Hart 2004). By explicitly modelling the bounded rationality and learning limitations of firms in our study, we may offer a better understanding of this complex relationship between corporate political strategy and firm's outcomes.

Our results also found evidence regarding the Red Queen theory's hypothesis that strategic adaptation to the social logics of competition leads to asymmetric advantage. We modelled the strategic adaptation to the social logics of competition in terms of the network construct of degree centrality to denote positional embeddedness of firms in the intercorporate network. Our rationale was that positional embeddedness leads to asymmetric rivalry in the focal firm, because network centrality via interlock ties enhanced the focal firm's access to information (a form of competitive advantage), which improved the action taking ability by the focal firm (Davis 1991).

Previous research has indicated that the flow of information is a definitive competitive advantage and leads to improved action-taking by firms (Gnyawali and Madhavan 2001). We followed the previous research to demonstrate the occurrence of positional embeddedness at the inter-firm level of network centrality by using the proxy of interlocked ties of the focal firm to other firms (Shrophshire 2011; Mizruchi 1996). This proxy of board interlocks allowed us to take a more nuanced look at positional embeddedness with respect to asymmetric competition.

In network research a distinction is made between two node sets based on which node set is more responsible for the embeddedness of the firm than the other. In the case of board interlocks both nodes, directors and corporate boards, are considered primary nodes. Therefore, we reckoned that positional embedeness at each node level had to be modelled to offer a better idea of how it affected asymmetric competition. Theory from group dynamics literature argues that the distribution of positional embeddedness on the focal firm's board affects decision-making and consequently its competitiveness (He and Huang 2011). Previous

research has demonstrated that directors with high centrality (those who hold multiple directorships) command high respect and authority from peers in boardrooms. Consequently, when a boardroom is dominated by a handful of board members with high centrality, there is a clear informal hierarchy in the boardroom that facilitates interactions. In line with previous research, we modeled this phenomenon using the Gini coefficient, and found some interesting results (He and Huang 2011). Specifically, we found that high inequality in the distribution of positional embeddedness of the focal firm's board lead to greater asymmetric rivalry, enabling the firm to carry out more actions compared to rivals. This result finds support for the Red Queen theory's hypothesis that strategic adaptation to the social logics of competition leads to asymmetric advantage. In terms of research on corporate governance, our finding lends further evidence to extant research on the effects of boardroom composition on performance (He and Huang 2011). More importantly, it attests the value of recognizing the human aspect of corporations and the importance of studying how group dynamics of decision-makers affects firm outcomes (Beckman et al. 2014, He and Huang 2011).

However, with regard to the overall positional embeddedness of the focal firm, we found that degree centrality (number of board interlocks) was negatively related to asymmetric rivalry, which was counter to our prediction. We found that greater positional embeddedness of the focal firm via number of board interlocks reduced its asymmetric rivalry advantage. We speculate that our results follow Shropshire's (2010) theory that over-embeddedness in the interlocking directorate reduces the firm's ability to utilize information in an efficient manner.

Our results also indicate that positional embeddedness can lead to asymmetric competitive analysis in firms that have a lopsided distribution of positional embeddedness in

their boardrooms. The results enrich (by inference) understanding of how group dynamics among key decision-makers lead to asymmetric competitive analysis. This finding also extends recent research on the informal hierarchy of a board and its implication on the firm's effectiveness due to the underlying social mechanisms that guide boardroom interactions (He and Huang 2011). Our study adds further support for research that explicitly accounts for the social mechanisms of a corporation's actions, and addresses the gap in extant studies on competition and strategy that treat corporations as impersonal black boxes. Our study also finds empirical support for the research of Beckman et al. (2014), who theorized that firms are not able to draw upon the full expertise and experience of their board members when the firm is dominated by a few star board members with greater positional embeddedness relative to fellow board members. Additionally, our finding of action repertoire simplicity is indicative of the competitive inertia associated with having high ranking decision-makers, who are afraid of deviating from established actions to protect their reputation and reliability (Wong and Boh 2010)

Each of these findings, paint an interesting story about positional embeddedness and asymmetric competition when taken together. As positional embeddedness of the firm increases, it may create problems related to information overload, with the firm getting overwhelmed with the large amount of information from multiple outside firms. However, having an informal social hierarchy in the boardroom (unequal distribution of positional embeddedness in the boardroom) may create a system that makes decision-making more efficient, resulting in the ability to undertake greater number of competitive actions in the focal

firm. But, an improvement in efficiency may have compromised the quality of actions taken, as shown by the reduced repertoire of actions taken.

To our knowledge, none of the previous studies in the corporate governance literature that investigate the embeddedness of interlock networks have taken the affiliation two-mode network structure of interlocking directorates into consideration. Extant research has applied a network perspective to corporate governance by examining interlocked firms' ties separately from the interpersonal network of ties among directors that sit on the same board. As scholars have argued, the type of cross level theory and methodology employed in our research that studied positional embeddedness at both nodes of a two-mode network structure avoids the aggregation errors of single-level theory and methodology (Klein and Kozlowski 2000; Klein, Danserau and Hall, 1994; Shropshire, 2010; Opsahl 2013). By doing so, our study answers the call for empirical research in the area of corporate governance that accounts for variance within the group (of focal board directors) based on individual differences in ties to other boards (Shropshire 2010; Opsahl 2013).

In conclusion, by modeling the positive and negative consequences of firms in a Red Queen we address the gap in the literature that either ignored the competitive interaction aspect of Red Queen process or left out the truly maladaptive consequences of Red Queen competition. Unlike previous research that modeled the negative impact of the Red Queen only in terms of lower performance due to rival actions, our research demonstrates that maladaptive consequences of the Red Queen are way worse than just a temporary reduction in performance. By assuming cognitive limitations of decision-makers, we were able to

demonstrate how coping strategies to the logics of competition lead to a truly dangerous situation of impaired awareness in firms.

Our research also contributes to the network literature by drawing a theoretical link between the concept of structural embeddedness and asymmetric rivalry. Specifically, we theorized that firms will strategically alter the configuration of network ties in such a way that their structural embeddedness leads to asymmetric rivalry. We argued that firms employ a strategy of structural embeddedness to overcome network constraints of the social logics of competition that prevent firms from gaining access to asset and status benefits, and in turn acquire competitive advantage terms of asymmetric rivalry (Burt 1992; Burt 2010; Mizruchi, 1996). However, our results showed structurally embedding network constraints to be unrelated to asymmetric competitive advantage for the firm. We measured structural embeddedness in terms of weak ties (indirect interlocks), representation of financial instututions and Fortune firm directors on the board but found no relationship to focal firm asymmetric rivalry.

The failure to find a significant relationship between weak ties and asymmetric rivalry for the focal firm also extends McEvily and Zaheer's (1999) study, which was unable to detect a relationship between embedded weak ties and competitive capabilities. Perhaps, the lack of association between indirect interlocks among industry rivals and relative competitive activity indicates mutual forbearance between industry rivals since scholars in the board interlock literature have argued that the presence of indirect interlocks between industry rivals serve as weak ties for signaling collusive behavior to restrict competition (Mizruchi 1996).

Our results also echo research on board interlock studies that have generally failed to find a significant relationship between representation of financial institutions on corporate boards and performance (Mizruchi 1996). On the basis of Mizruchi's (1996) argument, we consider the possible ambiguity of the causal ordering of structural embeddedness constructs of financial representation on the board, the high-status Fortune director appointments and their effect on asymmetric advantage. This is because having high-status directors and bankers on the board may lead to competitive advantage, but it could also be argued that high-status directors and bankers are attracted to firms that are successful to begin with (Mizruchi 1996). Therefore, before concluding that structural embeddedness is not related to asymmetric rivalry in firms, we encourage future research to investigate other possibilities. For example, using a lagged dependent variable to establish that the structural embeddedness initiatives by the firm precedes the firm's outcome measures (Mizruchi 1996).

6.2 Managerial and Policy Implications

Our study joins several recent studies that have empirically demonstrated the adverse impact of corporate political activity. More importantly, unlike previous studies, our study illustrates the extent of damage engaging in defensive manipulation of political logics can be to the firm. While engaging in political logics may have enabled the focal firm to be relatively more competitive compared to its rivals, this improvement was modest at best. Firms that heavily engaged in political logics were likely to lose their market share at a significantly higher rate than firms that did not participate in political activity. This finding has several implications for

managers and government policy. First, managers need to realize that engaging in political activity may not necessarily lead to the gains they hope to. Even if this is undertaken to keep up with the mimetic pressures of other rival firms that are engaging in the political activity, firms need to be wary of having a core strategy that is deeply focused on the political process. As our results suggest, this is likely to reduce your relative competitive standing, and blind you from rival actions. Restricting rivals from competing by intervening in the political markets is also likely to impair competitive analysis because it may create superstitious learning in the focal firm (March, Sproull and Tamuz 1991). Playing politics may also be a generally bad idea for reasons other than generating asymmetric competitive analysis in the focal firm. Since retailing is a service industry, the brand image of retailers is inextricably intertwined with their store image, as there is no clear separation between the products offered by the retailer and the store's image (Manjeshwar and Sternquist, 2008). Although politics in the United States has gotten increasingly partisan over the years, the majority of Americans remain solidly united in their contempt of corporate money in politics (Stohr 2015). Therefore, engaging in political activity may hurt retailers more adversely compared to non-service based industries (Torres-Spelliscy 2016).

Our research also found evidence pertaining to the impact of positional embeddedness on both asymmetric rivalry and asymmetric competitive analysis. The implications for managers follow in conjunction from the global measure of the firm's overall positional embeddedness and the local measure of distribution of positional embeddedness on the firm's board. This means that if we plot the dimensions of these global and local measures of embeddedness on an x and y axis then, per our results, most firms need to strive for Quadrant I (Figure 14). The

most optimal board structure from an efficiency standpoint is one where the firm is not over-embedded in the intercorporate network, and the type of boardroom structure where positional embeddedness of directors on the board is highly unequal, having only a few directors who have many outside ties to firms (Quadrant I in **Figure 14**).

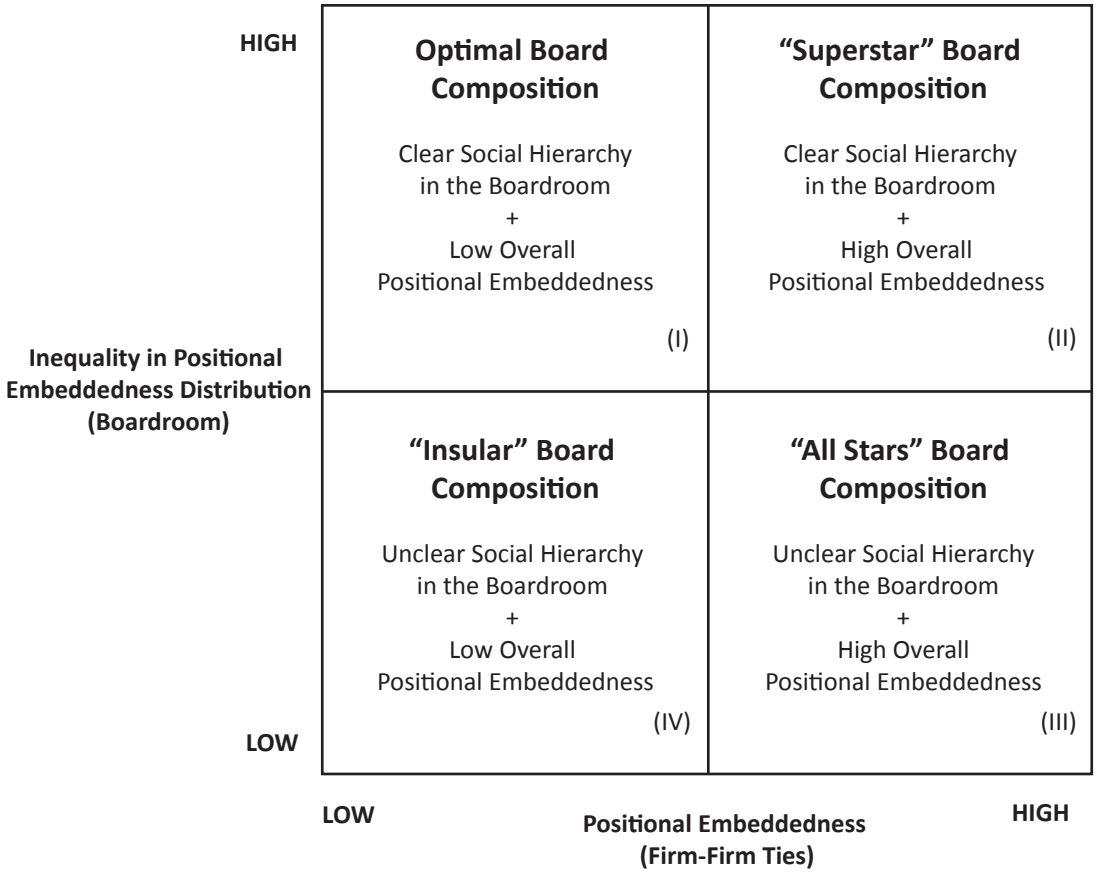

Figure 14: Board Composition based on the distribution of positional embeddedness in the boardroom and the overall positional embeddedness of the firm in the intercorporate board network.

Based on our results, a boardroom where only a few directors have positional embeddedness also leads to simple repertoire of actions. The latter is expected because the presence of a social hierarchy is to be expected in any social group, and the corporate board is not an exception to that norm (Magee and Galinsky 2008). And such hierarchy discourages lower ranked team members from contributing novel ideas and encourages the tendency to repeat information that is commonly held by the group (Stewart an Stasser 1995; Wittenbaum 2000). Information possessed by lower status individuals is also more likely to be viewed with skepticism. Additionally, highly central directors are less likely to endorse or propose strategic actions that deviate from their social identity. The challenge for firms then, is to be able to combine the best of both situations without sacrificing the quality and creativity of decisions made. To that end, we recommend that the chairman of the board take an active leadership role as the facilitator of boardroom discussion, and keep powerful board members from dominating decisions, encourage equal participation from all members of the board, and actively facilitate a group culture of mutual respect, empathy and interpersonal trust. These attributes are collectively aspects of "psychological safety", a group culture which is defined as "a shared belief that the team is safe for interpersonal risk taking (Edmondson, 1999, P. 354). Psychological safety is distinct from group cohesiveness, which encourages groupthink, and is also separate from a dysfunctional culture that permits a laissez-faire group dynamic. It refers to a climate that fosters confidence in group members that their ideas will not be ridiculed or that they will not be punished for speaking up (Edmondson 1999). This confidence that stems from mutual respect and trust has been shown to be critical for the functioning of high

achieving groups, and has been successfully applied at companies such as Google Inc. (Duhigg 2016).

6.3 Limitations and Future Research

This study has some limitations worth mentioning. First, we sampled firms from the U.S. retail industry. Limiting our study to a single industry has allowed us to perform a pure test for our theoretical model, and reduced the need to control for variation in the strategic adaptation to different logics of competition operating in a multi-industry data set. However, the retail industry does have certain distinctive characteristics that may explain why we were not able to find a significant relationship for our hypothesis regarding the proactive manipulation of institutional logics and asymmetric rivalry. Being a service-based industry, the retail sector does not actively file patents nor does it heavily invest in research and development (R&D) (Gotsch and Hipp, 2012). It may be that trademarks may not have adequately captured the construct of institutional logics because they do not measure the internal process of institutional entrepreneurship in firms, which is key to the manipulation of institutional logics. Future studies should supplement trademarks with survey instruments to capture the manipulation of institutional logics by firms.

Secondly, although the methodology of recording competitive actions by citing counts of actions found in press articles is an established procedure, similar to previous studies, our study captures only observable competitive actions that have been reported in the media (Jauch, Osborn and Martin 1980; Smith et al., 1992; Young, Smith and Grimm 1996; Derfus et al.

2008). It is plausible that not all firms believe in announcing competitive threats to rivals, and some may even prefer to attack with stealth instead.

Thirdly, it is worth noting that the 2010 Citizens United Supreme Court decision fails to take into account the existing FEC rules regarding disclosure, and allows major political spenders to contribute undisclosed sums of money, anonymously. This means that some of the money poured by the firms in our study may be unaccounted for. There is also the possibility that other firms that are not actively spending money in politics are benefiting by riding on the coat tails of those firms that do. Our study was not able to capture this possibility.

Lastly, while we did discover an interesting paradox, we have no way of verifying the causal mechanisms that linked positional embeddedness to the action repertoire simplicity measure of asymmetric competitive analysis, because we were unable to analyze the content and quality of actual boardroom interactions. Although we developed a theoretical argument based on logical inference to arrive at the causal mechanism that linked distribution of positional embeddedness on the focal firm's board and boardroom interaction, and consequently removed the possibility of alternative explanations, we believe that future research will benefit from the capturing actual boardroom interactions of firms where positional embeddedness of directors constitutes social hierarchy.

6.4 Conclusions

In his seminal essay on what makes a particular theory interesting, Davis (1971, p.309) differentiates between theories that are *interesting* from theories that are *not interesting* by

declaring interesting theories as those which *deny* certain assumptions of their audience (1971, p. 309). Adapting to the context's logic of competition is generally assumed to result into a favorable consequence for the firm. However, our extension of the Red Queen theory to the phenomenon of asymmetric competition denies this assumption of traditional theories of competition to reveal an interesting paradox. Strategic adaptations to the logics of competition prevailing in the political and social context of the market structure lead to asymmetric rivalries with competitors. However, the same strategic adaptations lead to the unintentional but deleterious consequence of asymmetric competitive analysis in the focal firm. The study of asymmetric competition has attracted scant research attention over the past three decades, but our results indicate that asymmetric competitive behavior as seen from the level of rivalrous action and from the level of competitive analysis bear important implications for firms. We hope that our effort to solve the paradoxical nature of asymmetric competition will stimulate further investigation into this important area of research.

APPENDICES

Appendix A: Content Analysis Schedule

Company Name: _____

Date of Article: _____ **Publication Source:** _____

Retailer Actions: The following list describes actions typically undertaken by retailers. Please read the following descriptions and place a checkmark (✓) in the column at the left to indicate whether the article captures these actions for the firm. If an article lists multiple company actions then please use a separate sheet for each company listed in the article.

Category	✓	Description
Assortment Mix	_____	Actions pertaining to the depth of merchandise carried- the number of different SKUs (Stock Keeping Unit) within a category.
Assortment Mix	_____	Actions pertaining to the variety of merchandise categories offered.
Assortment Mix	_____	Actions pertaining to the complementarity of the merchandise across categories.
Assortment Mix	_____	Actions pertaining to visual merchandising, presentation of the retail space, the physical characteristics of the store or website layout that displays the merchandise.[7]
Assortment Mix	_____	Actions pertaining to the depth of merchandise carried- the number of different SKUs (Stock Keeping Unit) within a category.

[7] Note: Do not include actions pertaining to displaying special merchandise, seasonal merchandise or markdown merchandise that is being promoted to attract customers. For e.g. "Wal-Mart debuts a more contemporary design: revamped signage and functional flooring highlight the changes"

Category	✓	Description
Assortment Mix	_____	Actions pertaining to inventory management, i.e. acquiring and maintaining proper assortment of merchandise.
Assortment Mix	_____	Actions pertaining to licensed brands, an exclusive contractual agreement with a well-known brand to produce or carry licensed merchandise.
Assortment Mix	_____	Actions pertaining to private label brands, products developed and marketed by the retailer, only available for sale at the retailer.
Assortment Mix	_____	Actions pertaining to premium branding strategy that offers the consumer a private label at a comparable manufacturer brand quality.
Promotion	_____	Actions pertaining to displaying merchandise that is being promoted. Do not include actions pertaining to visual merchandising that pertains to store design/website layout designed to facilitate shopping.
Promotion	_____	Actions pertaining to promoting seasonal merchandise.
Promotion	_____	Actions pertaining to promoting special merchandise.
Promotion	_____	Actions pertaining to promoting markdowns aimed at generating sales and increasing customer flow. Does not include clearance markdowns aimed at disposing merchandise or end-of-season markdowns aimed at price sensitive customers.
Promotion	_____	Actions pertaining to generating publicity for the retailer. Includes exposure in any new media that boosts sales that is not paid for by the retailer. For e.g. a news feature about a retailer sponsoring students for college scholarships.
Promotion	_____	Actions pertaining to writing a newspaper article, magazine column or an electronic newsletter on timely or relevant topics.
Promotion	_____	Sponsorship of events, tournaments, television shows.
Promotion	_____	Hiring a celebrity spokesperson to promote the retailer's products or services.
Promotion	_____	Actions pertaining to sponsorship of community project, nonprofit or charity organization.
Promotion	_____	Actions pertaining to promoting a cause and generating publicity.
Promotion	_____	Actions pertaining to sales efforts of salespersons, including training of expert and knowledgeable sales persons.

Category	✓	Description
Promotion	_____	Actions that encourage consumer trials through samples, in-store demonstrations, online videos and product testimonials.
Promotion	_____	Marketing activities that include TV, print, and radio commercials, including paid product placement.
Promotion	_____	Viral marketing activities that are geared towards creating a "buzz" about the retailer.
Promotion	_____	Activities to promote word-of-mouth advertising that includes, rewarding customers for referrals and positive reviews.
Promotion	_____	Direct mailing- store flyers, catalogues, postcards, brochures, and coupon booklets.
Pricing Strategy	_____	Discounts, sales, mark-downs, mark-ups.
Pricing Strategy	_____	Gifts with purchase, free.
Pricing Strategy	_____	Odd pricing- setting prices that end in odd numbers.
Pricing Strategy	_____	Pricelining- refers to when merchandise is sold in price ranges low, medium, high (premium) pricing.
Pricing Strategy	_____	Dynamic pricing- First-time customers are charged a lower promotional price.
Pricing Strategy	_____	Leader pricing- discounting a popular item to encourage and incentivize purchase on non-discounted items.
Pricing Strategy	_____	Low price guarantee policy- a policy that guarantees that the retailer will have the item for the lowest possible price and a promise to match or better any lower price found at a competing store.
Pricing Strategy	_____	Multiple unit pricing- offering discounts on bulk quantity (five for two dollars).
Pricing Strategy	_____	Bundling-discount on purchasing multiple items together.
Pricing Strategy	_____	Every Day Low Pricing (EDLP)- pricing strategy between regular non sale prices and deep discount sale price of competitors.
Service Strategy	_____	Activities and programs designed by the retailer to make the shopping experience convenient and rewarding for the customer.
Service Strategy	_____	Activities that include instrumental support to deliver service to customers through call centers, online chatting with support, in-store kiosks to order out of stock items or website that allows customer to look up availability of an item at a particular location.

Category	✓	Description
Service Strategy	_____	Using technology to maintain a database of customer information.
Service Strategy	_____	Actions geared towards giving personalized service to customers based on information collected from the customer loyalty database.
Service Strategy	_____	Engaging in customer relationship management through surveys, feedback and interviews with customers.
Service Strategy	_____	Engaging in a customer loyalty program to reward customers with incentives such as discounts on purchases, free items, gifts, special privileges for their repeated business.
Service Strategy	_____	Proprietary store credit card system that allows customers to charge purchases to retailer's store credit cards.
Service Strategy	_____	Opening store formats that cater to a particular market segment. For e.g., smaller versions of retailer's big box stores in urban areas.
Service Strategy	_____	Acceptance of different form of payment methods.
Service Strategy	_____	Alteration or customization service for merchandise.
Service Strategy	_____	Gift registry for special occasions.
Service Strategy	_____	Processing of financial services- cashing checks, loans, insurance etc.
Service Strategy	_____	Delivery or shipping service.
Service Strategy	_____	Fitting rooms.
Service Strategy	_____	Easy returns and/or easy pick-up from websites and physical stores.
Service Strategy	_____	Extended store hours.
Service Strategy	_____	Free shipping and handling.
Service Strategy	_____	Gift-wrapping service.
Service Strategy	_____	Layaway plans.
Service Strategy	_____	Personal shopping assistance in selecting merchandise.
Service Strategy	_____	Shopping carts.
Service Strategy	_____	In store cafeteria or rest areas.
Service Strategy	_____	Valet parking or designated parking spots.

Category	✓	Description
Supply Chain Management	_____	The set of activities employed by firms to seamlessly and efficiently integrate their suppliers, warehouses, stores and transportation intermediaries to deliver the right quantity of merchandise, at the right time and right location.
Supply Chain Management	_____	Electronic Data Interchange systems- data exchange systems that are developed and used by firms for the purpose of exchanging information with suppliers.
Supply Chain Management	_____	Public warehouses that are owned by a third party.
Supply Chain Management	_____	Distribution centers for holding merchandise that is unloaded from trucks.
Supply Chain Management	_____	Drop shipping: direct delivery by manufacturers to customers made at the retailer's request.
Supply Chain Management	_____	Quick response delivery systems designed to reduce the lead-time for receiving merchandise. Includes just in time delivery.

Appendix B: Software Version Information

Software / Library	Version	Description
R Studio	0.99.473	Integrated Development Environment (IDE) for script and software development
R Language	3.2.2	The R programming language
plm library	1.5-12	Linear models for panel data
igraph library	1.0.1	Network analysis and graphics
moments library	0.14	Moments, cumulants, skewness, kurtosis, and related tests
corrplot library	0.73	Visualization of correlation matrices
dplyr library	0.4.3	Data manipulation tools
tidyr library	1.0-7	Data formatting tools

Table 13: Versioning information for R, IDE, and R libraries used in this work.

Appendix C: Results of Panel Data Random-Effects Analyses for Asymmetric Rivalry (Relative Competitive Activity)

(No Amazon.com; N = 400)

Category	Variables	Model 1 (H1)		Model 2 (H2)		Model 3 (H3)		Model 4 (H3/H4)[a]	
		Coef.	*Std. Err.*	*Coef.*	*Std. Err*	*Coef.*	*Std. Err.*	*Coef.*	*Std. Err.*
Control Variables	Firm Size	-1.50E-4	2.80E-4	-9.27E-4 **	4.17E-4	-0.077E-4	2.93E-4	0.238E-4	2.88E-4
	Slack Resources	0.22	10.35	-	-	-	-	-	-
	Citizens United vs. FEC	-	-	-0.054	7.12	-	-	-	-
	Debt Ratio	-	-	-	-	22.65**	9.914		
	Board Size	-	-	-	-	1.79	2.93	6.75*	3.29
Proactive Institutional Logics	Trademarks	-0.16	0.171	-	-	-	-	-	-
Defensive Political Logics	Political Logics	-	-	8.62**	3.56	-	-	-	-
Structural Embeddedness	Fortune 1000 Directors	-	-	-	-	-	-	3.39*	1.98
	Financial Institution Directors	-	-	-	-	-4.75*	2.55	-	-
	Indirect Interlocks	-	-	-	-	-	-	5.03	5.89
Positional Embeddedness	Degree Centrality	-	-	-	-	-	-	-4.06****	1.00
	Gini Coefficient	-	-	-	-	-	-	98.87**	43.60

Table 14: Panel data results for random-effects models of asymmetric rivalry (relative competitive activity). Data excludes Amazon.com. Variables that are not present in a particular model are indicated by a dash (-). Hypothesis numbers are listed after the model number in parenthesis, e.g. H1, H2, H3, or H3/H4.

Table 14: (cont'd)

	Value	Std. Err.	Value	Std. Err.	Value	Std. Err.	Value	Std. Err.
Constant	13.82	19.78	21.42	18.56	-39.06	36.06	-65.47*	36.41
Wald Test Chi-Square	0.87	-	5.83**	-	3.48	-	23.81****	-

a Model 4 combines Hypotheses 3 and 4. See Results section for additional information.
* $p < 0.10$
** $p < 0.05$
*** $p < 0.01$
**** $p < 0.001$

Appendix D: Results of Panel Data Random-Effects Analyses for Asymmetric Competitive Analysis

(No Amazon.com; N=400)

Category	Variables	Action Repertoire Simplicity				Market Share Erosion			
		Model 1 (H5)		Model 2 (H6)		Model 3 (H5)[c]		Model 4 (H6)	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Control Variables	Firm Size	-1.18E-6**	0.59E-6	-1.04E-6	0.83E-6	-6.45-7	4.29E-7	-1.22E-6****	0.35E-6
	Board Size	1.02E-2	0.85E-2	-	-	3.86E-3	8.88E-2	-	-
	Citizens United VS. FEC	-	-	-9.50E-3	19.2E-3	-	-	-0.13***	0.042
	Industry Concentration	-	-	-	-	1.23E-9	1.84E-9	1.14E-9	1.09E-9
	Industry Growth	-	-	-	-	6.96E-3**	3.46E-3	8.83E-3***	3.05E-3
Positional Embeddedness	Degree Centrality	-3.45E-3	2.28E-3	-	-	2.23E-3	2.36E-3	-	-
	Gini Coefficient	0.22**	0.12	-	-	0.11	0.11	-	-
Defensive Political Logics	Political Logics	-	-	-4.00E-3	0.011E-3	-	-	0.15**	0.077

Table 15: Panel data results for random-effects re ression of asymmetric analysis. Data excludes Amazon.com Inc. Variables that are not present in a particular model are indicated by a dash (-). Hypothesis numbers are listed after the model number in parentheses,e.g. H5 or H6.

Table 15: (cont'd)

	Value	Std. Err	Value	Std. Err	Value	Std. Err.	Value	Std. Err.
Constant	0.63****	0.11	0.78 ****	0.031	-2.58E-2	9.25E-2	5.37E-2 **	2.33E-2
Wald-Test Chi-Square	8.39**	-	0.20	-	1.27	-	3.97**	-

c Pooled panel model analysis
* $p < 0.10$
** $p < 0.05$
*** $p < 0.01$
**** $p < 0.001$

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