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The Impact of Growth, Governance, and Geography on Franchise Performance

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Abstract

Growing franchise systems are admired and rewarded favorably by press, seen as "growth engines" in investor stock portfolios, and attract significant interest from potential franchisees. Yet growth brings with it the specter of intra-brand competition, and its attendant ill effect of sharply reducing the motivation of franchisees – the very drivers of such growth. Facing competition from their very own, franchisees indulge in shirking, in turn eliciting franchisor terminations in ever greater numbers as they run afoul of the franchise agreement. These franchisor terminations, in turn, may subsequently affect the financial position of franchise systems in terms of sales and profitability. It is therefore worth investigating the relational and financial consequences of franchise system growth. Importantly, it is useful to uncover means of growing even while reducing the extent to which terminations might even be necessary.

Further, as a franchise system's growth in a particular market fosters geographic proximity or clustering of the same-brand outlets leading to intrabrand competition, it is useful to uncover the conditions under which this proximity is beneficial or harmful to the same-brand outlets' performance. Proximal same-brand outlets may share knowledge while competing with one another. The boundary conditions where one effect overcomes the other are worth exploring.

My dissertation comprises two essays assessing the performance implications of growth and geography in the context of franchising at two different levels of analysis – at the franchise system-, and at the individual outlet-level. My first essay traces the growth in the retail footprint – the number of outlets operating – of 75 franchise systems operating in 11 industries, observed over up to thirteen years. In contrast, essay 2 examines the implications of growth-induced proximity for each of the 988 individual outlets of a single franchise system from its inception in 1977 until 2012. Overall, my findings suggest that franchise system growth increases franchisor terminations of franchisees, but the likelihood of these terminations may be reduced if growth relies on ownership of franchisor outlets, higher royalty rate, or clustering of outlets. Furthermore, the impact of

clustering of outlets on their performance is contingent on outlets' experience and the governance context.

Keywords**:** Franchising, Growth, Governance, Geography, Performance.

Statement of Authorship

This is to certify that I am the principal author and have had a major role in the preparation and writing of the manuscript (per http://grad.uwo.ca/current_students/regulations/8.html).

Essay 1 (Franchise System Growth and Franchisors' Relationship Termination Behavior)

Data with respect to the 75 franchise systems and their outlet growth patterns across 50 US states were made available to me by my thesis supervisor Dr. Kersi D. Antia. To these, I added market-level descriptors (population, income, taxes, GDP, and area). Under the supervision of Dr. Antia, I took the lead on model specification, estimation, and interpretation of results obtained. Dr. Antia and I collaborated on the positioning of essay 1 in manuscript form, the identification of relevant theoretical lenses, the rationale underlying each hypothesis, and all corresponding tables and figures in support of the self-contained manuscript that we submitted for potential publication to the *Journal of Marketing Research*. The manuscript has been invited for resubmission by the journal and the order of authorship – Butt and Antia – accurately reflects our respective contributions.

Essay 2 (Clustering, Governance, and Individual Outlet Sales: A Multi-Year Analysis of an Evolving Franchise System)

Data on the single franchise system examined in this essay are provided by Drs. Kersi D. Antia, Vishal Kashyap, and Brian Murtha. With their collaboration and under the supervision of Dr. Antia, I am responsible for outlet geocoding (so as to pinpoint each of the 988 outlets comprising the franchise system in our sample), computation of additional geospatial variables, and match-merging of additional data for each of the 270 US counties where each of the outlets of the franchise system are located. As in essay 1, Dr. Antia supervised me closely with respect to the model specification approach, technical rigor, theoretical perspectives included, and hypotheses rationale development. Multiple early drafts of the resulting manuscript were vetted by Dr. Antia, and subsequently by Drs. Kashyap and Murtha. The resulting manuscript is under second round review at *Journal of Marketing* and its order of authorship – Butt, Antia, Murtha, and Kashyap – accurately reflects our respective contributions.

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Chapter 1

Introduction

1.1) Franchising: Definition and Importance to the Economy

Franchising is a commonly used form of business, especially in the retail and service sectors (Bradach and Eccles 1989; Combs and Ketchen 2003). Franchise businesses make a significant contribution to the economy. In the US, a new franchise business opens every eight minutes, and 900,000 franchise outlets in the US generate over two trillion dollars in economic output and about 50 per cent of retail sales (International Franchise Association 2016). After the US, Canada is home to the second largest franchise business market in the world, with over 78,000 franchise units. The Canadian franchise industry generates approximately $68 billion in revenue every year (Canadian Franchise Association 2016).

A franchise arrangement involves the owner of a product or service (the franchisor) selling the right to use its brand name, product specifications, and business model to another party (the franchisee) in a specific location and time period, typically in exchange for an upfront fee plus ongoing royalties as a percentage of sales (Combs, Michael, and Castrogiovanni 2004).

Two different types of franchising relationships exist – product distribution franchising and business format franchising (International Franchise Association 2016).

Product Distribution/Trademark Franchising. In a product distribution franchise relationship, also known as trademark or traditional franchising, the franchisor makes available a product to the franchisee (Alon 2001; Lafontaine 1992). Typically, the product is sold with a mark-up to the franchisee, who then goes on to sell it at a further

profit. Examples of product distribution franchising can be found in the beverage, retail, gasoline, and automotive sectors.

Business Format Franchising. In marked contrast to trademark franchising, in a business format franchise relationship, the franchisor provides to the franchisee not just its brand name, products, and services, but an entire system for operating the business. The franchisee generally receives support from the franchisor in the form of site selection and development, operating manuals, training, quality control, and a marketing strategy (Sen 1998; Sorenson and Sorenson 2001). In return, the franchisee agrees to comply with all the stipulated contractual obligations, and to pay the franchisor an initial one-time payment and an ongoing stream of royalties, typically expressed as a percentage of gross sales. Business format franchising is widespread and especially popular in industries like fast food and full-service restaurants, hotels, and personal and business services (Combs and Ketchen 2003; Srinivasan 2006).

A franchise agreement is a partnership between the two parties, whereby the franchisor's brand name and operational know-how are wedded to the franchisee's effort, compliance, and capital. As such, franchising is considered a very effective vehicle for growth. Yet growth, in turn, poses challenges for the franchisor and its franchisees alike. The franchisor is challenged to ensure that system uniformity is maintained (Bradach 1997). Franchisees are constantly exposed to the risk of competing "with their own" as new same-brand outlets open in their vicinity (Pancras, Sriram, and Kumar 2012). Together, these considerations underscore the importance not only of *growth*, but also of appropriate *mechanisms deployed* by the franchisor to ensure system uniformity (governance), and of the specific *location/proximity* of outlets (geography) − what I refer to as growth, governance, and geography.

My dissertation seeks to assess the performance implications of growth, governance, and geography in the context of business format franchising. My choice of the business format franchising context is guided by at least three considerations. First, relative to product distribution/trademark franchising, business format franchising demands more

coordination and communication between franchisor and franchisees. Second, and primarily because of the shared brand, the performance implications of not following guidelines spill over beyond the focal outlet to others sharing the same brand. Third, business format franchising is the more common and increasingly popular type of franchising (International Franchise Association 2016). The next section includes a discussion of each of the three aspects of growth, governance, and geography in the context of business format franchising.

1.2) Growth

A significant body of prior research has equated firm growth with success (Shane 1996; Slater 1980). Such growth, whether reflected in increased sales (Sorenson and Sorensen 2001), number of employees (Evans 1987), or number of outlets (Shane 1996; Shane, Shankar, and Aravindakshan 2006), is thought to confer economies of scale (Geroski 1995; Shane 1996), and increase the likelihood of firm survival (Shane 1996). Within the context of franchising, growth is primarily thought of with respect to market coverage – the number of outlets in total, whether franchisor- or franchisee-owned. Such growth has always attracted interest and adulation; consider, for example, the statement, “If you're one of those who likes things to move fast, who wants a new challenge all of the time, then maybe a fast-growing franchise is for you” (Entrepreneur 2017).

The imperative for growth is even more pronounced for franchise systems due to their incentive structure (Martin 1988). Franchisors’ dependence on gross revenue-based royalties and the need to attract strong franchisee partners create a compelling incentive to grow the franchise system by expanding the number of outlets (Kaufmann and Rangan 1990). Yet, it is also well known that franchise systems struggle to achieve a delicate balance when managing growth in their retail footprint. Too slow, and they risk stagnant sales and sub-optimal scale; too fast, and they face the devastating losses that accompany an unrestrained increase in footprint.

Franchise system growth poses communication and coordination challenges for franchisors and strains their financial and managerial resources (Eisenhardt 1988; Penrose 1959; Shane 1996). The more far-flung the outlets, the greater the cost of coordinating them, and the lesser the franchisor's ability to ensure compliance with established operating procedures (Brickley and Dark 1987). These growth-related communication and coordination difficulties as well as resource constraints make the monitoring difficult which, in turn, enhances the shirking propensity of franchisees[1]. Greater shirking leads to greater instances of non-compliance (Bergen, Dutta, and Walker 1992), which likely result in a greater need for franchisor terminations[2] to weed out non-performing franchisees and to keep the system efficient and profitable.

Prior literature has made significant contributions to understanding franchise system growth and its drivers. Work by Brickley and Dark 1987, Lafontaine 1992, Norton 1988, and Shane 1996 provides support for the role of franchising in mitigating the agency problems of adverse selection and moral hazard, in turn helping achieve faster growth. Jindal 2011 and Kaufman and Dant 1996 also examine how franchise systems might grow; their work emphasizes the role of multi-unit franchising – an arrangement under which franchisees are allowed to own and operate multiple units – in reducing the franchisor burden of communication and coordination with its individual franchisees. Norton 1988 suggests that physically dispersed outlets are best franchised rather than company-owned. Most recently, Shane, Shankar, and Arvindakshan 2006 find that fast growing franchise systems fuel their growth by offering lower royalty rates and initial franchise fees, relying on self-owned outlets less, and lowering the initial investment required of their franchisees via financing assistance. Kosova and Lafontaine 2010 uncover a "ceiling effect", as older and larger franchise systems tend to exhibit lower system growth.

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[1] I acknowledge that franchisors are also prone to shirking with respect to their obligations, resulting in a situation known as double moral hazard (Lafontaine 1992); Klein (1980) suggests that concern for their brand reputation serves as a bond against franchisor shirking.

[2] Hereinafter, my use of the term "franchisor terminations" refers to franchisors' termination of their franchisees.

Despite these important contributions, prior research falls short of providing a definitive answer regarding the consequences of growth. In particular, three shortcomings are worth noting. First, the overwhelming focus of extant research has been on identifying the *drivers* of outlet growth, emphasizing growth as an end in itself (Eisenhardt 1988; Kalnins 2004; Pancras, Sriram, and Kumar 2012; Penrose 1959). This focus on growth presumes growth to be a positive outcome. Several real-life business cases (e.g., Subway's rapid growth and its declining same-store sales in the US, Wall Street Journal, August 15, 2015) contradict this assumption and demonstrate that greater growth is not synonymous with higher performance.

A second major limitation of extant research on growth pertains to its emphasis on *year-over-year* (YOY) growth differentials. The benefit of such an approach is the relative ease with which growth (i.e., increases or decreases relative to the prior year) may be inferred. The prime disadvantage of such a static view, however, lies in its single point in time focus (Palmatier Houston, Dant, and Grewal 2013), resulting in "…an incomplete picture of the signaling phenomenon in the marketplace" (DeKinder and Kohli 2008, p.84). Potential franchisees are more interested in the value of the growth trend of a franchise system over an extended period of time. This growth trend or *flow signal* as DeKinder and Kohli 2008 refer to it discounts the fluctuations attendant to YOY growth considerations. The absence of such an analysis from the extant growth literature represents a significant obstacle to gaining a better understanding of growth-related performance effects.

A third gap in our understanding of growth-attributable performance outcomes lies in the inadequate attention paid to ***how*** such growth occurs. An increasing retail footprint results in a "spread" of the markets covered, and a corresponding increase in the costs of communicating with and coordinating far flung outlets (Brickley and Dark 1987). At least three mechanisms have been identified as potential solutions to this coordination problem: establishing franchisor-owned outlets (i.e., *ownership-based governance*) (Brickley and Dark 1987), increasing franchisor incentives to maintain quality (i.e., *royalty rate*) (Lal 1990), and *clustering* outlets (i.e., geographic proximity) (Lu and

Wedig 2013). Notwithstanding recent theoretical developments (Bell, Tracey, and Heide 2009; Tracey, Heide, and Bell 2014) that point to an intriguing interplay between the geographic proximity inherent to clustering of outlets and the governance thereof, an empirical assessment of the interplay of growth, governance, and geography as yet awaits.

1.3) Governance

Palay (1984), p.265 defines governance as "…the institutional framework in which contracts are initiated, negotiated, monitored, adapted, and terminated." Within the context of business format franchising, ownership of the outlet represents a significant governance mechanism (Srinivasan 2006). Two aspects of ownership, in particular, are worth noting, 1) ownership-based governance, and 2) shared ownership.

Ownership-based governance reflects the extent to which the franchisor owns and operates some outlets even while franchising others (Heide 2003; Srinivasan 2006). The presence of franchisor-owned outlets along with franchisee-owned outlets ensures greater control of franchisor over operations, products, and profits (Heide 1994). This vertical integration enhances the credibility of the franchisor's contract termination safeguard, curtails franchisees' opportunism, and reduces the franchisor's vulnerability (Dutta, Bergen, Heide, and John 1995). Over the last three decades, a significant body of work in economics, marketing, and management has identified the drivers (e.g., Dutta et al.1995; Heide 1994, 2003) of ownership-based governance and its consequences (e.g., Michael 2000; Srinivasan 2006) alike. One of the highly cited advantages of ownership-based governance is the synergy it brings (Lafontaine and Kaufmann 1994; Martin 1988). Franchisors gain and leverage their experience in their self-owned outlets, over which they have control. Subsequently, they model responses in franchisee-owned outlets, over which they have much less control.

Furthermore, Bradach (1997) finds evidence of a two-way, mutual-learning process between franchisor and franchisee-owned outlets, which he calls the "ratcheting process", whereby both sides influence each other, raising the level of uniformity and the performance of the franchise system as a whole (Srinivasan 2006).

At the individual outlet-level, it is also important to understand the impact of shared ownership of the focal and proximal outlets (e.g., multi-unit franchisees). Shared ownership positively affects the knowledge transfer process by enhancing the motivation of outlets to seek and share knowledge with one another (Argote and Darr 2000; Darr and Kurtzberg 2000). Relatedly, proximal outlets that share ownership are likely to transfer knowledge through *contact learning* via the transmission of routines through personal and formal relationships, rather than requiring the focal outlet to rely on *mimetic learning* via observation or vicarious learning of routines from its proximal outlets (Baum and Ingram 1998; Miner and Haunschild 1995). As well, and perhaps as important, shared ownership of the clustered outlets weakens the competition intensity between the focal and proximal outlets (Kalnins and Lafontaine 2004).

Governance has a very important role to play in franchising, but at least two limitations remain. First, prior research has mostly studied the ownership context at the system-level (e.g., across all 50 US states) (Heide 2003; Srinivasan 2006). A firm's relative reliance on franchisor-owned outlets over time may vary significantly across the different markets the firm competes in. This is evident in Figure 1, which displays the ownership-based governance strategy of KFC at the system-level (Panel A) as well as in each of two US states (regional markets; Panels B, C). The overwhelming focus of prior work on system-level ownership-based governance hides the individual market-level dynamics and their performance consequences.

Second, extant literature provides little insight as to how performance outcomes may vary by ownership form. For a variety of reasons, franchisees are likely to be more vulnerable to intrabrand competition relative to franchisor-owned outlets and to benefit less from the knowledge transfer opportunity. Franchisors receive royalties as

a percentage of franchisees' sales and not of their profits (Lafontaine 1992). They are therefore incentivized to open new franchisee-owned outlets in close proximity to existing outlets as long as the total sales revenue across the existing and newly established outlets increases (Kalnins 2004). Further, franchisee-owned outlets are likely to gain less from knowledge transfer from proximal same-brand outlets due to franchisors' reliance on iron-clad contractual agreements (Kashyap, Antia, and Frazier 2012) that reduce the leeway available to franchisees to make significant changes in response to the additional knowhow they are able to glean from their proximal same-brand outlets. Overall, performance of franchisee-owned and franchisor-owned outlets is likely to vary, and this variation may have a significant impact on the franchise system performance in the presence of clustering and growth. As yet, however, there has been no rigorous assessment of how individual outlet performance may vary by governance – ownership-based governance or shared ownership – in presence of growth and clustering.

1.4) Geography

Geographic proximity[3] – the physical nearness of outlets – has a strong connection with franchise system growth. The primary obstacle to firm growth is the inability of firms' systems and routines to keep up with the ever-increasing demands imposed by rapid growth (Jargon 2015; Penrose 1959). Franchisors pursuing a growth strategy must ensure that each of its franchisees follow operating procedures completely, so as to ensure uniformity of the product offering across all markets served (Bradach 1997). The more far-flung the outlets, the greater the cost of monitoring them (Brickley and Dark 1987), and the lesser the franchisors' ability to ensure compliance with established operating procedures. The proximity of same-brand outlets provides a monitoring efficiency to franchisors as well as provides an opportunity for knowledge transfer between outlets (Lu and Wedig 2013). The extent of the proximity of outlets therefore may have important performance implications for the

[3] In this research, I measure proximity in terms of distance. To account for regional variances, I include market-specific control variables, such as population, area, income in my empirical specification.

franchise system. However, prior research on the consequences of proximity has yielded conflicting results.

On the one hand, proximity is known to induce richer, more frequent interactions (Ganesan, Malter, and Rindfleisch 2005), thereby facilitating the learning and the transfer of relevant operating knowledge among same-brand outlets (Kalnins and Mayer 2004). Argote and Miron-Spektor (2011, p.1124) define organizational learning as "…a change in the organization's knowledge that occurs *as a function of experience*." Such knowledge includes but is not limited to technical skills, product- and service process-, and local market-specific knowledge (Ho and Ganesan 2013; Kalnins and Mayer 2004). Knowledge acquisition might occur directly via the firm's own operating experience (i.e., knowledge creation) and/or indirectly by knowledge transfer from other firms' experience, and is continuous. Whether newly established or mature, outlets of the franchise system gain from learning from each other about their operating environment, acquiring product- and process-related knowhow, and sharing relevant and useful operating procedures and practices (Bradach 1997; Shane 2005). Due to this greater interaction, learning, and knowledge transfer, deviations from standard operating procedure become known more easily and peer pressure serves to reduce its incidence (Lafontaine and Slade 2007).

On the other hand, the prospect of intrabrand competition due to proximity simultaneously poses a daunting and real threat (Kalnins 2004; Pancras, Sriram, and Kumar 2012). Specifically, proximally located same-brand outlets are competitors with similar traits and are greater threats to one other (Baum and Mezias 1992). Greater physical distance between same-brand outlets is therefore recommended to avoid sales cannibalization (Kalnins 2004; Pancras, Sriram and Kumar 2012). Extant literature on proximity-related consequences is thus divided, with some scholars focusing on the positive performance effects of proximity, and others warning of its ill effects.

Although useful to the aim of grounding the assessment in a relevant and rigorous theoretical context, the exclusive reliance on one or the other theoretical perspective does not allow for the possibility that ***both*** positive and negative effects might obtain. As well, prior research has focused for the most part on the physical proximity (i.e., the geographic distance to the nearest neighbor or to others within the cluster) of same-brand outlets. The emphasis on physical nearness assumes geographic distance to be the sole determinant of outlet performance and ignores important factors that may significantly temper this relationship at the individual outlet- and the system-level, in particular, knowledge transfer.

This dissertation comprises two essays. A brief overview of each essay and the research question it answers, follows.

1.5) Essay 1: Overview and Research Question

Franchising has always relied on a strident growth narrative, yet evidence regarding the consequences of franchise system growth remains elusive. Whereas high system growth is lauded and actively sought, unfettered expansion may severely strain franchisors' ability to maintain system standards and reduce franchisee motivation to remain in compliance with their contractual obligations, likely resulting in higher terminations by franchisors. The present study assesses the relational (*franchisor terminations*) and financial (*system sales and profits*) consequences of franchise system growth. Our analysis of nearly 25,000 observations on 75 franchise systems across all 50 US states over up to 12 years relates growth in terms of a smoothed (up to 5-year) moving average of change in the number of outlets to franchisors' terminations of their franchisees. We synthesize insights from agency theory with research on governance (ownership and royalty rate) and clustering-based perspectives to assess the moderating role played by ownership-based governance, royalty rate, and clustering in the growth-franchisor terminations relationship. The sales- and profitability-related financial consequences of terminations are also assessed. Overall, essay 1 seeks to address the following question:

Research Question 1: *How does franchise system growth impact franchisor terminations and consequently, its financial performance?*

1.6) Essay 2: Overview and Research Question

As franchise systems expand, the clustering and resulting proximity of same-brand outlets often become a contentious issue. The increased interactions among outlets may facilitate knowledge transfer, even while inducing intra-brand competition. Prior research has considered each possibility − knowledge transfer *or* intra-brand competition − in isolation, resulting in conflicting recommendations to the central question: *should multiple same-brand outlets be clustered with or distant from one another?* The present study takes the perspective of the focal outlet, and emphasizes that the *opportunity* to share knowledge afforded by clustering-based proximity may or may not be realized, depending on the *motivation* and *ability* of the clustered outlets to transfer and absorb knowledge, and on the governance context. Our analysis of more than 8,000 observations on the 988 outlets of a US-based automotive service franchise system from 1977 to 2012, and corresponding outlet-level sales information from 2004 to 2012 provides support for our conceptual framework. In sum, essay 2 addresses the following question:

Research Question 2: *How does a franchise system's evolving growth pattern (clustering) impact the individual outlets' performance?*

1.7) Insights and Anticipated Contributions

This research makes at least three contributions to what is known about franchise system growth, governance, and geography. First, I synthesize the well-established theoretical perspectives of agency theory, clustering theory, intrabrand competition, and governance to provide a better understanding of franchise system growth and its performance consequences. Instead of using the year-over-year perspective of growth, this research provides a holistic view of growth by adopting a growth trend perspective that provides a growth pattern over multiple years, which is less prone to fluctuations.

Second, I assess the likely moderating impact of governance on franchise system growth and geographic decisions. Franchisors may rely on their own outlets and franchise others in a certain proportion. With the passage of time, franchisors may decide to persist with this proportion or change it by relying on self- and franchisee-owned outlets in current and new geographic markets. Thus, governance form may have some important implications for franchise system performance. This study attempts to assess the moderating impact of governance form in this growth, geography, and performance relationship. Specifically, my research assesses the moderating effect of ownership-based governance at the individual market-level on franchise system growth-performance relationship (Essay 1). I hypothesize that a greater proportion of franchisor-owned outlets at the individual market-level decreases the likelihood of franchisor terminations of franchisees. As well, my research investigates the tempering effect of governance context on the clustering-performance relationship at the individual outlet-level (Essay 2). I expect that shared ownership of same-brand outlets (e.g., multi-unit franchisees) enhances the motivation of clustered outlets to transfer knowledge and dampens the intra-brand competitive effects. Further, I hypothesize that franchisee-owned outlets perform less well when clustered relative to franchisor-owned outlets as they likely face greater intra-brand competition and gain less from knowledge transfer.

Finally, this research investigates the performance implications of clustering at the individual outlet-level. I extend the notion of clustering past its exclusive focus on how geographically close the outlets within a cluster are to the *specific identities* of the focal outlet and those proximal to it, and demonstrate that the impact of clustering on performance is contingent on outlets' experience and the governance context.

In what follows, I present essay 1 (Franchise System Growth and Franchisors' Relationship Termination Behavior) and essay 2 (Clustering, Governance, and Individual Outlet Sales: A Multi-Year Analysis of an Evolving Franchise System) in the form of chapter 2 and chapter 3 respectively. In each essay, I first develop the theoretical underpinnings via a proposed conceptual framework, and then discuss the individual hypotheses linking explanatory variables of interest to performance outcomes. This is

followed by a description of the research method, results, and their implications. Chapter 4 concludes my dissertation with a discussion of the points of commonality and differentiation of my essays, the implications arising from both essays taken as a whole, the limitations of my endeavors, and possible future research directions.

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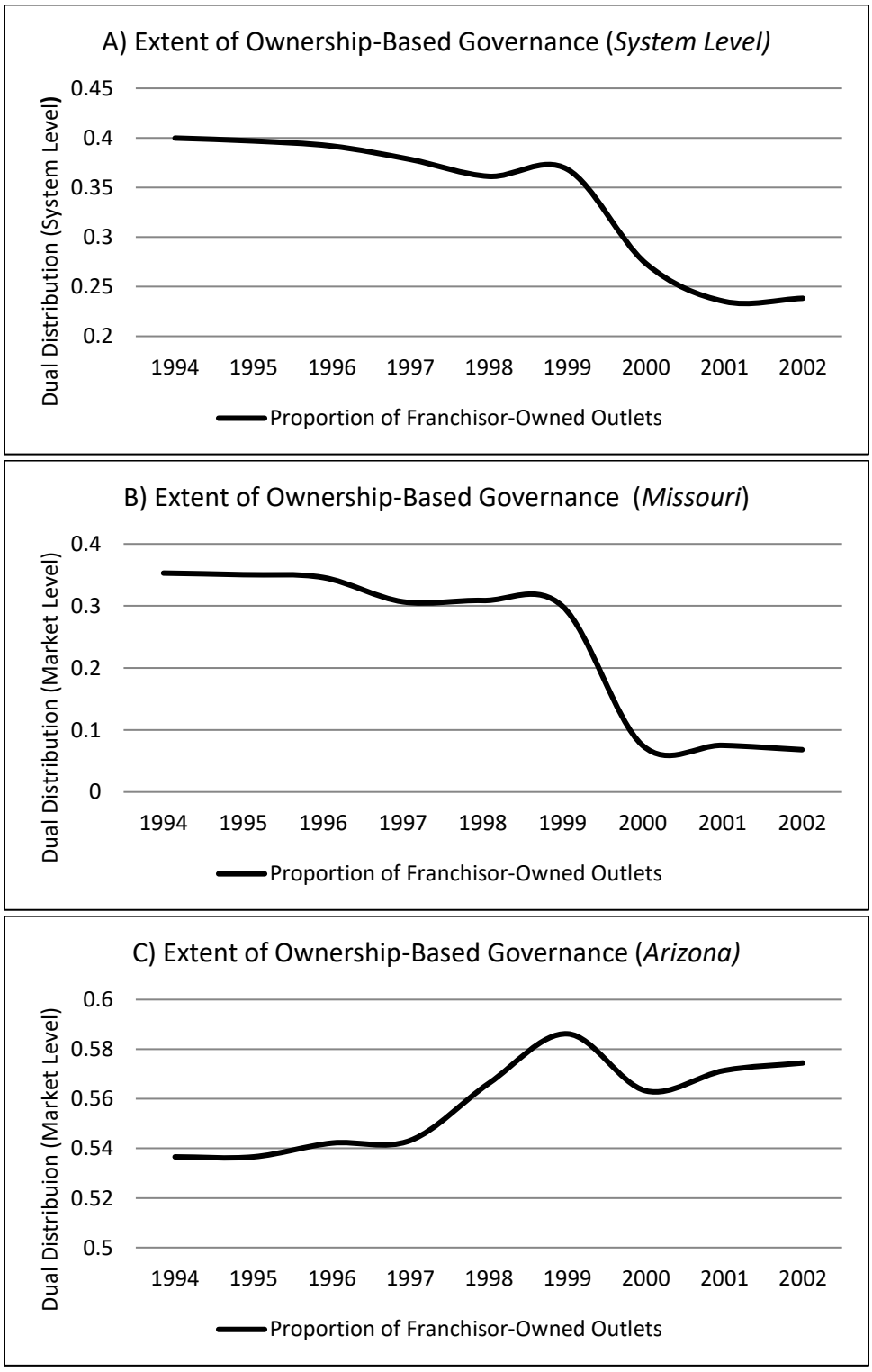
FIGURE 1
OWNERSHIP-BASED GOVERNANCE OF KFC



Chapter 2

Franchise System Growth and Franchisors' Relationship Termination Behavior

(Resubmitted to Journal of Marketing Research)

Over the last decade, the well-known quick service restaurant chain Subway has aggressively expanded its retail footprint – the total number of outlets operated – opening up to 1,200 outlets per year. This strident growth has not come without any problems, though. In August 2015, Subway experienced its first year of declining sales in over a decade. "Franchisees are frustrated…and perceptions of Subway's food quality…[are]…slipping" (Jargon 2015) as they shirk on their performance obligations in response to the perceived threat of intra-brand competition induced by the ramp-up in footprint. In a bid to maintain system standards, Subway has stepped up its terminations (Shane 1998) of non-compliant franchisees. Franchisors' dependence on gross revenue-based royalties and the need to attract strong franchisee partners create compelling incentives to grow the franchise system (Kaufmann and Rangan 1990); [4] their expansion efforts, however, are greeted with suspicion and frequently with outright hostility by their existing franchisees. The question that naturally arises is: *What are the relational and financial consequences of franchise system growth?*

Although efforts to better understand franchise system growth have been plentiful and long standing (Fan, Kühn, and Lafontaine 2013; Kaufman and Dant 1996; Norton 1988; Shane 1996; Shane, Shankar, and Arvindakshan 2006), our examination of prior research fails to provide a definitive answer on the issue of growth-attributable performance for at least three reasons. First, the overwhelming focus of extant research has been on identifying the *drivers* of outlet growth (see Kaufman and Rangan 1990 and Srinivasan, Sridhar, Narayanan, and Sihi 2013 for notable exceptions), emphasizing growth as an end

[4] We use the terms "franchise system" and "system" interchangeably to refer to the total number of outlets, whether franchisee- or franchisor-owned, across all markets (in the present context, US states) the franchise brand operates in.

in itself. Such a single-minded focus on growth for growth's sake ignores the deleterious effects of the intra-brand competition that might attend such growth (Pancras, Sriram, and Kumar 2012), and that firms may be hard-pressed to manage the increasing growth-attendant complexities (Penrose 1959). Subway's ongoing troubles with its franchisees represent but one recent example of growth-attributable pains.

A second limitation of extant research on growth pertains to its emphasis on year-over-year (YOY) growth differentials. The benefit of such an approach is the relative ease with which growth (i.e., increases or decreases relative to a base) may be inferred. Its prime disadvantage, however, lies in what DeKinder and Kohli (2008, p.84) refer to as the "…'point signal' – information about a firm at a single point in time…" and the resulting "…incomplete picture…" it provides (*ibid*.). Interested observers, whether they be potential or current franchisees or investors, are more apt to value the "flow signals" (*ibid.*) inherent in the long-term trend characterizing growth, and to discount the fluctuations attendant to YOY growth considerations. Yet, to the best of our knowledge, there has been no attempt made to rigorously discern the long term trends with respect to growth. The absence of such an effort represents a significant obstacle to gaining a more complete understanding of growth-related performance effects.

A third gap in our understanding of growth-attributable performance outcomes lies in the inadequate attention paid to ***how*** such growth occurs. By definition, an increasing retail footprint results in a "spread" of the markets covered, and a corresponding increase in the costs of communicating and coordinating far flung outlets (Brickley and Dark 1987). At least three mechanisms have been identified as potential solutions to this coordination problem: establishing franchisor-owned outlets (i.e., *ownership-based governance*) (Brickley and Dark 1987), increasing franchisor incentives to maintain quality (i.e., *royalty rate*) (Lal 1990), and *clustering* outlets (Lu and Wedig 2013). Notwithstanding recent theoretical developments (Bell, Tracey, and Heide 2009; Tracey, Heide, and Bell 2014) that point to an intriguing interplay between the geographic proximity inherent to clustering of outlets and the governance thereof, an empirical assessment of the interplay of growth, governance, and geography as yet awaits.

The present study, undertaken in the context of US business format franchising, represents an attempt to address each of the preceding limitations. Specifically, we posit the extent and nature of franchise systems' growth to cause variations in (a) franchisees' incentives to comply with performance obligations, and (b) franchisors' ability and motivation to take action against non-compliant franchisees (i.e., terminate agreements with existing franchisees) – what we refer to as *franchisor terminations*. We rely on a unique dataset of more than 25,000 observations on 75 franchise systems across 50 US states over up to 12 years, relating growth trends in terms of change in the number of outlets to observed franchisors' terminations of franchisees (i.e., *relational consequences*) and their sales and profitability-related implications (i.e., *financial consequences*).

In doing so, we make three key contributions to our understanding of franchise system growth and its consequences. First, we synthesize agency theory with research on governance (ownership and royalty rate) and clustering of outlets to provide a more complete understanding of the termination-related consequences of franchise system growth (Antia and Frazier 2001). To the best of our knowledge, ours is the first attempt to relate franchise system growth to variations in franchisors' terminations of franchisees and their corresponding system-wide financial consequences.

Second, we build upon and extend the year-over-year perspective adopted by prior growth-related inquiries to the ***growth trend*** displayed by each franchise system over a multi-year observation window. By describing franchise system growth in terms of a smoothed (up to 5-year) moving average of change in number of outlets, we accommodate a wide array of variations in franchise systems' developing retail footprints over time even while providing a holistic view of growth (see, for example, related work by DeKinder and Kohli 2008, and Palmatier, Houston, Dant, and Grewal 2013). We then investigate the impact of these growth trends on franchisor terminations.

Third, our theoretical framework and empirical analysis focus not only on *how much* but also *how* franchise systems grow, and their performance outcomes. We take as our starting point the classic growth-limiting problems of communication and coordination

challenges (Brickley and Dark 1987) and resource constraints (Penrose 1955; 1959), which likely enhance franchisees' propensity to shirk. Franchisor terminations are therefore likely to go up due to greater instances of non-compliance. We build on prior theoretical and empirical work emphasizing the role played by ownership-based governance, royalty rate, and clustering of outlets in affecting the growth-terminations relationship.

In the section that follows, we first develop the theoretical underpinnings of our integrative conceptual framework and elicit the individual hypotheses linking franchise system growth to franchisor terminations. This is followed by a description of the research method, results, and their implications. We conclude with the limitations of our study and possible future research directions.

Background

The success of the franchise business model rests on agents' (franchisees') compliance with the contractual terms offered by the principal (franchisor) (Antia and Frazier 2001), which is in turn dependent on the self-enforcing nature of these terms (Klein 1996; Lafontaine and Slade 2007; Telser 1960). Figure 1 represents our conceptual framework. Specifically, franchise agreements are said to be self-enforcing when franchisees are incentivized to comply with their performance obligations via a combination of a positive stream of rents accruing from their efforts (Bercovitz 2003) and the credible threat of being cut off from this stream of rents (i.e., terminated by the franchisor) if found to be shirking or otherwise non-compliant with the agreed to terms. Any franchisee-perceived reduction in the anticipated stream of rents and/or in the credible threat of franchisors' termination of errant franchisees is likely to elicit franchisee shirking, in turn eroding the self-enforcing nature of the franchise agreement (Klein 1995) and increasing franchisors' enforcement efforts (i.e., greater terminations).

We relate franchise system growth in each market – the increase in that market in the number of outlets operating under the franchised brand – to the system-wide (i.e., across markets) incidence of termination by franchisors of their franchisees. In the section that follows, we elicit the likely impact of franchise system growth on both the franchisees' anticipated stream of rents as well as their perceptions of the credible threat of franchisor termination. We first hypothesize the likely impact of the *extent* of growth in the number of outlets on the self-enforcing nature of the franchise agreement; this is followed by a discussion of how the *nature* of such growth – specifically, franchisors' reliance on ownership-based governance, royalty rate, and clustering – might "shift" (Shane 1996) franchisee perceptions of the anticipated stream of rents and/or the credible threat of franchisor termination, in turn varying the franchisee incentive to indulge in shirking and the observed franchisor terminations.

Two points are worth noting in our proposed framework. First, although the franchisor's termination of an individual franchisee and the consequent dissolution of the particular relationship is an off-equilibrium occurrence (i.e., the particular dyadic relationship has deviated from "steady state" conditions), the system-wide incidence of franchisors terminating franchisees is not at all atypical (Antia and Frazier 2001). A well-functioning franchise system requires the jettisoning of non-compliant franchisees (Brickley, Dark, and Weisbach 1991), making terminations a necessary and not uncommon franchisor practice. It is this system-wide extent of franchisor terminations upon which our interest focuses.

Second, and similar to the well-known notion of power being inferred from not needing to exercise it (Frazier and Summers 1984; Gaski 1984), self-enforcing agreements minimize the need for franchisor terminations as franchisees are incentivized by the stream of rents and the credible threat of their cessation to comply with their performance obligations (Antia and Frazier 2001; Klein 1995; Mathewson and Winter 1985). We rely on this well-theorized inverse association (Gaski 1984; Gaski and Nevin 1985) to attribute variations in observed system-wide franchisor

terminations to franchise system growth, and assess its implications for the extent to which the franchise agreement is self-enforcing.

Hypotheses

Extent of franchise system growth and terminations. We anticipate a direct positive association between growth in the number of outlets and franchisor terminations. We attribute this to the combination of a decrease in franchisees' anticipated stream of rents as well as in franchisors' monitoring and enforcement capabilities, each the attendant outcome of greater growth. As the number of outlets in a market increases, the prospect of intra-brand competition increases (Pancras, Sriram, and Kumar 2012). The addition of each new outlet increases the probability of a franchisee competing for sales with one or more same-branded outlets (Jargon 2015), and the resulting dilution of franchisees' stream of rents (Kalnins 2004).

As well, rapid growth in a market places undue stress on the franchisor's monitoring and enforcement capabilities (Shane 1996). In particular, the communication and coordination challenges for franchisors increase significantly in the wake of rapid growth and strains their financial and managerial resources (Eisenhardt 1988; Penrose 1959; Shane 1996). The result is a significant erosion of the franchisor's credible threat of termination, as the franchisor's ability to monitor its franchisees and respond to their shirking with appropriate corrective action is compromised.

Together, the decrease in anticipated rents and in the franchisor ability to monitor its fast growing number of franchisees pose a double jeopardy. Faced with the daunting prospect of intra-brand competition and a simultaneous reduced likelihood of franchisor monitoring, franchisees are likely to shirk on their quality inputs (Bergen, Dutta, and Walker 1992) and free ride (Rubin 1990). The egregious and more

frequent violations lead to a higher likely incidence of franchisor terminations (Antia and Frazier 2001).[5] We therefore expect that:

H_1: The greater the growth of the franchise system, the greater the number of franchisor terminations.

Shifting the Self-Enforcement Calculus

Thus far, our focus has been on the direct effect of the *extent* (i.e., the magnitude) of franchise system growth on franchisor terminations, *ceteris paribus*. We now shift our attention from *how much* to *how* such growth might occur. Specifically, we assess how each of three commonly deployed franchisor mechanisms – *ownership based governance, the royalty rate,* and *clustering* – might serve to "shift" franchisees' self-enforcement calculus.

Ownership-based governance. Ownership-based governance reflects the extent to which the franchisor owns and operates outlets in the franchise system. Over the last three decades, a significant body of work in economics, marketing, and management has identified the drivers (e.g., Dutta, Bergen, Heide, and John 1995; Heide 1994, 2003) of ownership-based governance and its consequences (e.g., Michael 2000; Srinivasan 2006) alike.

Ownership of outlets provides crucial local market information to franchisors and helps them set relevant performance benchmarks for franchisees (Bradach 1997; Dutta et al. 1995). No longer can franchisees lay the blame for inadequate performance on localized market inequities, as franchisor-owned outlets would be subject to the same factors. As a result, franchisors are better able to detect shirking and non-compliance of franchisees (Shane 1998). As well, self-owned outlets provide

[5] One might surmise that lower levels of monitoring and the resulting decrease in the likelihood of the franchisor detecting franchisee non-compliance should lead to a lower number of franchisor terminations (Antia et al. 2006). Franchisees emboldened to shirk by lower levels of franchisor monitoring, however, tend to shirk more (Bergen, Dutta, and Walker 1992), leading in turn to increased complaints by other franchisees and/or customers. The net result is an *increase* in the number of franchisor terminations as franchisors respond to these complaints.

a local market presence to the franchisor resulting in frequent face-to-face interactions and on-site visits to franchisees (Oxenfeldt and Kelly 1969; Srinivasan 2006), which enhances franchisors' ability to detect franchisees' shirking and non-compliance.

Furthermore, having self-owned outlets reduces franchisors' dependence on their franchisees. The franchisor may not be as bound by the constraints of maintaining relationships because it has less incentive to continue such relationships should franchisees shirk or fail to meet expectations (Lusch and Brown 1996). Moreover, the franchisor with relatively low dependence may not be as concerned about the consequences of retaliations to its actions (Kumar, Scheer, and Steenkamp 1995). This relative power advantage and lower dependence result in increased credibility of the franchisor's threat of terminating noncompliant franchisees (Heide 2003).

Interestingly, the establishment and operation of franchisor-owned outlets in the vicinity is not solely a threat. Rather, franchisor owned outlets play a significant role in demonstrating the efficacy of new operational procedures (Judd and Justis 2008), disseminating new knowhow (Argote 2011), and helping franchisees in these markets up their capabilities by "selling not telling" (Bradach 1997). The resulting increase in the franchisees' anticipated stream of rents is likely to persuade them to comply to a greater extent (Brickley and Dark 1987).

Together, the increase in the stream of rents and in the credible threat of termination thus likely strengthen the self-enforcing nature of the franchise agreement, rendering the need for franchisor terminations lower. The positive association between franchise system growth and franchisor terminations is likely weakened as franchisors rely more on ownership-based governance, as both the growth-attributed dilution of the stream of rents and of the credible threat of termination is countered. Accordingly,

H_2: The greater the extent of ownership-based governance, the weaker the positive association between franchise system growth and franchisor terminations of franchisees.

Royalty rate. The typical business format franchise relationship calls for the franchisee to make ongoing payments to the franchisor and to abide by the latter's operational stipulations. In return, the franchisor provides ongoing support to franchisees, and monitors and enforces quality standards across members of the franchise system on a continual basis (Lal 1990; Shane 2005). A rich body of prior work in economics (Gallini and Lutz 1992; Lafontaine 1992), management (Shane 1998; Shane and Foo 1999) and marketing (Agrawal and Lal 1995; Lal 1990) emphasizes the role of higher royalty rates in motivating franchisors to increase their monitoring and enforcement efforts.

To the extent that the franchisor receives ongoing royalties, she has an incentive not to default on her monitoring obligations (Lal 1990; Rubin 1978; Shane 1998). The royalty rate is directly related to the importance of brand-name investments (Lafontaine 1992; Lal 1990), and positively affects monitoring frequency (Agrawal and Lal 1995), in turn enhancing the franchisor's credible threat of terminating non-compliant franchisees (Lal 1990; Shane and Foo 1999). Franchisees in such well monitored systems are wary of running afoul of their compliance requirements (Kashyap, Antia, and Frazier 2012), and more prone to abide with these. In turn, the greater the compliance of franchisees, the lesser the need for franchisors to undertake corrective action, i.e., terminate noncompliant franchisees.

Although a higher royalty rate may decrease franchisee motivation to expend their best efforts on behalf of the brand (Antia, Mani, and Wathne 2017), the increased monitoring elicited by such high royalty rates is effective in maintaining and enhancing the value of the franchise brand (Lafontaine 1992; Lal 1990). The likely increase in franchisees' anticipated stream of rents is expected to evoke greater compliance, rendering franchisor terminations unnecessary.

Similar to the effect of ownership based governance, a higher royalty rate strengthens the self-enforcing nature of the franchise agreement by dissuading franchisees from

shirking (Rubin 1990). The higher royalty rate confers greater resources on the franchisors (Shane 1998), who are able to allocate these greater resources to meet the increased coordination and communication demands attendant to rapid franchise system growth. Accordingly,

H_3: The higher the royalty rate, the weaker the positive association between franchise system growth and franchisor terminations of franchisees.

Clustering. As franchise systems cluster their outlets, the total cost of monitoring is spread over a greater number of proximal outlets, thereby reducing the unit cost of monitoring each outlet and increasing the franchisor's monitoring ability (Lu and Wedig 2013). This increased monitoring ability makes it more likely for franchisors to detect violations and franchisee non-compliance (Brickley and Dark 1987), thereby increasing the credible threat of termination.

As well, clustering enables the efficient and effective sharing of operating knowhow among same-brand outlets (Argote and Darr 2000; Argote and Miron-Spektor 2011; Bradach 1997), thus boosting the anticipated stream of rents for franchisees. We suggest that greater clustering affords the focal outlet greater opportunities to seek and acquire knowledge from proximal same-brand outlets while allowing operators of closely located outlets to observe, meet, and share knowledge with one another with greater ease (Ganesan, Malter, and Rindfleisch 2005), thereby facilitating the transfer of relevant operating knowledge among outlets (Kalnins and Mayer 2004).

Together, the increase in the anticipated stream of rents and the credible threat of termination are likely to dominate the increased risk of intra-brand competition (Pancras, Sriram, and Kumar 2012) brought about by the clustering of same-brand outlets and the resulting propensity of franchisees to shirk. As in the case of ownership-based governance and a higher royalty rate, franchisors' reliance on clustering to grow their franchise systems expands the self-enforcing range of the franchise agreement (Klein 1996). We therefore expect this increased self-enforcing

range pursuant to clustering to weaken the positive effect of franchise system growth on terminations. Accordingly,

H_4: The greater the clustering of outlets, the weaker the positive association between franchise system growth and franchisor terminations of franchisees.

Method

Empirical Context and Data Collection Procedure

We assess growth-attributable performance in the context of US-based business format franchising. In the US, a new franchise business opens every eight minutes, and more than 900,000 franchise businesses generate over two trillion dollars in economic output (International Franchise Association 2015). The importance of this sector to the US economy is thus significant.

Our data collection approach requires following franchise systems' growth across the multiple US states they compete in, and assessing its impact on systemwide franchisor terminations of franchisees over an extended period of time. Our use of multiple sources of data enables us to collect rich archival information, and check the validity of each data source where overlapping. Relying on Bond's Franchise Guide, we sampled randomly from each of the 11 most popular franchised industries to select a sample of 75 US based franchise systems for the years 1993 to 2004 inclusive, and obtained information on their franchising history, royalty rate, and a host of other relevant system-specific information on an annual basis. For the same sample of 75 franchisors, we also obtained the franchise disclosure documents (FDD) filed with states' regulatory authorities for the years 1997, 2000, 2003, and 2004. Each FDD provides information on the current as well as the preceding two years of the franchisor's operations. Some FDDs also reported more than the prior two years of information, thus resulting in an unbalanced dataset of 75 franchise firms observed over 6 to 12 years from 1993 to 2004.

Perhaps most important, the FDD provides information on each franchise system's presence across each of the 50 US states. We manually transcribed the number of franchisor- and franchisee-owned outlets for each franchise system in each state and each year, and are thus able to obtain up to nearly 600 observations per franchise system (i.e., 50 states x 12 years). The variation in market coverage across the franchise systems resulted in 25,600 observations in our sample. Table 1 displays the variables used in this study and their data sources.

Unit of Analysis and Measures

Our unit of analysis is the individual franchise system *i* (*i* = 1,….,75) observed in US state *j* (*j* = 1,….,50) in year *t* (*t*= 1993,….., 2004). Our objective is to relate franchise system growth, ownership-based governance, royalty rate, and clustering to franchisors' terminations of franchisees. We measure franchisor terminations of franchisees as the sum of the number of franchisees terminated and not renewed by franchisor *i* at time *t* (FT_{it}).

For each franchise system *i,* we measure franchise system growth (GR_{ijt}) as a smoothed multi-year (up to 5-year) moving average of change in number of outlets in US state *j* in year *t.* This allows us to elicit a growth trend instead of a year-over-year (YOY) growth data point which provides information about a firm at a single point in time and is thus more prone to fluctuations (DeKinder and Kohli 2008). Consistent with prior research (Lafontaine and Shaw 2005; Srinivasan 2006), we measure ownership-based governance (OG_{ijt}) as the extent to which the franchise system relies on franchisor-owned and operated outlets, i.e., as the ratio of franchisor-owned outlets to the total number of outlets for franchise system *i* in US state *j* in year *t*. We measure the royalty rate (RR_{it}) as the ongoing payment as a percentage of sales that franchisees must pay the franchisor for their use of the trademark and other support (Agrawal and Lal 1995), and clustering (CL_{it}) as the concentration of outlets of franchise system *i* in year *t* across 50 US states using the Hirschman-Herfindahl Index (HHI). Prior research has extensively used the

HHI as a concentration metric (e.g., Feng, Morgan, and Rego 2015; Krasnikov, Mishra, and Orozco 2009).

Finally, we include several control variables expected to have an impact on franchisors' terminations of franchisees. We include franchise system age (FA_{it}) – the number of years elapsed since year of establishment of a franchise system, franchise system size (FS_{it}) – the number of franchised outlets operated, and initial franchise fee (IF_{it}) − the one-time fee paid by the franchisee. Further, we include market-specific control variables: market population (PP_{jt}), per capita income (INC_{jt}), total per capita taxes (TX_{jt}), market GDP (GDP_{jt}), and market area (AR_{j}). Acknowledging the likely variation in monitoring ability as a function of distance (Brickley and Dark 1987), we also include distance from headquarters (DH_{ij}), measured using ArcGIS 10.3 as the geodesic distance of the outlets of franchise system *i* in focal state *j* from the capital of the US state where franchise system *i* is headquartered. Additionally, we control for each of the 11 industries represented (IN_{k}) and each of the years (YR_{t}) included in our sample, using industry- and year-specific fixed effects. Table 2A presents the descriptive statistics and correlation matrix of our sample; Table 2B displays the same information for the untransformed raw data.

So as to check for the possibility of linear dependencies in the explanatory variables, we undertook a multicollinearity diagnostic test. The mean variance inflation factor (VIF) was 3.75. Including polynomials of ownership-based governance, royalty rate and clustering, the mean variance inflation factor (VIF) rose to 6.83, but remains below 10 (Hair et al. 1995), suggesting that multicollinearity is not a concern.

Model Estimation

To understand the impact of franchise system growth on the termination behavior of the franchisor, we have to account for multiple complexities. First, we have missing data with respect to franchisor terminations for some franchise systems and some years, and need to account for the possibility that these data may not be missing at random.

Second, our dependent variable (franchisor terminations (FT_{it}) is operationalized at the franchise system level (group or macro level) and is predicted by independent variables measured at the same systemwide level (royalty rate (RR_{it}) and clustering (CL_{it})) as well as those measured at the US state level (individual or micro level) (franchise system growth (GR_{ijt}) and ownership-based governance (OG_{ijt})). Snijders and Bosker (1999) call this a micro-macro multilevel situation. A seemingly possible way to obtain good estimates of the regression parameters in micro-macro situation would involve either disaggregating or aggregating the data. In the disaggregation approach, individuals receive scores on a group-level variable by assigning them their group score on that variable, i.e., all subjects in a particular group receive the same score on the corresponding individual-level variable, which reduces the variability in the data. In the aggregation approach, all variables are transformed into variables measured at the group level by assigning each group its average score on any individual-level variable, which similar to the disaggregation approach, also reduces the variability in the data yielding inappropriate estimates of the standard errors of the regression parameters. Therefore, regression analyses carried out in micro-macro situations most likely result in biased parameter estimates (Croon and Veldhoven 2007). Modeling the relationship between variables at different levels is therefore problematic (Croon and Veldhoven 2007). Without necessary level adjustments, the results may be generalized to an inappropriate level, because relationships among variables that hold at one level may not necessarily hold at another level (Snijders and Bosker 1999). It is therefore important to address this level adjustment bias.

Third, our variables of interest – franchise system growth (GR_{ijt}), ownership-based governance (OG_{ijt}), royalty rate (RR_{it}), and clustering (CL_{it}) – are typically strategic choices rather than random assignments, and hence are potentially endogenous. Our model specification approach must therefore account for the potential endogeneity of our regressors. We now describe each stage of our model specification approach in greater detail.

Stage 1: Correction for sample-induced endogeneity. So as to account for missing data with respect to our dependent variable, we specify a Heckman selection equation as follows:

$$
\begin{aligned}
(1) \qquad \text{INCLUDE}_{it} = {} & \gamma_0 + \gamma_1 \text{GR}_{ijt} + \gamma_2 \text{OG}_{ijt} + \gamma_3 (\text{OG}_{ijt})^2 + \gamma_4 \text{RR}_{it} + \gamma_5 (\text{RR}_{it})^2 \\
& + \gamma_6 \text{CL}_{it} + \gamma_7 (\text{CL}_{it})^2 + \gamma_8 \text{FA}_{it} + \gamma_9 \text{FS}_{it} + \gamma_{10} \text{IF}_{it} + \gamma_{11} \text{PP}_{jt} \\
& + \gamma_{12} \text{INC}_{jt} + \gamma_{13} \text{TX}_{jt} + \gamma_{14} \text{GDP}_{jt} + \gamma_{15} \text{AR}_{j} + \gamma_{16} \text{DH}_{ij} + \gamma_{17} \text{ME}_{it} \\
& + \sum_{r=18}^{r=28} \gamma_r \text{YR}_t + \sum_{p=29}^{p=38} \gamma_p \text{IN}_k + \varepsilon_{it}
\end{aligned}
$$

Where,

INCLUDE_{it} = Franchise system *i*'s availability of franchisor terminations information at time *t*,
GR_{ijt} = Franchise system growth,
OG_{ijt} = Ownership-based governance,
RR_{it} = Royalty rate (natural log-transformed),
CL_{it} = Clustering of outlets,
$(\text{OG}_{ijt})^2$, $(\text{RR}_{it})^2$, $(\text{CL}_{it})^2$ = Quadratic terms of ownership-based governance, royalty rate, and clustering, so as to discern potential ceiling effects,
FA_{it} = Franchise system age,
FS_{it} = Franchise system size (natural log-transformed),
IF_{it} = Initial franchise fee (natural log-transformed),
PP_{jt} = Market population (natural log-transformed),
INC_{jt} = Market income (natural log-transformed),
TX_{jt} = Market taxes (natural log-transformed),
GDP_{jt} = Market GDP (natural log-transformed),
AR_{j} = Market area (natural log-transformed),
DH_{ij} = Distance from headquarters (natural log-transformed),
ME_{it} = Market experience,
YR_t = Year-specific fixed effects,
IN_k = Industry-specific fixed effects, and
$\varepsilon_{it} \sim \text{N}(\mu, \sigma^2)$.

Following Certo, Busenbark, Woo, and Semadeni's (2016) guidelines, we include all our explanatory variables of interest – franchise system growth (GR_{ijt}), ownership-based governance (OG_{ijt}), royalty rate (RR_{it}), clustering (CL_{it}) and their polynomials – and control variables in the selection equation. The role of explanatory variables in the selection equation is important because the suitability of the Heckman selection model rests on the significance of both explanatory variables and lambda (Certo, Busenbark, Woo, and Semadeni 2016). The selection parameter created in this stage, the Inverse Mills Ratio (IMR_{it}), is then included in the substantive equation estimation.

Stage 2: Correction for micro-macro level. Our substantive equation estimation investigates the impact of franchise system growth, ownership-based governance, royalty rate, and clustering on franchisor terminations of franchisees. We specify our model as:

$$
\begin{aligned}
(2) \qquad FT_{it} = {} & \eta_0 + \eta_1 GR_{ij(t-1)} + \eta_2 OG_{ij(t-1)} + \eta_3 (OG_{ij(t-1)})^2 + \eta_4 RR_{i(t-1)} + \eta_5 (RR_{i(t-1)})^2 \\
& + \eta_6 CL_{i(t-1)} + \eta_7 (CL_{i(t-1)})^2 + \eta_8 GR_{ij(t-1)} * OG_{ij(t-1)} + \eta_9 GR_{ij(t-1)} * RR_{i(t-1)} \\
& + \eta_{10} GR_{ij(t-1)} * CL_{i(t-1)} + \eta_{11} FA_{i(t-1)} + \eta_{12} FS_{i(t-1)} + \eta_{13} IF_{i(t-1)} + \eta_{14} PP_{j(t-1)} \\
& + \eta_{15} INC_{j(t-1)} + \eta_{16} TX_{j(t-1)} + \eta_{17} AR_j + \eta_{18} GDP_{j(t-1)} + \eta_{19} DH_{ij} \\
& + \eta_{20} IMR_{i(t-1)} + \sum_{r=21}^{r=31} \eta_r YR_{t-1} + \sum_{p=32}^{p=41} \eta_p IN_k + u_{it}
\end{aligned}
$$

Where all terms are as described previously, and

FT_{it} = Count of franchisor terminations (natural log-transformed),
IMR_{it} = Inverse Mills Ratio from Heckman selection model, and
u_{it} = Random error

We use one-year lagged values of predictors to be more precise on the specific direction of causality and to reduce the possibility of endogeneity bias due to simultaneity (Sande and Ghosh 2014). It is clear from Equation 2 that our dependent variable, franchisor terminations (FT_{it}), is a franchise system level (group or macro level) variable. Two of our explanatory variables of interest, franchise system growth (GR_{ijt}) and ownership-based governance (OG_{ijt}) are the US state level (individual or micro level) variables. Other variables of interest: clustering (CL_{it}) and royalty rate (RR_{it}) are at the franchise system level (group or macro level).

Croon and Veldhoven (2007) propose a latent variable-based adjustment of predictors for analyzing micro-macro data. Their method uses the best linear unbiased predictors of the group means and yields unbiased estimates of the parameters. As our data also relates to micro-macro situation, we make level adjustment for our micro variables at the individual US state level and convert them to macro level at the franchise system level across 50 US states by using Croon and Veldhoven's (2007) suggested approach.

Per Equation 2, two micro level explanatory variables of interest need level adjustment – GR_{ijt} and OG_{ijt}. Although macro level variables do not require level adjustment, they are

used in the adjustment procedure for the micro level variables. The level adjustment procedure includes computing weight matrices W_1 and W_2, which require estimates of mean, variance and covariance matrices of micro and macro level variables respectively. Once computed, weight matrices W_1 and W_2 help estimate adjusted variables. Following this procedure, we compute and use adjusted variables $\widetilde{GR}_{it}$ (mean = .27, sd = 2.02) and $\widetilde{OG}_{it}$ (mean = .08, sd = .11) in our substantive equation estimation instead of unadjusted variables GR_{ijt} (mean = .29, sd = 4.20) and OG_{ijt} (mean = .07, sd = .21) respectively. Appendix 2A provides more information on Croon and Veldhoven's (2007) micro-macro level adjustment procedure. We re-specify our model in Equation 2 with adjusted variables as follows:

$$
\begin{aligned}
(3)\quad FT_{it} = {} & \beta_0 + \beta_1 \widetilde{GR}_{i(t-1)} + \beta_2 \widetilde{OG}_{i(t-1)} + \beta_3 (\widetilde{OG}_{i(t-1)})^2 + \beta_4 RR_{i(t-1)} + \beta_5 (RR_{i(t-1)})^2 \\
& + \beta_6 CL_{i(t-1)} + \beta_7 (CL_{i(t-1)})^2 + \beta_8 \widetilde{GR}_{i(t-1)} * \widetilde{OG}_{i(t-1)} + \beta_9 \widetilde{GR}_{i(t-1)} * RR_{i(t-1)} + \beta_{10} \widetilde{GR}_{i(t-1)} * CL_{i(t-1)} \\
& + \beta_{11} FA_{i(t-1)} + \beta_{12} FS_{i(t-1)} + \beta_{13} IF_{i(t-1)} + \beta_{14} PP_{j(t-1)} + \beta_{15} INC_{j(t-1)} + \beta_{16} TX_{j(t-1)} \\
& + \beta_{17} AR_j + \beta_{18} GDP_{j(t-1)} + \beta_{19} DH_{ij} + \beta_{20} IMR_{i(t-1)} + \sum_{r=21}^{r=31} \beta_r YR_{t-1} + \sum_{p=32}^{p=41} \beta_p IN_k + e_{it}
\end{aligned}
$$

Where all terms are as described previously, and adjusted variables are

$\widetilde{GR}_{it}$ = Franchise system growth (level adjusted), and
$\widetilde{OG}_{it}$ = Ownership-based governance (level adjusted)

After level correction, adjusted variables are now at the macro level in line with other macro level variables in our model. This adjustment eliminates the micro-macro level discrepancy as well as the potential bias created by it.

Stage 3: Correction for other sources of endogeneity. We account for the endogeneity of our regressors ($\widetilde{GR}_{it}$, $\widetilde{OG}_{it}$, RR_{it}, CL_{it}) by relying on the control function approach (Petrin and Train 2010). This approach uses exclusion restrictions to mitigate endogeneity concerns through a two-step procedure – an auxiliary estimation and then the substantive equation estimation – and has been used in several prior studies in marketing (Sridhar et al. 2016; Sridhar and Srinivasan 2012; Wang, Saboo, and Grewal 2015).

First, we perform an auxiliary estimation with the potential endogenous variable as the dependent variable and include our exgoneous variables as predictors. We include two

predictor variables as the exclusion restrictions that directly affect the endogenous regressor but do not affect our ultimate dependent variable. So as to meet the relevance requirements of a valid exclusion restriction, we rely on the insight that firms are prone to mimetic isomorphic pressures (DiMaggio and Powell 1983), such that their behavior is likely to be similar to and drawing from relevant other firms or peer group in their operating environment. As well, there is no reason to expect that these peers' past behavior will directly influence the outcome realized by the focal party. This approach to create excluded variables has been used in prior marketing studies (e.g., Kumar, Sunder, and Leone 2014; Sridhar, Germann, Kang, and Grewal 2016). Accordingly, we use one-year lagged average measures of franchise system growth, ownership-based governance, royalty rate, and clustering by franchise systems in the same two-digit NAICS code as the exclusion restrictions. Here, the underlying assumption is that these lagged industry average measures remain unaffected by firm-level idiosyncratic shocks and cannot correlate strongly with the residuals in Equation 3 (Lev and Sougiannis 1996). As per Germann, Ebbes, and Grewal (2015), we paid careful attention to the number of firms "forming a peer group" (page 9, footnote 9); accordingly, we excluded focal firm from the peer group and dropped peer groups with fewer than seven firms in our sample.

Additionally, we use firm-specific time-invariant predictor – franchised year fixed (*FYRi*) – as another exclusion restriction for each of our endogenous regressors. We measure franchised year fixed (*FYRi*) as the number of years elapsed since the year of establishment of a franchise system *i* until its first year of observation in our data set. The firm-specific time-invariant variable is most likely to be associated with our potential regressors, but is less likely to impact our dependent variable of interest (Antia, Mani, and Wathne 2017).

To assess the endogeneity of our regressors and the validity of exclusion restrictions, we conducted several tests. First, we tested whether our proposed endogenous regressors could be treated as exogenous. This endogeneity test used the difference of two Sargan-Hansen statistics (C statistic), where the test statistic is distributed as a chi-square with degrees of freedom equal to 1 for each of our endogenous regressors. The test rejects the

null hypothesis of exogeneity at $p < .01$ for each of our endogenous regressors. Second, our *F*-statistic of excluded instruments in the first stage was above the rule-of-thumb 10 (Staiger and Stock 1997). Third, we used Sargan-Hansen's J-statistic for the relevancy of exclusion restrictions. The Sargan-Hansen test is a test of overidentifying restrictions, where the joint null hypothesis is that the instruments are valid, i.e., uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation. The test fails to reject the null hypothesis. Overall, these tests provide evidence of the endogeneity of our regressors and the validity of our exclusion restrictions.

Using these exclusion restrictions, we obtain predicted residuals for our four potential endogenous regressors, which we include as covariates in our substantive equation. Our final model is:

$$
\begin{aligned}
(4)\quad FT_{it} = {} & \eta_0 + \eta_1 \widetilde{GR}_{i(t-1)} + \eta_2 \widetilde{OG}_{i(t-1)} + \eta_3 (\widetilde{OG}_{i(t-1)})^2 + \eta_4 RR_{i(t-1)} + \eta_5 (RR_{i(t-1)})^2 \\
& + \eta_6 CL_{i(t-1)} + \eta_7 (CL_{i(t-1)})^2 + \eta_8 \widetilde{GR}_{i(t-1)} * \widetilde{OG}_{i(t-1)} + \eta_9 \widetilde{GR}_{i(t-1)} * RR_{i(t-1)} \\
& + \eta_{10} \widetilde{GR}_{i(t-1)} * CL_{i(t-1)} + \eta_{11} FA_{i(t-1)} + \eta_{12} FS_{i(t-1)} + \eta_{13} IF_{i(t-1)} + \eta_{14} PP_{j(t-1)} \\
& + \eta_{15} INC_{j(t-1)} + \eta_{16} TX_{j(t-1)} + \eta_{17} AR_j + \eta_{18} GDP_{j(t-1)} + \eta_{19} DH_{ij} \\
& + \eta_{20} IMR_{i(t-1)} + \sum_{r=21}^{r=31} \eta_r YR_{t-1} + \sum_{p=32}^{P=41} \eta_p IN_k \\
& + \delta_1 res\_\widetilde{GR}_{it} + \delta_2 res\_\widetilde{OG}_{it} + \delta_3 res\_RR_{it} + \delta_4 res\_CL_{it} + e_{it}
\end{aligned}
$$

Where all terms in our final model are as described previously and δ_1-δ_4 capture the effect of the first stage prediction residuals on the dependent variable. We estimate Equation 4 above using a generalized least square (GLS) random-effects panel regression method.

Results

Heckman selection model. Table 3 displays the results of our first-stage Heckman selection model. The Inverse Mills Ratio is significant ($\lambda = -1.30$, $p < .01$) suggesting a selection bias, as we expected. The negative lambda coefficient implies that the unobservable variables in the selection model are negatively correlated with those in the final (substantive equation) model. We find that franchise systems with greater clustering are less likely to report franchisor terminations information, but at a diminishing rate ($\gamma_6 = -6.09$, $p < .01$; $\gamma_7 = 6.03$, $p < .01$). Further, franchise systems with a greater initial

franchise fee (γ_{10} = -.04, p < .01) and distance from headquarters (γ_{16} = -.02, p < .05) are less likely to provide terminations information. In contrast, older (γ_8 = .00, p < .01), larger (γ_9 = .06, p < .01), and more experienced (γ_{17} = .01, p < .01) franchise systems are more likely to provide franchisor terminations information. Royalty rate has an inverted U-shaped relationship (γ_4 = -.07, n.s.; γ_5 = -.08, p < .01) with the availability of terminations information. Other factors had no discernible impact on the termination information selection.

Substantive equation estimation. Table 4 displays the results of the generalized least square (GLS) random-effects panel regression estimates of three models. We include just our main variables of interest in Model 1. In Model 2, we also include the control variables. Model 3 is our full model including all variables of interest, covariates, interaction terms, and residuals from auxiliary estimation. As is clear from Table 4, these additions produce significant improvement in model fit ($\chi^2_{\text{Model 1}}$ = 657.11, p < .01; $\chi^2_{\text{Model 2}}$ = 3462.49, p < .01; $\chi^2_{\text{Model 3}}$ = 3832.75, p < .01). Our discussion will focus on Model 3, i.e., the full model.

The first result to note is that greater franchise system growth significantly increases franchisor terminations of franchisees (η_1 = .31, p < .01). This finding supports hypothesis H_1 which stated that higher growth is likely to be associated with more terminations.

Although not hypothesized, several interesting results related to the main effects of ownership-based governance, royalty rate, and clustering are worth noting. An examination of their estimated coefficients suggests that ownership-based governance is associated with increasing terminations (η_2 = 1.47, p < .01), but subject to a diminishing rate (η_3 = -2.92, p < .05). Royalty rate decreases terminations (η_4 = -2.75, p < .01) at a diminishing rate (η_5 = .24, p < .01). An increase in clustering is also associated with a decrease in number of terminations (η_6 = -9.06, p < .01).

We now turn our attention to the estimates pertaining to *how* this growth is achieved. Our second hypothesis H_2 predicted a negative effect of the ownership-based governance on franchise system growth and terminations relationship. This hypothesis would find support if we were to find a negative association between franchise systems' reliance on their own outlets for growth and the number of franchisor terminations. We find significant support for hypothesis H_2. Relying on their own outlets when growing, franchise systems decrease the incidence of franchisor terminations ($\eta_8 = -.83$, $p < .01$).

Hypothesis H_3 predicted a negative association between the franchise system growth reliant on high royalty rate and franchisor terminations of franchisees. This hypothesis would find support if we were to find a negative association between franchise systems' reliance on high royalty rate for growth and the number of franchisor terminations. We find strong support of hypothesis H_3. Franchise systems are less likely to terminate franchisees when they rely on higher royalty rate while they grow ($\eta_9 = -.40$, $p < .01$).

Finally, our hypothesis H_4 anticipated a decrease in franchisor terminations pursuant to clustering-reliant system growth. The pairwise interaction involving franchise system growth and clustering is found significant and negative ($\eta_{10} = -2.58$, $p < .01$), which shows that clustering-reliant growth decreases franchisor terminations. We therefore find support for H_4.

With respect to control variables, we find that franchise system age ($\eta_{11} = .01$, $p < .01$), franchise system size ($\eta_{12} = .25$, $p < .01$), and initial franchise fee ($\eta_{13} = .15$, $p < .01$) significantly and positively impact the termination incidence. We also find that the inverse mills ratio ($\eta_{20} = .79$, $p < .01$) significantly and positively affects terminations, which suggests that if the selection bias were unaccounted for, the estimated franchisor terminations would be overstated. Other covariates do not have a discernable impact on franchisor terminations.

Post hoc Analyses of Significant Interactions

So as to gain a better understanding of how ownership-based governance, royalty rate, and clustering temper the relationship between franchise system growth and franchisor terminations, we conducted a floodlight analysis using the Johnson-Neyman (JN) procedure (Spiller et al. 2013). Table 7 displays the results corresponding to the significant two-way interactions and Figure 2 graphs the simple slopes.

For ownership-based governance (*OG*), the JN lower bound occurs at .12 suggesting the simple slope of franchise system growth (*GR*) on terminations (*FT*) is significant below this point. The results show that at low levels of ownership-based governance, franchise systems pursuing growth significantly increase terminations (simple slope of *GR* under Low *OG* = .32, $p < .01$), and at high levels of ownership-based governance, franchise systems pursuing growth partially decrease terminations (simple slope of *GR* under High *OG* = -.21, $p < .10$).

The range of royalty rate (*RR*) is from 0 to 3.04. The JN lower and upper bounds occur at .26 and 1.27 respectively, suggesting the simple slope of franchise system growth on terminations is significant between 0 and .26, and between 1.27 and 3.04. The moderating effect of royalty rate on franchise system growth and terminations is found significant and positive at low levels (simple slope of *GR* under Low *RR* = .31, $p < .01$), and significant and negative at high levels (simple slope of *GR* under High *RR* = -.90, $p < .01$).

The moderating effect of clustering (*CL*) on franchise system growth (*GR*) and terminations (*FT*) fares similar to royalty rate. The range of clustering (*CL*) is from .03 to 1. The JN upper bound of .21 lies within this continuum, suggesting the simple slope of franchise system growth (*GR*) on terminations (*FT*) is significant between the interval .21 to 1. At low levels of clustering, franchise systems pursuing growth significantly increase the number of franchisor terminations (simple slope of *GR* under Low *CL* = .23, $p < .05$), and at high levels of clustering, they significantly decrease the number of franchisor

terminations (simple slope of *GR* under High CL = -2.27, $p < .01$). The moderating effect of clustering on franchise system growth and terminations is therefore significant at both low and high levels.

Overall, we obtain clear evidence that *franchise systems' reliance on ownership-based governance, royalty rate, or clustering to fuel their growth significantly and negatively affects their tendency to terminate franchisees.*

Alternate Specifications

We assessed the stability of our findings to alternate estimation approaches, alternate measures of growth, alternate time-related specifications, and alternative levels of analysis.

Alternate estimator. In order to test the robustness of our results, we used the random-effects negative binomial model (RENB). RENB regression fits a random-effects over-dispersion model for a count dependent variable. The mean of our raw count dependent variable (without natural log-transformation) is almost half that of its variance, which makes the RENB estimation suitable to our purpose. All our results with respect to the hypothesized effects remain robust to this alternate estimator.

Alternate measures of growth. Instead of a smoothed (up to 5-year) moving average of growth, we reduced one year and relied on a 4-year smoothed moving average of growth as an alternate measure. Our random effects panel regression results remain robust to this alternate measure of growth as well. Further, we assessed the impact of year-over-year (YOY) franchise system growth on the franchisor terminations. Our results indicate that YOY growth that relies on ownership-based governance or royalty rate decreases terminations, but relying on clustering increases terminations. Results from this model specification therefore exhibit discrepancies with respect to our smoothed 5-year or 4-year growth trend models, which bring to light the importance of using a growth trend instead of YOY growth that is more prone to fluctuations.

Alternate temporal separation. Our conceptualization and subsequent model specification approach have proceeded on the assumption of one-year lagged values of explanatory variables. We also assessed contemporaneous (immediate, within the same year) effects of predictors on the number of franchisor terminations. All our findings with respect to tempering effects of ownership-based governance, royalty rate, and clustering on franchise system growth-terminations relationship remain robust to this alternate temporal separation.

Alternate level of analysis. We also specified an alternate model by using unadjusted growth and ownership-based governance variables, i.e., without using Croon and Veldhoven's (2007) suggested adjustment approach. The results show that clustering and royalty rate only partially impact franchise system growth and terminations relationship. Our decision to adjust micro-level variables as per Croon and Veldhoven's approach therefore appears warranted.

The Financial Consequences of Franchisor Terminations

We also assessed the impact of franchisor terminations on two highly relevant financial outcomes for the franchise system – sales and profitability. Information on overall franchise system sales revenue (SR_{it}) is obtained on an annual basis from the FDD; we used the annual financial statements to compute system-wide net profit ratio (PR_{it}) as the ratio of franchisors' after tax profit to their net sales.

Both metrics are of immense relevance to franchisors and their key stakeholders alike (Burkitt 2015; Jargon 2015) as well as to scholars of growth (DeKinder and Kohli 2008; Palmatier et al. 2013). With greater number of franchisor terminations brought about by greater detection of violations and enforcement, franchisees' self-motivation to perform increases (Klein 1980; 1995), in turn leading to lesser shirking, higher compliance, and quality provision (Bercovitz 2003; Rubin 1990). End-customer satisfaction with the product offering correspondingly increases (Rust and Oliver

1994) as does repeat purchase (Taylor and Baker 1994), resulting in higher sales achieved by the franchise system. The costs associated with the franchisor policing of franchisee compliance with the agreement are also reduced (Kashyap, Antia, and Frazier 2012), thereby increasing the profit associated with the achieved sales. Franchise system sales also matter for franchisors due to their reliance on royalty payments which are calculated as a percentage of franchisees' sales, whereas profitability is important to franchisors to spur further growth and attract new franchisees.

After accounting for control variables listed in Table 1 and using contemporaneous, one-year lagged, and two-year lagged models, we find that franchise system sales suffer immediately as franchisor terminations increase (Coeff. = -.16, $p < .01$), but they significantly recover later ($Coeff._{\text{one-year lag}} = .21$; $Coeff._{\text{two-year lag}} = .13$, $p < .01$). Contrary to sales, we find that profitability improves in the immediate aftermath of terminations (Coeff. = .97, $p < .01$), and this improvement persists in later years ($Coeff._{\text{one-year lag}} = .79$, $p < .01$; $Coeff._{\text{two-year lag}} = 5.78$, $p < .05$). These results suggest that pruning of bad franchisees harms franchise system sales in the short run, but profitability improves as stronger, more compliant, and better performing franchisees remain in the system.

Discussion

The present study assesses an issue of fundamental importance to firms: How does franchise system growth impact franchisor terminations, and subsequently, system sales and profits? Within the context of franchising, characterized as it is by partners' mutual reliance on each other, growth-related consequences take on even more importance. Potential franchisees are advised to "…make sure the franchise has the long-term viability associated with vibrant growth, but also that it's not growing too fast to manage the issues associated with this growth" (Elgin 2005). To the best of our knowledge, however, guidance as to the growth rate appropriate to both the preceding imperatives is as yet forthcoming. Our analysis of 75 franchise systems observed over up to 12 years as

they increase their retail footprint across all 50 US states provides just such guidance. We hypothesize and find evidence of the interplay of growth, governance (ownership and royalty rate), and geography (clustering) significantly shifting the impact of growth on firms' financial outcomes via the inducement of franchisee compliance, i.e., the strength of the self-enforcement mechanism. Our synthesis of three well-established theoretical perspectives – agency theory, governance, and clustering – extends our understanding of growth beyond its current emphasis on *how much* to *how* such growth might occur.

Likely because "hard" information on actual behaviors and financial outcomes is so difficult to collect for non-publicly held firms, prior research has tended to focus on franchisee compliance and perceptions, either self-reported (Kashyap, Antia, and Frazier 2012) or as reported by the franchisor (Antia and Frazier 2001). Relying on regulation-required disclosure documents, the present research establishes a clear linkage between actual franchisor terminations and franchise system sales and profits. Our work provides much needed evidence of franchisor behavior-attributable performance outcomes.

We find that, by itself, growth in the number of outlets in each market the system operates in is associated with a significant increase in the number of franchisor terminations system-wide. This positive association, however, is not necessarily a bad outcome. Consistent with anecdotal (yet hitherto untested) claims that franchisor terminations help weed out "the bad eggs" (i.e., noncompliant franchisees), we do find that in the aftermath of such terminations (i.e., up to the two-year duration we tested for), terminations result in increased system-wide sales and profits. We attribute these positive effects of termination to the system-wide signal of franchisor commitment to system integrity they represent (Antia and Frazier 2001), and their corresponding franchisee effort-eliciting impact (Agrawal and Lal 1995). The contemporaneous yet short-lived negative effect of franchisor terminations on sales is a small price to pay for longer-term system integrity, particularly keeping in mind the immediate and positive gain in system-wide profits.

Findings from our study suggest that in addition to the extent of growth, *how* such growth occurs is of critical importance. We find evidence that franchisors' reliance on ownership-based governance, higher royalty rates, and clustering of its outlets each aid in strengthening the self-enforcement mechanism. This is manifest in a weakening of the positive association between system-wide growth and franchisor terminations. Each of the preceding three mechanisms serves the purpose of increasing the franchisees' anticipated stream of rents and/or the credible threat of their termination by the franchisor, thereby increasing the self-enforcing range of the franchise agreement. Just as power resides in a reduced necessity for its exercise (Frazier 1983), so do the self-enforcing terms result in lower observed terminations system-wide.

Ownership-based governance and the simultaneous reliance on own and partner inputs that it implies enjoy a time-honored status as an effective governance mechanism (Dutta et al. 1995; Heide 2003; Monteverde and Teece 1982). Our work builds on this foundation, and finds that franchisors' reliance on this mechanism when growing its retail footprint increases the strength of the self-enforcement mechanism; the number of franchisor terminations falls, consistent with the notion that ownership-based governance reduces the information asymmetry between the franchisor and its franchisees, and serves as a credible threat (Heide 2003).

Our findings with respect to the effect of a higher royalty rate under conditions of high growth are also worth discussing. Consistent with prior research (Lafontaine l992; Lal 1990), we do find evidence consistent with the notion that the royalty rate motivates franchisors' monitoring and system integrity-maintaining efforts, thereby increasing the credible threat of termination and correspondingly increasing the self-enforcing range of the franchise agreement. The result is a significant weakening of the positive growth-termination association. As well, albeit not hypothesized by us, the higher the royalty rate, the lower the observed franchisor terminations; beyond a point, however, raising the royalty rate further is counter-productive, as evidenced by the uptick in franchisor terminations (i.e., the quadratic term is positive and significant). Together, these findings

underscore the careful balance franchisors must strike when determining the appropriate royalty rate their franchisees must pay them.

The assessment of clustering effects that we offer confirms empirically the insights offered by the nascent literature in marketing on the impact of geography (Bell, Tracey, and Heide 2009; Mittal, Kamakura, and Govind 2004; Tracey, Heide, and Bell 2014). The clustering of outlets is found to significantly strengthen the self-enforcement mechanism when growing the retail footprint. Further probing of the simple slopes of growth on franchisor terminations helps better understand its effect on the growth-terminations association. As can be seen Figure 2 (third panel), growth in the number of outlets, when accompanied by a clustering-induced "critical mass" of outlets, is associated with a strengthened self-enforcement mechanism; in marked contrast, growth that relies on a lower level of clustering does not have any impact on the strength of self-enforcement mechanism. It thus appears that the combination of high growth and clustering increases the self-enforcing range of the franchise agreement, and reduces the necessity for franchisor terminations.

Limitations and Future Research Directions

As with any research, the present study is subject to some limitations. First, our reliance on longitudinal archival data, while affording rich insights into actual rather than reported behavior, cannot speak to the motivations underlying such behavior. All we can state is that the observed behavior patterns are not inconsistent with our hypothesized effects. Future work that synthesizes insights from archival and survey-collected micro-data, although difficult to conduct, would be very welcome. Second, the present study relates market- and system-level hypothesized predictors to the strength of the self-enforcement mechanism and subsequent financial outcomes at the system level. An assessment of market-level intermediate (e.g., terminations at market level) or final-stage outcomes would be a promising avenue for future research. Third, the data at hand precludes the ability to identify the specific location (street address and zip code) of individual outlets, whether franchisor- or franchisee-owned and operated. Such information, if available,

would provide rich insights on proximity-induced intra- and inter-brand competitive effects.

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TABLE 1
VARIABLES AND DATA SOURCES

Construct	Measure	Notation	Data Source
Franchisor Terminations	The count of franchisor terminations of franchisees for franchise system *i* in year *t*	FT_{it}	Franchise Disclosure Documents
Franchise System Growth	A smoothed multi-year moving average (up to 5-year) of change in number of outlets	GR_{ijt}	Bond's Franchise Guide (Computed from annual number of outlets in each US state)
Ownership-Based Governance	Ratio of franchisor-owned outlets to the total number of outlets for franchise system *i* in US state *j* in year *t*	OG_{ijt}	Bond's Franchise Guide
Royalty Rate	The ongoing payment as a percentage of sales in of franchise system *i* in year *t*	RR_{it}	Bond's Franchise Guide
Clustering	Concentration of outlets of franchise system *i* in year *t* as measured by the Hirschman-Herfindahl Index (HHI)	CL_{it}	Bond's Franchise Guide (Computed from annual number of outlets in each US state)
Control Variables			
Franchise System Age	Number of years elapsed since year of establishment of franchise system *i* in year *t*	FA_{it}	Bond's Franchise Guide
Franchise System Size	Number of franchised outlets operated by franchise system *i* in year *t*	FS_{it}	Bond's Franchise Guide
Initial Franchise Fee	The one-time fee paid by new franchisees in year *t*	IF_{it}	Bond's Franchise Guide
Market Population (millions)	Population of state *j* in year *t*	PP_{jt}	US Census Bureau
Income (millions)	Income per capita in state *j* in year *t*	INC_{jt}	Bureau of Economic Analysis
Market Taxes	Total state per capita taxes paid in state *j* in year *t*	TX_{jt}	Bureau of Economic Analysis
Market GDP (millions)	GDP of state *j* in year *t*	GDP_{jt}	Bureau of Economic Analysis
Market Area (square miles)	Area of state *j*	AR_{j}	US Census Bureau
Distance from Headquarters (miles)	The geodesic distance of the outlets of franchise system *i* in state *j* from the capital of the US state where firm *i* is headquartered	DH_{ij}	Computed variable using ArcGIS
Market Experience	Count of US states in which franchise system *i* is present in year *t*	ME_{it}	Bond's Franchise Guide

TABLE 2A
DESCRIPTIVE STATISTICS AND CORRELATION MATRIX

			1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
1	[a]Franchisor Terminations	FT_{it}	-													
2	Franchise System Growth	GR_{ijt}	-0.02	-												
3	Ownership-Based Governance	OG_{ijt}	-0.06	-0.01	-											
4	[a]Royalty Rate	RR_{it}	-0.05	0.00	-0.03	-										
5	Clustering	CL_{it}	-0.10	-0.03	-0.10	-0.05	-									
6	Franchise System Age	FA_{it}	0.22	0.03	0.08	-0.02	-0.17	-								
7	[a]Franchise System Size	FS_{it}	0.39	0.10	-0.03	0.17	-0.57	0.33	-							
8	[a]Initial Franchise Fee	IF_{it}	-0.21	-0.01	0.07	0.15	0.01	-0.01	-0.08	-						
9	[a]Market Population	PP_{jt}	0.00	0.04	0.12	0.00	0.00	0.00	0.01	0.00	-					
10	[a]Income (per capita)	INC_{jt}	0.02	0.02	0.03	0.03	-0.03	0.04	0.06	0.02	0.26	-				
11	[a]Market Taxes	TX_{jt}	0.01	0.01	0.06	0.01	-0.01	0.02	0.03	0.01	0.37	0.75	-			
12	[a]Market GDP	GDP_{jt}	0.01	0.05	0.13	0.01	-0.01	0.02	0.02	0.01	0.95	0.41	0.47	-		
13	[a]Market Area	AR_{j}	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.18	-0.26	-0.47	0.13	-	
14	[a]Distance from Headquarters	DH_{ij}	0.01	-0.03	-0.11	0.01	0.00	-0.01	0.02	0.01	-0.17	0.03	-0.02	-0.16	0.02	-
	Mean		1.75	0.29	0.07	1.73	0.16	25.49	5.00	9.68	15.03	10.53	8.16	11.60	10.75	7.10
	SD		1.38	4.20	0.21	0.53	0.19	12.98	1.78	1.80	1.05	0.16	0.23	1.06	1.10	1.24

n_1= 25,600
Correlations exceeding |.01| are significant at $p < .05$, two-tailed
a: Natural log-transformed

TABLE 2B
DESCRIPTIVE STATISTICS AND CORRELATION MATRIX (RAW VALUES)

			1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
1	Franchisor Terminations	FT_{it}	1.00													
2	Franchise System Growth	GR_{ijt}	0.00	1.00												
3	Ownership-Based Governance	OG_{ijt}	-0.08	-0.01	1.00											
4	Royalty Rate	RR_{it}	0.27	0.00	-0.07	1.00										
5	Clustering	CL_{it}	-0.05	-0.03	-0.10	-0.09	1.00									
6	Franchise System Age	FA_{it}	0.13	0.03	0.08	0.05	-0.17	1.00								
7	Franchise System Size	FS_{it}	0.36	0.14	0.03	0.28	-0.27	0.38	1.00							
8	Initial Franchise Fee	IF_{it}	-0.15	-0.04	0.12	-0.08	0.07	-0.09	-0.14	1.00						
9	Market Population	PP_{jt}	0.00	0.05	0.09	0.00	0.00	0.00	0.00	0.00	1.00					
10	Income (per capita)	INC_{jt}	0.03	0.02	0.03	0.03	-0.03	0.04	0.02	0.02	0.27	1.00				
11	Market Taxes	TX_{jt}	0.01	0.01	0.05	0.01	-0.01	0.02	0.01	0.01	0.31	0.80	1.00			
12	Market GDP	GDP_{jt}	0.01	0.05	0.08	0.01	-0.01	0.01	0.01	0.01	0.98	0.36	0.39	1.00		
13	Market Area	AR_{j}	0.00	0.01	-0.03	0.00	0.00	0.00	0.00	0.00	0.10	-0.02	-0.36	0.09	1.00	
14	Distance from Headquarters	DH_{ij}	0.02	-0.01	-0.07	0.06	-0.01	-0.02	0.04	0.03	-0.06	0.13	0.04	-0.04	0.22	1.00
	Mean		14.54	0.29	0.07	5.33	0.16	25.49	501.6	24620	5.55[b]	37892	3603	0.19[b]	75902	1733
	SD		27.66	4.20	0.21	2.88	0.19	12.98	901.4	12732	6.07[b]	6330	880	0.23[b]	96099	1242

n_1= 25,600
Correlations exceeding |.01| are significant at $p < .05$, two-tailed
b: Millions

TABLE 3
HECKMAN SELECTION MODEL ESTIMATES

[b]*Include*		Notation	Coefficient	Standard Error	z value
Intercept	γ_0		1.05	.99	1.07
Franchise System Growth	γ_1	GR_{ijt}	.00	.00	.89
Ownership-Based Governance	γ_2	OG_{ijt}	-.37	.21	-1.78
	γ_3	$(OG_{ijt})^2$	.38	.23	1.60
[a]Royalty Rate	γ_4	RR_{it}	-.07	.07	-1.00
	γ_5	$(RR_{it})^2$	-.08**	.03	-3.14
Clustering	γ_6	CL_{it}	-6.09**	.30	-20.29
	γ_7	$(CL_{it})^2$	6.03**	.31	19.45
Franchise System Age	γ_8	FA_{it}	.00**	.00	4.44
[a]Franchise System Size	γ_9	FS_{it}	.06**	.01	4.69
[a]Initial Franchise Fee	γ_{10}	IF_{it}	-.04**	.00	-5.54
[a]Market Population	γ_{11}	PP_{jt}	-.00	.04	-.00
[a]Income (per capita)	γ_{12}	INC_{jt}	.02	.11	.17
[a]Market Taxes	γ_{13}	TX_{jt}	-.00	.09	.05
[a]Market GDP	γ_{14}	GDP_{jt}	-.00	.04	-.07
[a]Market Area	γ_{15}	AR_j	.00	.01	.25
[a]Distance from Headquarters	γ_{16}	DH_{ij}	-.02*	.01	-2.38
Market Experience	γ_{17}	ME_{it}	.01**	.00	3.17
Year Fixed Effects	$\gamma_{18\text{-}28}$	YR_t	Yes		
Industry Fixed Effects	$\gamma_{29\text{-}38}$	IN_k	Yes		
Inverse Mills Ratio					
Lambda	Λ		-1.30**	.18	-7.11

Number of Observations = n_1 = 19,950, Wald χ^2 = 5892.59 ($p < .01$)
a: Natural log-transformed
b: Franchise system *i*'s availability of franchisor terminations information at time *t*
*$p < .05$, **$p < .01$, two-tailed

TABLE 4
GENERALIZED LEAST SQUARE (GLS) RANDOM-EFFECTS PANEL REGRESSION ESTIMATES

			Model 1 Main Effects Only		Model 2 With Control Variables		Model 3 Full Model	
[a]***Franchisor Terminations*** **(FT_{it})**		**Notation**	**Coefficient**	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**
Intercept	η_0		3.14**	.09	-.38	1.28	3.75**	1.27
Franchise System Growth	η_1	$\widetilde{GR}_{i(t-1)}$	.02**	.01	-.03**	.01	.31**	.11
Ownership-Based Governance	η_2	$\widetilde{OG}_{i(t-1)}$	.76*	.36	1.15**	.38	1.47**	.43
	η_3	$(\widetilde{OG}_{i(t-1)})^2$	-6.06**	.98	-2.93**	1.04	-2.92*	1.15
[a]Royalty Rate	η_4	$RR_{i(t-1)}$	-1.50**	.10	-1.90**	.10	-2.75**	.19
	η_5	$(RR_{i(t-1)})^2$	.51**	.03	.52**	.03	.24**	.04
Clustering	η_6	$CL_{i(t-1)}$	-3.81**	.30	-6.58**	.63	-9.06**	1.61
	η_7	$(CL_{i(t-1)})^2$	2.94**	.32	6.92**	.62	1.09	.75
Franchise System Growth * Ownership-Based Governance	η_8	$\widetilde{GR}_{i(t-1)} * \widetilde{OG}_{i(t-1)}$					-.83**	.08
Franchise System Growth * Royalty Rate	η_9	$\widetilde{GR}_{i(t-1)} * RR_{i(t-1)}$					-.40**	.03
Franchise System Growth * Clustering	η_{10}	$\widetilde{GR}_{i(t-1)} * CL_{i(t-1)}$					-2.58**	.32
Franchise System Age	η_{11}	$FA_{i(t-1)}$			.00	.00	.01**	.00
[a]Franchise System Size	η_{12}	$FS_{i(t-1)}$			.51**	.02	.25**	.08
[a]Initial Franchise Fee	η_{13}	$IF_{i(t-1)}$			.02	.01	.15**	.02
[a]Market Population	η_{14}	$PP_{j(t-1)}$			.00	.03	.00	.03
[a]Income (per capita)	η_{15}	$INC_{j(t-1)}$			.03	.16	.00	.14
[a]Market Taxes	η_{16}	$TX_{j(t-1)}$			.01	.12	.01	.12
[a]Market GDP	η_{17}	$GDP_{j(t-1)}$			-.01	.03	-.01	.03
[a]Market Area	η_{18}	AR_j			.00	.02	.00	.02
[a]Distance from Headquarters	η_{19}	DH_{ij}			-.03*	.01	-.02	.01
Inverse Mills Ratio	η_{20}	$IMR_{i(t-1)}$			2.17**	.18	.79**	.21
Year Fixed Effects	η_{21-31}	YR_{t-1}	No		Yes		Yes	
Industry Fixed Effects	η_{32-41}	IN_k	No		Yes		Yes	
Franchise System Growth Residuals	δ_1	$AI\_\widetilde{GR}_{i(t-1)}$					.70**	.10
Ownership-Based Governance Residuals	δ_2	$AI\_\widetilde{OG}_{i(t-1)}$					-1.24**	.36
Royalty Rate Residuals	δ_3	$AI\_RR_{i(t-1)}$					1.54**	.18
Clustering Residuals	δ_4	$AI\_CL_{i(t-1)}$					8.05**	1.35
			Wald $\chi2$ = 657.11**		Wald $\chi2$ = 3462.49**		Wald $\chi2$ = 3832.75**	

Number of Observations = n_2 = 9,517; a: Natural log-transformed; *p < .05, **p < .01, two-tailed

TABLE 5
SIMPLE SLOPES ANALYSIS OF SIGNIFICANT INTERACTIONS

	Estimated Impact on Franchisor Terminations (Simple Slope)	**t-Value**
Impact of GR on FT at various levels of OG		
OG (Low)	.32**	2.87
OG (High)	-.21+	-1.78
Impact of GR on FT at various levels of RR		
RR (Low)	.31**	2.83
RR (High)	-.90**	-8.61
Impact of GR on FT at various levels of CL		
CL (Low)	.23*	2.11
CL (High)	-2.27**	-7.32

FT: Franchisor Terminations, GR: Franchise System Growth,
OG: Ownership-Based Governance, RR: Royalty Rate, CL: Clustering

$^{+}p < .10$, $*p < .05$, $**p < .01$, two-tailed

FIGURE 1
CONCEPTUAL FRAMEWORK

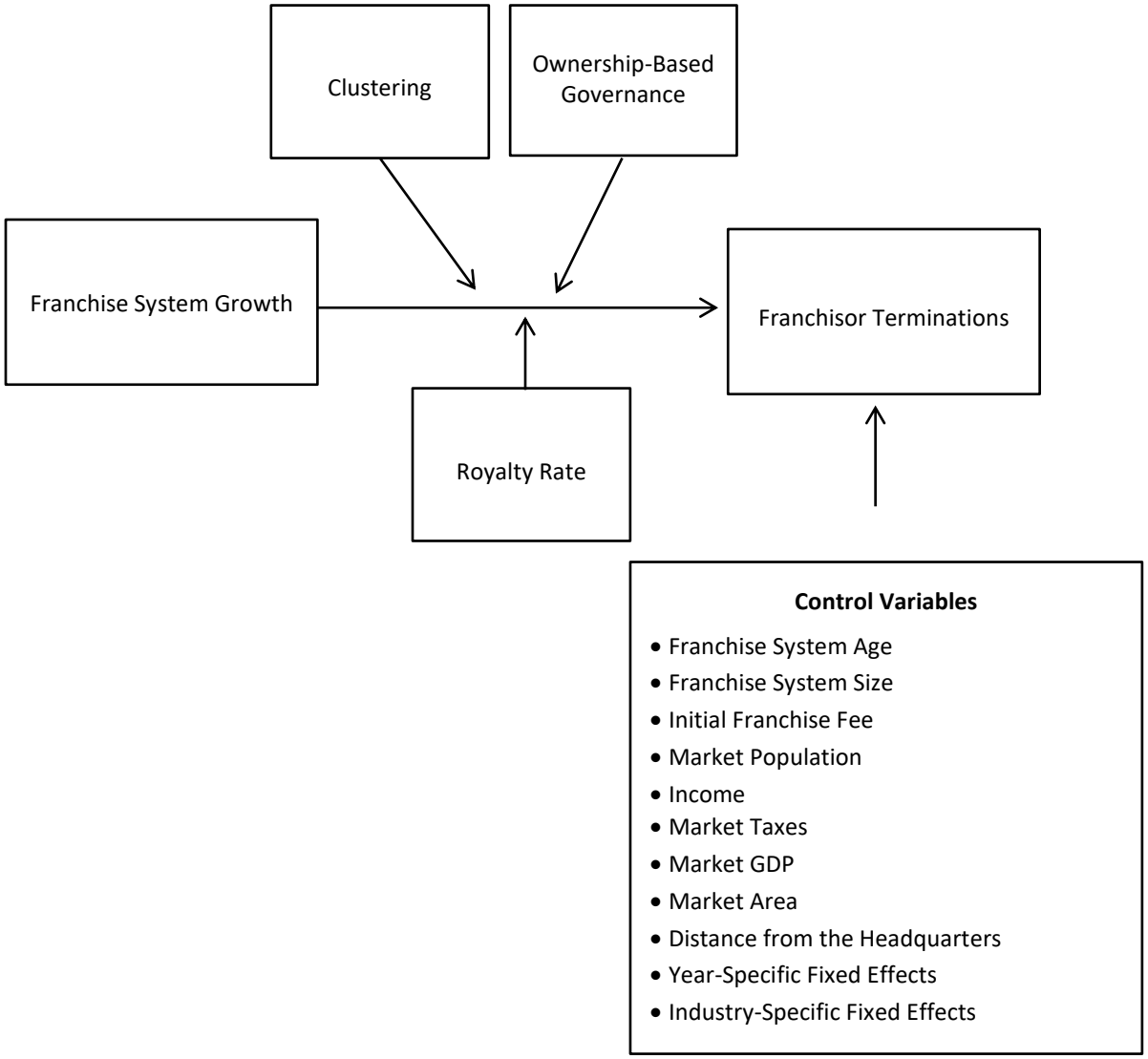
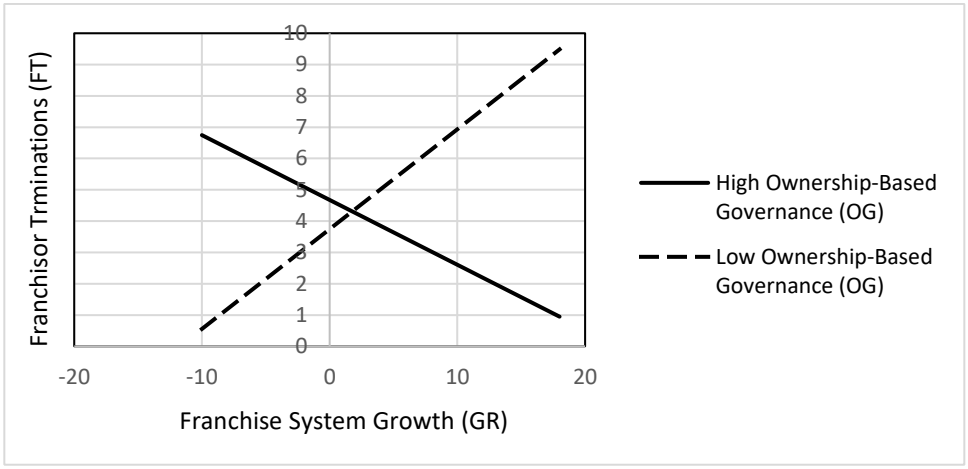
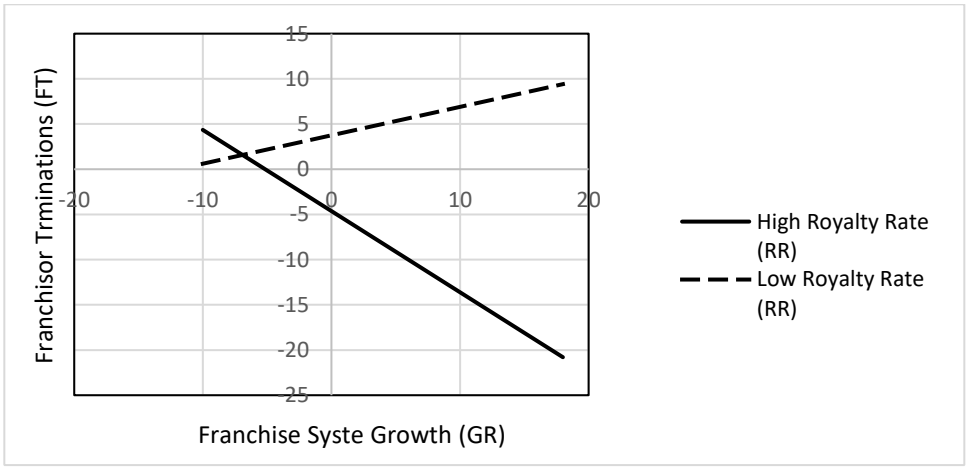
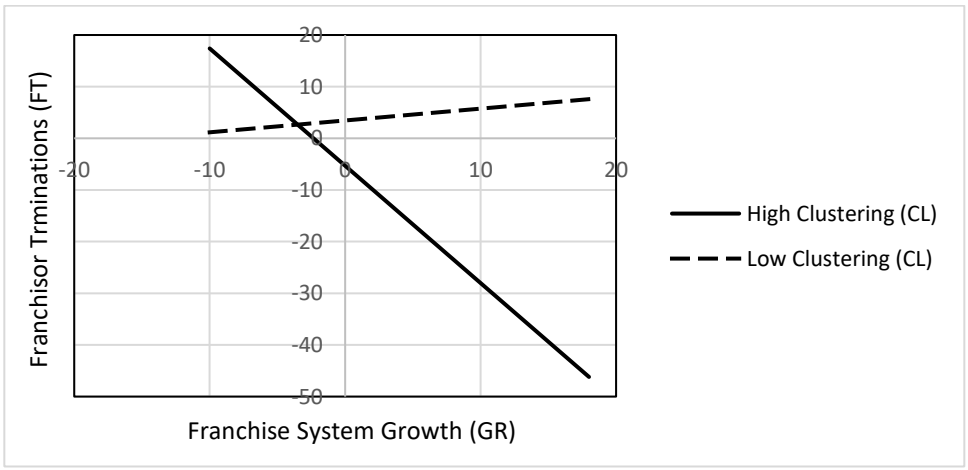


FIGURE 2
SIMPLE SLOPES ANALYSIS







APPENDIX 2A
THE MICRO-MACRO LEVEL ADJUSTMENT PROCEDURE

Croon and Veldhoven (2007) propose a latent variable-based adjustment of predictors for analyzing micro-macro data, which yields unbiased estimates of the parameters. Their approach, calls for the adjustment of the micro-level variables by computing weight matrices W_1 and W_2, which require estimates of the mean, variance and covariance matrices of micro and macro level variables. W_1 and W_2 are p x p and p x q matrices respectively, where p = number of micro-level variables and q = number of macro-level variables in the model. W_2 will be zero in the absence of macro-level predictor variable in the model. Once computed, weight matrices W_1 and W_2 help estimate adjusted variables.

Assuming a micro-macro level relationship that involves a macro-level dependent variable – terminations across all markets (Y), and a micro-level independent variable at the individual market-level (X_j) (where j denotes the specific market) and a macro-level independent variable across all markets (Z).

1) $$Y = X_j + Z + e$$

Where, e = Random error

A seemingly appropriate way to obtain good estimates of the regression parameters in Equation 1 would consist of aggregating the micro-level scores (X_j) to the macro-level by determining the group mean ($\bar{X}$) and then regressing Y on both $\bar{X}$ and Z. However, this aggregated regression analysis will yield unbiased estimates of the regression parameters only if there is no within-group variability, which is an unrealistic scenario.

The relationship between the micro-level variable and the macro-level (latent) variable score is given by

2) $$X_j = \bar{X} + v_j$$

Where,

$\overline{X}$ = The latent macro-level variable, predicted by the mean variable score of X_j,
v_j = Random error

Per Croon and Veldhoven's (2007) suggested approach, this mean of the micro-level predictor ($\bar{X}$) will be adjusted to the macro-level ($\tilde{X}$). To obtain unbiased estimates of the regression parameters, we regress Y on $\tilde{X}$ (instead of $\bar{X}$) and Z, i.e.,

3) $$Y = \tilde{X} + Z + u$$

Where,

$\widetilde{X}$ = The adjusted variable,
u = Random error

The Level-Adjustment Procedure

Croon and Veldhoven (2007) have proposed a three-step procedure to obtain unbiased parameter estimates in micro-macro level situations.

a) The first step involves the estimation of weight matrices, W_1 and W_2. The computation of weight matrices requires the estimates of the mean, variance and covariance matrices of micro and macro level variables via standard ANOVA techniques, as follows:

4) $$W_1 = (S_{\bar{X}\bar{X}} + S_{vv}/n_j - S_{\bar{X}Z}(S_{\bar{X}\bar{X}})^{-1}S_{Z\bar{X}})^{-1} (S_{\bar{X}\bar{X}} - S_{\bar{X}Z}(S_{\bar{X}\bar{X}})^{-1}S_{Z\bar{X}})$$

5) $$W_2 = (S_{ZZ})^{-1} S_{Z\bar{X}} (I_{pxp} - W_1)$$

Where,

S denotes a covariance matrix,
n_j = Number of observations at the micro-level,
I = Identity matrix

b) In the second step, the adjusted predictor is estimated as

6) $$\tilde{X} = (\bar{X})' (I_{pxp} - W_1) + (\bar{X})' W_1 + (Z - \bar{Z})' W_2$$

c) Finally, a regression analysis of Y on $\tilde{X}$ and Z is carried out as per Equation 3. The resulting estimates are unbiased (see Croon and Veldhoven (2007, page 52), for simulation-based evidence).

Chapter 3

Clustering, Governance, and Individual Outlet Sales: A Multi-Year Analysis of an Evolving Franchise System

(Resubmitted to Journal of Marketing on January 6th, 2017)

"Any time you open more and more units, there's always some impact…People are still making some money – it's just not what they used to make." – Hardy Grewal, Subway's largest U.S. development agent.

"Subways aren't cannibalizing each other…restaurants in the most Subway-dense markets actually have higher average sales." – Don Fertman, Subway's chief development officer.

- *The Wall Street Journal*, August 15, 2015.

The preceding quotes exemplify the starkly divergent views regarding clustering − the geographic concentration of interconnected institutions (Porter 1998). On the one hand, clustering is known to elicit richer, more frequent interactions (Ganesan, Malter, and Rindfleisch 2005), thereby facilitating the transfer of relevant operating knowledge among outlets (Kalnins and Mayer 2004). On the other hand, the prospect of proximity-induced intra-brand competition poses a daunting and real threat (Kalnins 2004; Pancras, Sriram, and Kumar 2012). In light of this, *should the multiple same-brand outlets of a franchise system be clustered with or be distant from one another?* For interested scholars and practitioners alike, the preceding question has profound implications yet remains largely unanswered.

Table 1 summarizes extant empirical research on the performance-related consequences of the proximity of same-brand outlets. Scholars working within a sociological tradition of clustering theory (Ganesan, Malter, and Rindfleisch 2005; Ingram and Baum 1997) emphasize almost exclusively the proximity-induced opportunities for greater learning, interaction, and knowledge-sharing among closely located outlets, and the consequent performance gains for the focal entity participating in such a cluster (Lu and Wedig 2013). The primarily economics-informed perspective on proximity (Kalnins 2004; Pancras, Sriram, and Kumar 2012), however, emphasizes the costs imposed by the

resulting intra-brand competition. As evident from Table 1, prior studies have adopted a knowledge transfer or intra-brand competition-informed viewpoint. As a result, the intriguing possibility that both perspectives might be valid remains unexplored.

The present study represents the first effort, to the best of our knowledge, to acknowledge and reconcile these seemingly conflicting effects of proximity. Within the context of a growing US-based franchise system, we take the perspective of the focal outlet seeking to leverage knowledge transferred from the proximal same-brand outlets it is clustered with, even while avoiding the sales cannibalization brought about by intra-brand competition. Our conceptual framework, grounded in the literature on organizational learning (e.g., Argote 2011; Darr and Kurtzberg 2000), integrates the Motivation-Opportunity-Ability (MOA) perspective (Argote, McEvily, and Reagans 2003; MacInnis, Moorman, and Jaworski 1991) with work on proximity-governance linkages (Bradach 1997; Brickley and Dark 1987; Tracey, Heide, and Bell 2014) to hypothesize the conditions under which each viewpoint – knowledge transfer or intra-brand competition – might prevail, as reflected in the focal outlet's sales performance.

Specifically, we posit that the *opportunity* to share knowledge afforded by clustering-based proximity may or may not be realized, depending on (a) the *motivation* of the focal outlet to seek knowledge from its proximal outlets, and of the latter to transfer their knowledge to the focal outlet, (b) the *ability* of the proximal outlets to transfer relevant knowledge and the focal outlet to absorb such knowledge, and (c) the governance[6] context (i.e., shared ownership and whether franchisor- or franchisee-owned).

The motivation of focal and proximal outlets to seek and transfer knowledge is hypothesized to vary as a function of shared ownership – i.e., the focal outlet is likely more motivated to seek knowledge from its proximal outlets, who in turn are likely more motivated to transfer knowledge to the focal outlet if they are owned by the same multi-

[6] We use the term "governance" to reflect the control- and coordination-related benefits conferred by organizational hierarchy (Williamson 1985, 1996). Henceforth, our use of the term governance refers to the ownership of the focal outlet.

unit franchisee. We also consider the ability inherent in the age-related experience of the outlets (reflected in the number of years elapsed since opening) – i.e., the proximal outlets' availability of knowledge gained through years of experience, and the focal outlet's ability to value, assimilate, and apply this knowledge – i.e., its *absorptive capacity* (Cohen and Levinthal 1990). Furthermore, the extent to which the focal outlet might experience variation in the likelihood of intra-brand competition and have the latitude to act on the knowledge thus transferred and absorbed is expected to vary as a function of its governance − whether it is franchisor- or franchisee-owned.

We rely on a unique multi-sourced dataset comprising more than 8,000 observations on the 988 outlets of a large US-based franchise system of automotive services across 41 US states, from its inception in 1977 to the year 2012. Top management of the franchise system shared data with respect to each outlet's location, year of establishment, and corresponding sales information for a nine-year period from 2004 to 2012. We supplemented these with relevant information from franchise disclosure documents (FDD) and with market-specific information we collected from publicly available archival sources. The rich, fine-grained information provides a unique opportunity to assess the impact of clustering on individual outlets' sales performance over time.

We make several key contributions to our understanding of clustering and its performance consequences. First, rather than limit our consideration to just the beneficial, knowledge transfer effects of clustering or the potentially negative intra-brand competition effects, we explicitly acknowledge and assess both possibilities. We argue that the net impact of clustering on outlet sales depends on the relative strength of each of these competing effects, and identify the boundary conditions with respect to when one effect might dominate the other.

Second, we build on evidence suggesting that the knowledge *available* from different outlets might vary as a function of their experience (Kalnins and Mayer 2004), and extend this insight by additionally considering the focal outlet's *ability to absorb* this

available knowledge as a function of its own experience (Cohen and Levinthal 1990; Zahra and George 2002). As we will discuss subsequently, a low level of either is likely to significantly compromise knowledge transfer among outlets, resulting in reduced performance levels. We are thus able to explain how, even within the same cluster of outlets, performance might vary as a function of the specific focal outlet and the specific proximal same-brand outlets considered. In emphasizing the role of experience of proximally located knowledge sources and recipient alike, we extend the notion of clustering past its exclusive focus on how geographically close the outlets within a cluster are to the *specific identities* of the focal outlet and those proximal to it.

Third, we build on and extend recent theoretical discussions (Bell, Tracey, and Heide 2009; Tracey, Heide, and Bell 2014) linking the well-established but hitherto separate notions of clustering and governance. We propose that variations in the extent of shared ownership of clustered outlets, and differences between franchisor- and franchisee-owned outlets in their relative vulnerability to intra-brand competition as well as in the operational leeway available to them, will likely result in differential performance outcomes. Ours is the first study, to the best of our knowledge, to unravel the complex interplay among geographic proximity, individual outlets' evolving experience, and their governance.

In the section that follows, we first develop the theoretical underpinnings of our conceptual framework and discuss the individual hypotheses linking clustering to outlet-level sales performance, and the moderating effects of the governance context. We then describe the research method, results, and their implications. We conclude with the limitations of our study and possible future research directions.

Conceptual Background

Figure 1 displays our proposed conceptual framework. Building on the well-established literature on organizational learning (Argote 2011; Darr and Kurtzberg 2000; Ho and Ganesan 2013; Huber 1991), we acknowledge the likely positive effects of clustering same-brand outlets in terms of the potential it poses for greater learning, interaction, and knowledge transfer due to their shared brand (Alcacer and Delgado 2016; Lu and Wedig 2013; Tracey, Heide, and Bell 2014). We also recognize the intra-brand competitive effects of clustering same-brand outlets (Pancras, Sriram, and Kumar 2012). Outlets clustered with one another are more likely to compete for the same set of customers, and therefore cannibalize sales (Davis 2006; Kalnins 2004). Our hypotheses address this fundamental tension and suggest when one perspective might dominate the other. A brief overview of each perspective follows.

Knowledge Transfer Effect

Argote and Miron-Spektor (2011, p.1124) define organizational learning as "…a change in the organization's knowledge that occurs as a function of experience." Such knowledge includes both explicit and tacit components, such as technical skills, product- and service process-, and local market-specific knowledge (Ho and Ganesan 2013; Kalnins and Mayer 2004). Acquiring knowledge is an ongoing process and might occur directly via the focal outlet's operating experience and/or indirectly from other outlets' experience (Argote and Miron-Spektor 2011; Bradach 1997; Shane 2005). Learning from others' experience may take place through *contact learning* – transmission of routines through personal and formal relationships, as well as through *mimetic learning* – imitating or vicarious learning of routines from other outlets (e.g., through observation) (Baum and Ingram 1998; Miner and Haunschild 1995).

To further explain the knowledge transfer effect of clustering, we rely on the well-established motivation, opportunity, and ability (MOA) framework (Argote, McEvily,

and Reagans 2003; MacInnis, Moorman, and Jaworski 1991) to inform our hypotheses. The *opportunity* for knowledge transfer exists to the extent that outlets have occasion to share knowledge with each other. We suggest that greater clustering affords the focal outlet greater opportunities to seek and acquire knowledge from proximal same-brand outlets while allowing operators of closely located outlets to observe, meet, and share knowledge with one another with greater ease (Ganesan, Malter, and Rindfleisch 2005). Our conceptual framework, however, suggests that such opportunities may or may not be realized, depending on the *motivation* and *ability* of outlets to seek, transfer, and absorb knowledge, and the governance context – shared ownership and franchisor vs. franchisee ownership. We briefly outline each factor below.

Motivation to seek and transfer knowledge. Motivation to seek knowledge is the extent to which a focal outlet is driven to learn from proximal same-brand outlets. Newly established focal outlets are less experienced and knowledgeable about local market conditions than more mature focal outlets. Therefore, ceteris paribus, we expect newly established focal outlets to be more motivated to seek knowledge than their more mature counterparts. *Motivation to transfer knowledge* is the extent to which proximal same-brand outlets are willing to share their knowledge with a focal outlet. Within a franchise system, the franchisor is incentivized and motivated to share operational knowhow with its franchisees; the transfer of knowledge from franchisor-owned outlets to a franchisee-owned focal outlet is thus likely to be free-flowing (Bradach 1997, 1998). Why might franchisee-owned outlets, however, be motivated to transfer their knowledge to other franchisee-owned outlets? Our review of the literature suggests that, although not as forthcoming with their knowledge as the franchisor, franchisee-owned outlets do share knowledge with each other even if separately owned and operated (Ingram and Simons 2002) for at least two key reasons. First, proximally located same-brand outlets are likely to share similar problems and experiences associated with their local markets (Darr and Kurtzberg 2000). These experiences give same-brand outlets similar frames of reference that should ease and encourage information sharing (Huber 1991; Shrivastava and Schneider 1984). Second, proximally located same-brand outlets face similar competition

(i.e., out-groups) and therefore identify more with their in-group (i.e., same-brand outlets) (Bhattacharya and Sen 2003; Sherif 1966; Tajfel and Turner 1979). Such identitification is likely to lead to in-group members having at least moderate levels of motivation to transfer knowledge to other same-brand outlets.

Ability to transfer and absorb knowledge. Although a necessary condition, the motivation to transfer knowledge is not sufficient for successful knowledge transfer. What is also needed is the ability to transfer and absorb knowledge. The *ability to transfer knowledge* is the extent to which proximal outlets have relevant skills and information to transfer to a focal outlet. The more mature an outlet, the more likely it is to have accumulated a greater amount of experience relative to a newer, less well-established outlet (Brittain 1989; Huber 1991). This greater depth of experience is reflected in stronger organizational routines and operating procedures, and deeper repositories of knowledge regarding their appropriate application (Argote and Miron-Spektor 2011; Knott 2003). Thus, the more mature proximal outlets are, the greater their ability to transfer knowledge to a focal outlet.[7] The *ability to absorb knowledge* is the extent to which a focal outlet has the capacity to incorporate information from proximal same-brand outlets. As the focal outlet gains experience, its ability to value, assimilate, and apply new knowledge – i.e., its *absorptive capacity* (Cohen and Levinthal 1990) – also increases. With an increase in its absorptive capacity, the focal outlet is more likely to value and use knowledge available from its proximal same-brand outlets (Cuypers, Cuypers, and Martin 2016), and to realize higher levels of productivity (Kim 1998) and performance (Chen, Lin, and Chang 2009).

Intra-Brand Competitive Effect

Coincident with potential knowledge transfer benefits are the costs of intra-brand competition and the sales cannibalization they elicit. Prior research provides evidence of

[7] We also acknowledge the possibility of diminishing returns to experience, and test for this in our empirical specification.

increased competition between closely located same-brand outlets (Kalnins 2003, 2004; Pancras, Sriram, and Kumar 2012). The clustered same-brand outlets sell the same products and share the same set of customers in close proximity to each other with little product or service differentiation (Pancras, Sriram, and Kumar 2012), and are therefore viewed as close substitutes by customers (Kalnins 2003). The perceived substitutability of same-brand outlets makes travel cost incurred by customers more salient (Davis 2006; Pancras, Sriram, and Kumar 2012), resulting in the sales cannibalization of existing outlets (Kalnins 2004). This cannibalization reduces as the distance between outlets increases (Davis 2006; Kalnins 2004; Pancras, Sriram, and Kumar 2012). Thus, proximally located same-brand outlets are likely to compete more fiercely than outlets farther away (Kaufmann and Rangan 1990).

Governance Context as Moderator

Our conceptual framework also identifies two relevant governance characteristics that help determine whether knowledge transfer or competitive effects dominate. Within the present context, we consider the shared ownership of the clustered outlets (i.e., multi-unit operations). We hypothesize shared ownership to result in a likely increased motivation to seek and transfer knowledge, thereby inducing a significant weakening of intra-brand competitive effects (Kalnins and Lafontaine 2004). Building on recent theoretical developments linking governance characteristics and geographic clusters (Bell, Tracey, and Heide 2009; Tracey, Heide, and Bell 2014), we also identify franchisor vs. franchisee ownership of clustered outlets as a critical "shifter" (Shane 2001) of the knowledge-competition boundary effects. Specifically, franchisees are hypothesized to experience higher costs of intra-brand competition and lower benefits of knowledge transfer relative to their franchisor-owned counterparts.

Hypotheses

Clustering Effects

Table 2 reflects the ideas outlined in the previous section and details the underlying logic for Hypotheses 1A, 1B, and 2 (under "Clustering Effects on Outlet Sales"). We suggest that clustering provides the *opportunity* for a focal outlet to learn from same-brand proximal outlets. Thus, our arguments below rest on the *motivation* and *ability* to transfer and absorb knowledge, and on the *intra-brand competition* between new and mature, and focal and proximal, outlets. We first take the perspective of the newly established focal outlet, followed by that of the mature focal outlet. For both new and mature focal outlets, we predict the impact of their clustering with other new and mature proximal same-brand outlets on their sales, balancing knowledge transfer and intra-brand competitive effects.

The perspective of the new focal outlet. Consider the cluster types represented in Table 2, wherein a new (N) focal outlet *i* may be clustered at time *t* with other new (N) or mature (M) proximal outlets of the same brand, forming clusters $CL_{it(NN)}$ and $CL_{it(NM)}$ respectively. Given its relative inexperience, a newly established focal outlet is likely to be highly motivated to seek knowledge from proximal same-brand outlets. However, its proximal same-brand outlets (whether new or mature) are, at best, moderately motivated to transfer knowledge due to intra-brand competition with the new focal outlet. In addition, a newly established focal outlet has less ability (i.e., absorptive capacity) to absorb knowledge due to its lower accumulated experience (Cohen and Levinthal 1990). The clustering of a newly established focal outlet with either new proximal same-brand outlets (with low ability to transfer knowledge) or mature proximal same-brand outlets (with high ability to transfer knowledge), therefore, does not translate into a significant knowledge benefit.

Relative to mature outlets, newly established outlets possess less knowledge of their own, and are less practiced and capable of performing the activities in which they are engaged

(Cohen and Levinthal 1990). Newly established outlets do not know local market conditions and competitors as well as their mature counterparts, thereby negatively impacting their sales performance. It is this liability of newness that makes a newly established focal outlet more susceptible to intra-brand competition (Freeman and Carroll 1983). Thus, we would expect a new focal outlet to succumb to the competitive effects of clustering.

> **H_{1A}**: The greater the clustering of a new focal outlet with other same-brand outlets, the lower its sales performance.

In addition, we argue that the intra-brand competition experienced by the new focal outlet is greater when the proximal same-brand outlets are mature – i.e., in $CL_{it(NM)}$ relative to the $CL_{it(NN)}$ cluster. Mature proximal outlets have greater market knowledge, conferring on them a competitive advantage over the newly established focal outlets. We therefore expect that, relative to clustering with other new same-brand outlets (i.e., $CL_{it(NN)}$), new focal outlets' sales performance will be more negative when clustered with mature proximal outlets (i.e., $CL_{it(NM)}$).

> **H_{1B}**: New focal outlets clustered with mature same-brand outlets will perform worse than those clustered with new same-brand outlets.

The perspective of the mature focal outlet. Now consider a scenario where a mature (M) focal outlet *i* is clustered at time *t* with other mature (M) or new (N) proximal outlets of the same brand, forming clusters $CL_{it(MM)}$ and $CL_{it(MN)}$ respectively. Given its accumulated experience, a mature focal outlet is likely to have less *motivation* (than a new focal outlet) to seek knowledge from proximal others; therefore, it is less relevant whether its proximal outlets are motivated to transfer knowledge to it. From an *ability* standpoint, however, a mature focal outlet is likely to benefit more from being clustered with mature, rather than new, proximal outlets. A mature focal outlet has greater accumulated experience and correspondingly higher absorptive capacity than its newly established counterparts (Zahra and George 2002). As such, it would benefit from being

clustered with other mature outlets of the same brand which have the ability to transfer knowledge due to their greater repository of relevant knowledge (Kalnins and Mayer 2004). This knowledge benefit to the mature outlet is limited when clustered with newly established outlets, as newly established outlets likely possess less relevant knowledge to transfer (Kalnins and Mayer 2004). From a knowledge transfer perspective, the mature focal outlet is better served when clustered with *other mature outlets* rather than with newly established proximal outlets.

However, from an intra-brand competitive threat perspective, the opposite inference is likely to prevail – i.e., the mature focal outlet is better served when clustered with *newly established outlets* rather than mature outlets. The reason for this inference lies in the greater market knowledge of the mature focal outlet, which confers a competitive advantage over the newly established proximal outlets. As proximal outlets' experience increases, however, this knowledge-based competitive advantage dissipates, and the focal outlet experiences a higher level of intra-brand competition from mature proximal outlets. This trade-off between knowledge benefits and intra-brand competition results in our hypothesizing no significant difference in sales performance between mature focal outlets clustered with mature and new outlets.

> **H_2**: The greater clustering of a mature focal outlet with other same-brand outlets will neither help nor hinder its sales performance.

Moderating Effects of Shared Ownership

Our hypotheses thus far have focused on the anticipated main effects of clustering on the focal outlet's sales performance. To these, we now add the potential moderating effects of shared ownership of the focal and proximal outlets (see *Moderation Effects of Shared Ownership,* Table 2). We define *shared ownership* as the extent to which outlets in the cluster are owned by the same operator as that of the focal outlet. For franchisee-owned focal outlets, this comprises only those proximal outlets owned by the same focal

franchisee. When the focal outlet is franchisor-owned, this comprises only the franchisor-owned outlets within that cluster.

Shared ownership affects the clustering-performance relationship in at least three ways. First, shared ownership creates even more *opportunities* for outlets to transfer knowledge to one another via multiple means. Indeed, Darr, Argote, and Epple (1995) note that outlets operating under shared ownership have more regular communication with each other and a greater number of interpersonal ties than those not sharing common ownership. Moreover, shared ownership creates more opportunities to transfer knowledge through contact learning (in addition to mimetic learning), in which knowledge is transferred through personal and formal relationships (Baum and Ingram 1998; Miner and Haunschild 1995). Second, shared ownership positively affects the knowledge transfer process by enhancing the *motivation* of outlets to seek and share knowledge with one another (Argote and Darr 2000; Darr and Kurtzberg 2000). Unlike outlets that do not share a common owner, outlets operating under shared ownership are likely to have greater norms of reciprocity, a common language system, and incentives to share knowledge, all of which enhance the motivation to not only seek, but also to share knowledge (Darr, Argote, and Epple 1995). Third, and perhaps as important, shared ownership of the clustered outlets weakens the intra-brand competition between the focal and proximal outlets (Kalnins and Lafontaine 2004). We now discuss how shared ownership might temper the performance implications of clustering for a newly established outlet and a mature outlet in turn.

The perspective of the new focal outlet. Recall that, per Hypothesis 1B, we expected a new focal outlet clustered with mature proximal outlets to underperform relative to a new focal outlet clustered with newly established outlets. We attributed this to the double jeopardy of a new focal outlet's inability to absorb knowledge from proximal (mature and new) outlets and a higher level of intra-brand competition from more mature proximal outlets. We expect shared ownership to significantly attenuate (i.e., weaken) both these adverse effects.

As the extent of shared ownership between a focal outlet and its proximal outlets increases, the motivation of the proximal outlets to transfer their knowledge to the focal outlet increases (Argote, McEvily, and Reagans 2003) due to the common owner's objective of ensuring successful operations across her multiple outlets. Although newly established focal outlets are less able to value, assimilate, and apply new knowledge (i.e., lower absorptive capacity), shared ownership creates more opportunities to learn by contact rather than solely relying on mimetic learning, which can help address some of these limitations (Darr, Argote, and Epple 1995). Thus, when operating under shared ownership, newly established focal outlets have additional ways to learn organizational routines and operating procedures that are less available to outlets that do not share common ownership.

Just as important, shared ownership of clustered outlets brings about a lowering of intra-brand competition, as clustered outlets that share ownership do not perceive each other as competitive threats (Kalnins and Lafontaine 2004). Thus, an increase in the extent of shared ownership likely brings about greater knowledge gains by new focal outlets from mature proximal outlets. Together, this suggests:

> **H_3**: As the extent of shared ownership increases, new focal outlets that are clustered with mature proximal outlets will perform better than those clustered with new proximal outlets.

The perspective of the mature focal outlet. Recall that per Hypothesis 2, a mature focal outlet had more (less) knowledge to gain from other mature (new) proximal outlets, but also faced more (less) intra-brand competition from these more (less) experienced outlets. The positive and adverse effects of clustering were expected to counter one another, resulting in no likely distinguishable performance levels. We expect shared ownership to change this as well.

As before, shared ownership is likely to enhance the motivation of the focal outlet to seek knowledge from its co-owned proximal outlets, and for the latter to transfer their

knowledge to the focal outlet (Hinds and Pfeffer 2003). Mature focal outlets possess greater accumulated experience and a correspondingly higher level of absorptive capacity (Zahra and George 2002); as well, mature outlets possess a greater repository of available relevant knowledge to transfer (Kalnins and Mayer 2004). Thus, mature proximal outlets are likely to provide knowledge benefits to mature focal outlets that have the ability to absorb this knowledge. This knowledge transfer-related benefit is likely reduced when proximal outlets are newly established. Notwithstanding their higher motivation to transfer knowledge, newly established outlets have less knowledge that might benefit the mature focal outlet.

Thanks to the dampened intra-brand competition brought about by shared ownership, mature focal outlets are relatively sheltered from the intra-brand competition typically associated with the presence of other mature outlets in their vicinity. Thus, an increase in the extent of shared ownership likely brings about greater knowledge gains by mature focal outlets from their mature proximal outlets. Together, this suggests:

> **H_4**: As the extent of shared ownership increases, mature focal outlets that are clustered with mature proximal outlets will perform better than those clustered with new proximal outlets.

Moderating Effects of Franchisor vs. Franchisee Ownership

We draw on the rich body of franchising research on the drivers (Brickley and Dark 1987; Lafontaine and Shaw 2005; Perryman and Combs 2012) and consequences of outlet ownership (Kalnins 2004; Michael 2000; Srinivasan 2006) to posit moderation of the earlier hypothesized clustering effects, depending on whether the focal outlet is franchisor- or franchisee-owned. Relative to franchisor-owned outlets, we suggest that franchisee-owned outlets are more vulnerable to intra-brand competition and benefit less from the knowledge transfer opportunity conferred by proximal same-brand outlets. The resulting increased costs for franchisees and the reduced knowledge benefits to them are

expected to result in franchisor-owned outlets outperforming their franchisee-owned counterparts across the clustering scenarios we assess. We discuss the increased costs and reduced benefits in turn.

As a consequence of higher levels of clustering-induced intra-brand competition, franchisees are more likely to shirk on quality inputs (Mathewson and Winter 1984) and to free ride on the efforts of other same-brand outlets (Rubin 1993). Relative to franchisee-owned outlets, franchisor-owned outlets are less likely to bear the brunt of intra-brand competition, as the franchisor is likely to be more strategic in ensuring that revenues at existing franchisor-owned outlets will not go down when new outlets are added (Kalnins 2004). Franchisor-owned outlets are also more likely to be subject to greater oversight and supervision by franchise headquarters (Brickley and Dark 1987), thereby reducing the incidence of shirking (Norton 1988). For these reasons, the costs and adverse consequences of intra-brand competition are likely lower for franchisor-owned outlets, relative to their franchisee-owned counterparts.

As well, we expect franchisees to benefit less from the proximity-conferred learning and knowledge-sharing opportunity than franchisor-owned outlets. Recall that the benefits of learning are realized when, on the basis of learning, the focal outlet undertakes different, improved actions and routines (Dodgson 1993; Huber 1991). Franchise systems, by their very design, emphasize uniformity over innovation. To ensure the former, franchisors rely on iron-clad contractual agreements and uniformity-ensuring constraints (Kashyap, Antia, and Frazier 2012) that reduce the leeway available to franchisees, relative to franchisor-owned outlets, to make significant changes in response to the additional knowhow they are able to glean from their proximal same-brand outlets. Thus, even if a focal franchisee has the *opportunity* to learn via clustering with proximal same-brand outlets, has proximal outlets that are *motivated* and have the *ability* to transfer knowledge to it, and additionally has the *absorptive capacity* to utilize the knowledge transferred, it may not be able to implement improved actions or routines due to its contractual constraints.

In essence, franchisee-owned outlets are (a) more likely to experience the prospect of a closely located same-brand outlet, and (b) more constrained in their ability to change their organizational routines and process in response to knowledge received from other proximal outlets. It is this double jeopardy that leads us to hypothesize that:

> **H_5**: Franchisor-owned focal outlets will outperform their franchisee-owned counterparts, the greater the clustering with other same-brand outlets; the dominance by franchisor-owned outlets will persist across new and mature outlets.

Research Method

Empirical Context and Data Collection Procedure

We collaborated with a large US-based franchisor of automotive maintenance and repair services to test our hypotheses. The firm, which started operations with two outlets in 1977, began franchising in 1988 and currently has 988 franchisor- and franchisee-owned outlets in 41 US states. The participating firm provided information on the date of establishment, specific location (street address), and the ownership of each outlet, i.e., franchisor- or franchisee-owned, from system inception in 1977 to its 988th outlet in 2012. Additionally, top management shared outlet-level sales performance information on an annual basis from 2004 to 2012. Examining a firm with multiple outlets in a single sector enables us to control for sector effects (Perryman and Combs 2012) while providing us with a unique opportunity to examine issues related to clustering and outlet governance at a granular level.

Supplementary data collection. We supplemented these data with various firm- and market-specific variables at the county level such as royalty rate, inter-brand competition, population, per capita income, and area from Franchise Disclosure Documents (FDDs), the United States Census Bureau, and the Bureau of Economic Analysis. Table 3 displays the complete list of variables used in this study and their data sources. The rich

information in the dataset provides us an unprecedented opportunity to compute spatial characteristics and link these to individual outlet performance.

Unit of Analysis and Measures

Our unit of analysis is the individual outlet *i* (*i* = 1,…..,, 988), observed *t* years since its inception (*t* = 0,….., 35). Our objective is to relate the clustering of outlets to their corresponding sales performance over time. Table 4A provides the descriptive statistics for all the variables and the pairwise correlations among them; Table 4B displays the same information for the untransformed raw data.

Sales performance. Our focal dependent variable, outlet-level sales revenue (SR_{it}), is the natural log-transformed annual sales revenue realized by outlet *i* in year *t*.

Cluster types. We assessed the extent to which each outlet *i* was part of a cluster of same-brand outlets at time *t* by computing the Local Moran's I index (Anselin 1995) using ArcGIS 10.3. The Local Moran's I estimates clustering strength or spatial autocorrelation of a focal outlet based on two factors: 1) its geographic proximity to other outlets, and 2) its similarity to or dissimilarity with other outlets of the same franchise system on a specific attribute, in our case outlet *i*'s accumulated experience as inferred from its age. Given a set of outlet locations and the associated accumulated experience, the Local Moran's I computes the extent to which an individual outlet is clustered with other outlets, and if so, the nature of clustering – with similar or dissimilar accumulated experience levels.

The computation of the Local Moran's I generates two outputs 1) the Local Moran's I score along with a z-score and a p-value which provide the strength of clustering for each outlet, and 2) the cluster category of each significantly clustered outlet based on its attribute (i.e., in the present context, outlet age). The Local Moran's I identifies outlets with low (i.e., younger age outlets) and high (older age outlets) attribute values by using

the normal distribution of outlet age, categorizing each as new and mature respectively. It, thus, not only allows us to infer the strength of clustering at the individual outlet level, but also the four archetypal cluster types of theoretical relevance based on age: $CL_{it(NN)}$, whereby a new focal outlet *i* is clustered with other new outlets at time *t*; $CL_{it(NM)}$, indicating a new focal outlet *i* clustered with mature outlets at time *t*; $CL_{it(MM)}$, when a mature focal outlet *i* is clustered with other mature outlets at time *t*; and $CL_{it(MN)}$, when a mature focal outlet *i* is clustered with new outlets at time *t*. Prior studies in marketing have used Moran's I index to measure spatial dependence of variables (e.g., Mittal, Kamakura, and Govind 2004; Peters, Albers, and Kumar 2008). The Appendix 3A provides additional details with respect to the Local Moran's I computation, and Figure 2 displays examples from our data of each of the four prototypical clustering types.

Shared ownership. Consistent with prior research (Lu and Wedig 2013), we define clustering within a boundary of 25-mile radius of the focal outlet, and measure shared ownership of clustered outlets (SO_{it}) as the count of proximal outlets *j* within this 25-mile radius of the focal outlet *i* at time *t*. For franchisee-owned focal outlets, this measure counts only those proximal outlets that are owned by the same focal franchisee (i.e., multi-unit franchisees). When the focal outlet is franchisor-owned, the count includes only franchisor-owned outlets within 25-radius of the focal outlet.

Franchisor vs. franchisee ownership. We operationalize franchisor vs. franchisee ownership (FFO_i) as a dichotomous variable which takes a value of 1 when an outlet *i* is franchisee-owned, and 0 when franchisor-owned (Dutta, Bergen, Heide, and John 1995; Heide 2003).

Control variables. We incorporate several control variables that are expected to have an impact on the individual outlet's sales performance over and above our hypothesized variables. We measure the cluster size (CS_{it}) as the number of same-brand outlets within a 25-mile radius of a focal outlet. We also include the mean age of outlets in a 25-mile radius of the focal outlet, incorporating its quadratic term as well to control for the

possibility of diminishing returns to experience. We control for franchise system size (FS_t) − the total number of outlets in operation in year *t*, and royalty rate (RR_t) − the ongoing payment as a percentage of sales that franchisees must pay the franchisor for their use of the trademark and other support. System size reflects overall access of the outlet to resources which could impact performance; royalties incentivize franchisor investments in the brand (Agrawal and Lal 1995), thereby boosting franchisee sales and making the franchise more attractive to franchisees (Shane 1998). We also control for market-specific effects on outlet sales performance. The most fine-grained market data we are able to collect is at the US county level *k* (*k*=1,…., 270). We include inter-brand competition (IBC_{kt}) – the total number of outlets of other competing brands, included in the five-digit NAICS code corresponding to the sector in which the franchise system operates, located in county *k* in year *t*. We also include the population (POP_{kt}) of county *k* in year *t*, the income per capita (IN_{kt}) in county *k* in year *t*, and the area of the county (AR_k) in square miles. Finally, we control for unobserved heterogeneity by including year-specific fixed effects for the *t* years in our dataset.

Model Specification

Although we were able to obtain data pertaining to individual outlet locations from the inception of the franchise system in 1977, corresponding outlet sales data are available only from 2004, and are missing for some outlets. To account for potential biased parameter estimates due to sales data not missing at random, we correct for selection bias (Cameron and Trivedi 2005; Greene 2003) by specifying a Heckman selection model (Heckman 1976) in the first stage of the analysis and including the lambda vector thus obtained in the second stage. This second-stage (substantive) equation investigates the interplay of clustering, shared ownership, franchisor- versus franchisee-ownership of the focal outlet, and their impact on outlet sales performance while accounting for potential endogeneity of the regressors.

Stage 1: Correction for sample selection bias. We specify our selection equation as a probit model as follows:

$$(1) \qquad INCLUDE_{it} = \beta_0 + \beta_1 OA_{it} + \beta_2 FE_i + \sum_{q=3}^{10} \beta_q YR_t + \varepsilon_{it}$$

Where,

$INCLUDE_{it}$ = Outlet *i*'s availability of sales information at time *t*,
OA_{it} = Age of Outlet *i* at time *t*,
FE_i = Franchisee-Owned as a binary variable (franchisee-owned = 1, and 0 otherwise),
YR_t = Specific Years as dummy variables with 2004 as the excluded base year, and $\varepsilon_{it} \sim N(\mu_1, \sigma^2)$

From equation (1) above, we obtain and store the Inverse Mills Ratio (i.e., Lambda) vector for subsequent inclusion in the second stage of analysis.

Stage 2: Substantive equation estimation. In the second stage, we relate each outlet's clustering, shared ownership, and franchisor vs. franchisee ownership to its annual sales performance. Our model specification approach in this stage is informed by the need to account for the potential endogeneity of regressors – clustering ($CL_{it(NN)}$, $CL_{it(NM)}$, $CL_{it(MM)}$, $CL_{it(MN)}$), shared ownership (SO_{it}), and franchisor vs. franchisee ownership (FFO_i). The clustering-related regressors and shared ownership are time-varying, whereas franchisor vs. franchisee ownership is time-invariant. Durbin-Wu-Hausman tests of these variables yielded significant evidence of endogeneity. We therefore specified an endogeneity-correcting regression equation. We treat the interactions of clustering with shared ownership and with franchisor vs. franchisee ownership as endogenous, since interaction terms of endogenous regressors are also endogenous (Wooldridge 2010).

We use the Hausman-Taylor Instrumental Variables (henceforth, HTIV) regression approach to account for endogenous regressors. Several prior research studies in marketing have used the HTIV model to account for the endogeneity of time-varying and time-invariant regressors (e.g., Boulding and Christen 2003, 2008; Germann, Ebbes, and

Grewal 2015; Jacobson 1990. See Appendix 3B for estimation details and checks of its appropriateness). We specify our HTIV model as follows (variables in bold font denote endogenous regressors, of which governance (GOV_i) is time invariant):

$$
\begin{aligned}
(2)\quad SR_{it} = {} & \eta_0 + \eta_1 \boldsymbol{CL_{it(NN)}} + \eta_2 \boldsymbol{CL_{it(NM)}} + \eta_3 \boldsymbol{CL_{it(MM)}} + \eta_4 \boldsymbol{CL_{it(MN)}} + \eta_5 \boldsymbol{SO_{it}} + \eta_6 \boldsymbol{FFO_i} \\
& + \eta_7 \boldsymbol{CL_{it(NN)} * SO_{it}} + \eta_8 \boldsymbol{CL_{it(NM)} * SO_{it}} + \eta_9 \boldsymbol{CL_{it(MM)} * SO_{it}} + \eta_{10} \boldsymbol{CL_{it(MN)} * SO_{it}} \\
& + \eta_{11} \boldsymbol{CL_{it(NM)} * FFO_i} + \eta_{12} \boldsymbol{CL_{it(MM)} * FFO_i} + \eta_{13} \boldsymbol{CL_{it(MN)} * FFO_i} + \eta_{14} CS_{it} \\
& + \eta_{15} AP_{it} + \eta_{16} (AP_{it})^2 + \eta_{17} FS_t + \eta_{18} RR_t + \eta_{19} IBC_{kt} + \eta_{20} POP_{kt} + \eta_{21} IN_{kt} \\
& + \eta_{22} AR_k + \eta_{23} IMR_{it} + \sum_{r=24}^{31} \eta_r YR_t + \alpha_i + u_{it}
\end{aligned}
$$

Where,
SR_{it} = Outlet Sales Revenue (natural log-transformed),
$CL_{it(NN)}$ = Clustering of a new focal outlet with other new outlets,
$CL_{it(NM)}$ = Clustering of a new focal outlet with mature outlets,
$CL_{it(MM)}$ = Clustering of a mature focal outlet with other mature outlets,
$CL_{it(MN)}$ = Clustering of a mature focal outlet with new outlets,
SO_{it} = Shared ownership of clustered outlets,
FFO_i = Ownership of a focal outlet *i* (franchisee-owned = 1, franchisor-owned = 0),
CS_{it} = Cluster Size,
AP_{it} = Mean Age of Clustered Outlets,
$(AP_{it})^2$ = Quadratic Term for Mean Age of Clustered Outlets,
FS_t = Firm Size,
RR_t = Royalty Rate,
IBC_{kt} = Inter-brand Competition,
POP_{kt} = Market Population (natural log-transformed),
IN_{kt} = Income per capita (natural log-transformed),
AR_k = Market Area (natural log-transformed),
YR_t = Year,
IMR_{it} = Inverse Mills Ratio,
$\alpha_i \sim$ iid (μ_2, σ_α^2), and $u_{it} \sim$ iid (μ_3, σ_e^2).

Note that over the period 2004 through 2012, there are no observed instances of clustering of new franchisor-owned outlets with other new outlets. As such, the impact of franchisee-owned new outlets clustering with other new outlets may be inferred by reference to the main effect of $CL_{it(NN)}$ in Eq (2) above.

Results

Model-free evidence. Per Table 4A, the clustering of a new focal outlet with other outlets is significantly and negatively correlated with outlet sales (r($CL_{it(NN)}$) = -.05; r($CL_{it(NM)}$) =

-.04, both $p < .01$), as we expected. In comparison, the clustering of mature outlets is significantly and positively correlated with outlets when proximal outlets are mature (($r(CL_{it(MM)}) = .10$, $p < .01$), and negatively correlated when proximal outlets are new (($r(CL_{it(MN)}) = -.04$, $p < .01$). Clearly, the clustering of new focal outlets is associated with less favorable sales performance than the clustering of mature focal outlets. Thus, these results provide initial model-free evidence for our baseline hypotheses H_1 and H_2.

The Heckman selection model. The overall model is significant (Wald $\chi^2 = 10.58$, $p < .01$), and we find clear evidence of selection with respect to sales information availability ($\lambda = -1.15$, $p < .01$). We find that mature outlets ($\beta_1 = .05$, $p < .01$) are more likely to provide sales information, whereas franchisee-owned outlets ($\beta_2 = -.24$, $p < .01$) are less likely to provide sales information relative to franchisor-owned outlets. We also find that relative to the base year of 2004, there is greater availability of outlet sales information in subsequent years.

The HTIV estimation. Table 5 displays the results of the HTIV estimation. The overall model is significant (Wald $\chi^2 = 11{,}096.91$, $p < .01$), suggesting that the hypothesized predictors of outlet-level sales performance have significant explanatory power. The main effect of clustering on the focal outlets' sales performance is significant and negative when new focal outlets are clustered with new proximal outlets ($\eta_1 = -.03$, $p < .01$), and with mature proximal outlets ($\eta_2 = -.10$; $p < .05$) of the same brand. We therefore find support for hypothesis H_{1A}. However, there were no significant sales performance differences between new focal outlets being clustered with new or mature proximal outlets of the same brand ($\chi^2 = 2.49$, n.s.); hypothesis H_{1B} is therefore not supported. As hypothesized, we find no impact of clustering of mature focal outlets with other mature ($\eta_3 = .01$; n.s.) or new outlets ($\eta_4 = .04$; n.s.) on the focal outlets' sales performance. We thus find support for hypothesis H_2.

We also find support for Hypothesis H_3, which predicted that new focal outlets perform better when clustered with mature ($\eta_8 = .01$, $p < .05$) rather than new ($\eta_7 = -.01$, $p < .01$)

proximal outlets that are under shared ownership. Per H_4, as the extent of shared ownership increases, mature focal outlets gain sales when clustered with mature proximal outlets (η_9 = .00, p < .01), and lose sales when clustered with new proximal outlets (η_{10} = -.02, p < .01). Thus, hypothesis H_4 is supported.

Hypothesis H_5 predicted that franchisee-owned outlets would gain less from clustering relative to franchisor-owned outlets. We find partial support for this hypothesis. Specifically, we find that mature franchisee-owned outlets achieve lower sales than their franchisor-owned counterparts, when in close proximity to other mature outlets (η_{12} = -.07, p < .01), which is in line with hypothesis H_5. Relative to their franchisor-owned counterparts, the clustering of new franchisee-owned outlets with mature outlets results in significant gains to sales performance (η_{11} = .09, p < .05). This runs counter to hypothesis H_5. Furthermore, we find that the clustering of mature franchisees outlets with new outlets does not significantly differ relative to their franchisor-owned counterparts (η_{13} = -.14, n.s.). Finally, the franchise system had no instances of new franchisor-owned outlets clustering with other new outlets: the lack of a contrast precludes the ability to test their relationship. Overall, franchisor vs. franchisee ownership is found to significantly affect the clustering-performance relationship for both new and mature focal outlets.

With respect to control variables, we find that firm size (η_{17} = .00, p < .01) significantly and positively affects outlet-level sales. Cluster size (η_{14} = -.10, p < .01) and royalty rate (η_{18} = -.39, p < .01), however, have a significant and negative relationship with outlet-level sales. The mean age of cluster (η_{15} = -.06, p < .01) is significantly and negatively associated with outlet sales but with a marginally significant diminishing trend (η_{16} = .00, p < .10). For market-specific control variables, greater population (η_{20} = .20, p < .01) and per capita income (η_{21} = 1.04, p < .01) significantly and positively increase outlet-level sales, whereas inter-brand competition (η_{19} = .00, p < .10) partially and positively affects outlet-level sales. Market area (η_{22} = -.05, n.s.) does not significantly affect outlet-level sales. Finally, we find significant year-specific effects on outlet-level sales.

Post hoc Analysis of Significant Interactions

For a better understanding of the moderating impact of shared ownership and franchisor vs. franchisee ownership on clustering and outlet-level sales relationship, we conducted an analysis of simple slopes for all significant interactions (Aiken and West 1991; Dawson 2014; DeCoster and Leistico 2007). Table 6 displays the results corresponding to the significant two-way interactions.

An examination of Figure 3A (Panel 1 & 2) suggests that new focal outlets' sales are not significantly affected by their clustering with mature proximal outlets under the shared ownership (the simple slope of $CL_{it(NM)}$ for franchisor-owned focal outlets = .08, n.s.). New focal outlets, however, lose more sales when clustered with other new outlets under the shared ownership (the simple slope of $CL_{it(NN)}$ for franchisor-owned focal outlets = -.20, $p < .01$). Figure 3A (Panel 3 & 4) suggests that mature focal outlets gain sales when clustered with other mature outlets in the presence of shared ownership (the simple slope of $CL_{it(MM)}$ for franchisor-owned focal outlets = .12, $p < .01$). Mature focal outlets' sales performance, however, is harmed when clustered with new outlets under the shared ownership (the simple slope of $CL_{it(NN)}$ for franchisor-owned focal outlets = -.67, $p < .01$).

Figure 3B (Panel 1) suggests that clustering of a new focal outlet with mature outlets harms outlet-level sales when the focal outlet is franchisor-owned (the simple slope of $CL_{it(NM)}$ for franchisor-owned focal outlets = -.10, $p < .05$). Relative to franchisor-owned new focal outlets, franchisee-owned new focal outlets are not significantly hurt or helped by their proximity to mature outlets (the simple slope of $CL_{it(NM)}$ for franchisee-owned focal outlets = -.01, n.s.). Figure 3B (Panel 2) suggests that mature franchisor-owned focal outlets' clustering with other mature outlets has no significant impact on their sales performance (the simple slope of $CL_{it(MM)}$ for franchisee-owned focal outlets = .01, n.s.). It is only franchisee-owned mature focal outlets that lose from greater clustering with

other mature outlets (the simple slope of $CL_{it(MM)}$ for franchisee-owned focal outlets = -.06, $p < .05$).

Alternate Specifications

We assessed the stability of our findings to alternate estimation approaches, alternate measures of performance, alternative explanations for the effects reported, alternate time-related specifications, and alternative levels of analysis.

Alternate estimator. In order to test the robustness of our results, we used the fixed-effects approach as an alternate estimator. The FE estimation results in the dropping of the time-invariant franchisor vs. franchisee ownership (FFO_i) variable, but retains all four archetypal clustering types and their interactions with shared ownership and franchisor vs. franchisee ownership. All results with respect to the hypothesized effects remain robust.

Alternate measure of performance. We also relied on a different but related measure of outlet performance – sales transaction volume, which we operationalized as the total number of transactions reported by each outlet per year. Our HTIV estimates remain robust to this alternate measure of performance as well.

Alternative explanation for the effects reported. We also explored the possibility that the focal outlet's sales might be impacted not because of any knowledge transfer pursuant to clustering, but rather by better franchisor monitoring capabilities as a function of nearby franchisor-owned outlets. So as to test this alternative explanation, we computed the number of franchisor-owned outlets in the county of location of the focal outlet, and included this variable in our model. All the clustering-related effects and their interactions with shared ownership and franchisor vs. franchisee ownership remain robust, and the main effect of the additional regressor is non-significant.

Alternate temporal separation. Our conceptualization and subsequent model specification approach have proceeded on the assumption of contemporaneous (immediate, within the same year) effects of clustering on the sales performance of each outlet. We also assessed one- and two-year lagged models of the hypothesized relationships. Our principal findings of baseline hypotheses, and that of moderating effects of shared ownership and franchisor vs. franchisee ownership, persist.

Alternate level of analysis. Prior research has mostly used clustering as a global or system-wide construct (within the present context, across all 988 outlets of the franchise system) without investigating the type of clustering or with whom a focal outlet is clustered. We therefore specified an alternate model, measuring clustering at the system-level and treating it as an endogenous regressor. The HTIV estimation results show that the system-wide clustering of outlets is positively and significantly associated with the individual outlets' sales. This is consistent with prior research which does not pay heed to the accumulated experience, shared ownership, and franchisor vs. franchisee ownership of the clustered outlets (see, for example, Lu and Wedig 2013). This result, however, masks the nuances that emerge from a fuller consideration of the specific identities of the focal and proximal outlets, and provides a misleading confidence in clustering effects on performance.

Discussion

Proximity is a contentious issue for all franchising participants. Yet, it is a particular irritant for franchisees due to sales cannibalization concerns. Although much has been made of the positive effects of clustering, our own assessment of its impact suggests that concerns regarding the proximity of other same-brand outlets are well placed. Our contention that physical distance is not the sole determinant of outlet sales finds support. We discuss the theoretical and managerial implications of our findings in turn.

Theoretical Implications

The present research is motivated by the conflicting findings and assertions about the effects of clustering. It is important to note that disagreements with respect to clustering-attributable performance exist not only across but also *within* paradigms. Consider, for example, how much at odds the studies reporting positive effects of agglomeration (Chung and Kalnins 2001) are with those warning of significant sales cannibalization (Pancras, Sriram, and Kumar 2012). A similar schism is observed even for those adopting a sociology-informed clustering viewpoint and the knowledge transfer this implies. Whereas Lu and Wedig (2013) report positive performance effects, Ingram and Baum (1997) find evidence of a negative impact of clustering.

Our study builds on and significantly extends both streams of work. We further unpack the knowledge transfer paradigm, even while acknowledging the possibility of proximity-induced intra-brand competition. In particular, we call for a more nuanced consideration of clustering's impact – one that emphasizes not just physical distance, but physical distance *from whom*. In contrast to prior assessments of clustering's performance-related consequences, we posit and find strong evidence in support of the notion that the association between proximity and performance is not direct nor strictly positive. Rather, outlet performance may be helped or hindered by clustering with other same-brand outlets, depending on the motivation of the proximal outlets to transfer their knowledge to the focal outlet and the latter's ability to absorb such knowledge. We provide evidence consistent with the notion that whereas motivation to transfer knowledge to the focal outlet increases with shared ownership, the ability to absorb this knowledge varies with the age and consequent operating experience of the focal outlet.

This insight leads naturally to the next theoretical implication − that the specific identities of the focal outlet and of the same-brand outlets it may cluster with matter. Once it is acknowledged (a) that the impact of clustering might vary by outlets comprising the cluster, and (b) that in addition to physical distance, experience gained (whether own or through the experience of others) matters, it becomes possible to discern and explain

variations in performance for different outlets within the cluster. It is worth noting that until now, research on clustering has focused exclusively on system-level clustering; in the present context, this amounts to a single "clustering score" representing the extent of clustering across all 988 outlets of the franchise system we assessed. As we have demonstrated previously, such an aggregative approach does indeed yield a positive association between clustering and sales. *It is only when clustering is unpacked, that is, an individual outlet's extent of clustering with other same-brand outlets is considered, that we see evidence of positive and negative cluster-attributable effects*. Our research calls for a more subtle, disaggregated approach to assessing clustering's impact.

A third important theoretical implication pertains to the critical role of at least two facets of the governance context, and their interplay with proximity. We find shared ownership to be a critical "shifter" (Shane 2001) of the motivation for knowledge transfer among proximal same-brand outlets. When the focal outlet and its proximal same-brand outlets share ownership (whether they be franchisees operating under the same multi-unit franchisee, or franchisor-owned outlets clustered proximally), intra-brand competition is reduced. Importantly, we also find the juxtaposition of both governance and proximity, alluded to and emphasized by Heide and his colleagues, to have significant performance implications. Marrying insights from the well-known agency problem that franchising is subject to (Galini and Lutz 1992; Lafontaine 1992; Lal 1990) with the literature on knowledge transfer (Argote 2011), we hypothesize and find evidence consistent with the notion that franchisor vs. franchisee ownership serves to temper the effects of clustering. Franchisees are seen to realize reduced gains and increased costs relative to their franchisor partners. This finding is central to explaining and reconciling the significantly diverging contentions of each party with respect to proximity referred to in the opening quotations of this research effort.

All in all, the present study emphasizes that the impact of clustering for each franchise system participant is not at all straightforward. Rather, it varies, depending on the *motivation* of the proximal outlets to transfer their knowledge to the focal outlet and the

ability of the focal outlet to absorb this knowledge and act on it. The *governance context*, as reflected in shared ownership of the clustered outlets, does appear to significantly temper (strengthen) the motivation of proximal outlets to transfer their knowledge; as well, franchisee ownership is found to be associated with mixed results – whereas mature franchisee-owned outlets experience reduced sales in proximity to other mature outlets, their newly established counterparts do not. Together, our findings suggest a far more nuanced interplay of proximity, its knowledge transfer possibilities, and the potential for intra-brand competition.

Managerial Implications

For franchisees. Our post hoc calculations suggest that, relative to franchisor-owned outlets, a new franchisee-owned outlet may expect to gain 9.5 per cent of mean annual sales or just over $39,000 when clustered with mature same-brand outlets[8]. Although the preceding result runs counter to our expectation, one explanation for this might lie in new franchisees' increased motivation to gain as much as possible from the experience gained and knowledge shared by clustered mature outlets. Relative to franchisor-owned outlets, mature franchisee-owned outlets lose mean annual sales of 6.7 per cent (just over $27,000) when clustered with other mature outlets of the same brand. All in all, our results imply that franchisees opening new outlets closer to mature outlets of the same brand are likely to realize significant sales performance gains. In contrast, *ceteris paribus*, mature franchisees clustered with other mature same-brand outlets find themselves facing the prospect of intra-brand competition.

For franchisors. Similar to franchisees, franchisor-owned outlets also experience a mixed bag for their clustering with other same-brand outlets. A new franchisor-owned focal outlet loses nearly 10 per cent or just over $39,000 in mean annual sales when clustered with mature outlets. When new franchisor-owned outlets are clustered with other new

[8] These estimates and those that follow are based on the current sample; no claim is made regarding their generalizability.

outlets, the loss in sales is not nearly as bad – these outlets lose on average just over 3 per cent of their mean annual sales or close to $12,500. We also find that mature franchisor-owned outlets remain relatively unaffected by outlet clustering, regardless whether the cluster comprises new or mature proximal outlets. Taken together, the pattern of results suggests that franchisors mindful of the sales performance of the outlets owned by them would be well advised to avoid establishing these outlets in proximity to other same-brand outlets, whether mature or new.

Across both franchisor- and franchisee-owned outlets, shared ownership of the focal and proximal outlets does appear to help facilitate knowledge transfer and blunt intra-brand competition. Under shared ownership, newly established outlets clustered with mature proximal outlets outperform their counterparts clustered with new proximal outlets by nearly 1 per cent of mean annual sales or just under $5,000. For mature outlets, the difference is even more striking – mature outlets clustered with other mature proximal outlets outperform their counterparts clustered with new proximal outlets by nearly 3 per cent of mean annual sales or just under $11,500. Given the average multi-unit owning entity (whether franchisor or multi-unit franchisee) in this franchise system owns 21 outlets, the sales performance gains accruing from shared ownership are certainly significant.

Limitations and Future Research Directions

As with any research effort, our own study has limitations that we hope will form the basis for future research. First, although we were able to track the sales performance of each outlet in the franchise system over an extended period of time, we were able to do only from 2004. Future research that includes information on the evolution of sales performance over the entire life-cycle of the franchise system and/or its individual outlets would provide much needed additional insights with respect to proximity and its performance consequences for early- versus late-in-the-lifecycle franchise systems.

Second, our reliance on archival data over nearly a decade, while a significant strength of our research effort because of the longitudinal insights it affords, also limits our ability to directly observe (or solicit survey responses regarding) the preceding variables directly. Instead, we rely on proxy variables on the assumption that the relationship between the proxy and the concept to be measured is reasonable (Lafontaine 1992). Additional efforts to integrate archival with micro (survey-based, for example) data would add significant value, in our opinion.

Finally, we analyze and report results on the evolution of a single franchise system only. My results are therefore specific to this sample. Future efforts that include multiple firms from diverse industries would help extend our findings by considering multiple franchise system outlets and their competitive and cooperative interactions over time.

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TABLE 1
SELECTED EMPIRICAL RESEARCH ON THE IMPACT OF PROXIMITY

Study	Context	Knowledge Transfer vs. Intra-brand Competition Considered	Governance-Induced Effects Considered	Outlet-Level Clustering Considered	Location's Financial Performance Considered	Key Findings
Ingram and Baum (1997)	Hotels in Manhattan	Knowledge transfer	No	No	No	Chain-affiliated hotels are less likely to survive when the chain operated more units there.
Kalnins and Mayer (2004)	Pizza restaurants in Texas	Knowledge transfer	Yes	No	No	Multiunit owners benefit from local congenital experience.
Lu and Wedig 2013	For-profit nursing home chains in the US	Other (Monitoring cost)	No	Yes	No	Clustered nursing homes achieve higher quality due to close monitoring.
Brickley and Dark (1987)	Franchise companies in multiple industries in the US	Other (Monitoring cost)	Yes	No	No	Company-owned units are located closer to monitoring headquarters.
Kalnins (2004)	Franchised and company-owned lodging establishments in Texas	Intra-brand competition	Yes	No	Yes	New same-brand franchised outlets cannibalize the incumbents' revenues.
Ganesan, Malter, and Rindfleisch (2005)	Firms in the U.S. optics industry	Knowledge transfer	No	No	No	Firms located in close proximity engage in increased face-to-face communication, but this has little effect on acquiring new product enhancing knowledge.
Pancras, Sriram, and Kumar (2012)	A franchised chain of fast food restaurants in a large US metropolitan area	Intra-brand competition	No	No	Yes	Sales cannibalization increases as the distance between stores decreases.
Perryman and Combs (2012)	Fast-food/quick-service establishments in Florida	Other (Monitoring cost)	Yes	No	No	Multi-outlet franchising is cost efficient.
This Study	A large US based automotive service franchise system	Both	Yes	Yes	Yes	The impact of clustering of same-brand outlets on their sales is contingent on outlets' experience and the governance context.

TABLE 2
THE LOGIC OF HYPOTHESES

Cluster Type	Outlet Type	Motivation to seek knowledge / Motivation to transfer knowledge	Ability to absorb knowledge / Ability to transfer knowledge	Knowledge Benefit to the Focal Outlet	Intra-Brand Competition Faced by the Focal Outlet	Specific Hypothesis
Clustering Effects on Outlet Sales						
$CL_{it(NN)}$	Focal	High	Low	Low	High	H_{1A}, H_{1B}
	Proximals	Moderate	Low			
$CL_{it(NM)}$	Focal	High	Low	Low	Higher	
	Proximals	Moderate	High			
$CL_{it(MM)}$	Focal	Low	High	High	High	H_2
	Proximals	Moderate	High			
$CL_{it(MN)}$	Focal	Low	High	Low	Low	
	Proximals	Moderate	Low			
Moderation Effects of Shared Ownership						
$CL_{it(NN)}$	Focal	High	Low	Low	Low	H_3
	Proximals	High	Low			
$CL_{it(NM)}$	Focal	High	Low	Moderate	Low	
	Proximals	High	High			
$CL_{it(MM)}$	Focal	High	High	High	Low	H_4
	Proximals	High	High			
$CL_{it(MN)}$	Focal	High	High	Low	Low	
	Proximals	High	Low			

Note: Subscripts "N" and "M" denote new and mature outlets. The first letter always represents the focal outlet, whereas the second one always represents proximal outlets. For example, CL_{NM} cluster type indicates a new focal outlet that is clustered with mature proximal outlets of the same brand.

TABLE 3
VARIABLES AND DATA SOURCES

Construct	Measured Variable	Notation	Data Source
Clustering	Proximity of a new focal outlet *i* with other same-brand new outlets *j* in year *t*	$CL_{it(NN)}$	Computed using ArcGIS 10.3
	Proximity of a new focal outlet *i* with same-brand mature outlets *j* in year *t*	$CL_{it(NM)}$	
	Proximity of a mature focal outlet *i* with other same-brand mature outlets *j* in year *t*	$CL_{it(MM)}$	
	Proximity of a mature focal outlet *i* with same-brand new outlets *j* in year *t*	$CL_{it(MN)}$	
Shared Ownership	Shared ownership of a focal outlet *i* with other same-brand outlets *j* within a cluster in year *t*	SO_{it}	
Franchisor vs. Franchisee Ownership	Dichotomous variable which equals 1 when a focal outlet *i* is franchisee-owned and 0 if franchisor-owned	FFO_i	Internal Company Records
Sales Performance	Sales revenue of a focal outlet *i* in year *t*	SR_{it}	
Control Variables			
Cluster Size	Number of outlets within 25-mile radius of a focal outlet *i* in year *t*	CS_{it}	Computed using ArcGIS 10.3
Mean Age of Clustered Outlets	Mean age of proximal outlets within 25-mile radius of a focal outlet *i* in year *t*	AP_{it}	Internal Company Records
Firm Size	Total number of outlets in year *t*	FS_t	
Royalty Rate	The ongoing payment as a percentage of sales in year *t*	RR_t	Franchise Disclosure Documents
Inter-brand Competition	Number of outlets of competitor brands located in county *k* in year *t*	IBC_{kt}	US Census Bureau
Area (square miles)	Area of county *k*	AR_k	
Population (millions)	Population of county *k* in year *t*	POP_{kt}	Bureau of Economic Analysis (BEA)
Income (millions)	Income per capita of county *k* in year *t*	IN_{kt}	

TABLE 4A
CORRELATION MATRIX AND DESCRIPTIVE STATISTICS

			1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
1	Outlet Sales Revenue[a]	SR_{it}	-														
2	Clustering (new-new)	$CL_{it(NN)}$	-0.05	-													
3	Clustering (new-mature)	$CL_{it(NM)}$	-0.04	-0.07	-												
4	Clustering (mature-mature)	$CL_{it(MM)}$	0.10	-0.16	-0.07	-											
5	Clustering (mature-new)	$CL_{it(MN)}$	-0.04	-0.02	-0.01	-0.02	-										
6	Shared Ownership	SO_{it}	0.07	0.02	-0.06	0.35	-0.02	-									
7	Franchisor vs Franchisee Ownership	FFO_{i}	-0.11	0.27	-0.07	-0.54	0.03	-0.35	-								
8	Cluster Size	CS_{it}	0.02	-0.02	0.05	0.31	0.00	0.89	-0.31	-							
9	Mean Age of Clustered Outlets	AP_{it}	0.24	-0.51	0.15	0.52	-0.03	0.30	-0.63	0.31	-						
10	Firm Size	FS_{t}	0.32	0.06	0.00	0.04	0.04	0.01	0.07	0.02	0.22	-					
11	Royalty Rate	RR_{t}	0.13	0.05	0.00	0.03	0.04	-0.01	0.07	0.00	0.22	0.72	-				
12	Inter-Brand Competition	IBC_{kt}	-0.08	0.21	-0.02	-0.07	0.10	0.15	0.15	0.17	-0.07	0.06	0.07	-			
13	Market Population[a]	POP_{kt}	0.04	0.13	-0.04	0.03	0.05	0.41	0.07	0.42	0.05	0.03	0.05	0.68	-		
14	Income per capita[a]	IN_{kt}	0.17	0.20	-0.02	0.03	0.05	0.34	0.08	0.38	0.01	0.29	0.23	0.17	0.42	-	
15	Market Area[a]	AR_{k}	-0.07	0.10	-0.05	-0.10	0.02	-0.15	0.24	-0.15	-0.04	0.05	0.06	0.45	0.32	-0.08	-
	Mean		12.92	0.75	0.12	1.21	0.01	8.07	0.59	9.26	9.16	817.9	8.42	65.71	1.08	10.03	3.14
	SD		0.87	1.89	0.67	2.89	0.21	6.84	0.49	7.82	5.58	87.45	0.49	112.6	9.75	11.49	9.91

n_1= 12,909

Correlations exceeding |.02| are significant at $p < .05$, two-tailed

a: Natural log-transformed

TABLE 4B
CORRELATION MATRIX AND DESCRIPTIVE STATISTICS (RAW VALUES)

			1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
1	Outlet Sales Revenue	SR_{it}	-														
2	Clustering (new-new)	$CL_{it(NN)}$	0.03	-													
3	Clustering (new-mature)	$CL_{it(NM)}$	-0.03	-0.07	-												
4	Clustering (mature-mature)	$CL_{it(MM)}$	0.07	-0.16	-0.07	-											
5	Clustering (mature-new)	$CL_{it(MN)}$	-0.03	-0.02	-0.01	-0.02	-										
6	Shared Ownership	SO_{it}	0.08	0.02	-0.06	0.35	-0.02	-									
7	Franchisor vs Franchisee Ownership	FFO_{i}	-0.08	0.27	-0.07	-0.54	0.03	-0.35	-								
8	Cluster Size	CS_{it}	0.04	-0.02	0.05	0.31	0.00	0.89	-0.31	-							
9	Mean Age of Clustered Outlets	AP_{it}	0.19	-0.51	0.15	0.52	-0.03	0.30	-0.63	0.31	-						
10	Firm Size	FS_{t}	0.33	0.06	0.00	0.04	0.04	0.01	0.07	0.02	0.22	-					
11	Royalty Rate	RR_{t}	0.15	0.05	0.00	0.03	0.04	-0.01	0.07	0.00	0.22	0.72	-				
12	Inter-Brand Competition	IBC_{kt}	-0.08	0.21	-0.02	-0.07	0.10	0.15	0.15	0.17	-0.07	0.06	0.07	-			
13	Market Population	POP_{kt}	-0.06	0.21	-0.02	-0.05	0.11	0.19	0.13	0.20	-0.03	0.07	0.09	0.99	-		
14	Income per capita	IN_{kt}	0.25	0.23	-0.02	0.01	0.05	0.31	0.09	0.34	-0.02	0.27	0.21	0.15	0.18	-	
15	Market Area	AR_{k}	-0.09	0.16	-0.03	-0.09	0.04	-0.07	0.19	-0.08	-0.07	0.07	0.09	0.39	0.38	-0.10	-
	Mean		522614	0.75	0.12	1.21	0.01	8.07	0.59	9.26	9.16	817.86	8.42	65.71	756475	42350	1420.3
	SD		306703	1.89	0.67	2.89	0.21	6.84	0.49	7.82	5.58	87.45	0.49	112.57	1210491	10249	23.20

n_1= 12,909

Correlations exceeding |.02| are significant at $p < .05$, two-tailed

TABLE 5
HAUSMAN-TAYLOR INSTRUMENTAL VARIABLE (HTIV)
REGRESSION ESTIMATES

Outlet Sales Revenue[a]			**Hs**	**Coeff.**	**Standard Error**	**z value**
Intercept		η_0		1.69	1.45	1.17
Clustering (new-new)	$CL_{it(NN)}$	η_1	$H_{1A,1B}$	-.03**	.01	-3.06
Clustering (new-mature)	$CL_{it(NM)}$	η_2	$H_{1A,1B}$	-.10*	.04	-2.35
Clustering (mature-mature)	$CL_{it(MM)}$	η_3	H_2	.01	.02	.52
Clustering (mature-new)	$CL_{it(MN)}$	η_4	H_2	.04	.12	.38
Shared Ownership	SO_{it}	η_5		.04**	.01	4.80
Franchisee Ownership	FFO_i	η_6		-.80**	.15	-5.33
Clustering (new-new) * Shared Ownership	$CL_{it(NN)} * SO_{it}$	η_7	H_3	-.01**	.00	-4.84
Clustering (new-mature) * Shared Ownership	$CL_{it(NM)} * SO_{it}$	η_8	H_3	.01*	.00	1.99
Clustering (mature-mature) * Shared Ownership	$CL_{it(MM)} * SO_{it}$	η_9	H_4	.00**	.00	4.09
Clustering (mature-new) * Shared Ownership	$CL_{it(MN)} * SO_{it}$	η_{10}	H_4	-.02**	.01	-4.00
Clustering (new-mature) * Franchisee Ownership	$CL_{it(NM)} * FFO_i$	η_{11}	H_5	.09*	.04	2.23
Clustering (mature-mature) * Franchisee Ownership	$CL_{it(MM)} * FFO_i$	η_{12}	H_5	-.07**	.02	-2.86
Clustering (mature-new) * Franchisee Ownership	$CL_{it(MN)} * FFO_i$	η_{13}	H_5	-.14	.12	-1.20
Cluster Size	CS_{it}	η_{14}		-.10**	.01	-13.40
Mean Age of Clustered Outlets	AP_{it}	η_{15}		-.06**	.01	-6.20
Change in Mean Age of Clustered Outlets	$(AP_{it})^2$	η_{16}		.00+	.00	1.79
Firm Size	FS_t	η_{17}		.00**	.00	7.37
Royalty Rate	RR_t	η_{18}		-.39**	.05	-7.90
Inter-brand Competition	IBC_{kt}	η_{19}		.00+	.00	1.70
Market Population[a]	POP_{kt}	η_{20}		.20**	.05	3.95
Income per capita[a]	IN_{kt}	η_{21}		1.04**	.14	7.41
Market Area[a]	AR_k	η_{22}		-.05	.06	-0.84
Inverse Mills Ratio	IMR_{it}	η_{23}		-.78**	.08	-10.25
Year Fixed Effects	YR_t	$\eta_{24\text{-}31}$		Yes		

Number of Observations = n_2 = 6,576; Wald $\chi 2$ = 11,096.91 ($p < .01$)
Base Year = 2004
[a]: Natural log-transformed

+$p < .10$, *$p < .05$, **$p < .01$, two-tailed tests.

TABLE 6
SIMPLE SLOPES ANALYSIS OF SIGNIFICANT INTERACTIONS

	Estimated Impact on Outlet-Level Sales (Simple Slope)	**t-value**	**p-value**
Impact of clustering of the new focal outlet with other new outlets on outlet sales *under shared ownership*			
Shared Ownership (Low)	-.03	-3.06	.00
Shared Ownership (High)	-.20	-7.04	.00
Impact of clustering of the new focal outlet with mature outlets on outlet sales *under shared ownership*			
Shared Ownership (Low)	-.10	-2.35	.02
Shared Ownership (High)	.08	1.25	.21
Impact of clustering of the mature focal outlet with other mature outlets on outlet sales *under shared ownership*			
Shared Ownership (Low)	.01	.52	.60
Shared Ownership (High)	.12	6.64	.00
Impact of clustering of the mature focal outlet with new outlets on outlet sales *under shared ownership*			
Shared Ownership (Low)	.04	.38	.71
Shared Ownership (High)	-.67	-3.22	.00
Impact of clustering of the new focal outlet with mature outlets on outlet sales *with respect to franchisor vs. franchisee ownership*			
Franchisor vs. Franchisee Ownership (Franchisor-Owned)	-.10	-2.35	.02
Franchisor vs. Franchisee Ownership (Franchisee-Owned)	-.01	-.33	.74
Impact of clustering of the mature focal outlet with other mature outlets on outlet sales *with respect to franchisor vs. franchisee ownership*			
Franchisor vs. Franchisee Ownership (Franchisor-Owned)	.01	.52	.60
Franchisor vs. Franchisee Ownership (Franchisee-Owned)	-.06	-2.40	.02

FIGURE 1
CONCEPTUAL FRAMEWORK

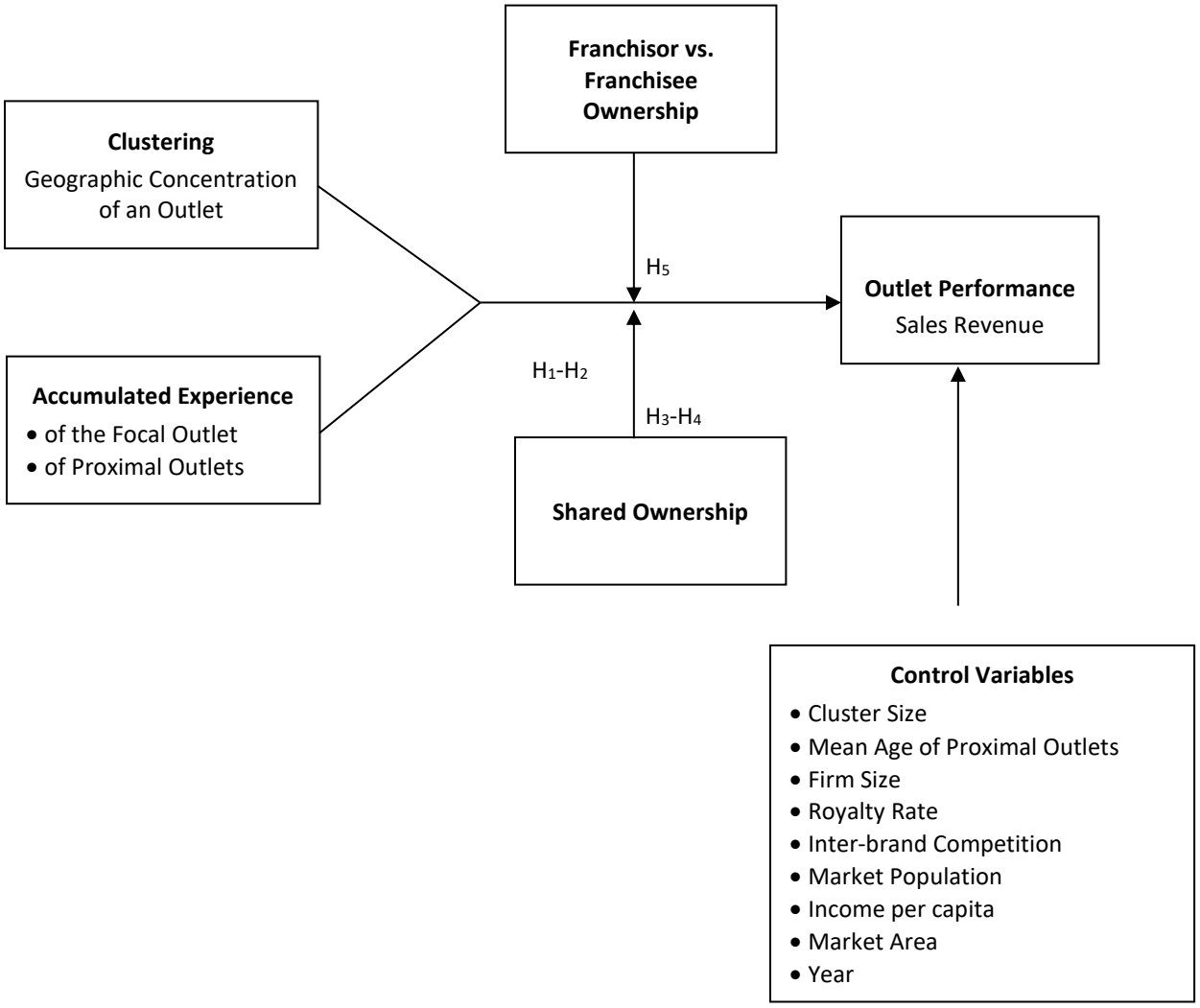


FIGURE 2
CLUSTERING OF OUTLETS IN YEAR 2012

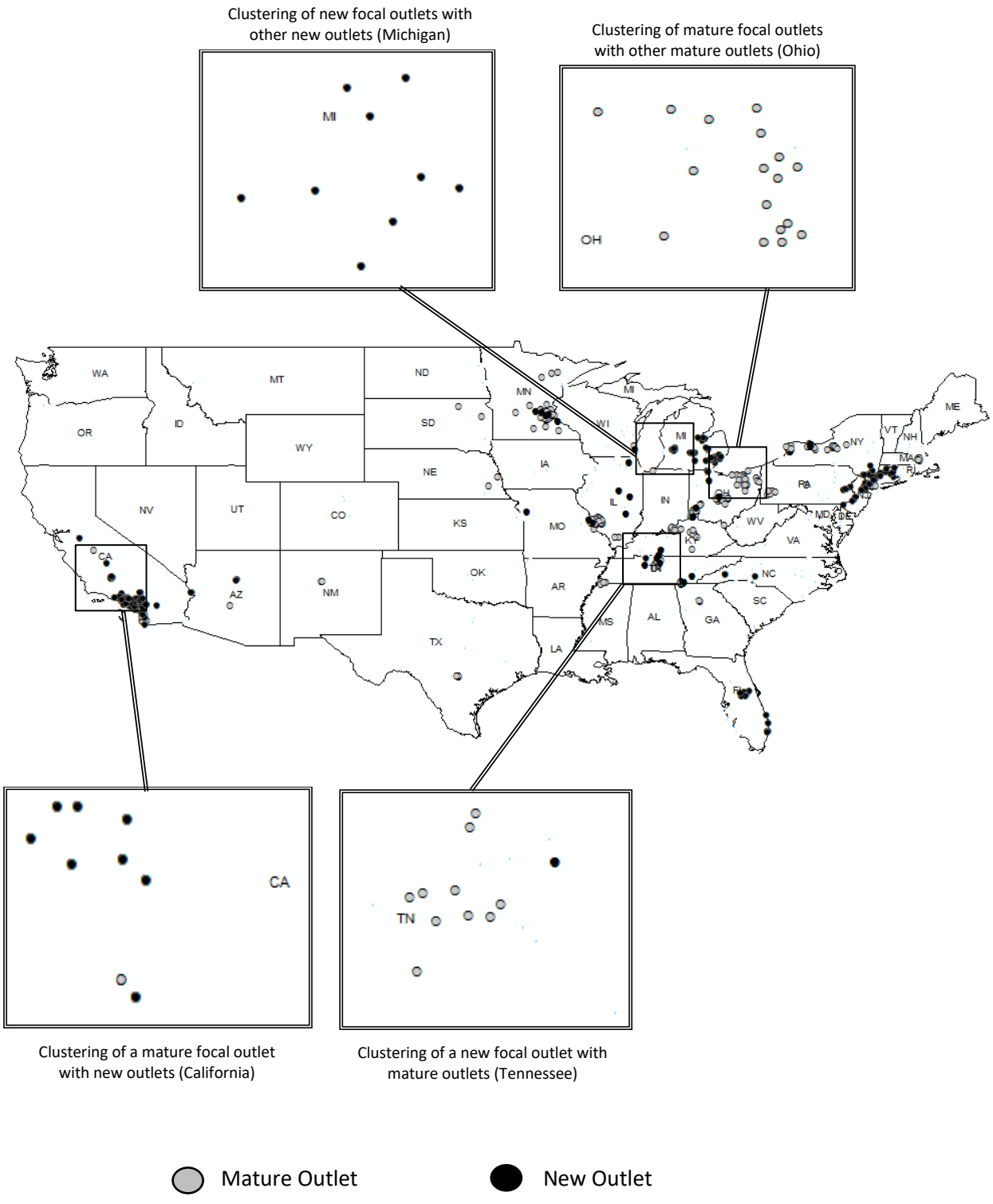
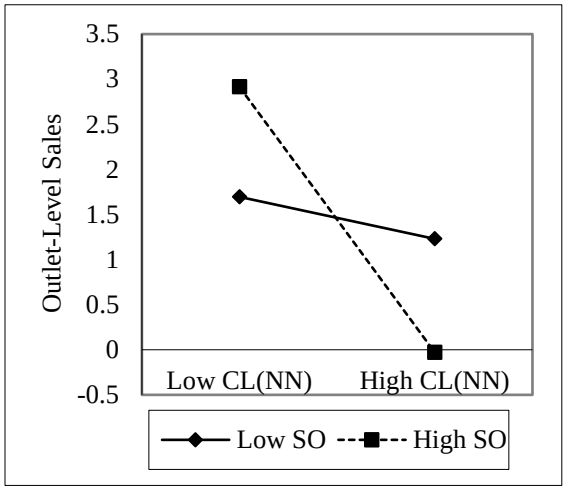
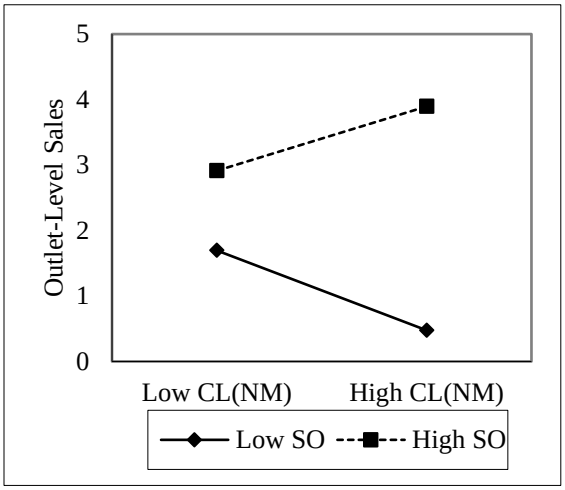


FIGURE 3A
SIMPLE SLOPES ANALYSIS FOR SIGNIFICANT INTERACTIONS (SHARED OWNERSHIP)

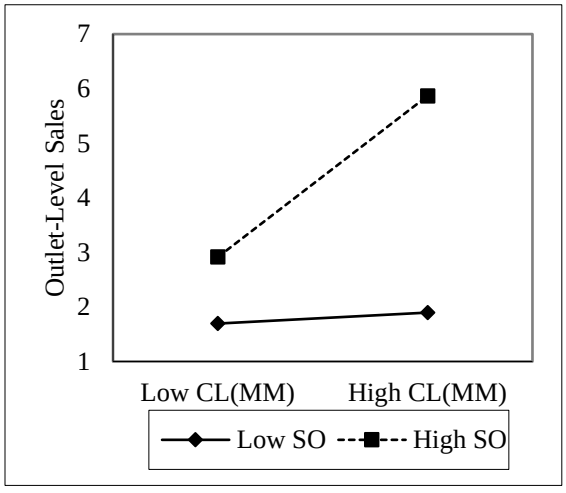
Panel 1:
Impact of Clustering of the New Focal Outlet with Other New Outlets on Outlet-Level Sales



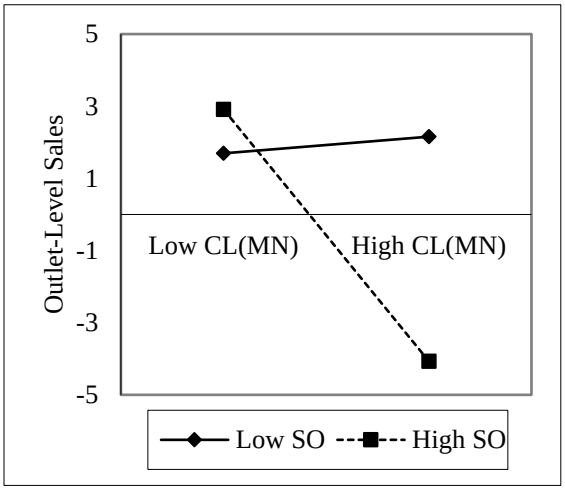
Panel 2:
Impact of Clustering of the New Focal Outlet with Mature Outlets on Outlet-Level Sales



Panel 3:
Impact of Clustering of the Mature Focal Outlet with Other Mature Outlets on Outlet-Level Sales



Panel 4:
Impact of Clustering of the Mature Focal Outlet with New Outlets on Outlet-Level Sales

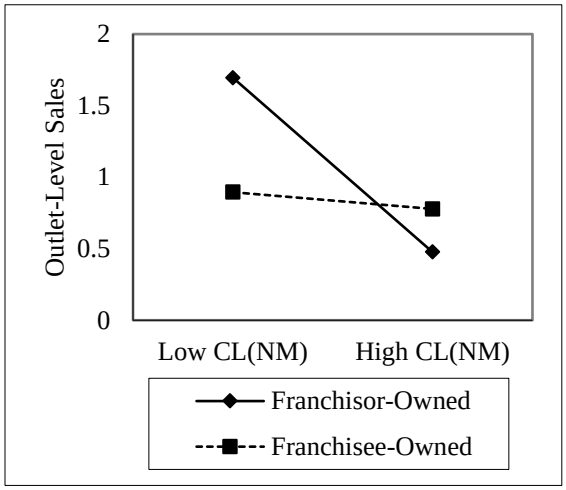


CL(NN): Clustering of the new focal outlet with other new outlets
CL(NM): Clustering of the new focal outlet with mature outlets
CL(MM): Clustering of the mature focal outlet with other mature outlets
CL(MN): Clustering of the mature focal outlet with new outlets
SO: Shared ownership of clustered outlets

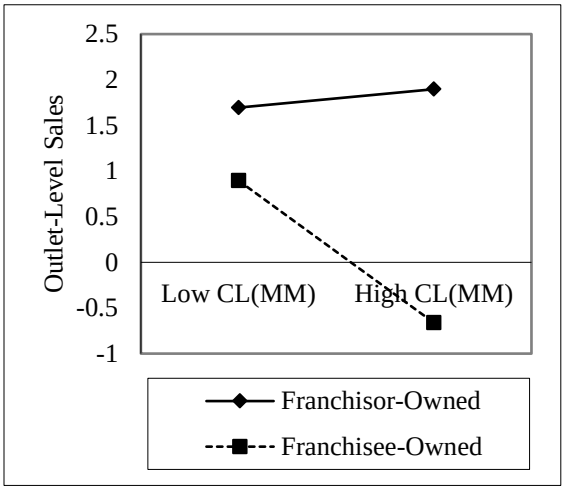
Note: Outlet-level sales are natural log transformed

FIGURE 3B
SIMPLE SLOPES ANALYSIS FOR SIGNIFICANT INTERACTIONS
(FRANCHISOR VS. FRANCHISEE OWNERSHIP)

Panel 1:
Impact of Clustering of the New Focal Outlet with Mature Outlets on Outlet-Level Sales



Panel 2:
Impact of Clustering of the Mature Focal Outlet with other Mature Outlets on Outlet-Level Sales



CL(NM): Clustering of the new focal outlet with mature outlets
CL(MM): Clustering of the mature focal outlet with other mature outlets

Note: Outlet-level sales are natural log transformed

APPENDIX 3A
COMPUTATION OF THE LOCAL MORAN'S I

The Local Moran's I index (Anselin 1995) estimates clustering strength or spatial autocorrelation of a focal outlet based on its geographic proximity from other outlets and its attribute similarity or dissimilarity from other outlets simultaneously.

The Local Moran's I (LMI_i) for a focal outlet *i* can be computed as:

1) $$LMI_i = \frac{(x_i - \bar{X})}{s_i^2} \sum_{j=1, j\neq i}^{n} w_{i,j} (x_j - \bar{X})$$

Where x_i is an attribute of an outlet *i*, in our context, it is the age of outlet *i*. $\bar{X}$ is the mean of the corresponding attribute. $w_{i,j}$ is the spatial weight between outlets *i* and *j*. This spatial weight is based on the *inverse distance* conceptualization. Therefore, lesser distance means greater spatial weight. Finally, s_i^2 can be calculated as:

2) $$s_i^2 = \frac{\sum_{j=1, j\neq i}^{n} w_{i,j}}{n-1} - \bar{X}^2$$

Where n is the total number of outlets.

A positive value for LMI_i indicates that a focal outlet *i* has neighboring outlets with similar attributes. A negative value for LMI_i shows that a focal outlet *i* has neighboring outlets with dissimilar values. In both cases, it means that the focal outlet *i* is part of a cluster. The LMI_i approaches zero in case of a random spatial pattern. The LMI_i is a relative measure and can only be interpreted within the context of its computed z-score or *p*-value.

In addition to the LMI_i value for each outlet, the computation of the Local Moran's I also generates the cluster category of each significantly clustered outlet based on its attribute (i.e., in this context, outlet age). The Local Moran's I identifies outlets with low (i.e., younger age) and high (older age) attribute values by using normal distribution of outlets' age and categorizes them as new and mature respectively, yielding four archetypal cluster types. For our data, the Table below displays the age range of mature and new outlets, as computed by the Local Moran's I statistic. For example, in 2004, a mature outlet was at least 8 years old, whereas a new outlet was at most 3 years old.

	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Age Range for Mature Outlets (in years)	8-27	9-28	9-29	8-30	9-31	10-32	11-33	12-34	13-35
Age Range for New Outlets (in years)	0-3	0-1	0-2	0-3	0-4	0-5	0-6	0-7	0-8

APPENDIX 3B
THE HAUSMAN-TAYLOR INSTRUMENTAL VARIABLES (HTIV) ESTIMATION

Panel data lend themselves to analysis by fixed-effects (FE) or random-effects (RE) estimation approaches (Baltagi 2008). FE estimation yields consistent estimates but has the disadvantage that it does not yield any estimates for coefficients of time-invariant variables. RE estimation, however, leads to inconsistent estimates when the regressors are not independent of the unobserved individual fixed error term. Hausman and Taylor (1981) proposed an alternative model where some, but not all, the regressors are correlated with the individual fixed error term (α_i) and not with random error (u_{it}). This model is based on an instrumental variable estimator that uses both the between and within variation of strictly exogenous variables as instruments, and does not rely on external instrumental variables.

This Hausman-Taylor Instrumental Variable (henceforth, HTIV) specification splits time- varying (X) and time-invariant (Z) regressors into two sets of variables. The first set of regressors [X_1, Z_1] is assumed exogenous and not correlated with α_i or u_{it}, whereas the second set [X_2, Z_2] is endogenous and is correlated with α_i but not with u_{it} (Baltagi, Bresson, and Pirotte 2003). The HTIV approach makes the critical assumption that some of the regressors (X) are correlated with the fixed error term, but not with the random error term [i.e., Cov (α_i, X) $\neq 0$, rather than Cov (u_{it}, X) $\neq 0$] (Baltagi 2008). As our analysis includes both time-varying (clustering and shared ownership) and time-invariant (franchisor vs. franchisee ownership) endogenous regressors, they need to be tested for their associations with the fixed error term (α_i).

The time-invariant endogenous regressors (Z) can only be associated with omitted fixed effects (α_i) and not with random errors (u_{it}) (Boulding and Christen 2003). To investigate the association of time varying endogenous regressors (X) with the fixed error term (α_i), I use Ebbes, Bockenholt, and Wedel's (2004) two-step procedure to test for $X\alpha$-dependencies. First, I specified FE and RE regressions for equation (2). Second, I compared both results by using the standard Hausman (1978) test, where the null hypothesis assumes that X and α_i are independent. The significant result ($p < .01$) supported the $X\alpha$-dependencies.

In contrast to FE estimation, HTIV estimation accommodates both time-varying and time-invariant regressors. To retain the time-invariant variables, the HTIV pre-multiplies the model by $\Omega^{-1/2}$, where Ω is the variance-covariance term of the error component $\alpha_i + u_{it}$ (Baltagi 2008). This estimation then runs a two-stage least squares (2SLS) regression using [$\tilde{X}_1$, $\tilde{X}_2$, $\bar{X}_1$, Z_1] as instruments (Baltagi, Bresson, and Pirotte 2003; Wooldridge 2010), where $\tilde{X}_1$ and $\tilde{X}_2$ are the deviations from means of X_1 and X_2 respectively, $\bar{X}_1$ is the mean of X_1, and Z_1 is used as an instrument for itself. For model identification, there must be at least as many elements in X_1 as those in Z_2. The assumption guiding this approach is that deviations from the mean of the explanatory variables can be validly excluded from the main equation as moment conditions,[9] which can thus be reinterpreted as exclusion restrictions. To assess the suitability of HTIV over FE estimation, I relied on Baltagi, Bresson, and Pirotte's (2003) procedure. I estimated equation (2) using HTIV, and undertook a comparison of FE with HTIV estimates, again using the standard Hausman (1978) test. The non-significant result ($p > .10$) confirmed a preference for HTIV over FE estimation. My use of HTIV specification is therefore appropriate.

[9] The moment condition refers to any variable that, when measured in deviations from the mean, is uncorrelated with the individual effect.

Chapter 4

Conclusion

4.1) Discussion

My dissertation investigates the financial consequences of growth and geography in the context of business format franchising. As well, I assess the tempering impact of governance form on this growth-geography-performance relationship.

My first essay studies the association between growth of franchise systems and franchisors' terminations of franchisees, and subsequent financial performance at the franchise system-level. Further, essay 1 investigates the moderating effects of ownership-based governance, royalty rate (governance), and clustering (geography) on the growth-franchisor terminations relationship. In so doing, I am able to assess the interplay of growth, governance, and geography, and investigate its performance implications for franchise systems, both in terms of relationship terminations and its subsequent financial consequences.

As franchised systems grow, their ability to monitor far-flung franchisee-owned outlets is compromised. This erosion of monitoring capability reduces the threat of terminations, which results in a greater propensity on the part of franchisees to shirk and thereby leading to more terminations. However, the manner in which growth occurs poses significant implications for this growth-termination association. Specifically, as franchisors rely to a greater extent on ownership-based governance, higher royalty rates, and clustering of outlets, their ability to pose a credible threat of termination of noncompliant franchisees increases. It is this increase in the credible threat that serves to dissuade franchisees from shirking, in turn, reducing the very necessity of terminations.

Essay 2 investigates the interplay of growth, governance, and geography and its performance implications for a single franchise system at the individual outlet-level. Focusing on clustering (geography) of outlets, essay 2 studies the evolution (growth) of a single franchise system from its inception in 1977 with just two outlets to its operation of 988 outlets in 2012. Essay 2 also investigates the effect of governance – shared ownership (e.g., multi-unit franchisees) and franchisor vs. franchisee ownership – on this clustering-performance relationship. Specifically, essay 2 takes the perspective of both newly established and mature focal outlets; I posit and find evidence consistent with the notion that the opportunity to share knowledge provided by clustering may or may not be realized, depending on the motivation and ability of the newly established and mature proximal and the focal outlets to transfer and absorb knowledge, and on the governance context.

Essays 1 and 2, therefore, complement each other by studying related phenomenon using two different datasets at two different levels of analysis. Whereas essay 1 studies the performance implications of growth, governance, and geography at the franchise system (macro level), essay 2 studies a similar phenomenon, but at the individual outlet-level for a single franchise system (micro level).

Despite these complementarities, essays 1 and 2 differ from each other in several important dimensions. Table 1 presents these points of differentiation. Essay 1 studies performance implications of growth for the franchise system. It relies on a bigger sample comprising 75 franchise systems observed over a decade. Its unit of analysis is the individual franchise system. So as to deal with the potentially endogenous nature of our regressors (growth, ownership-based governance, royalty rate, and clustering), I use the endogeneity correcting control function approach (Petrin and Train 2010) to obtain unbiased estimates. I find that growth increases franchisor terminations of franchisees, but these terminations may be reduced when growth is achieved through greater reliance on ownership-based governance, higher royalty rate, or greater clustering of outlets. I further find that greater number of terminations improve franchise systems' financial position in terms of sales and profitability. I attribute this to lesser shirking, higher

compliance, and quality provision on the part of franchisees (Bercovitz 2003; Rubin 1990). End-customer satisfaction and repeat purchases go up (Rust and Oliver 1994; Taylor and Baker 1994), resulting in higher sales achieved by the franchise system. The costs associated with the franchisor policing of franchisee compliance with the agreement are also reduced (Kashyap, Antia, and Frazier 2012), thereby increasing the profitability.

Essay 2 assesses the impact of clustering on outlet-level sales performance. It studies the evolution of a single franchise system from its inception in 1977 till 2012. Here, my unit of analysis is the individual outlet. I use the Hausman Taylor Instrumental Variable (HTIV) (Hausman and Taylor 1981) regression technique to obtain regression estimates. As my model includes both time-varying (clustering and shared ownership) and binary time-invariant (ownership-based governance) regressors, the use of the HTIV approach is suitable because it handles both time-varying and time-varying endogenous regressors and corrects for endogeneity using internal instruments.

Overall, my dissertation comprises two separate research studies that fall under the same broad topic related to performance implications of growth, governance, and geography-related decisions in the context of business format franchising.

4.2) Practical Implications

The results of the present study have important implications for franchising practitioners. Essay 1 indicates that franchise systems can grow faster without necessarily increasing the franchisor terminations of franchisees by relying on ownership-based governance, higher royalty rate, and greater clustering of outlets. The findings of essay 2 demonstrate that the impact of clustering on outlets' sales is contingent on outlets' experience and the governance context. These findings lead to practical implications for franchisors and franchisees, as well as for those considering investing in franchise businesses (i.e., potential franchisees). In what follows, I consider the implications of my dissertation for each of the preceding stakeholders.

For franchisors. My findings suggest that franchisors should rely on ownership-based governance, on higher royalty rates, or on clustering of outlets in their quest for growth. Each of the preceding mechanisms enhances the monitoring motivation and/or ability of franchisors, helps them detect franchisee non-compliance, in turn increasing the credible threat of termination of errant franchisees. This increase in the credible threat serves to discourage franchisees from shirking, therefore, reducing the need of terminations.

Furthermore, I find that new franchisor-owned outlets lose sales when clustered with other outlets, regardless of whether these proximal same-brand outlets are newly established or mature. We ascribe this adverse effect of clustering to the lower absorptive capacity of newly established outlets, and their consequent inability to learn from other proximal same-brand outlets. When such absorptive capacity is increased, as it is in the case of mature outlets, the focal outlets' sales performance is not adversely impacted by multiple other proximal same-brand outlets. Thus, franchisors desiring to maximize sales performance of their owned outlets are advised to avoid establishing new outlets in proximity to other same-brand outlets (regardless of whether these outlets are newly established or mature). For mature franchised outlets, however, our findings suggest no such strictures need apply. These outlets' sales performance does not appear adversely impacted by proximity to other same-brand outlets. Once well-established, franchisor-owned outlets need not fear the intra-brand competition that plagues their less well-established counterparts.

For franchisees. For franchisee-owned outlets, we would make the opposite recommendations. Specifically, newly established franchisee-owned outlets, rather than fear the intrabrand competition from mature outlets of the same brand, are well advised to seek them out! These new outlets are demonstrated to gain from experience of proximal mature outlets. It is the mature franchisee-owned outlets instead that find themselves facing the prospect of intra-brand competition, and losing significant amount of sales.

For both franchisors and franchisees. For both franchisor- and franchisee-owned outlets, shared ownership of the focal and proximal outlets does appear to help facilitate

knowledge transfer and blunt intra-brand competition. Under shared ownership, newly established focal outlets clustered with mature proximal outlets outperform their counterparts clustered with new proximal outlets. This occurs for two reasons: first, all outlets, whether newly established or mature, gain from the opportunity to learn through direct contact (rather than solely rely on mimetic learning) from the experience of proximally located mature outlets under the shared ownership. Second, and as important, the fear of intrabrand competition is significantly mitigated by the common ownership of the focal and the proximal same-brand outlets.

Our analysis and the subsequent calculation of sales elasticities paint a nuanced picture of gains and losses attributable to proximity, depending on the ownership and experience levels of both the focal outlet and those in its proximity.

For potential investors. My findings would also be useful for someone considering investment in a franchise system. First, my results suggest that it is useful for investors to understand the growth strategy of franchise systems before investment, i.e., not just *how much*, but *how* such growth is achieved. Whereas franchise system growth is associated with more franchisor terminations, this tendency for terminations is significantly reduced when growth is achieved through ownership-based governance, higher royalty rate, or greater clustering of outlets. Each of the preceding mechanisms "shifts" the credible threat of termination, thereby eliciting a lower propensity for franchisee shirking. For those considering becoming franchisees, our findings suggest a note of caution in "chasing" high growth franchise systems. Although portrayed and perceived as "being on a tear", such systems tend to shed greater numbers of noncompliant franchisees unless they rely on a higher proportion of franchisor-owned outlets, charge higher royalty rates, or cluster the system's outlets. Taken together, these findings help potential franchisees avoid the trap of investing in franchise systems chasing unrestrained growth; rather, they might invest in growing franchise systems that mind how they grow.

Findings from my dissertation (specifically, essay 2) suggest that potential new franchisees should look at the clustering pattern of existing same-brand outlets before

accepting a site for their new outlet. My results indicate that new franchisee-owned outlets perform well when clustered with mature same-brand outlets. This is likely due to new franchisees' increased motivation to gain as much as possible from the experience gained and knowledge shared by the clustered mature outlets. Potential new franchisees are therefore advised to establish new outlets in proximity to mature same-brand outlets to gain from their accumulated experience. Further, new franchisees may also pursue multi-unit ownership strategy. Shared ownership of multiple outlets enhances motivation to share knowledge as well as dampens intra-brand competition, which positively impact newly established outlets' performance.

Overall, the results of this research provide much-needed guidance to franchisors, franchisees, and potential investors who want to better understand the performance outcomes of growth strategies, ownership decisions, and location choices over an extended period of time.

4.3) Limitations

My findings must be viewed in light of certain limitations. First, essay 1 uses a rich dataset comprising 75 franchise firms operating in multiple industries observed over a decade across 50 US states. These data include market-level (US state-level) locational information of outlets, but lack street-level address information of the individual outlets, precluding the estimation of clustering precisely at the individual outlet-level. Essay 2, however, relies on data comprising street-level addresses of outlets, enabling me to pinpoint the exact location of each of the 988 outlets in the sample. This dataset, however, comprises outlets of a single franchise system. The study of the evolution of a single franchise system controls for sector-specific heterogeneity, but also limits the generalizability of my findings. Ideally, panel data comprising multiple franchise systems from diverse industries with street-level outlet address information would be useful.

Another limitation that seems particularly relevant is that, in both essays 1 and 2, I rely on unobserved conceptual mechanisms or intervening variables when specifying the

rationale underlying hypothesized relationships. My first essay investigates the impact of franchise system growth on franchisors' terminations of franchisees, where I present my logic underlying the growth-terminations relationship relying on unobserved intervening variables – franchisors' monitoring ability and franchisees' compliance. Similarly, my essay 2 rests on the conceptual mechanism of knowledge transfer from proximal outlets to the focal outlet, which is unobserved. Future efforts to measure these unobserved intervening variables – for example, by conducting surveys with the individual outlet managers, or by designing laboratory experiments to provide a better understanding of the underlying conceptual mechanisms – and to integrate them with the archival data already available would add richness to the findings.

A third potentially important limitation relates to my use of secondary data. My reliance on longitudinal archival data, while affording rich insights into actual rather than reported behavior, cannot speak to the motivations underlying such behavior. I rely on proxy variables with the assumption that the relationship between the proxy and the construct is reasonable, and that the observed behavior patterns are consistent with my hypothesized effects. Additional efforts to integrate archival data with some form of primary data (e.g., survey-based data) would add significant value to the research on this topic.

4.4) Future Research Directions

The results of this study have direct implications for research on franchising going forward. In essay 1, I have so far investigated the impact of growth on the relationship and financial performance of franchise systems. A promising avenue to explore is to investigate how growth might impact financial returns, especially, stock returns. Many franchise systems are publicly held and are followed closely by investors, who reward high growth firms. At the same time, franchisees of these high growth franchise systems may not be enamored by growth when new outlets are opened in proximity to the existing ones. Investigating how growing franchise systems might balance the divergent interests of these key stakeholders represents a potential fruitful avenue for research.

In essay 2, I have looked at the impact of clustering of same-brand outlets on their sales performance, and how this effect is tempered by outlets' experience and the governance context. The focus of this study is on the same brand. In reality, it is common to find directly competing brands – i.e., outlets of different franchise systems belonging to the same industry or sector, located close to each other. These rival brands' outlets fiercely compete with one another to attract customers and gain sales. Findings of this study can be extended by investigating the impact of such inter-brand competition along with intra-brand competition. Specifically, we can categorize outlets based on their governance structure, e.g., a franchised outlet affiliated with a chain, a non-franchised outlet affiliated with a chain, and a non-franchised outlet not affiliated with a chain (e.g., a "mom and pop" store). In a particular market, a focal franchised-chain outlet may be located in proximity to several other outlets: 1) other same-brand franchised-chain outlets, 2) franchised-chain outlets of competing brands, 3) non-franchised-chain outlets of competing brands, and 4) non-franchised-non-chain outlets of competitors. Investigating the impact of clustering of these outlets on the focal outlet survival would represent a useful extension of my current study.

In summary, my research represents a useful step in exploring the performance implications of growth and geography (clustering) for franchise systems at two different levels of analysis – at the franchise system level and at the outlet level. It further assesses the moderating impact of ownership-based governance. I hope that my research stimulates further work relating growth and clustering to different measures of franchise system performance and exploring further relevant boundary conditions that might shift this critical relationship.

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TABLE 1
COMPARISON OF ESSAYS 1 AND 2

Dimensions	Essay 1	Essay 2
Research Questions	How does franchise system growth impact franchisor terminations and consequently its financial performance?	How does a franchise system's evolving growth pattern impact the individual outlets' performance?
Theoretical Lenses Used	Agency Theory, Governance, Cluster Theory (Monitoring Efficiency)	Cluster Theory (Knowledge Transfer), Intrabrand Competition, Governance
Research Context and Data Collected	75 franchise systems across 50 US states observed from 1993 to 2004	988 outlets of a single franchise system across 50 US states observed from 1977 to 2012
Unit of Analysis	Franchise System	Individual Outlet
Outcome Studied	Franchisor Terminations, Sales, Profit	Outlet-Level Sales Revenue
Predictors Included	Growth, Ownership-Based Governance, Royalty Rate, Clustering	Clustering, Shared Ownership, Ownership-Based Governance
Endogeneity Corrected Method Used	Control Function (Petrin and Train 2010)	Hausman Taylor Instrumental Variable (1981)
Principal Findings	Franchise system growth increases franchisor terminations of franchisees, but growth relying on governance, royalty rate, and clustering decrease it. Greater number of terminations improve franchise systems' financial performance	The impact of clustering on outlet-level sales is contingent on outlet experience and governance context

Curriculum Vitae

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EDUCATION

Doctor of Philosophy (Marketing), Ivey Business School, Western University − London, Canada, June 2017

Dissertation: The Impact of Growth, Governance, and Geography on Franchise Performance

Committee: Kersi D. Antia (advisor), Neil T. Bendle

Master of Science (Marketing), Carey Business School, Johns Hopkins University − Baltimore, USA, December 2011

Master of Business Administration (Marketing), University of the Punjab − Lahore, Pakistan, June 1998

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HONOURS AND AWARDS

Al Mikalachki PhD Research Fund Award, 2016

URISA's Be Spatial Student Bursary, 2015

Brock Scholarship for Academic Excellence, 2014-16

Plan for Excellence Doctoral Fellowship, Ivey Business School, 2013-17

Fulbright Scholar Program, 2010-11 (Master's Program at Johns Hopkins University)

Gold Medal, University of Punjab, for university-wide top ranking in Bachelor's Program

RESEARCH INTERESTS

I rely on state-of-the-art econometrics and GIS-informed spatial techniques to investigate the impact of 1) growth, 2) governance, and 3) geography on firm performance in

business-to-business relationships. I am also interested in the appropriate use of firm performance metrics by marketing scholars and practitioners alike.

MANUSCRIPTS UNDER REVIEW

Moeen N. Butt, Kersi D. Antia, Brian Murtha, and Vishal Kashyap, "Clustering, Governance, and Individual Outlet Sales: A Multi-Year Analysis of an Evolving Franchise System", in preparation for third round submission to *Journal of Marketing*

Neil T. Bendle and Moeen N. Butt, "The Misuse of Accounting-Based Approximations of Tobin's q in a World of Market-Based Assets", in preparation for third round submission to *Marketing Science*

Moeen N. Butt and Kersi D. Antia, "Franchise System Growth and Franchisor Terminations", resubmitted to *Journal of Marketing Research*

WORK IN PROGRESS

Moeen N. Butt, Kersi D. Antia, Kenneth H. Wathne, Robert Fisher, and Shane Wang, "Crisis Management in a Co-Branding Alliance Network", targeted to *Journal of Marketing*

Moeen N. Butt, Kersi D. Antia, Brian Murtha, and Vishal Kashyap, "Interbrand and Intrabrand Clustering: Their Impact on Outlets' Survival", targeted to *Strategic Management Journal*

Moeen N. Butt and Kersi D. Antia, "Governance Persistence and Substitution in Dual Distribution: Their Impact on Firm Reputation", targeted to *Journal of Marketing*

CASES

Weifen Zhuang, Yongquan Lan, Zhaowei Miao, Kersi D. Antia, and Moeen N. Butt (2015). "Xiamen Airlines: Bracing for Impact". Ivey Publishing, Product Number: 9B15A015

Moeen Butt (2012). "FlavorAdd: A Behind-the-Counter Mystery". Asian Journal of Management Case Conference. Lahore University of Management Sciences

Moeen Butt and Asif Malik (2012). "A Note on Secondary Data in Pakistan: Education and Healthcare Indicators". Lahore University of Management Sciences

CONFERENCE PRESENTATIONS

"Clustering, Governance, and Individual Outlet Sales: A Multi-Year Analysis of an Evolving Franchise System" (with Kersi D. Antia, Brian Murtha, and Vishal Kashyap), INFORMS Marketing Science Conference, Los Angeles, June 2017

"Clustering, Governance, and Individual Outlet Sales: A Multi-Year Analysis of an Evolving Franchise System" (with Kersi D. Antia, Brian Murtha, and Vishal Kashyap), Winter Marketing Educators' Conference (Winter AMA), Orlando, February 2017

"Crisis Management in a Co-Branding Alliance Network" (with Kersi D. Antia, Kenneth H. Wathne, Robert Fisher, and Shane Wang), Winter Marketing Educators' Conference (Winter AMA), Orlando, February 2017

"Proximity, Ownership-Related Governance, and Individual Outlet Sales: A Multi-Year Analysis of an Evolving Franchise System" (with Kersi D. Antia, Brian Murtha, and Vishal Kashyap), Institute for the Study of Business Markets (ISBM), Biennial Academic Conference 2016, Atlanta, August 2016

"Proximity, Ownership-Related Governance, and Individual Outlet Sales: A Multi-Year Analysis of an Evolving Franchise System" (with Kersi D. Antia, Brian Murtha, and Vishal Kashyap), Theory + Practice in Marketing Conference, Houston, May 2016

"A Pace Too Brisk? Firm Growth and its Impact on Performance" (with Kersi D. Antia), Winter Marketing Educators' Conference (Winter AMA), Las Vegas, February 2016

"A Pace Too Brisk? Firm Growth and its Impact on Performance" (with Kersi D. Antia), GIS Day Conference, London ON, November 2015 [poster]

"Growth, Governance, and Geography in Distribution Channels Research" (with Kersi D. Antia), Summer Marketing Educators' Conference, Chicago, August 2015

"A Pace too Brisk, A Span too Wide: Firm Growth and its Impact on Performance", (with Kersi D. Antia), INFORMS Marketing Science Conference, Baltimore, June 2015

"The Use and Misuse of Tobin's q in Marketing", (with Neil Bendle), Marketing Strategy Meets Wall Street IV, Singapore, January 2015

"The All Powerful q: The Use and Misuse of Tobin's q in Marketing", (with Neil Bendle), Canadian Empirical & Theoretical Symposium in Marketing Strategy, Hamilton, ON, May 2014 [poster]

TEACHING INTERESTS

Marketing Metrics, Retailing, Channel Design and Management, Brand Management, Marketing Management, Marketing Research

TEACHING EXPERIENCE

Teaching Fellow, Lahore University of Management Sciences (LUMS) −
Lahore, Pakistan, Fall 2012-Spring 2013

Lecturer, FAST-National University of Computer and Emerging Sciences −
Lahore, Pakistan, Spring 2012

Lecturer, FAST-National University of Computer and Emerging Sciences −
Lahore, Pakistan, Fall 2008-Spring 2010

PROFESSIONAL EXPERIENCE

Marketing Manager, Ihsan Sons (Private) Limited −
Lahore, Pakistan, 2005-2008

Deputy Manager Marketing, Sapphire Fibers Limited −
Lahore, Pakistan, 1998-2005

TRAINING AND WORKSHOPS

Teaching Seminar, Ivey Business School, September-December 2014

PhD Camp, Institute for the Study of Business Markets (ISBM), San Francisco, July 27-August 1, 2014

Introduction to GIS, Map and Data Centre-Western University, London, October 3, 2014

The Language of Conference Presentations, Western Teaching Support Center, London, June 10-12, 2014

ArcGIS Desktop, Network Analysis Modules, June-July 2014

Advanced Statistics Workshop, Ivey Business School, May 12-23, 2014

Training Camp, Monitoring & Evaluation, ASP-LUMS, Lahore, July 16-20, 2012

Training Camp, Training of Trainers, ASP-LUMS, Lahore, June 4-8, 2012

PROFESSIONAL AFFILIATIONS

American Marketing Association (AMA)

Urban and Regional Information Systems Association (URISA) Ontario

REVIEWING

American Marketing Association (AMA) Summer AMA Conference, San Francisco, CA, August 2017

BMM-EMAC 8th Biennial International Conference on Business Market Management, Graz, Austria, July 2017

European Marketing Academy (EMAC) Winter Educators Conference, Groningen, Netherlands, May 2017

American Marketing Association (AMA) Winter Educators Conference, Orlando, FL, February 2017

European Marketing Academy (EMAC) Winter Educators Conference, Oslo, Norway, May 2016

American Marketing Association (AMA) Winter Educators Conference, Las Vegas, NV, February 2016

American Marketing Association (AMA) Winter Educators Conference, San Antonio, TX, February 2015

OTHER SERVICE

Faculty Representative, Admission Committee, LUMS, 2012-2013

Faculty Representative, Undergraduate Curriculum Committee, LUMS, 2012-2013

Student Counselor, FAST Business School, 2009-2010

Faculty Advisor, Industry Liaison Committee, FAST Business School, 2009-2010

DOCTORAL COURSEWORK

Marketing

Theories of Marketing	Kersi D. Antia
Marketing Metrics	Raji Srinivasan
Consumer Behavior	Matthew Thomson

Experimental Design	Allison Johnson
Decision Making	Neil T. Bendle

Quantitative

Mathematics for Economists	Andres Carvajal
Econometrics & Quantitative Methods I	John Knight
Econometrics & Quantitative Methods II	Youngki Shin
Time Series Econometrics	John Knight
Univariate Analysis	Chris Higgins
Structural Equation Modelling	Bradley A. Corbett

Other Coursework

Research Methodology I	Matthew Thomson
Research Methodology II	Matthew Thomson
Foundations of Management Teaching	Debbie Compeau
Cross Disciplinary Research	Mark Zbaracki