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College Football Recruiting: The Role of Relational Rivalry in Factor-Market Competition

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Scott M. Soltis[1], Chris Sterling[2], Walter J. Ferrier[1], and Stephen Borgatti[1]

Abstract

Owning to its focus on the competitive intensity between firms across both product and resource markets, the theory of factor-market competition (FMC) sparked interest among strategy scholars who study the drivers, processes, and outcomes related to inter-firm competition. Yet, despite some initial theoretical advancement, little progress has been made in this potentially important research stream. In this study, we empirically explore elements of relational rivalry between firms (explicit rivalry, capability to compete, and status similarity) drive the intensity of FMC. Using the market for high school recruits among National Collegiate Athletic Association (NCAA) football teams as our research setting, we show that these psychosocial aspects of relational rivalry (as well as some product-market based structural aspects) indeed drive FMC. Further analysis reveals that the nature of these relationships is contingent on another underexplored element of FMC: factor quality. As such, our study is an early test of the theory of FMC, a refinement of the theory to account for resource properties, and an

[1]University of Kentucky, Lexington, USA
[2]California State University, Fresno, USA

Corresponding Author:
Scott M. Soltis, University of Kentucky, 323Q Gatton College of Business and Economics, Lexington, KY 40506, USA.
Email: scott.m.soltis@uky.edu

extension beyond structural aspects into the role of relational rivalry on the intensity of FMC.

Keywords
competition, resource based view, social networks, strategy or strategic management, network analysis

Interfirm competition and competitive advantage have arguably served as the principal foci of research and managerial thought in strategic management. Among the important domains of research in the field is the crucial role that resources play in the firm's ability to achieve and sustain competitive advantage (Barney, 1991). Although scholarly inquiry about how firms develop and leverage resources to achieve gains in product markets is commonly understood, the nature of competition for these resources remains a largely understudied phenomenon.

Built on the logic of strategic factor markets (Barney, 1986), theories of factor-market rivalry (FMR) focus on the conditions and circumstances that drive "competition over resource positions" (Markman et al., 2009, p. 423) manifest in the processes associated with selecting and acquiring resources the firm believes to provide value for itself (Capron & Chatain, 2008). Competitive advantage occurs only when value-creating resources are heterogeneously distributed among firms. To arrive at such a situation, the focal firm must be able to identify, compete for, and acquire a given resource ahead of rivals (Peteraf, 1993). Establishing a better understanding of why firms struggle and compete for resources is important because "resource heterogeneity is the *sine qua non* of competitive advantage" (Peteraf, 1993, p. 185). Although the link between resources, competitive behavior, and performance is becoming clearer, we know little about how, why, and with whom firms compete for resources.

Markman and colleagues (2009) urged that future research in FMR should empirically validate the theory's propositions and extend its theoretical boundaries. Yet, only a handful of studies to date have examined what drives FMR. These include, for example, the exploration of how scarce supply chain resources (Ellram et al., 2013), technological resource positions and preemption via patent litigation (Gianiodis et al., 2019; Theeke & Lee, 2017), labor market frictions (Allen et al., 2022; Opengart et al., 2018), and the pricing of scale-free resources (Asmussen, 2015) predict FMR. Further, although some studies provide support for the relationship between product-market [un-]commonality and FMR—a key tenet of the theory of FMR—they

are constrained to identifying competitors solely on common objective, structural aspects of industry and market contact.

In this study, we empirically explore whether elements of relational rivalry between firms (explicit rivalry, capability to compete, and status similarity) drive the intensity of FMR. Scholars have recently argued that extant theories of FMR are "constrained to structural rivalry...with no consideration of subjective features of rivalry like competitive tension, psychology of rivalry, or relational rivalry" (Kilduff, 2019, p. 791). Drawing from the socio-cognitive approach to competitor identification—see Gur and Greckhamer (2019) for a comprehensive review—we introduce and explore the influence of "relational rivalry" on the intensity of factor-market competition (FMC) between a pair of firms (Kilduff, 2019; Kilduff et al., 2010). A relational rival "…is a specific, identifiable competitor that has a historical, ongoing, and subjective relationship with the focal firm that involves higher subjective stakes of the relationship and its outcomes" (Kilduff, 2019, p. 777). Further, Kilduff (2019) notes that "it is certainly possible that interfirm relational rivalry could also…affect factor-market competition" (p. 791). We agree and believe that our study is uniquely designed to extend FMR theory by developing the logic for and empirically testing the influence of three subjective attributes of the competitive relationship between firms that define relational rivalry on the intensity of FMC between them[2]. Namely, we study rival salience (the existence of a mutually perceived relational rivalry), the perceived capability to contest (current and recent relative product market performance), and status similarity (long-term, historical relative product market performance) as drivers of competitive tension which, in turn, manifests as increased levels of FMC (Chen et al., 2007; Kilduff, 2019).

Our second research question centers around whether the nature of the relationships between elements of relational rivalry and FMR is contingent on another underexplored element of FMC: factor quality. Markman and colleagues (2009) draw attention to how the intrinsic nature of resources themselves can motivate factor rivalry between firms. Attributes of resources include, for example, scarcity, complementarity, mobility, versatility, substitutability, and overall quality (Adegbesan, 2009; Capron & Chatain, 2008; Chatain, 2014; Gianiodis et al., 2019; Markman et al., 2009; Schweiterman & Miller, 2016). Here, we further extend the theory of FMR by exploring how the dynamics of competition differ for different levels of resource quality.

As noted by Markman and colleagues (2009), "…factor-market rivalry centers on resources as axes of competition rather than on their ultimate tie to sustainable competitive advantage in product markets" (p. 425). Therefore, we restrict our empirical investigation to a particular resource context. We study a common, but very particular type of factor-market competition: The

recruitment and selection of human factors. Given that human resources vary greatly in terms of quality (e.g., knowledge, skills, abilities, motivation) we are also able to test how competition for resources is influenced by resource quality. Our study of factor-market competition takes place in a setting in which the attributes and identities of competitors within the product market are well-defined and competition for strategic factors (human resources) is unambiguously crucial for organizational success. We study patterns of competition for human resources in Division I NCAA college football. In this setting, new recruits (high school football players) are undoubtedly the most important factor sought out by teams. Due to the labor-intensive nature of the industry, the ability to win in this "factor market" is a critical prerequisite for success in the "product market," that is when football teams compete on the playing field.

Background and Theory

Drawing, in part, from concepts in competitive dynamics, competitor identification, and the awareness-motivation-capability (AMC) framework (Chen, 1996; Chen et al., 2007; Smith et al., 2001), the theory of FMR explains the managerial, organizational, and market-level antecedents that motivate firms to compete in factor markets to gain competitive advantage (Markman et al., 2009) The theory of FMR offers, among other things, a useful framework that specifies that varying levels of the awareness, motivation, and capability of the firm to compete aggressively in factor markets are influenced by the degree of product-market and resource commonality between firms.

Underpinning both competitive dynamics and FMR, the AMC framework establishes the preconditions for dyadic competitive interaction among firms in product markets and/or factor markets (Chen, 1996; Markman et al., 2009; Smith et al., 2001). Here, competitive action occurs only when the firm is aware of a given competitor, is motivated to attack (or respond), and is capable to carry out the action. In most competitive dynamics research, competing firms are identified by objective, structural properties of the relationship between them, such as market commonality, multimarket contact, and resource similarity (Chen, 1996; Gimeno, 1999; Yu & Cannella, 2007). Yet, a key tenet of the theory of factor-market rivalry explains "why firms compete over resources in factor markets even in the absence of product-market commonality" (Markman et al., 2009, p. 424). Indeed, Gianiodis and colleagues (2019) caution that "an overreliance on an industry lens may cause some scholars to overlook adversarial encounters among unrelated firms that do not engage each other in product markets but may contest each other in factor markets (Ndofor et al., 2011; Sirmon et al., 2008)" (p. 447). For

instance, the recent global microchip shortage aptly illustrates this situation. Firms from well over 100 different industries that do not compete against each other in product markets – for example, consumer electronics, automakers, medical devices, household appliances, etc. – competed fiercely for supply contracts with the world's top microchip foundries. Thus, the theory of FMR represents a significant departure from the conventional wisdom associated with competitor identification—and the AMC framework—commonly based on industry segments or strategic groups that exist within industries.

Research in competitor identification also includes the consideration of subjective, socio-cognitive factors to identify and categorize competing firms (Bergen & Peteraf, 2002; Peteraf & Shanley, 1997; Porac et al., 1995; Reger & Huff, 1993; Reger & Palmer, 1996; Tsai et al., 2011). Despite its early focus on the objective, structural drivers of competitive behavior (same SIC code, strategic similarity, etc.), recent work in competitive dynamics has explored the role of important subjective psycho-social attributes of competition between firms, such as competitive tension, identity domains, and managers' interpretation of perceived competitive threats that evolve over time in dynamic competitive relationships (Chen et al., 2007; Kilduff, 2019; Kilduff et al., 2010; Livengood & Reger, 2010; Marcel et al., 2011). Extending these ideas to the theory of FMR, we argue that the firm's motivation and decision to compete with a given rival in factor markets is a function of how it sees and interprets the situation in the socio-subjective competitive domain. Accordingly, while controlling for the structural aspects of product-market [un-] commonality, we argue that the intensity of FMC between a pair of firms is driven by the extent to which they are "relational rivals" (Kilduff, 2019). This view of rivalry helps us overcome the potential limitations associated with competitor identification based solely on industry or market classifications and enables us to account for intense rivalry in factor markets in the absence of market commonality.

Relational Rivalry

Structural rivalry involves "competing firms…that are currently vying for the same scarce resource or outcomes, commonly identified…as within the same industry, or market or strategic group" (Kilduff, 2019, p. 776). By contrast, relational rivalry is conceptualized as "…a relationship a focal competitor has with a target competitor—formed by the experiences of similarity over time—that heightens the subjective stakes of competition for the focal competitor independent of the objective characteristics of the situation (Kilduff, 2019, p. 776). A relational rivalry is formed when firms have competed against each other—either in product markets or factor markets—for an extended period of

time, are similar or evenly matched in terms of performance or reputation, and/or are both widely known to be rivals in the eyes of stakeholder groups (Kilduff, 2019).

In sharp contrast to the mechanisms that normally result in competitive forbearance between competing firms—i.e., multimarket contact and resource similarity (Gimeno, 1999)—relational rivals have a heightened awareness of each other, feel an amplified motivation to attack, and believe that each other possesses the capability to attack (Kilduff, 2019). More specifically, firms attack each other in product markets by aggressively carrying out a series of competitive moves – for example, new product introductions, price cuts, advertising campaigns, etc. – with the intent to improve relative firm performance. Consequently, when examined through the lens of the AMC framework, relational rivals exhibit a higher likelihood to attack each other owing to a sustained high level of competitive tension (Chen et al., 2007; Kilduff et al., 2010).

Drawing from the socio-cognitive approach to competitor identification and relational rivalry, we argue that the extreme motivation to compete in factor markets results from the salience of the rivalry in the eyes of both competing firms and the stakeholders that surround them, the belief that each firm possesses a similar capability to compete, and the similarity in each firm's status.

Rival Salience

Relational rivalries exhibit a heightened salience between the focal competitors and a target firm vis-à-vis other competitors (Kilduff, 2019). The institutionalization of relational rivalries is marked by several cognitive, normative, and regulative elements (Scott, 1995), a shared language used to describe the interfirm relationship (Rindova et al., 2004), and clear recognition of the rivalry in the eyes of organizational members, other competitors, and stakeholders. A firm whose managers have strong feelings of competitive tension about a relational rival often increases the competitive intensity of product-market actions toward the rival (Chen et al., 2007; Kilduff et al., 2010). To the extent that key stakeholders such as boards of directors, investors, and others recognize another firm as a rival, this resultant tension likely spreads throughout the organization and is felt most acutely by those in positions to make and enact decisions which may help or harm competitive positioning with the rival. We argue that firms that hold—and/or are perceived by stakeholders to hold—a long-standing enmity, a profound negative affect toward, or a heightened level of perceived competitive tension toward each other will be most salient to each other (Chen et al., 2007; Ingram & Yue,

2008; Kilduff, 2019) and, consequently, will be highly motivated to compete more vigorously against each other in factor markets.

In alignment with the theory of FMR, Capron and Chatain (2008) argue that attacking a product-market rival in the factor market would likely be both practical for the firm and personally gratifying for managers. More specifically, these authors (2008) suggest the presence of a strong desire of a firm to preemptively inflict woe upon rivals by taking actions to "degrade the resource position of its rivals" (p. 98), "deliberately weaken a rival's resource position" (p. 100), or to "make its rivals' resources less acceptable to…parties associated with the broader institutional context" (p. 101). Indeed, a manager who beats out a rival for a vital resource reflects a strong competitor orientation and would be especially enthusiastic to not only gain a valuable resource for the firm (differential gains), but also deny the rival's ability to acquire the resource (differential losses) (Capron & Chatain, 2008). Markman and colleagues (2009) refer to this as resource captivity and preemption. Chatain (2014) argues that the motivation to aggressively preempt a rival's access to key resources often outweighs the likelihood of forbearance in attacking a competitor. We argue that this motivation is amplified for relational rivals. Indeed, within the context of competition for human resources—especially in industries in which human resources serve as the principal critical success factor—the firm's motivation to out-compete its most salient rivals for key resources is likely to be particularly strong. Further, owing to the heightened awareness between relational rivals, each firm is less likely to be blindsided by them or fall victim to factor-market myopia underscoring the important influence of strategic awareness in factor market competition (Gianiodis et al., 2019; Opengart et al., 2018; Zajac & Bazerman, 1991).

Our research setting focuses on competition for human factors (football players) among salient competitors that form relational rivalries (football teams). For instance, The University of Alabama and Austin Peay University rarely play each other and have very few overlapping characteristics which decrease the likelihood of the formation of a relational rivalry and, therefore, are less likely to compete for common high school football recruits. By contrast, Alabama and Auburn University have competed each year in a contest dubbed "The Iron Bowl" since 1893, have many overlapping characteristics, and are likely to compete fiercely for the same players. Thus, such longstanding, institutionalized rivalries unambiguously heighten both the perceived and realized salience of the firms that form the rivalry and increase the intensity of FMC between them.

H1: Rival salience will be positively related to the intensity of factor-market competition.

Capability to Contest

Marcel and colleagues (2011) argued that managers are more aware of specific other firms and respond to cues and stimuli associated with the nature of the competitive relationship. This serves as a key source of competitive tension that results in a heightened awareness of specific other firms (Chen et al., 2007). Research drawing from the AMC framework suggests that a variety of organizational attributes of rival firms—e.g., firm size, resources, past competitive behavior, or status—serve as socio-cognitive cues on which managers often focus attention and sources of competitive tension (Chen et al., 2007; Marcel et al., 2011; Chen & Miller, 2012). Managers of rival firms perceive an elevated level of competitive tension toward each other when they share a reciprocal and mutual belief that they each possess the capability to attack one another. This is called a rival's capability to contest, a meta-construct that serves as a significant antecedent to competitive tension and the likelihood of a competitive attack or response (Chen et al., 2007). Consistent with Kilduff's (2019) framework of relational rivalry, we argue that firms that believe or perceive that they are evenly matched with a relational rival in product markets should also compete more intensely in factor markets. This argument stands in contrast to the logic associated with forbearance in competitive situations marked by multimarket competition and resource similarity or dependence (Gimeno, 1999; Yu & Cannella, 2007). Indeed, whereas Markman and colleagues (2009) argue that the motivation to attack or forebear is associated with various combinations of product-market and factor-market overlap, we predict that forbearance to compete in factor markets among relational rivals is absent.

Drawing from the similarity paradigm of competitor identification (Chen, 1996; Chen et al., 2007), competitive tension in factor markets should be highest between firms that share similar competitive short-run and long-run outcomes in product markets. When firms are evenly matched in terms of past performance, managers perceive and associate this with the rival's capability to contest each other in the marketplace (Chen et al., 2007; Kilduff et al., 2010). We, therefore, predict that the capability to contest will intensify competition in factor markets.

> **H2:** Similarity in firms' capability to contest will be positively related to the intensity of factor-market competition between them.

Status Similarity

Whereas the capability to contest is centered on the current state of rivalry between firms, we also expect longer-term, historical firm attributes to

influence the intensity of FMC. Beyond structural competition, managers take path-dependent, socially constructed attributes—like status, shared identities, reputation, or organizational image—into account when identifying competitors (Ingram & Yue, 2008; Labianca et al., 2001; Livengood & Reger, 2010; Washington & Zajac, 2005). One such social evaluation is relative status, defined as esteem, prestige, respect, and social standing relative to other firms which has a strong effect on the nature of competition (Piazza & Castellucci, 2014; Podolny, 1993). Past research in strategy, organization theory, sociology, and psychology has studied how relative status influences awareness, motivation, and capability. For instance, studies by Graffin et al. (2013) and Kovács & Sharkey (2014) suggest a positive relationship between relative status and awareness. Washington and Zajac (2005), using the empirical context of basketball teams within the NCAA, found that relative status was positively related to motivation to compete.

We argue that firms that are evenly matched in terms of status are likely to exhibit a culture that engenders strong competitor orientation, increases awareness of each other, and strengthens their motivation to beat each other in any way possible (Armstrong & Collopy, 1996; Kilduff et al., 2010). Status-similar firms are more likely to form a relational rivalry—independent of product-market commonality—and are likely to compete aggressively against each other in both product and factor markets. Therefore, we predict that organizations of similar status will compete more heavily for common resources.

H3: Status similarity will be positively related to the intensity of factor-market competition.

Factor Quality

Markman and colleagues (2009) note that future research should parameterize key attributes of resources for which firms compete. Yet, few studies to date have examined how attributes of the resource being contested influence the dynamics of FMR. Asmussen (2015) provides a rare glimpse into the role of resources in FMR and posit that the expected value of "scale-free resources"—those that can be acquired and used by multiple firms at the same time—decreases the intensity of factor-market competition for them when competing firms have a high level of product-market commonality. Building on Capron and Chatain's (2008) ideas about differential losses, Chatain (2014) argues that the value of preemption for high-quality resources is sometimes stronger than the value of resource use. Similarly, Schwieterman & Miller (2016) argue that even in the absence of product-market commonality, firms

can preemptively force rivals to use lower-quality resources. This suggests that firms are strongly motivated to compete for the highest quality resources to deny a rival's access to those resources.

The resource-based view of the firm centers on a set of attributes of resources that contribute to competitive advantage (Barney, 1991). Resources that are valuable, rare, inimitable, and have organizational complements (VRIO) enable the firm to uniquely exploit opportunities and/or neutralize threats. Thus, consistent with the theory of FMR, competition for VRIO factors that provide the firm with scarcity rents will be more intense than competition for commodity-like or scale-free resources in greater abundance and/or have little opportunity costs associated with their acquisition and use (Capron & Chatain, 2008; Levinthal & Wu, 2010). High-quality human resources, in particular, are scarce, discrete, and are not scale-free (Barney & Wright, 1998). In terms of labor markets, substantial variation exists among the resources leading to significant information asymmetries as well as substantial costs associated with the search for information (Fulmer & Ployhart, 2014). Further, if a firm believes that by acquiring the new resource gives it a combinatorial advantage over rivals, or if the firm's acquisition of the resource will hurt a rival by denying it access to the resource, the firm will be more likely to preemptively acquire the resource (Adegbesan, 2009; Capron & Chatain, 2008; Chatain, 2014). Indeed, when a firm is pursuing a high-quality resource, its most salient rivals are likely to be aware of the firm's intentions and motivations to deny the rival of the resource (Capron & Chatain, 2008).

By contrast, the aggressive pursuit of low-quality resources would not be worth the risks of retaliation and likely lead to mutual forbearance and avoidance of engagement (Markman et al., 2009). Given the heightened state of awareness that rivals have for one another, there could potentially be a negative effect of relational rivalry on competition at the lower levels of factor quality whereby rivals go out of their way to not engage for fear of escalation or retaliation. One attenuating factor to this potential negative effect is the subjective nature of human capital value assessments. While there may be consensus on the knowledge, skills, abilities, and other characteristics that make a recruit 'higher quality', individual managers might vary from these assessments and view a resource as undervalued and therefore worth the risks of pursuit even if (or possibly because) a rival has interest.

In total, owing to the strong psychological and emotional interdependence between relational rivals (Chen et al., 2007; Kilduff, 2019; Kilduff et al., 2010), we predict that the positive effects of rival salience, capability to contest, and status similarity on the intensity of FMC, we predicted above, will be more pronounced when the resource sought is of high quality.

H4a: The positive relationship between rival salience and the intensity of factor-market competition will strengthen for higher-quality resources.
H4b: The positive relationship between the capability to contest and the intensity of factor-market competition will strengthen for higher-quality resources.
H4c: The positive relationship between status similarity and the intensity of factor-market competition will strengthen for higher-quality resources.

Method

We speculate that one key reason that there have been so few tests and extensions of the theory of FMR is the difficulty of obtaining suitable data. Indeed, to adequately test many of the propositions put forth in FMR, it would be necessary to pinpoint exactly which resource(s) firms compete for and establish dyadic competitive relationships in both the product and factor markets that include *all* competing firms. The level of publicity, transparency, and comprehensiveness of Football Bowl Subdivision (FBS) NCAA football recruiting data enables us to explore FMR in ways that would be difficult to accomplish in other research settings. The FBS is the highest level of collegiate football and is a significant source of revenue for member institutions as evidenced by the recent six-year $7.8 billion dollar contract by ESPN to retain exclusive rights to air the College Football Playoff (Dinich, 2024). The data for our sample were taken from scout.com which was the leading news organization at the time for collegiate recruiting (scout.com is now part of 247sports.com owned by Paramount). Information on player preferences and university offers were collected by a team of reporters leveraging relationships to universities, high schools, and the athletes directly. Information on player quality was derived from a methodology which analyzes NFL player profiles from when they were high school athletes.[1] Our sample includes the entire population of organizations (119 university football teams) in a particular product market (FBS college football) and all potential human factors (2750 high school football recruits) for the 2008 recruiting season. Indeed, the fine-grained nature and comprehensiveness of our data not only enhances opportunities for theory testing, but can also increase generalizability (Day et al., 2012; Fonti et al., 2023; Wolfe et al., 2005).

The time span of our study (2006–2008) was purposefully selected because it represents a period of stability of team membership among the Power-5 athletic conferences[3]. This helps us avoid the potential confounding influence of exogenous shocks in the NCAA football "product-market." For example, when the University of Missouri shifted from the Big-12 conference to the Southeastern Conference in 2012, this would have disrupted the integrity and

validity of several of our variables of interest and key control variables: Rival salience, capability to compete, and strategic group co-membership. Furthermore, the expansion of conferences has likely had significant impact on the status of a firm based on prior research in brand equity in high-level intercollegiate athletics (Carr, 2014; Gladden et al., 1998). Our study timeframe also precedes the use of the NCAA Transfer Portal (debuted in 2018) which created a new labor market involving existing NCAA football players. Consequently, football teams are now less reliant on recruiting top-tier high school players and instead using the transfer portal to poach players from other teams.

Data and Variables of Interest

Intensity of Factor-Market Competition. Defining a phenomenon that has not heretofore been empirically investigated or operationalized presents some challenges. Current theories of FMR remain unclear as far as how factor-market competition is manifest and observed. Capron and Chatain (2008) define FMR as the likelihood of the focal firm to deploy actions against its competitors' resources in factor markets. Markman and colleagues (2009) define it more generally as competition over resource positions. In an effort to be consistent with both prior research in competitive dynamics and current theories of FMR, we measure our dependent construct—*the intensity of factor-market competition*—as the number of distinct human resources (recruits) that a pair of organizations actively sought to acquire in common. Given some top athletes receive dozens of scholarship offers, we only counted co-recruitment as occurring when (1) both teams had made an offer to the recruit and (2) the recruit had publicly reported both schools were under final consideration. More specifically, we started with a 2-mode player-by-team matrix Z in which $z_{ij} = 1$ if player i received and considered offer from team j, and $z_{ij} = 0$ otherwise. Using the "Affiliations" routine in UCINET VI (Borgatti et al., 2002) we computed the matrix product Z'Z to construct a team-by-team matrix C of recruiting overlap. In this matrix, c_{ij} gives the number of recruits that were being actively recruited by both team i and team j. The higher the number of recruits the pair of teams have in common, the greater the intensity of FMC between them.

We also constructed matrices that were a subset of this larger dataset to examine effects on the intensity of factor market competition for various levels of resource (recruit) quality. To determine the quality of a recruit, we used ratings provided by scout.com, which is a football talent rating organization that is widely used the assessment and screening of high school athletes. The website uses a mix of objective and subjective criteria to evaluate and rate each

high school player in the nation on a 5-point scale (expressed as one to five "stars") where top recruits were given five stars. In order to examine the differential impacts of our independent variables on competitive intensity for different levels of recruit quality we constructed a separate factor market competition network for each of the four levels of recruit quality we studied (only eleven 1-star athletes were recruited and so we did not analyze the 1-star competition network). Our approach of using publicly available "star-based" ratings by expert evaluators is similar to that used in recent research on hotel quality ratings (Wang et al., 2016).

Rival Salience. For most football teams in our sample, some particular games they play are widely known as important "rivalry games"—e.g., the Iron Bowl, Red River Shootout, Clean Old-fashioned Hate, The Commander-in-Chief's Trophy, Bedlam—that are reflective of each school's longstanding mutual identification of each other as bitter rivals. These high-stakes games garner the most attention by the players, coaches, student body, alumni, and the media. To avoid biasing the results, we turned to sources that are entirely independent of other data sources we used in our study; namely, a pre-existing compilation of rivalry games found in Wikipedia and other popular sources (e.g., NCAA.COM). Most football programs in our sample played one to three of these rivalry games each season, and many dating back nearly 100 years which suggests the stability and validity of the rival salience construct. So, for each dyad of teams in our sample, we coded rival salience as 1 if they play in a rivalry game and coded it 0 if they do not.

Capability to Contest. Drawing from Chen and colleagues' (2007) study of competitive tension, the perception of a rival team's capability to contest the focal firm rests, in part, on the extent to which they exhibit performance similarity in the product market. Given this, we calculated the capability to contest using the difference in each team's performance at the end of the 2006 and 2007 football seasons. For our measure, we used the performance ratings of each team reported by MASSEYRATINGS.COM (one of six computer-based ratings formerly used by the Bowl Championship Series). Using the Massey Rankings, we created two matrices—for 2006 and 2007—consisting of absolute difference scores for all team dyads in our sample. We reverse coded the values in these matrixes to arrive at performance similarity scores for each pair of teams in 2006 (*t-1*) and 2007 (*t*)[4]. High scores indicate that the teams have a similar capability to contest, low scores indicate dissimilarity.

Status Similarity. Owing to history, tradition, achievement, and celebrity, there is great variation in recognized status across football teams. According to the

AMC framework (Chen et al., 2007), status is likely to serve as a key antecedent of competitor identification and the formation of relational rivalries (Kilduff, 2019; Kilduff et al., 2010; Tsai et al., 2011). This, then, will likely impact the intensity of FMC between firms.

To measure the extent to which a pair of football teams share similar level of status, we constructed a measure of program status from data provided by *ESPN's* research department. This composite measure of football program status includes for each team a historical range (1936–2007) of important team- and player-level indicators that inform the status ranking for each football team: National championships, bowl wins, final season rankings, All-Americans, NFL draft picks, etc. Since we expected recruits (primarily ages 17 or 18) to be at least partially biased by more recent history, we created a score that gave equal weight to a school's prestige score since 1936 and their score since 1998 (the beginning of the Bowl Championship Series (BCS). From this team-specific composite measure, we constructed a team-by-team matrix consisting of absolute differences in the ESPN reputation measure and reverse-coded to indicate similarity.

Control Variables

Much theoretical and empirical attention has been paid to the objective, structural drivers of competition between firms. According to the theory of FMR, the relationship between firms that compete in the same product-market space—whether defined by industry commonality, strategic groups, or geographic proximity—is likely to influence the intensity of competition in factor markets. Furthermore, structural competition is a prerequisite for relational rivalry (Kilduff, 2019; Kilduff et al., 2010). Therefore, we control for common observable and objective structural dimensions that characterize product-market interdependence among firms that are also likely to influence the intensity of FMC between them: Direct product-market contact (Chen et al., 2007), strategic group co-membership (Fiegenbaum & Thomas, 1995; Ingram & Yue, 2008; Peteraf & Shanley, 1997), and geographic proximity (Baum & Mezias, 1992; Bromiley et al., 2002; Yu & Cannella, 2007)

Direct Product-Market Contact. Product-market commonality and multimarket competition are widely understood to be key drivers of competitive behavior between firms (Chen, 1996; Chen et al., 2007; Gimeno, 1999; Gimeno & Woo, 1996; Karnani & Wernerfelt, 1985). Recent research shows that product-market [un-]commonality also influences the intensity of competition in factor markets (Ellram et al., 2013; Gianiodis et al., 2019; Markman et al., 2009; Lee & Fong, 2015; Schwieterman & Miller, 2016; Theeke & Lee, 2017).

In our research setting, one could reasonably agree that the organizations we study compete in the NCAA Division 1 college football industry. Yet, although it is understood that college football teams "compete" for fans, TV coverage, advertisers, and so on, the clearest manifestation of product-market competition in our setting is the games played on the field. We therefore define (and control for) a football program's product market as the portfolio of games it plays against other teams in a given season. Our definition is closely aligned with Bergen and Peteraf's (2002) category of direct competitors and is constrained to product-market contact; that is, football games involving the focal team with 12 particular other teams (accounting for an additional one to three games in the postseason championships). Therefore, direct product-market contact between a pair of teams equals 1 if they played each other throughout the recruiting cycle, and zero otherwise.

Strategic Group Co-membership. Strategic groups may be formed based on their adherence to (or mimicry of) a common set of strategic norms (Oliver, 1991) or their desire to collectively form an institutionally legitimate strategic group (Fiegenbaum & Thomas, 1995). While other conceptualizations of strategic groups exist, we adopt this conceptualization and extend its theoretical logic into the domain of FMR; namely, that group co-membership and the attendant norms and a shared identity similarly guide the way member firms approach factor-market rivalry.

For our study, we define strategic groups as NCAA athletic conferences; that is, the PAC-10, Southeastern Conference, Big Ten, and others as they existed during our study period. Athletic conferences also exhibit some attributes that characterize traditional strategic groups (Caves & Porter, 1977; Fiegenbaum & Thomas, 1995; Kilduff et al., 2010) since they have significant barriers to entry and exit (i.e., conference membership is invitation-only and carries stiff financial penalties for leaving the conference). Further, members of a given athletic conference often have a shared identity and aspirations anchored in emotion and pride, project a common image and reputation in the eyes of key stakeholders, have strong geo-cultural roots, and vary greatly in terms of conference celebrity and brand equity (Carr, 2014; Kilduff et al., 2010; Morgan & Klimasewski, 2015). Further, the athletic conferences included in our study exhibit some significant differences in relative competitive balance among its members (Quirk, 2004). For instance, whereas the Southeastern and Big-10 conferences are comprised of many teams that have a history of championship titles and winning records against both conference and non-conference opponents (more competitive balance), the Atlantic Coast Conference is dominated by only a few teams (less balance). Here, a new player might be

attracted to schools in one conference or another because of the difference in balance.

Markman and colleagues (2009, p. 436) argue that factor market competition may occur "among dissimilar firms, from dissimilar industries or strategic groups." The authors do not explicitly rule out the idea that FMC can exist within strategic groups, but rather downplay the influence of this characteristic. Conversely, research in the competitive dynamics of product markets has demonstrated that firms within a strategic group are more likely than non-group firms to compete with one another since firms that are members of the same strategic group are more aware of each other and will be motivated to compete for similar resources as they jockey for position in product markets (Farjoun, 1994; Kilduff, 2019; Kilduff et al., 2010; Porac & Thomas, 1990). Therefore, we control for strategic group co-membership with a team-by-team matrix where a 1 represents the dyad of teams is in the same conference with a 0 for different conferences.

Geographic Proximity. Spatial geography plays an important role in a variety of firm strategic choices and outcomes. Examples of the role of geography in firm decision-making include whether to acquire a target firm that is far/near to the acquirer's headquarters (Baum et al., 2000), whether competition between industry incumbents and new entrants is more/less intense based on the distance between them (Carroll & Wade, 1991), or whether a cluster of geographically proximate firms reap economies of agglomeration (Myles Shaver & Flyer, 2000). As far as competitive behavior is concerned, geographic proximity between firms is associated with higher levels awareness of and product-market competition between them (Baum & Mezias, 1992; Chen & Miller, 2012; Kilduff et al., 2010; Porac et al., 1989; Yu & Cannella, 2007).

In contexts that involve competition for human resources, geographic proximity is a particularly important factor that increases competition among rivals in factor markets. Human resources engender more localized competition since they are not perfectly mobile (Wright et al., 1994). Meta-analytic research on the role of firm location on recruiting decisions suggests that the geographic area where a job is located will be a key driver of both attraction (p = .32) and the likelihood of accepting an offer (p = .35; Chapman et al., 2005). Since human resources have geographic restrictions and/or preferences, firms are likely to be more attuned to the factor-market needs and strategies of geographically proximate factor-market competitors irrespective of whether they compete directly in product markets.

With specific regard to the organizations in our sample, geography plays a key role in shaping the competitive landscape among college football teams (McGowin, Stand-Gravois & Chaney, 2012). Geographic proximity

influences the formation of salient rivalries (Kilduff et al., 2010), establishes the distinction between in-group and out-group associations among teams, players, and fans (Ingram & Yue, 2008), and, thus, is likely to influence the preferences of new recruits (Wright et al., 1994).

To measure the geographic proximity associated with a given pair of universities, we constructed a distance matrix consisting of the distance between each pair of schools (in miles, reverse-coded) based on latitude and longitude data from *Google Maps*.

Analysis

We used double semi-partialling multiple regression QAP (Dekker et al., 2007), which we abbreviate as MR-QAP, to test propositions related to our research questions. Our data are dyadic – each variable consists of a 119-by-119 matrix indicating relationships between teams. Dyadic data are problematic for OLS because of non-independence of observations, leading to autocorrelation of the residuals. In addition, the dependent variable is valued, making it impractical to use exponential random graph models (see Robins et al. (2007) for a discussion).

Due to the nature of our analysis (predicting the number of recruits two schools had in common), we also introduced a statistical control (maximum potential overlap) for the number of offers made by each school since if two schools made many offers, there was a greater chance of having recruits in common. In order to explore differences in the competitive dynamics for high-quality versus low-quality factor markets, we ran separate MR-QAP regressions using the decomposed competition networks for various levels of recruit quality. We interpreted these patterns qualitatively, but also supplemented the results with Steiger (1980) tests for interdependent correlations. These were used to determine if differences (across recruit quality levels) in an independent variable's ability to explain competition were significant. All analyses were conducted using UCINET IV (Borgatti et al., 2002).

Results

Table 1 reports the correlations among variables included in our study. While several networks were highly correlated, the variance inflation factors (VIFs) in our regression models ranged from 1.06 to 1.86. Table 2 reports the regression results from MR-QAP. The coefficients in Model 1 are used to test hypotheses 1–3. The coefficients reported in Model 2 are used to test hypotheses 4a–c, which account for factor quality.

Table 1. Quadratic Assignment Procedure (QAP) Correlation Coefficients.

Variables	1	2	3	4	5	6	7	8
1. Intensity of factor-market competition								
2. Rival salience	0.31 (.000)							
3. Status similarity	−0.02 (.230)	−0.01 (.103)						
4. Capability to compete (t)	0.11 (.000)	−0.01 (.072)	0.13 (.000)					
5. Capability to compete (t-1)	0.08 (.000)	−0.01 (.115)	0.18 (.000)	0.54 (.000)				
6. Geographic proximity	−0.30 (.000)	−0.11 (.000)	−0.04 (.234)	−0.01 (.393)	0.01 (.368)			
7. Strategic group Co-membership	0.41 (.000)	0.23 (.000)	−0.04 (.000)	−0.08 (.000)	−0.06 (.000)	−0.21 (.000)		
8. Direct product-market contact	0.38 (.000)	0.29 (.000)	−0.02 (.012)	−0.04 (.000)	−0.02 (.016)	−0.19 (.000)	0.66 (.000)	
9. Maximum potential overlap	0.49 (.000)	0.06 (.000)	0.13 (.013)	−0.17 (.000)	−0.06 (.051)	−0.01 (.378)	0.10 (.000)	0.08 (.000)

p values reported in parentheses.

Table 2. Results of MRQAP Analysis Predicting Intensity of Factor-Market Competition.

	Model 1	Model 2			
Variables	Overall	2-Star	3-Star	4-Star	5-Star
Geographic proximity	−.21 (.00) *.000*	−.26 (.00) *.000*	−.20 (.00) *.000*	−.07 (.00) *.016*	−.01 (.00) *.672*
Strategic group Co-membership	.19 (.30) *.000*	.13 (.13) *.000*	.19 (.15) *.000*	.16 (.11) *.000*	.04 (.04) *.010*
Direct product-market contact	.12 (.29) *.000*	.15 (.12) *.000*	.11 (.14) *.000*	.04 (.10) *.003*	.01 (.04) *.403*
Maximum potential overlap	.44 (.00) *.000*	.18 (.00) *.000*	.46 (.00) *.000*	.44 (.00) *.000*	.26 (.00) *.000*
Rival salience	.18 (.53) *.000*	.15 (.21) *.000*	.12 (.25) *.000*	.16 (.18) *.000*	.16 (.07) *.000*
Status similarity	.02 (.00) *.005*	.11 (.00) *.000*	.02 (.00) *.318*	−.05 (.00) *.083*	−.06 (.00) *.044*
Capability to compete (t)	.00 (.00) *.836*	.01 (.00) *.529*	−.01 (.00) *.307*	.00 (.00) *.812*	.00 (.00) *.775*
Capability to compete (t-1)	.02 (.00) *.016*	−.02 (.00) *.135*	.01 (.00) *.269*	.06 (.00) *.009*	.07 (.00) *.003*
R-squared	0.47	0.29	0.44	0.34	0.13
Adjusted R-squared	0.47	0.29	0.44	0.33	0.13

Standard errors reported in parentheses, *p* values reported in *italics*.

Hypothesis 1 predicted that rival salience between firms would be positively related to the level of FMC between them. This hypothesis is supported as the coefficient reported in Model 1 in Table 2 for rival salience is positive and in the predicted direction ($b = 0.18$, $p < .001$). Hypothesis 2 predicted that capability to contest would be positively related to intensity of FMC. Neither the coefficient for current-year capability to contest (*t*) nor prior year capability to contest (*t-1*) was significant. Overall, these results do not support hypothesis 2. Hypothesis 3 predicted that status similarity would increase the intensity of FMC between two firms. The coefficient for status similarity is not statistically significant, thus hypothesis 3 was not supported.

Hypothesis 4a–c predicted that the relationship between our three main effects variables and the intensity of FMC between firms depends on factor quality. Hypothesis 4a predicted that the relationship between rival salience

and FMC would increase as factor quality increases. However, as can be seen in the pattern of coefficients in Model 2 (and confirmed with Steiger tests), the effect of rival salience remains relatively stable across all levels of factor quality. Therefore, hypothesis 4a is not supported.

Hypothesis 4b predicted that the relationship between capability to contest and FMC likewise depends on factor quality. For current-year capability to contest (t), we found no significant relationship. However, for prior-year capability to contest (*t-1*), we found that the intensity of FMC increased for 4-star (b = 0.06, $p < .01$) and 5-star (b = 0.07, $p < .005$) players. Therefore, hypothesis 4b is partially supported.

As for hypothesis 4c, we found that teams that had similar status—i.e., similarly high status or similarly low status—were *less likely* to engage each other in FMC for *high-quality factors* (5-star: b = −0.07, $p < .05$) and *more likely* to engage each other for *lower-quality factors* (2-star: b = 0.11, $p < .001$). Therefore, hypothesis 4c was not supported. While the patterns were sometimes unexpected, these results demonstrate that the markets for high quality factors are indeed different from the markets for low quality factors and have different predictors.

Discussion

Our findings broadly suggest that relational rivals are highly motivated to compete for common resources, under certain conditions and circumstances. This stands in contrast to research related to mutual forbearance that suggests that product-market commonality, multimarket competition, and resource dependence result often result in a reduced level of competitive intensity between firms (Gimeno, 1999; Markman et al., 2009). Yet, the devil is in the details. Among the antecedents of relational rivalry, only *rival salience* had a significant and positive direct relationship with the intensity of FMC. Further, contrary to expectations, rival salience exhibited a stable positive effect across all levels of resource quality. Thus, it appears that in circumstances involving head-to-head competition between longstanding, mutually acknowledged rivals the motivation to win the battle for resources—irrespective of resource quality or even their expected value—trumps any concerns related to forbearance or fear of retaliatory response.

Although the *capability to contest*—current year or prior year— did not have a main effect on the level of FMC, this relationship is better understood when accounting for factor quality. Prior-year capability to contest (*t-1*) had a positive relationship with the intensity of FMC for only high-quality factors. Consistent with prior theory (Capron & Chatain, 2008; Kilduff, 2019) and empirical research (Chen et al., 2007), we found that competing firms that

perceive the preconditions for a relational rivalry—and the resultant competitive tension—exhibit higher levels of FMC when the resources being sought are scarce and of a high enough quality to potentially improve relative short-term performance. We believe this is supported by the threads of FMR theory that address the upside of acquiring high-quality resources and the benefits of preemptively blocking a rival firm from access to the resource (Capron & Chatain, 2008; Chatain, 2014; Markman et al., 2009; Opengart et al., 2018; Schwieterman & Miller, 2016).

We find a curiously complex relationship between *status similarity* and FMC. On the whole, status similarity was not directly related to FMC as we predicted. We reason that the lack of a main effect may be due to conflicting pressures—increased motivation versus forbearance—whereby status-similar organizations are more likely to compete for lower-quality resources, but less likely for higher-quality resources. However, the relationship between status similarity and FMR flips from a positive relationship for low-quality resources to a negative relationship for high-quality resources. For the organizations in our study, this unexpected increase in competition for lower-quality resources may be attributable to at least two factors. First, lower-status teams are often crowded out of the market for the top recruits (with few notable exceptions each cycle) and commonly rely on lower-quality players—really, any players—to fill their team roster year after year. This, then, likely enhances competition among firms with a low-low status similarity match. However, teams with high status rarely recruit low-quality players. When they do, they create a signaling effect that motivates other high-status teams to take notice of potentially overlooked or misclassified lower-quality players. This reasoning is consistent with concepts related to ex ante limits to competition and resource picking where firms can identify and acquire undervalued or barely noticed resources (Makadok, 2001; Peteraf, 1993). However, owing to a keen awareness of and heightened motivation for aggressive competition among relational rivals, the likelihood of blind spots for low-quality resources among status-similar, high-status relational rivals appears to be very low.

Our findings related to competition among status-similar organizations for high-quality resources appear to support the mutual forbearance logic of the theory of FMR (Markman et al., 2009). For the highest quality resources, we find that it is *status-dissimilar* teams that compete with each other most intensely. We believe that there are multiple plausible explanations that warrant future inquiry. Evidence from prior research suggests firms are motivated to compete against other firms that are higher in status relative to themselves (Kacperczyk et al., 2015; Kilduff et al., 2010). Lower-status firms are likely to direct more attention to higher-status firms and have a strong motivation to compete with them (Graffin et al., 2013; Kovács & Sharkey,

2014; Washington & Zajac, 2005). Perhaps owing to complacency, inertia, or having a distorted view of the competitive hierarchy among firms in the market, high-status firms are less likely to consider lower-status firms as serious competitive threats (Chen & Miller, 1994; Tsai et al., 2011). Further, low-status organizations seek to extract sizable differential gains when they can successfully acquire a high-quality resource, whereas high-status organizations must acquire high-quality resources to avoid differential losses associated with not acquiring the resource (Capron & Chatain, 2008; Chatain, 2014; Markman et al., 2009). This, then, creates more opportunities for cross-status competition. Additionally, Table 1 highlights the correlations between *current-year capability to contest* and *prior-year capability to contest* and *status similarity* as −0.14 and −0.18, respectively. So, while many higher-performing teams need high-quality resources to maintain their success, many high-status teams could be trying to improve future performance—or to regain past glory—and must compete with up-and-coming programs for high-quality players. Future research could explore how the interaction of [strong] long-term organizational status and [weak] recent and current performance—and vice versa—influences the intensity of FMC.

Although not included in our hypotheses, our empirical analysis suggests a strong relationship between several important objective, structural aspects of firm competition in product-markets and the intensity of FMC. Indeed, all three factors we included in our analysis—direct product-market contact, strategic group co-membership, and geographic proximity—have significant positive relationships with FMC. These findings remain largely consistent across levels of recruit quality, although geographic proximity plays less of a role for the highest quality factors. These results provide additional empirical support for one of the core tenets of the theory of FMR: Product-market commonality directly influences factor-market rivalry.

Theoretical and Practical Implications

Our study illuminates a set of new elements that warrant a deeper consideration of the theories of FMR. Prior work in this area was limited to objective, structural aspects of the product market. While controlling for these factors, we found that the intensity of factor-market competition between firms is indeed influenced by several subjective, socio-cognitive factors. Also, by accounting for properties of the factors themselves, such as factor quality, we add significant nuance to theories of FMR. Thus, future research must consider both the objective structure and perceived structure of the competitive context. Further, whereas theories of FMR include certain aspects or properties of firm resources and firm-level resource profiles, such as mobility,

versatility, leapfrogging, preemption, captivity, and so on, our study focused on the more general attribute of the quality of the pursued resources. Yet, owing to the influence of factor quality on FMR, our findings suggest that the relationship between PMR and FMR is a complex one and that additional relevant resource properties should be accounted for in future studies.

Drawing insights from Kilduff's (2019) work, our study introduces a new way that the AMC framework relates to FMR. As noted above, we found that independent of the structural competitive relationship between firms, the antecedents of relational rivalry heighten the awareness of particular competitors and strengthen the motivation to attack (or retaliate against) them in factor markets. Although more research is needed, our findings also suggest that characteristics of the resource being pursued may also shape awareness and motivation which may drive action or forbearance.

Our findings demonstrate only limited evidence of competitive blindsiding occurring in our study. While recent advances have demonstrated the benefits of understanding competitive actions from indirect competitors who stand to become future rivals (Downing et al., 2019), there are some features of our sample that may make such behaviors occur less frequently. Our findings suggest that the greater the transparency regarding competition for resources and the more industry-specific the resources that are being pursued, the less likely blindsiding will occur.

Finally, beyond the direct implications of our study for FMC, we also help to advance the study of organizational recruitment. In Barber's (1998) review of the recruitment literature, she laments the fact that despite exponential growth in recruitment research during the 1990's, research from the applicant's perspective had far outweighed the organizational viewpoint. While there have been advancements made in the study of inter-firm competition for human resources (Gardner, 2005; Miller & Shamsie, 1996; Williamson & Cable, 2003;) and related areas such as human capital pipelines (Brymer et al., 2014) the applicant perspective still dominates the field as does a view that does not account for relationships (Soltis et al., 2018). We are hopeful that our study will prompt others to consider the dyadic firm-level implications of employee recruitment more purposefully.

The practical implications of our work are threefold. First, from a FMR perspective, our findings suggest that a myopic view of a rival firm as strictly a competitor for goods or services can be perilous for management and lead to blind-siding within factor markets. While it is often easier to discern who primary competitors are in a product market, astute firms should also be aware of which firms they compete with on factor markets as well. From a labor market perspective, this data is low cost for organizations to collect as they can mine current databases to see where they hired employees from, utilize exit

interviews to determine where employees are going, and add application or interview questions to ascertain where else a job applicant applied (or had an offer from). Second, firms that occupy similar levels of status in their respective product markets are, surprisingly, less likely to compete with each other for high-quality factors. Thus, managers should anticipate higher levels of FMR from firms that are notably higher or lower in status. Third, from an intercollegiate athletics perspective, this research is insightful but also must be interpreted with caution. Knowledge of which schools a program is more frequently competing with (and who their rivals are competing with) for different types of recruits can help sharpen recruiting messaging to help the program stand out. The caution needed for interpreting our results for intercollegiate athletics recruiting is due to the recent seismic shifts in the landscape such as name, image, and likeness compensation (which essentially allows schools to offer financial incentives to recruits), the emergence of the transfer portal (which allows recruits to be much more mobile after enrollment), and conference realignment (which has all but eliminated some previous rivalries and will likely lead to the emergence of new ones). While these changes suggest that there may be new (or additional) antecedents to FMR in this market, it also makes more acute the need for programs to be continuously surveying this competitive landscape.

Potential Limitations and Future Research

Many organizational scholars have taken advantage of the comprehensiveness and availability of sports-related data to empirically examine other difficult-to-test theories. Sports-related data have been the subject of many studies into management and organizations and as such, comprehensive reviews and commentaries of organizational studies that have used sports-related samples are available (Day et al., 2012; Fonti et al., 2023; Wolfe et al., 2005). Sports settings serve as a useful quasi-experiment for managerial studies because of the accuracy of measures and reduced risk of confounds (Wolfe et al., 2005). Although our analysis focused on competition for human factors in a sports context, our findings have sufficiently wide generalizability for human resources in most industry contexts. Indeed, consistent with Fonti and colleagues' (2023) arguments about the usefulness and generalizability of studies using sports data, our study focuses on organizational resources, uses highly transparent fine-grained data, taps into socio-subjective factors like status, and unambiguously captures the context of rivalry and interdependence between organizations.

Although there are several advantages to our sample and several examples of excellent research conducted in sports settings, we do recognize that

utilizing NCAA football teams and high school players as a sample does cause some concerns over generalizability. First, although universities differ in the benefits they can offer students such as academic opportunities, campus atmosphere, and the likelihood of drawing the attention of NFL scouts, the NCAA (at the time of data collection) restricted the actual "compensation" offered to each player. They could only receive a renewable scholarship that covers the student-athlete's tuition, room and board, and books. In a business setting, organizations can offer a variety of levels of compensation and benefits to attract talent to the organization. Secondly, all of these resources are highly industry-specific. Very few athletes deal with offers to play collegiate football or another sport, while it is not uncommon for a traditional job seeker to be weighing offers from firms in multiple industries. While the level of specialization that exists in many collegiate offerings has increased and the job-specific skills obtained from work experience can restrict inter-industry mobility of job seekers, we do recognize that this is another limitation of our sample.

Our findings associated with relational rivalry and FMR should generalize particularly well to factor-markets in which resources are in limited supply, expire in or become obsolete at predictable intervals, are subject to property rights, experience time diseconomies or seasonality, or have real option-like properties. For example, drugs developed and sold by pharmaceutical companies are afforded limited patent protection. One strategy (besides in-house R&D efforts) to ensure that a given pharma company has a promising new drug development pipeline – that is, potentially new patent-protected drugs to replace those nearing the end of their patent period – is to take a small equity stake in a specialized biotech firm developing a promising new drug formulation in a specific therapeutic domain. The equity stake gives the pharma firm the first right of refusal in terms of choice of making follow-on investments (or full acquisition) or stepping away from the relationship with the biotech firm. Yet, like the market for high-quality football players, the market for high-quality biotech firm's with promising proto-drug formulations or technology is limited. This "small numbers" condition motivates pharma firms to compete for biotechs with the most promising emerging technology. The core propositions of the theory factor-market rivalry – and our extensions of it – would be useful to predict which pharma firms would compete against specific others for the chance to take a stake in a high-quality biotech firm.

We believe that although our study stands as an early and partial empirical test of theories of FMR put forth by Capron and Chatain (2008), Markman and colleagues (2009) and others, we acknowledge that it is limited in scope. One of our core research questions focused on whether certain aspects of product-market competition between organizations influenced the level of FMC. We

did not explore, for example, whether firms that compete for common factors leverage them in entirely different product markets (Markman et al., 2009) or how firm similarities in resources give rise to a convergence in strategy or strategic positions (Gimeno & Woo, 1996). Further, beyond a general conceptualization of quality, we did not test whether other proposed factor characteristics—like substitutability (Capron & Chatain, 2008), versatility and mobility (Markman et al., 2009), or complementarity (Adegbesan, 2009)—influenced FMC.

We also do not explore the relationship between FMR and firm performance. Indeed, many studies in competitive dynamics do not explicitly account for firm performance in theory or empirical tests (e.g., Gnyawali et al., 2006; Chen et al., 1992; Yu & Cannella, 2007; Uhlenbruck et al., 2017). We believe that the relationship between FMC and attendant performance outcomes is an interesting avenue for further inquiry.

Our study relies on comprehensive data from one recruiting cycle. The dynamics of these competitive relationships would be a useful extension of this work. A better understanding of how product and factor market competitiveness (in general) impacts specific dyadic relationships could serve to better explain some of the findings from our recruiting cycle. Further, the movement of human resources (players or coaches) from one organization to another can likely increase the degree of high school recruiting competition and general feelings of rivalry. A future study, in this or other contexts, that explores multi-market FMC could underscore the relational dynamism that exists between organizations and increase understanding of FMR antecedents and consequences. A future study in this context could also profitably explore the impacts of significant organizational changes on FMC by tracking changes in conference affiliation, coaching changes, resource changes (TV contracts) and so on.

Finally, beyond the influence of structural and relational rivalry on FMC, our study did not account for potential idiosyncratic team-to-player factors that motivated a team to pursue a particular player. Indeed, prior research suggests that the pursuit of new resources may involve the firm's ability to integrate, bundle, and orchestrate resources to achieve a superior resource portfolio vis-à-vis competitors (Adegbesan, 2009; Sirmon et al., 2011; Sirmon et al., 2008). Further, although our study found that the intensity or level of FMC between competing organizations can be predicted by variables constructed from publicly available secondary data, it lacks the fine-grained nuance commonly associated with qualitative analysis. In other words, we attributed higher or lower levels of awareness, motivation, and capability to compete in factor markets to sets of observable factors left to interpretation by managers. We did not explore the managerial rationales that supported the

decision to compete or forbear with a given rival for new resources. Future research could use qualitative methods to surface the reasons *why* a football coach, for instance, pursued a particular versatile player, resisted the pressure associated with relational rivalry to instead avoid FMR with a particular team, or overlooked a lower-status team that successfully encroached on the focal team's recruiting territory (Andrevski et al., 2021).

Conclusion

In sum, our findings contribute to a better understanding of the phenomenon and theory related to FMC. In doing so, we sought to extend the current theoretical frame to better account for psycho-social, relational, rivalrous drivers of FMC, refine nascent theories of FMC by accounting for factor quality, and test some of the proposed underlying overlap between PMC and FMC. The findings of our study suggest that the dynamics of factor-market rivalry are more complex than first imagined. Accordingly, we hope that future research could continue to tease out these relationships to paint a more complete and comprehensive empirical picture of FMR.

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ORCID iDs

Scott M. Soltis https://orcid.org/0009-0007-7985-025X
Chris Sterling https://orcid.org/0000-0002-3476-5146

Supplemental Material

Supplemental material for this article is available online.

Notes

1. Details on the methodologies used by scouts.com/247sports.com are available at https://247sports.com/college/oregon/article/247sports-product-and-features-guide-134261/ and https://247sports.com/college/georgia/longformarticle/georgia-bulldogs-recruiting-everything-you-need-to-know-about-247sports-rating-process-143324123/#1365350.

2. Here, we introduce the theoretical construct of the intensity of *factor-market competition* (FMC) – which we operationalize in our empirical analysis – to help the reader distinguish it from our abbreviation associated with our description the theory of *factor-market rivalry* (FMR).
3. In 1990, the Big-10 added Penn State, the SEC added Arkansas and South Carolina; in 1991, the ACC added Florida State; in 2004, the ACC added Miami, Virginia Tech, and Boston College; in 2011, the Pac-10 added Utah and Colorado, and the Big-10 added Nebraska; in 2012, the SEC added Texas A&M and Missouri, and the Big-12 added Texas Christian and West Virginia; in 2013, the ACC added Pittsburgh, Syracuse, and Louisville, and the Big-10 added Rutgers and Maryland. As of this writing, the SEC is negotiating to add both Texas-Austin and Oklahoma and the University of Southern California and the University of California-Los Angeles have announced intentions to join the Big-10.
4. We chose to include two years for this variable since the recruiting cycle included several months before the 2007 season and concluded after the end of that season.

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Author Biographies

Scott M. Soltis obtained his Ph.D. in Management from the University of Kentucky where he is currently an Assistant Professor of Management. He primarily conducts research at the intersection of HR and social networks and studies phenomena such as employee turnover, recruitment, performance, and person-organization fit. His work has been published in a variety of top-tier outlets in management and other business disciplines.

Dr. Chris Sterling holds a PhD in Business Administration with an emphasis in Organizational Behavior from the University of Kentucky. He is an Associate

Professor in the Department of Management at California State University, Fresno. Dr. Sterling's research focuses on how the emotions, perceptions, and relationships of organizational members influence well-being and performance in the workplace. In addition to his work on workplace social networks, he also investigates the effects of mindfulness interventions in professional settings.

Walter J. Ferrier earned his Ph.D. in Strategic Management at the University of Maryland. His research interests include the dynamics of head-to-head competition, strategic decision making, and the influence of inter-organizational networks on strategy. His research has been published in the Strategic Management Journal, Academy of Management Journal, Academy of Management Review, Journal of Management, Strategic Organization, and others. He won the Academy of Management Journal's Best Paper Award for his research on competitive interaction published in 1999.

Stephen Borgatti obtained his Ph.D. in Mathematical Social Science from the University of California, Irvine. His research focuses on theory and method in social network analysis. He has written two books on the topic, and is a member of the LINKS Center for Social Network Analysis at the University of Kentucky. He is a past editor of several journals, including *Field Methods* and *Organization Science*.