COLLEGE FOOTBALL RECRUITING: A TEST OF FACTOR MARKET COMPETITION THEORY

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INTRODUCTION

Organizations are embedded in relationships with a wide variety of other organizations – suppliers, buyers, rivals, joint venture partners, etc. – which suggests that they compete with one another in multiple dimensions. Although extant theory and empirical research from a wide variety of literature streams has explored and explained the processes and outcomes associated with organizations vying with one another in product markets, taking stock of organizational embeddedness may reveal heretofore latent or understudied dimensions of competitive interaction between organizations (Chen, 1996; Gulati *et al*., 2000; Uzzi, 1997). Our paper adopts this framing and seeks to examine interorganizational rivaly using an emergent research stream: Factor market competition.

Increased attention to factor market competition has led to a series of theoretical articles discussing the antecedents to competitive behavior in factor markets (Capron & Chatain, 2008) and the processes associated with factor market rivalry (Markman, Gianiodis & Buchholtz, 2009). These articles lay the groundwork for an empirical test of both the assumptions that make factor market competition distinct from product market competition and propositions that articulate how product market competition manifests itself. Using a dataset consisting of high school football athletes that are being recruited to play for National Collegiate Athletic Association (NCAA) football programs, we empirically test the fundamentals of the theory of factor market competition from a particular aspect: The competition for human resources. Indeed, strategic human resource management has been shown to be an integral part of the success of an organization (Barney & Wright, 1998) and competition for these resources is fertile ground for an empirical study of factor markets.

THEORY AND HYPOTHESES

The resource-based view, competitive dynamics, and IO economics have shaped current thinking about factor market competition and have led to many of the assumptions and propositions about the antecedents of dyadic factor market-related competitive actions between

firms and the overall propensity of organizations to carry out actions in factor markets. As will be more fully described below, we adopt many of these ideas to develop and test a set of hypotheses related to factor market competition for human resources. More specifically, we examine the characteristics of and relationships between organizational dyads (i.e., NCAA football teams) and define factor market competition as instances where an individual (i.e., high school football player) has expressed interest in "working" for the organizations that comprise the dyad and both organization have reciprocated this interest by extending "offers of employment" to the individual.

Prior research has stressed that product-market overlap is a precursor to organizational interdependence (Baum & Korn, 1996; Gimeno & Woo, 1996, 1999; Karnani & Wernerfelt, 1985) which creates the potential for multimarket competition (Chen, 1996). The most straightforward form of multimarket competition occurs when two firms compete head to head in the product market.

Relatedly, Caves and Porter (1977) introduced the concept of strategic groups within a given industry whereby organizations marked by high levels of similarity along the lines of resources, products, and/or strategic positioning belong to the same group and tend to compete with one another in product markets. Only recently, however, has the notion that resource similarity been extended to factor market competition – as two firms that are producing similar outputs are likely rely on and compete for similar or substitutable inputs. Using the RBV assumption that resources are not limitless (particularly when discussing human resources), we can infer that the "war for talent" will be heavily waged within the boundaries of strategic groups.

Another form of strategic similarity that may impact both product and factor market competition is geographic (or spatial) proximity. Indeed, Yu and Cannella (2007: 666) suggest that even in today's global economy, when contemplating a responding to rival's attack in a firm's product market "…geographic distance adds to the cost and difficulty of internal coordination, increasing the resources required for responding." These costs and difficulties make it difficult for a firm to compete heavily with distant rival firms in most product or factor markets. Further, since human resources are not perfectly mobile (Wright, McMahan & McWilliams, 1994) localized competition for these resources should be particularly intense.

Further, the competitive dynamics literature that explores the propensity of an organization to respond to the competitive actions of a rival suggest that: a) the more the focal organization is dependent on a given product market, and b) the focal firm's perception that it would be easy to mount a response the more likely it *will* carry out a response (Chen & MacMillan, 1992; Chen & Miller, 1994; Chen, Smith & Grimm, 1992). Building on this logic, Capron and Chatain (2008: 112) extend this logic to factor markets and suggest that "…when an action is easy to imitate – that is, if it can be countered simply and without much organizational disruption – competitors will respond quickly." So, consistent with theory in competitive dynamics we believe that both an organization's dependence in a given product market and the ease with which retaliatory factor market responses can be carried out will increase the level of factor market rivalry between organizations.

Finally, an organization's reputation or image constitutes an important resource for attracting human resources (see meta-analytic results of Chapman *et al*., 2005). Indeed, both a firm's current and recent public image and familiarity (see the firm's "celebrity effect" as described by Rindova, Pollock & Hayward, 2006) profound impact on an organization's ability

to attract human talent and should intensify factor market competition similarly to other resources described above.

From these ideas, we developed a set of hypotheses regarding general likelihood that a dyad of organizations would compete for human resources. We also added two hypotheses related to the quality of human capital. Not all resources are equal in terms of what they might be able to provide to an organization. For instance, it has been proposed that when an organization is faced with differential losses by *not* possessing a resource, it will be more likely to compete for the resource (Capron & Chatain, 2008). Likewise, the role of organizational prestige discussed above but also has relevance for factor quality. More specifically, wow prestige organizations will need to obtain at least low quality human resources or be faced with labor shortages. Conversely, high prestige organizations will need to try to obtain high quality human resources in order to maintain a position of high prestige. Additionally, it has been proposed that more substitutable factors have less competition since scarcity rents will be lower (Capron & Chatain, 2008). This is another RBV-based idea that resources that are rare have the ability to provide competitive advantage and will be sought out above and beyond resources that are either in abundance or have many close substitutes. A summary of all hypotheses are seen in Table 1.

Table 1 about here

METHODS

Sample

The sample used for this study was the 2008 recruiting season for NCAA FBS football players. There were 119 football programs in the 2008 recruiting season vying for 2,750 athletes. The sample was generated from publicly available data on the scout.com website.

While there are some specific advantages and drawbacks to using our sample, the use of the athletic realm to explore complex issues that are difficult to examine in a more traditional setting is not unprecedented, as suggested by Wolfe *et al.* (2005). Thanks to previous research in similar settings and the many areas of commonality between athletic organizations and businesses, constructs developed for a business setting can be mapped onto institutions in collegiate football and will be enumerated in the following section along with greater details of the sample.

Dependent Variables

Dyadic recruiting competition. We employed social network analytics in UCINET VI (Borgatti, Everett & Freeman, 2002) to construct the matrix of competition for recruits. Competition between two programs was measured as the number of recruits that both programs made offers to, and where both programs were under consideration by the recruit.

The nature of our data also allowed us to create several variations of the competition matrix needed for testing hypotheses related to resource quality and procurement timing. There are three clear stages of any given recruiting year. The first occurs in February immediately after the previous cycle has ended and continues until the beginning of the NCAA FBS regular season, the second takes place during the regular season, and the final stage is the frantic month between

the end of the season and the first Wednesday in February when recruits officially make a binding commitment to attend a school and play collegiate football.

      Recruit Quality. In order to test the hypothesis relating organizational prestige to recruit quality, we constructed five variables consisting of the number of offers extended to recruits of a given star level. Counting frequencies of different star recruits is preferable to simply averaging the star level of all of a program's offers because the 5-star rating system is at an ordinal level of measurement at best.

      Competition for Recruit (Recruit Demand). The final two hypotheses involve the amount of competition for a given recruit. To measure amount of competition for a recruit, we simply counted the number of schools competing for that recruit.

Independent Variables

      Strategic Group Co-membership. In our sample, strategic groups are clearly defined as the conferences that programs choose to join (such as the Sun Belt or Big Ten). These conferences exist within the larger competitive domain of NCAA FBS football, and programs within these conferences have many similarities such as playing style, pre-game traditions, some geographic similarity, and varying degrees of academic similarity.

      Head-to-Head Product Market Competition. We were able to capture whether or not two programs met on the field in the year of our sample, which served as a direct indicator of product market competition.

      Historic Product Market Competition. In addition to the games played in a given year there are usually several games that are historically considered rivalry games. These games carry significance above and beyond those of normal games and they have been known to be the measuring stick of how well a program is doing. Most programs had between one and three historic rivals.

      Geographic Product Market Competition. Just as companies can have regional overlap, two schools that are closely located will frequently be in competition. In order to capture this competition, we constructed a distance matrix between every school in the sample. Geographic coordinates for each school were obtained from Google Earth and converted into a matrix of distances between pairs of schools.

      Program Level of Resources and Prestige. We utilized a measure constructed by the ESPN Research Department that factored in national titles, bowl wins and appearances, final season poll rankings, consensus All-Americans, and first round NFL draft picks. We constructed an absolute difference matrix where two schools had a small number if they were similar (i.e. both were high or low scores on the ESPN success measure) and a high score if they were very different on the ESPN measure.

      2006 Product Market Performance Similarity. Our final independent variable was the on-field performance of the season before the pre-season recruiting stage (2006). This variable was important to capture as another image variable that a program could leverage in an attempt to gain a commitment from a recruit. We used the final season rankings of each team based on the ratings of Kenneth Massey (masseyratings.com). As we did with the matrix form of the prestige score, we calculated the absolute difference score in terms of the ratings for each set of teams.

Analysis

In order to test our dyadic hypotheses predicting competition between two schools we used MRQAP (Krackhardt, 1988 for more details on the procedure), a multiple regression technique designed to deal with the autocorrelation inherent in dyadic data and has been used fruitfully to explore perceived competitive tension (Chen, Su & Tsai, 2007) and actual patterns of competition among organizations (Tsai, 2002). Hypothesis 4 was tested via a simple bivariate correlation. Finally, Hypotheses 5 was tested via one-way ANOVA with Dunnett's T3 post-hoc multiple comparisons.

RESULTS

We had 117 schools in these matrices, it yielded 13,572 (117 x 116) pairs of competitive observations that could be used to test Hypotheses 1-3. Hypotheses 1a,b, and c predict that head-to-head product market competition, historic product market competition, and co-membership in strategic groups would spill over into competition in factor markets. The coefficients for head-to-head competition (.15), historic competition (.13), and co-membership in strategic groups (.24) were all statistically significant and in the predicted directions (all $p < .001$), thus supporting Hypotheses 1a, b, and c.

Hypothesis 2 stated that geographic proximity should increase the intensity of competition between programs. The coefficient for geographic proximity was in the predicted direction (-.21) and statistically significant ($p < .001$) providing support for Hypothesis 2.

Hypotheses 3a and 3b predicted negative effects of similarities of program prestige and , and product market performance of the year during the final two recruitment stages on competition for recruits. While the hypothesis regarding program prestige similarity was not supported, the coefficient for current year performance (-.09) was significant ($p < .001$) and in the predicted direction supporting Hypothesis 3b. Since the coefficient for prestige similarity on overall competition was not statistically significant, we examined the competitive matrix divided by stage and, separately, by recruit quality.

Similar program prestige significantly predicted competition for 1-star (-.06, $p < .01$) and 2-star recruits (-.09, $p < .001$) as we had originally hypothesized for overall competition. While prestige similarity was not statistically significant competition for 3-star recruits, the coefficients for both 4-star competition (.13, $p < .01$) and 5-star competition (.11, $p < .01$) were statistically significant and in the opposite direction of the hypothesis. Taken as a whole these results suggest recruit quality as a moderator of the program prestige similarity and recruit competition relationship such that for low quality recruits more similar programs compete while more dissimilar programs are likely to compete for high quality recruits.

 Hypothesis 4 stated that when a program is met with differential losses by not having a resource, they will compete more heavily for that resource. The correlations found support these Hypotheses as lower prestige programs compete significantly more heavily in the markets for 1-star (-.21, $p < .05$) and 2-star recruits (-.35, $p < .001$) while high prestige programs compete more heavily for 3-star (.41), 4-star (.70), and 5-star (.74) recruits (all significant at the $p < .001$ level). The sign change present in these correlations is further support for the interactive effect of program prestige and recruit quality on not only dyadic competition, but also overall levels of action.

Hypothesis 5 suggested significant effects of recruit quality and stage of recruitment in the average number of competitors for a recruit. Consistent with Hypothesis 5, an overall effect

of recruit quality on competition for that recruit was found (F [4, 2705] = 157.17, *p* <.001). Post hoc comparisons using Dunnett's T3 further supported Hypothesis 5 that the nature of the effect was such that the mean competition for rare 5-star (M = 5.97, SD = 1.63) or 4-star recruits (M = 5.77, SD = 1.89) was significantly higher than that of more substitutable 3-star (M = 5.31, SD = 2.09) or 2-star recruits (M = 3.39, SD = 2.36).

DISCUSSION AND CONCLUSIONS

This paper presents the first large-sample test of the foundations of factor market theory. In sum, the above findings support many of the propositions of the extant factor market competition literature such as the large amount of spillover from product market competition, the importance of strategic groups, and the influence of resource quality and resource market formation on competitive propensity.

The above series of findings in a setting of human resource competition lends support to the flexibility of factor market theory for studies both within and across industries as the need to attract employees is faced by every organization. While our research setting was unique, using unique datasets to study complex phenomenon is not without precedent and similarities between the recruitment process in the collegiate football setting and that of a traditional business setting abound. Additionally, our data allowed for insights generally unavailable to the public in a more traditional setting. Our study represents a good start to an empirical understanding of factor market competition and will hopefully encourage future research in the area.

REFERENCES AVAILABLE FROM THE AUTHORS

TABLE 1: Summary of Hypotheses and Findings

Hypothesis	Testing Method	Result
H1a: Head-to-head competition on a product market will lead to increased human resource competition between two organizations.	MRQAP	Supported
H1b: The presence of a historic product market rivalry will lead to increased human resource competition between two organizations.	MRQAP	Supported
H1c: Strategic group co-membership will lead to increased competition for human resources.	MRQAP	Supported
H2: Geographic distance between two firms will be negatively related to human resource competition.	MRQAP	Supported
H3a: Organizations of similar resource levels will have less human resource competition.	MRQAP	Not Supported
H3b: Organizations with similar images in the time period prior to the recruitment cycle will have less human resource competition.	MRQAP	Supported
H4: Organizational prestige will be positively related to the quality of human resources pursued.	Bivariate correlation	Partially Supported
H5: Higher quality human resources will engender more competition (greater demand) than lower quality resources.	One-way ANOVA	Supported