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# Who shall get more? How intangible resources and aspiration levels affect the valuation of resource providers

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## ABSTRACT

In this study we identify the effects of reputation and status by determining how they are differently valued by organizations that are concurrently pursuing different goals. Building on research on intangible assets and on aspiration levels, we develop a framework to explain organizations' valuation of resource providers. We expect organizations to value resource providers who possess a specific type of intangible asset higher as their performance, relative to aspirations, decreases on the outcome more closely tied to that particular asset. We also expect to observe this sensitivity primarily when the organization has a low level of the intangible asset in question. Based on this framework, we derive specific hypotheses using the differential relationships between reputation and status, as two types of intangible assets, and product quality and revenues, as two types of goals. We find support for our hypotheses using a longitudinal dataset on NBA teams and players.



Keywords: status, reputation, intangible assets, aspiration levels, regression analysis

## INTRODUCTION

There is a long tradition of research on reputation and status in the social sciences. Although for many years the two concepts have been developed in different fields, mostly in economics for reputation (Lange et al., 2011) and in sociology for status (Piazza and Castellucci, 2014; Sauder et al., 2012), in recent years organizational scholars have used both of them to better understand organizational choices or outcomes. For instance, it has been shown that status and reputation are used sequentially to select exchange partners (Jensen and Roy, 2008), that they have independent and interdependent effects in alliance formation (Stern et al., 2014), and that they have different effects on quality, diversity, and bridging opportunities of network partners (Chandler et al., 2013) and on organizational outcomes such as revenues and product quality (Ertug and Castellucci, 2013).

Despite these efforts, a clear theoretical and empirical distinction between the two concepts is still difficult to achieve. Distinguishing between the two is difficult partially because reputation, often considered as a generalized expectation of the quality of an actor based on perceptions of past demonstrations of quality (Lange et al., 2011), and status, an intersubjectively accepted ordering or ranking of social actors (Washington and Zajac, 2005), both work as a signal of quality (Sorenson, 2014). In this paper we explore how resource providers' reputation and status are differently valued by organizations that are concurrently pursuing different goals. Rather than considering how similar products offered by different producers possessing different levels of reputation and status might affect external audiences' perceptions (e.g., Waguespack and Sorenson, 2011), we study how the same resource provider, who simultaneously possesses different levels of reputation and status, is valued by organizations that try to achieve different goals.

By explicitly considering multiple organizational goals, we extend our understanding of the

distinction between reputation and status. In particular, by considering how the same resource provider is valued differently by organizations, depending on its reputation and status, we can control for the confounding effect of quality, as it does not vary for the very same resource provider (Sorenson, 2014). Moreover, by considering variations in organizational preferences for reputation or status due to different organizational goals, we also start to engage in transaction level analysis that allows us to disentangle the two effects (Sorenson, 2014). As a resource provider has one and the same level of quality, its value to an organization that is trying to pursue multiple goals will depend on the value placed to either reputation or status.

Insofar as reputation and status have different effects on different organizational goals (Ertug and Castellucci, 2013), organizations for whom a specific goal is currently more pressing will be differently interested in obtaining either reputation or status from the same resource provider, thereby placing a higher value to the intangible asset more closely linked to that goal and compensating the resource provider accordingly. Furthermore, insofar as organizations possess varying levels of different intangible assets, the importance of a particular intangible asset will also vary accordingly. If the organization possesses only a low level of the intangible asset that it needs to achieve a goal, then the organization will value that particular intangible asset even more, compensating the resource providers accordingly. Conversely, organizations that already possess a high level of the intangible asset needed to achieve a goal will not value this asset above and beyond the value that they generally attribute to it.

We test these ideas in the context of NBA players and teams. As the inherent quality of players at a given point is constant, we predict their value for a particular team as based on the players' reputation or status. Insofar as reputation is more closely linked to team performance, rather than to revenues, and status is more closely linked to revenues, rather than to team performance (see

Ertug and Castellucci, 2013), teams needing to meet one of these two goals should value players differently, depending on the players' level of reputation and status. We find that as a team's on-court performance, relative to aspiration levels, decreases, the team pays players more for their reputation but not for their status. Conversely, as a team's revenues, relative to aspiration levels, decrease, the team pays players more for their status but not for their reputation. These results show that the same player will be paid differently depending on the organizational need for reputation or status. The player will be paid more for reputation, but not for status, if the team needs to improve on-court performance; and he will be paid more for status, but not for reputation, if the team needs to increase revenues.

Moreover, we find that the sensitivity of the salary paid to a player to a team's performance on various goals depends on the levels of either reputation or status already present in the team. Teams that already possess high levels of reputation do not pay high-reputation players a salary that is any higher than the salary level based only on differences between the team's on-court performance and aspiration levels. Similarly, teams that already possess high levels of status do not pay high-status players a higher level of salary beyond that which is based on differences between revenues and aspiration levels. In other words, the relationship between a team's need for a particular type of intangible asset and the willingness to pay more for that intangible asset is especially prominent for teams that have only a low level of that particular asset.

## THEORY AND HYPOTHESES

In their foundational work on the behavioral theory of the firm, Cyert and March (1963) suggest that the discrepancy between aspiration levels and performance, also called attainment discrepancy (Lant, 1992), guides organizational decision making by discriminating between success and failure. Although research has used attainment discrepancy mostly to explain

organizational change, learning, or risk taking (for a review, see Shinkle, 2011), scholars have also used aspiration levels to explain a broader set of strategic decisions related to the resource base available to an organization, such as entrance to novel relationships (Baum et al., 2005), acquisitions (Iyer and Miller, 2008), R&D expenditures (Greve, 2003a), or divestments (Moliterno and Wiersema, 2007). This recent stream of research shows that attainment discrepancy is a key mechanism in determining whether an organization needs to increase (internally or externally) or decrease its resource base, thereby suggesting that resources can be of varying relevance to a firm for the achievement of its goals.

Along these lines, we argue that organizations need to decide on what resources to invest in and how much these resources are worth to them. These are strategic decisions because they affect the ability of organizations to meet their goals while meeting their budget constraints. Among the different types of resources available to organizations, intangible assets play an important role in creating competitive advantage (Hall, 1992), as the accumulation and utilization of such assets affects the competitive success of a strategy (Itami and Roehl, 1991). In addition to reputation, which has been shown to increase survival chances (Rao, 1994) and financial performance (Deephouse, 2000; Roberts and Dowling, 2002), other intangible assets also produce positive outcomes for organizations. For instance, status allows firms to charge higher prices (Benjamin and Podolny, 1999) and get greater effort from their exchange partners (Castellucci and Ertug, 2010), celebrity increases a firm's opportunity set (Rindova et al., 2006) and reduces market penalties associated with negative earnings surprises (Pfarrer et al., 2010).

Insofar as an intangible asset has a positive effect on a particular outcome for an organization, organizations trying to reach a specific level of performance on that outcome will try to acquire, develop, or maintain their level of that intangible asset. For instance, with them aim of increasing

their valuation, firms approaching IPO hire more prestigious executives, as the presence of such executives is believed to increase social validation and perceived worth (Chen et al., 2008). Moreover, Ertug and Castellucci (2013) show that firms trying to achieve different goals selectively recruit resource providers possessing different levels of intangible assets, as different kinds of intangible assets matter differently for different goals. The authors show, in particular, that reputation, being more closely tied to past performance, has a greater positive effect on the quality of the organization's products than does status. On the other hand, they show that status, being easier for audiences to observe and act on as endorsements, has a greater positive effect on the organization's revenues than does reputation. Consequently, to increase their products' quality organizations will recruit providers with high reputation, whereas to increase their revenues organizations will recruit providers with high-status.

In the same way that organizations try to acquire intangible assets to solve their performance problems, they should also place higher value on those assets that are needed more at a given point in time, thereby providing higher payments to the providers of such intangible assets. For instance, organizations trying to increase their social validation and perceived worth are willing to pay higher premiums to prestigious executives before their IPO (Chen et al., 2008). However, as organizations have multiple, potentially interdependent goals (Cyert and March, 1963) that are differently affected by intangible assets possessed by the same resource provider, organizations will assess resource providers on the particular intangible asset that is needed for the organization to reach its more pressing goal. We focus on two outcomes that constitute different organizational goals, product quality and revenues, and the valuation of two intangible assets, reputation and status, which affect these outcomes differently. In our study, in line with the "being known for something" dimension of reputation (Lange et al., 2011), we define reputation

as a generalized expectation of an actor's future behavior or performance based on perceptions of past behavior or performance (Deephouse and Suchman, 2008; Fombrun, 1996; Rindova et al., 2005). In particular, we consider reputation for quality, which is defined as a generalized expectation of the quality of a resource provider based on perceptions of past demonstrations of quality. As for status, we define it as a socially constructed, intersubjectively accepted ordering or ranking' of social actors (Washington and Zajac, 2005: 284), based on the esteem or deference that each actor can claim by virtue of the actor's membership in a prestigious group with boundaries to entrance (Benjamin and Podolny, 1999; Deephouse and Suchman, 2008). If the strength of associations between the intangible assets of reputation and status and the outcomes of product quality and revenues are different, as shown by Ertug and Castellucci (2013), then an organization's valuation of these assets should also vary systematically with that organization's performance on these two outcomes.

In particular, as an organization's product quality decreases relative to aspirations, the organization will have an increasing need for securing resource providers with higher levels of reputation to address this problem, and therefore be more willing to pay resource providers more for their reputation. In contrast, as an organization's product quality increases with respect to aspirations, the willingness to pay resource providers for the reputation they bring to the organization should be lower. Reputation will be valuable in general, but as an organization's product quality increases, the value of reputation for the organization will decrease. Therefore, we predict:

*H1: The positive relationship between a resource provider's reputation and the price paid to that resource provider increases as the organization's product quality, relative to aspirations, decreases.*

Before we proceed further, it is worth making a note about our arguments, with respect to the effect of attainment discrepancy. While some research predicts differences on organizational decision-making depending on whether performance is above or below aspiration levels (see for instance, Baum et al., 2005; Shipilov et al., 2011), such research is focused mostly on the probability of change. In such cases, either inertial or threat rigidity processes might have an effect on differential responses to attainment discrepancy (Greve, 2003b) based on whether performance is above or below an aspiration level. While our theory is built on attainment discrepancy, we do not focus on the probability of change and, therefore, we do not have theoretical reasons as to why inertial or threat rigidity process might change the valuation of an intangible asset differently above or below an aspiration level. This is why we predict that an increase or decrease of performance "relative to" an aspiration level will lead to differences in valuation. A decrease in performance might occur with performance starting at either below or above an aspiration level. Yet, it is the decrease in performance relative to an aspiration level that changes how resources are valued by the organization. In other words, although a given level of performance can be either above or below aspiration levels, what we propose as relevant for the evaluation of a resource is whether the performance relative to aspirations is decreasing, thereby producing an increase in the valuation of the resource, or increasing, thereby producing a decrease in the valuation of the resource. With this comment made, we move on to derive a prediction analogous to H1, but now with respect to status.

Although research has used both reputation and status to predict organizational outcomes (Jensen and Roy, 2008; Stern et al., 2014), the two concepts are theoretically distinct (Sorenson, 2014). While the rewards generated by reputation are closely tied to differences in quality or merit, the privileges generated by status are both more stable than differences in quality or merit (Chandler

et al., 2013), and based on differences in social rank, as separate from or not reflecting differences in performance (Waguespack and Sorenson, 2011; Washington and Zajac, 2005). This status rank may have originally been formed on the basis of differences in performance (Podolny, 2005), yet an actor may maintain its high status for some time while facing a declining performance (Podolny, 1993). Therefore, reputation should be a stronger predictor of product quality than status as the former is more closely tied to past demonstrations of quality. Indeed, while finding that reputation is a stronger predictor of product quality than status, and in line with Shipilov and Li (2008), Ertug and Castellucci (2013) also found status to be a stronger predictor of revenues than reputation. The argument is that by being more easily observable than reputation, status acts as a more readily accessible certification of an actor's quality that influences customers' perception of the quality of the actor's products. Insofar as revenues are influenced by a product's price, organizations that work with high-status resource providers will have higher revenues because the price customers are willing to pay for a product manufactured with resources from high-status providers is higher (Benjamin and Podolny, 1999).

Therefore, as an organization's revenues decrease, relative to aspirations, the organization will recognize this problem and will be more willing to pay resource providers more for their status, as resource providers with high-status have greater value for the organization. In contrast, while status remains valuable in general as an intangible asset, as an organization's revenues increase relative to aspirations, revenues will not be categorized as a problem that needs immediate attention. As the value of resource providers with high-status is lower in this case, the organization will be less willing to pay more for status. Thus, we predict:

*H2: The positive relationship between a resource provider's status and the price paid to that resource provider increases as the organization's revenues, relative to aspirations, decrease.*

In these first two hypotheses, we predict that as an organization's performance on a particular outcome is lower, the organization will attempt to address this problem by focusing on the intangible asset more closely linked with this particular outcome, and therefore be willing to pay their resource providers more for that particular intangible asset. In particular, when product quality is lower relative to aspiration levels, organizations are willing to pay resource providers more for their reputation. Conversely, when revenues are lower relative to aspiration levels, organizations are willing to pay resource providers more for their status.[1]

If organizations myopically seek short-term solutions to a problem (Levinthal and March, 1993), they should value resource providers by attributing greater value to the intangible asset possessed by the resource provider that is most likely to solve that particular problem. Therefore, we argue that the attainment discrepancy driven valuation of resource providers should be more relevant for those organizations that possess only a low level of the particular intangible asset. Availability of resources has been argued to promote complacency and inertia (Sitkin, 1992) through the creation of competency traps (Leonard-Barton, 1992; Levinthal and March, 1993). In a study on strategic change, Kraatz and Zajac (2001) found that organizations enjoying higher levels of valuable resources perceive a reduced need to adapt, thereby being less likely to undertake adaptive change, since resources work as barriers to learning, environmental buffers, and create commitments to specific goals. The mechanism that is most relevant for our study is that possessing high levels of valuable resources reduces the likelihood that organizations will perceive and respond to external threats. Insofar as external threats are translated as decreases in organizational performance relative to aspiration levels, it is possible to argue that organizations that possess high levels of an intangible asset would be less likely to perceive a need to trigger problemistic search. Following the same direction and rationale, Arrfelt and his colleagues

(2013) established a direct link between possession of resources, aspiration levels, and remedial actions. In their study of capital investment, the authors found that the availability of resources produces decision biases to engage in capital allocations as a response to discrepancies in performance with respect to internal, peer, and historical aspirations, in such a way that the relationship between poor performance relative to aspirations and over-investment is weaker for resource-rich organizations.

Building on this line of research, we argue that organizations whose performance on an outcome is decreasing relative to aspirations, and that also possess low levels of the particular intangible asset that is closely related to this outcome will be more likely to value this intangible asset highly. As such, these organizations will be more sensitive to placing a higher value to the intangible asset in light of attainment discrepancies. For an organization whose performance on an outcomes is decreasing, relative to aspirations, and that also does not possess a high level of the intangible asset that is likely to help it address this problem, the sensitivity between such decreasing performance and the willingness to pay should be more pronounced. On the other hand, if an organization already possesses high levels of the particular intangible asset it is in need of, a decrease in performance should not produce a yet greater willingness to pay for that particular intangible asset, above and beyond the regular valuation for it. If the organization already possesses high levels of the particular intangible asset that is positively linked to an outcome on which performance is decreasing relative to aspirations, the organization might instead look for other ways to fix this problem (Cyert and March, 1963). Consequently, as the organization would not place an even higher value to this particular asset, and accordingly would not pay resource providers more for it (above and beyond the regular level of valuation that this intangible assets commands). Recall that we consider attainment discrepancy in two

organizational outcomes, i.e., product quality and revenues. Because these outcomes, and goals that relate to them, are differently affected by reputation and status, we have hypothesized in H1 and H2 that the value of an intangible asset (in our case, either reputation or status) will be moderated by the attainment discrepancy on the outcome most closely linked to that asset (either product quality or revenues). Following our discussion in this section, we additionally expect these two moderation effects to be different for organizations that possess different levels of either reputation or status. Therefore, we predict:

*H3: The moderation effect proposed in Hypothesis 1 will be more prominent for organizations that have a low level of reputation.*

*H4: The moderation effect proposed in Hypothesis 2 will be more prominent for organizations that have a low level of status.*

**THE NATIONAL BASKETBALL ASSOCIATION**

We used data on a sample of players and teams in the National Basketball Association (NBA) to test our hypotheses, building on the database used in Ertug and Castellucci (2013). NBA is one of the four North American professional major sports leagues. It was founded in 1946 as the Basketball Association of America. The association adopted the name "National Basketball Association" following a merger with the National Basketball League in 1949, and later, in 1976, another merger with the American Basketball Association. Currently, thirty teams compete in the NBA, twenty-nine from the USA and one from Canada. These teams are divided between two conferences (Eastern and Western), each of which has three divisions (Atlantic, Central, Southeast and Northwest, Pacific, Southwest) with each division containing five teams each. The

rules and regulations for player contracts, trades, revenue distribution, the Draft, and the salary cap are set out in the Collective Bargaining Agreement (CBA), signed between the NBA and the NBA Players Association.

The NBA is a very suitable context for testing our hypotheses. First, since the resource providers we consider are the players, there are a number of objective indicators of their quality. Therefore, the quality of a player, despite the heterogeneity related to differences in positions, can be assessed by measuring his performance through these indicators. To take a few examples, the number of offensive and defensive rebounds, field goal percentage, and points scored are statistics readily available to audiences. Nevertheless, despite these detailed objective measures of quality, there is uncertainty in how well a player's current quality is related to his future quality (as an illustration, in our sample, the correlation of a player's performance between two seasons is .57). As a result, the second reason for the suitability of this setting is that teams' decisions regarding the valuation of their resource providers are also based on certifications of quality. Similar to the evaluation of a CEO's quality (Wade et al., 2006), in this setting quality is assessed by certifications given to players through awards (e.g., the Most Valuable Player award) or selection for special teams (e.g., for the NBA-All Star Game or All-NBA Teams). Third, because of exceptions to the salary cap – indeed making it a "soft" cap,[2] players and teams have a certain flexibility regarding the negotiation and renegotiation of salaries. Fourth, teams have different goals they pursue. On the one hand, teams pursue good on-court performance. On the other hand, teams are also concerned with increasing their revenues through ticket sales, merchandise, and television rights. While these objectives may be seen as complementary, our claim, consistent with the findings reported by Ertug and Castellucci (2013), is that they are separate and pursued as such by teams via different strategies. A correlation of .31 between on-

court performance and ticket income in the same season in our sample suggests that on-court performance and financial returns, while not independent of each other, are only modestly correlated. Therefore focusing on only one performance outcome does not appear sufficient to ensure success in the other outcome at the same time.

The hypotheses we have developed translate to the specific setting of the NBA as follows: H1 predicts that the positive relationships between a player's reputation and his salary will be stronger as team's season performance, relative to aspirations, decreases. H2 predicts that the positive relationship between a player's status and his salary will be stronger as a team's ticket income, relative to aspirations, decreases. H3 predicts that the moderation effect proposed in H1, i.e., a player's reputation having a stronger association with his salary when his team's on court performance decreases, will be more prominent in a sub-sample of teams whose players' average reputation is low. Finally, H4 predicts that the moderation effect proposed in H2, i.e., a player's status having a stronger association with his salary when his team's ticket income decreases, will be more prominent in a sub-sample of teams whose players' average status is low.

## METHODS AND VARIABLES

We tested our hypotheses using longitudinal data from the 1989/1990 season to the 2004/2005 season. Data on player performance, demographics, and team performance were coded from the Official NBA Guide 2005-2006 (Sporting News and NBA, 2005) and the official NBA website (www.nba.com). Data for player salaries were coded from the USA Today Salaries Database (2009) and Patricia Bender's basketball website (2009). Data for ticket income were coded from annual reports by Financial World and Forbes.

We tested our hypotheses by predicting the salary paid to a player with regression models for

panel data with player fixed effects, using robust standard errors, as clustered to adjust for the possible non-independence of same player observations over time. As we also mention below, we also incorporate team fixed effects and season fixed effects in our estimations, by including a set of indicator variables for each of these two sets of factors.

**Dependent Variable**

*Player salary*. We used yearly salary figures in $US as giving us a good indication of the teams' valuation of their resource providers, i.e. their players. Everything else equal, if the value of a player for a team, which is based on the intangible assets brought by the player to the team, is higher, the team would offer the player a higher salary, and vice versa. To reduce the skewness of the distribution of the absolute dollar amount of these salaries, we transform them by taking their natural logarithm and use the resulting variable in our analysis.

**Independent Variables**

*Player reputation*. We construct our measure for the reputation of a player in a given season by using data on his average performance during the previous three seasons, as adjusted by a linear annual decay function such that performance in the previous year is divided by one, performance two years ago is divided by two and so on. Our measure for performance in each season is the Player Efficiency Rating (PER), developed by John Hollinger (2005). PER provides a per-minute rating of a player's performance, standardized for each year. Appendix 1 contains a description of the calculation of PER and the formulae.

While it would be very difficult to claim that any single measure, regardless of how sophisticated or elegant, comprehensively captures all the relevant dimensions of a player's performance, the PER provides a good measure. To start with, PER captures more than simply points scored.

Points scored do represent an important component of a player's performance but is certainly not all of it. Some players perform well for the team by helping other players score or by preventing the other team from scoring. A performance measure based only on points scored would underestimate the performance of such players. In our sample, the correlation between PER and points scored is .64. To give an indication, this is lower, for example, than the correlation of .81 between points scored and the measure used to determine IBM Award winners (awarded by the NBA between 1983 and 2002). This suggests that PER captures other dimensions of a player's skills beyond just points scored. Second, the PER is highly correlated with another set of measures of player performance developed by Staw and Hoang (1995). To measure the relationships between the two measures, we followed the methodology described by Staw and Hoang and calculated their three factors (i.e., toughness, quickness and scoring) for our sample. We then combined these three factors by summing them to arrive at a single measure, whose correlation with PER is .80 ($p < .001$). While Staw and Hoang developed the three factors as independent variables in their models to capture possible differences across positions, the PER was developed and refined to capture overall performance, regardless of position. Therefore, we use the PER to measure player performance, and thus to construct our reputation measure.

*Player status.* We construct a dichotomous variable to measure player status, which was coded as 1 for high-status players and as 0 for non-high-status players. In deciding whether a player was high-status or not, we used data on awards and team-selection honors. Specifically, we used data on the Most Valuable Player award (MVP), selection into the NBA All-Star Game, and selection into any of the All-NBA Teams ($1^{st}$, $2^{nd}$, or $3^{rd}$). During the period for which we have collected data: The MVP award winner is chosen through votes cast by a panel of sportswriters and broadcasters throughout the United States and Canada. The starting players in the All-Star Game

are selected by a fan ballot where each position in each team is filled by the player with the most votes for that position, while the reserves are chosen by the head coaches, who are not allowed vote for players on their own team. The players who are invited to the All-NBA Teams are also selected by a panel of broadcasters in the United States and Canada. For each position, the player with the most votes gets chosen for that position for the 1st team, while the player with the second most votes gets chosen into the 2nd team, and the player with the third most votes gets chosen into the 3rd team.[3]

If a player was selected for any of these honors in the previous three seasons, then we code him as being high-status in the current season. Conversely, if a player was not selected for any of these honors during any of the previous three seasons, we code him as being non-high-status in the current season.[4] To assess the robustness of this measure, and our results, we used 3-, 5-, and 7-year moving windows as well as one where awards/honors were considered since the player's entry in the NBA, i.e., a player turning high-status would always remain high-status. While all of the measures resulting from the use of these alternative windows produce consistent significant support for our hypotheses, we use the 3-year window for a number of reasons. First, the NBA is a setting where the number of slots for these awards and honors – compared to the entire eligible population for the awards – is relatively high, about 10% of the population. Second, these awards and team selection honors are given every year, thus making it possible, and indeed not rare, for genuinely high-status players to accumulate multiple awards and honors over the years. Indeed, using the 3-year window, Kobe Bryant, Dwyane Wade, Tim Duncan, and Paul Pierce, to take four well-known cases, would be categorized as high-status every year from their first year of winning an award or honor until the end of our study period, i.e., 2005. Third, as one empirical verification of the first and second reasons above, of the alternative window options, the 3-year

window produces the greatest heterogeneity between high-status and non-high-status groups while also producing the greatest homogeneity within the high-status group (as indicated by *t*-tests in which the measure used for heterogeneity and homogeneity was the cumulative number of awards or honors won up to the present season).[5] We believe this measure to provide a good indication of – and differentiation between – high-status and non-high-status actors in the setting we study. Research on status has also used other measures, in settings where information about deference relationships among actors was systematically available (e.g., Baum et al., 2005; Podolny, 1993), or building on the idea developed by Merton (1968) that high-status actors, as compared to non-high status actors, receive disproportionate credit for their level of achievements (e.g., Castellucci and Ertug, 2010). In particular, research that uses information about deference relationships, and employs the eigenvector centrality measures proposed by Bonacich (1987), provides continuous – and therefore finer-grained – status scores for the actors being considered. Where systematic and reliable information about deference relationships is available, researchers have often employed this method of measuring status. However, given what status conceptually refers to in our theory and its reflection in the setting we study, the way we have chosen to differentiate between high-status and non-high-status players in a given year allows us to capture these differences to empirically test our predictions.

*Product quality relative to aspirations.* We use performance relative to the teams' historical aspiration levels[6] defined as a moving average of past product quality (Greve, 1998; Lant et al., 1992; Levinthal and March, 1981), obtained using the following formula:

$$A_t = \alpha P_{t-1} + (1-\alpha) A_{t-1}$$

Where A is the aspiration level, P is performance (product quality), t is the time period, and $\alpha$ is an updating parameter. To measure P, a team's product quality, we use the performance of the

team in a season. In particular, we created a variable, which took a value of 1 if the team did not qualify for the Playoffs, 2 if the team qualified for the Playoffs, 3 if the team advanced to the Conference Semifinals, 4 if the team advanced to the Conference Finals, 5 if the team advanced to the NBA Finals, and 6 if the team won the NBA Championship.[7] The updating parameter $\alpha$ in this formula updates the previous aspiration levels by weighting the relevance of the new information coming from the team's recent performance. Lower levels of this parameter, such as .25, suggest that the decision maker would place less weight on recent performance information and would be confident in relying on the previous aspiration level. Conversely, higher levels of this parameter, such as .75, imply that the decision maker would place more weight on recent performance information and relies less on the previous aspiration level (Greve, 2003b). Because the results were similar for any of the three values commonly considered for this parameter, i.e., .25, .50, and .75, and because there exists no strong information to prefer a high or low updating parameter, we report the results obtained using a value of .50. To calculate the final measure we enter into our models, we subtract a team's past product quality (product quality in the previous season) from the team's historic aspiration level for product quality in the previous season. This produces a measure that indicates the team's product quality in the previous season, relative to aspirations.

*Revenues relative to aspirations.* In measuring a team's aspiration level for revenues, we use historical aspirations as a moving average of past revenues, constructed in the same way as product quality aspirations. Similarly, to arrive at the final measure we enter into our estimation models, we subtract a team's past revenues (revenues in the previous season) from their historic aspiration level for revenues in the previous season. This produces a measure that indicates the team's revenues in the previous season, relative to aspirations.[8]

**Control Variables**

Below we list and describe the control variables we incorporate in our estimations, as grouped under player-level and team-level control variables. We also mention the sets of indicator variables we enter, to control for any fixed effects other than player-level fixed effects, since they are incorporated in our estimations. Finally, we describe how we address possible sample selection issues.

*Player-level control variables.* We enter an indicator variable to control for whether the current season is the player's first season with his current team (*First year in team*), coded as one if it is the first season, and zero otherwise. We control for the natural logarithms of the number of years the player has spent with his team beyond the first season (*Team tenure*) as well as the number of years the player has been in the NBA (*NBA tenure*), in order to control for the effects of experience and tenure on salary. To account for the possible effects on current salary of how much a player was utilized in the previous season, we also control for the natural logarithm of minutes (plus one) a player has played for in the previous season (*Past minutes played*). We also take into account a player's historical performance, beyond the previous three seasons, by entering a variable, *Player historical performance*, which averages the player's performance (PER) between the fourth and seventh seasons before the current season. Finally, to control for effects of free agency on salary, we enter an indicator variable (*Free agent*), which is set to 1 if the player was a free agent before the beginning of the current season and 0 otherwise.

*Team-level control variables.* To take into account a team's heritage and its history of success, we control for the natural logarithm of the number of years from the founding of the franchise (*Team age*) and for a variable that counts the cumulative number of times the team has won the NBA championship (*Team cumulative championships*). The salary paid to a player might also be

influenced by the performance or status of the players on the team who are in the same position as that player. We consider the three broad positions of guard, center, and forward, and construct a control variable that is equal to the average reputation (performance in the past three years, weighed by a linear annual decay) of the players on the focal player's team in that season who are in his position (*Team performance at position*) and another control variable that counts the number of high-status players on the focal player's team in that season who are in his position (*Team high-status at position*). We also control for the team's payroll in the current season, in millions of dollars (*Team payroll*) and the team's total revenues from all sources in the previous season, divided by ten million (*Team total past revenue*). To account for effect on salary related to market size, we also enter control variables for the population (*Population*), divided by 100,000, and the per capita income (*Per capita income*), divided by 10,000, of the city of the franchise, as reported by the US Census Bureau, the US Bureau of Labor statistics and Canada's National Statistics Agency.

*Team indicators.* We enter a set of indicator variables to capture time invariant heterogeneity across teams not captured by our control variables.

*Season indicators.* We also enter a set of indicator variables to capture possible season specific variation in salary during the period covered by our data.

*Sample-selection variable.* Even as there exist rare cases where a player changed teams twice or more within a season, players in our sample played for a single team in 91% of the player-season observations. To make our measures of players and teams commensurable within a season and also over time, we use data on player-season observations where players did not change teams during the season. To account for potential bias (Heckman, 1979) introduced by this decision, we calculate the inverse Mill's ratio (labeled Lambda, λ) and include it in our estimation models. To

calculate this variable, we added to the specification used in our main analysis (in Model 1) *the number of games the player started in the previous season* as the identifying variable in predicting which players would be more likely to not change teams during the season (and therefore be included in the estimation sample for our main analysis). Players who start fewer games are less preferred by their teams and are thus more likely to be traded during a season. We also note that while this identifying variable indeed does have a significant coefficient in this first-stage selection equation, it does not have a significant effect in our second-stage estimation model. The resulting Lambda from this calculation is then included in all models in our main analysis.

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Insert Table 1 about here

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**RESULTS**

Table 1 presents the summary statistics and correlations for the variables used in estimating our models. The correlation between player reputation and player status is .62, indicating that while our measures of these two intangible assets are related, they are also distinct from each other, with only 38% of the variance in one being explained by the variance in the other and 62% of the variance attributable to other factors. Even though we use the raw variables in reporting the correlations and the summary statistics, to provide an idea of the averages and the dispersion, we orthogonalize our measures of reputation and status before we enter them in our models. Specifically, we use a Gram-Schmidt procedure (Golub and Van Loan, 1996), as implemented in the *orthog* command in Stata 11 to generate new orthogonalized measures for reputation and status. The resulting measures are such that each now captures variance not explained by a linear relationship with the other variable. This procedure has been used to obtain estimates for two or

more variables when their correlation might have been a cause for concern (e.g., Galunic et al., 2012; Hiatt et al., 2009; Pollock and Rindova, 2003)

Table 2 presents the results for player salary estimations. Model 1 is the baseline model, which includes only the control variables. We note that player reputation and player status both have significant and positive associations with player salary ($p < .001$). While we have not hypothesized about these main effects, these results are consistent with past research on intangible assets and they also provide evidence for the soundness of our assumption in H1 and H2, that there would be a positive association between each of these two intangible assets and the salary paid to resource providers, i.e., players. We also note that, as might be predicted based on knowledge of this particular setting, player tenure (both in the team or in the NBA) has a positive and significant effect on salary ($p < .05$ for team tenure and $p < .001$ for NBA tenure).

Model 2 introduces the interaction between player reputation and product quality relative to aspirations, to test H1. This interaction variable has a negative and significant coefficient (-2.34 *t*-test, $p < .05$), while player reputation also retains its positive and significant coefficient ($p < .001$). These results support for H1: while player reputation has a positive effect on a player's salary, this relationship becomes stronger (weaker) as the team's product quality relative to aspirations decreases (increases). As a team needs to address the problem of a decrease in product quality, it will value players who possess higher reputations more, since having players with a higher reputation is expected to help the team remedy its performance problems on the product quality outcome. This interaction effect is also plotted in Figure 1, where the slopes of the lines show that the valuation of reputation is higher when a team's performance on its product quality is low, relative to aspirations, as compared to when that performance is high. The figure was produced using the coefficients from the full model (Model 4) and considering low-

performance as one standard deviation below the mean and high-performance as one standard deviation above the mean.

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Insert Table 2 and Figures 1 and 2 about here

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Model 3 introduces the interaction between player status and revenues relative to aspirations, to test H2. This interaction variable has a negative and significant coefficient (-4.11 *t*-test, $p < .001$), while player status also retains its positive and significant coefficient ($p < .001$). These results support H2: while player status has a positive effect on a player's salary, this relationship becomes stronger (weaker) as a team's revenues relative aspirations decrease (increases). As there emerges a problem of lower revenues, a team will value players who possess high-status more, since status is expected to help the team earn higher revenues and thus address its problem. This interaction effect is also plotted in Figure 2, where the slopes of the lines show that the valuation of status is higher when a team's performance on revenues is low, relative to aspirations, as compared to when that performance is high. Figure 2 was produced using the coefficients from Model 4 and considering low-performance as one standard deviation below the mean and high-performance as one standard deviation above the mean.

In Model 4, where we add both interaction variables to Model 1, the results do not change: both of the interaction variables have negative and significant coefficients (-2.24 *t*-test, $p < .05$ and -4.05 *t*-test, $p < .001$) while the respective intangible assets -- status and reputation -- retain their positive and significant coefficient on player salary ($p < .001$).

In Models 5 and 6, used to test H3, we use the same specification as in Model 2 and run it on two sub-samples:[9] Model 5 displays the results of the estimation in a sub-sample where *Team performance at position* is greater than the sample mean (n = 962) and Model 6 displays he

results of the estimation in a sub-sample where *Team performance at position* is smaller than or equal to the sample mean (n = 1081). In Model 5 the interaction variable does not have a significant coefficient. In Model 6, however, we see that the interaction between player reputation and product quality relative to aspirations retains its negative coefficient at a significant, albeit marginal, level (-1.80 *t*-test, $p < .075$). These results support H3 where we predicted H3 that the moderation relationship proposed in H1 would be prominent for organizations that possess a low level of reputation (the sub-sample in Model 6, where the average reputation of the team's players in the same position as those of the focal player are equal to or lower than the sample mean) but not for those that already possess a high level of reputation (for teams where this level is above the sample mean).

In Models 7 and 8, we again use two sub-samples to test H4. In this case, we use the same specification in Model 3 and run it on the following two sub samples: Model 7 displays the results of the estimation in a sub-sample where there is at least one other high-status player in the player's position on the team's roster (n = 850) and Model 8 displays the results of the estimation in a sub-sample where there is no other high-status player in the player's position on the team's roster (whether the player himself is high-status or not) (n = 1193).[10] In Model 7, the interaction between player status and revenues relative to aspirations does not have a significant coefficient. In Model 8, however, we see that this same interaction variable has a negative and significant coefficient (-2.93 *t*-test, $p < .01$). The results, supporting H4, show that the moderation effect hypothesized in H2 is observable for those teams that have a low level of status, which is needed to solve their revenue problem, as in Model 8, but not for those teams that have a high level of status, as in Model 7 (based on its distribution in our overall sample, where the split we use provides two sub-samples of large enough size to find any statistically significant effects).

**Additional Analysis**

Even though there are four possible interaction variables that can be calculated between reputation and status and quality and revenues, we predicted in our Hypotheses 1 and 2 significant interactions between *Player reputation* and *Product quality relative to aspirations* and between *Player status* and *Revenues relative to aspirations*, respectively. Although we expect a significant moderation effect in only the two cases we hypothesize about, it is worth reporting the results for the two interaction variables on which we make no formal predictions and which, according to our framework, would not show significant moderation effects: Namely the two interaction variables between (a) *Player reputation* and *Revenues relative to aspirations* and (b) *Player status* and *Product quality relative to aspirations*. If we add these interaction variables individually to Model 1, we see that neither has a significant coefficient ($p > .20$). The same result obtains if we enter these two interaction variables together to Model 1 (yielding a specification similar to Model 3, albeit with these two interaction variables rather than the two we have included in the table and which we had hypothesized about), neither interaction variable has a significant coefficient ($p > .20$). Furthermore, if we add these two interaction variables to the full model, thus including all four interaction variables, we find that the two interaction variables that correspond to our predictions in Hypothesis 1 and 2 still both have coefficients that are negative and significant ($p < .05$ and $p < .001$, respectively), while the other two have non-significant coefficients. These results provide further support for our prediction that organizations value more highly those intangible assets that are likely to solve their more immediate performance problems, while also suggesting that there is no statistically significant increase in organizations uniformly paying more for intangible assets across the board. The distinction between reputation and status and their respective relationship with a particular

outcome seems to be meaningful and real to organizations, as reflected in which assets they are willing to pay more for and which they are not, depending on whether the assets can address the performance problem on a particular outcome.

**Alternative Explanations**

We used the available data to eliminate the possibility of either different mechanisms or alternative explanations for our findings. First, while we use player-level fixed-effects estimations and include various time varying player-level control variables in our models, it might be suggested that we focus too much on teams as the active party in determining the outcome of resource valuation and, consequently, how much players are paid for the intangible assets they contribute to the team. If players play a more active role in this process, there should be factors allowing them greater leverage in determining their salary, and which should moderate a team's valuation of their status or reputation. To investigate this possibility, we introduce a new variable to our models, namely the *Number of free agents in the player's position*. If the players are as active and important as teams are in determining the outcome of the valuation process, we argue that the fewer free agents that are present in a given year in the focal player's position, the more that player should be able to negotiate more favorable terms with his team. By adding it as another control variable to our current models, we find that the variable itself does not have a significant coefficient and that all of our hypothesized effects continue to receive statistical support at the same significance levels as those reported in our main analysis. By also adding to Model 1 separately the interaction of this variable with *Player status*, *Player reputation*, *Product quality relative to aspirations*, and *Revenues relative to aspirations*, we see that none of these interaction variables has a significant coefficient. This suggests that beyond

the variables we control for and the mechanisms we propose, there is no significant association between the availability of free agents in a focal player's position and whether that player is able to secure a higher salary based on his possession of intangible assets or the team's recent performance. While these results do not conclusively rule out that in this setting players might be as active in the outcome of the resource valuation process as the teams themselves, they suggest that with this particular measure we find no evidence of it.

Second, it is possible that the effects hypothesized in H3 and H4 could also be explained by a mechanism through which a player might accept a lower valuation of his intangible assets by a team that already has a high level of a particular intangible asset, as compared to one that has a lower level. To test this alternative explanation, we first construct overall team-level variables for status and reputation, which are the average reputation of the players on a team's roster, *Team average reputation*, and the average (or the proportion, since this is a dummy variable) status of the players on a team's roster, *Team average status*. We then calculated two interaction variables, *Player reputation* X *Team average reputation* and *Player status* X *Team average status*. If either interaction is significant, this would suggest that a player might accept a lower valuation of his intangible asset from a team that already possesses a higher level of that intangible asset (and, conversely, secure a higher valuation from a team that possesses a lower level of that intangible asset). When we add these interaction variables to Model 1, whether separately or together, we see that neither has a significant coefficient. These results suggest that in the setting we study, there is no statistically significant evidence of this alternative mechanism. It is also worth reporting that the statistically significant support for all of our hypothesized effects remains at the same levels and thus are robust to the addition of these two team-level control variables to all of our model specifications.

Third, as there might be decreasing marginal returns to reputation or status, the effects proposed in either H3 or H4 might not be due to the mechanisms we proffer but rather due to the possibility that a team with a higher level of status derives less benefits from an increment in either reputation or status of a given resource provider, thus becoming less sensitive in paying for status, as compared to a team with lower level of status. Even though our models include control variables for *Team performance at position* and *Team high-status at position*, which account for the intangible asset levels of teams, we nevertheless looked further into this possibility. First, we calculated two new variables, which are *Change in team performance at position* and *Change in team high-status at position*, that capture the extent to which the team's level of reputation and status have changed in the last year. When we add these two additional variables to Model 4 in Table 2, we see that the coefficient of neither variable is significant, while the interaction variables we use to test H1 and H2 retain their statistical significant support. Moreover, we also added two more interactions to Model 4, which were (a) the interaction between *Team performance at position* and *Change in team performance at position* and (b) the interaction between *Team high-status at position* and *Change in team high-status at position*. Neither of these new interaction variables has a significant coefficient (regardless of whether we keep our hypothesized interaction variables in the model, as in Model 4, or remove them), thus the results do not offer an indication of different marginal returns in our setting. In addition, the interaction variables used to test H1 and H2 continue to have negative and statistically significant coefficients. Finally, with the addition of the new control variables for *Change in team performance at position* and *Change in team high-status at position* to Models 5-8, we continue to observe the same levels of statistical support we report in our main analysis for H3-H4, while neither of these two additional control variables has a significant coefficient in any of the four

models. In sum, both because of the control variables we already have in our models and what the results above indicate, i.e., no support for the idea that there might be different marginal returns in our setting, it does not appear that this mechanism provides an alternative explanation.

**Robustness Checks**

Even though the salary cap in the NBA is a soft cap (meaning that there are exceptions that allow teams to exceed this cap), we nevertheless checked whether our results are robust to the inclusion of a control variable that captures the salary cap for each season. Adding this new control variable to our models results in more than half of the year indicator variables being dropped from the models, due to the resulting high multicollinearity. Nevertheless, the coefficients of the interaction variables we use to test our hypotheses remain in the predicted directions and are statistically significant ($p < .05$). If we run the models including the salary cap control variable but removing the entire set of year indicator variables, we obtain the same results, such that the coefficients of the interaction variables used to test our hypotheses are in the predicted directions and are statistically significant ($p < .05$).

A separate robustness check we performed concerns the dependent variable. While we chose to transform our dependent variable, player salary, by taking its logarithm to reduce the skewness in the distribution of this variable, we performed a check to see whether our results were sensitive to this transformation. If we use the absolute dollar values for player salary, without any transformation, to measure player salary, we see again that all of our hypothesized effects are still supported by the estimations at statistically significant ($p < .05$) levels.

**CONCLUSION**

Building on research showing that different intangible assets are more tightly coupled with

different organizational outcomes, we propose a general framework whereby the valuation of a resource provider depends not only on the level of the intangible assets it possesses, but also on how an organization performs, relative to aspiration levels, on the outcomes the intangible assets are more closely linked to. Moreover, we also propose that the moderation effect of attainment discrepancies on the valuation of an intangible asset should be more prominent for organizations possessing a low level of the intangible asset, and less prominent for organizations possessing a high level of the intangible asset. We developed hypotheses on how performance on two outcomes, i.e., product quality and revenues, relative to aspiration levels, affects the valuation of two intangible assets, i.e., reputation and status, and how these effects depend on the levels of either reputation or status possessed by an organization. We find support for our hypotheses, albeit marginal in one case, in a sample of NBA players and teams from 1989 to 2005.

This study makes important contributions to the literature on the distinction between and valuation of reputation and status. First, by revealing how the different interests of organizations translate into differential attention to either reputation or status, we are able to shed additional light on the distinction between these two theoretical constructs (Sorenson, 2014). Building on previous reseach showing reputation and status to differently affect organizational outcomes such as product quality and revenues (Ertug and Castelluci, 2013), we explore how these intangible assets are valued by organizations that need them more, as they are more likely to help resolve specific performance problems. As the value attributed to an intangible asset (e.g., reputation) depends on performance on the outcome which it affects more directly (e.g., quality), but not on the other outcomes (e.g., revenues), as we show in our additional analyses, reputation and status seem to be theoretically and empirically distinct. They, in fact, matter differently depending on the outcome organizations want to achieve and, for this reason, they are sought

after and valued differently.

Second, our findings have implications for research on the hiring of executives. While Chen and his colleagues (2008) have shown that organizatins are more likely to hire prestigious executives and pay them higher salaries as a pre-IPO dress up strategy, our results would suggest such a strategy to be beneficial only in the short run. Insofar as prestigious or high-status executives can increase the visibility of the organization, they will help the organization to increase revenues or valuation goals. Yet, such a strategy might fall short in generating long term performance unless these executives are also of high reputation. Wade and colleagues (2006) show, in fact, that although certified CEOs help generate short term abnormal returns, they are also associated with a negative effect on long term performance. By considering that different intangible assets have different effects on different outcomes, our framework would suggest that a more sensitive approach might be to hire both high-status executives and high-status reputation executives if an organization is pursuing both valuation and performance goals. Moreover, as board members might be inherently more visible than executives, and as executives might be closer to the creation of organizational performance, our framework would also propose there to be additioanl value to hire, and pay accordingly, high-status board members and high reputation executives.

Third, this study extends our knowledge of the consequences of myopic search. Although research has consistently shown that organizations search for solutions that are intended to solve their problems in the short run (Greve, 2008), we still do not know much on how this temporally myopic search affects the valuation of resurces that are used to solve attainment discrepancies. Our findings show that organizations possessing a high level of an intangible asset do not value that asset necessarily higher, based on their need to solve their performance problems. If an organization is facing attainment discrepancies on one outcome, the level of the intangible asset

it possesses that is closely tied to that outcome is, while being high, clearly not enough to keep the organization from experiencing low performance. Yet, we find that organizations do not seem to recognize the need to value such assets higher, as they are blinded by the relatively high level of the asset they already posses.

We acknowledge that our sample has some specific features that might limit claims of empirical generality for the results we report. First, the presence of collective bargaining in the NBA, which imposes a soft salary cap, and also minimum and maximum salary provisions, might make players' salaries less flexible to variation in performance when compared to resource providers in other settings. However, the presence of many exceptions to the cap and the provisions, as reported briefly in the description of the industry, allow *de facto* teams and players to renegotiate the salary conditions within certain limits. In addition, the fact that we find support for our hypotheses in a regulated industry makes us more comfortable in claiming that our results might generalize to other, less regulated, industries, where salaries, and therefore evidence of variation in organizations' valuation of assets, are more flexible. Second, the NBA is characterized, like most other sports, by the presence of detailed and numerous statistics available for each player and team – which researchers have used to study topics as varied as certification (e.g., Graffin and Ward, 2010) and coordination (e.g., Ethiraj and Garg, 2012). This allows teams to assess the attributes of players and, ultimately, determine their value. In industries where such metrics are not as easily and widely available, the effects we found in this setting might be weaker. In a related manner, since part of our argument builds on the differences in the ease of observability between status and all the information that might be captured in an actor's reputation, settings where such differences are minimal or negligible might possibly evince less distinction between the effects of status and reputation. Moreover, our distinction might not apply in contexts, such

as that of star security analysts (Groysberg et al., 2008), where the acquisition of a star worker or high-status individual is tightly related to their individual performance, thereby making it more difficult to clearly distinguish between status and reputation. Third, even though with the data available to us, we did not find evidence of players being as active and influential as teams are in determining their valuation in the setting we study, the different characteristics of other settings might also provide evidence for these separate mechanisms, in addition to the mechanisms we develop and test. Finally, in our study, we do not consider how complementarities of resources might affect their valuations (Ethiraj and Garg, 2012), but only the value that a resource is assigned in isolation from the others. Future research might extend our framework by considering how an intangible asset, as brought by a specific resource provider, is differently valued as it complements the, same kind of or other kinds of, intangible assets brought to the organization by other resource providers.

In conclusion, our study illustrates the importance of considering both attainment discrepancies and the level of intangible assets available to organizations as determinants of the valuation of resources. By so doing, it is possible to observe that the value of an intangible asset is determined not only by the "inherent" value it possesses, but also by the organization's state of need. By considering the state of need as a determined by both of attainment discrepancies and internal characteristics – i.e., the level of the particular intangible asset the organization possesses – this study represents an important extension and generalization to our understanding of the valuation of resources.



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## Notes

[1] Based on the arguments developed to formulate Hypothesis 1 and Hypothesis 2, we do not expect there to be moderating effects for the remaining two "cross" possibilities between the two performance dimensions and the two intangible assets. In other words, we do not expect that the relationship between a resource provider's reputation and the price paid by the organization will be moderated by the performance of the organization on revenues, relative to aspirations. Similarly, neither do we expect that the relationship between a resource provider's status and the price paid by the organization to be moderated by the performance of the organization on the quality of its products, relative to aspirations. Our arguments suggest that for these two cases, the particular intangible asset will be weakly related to the particular performance dimension and, thus, the willingness of the organization to pay for the intangible asset is not expected to be sensitive to its performance on the particular performance dimension. Indeed, as we discuss in detail later in our additional analysis sub-section, we do test for the possible presence of all four possible moderating effects and find, consistent with our framework, that the two effects we hypothesize in H1 and H2 receive statistically significant support while the other two do not.

[2] In addition to a brief spell in the 1940s, the NBA has had a salary cap, as calculated by a percentage of the NBA revenues, from the 1984/5 season onward. The salary cap limits the total salary of a team's players, with the goal of ensuring a balance among teams. There are a number of exceptions to the NBA salary cap, thus making it a "soft" cap. A soft cap allows teams to agree to pay salaries that would place the team beyond the cap. Therefore, teams are able, de facto, to exceed the salary cap in paying players. To disincentivize this, a further luxury tax payment is imposed on teams whose payroll exceeds a "tax level." The "tax" for teams exceeding this level is to pay one dollar to the league for each payroll dollar exceeding it. Even with the luxury tax, however, teams agree to pay salaries that puts them beyond these levels. For example, in 2005-06, where the salary cap was $49.5 million and the luxury tax was $61.7 million, the New York Knicks' payroll was $124 million, which put them $74.5 million above the salary cap and $62.3 million beyond the tax line.

[3] We do not use awards/honors focused on specific positions or tenure, such as "defense" or "rookies", as we aim to construct a measure that is comparable across positions.

[4] Whether we used MVP, NBA All Star, and the 1st All NBA Team only, or added the 2nd All NBA team, or also added the 3rd All NBA team (which yields the measure we use in our study), the correlations between the resulting measures are very high ($r$ = .98), and the results remain the same and statistically significant at the levels we report.

[5] To illustrate: while the 3-year window differentiates between the group of Bryant, Wade, Duncan, Pierce and, for example, Juwan Howard and Jerry Stackhouse, a measure that categorizes players as high-status players from their first award or honor onward would not. According to the 3-year measure, Jerry Stackhouse is a high-status player in 2001, 2002, 2003, and 2004, on account of his 2000 and 2001 appearances in the All-Star team, but he would also be high-status in every subsequent season up to his retirement with a fixed window measure. To take another case, based on his 1996 All-Star appearance, Juwan Howard would be high-status in 1997, 1998, and 1999 but not onward based on the 3-year window, while he would always remain a high-status player based on the alternative measure. These suggest that widely accepted high-status players (e.g., Bryant, Wade, Duncan, Pierce) would indeed be categorized as high-status in every year from their first award/honor year onward based on our 3-year window in any case, whereas the same measure also differentiates between these players and those such as Juwan Howard and Jerry Stackhouse – who are categorized as high-status for the 3-years following their honors but not afterward.

[6] One can use social aspiration levels, historical aspiration levels, or a combination of the two to measure overall aspiration levels. While most research has chosen to employ a combination of the two, the performance to be measured in those studies was usually market share or return on assets (e.g., Baum et al., 2005; Greve, 1998; Mishina et al., 2010; Mitsuhashi and Greve, 2009) where the average performance of all firms, or firms in a peer group, i.e., for a social comparison, could change depending on the change in the number of firms constituting the social comparison group. However, the number of NBA teams was stable throughout our observation period. As a result, there is no substantive variance for social aspiration in team performance (because the number stays the same and there are always the same number of teams that proceed to a next round, the average does not change in a meaningful way). However, in the case of revenues as measured by ticket income, the stadium size of teams does play an important role, while each team also has a limited geographic span/reach (it is not a realistic option for most fans living in Dallas to choose between attending a basketball game between Dallas or Miami – the realistic option is whether to attend a game in Dallas or not to attend one at all). Accordingly, we use historical aspiration levels to capture overall team aspirations.

[7] Because this measure incorporates information on post-season success we judged it to be superior to other metrics such as "win-loss percentage" or "rank within division", which limit the information captured to regular season success only. Yet, this variable is correlated 0.78 ($p < .001$) with "win-loss percentage" and 0.77 ($p < .001$) with "rank within division". Because our variable additionally captures post season success (and where, for post-season there is no widely accepted continuous metric one might use to assess performance) in addition to success in regular season that more continuous measures might capture, we use it in assessing a team's overall on-court performance, i.e., product quality, for a given season.

[8] Even though for the framework we develop we do not have a theoretical reason, a priori, to expect differences and use a spline specification, as we discuss following H1 and H2, we also checked this empirically. Indeed, we find no consistent pattern of statistically significant differences in the coefficients of the pairs of variables produced by using the spline specification for each of the interaction we use in testing our hypotheses.

[9] We test the propositions in Hypotheses 3 and 4 by running models containing the same two-way interactions in separate sub-samples, rather than using three way interactions, for the easier interpretation of results this method yields (as compared to the interpretation of three way interactions).

[10] In Model 8, the variable *Team high status at position* gets dropped from the model since there is no variation in that variable within that sub-sample, i.e., it is restricted to be zero by construction. The same variable is kept in Model 7 since there exist cases where there is more than one other high-status player on the team's roster in the focal player's position.



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## TABLE 1: DESCRIPTIVE STATISTICS AND CORRELATIONS•

| Variable | mean | s.d. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Player salary | 14.7 | 1.07 | | | | | | | | | | | | | | | | | | |
| 2. Player reputation | 8.80 | 2.53 | .55 | | | | | | | | | | | | | | | | | |
| 3. Player status | 0.18 | 0.38 | .41 | .62 | | | | | | | | | | | | | | | | |
| 4. Player historical performance | 14.7 | 3.93 | .44 | .66 | .50 | | | | | | | | | | | | | | | |
| 5. First year in team | 0.35 | 0.48 | -.33 | -.25 | -.17 | -.12 | | | | | | | | | | | | | | |
| 6. Team tenure | 0.85 | 0.75 | .38 | .35 | .28 | .22 | -.84 | | | | | | | | | | | | | |
| 7. NBA tenure | 2.15 | 0.34 | -.02 | -.06 | .03 | .26 | .12 | -.07 | | | | | | | | | | | | |
| 8. Past minutes played | 0.44 | 0.97 | .45 | .55 | .29 | .30 | -.23 | .26 | -.08 | | | | | | | | | | | |
| 9. Free agent | 0.29 | 0.45 | -.41 | -.24 | -.16 | -.16 | .51 | -.46 | .07 | -.22 | | | | | | | | | | |
| 10. Team age | 3.43 | 0.56 | .13 | .02 | .03 | -.02 | .01 | -.01 | .01 | .01 | -.01 | | | | | | | | | |
| 11. Team cumulative championships | 1.91 | 3.66 | .04 | .01 | .01 | .01 | .01 | .01 | -.03 | .02 | -.01 | .43 | | | | | | | | |
| 12. Team performance at position | 8.73 | 1.36 | .24 | .55 | .32 | .37 | -.14 | .19 | -.01 | .31 | -.09 | .03 | .01 | | | | | | | |
| 13. Team high-status at position | 0.68 | 0.73 | .09 | .24 | .44 | .22 | -.11 | .16 | .07 | .11 | -.04 | .01 | .01 | .42 | | | | | | |
| 14. Team payroll | 17.5 | 0.46 | .39 | .01 | .01 | .02 | .03 | -.01 | .07 | -.04 | .04 | .22 | .08 | .03 | .07 | | | | | |
| 15. Team past revenue | 66.5 | 34.5 | .34 | .02 | .03 | .01 | .05 | -.02 | .06 | .04 | .04 | .33 | .24 | .02 | .04 | .77 | | | | |
| 16. Population | 15.7 | 20.9 | .02 | -.03 | .01 | -.04 | -.03 | .02 | .03 | -.02 | .01 | .29 | .13 | -.06 | .03 | .15 | .30 | | | |
| 17. Per capita income | 3.23 | 0.64 | .27 | -.05 | -.04 | -.09 | .09 | -.09 | -.04 | -.06 | .04 | .37 | .22 | -.09 | -.08 | .61 | .56 | .23 | | |
| 18. Product quality relative to aspirations | 0.13 | 1.25 | -.04 | -.01 | -.01 | -.02 | -.04 | .01 | .01 | .01 | .01 | -.05 | .01 | -.02 | .06 | .01 | -.03 | -.03 | -.05 | |
| 19. Revenues relative to aspirations | 1.46 | 2.36 | -.28 | .04 | .03 | .03 | -.09 | .07 | -.04 | .10 | -.09 | -.18 | -.03 | .05 | .07 | -.72 | -.60 | -.01 | -.59 | .06 |

• n = 2043. Correlations greater than |.05| are significant at $p < .05$

## TABLE 2: FIXED-EFFECTS REGRESSIONS ESTIMATING PLAYER SALARY•

| Variables | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
|---|---|---|---|---|---|---|---|---|
| Player reputation | .140*** | .142*** | .126*** | .129*** | .118* | .147* | .115+ | .141** |
| | (.037) | (0.037) | (.036) | (.037) | (.058) | (.063) | (.061) | (.054) |
| Player status | .147*** | .147*** | .178*** | .177*** | .153*** | .138* | .145* | .162*** |
| | (.031) | (.031) | (.032) | (.031) | (.045) | (.057) | (.061) | (.041) |
| (Player reputation) * (Product quality relative to aspirations) | | -.022* | | -.021* | -.013 | -.037+ | | |
| | | (.009) | | (.009) | (.014) | (.020) | | |
| (Player status) * (Revenues relative to aspirations) | | | -.024*** | -.024*** | | | -.019 | -.021** |
| | | | (.006) | (.006) | | | (.012) | (.007) |
| Player historical performance | .029* | .029* | .027* | .027* | .033* | .025 | .040+ | .018 |
| | (.014) | (.014) | (.013) | (.014) | (.016) | (.018) | (.021) | (.017) |
| First year in team | -.100 | -.103 | -.097 | -.099 | -.176 | -.042 | -.026 | -.010 |
| | (.067) | (.067) | (.066) | (.066) | (.110) | (.098) | (.130) | (.096) |
| Team tenure | .111* | .112* | .108* | .109* | .125 | .159* | .146 | .128* |
| | (.048) | (.048) | (.047) | (.046) | (.074) | (.072) | (.093) | (.060) |
| NBA tenure | 1.340*** | 1.359*** | 1.441*** | 1.457*** | .855 | 2.454*** | 1.537** | 1.961*** |
| | (.348) | (.346) | (.340) | (.339) | (.520) | (.557) | (.481) | (.495) |
| Past minutes played | .042 | .041 | .041 | .040 | .024 | .016 | .059 | .055 |
| | (.027) | (.027) | (.026) | (.026) | (.052) | (.043) | (.034) | (.046) |
| Free agent | -.307*** | -.304*** | -.311*** | -.309*** | -.149 | -.332*** | -.229** | -.326*** |
| | (.047) | (.047) | (.046) | (.046) | (.078) | (.077) | (.081) | (.068) |
| Team age | -.123 | -.129 | -.049 | -.056 | -.053 | -.144 | 1.301** | -.366 |
| | (.232) | (.230) | (.235) | (.233) | (.326) | (.350) | (.487) | (.312) |
| Team cumulative championships | .008 | .006 | .010 | .008 | -.015 | -.064 | -.029 | .013 |
| | (.048) | (.048) | (.046) | (.046) | (.076) | (.080) | (.092) | (.072) |
| Team performance at position | -.018 | -.021 | -.015 | -.018 | -.017 | .021 | -.036 | -.014 |
| | (.014) | (.014) | (.014) | (.014) | (.026) | (.034) | (.030) | (.020) |
| Team high-status at position | -.062* | -.061* | -.058 | -.058 | -.087* | -.120* | -0.040 | . |
| | (.031) | (.031) | (.030) | (.030) | (.044) | (.054) | (.074) | . |
| Team payroll | .186* | .178+ | .161+ | .154+ | .283* | -.008 | .430** | .117 |
| | (.094) | (.093) | (.094) | (.093) | (.137) | (.150) | (.162) | (0.153) |
| Team past total revenue | .003 | .003 | .003 | .003 | .002 | .007* | .001 | .004 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (.002) | (.002) | (.002) | (.002) | (.002) | (.003) | (.003) | (.003) |
| Population | -.017 | -.016 | -.015 | -.013 | .025 | -.025 | .011 | -.023 |
| | (.021) | (.021) | (.021) | (.021) | (.034) | (.037) | (.043) | (.028) |
| Per capita income | -.083 | -.081 | -.073 | -.071 | -.237 | -.108 | .518 | -0.130 |
| | (.169) | (.168) | (.166) | (.165) | (.330) | (.228) | (.401) | (.222) |
| Product quality relative to aspirations | -.017 | -.016 | -.015 | -.014 | -.009 | -.021 | -.024 | -.017 |
| | (.010) | (.010) | (.010) | (.010) | (.019) | (.018) | (.015) | (.016) |
| Revenues relative to aspirations | -.141 | -.143 | -.106 | -.108 | .016 | -.168 | .126 | -.079 |
| | (.086) | (.086) | (.086) | (.085) | (.154) | (.129) | (.171) | (.110) |
| Lambda (inverse mills) | .160 | .171 | .152 | .162 | .427 | .087 | -.728* | .121 |
| | (.157) | (.157) | (.156) | (.156) | (.306) | (.235) | (.359) | (.225) |
| Constant | 8.499*** | 8.595*** | 8.338*** | 8.431*** | 8.226** | 12.676*** | -4.446 | 9.170** |
| | (2.116) | (2.104) | (2.107) | (2.096) | (3.021) | (2.854) | (4.242) | (3.082) |
| Number of observations | 2043 | 2043 | 2043 | 2043 | 962 | 1081 | 850 | 1193 |
| R-squared (within) | 0.300 | 0.302 | 0.309 | 0.311 | 0.393 | 0.353 | 0.413 | 0.368 |

• The number of observations for each model are reported in the table. Clustered robust errors, adjusted for non-independence across same player observations, are in parentheses. Player fixed-effects are incorporated in the estimation of all models. Unreported season and team indicator variables are included in all models. There is a significant improvement in fit between all nested models.
Two tailed tests: $^{+}p < .10$ $^{*}p < .05$ $^{**}p < .01$ $^{***}p < .001$

**Figure 1. Effect of reputation on salary for different levels of product quality relative to aspirations**

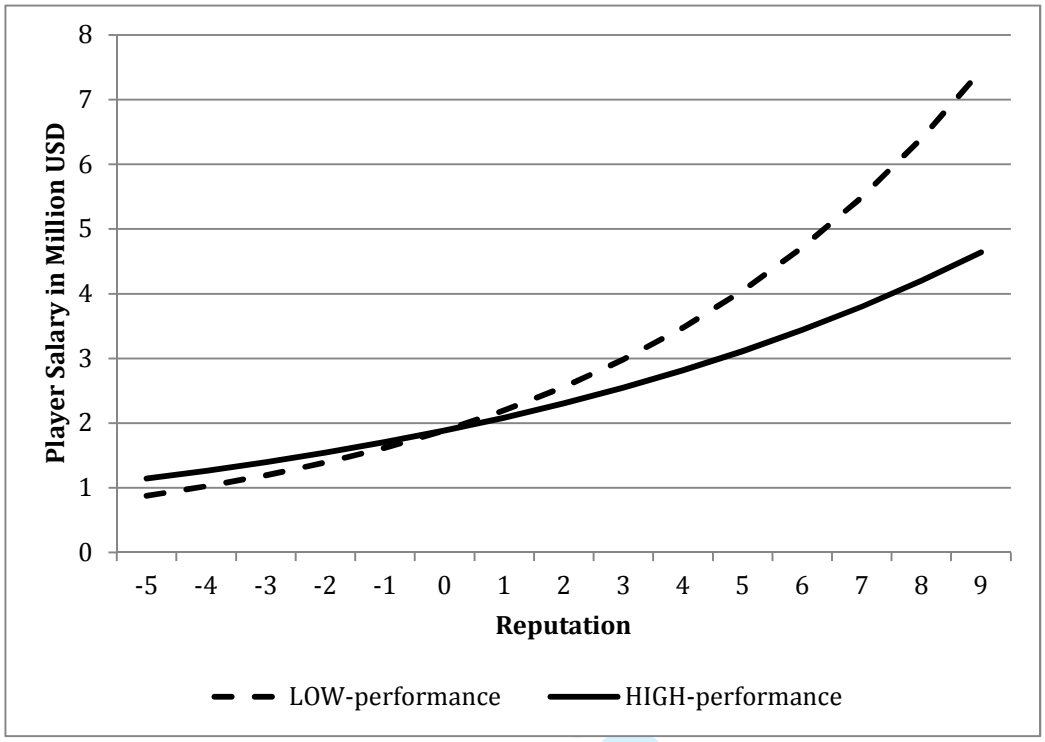
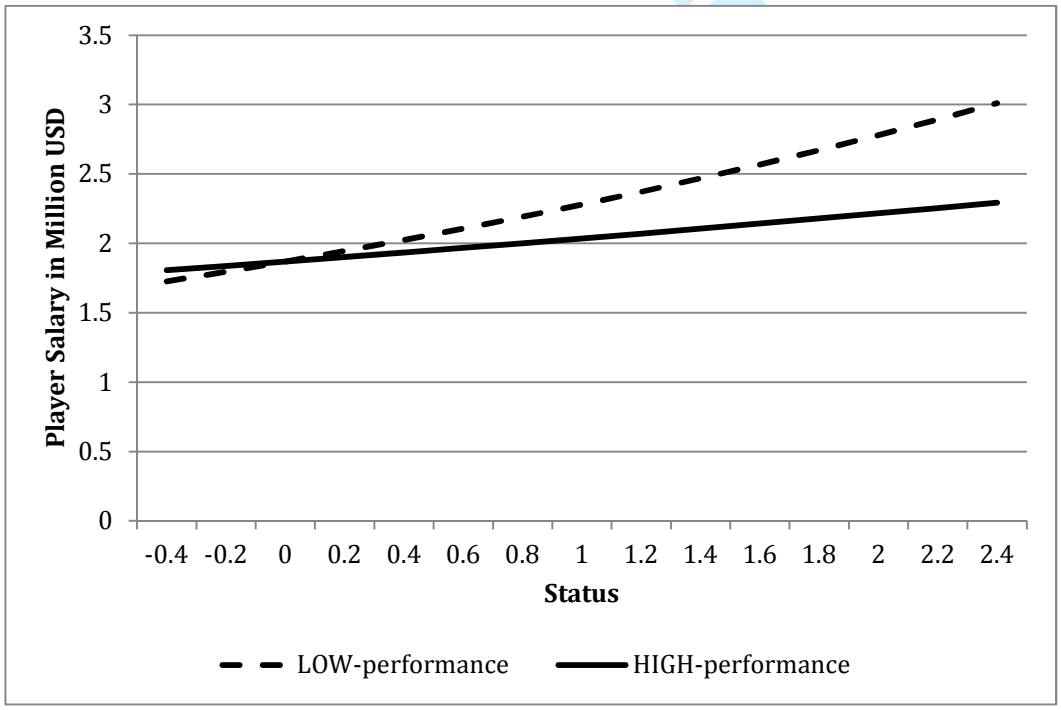



**Figure 2. Effect of status on salary for different levels of revenues relative to aspirations**



## APPENDIX 1: CALCULATING THE PLAYER EFFICIENCY RATING (PER)

First, uPER is calculated as follows:

***uPER*** = (1/MP) * [3P + (2/3) * AST + (2 - factor * (team_AST / team_FG)) * FG
+ (FT *0.5 * (1 + (1- (team_AST / team_FG)) + (2/3) * (team_AST / team_FG)))
- VOP * TOV - VOP * DRB% * (FGA - FG) - VOP * 0.44 * (0.44 + (0.56 * DRB%)) * (FTA - FT) + VOP * (1 - DRB%) * (TRB - ORB) + VOP * DRB% * ORB + VOP * STL + VOP * DRB% * BLK - PF * ((lg_FT / lg_PF) - 0.44 * (lg_FTA / lg_PF) * VOP)]

Where:

Factor = (2 / 3) - (0.5 * (lg_AST / lg_FG)) / (2 * (lg_FG / lg_FT))
VOP = lg_PTS / (lg_FGA - lg_ORB + lg_TOV + 0.44 * lg_FTA)
DRB% = (lg_TRB - lg_ORB) / lg_TRB

Once *uPER* is calculated, it is adjusted for team pace and normalized to the league to become:

***PER*** = [uPER * (lg_pace/tmPace)] * (15/lg_uPER)

Where *tmPace* is an estimate of the number of possessions per 48 minutes by a team, calculated as follows:

*tmPace* = 48 * (Tm Poss + Opp Poss) / (2 * (Tm MP /5), which sets the league average (of PER) to 15 for all seasons.

The abbreviations in the formulae above stand for the following:

MP – Minutes played
AST – Assists
FG – Field goals
FT – Free throws
FTA – Free throw attempts
VOP – Value of possession
TOV – Turnovers
DRB – Defensive rebounds
ORB – Offensive rebounds
TRB – Total rebounds
BLK – Blocks
PF – Personal fouls
PTS – Points
STL – Steals
TOV – Turnovers
Tm Poss – Team possession
Tm MP – Team total minutes played
Opp Poss – Opponent possession
team_AST – Team total assists
team_FG – Team total field goals
lg_FT – League total free throws
lg_FTA – League total free throw attempts
lg_PF – League total personal fouls
lg_AST – League total assists
lg_FG – League total field goals
lg_FGA – League total field goal attempts
lg_PTS – League total points
lg_TRB – League total rebounds
lg_ORB – League total offensive rebounds
lg_TOV – League total turnovers
lg_uPER – League average uPER