

THE PERFORMANCE IMPLICATIONS OF RESOURCE AND PAY DISPERSION: THE CASE OF MAJOR LEAGUE BASEBALL

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Research summary: Building on research in strategic management that has found that high levels of pay dispersion are detrimental to firm performance; we examine the potential dependence of those findings on similar dispersion in the latent potential of those resources to contribute to performance. We find that congruence between resource value dispersion and pay dispersion is positively related to organizational performance. Additionally, we find that this congruence moderates the effects of both organizational resources and organizational pay levels on organizational performance. These findings contribute to a growing line of research that explores the implications of key human resource value and pay combinations for organizational performance.

Managerial summary: While differences in income between key employees (i.e., dispersed pay) can instill feelings of inequity and be detrimental to organizational performance, such differences may also increase the odds of attracting star talent and help performance. In the context of Major League Baseball (MLB), we find that performance improves when dispersions in pay are congruent with the dispersion in the contributions that team members make to their organizations. We also find that the positive effects on performance of higher total pay and of level of organizational talent are enhanced by congruent pay and contribution dispersions. These findings suggest organizations may benefit from consistent dispersions in pay and talent and that important contributions by key organizational members need to be visible when organizations have dispersed pay structures. Copyright © 2016 John Wiley & Sons, Ltd.

INTRODUCTION

The recognition that human resources are, at one time, the fundamental driver of firm performance (Barnard, 1938; Drucker, 2007), and yet different in terms of rent appropriation opportunities from other strategically valuable resources (Coff,

1997, 1999), has long been a subject of theoretical and empirical analysis in the organizational theory, economics, and strategy literature (Adams, 1965; Barnard, 1938; Berle and Means, 1932). Because in the case of key personnel, such as top business executives or top performers, the likelihood of various market imperfections surviving the contractual agreement is largely contingent on the structural and behavioral conditions surrounding the resource that cannot be assumed away (Coff, 1997), one relatively recent line of inquiry has focused on “pay dispersion” among key organizational human resources as an important predictor of organizational performance (Milgrom and Roberts,

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1992). Building on theory that argues that social comparisons in dispersed pay structures creates disincentives for cooperation and instill feelings of inequity that affects performance, researchers in strategic management have found that high levels of pay dispersion are detrimental to firm performance (e.g., Fredrickson, Davis-Blake, and Sanders, 2010; Siegel and Hambrick, 2005).

Although prior research in this tradition has generated important insights about how relative pay of key employees affects organizational performance, almost no attention has been dedicated to what is potentially the most important legitimating factor for pay dispersion: resource value. As we here refer to human resources, it is important to note that by resource value we refer to the value that is latent in the human resources that are part of an organization (Peteraf, 1993) because, in contrast with other resources, human resources are less imperfectly mobile and may require management to establish conditions to preserve their heterogeneity (e.g., incentives, contextual conditions) (Campbell, Coff, and Kryscynski, 2012; Coff, 1997) because such resources can decide on their level of contribution to organizational outcomes within their latent potential value. If key employees' differential values to organizational performance justify highly dispersed pay structures, similar dispersions of resources and pay may compensate for the negative effects of pay dispersion and contribute to organizational performance. The "similarity hypothesis," or the idea that individuals will compare themselves with similar others (Wood, 1989), is a core proposition in Festinger's (1954) social comparison theory. We argue that there is a need to account for dissimilarity in the form of differences in key employees' value to the organization in pay dispersion research. Congruence between pay and resource value dispersions should reduce relative deprivation effects, and consequently, improve organizational performance. Therefore, in this article, we theorize and evaluate the joint effects of organizational resource value dispersions and pay dispersions on organizational performance.

Given the premium placed within strategic management theorizing on the importance of firm resources for heterogeneous performance (Barney, 1991), it is perhaps surprising that the effects of resource value dispersions have not been integrated into pay dispersion research. There may be at least three reasons for this neglect. First, scholars may believe that the negative effects of pay dispersion

are independent of whether compensation differences are justifiable (Mahoney, 1983). In this sense, researchers argue that individuals may be "more likely to focus on differences in how they are treated by the firm than on differences in contributions to the firm" (Fredrickson *et al.*, 2010: 1034) and that therefore contribution differences are not consequential to the negative effects of pay dispersion on performance (e.g., Milgrom and Roberts, 1992; Pfeffer and Langton, 1993; Siegel and Hambrick, 2005). This argument is consistent with the logic that contributions to the firm can be difficult for individuals to assess. However, individuals' contributions in many organizations are easily assessed given such factors as a clear distribution of responsibilities and the existence of well-established measures for individuals' contributions that are visible to all organization members. As such, individuals' contributions to the organization may be more salient than previously thought, and therefore, consequential to the evaluation of the effects of pay dispersion on organizational performance. Second, researchers may be limited in their opportunities to address the comparison between pay and resource contributions because of the difficulty in collecting data on both pay and resource contributions (Madigan, 1985; Madigan and Hoover, 1986). Third, because researchers may not believe that the set of organizational resources can be addressed easily by management, scholars may view resource values as a less relevant consideration for practice, and thus, may have been reluctant to investigate the issue. Yet, resource dispersion is manageable: Staffing and responding to both voluntary and involuntary turnover is a fundamental managerial responsibility that is increasingly important to organizational performance (Aime *et al.*, 2010; Ployhart, 2006).

We contribute to both the pay dispersion literature by establishing a fundamental boundary condition for its theory and implications and to resource-based theorizing by integrating insights of social comparison theory to expand our understanding of the implications of human resources being less imperfectly mobile than other resources (Campbell *et al.*, 2012; Coff, 1997) and conditions that allow management to preserve heterogeneity. Specifically, we theorize that pay and resource dispersion congruence (when the dispersion in pay matches the dispersion in resource values) will have a positive effect on organizational performance. We then provide arguments for a moderating effect of

pay and resource dispersion congruence on the relationship between organizational human resources and performance. Finally, we theorize that pay and resource dispersion congruence will enhance the relationship between overall organizational pay and performance. Following previous research on pay dispersion, we use data from competitive sports to test our hypotheses to enhance the comparability of our results with extant research (Bloom, 1999; Depken, 2000; Howard and Miller, 1993). Our findings ultimately imply that organizations that balance their pay and resource dispersions will tend to have better results at similar key employee pay levels. That is, when the dispersions of resources and pay are congruent, performance will follow.

THEORY

The role of congruence between dispersion of resources and pay

According to social comparison approaches (Festinger, 1954), individuals experience relative deprivation when they perceive that they have received less than their fair share of rewards in comparison to others (Cowherd and Levine, 1992; Siegel and Hambrick, 1996). When such comparisons exist, pay dispersions are likely to result in lower levels of commitment to organizational goals as well as less cohesiveness, satisfaction, coordination, collaboration, and efficient information processing, leading to lower firm performance (Cowherd and Levine, 1992; Deutsch, 1985). That is, dispersed pay structures "create disincentives for cooperation, instill feelings of inequity, promote dissatisfaction, and diminish performance" (Bloom, 1999: 27). When the individual-level effects are jointly considered, scholars find that high levels of pay dispersion are detrimental to organizational performance (e.g., Depken, 2000; Fredrickson *et al.*, 2010; Shaw, Gupta, and Delery, 2002; Siegel and Hambrick, 2005).

Although previous research illustrates that pay dispersion has a harmful effect on performance, scholars have not acknowledged the potential effect of a concurrent dispersion in the potential contribution of different resources. We argue that congruence between pay and resource dispersions will have a positive effect on performance. Two theoretical reasons support our argument. First, equity theory suggests that individuals' distress or feelings

of deprivation derive from the joint consideration of both the rewards or payments they receive and their inputs or contributions to performance in comparison to those of similar others (Adams, 1963, 1965); that is, the expectation that the outcome/input relationship will be equal to those of similar others (Carrell and Dittrich, 1978; Telly, French, and Scott, 1971). Therefore, from an equity perspective, individuals are less likely to experience deprivation and distress when the relationship between their rewards and pay is consistent with that of similar others. As in the case of pay dispersion, if we extend this logic to the organizational level, congruent levels of pay and resource dispersion should be beneficial to organizational commitment, cooperation, and overall performance.

Second, a core proposition in Festinger's (1954) social comparison theory, which together with exchange and dissonance theorizing forms the core of equity theory (Adams, 1963, 1965), is that people will compare themselves with similar others (Wood, 1989). This "similarity hypothesis" is not usually acknowledged by applications of social comparison theory to the relationship between pay dispersion and firm performance. However, the similarity hypothesis is a fundamental aspect of social comparison theory, equity theory, and the relative deprivation theories used to make the connection between pay dispersion and firm performance (Siegel and Hambrick, 1996). Relative deprivation is also theoretically targeted at a "similar other" so that individuals tend to want what similar others possess (Cartwright and Harary, 1956). The issue here is that differential contributions to performance will dramatically affect perceptions of similarity. A large resource dispersion between two members in a team diminishes perceptions of similarity because it is indicative of differences in perceived power (Finkelstein, 1992) and status (Finkelstein, Hambrick, and Cannella, 2009). Since power, status, and perceptions of inherent performance are relevant surrounding indicators or dimensions of similarity available for comparison, individuals will not see others with significantly different levels of performance as "similar others." Therefore, people will not experience distress or relative deprivation when others who make significantly higher contributions to performance are better rewarded. As with our previous argument, extending the logic to the level of the organization, similar or congruent levels of pay and resource dispersion should be beneficial

to organizational commitment, cooperation, and overall performance. Therefore, we hypothesize the following.

Hypothesis 1: Congruence between resource and pay dispersions will be positively related to performance.

The moderating effect of congruence in resource and pay dispersion on the relationship between overall resource value and performance

While we argue that organizational performance will be directly impacted in a positive manner by congruence between dispersions of resources and pay, we also anticipate that there will be an interactive effect between such congruence and the overall value of an organization's resources. Specifically, we contend that the positive relationship between higher value resources and performance, as is specified by resource-based theorizing, will be stronger if there is congruence between resource and pay dispersions.

The fact that possession of valuable resources, and particularly, human resources (cf. Barney and Arikan, 2005) can be a significant driver of sustainable differences in firm performance has long been a staple in management research (Barney, 1991). However, "merely having talented employees" does not guarantee performance as they may "reject the firm's authority or be unmotivated" and "need not be satisfied with supervision, coworkers, or advancement opportunities" among other problems that "may prevent firms from generating" positive performance from higher quality human resources (Coff, 1997: 374). That is, the relationship between human resource value and firm performance may be moderated by a variety of conditions that affect whether individuals utilize their talents to their fullest extent, and therefore, whether firms are able to leverage these talents to experience enhanced performance (Coff, 1999). For instance, the social comparison logic argued in this article suggests that underpaying valuable employees may cause these individuals to give less than full effort or even undermine the efforts of others (Hambrick, 1995; Lazear, 1995), both of which may prevent firms from generating favorable performance from the employment of valuable human resources (Bloom, 1999; Shaw *et al.*, 2002; Siegel and Hambrick, 2005). Likewise, if valuable human

resources feel that they are making a substantially greater contribution to the organization, they may respond in a similar fashion (Fredrickson *et al.*, 2010), therefore prohibiting the organization from generating favorable performance based on the employment of the valuable human resources.

A firm that is able to create congruence between the payment of human resources and their value to the organization may prevent such perceptions of inequity from arising, and thus, preclude employees from responding by either withholding effort or sabotaging coworkers' efforts. As a result of preventing responses that, in essence, impact whether individuals utilize the full extent of their abilities, organizations with congruence between the dispersions of resources and pay will experience a stronger relationship between the actual value of their human resources and the subsequent performance of the organization.

Hypothesis 2: Congruence between resource and pay dispersions will moderate the relationship between overall resource value and performance such that the positive relationship between overall resource value and performance is stronger when congruence between resource and pay dispersions is high.

The moderating effect of congruence in resource and pay dispersion on the relationship between overall organizational pay level and performance

Efficiency wage theory provides the theoretical basis for research on the existence of wide between-industry and between-firm employee pay differences (Milgrom and Roberts, 1992). According to efficiency wage theory, organizations that pay higher wages than competitors will experience increases in performance at the organizational level because employers who decide to pay more to some or all employees may attract or retain the best performers (Brown, Sturman, and Simmering, 2003), reduce unproductive behavior (Akerlof and Yellen, 1986), and increase individual effort (Milgrom and Roberts, 1992). Alternatively, organizations that have lower levels of pay than competitors may be exchanging cost for performance (Milkovich and Newman, 2002). Higher wages, then, can be considered a "gift-exchange" that increases performance (Akerlof, 1982; Solow, 1979). However, previous studies report mixed or

ambiguous support for efficiency wage theory (cf. Krassoi Peach and Stanley, 2009). We argue that congruence between resource and pay dispersions may provide a contingency factor to help clarify the relationship between organizational pay levels and performance.

Consistent with theory and research in economics, high-paying organizations attract employees of all levels of ability and select among them, while low-paying organizations mostly get to select from low-ability employees. As a result, low-paying organizations include employees who have fewer alternatives to move to more attractive work opportunities because they are more likely to be selected from pools with lower levels of ability, while high-paying firms include individuals with more alternatives in the marketplace as they are selected from pools, including higher levels of ability (Malcolmson, 1981; Weiss, 1980). Because of this difference in ability of employee selection pools between high and low paying firms, there are at least two reasons to expect congruence between resource and pay dispersions to moderate the relationship between pay level and performance.

First, in organizations with higher pay levels, the availability of more talent within teams lays the ground for more potential causal ambiguity as to the source of performance increasing the potential for employees to perceive negative social comparisons and withhold collaboration. Therefore, congruence between resource and pay dispersions will make higher paying organizations able to capture the positive performance implications of higher pay levels by reducing the increased rewards distribution conflicts that result from employing higher ability individuals. While causal ambiguity due to higher ability pools of employees may complicate pay legitimacy by increasing the potential for disperse performance claims in the organization, signals to approach congruence between resource and pay dispersions (e.g., social capital, key player roles in projects) will exist even in these higher causal ambiguity situations (Blyler and Coff, 2003), allowing decision makers to approximate or satifice legitimate pay distributions. Such congruence will reduce the likelihood that employees will withhold effort or sabotaging coworkers efforts (Hambrick, 1995; Lazear, 1995), allowing organizations to capture the benefits of higher levels of pay. Therefore, in line with social comparison theory, we expect congruence between resource and pay dispersions

to moderate the positive relationship between organizational pay and performance.

Second, the difference in ability and alternative employment options between high and low paying organizations is also important because when individuals lack alternatives to a relationship, they are both less likely to have strong perceptions of inequity and more likely to remain committed to the relationship regardless of equity perceptions (Gould, 1979; Lawler, Hackman, and Kaufman, 1973; Michaels, Acock, and Edwards, 1986; Russult, 1983). For example, Latham (2007) noted that during the Great Depression, although workers held hostile attitudes toward management, their greatest fear was job loss; since there were perilously few alternatives to secure a paying job, Depression Era employees responded differently to their working conditions than employees during other periods. Similarly, individuals in low-paying organizations with low congruence between resource and pay dispersions may be less likely to respond to feelings of inequity in ways such as lowering their commitment to their organizations and diminishing performance, principally because they have fewer options available should such behavior result in dismissal. On the contrary, individuals in high-paying organizations (and therefore, with more alternative employment opportunities) are more likely to lower their commitment to the organization when congruence between resource and pay dispersion is low. As a result, we expect congruence between resource and pay dispersions to moderate the positive relationship between organizational pay and performance as predicted by efficiency wage theory.

Hypothesis 3: Congruence between resource and pay dispersions will moderate the relationship between organizational pay level and performance with weaker effects for lower levels of congruence between pay and resource dispersions.

METHODS

Sample

To test our hypotheses, we analyzed the performance of Major League Baseball (MLB) teams. Sports, particularly professional baseball, have proven to be particularly good settings for testing phenomena related to human resources (Sirmon,

Gove, and Hitt, 2008; Wolfe *et al.*, 2005), including pay dispersion (Depken, 2000; Howard and Miller, 1993; Lord and Hohenfeld, 1979). In particular, this population choice achieves three fundamental purposes for our study. First, it allows us to consistently assess resource (player) value and pay simultaneously, thereby avoiding an important constraint of previous research (Madigan, 1985; Madigan and Hoover, 1986). Combining data from MLB organizations with Baseball Info Solutions' proprietary data, we have full access to resource value and payment information for all individual players on these teams. Second, because previous studies used the context of MLB to address pay dispersion questions, the comparability of our results with extant research is enhanced, providing background for the contributions of our study. Finally, prior research suggests that negative outcomes associated with pay dispersion such as failing to collaborate (Pfeffer and Langton, 1993), withholding effort or undermining the efforts of others (Hambrick, 1995; Lazear, 1995) are exacerbated in settings where collaborative work is essential (Fredrickson *et al.*, 2010; Shaw *et al.*, 2002; Siegel and Hambrick, 2005). Professional baseball is one such setting (Bloom, 1999; Wolfe *et al.*, 2005), a fact that adds value for our study¹.

Measures

Dependent variable

Performance was measured as the percentage of games each MLB organization won in a focal year (e.g., Bloom, 1999; Sirmon *et al.*, 2008). The variable was multiplied by 100 for scaling.

Independent variables

To measure both resource and pay dispersions in MLB teams, we utilized the Gini coefficient. Because we are interested in assessing the two dispersions simultaneously, a measure was needed that would be comparable across both. Research suggests that the Gini coefficient is invariant across different distributions of inequality, whereas other

measures of dispersion (e.g., coefficient of variation, focal value minus lowest value, highest value minus focal value) may not be (Donaldson and Weymark, 1980; Levy and Murnane, 1992). An added benefit of using the Gini coefficient is that the measure is commonly employed in assessments of pay dispersion (e.g., Brown *et al.*, 2003; Fredrickson *et al.*, 2010; Levy and Murnane, 1992) and has exhibited significant correlation with other measures (e.g., Bloom, 1999; Shaw *et al.*, 2002). Assessments of dispersion using the Gini coefficient vary from a high of 1, which indicates the highest amount of possible dispersion (or absolute inequality), to a low of 0, which indicates the lowest amount of possible dispersion (or absolute equality). *Pay dispersion* was measured using the Gini coefficient for the dispersion of individuals' total pay in the organization as reported by the organizations that includes all actual pay to a player by a team in a year. *Resource dispersion* was measured using the Gini coefficient for the dispersion of individuals' contributions to the performance of the organization. Because our theory addresses whether feelings of deprivation affect individual behaviors contemporaneously, we measured resource dispersion and all other variables in the same year unless noted (Bloom, 1999). A given individuals' value or contribution relative to other individuals was assessed using the long-form method of adjusted player contribution outlined by noted baseball statistician Bill James (James, 2009; James and Henzler, 2002). James's calculation of players' contributions was particularly relevant to our study because it is utilized by MLB organizations to assess individuals' value (Lewis, 2003; Nayer, Schwarz, and Pierce, 2007) and scholars have both commented on the merits of James's measures (e.g., Humphrey, Morgeson, and Mannor, 2009; Piette, Anand, and Zhang, 2010) and employed them to assess player value (Burger and Walters, 2008; Lanning, 2010).

Although James's calculation of player contribution is complex, and we omit the full measure due to space restrictions (the full formulation is 84 pages of text; for the complete formula, see James and Henzler, 2002: 16–100), the measure combines both offensive (e.g., batting, base running) and defensive (e.g., pitching, fielding) metrics into a single integer that allows for comparisons of relative productivity across positions. The integer we used is based on combining the marginal productivity associated with both creating (i.e., offense) and

¹ A labor strike during 1994 led to the cancellation of more than 30 percent of the games; as a result, performance and compensation data from this season may not be comparable to others. To guard against this potential confound, we omitted the year 1994 from our analysis. Results of supplemental analyses, including 1994, are consistent across all hypothesized effects.

preventing (i.e., defense) runs, the unit of scoring in baseball, and isolating a player's productivity independent of the situation a player is in such that a higher value reflects a higher marginal productivity. Thus, the measure combined all possible ways in which runs are created through offense (e.g., getting on base, running the bases, and not making outs) and prevented through defense (e.g., preventing opposing batters from creating runs).

In considering both runs created and prevented, the measure has important benefits over other potential approaches to calculate player value. First, the measure adjusts each individual's personal performance to account for various factors that may obscure the individual's true contribution to the performance of the organization (e.g., conditions of the home field, the league in which he plays, the strength of other players on the team). For example, professional baseball organizations compete in 162 games per season, half of which are played at "home" and half of which are played as visitors at opponents' home fields. The formula created by James adjusts for the field on which the games are played since this may affect individual performance. Second, players' performance is affected by the strength of others around them (e.g., a good pitcher may be adversely impacted by bad defensive players) and must be adjusted to get a true indication of an individual's performance. Finally, the measure accounts for positional differences so that players who perform different, specialized tasks are comparable (e.g., different skills such as pitching, fielding, batting, and base running; different positions such as shortstop, pitcher, and right field). In this way, specialized services of say a relief pitcher can be compared to a starting pitcher that can also be compared to an individual who is a strong hitter and poor fielder. Further, the measure is standardized so that the benefits of playing with better players or in better offensive or defensive situations are equalized across settings. In order to account for in-season roster changes for both pay and resources, for every team, we included the player portion of pay effectively covered by each team in the year and the portion of player contribution by the player to each team in the year. Consistent with Sirmon, Hitt, and Gove (2008), we applied a minimum-use criterion and included proportion to their pay and contribution for each team of players that accumulated at least 10 at bats, or innings, or chances in the field, for that team.

Congruence between resource and pay dispersions was measured as one minus the absolute difference between the dispersions of resources and pay² so that a higher value indicates a greater degree of congruence between the dispersions of pay and resources. To confirm that our use of a difference score was justified, we analyzed whether our measure satisfies the four constraints noted by Edwards (2002). The results of this analysis showed that our measure met each of the four constraints, and as such, the use of the difference score to assess *Congruence between pay and resource dispersion* is justified³ (Milton and Westphal, 2005; Westphal and Fredrickson, 2001). We measured the dispersions of both pay and resource contributions in the concurrent year because, in line with the tradition of the pay dispersion literature, current contributions are more salient than either leading or lagged pay and individual performance levels, and are therefore more likely to influence the players current experiences of deprivation and distress (Bloom, 1999) when the rewards are misaligned with current contributions affecting organizational commitment, cooperation, and overall performance.

Control variables

Last season's winning percentage is the lagged dependent variable, taken in the year prior to the focal year (Bloom, 1999; Harder, 1991), to control for the possibility that performance in a previous year affects subsequent performance. We multiplied the variable by 100 for scaling. *Market size* is the logged value of the population of the MLB organization's city and was included to control for economic effects on the performance of MLB

² Supplemental analysis shows a negative effect of pay dispersion on performance ($b = -6.43$; $se = 2.22$; $p = 0.002$; $p = 0.002$) in line with prior pay dispersion research (e.g., Bloom, 1999; Fredrickson *et al.*, 2010; Shaw *et al.*, 2002; Siegel and Hambrick, 2005) and a negative effect of resource dispersion on performance ($b = -11.79$; $se = 2.16$; $p = 0.000$).

³ We regressed the equation on organizational performance and found that: (1) the variance explained by the equation differs from zero; (2) the coefficients on pay dispersion (X) and compensation dispersion (Y) were significant, as were the interactions of both these variables with W (a dummy equal to 0 when $X \geq Y$ and equal to 1 when $X < Y$) while the coefficient on W was not significant; (3) the coefficient on X was of opposite sign to the coefficients on both Y and WX and of the same sign as the coefficient on WY ; (4) none of the terms one order higher (e.g., X^2 , XY , Y^2 , WX^2 , WXY , and WY^2) were significant when added to the model.

organizations (Bloom, 1999; Sheehan, 1996). Organizations may spend more on salaries to obtain more talented employees or to motivate current employees to perform at a higher level (Brown *et al.*, 2003; Milgrom and Roberts, 1992). To account for spending advantages, we included the yearly *Average total team payroll in MLB* as well as the focal team's *Average pay*, calculated as the average spending on player salaries for each organization (Bloom, 1999), both of which are divided by 1 million for scaling. Consistent with resourced-based view (RBV), we expect organizations with more valuable employees will perform favorably relative to organizations with less valuable employees. As such, we controlled for the *Overall resource value*, measured by dividing the sum of each organizations' employee contributions (outlined above) by the average of all MLB organizations. We also controlled for the *Congruence between age dispersion*, measured as the Gini coefficient of age on the team in a focal year, with pay dispersion which accounts for social comparisons effects related to age and pay, calculated as one minus the absolute difference between the two measures of dispersion. Managerial ability may affect performance, and thus, following Holcomb, Holmes, and Connelly (2009), we controlled for *Managerial ability* using weighted career winning percentage (Dirks, 2000). *Team desirability* is a dummy that takes a value of 1 if a team appeared in the World Series within a five-year period prior to the focal year, and 0 otherwise⁴. Our measure of team desirability helped account for a track record for winning (Bidwell *et al.*, 2015; Rider and Tan, 2015).

Analysis

We used generalized least squares (GLS) regression because the data had heteroskedasticity and autocorrelation (Wooldridge, 2002). As the autocorrelation process may differ by panel, we used panel-specific autocorrelation coefficients as well as a year variable (Zhang and Rajagopalan, 2010).

⁴ In robustness tests, we found that our results were unchanged omitting team desirability as well as to the use of other measures of the construct. Specifically, we utilized dummy variables for winning and losing teams in the World Series as well as alternative lag periods of all team desirability measures (i.e., one year; three years) and found that our hypothesized effects were unchanged.

RESULTS

Descriptive statistics and correlations are presented in Table 1, while coefficient estimates are presented in Table 2; Model 1 includes control variables, while Models 2–4 add hypothesized effects.

Results provide support for Hypothesis 1, which predicted that congruence between pay and resource dispersion would be positively related to performance. Congruence between pay and resource dispersion is significantly and positively related to performance in Model 2 ($b = 7.74$; standard error = 2.38; $p = 0.00$). This finding shows that team performance improves when pay dispersion and resource dispersion are congruent. In practical terms, it implies that teams whose congruence between pay and resource dispersion improves as a result of a one standard deviation shift in pay disparity will win approximately one more game in the season. While this figure may seem small, it is not. Winning just one less game in a season within the period in our sample would imply that 11 of the 64 teams that made the playoffs during those years (17.2%) could not have made the playoffs, and this estimate is conservative because MLB performance is a "net-zero" outcome in which one team's loss of a game is another team's win, and therefore, the effects could be larger depending on the competitors that give up the win. Also, from a strict performance average perspective, given that baseball performance is constrained and average performance plus minus 2 standard deviations ranges between 37 and 63 percent wins, the percentage change in wins for every one standard deviation change in the pay dispersion component of congruence accounts to 2.1 percent of the performance range. Overall, this results provide practical and statistical support for Hypothesis 1. Additionally, we find support for Hypothesis 2 in Model 3, which indicates that congruence between resource and pay dispersions will positively moderate the relationship between overall resource value and performance ($b = 36.66$; standard error = 16.69; $p = 0.03$). In practical terms, it implies that for teams with high level of resources an improvement in congruence between pay and resource dispersion as a result of a one standard deviation shift in pay disparity will lead to approximately two more wins in the season. As a reference of practical significance, winning two less games in a season within the period in our sample would imply that at least 17 of the 64 teams (26.6%) that made

Table 1. Descriptive statistics and correlation matrix

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10
1. Winning percentage	0.50	0.66										
2. Last season's winning percentage	0.50	0.66	0.35									
3. Market size	13.62	0.78	0.08	0.08								
4. Average total team payroll in MLB ^a	1.15	0.39	-0.00	0.00	-0.01							
5. Average pay ^a	1.16	0.59	0.32	0.39	0.20	0.65						
6. Overall resource value	1.00	0.14	0.93	0.38	0.11	0.00	0.37					
7. Team desirability	0.22	0.48	0.25	0.34	-0.12	-0.05	0.17	0.26				
8. Congruence between age and pay dispersions	0.49	0.07	0.13	0.07	-0.01	-0.10	-0.02	0.09	0.06			
9. Managerial ability	0.32	0.18	0.15	0.22	-0.12	0.12	0.24	0.16	0.23	0.09		
10. Pay dispersion	0.58	0.07	-0.12	-0.04	0.00	0.10	0.04	-0.08	-0.05	-0.98	-0.06	
11. Resource dispersion	0.60	0.05	0.00	0.06	0.04	0.08	0.11	0.08	0.02	-0.10	-0.00	0.10

^a Measure was scaled 1/1 m. Standard errors in parentheses. *n* = 276.

the playoffs during those years could not have made the playoffs. From a performance average perspective, the percentage change in wins for every one standard deviation change in the pay dispersion component of congruence amounts to 3.8 percent of the performance range. Finally, the results also show strong support for Hypothesis 3⁵. We find that the interaction term between average pay and congruence between resource and pay dispersions is positive and significant ($b = 12.20$; standard error = 3.23; $p = 0.00$), suggesting that congruence between resource and pay dispersions strengthens the effect of organizational pay levels on performance. In empirical terms, it implies that for teams with high level of pay an improvement in congruence between pay and resource dispersion as a result of a one standard deviation shift in pay disparity will lead to approximately three more wins in the season. As a reference of practical significance, winning three less games in a season within the period in our sample would imply that at least 22 of the 64 teams (34.4%) that made the playoffs during those years could not have made the playoffs. From a performance average perspective, the percentage

change in wins for every one standard deviation change in the pay dispersion component of congruence amounts to 4.2 percent of the performance range. Overall, these results show the empirical and statistical significance of our findings.

DISCUSSION

The pattern of results in our study offers insights into how dispersions in both human resource values and pay affect performance. In general, our findings illustrate the interdependency between resources and payment combinations in organizations that may qualify and extend previous research. We first show considering resource dispersion interdependently with pay dispersion may enrich the important findings of the pay dispersion literature (Bloom, 1999; Mahoney, 1983; Milgrom and Roberts, 1992; Pfeffer and Langton, 1993; Siegel and Hambrick, 2005). We show that congruent levels of pay and resource dispersions are beneficial to performance. In many ways, this finding adds an equity or meritocratic perspective to the pay dispersion literature. Employees or team members may have particular expectations of rewards associated with their contributions to the organization. This insight is illustrated by Joe DiMaggio stating that "based on what Dave Winfield got for his statistics, I'd have to say, George [Steinbrenner—New York Yankees owner], you and I are about to become partners" (Kirshenbaum, 1981: 26). To our knowledge, this study is the first to examine whether the dispersion of human resource value to the organization help qualify the findings of the pay dispersion literature.

⁵ Although winning baseball games is the most important outcome in MLB (Wolfe *et al.*, 2005), we tested the robustness of our analyses to an alternative outcome: making the playoffs, coded as a dummy variable with a value of 1 if a team makes the playoffs in a given year, and 0 otherwise. Because this DV is dependent on league and division, we include controls for *League* and *Division*, and test it between 1995 and 2000 because rules for qualification were different before that date. All results are directionally consistent with our article results with only the moderating effect for Hypothesis 2 failing to reach significance probably because of the reduced sample and less overall predictability of this more distal and conditional DV.

Table 2. GLS regression on performance

	Model 1	Model 2	Model 3	Model 4
Constant	7.84 (3.18) [0.01]	-0.71 (4.09) [0.86]	34.65 (16.66) [0.04]	12.66 (5.58) [0.02]
Last season's winning percentage ^a	-0.03 (0.02) [0.16]	-0.03 (0.02) [0.09]	-0.04 (0.02) [0.04]	-0.04 (0.02) [0.02]
Market size	-0.28 (0.18) [0.12]	-0.25 (0.18) [0.17]	-0.33 (0.18) [0.07]	-0.28 (0.18) [0.13]
Average total team payroll in MLB ^b	0.70 (0.45) [0.12]	0.66 (0.45) [0.14]	0.34 (0.46) [0.46]	0.55 (0.44) [0.21]
Average pay ^b	-0.11 (0.33) [0.75]	-0.19 (0.33) [0.56]	0.01 (0.34) [0.97]	-11.46 (3.04) [0.00]
Managerial ability	-0.31 (0.69) [0.65]	-0.06 (0.67) [0.93]	-0.16 (0.67) [0.81]	-0.09 (0.65) [0.89]
Overall resource value	42.86 (0.87) [0.00]	42.57 (0.82) [0.00]	7.93 (15.59) [0.61]	42.96 (0.77) [0.00]
Team desirability	0.22 (0.34) [0.52]	0.24 (0.33) [0.47]	0.32 (0.32) [0.32]	0.21 (0.32) [0.52]
Congruence between age and pay dispersions	7.32 (2.22) [0.00]	10.18 (2.30) [0.00]	10.50 (2.33) [0.00]	8.07 (2.30) [0.00]
Congruence between pay and resource dispersions		7.74 (2.38) [0.00]	-28.29 (16.75) [0.09]	-5.09 (4.29) [0.24]
Congruence between pay and resource dispersions × overall resource value			36.66 (16.69) [0.03]	
Congruence between pay and resource dispersions × average pay				12.20 (3.23) [0.00]
<i>Chi</i> ²	2999.89 [0.00]	3434.00 [0.00]	3970.14 [0.00]	8720.58 [0.00]
Change in <i>Chi</i> ²		10.06 [0.00]	4.82 [0.03]	14.27 [0.00]

^a Measure was scaled by a factor of 100.^b Measure was scaled by 1/1 million. Time dummies included in analyses but excluded from the table.

n = 276. Estimated coefficients are in bold. Standard errors in parentheses and p values are between square brackets.

Additionally, our results suggest that congruence between pay and resource dispersions also moderate the relationship between the aggregate level of organizational resource value and performance. This suggests that the positive relationship suggested by RBV between resources and performance is strengthened when resource and pay dispersions are congruent with each other. This finding complements our main findings and supports Coff's (1997, 1999) suggestion that the relationship between

possessing superior human resources and performance may be contingent on other organizational factors. Finally, our study shows that to realize the benefits of higher pay levels, it is also important to maintain congruence between pay and resource dispersions. In fact, our findings indicate that the effect of high pay levels on performance due to the ability to attract, retain, and motivate talent is positive under conditions of tightly aligned pay and resource dispersions. This qualifies the arguments

of efficiency wage theorists that organizations that compensate their employees at higher levels than their competitors will enjoy superior performance (Brown *et al.*, 2003; Milgrom and Roberts, 1992) and may help explain the mixed support of the theory in empirical tests (Krassoi Peach and Stanley, 2009).

Our research has important practical implications. Based on our findings, resource decisions may need to be supported by tightly aligned salary and resource dispersions in their organizations. Organizations that need, or develop, to include a variety of contributions from its human resources and resource decisions such as including star performers or more homogeneous resource stocks, may need to consider both the capacity of and the demands on the organization implied by such decisions in order to optimize performance. Tightly aligning pay distributions with individual contributions may require improved evaluation systems to identify contributions and more signaling or communications efforts to highlight contributions in heterogeneous pay structures. A CEO with a star performer in her top management team should consider both a pay package that is consistent with the heterogeneous contribution of the star player in comparison to the rest of the top management team, but also clear signaling of the added contributions by the star team member to the organization. Alternatively, organizations with homogeneous resource contributions should contain differential pay structures to capitalize on their resources. Additionally, practitioners considering increased investments in human resources should take note that higher organizational pay levels may not benefit organizations that are not congruent in their pay and resource dispersions. While high pay levels are a fundamental tool to attract talent, such attraction of talent may make it more difficult to evaluate and clarify differential contributions to the organization and may place even greater emphasis on evaluation, turnover decisions, and contribution information or signaling.

Although our article offers a number of insights for management theory and practice, one relevant limitation to note may be that while the use of professional baseball allows the analyses of both pay and resource contribution and makes the study comparable with extant strategy literature on pay dispersion that utilizes MLB samples (Bloom, 1999; Depken, 2000; Howard and Miller, 1993), it presents idiosyncrasies, like the focus on

head-to-head competition, that put some limits on the generalizability of our findings (Wolfe *et al.*, 2005). Also, it is important to note that conditions of interdependence may vary in organizations such that some organizations may be more or less represented in term of interdependence, potentially limiting the contribution of our study. We think however the theory should be consistent across normal levels of interdependence.

In conclusion, we see strong support in our findings for the general idea that there are important interdependencies between resource values and their payments that have significant effects on performance. We were able to find that the congruence between resource value dispersion and pay dispersion, and the actual interaction between that congruence measure and both the overall stock of resources of the organization and the organizational pay levels all extend the explanatory power of the pay dispersion literature. We believe that our findings speak to the larger issue of how to better select and deploy (organize, pay) resources for improved performance.

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