Brands in the Labor Market: How Vertical and Horizontal Brand Differentiation Impact Pay and Profits Through Employee-Brand Matching

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Abstract

The primary focus of brand equity research has been on how brand knowledge creates value for firms through customer behavior in product markets. Using archival data and five experiments, this article tests a framework that outlines the unique role brands play in the labor market. The framework distinguishes between vertical and horizontal differentiation and shows that vertical brand differentiation is associated with lower pay, whereas horizontal brand differentiation is associated with higher pay. Employees are also vertically and horizontally differentiated and firms high in horizontal brand differentiation pay more for employees who match their brands' differentiating characteristics (i.e., brand-relevant complementarities). Results show that these brand-pay relationships have important downstream effects on employee behavior and, consequently, on firm profits. Specifically, leveraging vertical brand differentiation to lower pay represents a false economy because profits are attenuated by negative effects on employee productivity and retention. In contrast, when managers at firms high on horizontal brand differentiation pay more, profits increase via the same mediating employee behaviors. Six firm strategies and investments that influence firm bargaining power in the employee-brand matching process are found to moderate the brand-pay relationship and downstream effects on profits.

***Keywords**:* Brand differentiation, labor market, employees, employee differentiation, employee-based brand equity, matching, pay, bargaining power

Introduction

Brand equity is the value a brand contributes to the firm (Farquhar 1989). The primary focus of brand equity research has been on how brand knowledge creates value for firms through customer behavior in product markets, or what Keller (1993) calls *customer-based brand equity.* This includes customer-level outcomes such as willingness to pay (e.g., Datta, Ailawadi, and Van Heerde 2017) and firm-level outcomes such as stock valuations and profits (e.g., Mizik 2014).

Research has also identified a second source of brand equity that affects labor markets. *Employee-based brand equity* is defined as the "value a brand provides to a firm through its effects on the attitudes and behaviors of its employees" (Tavassoli, Sorescu, and Chandy 2014, p. 677). To date, it has been documented via a single financial outcome: employees' willingness to accept lower pay (Cable and Turban 2003; DelVecchio et al. 2007; Tavassoli, Sorescu, and Chandy 2014). We contribute to this nascent literature in three ways.

First, we challenge the current understanding of employee-based brand equity and propose that different dimensions of brand knowledge—vertical and horizontal brand differentiation (Dommer, Swaminathan, and Ahluwalia 2013; Ordabayeva and Fernandes 2018; Spiller and Belogolova 2017)—have opposite effects on pay. We show that vertical brand differentiation is associated with lower pay, whereas horizontal brand differentiation is associated with higher pay.

Second, drawing on human capital theory (Becker 1964), we suggest that employees also vary in terms of vertical and horizontal differentiation. Leveraging this distinction, we find that firms[1] high in horizontal brand differentiation pay more to hire employees who match their brand's differentiating characteristics—a like-with-like dynamic known as *positive assortative matching*—whereas vertically differentiated brands do not systematically match with vertically

[1] Given our focus on brand differentiation at the firm level, we use the terms "brand" and "firm" interchangeably.

differentiated employees. Across all types of employee-brand matches, we find that the brand-pay relationship is moderated by a set of firm strategies and investments that influence firm bargaining power across different stages of the matching process. These stages include the firm's demand for labor relative to its supply (labor availability), approach to forming a consideration set of job candidates (labor identification), attractiveness to job candidates beyond pay (labor attraction), and improvements in match quality through training (labor development).

Third, previous research suggests that if brand equity is leveraged to lower pay, it should translate into higher profits (Tavassoli, Sorescu, and Chandy 2014). We challenge this view and show it represents a false economy. When managers leverage vertical brand differentiation to lower pay, it negatively affects profits due to the mediating effects of lower employee productivity and retention. This means that profits are lower than would have been achieved by the positive effect of brand alone. In contrast, we find that when managers pay more due to horizontal brand differentiation, it increases profits via the same mediating employee behaviors.

The next section describes our theory and predictions about employee-brand matching and its effect on pay, employee behaviors, and profits. This is followed by our empirical strategy, which involves the use of archival data and experiments to test our predictions.

Brands in the Labor Market

What role do brands play in the labor market? To answer this question, we characterize the heterogeneous labor market participants—firms and employees—along dimensions that allow us to describe strategic interactions unique to employee-based brand equity.

Heterogeneous Labor Market Participants

Brand differentiation. Formalized in economics by Hotelling's (1929) model of market competition and subsequently in Lancaster's (1979) theory of consumer choice, among others,

Tirole (1988, pp. 96-97) specifies that with *vertical differentiation*, "all consumers agree over the most preferred mix of characteristics and, more generally, over the preference ordering," while with *horizontal differentiation* "the optimal choice [at equal prices] depends on the particular consumer." As outlined by Spiller and Belogolova (2017, p. 970), this distinction is central to marketing: "Marketers and researchers alike typically regard products as differentiated by quality (modeled via vertical differentiation) or taste (modeled via horizontal differentiation)," with market segments (e.g., Desai 2001), products (e.g., Liu, McFerran, and Haws 2020), customer reviews (e.g., Lee, Bollinger, and Staelin 2023), and product lines (e.g., Balachander and Stock 2009) characterized along these two dimensions.

Brands can also be characterized along vertical and horizontal dimensions (Dommer, Swaminathan, and Ahluwalia 2013; Ordabayeva and Fernandes 2018). These dimensions reflect associations based on product (e.g., perceived quality) and non-product attributes (e.g., symbolic benefits) (Keller 1993). In line with this literature, we define *vertical brand differentiation* as the holistic perception of a brand's superior quality relative to other brands and *horizontal brand differentiation* as the holistic perception of a brand's uniqueness relative to other brands.

Vertically differentiated brands therefore tend to perform well on dimensions most consumers regard positively, such as Vanguard's reliable investment returns or Ritz-Carlton's high-level of service. Horizontally differentiated brands, on the other hand, perform well on distinctive qualities that may only be valued by some consumers, such as Jeep's rugged image or Dove's natural-beauty positioning. Brands can of course be differentiated along both vertical and horizontal dimensions. For example, Dior and Gucci are both vertically differentiated in terms of their universally-valued quality of craftsmanship and heritage of excellence as well as horizontally differentiated in terms of Dior's timeless style and classic feminine beauty and

Gucci's fashion-forward androgyny, for which preferences diverge as a matter of taste.

Literature in consumer research finds that consumers leverage these vertical and horizontal brand associations. Specifically, consumers seek to transfer these brand meanings to vertically differentiate and signal they are better than others or to horizontally differentiate and signal their uniqueness (Dommer, Swaminathan, and Ahluwalia 2013; Ordabayeva and Fernandes 2018).

Employee differentiation. We suggest that employees can also be characterized as being vertically and horizontally differentiated. They can be considered to be vertically differentiated through what Becker (1964) refers to as *general human capital*—universally valued employee knowledge, skills, and traits, such as negotiation and planning skills or a strong work ethic. Some universally valued human capital may be tied to specialized job skills (e.g., coding; Gibbons and Waldman 2004) or occupations (Mayer, Somaya, and Williamson 2012) and has been examined in terms of *person-job fit* in the organizational psychology literature (Kristof-Brown 2000). In line with this literature, we view employees as being more vertically differentiated when their general human capital can be objectively ranked and is valued by many firms.

In contrast, employees can be horizontally differentiated through what Becker (1964) refers to as *specific human capital*, which is not better or worse in an absolute sense, but is subjectively valued by some firms. It is often viewed as the degree of *person-organization fit* based on an applicant's personality, attitudes, or life experiences (Kristof-Brown 2000).

Person-organization fit, referred to in our framework as employee-brand fit, is a highly relevant form of specific human capital given consumers use their experiences with employees to create and update their brand knowledge (Sirianni et al. 2013). For this reason, a horizontally differentiated brand such as Wildfang, a purveyor of apparel for feminists and a self-proclaimed home of tomboy culture, values female workers who share its brand's masculine identity

(Mathwick 2017). This characteristic is negatively valued by Kate Spade, a brand defined by its feminine style. Research on elite professional service firms has likewise observed that firms evaluate client-facing employee fit based on "distinct personalities, derived from the typical extracurricular interests and self-presentation styles…" (Rivera 2012, p. 1007). Horizontal differentiation extends to employees working behind the scenes. To that end, Procter & Gamble seeks employees passionate about babies and aims for "… everyone working on Pampers to live the brand ideal in everything they [do]" (Stengel 2011, p. 180).

Employee-Brand Matching

Firms and employees match in labor markets with the aim of maximizing the joint value created and shared between them (Becker 1964). Firms define *match quality* in terms of the performance gains employees provide (Weller et al. 2019), while employees focus on the pecuniary and nonpecuniary benefits received for their labor (Campbell, Coff, and Kryscynski 2012; Lucas 1977). For firms to secure strong matches, they need to compensate in accordance with the value employees provide (e.g., Eckert et al. 2022).

Importantly, matches vary in their *complementarity*—sometimes referred to as production or resource complementarities—meaning certain types of workers create more value at certain types of firms (Becker 1964). For example, faculty who are talented case writers create more value at Harvard Business School, which has matching idiosyncratic resources (e.g., Harvard Business Publishing), than at other universities. We propose that *employee-brand complementarity*—the value created from the fit between brand and employee differentiation—is particularly important for horizontally differentiated brands.

The ability of firms and employees to match optimally is challenged by labor market frictions or search costs due to imperfect information. On the firm side, imperfect information

makes it costly to identify high-quality matches. Firms can reduce frictions by investing in stronger hiring capabilities (Jiang et al. 2012) or building well-known and respected brands, which would be more salient and attractive to applicants during the job search process (Collins and Han 2004). Conversely, imperfect information makes it costly for applicants to signal they are high-quality, but they can do so, for example, by obtaining a degree from a respected university (Spence 1973) or working for a prestigious brand (Bidwell et al. 2015). All else equal, the higher the frictions faced by the firm (employee), the lower the firm's (employee's) bargaining power.

Predictions

Our framework is depicted in Figure 1. We begin by theorizing that pay will be lower (higher) at vertically (horizontally) differentiated brands. We further theorize that the effect of horizontal brand differentiation on pay will be influenced by the degree to which prospective employees are horizontally differentiated in a way that fits the brand. We then consider how firm strategies and investments across the employee-brand matching process (labor availability, identification, attraction, and development) shift firm bargaining power and moderate the brand-pay relationship. Given these effects, we predict that to the extent vertical (horizontal) brand differentiation results in lower (higher) pay, profits will decrease (increase) as a result of the negative (positive) mediating effects of employee productivity and retention.

[Insert Figure 1 here]

The Effect of Vertical Brand Differentiation on Pay

Previous literature on pay has, implicitly or explicitly, described employee-based brand equity in terms of vertical brand differentiation, such as brand status or prestige (Bidwell et al. 2015; DelVecchio et al. 2007; Tavassoli, Sorescu, and Chandy 2014; Yang, Shi, and Goldfarb

2009). For example, Cable and Turban (2003) asked students to rate hypothetical employers on "good public image" and "very familiar" to predict minimum salary requirements. DelVecchio et al. (2007) similarly observed lower salary requirements for hypothetical jobs at firms with more expensive brands that have higher awareness, market share, and perceived quality.

Vertical brand differentiation enhances firm bargaining power to offer lower pay for several reasons. First, a key nonpecuniary benefit affecting firm bargaining power is brand-knowledge transfer from being associated with a firm's brand (Highhouse, Thornbury, and Little 2007; Tavassoli, Sorescu, and Chandy 2014; Yang, Shi, and Goldfarb 2009). Core to this view is the premise that a person's underlying quality is a difficult-to-observe characteristic that is socially constructed (Lynn, Podolny, and Tao 2009). For example, the perceived quality of scientists is based not only on scholarly merit, but also on the prestige of their academic affiliations (Hargens and Hagstrom 1982). Hedonic wage theory suggests that this brand-knowledge transfer constitutes *psychic wages* that substitute for pay (Lucas 1977).

Second, brand-knowledge transfer benefits employees in the form of resumé power, which can also serve as a substitute for pay. Resumé power from a vertically differentiated brand serves as a signal of general human capital that enhances employees' value in labor markets (Tavassoli, Sorescu, and Chandy 2014). Because firms are uncertain about the quality of an applicant, they consider signals such as the vertical differentiation of an applicant's degree-granting institution (Spence 1973) and former employers (Bidwell et al. 2015) to assess quality.

Third, vertical brand differentiation improves firm bargaining power by reducing search costs associated with labor market frictions. In particular, research has shown that the brand awareness associated with quality perceptions (Bronnenberg, Dubé and Moorthy 2019) increases the number of job applicants at well-known and respected brands, thereby reducing firm search

costs (Collins 2007; Collins and Han 2004). For all these reasons, we expect that the higher a firm's level of vertical brand differentiation, the greater its bargaining power and ability to attract the same quality of employee for less pay.

H1: Pay is lower, on average, the higher a firm's level of vertical brand differentiation.

The arguments in support of H1 do not leverage any link between vertically differentiated employees and brands. This is because both positive assortative matching (Mackey, Molloy, and Morris 2014) and negative assortative matching (Yang, Shi, and Goldfarb 2009) are possible under different conditions (Eeckhout 2018). Positive (negative) assortative matching refers to employees and brands being more (less) likely to match when they share the same characteristics. We offer a detailed discussion of each type of matching in Web Appendix A and simply note here that we do not expect vertical employee differentiation to moderate the effect of vertical brand differentiation on pay in H1. In contrast, we discuss next how positive assortative matching should impact the relationship between horizontally differentiated employees and brands.

The Effect of Horizontal Brand Differentiation on Pay

Whereas previous research has linked vertical brand differentiation to lower pay, the employee-based brand equity literature has been entirely silent on horizontal brand differentiation. We address this shortcoming and predict that horizontal brand differentiation will have opposite effects on pay for the following reasons.

First, horizontal differentiation is, by definition, positively assortative. Horizontally differentiated brands should seek to match with the same type of horizontally differentiated employees because these employees offer brand-relevant complementarities through their specific human capital (Gelb and Rangarajan 2014; Sirianni et al. 2013). These complementarities create greater economic value for the firm, which is shared in the form of higher pay (Becker 1964).

Second, a firm's demand for specific human capital that fits the requirements of its horizontal brand differentiation creates a restrictive matching condition in the form of a smaller available labor pool (Mackey, Molloy, and Morris 2014). As with any scarce talent, this increases the bargaining power of employees who are brand-relevant matches, resulting in horizontally differentiated firms paying higher wages for a match (Campbell, Coff, and Kryscynski 2012; Mackey, Molloy, and Morris 2014).

Third, the same way horizontally differentiated brands appeal to only a subset of consumers (Datta, Ailawadi, and van Heerde 2017), they should provide psychic wages in the form of self-expression benefits to only a minority of employees (Highhouse, Thornbury, and Little 2007). Brand-knowledge transfer from such brands may even be a disincentive for individuals who do not identify with the unique brand associations. For example, employees who want to express a feminine self-identity may receive negative utility from the brand-knowledge transfer of Wildfang's more masculine image. This disincentive restricts the number of potential employee matches attracted to the firm.

Fourth, it follows that horizontal brand differentiation confers limited resumé power because it signals specific human capital that is not transferable to most other firms. Working for Southwest Airlines signals that an employee has a quirky personality, which may make this employee more attractive to a brand like Benefit Cosmetics with the tagline "Laughter is the best cosmetic," but not to brands that do not value this quality. For all these reasons, we predict:

H2a: Pay is higher, on average, the higher a firm's level of horizontal brand differentiation.

The positive assortative matching underlying this main effect further suggests an interaction such that the effect of horizontal brand differentiation on pay should be highest for employees matched on (brand-relevant) horizontal differentiation. We therefore predict:

H2b: Firms high in horizontal brand differentiation pay more for employees high on matched (brand-relevant) horizontal differentiation, but not for employees low on it.

Employee-Brand Matching Process Moderators

The matching process between employees and brands is shaped by various factors—the firm's demand for labor (*labor availability*), its approach to creating a consideration set of candidates (*labor identification*), its ability to attract candidates (*labor attraction*), and its investment into match quality (*labor development*). We predict that firm strategies and investments in these activities will shift firm bargaining power and impact the brand-pay relationship. We offer a broad discussion of these moderating factors and test their effects using an array of specific measures.

Labor availability. The employee-brand matching process relies on the supply of talent that meets the firm's demand. All else equal, firms have lower bargaining power when they require human capital that is in short supply relative to firm demand (Mackey, Molloy, and Morris 2014). This dynamic underlies our prediction in H2b. Firms also face labor availability constraints as the number of firms competing for similar talent increases. These types of labor-supply requirements should weaken the firm's bargaining power and decrease (increase) the negative (positive) effect of vertical (horizontal) brand differentiation on pay.

Labor identification. Firms need to identify qualified applicants from the pool of available labor to form a consideration set from which to hire. Firms may rely on different strategies and investments that either enhance or limit their bargaining power. One approach is to build stronger capabilities in people practices, including hiring procedures and compensation negotiations (e.g., Jiang et al. 2012). Such capabilities reduce labor-market frictions and increase the firm's bargaining power (Schmidt and Hunter 1998), thus increasing (decreasing) the negative (positive) effect of vertical (horizontal) brand differentiation on pay.

Firms can also strategically rely on employee referrals to identify and screen candidates. Such employee referrals reduce uncertainty about applicant quality by virtue of the private information an internal referrer has about difficult-to-observe candidate characteristics such as person-organization fit (Eeckhout 2018; Montgomery 1991). Further, referrals are credible signals of quality (Spence 1973) because current employees put their reputations on the line to endorse applicants. This higher certainty and certification increase a candidate's bargaining power. Therefore, the negative (positive) effect of vertical (horizontal) brand differentiation on pay is decreased (increased) by the degree to which firms rely on employee referrals in hiring.

Labor attraction. Once identified, firms compete to attract applicants through pecuniary and nonpecuniary benefits. Our theory has thus far focused on resumé power and psychic wages as the key source of nonpecuniary benefits. However, companies also offer other benefits associated with a positive work environment or with an employee's health and well-being. Such benefits increase firm bargaining power, which should increase (decrease) the negative (positive) effect of vertical (horizontal) brand differentiation on pay.

Labor development. Firms invest in match quality by developing labor through various means, such as on-the-job training. Becker's (1964) seminal theory of human capital is centered on the idea that there are two types of training that improve human capital: general and specific.

We posit that training that improves vertical brand differentiation can be considered general training because it relates to quality dimensions universally valued by firms and consumers. For example, any training that enhances the job skills of a physician or a customer service agent will be valued by all firms because such skills are valued by all consumers. Given this, general training not only increases the value of the employee at the focal firm, but also to many other firms. If so, it is not efficient for firms to fully absorb the costs of such general training and firms

should pass on some of the training costs in the form of lower wages (Becker 1964). Employees, in turn, should absorb these costs in exchange for an increase in their vertical employee differentiation. As a result, general training that relates to vertical brand differentiation should strengthen the negative effect of vertical brand differentiation on pay.

In contrast, training to maintain or improve horizontal brand differentiation is non-transferable to other firms; thus, employees need to be incentivized to invest time and effort to acquire this type of specific training (Becker 1964). Given this, the resulting productivity gains from specific training tend to be shared with employees in higher pay. Specific training also increases the employee's replacement costs at the focal firm (Campbell, Coff, and Kryscynski 2012). For both reasons, higher levels of specific training that relate to horizontal brand differentiation should strengthen the positive effect of horizontal brand differentiation on pay.

Having considered the effect of employee-brand matching on pay, as well as process moderators, we now consider the downstream effect on firm profits. To simplify the presentation, our predictions focus only on the mediating effect of pay and associated intermediate employee productivity and retention outcomes on the brand-profit relationship. However, we expect the aforementioned moderators on the brand-pay relationship to flow through to profits, which we examine using tests of moderated mediation.

The Impact of Brand-Based Pay on Profits

Previous research has documented the negative effect of brand equity on pay and suggested that if brand equity is leveraged to lower pay, this should translate into higher profits (Tavassoli, Sorescu, and Chandy 2014). We challenge this view. Specifically, to the extent that vertical brand differentiation is leveraged to lower pay, we expect it to diminish profits due to losses in employee *productivity* (i.e., rate of output per employee) and *retention* (i.e., proportion of

employees who voluntarily chose to stay). In contrast, when managers at firms high on horizontal brand differentiation pay more, profits increase via the same mediating employee behaviors.

This view is supported by the efficiency wage literature, which points to the motivational effects of pay on productivity. As Akerlof and Yellen (1990, p. 258) note, "[t]he motivation for the fair wage-effort hypothesis is a simple observation concerning human behavior: when people do not get what they deserve, they try to get even." Employees may not anticipate that accepting lower pay at a vertically differentiated brand will become demotivating despite the psychic wages or resumé power they receive in return (Deci, Koestner, and Ryan 1999).

Conversely, higher pay can be motivating. Efficiency wage research has shown higher pay to result in employees exerting extra effort and reducing shirking due to higher morale, reciprocity, and perceived fairness (Akerlof and Yellen 1986; Weiss 2014), thereby driving up productivity and profits. For example, Henry Ford's decision to offer workers $5 a day in 1914 (nearly twice the going rate) led to higher profits via productivity gains (Raff and Summers 1987). Government workers have also been found to increase effort levels by 1% per .24% increase in pay (Taylor and Taylor 2011).

Brand-based pay should also affect employee mobility. All things equal, the lower the pay, the more attractive are outside job opportunities. This should result in lower retention when the firm has leveraged its vertical brand differentiation to lower pay because employees can expect (and may seek) higher pay elsewhere. The opposite dynamic should unfold when horizontal brand differentiation translates into higher pay—these employees should, on average, expect a pay cut from switching jobs to join firms that may not value their specific human capital (Campbell, Coff, and Kryscynski 2012). This creates a bilateral monopoly dynamic (mutual hostage situation) because higher specific human capital simultaneously increases and limits employee bargaining

power. As a result, employees will be paid more and the incumbent employer enjoys higher profits because employees cannot entirely appropriate the economic rents they produce (Campbell, Coff, and Kryscynski 2012; Mackey, Molloy, and Morris 2014). Finally, a higher-than-market-rate pay has also been shown to increase job satisfaction, which decreases the attractiveness of outside offers and increases retention (Galizzi and Lang 1998).

For all these reasons, lower (higher) pay due to vertical (horizontal) brand differentiation should result in lower (higher) levels of employee productivity and retention and thereby attenuate (enhance) profits. Research on efficiency wage models indicates that managers do not anticipate the full impact of pay on productivity or retention (Akerlof and Yellen 1986; Weiss 2014). This is likely because, unlike discrete compensation costs, these costs occur over time and manifest in an array of absenteeism, productivity losses, separation, and replacement costs that are difficult to measure accurately (Cascio 1982). We therefore predict:

H3: Vertical brand differentiation negatively affects profits through lower pay, which reduces employee (a) productivity and (b) retention.

H4: Horizontal brand differentiation positively affects profits through higher pay, which increases employee (a) productivity and (b) retention.

Archival Data Strategy

Overview of Empirical Strategy

We use a multi-method approach to test our framework. We rely on archival data to test the effect of brand differentiation on pay (H1, H2a), the effect of brand differentiation on profits as mediated by pay and employee behaviors (H3, H4), and how firm strategies and investments across the employee-brand matching process shift firm bargaining power to influence the brand-pay relationship. We use experiments to complement this analysis in three ways. First, we test the validity of our archival measures of vertical and horizontal brand differentiation in a study with

consumers. Second, we test the effect of employee-brand matching on pay (H2b) in two studies with human resource (HR) managers. Third, we test our assumptions about manager (employee) myopia regarding the effects of pay on productivity and retention using HR managers (students).

Data Description and Sample

Testing our predictions requires firm-level data on brand differentiation, pay, productivity, retention, and profits. We use BAV data from Young & Rubicam to measure brand differentiation. We obtain data on pay, retention, and various other controls from applications to *Fortune*'s *100 Best Companies to Work For* list (hereafter *Fortune* "best places to work" list). Collected by The Great Place to Work Institute (GPWI), these data rely on two surveys. The Trust Index© examines management practices and company climate and is completed by a random sample of 200 employees from each submitting company. The Culture Audit© examines questions about average pay, retention, and benefits and is completed by HR professionals. We use additional databases to construct moderators and control variables as detailed below.

Our sample is constructed by intersecting data obtained from BAV, GPWI, and Compustat. Specifically, the intersection of BAV data from 930 firms, GPWI data (2006-2017) from the 628 publicly traded firms that applied, and Compustat data resulted in 526 observations from 183 public firms. This sample constitutes an unbalanced panel, with 87 firms applying only once to the *Fortune* "best places to work" list and only five firms applying in all 12 years. The average firm in our sample is relatively large, with over 16,000 employees, which is not surprising given the *Fortune* application process requires resources that are most likely to be found in larger firms.

Dependent Variables

Our key dependent variable is *profits,* which is measured using the logarithm of earnings before interest, tax, depreciation, and amortization (EBITDA) from Compustat. This type of

accounting-based metric of firm performance is a more appropriate outcome of the effect of brand differentiation on pay and employee behaviors than forward-looking metrics of firm value (e.g., Tobin's *q*, which we nevertheless include in a robustness test). This is because the effect of pay, retention, and productivity primarily materializes in the annual performance of the firm. We therefore use *Profits* at time *t+1* and all independent variables at time *t* to allow for the effects of pay, productivity, and retention to be recognized in firm performance.

Independent Variables

Overview of measures of brand differentiation. We rely on BAV data to construct our measures of horizontal and vertical brand differentiation. These data are based on the perceptions of a representative sample of U.S. adults and include measures of brand knowledge that allow for comparisons across products and markets. Horizontal brand differentiation, defined as the holistic perception of a brand's uniqueness relative to other brands, is measured as the average of the (standardized) percent agreement with "unique," "different," "distinctive," and "dynamic" brand associations. Vertical brand differentiation, defined as the holistic perception of a brand's superior quality relative to other brands, is captured by six measures: the percent agreement with "high quality," "leader," and "reliable" brand associations and ratings of "regard" (on a 7-point scale anchored by "Extremely low regard" to "Extremely high regard"); ratings of "familiarity" (on a 7-point scale anchored by "Never heard of" to "Extremely familiar"); and ratings of "relevance" (on a 7-point scale anchored by "Not at all relevant" to "Extremely relevant").[2] Vertical brand differentiation is the average of these six (standardized) items.

[2] To map brand-level BAV data to the firm level, Mizik and Jacobson (2009) focus on monobrand firms, while Tavassoli, Sorescu, and Chandy (2014) link individual brands to their parent firms. We follow the latter approach and select the brand with the highest BAV score for each firm for two reasons. First, we retain a larger sample by including both monobrand and multibrand firms. Second, since BAV does not track all brands for multibrand firms, an average measure may not yield a valid brand measure. We include a control variable denoting monobrands (corporate brands) in our models.

Support from literature for our brand differentiation measures. We offer evidence from the consumer behavior and brand equity literatures to support our measures. The consumer behavior literature examining horizontal and vertical differentiation has relied on similar types of definitions, measures, and manipulations (see Web Appendix B and Table WB). Consumer research has measured horizontal differentiation as "atypical," "unrepresentative," and "dissimilar" (Dommer, Swaminathan, and Ahluwalia 2013) and found it to be associated with Google Trends search terms such as "alternative, anti-establishment, Bohemian, counterculture, creative, distinct, geek, Indie, unconventional, unorthodox" (Ordabayeva and Fernandes 2018). Research has also manipulated horizontal differentiation through "just different" and "unique" (Ordabayeva and Fernandes 2018). Consumer research has also associated *dynamic* with horizontal brand differentiation. For example, Ordabayeva and Fernandes (2018) measure "hipster" and "creative" in Google search terms and manipulate a brand description as "edgy and irreverent, hip."

The literature also supports the idea that *high quality*, *leader, regard,* and *reliable* reflect vertical brand differentiation. Studies measure ratings of "status, wealth, power, and prestige" (Dommer, Swaminathan, and Ahluwalia 2013), whether products are "better" (Spiller and Belogolova 2017), and "better/best, elegant, elite, luxury, money, prestige, rich, and success" from Google search terms (Ordabayeva and Fernandes 2018). Research also manipulated "just better" (Ordabayeva and Fernandes 2018) and "objectively better" (Spiller and Belogolova 2017).

Previous literature also included *familiarity* as an important component of vertical brand differentiation. Cable and Turban (2003) find that ratings of company familiarity (e.g., "I am very familiar with this firm") are a strong predictor of perceptions of its reputation—an indicator of vertical brand differentiation. DelVecchio et al. (2007) measure "brand awareness" and

"perceived quality" to reflect brand strength—another indicator of vertical brand differentiation. We believe that *familiarity* contributes to vertical brand differentiation for two reasons. First, research has documented a positive relationship between awareness or advertising expenditures and perceptions of quality (e.g., Bronnenberg, Dhar, and Dubé 2017), even after accounting for actual quality (Moorthy and Zhao 2000). Second, for consumers to use vertically differentiated brands to signal their own quality (Ordabayeva and Fernandes 2018), the brand must be recognized by others.[3] In contrast, horizontal brand differentiation can result from both low and high familiarity: low, because consumers tend to perceive unfamiliar brands as atypical of a category (Bijmolt et al. 1998) and high, when consumers become familiar with a brand's unique attributes (Murphy and Wright 1984).

Turning to *relevance*, which reflects how important a brand is across individuals in the marketplace, the literature points to its role in vertical brand differentiation for the following reasons. First, relevance is a motivational variable (Celsi and Olson 1988; Zaichowsky 1985) and more involved consumers have been found to hold stronger quality beliefs (Steenkamp 1990). Second, consumers can also better signal their superiority in product domains that are widely relevant because it is easier to make attribute-based comparisons across quality levels (Liu, McFerran, and Haws 2020). For example, the practice of "keeping up with the Joneses" refers to people wanting to own the same brands as their peers in order to keep pace with them. Third, highly relevant brands tend to have larger market shares and market share has been shown to be a quality signal in and of itself (Bhattacharya, Morgan, and Rego 2022). DelVecchio et al. (2007) also includes "market share" as a measure of brand strength. In contrast, horizontal brand

[3] As Jeremy Bullmore (2001), the former Chair of J. Walter Thompson, noted: "It is not enough for BMW to be known only to that 5% of the population wealthy enough even to contemplate buying one. For BMW to enjoy real fame, it needs to be known almost indiscriminately … what's the point of your driving about in a £50,000 BMW if 95 per cent of us peasants don't realize just how successful you must be to own one?"

differentiation should be lower when it is relevant to many consumers. Consistent with this idea, individuals with a higher need for uniqueness have been shown to differentiate themselves by rejecting choices deemed relevant by others (Berger and Heath 2007).

In addition to the consumer behavior literature, the brand equity literature relying on BAV data suggests that the BAV pillars of esteem (comprised of high quality, leader, regard, and reliable), relevance, and familiarity are related to vertical brand differentiation, whereas energized differentiation (comprised of unique, different, distinctive, dynamic, and innovative) is related to horizontal brand differentiation, albeit without invoking these construct labels (see Web Appendix C for details). Datta, Ailawadi, and van Heerde (2017) show that energized differentiation correlates negatively with sales-based brand equity and market share because it "does not necessarily appeal to the masses" except in hedonic categories where consumers can "better ascertain and appraise a brand's unique aspects" (p. 13). In contrast, esteem, familiarity, and relevance positively correlate with sales-based brand equity and market share, especially in categories with "social value … because these brands are more likely to be recognized and respected by others" (p. 6). Similarly, Lovett, Peres, and Shachar (2013, 2014) observe that brand esteem, relevance, and familiarity are related to brand visibility and customer perceptions of satisfaction, usage, and lower risk.

Empirical support for our measures of brand differentiation. We offer three types of empirical evidence to support our measurement approach. First, we perform an exploratory and confirmatory factor analysis of our measures. As detailed in Web Appendix D, our results show our measures are reliable and have discriminant and convergent validity.

Second, we conduct an experiment that establishes the correspondence between the items used in our measures and the constructs of vertical (perceptions of superior product quality) and

horizontal (perceptions of uniqueness) brand differentiation (Study 1 in Web Appendix E).

Third, we use external YouGov brand measures and our archival data to establish nomological validity (see Web Appendix F). We find that YouGov measures of brand quality (as an indicator of quality), brand recommendation (as an indicator of regard), brand awareness (as an indicator of familiarity), brand consideration (as an indicator of relevance), and brand health (which is the sum of these metrics and other metrics such as buzz and awareness of firm advertising as an overall indicator of regard and quality) correlate more strongly with our measure of vertical brand differentiation than with our measure of horizontal brand differentiation (Table WF.1). Further, consistent with their more universal appeal, firms high in vertical brand differentiation are larger and have higher market shares. In contrast, employees at firms high in horizontal brand differentiation respond more positively to the Trust Index© measure "I can be myself around here," which indicates positive assortative matching (see Table WF.2).

Mediator Measures

Pay is obtained from HR professionals in the Culture Audit©. Specifically, they are asked to identify, "What is the job function or title of the largest number of full-time salaried employees?" followed by "What was the average annual base pay rate for an employee in this position in the past 12 months?" While we were not able to obtain the exact job function for which salaries are reported (most respondents left the field blank), the manner in which these data are collected ensures that the reporting is done for the most representative group of employees for each firm. We also replicate our findings using a measure of pay that includes both salary and bonus. Consistent with Tavassoli, Sorescu, and Chandy (2014), we log transform these variables.

We use Data Envelopment Analysis (DEA) to create our measure of *productivity* (e.g., Donthu and Yoo 1998; Kamakura, Ratchford, and Agrawal 1988). This captures the extent to

which the firm produces the maximum quantity of outputs for a given level of inputs, where the frontier is determined by the set of firms in the same three-digit SIC code. Following Bucklin (1978) and Doutt (1984), we use the number of employees and assets as inputs, net profit margin as outputs, and the DEA package in STATA to compute each firm's productivity score. We use net profit margin as the performance output to avoid a direct correlation of this output with EBITDA—our ultimate dependent variable. We replicate our findings with a productivity measure based on employee ratings of "People here are willing to give extra to get the job done" from the Trust Index©.

We measure *retention* as the percentage of employees who voluntarily remained with the company in a given year, reflecting 100% minus voluntary turnover reported by HR professionals as part of the Culture Audit©. We replicate our findings with a retention measure based on employee ratings of "I want to work here a long time" from the Trust Index©.

Measures of Employee-Brand Matching Process Moderators

Our conceptualization discussion of the employee-brand matching process offers a broad discussion of factors that moderate the brand-pay relationship. We now describe six specific moderators we expect to impact firm bargaining power (see Web Appendix G for predictions).

Labor availability. We examine two moderators that *decrease* firm bargaining power due to its demand for specific types of labor. First, *demand for technical talent,* defined as firm hiring requirements for employees with high levels of specialized analytical, engineering, and scientific skills, is captured by three indicators that constitute a formative measure: the average of the standardized values of R&D intensity (Compustat), the relative number of new product announcements made by each firm (RavenPack), and a dummy that captures whether the firm is listed on Nasdaq (CRSP), which is focused on new technologies (see Web Appendix H).

Second, *demand for front-line employees*, defined as firm hiring requirements for employees who work at the boundary of the organization and directly represent the brand to customers, is important in services industries (Eckert et al. 2022; Vomberg, Homburg, and Bornemann 2015). We measure it with a dummy that is 1 for services firms and 0 otherwise.

Labor identification. We examine two moderators that should influence firm bargaining power due to the ability to create a strong consideration set of potential employees. First, *human resource management (HRM) sophistication*, defined as the degree to which the firm is competent and innovative in people practices (Jiang et al. 2012), should *increase* firm bargaining power. This is measured as the degree to which the firm has developed four key HR policies: a health and safety policy, a diversity and opportunity policy, a policy against child labor, and a policy supporting the human rights of employees (collected by Eikon Refinitiv as part of a governance assessment). We average the four scores, which range from 0 to 100 ($\alpha = .83$). Second, *reliance on employee referrals*, which should *decrease* bargaining power, is reported by HR professionals in the Culture Audit© as the percentage of new hires referred by current employees.

Labor attractiveness. *Benefits,* which *increase* firm bargaining power, are measured using the percentage of nine benefits offered by the company (e.g., childcare, tuition, number of days off) ($\alpha = .87$), as reported in the Culture Audit© and summarized in Web Appendix H.

Labor development. *Employee training* comes from the Culture Audit© and is the number of hours of training offered to the largest group of employees. As discussed, training should increase (decrease) firm bargaining power with vertical (horizontal) brand differentiation.

Control Variables

In addition to industry and time dummies, we include 11 control variables to rule out endogeneity threats due to observable determinants of our dependent variables.[4] We include vertical (horizontal) brand differentiation in models where horizontal (vertical) differentiation is the focal independent variable because brands can vary on both;[5] *firm size* using the logarithm of the number of employees from the Culture Audit© data; the *proportion of managers* among the respondents to the Trust Index© to capture employee heterogeneity; and a dummy for *corporate brand* because the effect of brand on pay may be stronger for these firms.

We include two controls that reflect the overall positive nature of the workplace: (1) *employee engagement* based on the average employee response to 12 questions that reflect engagement and satisfaction with the workplace from the Trust Index© (summarized in Web Appendix H) and (2) firm inclusion on the *Fortune's* "best places to work" list (using a dummy variable). We also use the previously described *benefits* and *training* as control variables in the pay and employee behavior models because employees likely derive utility from them, which can impact the pay they accept and their productivity and retention.

We include *industry concentration* measured by the Herfindahl-Hirschman Index (HHI) as the sum of squares of firm market share in an industry defined by three-digit SIC codes (e.g., Luo, Homburg, and Wieseke 2010). We add a dummy that captures whether the firm is in the higher paying *high-tech sector* (SIC codes 35, 59, and 73; Mizik and Jacobson 2009)[6] and *industry sales*

[4] Other time-varying firm and industry controls are possible. However, we weighed these opportunities against the predictor-to-sample size constraints posed by our data.
[5] We also consider the possibility that the two dimensions of brand differentiation might interact to influence outcomes by including the interaction of the two variables in all models. When significant, which only occurs in the profit model, we include it in the model (our results replicate regardless).
[6] We remove this control in models involving the firm demand for technical talent moderator and results replicate.

growth to the profit equation because higher growth industries provide more opportunities to earn profits (Lee 2014). Table 1 describes all variables in our models.

[Insert Table 1 here]

Archival Data Estimation Approach

Models

Serial mediation model. Our theory posits that vertical and horizontal brand differentiation have opposite effects on pay, which influences employee productivity and retention to affect profits. This structure reflects a serial mediation model, depicted in Figure 1, which we test using PROCESS model 81 with 5000 bootstrapped samples (Hayes 2013). We control for selection bias and endogeneity for observable firm differences in the choice to apply to the *Fortune* ranking with a Heckman selection model and for the endogeneity of brand differentiation, pay, productivity, and retention with a control function approach—all discussed subsequently.

We do not control for unobserved firm differences using a fixed effects model for our main mediation models because 87 of the 183 firms in our sample have only one observation. We do, however, add industry and year fixed effects to all models and control for a range of observables. Moreover, as we discuss subsequently, we use an instrument-based correction for endogeneity, which helps account for the effect of unobservables (Wooldridge 2015). We measure all independent variables and mediators at time t and profits at time t+1 (while controlling for profits at time t). Using this specification, we fail to reject the null hypothesis of no first-order autocorrelation using a Wooldridge test (F (1,56) = 0.20, p = 0.66).

We estimate the following system of four equations:

(1) $$\text{Pay}_{it} = \beta_0 + \beta_1\text{Vertical\_Brand\_Diff}_{it} + \beta_2\text{Horizontal\_Brand\_Diff}_{it} + \beta_3\text{Num\_Employees}_{it} + \beta_4\text{Corporate\_Brand}_{it} + \beta_5\text{Industry\_Concentration}_{it} + \beta_6\text{Best\_Places\_Work\_List}_{it} + \beta_7\text{Employee\_Engagement}_{it} + \beta_8\text{Prop\_Manager}_{it} + \beta_9\text{Tech}_{it} + \beta_{10}\text{Benefits}_{it} + \beta_{11}\text{Training}_{it} + \beta_{12}\lambda_{it} + \beta_{13\text{-}20}\text{Industry}_{it} + \beta_{21\text{-}31}\text{Year}_{t} + \beta_{32}\text{Resid\_VBD}_{it} + \beta_{33}\text{Resid\_HBD}_{it} + \varepsilon_{it}$$

(2) $Productivity_{it} = \gamma^{P}_{0} + \gamma^{P}_{1}Pay_{it} + \gamma^{P}_{2}Vertical\_Brand\_Diff_{it} + \gamma^{P}_{3}Horizontal\_Brand\_Diff_{it} + \gamma^{P}_{4}Num\_Employees_{it} + \gamma^{P}_{5}Corporate\_Brand_{it} + \gamma^{P}_{6}Industry\_Concentration_{it} + \gamma^{P}_{7}Best\_Places\_Work\_List_{it} + \gamma^{P}_{8}Employee\_Engagement_{it} + \gamma^{P}_{9}Prop\_Manager_{it} + \gamma^{P}_{10}Tech_{it} + \gamma^{P}_{11}Benefits_{it} + \gamma^{P}_{12}Training_{it} + \gamma^{P}_{13}\lambda_{it} + \gamma^{P}_{14\text{-}21}Industry_{it} + \gamma^{P}_{22\text{-}32}Year_{t} + \gamma^{P}_{33}Resid\_VBD_{it} + \gamma^{P}_{34}Resid\_HBD_{it} + \gamma^{P}_{35}Resid\_Pay_{it} + \varepsilon'_{it}$

(3) $Retention_{it} = \gamma^{R}_{0} + \gamma^{R}_{1}Pay_{it} + \gamma^{R}_{2}Vertical\_Brand\_Diff_{it} + \gamma^{R}_{3}Horizontal\_Brand\_Diff_{it} + \gamma^{R}_{4}Num\_Employees_{it} + \gamma^{R}_{5}Corporate\_Brand_{it} + \gamma^{R}_{6}Industry\_Concentration_{it} + \gamma^{R}_{7}Best\_Places\_Work\_List_{it} + \gamma^{R}_{8}Employee\_Engagement_{it} + \gamma^{R}_{9}Prop\_Manager_{it} + \gamma^{R}_{10}Tech_{it} + \gamma^{R}_{11}Benefits_{it} + \gamma^{R}_{12}Training_{it} + \gamma^{R}_{13}\lambda s_{it} + \gamma^{R}_{14\text{-}21}Industry_{it} + \gamma^{R}_{22\text{-}32}Year_{t} + \gamma^{R}_{33}Resid\_VBD_{it} + \gamma^{R}_{34}Resid\_HBD_{it} + \gamma^{R}_{35}Resid\_Pay_{it} + \varepsilon''_{it}$

(4) $Profits_{it+1} = \nu_{0} + \nu_{1}Profits_{it} + \nu_{2}Productivity_{it} + \nu_{3}Retention_{it} + \nu_{4}Pay_{it} + \nu_{5}Vertical\_Brand\_Diff_{it} + \nu_{6}Horizontal\_Brand\_Diff_{it} + \nu_{7}Vertical\_Brand\_Diff_{it} * Horizontal\_Brand\_Diff_{it} + \nu_{8}Num\_Employees_{it} + \nu_{9}Corporate\_Brand_{it} + \nu_{10}Industry\_Concentration_{it} + \nu_{11}Best\_Places\_Work\_List_{it} + \nu_{12}Employee\_Engagement_{it} + \nu_{13}Prop\_Manager_{it} + \nu_{14}Tech_{it} + \nu_{15}Industry\_Growth_{it} + \nu_{16}\lambda_{it} + \nu_{17\text{-}24}Industry_{it} + \nu_{25\text{-}35}Year_{t} + \nu_{36}Resid\_VBD_{it} + \nu_{37}Resid\_HBD_{it} + \nu_{38}Resid\_Pay_{it} + \nu_{39}Resid\_Productivity_{it} + \nu_{40}Resid\_Retention_{it} + \varepsilon'''_{it}$,

where *i* denotes firm, *t* denotes year, and λ controls for the potential selection bias caused by only including firms that applied to the *Fortune* "best places to work" list. We explain in the next section how we obtain Resid_VBD and Resid_HBD, which control for the endogeneity of vertical and horizontal brand differentiation, Resid_Pay, which controls for the endogeneity of pay, and Resid_Productivity and Resid_Retention, which control for the endogeneity of productivity and retention. The remaining variables are as previously described.

We take the following steps to increase confidence that our profit results are due to mediation. First, key predictors (brand differentiation), moderators (across the employee-brand matching process), mediators (pay and employee behaviors), and outcomes (profits) represent distinct theoretical domains. Second, the intercorrelations between variables are low (see Table 1). Third, the variables are measured using distinct approaches that leverage data from different sources, reducing common method bias. Fourth, our brand and employee moderators and mediators are temporally separated from profit, which is assessed in *t+1*.

Moderated serial mediation model. We examine the impact of six moderators that reflect facets of the employee-brand matching process on the brand differentiation-pay relationship and on the mediating effect of brand differentiation on profits by adding them to equation (1) and using PROCESS model 83 with 5000 bootstrapped samples. The statistical inference drawn from these models refers to whether each moderator has a nonzero weight in the function linking the indirect effect of brand differentiation on profits through employee behaviors (Hayes 2015). This weight, referred to as the index of moderated mediation (IMM), is reported in Table 5 and the estimation of moderated serial mediation models is described in Web Appendix I.

Identification Strategy

It is important to account for potential sources of bias that threaten the identification of our models. First, we need to account for firm choice to apply to the *Fortune* "best places to work" list. Second, we need to account for the endogeneity of brand differentiation, pay, productivity, and retention. We briefly outline our identification strategy here and offer a complete description of all instruments, explanations of their validity, our models, and results in Web Appendix J.

Accounting for firm choice to apply for inclusion in the Fortune list. Firms do not randomly apply to the *Fortune* list. Instead, the choice is likely driven by firm and industry characteristics that could introduce selection bias. We control for this potential bias by using a Heckman selection model (see equation 5 in Web Appendix J) in which we estimate the decision to apply to the ranking (see Table WJ.1) and then use the inverse Mills ratio obtained from this model as a control variable in equations (1)-(4).

Accounting for the endogeneity of brand differentiation. The relationships between brand differentiation, pay, employee behaviors, and profits may also be impacted by unobserved variables. For instance, the impact of brand differentiation on profits may depend on market

trends that may lead to some brand characteristics being preferred to others. To account for this potential source of endogeneity, as shown in equations (6) and (7) in Web Appendix J, we use a control function approach that models each brand differentiation dimension as a function of an instrument and a set of control variables (Petrin and Train 2010) (see Table WJ.2). We then extract residuals from these models and add them to equations (1)-(4).

Accounting for the endogeneity of pay, productivity, and retention. Given firms choose the pay they offer employees, pay is endogenous. Productivity and retention equations may also suffer from endogeneity resulting from unobservables that influence both pay and employee behaviors, such as the threat of a recession or other macroeconomic factors. To account for these possibilities, we use a control function approach that models pay, productivity, and retention as a function of instruments and a set of control variables (see detailed explanations and equations (8), (9), and (10) in Web Appendix J and Tables WJ.3 and WJ.4). We add residuals for pay to equations (2)-(4) and for productivity and retention to equation (4).

Archival Data Results

How Brand Differentiation Affects Pay

In terms of model-free evidence, we find that vertical brand differentiation is negatively correlated with pay ($\rho = -.15$, $p < .001$) and horizontal brand differentiation is positively related to pay ($\rho = .16$, $p < .001$). In terms of formal model testing and in support of H1 and as shown in Table 2, results show vertical brand differentiation has a *negative* effect on pay ($\beta_1 = -.107$, $p < .01$). In contrast and in support of H2a, horizontal brand differentiation has a *positive* effect on pay ($\beta_2 = .091$, $p < .001$).

[Insert Table 2 here]

How Brand Differentiation Affects Profits as Mediated by Pay and Productivity

We now consider the effects of brand differentiation on profits through the mediating effects of pay and productivity. Using PROCESS model 81, we test the pathways in Figure 1 for brand differentiation through to profits. Table 3, parts 1a and 2a, report all direct pathways and parts 1b and 2b report the serial mediation effects in the form of indirect effects from brand differentiation to profits through pay and productivity.

In support of H3a, vertical brand differentiation has a *negative* indirect effect on profits mediated by pay and productivity (Vertical Brand Differentiation→Pay→Productivity →Profits indirect effect = -.0095, 95%CI: [-.0258, -.0015]). Importantly, given the direct effect of vertical brand differentiation on profits is positive (see Table 3) and the indirect effect through pay and the employee behaviors is negative, we have a case of competitive mediation (Zhao, Lynch, and Chen 2010). This means that when vertically differentiated brands offer lower pay, the positive effect of vertical brand differentiation on profits is weakened due to a reduction in productivity. In support of H3b, horizontal brand differentiation has a *positive* indirect effect on profits mediated by pay and productivity (Horizontal Brand Differentiation→Pay→Productivity→Profits indirect effect = .0081, 95%CI: [.0021, .0180]). Offering higher pay enhances the positive effect of horizontal brand differentiation on profits due to an increase in employee productivity.

How Brand Differentiation Affects Profits as Mediated by Pay and Retention

Using the same approach, we now consider the effects of brand differentiation on profits through the mediating effects of pay and retention. Table 4, parts 1a and 2a, report all direct pathways and parts 1b and 2b report indirect effects. In support of H4a, vertical brand differentiation has a negative indirect effect on profits as mediated by pay and retention (Vertical Brand Differentiation→Pay→Retention→Profits indirect effect = -.0120, 95%CI: [-.0285,

-.0021]). As with productivity, this competitive mediation indicates that the positive effect of vertical brand differentiation on profits is weakened due to pay-induced losses in retention. In support of H4b, horizontal brand differentiation has a positive indirect effect on profits as mediated by pay and retention (Horizontal Brand Differentiation→Pay→Retention→Profits indirect effect = .0103, 95%CI: [.0021, .0237]). Offering higher pay enhances the positive effect of horizontal brand differentiation on profits due to an increase in employee retention.

Following Pieters (2017), we reverse the order between pay and the two employee behavior mediators (productivity and retention). As expected, we find the indirect effect is not significant in any of these four serial mediation models (see Tables 3 and 4).

[Insert Tables 3 and 4 here]

Employee-Brand Matching Moderators and Moderated Mediation to Firm Profits

We report our findings in two steps. First, we report how moderators associated with the employee-brand matching process influence the brand-pay link (see Web Appendix G for formal predictions). Second, we present evidence regarding whether this moderation, in turn, affects the mediating effect of pay through employee productivity and retention to profits (see Table 5). Specifically, for each moderator, we follow Hayes (2015) and compute the index of moderated mediation (IMM) to test whether the moderator influences the paths from brand to profits for each combination of brand differentiation (vertical and horizontal), pay, and employee behavior (productivity and retention). Web Appendix K presents the conditional indirect effects from these models and details how mediation varies across different levels of each moderator.

Labor availability. We find that demand for technical talent positively moderates the effect of vertical brand differentiation on pay ($\beta^{VBD}_{\text{mod}} = .16$, $p < .001$), indicating that the negative effect of vertical brand differentiation on pay decreases. Tests of moderated mediation (see Table

5 and Web Appendix K) indicate that the negative effect of vertical brand differentiation extends to profits only when demand for technical talent is moderate or low, but not when it is high, suggesting that demand for scarce talent limits the bargaining power of vertically differentiated firms. There is no moderation for horizontal brand differentiation.

We find that demand for front-line employees has a positive moderating effect on the effect of horizontal brand differentiation on pay ($\beta^{HBD}_{\text{mod}} = .22$, $p = .002$), meaning it further increases pay. Tests of moderated mediation indicate that the positive effect of horizontal brand differentiation only extends to profits when the firm is a services company, not when it is a product company (see Table 5 and Web Appendix K). There is no moderation for vertical brand differentiation. We speculate these results may reflect front-line employees playing a greater role in expressing horizontal brand differentiation.

Labor identification. As firms improve their ability to identify the right applicants, this should reduce pay pressures. In support of this view, we find that the moderating effect of HRM sophistication on the effect of vertical ($\beta^{VBD}_{\text{mod}} = -.003$, $p = .005$) and horizontal ($\beta^{HBD}_{\text{mod}} = - .002$, $p = .001$) brand differentiation on pay is negative, indicating that the negative (positive) effect of vertical (horizontal) brand differentiation on pay is increased (decreased). Tests of moderated mediation indicate that the negative effect of vertical brand differentiation only extends to profits when HRM sophistication is moderate or high, but not low (see Web Appendix K). On the other hand, the positive effect of horizontal brand differentiation only extends to profits when HRM sophistication is low.

In contrast, we find that only the moderating effect of employee referrals on the effect of horizontal brand differentiation on pay is positive ($\beta^{HBD}_{\text{mod}} = .005$, $p = .03$), suggesting that horizontally differentiated brands that rely on their employees to identify talent pay even more

given the referral is a likely credible signal of fit. Tests of moderated mediation indicate that this positive effect of horizontal brand differentiation only marginally extends to profits when employee referrals are moderate or high (see Table 5 and Web Appendix K). We do not find a parallel effect for vertical brand differentiation, possibly because these firms do not need to rely as much on referrals because they do not seek the more difficult-to-evaluate horizontal matches.

Labor attraction. We predicted that the effect of brand differentiation on pay should depend on firm benefit levels. In support of this view, we find that benefits magnify the negative effect of vertical brand differentiation on pay ($\beta^{VBD}_{\text{mod}} = -.26$, $p < .001$), meaning the effect increases as firm benefits increase. Tests of moderated mediation indicate that the negative effect of vertical brand differentiation only extends to profits when benefits are moderate or high (see Table 5 and Web Appendix K). We do not find a parallel effect for horizontal differentiation.

Labor development. We predicted that training that serves vertical (horizontal) brand differentiation should increase (decrease) firm bargaining power. The interaction of training with each brand dimension allows us to identify these opposing effects. Training has a *negative* moderating effect on the effect of vertical brand differentiation on pay ($\beta^{VBD}_{\text{mod}} = -.003$, $p = .04$), further decreasing pay, consistent with the idea that general training increases employee vertical differentiation and firm bargaining power. In contrast, training has a marginal *positive* moderating effect on the effect of horizontal brand differentiation on pay ($\beta^{HBD}_{\text{mod}} = .003$, $p = .06$). This is because this type of training is less likely to be transferable to other employment opportunities and thus employees need to be incentivized to obtain it, resulting in lower firm bargaining power. Tests of moderated mediation indicate that both effects extend to profits (see Table 5) and Web Appendix K shows that the effect of training on vertical or horizontal brand differentiation on pay through to profits only occurs when training is moderate or high, but not low.

Additional Analyses

Ruling Out Alternative Mechanisms

Our theory focuses on employee-brand matching as the underlying mechanism for the brand-pay relationship. We test this directly in our experiments, which follow, and indirectly in our examination of the effect of a set of moderators associated with the employee-brand matching process in our archival data. Web Appendix L presents tests ruling out four alternative explanations—benefits and training, firm resources, and employee age as explanations for the negative effect of vertical brand differentiation on pay, and employee diversity as an explanation for the positive effect of horizontal brand differentiation on pay.

Robustness Checks

We replicate our results using eleven different tests, including different measures of brand differentiation, pay, productivity, retention, and profits (see Web Appendix M).

Sustainability of Firms Using a Vertical Brand Differentiation Low Pay Strategy

Our results indicate that when managers leverage vertical brand differentiation to lower pay, it negatively affects profits due to mediating effects of lower employee productivity and retention. To investigate the sustainability of this strategy over the long run, we show in a series of alternative models that this lower pay does not have a negative impact on vertical brand differentiation or sales in future time periods. Instead, perceptions of vertical brand differentiation appear to be sticky over time (see Web Appendix N for results).

Experimental Results

Our archival data lack direct measures of employee differentiation. Hence, we cannot test H2b. We therefore conduct two experiments that manipulate employee differentiation to test our hypotheses. Study 2 examines employee-brand matching to test our assumption of no assortative

matching for vertical differentiation and positive assortative matching for horizontal differentiation in H2b. Study 3 examines the interaction of horizontal brand and employee differentiation to provide an additional test of H2b. We also conduct Studies 4 and 5 to examine whether managers and job candidates are myopic about the demotivating effects of lower pay.

Study 2: Employee-Brand Matching Experiment

Study 2 examines whether employee-brand matching is assortative. It relies on a sample of 204 HR managers from chapters of the Society for Human Resource Managers (SHRM) (M_{age} = 36.15 years; 7.2 years of HR experience) and employs a hypothetical hiring scenario using a 2 (high vertical or horizontal employee differentiation) x 2 (high vertical or horizontal brand differentiation) design. A repeated-measures GLM analysis reveals a significant brand-by-employee interaction. Examining the interaction, we find that HR managers at firms high in horizontal brand differentiation are willing to pay more for horizontal employee matches than for high vertically differentiated employees. In contrast, HR managers at firms with high vertical brand differentiation do not offer high vertically nor horizontally differentiated employees differential pay. These results, which are discussed in detail in Web Appendix P, support the idea that vertical matching is non-assortative, whereas horizontal matching is positively assortative (H2b) and limits firm bargaining power.

Study 2 also tests our assumptions regarding resumé power, psychic wages, and the relative scarcity of horizontal employee-brand matches. We find that vertical brand differentiation confers more resumé power, but not social status, than high horizontal brand differentiation while horizontal brand differentiation provides self-expressive benefits. Importantly, this study also shows that HR managers perceive employees who provide a high horizontal brand fit to be scarcer than employees who are highly vertically differentiated.

Study 3: Horizontal Matching Experiment

While Study 2 examines H2b by examining vertical versus horizontal matching, Study 3 tests H2b using different levels of horizontal brand and employee differentiation. It utilizes a hypothetical hiring scenario in a 2 (low or high horizontal brand differentiation) x 2 (low or high horizontal employee differentiation) design. The results from 118 HR managers recruited via the SHRM (M_{age} = 47.4; 14.6 years of HR experience) show that HR managers at firms with high (low) horizontal brand differentiation are (are not) willing to pay more for horizontally matched employees because of lower perceived firm bargaining power (see Web Appendix Q for details). Study 3 thereby demonstrates positive assortative matching across different levels of horizontal brand and employee differentiation.

Study 4: Are HR Managers Myopic About the Effects of Pay?

Study 4 tests the assumption that HR managers do not fully anticipate the behavioral consequences of paying less at firms with vertically differentiated brands. Ninety-five HR managers (M_{age} = 48.9 years; 15.1 years of HR experience) recruited via the SHRM participated in a 2 (high or average vertical brand differentiation) x 2 (10% below or industry-average pay) study design. Using hypothetical scenarios, we find that HR managers are myopic regarding the effects of paying less on employee productivity at firms with high and average levels of vertical brand differentiation. They are, however, sensitive to the effects of pay on retention, but only marginally so (see Web Appendix R).

Study 5: Are Job Candidates Myopic About the Effects of Pay?

Study 5 examines job candidates' willingness to accept lower pay at firms with vertically differentiated brands and whether they anticipate they will be less productive and stay for a shorter period if they do so. A sample of 129 students (M_{age} = 20.7 years; 60% female)

participated in a 2 (high or average vertical brand differentiation) x 2 (10% below or industry-average pay) study design. In a hypothetical scenario, we find that job candidates are more likely to accept a job at industry-average (versus below average) pay levels and at a high (versus average) vertically differentiated brand. Further, a significant interaction of pay and brand shows a smaller decrease in job acceptance due to lower pay at firms with high (versus average) levels of vertical brand differentiation. Furthermore, job candidates do not expect pay levels to affect their productivity or job tenure at either level of vertical brand differentiation, implying that they are myopic about the effects of pay on their future behavior (see Web Appendix S).

Discussion and Implications

Theoretical Implications

Brand differentiation and employee-based brand equity. The brand equity literature has only examined the effects of vertical brand differentiation on pay. This is surprising given the consumer behavior and branding literatures have shown vertical and horizontal brand differentiation to have opposite effects. Extending this view, we offer a theoretical framework that predicts effects for both vertical and horizontal brand differentiation on pay. This more complete understanding of employee-based brand equity has important implications for the study of branding, including how firms can leverage brands in attracting and retaining employees.

Employee-brand matching. We stake new territory in the literature by leveraging the fact that employees are also differentiated to consider how employee-brand matching influences pay. Our theory and experimental findings indicate that horizontally differentiated brands will pay more for matches with horizontally differentiated employees who offer valuable brand complementarities. Matching vertically differentiated brands and employees is not expected to be

uniformly negatively or positively assortative; it depends on employee-firm complementarities (as well how management trades off hiring more versus better workers; Eeckhout and Kircher 2018).

The employee-brand matching process. We extend the human capital literature by conceptualizing an employee-brand matching process and examining six specific strategies and investments a firm can use to influence its bargaining power across the four different stages of this process. Our findings identify conditions when the brand-pay relationship shifts depending on these firm actions. Highlighting one such effect, Becker (1964) posits that training related to vertical (horizontal) brand differentiation should reflect firm investments in developing general (specific) human capital and therefore increase (decrease) firm bargaining power in setting pay. Consistent with this prediction, we find that training related to vertical (horizontal) brand differentiation magnifies the negative (positive) impact of brand differentiation on pay.

The effect on employee-based brand equity on firm performance. Previous research equated higher profits with the lower pay associated with brand equity (Tavassoli, Sorescu, and Chandy 2014). Our findings challenge this view. Specifically, we find that brand-induced lower pay weakens employee productivity and retention, which lowers profits. Thus, leveraging vertical brand differentiation to lower pay represents a false economy. At the same time, the higher pay due to horizontal brand differentiation results in a net-positive effect on profits via improved employee productivity and retention. It is therefore important to consider the full effect of leveraging brand equity on employee behaviors to evaluate its effect on firm performance.

A new perspective on BAV pillars. As reviewed in Web Appendices B and C, previous consumer and brand research has found brand dimensions to diverge in their effects on consumer and investor behavior, most often finding that the BAVs pillar of *energized differentiation* (closely related to horizontal brand differentiation) behaves differently from *esteem*, *relevance,*

and *familiarity* (associated with vertical brand differentiation). Given our findings and validation work—including replications using the BAV pillars (Web Appendix M, Replication 7)—we believe there is an opportunity to reconsider research on the consequences of brand knowledge using the theoretical lens of vertical and horizontal brand differentiation.

Practical Implications

Avoid leveraging vertical brand differentiation to reduce pay. Our results suggest that even if vertical brand differentiation can be leveraged to reduce pay, managers should refrain from doing so. Instead, managers should consider other ways to leverage their vertical brand differentiation to help their firms, including attracting a larger pool of applicants or highlighting resumé power to convert offers.

Incorporate horizontal brand differentiation into pay benchmarks. HR departments rely on pay benchmarks. Our findings suggest they should consider brand differentiation in setting those benchmarks. On one hand, managers should not be deterred from investing in pay if their firms enjoy high horizontal brand differentiation since this can translate into higher profits through positive employee behaviors. On the other hand, managers at firms with low horizontal brand differentiation should withstand pressures to increase pay to the level of more horizontally differentiated competitors because they lack the brand complementarities that justify higher pay.

Manage the marketing-HR interface across the employee-brand matching process. Our findings show how brand differentiation, which is typically under the purview of marketing, has a profound effect on HR outcomes. Given cross-functional cooperation between Marketing and HR to build brands is reported to be only moderate (The CMO Survey 2023), marketing managers have an opportunity to work more closely with their HR counterparts to build and leverage the brand across the employee-brand matching process. For example, marketing investments into

vertical brand differentiation that increase awareness should consider the returns from increasing the size of the pool of job applicants. Marketing skills should also be used to promote vertical differentiation benefits in the form of psychic wages and resumé power to prospective employees in order to convert job offers. Finally, marketing should be involved in defining the key qualities of employee-brand matches and in designing training to support horizontal brand differentiation.

Future Research Directions

Do other firm characteristics moderate the effect of brand differentiation on pay? We examine a range of firm moderators impacting firm bargaining power in the employee-brand matching process. Future research might consider other factors that occur in the matching process—for example, the impact of firm location, which may influence access to labor, or stronger coordination between marketing and HR, which should improve firm bargaining power.

Do employee characteristics moderate the effect of brand differentiation on pay? We focus on employee differentiation as reflected in general and specific human capital. Future research could examine whether the effect of brand differentiation on pay varies by *employee type*. For example, women and minorities tend to earn lower pay (have less bargaining power). It would be interesting to know whether these populations are more likely to take a pay cut to work at vertically differentiated brands and whether this translates into an overall positive pay-off for their careers due to the associated resumé power. Further, future research could examine if Ordabayeva and Fernandes' (2018) finding that vertical (horizontal) brand differentiation has more utility to consumers with a conservative (liberal) ideology also applies to employees.

What other factors might mediate the brand→profit relationship? Although we find pay and employee behaviors mediate the relationship between brand and profits, given the direct effect of vertical brand differentiation on profits, other mediators are also operating (Zhao, Lynch,

and Chen 2010). Future research may explore product-market factors, such as when vertical brand differentiation increases customer acquisition (Stahl et al. 2012) and financial-market factors, such as when vertical brand differentiation lowers the cost of capital (Larkin 2013).

Limitations

There are limitations in our data. The sample of firms that apply to the *Fortune* list is comprised of mostly large, well-performing, publicly traded firms. Even though we control for potential selection bias, the effects we document may not extend to smaller or privately held firms. Moreover, given the nature of our employee and pay data, our results only apply to the most representative employees of these firms. Finally, we do not have a direct measure of employee differentiation in our archival data. While we use experiments with HR managers to manipulate employee differentiation to offer evidence about our effects, future research could use more fine-grained employee data to test our ideas more completely.

Conclusion

We uncover a unique role for brands in labor markets. Distinguishing between vertical and horizontal sources of brand differentiation, we find that vertical (horizontal) brand differentiation is associated with lower (higher) pay and that firms high in horizontal brand differentiation pay more for employees who offer brand-relevant complementarities. Our findings show that these brand-pay relationships have important downstream effects. Specifically, when managers leverage vertical brand differentiation to lower pay, profits are lower due to the mediating effects of lower employee productivity and retention, and that when managers pay more at firms high on horizontal brand differentiation, profits are higher via the same mediating employee behaviors. We also identify a set of firm strategies and investments in the employee-brand matching process that moderate the brand-pay relationship and downstream profit effects.

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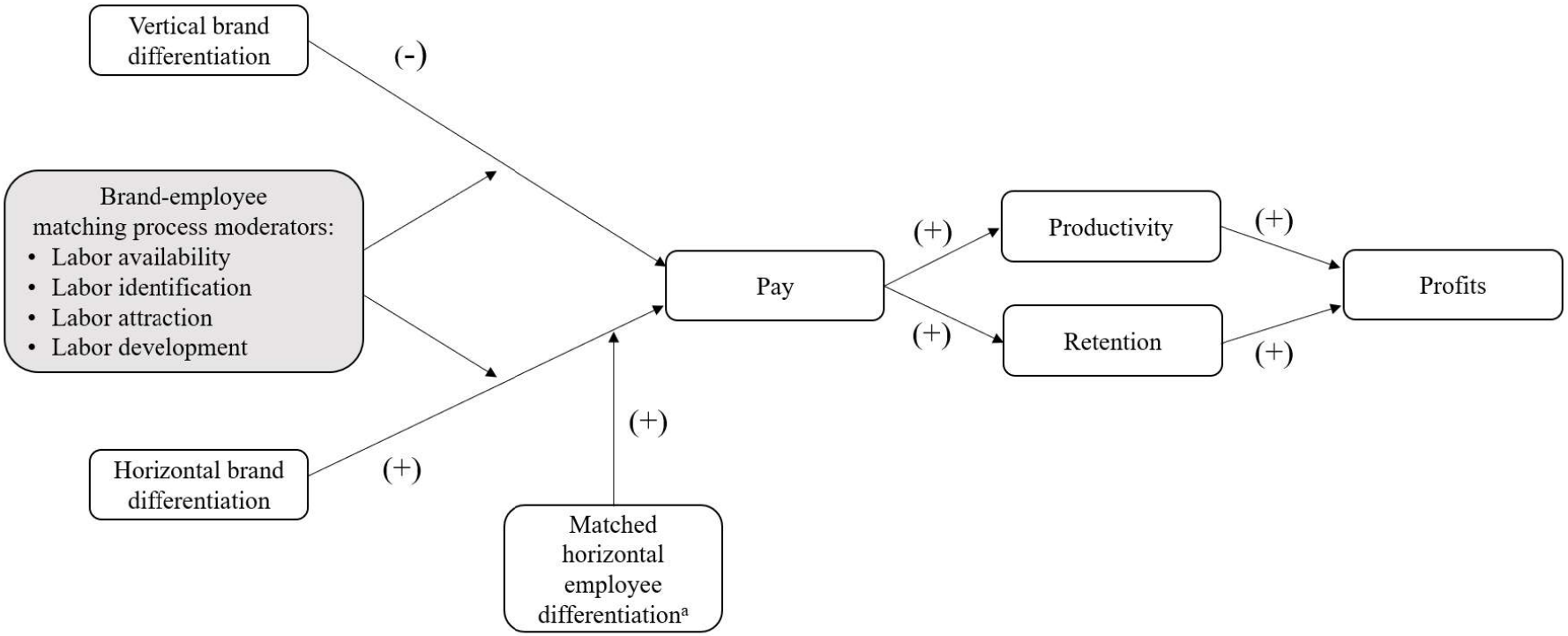
Figure 1. How Vertical and Horizontal Brand Differentiation Impact Pay and Profits Through Employee-Brand Matching



[a] The moderating effect of horizontal employee differentiation is tested in Experiments 2 and 3.

Table 1. Descriptive Statistics

	Mean	SD	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Vertical brand differentiation	0.219	0.844	526	1																			
2. Horizontal brand differentiation	0.111	0.869	526	0.2	1																		
3. Pay (log)	11.13	0.472	526	-0.15	0.16	1																	
4. Productivity	0.152	0.085	526	-0.04	-0.09	0.19	1																
5. Retention	0.918	0.06	526	0.19	0.12	0.22	0.09	1															
6. Profits ($MM) (log)	7.546	1.647	526	0.2	-0.15	0.17	0.06	0.18	1														
7. Employee engagement	4.237	0.188	526	-0.08	0.27	0.16	0.05	0.04	-0.16	1													
8. Employees (000) (log)	9.71	1.315	526	0.21	-0.15	-0.24	-0.02	0.08	0.45	-0.22	1												
9. Proportion managers	0.258	0.102	526	0.06	0	0.09	-0.03	-0.08	0.03	0.15	-0.26	1											
10. Corporate brand	0.772	0.42	526	-0.14	0.06	0.07	0.02	-0.04	0.13	-0.03	0.17	-0.07	1										
11. Industry concentration	0.202	0.168	526	0.13	0.04	-0.09	-0.06	0.09	-0.09	-0.12	-0.06	0.1	-0.05	1									
12. High-tech sector	0.078	0.268	526	-0.08	0	0.13	0.03	0.12	-0.05	0	0.04	-0.1	0.06	-0.06	1								
13. “Best places to work” list	0.209	0.407	526	0.26	0.06	-0.02	-0.02	0.2	0.43	0.05	0.47	0.01	0.22	-0.06	0.09	1							
14. Industry sales growth	0.357	0.48	526	0.06	0.17	0.09	-0.03	0.16	0.06	0.55	0.04	-0.05	0.1	-0.03	0.03	0.29	1						
15. Benefits	0.046	0.137	526	0.02	-0.02	0.04	-0.06	0.01	0	0.03	-0.04	0.06	-0.04	-0.05	-0.03	0.03	-0.05	1					
16. Training	0.547	0.307	526	0.08	-0.03	-0.01	0	0.1	0.24	-0.05	0.06	0.11	-0.05	0.01	0	0.08	0.07	0.13	1				
17. Demand for technical talent	23.055	17.335	526	0.34	0.22	0.12	0	0.05	0.2	0.12	0.03	0.02	0.02	-0.09	-0.01	0.23	0.16	0	0.09	1			
18. Demand for front-line employees	0.003	0.693	526	-0.01	0.19	0.31	0.01	-0.01	-0.06	0.23	-0.17	0.01	0.12	-0.32	0.04	0.02	0.13	0.07	-0.11	0.27	1		
19. HRM sophistication	0.202	0.402	526	0	0.13	0.17	0.01	-0.18	0	0.23	-0.12	0.04	0.06	-0.24	-0.15	0.07	0.22	0.11	0.01	0.26	0.48	1	
20. Employee referral strategy	56.881	22.778	486	0.12	-0.07	0.04	0.01	0.18	0.33	-0.07	0.16	0.14	-0.05	0.02	0.09	0.16	0.07	0.1	0.79	0.12	-0.05	0.01	1

Notes: All variables are at the firm level unless noted. Correlations higher than .09 are significant at 95% or higher.

Table 2. The Effect of Brand Differentiation on Pay

Variables	Coefficient (SE)
Vertical brand differentiation (VBD)	-.107 (.039)**
Horizontal brand differentiation (HBD)	.091 (.028)***
Employee engagement	.184 (.134)
Number of employees	-.012 (.019)
Percentage managers	.110 (.208)
Corporate brand	.123 (.048)*
Industry concentration	-.265 (.142)
High-tech sector	.012 (.081)
"Best places to work" list	-.005 (.052)
Benefits	.043 (.120)
Training	.002 (.001)
Endogeneity correction for VBD	-.006 (.028)
Endogeneity correction for HBD	-.053 (.001)
Inverse Mills ratio (λ)	.010 (.024)
Adjusted R-square	.23
Observations	526

Notes: All variables are at the firm level unless noted. The model includes industry and year dummies, which are not reported for parsimony.
***$p < .001$, **$p < .01$, *$p < .05$

Table 3. Brand Differentiation→Pay→Productivity→Profits Mediation Results

1. <u>Vertical Brand Differentiation (VBD)→Pay→Productivity→Profits</u>

a. Model Path Estimates:

	B	**SE**	***t***	***p*-value**
VBD→Pay	-.107	.040	-2.726	.007
VBD→Productivity	.002	.010	.220	.826
Pay→Productivity	.035	.013	2.727	.007
Pay→Profits	-.105	.093	-1.128	.260
Productivity→Profits	2.538	.870	2.916	.004
VBD→Profits	.153	.078	1.949	.052

b. Indirect Effect (5000 bootstraps, 95% Confidence Interval):

	B	**SE**	**LL 95%CI**	**UL 95%CI**
VBD→Pay→Productivity→Profits	-0.0095	0.0058	-0.0258	-0.0015
VBD→Productivity→Pay→Profits	0.0000	0.0005	-0.0007	0.0011

2. <u>Horizontal Brand Differentiation (HBD)→Pay→Productivity→Profits</u>

a. Model Path Estimates:

	B	**SE**	***t***	***p*-value**
HBD→Pay	.100	.030	3.172	.002
HBD→Productivity	-.011	.006	-1.951	.052
Pay→Productivity	.035	.013	2.727	.007
Pay→Profits	-.105	.093	-1.128	.260
Productivity→Profits	2.538	.870	2.916	.004
HBD→Profits	.009	.057	0.159	.874

b. Indirect Effect (5000 bootstraps, 95% Confidence Interval):

	B	**SE**	**LL 95%CI**	**UL 95%CI**
HBD→Pay→Productivity→Profits	0.0081	0.0042	0.0021	0.0180
HBD→Productivity→Pay→Profits	0.0000	0.0004	-0.0008	0.0008

Note: CI represents the confidence interval, LL is the lower limit, and UL is the upper limit.

Table 4. Brand Differentiation→Pay→Retention→Profits Mediation Results

1. <u>Vertical Brand Differentiation (VBD)→Pay→Retention→Profits</u>

a. Model Path Estimates:

	B	**SE**	***t***	***p*-value**
VBD→Pay	-.107	.040	-2.726	.007
VBD→Retention	.008	.004	1.910	.057
Pay→Retention	.042	.010	4.123	.000
Pay→Profits	-.105	.093	-1.128	.260
Retention→Profits	2.690	.944	2.849	.005
VBD→Profits	.153	.078	1.949	.052

b. Indirect Effect (5000 bootstraps, 95% Confidence Interval):

	B	**SE**	**LL 95%CI**	**UL 95%CI**
VBD→Pay→Retention→Profits	-0.0120	0.0068	-0.0285	-0.0021
VBD→Retention→Pay→Profits	-0.0002	0.010	-0.0027	0.0016

2. <u>Horizontal Brand Differentiation (HBD)→Pay→Retention→Profits</u>

a. Model Path Estimates:

	B	**SE**	***t***	***p*-value**
HBD→Pay	.100	.030	3.172	.002
HBD→Retention	.005	.003	1.308	.191
Pay→Retention	.042	.010	4.123	.000
Pay→Profits	-.105	.093	-1.128	.260
Retention→Profits	2.690	.944	2.849	.005
HBD→Profits	.009	.057	0.159	.874

b. Indirect Effect (5000 bootstraps, 95% Confidence Interval):

	B	**SE**	**LL 95%CI**	**UL 95%CI**
HBD→Pay→Retention→Profits	0.0103	0.0056	0.0021	0.0237
HBD→Retention→Pay→Profits	-0.0003	0.0014	-0.0031	0.0025

Note: CI represents the confidence interval, LL is the lower limit, and CL is the upper limit.

Table 5. Moderated Mediation Effects: How the Employee-Brand Matching Moderators Influence the Effect of Brand Differentiation on Pay Through Employee Behaviors to Profits

Employee-Brand Matching Process	Moderator	Type of Brand Differentiation	Moderated Mediation through Productivity to Profits	Moderated Mediation through Retention to Profits
Labor Availability	Demand for technical talent	Vertical	IMM = .013 95%CI: [.003, .031]	IMM = .018 95%CI: [.004, .042]
		Horizontal	NS	NS
	Demand for front-line employees	Vertical	NS	NS
		Horizontal	IMM = .016 95%CI: [.002, .038]	IMM = .030 95%CI: [.006, .060]
Labor Identification	HRM sophistication	Vertical	IMM = -.0003 95%CI: [-.0002, -.0000]	IMM = -.0003 95%CI: [-.0007, -.0001]
		Horizontal	IMM = -.0002 95%CI: [-.0005, -.0000]	IMM = -.0003 95%CI: [-.0006, -.0000]
	Employee referral strategy	Vertical	NS	NS
		Horizontal	IMM = .0004 90%CI: [.0000, .0008]	IMM = .0006 90%CI: [.0001, .0013]
Labor Attraction	Benefits	Vertical	IMM = -.021 95%CI: [-.0511, -.0041]	IMM = -.030 95%CI: [-.0637, -.008]
		Horizontal	NS	NS
Labor Development	Training	Vertical	IMM = -.0002 90%CI: [-.0006, -.0000]	IMM = -.0003 90%CI: [-.0008, -.0001]
		Horizontal	IMM = .0002 90%CI: [.0000, .0005]	IMM = .0003 90%CI: [.0000, .0008]

Web Appendices for: "Brands in the Labor Market: How Vertical and Horizontal Brand Differentiation Impact Pay and Profits Through Employee-Brand Matching"*

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*These materials have been supplied by the authors to aid in the understanding of their paper. The AMA is sharing these materials at the request of the authors.

Web Appendix A: Matches Between Vertically Differentiated Employees and Brands

H1 posits a negative relationship between vertical brand differentiation (VBD) and pay. We do not expect H1 to systematically vary across different levels of vertical *employee* differentiation. This is because different forms of assortative matching can give rise to the relationship predicted by H1 being stronger for more or less vertically differentiated employees.

There are several conditions when *negative assortative matching* may occur. First, employees with lower perceived vertical differentiation might more highly value the increase in resumé power earned from working at vertically differentiated brands. If these types of employees are willing to take a pay cut to work at firms with highly vertically differentiated brands and these firms are more likely to hire them, this would result in negative assortative matching. In this case, H1 would be stronger among *less* vertically differentiated employees. Second, a different pattern of negative assortative matching can result in H1 being stronger among *more* vertically differentiated employees. This can occur when more vertically differentiated employees provide higher marginal value at less vertically differentiated brands. For example, a mid-level NBA team is likely to have more excess stadium capacity (a resource complementarity) to fill than a top team and thus stands to profit more from paying for an all-star player who can attract new spectators (Yang, Shi and Goldfarb 2009). Similarly, top managers may be financially enticed to improve the fortunes of a less vertically differentiated firm because they have a relatively greater impact in such a context. This dynamic would result in H1 being stronger for more vertically differentiated employees because firms with lower VBD outbid firms with higher VBD for their services (but not for the services of employees who are less vertically differentiated).

There are also conditions when *positive assortative matching* occurs—where the best workers match with the best firms. For example, Mackey, Molloy, and Morris (2014) found that top managers who represent scarce general human capital tend to match with the best (resource rich) firms where they are also paid more. If positive assortative matching occurred across all or most of a firm's employees, this would result in firms with high levels of VBD paying more—the opposite of what H1 predicts. One cannot necessarily expect this outcome at the firm level, however, because vertical matching can follow a heterogenous pattern within firms (Eeckhout 2018). Specifically, vertically differentiated managers are often those able to effectively deploy and get the best out of their people and they gain leverage by hiring more low-skilled workers. Therefore, in situations where top employees show positive assortative matching (e.g., Mackey, Molloy and Morris 2014) this intra-firm dynamic may result in negative assortative matching for the majority of other workers (Eeckhout 2018). This complex employee-brand matching dynamic would not only restore the predictions of H1, but also result in H1 being stronger for less vertically differentiated employees and absent or reversed for top employees.

We have described several vertical matching patterns that may result in H1 being stronger for employees with high or with low levels of vertical differentiation. On average, across different industries and firms, we therefore do not expect a particular pattern. It also does not appear that positive (or negative) assortative matching among vertically differentiated brands and firms is observed in Eeckhout's review (2018, p. 22), which concludes that there is "little direct evidence" that more skilled workers are more productive in better firms.

Finally, one more hurdle in determining the relationship between vertical brand and vertical employee differentiation lies in defining what constitutes a high-quality match. This is because brands and employees can be vertically ranked on different attributes. In some cases, vertical employee differentiation may map directly onto VBD, such as in creative design industries (e.g., architecture or fashion) or in professional services (e.g., consulting or law). Matches here may be positively assortative where better firms rely on better people and pay them more. In different contexts, or for different segments of workers within the firm (e.g., front-line versus back-office staff), brand-employee fit on vertical dimensions is less clear. For example, it may be the case that more vertically differentiated and more valued workers are those who produce higher-quantity outputs (i.e., are more efficient) rather than higher-quality outputs (i.e., are more effective). This lack of direct correspondence between the attributes that define vertical employee and VBD increases the difficulty of predicting how they combine to affect pay across the heterogeneous contexts we observe.

For all these reasons, we do not rely on any form of assortative matching to predict H1 nor do we expect employee vertical differentiation to systematically moderate H1. We also test this view in Study 2 (see Web Appendix P).

Web Appendix B: Review of the Consumer Behavior Literature Relevant to Measures to Vertical and Horizontal Brand Differentiation

Table WB reviews the correspondence between our measures of vertical (VBD) and horizontal (HBD) brand differentiation with the definitions, measures, and manipulations used in the consumer behavior literature. We denote conceptual correspondence by matching superscripts. While this consumer behavior literature does not explicitly measure or manipulate brand familiarity or relevance (although familiarity is inherent in concepts such as "prestige," as we discuss in our article), the consumer and employee brand equity literatures do, as outlined in Web Appendix C.

Table WB. Definitions and Operationalizations of VBD and HBD in the Consumer Behavior Literature

	Vertical Brand Differentiation	***Horizontal Brand Differentiation***
Current article	Measures: BAV's "high quality,"[1] "regard,"[2] "reliable,"[3] "leader,"[4] "familiarity," and "relevance."	Measures: BAV's "different,"[5] "unique,"[6] "distinctive,"[7] and "dynamic."[8]
Dommer, Swaminathan, and Ahluwalia (2013)	Definition: "Vertical differentiation involves selecting brands that confer status or demonstrate one's superiority to others in a reference group (i.e., 'vertical brands,' e.g., Armani Exchange)" (p. 658). Measures: "[E]xtent to which the brand was a symbol of status,[2, 4] wealth, power, and prestige"[2, 4] (p. 261). "[A] clothing brand that highlights how your superiority[1, 2, 4] and role within the group makes you different from other group members" (p. 673).	Definition: "Horizontal differentiation implies achieving distinction within a social group (e.g., business students) by exhibiting preferences for brands (such as Hollister) that allow for differentiation from typical members of the reference group based on taste, traits, and so forth. These horizontal brands are not necessarily associated with higher status within the group" (p. 658). Measures: "[S]imilarity between the brand and the business school student identity: consistent/inconsistent,[5-7] typical/atypical,[5-7] similar/dissimilar"[5-7] (p. 261). "[A] clothing brand that highlights how your own individual qualities,[6] such as your abilities, opinions, and traits, make you different from other group members" (p. 673).
Liu, McFerran, and Haws (2020)	Definition: "[O]rdinal (akin to vertical, graduated, ranked, and alignable) […] variables" that "largely mirror the 'vertical' […] differentiation distinction often used in economics and marketing, while being broader. […] Ordinal differences enable judgments of better/worse[1, 2, 4] or greater/lesser[1, 2, 4] (as well as same/different) (p. 135)." Manipulations: Portion sizes, brand prestige,[2, 4] prices, and donation amounts	Definition: "[N]ominal (akin to horizontal, unranked, nonalignable) variables" that "largely mirror the […] 'horizontal' differentiation distinction often used in economics and marketing, while being broader. […] [N]ominal differences only enable judgments of same/different" (p. 135). Measures: Food flavors, pasta shapes, earthy/fruity, donation causes

Min and Cunha (2019)	Definition: "Vertical attributes are those for which there is a general consensus among all consumers over the preference ordering of attribute levels, and thus provide a basis for individuals to objectively rank products based on quality" (p. 174). Measures (manipulation check): "perform better"[1-4] Manipulations: Monetary savings associated with energy efficiency/appliance's storage capacity/number free of charge monthly transactions	Definition: "[H]orizontal attributes are those for which the preference ordering depends on the particular consumer and, as a consequence, rankings are strongly influenced by personal taste" (p. 174). Measures (for manipulation): Personal preference for variant Manipulations: Appliance color/desirability of sustainability initiative
Ordabayeva and Fernandes (2018)	Definition: "[C]onsumers may seek to differentiate themselves vertically in the social hierarchy to show their superior position, role or success compared to others [...] through products that signal they are better than others" (p. 228). Measures: Counts of Google Trends search terms including "better[1, 2] /best,[4] convertible, diamonds, elegant, elite,[2, 4] jewelry, luxury, mansion, money, prestige,[2, 4] rich, success."[2, 4] Manipulations: Mugs with "Just better";[1, 2, 4] a Ralph Lauren gift card; a shoe line described as "luxurious and classy,"[2, 4] and "posh,[2, 4] elegant, and sometimes extravagant"; and color that is "a symbol of one's success,[2, 4] prosperity, and accomplishments."[2, 4]	Definition: "[C]onsumers may differentiate horizontally in the social hierarchy to express their unique traits, personality, and values compared to others […] through products that signal they are unique from others" (p. 228). Measures: Counts of Google Trends search terms including "alternative,[5-7] anti-establishment,[5-7] Bohemian,[5-7] counterculture,[5-7] creative,[8] distinct,[5-7] edgy,[8] geek,[5-7] hipster,[8] Indie, unconventional,[5-7] unorthodox."[5-7] Manipulations: Mugs with "Just different";[5-7] an Urban Outfitters gift card; a shoe line described as "edgy,[8] unique,"[6] "irreverent, hip,[8] and sometimes eccentric;"[5-7] and color that is "a symbol of one's originality,[5-7] rebelliousness,[5-7] and edge."[8]
Spiller and Belogolova (2017)	Definition: "[P]roducts as differentiated by quality (modeled via vertical differentiation) […] such that one product is objectively better" (p. 970). Measures: "[Brand x] is objectively better than [Brand Y],"[1, 2, 4] "It is a matter of fact that [Brand X] is better than [Brand Y]."[1, 2, 4] "Quality"[1-4]	Definition: "[P]roducts as differentiated by […] taste (modeled via horizontal differentiation) […] such that one product is a better match with their own personal preferences" (p. 970). Measures: "Neither one is objectively better, it is a matter of opinion/taste/personal preference." "Taste"

Web Appendix C: Summary of the Brand Equity Literature Relevant to Vertical and Horizontal Brand Differentiation

Table WC examines brand equity research that refers to vertical (VBD) and horizontal (HBD) brand differentiation directly or indirectly via observed findings. We compare the measures used in our article to the measures/manipulations used in this literature by matching superscripts. The table further highlights the dearth of research on horizontal brand differentiation, which is a gap we fill with our research.

Table WC. The Relationship of the Brand Equity Literature to Vertical and Horizontal Brand Differentiation

	Relationship to Vertical Brand Differentiation	***Relationship to Horizontal Brand Differentiation***
Current article	Measures: "high quality,"[1] "regard,"[2] "reliable,"[3] "leader,"[4] "familiarity,"[5] and "relevance."[6]	Measures: "different,"[7] "unique,"[8] "distinctive,"[9] and "dynamic."[10]
Aaker and Jacobson (1994)	Findings: Unanticipated changes in perceived quality provide incremental information to accounting data in explaining future stock returns, whereas changes in brand salience do not. Measures: EquiTrend quality[1, 3] perceptions for consumer-product firms and the proportion of consumers expressing an opinion about the brand ("salience")[5]	*Not examined*
Aaker and Jacobson (2001)	Findings: Unanticipated changes to brand perceptions for computer companies are positively related to stock returns in the form of return on equity. Measures: Perceived brand quality[1, 3] and brand attitudes[2] from *Financial World*	*Not examined*
Bronnenberg, Dhar, and Dubé (2007)	Findings: The dispersion of a brand's perceived quality is correlated with the cross-market dispersion in market shares. Measures: BAV's "high quality"[1, 3] and "best brand in category"[4]	*Not examined*
Bronnenberg, Dhar, and Dubé (2009)	Findings: There is a persistent advantage of early entry on a geographic differences of brand market share and brand quality perceptions. Measures: Average of BAV's of "high quality,"[1, 3] "good value," and "best brand in category"[4]	*Not examined*
Cable and Turban (2003)	Findings: Reputation perceptions indicate greater anticipated pride from employment and lower minimum salary requirements. Measures: Reputation perceptions[2] ("company with a good public image/good reputation/heard a lot of good things about this firm/excellent reputation"), as driven by *Fortune's* "Most Admired Companies" index combined with job seekers' familiarity[5] ("know quite a bit about this	*Not examined*

	firm/very familiar with this firm/very familiar with this firm's products and services")	
Datta, Ailawadi, and van Heerde (2017)	Findings: *Relevant brand stature* is positively related to sales-based brand equity and market share, with the strongest positive effect in categories that hold "social value …because these brands are more likely to be recognized and respected by others" (p. 6). Measures: *Relevant brand stature* is based on a factor representing BAV's *esteem*,[1-4] *familiarity*,[5] and *relevance*[6]	Findings: *Energized differentiation* correlates negatively with sales-based brand equity and market share as it "does not necessarily appeal to the masses," especially in hedonic categories where consumers can "better ascertain and appraise a brand's unique aspects" (p. 13). Measures: BAV's *energized differentiation*[7-10]
DelVecchio, Jarvis, Klink, and Dineen (2007)	Findings: Working for "strong brands" provides perceived resumé power and lower minimum salary requirements. Measures: Perceived quality,[1, 3] favorability,[2] familiarity,[5] market share,[6] and higher prices Manipulations: Quality[1, 3] and familiarity[5]	*Not examined*
Kim, York, and Lim (2011)	Findings: Brand equity has a direct effect on job pursuit, whereas corporate reputation does not. Measures: Corporate reputation ("company with a good public image/good reputation[3]/heard a lot of good things about this firm[5]/excellent reputation[4]"); Study 1 brand-equity measures of performance[1, 3] (e.g., "superior performance"[4]), social image (e.g., "well regarded"[2] and "fits my personality"[6]), value ("well priced"), trustworthiness[3] (e.g., "very trustworthy"), and attachment[6] (e.g., "positive personal feelings"); Study 2 brand-equity measures of quality,[1, 3] favorability,[2, 6] and familiarity[4]	*Not examined*
Larkin (2013)	Findings: *Brand stature* reduces earnings volatility, improves credit ratings, and increases leverage. Measures: Combination of BAV's *esteem*[1-4] and *familiarity*[5]	*Not examined*
Lovett, Peres, and Shachar (2013)	Findings: BAV's *esteem*, and *familiarity* are positively related to both online and offline word-of-mouth (WOM); *relevance* is negatively related to online and positively related to offline WOM. *Esteem*, *familiarity*, and *relevance* are highly correlated (ρ = 0.68 to -0.80), but not *energized differentiation* (ρ = -0.01 to 0.10). Measures: BAV's *esteem*,[1-4] *familiarity*,[5] and *relevance*[6], as well as a single-item "familiarity"[5] question	Findings: BAV's *energized differentiation* is positively related to both online and offline word-of-mouth. Measures: BAV's *energized differentiation*[7-10]
Lovett, Peres, and Shachar (2014)	Findings/measures: BAV's *esteem*,[1-4] *familiarity*,[5] and *relevance*[6] are highly correlated with one another (ρ = 0.64 to 0.80) as well as with BAV's *consideration* and *usage* (ρ = 0.58 to 0.88). BAV's *consideration* is the percentage of respondents who indicate that this is the brand, or one of the several brands, they would consider to buy or use and *usage* is the	Findings: BAV's *energized differentiation*[7-10] is not or only weakly correlated with BAV's *esteem*, *familiarity*, and *relevance* as well as with *consideration* and *usage* (ρ = -0.04 to 0.10)

	percentage of respondents who stated that they use the brand occasionally or often.	
Mizik and Jacobson (2008)	Findings: Changes in BAV's *relevance*,[6] but not *esteem*[1-4] or *familiarity*[5] predict stock returns.	Findings: Changes in BAV's *energy*,[10] but not *differentiation*[7-9] metrics predict stock returns.
Mizik and Jacobson (2009)	Findings/measures: A factor analysis revealed a factor of approximately equal weightings of *esteem*,[1-4] *familiarity*,[5] and *relevance.*[6] Changes in BAV's *esteem*,[1-4] *familiarity*,[5] and *relevance*[6] improve predictions for the enterprise value-to-sales ratio in several industry sectors.	Findings/measures: A factor analysis revealed a second factor primarily based on BAV's *differentiation* and *energy*. Changes in *differentiation*[7-9] (significantly) and *energy*[10] (marginally) positively relate to the value-to-sales ratio.
Netemeyer, Krishnan, Pullig, Wang, Yagci, Dean, Ricks, and Wirth (2004)	Findings: Perceived quality/value is one of two core/primary customer-based brand equity facets that drive brand purchase. Measures: "[V]ery high quality,"[1] "best brand in its product class,"[4] "consistently[3] performs better[1]," "count on for [..] consistent[3] high quality[1]," and several value measures (e.g., "a good buy")	Findings: Uniqueness is the second of two core/primary customer-based brand equity facets driving brand purchase. Measures: "[V]ery different from,"[7] "unique from"[8] "distinct from,"[9] "really stands out from"[9]
Stahl, Heitmann, Lehmann, and Neslin (2012)	Findings/measures: BAV's *esteem*[1-4] is positively related to customer retention; *familiarity*[5] is positively related to customer acquisition, customer retention, and customer profit margins; and *relevance*[6] is positively related to customer acquisition.	Findings/measures: BAV's *energized differentiation*[7-10] is positively related to customer profit margin, but negatively related to customer acquisition and retention (presumably because of "the role of a specialized product and a smaller target group for highly differentiated products" (p.54)). "[D]ifferentiation is the pillar least correlated with the other pillars" (p. 59).
Vomberg, Homburg, and Bornemann (2015)	Findings: Brand equity and human capital interact positive to affect firm financial performance. Brand equity and human capital are found to interact separately with services industries Measures: EquiTrend's perceived quality[1, 3] and familiarity[5]	*Not examined*

Notes: BAV measures overall brand strength across four brand pillars: *esteem* (using a formula combining "regard" [rated on "Extremely low regard" to "Extremely high regard"] and percent agreement with "reliable," "high quality," and "leader" brand associations); *familiarity* (rated on "never heard of" to "extremely familiar"); *relevance* (rated on "Not at all relevant" to "Extremely relevant"); and *energized differentiation* (percent agreement with "different," "unique," "distinctive," "dynamic," and "innovative" associations). Previously, BAV separated *energy* ("dynamic" and "innovative") and *differentiation* ("different," "unique," "distinctive").

Web Appendix D: Construct Validation of the Brand Differentiation Measures

We validate our constructs of vertical (VBD) and horizontal (HBD) brand differentiation using an exploratory factor analysis, a confirmatory factor analysis, and an experiment. We describe the factor analyses results in this appendix and the experimental results in Web Appendix E.

We begin with an exploratory factor analysis of our brand differentiation measures. Using a varimax rotation, we extract two factors with eigenvalues greater than 1 that account for 71% of the variance. Factor loadings in Table WD1 indicate that the measures associated with VBD load on the first factor and not on the second, while measures associated with HBD do the opposite.

Table WD.1. Exploratory Factor Analysis Results

High quality	.734	.260
Leader	.849	.207
Regard	.925	.134
Reliable	.886	-.063
Familiarity	.825	-.015
Relevance	.88	.128
Unique	-.017	.875
Different	-.273	.799
Distinctive	.253	.805
Dynamic	.255	.752
Innovative	.252	.671

We then conducted a confirmatory factor analysis to further assess the reliability and validity of our brand differentiation measures. Initial testing indicated model fit was significantly weaker when "Innovative" was included in the model than when it was removed ($\Delta\chi^2$ (9) = 319.42, $p < .0001$ and change in ΔCFI =.049). We examined the literature and found support for the importance of innovation in both horizontal and vertical differentiation. This is logical given that innovation could contribute to both high quality and high uniqueness perceptions. Research shows that firms have an incentive to horizontally differentiate via innovation in dynamic environments with changing consumer tastes (Miller and Friesen 1982; Tripsas 2008; Wang and Chen 2010), in highly competitive markets with low product differentiation (Weiß 2003), and in markets in which consumers seek variety (Rosenkranz 2003). At the same time, it is well established that investing in product innovation underlies vertical differentiation (Shaked and Sutton 1982; Wauthy 1996). Competitive conditions can also provide high-quality brands a greater incentive to invest in product innovation than low quality brands (Bonanno and Haworth 1998; Filippini and Martini 2010; Lambertini and Orsini 2000). Given this evidence, we dropped innovativeness from our HBD measure. However, because innovativeness is often used together with different, distinctive, and unique in the brand equity literature, we perform a robustness check and replicate our results (see Web Appendix M, Replication 6).

Our model results show reasonable fit (χ^2 (15) = 69.06, p < 000; comparative fit index = 0.988; root mean square error of approximation = 0.083; standardized root mean square error of approximation = 0.062). The average variance extracted (AVE) exceeds the recommended threshold values. Specifically, the AVE for VBD is 0.673 and for HBD is 0.555, while the squared correlation (SC) between the two variables is 0.104. Given AVE is 0.50 or greater, the model indicates convergent validity for both VBD and HBD. In addition, given the AVE exceeds the SC, the discriminant validity of VBD and HBD is supported. All indicator reliabilities (IR) exceed the 0.40 threshold recommended in Bagozzi and Yi (2012), as shown in Table WD2. Table WD3 presents the descriptive statistics for the item used in the construct validity analysis.

Table WD.2. Brand Differentiation Measure Validity

Construct	IL[b]	IR[b]
Vertical Brand Differentiation (AVE = .673; CA = .929; CR = .924)[a]		
High quality	.708	.501
Leader	.821	.674
Regard	.943	.671
Reliable	.819	.646
Familiarity	.804	.654
Relevance	.809	.501
Horizontal Brand Differentiation (AVE = .555; CA = .838; CR = .828)		
Unique	.744	.554
Different	.603	.364
Distinctive	.937	.878
Dynamic	.650	.423

[a] AVE = average variance extracted; CA = Cronbach's alpha; and CR = composite reliability.

[b] Standardized item loadings (ILs) represent the square root of indicator reliabilities (IRs).

Table WD.3. Descriptive Statistics for BAV Items Used in Brand Differentiation Measures

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. High quality	18.369	8.335	1									
2. Leader	18.347	7.105	0.63	1								
3. Regard	4.639	0.599	0.69	0.71	1							
4. Reliable	18.942	7.880	0.61	0.73	0.77	1						
5. Familiarity	3.426	1.222	0.50	0.66	0.79	0.62	1					
6. Relevance	2.873	0.773	0.58	0.68	0.91	0.75	0.70	1				
7. Unique	8.089	3.659	0.23	0.11	0.17	-0.07	0.04	0.12	1			
8. Different	7.435	3.407	-0.01	-0.14	-0.07	-0.25	-0.16	-0.06	0.75	1		
9. Distinctive	11.099	3.889	0.48	0.38	0.33	0.14	0.23	0.25	0.68	0.52	1	
10. Dynamic	8.203	3.682	0.33	0.45	0.24	0.19	0.12	0.27	0.49	0.35	0.59	1

Web Appendix E: Experimental Evidence Regarding the Correspondence of Measures to Vertical and Horizontal Brand Differentiation (Study 1)

We conducted an experiment to establish the correspondence between our measures and the constructs of vertical (VBD) and horizontal (HBD) brand differentiation. We did so by directly assessing how individual brand characteristics reflecting our VBD and HBD measures influence perceptions of brand uniqueness and superior quality.

Design, Sample, and Procedure

We collected data on Prolific (N = 149; M_{age} = 36.5 years; Gender: 73 female, 75 male, 1 other) using a one-factor between-subjects design. The study involved giving participants a goal of either selecting brands that will be perceived by others as superior in quality or as unique—the core features of our brand differentiation definitions. Specifically, participants were asked to "Imagine a person who is attending a social event for work that is attended by their co-workers and their guests, many of whom the person may not know. The person is selecting different types of branded products to wear to the party, including clothing, shoes, and watches or jewelry. This person wants to select brands that will be perceived as [unique or superior in quality] by people attending the party."

Participants were then introduced to "a set of characteristics of the brands associated with the clothing, shoes, and watches or jewelry the person is considering wearing to the party." The brand characteristics were: "high quality," "highly regarded," "reliable," "a leader," "familiar," "highly relevant," "different," "distinctive," "dynamic," and "unique" presented in random order. Participants were asked to rate each on the degree to which "the brand characteristic will help them achieve this perception" [unique or superior in quality] on a 7-point scale (1 = Not help achieve this perception, 7 = Very much help achieve this perception). We note that "high quality" ("unique") is akin to a manipulation check of VBD (HBD) and that the more interesting test is to observe how the other brand characteristics are rated across the two conditions.

Results

Given our measure validation objectives, we begin by reviewing the mean scores for each of individual measures developed for the VBD and HBD constructs. As shown in Table WE.1, the means for the VBD items scored significantly higher on the likelihood of being selected for superior quality than uniqueness, while the HBD items scored significantly higher on the likelihood of being selected for uniqueness than superior quality.

Table WE.1. Contrasts of Individual VBD and HBD Items Across Experimental Conditions

Measures	Goal: Select products superior in quality	Goal: Select unique products	t-value (DF = 147) and p-value
High Quality	6.25 (1.11)	4.75 (1.35)	7.37, $p < .0001$
Reliable	6.05 (1.78)	3.51 (1.45)	11.73, $p < .0001$
Leader	5.49 (1.18)	3.62 (1.57)	8.20, $p < .0001$

Regard	5.99 (1.34)	4.13 (1.52)	8.42, $p < .0001$
Relevant	5.12 (1.25)	3.68 (1.78)	5.70, $p < .0001$
Familiar	4.40 (1.24)	2.61 (1.58)	7.68, $p < .0001$
Different	4.22 (1.42)	6.07 (1.12)	-8.83, $p < .0001$
Distinctive	4.92 (1.24)	5.61 (1.35)	-3.23, $p < .0015$
Dynamic	4.39 (1.49)	4.82 (1.33)	-1.81, $p < .08$
Unique	4.75 (1.26)	6.53 (0.92)	-9.87, $p < .0001$

A confirmatory factor analysis of these measures results in a CFI of 92%. The measures display good convergent and discriminant validity with the AVE for VBD = .61 and the AVE for HBD = .53. In an exploratory factor analysis with an oblique promax rotation, we likewise observe two factors with eigenvalues greater than 1 that account for 67% of the variance. The first factor has high loadings of high quality (0.75) reliable (0.84), leader (0.85), regard (0.89), relevant (0.78) and familiar (0.73), and low loadings of unique (-0.38), different (-0.45), distinctive (0.08), and dynamic (0.17), whereas the second factor had high loadings of unique (0.89), different (0.84), distinctive (0.74), and dynamic (0.61) and low loadings of high quality (-0.12), reliable (-0.27), leader (-0.04), regard (-0.04), relevant (-0.04) and familiar (-0.27). Given this, we formed VBD (VBD Index) and HBD (HBD Index) measures that are the average of the relevant items. The Cronbach alpha for the corresponding scales was adequate (VBD, $\alpha = 0.90$ and HBD, $\alpha = 0.78$).

Consistent with expectations, the VBD Index measure was significantly higher when participants were given a goal of selecting brands perceived as superior in quality versus unique ($M_{quality} = 5.55$ vs. $M_{unique} = 3.72$, $t(147) = 11.28$, $p < .0001$) (see Table WE.2). In contrast, the HBD Index measure was significantly higher when participants were given a goal of selecting brands perceived as unique versus superior quality ($M_{unique} = 5.75$ vs. $M_{quality} = 4.57$, $t(147) = -7.60$, $p < .0001$).

Table WE.2. Contrasts of VBD and HBD Measures Across Experimental Conditions

Measure	Goal: Select products superior in quality	Goal: Select unique products	t-value (DF = 147) and p-value
VBD Index	5.55 (0.77)	3.72 (1.17)	11.28, $p < .0001$
HBD Index	4.57 (1.08)	5.75 (0.80)	-7.60, $p < .0001$

Discussion

These findings provide direct experimental evidence that the brand characteristics of regard, reliable, high quality, leader, relevance, and familiarity correspond more to VBD, whereas the brand characteristics of different, distinctive, unique, and dynamic correspond more to HBD.

Web Appendix F: Tests of Nomological Validity

YouGov brand data have been previously used in the marketing literature (Colicev et al. 2018; Hewett et al. 2016). These data are based on the opinions of a representative sample of consumers drawn daily from a panel of 5 million consumers. Reviewing these data, we were able to identify brand metrics that conceptually relate to VBD, but not HBD. For the sub-sample of data where our BAV and YouGov data overlap, we therefore expected the YouGov measures to correlate more strongly with our BAV-based measure of VBD than HBD. Specifically, we suggest that YouGov's "brand quality" measure ("Is the brand of good or poor quality?) reflects BAV's measure of "brand quality;" YouGov's "brand recommend" measure ("Would you recommend this brand to a friend or tell them to avoid it?") corresponds to BAV's measure of "brand regard;" YouGov's "brand awareness" ("Are you aware of the brand?") is similar to BAV's measure of "brand familiarity;" YouGov's "brand consideration" ("When you are in the market next to make a purchase, which brands would you consider?") corresponds to BAV's measure of "brand relevance;" and YouGov's overall "brand health" (an average of these and other metrics such as buzz and awareness of firm advertising) should correspond to our measure of vertical brand differentiation, which reflects all of the noted BAV measures.

Data for these measures were available for between 124-285 firms in our sample, preventing full model testing. However, in the interests of nomological validity, we present the correlations of our two brand differentiation measures and each of these YouGov measures (calculated as the difference between the positive and negative perception scores for each variable) in Table WF.1. Results confirm our expectation that these measures are more strongly associated with our VBD than our HBD measures, thus providing further evidence of construct validity.

Table WF.1. Tests of Nomological Validity of Brand Differentiation Measures Using YouGov Brand Measures

		Correlations		Fisher z-test
YouGov Measures	N	VBD	HBD	
Brand Awareness	124	.54***	-.09	5.35***
Brand Consideration	124	.81***	.24**	6.81***
Brand Quality	285	.80***	.28***	9.72***
Brand Recommend	285	.81***	.24***	10.47***
Brand Health	285	.83***	.24***	11.16***

***$p < .001$, **$p < .01$, *$p < .05$, $^{\dagger} p < .10$

We also use our archival data to establish nomological validity. Consistent with their more universal appeal, firms high in vertical brand differentiation are found to be larger and have higher market shares. In contrast, employees at firms high in horizontal brand differentiation respond more positively to the Trust Index© measure "I can be myself around here," which indicates positive assortative matching (see Table WF.2).

Table WF.2. Tests of Nomological Validity of Brand Differentiation Measures Using Related Firm and Employee Measures

	Correlations		Fisher z-test
	VBD	HBD	
Firm size (log employees)	.21***	-.15	5.89***
Firm market share	.28***	-.05	5.46***
Employee average "I can be myself around here"	-.15**	.32***	-7.81***

Notes: "I can be myself around here" reflects employee agreement to this question in the Trust Index©.

***$p < .001$, **$p < .01$, *$p < .05$, $^{\dagger} p < .10$

Web Appendix G: Formal Predictions of the Employee-Brand Matching Process Moderators

Stage of the Matching Process	Moderator	Prediction	Impact on Firm Bargaining Power
Labor availability	Demand for technical talent	Higher demand for technical talent will decrease (increase) the negative (positive) effect of vertical (horizontal) differentiation on pay.	Decrease
	Demand for front-line employees	Higher demand for front-line employees will decrease (increase) the negative (positive) effect of vertical (horizontal) differentiation on pay.	
Labor identification	HRM sophistication	Stronger HRM sophistication will increase (decrease) the negative (positive) effect of vertical (horizontal) differentiation on pay.	Increase
	Employee referrals	Higher reliance on employee referrals will decrease (increase) the negative (positive) effect of vertical (horizontal) differentiation on pay.	Decrease
Labor attraction	Benefits	Higher levels of benefits will increase (decrease) the negative (positive) effect of vertical (horizontal) differentiation on pay.	Increase
Labor development	Training	Higher levels of training will increase (increase) the negative (positive) effect of vertical (horizontal) differentiation on pay.	Depends on type of brand differentiation

Web Appendix H: Descriptive Statistics for Multi-item Scales for Control Variables and Moderators Used in Archival Study

This Web Appendix contains descriptive statistics for multi-item scales used for control variables and moderators of the brand-pay relationship. Indicator correlations are offered for all measures while regression and VIFs are offered for formative measures.

Table WH.1. Employee Engagement (control variable, reflective measure)

Indicator Correlations

	1	2	3	4	5	6	7	8	9	10	11	12
1. When people change jobs or work units, they are made to feel right at home.	1											
2. When I look at what we accomplish, I feel a sense of pride.	0.81	1										
3. I feel good about the ways we contribute to the community.	0.66	0.68	1									
4. People here are given a lot of responsibility.	0.55	0.58	0.60	1								
5. People care about each other here.	0.89	0.77	0.61	0.54	1							
6. I'm proud to tell others I work here.	0.74	0.85	0.74	0.65	0.75	1						
7. There is a "family" or "team" feeling here.	0.90	0.82	0.60	0.42	0.92	0.78	1					
8. People celebrate special events around here.	0.81	0.73	0.68	0.45	0.78	0.75	0.83	1				
9. We're all in this together.	0.89	0.87	0.64	0.50	0.88	0.80	0.94	0.82	1			
10. I am treated as a full member here regardless of my position.	0.90	0.78	0.54	0.44	0.84	0.70	0.91	0.72	0.92	1		
11. I feel I make a difference here.	0.87	0.89	0.61	0.58	0.83	0.78	0.87	0.72	0.89	0.88	1	
12. Taking everything into account, I would say this is a great place to work.	0.88	0.87	0.70	0.52	0.85	0.86	0.92	0.82	0.94	0.90	0.88	1

Following Diamantopoulos and Winklhofer (2001), we validate our formative measure in two steps. The tables that follow offer details. We first assess indicator collinearity by calculating the correlations between the three indicators, which are moderate in size. We also run regression analyses of all indicators as independent variables on each indicator as a dependent variable and find VIFs below 2, indicating multicollinearity is not a threat to our formative approach.

Table WH.2. Demand for Technical Talent (moderator, formative measure)

Indicator Correlations

	1	2	3
1. R&D intensity	1		
2. Relative number of new product announcements	.20	1	
3. Nasdaq listing	.30	.16	1

Regressions and VIF to Determine the Appropriateness of the Three Formative Indicators

	DV=R&D intensity		DV=Relative number of new product announcements		DV=Nasdaq listing	
	Coeff (SE)	VIF	Coeff (SE)	VIF	Coeff (SE)	VIF
R&D intensity			.17 (.04)***	1.10	.27 (.04)***	1.04
Relative number of new product announcements	.16 (.04)***	1.03			.10 (.04)***	1.04
Nasdaq listing	.27 (.04)***	1.03	.11 (.04)***	1.10		

****p* < .001, ***p* < .01, **p* < .05

Table WH.3. Human Resource Management Sophistication (moderator, reflective measure)

Indicator Correlations

	1	2	3	4
1. Health and safety policy	1			
2. Diversity and opportunity policy	.69	1		
3. Child labor policy	.56	.58	1	
4. Human rights policy	.43	.42	.61	1

Table WH.4. Benefits (moderator and control variable, reflective measure)

Indicator Correlations

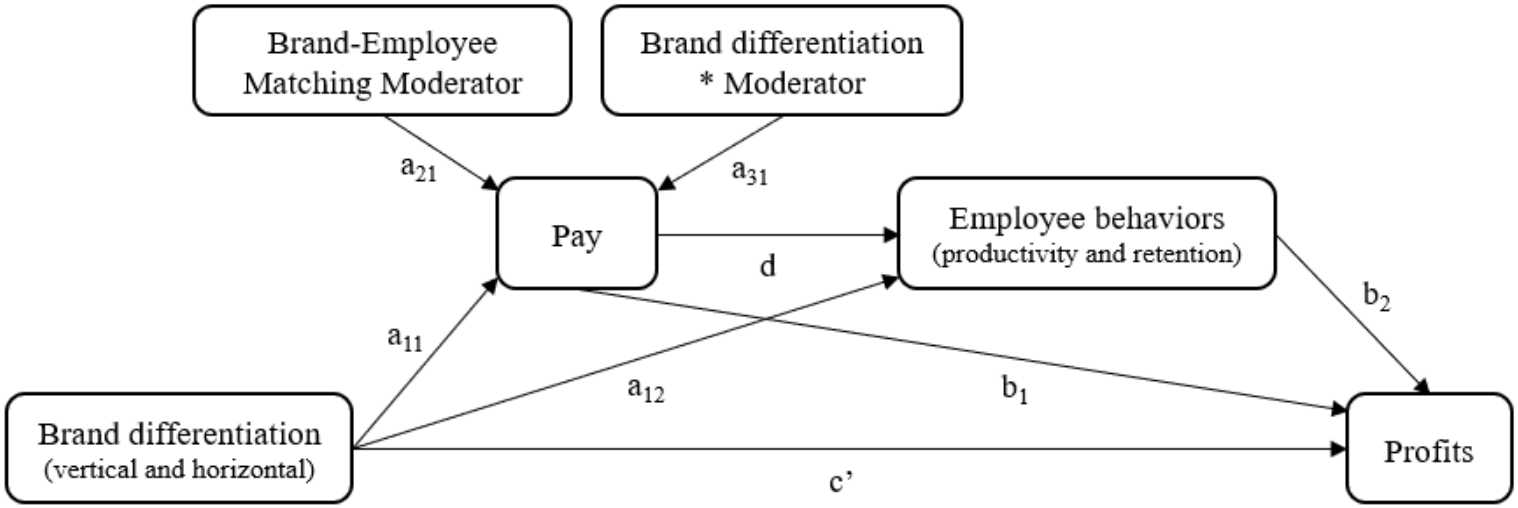
	1	2	3	4	5	6	7	8	9
1. Availability of a formal policy or program that allows all employees to receive a specified number of days off per year to volunteer	1								
2. Provision for a flexible schedule program as a regular work arrangement	.24	1							
3. Provision to allow employees to telecommute or work at home as a regular work arrangement	.21	.65	1						
4. Availability of compressed workweeks (e.g., work four 10-hour days and take Fridays off) on a year-round, regular basis	.26	.55	.56	1					
5. Availability of an onsite child care center	.11	.22	.27	.19	1				
6. Availability of an offsite child care center	.22	.23	.29	.24	.43	1			
7. Reimbursement of child care costs when employees travel out-of-town or work late	.30	.59	.67	.53	.29	.35	1		
8. Availability of a tuition reimbursement program	.26	.56	.64	.45	.33	.38	.75	1	
9. Availability of a 401k or 403b plan	.29	.64	.71	.52	.29	.33	.86	.80	1

Notes: All variables in this Web Appendix are at the firm level unless noted. For all four correlation tables, correlations higher than .09 are significant at 95% or higher.

Web Appendix I: Computational Details Underlying the Estimation of Moderated Serial Mediation Models

The stylized model below illustrates, in a simplified way, the estimation of the indirect effects and the index of moderated mediation. Specifically, following Hayes (2015), the equations can be written as follows:

$$\text{Pay} = i_{\text{Pay}} + a_{11}\text{Brand differentiation} + a_{21}\text{Moderator} + a_{31}\text{Brand differentiation} * \text{Moderator} + \Sigma a_{j1}\text{Controls} + e_{\text{Pay}}$$
$$\text{Employee behaviors} = i_{\text{Employee behaviors}} + a_{12}\text{Brand differentiation} + d\text{Pay} + \Sigma a_{k2}\text{Controls} + e_{\text{Employee behaviors}}$$
$$\text{Profits} = i_{\text{Profits}} + c'\text{Brand differentiation} + b_1\text{Pay} + b_2\text{Employee behaviors} + \Sigma b_{l3}\text{Controls} + e_{\text{Profits}}$$



In the absence of the moderator, the indirect effects (testing H3 and H4) are denoted by $a_{11}*d*b_2$. Introducing the moderators in the moderated serial mediation models tests whether the indirect effect is influenced by the values of the moderator. Specifically, the indirect effect is computed as $(a_{11} + a_{31}*\text{Moderator})*d*b_2$. The index of moderation for the indirect effect is computed as $a_{31}*d*b_2$ for each pair of moderator and brand differentiation dimensions.

Interpretive note: The coefficients for the interaction between each brand differentiation variable and each moderator on pay are described in detail on pages 30-32 of the paper. The indirect effects and associated index of moderated mediation (IMM) to test for moderated mediation (the effect of the moderator traveling all the way to profits through pay and the employee behaviors) are in Table 5 and the conditional indirect effects of brand differentiation on profits at various levels of the moderators in Web Appendix K. Importantly, the index of moderated mediation (IMM) is designed to be computed for one moderator at a time given it captures how a mediated effect shifts for various values of that moderator (Hayes 2015).

Web Appendix J: Identification Strategy Description and Model Results

This Web Appendix offers complete reporting related to our identification strategy. This includes four sections dedicated to account for firm choice to apply to *Fortune's 100 Best Companies to Work For* list and the need to account for the endogeneity of brand differentiation, pay, productivity, and retention.

Section 1: Accounting for Firm Choice to Apply for the Fortune "Best Places to Work For" List

Firms do not randomly apply to the *Fortune 100 Best Companies to Work For* list (hereafter *Fortune* "best places to work" list). Instead, this choice is likely driven by firm and industry characteristics that could introduce selection bias. To resolve this, we use Compustat data to assemble a set of firms that did not apply for the ranking, but belong to the same three-digit SIC codes as the applying firms for each year in our sample.

We then use a Heckman two-step estimation to model the decision to apply (Heckman 1979). We first estimate a Probit model where the dependent variable takes the value 1 if the firm applied to *Fortune* "best places to work" list and 0 otherwise. As predictors, we include net profit margin because high-performing firms are more likely to have the resources to apply. We use net profit margin in order to avoid using the same performance variable (EBITDA) in this auxiliary equation as our dependent variable in the main model. We further include firm size (log of number of employees) because larger firms are more likely to have personnel who can oversee the application process. As elsewhere, we include industry and year dummies, a dummy variable that identifies firms in the high-tech sector, and HHI. We lag all these independent variables to account for the fact that firms report the last available fiscal year data when applying.

We include two variables that serve as instruments. First, we add a dummy variable that takes the value 1 (0 otherwise) if the firm is included in the *Fortune 100 Most Admired Companies* (*Most Admired*) ranking because firms with satisfied employees may enjoy a higher overall reputation. This variable is highly correlated with the choice to apply to the *Fortune* "best places to work" list, which reflects both the success of the firm as well as having processes in place to collect the data needed for these types of applications. At the same time, this variable is not a significant determinant of pay, productivity, retention, or profits. Second, we include the percentage of firms *applying* for the *Fortune* "best places to work" list in a firm's industry as an exclusion restriction. This variable is correlated with the firm's likelihood of applying for isomorphism reasons because firms competing in the same labor market will be under increased pressure to offer a good working environment and vie for the same employee recognition as their peers. At the same time, peers' applications, rather than whether the peers actually win a spot on the *Fortune* "best place to work" list, should not be related to the profits of the focal firm (Germann, Ebbes, and Grewal. 2015). Further, to ensure that the exclusion restriction is not subject to the leave-one-out critique, we consider all firms that are in the firm's primary three-digit SIC code(s) (Germann, Ebbes, and Grewal 2015). Using these variables, we estimate equation (5), using a Probit specification, where *i* indexes the firm and *t* the year:

(5) Prob (Fortune_Apply$_{it+1}$ = 1|Covariates$_{it}$) = $\phi(X\alpha_{it})$, *where* $X\alpha_{it} = \alpha_0 + \alpha_1$Profit_Margin$_{it} + \alpha_2$Num_Employees$_{it} + \alpha_3$Industry_Concentration$_{it} + \alpha_4$Most_Admired_List$_{it} + \alpha_5$Tech$_{it} + \alpha_6$Competitor_Best_Places_Work_List_Apply$_{it} + \alpha_{7\text{-}13}$Industry$_{it} + \alpha_{14\text{-}18}$Year$_t + \varepsilon^s_{it}$

The final sample on which we estimate this selection model includes 33,368 firm-year observations. Results, which are shown in Table WJ.1, indicate that firms that apply are more likely to have higher net profit margins (α_1 = 1.41, $p < .001$), have more employees (α_2 = .54, $p < .001$), operate in more concentrated industries (α_3 = 2.43, $p < .001$), be included in the *Most Admired* ranking (α_4 = .88, $p < .001$), and belong to high-tech industries (α_5 = .33, $p < .05$). Our results confirm that peers' *Fortune* "best place to work" applications is an appropriate exclusion restriction: it is a significant determinant of the likelihood of the firm applying to the list (α_6 = 5.26, $p < .001$), the performance of the selection equation increases significantly when it is added to the model ($\Delta\chi^2(1) = 103.92$, $p < .001$), and the instrument has a low correlation with firm profits (ρ = -.06). From this selection equation, we compute the inverse Mills ratio as $\lambda = \varphi('X) / \Phi('X)$, where φ and Φ are the probability density function and cumulative density function of the normal distribution, and add it to our main models to account for the effect of omitted unobservable variables (Gill, Sridhar, and Grewal 2017).

Table WJ.1. Selection Model Results

	Choice to Apply for *Fortune* "Best Place to Work" List
Most Admired list	.883 (.131)***
Peer *Fortune* "best places to work" list applications (%)	5.263 (.509)***
Profit margin	1.406 (.174)***
Number of employees	.537 (.016)***
Industry concentration	2.425 (.220)***
High-tech sector	.325 (.135)*
χ^2 (27)	2753.92***
Pseudo R-square	.224
Observations	33,368

Notes: All variables are at the firm level unless noted. The model includes industry and year dummies, which are not reported for parsimony.
***$p < .001$, **$p < .01$, *$p < .05$

Section 2: Accounting for the Endogeneity of Vertical and Horizontal Brand Differentiation

It is possible that the relationships between brand differentiation, pay, employee behaviors, and profits are also impacted by unobserved variables. For example, macroeconomic trends may affect demand for premium products associated with vertical differentiation as well as firm investments into this brand dimension (Scholdra et al. 2022). Similarly, consumer trends, such as the shift towards gender-neutral fashion, may lead to some horizontal brand characteristics being preferred over others, such as Gucci's androgyny versus Dior's femininity. To account for these and other possibilities, we use a control function approach that models each brand differentiation dimension as a function of an instrument and a set of control variables (Petrin and Train 2010). We then extract residuals from these models and add them to equations (1)-(4).

We use a peer-based instrument for brand differentiation and offer both supply- and demand-side explanations and empirical evidence for this choice, details of which follow.

Supply-side mechanisms. Supply-side pressures emerge from the interaction between firms and the ecosystem of non-customer stakeholders with which they interact in an industry. The literature points to three types of isomorphism that may play a role in industry brand differentiation conformity: coercive, mimetic, and normative (DiMaggio and Powell 1983). First, *coercive influence* can stem from the actions of supplier, channel partner, and regulator stakeholders. For example, pressures to adopt certain brand standards may arise from suppliers and sales channels that have adopted standards and ways of doing business (e.g., fair trade) that are geared toward higher levels of vertical differentiation. Similarly, the adoption of private label (store) brands by powerful retailers can create vertical differentiation pressures for brands that compete against private labels due to profitability and delisting-potential pressures (Venturini 2006). Channel partners can also increase pressures to horizontally differentiate. For example, multi-brand retailers seek to carry a broad product assortment to satisfy consumer segments with different tastes while also minimizing feature-overlap (Boatwright and Nunes 2001). Under these conditions, manufacturers will strive to strengthen perceptions of brand uniqueness in order to be attractive to the retailer's assortment needs.[1] Finally, coercive isomorphism can also arise from regulatory and media pressure. For instance, Deephouse (1996) shows that regulations pressuring banks to maintain higher capital requirements tend to push banks towards being "safer"—a vertically differentiated quality that is universally valued. Media coverage, which also informs consumers that banks with higher reserves are "safer," further increases demand for banks that perform well on this attribute (see also Deephouse 1996).

Second, *mimetic influences* refer to firms' tendencies to imitate their industry peers, especially under conditions of uncertainty (DiMaggio and Powell 1983). This is likely the case for branding decisions for several reasons. Under demand uncertainty, firms may imitate leading brands because these firms are perceived as having superior information about the value of a competitive strategy or position (e.g., Haunschild and Miner 1997) or because being perceived as similar to a vertically differentiated brand can signal the imitator brand's own quality (e.g., Westphal, Gulati, and Shortell 1997) or status (e.g., Fligstein 1985). Imitation can also be a form of tacit collusion that mitigates the profit-damaging effects of intense competition among rivals (Leiberman and Asaba 2006). As Porter (1979, p. 217) explains, firms in the same industry may behave in similar ways because "… divergent strategies reduce the ability of the oligopolists to coordinate their actions tacitly… reducing the average industry profitability." Leiberman and Asaba (2006) review additional work in strategy and economics pointing to the same conclusion.

Mimetic isomorphism can also occur because rivals are more likely to share personnel and practices within, rather than across, industries. In terms of personnel, job switching is bounded, in part, by industry sector experience (King, Burke, and Pemberton 2005) including that of marketers (Hoolahan and Reed 2009). This should foster norms towards creating uniqueness and/or superior quality to be shared more within than across industries. Practices that affect brand differentiation also tend to spread more readily within than across industries. For example, financial institutions have been found to imitate their rival's introduction of Total Quality

[1] This "competition on uniqueness" means that brands strive to find a distinctive position—not to converge on the same type of uniqueness. This should, in turn, increase the average HBD level within an industry.

Management, which has led to higher vertical differentiation in the sector through process improvements and zero-defect initiatives (Montes and Jover 2004).

Third, *normative influences* that emerge from "professionalization" can also lead to isomorphism (DiMaggio and Powell 1983). For example, normative influences can arise when trade bodies set certain standards or require certain qualifications, thus leading to converging levels of vertical differentiation. Isomorphic strategies can also emerge from managers within an industry having similar training and/or backgrounds.

Demand-side mechanisms. Demand-side *coercive influences* refer to (actual and perceived) pressures for convergence that emerge from firms interacting with current or potential customers. We identify three influences. First, different industries provide different opportunities to differentiate based on consumer demand. In commodity-like markets such as energy or banking, consumer choice is less a matter of taste, which makes investments into horizontal differentiation less profitable. As a result, firms in these sectors would be, on average, less horizontally differentiated. Conversely, in consumer-identity driven markets such as fashion and automobiles, brands can be profitable by appealing to different consumer segments, which results in higher levels of horizontal differentiation within these sectors. Multi-brand retailer assortment decisions affect brand strategies and can further these tendencies (Briesch, Chintagunta, and Fox 2009). For example, when consumer choices are anchored by quality-based considerations, retailers should find it optimal to employ a vertical differentiation assortment strategy. In contrast, when consumer choices are anchored by type (or taste) based considerations, retailers should find it optimal to employ horizontal assortment differentiation strategies (Shao 2015).

Second, research suggests that consumers rely on *product-category schemas* to evaluate products (Halkias 2015). These schemas or knowledge structures tend to be shaped by the most dominant or "prototypical" brands in the category (Boush and Loken 1991; Loken and Ward 1990) and can result in a preference for "the ordinary" (Landwehr, Labroo, and Herrmann 2011). For example, early entrants into categories tend to have an outsized influence on consumer expectations for certain attribute combinations (Carpenter and Nakamoto 1989). This is because exposure to the attributes and qualities fosters consumer learning and preference formation for those qualities. Consequently, only moderate deviations from schema-driven expectations tend to result in positive brand evaluations (Meyers-Levy and Tybout 1989).

Third, perceived shifts in market demand can cause brands to converge on similar market positions. For example, current trends regarding sustainability show stalwarts such as Levi's using campaigns such as "Buy Better, Wear Longer" to close the gap with Patagonia's vertically differentiated sustainability credentials in the highly competitive apparel industry. These consumer pressures can *increase* VBD levels an industry (as in the aforementioned example towards "safer "banks" in Deephouse [1996]). Shifts in market demand can also *decrease* HBD levels within an industry when brands converge on an on-trend brand positioning (Carson, Jewell, and Joiner 2007) or *increase* HBD across competing brands when consumer choices are characterized more by taste than quality-based decisions (Shao 2015).

Empirical evidence. To test the validity of our arguments, we used the entire BAV data to calculate the average VBD and average HBD scores for all brands available in the 86 industries at the 3-digit SIC code level represented in our sample. Six of these industries had

fewer than five observations resulting in a sample of 80 industries and 4,879 observations. We analyzed this data in two ways. First, we found that SIC code indicator variables accounted for a significant amount of variance in both HBD (R^2 = 28.7, $F(79, 4799) = 24.5$, $p < .0001$) and VBD (R^2 = 38.0, $F(79, 4799) = 37.3$, $p < .0001$), suggesting that the variance in both VBD and HBD is smaller within than across industries. This confirms there is a significant degree of isomorphism for each brand dimension at the 3-digit SIC code level, which is the level we use to calculate our instruments. Second, we compare the degree of HBD and VBD within each industry and found these to significantly differ for 68 of 80 industries in our sample (at $p < 0.05$ in 5 industries, at $p \leq 0.01$ in 11 industries, at $p \leq 0.001$ in 7 industries, and at $p < 0.0001$ in the remaining 45 industries). In 40 (28) industries, the HBD (VBD) level was significantly greater than the VBD (HBD) level.

Summary. For these supply- and demand-side reasons, and based on an analysis of how industries differ on VBD and HBD, we suggest that using an industry peer instrument for brand differentiation meets the relevance criterion. To be clear, we are not suggesting that all firms in a given industry will be high on HBD or VBD. Rather, since both forms of differentiation exist on a continuum, we suggest and observe that differentiation levels are relatively higher or lower in certain industries depending the strength of these forces.

Implementation of control function approach. The instrument is computed as the average of industry peers' VBD and HBD levels across the firm's primary three-digit SIC codes. This follows Germann, Ebbes, and Grewal's (2015) approach to use peer firms across all of the firm's primary SIC codes listed in the Compustat Segments database. Since most firms are listed in multiple SIC codes and these codes change over time, peer brand differentiation differs across firms and over time, ensuring that the instrument has adequate variability. This variability further contributes to the validity of the exclusion restriction because a peer instrument computed across many industries is unlikely to impact the pay, employee behaviors, and profits of the focal firm. We thus model VBD (HBD) as a function of the peer-firm based VBD (HBD) instrument and the same control variables included in the pay, productivity, and retention equations. We estimate equations (6) and (7):

(6) $$\text{Vertical\_Brand\_Diff}_{it} = \zeta_0^{VBD} + \zeta_1^{VBD}\text{Peer\_Vertical\_Brand\_Diff}_{it} + \zeta_2^{VBD}\text{Horizontal\_Brand\_Diff}_{it} + \zeta_3^{VBD}\text{Num\_Employees}_{it} + \zeta_4^{VBD}\text{Corporate\_Brand}_{it} + \zeta_5^{VBD}\text{Industry\_Concentration}_{it} + \zeta_6^{VBD}\text{Benefits}_{it} + \zeta_7^{VBD}\text{Training}_{it} + \zeta_8^{VBD}\text{Best\_Places\_Work\_List}_{it} + \zeta_9^{VBD}\text{Tech}_{it} + \zeta_{10\text{-}17}^{VBD}\text{Industry}_{it} + \zeta_{18\text{-}28}^{VBD}\text{Year}_t + \varepsilon^{VBD}_{it}$$

(7) $$\text{Horizontal\_Brand\_Diff}_{it} = \zeta_0^{HBD} + \zeta_1^{HBD}\text{Peer\_Horizontal\_Brand\_Diff}_{it} + \zeta_2^{HBD}\text{Vertical\_Brand\_Diff}_{it} + \zeta_3^{HBD}\text{Num\_Employees}_{it} + \zeta_4^{HBD}\text{Corporate\_Brand}_{it} + \zeta_5^{HBD}\text{Industry\_Concentration}_{it} + \zeta_6^{HBD}\text{Benefits}_{it} + \zeta_7^{HBD}\text{Training}_{it} + \zeta_8^{HBD}\text{Best\_Places\_Work\_List}_{it} + \zeta_9^{HBD}\text{Tech}_{it} + \zeta_{10\text{-}17}^{HBD}\text{Industry}_{it} + \zeta_{18\text{-}28}^{HBD}\text{Year}_t + \varepsilon^{HBD}_{it}$$

We estimate these models on our main sample, which includes 526 observations. Results in Table WJ.2 indicate that both VBD (ζ_1^{VBD} = .85, p<.001) and HBD (ζ_1^{HBD} = 1.05, p<.001) are positively related to their peer-based instrument. From equations (6) and (7), we obtain the residuals $Resid\_VBD_{it}$, and $Resid\_HBD_{it}$, which we add to equations (1)-(4) to control for the endogeneity of brand differentiation.

Table WJ.2. Results of Auxiliary Equations Used to Account for the Endogeneity of Brand Differentiation

	VBD	HBD
Industry peer VBD	.853 (.054)***	
Industry peer HBD		1.049 (.058)***
VBD		.196 (.038)***
HBD	.192 (.032)***	
Number of employees	.129 (.021)***	-.074 (.023)**
Corporate brand	-.132 (.058)*	.235 (.061)***
Industry concentration	-.426 (.158)**	-.454 (.167)**
"Best places to work" list	.196 (.061)**	-.024 (.073)
High-tech sector	-.440 (.095)***	-.034 (.101)
Employee engagement	-.259 (.162)	.691 (.191)***
Percentage managers	.588 (.249)*	-.743 (.265)**
Benefits	.357 (.144)*	-.075 (.153)
Training	.008 (.001)***	.0003 (.002)
Adjusted R-square	.66	.62
Observations	526	526

Notes: All variables are at the firm level unless noted. The model includes industry and year dummies, which are not reported for parsimony.
***$p < .001$, **$p < .01$, *$p < .05$

Section 3: Accounting for the Endogeneity of Pay

Firms choose the pay they offer their employees. As a result, pay could be endogenous and the productivity and retention equations may suffer from endogeneity resulting from unobserved variables that may also influence this pay decision, such as unique labor conditions created by macroeconomic factors or shifts in technology. For instance, following a shift in technological standards, firms may increase pay for employees trained in the new technology, who may also be more productive as they utilize this technology. Using a control function approach, we estimate the pay equation using all variables included in equation (1) and two instruments for pay.

The first instrument is the average firm pay level in the same geography, but not in the same industry, as the focal firm. The instrument is relevant because firms that belong to the same geographic region are likely to adjust pay levels to the standard of living in that region. The instrument satisfies the exclusion restriction because, while pay in the same industry could affect the focal firm's employee productivity and retention, pay offered in other industries should not influence employee productivity or retention because employees are less likely to be aware of these salaries and cannot easily transfer to higher-paying industries. This instrument is constructed using the log of average salary offered by firms that: (1) participated in the *Fortune* "best places to work" survey; (2) are headquartered in the same geographic region as the focal firm (one of ten standard federal regions established by the Office of Management and Budget); and (3) are not in the same industry (3-digit SIC code) as the focal firm. In support of this decision, we find that the instrument predicts pay in the first-stage equation ($\beta = .74$, $p < .001$).

The second instrument is the average pay given to the independent directors of the industry peers of each firm. Independent directors are members of the board of directors who work outside the firm and do not have a material relationship with the firm other than the payment granted for the oversight they provide as board members. The instrument is relevant because firms that offer higher wages are also more likely to have higher director fees, but these fees should also be set according to industry norms in order for firms to attract quality independent directors. Recent research has shown that the board of directors sets outside director pay levels using the director compensation of industry peers (Damm 2022; Frye, Gatchev, and Pham 2021). This finding follows a wide-ranging literature showing similar peer effects in CEO pay (Bizjak, Lemmon, and Nguyen 2011). There are many reasons for this and several follow the logic of supply-side of isomorphism offered in Section 2 of this Appendix J.

At the same time, since industry peer independent director pay levels are unlikely to be known by the average employee in a firm and these directors have no interaction with the focal firm, their pay should not impact employee productivity or retention, nor firm profits—the latter point has been demonstrated in Hempel and Fay (1994). In support of this view, we find that industry peer outside director pay is not related to any of these variables (all *ps* > .10). As with the instruments for brand differentiation, this instrument also follows Germann, Ebbes, and Grewal 's (2015) approach to use peer firms across all of the firm's primary SIC codes listed in the Compustat Segments database, ensuring that the instrument has adequate variability. As expected, this instrument predicts pay (β = .34, p <.001). Further, the Sargan test of overidentification is not significant (χ^2 = 1.75, p = .19 for the retention equation and χ^2 = 1.13, p = .29 for the productivity equation), indicating that the instruments are valid.

The full results for the pay model in equation (8), which includes both instruments, are presented in Table WJ.3. From this model we obtain the residual $Resid\_Pay_{it}$, which we add to equations (2)-(4) to control for the endogeneity of pay using the control function approach.

(8) $Pay_{it} = \beta_0 + \beta_1 Vertical\_Brand\_Diff_{it} + \beta_2 Horizontal\_Brand\_Diff_{it} + \beta_3 Num\_Employees_{it} + \beta_4 Corporate\_Brand_{it} + \beta_5 Industry\_Concentration_{it} + \beta_6 Best\_Places\_Work\_List_{it} + \beta_7 Employee\_Engagement_{it} + \beta_8 Prop\_Manager_{it} + \beta_9 Tech_{it} + \beta_{10} Benefits_{it} + \beta_{11} Training_{it} + \beta_{12} \lambda_{it} + \beta_{13\text{-}20} Industry_{it} + \beta_{21\text{-}31} Year_t + \beta_{32} Resid\_VBD_{it} + \beta_{33} Resid\_HBD_{it} + \beta_{34} Pay\_Peer\_Geography_{it} + \beta_{35} Pay\_Peer\_Indep\_Directors_{it} + \varepsilon_{it}$

Table WJ.3. Results of Auxiliary Equations Used to Account for the Endogeneity of Pay

	Pay
Pay of geographical peers in other industries	.736 (.111)***
Pay of industry peer independent directors	.339 (.095)***
VBD	-.063 (.029)*
HBD	.072 (.026)**
Employee engagement	.199 (.126)
Number of employees	-.024 (.018)
Percentage of managers	.093 (.198)
Corporate brand	.151 (.046)**
Industry concentration	-.110 (.136)
"Best places to work" list	-.054 (.049)

High tech sector	.103 (.075)
Benefits	.088 (.113)
Training	.001(.001)
Inverse Mills ratio (λ)	-.0055 (.023)
Adjusted R-square	.32
Observations	526

Notes: All variables are at the firm level unless noted. The model includes SIC and year dummies, which are not reported for parsimony.
***$p < .001$, **$p < .01$, *$p < .05$

Section 4: Accounting for the Endogeneity of Productivity and Retention

While employee productivity and retention are not fully controlled by firms, omitted variables can impact the relationship between these employee behaviors and profits. For instance, when new technologies lead to changes in technological standards, the productivity and retention of employees trained in the previous generation technology may weaken profits. To account for the potential endogeneity of productivity and retention, we again use a control function approach and the Germann, Ebbes, and Grewal (2015) approach of using peers in firms' primary and secondary SIC codes to construct peer-based instruments.

In support of the use of a peer instrument, we first revisited the isomorphism literature. As noted there, a key driver of isomorphism in an industry is the level of uncertainty associated with the environment. High uncertainty leads to mimetic processes. However, DiMaggio and Powell (1983) highlight normative mechanisms of isomorphism that may also be operating. In our context, we are utilizing a sample of firms that are relatively similar, given they have all applied to the *Fortune* "best places to work" survey. Given this, DiMaggio and Powell point to the normative pressures that shape organizational processes, such similar patterns of hiring from universities, promotion practices, and skill-level requirements (pp. 152-153). This means that employees working for these firms face similar types of internal practices. Second, research has documented that personality types vary across industries with certain types of people attracted to some industries, but not others (Holland 1997). For example, Törnroos, Jokela, and Hakulinen (2019) document differences that exist between major occupational groups (associated with industries) and the big five personality traits.

For both of these reasons, we think it is reasonable to suggest that firms competing in an industry tend to have similar levels of employee productivity and retention. We verify this and find that average industry peer productivity and retention are significant determinants of firm-level productivity and retention. Finally, in terms of whether instruments meet exclusion restriction requirements, we use the Germann, Ebbes, and Grewal (2015) approach to select peers in both the primary and secondary industry for each firm. This creates a diverse set of peers with productivity and retention levels that are not likely to impact the profits of the focal firm.

Using equations (9) and (10), we find the instrument for productivity is positively related to productivity ($\beta = 2.68$, $p = .02$) and the instrument for retention is positively related to retention ($\beta = .56$, $p < .001$) (see Table WJ.4). We add the residuals $Resid\_Productivity_{it}$ and $Resid\_Retention_{it}$, to equation (4) to control for the endogeneity of employee behaviors.

(9) $Productivity_{it} = \gamma^{P}_{0} + \gamma^{P}_{1}Pay_{it} + \gamma^{P}_{2}Vertical\_Brand\_Diff_{it} + \gamma^{P}_{3}Horizontal\_Brand\_Diff_{it} + \gamma^{P}_{4}Num\_Employees_{it} + \gamma^{P}_{5}Corporate\_Brand_{it} + \gamma^{P}_{6}Industry\_Concentration_{it} + \gamma^{P}_{7}Best\_Places\_Work\_List_{it} + \gamma^{P}_{8}Employee\_Engagement_{it} + \gamma^{P}_{9}Prop\_Manager_{it} + \gamma^{P}_{10}Tech_{it} + \gamma^{P}_{11}Benefits_{it} + \gamma^{P}_{12}Training_{it} + \gamma^{P}_{13}\lambda_{it} + \gamma^{P}_{14\text{-}21}Industry_{it} + \gamma^{P}_{22\text{-}32}Year_{t} + \gamma^{P}_{33}Resid\_VBD_{it} + \gamma^{P}_{34}Resid\_HBD_{it} + \gamma^{P}_{35}Resid\_Pay_{it} + \gamma^{P}_{36}Peer\_Productivity_{it} + \varepsilon'_{it}$

(10) $Retention_{it} = \gamma^{R}_{0} + \gamma^{R}_{1}Pay_{it} + \gamma^{R}_{2}Vertical\_Brand\_Diff_{it} + \gamma^{R}_{3}Horizontal\_Brand\_Diff_{it} + \gamma^{R}_{4}Num\_Employees_{it} + \gamma^{R}_{5}Corporate\_Brand_{it} + \gamma^{R}_{6}Industry\_Concentration_{it} + \gamma^{R}_{7}Best\_Places\_Work\_List_{it} + \gamma^{R}_{8}Employee\_Engagement_{it} + \gamma^{R}_{9}Prop\_Manager_{it} + \gamma^{R}_{10}Tech_{it} + \gamma^{R}_{11}Benefits_{it} + \gamma^{R}_{12}Training_{it} + \gamma^{R}_{13}\lambda s_{it} + \gamma^{R}_{14\text{-}21}Industry_{it} + \gamma^{R}_{22\text{-}32}Year_{t} + \gamma^{R}_{33}Resid\_VBD_{it} + \gamma^{R}_{34}Resid\_HBD_{it} + \gamma^{R}_{35}Resid\_Pay_{it} + \gamma^{R}_{36}Peer\_Retention_{it} + \varepsilon''_{it}$

Table WJ.4. Results of Auxiliary Equations Used to Account for the Endogeneity of Employee Retention and Productivity

	Employee Productivity	**Employee Retention**
Industry peer productivity	2.684 (1.151)*	
Industry peer retention		.556 (.107)***
Employee pay	.036 (.009)***	.023 (.005)***
VBD	.010 (.006)	.003 (.004)
HBD	-.012 (.005)*	.006 (.003)
Employee engagement	.068 (.026)**	.027 (.016)
Number of employees	-.0007 (.004)	.004 (.002)
Percentage of managers	-.095 (.040)*	-.096 (.025)***
Corporate brand	.001 (.009)	.003 (.006)
Industry concentration	.007 (.027)	-.024 (.017)
"Best places to work" list	-.025 (.010)*	.016 (.006)*
High-tech sector	.024 (.015)	-.0002 (.010)
Benefits	.036 (.023)	.026 (.014)
Training	-0.0001 (.0002)	-0.0002 (.0001)
Inverse Mills ratio (λ)	-.002 (.005)	-.005 (.003)
Adjusted R-square	.12	.30
Observations	526	526

Notes: The average of peer firm retention and productivity are measured across all primary three-digit SIC codes. All variables are at the firm level unless noted. The model includes SIC and year dummies, which are not reported for parsimony.
***$p < .001$, **$p < .01$, *$p < .05$

In sum, we account for potential selection bias using a Heckman model and for the potential endogeneity of brand differentiation, pay, productivity, and retention using a control function approach. All peer-based instruments are computed using the Germann, Grewal, and Ebbes (2015) approach of considering peers across both primary and secondary SIC codes, ensuring that there is sufficient variability in these instruments at the firm level. Finally, we check the correlation of the six peer-based instruments and find these correlations range from ρ = -.21 to .32, suggesting that the peer-based instruments are sufficiently distinct.

Web Appendix K: Conditional Indirect Effects of Brand Differentiation on Profits Through Pay and Employee Behaviors at Different Levels of Firm Moderators

This Web Appendix presents the conditional indirect effects from our estimated serial moderated mediation models. This modeling approach details how mediation varies across different levels of each moderator. For all tables, CI represents the confidence interval, LL is the lower limit, UL is the upper limit, and Bootstrap n=5000. If significant, these findings support the view that the employee-brand matching process moderators not only change the brand differentiation-pay relationship, but that the moderating effects go all the way through to profits via changes to employee productivity (or retention).

Conditional Indirect Effects at Different Levels of Firm Demand for Technical Talent (WK.1): Demand for technical talent significantly moderates the relationship between VBD and pay, but not HBD. The negative effect of VBD on profits through pay and productivity (or retention) is significant when demand for technical talent is average or 1 SD below the mean, but not when it is 1 SD above the mean.

Table WK.1	**Demand for Technical Talent**	**Productivity**				**Retention**			
		B	SE	LL 95%CI	UL 95%CI	B	SE	LL 95%CI	UL 95%CI
Vertical Brand Differentiation	- 1 SD	-.0152	.0086	-.0393	-.0033	-.0212	.0104	-.0047	-.0057
	Mean	-.0111	.0067	-.0305	-.0022	-.0015	.0079	-.0357	-.0039
	+1 SD	.0025	.0049	-.0071	.0140	.0035	.0073	-.0096	.0191

Conditional Indirect Effects at Different Levels of Firm Demand for Front-line Employees (Table WK.2): Demand for front-line employees significantly moderates the relationship between HBD and pay, but not VBD. Results indicate that the positive effect of HBD on profits through pay and productivity (or retention) is significant for services firms, but not for product firms.

Table WK.2	**Demand for Front-line Employees**	**Productivity**				**Retention**			
		B	SE	LL 95%CI	UL 95%CI	B	SE	LL 95%CI	UL 95%CI
Horizontal Brand Differentiation	Product Firm	.0000	.0004	-.0001	.0012	.0005	.0068	-.0011	.0191
	Services Firm	.0204	.0109	.0038	.0465	.0366	.0156	.0100	.0708

Conditional Indirect Effects at Different Levels of Firm HRM Sophistication (Table WK.3): Results indicate that the negative effect of VBD on profits through pay and productivity (or retention) is significant when HRM sophistication is average or 1 SD above the mean, but not when it is 1 SD below the mean. Alternatively, the positive effect of HBD on profits through pay and productivity (or retention) is significant when HRM sophistication is 1 SD below the mean, but not when it is average or 1 SD above the mean.

Table WK.3	**HRM Sophistication**	**Productivity**				**Retention**			
		B	SE	LL 95%CI	UL 95%CI	B	SE	LL 95%CI	UL 95%CI
Vertical Brand Differentiation	- 1 SD	-.0033	.0049	-.0157	.0043	-.0045	.0063	-.0199	.0056
	Mean	-.0103	.0066	-.0280	-.0018	-.0139	.0077	-.0333	-.0029
	+1 SD	-.0154	.0091	-.0388	-.0036	-.0208	.0101	-.0459	-.0051
Horizontal Brand Differentiation	- 1 SD	.0108	.0057	.0026	.0242	.0146	.0072	.0033	.0312
	Mean	.0053	.0036	-.0004	.0136	.0071	.0051	-.0002	.0187
	+1 SD	.0019	.0041	-.0082	.0095	.0017	.0054	-.0086	.0137

Conditional Indirect Effects at Different Levels of Firm Employee Referral Strategy (Table WK.4): Results show that the firm's employee referral strategy significantly moderates the relationship between HBD and pay, but not VBD. As noted in Table WK.4, the positive effect of HBD on profits through pay and productivity (or retention) is significant when the percentage of employees referred is average or 1 SD above the mean, but not when it is 1 SD below the mean.

Table WK.4	**Employee Referral Strategy**	**Productivity**				**Retention**			
		B	SE	LL 90%CI	UL 90%CI	B	SE	LL 90%CI	UL 90%CI
Horizontal Brand Differentiation	- 1 SD	.0024	.0031	-.0015	.0074	.0038	.0046	-.0024	.0129
	Mean	.0071	.0043	.0014	.0152	.0110	.0063	.0032	.0230
	+1 SD	.0111	.0064	.0022	.0024	.0171	.0094	.0057	.0375

Conditional Indirect Effects at Different Levels of Firm Benefits (Table WK.5): Results show that benefits significantly moderate the relationship between VBD and pay, but not HBD. Specifically, the negative effect of VBD on profits through pay and productivity (or retention) is significant when the benefits offered by firms are average or above, but not when they are 1 SD below the mean.

Table WK.5	**Benefits**	**Productivity**				**Retention**			
		B	SE	LL 95%CI	UL 95%CI	B	SE	LL 95%CI	UL 95%CI
Vertical Brand Differentiation	- 1 SD	.0033	.0051	-.0048	.0160	.0047	.0073	-.0086	.0218
	Mean	-.0098	.0062	-.0266	-.0014	-.0139	.0074	-.0333	-.0028
	+1 SD	-.0151	.0088	-.0394	-.0032	-.0213	.0101	-.0466	-.0060

Conditional Indirect Effects at Different Levels of Firm Training (Table WK.6): Results show that the negative effect of VBD on profits through pay and productivity (or retention) is significant when training is average or 1 SD above the mean, but not when it is 1 SD below the mean. Alternatively, the positive effect of HBD on profits through pay and productivity (or retention) is significant when training is average or 1 SD above the mean, but not when it is 1 SD below the mean.

Table WK.6	**Training**	**Productivity**				**Retention**			
		B	SE	LL 90%CI	UL 90%CI	B	SE	LL 90%CI	UL 90%CI
Vertical Brand Differentiation	- 1 SD	-.0016	.0052	-.0113	.0057	-.0022	.0073	-.0148	.0085
	Mean	-.0068	.0050	-.0173	-.0008	-.0095	.0063	-.0229	-.0014
	+1 SD	-.0120	.0072	-.0266	-.0033	-.0168	.0085	-.0325	-.0055
Horizontal Brand Differentiation	- 1 SD	.0015	.0038	-.0040	.0083	.0022	.0054	-.0053	.0126
	Mean	.0063	.0037	.0016	.0128	.0088	.0051	.0022	.0184
	+1 SD	.0110	.0062	.0030	.0230	.0154	.0083	.0047	.0316

Web Appendix L: Ruling out Alternative Explanations for the Brand Differentiation-Pay Relationship

This Web Appendix rules out four alternative explanations associated with the effect of vertical brand differentiation (VBD) and horizontal brand differentiation (HBD) on pay.

Vertical Brand Differentiation

Alternative explanation #1: Firms high on VBD may have more resources if they are more profitable. These resources may allow firms high in VBD to offer more benefits and training, which are a substitute for pay. We find that VBD is indeed positively associated with benefits (coeff. = .36, p = .01) and training (coeff. = .008, $p < .001$). However, in Model (1), where pay is a dependent variable, both benefits and training are used as controls and their presence does not influence the VBD-pay relationship. Moreover, neither benefits ($\beta_{10} = .088$, $p = .78$) nor training ($\beta_{11} = .001$, $p = .83$) are significant determinants of pay. We also tested whether benefits or training act as a mediator of the brand-pay relationship as VBD→benefits→pay or VBD→training→pay. We find no evidence of mediation with this structure: VBD→benefits→pay (indirect effect = .0010, 95%CI: [-.0060, .0097]) and VBD→training→pay (indirect effect = .0110, 95%CI: [-.0075, .0322]).

Alternative explanation #2: Firms high on VBD have more physical and managerial resources that allow the firm to create good working conditions. These resources may be viewed by employees as a substitute for pay. We test for the effect of resources through several variables from the Trust Index©. To begin, we created a two-item measure of physical resources as the average of employee agreement with two statements: "I am given the resources and equipment to do my job" and "Our facilities contribute to a good working environment" ($\rho = .85$). Including this variable in Model (1) does not influence our results. In addition, we created a measure of managerial resources as the average of employee agreement with three statements: "Management has a clear view of where the organization is going and how to get there;" "Management does a good job of assigning and coordinating people;" and "Management is competent at running the business" ($\alpha = .96$). Adding this control variable in Model (1) does not influence our results. We also tested whether these two types of resources could act as a mediator of the brand-pay relationship. We find no evidence of mediation with this structure: VBD→physical resources→pay (indirect effect = -.0032, 95%CI: [-.0126, .0027]) and VBD→manager resources→pay (indirect effect = .0079, 95%CI: [-.0005, .0205]).

Alternative explanation #3: VBD attracts younger workers who are paid less. To test this, we examined the VBD→employee age→pay relationship with worker age measured by the percentage of employees below the age of 25 who work at the firm. We do not observe a significant indirect effect (indirect effect = .0086, 95%CI: [-.0066, .0090]), despite that the percentage of younger workers does have a direct negative effect on pay and productivity. Finally, our results do not change if we add the percentage of younger workers as a control to Model (1).

Horizontal Brand Differentiation

Alternative explanation #4. Firms with high HBD may seek out employees with traits that match the uniqueness of their brands. To attract sufficient numbers of such scarce employees, firms with high HBD are more likely to find it necessary to hire more diverse employees. This overt valuing of diversity—not higher pay—could lead to higher retention and productivity because employees may feel more valued. This would suggest an HBD→valuing diversity→employee behavior relationship. To test this idea, we created a measure of the extent to which the firm values diversity from the Trust Index© of employees reflecting agreement with four statements: "People here are treated fairly regardless of their race;" "People here are treated fairly regardless of their gender;" "People here are treated fairly regardless of their age;" and "People here are treated fairly regardless of their sexual orientation" (α = .97). When we add valuing diversity as a control to equation (1), we find that HBD is positively associated with valuing diversity (coeff. = .094, p =.001), which provides additional face validity to the connection between the brand and employee traits. However, diversity does not mediate the HBD-employee behavior relationship for productivity (indirect effect = -.0001, 95%CI: [-.0012, .0008]) or for retention (indirect effect = -.0005, 95%CI: [-.0020, .0004]).

Web Appendix M: Robustness Checks

This Web Appendix presents eleven replications of our main effects of vertical (VBD) and horizontal (HBD) brand differentiation on pay as well as the mediating effect of pay on profits through employee behaviors. For each replication, we present the size of the effects associated with H1 and H2a in Table WM.1, below. Note that some of the replications do not apply to H1 and H2a (e.g., different retention, productivity, and financial outcome measures). We report replications for all serial mediation results that show the indirect effects of brand differentiation on profits through pay, productivity, and retention (H3 and H4) in Table WM.2.

Replication 1: Alternative brand differentiation measures using individual items. We examine whether results are robust to using a single-item measure of VBD based on "high quality" only and a single-item measure of HBD based on "unique" only. Their direct effects on pay (Table WM.1) and their indirect effects on profits for both productivity and retention (Table WM.2) replicate at 95%.

Replication 2: Combining VBD and HBD into an overall measure. As expected, none of the effects replicate when combining our VBD and HBD measures into an overall brand index (Tables WM.1 and WM.2).

Replication 3: Alternative measures using average brand differentiation. For multi-brand firms, we recompute the brand measures using the average across all their brands included in the BAV survey, instead of the strongest brand for the firm, which is used in our main analysis. The direct effect of brand differentiation on pay (Table WM.1) and the indirect effects on profits for both productivity and retention (Table WM.2) replicate at 95%.

Replication 4: Alternative VBD and HBD measures using the BAV_R measures. BAV offers two versions of its brand measures: a set that is indexed by _C, which represents raw scores and a set indexed by _R, which represents "percentile ranked against all the _C scores for that same metric" based on the year in which the data were collected. We use the _C scores in our analysis, but replicate our results using the _R measures. Specifically, the direct effect of both the VBD and HBD measures on pay (Table WM.1) and the indirect effects on profits (Table WM.2) replicate at 95% for both productivity and retention.

Replication 5: Alternative VBD measure. We examine whether results are robust to using a measure of VBD that includes only high quality, leader, regard, and reliable (dropping familiarity and relevance). The direct effect of this VBD measure on pay (Table WM.1) and the indirect effects on profits (Table WM.2) replicate at 95% for both productivity and retention.

Replication 6: Alternative HBD measure. We examine whether results are robust to using a measure of HBD that also includes innovativeness—consistent with how BAV defines energized differentiation. The direct effect of this measure of HBD on pay (Table WM.1) and the indirect effects on profits (Table WM.2) replicate at 95% for both productivity and retention.

Replication 7: Alternative brand differentiation measures based on BAV pillars. In order to provide a connection to the previous brand equity literature, we examine whether results are

robust to using a brand differentiation measure based on BAV's four brand pillars: esteem (based on high quality, reliable, regard, and leader), relevance, familiarity, and energized differentiation (based on different, distinctive, dynamic, unique, and innovative). Specifically, in line with previous research, we group esteem, relevance and familiarity into one measure, which we use as a proxy for VBD. We standardize all these measures and we take the average of esteem, relevance, and familiarity to create our VBD measure. We use energized differentiation as a measure of HBD. The direct effect of these measures on pay (Table WM.1) and the indirect effects on profits (Table WM.2) replicate at 95% for both productivity and retention.

Replication 8: Alternative pay measure. The direct effect of VBD and HBD on pay (Table WM.1) and the indirect effects on profits (Table WM.2) replicate at 95% for both productivity and retention using a pay measure that includes salary and bonus. Bonus is measured in the Culture Audit© as: "What was the average additional cash compensation for an employee in this position in the last 12 months? You should include bonuses, cash payouts, and overtime."

Replications 9-10: Employee-reported retention and productivity measures. Using employee-reported measures from the Trust Index© for productivity ("People here are willing to give extra to get the job done") and retention ("I want to work here a long time"), the indirect effects replicate at 95% for VBD and HBD (Table WM.2).

Replication 11: Alternative financial performance measure. Results are robust to using Tobin's *q* instead of profits. The indirect effects and the moderated mediation results replicate at 95% (90%) for productivity (retention) and VBD and HBD (Table WM.2).

Table WM.1. Replications of the Impact of VBD (H1) and HBD (H2a) on Pay

	VBD→Pay (H1) Coefficient (SE)	**HBD→ Pay (H2A) Coefficient (SE)**
Replication 1: Alternative VBD and HBD Measures Using Individual Items		
	-0.0998 (0.0302)***	0.0478 (0.0232)*
Replication 2: Combining VBD and HBD into an Overall Brand Differentiation Measure		
	0.0155 (0.0445)	
Replication 3: Alternative VBD and HBD Measures Using Average Brand Differentiation		
	-0.0704 (0.0369)†	0.0941 (0.0293)**
Replication 4: Alternative VBD and HBD Measures Using "_R" measures from the BAV data		
	-0.1092 (0.0389)**	0.0909 (0.0288)**
Replication 5: Alternative VBD Measure (excluding familiarity and relevance)		
	-.0938 (.0369)*	0.0923 (0.0291)**
Replication 6: Alternative HBD Measure (including innovative)		
	-0.1072 (0.0371)**	0.1188 (0.0322)**
Replication 7: Alternative VBD and HBD Measures Based on a BAV Pillars		
	-.0966 (0.0367)**	.0835 (0.0240)***
Replication 8: Alternative Pay Measure (including bonuses)		
	-0.1187 (0.0397)**	0.0659 (0.0275)*

***$p < .001$, **$p < .01$, *$p < .05$, †$p < .10$

Table WM.2. Serial Mediation (H3 and H4) Replications

Brand Differentiation Dimension	Employee Behavior	X→M₁→M₂→Y (Indirect Effect with Bootstrap at 95%CI)			
		Coefficient	Bootstrap SE	LL CI	UL CI
Replication 1: Alternative VBD and HBD Measures Using Individual Items					
High quality	Productivity	-0.0080	0.0047	-0.0200	-0.0018
	Retention	-0.0127	0.0059	-0.0259	-0.0034
Unique	Productivity	0.0038	0.0025	0.0004	0.0105
	Retention	0.0061	0.0037	0.0003	0.0158
Replication 2: Combining VBD and HBD into an Overall Brand Differentiation Measure					
Overall Brand Differentiation	Productivity	0.0012	0.0036	-0.0076	0.0083
Overall Brand Differentiation	Retention	0.0018	0.0053	-0.0090	0.0124
Replication 3: Alternative VBD and HBD Measures Using Average Brand Differentiation for the Firm					
VBD	Productivity	-0.0056	0.0042	-0.0170	-0.0002
HBD	Productivity	0.0075	0.0040	0.0015	0.0164
VBD	Retention	-0.0076	0.0051	-0.0197	-0.0003
HBD	Retention	0.0101	0.0052	0.0022	0.0225
Replication 4: Alternative VBD and HBD Measures Using "_R" measures from the BAV data					
VBD	Productivity	-0.0097	0.0059	-0.0271	-0.0016
HBD	Productivity	0.0081	0.0042	0.0021	0.0179
VBD	Retention	-0.0124	0.0069	-0.0297	-0.0024
HBD	Retention	0.0103	0.0056	0.0022	0.0241
Replication 5: Alternative VBD Measure (excluding familiarity and relevance)					
VBD	Productivity	-0.0083	0.0054	-0.0213	-0.0010
HBD	Productivity	0.0082	0.0043	0.0021	0.0181
VBD	Retention	-0.0107	0.0062	-0.0256	-0.0017
HBD	Retention	0.0105	0.0057	0.0021	0.0249
Replication 6: Alternative HBD Measure (including innovative)					
VBD	Productivity	-0.0100	0.0060	-0.0243	-0.0017
HBD	Productivity	0.0111	0.0054	0.0032	0.0236
VBD	Retention	-0.0118	0.0065	-0.0279	-0.0023
HBD	Retention	0.0131	0.0067	0.0032	0.0303
Replication 7: Alternative VBD and HBD Measures Based on a BAV Pillars					
VBD	Productivity	-0.0105	0.0063	-0.0266	-0.0014
HBD	Productivity	0.0077	0.0037	0.0022	0.0164
VBD	Retention	-0.0089	0.0054	-0.0236	-0.0014
HBD	Retention	0.0091	0.0048	0.0019	0.0200

Replication 8: Alternative Pay Measure (including bonuses)					
VBD	Productivity	-0.0115	0.0062	-0.0276	-0.0024
HBD	Productivity	0.0064	0.0035	0.0009	0.0148
VBD	Retention	-0.0133	0.0071	-0.0296	-0.0027
HBD	Retention	0.0074	0.0046	0.0009	0.0183
Replication 9: Employee-Reported Measure of Productivity					
VBD	Productivity	-0.0064	0.0037	-0.0154	-0.0009
HBD	Productivity	0.0055	0.0029	0.0016	0.0108
Replication 10: Employee-Reported Measure of Retention					
VBD	Retention	-0.0088	0.0043	-0.0188	-0.0018
HBD	Retention	0.0075	0.0037	0.0026	0.0149
Replication 11: Alternative Financial Performance Measure (Tobin's *q*)					
VBD	Productivity	-0.0076	0.0047	-0.0186	-0.0010
HBD	Productivity	0.0033	0.0023	0.0002	0.0086
VBD	Retention	-0.0047	0.0039	-0.0129	-0.0002
HBD	Retention	0.0020	0.0017	0.0001	0.0054

Notes: This table shows the replication results for the main serial mediation results. Complete replication results related to serial moderated mediation are available upon request from the authors. CI is the confidence interval, LL is the lower limit, and CL is the upper limit. Bootstrap n=5000. All replications are significant using a 95% CI, except for Replication 11 for the retention mediator, which is significant using a 90% CI.

Web Appendix N: Sustainability of Leveraging Vertical Brand Differentiation to Pay Employees Less

Our results indicate that when managers leverage vertical brand differentiation (VBD) to pay employees less, it negatively affects profits due to the mediating effects of lower employee productivity and retention. It is important to note that profits based on VBD are not negative when VBD is leveraged to lower pay, but instead are lower than would have been achieved by the positive effect of VBD alone. Nevertheless, one question that arises is the sustainability of this strategy over the long run. For example, it is entirely possible that brand perceptions of quality could deteriorate as a result of productivity and retention losses. This would undermine the firm's ability to leverage VBD to pay less over time. However, managers who leverage VBD to pay less might be myopic regarding the negative effects on downstream VBD perceptions.

To examine this question, we begin by demonstrating that VBD at t0 predicts future VBD in t+1 and t+2 (see Table WN1). Using this baseline model, we estimated a series of models that examine the same mediating chain used in our main analysis. but instead of profits, we predict VBD in t+1 and t+2. As shown in Table WN.1, we find no indication that this chain of events unfolds. We also estimate a simpler model that examines the effect of VBD_{t0}→Pay→VBD_{t+1} or VBD_{t+2} and again find no downstream effects. Lastly, we replace VBD_{t+1} or VBD_{t+2} with $Sales_{t+1}$ or $Sales_{t+2}$ and estimate the same models with the view that quality perceptions may be sticky, but Sales may show a deterioration effect more quickly. As before, we find no support for the longer-term effects of lower pay on Sales. It is possible that productivity and retention losses would, over time, undermine downstream VBD and Sales. However, our results indicate that consumer brand knowledge is relatively sticky. Further, it is possible that high VBD firms find it easier to attract high quality employees, which may offset some of the losses caused by low pay.

Table WN.1. How VBD-Induced Lower Pay Affects Downstream VBD Perceptions and Sales

Model	*N*	B	SE	LL 95%CI	UL 95%CI
VBD_{t0}→VBD_{t+1}	512	0.8964	0.0278	0.8418	0.9509
VBD_{t0}→VBD_{t+2}	472	0.8653	0.0305	0.8052	0.9523
VBD_{t0}→Pay→Productivity→VBD_{t+1}	512	-0.0011	0.0010	-0.0038	0.0003
VBD_{t0}→Pay→Productivity→VBD_{t+2}	472	-0.0005	0.0009	-0.0029	0.0007
VBD_{t0}→Pay→ Retention→VBD_{t+1}	512	0.0001	0.0014	-0.0032	0.0025
VBD_{t0}→Pay→ Retention→VBD_{t+2}	472	-0.0004	0.0011	-0.0030	0.0017
VBD_{t0}→Pay→VBD_{t+1}	512	0.0025	0.0032	-0.0026	0.0099
VBD_{t0}→Pay→VBD_{t+2}	472	0.0035	0.0035	-0.0024	0.0127
VBD_{t0}→Pay→$Sales_{t+1}$	526	-64.263	408.76	-1048.73	699.89
VBD_{t0}→Pay→$Sales_{t+2}$	516	-118.41	463.45	-1200.67	700.71

Web Appendix O: Pretests for Horizontal Matching Stimuli

We performed two pre-tests to develop the horizontal matching stimuli for Studies 2 and 3. Our goal was to select employee characteristics that are not objectively better or worse, but more a matter of taste. We chose to identify a set of extreme and typical sports that offer their participants the opportunity to express their individuality, but not an opportunity to gain social status. This was to ensure we were tapping horizontal employee differentiation, not vertical employee differentiation. This choice is also supported by the observation that recruiters rely on applicants' extracurricular activities such as sports listed on their resumés, to determine organizational fit (Rivera 2012). We also sought to ensure that participants viewed the number of people participating in extreme sports as smaller than the number of people participating in more common sports. This means the supply of employees with this background available to hire should be smaller, which is what we theorize will be the case with most brand-relevant horizontally differentiated employees.

As a first pre-test, we recruited fifty participants from Prolific (M_{age} = 38; 44% female) to rate a set of extreme and typical sports drawn from https://en.wikipedia.org/wiki/Extreme_sport and http://www.physicalactivitycouncil.com/ on three measures: (1) expression of individuality, (2) ability to gain social status, and (3) number of people participating. Based on these ratings, for Study 3, we selected three high-risk (ice diving, volcano surfing, and flowriding) and three typical (biking, running, and swimming) sporting activities. A set of t-tests of mean differences indicate that the three extreme sports were rated as offering a stronger expression of individuality ($M_{extreme}$ = 4.61, SD = 1.64) than the typical sports ($M_{typical}$ = 3.82, SD = 1.25; t = 3.64, $p < .001$) where 1 = "not at all" and 7 = "a great deal," but that they offered no difference in the ability to gain social status ($M_{extreme}$ = 3.64, SD = 1.75 vs $M_{typical}$ = 3.69, SD = 1.47; t = -.29, p = .76). We also observe that the perceptions of the number of people participating in the extreme sports was smaller ($M_{extreme}$ = 1.59, SD = 1.17) than the typical sports ($M_{typical}$ = 5.05, SD = 1.02; t = -18.54, $p < .001$) using the scale 1 = "a very small number of people" and 7 = "a very large number of people." Table WO summarizes the individual sport ratings on all three measures.

Table WO. Pretest Results for Studies 2 and 3

	Individuality 1 = not at all, 7 = a great deal	Social Status 1 = not at all, 7 = a great deal	Number of Participants 1 = very small number, 7 = very large number
Basketball	M = 3.84, SD = 1.57	M = 4.86, SD = 1.65	M = 4.74, SD = 1.44
Biking	M = 4.12, SD = 1.59	M = 3.78, SD = 1.57	M = 4.30, SD = 1.44
Camping	M = 4.38, SD = 1.38	M = 3.28, SD = 1.53	M = 3.96, SD = 1.42
Cliff diving	M = 4.54, SD = 1.83	M = 4.06, SD = 1.67	M = 1.72, SD = 1.06
Flowriding	M = 4.56, SD = 1.81	M = 3.54, SD = 1.74	M = 1.76, SD = 1.2
Freediving	M = 4.74, SD = 1.74	M = 3.88, SD = 1.71	M = 1.66, SD = 1.11
Highlining	M = 4.42, SD = 1.80	M = 3.80, SD = 1.82	M = 1.86, SD = 1.29
Hiking	M = 4.04, SD = 1.38	M = 3.42, SD = 1.63	M = 4.90, SD = 1.4
Ice climbing	M = 4.62, SD = 1.71	M = 3.96, SD = 1.86	M = 2.06, SD = 1.43
Ice diving	M = 4.70, SD = 1.76	M = 3.64, SD = 1.82	M = 1.64, SD = 1.41

Kitesurfing	M = 4.78, SD = 1.58	M = 3.88, SD = 1.73	M = 1.94, SD = 1.3
Mountainboarding	M = 4.74, SD = 1.60	M = 3.90, SD = 1.80	M = 2.32, SD = 1.64
Parkour	M = 5.02, SD = 1.67	M = 3.78, SD = 1.59	M = 2.20, SD = 1.19
Pilates	M = 3.44, SD = 1.39	M = 3.42, SD = 1.58	M = 4.26, SD = 1.44
Ping Pong	M = 3.56, SD = 1.58	M = 2.88, SD = 1.48	M = 3.58, SD = 1.73
Running	M = 3.64, SD = 1.45	M = 3.76, SD = 1.73	M = 5.82, SD = 1.3
Street luge	M = 4.52, SD = 1.74	M = 3.60, SD = 1.76	M = 1.72, SD = 1.32
Swimming	M = 3.70, SD = 1.43	M = 3.54, SD = 1.70	M = 5.04, SD = 1.24
Tennis	M = 4.06, SD = 1.53	M = 4.72, SD = 1.54	M = 4.58, SD = 1.42
Volcano surfing	M = 4.58, SD = 2.04	M = 3.74, SD = 2.06	M = 1.38, SD = 1.15
Weightlifting	M = 4.02, SD = 1.61	M = 4.28, SD = 1.65	M = 4.72, SD = 1.48
Wingsuit flying	M = 4.84, SD = 1.67	M = 4.02, SD = 1.93	M = 1.66, SD = 1.31
Zumba	M = 4.10, SD = 1.46	M = 3.16, SD = 1.62	M = 3.42, SD = 1.59

A second pretest for Study 3 (Prolific; N = 100, M_{age} = 35.1; 52% female) asked participants to "Imagine you are reviewing a set of job applicants for a position that interacts with customers and you come across the resume of an application for a person that regularly participates in high-risk sporting activities such as ice diving, volcano surfing, and flowriding (in sporting activities such as biking, running, and swimming)," with the two applicant profiles presented in random order. Results confirm that participants see the extreme applicants as less common among adults of working age in the U.S. ($M_{extreme}$ = 4.79, SD = 1.23 vs. $M_{typical}$ = 7.66, SD = 1.51; t (49) = -14.62, $p < .001$ where 1 = "very uncommon" and 7 = "very common"). This pretest was also part of a 2 x 2 design that mimicked the design we used in Study 3 (see Web Appendix Q). We observe the same 2-way interaction and pattern of results for pay and bargaining power as reported there.

Web Appendix P: Employee-Brand Matching Experiment (Study 2)

Objectives

Our theoretical model is predicated on the quality of the employee-brand match. While we had no *a priori* expectations about the sorting of vertically differentiated employees and vertically differentiated brands (see post-H1 discussion on pages 9-10 and Web Appendix A), we predict in H2b that horizontally differentiated brands would most value employees who match on the same horizontal attribute (i.e., positive assortative matching). We test both of these dynamics in this study. In addition, we measure managers' perceptions of several nonpecuniary benefits provided by working at vertically and horizontally differentiated brands and their expectations regarding the scarcity of good matches, which we viewed as more restricted for horizontally differentiated brands.

Sample

We recruited 204 Human Resource (HR) managers from a chapter of the Society for Human Resource Managers (SHRM) (M_{age} = 36.15 years; 7.2 years of HR experience). Two respondents were omitted from the analysis because they had zero years of HR experience. (This had no bearing on the results.) The SHRM chapter president sent an email to chapter members and posted on the group's LinkedIn page to invite participation in return for an opportunity to win one of three $100 Amazon gift cards and a free webinar that would explain our findings.

Design and Measures

The design was a within-subjects 2 (high vertical [VED] or horizontal [HED] employee differentiation) x 2 (high vertical [VBD] or horizontal [HBD] brand differentiation). Following our pretesting in Web Appendix O, we focused on different types of sports brands. Participants were told to imagine they were a HR manager interviewing job applicants for a customer-facing position and to imagine doing so at two different types of companies that are identical in size and profitability except for how they are regarded by consumers. Consistent with our brand differentiation measures, the two firms were described as:

> High vertically differentiated brand: "**Prestigio** is a leading mainstream sports brand held in high esteem and regard relative to other brands in the industry. It is well known and many consumers find it relevant to their needs when engaging in mainstream sports."
>
> High horizontally differentiated brand: "**Radical** is an extreme sports brand that is seen as different and unconventional. It is less well known and only some consumers find it relevant to their needs when engaging in extreme sports."

Immediately following these descriptions, we measured managers' perceptions of several nonpecuniary benefits by asking them to indicate whether each of following four statements was "More true of Prestigio" (coded as +1), "Equally true of both brands" (0), or "More true of Radical" (-1). The statements described (a) the resumé power ("Working at this company enhances how attractive employees are to most other companies as potential hires"); (b) social status ("Working at this company enhances the social standing of employees among friends and family"); (c) expression of individuality ("Working at this company allows some employees to

express their individuality"); and (d) the scarcity of finding the right type of employee ("People who are a good match to work for this company are scarce").

Next, managers received the descriptions of a high VED job candidate ("The applicant is a university graduate with a record of being a hard worker") and a high HED job candidate ("The applicant has a fearless personality and regularly participates in high-risk sporting activities such as ice diving and volcano surfing"). The description of the HED was designed to match the attributes sought by the horizontally differentiated brand. The extreme sports were selected from pretesting to express individuality, but not signal social status (see Web Appendix O).

The job candidates and branded companies appeared randomly in counterbalanced order. Managers were asked to rate: "Which of the following salary levels would you be willing to offer in order to attract this applicant to this job." They did so by indicating whether they would or would not offer each of the following pay levels: a pay level 15%, 10%, 5%, and 2% above the industry average, at the industry average, and 2%, 5%, 10% and 15% below the industry average. We chose this Multiple Price List (MPL) elicitation format because it is easy to explain to subjects and because it has been shown to more truthfully reveal willingness-to-pay (Andersen et al. 2006). The maximum willingness-to-pay was our dependent variable.

Results and Discussion

We first examine HR managers' brand perceptions. We calculate the relative extent to which they associate a particular characteristic more with working for a vertically (scored as +1) versus a horizontally (-1) differentiated brand. Results show a significant positive mean for resumé power ($M_{resumé\_power}$ = .43, SD = .66; t = 9.36, p < .001), indicating that, on average, HR managers attributed *more* resumé power to working at the VBD compared to the HBD firm. In contrast, a significant negative mean shows that working at the VBD firm is perceived to provide employees with a *weaker* ability to express their individuality compared to working for a HBD firm ($M_{individuality}$ = -.27, SD = .78, t = -5.04, p < .001). Working at either firm resulted in the same level of social status (M_{social_status} = .02, SD = .80, t = 0.44, p = .66). These findings show that working at VBD and HBD firms confer different nonpecuniary benefits. Working at a VBD firm provides more resumé power (see H1), but not, as we had expected, more social status. It is possible that both VBD and HBD firms were viewed as offering social benefits of different types. In contrast, working at a HBD firm provides a means of self-expression, which for any given attribute may be valued by some, but not most, employees (see H2a).

Importantly, a negative mean indicates HR managers believe that employees who are a good match for the HBD firm are significantly scarcer than employees who match the VBD firm ($M_{scarcity\_of\_match}$ = -.30, SD = .65, t = -6.70, p < .001). (Note that participants made this rating *before* they saw the description of the horizontally-matching job candidate, who was described as participating in high-risk sports.) This finding supports our assumption that firms high on horizontal brand differentiation face thinner labor markets (see H2b).

Turning to the maximum pay levels indicated, we found that HR managers differentially value the two types of employees at the different types of brands. A repeated-measures GLM analysis reveals a significant main effect for brand differentiation (F(1, 808) = 5.34, p = .02), reflecting that managers at HBD firms are willing to pay more, on average. The analysis also

reveals a significant main effect for employee differentiation ($F(1, 808) = 11.75$, $p < .001$), reflecting that HR managers are willing to pay horizontally differentiated employees more, on average. These main effects are qualified by a significant brand-by-employee interaction ($F(1, 808) = 6.73$, $p < .001$). The means for each type of match are summarized in Table WP.

The significant interaction shows that matching according to horizontal differentiation is positively assortative (H2b). HBD firms are willing to pay more for horizontally ($M_{HBD/HED}$ = 9.93% above industry average, SD = 4.99) than for vertically differentiated employees ($M_{HBD/VED}$ = 8.40%, SD = 5.81, $t = 4.42$, $p <. 001$). HBD firms are also willing to pay more for horizontally differentiated employees ($M_{HBD/HED}$ = 9.93%, SD = 4.99) than are VBD firms ($M_{VBD/HED}$ = 8.68%, SD = 5.45, $t = 3.30$, $p = .001$). Finally, in terms of like-with-like matching, HBD firms are also willing to pay more for a horizontally differentiated employees ($M_{HBD/HED}$ = 9.93%, SD = 4.99) than VBD firms are willing to pay for vertically differentiated employees ($M_{VBD/VED}$ = 8.50%, SD = 5.90, $t = 4.00$, $p < .001$).

In contrast, VBD firms are not willing to pay more for vertically ($M_{VBD/VED}$ = 8.50% above industry average, SD = 5.90) than for horizontally differentiated employees ($M_{VBD/HED}$ = 8.68%, SD = 5.45) ($t = 0.71$, $p = .48$). VBD firms are also not willing to pay more for vertically differentiated employees ($M_{VBD/VED}$ = 8.50%, SD = 5.90) than are HBD firms ($M_{HBD/VED}$ = 8.40%, SD = 5.81) ($t = -0.21$, $p = .83$). Finally, VBD firms also offer similar pay to horizontally differentiated employees ($M_{VBD/HED}$ = 8.68%, SD = 5.45) as HBD firms do to vertically differentiated employees ($M_{HBD/VED}$ = 8.40%, SD = 5.81), ($t = -.89$, $p = .38$). These null results are consistent with non-assortative matching expected for vertical differentiation (see Web Appendix A).

Taken together, these results support H2b, which predicts positive assortative matching and higher pay for horizontally differentiated employees that are matched on the HBD firm's attributes.

Table WP. Willingness-to-Pay Means (SDs) for Different Employee-Brand Matches

	Employee with high horizontal differentiation (HED)	Employee with high vertical differentiation (VED)
Brand with high vertical differentiation (VBD)	8.68% (5.45)[ii]	8.50% (5.90)[ii]
Brand with high horizontal differentiation (HBD)	9.93% (4.99)[i]	8.40% (5.81)[ii]

Note: Means with different (the same) superscript are (are not) significantly different.

Web Appendix Q: Horizontal Matching Experiment (Study 3)

Objective

While Study 2 examines H2b by examining horizontal versus vertical matching, Study 3 tests H2b using different levels of horizontal brand differentiation (HBD) and horizontal employee differentiation (HED).

Sample

The study was a 2 (between-subjects: low or high HBD) x 2 (within-subjects: low or high HED) design. We approached members of several chapters of the Society for Human Resource Managers; participating Human Resources (HR) managers were unique for each study involving SHRM chapters. We recruited 124 participants (M_{age} = 47.4; 14.6 years of HR experience) through an email letter from the chapter president who invited members to participate in return for an opportunity to win one of three $100 Amazon gift cards and a free webinar that we would conduct to explain our findings. We eliminated four participants with no HR experience and two participants who took more than an hour to complete the study (doing so does not affect the significance of our results).[2]

Stimuli and Measures

To capture the nature of horizontal differentiation, we focused on characteristics of employees and brands that are not objectively better or worse, but more a matter of taste. The sporting goods industry provides a good context whereby some consumers like certain types of sports and other consumers like other types.

The pretests described in detail in Web Appendix O were used to identify more extreme sports and more typical sports that offered the opportunity for self-expression (horizontal differentiation), that were not different in the social status (vertical differentiation), and that were viewed as varying in the number of participants with extreme sports involving fewer people, which was important to reflect the fact that prospective employees who participate in extreme sports are likely to be smaller in number. Using these criteria, we selected three common sports (biking, running, and swimming) and three extreme sports (ice diving, volcano surfing, and flowriding).

Participants were told to imagine they were acting as a HR manager for a firm reviewing job applicants for a position that interacts with customers. Following our pretesting, in the between-subject horizontal brand differentiation manipulation, participants were told they worked for a firm *high in HBD* ("very unconventional brand in the minds of consumers. It is associated with extreme sports and is very unique relative to other brands in the industry") or *low in HBD* ("very conventional brand in the minds of consumers. It is associated with common sports and is very similar to other brands in the industry"). Following the brand manipulation, participants were told they came across the resumé of job applicants who regularly participate in "high-risk sporting activities such as ice diving, volcano surfing, and flowriding" (*high HED*) or

[2] We applied this criterion consistently across all experiments, but only eliminated participants in Studies 3 and 5. Results hold regardless of this decision.

"sporting activities such as biking, running, and swimming" (*low HED*) presented in random order. Each employee type was followed by questions about bargaining power and pay levels. For bargaining power, we asked: "Keeping in mind the company you work and this applicant, do you think your company will have more or less bargaining power compared to the applicant when negotiating a salary?" where 1=less power than the applicant and 7 = more power than the applicants. For pay, we asked: "What is the minimum amount you can offer this type of applicant and still succeed in attracting them to accept a position in your company? where 1 = 25% less than the industry average, 6 = industry average, and 11 = 25% more than the industry average.

Results

A repeated-measures ANOVA that controls for order indicates a significant main effect with the more horizontally differentiated employee being offered more pay ($F(1,115) = 5.20$, $p = .02$) as well as a brand-by-employee type interaction ($F(1,115) = 4.97$, $p = .03$). Consistent with H2b, managers at firms with high HBD offer *higher* pay to matching horizontally differentiated employees ($M_{\text{high-HBD/high-HED}} = 7.63$, SD = 1.63 vs. $M_{\text{high-HBD/low-HED}} = 6.75$, SD = 1.51; $t(59) = 4.35$, $p = .001$), whereas managers at firms with low HBD show no difference in willingness to pay for low or high horizontally differentiated employees ($M_{\text{low-HBD/high-HED}} = 7.28$, SD = 1.41 vs. $_{\text{low-HBD/low-HED}} = 7.05$, SD = 1.39; $t = 1.10$, $p = .28$).

The results are similar, but weaker, for measures of bargaining power. A repeated-measures ANOVA reveals a marginally significant main effect with more horizontally differentiated employees enjoying higher bargaining power ($F(1,115) = 3.77$, $p = .06$), as well as a marginally significant brand-by-employee type interaction ($F(1,115) = 2.77$, $p = .10$). Paired *t*-tests show that managers at firms high on HBD believe they have *less* bargaining power relative to horizontally differentiated employees ($M_{\text{high-HBD/high-HED}} = 3.77$, SD = 1.79 vs. $M_{\text{high-HBD/low-HED}} = 4.28$, SD = 1.44; $t = -1.97$, $p = .05$) whereas those at firms low on HBD show no difference in bargaining power relative to the two employees types ($M_{\text{low-HBD/high-HED}} = 4.00$, SD = 1.71 vs. $M_{\text{low-HBD/low-HED}} = 3.97$, SD = 1.52; $t = 0.15$, $p = .88$).

We further examined whether a firm's bargaining power contributes to the effect of horizontal matching on pay. First, we establish that the higher the perceptions of firm bargaining power, the lower the pay offered by HR managers ($F(10, 107) = 4.22$, $p < .0001$). Second, we find that when HBD is included in the regression, bargaining power continues to predict differences in pay ($F(10, 106) = 3.82$, $p < .0002$), whereas the effect of HBD becomes nonsignificant ($F(1, 106) = 2.07$, $p > .15$). This suggests that bargaining power is a more proximal predictor of pay and that HBD does not have additional explanatory power when this is partialled out.

Discussion

Overall, these result support the intuition in H2b. The pattern of means shows that HR managers at firms with high HBD have lower bargaining power and will offer higher pay to applicants who are well matched in terms of horizontal employee differentiation compared to firms with a low level of HBD. Further analysis indicates that employee-brand matching influences the perceived bargaining power of horizontally differentiated brands.

Web Appendix R: Are HR Managers Myopic About the Effects of Lower Pay? (Study 4)

We predict and show that when managers leverage vertical brand differentiation (VBD) to lower pay, there is a negative effect on profits due to the mediating effects of lower pay and lower employee productivity and retention on profits. This finding is predicated on the assumption that managers do not fully anticipate the employee costs we identify. We performed an experiment with Human Resources (HR) managers to test this assumption.

Sample

We recruited 95 HR managers from different chapters of the SHRM (M_{age} = 48.9 years; 15.1 years of HR experience). Chapter presidents invited members by email to participate in return for an opportunity to win one of three $100 Amazon gift cards and a free webinar that would explain our findings.

Design and Measures

The design was a 2 (counter-balanced within-subjects: high or average VBD) x 2 (between-subjects: 10% below or industry average pay). Participants were asked to imagine they are a HR manager for each of two companies and are interviewing job applicants for an open position. They were told the companies are identical in size, profitability, and benefits, but different in how they are regarded by customers. Specifically, in terms of VBD, one firm was high ("…the company has a high stature brand in the minds of consumers. It is a leading brand that is held in high esteem and regard relative to other brands in the industry") and one was average ("…the company has an average stature brand in the minds of consumers. It is a mid-market brand held in average esteem and regard relative to other brands in the industry"). We selected "average" stature because "low" stature would not reflect our archival sample nor may it be a desirable place to work.

For each firm, participants were told that a job applicant had accepted a salary either at 10% below or at the industry average. Following this, they were asked to rate *employee productivity expectations* on three 7-item measures: the amount of effort (1 = Put in the minimum effort required, 7 = Put in as much effort as possible), intensity of effort (1 = Do the job, but nothing more, 7 = Go the extra mile), and productivity (1 = Less productive than he or she is able, 7 = As productive as he or she is able). Participants also rated *employee retention expectations* by "How many years do you estimate the job applicant will continue to work for the [high/average] stature company?" (1, 2, 3, 4, 5, 6, or 7+ years).

Results and Discussion

We averaged the three productivity scores to form an index (α = .91) (separate analyses convey the same results). Results of a repeated-measures GLM suggest HR managers are entirely myopic regarding the effects of pay on productivity, but that they are somewhat sensitive to the effect of pay on retention. We report these analyses below and, in Table WR, we summarize the means and between-subjects contrasts across pay levels for productivity and retention within high- and average-VBD firms.

A repeated-measures GLM analysis reveals no main effect of pay on productivity ($F(1,92) = 0.21$, $p = .65$) and a significant effect of VBD ($F(1,92) = 5.03$, $p < .05$) with managers expecting employees to work harder at the high-VBD ($M_{high\_VBD} = 5.21$, SD = 1.44) than the average-VBD ($M_{average\_VBD} = 4.53$, SD = 1.53) firm. Importantly, we do not observe a significant interaction between pay and VBD ($F(1,92) = 0.66$, $p = .42$) on productivity expectations.

A parallel analysis for the retention measure reveals a marginally significant positive main effect of pay ($F(1,92) = 3.68$, $p = .06$) and a significant effect of VBD ($F(1, 92) = 16.26$, $p < .001$) with managers expecting employees to stay longer at the high-VBD ($M_{high\_VBD} = 3.56$, SD = 1.44) than at the average-VBD firm ($M_{average\_VBD} = 2.53$, SD = 1.24). As with productivity, we do not observe a significant interaction between pay and VBD ($F(1, 92) = 0.03$, $p = .85$) on retention expectations.

These results suggest that HR managers are myopic about the effect of pay on productivity, but a marginally significant main effect indicates that they do expect higher pay to increase employee retention. As Table WR summarizes, this marginal effect of pay on retention expectations is not significant for high-VBD companies ($p = .15$) and marginally significant for average-VBD companies ($p = .06$).

Table WR. Between-Subjects Contrasts Across Pay Levels for HR Managers

	Pay 10% below industry average (N=50)	Pay at industry average (N=45)	Between-subjects *t*-test
High-VBD firm			
Productivity	5.21 (1.46)	5.21 (1.44)	$t = -0.03$, $p = .98$
Retention	3.30 (1.62)	3.84 (2.04)	$t = -1.45$, $p = .15$
Average-VBD firm			
Productivity	4.23 (1.52)	4.64 (1.55)	$t = -0.67$, $p = .51$
Retention	2.30 (1.02)	2.78 (1.41)	$t = -1.91$, $p = .06$

Web Appendix S: Are Job Candidates Myopic About the Effects of Lower Pay? (Study 5)

Our archival analysis shows that employees who are in lower-paying jobs at vertically differentiated brands (VBD) are less productive and have higher voluntary turnover. This may reflect a "fair trade" by employees (Akerlof and Yellen 1990), or employees are myopic about their own behavior (Deci, Koestner, and Ryan 1999). We explore these interesting alternative scenarios. Following the HR study, we also manipulate pay levels, because relying on job candidates' own minimum pay requirements can result in a selection effect whereby less productive employees self-select into lower paying jobs.

Sample

We recruited 132 U.S. university students (M_{age} = 20.7 years; 60% female; 1.53 years of work experience) using an intercept technique during four evenings on campus. We relied on students because they are not currently employed full-time, but will be entering the job market soon. Students were invited to participate in return for an opportunity to win one of three $100 Amazon gift cards. Three participants who took over one hour to complete the survey were removed from the results (doing so did not affect the significance of any of the effects).

Design and Measures

As with the HR manager study in Web Appendix R, the design was a 2 (counter-balanced within-subjects: high or average VBD) x 2 (between-subjects: 10% below or industry average). The manipulations for VBD and pay were the same as the manager myopia study except for two differences that pretesting showed were more important for the manager study. First, participants were not told the two companies were identical in size, profitability, and benefits. Second, participants were not shown both firm profiles initially; instead, the second (counterbalanced) profile was only revealed after they responded to the first one.

Participants were asked to imagine they interviewed for a job with the firm and that they were offered a position at a pay level at or 10% below the industry average. They rated, "How likely are you to accept the position at this pay level?" (Not at all likely = 1; Extremely likely = 7), followed by the same productivity and retention ratings as in the manager study. They then repeated the same procedure for the second firm.

Results and Discussion

Means and between-subjects contrasts are shown in Table WS. A repeated-measures GLM analysis reveals participants are more willing to accept a job with higher pay ($F(1,127) = 28.08$, $p < .0001$) and at a high-VBD firm ($F(1,127) = 165.27$, $p < .0001$). Importantly, a significant interaction shows that participants are less sensitive to pay when accepting a job at the high-VBD firm ($F(1,127) = 4.32$, $p = .04$). The difference in job acceptances at industry-average pay levels compared to below industry-average pay levels was greater at average-VBD companies ($M_{average\_VBD}$ = -1.24, SD = 1.32) than high-VBD brands (M_{high_VBD} = -.67, SD = 1.40).

As before, we combined the productivity measures into an index (α = .92) (separate analyses convey the same results). Pay had no main effect on productivity ($F(1,127) = 0.91$, $p = .34$) and, while participants expected to be more productive at high-VBD companies ($F(1,127) = 98.07$, $p < .0001$), pay did not interact with this VBD main effect ($F(1,127) = 0.12$, $p = .73$).

Similarly, pay did not have a main effect on retention ($F(1,127) = 0.92$, $p = .34$) and participants expected to stay longer at high-VBD companies ($F(1,127) = 135.44$, $p < .001$). However, there was a marginal pay-by-VBD interaction effect on retention ($F(1,127) = 3.02$, $p = .08$) that suggests pay affects retention more at high-VBD companies ($M_{high\_VBD/low\_pay} = 3.09$, SD = 1.27 vs. $M_{high\_VBD/average\_pay} = 3.44$, SD = 1.46) than at average-VBD companies (M $M_{average\_VBD/low\_pay} = 2.12$, SD = 1.22 vs. $M_{average\_VBD/average\_pay} = 2.13$, SD = 0.87).

In summary, participants were myopic related to productivity expectations, meaning they had no *a priori* intention to change their productivity behaviors at both high and average-VBD brands. Pay only weakly affected employee expectations regarding their job tenure at high-VBD brands. Therefore, like HR managers, job candidates did not appear to anticipate the behaviors we report in our archival analysis.

Table WS, Between-Subjects Contrasts Across Pay Levels for Job Candidates

	Pay 10% below industry average (N=68)	Pay at industry average (N=61)	Between-subjects *t*-test
High-VBD firm			
Pay acceptance	4.54 (1.46)	5.21 (1.33)	$t = -2.71$, $p = .008$
Productivity	5.56 (1.28)	5.80 (1.05)	$t = -1.18$, $p = .24$
Retention	3.09 (1.27)	3.44 (1.46)	$t = -1.48$, $p = .14$
Average-VBD firm			
Pay acceptance	2.50 (1.20)	3.74 (1.45)	$t = -5.30$, $p < .001$
Productivity	4.68 (1.66)	4.86 (1.38)	$t = -0.67$, $p = .50$
Retention	2.12 (1.22)	2.13 (0.87)	$t = -0.07$, $p = .94$

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