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The Impact of Industry Cycles on Strategic Management of Human Capital: Three Empirical Studies

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The Impact of Industry Cycles on Strategic Management of Human Capital: Three Empirical Studies

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Abstract

Research on strategic human capital management (HCM) has concentrated on firm outcomes such as performance and competitive advantage. However, there is less understanding regarding the determinants of firms' strategic behaviors in HCM. While the influence of context on firm behaviors has been well documented in the management literature, it has been under-researched in the specific realm of strategic HCM. This dissertation addresses how industry cycles, an important market context, affect firms' management of existing human capital regarding the treatment of women employees, and firms' acquisition of human capital through human-assets-embodied (HAE) acquisitions.

By using multilevel and longitudinal analyses the three empirical studies in this dissertation found determining effects of industry cycles on firms' strategic behaviors in HCM. The results of the first study indicate that firms manage their tendencies for gender discrimination regarding differential punishment–referred to as the gender punishment gap– during downturns by imposing low-visibility punishments (through pay freezes) rather than high-visibility punishments (through layoffs) on top female leaders to mitigate reputation loss. The second study confirms firms' higher likelihood to promote women into leadership positions during downturns than upturns–the glass cliff phenomenon– but highlights firms' strategic consideration that only women who are top performers experience increased promotion chances during downturns. The third study shows that firms make HAE acquisitions more in upturns than downturns to meet their strategic priorities and take advantage of the benefits from human capital embodied in acquisitions.

By emphasizing the influential effects of context on firms' strategic decision-making, the three studies explain why and when firms undertake certain HCM practices, thereby deepening

our understanding of firms' strategic behaviors in human capital management. Therefore, the dissertation complements existing research on strategic HCM, which focuses on the outcomes of HCM behaviors. It also contributes to management practice by sensitizing business decision-makers to the important role of industry cycles in HCM practices.

Preface

All three studies are original, unpublished work co-authored with Dr. Peter Sherer. The author of this manuscript (Ke Wang) has completed the majority of the work for all three studies and obtained co-author permission (see Appendix). The data reported in studies 1 & 2 are covered by Ethics Certificate number REB21-1396, issued by the University of Calgary Conjoint Ethics Board for the project "Executive Compensation in Energy Firms" on October 28, 2021. The data reported in study 3 are covered by Ethics Certification number REB16-2005, issued by the University of Calgary Conjoint Ethics Board for the project "Strategic Adaptation in the Oil and Gas Industry" on February 9, 2017.

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Introduction

Research on strategic human capital mainly focused on the importance of human capital—knowledge, skills, abilities, and other characteristics embedded in individuals—to firm performance and competitive advantage (Boon et al., 2018; Campbell et al., 2012; Crook et al., 2011). In recognizing the positive relationship between human capital and firm performance, studies stressed the importance of firms' behaviors in managing human capital to accrue economic benefits (e.g., Boon et al., 2018; Delery & Roumpi, 2017; Ployhart & Moliterno, 2011). Most empirical studies on firms' human capital management (HCM) behaviors linked these behaviors to firm outcomes, with less attention given to the determinants of these behaviors. As a result, important questions remain less understood, such as why firms adopt certain practices over others in managing their human capital and when they are more likely to implement these practices.

The context is a key factor in answering these questions. The impact of context, market conditions in particular, on firm behaviors has been well recognized in the management literature (Cappelli & Sherer, 1991; Johns, 2006; Porter, 1980; Pfeffer & Salancik, 1978). Firms adjust their behaviors in response to market conditions either to avoid losses or gain benefits (Aldrich & Pfeffer, 1976; Mowday & Sutton, 1993). This dissertation explores how the market context of industry cycles affects firms' human capital management (HCM) behaviors, with strategic focuses on loss mitigation and benefit acquisition.

Firms make strategic decisions in managing their existing or potential additional human capital (Boon et al., 2018). In the first two studies of this dissertation, I focus on how industry cycles affect firms' management of existing human capital, specifically their behaviors in treating women employees, to avoid reputation loss and accrue economic benefits. In the third

paper, I focus on how industry cycles affect firms' acquisition of human capital, specifically through acquiring whole firms/business units, to take advantage of the benefits from these acquisitions, as opposed to those acquisitions free of human assets and contain just physical assets (e.g., land, buildings, facilities, and machinery).

Firms' treatments of female employees are affected by decision-makers' stereotype-based mindset. First, deeply rooted gender stereotypes in the workplace have led to firms' discriminatory treatment of female employees (Blau & Kahn, 2017; Blau et al, 2021; Hing et al., 2023; Ryan & Haslam, 2007). Firms' gender discrimination behaviors, once they are known by the public, can lead to significant reputational losses (McDonnell & King, 2013; Sharkey et al., 2022; Wang et al., 2016). In particular, because of the public visibility and the symbolic role of corporate top leaders, gender discrimination among this group could send out negative signals and damage a firm's reputation (Bear et al., 2010; Brammer et al., 2009; Saeed et al., 2022). Due to the importance of firm reputation to business success, firms should want to avoid reputation losses by managing their behaviors in treating female employees (McDonnell & King, 2013; Pfarrer et al., 2010; Wang et al., 2016).

Second, people tend to associate women employees in organizations with communal traits such as sympathetic, understanding, intuitive, and tactful (Ryan et al., 2011). Related to these traits, women are believed to have better relational skills in personnel issue management and superior leadership abilities in handling crisis situations (Eagly et al., 1992; Morgenroth et al., 2020; Ryan & Haslam, 2007; Ryan et al., 2011). Therefore, women employees are perceived to possess specific human capital that could benefit firms.

Given the above arguments, two perspectives can be taken in researching firms' strategic behaviors in treating female employees. The first to consider is how firms manage their

discriminatory behaviors against female employees to avoid potential risks and losses. The second to consider is how firms take advantage of the perceived human capital embodied in female employees to accrue economic benefits.

I address the impact of industry cycles on both perspectives regarding firms' strategic management of female employees. First, industry downturns trigger or amplify firms' inclinations to discriminate against women employees, requiring firms to address these inclinations and avoid reputation loss (International Labor Organization, 2020; Landsman, 2019; Selody, 2010). Therefore, the first study focuses on how firms manage their gender discrimination behaviors during industry downturns when they are simultaneously influenced by an increased tendency towards discrimination and a strategic intention to avoid reputational loss. Second, industry downturns increase firms' demand for the specific human capital that female candidates are perceived to have, encouraging firms to promote female candidates to leadership positions (Morgenroth et al., 2020; Ryan & Haslam, 2007). Firms at the same time seek candidates' potential ability to improve firm performance and turn things around (Bundy et al., 2017; Kulich et al., 2018; Slatter et al., 2011; Wu et al., 2021). Therefore, the focus of my second study is on how firms leverage the perceived human capital of female candidates in leadership promotion decisions while simultaneously seeking among female candidates the potential to improve firm performance during downturns. While the first paper focuses on how industry cycles affect firms' management of female employees indirectly by affecting firms' discriminatory tendencies, the second paper focuses on the direct effect of industry cycles on firms' management of female employees with a stereotypical but also strategic mindset.

Firms not only need to manage existing human capital but also potential added human capital. Firms acquire human capital in multiple ways; an important but less understood method

is acquiring entire firms or business units that include human assets (Boon et al., 2018; Coff, 2002; Groysberg & Abrahams, 2006; Munyon et al., 2011; Ng & Stuart, 2022). Again, I consider the impact of industry cycles on firms' human capital management behaviors here in the specific context of human-assets-embodied (HAE) acquisitions. Thus, the third paper examines how industry cycles impact firms' HAE acquisitions by influencing the perceived value of human assets involved in these deals.

Collectively, the three studies in this dissertation explore the impact of industry cycles on firms' strategic behaviors in managing existing human capital and acquiring additional human capital. They help to deepen our understanding of firms' HCM behaviors and complement existing research on strategic HCM, which focuses mainly on the outcomes of HCM behaviors. The studies also contribute to practice by informing firms when and how they could apply certain HCM practices to obtain desired performance outcomes.

Study 1: How the Threat of Reputational Loss Conditions the Gender Punishment Gap: The Use of Low versus High-Visibility Punishments by Firms

The gender punishment gap phenomenon suggests that women receive more severe punishment than men for similar misconduct at work and when bad events occur (Egan et al., 2022; Landsman, 2019; Sarsons, 2017; Selody, 2010). However, research on top management diversity implies that firms' discriminatory behaviors against women in top positions send out negative signals and thus would damage a firm's reputation (Bear et al., 2010; Saeed et al., 2022; Sharkey et al., 2022; Wang et al., 2016). We argue that firms are subject to the gender punishment gap in their decision-making but intentionally manage their discriminatory behaviors to avoid reputation loss.

Specifically, we build on signaling theory to distinguish between high-visibility and low-visibility punishment and investigate how firms use different punishments on different groups of employees (Connelly et al., 2011; Spence, 1978, 2002). We argue that because the gender punishment gap among firms' top leaders is more likely to be known by the public than non-leaders, firms will resort to low-visibility punishments for women top leaders to avoid reputational loss. For non-leaders, because of the massive number and limited public attention associated with them, firms will use high-visibility punishments for women among them.

We test these arguments with multi-level piecewise regression and random-effects logistic regression using a dataset that covers over 80,000 employees in 200 firms in the Canadian oil and gas industry in the context of a major industry downturn. As hypothesized, we find that, during an industry downturn, firms punished women top leaders through low-visibility pay freezes instead of high-visibility job terminations, and firms laid off women in non-top leadership positions more than their male counterparts. The findings speak to the gender punishment gap literature by identifying important boundary conditions of the gender punishment gap. The paper also contributes to the literature on top management diversity by suggesting that, while firms recognize the reputational benefits of having women in top leadership positions, they still tend to punish them disproportionately, albeit in subtler ways. It helps understand firm behaviors that are simultaneously influenced by the gender punishment gap and strategic concerns for reputation loss.

Study 2: The Glass Cliff: How Individual Performance Matters to Women's Promotion Opportunities in a Crisis

The glass cliff refers to the phenomenon that women get more risky leadership positions than men (Haslam et al., 2010; Morgenroth et al., 2020; Ryan & Haslam, 2005). One form of the

glass cliff is the increased likelihood of leadership promotions for women from good times to crisis times (Morgenroth et al., 2020). The mainstream explanation of the glass cliff suggests that women are more likely to be promoted into leadership positions during crises than good times because the perceived communal traits of women candidates are especially valuable for firms during crisis times (Morgenroth et al., 2020; Ryan et al., 2011; Ryan & Haslam, 2007).

However, literature on crisis leadership suggests that during crisis times, firms need leaders who possess not only communal traits but also the capability to improve the firm's performance effectively (Bundy et al., 2017; Kulich et al., 2018; Slatter et al., 2011; Wu et al., 2021). Given the mixed empirical results regarding the existence of the glass cliff in the management domain (Morgenroth et al., 2020), we argue that one important but under-researched moderator to the glass cliff phenomenon is candidates' individual performance, which reflects their potential to improve firm performance. Being a woman does not necessarily make an individual more likely to be promoted into leadership positions during crises; only women who are top performers get higher leadership promotion chances during crises.

We test these arguments using the same dataset used for the first study. The results of our random-effect logistic regression show empirical support for our argument. Women only get higher promotion chances for leadership positions when there's a "cliff" in front of them and they only get those precarious positions if performing at the very top level. This study contributes to the glass cliff literature by addressing an important moderator - individual performance - that has been long ignored in the literature (Kulich et al., 2018; Morgenroth et al., 2020). The study also builds a stronger nexus between the glass cliff and crisis leadership literature.

Study 3: When are Human Assets Embodied in Acquisitions Valuable? The Impact of Industry Cycles on Human-Assets-Embodied Acquisitions

Firms acquire human assets in multiple ways, one important approach being Human-Assets-Embodied (HAE) acquisitions, where entire firms or business units including human assets are acquired (Boyacıoğlu et al., 2023; Chatterji & Patro, 2014; Ng & Stuart, 2021). Firms acquire human assets through HAE acquisitions because it helps them avoid the fierce competition for talented workers in the labor market and speeds up business expansion (Chen et al., 2023; Munyon et al., 2011; Ng & Stuart, 2021).

However, firms' HAE acquisition behaviors are affected by industry cycles such that firms may see human assets embodied in acquisition deals as valuable during the upturn but not so during the downturn (Cappelli & Sherer, 1991; Johns, 2006; Mowday & Sutton, 1993). During the upturn, the open labor market is tight, and firms prioritize business growth over survival (Chen et al., 2023; Greer, 1984; Mascarenhas & Aaker, 1989; Pangarkar &. Lie, 2004). As a result, firms see HAE acquisitions as beneficial in avoiding the fierce labor market competition and saving time on training new employees and building new teams. When the downturn hits, the labor market turns slack, and firms prioritize survival instead of growth (Bundy et al., 2017; Cappelli & Sherer, 1988; Greer & Ireland, 1992). Consequently, firms perceive HAE acquisitions as unnecessary and burdensome because they increase labor costs and offer no advantage over direct labor market hiring. Therefore, we argue that firms are more likely to acquire HAE targets during upturns than downturns.

We tested our arguments using a dataset that covers 821 acquisition deals of 114 crude oil-focused Exploration and Production (E&P) firms and the period from the first quarter of 2007 to the fourth quarter of 2020. For comparison, we also tested the impact of industry cycles on

firms' human-assets-free (HAF) acquisitions, where no human asset is involved in the transactions. The results support our hypothesis that the likelihood of HAE acquisitions is higher during upturns compared to downturns, which contrasts distinctly with the pattern observed for HAF acquisitions. The findings speak to the literature on human capital acquisitions (HCA) by highlighting industry cycles as an important factor that affects firms' HCA decisions and, potentially, the HCA outcomes. The paper also contributes to the Mergers and Acquisition (M&A) literature by addressing the less-explored antecedent of timing in firms' acquisition behaviors, and by identifying varying timing effects on different types of acquisitions.

Statement of Contribution

All three studies are original and unpublished work co-authored with Dr. Peter Sherer, my Ph.D. supervisor. I am the primary author for all three studies and, with Dr. Sherer's guidance, have completed the majority of the work, including theoretical framing, data collection, statistical analyses, and manuscript writing. Dr. Sherer offered substantial contributions in establishing and refining the research question, framing the theoretical argument, accessing the main part of the data, and revising the manuscript. The co-author's permission is included in the Appendix.

Summary

Firms make strategic decisions regarding human capital management (HCM). Studying the impact of industry cycles helps deepen our understanding of firms' strategic decisions and behaviors in HCM. The three empirical studies in this dissertation investigate how the industry cycles affect (i) firms' management of existing human capital, specifically women employees who are valuable for firms' strategic goals and (ii) firms' acquisition of future human capital, specifically through human-assets-embodied (HAE) acquisitions. Collectively, the three studies

help to explain why and when firms undertake certain HCM practices, highlighting the impact of industry cycles on firms' strategic decision-making.

Study 1: How the Threat of Reputational Loss Conditions the Gender Punishment Gap: The Use of Low versus High-Visibility Punishments by Firms

Introduction

Discrimination against females in the workplace is well documented in the literature across management, economics, sociology, and the broader organizational sciences. Women have more limited opportunities for getting hired (Goldin & Rouse, 2000; Gorman, 2005; Hing et al., 2023), receive lower compensation (Altonji & Blank, 1999; Blau & Kahn, 2017; Blau et al, 2021; Weichselbaumer & Winter-Ebmer, 2005), and get fewer promotions (Ginther & Kahn, 2004; Goldin & Rouse, 2000; Gorman & Kmec, 2009). More recently, researchers have found that the gender gap extends beyond hiring, compensation, and promotional opportunities to the punishment of behaviors (Brewer et al., 2020; Egan et al., 2022). For similar actual or perceived misconduct at work, women receive more severe punishment than men, what has been labeled the "gender punishment gap" (Egan et al., 2022; Sarsons, 2017; Selody, 2010).

Even so, there can be limits to firms applying gender-based punishments. Research on top management diversity suggests that the gender punishment gap has adverse reputational effects on firms. Several studies find a positive relationship between the presence of women in top positions and firms' reputation—the public's recognition of the quality of a firm's capabilities, outputs, and prospects as compared to competitors (Bear et al., 2010; Brammer et al., 2009; Fombrun & Shanley, 1990; Miller & del Carmen Triana, 2009; Rindova et al., 2005; Saeed et al., 2022). One way that women in top positions benefit firms' reputations is by sending visible and positive signals to outside observers regarding firms' attention to women and minorities, commitment to diversity, and their socially responsible stance (Bear et al.,2010; Brammer et al., 2009; Miller & del Carmen Triana, 2009). In this sense, disproportionately

penalizing women in top positions, as a type of gender discrimination visible to the public, damages firms' reputations by sending negative signals regarding firms' stereotypical and discriminative mindset, as well as their socially irresponsible stance. Given the importance of reputation to firm performance (Pfarrer et al., 2010; Fombrun & Shanley, 1990), firms should strive to avoid imposing disproportionate penalties on female top leaders to prevent reputation loss (McDonnell & King, 2013; Sharkey et al., 2022; Wang et al., 2016).

In this paper, we theorize and test hypotheses about firms' behaviors regarding the gender punishment gap, considering firms' concern for reputational loss. Building on signaling theory (Connelly et al., 2011; Spence, 1978, 2002), we argue that firms will find low-visibility ways to penalize women in top leadership positions while avoiding reputation loss. Low-visibility punishments for women, which we examine through pay freezes, send less perceptible signals to outside observers. High-visibility punishments, which we examine through job terminations, stand in contrast as they send strongly observable signals to outside observers (Connelly et al., 2011; Ramaswami et al., 2010; Spence, 1978, 2002). Low-visibility punishments have limited potential for reputation loss because their negative signals are hard for outside observers to detect. Firms apply low-visibility punishment among top corporate leaders because (1) the limited number of top leaders in a firm makes any of them noticeable; (2) top-level positions attract intensive public attention. In contrast, high-visibility punishment among non-top leader employees can be hidden in the massive number and the limited public attention associated with non-top leader employees.

We addressed these arguments in the context of an industry downturn in which firms reduced and eliminated labor costs, a context that has been shown to be a valuable way of looking at the gender punishment gap outside of instances of individual misconduct (Landsman,

2019; Selody, 2010; Thébaud & Sharkey, 2015). We hypothesized that (1) women top leaders are subjected to more severe punishment than men when it comes to low visibility pay freezes, and (2) women who do not occupy top leadership positions face more severe gender punishment than men in the form of mass job terminations. We tested these hypotheses by applying multi-level piecewise regression and random-effects logistic regression on a large proprietary dataset (N= 276,282) containing yearly compensation, termination, and other employment data for oil and gas Exploration and Production (E&P) firms in Canada from 2012 to 2017. The results supported the hypotheses: during a downturn, firms punished women top leaders more than their male counterparts through pay freezes and punished women in non-top leadership positions more as compared to men through job termination.

Our study highlights the visibility of punishments through which firms avoid reputation loss in their gender-differential punishment behaviors. It connects the literature on the gender punishment gap to that on top management gender diversity and reputation. We contribute to establishing the boundary conditions for when we can expect women to face more or less severe repercussions for their firm's misfortunes and potentially their actions. The concern for potential reputation loss constrains firms to use high-visibility punishments with women top leaders. However, it does not safeguard women top leaders from subtler forms of punishment, which are less visible to outside observers. Thus, our study confirms the basis for the gender punishment gap yet suggests there is more to it that can only be understood by considering firms' concern for potential reputation loss.

Theory and Hypotheses Development

The Gender Punishment Gap

A considerable body of research on workplace gender discrimination has consistently shown that women, as compared with men, have a lower likelihood of getting hired, receive lower compensation, and face a lower chance of getting promoted (Hing et al., 2023; Leslie et al., 2017). More recently, research has extended to the gender punishment gap–the disproportionate punishment of women as compared to men for actual or perceived inappropriate conduct or misconduct (Egan et al., 2022; Sarsons, 2017; Selody, 2010). Brewer et al. (2020) found that, for similar medical errors, female medical residents got harsher criticism and less supportive feedback than male residents. Egan et al. (2022) found that for similar misconducts, female (compared to male) financial advisors were more likely to leave their positions and less likely to get new jobs. Sarsons (2017) found that female surgeons got fewer referrals from physicians than male surgeons following a patient's death.

The existing research on the gender punishment gap focuses mainly on events following instances of individual misconduct. The gender punishment gap, however, is not limited to such actions. Any negative event can engender punishment – including those that are not under an individual's direct control, where the basis of the "misconduct" is less clear (International Labour Organization, 2020; Landsman, 2019; Selody, 2010). In this regard, Selody (2010) found that when a firm's market value decreases during a downturn, female executives' compensation is more negatively affected than male executives. Recent reports during the pandemic-related downturn also showed that women had a higher job loss rate than male employees (International Labour Organization, 2020; Madgavkar et al., 2020). Three main explanations have been given for why downturns trigger and amplify unfair treatment for women (and minority ethnic groups) (Chattopadhyay & Bianchi, 2021; Dias, 2023; International Labour Organization, 2020; Johnston & Lordan, 2016; Landsman, 2019; Thébaud & Sharkey, 2015). The first reason is that

organization members feel more insecure during downturns, given the fiercer competition for scarce resources. This would, in turn, trigger organization members' implicit bias against women and minority ethnic groups that could have been hidden during upturns (Johnston & Lordan, 2016). The second is that the high uncertainty during downturns makes people more likely to rely on heuristics and conventional ideas for managing information (Tversky & Kahneman, 1974). Thus, implicit cultural stereotypes (i.e., bias against women and minority ethnic groups) are more likely to affect people's decision-making during downturns (Thébaud & Sharkey, 2015). The third reason that downturns trigger and amplify unfair treatment for females (and minority ethnic groups) is that the slack labor market during downturns guarantees enough labor supply for firms, thus allowing firms to act negatively without having to be as concerned with hiring and filling jobs (Dias, 2023).

Women in Top Positions and Firm Reputational Loss

A separate literature has developed that speaks to the reputational effects of the gender punishment gap on firms. Research has found a consistent positive relationship between the presence/number of women in top positions (i.e., executives and board members) and firm reputation (Bear et al, 2010; Brammer et al., 2009; Miller & del Carmen Triana, 2009; Saeed et al., 2022). Top management gender diversity enhances a firm's reputation directly and indirectly. Directly, top management gender diversity improves a firm's reputation by sending out positive signals about the firm's attention to women and minorities, its dedication to diversity, as well as its ethical and socially responsible stance (Bear et al., 2010; Brammer et al., 2009; Miller & del Carmen Triana, 2009). Indirectly, top management gender diversity enhances a firm's reputation by promoting the firm's reputation-building behaviors, such as more comprehensive decision-

making, more efficient governance, and more socially responsible activities, which then send positive signals to outside observers (Bear et al., 2010; Brammer et al., 2009).

These reputational effects of top management diversity, particularly the direct effect, inform our understanding of the potential reputational effects of the gender punishment gap. While top management gender diversity sends positive signals to outside observers, firms' disproportionate punishment of women top leaders sends negative signals regarding firms' stereotypical and discriminative mindset and unethical/ socially irresponsible stances. These negative signals would subsequently lead to adverse public perceptions of firms, resulting in a loss of reputation (Deephouse & Carter, 2005; Fombrun & Shanley, 1990; Sharkey et al., 2022). This reputation loss could be especially significant given the prevailing social norm of promoting gender diversity among top-level firm leaders (Naumovska et al., 2020). Such social norms mean that more stakeholders expect firms to improve their top management gender diversity. Because stakeholders' assessments of firms' reputations depend upon the congruence between firms' apparent behaviors and the observers' preferences (Brammer et al., 2009; Fombrun & Shanley, 1990), firms' behaviors that go against outside observers' expectations, such as disproportionate punishment of women top leaders, would lead to negative reputation assessments from more stakeholders.

Considering the significant influence of reputation on firm outcomes (Pfarrer et al., 2010; Fombrun & Shanley, 1990), decision-makers within firms strive to avoid or minimize the adverse reputational effects stemming from negative signals (McDonnell & King, 2013; Sharkey et al., 2022; Wang et al., 2016). Therefore, firms' concern for reputation loss potentially moderates their actions that punish women more than men.

Low-Visibility and High-Visibility Punishments on Top-Leader and Non-Leader Women

A key means to reconcile the arguments on the gender punishment gap versus firms' concern for reputational loss is to look at different types of punishments. Research has focused on types of punishments, including criticism/negative comments, low-performance scores, difficulty in acquiring funding, client/business loss, pay freezes, job terminations, and low reemployment chances (Brewer et al., 2020; Egan et al., 2022; Sarsons, 2017; Selody, 2010; Hing et al., 2023; Thébaud & Sharkey 2015). We add to the literature by differentiating punishments based on the visibility of the negative signals they release.

The signaling theory primarily focuses on how individuals and organizations intentionally transmit positive signals to other entities (Spence, 1978, 2002). However, it also underscores the significance of the less-explored negative signals that are typically conveyed unintentionally (Connelly et al., 2011; Fischer & Reuber, 2007; Jain et al., 2008; Spence, 2002). Signaling theory specifies "signal visibility" as a defining characteristic of effective signals (Conelly et al., 2011; Ramaswami et al., 2010; Spence, 1978, 2002). The reputational loss associated with different types of punishments varies with the visibility of the negative signals released by them (Connelly et al., 2011; Spence, 2002). Low-visibility punishment releases negative signals that are hard to see and notice by the public and thus cause less severe reputational loss for firms. On the contrary, high-visibility punishment releases negative signals that are easy to see/notice by the public and thus cause more severe reputational loss (Love & Kraatz, 2009; Selody, 2010).

Gender-differential punishments on employees at different career levels have varying reputational effects. Punishment of female top leaders sends more visible signals to outside observers than that of female non-top leader employees. The small number of top leaders makes it hard to hide that punishment (Bear et al., 2010; Miller & del Carmen Triana, 2009). In

addition, punishing female top leaders attracts more public attention than punishing female employees who are not top leaders. According to the signaling theory, a signal is more effective when it gets more attention from the signal receivers (Connelly et al., 2011; Spence, 1978, 2002). We argue that signal receivers in the market pay more attention to punishment among top corporate leaders than to non-top leader employees. First, society pays notably greater attention to diversity and gender equality among top corporate leaders than among non-top leader employees (Naumovska et al., 2020; Saeed & Riaz, 2023). Second, top corporate leaders, compared to non-top leader employees, have higher chances of media exposure, thus getting more public attention (Bennedsen et al., 2022; Leslie et al., 2017). Therefore, for the same type of gender-differential punishment, its appearance in top leaders gets more attention than in non-top leader employees and, therefore, causes more severe firm reputation loss.

In this paper, we use pay freezes and job terminations, two key strategies for firms' labor cost control (Bewley, 1998; Johnston & Lordan, 2016; Yoon, 2023), to proxy low-visibility punishment and high visibility punishment, respectively. Based on the argument mentioned above, firms potentially use pay freezes for women top leaders during a downturn to avoid severe reputation loss. At the same time, firms use job terminations for women non-top leader employees because these actions can be hidden in the mass of layoffs and the lower-level public attention associated with any non-top leader employee. Moreover, firms prefer gender-differential job terminations rather than gender-differential pay freezes for non-top leader employees when they can avoid the severe reputation loss associated with gender-differential job terminations. The literature on "sticky wages" has found that managers generally believe that job terminations, compared to pay freezes, cause less damage to employee morale and give firms greater control over whom to let go during a downturn (Bewley, 1998; Yoon, 2023). Firms that

do job terminations and pay freezes/cuts at the same time are rare, as taking such actions signals a firm is in desperate circumstances (Bewley, 1998; Cajner et al., 2020; Long & Dam, 2020). Based on this argument, we develop two hypotheses:

> **H1:** *Women in top leadership positions face greater pay freezes than male top leaders. Specifically, for top corporate leaders, women's pay increasing rate (pay slope) reduces more than men's during the downturn.*
>
> **H2:** *Women in non-top leader positions face greater job terminations than men in non-top leader positions. Specifically, for non-top leader employees, the likelihood of women's job termination increases more than that of men during the downturn.*

Method

The research context is the E&P industry in Canada from 2012-2017, during which time there were fluctuating economic conditions due to unstable international oil prices (Mathews, 2005; Wang et al., 2019). The six-year period covered in the dataset includes a major downturn in the E&P industry (2015-2017) and an equal-length upturn (2012-2014). Industry downturns provide a broader and less idiosyncratic test than actual misconducts to observe the existence of the gender punishment gap. Industry downturns are largely exogenous to individuals' abilities and affect all organizational members of a firm (Landsman, 2019). The year 2014 in the dataset is counted as an upturn year since it refers to the period from April 2013 to April 2014, but the downturn started in the third quarter of 2014. The major downturn in the E&P industry was deep in that it lasted for 3 years, thus allowing sufficient time for firms' actions regarding punishment behaviors to occur. The data used in this paper are obtained from a large multinational consulting firm that collects annual compensation data on employees in firms. The data include detailed compensation items such as base salary, short-term incentive pay (bonus), long-term incentive

pay (equity pay), perks, and allowances. The data also contain employee demographic characteristics, including gender, age, tenure, education level, union status, and the like. The dataset includes 276,282 individual-year observations.

For testing Hypothesis 1, a multi-level piecewise regression model (Model 1) was used. Multi-level modeling was used because the data are hierarchical, consisting of time-level (level-1) variables, individual-level (level-2) variables, and firm-level (level-3) variables. The piecewise regression was used because, at the time level (level 1), the linear trends of employee salary changed from upturn to downturn years (Mitchell, 2012). For testing Hypothesis 2, a random-effects logistic regression model (Model 2) was used. Logistic regression is used because of the dichotomous nature of the dependent variable. A random-effect model is used because of meaningful variances both within and between individuals. The final sample for Model 1 included 40,987 individual employees nested in 62 firms, totaling 194,117 individual-year observations. The final sample for Model 2 includes 57,464 individuals nested in 75 firms, totaling 199,773 individual-year observations. The sample size for Model 1 is smaller than that for Model 2 because the piecewise regression model (Model 1) requires sample individuals/firms with both upturn observations and downturn observations.

Dependent variables

Two dependent variables were investigated. Model 1 uses the *yearly salary (or hourly wages converted to annual amount) of individuals (PAY),* which is a time-level (level-1) variable. We use a nominal yearly base salary (in thousands of Canadian dollars) to measure this variable in line with prior research (Bihan et al., 2012; Kawaguchi & Ohtake, 2007). Model 2 uses *job termination (TM),* which is also a time-level (level-1) variable. Job termination cases during the industry downturn are treated as primarily involuntary turnovers, as suggested by prior research

(Saeed & Riaz, 2023; Landsman, 2019). A dichotomous measure (1 for job termination; 0 for not-terminated) is used for this variable. It is coded based on employees' appearance (or not) in the data of the following survey year. For example, *TM* for an employee in the year 2014 is coded as "1" if this employee stopped appearing in the survey(s) of and following 2015.

Independent variables

The three focal independent variables for Model 1 are: *survey year (T1* and *T2), individual's gender (FEM),* and *top corporate leader (TPLD)*. *T1* and *T2* are time-level (level-1) variables, while *FEM* and *TPLD* are individual-level (level-2) variables. In a piecewise regression model, *survey year* is separated into two variables: *T1* for the upturn years and *T2* for the downturn years. For *Gender,* a dummy measure (0=male; 1=female) is used; for *Top Corporate Leader,* a dummy measure (1=top corporate leader; 0= non-top leader employee) indicates whether someone is in a top leadership position or not in the first survey year. Top leadership positions cover two main groups: head of organization (including CEO, president, divisional president) and functional head (including CFO, COO, Executive VP, Senior VP, etc.).

For Model 2, the independent variables are *industry downturn (DOWNT), FEM,* and *TPLD. DOWNT* is measured by a dummy variable (1=downturn; 0=upturn). The survey years coded as 1 for *DOWNT* include 2014, 2015, 2016, and 2017. The year 2014 is counted as a downturn year for *DOWNT* because the dependent variable of Model 2, *TM,* for one employee would be coded as "1" for the year 2014 if this employee stopped showing up from the 2015 survey. Therefore, *TM=1* for an employee in 2014 actually means the employee departed his job in 2015, which belongs to the downturn period.

Control variables

At the firm level, *firm size (FSIZE)* is controlled in both Model 1 and Model 2, given the effects of firm size on employees' pay and turnover likelihood (Babecký et al., 2010; Guthrie, 2000). *FSIZE is* measured by firms' average yearly numbers of employees. At the time level, *top performer (TOP),* a dummy variable coded as 1 if an employee is recognized as a top performer and 0 if not in a certain year, is included in both Model 1 and Model 2 because top performers are believed to get higher payment, larger pay increases and lower likelihood of being laid off (Joshi et al., 2015). *Individual's yearly career stream level (CSLVL*), a categorical variable including 17 specific career streams and levels*,* is controlled in Model 1 because career streams and levels could affect employee pay and rate increases (Blau & Kahn, 2017; Bertrand & Hallock, 2000).

At the individual level, *tenure* (*TEN_L* and *TEN_H*), *Union status (UNION), Age (AGE_Y* and *AGE_O), Education (ED1- ED5),* and *Corporate function job (FUNC)* are included in both Model 1 and Model 2 and *Relative pay (RELAP)* is controlled in only Model 2, referring to prior related literature (Altonji & Shakotko, 1987; Blinder & Choi, 1990; Lazear, 1979; Blau & Kahn 2017; Bertrand & Hallock, 2000; Dencker, 2012). *Tenure* is a categorical variable measured by the length between an employee's hiring year and the first survey year (low-tenure and high-tenure compared to mid-tenure). *Union status* is a dummy variable coded as 1 if an employee is unionized and 0 if not. *Age* is a categorical variable measured by the age group (young and old compared to the mid-age group) to which an employee belongs. *Education* is a categorical variable containing five different education levels (Ph.D., Master, Bachelor, College, and Less than College). *Corporate function job,* a dummy variable indicating whether one employee's type of occupation is related to corporate functions (such as legal, accounting, administration, et al.), is coded as 1 if an employee's occupation is related to corporate functions

and 0 if not. *Relative pay* is measured by the ratio of one employee's pay during the first survey year and the average pay of employees in the same career level in that same year.

Model 1 and Model 2 are used to test Hypothesis 1 and Hypothesis 2, respectively. Both Model 1 and Model 2 include a baseline model (Model 1a/2a) and a full model (Model 1b/2b). The baseline models and full models for testing Hypothesis 1 and Hypothesis 2 are specified as equations (1a), (1b), (2a) and (2b) below:

$$(1a)\ PAY=\beta_0+\beta_1(T1_{ijk})+\beta_2(T2_{ijk})+\beta_3(TOP_{ijk})+\{\beta_4(CSLVL1_{ijk})+\ldots+\beta_{19}(CSLVL16_{ijk})\}+\beta_{20}(FEM_{jk})+\beta_{21}(TPLD_{jk})+\beta_{22}(TEN\_L_{jk})+\beta_{23}(TEN\_H_{jk})+\beta_{24}(UNION_{jk})+\beta_{25}(AGE\_Y_{jk})+\beta_{26}(AGE\_O_{jk})+\beta_{27}(ED1_{jk})+\beta_{28}(ED2_{jk})+\beta_{29}(ED4_{jk})+\beta_{30}(ED5_{jk})+\beta_{31}(FUNC_{jk})+\beta_{32}(FSIZE_k)+e_{ijk}+u_{0jk}+u_{1jk}(T1_{ijk})+u_{2jk}(T2_{ijk})+v_{0k}$$

$$(1b)\ PAY=\beta_0+\beta_1(T1_{ijk})+\beta_2(T2_{ijk})+\beta_3(TOP_{ijk})+\{\beta_4(CSLVL1_{ijk})+\ldots+\beta_{19}(CSLVL16_{ijk})\}+\beta_{20}(FEM_{jk})+\beta_{21}(TPLD_{jk})+\beta_{22}(TEN\_L_{jk})+\beta_{23}(TEN\_H_{jk})+\beta_{24}(UNION_{jk})+\beta_{25}(AGE\_Y_{jk})+\beta_{26}(AGE\_O_{jk})+\beta_{27}(ED1_{jk})+\beta_{28}(ED2_{jk})+\beta_{29}(ED4_{jk})+\beta_{30}(ED5_{jk})+\beta_{31}(FUNC_{jk})+\beta_{32}(FSIZE_k)+\beta_{33}(T1_{ijk}*FEM_{jk})+\beta_{34}(T2_{ijk}*FEM_{jk})+\beta_{35}(T1_{ijk}*TPLD_{jk})+\beta_{36}(T2_{ijk}*TPLD_{jk})+\beta_{37}(FEM_{jk}*TPLD_{jk})+\beta_{38}(T1_{ijk}*TPLD_{jk}*FEM_{jk})+\beta_{39}(T2_{ijk}*TPLD_{jk}*FEM_{jk})+\beta_{40}(T1_{ijk}*AGE\_Y_{jk})+\beta_{41}(T2_{ijk}*AGE\_Y_{jk})+\beta_{42}(T1_{ijk}*AGE\_O_{jk})+\beta_{43}(T2_{ijk}*AGE\_O_{jk})+\beta_{44}(T1_{ijk}*UNION_{jk})+\beta_{45}(T2_{ijk}*UNION_{jk})+\beta_{46}(T1_{ijk}*FUNC_{jk})+\beta_{47}(T2_{ijk}*FUNC_{jk})+\beta_{48}(T1_{ijk}*RELAP_{jk})+\beta_{49}(T2_{ijk}*RELAP_{jk})+e_{ijk}+u_{0jk}+u_{1jk}(T1_{ijk})+u_{2jk}(T2_{ijk})+v_{0k}$$

$$(2a)\ TM=\beta_0+\beta_1(DOWNT_{ij})+\beta_2(TOP_{ij})+\beta_3(RELAP_{ij})+\beta_4(FEM_j)+\beta_5(TPLD_j)+\beta_6(TEN\_L_j)+\beta_7(TEN\_H_j)+\beta_8(UNION_j)+\beta_9(AGE\_Y_j)+\beta_{10}(AGE\_O_j)+\beta_{11}(ED1_j)+\beta_{12}(ED2_j)+\beta_{13}(ED4_j)+\beta_{14}(ED5_j)+\beta_{15}(FUNC_j)+\beta_{16}(FSIZE_j)+e_{ij}+u_{0j}$$

$$(2b)\ TM=\beta_0+\beta_1(DOWNT_{ij})+\beta_2(TOP_{ij})+\beta_3(RELAP_{ij})+\beta_4(FEM_j)+\beta_5(TPLD_j)+\beta_6(TEN\_L_j)+\beta_7(TEN\_H_j)+\beta_8(UNION_j)+\beta_9(AGE\_Y_j)+\beta_{10}(AGE\_O_j)+\beta_{11}(ED1_j)+\beta_{12}(ED2_j)+\beta_{13}(ED4_j)+\beta_{14}(ED5_j)+\beta_{15}(FUNC_j)+\beta_{16}(FSIZE\_C_j)+\beta_{17}(DOWNT_{ij}*FEM_j)+\beta_{18}(DOWNT_{ij}*TPLD_j)+\beta_{19}(FEM_j*TPLD_j)+\beta_{20}(DOWNT_{ij}*TPLD_j*FEM_j)+\beta_{21}(DOWNT_{ij}*AGE\_Y_j)+\beta_{22}(DOWNT_{ij}*AGE\_O_j)+\beta_{23}(DOWNT_{ij}*UNION_j)+\beta_{24}(DOWNT_{ij}*FUNC_j)+\beta_{25}(DOWNT_{ij}*RELAP_{ij})+\beta_{26}(DOWNT_{ij}*FSIZE_j)+e_{ij}+u_{0j}\ ,$$

where the *ijk* suffix on the explain variables refers to the variable value of year i for individual j in firm k; variables with suffix *jk* (in Model 1a and 1b) or suffix *j* (in Model 2a and 2b) are level-2 variables; variables with only suffix *k* (without *i* and *j*) are level-3 variables; e_{ijk}, u_{0jk}, and v_{0k} in Model 1a and 1b are error terms of level 1 (time-level), level 2 (individual-level), and level 3 (firm-level); $u_{1jk}(T1_{ijk})$ and $u_{2jk}(T2_{ijk})$ indicate the inclusion of random coefficients, which permits both the intercepts and coefficients of the time-level variables T1 and T2 to vary (Mehmetoglu &

Jakobsen, 2022), in the model and they refer to the difference between the effect of *T1 (T2)* on a certain individual and the effect of *T1 (T2)* on all individuals. The e_{ij} *and* u_{0j} in Models 2a and 2b are within variation error term and individual-specific (rather than time-specific) error term.

To test H1, we include in Model 1b the interaction between *T1 (T2)* and *FEM*, the interaction between *T1 (T2)* and *TPLD*, and the 3-way interaction among *T1 (T2)*, *FEM*, and *TPLD*. Also, we allowed random coefficients for the level-1 variables *T1* and *T2* and controlled for the interactions between *T1/T2* and related level-2 variables, including *AGE, UNION, RELAP*, and *FUNC*, since these level-2 variables in Model 1 should affect not only the intercepts but also coefficients (slopes) of level-1 variables *T1* and *T2* (Mitchell, 2012).

To test H2, we include in Model 2b the interaction between *DOWNT* and *FEM*, the interaction between *DOWNT* and *TPLD*, as well as a 3-way interaction among *DOWNT, FEM,* and *TPLD*. Similarly, the interactions between downturn and other level-2 variables are included as controls in Model 2 to ensure the accuracy of prediction results regarding the focal interactions. In addition, we controlled for the interaction between *DOWNT* and the level-3 variable *FSIZE* in Model 2 because different-sized firms have different layoff behaviors during the upturn versus the downturn.

Results

The means, standard deviations, and correlations for the independent and dependent variables in Model 1 and Model 2 are shown in Table 1.1 and Table 1.2. The mean of the dependent variable *PAY* (119.72) indicates that the average yearly salary for all the sampled employees across different years is approximately 120,000 Canadian dollars (CAD). According to the correlation matrixes, an *individual's gender (FEM)* is negatively correlated with *yearly salary (PAY)* ($p < 0.001$) and positively correlated with *job termination (TM)* ($p < 0.001$). *Top*

corporate leader (TPLD) is positively correlated with *PAY* ($p < 0.001$) and not significantly correlated with *TM* ($p > 0.05$). Among all the employees included in the final sample for Model 1 (1a and 1b), 2,269 (1%) are top corporate leaders, 204,517 (99%) are non-top leader employees; 56,923 (28%) are females, and 149,863 (72%) are males. Among the 2,269 top corporate leaders, 328 (14%) are females, and 1941 (86%) are males.

Insert Tables 1.1 & 1.2 about here

Table 1.3 shows the results of Models 1a and 1b. In the baseline model (Model 1a), *FEM* is negatively related to *PAY* ($\beta = -12.70$, $p < .001$), indicating that women on average are paid approximately 12,700 CAD less than men annually. The survey year variables *T1* and *T2* both positively predict *PAY*, but the coefficient for *T1* ($\beta = 6.72$, $p < .001$) is larger than that for *T2* ($\beta = 1.56$, $p < .001$), indicating employees' *PAY* increases faster (by about 5,160 CAD more each year) during upturn period than downturn period. *TPLD* has a large positive coefficient ($\beta = 103.69$, $p < .001$), meaning that top corporate leaders get much higher payments (approximately 103,690 CAD more annually) than employees at lower career levels.

Insert Table 1.3 about here

In the full model (Model 1b), the interaction between *FEM* and *T1* is negative and significant ($\beta = -0.60$, $p < .001$), but the three-way interaction among *TPLD, FEM,* and *T1* is non-significant ($\beta = 0.86$, n.s.). This means that for non-top leader employees, women's pay increased slower (with a pay increasing rate smaller by 0.6) than men's during the upturn. For

top leaders, the gender gap in pay increases narrows (with women's pay increasing rate 0.26 larger than men's) but the gap is not significantly different from that for non-top leader employees.

The interaction between *FEM* and *T2* is not significant (β = -0.03, n.s.), but the three-way interaction among *TPLD, FEM,* and *T2* is significant and negative (β = -1.24, $p < .01$). This means that for non-top leader employees, women's pay increase is not significantly different from men's during the downturn (with women's pay increasing rate only 0.03 smaller than men's). However, for top leaders, the gender gap in pay increases is significantly wider than that for non-top leader employees (with women's pay increasing rate 1.27 smaller than men's). In other words, the pay increase (slope) for women top leaders is significantly smaller than that for men top leaders during the downturn. This finding indicates the existence of the gender punishment gap in pay freezes at the level of top leaders but not in non-top leader employees.

To further verify the existence of gender punishment gap in pay freezes among top corporate leaders, we take a difference-in-difference (DID) approach (Mitchell, 2012), testing the significance of the difference between the reduction of pay pay-increasing rates (pay slopes) from the upturn to the downturn for female top leaders and the reduction of pay slopes for male top leaders. The results show the reduction of pay slopes for female top leaders is significantly larger than that for male top leaders ($\Delta\beta$ = 2.1, $p < .01$). This test confirms the gender punishment gap in pay freezes occurs at the top corporate leaders' level. The results are illustrated in Figure 1.1 and Figure 1.2.

Insert Figures 1.1 & 1.2 about here

Figure 1.1 shows the trends of pay changes for men and women in top leadership positions versus non-top leadership positions. The year 2014, the starting year of the downturn, appears to be the "knots" (breaking points) for the trend lines of employee pay changes. After 2014, employees' pay slopes consistently flattened. However, the degree of flattening differs across men and women in top leadership positions versus non-top leadership positions. Figure 1.2 clearly shows this difference. Among top corporate leaders, women's pay slope has a larger drop than men's (13.8% versus 12.6%), while among the non-top leader employees, women's pay slope has a smaller drop than men's (4.6% versus 5.3%). It, again, shows that during the downturn, women are punished more severely through pay freezes at the top leadership level but not at the non-top leadership level. Therefore, H1 is supported.

Table 1.4 shows the results of Models 2a and 2b. The results from the baseline model (Model 2a) show there are approximately 229% higher job termination odds for employees during the downturn than upturn ($\beta = 1.19$, $p < .001$, odds ratio = 3.29). Females have generally higher job termination chances (about 13% higher in odds) than males ($\beta = 0.12$, $p < .001$, odds ratio = 1.13). Top corporate leaders show a similar job termination chance with employees at lower career levels ($\beta = -0.04$, n.s., odds ratio = 0.96). The full model (Model 2b) results show that the interaction between *FEM* and *DOWNT* is positive and significant ($\beta = 0.09$, $p < .05$), but the three-way interaction among *TPLD*, *FEM* and *DOWNT* is not significant ($\beta = 0.28$, n.s.). Given that the β for the interaction term *FEM* * *DOWNT* represents the conditional effect of *FEM* * *DOWNT* on *TM* when *TPLD* = 0, the positive coefficient for *FEM* * *DOWNT* means that at the non-top leader level, the increase of job termination log-odds from the upturn to the downturn for women is larger (0.09 higher in log-odds and 1.09 higher in odds ratio) than that for men. The non-significant three-way interaction (*TPLD*FEM*DOWNT)* means that, for the

top leaders, the increase in job termination log-odds during the downturn for women is not significantly different from that for men. The DID approach is not applied to Model 2b because the variable *DOWNT,* rather than *T1/T2,* is used to measure time. Consequently, there is no need to compare differences in time slope changes across different genders. Figure 1.3 illustrates this result: for non-top leader employees, women have a similar job termination probability with men during the upturn but have a higher job termination probability than men during the downturn; for top corporate leaders, the job termination probabilities for men and women are not significantly different during either upturn or downturn (shown as heavily overlapping confidence intervals in the right side of Figure 1.3). This finding indicates the existence of the gender punishment gap in job termination among non-top leader employees but not among top leaders, providing support for H2.

Insert Table 1.4 and Figure 1.3 about here

Robustness Test

The finding that female top leaders' pay slope dropped more than male top leaders' during the downturn (based on the results of Model 1b) is subject to the alternative explanation that female top leaders get fewer promotion opportunities than male top leaders during the downturn, as is suggested by the "glass ceiling" theory (Hymowitz & Schellhardt, 1986). Considering this possibility, we did an additional random-effects logistic analysis that focuses on promotion likelihood. The data shows female top leaders are *not* disadvantaged as compared to male top leaders when it comes to promotion during the downturn. The inclusion of the *yearly career stream level (CSLVL)*, a control variable that contains 17 specific career stream levels, in

Model 1b also helps to exclude this alternative explanation as *CSLVL* captures the changes in employee career levels across different years, thus controls for the effect of promotions on the pay changes.

Another potential alternative explanation is that female top leaders are at comparatively lower ranks, thus getting lower pay and larger pay freezes during the downturn. We substituted the *top corporate leader* variable with a categorical variable representing detailed leadership levels to test this alternative explanation. The result for the pay freezes of female top leaders still holds. In addition, in Model 1b, we included the interactions between *relative pay (RELAP)* and *survey years (T1 & T2) to c*ontrol for the effect of comparative ranks (*relative pay*) on pay slopes. Taken together, the results confirm the more severe pay loss for female top leaders compared to male top leaders during the downturn.

We used an alternative statistical model to test the robustness of Models 2a and 2b. Specifically, we replaced the random-effects logistic regression model with the multi-level logistic regression model based on the argument that the latter yields more accurate results, especially regarding cross-level interactions. The results are still consistent with our findings.

Discussion and Conclusion

We find evidence corroborating the existence of the gender punishment gap and also provide a more nuanced understanding of the phenomenon, shedding further light on the process by which it occurs. During the downturn, women top leaders' pay growth slowed compared to their male counterparts and women non-top leaders were terminated at higher rates than their male counterparts. The findings, consistent with prior literature, show a clear gender punishment gap (Egan et al., 2022; Sarsons, 2017; Selody, 2010). More importantly, this paper adds to the existing literature by revealing the various manifestations of the gender punishment gap among

different groups within organizations. The findings highlight the moderating effects of firms' reputational concern on their gender-differential punishment behaviors. They point to the level of employee and attendant visibility of the punishment as critical boundary conditions for gaining further insight into the gender punishment gap.

This study also speaks to the literature on top management gender diversity and firm reputation. The positive reputational effect of top management gender diversity would encourage firms to include more women in top management teams, but there could be subtler ways in which women in top positions are still unfairly treated. This inference is consistent with several recent studies, which found that women top leaders are more likely to be appointed during a crisis time (Ryan et al., 2016) and that they are not given influence equal to male top leaders (Benton, 2021; Knippen et al., 2019). By considering both the mechanism of gender punishment gap and firms' concern for top management gender diversity and reputations, this paper builds a nexus between these two bodies of literature and reconciles the apparent conflict between their respective arguments (Bear et al, 2010; Brammer et al., 2009; Landsman, 2019; Miller & del Carmen Triana, 2009; Naumovska et al., 2020; Saeed et al., 2022; Saeed & Riaz, 2023; Selody, 2010).

This paper also contributes to the signaling theory. The lack of focus on negative signals has been identified as a significant gap in the signaling theory literature (Connelly et al., 2011; Spence, 2002). Our paper fills this gap by examining how firms manage negative signals that could be detrimental to firm reputation (McDonnell & King, 2013; Sharkey et al., 2022). While firms intentionally send out positive signals, they also concurrently endeavor to minimize the unintentional transmission of negative signals associated with their behaviors. Future research

can further enhance signaling theory by examining various strategies firms employ, besides the ones this paper identified, to avoid/minimize negative signals.

A potential limitation of this paper is that reputation losses associated with the visible gender punishment gap are not directly measured and examined. The key reason is that if firms act on the potential loss and avoid high-visibility punishments we will not observe instances where the loss occurred. By finding strong evidence for firms' use of different punishments with top leaders and non-leader employees, this paper indicates the underlying impact of firms' reputational concern on their gender-differential punishment behaviors. Future research that establishes a context in which reputation loss can be directly measured (e.g., identifying situations where firms feel less constrained and opt for high-visibility punishments) would be valuable.

Future research will benefit from examining these arguments in different contexts. The industry context of this paper, the E&P industry, is male-dominated (only 28% of employees are females). One could speculate that in industries represented by a larger proportion of women in top leadership levels, we might see even greater use of low-visibility punishments to avoid public attention, or that firms use more high-visibility punishments given the greater representation of women.

The recent decade has witnessed fast-growing attention on workplace equality, diversity, and inclusion issues. Practitioners trying to promote workplace gender equality generally focus on reducing the most apparent forms of the gender gap and often ignore the amplifying effect of downturns on gender inequality. By knowing the inequality-amplifying effect of downturns and the potential existence of low-visibility gender gaps, practitioners could develop more comprehensive and better-conceived strategies and plans to promote workplace gender equality.

Table 1.1 Means, Standard Deviations, and Correlations for Model 1

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9
1.PAY	119.72	46.18	1.00								
2.T1	2.54	0.73	0.11	1.00							
3.T2	0.91	1.09	0.08	0.52	1.00						
4.TOP	0.16	0.37	0.12	0.06	0.04	1.00					
5.FEM	0.27	0.45	-0.23	0.00	0.00	0.01	1.00				
6.TPLD	0.01	0.10	0.44	0.00	0.00	0.04	-0.03	1.00			
7.TEN_L	0.49	0.50	-0.16	0.11	0.05	-0.05	0.00	-0.03	1.00		
8.TEN_M	0.27	0.44	-0.01	-0.07	-0.03	0.03	0.01	-0.02	-0.59	1.00	
9.TEN_H	0.24	0.43	0.19	-0.05	-0.02	0.03	-0.01	0.05	-0.55	-0.35	1.00
10.UNION	0.08	0.28	-0.06	-0.02	-0.02	-0.13	-0.14	-0.03	-0.05	0.03	0.03
11.AGE_Y	0.36	0.48	-0.27	0.03	0.03	0.04	0.05	-0.07	0.25	0.01	-0.30
12.AGE_M	0.29	0.45	0.08	0.00	0.01	0.01	-0.01	0.00	-0.04	0.03	0.01
13.AGE_O	0.35	0.48	0.20	-0.04	-0.04	-0.05	-0.04	0.07	-0.21	-0.04	0.30
14.ED1	0.00	0.06	0.07	0.00	0.00	0.02	-0.01	0.01	0.00	0.00	0.00
15.ED2	0.04	0.19	0.17	0.00	0.00	0.07	0.00	0.05	-0.01	-0.01	0.02
16.ED3	0.19	0.39	0.17	0.00	0.01	0.14	0.05	0.09	-0.01	0.00	0.01
17.ED4	0.13	0.33	-0.10	0.00	0.00	0.06	0.06	-0.03	-0.02	0.03	-0.01
18.ED5	0.65	0.48	-0.14	0.00	-0.01	-0.19	-0.07	-0.07	0.03	-0.02	-0.01
19.FUNC	0.29	0.45	-0.09	0.00	0.00	0.03	0.42	0.07	-0.03	0.01	0.02
20.FSIZE	7.99	1.23	-0.04	-0.02	0.00	0.00	-0.09	-0.15	-0.11	0.02	0.10
	10	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
10.UNION	1.00										
11.AGE_Y	0.02	1.00									
12.AGE_M	-0.03	-0.48	1.00								
13.AGE_O	0.01	-0.55	-0.47	1.00							
14.ED1	-0.02	-0.02	0.01	0.01	1.00						
15.ED2	-0.06	-0.04	0.03	0.01	-0.01	1.00					
16.ED3	-0.14	0.07	-0.02	-0.05	-0.03	-0.09	1.00				
17.ED4	-0.10	-0.03	0.00	0.02	-0.02	-0.07	-0.18	1.00			
18.ED5	0.21	-0.02	0.00	0.02	-0.08	-0.26	-0.65	-0.52	1.00		
19.FUNC	-0.20	-0.03	0.03	0.00	-0.02	0.02	0.11	0.04	-0.12	1.00	
20.FSIZE	0.27	0.00	0.00	0.00	-0.01	-0.06	-0.19	-0.14	0.28	-0.13	1.00

* The time-level variable *yearly career stream level,* which is a categorical variable including 17 specific career levels, is omitted in the correlation table to save space. Including/excluding the *yearly career stream level* variable in regression models does not significantly change the main results.

Table 1.2 Means, Standard Deviations, and Correlations for Model 2

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9
1.TM	0.13	0.34	1.00								
2.DOWNT	0.59	0.49	0.09	1.00							
3.TOP	0.15	0.35	-0.04	0.07	1.00						
4.FEM	0.29	0.45	0.02	-0.01	0.01	1.00					
5.RELAP	0.00	0.15	0.02	0.00	0.02	-0.29	1.00				
6.TPLD	0.01	0.11	0.00	0.00	0.04	-0.04	0.02	1.00			
7.TEN_L	0.50	0.50	-0.03	0.14	-0.05	-0.01	0.04	-0.03	1.00		
8.TEN_M	0.26	0.44	0.02	-0.09	0.03	0.02	-0.03	-0.02	-0.60	1.00	
9.TEN_H	0.24	0.42	0.01	-0.07	0.03	-0.01	-0.01	0.05	-0.56	-0.33	1.00
10.UNION	0.08	0.26	0.00	-0.02	-0.12	-0.13	0.07	-0.03	-0.05	0.03	0.03
11.AGE_Y	0.36	0.48	-0.03	0.05	0.03	0.05	-0.02	-0.07	0.25	0.00	-0.30
12.AGE_M	0.28	0.45	-0.03	0.01	0.01	-0.01	-0.01	0.00	-0.02	0.03	0.00
13.AGE_O	0.35	0.48	0.05	-0.06	-0.05	-0.04	0.03	0.07	-0.23	-0.03	0.30
14.ED1	0.00	0.07	0.01	0.00	0.02	-0.01	0.04	0.01	0.00	0.00	0.00
15.ED2	0.04	0.19	0.00	0.00	0.06	-0.01	0.06	0.06	0.00	-0.01	0.01
16.ED3	0.19	0.39	-0.01	0.00	0.13	0.04	0.07	0.09	0.00	0.00	0.00
17.ED4	0.13	0.33	-0.01	-0.01	0.06	0.05	-0.06	-0.03	-0.02	0.03	-0.01
18.ED5	0.64	0.48	0.02	0.01	-0.17	-0.06	-0.04	-0.08	0.02	-0.02	0.00
19.FUNC	0.30	0.46	0.00	0.00	0.03	0.42	-0.26	0.06	-0.02	0.01	0.02
20.FSIZE	0.00	1.30	-0.01	0.00	0.01	-0.09	0.00	-0.15	-0.11	0.03	0.10
	10	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
10.UNION	1.00										
11.AGE_Y	0.02	1.00									
12.AGE_M	-0.03	-0.48	1.00								
13.AGE_O	0.00	-0.56	-0.46	1.00							
14.ED1	-0.02	-0.02	0.01	0.01	1.00						
15.ED2	-0.06	-0.05	0.04	0.01	-0.01	1.00					
16.ED3	-0.13	0.07	-0.02	-0.05	-0.03	-0.10	1.00				
17.ED4	-0.10	-0.02	0.00	0.02	-0.02	-0.07	-0.18	1.00			
18.ED5	0.20	-0.02	0.00	0.02	-0.09	-0.27	-0.65	-0.51	1.00		
19.FUNC	-0.19	-0.04	0.03	0.01	-0.02	0.01	0.10	0.03	-0.11	1.00	
20.FSIZE	0.27	0.00	0.00	-0.01	-0.02	-0.06	-0.19	-0.13	0.27	-0.13	1.00

Table 1.3 Results of Multilevel Piecewise Regression Predicting Employee Pay

	Variables:	Model 1a	Model 1b
Time-Level Variable	Survey year (2012-2014)	6.72*** (0.02)	7.50*** (0.05)
	Survey year (2015-2017)	1.56*** (0.02)	1.37*** (0.04)
Employee-Level Variables (constant over time)	Female (0/1)	-12.70*** (0.30)	-12.14*** (0.31)
	Top Corporate Leader (0/1)	103.69*** (1.33)	104.19*** (1.44)
Interactions	Female*Top Corporate Leader		-0.33 (3.21)
	Female*Survey year (2012-2014)		-0.60*** (0.06)
	Female*Survey year (2015-2017)		-0.03 (0.04)
	Top Corporate Leader*Survey year (2012-2014)		10.35*** (0.25)
	Top Corporate Leader*Survey year (2015-2017)		3.04*** (0.19)
	Female*Survey year (2012-2014)*Top Corporate Leader		0.86 (0.62)
	Female*Survey year (2015-2017)*Top Corporate Leader		-1.24** (0.48)
Time-Level Controls [1] (variables that change over time)	Top Performer (0/1)	0.54*** (0.04)	0.51*** (0.04)
Employee - Level Controls (constant over time)	Tenure (low, relative to mid level)	-2.80*** (0.30)	-2.93*** (0.29)
	Tenure (high, relative to mid level)	3.59*** (0.35)	3.38*** (0.35)
	Unionized (0/1)	7.13*** (0.56)	8.36*** (0.56)
	Age (young, relative to mid)	-12.28*** (0.31)	-12.27*** (0.31)
	Age (old, relative to young)	6.54*** (0.31)	6.94*** (0.31)
	Education (PhD, relative to Bachelor)	16.96*** (1.93)	17.27*** (1.90)
	Education (Master, relative to Bachelor)	8.78*** (0.70)	9.00*** (0.70)

	Education (College relative to Bachelor)	-9.57*** (0.46)	-10.18*** (0.45)
	Education (Less than College, relative to Bachelor)	-10.79*** (0.40)	-11.51*** (0.40)
	Corporate Function Job (0/1)	-6.79*** (0.30)	-6.22*** (0.30)
Firm-Level Control (constant over time)	Firm Size (yearly average)	3.40*** (0.77)	3.62*** (0.81)
Cross-level Interaction Controls	Corporate Function Job*Survey year (2012-2014)		-0.73*** (0.06)
	Corporate Function Job*Survey year (2015-2017)		0.11** (0.04)
	Unionized*Survey year (2012-2014)		-1.41*** (0.08)
	Unionized*Survey year (2015-2017)		2.27*** (0.06)
	Age (young, relative to mid)*Survey year (2012-2014)		-0.13* (0.06)
	Age (old, relative to mid)*Survey year (2012-2014)		-0.87*** (0.06)
	Age (young, relative to mid)*Survey year (2015-2017)		0.35*** (0.04)
	Age (old, relative to mid)*Survey year (2015-2017)		-0.48*** (0.04)
	Relative Pay of First Survey Year*Survey year (2012-2014)		5.49*** (0.16)
	Relative Pay of First Survey Year*Survey year (2015-2017)		1.06*** (0.12)
Constant		64.15*** (4.31)	62.27*** (4.48)
Number of Observations	N (firms)	62	62
	N (employees)	40,987	40,987
	N (firm-employee-year)	194,117	194,117

[1] The time-level variable *yearly career stream level*, a categorical variable including 17 specific career levels, is controlled in the models but omitted in the results table to save space.

+p <0.1
*p <= .05
**p <= .01
***p <= .001

Table 1.4 Results of Random-Effects Logistic Regression Predicting Log-Odds of Job Termination

Variables:	Model 2a	Model 2b
Downturn (0/1)	1.19*** (0.02)	1.05*** (0.04)
Female (0/1)	0.12*** (0.02)	0.05 (0.04)
Top Corporate Leader	-0.04 (0.06)	0.08 (0.13)
Female*Top Corporate Leader		-0.08 (0.33)
Female*Downturn		0.09* (0.04)
Top Corporate Leader*Downturn		-0.21 (0.15)
Female*Downturn*Top Corporate Leader		0.28 (0.38)
Controls:		
Top Performer (0/1)	-0.48*** (0.02)	-0.47*** (0.02)
Tenure (low, relative to mid level)	-0.12*** (0.02)	-0.11*** (0.02)
Tenure (high, relative to mid level)	-0.06** (0.02)	-0.05** (0.02)
Unionized (0/1)	-0.11*** (0.03)	-0.07 (0.06)
Age (young, relative to mid)	0.03+ (0.02)	-0.01 (0.04)
Age (old, relative to young)	0.30*** (0.02)	0.24*** (0.04)
Education (PhD relative to Bachelor)	0.28** (0.10)	0.28** (0.10)
Education (Master, relative to Bachelor)	0.05 (0.04)	0.05 (0.04)
Education (College relative to Bachelor)	0.07** (0.03)	0.07* (0.03)
Education (Less than College, relative to Bachelor)	0.17*** (0.02)	0.17*** (0.02)
Corporate Function Job (0/1)	-0.03+ (0.02)	-0.08* (0.04)
Relative Pay in First Survey Year	0.48*** (0.05)	-0.20+ (0.10)

Firm Size	-0.01* (0.01)	-0.16*** (0.01)
Corporate Function Job*Downturn		0.06 (0.04)
Unionized*Downturn		-0.04 (0.07)
Age (young, relative to mid)*Downturn		0.05 (0.04)
Age (old, relative to mid)*Downturn		0.08+ (0.04)
Relative Pay in First Survey Year*Downturn		0.87*** (0.11)
Firm Size *Downturn		0.19*** (0.01)
Constant	-3.00*** (0.03)	-2.89*** (0.04)
N (firms)	75	75
N (employees)	57,464	57,464
N (employee-year)	199,773	199,773

+p <0.1
**p <= .05*
***p <= .01*
****p <= .001*

Figure 1.1 Trends of Pay Changes for Males and Females at Top Leadership Positions versus Non-Top Leadership Positions

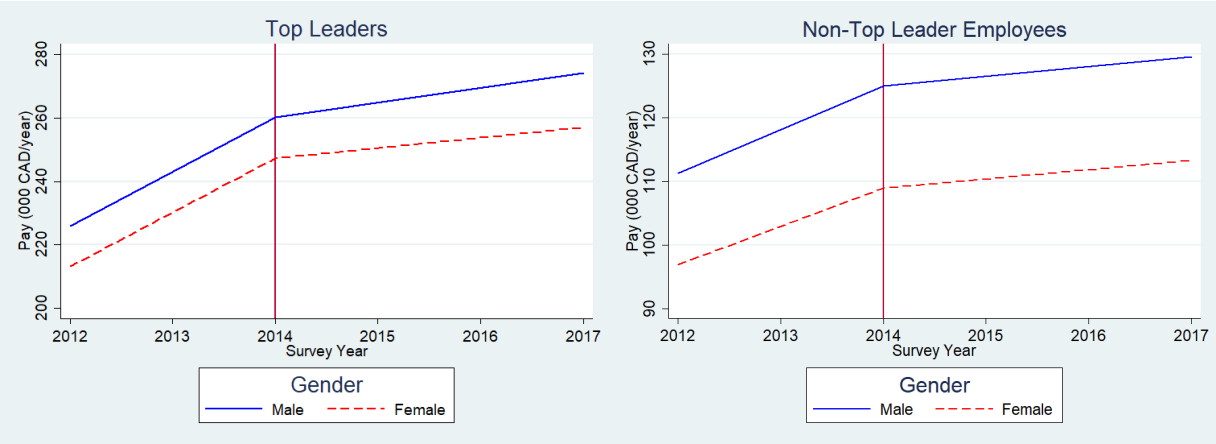


Figure 1.2 Pay Slope Changes of Males and Females at Top Leadership Positions versus Non-Top Leadership Positions from Industry Upturn to Downturn

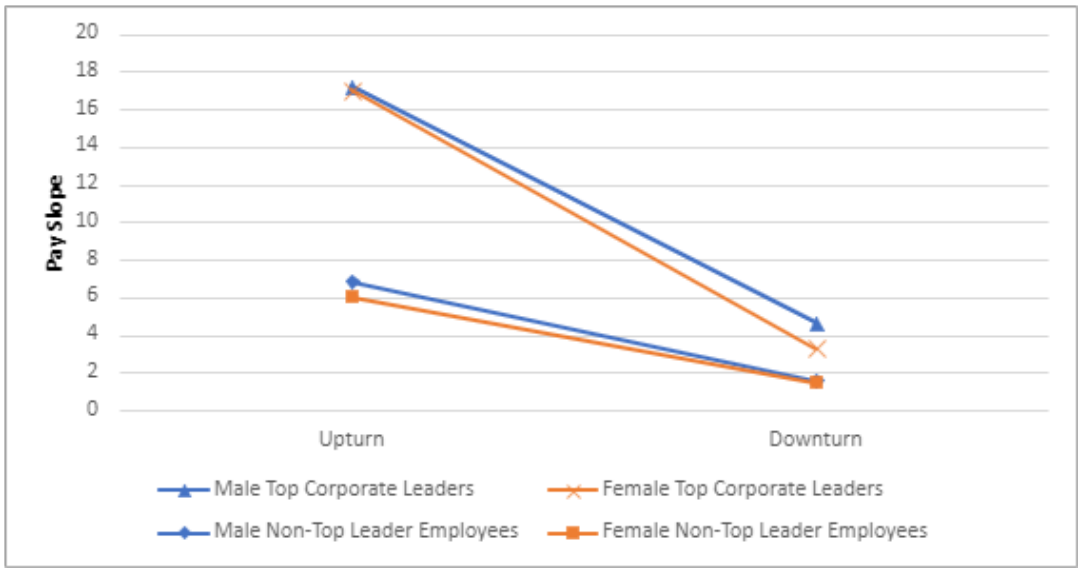
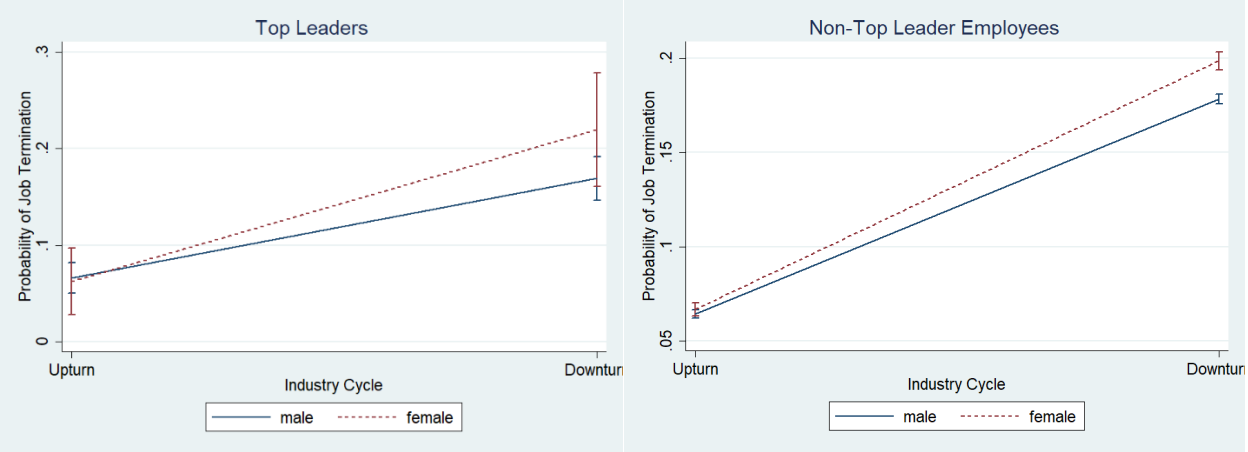


Figure 1.3 Probability of Job Termination for Males and Females at Top Leadership Positions versus Non-Top Leadership Positions from Industry Upturn to Downturn



Study 2: The Glass Cliff: How Individual Performance Matters to Women's Promotion Opportunities in a Crisis

Introduction

The *glass cliff* phenomenon refers to women getting leadership positions associated with a greater risk of failure than men (Haslam et al., 2010; Morgenroth et al., 2020; Ryan & Haslam, 2005). One of the main forms of the glass cliff phenomenon is the increased likelihood of women being selected as leaders during crises (Morgenroth et al., 2020). The phenomenon has attracted a lot of interest from academics and the public (Morgenroth et al., 2020; Ryan et al., 2016). However, empirical results regarding the existence of the glass cliff are mixed (Morgenroth et al., 2020). While some scholars find strong support for the existence of the phenomenon, others find no or very weak support (Haslam & Ryan, 2008; Morgenroth et al., 2020; Ryan et al., 2016), suggesting key moderators have not been addressed.

The glass cliff literature has found moderating effects for characteristics of leadership promotion/appointment decision-makers, contexts for examining the glass cliff, and types of crises (Morgenroth et al., 2020; Reinwald et al., 2022; Ryan et al., 2016). However, less attention is paid to the characteristics of candidates receiving leadership positions during crisis times. This has been identified as an important issue in classical Glass Cliff studies (Kulich et al., 2018). Researching the characteristics of candidates who experience glass cliff versus those who do not helps to clarify the boundary and the underlying mechanisms of the phenomenon. Therefore, the question addressed in this paper is: which women are selected/promoted into leadership positions during crises?

I argue that one characteristic of candidates that moderates the glass cliff effect is candidates' recent individual performance. Literature in crisis leadership/turnaround leadership

emphasized the importance of leaders' abilities both in handling personnel issues (more broadly, managing stakeholder relations) and in implementing changes to effectively improve firm performance during crises (Bundy et al., 2017; Kulich et al., 2018; Slatter et al., 2011; Wu et al., 2021). However, Glass Cliff researchers found that during crisis situations, women candidates were perceived as having advantages in dealing with staffing issues and taking responsibility and blame, but not necessarily in effectively improving firm performance (Ryan et al., 2011). Therefore, it stands to reason that women candidates who show potential for improving firm performance, compared to those who do not, should be more likely to be promoted during crises. Candidates' potential for improving firm performance can be reflected in their individual performance. Outstanding performers/top performers' deep knowledge regarding their work enables them to identify problems and make the right changes to improve firm performance (Siegel, 1993). In addition, top performers pay close attention to tasks (though not necessarily more task-oriented than relationship-oriented), which are critical for improving firm performance during crises (Kulich et al., 2018; Slatter et al., 2011). I argue that the glass cliff, therefore, operates for top performers. That is, being a woman does not necessarily make one more likely to get promoted to leadership positions during crisis times (versus non-crisis times) but being a woman and a top performer at the same time does.

I tested this argument with random-effect logistic regression using a proprietary personnel data set on over 80,000 employees across 200 firms in the Canadian oil and gas industry. In line with the hypothesis, I find the glass cliff effect occurs among top performers but not among non-top performers. Women top performers' relative promotion likelihood (the ratio of women's to men's promotion probability) increased significantly from the upturn to the downturn. On the contrary, women who are not top performers experienced similar relative

promotion likelihood during the upturn and downturn. This effect persists when other characteristics of candidates that could potentially moderate the glass cliff effect are controlled for.

This paper contributes to the glass cliff literature by identifying the critical role of individual performance in the existence of the glass cliff. It also builds a stronger nexus between the crisis leadership literature and the glass cliff literature. The finding of the paper suggests that the boundary of the glass cliff phenomenon arises with the expectation of leaders' ability to improve firm performance during crises. Women only get higher chances for leadership promotions when there's a "cliff" in front of them and they only get those precarious positions if performing at the very top level.

Theory and Hypothesis Development

The Glass Cliff and Underlying Mechanisms

The glass cliff phenomenon was first discussed by Ryan & Haslam (2005) and has been the subject of considerable research since that time (Bennhold, 2016; Morgenroth et al., 2020). The phenomenon was originally examined in the management domain but was later examined in the political, sports, non-profit, and education domains (Morgenroth et al., 2020). The glass cliff phenomenon appears mainly in three different forms. The first form is the positive correlation between crisis time and the appointment of female (versus male) leaders. The second form is women being rated higher as suitable leaders than men in crisis time (versus non-crisis time). The third form is the increased relative likelihood of women being selected as leaders from non-crisis time to crisis time (Morgenroth et al., 2020).

The analysis in this paper is based on the third form of glass cliff because (1) using leadership appointment likelihood instead of gender of leader as the dependent variable allows for including more of candidates' characteristics besides gender in the model; (2) the archival

panel data used in this paper allows for testing within-individual differences across different times, thus suits the research design for testing the third form. Existing glass cliff literature on leadership appointments generally does not distinguish between insider appointments (promotions) and outsider appointments, except for Reinwald et al. (2022), who found that Glass Cliff only occurred in leadership promotions. This paper focuses solely on leadership promotions to (1) avoid the issue of incomparable samples and (2) narrow the focus down to gender equality among existing employees in firms.

Three main explanations are given for the glass cliff phenomenon. The first and the one most frequently referred to, the "stereotype explanation," is that women are promoted to leadership positions during crisis time because it is believed women's communal traits such as sympathetic, understanding, intuitive, and tactful are especially needed in dealing with crisis situations (Morgenroth et al., 2020; Ryan & Haslam, 2007). The second, the "prejudice explanation," is that women are promoted to leadership positions during crisis times because such positions are less desirable to potential candidates and may set them up for failure (Morgenroth et al., 2020; Ryan et al., 2016). The third, the "changes signalling explanation," is that firms promote women to leadership positions during crisis time to signal outside observers about firms' willingness for fundamental changes within the firms (Morgenroth et al., 2020; Reinwald et al., 2022). Among the three explanations, the "stereotype explanation" underlies most empirical studies on the glass cliff and is thus chosen as the basis for building my argument in this paper.

Despite all the efforts spent on explaining the glass cliff, empirical studies showed mixed results regarding the existence of this phenomenon (Adam et al., 2009; Carroll et al., 2013; Morgenroth et al., 2020; Santen & Donker, 2009). A recent meta-analysis by Morgenroth et al.

(2020) concluded “no evidence for the existence of glass cliff in the management domain” (p. 822). The mixed results, rather than disproving the glass cliff, suggest the context-dependent nature of the phenomenon and raise important questions regarding when and where the glass cliff effect occurs (Ryan et al., 2016).

Moderators of the Glass Cliff

Existing literature has identified several factors that influence the presence of the glass cliff phenomenon; however, some important moderators remain overlooked. The moderators that have been addressed in the existing literature can be clustered into three categories: characteristics of promotion decision-makers, contexts for examining the glass cliff, and types of crises (see Table 2.1 for the detailed list). Regarding characteristics of promotion decision-makers, Brown et al. (2011) found that the glass cliff was more likely to exist when the decision-makers hold a strong legitimizing ideology (when they strongly support the status quo and favour system justification) because these decision-makers are more willing to set women up for failure.

Insert Table 2.1 about here

In terms of contexts for examining the glass cliff, Ryan et al. (2010) found that the glass cliff effect occurred in the UK Conservatives Party but not in the Labour Party because the affirmative actions taken by the Labour Party helped ensure election gender equality and avoid the glass cliff. Rink et al. (2013) found that the glass cliff only existed in situations where organizational stakeholders did not support the decision to appoint a new leader, which indicates that social resources would not be available to the new leader and, thus communal leadership skills are needed. In support of the “change signalling explanation”, Reinwald et al. (2022) found that the glass cliff only existed in firms that drew a high level of public attention. They also

found the moderating effect of the existence of existing female executives, such that the glass cliff was only observed in firms without existing female executives. In a similar vein, Bruckmüller & Branscombe (2010) found that the glass cliff only existed in firms with a male-dominated history of leadership.

On the moderating effects of crisis types, Kulich et al. (2015) found that the glass cliff occurred when the crisis was attributed to past leadership but did not occur when the crisis was attributed to global economic circumstances. Mulcahy & Linehan (2014) found the glass cliff existed only if the crisis was severe (when companies' financial loss was big). Ryan et al. (2011) distinguished among crises requiring different leadership actions. They found a preference for female leaders when the crises required leaders to endure the crisis, act as a scapegoat, or handle staffing issues. However, no gender preference was observed when the crises needed leaders to act as spokespersons for the organization or to improve company performance. Haslam et al. (2010) found the glass class cliff phenomenon was contingent on different measures of firm performance: the class cliff effect was observed when stock-based measures instead of accountancy-based firm performance were used to proxy crises.

However, less attention was paid to the characteristics of women candidates receiving promotion decisions. Kulich et al. (2018) pointed out one important problem with prior classical Glass Cliff studies is the lack of consideration for the differences in candidates' characteristics other than their gender. They found when candidates' gender and their leadership traits were both considered, candidates' leadership traits rather than gender predicted their higher likelihood of being selected as leaders during crises. However, Kulich et al. (2018) did not consider the interaction effect between candidates' gender and their leadership traits on crisis leadership selections. The lack of consideration for the moderating effect of candidates' other-than-gender

characteristics could be part of the reasons for the mixed empirical results on the existence of the glass cliff effect.

Individual Performance: The Missing Moderator

Indirect evidence from existing glass cliff literature suggests that an important moderator for the glass cliff effect is candidates' individual performance. A further investigation through experiments into the "stereotype explanation" of the glass cliff phenomenon showed that during crises, women's communal traits were believed to be helpful in dealing with firms' staffing issues and in taking responsibility and blame, but not necessarily helpful in directly improving firm performance (Ryan et al., 2011). However, literature on crisis leadership/turnaround leadership stressed the importance of leaders' abilities both in handling staffing issues and in implementing changes to effectively improve performance in crises (Bundy et al., 2017; Slatter et al., 2011; Wu et al., 2021). In this regard, women candidates who do not show the potential to improve firm performance may not be selected for leadership promotions during crises, while women candidates who show the potential should get a higher promotion chance.

Among women candidates' characteristics, one that reflects their potential for improving firm performance is their individual performance. Firms usually evaluate and rank employees' performance using forced distribution rating systems (Giumetti et al., 2015). The top 10% of performers within firms are typically rated as "top performers." There are two main reasons why being a top performer reflects one's potential to improve firm performance during crises. First, top performers commonly have deep knowledge regarding their work (Siegel, 1993). This makes them more likely to identify problems/opportunities and implement the right changes to help firms turn things around and improve performance. Second, being outstanding in individual performance reflects one's attention to tasks and details, which is necessary for improving firm performance during crises (Kulich et al., 2018; Slatter et al., 2011). Since the potential to

improve firm performance is necessary for effective leadership during crises and the "top performer" status reflects this potential of candidates, I argue that candidates' "top performer" status moderates the existence of the glass cliff effect. Women top performers with the potential to improve firm performance should get a higher relative promotion likelihood during crisis times than non-crisis times. Women non-top performers, though having communal traits that are believed to be helpful to firms during crisis times, lack the potential to save firms' performance and, thus may not get higher relative promotion opportunities during crisis times than during non-crisis times. Based on this argument, I develop the following hypothesis.

Hypothesis: Women top performers experience a higher promotion likelihood (relative to their male counterparts) during the crisis time than during the non-crisis time.

Method

Data

The research context is the oil and gas exploration and production (E&P) industry in Canada from 2012-2017, during which time there were fluctuating economic conditions due to unstable international oil prices (Wang et al., 2019). The six-year period covered in the dataset includes a major downturn in the E&P industry (2015-2017) and an equal-length upturn (2012-2014). The long-lasting and serious industry downturn of 2015-2017 makes an appropriate context for studying the "crisis time." The management domain, from which the glass cliff literature originates, is selected due to its foundational role in current theoretical explanations of the glass cliff phenomenon. The data were obtained from a large multinational consulting firm that collects annual data regarding detailed compensation and career level information of employees in different firms.

Dependent Variable

The statistical model of this paper predicts the log-odds of *Leadership Promotion (PM),* the dependent variable. *PM* is measured by a dummy variable that equals 1 if an employee's career level changed upward in a certain year and equals 0 if not.

The log-odds of *PM* is then used to calculate the relative likelihood of *PM* for women candidates—the ratio between women candidates' and men candidates' probability of *PM*. We focus on the relative likelihood of *PM* for women candidates in this paper because both men's and women's probability of *PM* decrease during a serious crisis given the reduced number of promotion positions available. As a result, it only makes sense to test the glass cliff effect by comparing the relative likelihood of *PM* for women candidates during crisis time versus during non-crisis time.

Independent Variables

Crisis Time (CRISIS) is proxied by the industry downturn, a dummy variable that equals 1 if the fiscal year is in a downturn and 0 if in an upturn. Upturn years in this study include 2012, 2013, and 2014 while downturn years include 2015, 2016, and 2017. *Gender (FEM)* is measured by a dummy variable (1=female; 0=male). *Recent Performance (TOP_L)* is measured by whether an individual employee has been rated by their firms as a top performer (typically the top 10% of employees by individual performance) or not (1=top performer; 0=non-top performer) in the year before the fiscal year. In cases where the *TOP_L* of an employee in a certain year is missing, *TOP_L* is coded as 0.

Control Variables

Career Level at First Survey Year (CL), Age (AGE), Tenure (TEN), education (ED), *type of occupation at First Survey Year (OT)*, and *size of the firm an employee belongs to (FSIZE)* are controlled as they potentially affect the existence of the glass cliff effect (Morgenroth et al.,

2020; Reinwald et al., 2022). *Career Level at First Survey Year (CL)* is a categorical variable that includes 9 specific career levels ranging from entry-level to head of organization. *Age (AGE)* is a categorical variable measured by the age group (young and old compared to the mid-age group) to which an employee belongs. *Tenure (TEN)* is a categorical variable measured by the length between an employee's hiring year and the first survey year (low-tenure and high-tenure compared to mid-tenure). *Education (ED)* is a categorical variable containing five different education levels (Ph.D., Master, Bachelor, College, and Less than College). *Type of Occupation at First Survey Year (OT)* is a categorical variable containing 19 different types of occupations such as administration, engineering, accounting, etc. The *size of the firm an employee belongs to (FSIZE)* is measured by the firm's yearly average number of employees.

Analysis Tool and Models

The random-effect logistic regression is used for data analysis because of the dichotomous dependent variable and the existence of both within-individual and between-individual variances (Mehmetoglu & Jakobsen, 2022). The Hausman test also supports the use of the random-effect model instead of the fixed-effect model. The baseline model tests if there is a general glass cliff effect on women. It includes the two-way interaction between the *Crisis Time* and *Gender (CRISIS * FEM)* and other two-way interactions that could potentially suppress/exclude the glass cliff effect, including *CRISIS * TOP_L*, *CRISIS * AGE*, *CRISIS * TEN*, and *CRISIS * CL*.

In the full model, I include the three-way interaction among *Crisis Time (CRISIS), Gender (FEM)*, and *Recent Performance (TOP_L)* to test the moderating effect of *TOP_L* on the existence of the glass cliff effect. In addition, I also controlled for the potential moderating effects of *AGE, TEN, CL,* and *FSIZE* on the glass cliff effects (Mulcahy & Linehan, 2014;

Morgenroth et al, 2020). The final samples used in both the baseline model and the full model include 59,930 employees and 177,963 individual-year observations. The baseline model and full model are specified as equations (1) and (2) below:

$$(1)\ PM=\beta_0+\beta_1(CRISIS_{ij})+\beta_2(TOP\_L_{ij})+\beta_3(FEM_j)+\beta_4(TEN\_L_j)+\beta_5(TEN\_H_j)+\beta_6(UNION_j)+\beta_7(AGE\_Y_j)+\beta_8(AGE\_O_j)+\beta_9(ED1_j)+\beta_{10}(ED2_j)+\beta_{11}(ED4_j)+\beta_{12}(ED5_j)+\{\beta_{13}(CL1_j)+\ldots+\beta_{20}(CL8_j)\}+\{\beta_{21}(OT1_j)+\ldots+\beta_{38}(OT18_j)\}+\beta_{39}(FSIZE_j)+\beta_{40}(CRISIS_{ij}*FEM_j)+\beta_{41}(CRISIS_{ij}*TOP\_L_{ij})+\beta_{42}(CRISIS_{ij}*TPLD_j)+\beta_{43}(CRISIS_{ij}*TEN\_L_j)+\beta_{44}(CRISIS_{ij}*TEN\_H_j)+\beta_{45}(CRISIS_{ij}*AGE\_Y_j)+\beta_{46}(CRISIS_{ij}*AGE\_O_j)+e_{ij}+u_{0j}$$

$$(2)\ PM=\beta_0+\beta_1(CRISIS_{ij})+\beta_2(TOP\_L_{ij})+\beta_3(FEM_j)+\beta_4(TEN\_L_j)+\beta_5(TEN\_H_j)+\beta_6(UNION_j)+\beta_7(AGE\_Y_j)+\beta_8(AGE\_O_j)+\beta_9(ED1_j)+\beta_{10}(ED2_j)+\beta_{11}(ED4_j)+\beta_{12}(ED5_j)+\{\beta_{13}(CL1_j)+\ldots+\beta_{20}(CL8_j)\}+\{\beta_{21}(OT1_j)+\ldots+\beta_{38}(OT18_j)\}+\beta_{39}(FSIZE_j)+\beta_{40}(CRISIS_{ij}*FEM_j)+\beta_{41}(CRISIS_{ij}*TOP\_L_{ij})+\beta_{42}(FEM_j*TOP\_L_{ij})+\beta_{43}(CRISIS_{ij}*FEM_j*TOP\_L_{ij})+\beta_{44}(CRISIS_{ij}*TPLD_j)+\beta_{45}(FEM_j*TPLD_j)+\beta_{46}(CRISIS_{ij}*FEM_j*TPLD_j)+\beta_{47}(CRISIS_{ij}*TEN\_L_j)+\beta_{48}(CRISIS_{ij}*TEN\_H_j)+)+\beta_{49}(FEM_j*TEN\_L_j)+\beta_{50}(FEM_j*TEN\_H_j)+\beta_{51}(CRISIS_{ij}*FEM_j*TEN\_L_j)+\beta_{52}(CRISIS_{ij}*FEM_j*TEN\_H_j)+\beta_{53}(CRISIS_{ij}*AGE\_Y_j)+\beta_{54}(CRISIS_{ij}*AGE\_O_j)+\beta_{55}(FEM_j*AGE\_Y_j)+\beta_{56}(FEM_j*AGE\_O_j)+\beta_{57}(CRISIS_{ij}*FEM_j*AGE\_Y_j))+\beta_{58}(CRISIS_{ij}*FEM_j*AGE\_O_j)+\beta_{59}(FEM_j*FSIZE_i)+\beta_{60}(CRISIS_{ij}*FSIZE_i)+\beta_{61}(FEM_j*CRISIS_{ij}*FSIZE_i)+e_{ij}+u_{0j}\ ,$$

where the *ij* suffix on the explain variables refers to the variable value of year i for individual j; variables with suffix *ij* are level-1 variables and variables with only suffix *j* (without *i*) are level-2 variables; e_{ij} *and* u_{0j} in Models 1 and 2 are within variation error term and individual-specific (rather than time-specific) error term.

Results

The correlations among all variables included in the analysis, as well as the means and standard errors of all included samples for each variable are shown in Table 2.2. Among all the individual-year observations, 11% are associated with a promotion case. Across all samples used for regression analyses, there are a total of 19,047 promotion cases. Among these promotion cases, 12,078 (63%) are in upturns and 6,969 (37%) are in downturns; 13,568 (71%) are men promotions and 5,479 (29%) are women promotions.

Insert Table 2.2 about here

The regression results are shown in Table 2.3. The baseline model shows that the coefficient of *FEM* is negative (β = -0.24, p < .001, odds ratio = 0.79), suggesting that, in general, the odds of women being promoted are 21% lower than those for men. The coefficient of *CRISIS* is negative (β = -1.38, p < .001, odds ratio = 0.25), indicating that an employee's odds of promotion in the downturn are typically 75% lower than in the upturn. The coefficient of *TOP_L* is positive (β = 0.61, p < .001, odds ratio = 1.84), indicating that top performers' promotion odds are 84% higher than non-top performers. The coefficients of control variables show that unionized employees are promoted more than non-unionized employees (β = 0.38, p < .001, odds ratio =1.46); high-tenure employees get fewer promotions than mid-tenure employees (β = -0.15, p < .001, odds ratio = 0.86); young employees get more promotions than mid-age employees (β = 0.17, p < .001, odds ratio = 1.19); old employees get less promotions than mid-age employees (β = -0.50, p < .001, odds ratio = 0.61); employees with a Master's degree get more promotions than those with a Bachelor's degree (β = 0.17, p < .001, odds ratio = 1.19); employees with under-college degrees get less promotions than those with a Bachelor's degree (β = -0.18, p < .001, odds ratio = 0.84); employees in larger firms get smaller promotion chances (β = -0.06, p < .001, odds ratio = 0.94).

Insert Table 2.3 about here

The interaction of *CRISIS* and *FEM* is positive ($\beta = 0.09$, $p < .01$), indicating a general but small glass cliff effect among all employees. However, in the full model where three-way interactions are included, the two-way interaction of *CRISIS* and *FEM* turns non-significant ($\beta = 0.07$, n.s.), while the three-way interaction among *CRISIS, FEM*, and *TOP_L* is positive ($\beta = 0.23$, $p < .05$), controlling for other related three-way interactions (all non-significant in the full model). The non-significant two-way interaction indicates that for non-top performers, the changing slope of women's promotion log-odds from the upturn to the downturn is not significantly different from men's (*chi2*= 2.1, n.s.). In other words, women's promotion probability relative to men's does not change significantly from the upturn to the downturn (see Figure 2.1), indicating the absence of the glass cliff effect among non-top performers. The positive and significant three-way interaction indicates that the change in women's relative promotion likelihood from the upturn to the downturn is significantly more positive among top performers than among non-top performers. A comparison test shows that women top performers' relative promotion likelihood increased significantly from the upturn (86%) to the downturn (106%) (*chi2*= 5.7, $p < .05$), indicating a clear glass cliff effect. This difference in changing slopes of women top performers versus women non-top performers regarding relative promotion likelihood (as is shown in Figure 2.1) illustrates the moderating effect of candidates' "top performer" status on the glass cliff effect.

Insert Figure 2.1 about here

Discussion and Conclusion

This paper contributes to the glass cliff literature by addressing the moderating effects of candidates' recent individual performance, which may have been an important factor leading to the mixed empirical results regarding the existence of glass cliffs. The recent meta-analysis by Morgenroth et al. (2020) found mixed results regarding the glass cliff effect in the management and sports domains, but consistent results supporting the glass cliff effect in the non-profit and education domains. The reason for this result is not yet well explained. The finding of this paper suggests that the more consistent empirical support for the glass cliff in the non-profit and education domains might be associated with the less urgent need for leaders' performance-improving ability (compared to the management and sports domains) during crises.

This study also builds a stronger nexus between the glass cliff and crisis leadership literature. Based on insights from the crisis leadership literature regarding the importance of crisis leaders' ability to effectively improve firm performance, Kulich et al. (2018) argued that candidates' leadership traits, rather than gender, predicted their higher chance in crisis leadership selection. Their argument and findings challenge the glass cliff literature to look beyond gender. Our paper, based on insights from the crisis leadership literature (Bundy et al., 2017; Slatter et al., 2011; Wu et al., 2021), argued for the importance of both candidates' gender and their performance-improving potential and highlighted the positive interaction effect between the two for crisis leadership selection.

The study also speaks to the theoretical explanations of the glass cliff phenomenon. The finding from this paper supports the "stereotype explanation," which suggests that firms promote women to leadership positions during crises to take advantage of women's communal leadership traits, but does not support the "prejudice explanation," which suggests that firms promote

women to leadership positions during crises to set women up for failure. This is consistent with prior research (i.e., Ryan & Haslam, 2007; Haslam & Ryan, 2008), which challenged the "prejudice explanation" by finding that people who hold sexist views (compared to those who rejected the views) were not more likely to push women to glass cliffs. Regarding the "stereotype explanation," Ryan et al. (2011) refined it by finding that communal leadership traits are not always preferred during crises. Building on their study, this paper suggests that communal traits, only when combined with candidates' potential for effectively improving firm performance, are preferred by leadership promotion decision-makers during crises (versus non-crisis situations). This means that not only are women getting more precarious leadership positions than men, but they also have to work hard until they are the very best to get to those precarious leadership positions. By revealing this fact, this paper hopes to call further attention to this very subtle form of gender discrimination. We also hope that with further refined knowledge of the glass cliff phenomenon, more effective actions could be taken to promote gender equality and diversity in the workplace.

The empirical analysis of this paper presents some methodological improvements compared to the prior glass cliff literature. The use of industry downturns to measure crises in this paper helps avoid the reverse causality concerns often associated with prior empirical research that proxies crises by declining firm performance (Adam et al., 2009; Cook & Glass, 2014; Reinwald et al., 2022). A negative relationship between firm performance and women leader appointment could be interpreted as the latter causing the former, but a negative relationship between industry downturn and women leader appointment only indicates one causal direction—the former causing the latter.

In addition, this paper extended the sample of empirical research regarding the glass cliff from executives/top management promotions to low/middle management promotions (Morgenroth et al., 2020; Ryan et al., 2016). This is important because the original definition and explanations of the glass cliff do not exclude low/middle management promotions (Haslam & Ryan, 2008; Ryan & Haslam, 2005; Haslam et al., 2010), but data on those promotion cases are rarely available. The finding of this paper clarifies that the glass cliff effect is not limited to executives/top management promotions. Future research would benefit from verifying the findings of this paper with contexts beyond the E&P industry and the business domain, which this paper focused on. Moreover, research focusing on minority groups in addition to women, such as ethnic or racial minorities, would further contribute to the glass cliff literature.

Table 2.1 Moderators of the glass cliff effect studied in existing literature

	Study	Moderator Studied	Context of Study	Methodology
Characteristics of promotion decision-makers	Brown et al. (2011)	Decision-makers' legitimizing ideology	Political Leader Selection	Experimental
Contexts for examining the glass cliff	Ryan et al. (2010)	Conservative/Labor Party	Gender difference in seats contested in Political Parties	Archival
	Rink et al. (2013)	Social resources availability in firms	Corporate Leader Evaluation	Experimental
	Reinwald et al. (2022)	Existence of existing female executives in firms; public attention drawn by firms	Corporate Top Management Appointment	Archival
	Bruckmüller & Branscombe (2010)	Firms' male-dominated history of leadership	Corporate Leader Selection	Experimental
Types of crises	Kulich et al. (2015)	Crisis attributed to past leadership versus global economic circumstances	Corporate Leader Selection	Experimental
	Mulcahy and Linehan (2014)	Severity of crisis	Changes of Board Gender Diversity	Archival
	Ryan et al. (2011)	Crises requiring different leadership actions	Corporate Manager Evaluation	Experimental
	Haslam et al. (2010)	Accountancy/Stock-based performance measures.	Women's appearance on company boards	Archival

Table 2.2 Means, Standard Deviations, and Correlations

	Mean	**s.d.**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	
1.PM	0.11	0.31	1							
2.FEM	0.29	0.45	0.00	1						
3.CRISIS	0.46	0.50	-0.14	-0.01	1					
4.TOP_L	0.15	0.36	0.04	0.01	0.07	1				
5.TEN_L	0.51	0.50	0.08	-0.01	0.12	-0.07	1			
6.TEN_M	0.26	0.44	-0.01	0.02	-0.07	0.03	-0.60	1		
7.TEN_H	0.23	0.42	-0.09	-0.01	-0.06	0.04	-0.56	-0.32	1	
8.UNION	0.08	0.26	0.01	-0.13	-0.02	-0.12	-0.05	0.03	0.03	
9.AGE_Y	0.37	0.48	0.16	0.05	0.05	0.03	0.25	0.00	-0.30	
10.AGE_M	0.28	0.45	-0.03	-0.01	0.01	0.01	-0.02	0.03	-0.01	
11.AGE_O	0.35	0.48	-0.13	-0.04	-0.06	-0.04	-0.23	-0.03	0.30	
12.ED1	0.00	0.07	0.00	-0.01	-0.01	0.02	0.00	0.00	0.00	
13.ED2	0.04	0.19	0.00	-0.01	0.00	0.07	0.00	-0.01	0.01	
14.ED3	0.19	0.39	0.05	0.04	0.00	0.14	0.00	0.00	0.00	
15.ED4	0.12	0.33	0.00	0.05	-0.01	0.06	-0.02	0.03	-0.01	
16.ED5	0.65	0.48	-0.04	-0.06	0.01	-0.19	0.02	-0.02	0.00	
17.FSIZE	0.00	1.32	-0.01	-0.09	0.01	0.00	-0.11	0.03	0.10	
	8	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
8.UNION	1									
9.AGE_Y	0.02	1								
10.AGE_M	-0.03	-0.48	1							
11.AGE_O	0.00	-0.56	-0.46	1						
12.ED1	-0.02	-0.02	0.01	0.01	1					
13.ED2	-0.06	-0.05	0.04	0.01	-0.01	1				
14.ED3	-0.13	0.07	-0.02	-0.05	-0.03	-0.10	1			
15.ED4	-0.10	-0.03	0.00	0.02	-0.02	-0.07	-0.18	1		
16.ED5	0.20	-0.02	0.00	0.02	-0.09	-0.27	-0.65	-0.51	1	
17.FSIZE	0.27	0.01	0.00	-0.01	-0.02	-0.06	-0.19	-0.13	0.27	1

***** Two variables are omitted in the correlation table to save space: *Career Level at First Survey Year (CL),* which is a categorical variable including 9 specific career levels, and *Type of Occupation at First Survey Year (OT),* which is a categorical variable including 19 specific occupation types.

Table 2.3 Results Predicting Log-Odds of Promotion for Men and Women Top Performers versus Non-Top Performers during Different Times

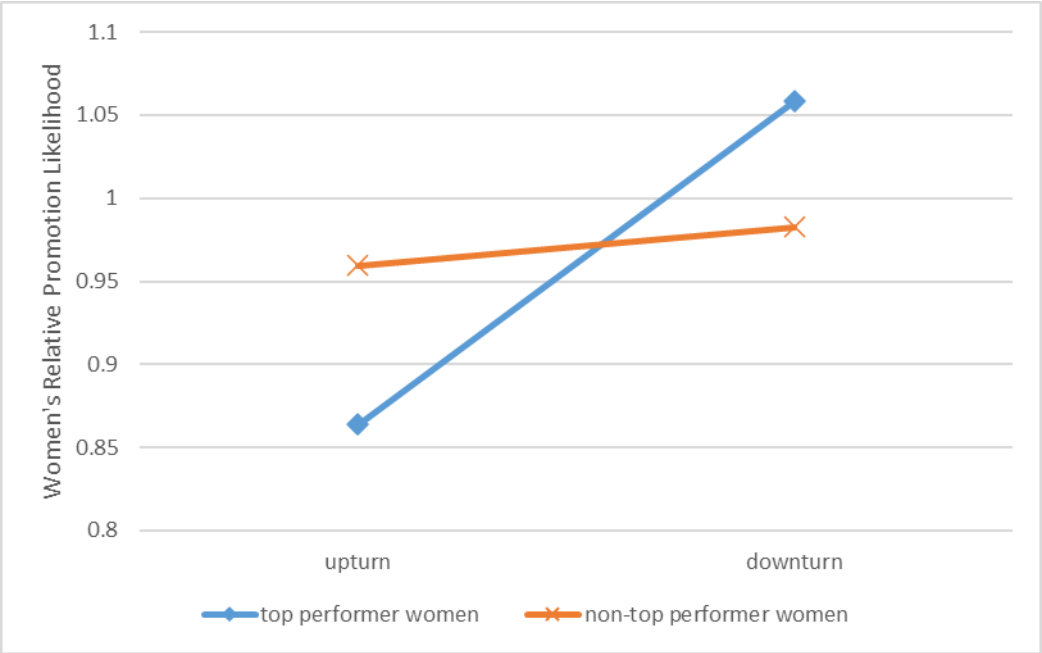
	Variables:	**Baseline Model**	**Full Model**
Time-Level Variable	Downturn (0/1)	-1.38*** (0.05)	-1.38*** (0.06)
	Top Performer (0/1, 1 year lagged)	0.61*** (0.03)	0.65*** (0.04)
Employee-Level Variables	Female (0/1)	-0.24*** (0.03)	0.02 (0.06)
Interactions	Top Performer *Downturn	-0.10* (0.04)	-0.08 (0.05)
	Female*Downturn	0.09** (0.04)	0.07 (0.10)
	Female*Top Performer		-0.15* (0.07)
	Female*Downturn*Top Performer		0.23* (0.09)
Controls:			
Employee -Level Controls (constant over time)	Tenure (low, relative to mid level)	-0.05+ (0.02)	0.00 (0.03)
	Tenure (high, relative to mid level)	-0.15*** (0.03)	-0.22*** (0.04)
	Unionized (0/1)	0.38*** (0.04)	0.39*** (0.04)
	Age (young, relative to mid)	0.17*** (0.03)	0.15*** (0.03)
	Age (old, relative to young)	-0.50*** (0.03)	-0.49*** (0.04)
	Education (Phd, relative to Bachelor)	0.20+ (0.12)	0.20+ (0.12)
	Education (Master, relative to Bachelor)	0.15*** (0.04)	0.15*** (0.04)
	Education (College relative to Bachelor)	-0.05+ (0.03)	-0.06+ (0.03)
	Education (Under College, relative to Bachelor)	-0.19*** (0.02)	-0.19*** (0.02)

	Type of Occupation at First Survey Year (0/1)	controlled	controlled
	Career Level at First Survey Year (0/1)	controlled	controlled
	Size of Firm that an Employee Belongs to (yearly average)	-0.06*** (0.01)	-0.06*** (0.01)
Interaction Controls	Career Level at First Survey Year (Executives)*Female		0.54 (0.41)
	Career Level at First Survey Year (Executives)*Downturn	1.05*** (0.22)	1.05*** (0.25)
	Career Level at First Survey Year (Executives)*Female*Downturn		0.11 (0.58)
	Tenure (low, relative to mid level)*Female		-0.15** (0.05)
	Tenure (high, relative to mid level) *Female		0.23*** (0.07)
	Tenure (low, relative to mid level)*Downturn	0.24*** (0.04)	0.22*** (0.05)
	Tenure (high, relative to mid level) * Downturn	-0.03 (0.06)	0.04 (0.08)
	Tenure (low, relative to mid level)*Female*Downturn		0.07 (0.09)
	Tenure (high, relative to mid level) *Female*Downturn		-0.21 (0.13)
	Age (young, relative to mid) *Female		0.10+ (0.06)
	Age (old, relative to young) *Female		-0.04 (0.07)
	Age (young, relative to mid) *Downturn	0.07+ (0.04)	0.10* (0.05)
	Age (old, relative to young) *Downturn	-0.04 (0.05)	-0.07 (0.06)
	Age (young, relative to mid) *Female*Downturn		-0.10 (0.09)
	Age (old, relative to young) *Female*Downturn		0.12 (0.12)
	Female* Size of Firm that an Employee Belongs to		0.05** (0.02)
	Downturn* Size of Firm that an Employee Belongs to		-0.13*** (0.02)
	Female*Downturn*Size of Firm that an Employee Belongs to		-0.04 (0.03)

	Constant	-0.29 (0.18)	-1.07*** (0.19)
Number of Observations	N (employees)	59,930	59,930
	N (employee-year)	177,963	177,963

+p <0.1
**p <= .05*
***p <= .01*
****p <= .001*

Figure 2.1 The Changes in Women's Relative Promotion Likelihood (the ratio of women's to men's promotion probability) from the Upturn to the Downturn



Study 3: When are Human Assets Embodied in Acquisitions Valuable? The Impact of Industry Cycles on Human-Assets-Embodied Acquisitions

Introduction

Human assets–the collective knowledge, skills, and qualities of individuals possessed by and valuable to an organization (Becker, 2009; Coff, 1993)–are a key factor firms take into consideration in their acquisition decisions (Chen et al., 2023; Coff, 1993, 2002; Younge et al., 2015). An important reason, though not always the dominating one, that firms acquire is to get talented employees from the targets (Boyacıoğlu et al., 2023; Chatterji & Patro, 2014; Ng & Stuart, 2022). Firms obtain human assets through acquisitions because it helps firms get intact teams and skilled talents that could be hard to access through alternative ways (Chen et al., 2023; Coff, 2002; Groysberg & Abrahams, 2006; Munyon et al., 2011; Ng & Stuart, 2022).

However, contextual contingencies may affect corporate decision-makers' perceptions (Cappelli & Sherer, 1991; Johns, 2006; Mowday & Sutton, 1993), such that certain human assets may be perceived as valuable in one context but not so in another. In this paper, we investigate how industry cycles, an important market context, affect the perceived value of human assets embodied in acquisition deals and, therefore, firms' behaviors of acquiring human-assets-embodied (HAE) targets.

We argue that firms value human assets embodied in acquisitions during upturns but not downturns. First, firms tend to focus on business expansion and speed of scaling during upturns (Lubatkin & Chatterjee, 1991; Mascarenhas & Aaker, 1989). In this sense, firms should find the teams of employees embodied in acquisitions valuable because they help firms accelerate business growth by saving them time on training new hires, building new teams, and developing team-specific human capital (Chen et al., 2023; Eckardt et al., 2018; Groysberg & Abrahams,

2006; Huckman & Pisano, 2006; Munyon et al., 2011). Nevertheless, firms would find HAE acquisitions unnecessary during downturns because the speed of growth is no longer their primary focus (Mascarenhas & Aaker, 1989). Instead, firms prioritize survival over growth during downturns (Lubatkin & Chatterjee 1991; Mascarenhas & Aaker, 1989). Since HAE acquisitions increase firms' labor costs and make survival more difficult, firms view human assets embodied in acquisitions as unnecessary costs during downturns.

Second, the open labor market is tight during upturns, making it difficult and expensive to hire individual talents directly from the market (Cappelli & Keller, 2014; Chen et al., 2023). In this sense, firms see HAE acquisitions as an alternative way to acquire talented employees while avoiding the shortage and fierce competition for skilled workers in the open labor market (Chen et al., 2023). However, the labor market is slack during downturns, and hiring individuals directly from the market is comparatively easy and less expensive (Cappelli & Sherer, 1988; Greer, 1984; Greer & Ireland, 1992). As a result, HAE acquisitions offer no advantage over direct labor market hiring for human assets acquisitions and, thus, are no longer attractive for firms. Given these influences of industry cycles on firms' perceived value of human assets embodied in acquisitions, firms should be more likely to acquire HAE targets during upturns than during downturns.

As a comparison, we examine the effects of industry cycles in acquisitions that do not involve human assets, which we term human-asset-free (HAF) acquisitions. Firms would use HAF acquisitions during upturns because they, like HAE acquisitions, contribute to firms' business growth/expansion, though the contribution is less than HAE acquisitions (Lubatkin & Chatterjee 1991; Mascarenhas & Aaker, 1989). However, firms would also use HAF acquisitions during downturns. Costs associated with the holding and maintenance of the physical assets

acquired through HAF acquisitions are more controllable than labor costs. Firms can pay the minimum maintenance costs and save the acquired physical assets for later use/development when the downturn ends. In this sense, HAF acquisitions add less financial burden to firms. Moreover, firms can get lower-priced and better-quality physical assets during downturns because of the urgency for asset sales and the higher odds of better-quality assets being sold (Kusewitt, 1985; Maksimovic & Phillips, 1998, 2001; Pangarkar &. Lie, 2004). Therefore, we argue that firms would be equally likely to acquire HAF targets during upturns and downturns.

We tested these arguments with random-effect logistic regressions using a longitudinal dataset comprising 821 acquisition deals of 114 crude oil-focused Exploration and Production (E&P) firms, which existed through the studied period from the first quarter of 2007 to the fourth quarter of 2020. The studied period encompasses two major downturns that significantly impacted the E&P industry, particularly oil-focused E&P firms. The results show that the probability of firms acquiring HAE targets is significantly higher during upturns than during downturns, controlling for other factors that could affect firms' acquisition likelihood. Moreover, the probability of firms acquiring HAF targets is similar during both upturns and downturns.

This paper contributes to the literature on human capital acquisitions by examining the impact of industry cycles on firms' HAF acquisitions, a key way of acquiring human capital. It deepens our understanding of firms' HAE acquisition behaviors by explaining how they are affected by firms' varying perceptions at different times. This study also contributes to the Mergers & Acquisition literature by expanding knowledge on the differences between HAE acquisitions and HAF acquisitions and highlighting industry cycles as an important antecedent of these different types of acquisitions.

Theory and Hypothesis Development

Firms' acquisition decisions are affected by various factors, such as external environment, firm characteristics, focus on value creation, and managerial self-interests (Haleblian et al., 2009). One key factor affecting firms' acquisition decisions is human assets embodied in acquisition deals. Here, human assets refer to the collective skills, knowledge, abilities, and qualities of individuals possessed by and valuable to the organization (Becker, 2009; Coff, 1993; Ng & Stuart, 2022; Ranft & Lord, 2000).

A stream of literature focuses on those acquisitions in which the goal is to obtain human assets in the target firms (Coff, 1993; Chen et al., 2023; Munyon et al., 2011; Coyle & Polsky, 2013). Firms are willing to acquire a target to obtain their human assets even if the target firm does not have any real product/service, the so-called "acq-hiring" phenomenon (Boyacıoğlu et al., 2023; Chatterji & Patro, 2014; Coyle & Polsky, 2013). Firms acquire human assets by acquiring entire firms or business units because it helps firms improve their speed of scaling/business expansion and avoid the difficulties in hiring talented employees from the external labor market (Ng & Stuart, 2022; Chen et al., 2023; Munyon et al., 2011; Coyle & Polsky, 2013).

Researchers have emphasized the importance of context in shaping individual and organizational behaviors (Cappelli & Sherer, 1991; Johns, 2006; Mowday & Sutton, 1993). However, the contextual effect in firms' human capital acquisitions is not well-addressed. In this study, we investigate the impact of industry cycles, a critical environmental context, on firms' behaviors toward human-assets-embodied (HAE) acquisitions.

Industry Cycles and Human-Assets-Embodied Acquisitions

We argue that industry cycles affect firm decision-makers' perceptions such that human assets embodied in acquisitions may be viewed as valuable during upturns but not during

downturns. Firms value human assets embodied in acquisitions during upturns for two main reasons. First, firms tend to prioritize business expansion during upturns, and human assets embodied in acquisitions help accelerate this process (Mascarenhas & Aaker, 1989; Pangarkar & Lie, 2004). For individuals hired directly from the open labor market, firms need to spend a significant amount of time training these employees and building new teams from them (Chen et al., 2023; Munyon et al., 2011; Coff, 2002). In light of the fierce competition and fast changes in the business world, "building work teams from scratch can be yesterday's luxury" (Wysocki, 1997, p. A1). In this sense, getting entire teams of employees who already know each other and their work can benefit firms by saving them time in training new employees, familiarizing them with each other, and building new teams from them (Chen et al., 2023; Munyon et al., 2011). HAE acquisitions also help accelerate firms' growth by retaining the team-specific human capital (such as knowledge of unique routines and skills specific to team collaborations), which is valuable only to the teams within the target firms or business units (Becker, 2009; Groysberg et al., 2008; Huckman & Pisano, 2006). One drawback of acquiring individual talents from other organizations is losing the acquired individuals' team-specific human capital that ensured their high performance at their original organization (Groysberg et al., 2008; Campbell et al., 2014). By allowing for the acquisition of entire teams, HAE acquisitions ensure that acquired talent do not have to spend time learning routines and establishing norms (Eckardt et al., 2018; Groysberg et al., 2008; Groysberg & Abrahams, 2006).

Second, the open labor market is tight during upturns, and HAE acquisitions help avoid the shortage of and fierce competition for skilled workers in the open labor market (Ng & Stuart, 2022; Chen et al., 2023). The tight labor market during upturns makes it difficult and expensive to hire individual talents directly (Cappelli & Keller, 2014; Chen et al., 2023). As the "war for

talents" intensifies during upturns, firms explore alternative methods of acquiring human assets (Michaels et al., 2001; Ng & Stuart, 2022). In this sense, HAE acquisitions provide firms with an alternative way to access skilled workers without relying directly on the open labor market and thus would be valued by firms during upturns.

However, firms would not value human assets embodied in acquisitions during industry downturns. First, expansion and growth are no longer firms' priorities during downturns (Bundy et al., 2017; Wu et al. 2021), so the expansion-accelerating effect of HAE acquisitions loses its attractiveness to firms. Instead of expansion and growth, firms tend to prioritize survival during downturns, and one typical thing they do is lay off employees to save on labor costs (Cascio, 1993; Lubatkin & Chatterjee, 1991; Mascarenhas & Aaker, 1989). Since human assets embodied in acquisitions increase firms' labor costs, and thus add pressure to firms' survival, firm decision-makers should see them as unnecessary and burdensome.

Though firms could engage with countercyclical hiring strategies and hoard employees during the downturn (Greer, 1984; Greer & Ireland, 1992), they are unlikely to favor the approach of HAE acquisitions. The open labor market is slack during downturns and individual hiring directly from the labor market is easy and inexpensive (Cappelli & Sherer, 1988; Greer & Ireland, 1992). As a result, acquiring human assets through HAE acquisitions is no longer cost-competitive, leading firms to prefer hiring directly from the open labor market. In summary, firms should view human assets embodied in acquisitions as beneficial and valuable during upturns but not during downturns. As a result, firms would be more willing to engage with HAE acquisitions during upturns than downturns.

Hypothesis: Firms are more likely to acquire Human-Assets-Embodied targets during upturns than downturns.

Industry Cycles and Human-Asset-Free Acquisitions

Industry cycles affect the likelihood of human-asset-free (HAF) acquisitions, which involve only physical assets such as land, buildings, facilities, and equipment (Lee et al., 2018), differently compared to human-assets-embodied (HAE) acquisitions. Firms may use HAF acquisitions during economic upturns because the physical assets acquired through these transactions contribute to firm growth by saving time that would otherwise be spent creating these assets independently or purchasing them piecemeal from the market (Maksimovic & Phillips, 2001). Although firms still need to hire new employees and build new teams to operate the acquired physical assets, they would opt for HAF acquisitions during upturns because of their interest in business expansion and growth (Mascarenhas & Aaker, 1989).

Firms could also use HAF acquisitions during downturns. Due to the absence of human assets in transactions, HAF acquisitions do not directly increase firms' labor costs. Although firms would still incur costs associated with the holding and maintenance of the physical assets acquired through HAF acquisitions, these costs are more controllable than labor costs. Since acquired physical assets, unlike human assets, are wholly owned and controlled by firms, they cannot choose to leave if firms are not treating them well (Coff, 1993, 1997). As a result, firms can pay the minimum maintenance costs and save the acquired physical assets for later use/development when the downturn ends. The slack labor market makes this easy and less expensive even if firms need to hire new employees to operate the acquired assets during the downturn. In summary, HAF acquisitions add less financial burden and pressure for firms during downturns.

In addition, firms would use HAF acquisitions during downturns because they can take advantage of the low price and high quality of physical assets (Maksimovic & Phillips, 1998, 2001; Shleifer & Vishny, 2011). The cost of physical assets is lower during downturns than

upturns because the default risk and survival pressure push firms to sell assets quickly (Shleifer & Vishny, 2011).[1] The quality of assets that firms can acquire is better during downturns than upturns because, as research has found, firms are willing to sell their better-quality assets only when they are in dire financial straits (Maksimovic & Phillips, 1998, 2001). Therefore, firms would use HAF acquisitions during upturns and during downturns. For this reason, we do not specify a directional hypothesis and instead expect to see firms equally willing to acquire HAF targets during different industry cycles.

Method

Data and Model

The principal data were from the Evaluate Energy database, which covers all acquisition deals in the global energy industry from 1989 to the most recent year. The database also covers detailed financial and operational data of energy firms worldwide. We also use the CanOils dataset, which focuses mainly on Canadian-based energy companies and international energy companies with business in Canada, to get supplementary operational data of Canadian and US energy firms. In addition, we used the Macrotrends research platform to fill in the missing data for firms' historical number of employees.

The final sample consists of 821 completed acquisition deals of 114 crude oil-focused Exploration and Production (E&P) firms in North America, which existed through the studied period from the first quarter of 2007 to the fourth quarter of 2020 (56 quarters in total). Quarterly data are used to ensure the accuracy of upturn/downturn period identifications. The period of

[1] Although firms could also want to take advantage of the lower price to acquire HAE targets during downturns, the increased labor costs needed to retain the acquired human assets would deter them from doing so (Pangarkar &. Lie, 2004, Coff, 1993). Even if they decide to stockpile some human assets for later use, the low price and easiness of hiring from the open labor market during downturns will hold firms back from HAE acquisitions (Cappelli & Sherer, 1988; Chen et al., 2023; Greer & Ireland, 1992).

2007-2020 was chosen because it captures two major downturns of the E&P industry and covers an upturn period and a downturn period with about equal length. Only crude oil-focused E&P firms are sampled because they are strongly affected by the international oil price, which is the basis for identifying the industry's upturns and downturns.

To test the hypothesis, we used random-effect logistic regressions for longitudinal data analysis. Logistic regression was used because of the dichotomous nature of dependent variables. Random effects were used because of the focus on investigating both within-firm and across-firm variances in acquisition likelihoods.

Dependent Variables

Two dependent variables were investigated separately: *Human-Assets-Embodied acquisition (HAEA) and Human-Asset-Free acquisition (HAFA).* We investigate HAEA and HAFA separately because firms' decisions regarding HAEA and HAFA are not mutually exclusive. This means firms could decide to engage in both HAEA and HAFA within the same quarter. *HAEA* is measured by a dummy variable that equals 1 if a firm announced a Human-Assets-Embodied (HAE) acquisition during a specific quarter and later completed the deal, and quals 0 if not. *HAFA* is measured by a dummy variable with the value of 1 if a firm announced a Human-Asset-Free (HAF) acquisition during a certain quarter and later completed the deal and the value of 0 if not.[2]

To identify HAE and HAF acquisitions, we went through a four-step process. First, we coded acquisitions of stand-alone firms (whole corporations) as HAE acquisitions since they are well-known for the inclusion of human assets (Lee et al., 2018). Next, we focused on the rest of the acquisition deals—asset acquisitions—and identified asset acquisitions with significant

[2] The cases where HAEA (HAFA) =0 include (1) no HAE (HAF) acquisition was announced during a certain quarter, and (2) an HAE (HAF) acquisition was announced during the quarter but was never completed.

employee number increases of acquiring firms in the year following the acquisition year. Using a similar method taken by Lee et al. (2018), we coded acquisitions with an acquirer employee increasing rate above 5% as Human-Assets-Embodied acquisitions. Third, we check the "stage of acquired assets" of all asset acquisitions. If the stage of acquired assets is "exploring" or "royalty," the acquisition was recoded as HAF acquisitions because exploring assets and royalty assets do not include human assets. This step helps to exclude cases that were mistakenly coded as HAE acquisitions. Fourth, we went through the acquisition rationale of all the acquisition deals to find cases where firms specifically mentioned the inclusion of human assets in the acquisition deals. This step includes any case that should be coded as HAE acquisitions but was not because of small employee increases.

Independent Variable and Control Variables

The focal variable of the analyses is the *industry cycle*, which is measured by a dummy variable (*DOWNT*) that takes the value 1 if the announcement of an acquisition was made during an industry downturn and the value 0 if during an industry upturn. The upturn and downturn periods are distinguished based on the average international crude oil price during each quarter. Two downturn periods are covered in the studied time period. The first one is the period from the fourth quarter of 2008 to the second quarter of 2009 and the second one is the period from the first quarter of 2015 to the fourth quarter of 2020. The rest of the periods are identified as upturn periods. As a result, there are 27 downturn quarters and 29 upturn quarters, which are about equal. Figure 3.1 shows the identified upturn and downturn periods.

Insert Figure 3.1 about here

For both sets of regressions, *recent acquisition experience* of acquiring firms is controlled because consistent evidence has shown that firms with recent acquisition experience are more likely to acquire (Amburgey & Miner, 1992; Haleblian et al., 2006, 2009). Acquiring firms' *size* and *sales growth (1 year lagged)* are controlled because it was found that firms with larger size and faster growth are more likely to acquire (Lee et al., 2018; Harford, 1999). Besides, acquiring firms' *age, return on assets ratio (1 year lagged), leverage ratio (1 year lagged)* and the *industry sector* are also controlled in the analyses because they, as suggested in prior literature, could all affect firms' acquisition likelihood in different ways (Coff, 1993; Haleblian et al., 2006, 2009, 2012; Devers et al., 2020; Kaul, 2012; Kaul et al., 2018; Kravet, 2014; Lee et al., 2018).

Firm size (FSIZE) is measured by a firm's yearly average employee numbers across the studied period. *Firm age (FAGE)* is measured by the difference between a focal year and a firm's earliest reporting year. *Recent acquisition experience (EXP)* is measured by a dummy variable with a value of 1 if a firm had at least one acquisition during the previous year/4 quarters and a value of 0 if not. *Sales growth (SGRO)* is measured by a firm's increasing rate of revenue during the previous year. *Return on assets ratio (ROA)* is measured by the ratio of a firm's equity and average total assets during the previous year. *Leverage ratio (LEV)* is measured by the ratio of a firm's total liabilities and total assets. *Industry sector (E&P)* is measured by a dummy variable with a value of 1 if the acquiring firm mainly focuses on the Exploration & Production of oil and gas resources and a value of 0 if the acquiring firm's business goes beyond the Exploration & Production or is an integrated firm.

Results

Table 3.1 shows the means and standard deviations of each variable and the correlations among all variables included in the study. In 5% of the firm-year observations, firms made

Human-Assets-Embodied (HAE) acquisitions; in 8% of the firm-year observations, firms made Human-Asset-Free (HAF) acquisitions. The correlation coefficients indicate that the *industry cycle (DOWNT)* is negatively correlated with *Human-Assets-Embodied acquisitions (HAEA)* ($p < 0.001$) but not significantly correlated with *Human-Assets-Free acquisitions (HAFA)* ($p > 0.05$).

Insert Table 3.1 about here

The results of the random effects logistic regression analysis are shown in Table 3.2. For HAE acquisitions, *industry cycle (DOWNT)* is negatively related to the acquisition likelihood ($\beta = -0.39$, $p < 0$ .05, odds ratio = 0.68). There is about a 32% decrease in the odds of firms' HAE acquisitions from the upturn to the downturn. As Figure 3.2 shows, the probability of firms' HAE acquisitions decreased from approximately 9% in the upturn to about 6% in the downturn. Therefore, the hypothesis is supported. Among the control variables, the *recent acquisition experience (EXP)* is positively related to the HAE acquisition likelihood ($\beta = 0.46$, $p < 0.01$, odds ratio = 1.58). It shows that firms with recent acquisition experience have 58% higher odds of acquiring HAE targets than firms without recent acquisition experience. In addition, acquiring firm's *sales growth (SGRO), return on assets ratio (ROA), firm size (FSIZE), and industry sector (E&P)* are all positively related to acquisition likelihood. These results indicate that firms with faster growth, better performance, and larger size are more likely to engage with HAE acquisitions and that E&P firms are more likely to acquire HAE targets than integrated firms.

For HAF acquisitions, *DOWNT* is not significantly related to the acquisition likelihood ($\beta = 0.17$, n.s.). As Figure 3.2 shows, firms are about equally likely to acquire HAF targets during the upturn and the downturn. The control variables, *EXP* and *FSIZE,* are positively

associated with the HAF acquisition likelihood, indicating that firms with recent acquisition experience and larger size are more likely to acquire HAF targets.

Insert Table 3.2 about here

Figure 3.2 illustrates a comparison between the results regarding HAE and HAF acquisition likelihood. Although the upward slope from the upturn to the downturn for HAF acquisition likelihood is not statistically significant, it contrasts with the downward slope for HAE acquisitions. The variant effect of industry cycles on HAF and HAE acquisitions demonstrated the critical role of firms' human asset considerations in affecting their acquisition decisions and behaviors.

Insert Figure 3.2 about here

Robustness Test

Complementary analyses were done to test the robustness of the results. First, we used different cutoff time points to identify upturns and downturns to see if the results held. We recoded the period between the first and third quarters of 2018 as an upturn rather than a downturn since the oil price increased temporarily. The main results of the analyses did not change. In another complementary study, we replaced the 5% employee number increasing rate used for identifying HAE acquisition deals with alternative percentages (3%-7%) to test the sensibility of the results. The coefficients for the focal independent variables demonstrate low sensitivity and high robustness when alternative percentages are used.

Discussion and Conclusion

By addressing industry cycles as the key contextual factor, this paper explains how firms' human-assets-embodied (HAE) acquisitions are influenced by the perceived value of human assets embodied in acquisitions at different times. This helps to deepen our understanding of firms' decisions and behaviors regarding HAE acquisitions. The paper speaks to the literature on human capital acquisition, which has largely overlooked the impact of timing (Boyacıoğlu et al., 2023; Chatterji & Patro, 2014; Chen et al., 2023; Coff, 2002; Eckardt et al., 2018; Groysberg & Abrahams, 2006; Munyon et al., 2011). Future research that examines the timing effects in acqui-hiring, cluster hiring, and human capital-intensive acquisitions could offer valuable contributions to the respective bodies of literature.

In addition, this study contributes to the Mergers & Acquisitions (M&A) literature by examining the determining effect of industry cycles on different types of acquisitions. While the antecedents of acquisitions were often researched, only a few papers focused on the determining effect of industry cycles (Haleblian et al., 2009; Kusewitt, 1985; Pangarkar &. Lie, 2004). Among those few papers, none has distinguished the effects of cycles on different types of acquisitions. This paper fills the gap by investigating the cycle effects on both HAE and HAF acquisitions. Most importantly, we found significant and critical differences between the cycle effects on the two types of acquisitions. This naturally leads to important questions, such as which type of acquisition provides more value for firms in different industry cycles. Future research regarding the impact of HAE/HAF acquisitions on firm outcomes and the moderating effects of industry cycles on those relations would make important contributions to the M&A literature.

This paper also suggests other potential directions for future research. Firms' decisions regarding HAE and HAF acquisitions could affect each other, although they should not be mutually exclusive. Future research that looks at the relationship between firms' HAE and HAF acquisitions would be value-adding. Moreover, this study differentiated between types of acquisitions based on whether or not human assets were involved in the transactions. Given the significant differences between the two types of acquisitions identified in this paper, future research could explore acquisitions with varying levels of human asset involvement and examine how they are differentially affected by industry cycles.

Lastly, the analysis in this paper uses the context of the oil and gas E&P industry, which is less human capital-intensive than other industries such as Information Technology and Health Services (Coff, 1993, 2002). Research has suggested that firms in higher human capital-intensity industries would be affected more by human capital issues in acquisition deals (Boyacıoğlu et al., 2023; Coff, 1993, 2002). Therefore, one would expect to see more distinct firm behaviors toward HAE/HAF acquisitions in more human capital-intensive industries. By identifying the different effects of industry cycles on firms' HAE/HAF acquisitions, even in an industry with comparatively low human capital intensity, this paper underscores the role of firms' human asset considerations in their acquisition decisions.

Table 3.1 Means, Standard Deviations, and Correlations

	Mean	**s.d.**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1.HAEA	0.05	0.21	1									
2.HAFA	0.08	0.27	-0.07	1								
3.DOWNT	0.48	0.50	-0.04	0.01	1							
4.FAGE	0.00	0.93	0.01	0.04	0.43	1						
5.EXP	0.13	0.34	0.08	0.13	-0.01	0.05	1					
6.SGRO	0.00	14.80	0.04	0.01	-0.04	-0.14	0.01	1				
7.ROA	0.00	1.47	0.02	0.03	-0.06	0.01	0.05	-0.01	1			
8.LEV	0.00	24.31	0.00	-0.02	0.04	0.02	-0.03	-0.02	-0.24	1		
9.E&P	0.91	0.28	-0.01	-0.07	0.00	-0.29	-0.05	0.03	-0.06	0.0	1	
10.FSIZE	0.00	2.42	0.08	0.15	0.00	0.39	0.16	-0.09	0.21	0.0	-0.55	1

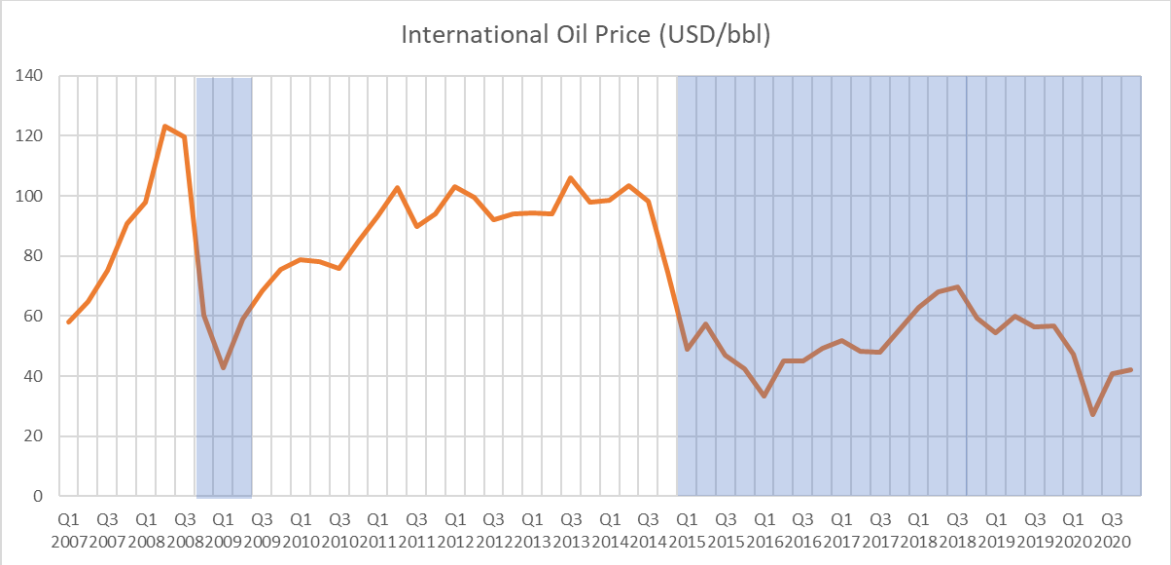
FAGE, SGRO, ROA, LEV, and *FSIZE* are all mean centered.

Table 3.2 Results Predicting Log-Odds of Human-Assets-Embodied Acquisitions and Human-Asset-Free Acquisitions

	Human-Assets-Embodied Acquisition	Human-Asset-Free Acquisition
Industry Cycle (Downturn relative to Upturn)	-0.39* (0.17)	0.17 (0.15)
Acquiring Firm's Age (mean centered)	-0.05 (0.17)	0.17 (0.16)
Acquiring Firm's Recent Acquisition Experience	0.46** (0.17)	0.46** (0.15)
Acquiring Firm's Sales Growth (1 year lagged and mean centered)	0.01* (0.00)	0.00 (0.00)
Acquiring Firm's ROA (1 year lagged and mean centered)	1.50* (0.71)	0.27 (0.53)
Acquiring Firm's Leverage (1 year lagged and mean centered)	-0.84+ (0.44)	0.04 (0.28)
Acquiring Firm's Industry Sector (E&P relative to Integrated)	1.09** (0.39)	0.23 (0.33)
Acquiring Firm' Size (mean centered)	0.17** (0.06)	0.17** (0.06)
Constant	-5.43 (0.93)	-2.94 (0.61)
N (firms)	73	73
N (firm-year)	3,140	3,140

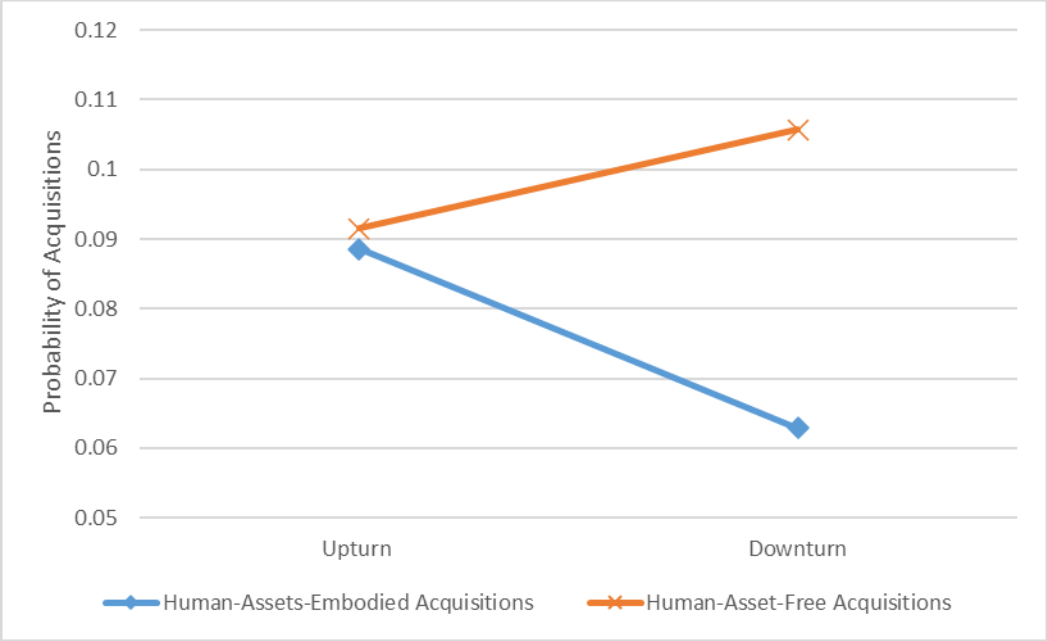
+p <0.1
**p <= .05*
***p <= .01*
****p <= .001*

Figure 3.1 International Oil Price of the Studied Period (Downturn Periods are in Shades)



Data Source: Evaluate Energy

Figure 3.2 Probability of Human-Assets-Embodied Acquisitions and Human-Asset-Free Acquisitions During Different Industry Cycles



Conclusion

The three studies in this dissertation investigated the impact of industry cycles, an important market context, on firms' management of existing and potential additional human capital with strategic focuses on loss mitigation and benefit acquisitions. The studies addressed the under-researched timing effects in firms' human capital management (HCM) behaviors, explaining why firms adopt certain HCM actions over others and when they implement them.

The first study explored how industry cycles affect firms' treatment of women employees to avoid reputation loss. The findings show that the industry downturn increased firms' inclinations towards gender discrimination such that women are subject to more severe losses than their male counterparts—a reflection of the *gender punishment gap* (Egan et al., 2022; Landsman, 2019; Sarsons, 2017; Selody, 2010). However, firms' concern for potential reputation loss conditions their gender discrimination behaviors, such that top female leaders were punished through low-visibility wage freezes. In contrast, women non-leaders were punished through high-visibility job terminations. The study confirmed the existence of the gender punishment gap yet suggested there was more to it. While firms are more likely to punish women during the industry downturn, they strategically manage their behaviors to avoid potential reputation loss. The study contributes to the literature on the gender punishment gap by refining the boundaries of this phenomenon. It also contributes to the signalling theory by addressing how firms manage negative (instead of positive) signals, which have been under-researched in the literature (Connelly et al., 2011; Spence, 2002), to mitigate reputation loss.

The second study explored how industry cycles affect firms' promotion of women employees to gain economic benefits. It examined the *glass cliff* effect, which suggests that firms are more likely to promote women (relative to men) to leadership positions during downturns

than upturns, potentially to take advantage of women candidates' communal leadership skills to handle crises (Morgenroth et al., 2020; Ryan et al., 2016). The results show that while firms tend to promote women more during the downturn, they simultaneously looked for candidates' potential to improve firm performance, and consequently, only women who are top performers experienced a higher promotion likelihood (relative to men) during the downturn than upturn. The study helps explain the mixed empirical results regarding the glass cliff by highlighting the overlooked moderator of individual performance (Morgenroth et al., 2020). It suggests that the boundary of the glass cliff phenomenon arose with the expectation of leaders' ability to improve firm performance during crises.

The third study explored the impact of industry cycles on firms' acquisition of human capital through acquiring entire firms/business units with embodied human assets. The results show that firms favored upturns rather than downturns for human-assets-embodied (HAE) acquisitions to meet their strategic priority on business growth/expansion during upturns and to keep their costs low during downturns. In contrast, firms demonstrated a similar likelihood of acquiring human-assets-free (HAF) targets during both upturns and downturns. The study sheds further light on firms' strategic human capital acquisition by highlighting the under-researched determining effects of industry cycles on firms' human capital acquisition behaviors (Boon et al., 2018; Coff, 2002; Groysberg & Abrahams, 2006). It also contributes to the mergers and acquisition literature by addressing the less-explored antecedent of timing in firms' acquisition behaviors and by identifying the varying timing effects on different types of acquisitions (Haleblian et al., 2009).

This dissertation helps to address the "why" and "when" of firms' HCM behaviors, thereby deepening our understanding of these practices. By addressing the determining effects of

industry cycles, the dissertation complements existing strategic HCM literature, which focuses mainly on the outcomes of firms' HCM behaviors (Boon et al., 2018; Campbell et al., 2012; Crook et al., 2011).

This dissertation also has significant implications for business practices. By demonstrating the existence of subtle forms of gender discrimination, such as low-visibility gender punishment gaps (although women top leaders are not subject to disproportionate layoffs, they suffer more wage freezes) and glass cliffs (although women get promoted into leadership positions, they only get more precarious positions), this dissertation helps business practitioners develop more comprehensive strategies to deal with the Equity, Diversity, and Inclusion (EDI) issues in HCM management. Moreover, by revealing the impact of industry cycles on firms' HAE acquisition behaviors, this dissertation sensitizes business practitioners to make more informed and better-conceived decisions in human assets acquisitions to obtain desired performance outcomes.

This dissertation opens several avenues for future research. One of them is to investigate the effect of industry cycles on firms' HCM behaviors beyond those examined in this dissertation. Future research could examine the impact of industry cycles on firms' management of other minority groups in the workplace, such as 2SLGBTQI+ individuals, racial minorities, ethnic minorities, older employees, and employees with disabilities. In addition, future research could study the impact of industry cycles on firms' human asset acquisitions in different ways, such as acqui-hiring, cluster hiring, human capital-intensive acquisitions, and hiring of stars (Chatterji & Patro, 2014; Chen et al., 2023; Coff, 2002; Eckardt et al., 2018; Groysberg et al., 2008; Groysberg & Abrahams, 2006; Munyon et al., 2011). Furthermore, future research could

explore the impact of industry cycles on firms' HCM activities across broader categories, such as personnel selection, training, motivation, and downsizing (Boon et al., 2018).

Another direction for potential future research is to explore the mediating variables for the relationship between industry cycles and firms' HCM behaviors. By finding strong evidence for firms' distinct HCM behaviors during different industry cycles, this dissertation indicates the mediating effects of firms' strategic considerations on the relationship between industry cycles and HCM behaviors. Future research that directly measures firms' strategic considerations and tests these mediating effects would be valuable. Furthermore, although this dissertation uses the oil and gas exploration and production (E&P) industry as the research context, the findings should be generalizable to other cyclical industries such as mining and energy services (Kumar, 1991; Petersen & Strongin, 1996). Future research could examine the effect of industry cycles on firms' HCM behaviors in different industrial contexts.

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Appendix

Co-author permission:

"As a co-author for Studies 1, 2 and 3 within this manuscript, I approve the inclusion of these works as part of the dissertation of Ke Wang. The text associated with Studies 1, 2 and 3 within the Introduction and Conclusion section of the dissertation is also approved. I am aware that this dissertation will be added to the digital theses repository at the University of Calgary, The Vault (https://prism.ucalgary.ca/)."

Dr. Peter Sherer

June 26, 2024 (via email)