

Investing for Keeps: Firms' Prepandemic Investments in Human Capital Decreased Workforce Reductions Associated With COVID-19 Financial Pressures

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We examine how firms' prepandemic investments in human capital influence their use of workforce reductions and layoffs (hereafter, workforce reductions) as a response to financial pressures during the coronavirus disease (COVID-19) pandemic. We contend that workforce reductions must be examined in the context of firms' broader financial and resource orchestration environments. First, we suggest that firms' relative exposure to pandemic financial pressures (PFPs) will determine their need to cut costs during the pandemic. Second, we argue that a firm's prior investments in employees' human capital will reduce the attractiveness of workforce reductions as a cost-cutting response to PFPs, as human capital investment (HCI) increases the value of employees' knowledge, skills, and abilities and motivation, thus inducing firms to seek alternative measures to reduce costs. We then argue that the attenuating influence of HCI on the effect of PFPs on workforce reductions will be stronger when HCI is matched with greater investments in physical capital, as employees' human capital will create more value—and will translate to a bigger loss following employee departures—in such circumstances. We demonstrate support for our hypotheses in a sample of 1,364 U.S. banks using data from quarterly Federal Deposit Insurance Corporation (FDIC) reports, news articles, and Worker Adjustment and Retraining Notifications (WARN) Act filings through the fourth quarter of 2020. We discuss implications for our understanding of the impact of the COVID-19 pandemic on organizations and employees and for research on resource orchestration and human capital.

Keywords: COVID-19, layoffs, downsizing, Strategic Human Resource Management, resource orchestration

Supplemental materials: <https://doi.org/10.1037/apl0001002.supp>

The economic crisis brought on by coronavirus disease (COVID-19) has required many firms to reduce expenses (Broughton, 2020), leading to an increase in workforce reductions (de León & Geller, 2020) and layoffs (Davidson, 2020). Extant research offers evidence consistent with this pattern (Datta et al., 2010) but tells us little about the conditions under which firms are most likely to cut jobs in times of economic crisis (Flammer & Ioannou, 2020). This is important, as the consequences of layoffs extend beyond job cuts—they threaten employee morale (Trevor & Nyberg, 2008) and undermine a firm's social structure (Guthrie & Datta, 2008) and knowledge stocks (Lim et al., 2013). Thus, understanding the conditions under which firms have been most likely to use layoffs and workforce reductions¹ in response to pandemic financial pressures (PFPs) represents a key

question related to the impact of COVID-19 on organizations and employees.

Understanding the use of workforce reductions in the face of an economic crisis requires a consideration of firms' prior investments in employees' human capital, as well as of how employees fit within firms' broader resource orchestration activities. First, we suggest that a firm's exposure to PFPs will determine the pressure it faces to reduce costs, prompting a consideration of workforce reductions. Second, we argue that a firm's prior investment in employees' human capital will shape the attractiveness of workforce reductions as a cost-cutting response. In particular, human capital investment (HCI) increases the value of employees' knowledge, skills, and abilities (KSAs) and motivation (Bentley & Kehoe, 2020; Sirmon & Hitt, 2009) and points to a firm's prioritization of its workforce (Iverson & Zatzick, 2007). Thus, firms with higher levels of HCI will likely seek to avoid workforce reductions as a response to PFPs. We then argue that the attenuating effect of HCI will be stronger in firms with higher levels of physical capital investment (PCI), where, when paired with high levels of HCI, PCI may offer an opportunity for the co-specialization of HCI and/or represent an alternative area in which such firms have capacity to cut costs in order to avoid making workforce reductions.

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We would like to thank Joanne Cao and Joonyoung Kim for their excellent research assistance. This research was supported in part by a grant provided by the Center for Advanced Human Resource Studies (CAHRS) at Cornell University.

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¹ Hereafter, "workforce reductions," except in discussing unique conceptual arguments or empirical findings.

Theoretical Background and Literature Review

The Logic(s) Underlying Workforce Reductions

Two logics underlie workforce reductions: decreased demand and increased efficiency (Datta et al., 2010), wherein workforce reductions provide firms a buffer against financial uncertainty by decreasing costs and increase efficiency by eliminating slack, respectively. These logics have been borne out in evidence of increased workforce reductions amid financial strain tied to an economic crisis (Flammer & Ioannou, 2020), declining demand (Baumol et al., 2003; Filatotchev et al., 2000), and poor firm performance (Budros, 2002, 2004).

Scholars have also cited the increased efficiency logic in positing a positive effect of the use of “high-investment” human resource (HR) practices on workforce reductions, suggesting that by improving employee effectiveness, such HR practices enable firms to move to leaner workforces—though findings have been mixed. Notably, Osterman (2000) found that firms’ use of high-performance work practices increased the likelihood of layoffs. Meanwhile, Iverson and Zatzick (2007) found that the use of high-commitment HR practices was positively related to workforce reductions through natural attrition and negatively related to reductions through early retirements and layoffs. Increased efficiency has also been cited as a rationale for a positive link between employee compensation and layoffs—though, with few exceptions (e.g., Yoo & Mody, 2000), this effect has been nonsignificant (Budros, 2000; Iqbal & Shetty, 1994). Finally, scholars have posited that firms may seek increased efficiency by investing in technology to replace employees, though again results have been mixed [e.g., Budros (1997) found no effect, while Wagar (1997) reported a positive effect of “labor-saving technology” on workforce reductions].

In addition to these findings being inconclusive, we note that this research was conducted outside a crisis context. This is critical in that downsizing a workforce as part of a broader, planned effort to increase efficiency (where both HR investments and workforce reductions are likely strategically targeted to specific positions with cuts in mind) is materially different from the decision to lay off employees as an emergency cost-cutting measure in response to unexpected financial pressures in a crisis. This is evident, for instance, in Osterman’s (2000) findings, where high-performance work practices positively predicted the use of layoffs, but firms making layoffs nonetheless experienced a net *growth* in employment in the same period.

We derive three relevant conclusions from this work. First, while it is clear that financial pressures increase the prevalence of workforce reductions *generally*, we know little about when financial strain is most likely to lead to workforce reductions—particularly when such strain is tied to the uncertainty and volatility of a global crisis. Second, while investments in employees *may* allow firms to lean out their workforces to increase efficiency, evidence of this strategy is mixed (Datta et al., 2010). Finally, the conditions under which the relationship between firms’ investments in employees and workforce reductions vary are even less well understood.

Insights From Strategic Human Resource Management and Resource Orchestration

Strategic Human Resource Management (SHRM) research provides evidence that firms’ investments in employees’ human capital

support the development of superior KSAs and increased motivation (Jiang et al., 2012). HCI (we focus on financial allocations to training) enables firms to develop employees’ firm-specific KSAs (Kim & Ployhart, 2014; Ployhart et al., 2011) which align with an organization’s unique needs (Hatch & Dyer, 2004). These investments also convey psychological benefits—increasing employees’ perceived organizational support (Kurtessis et al., 2017), organizational commitment (Gardner et al., 2011), and motivation (Jiang et al., 2012)—and increase employee retention (Gardner et al., 2011). These responses manifest in part because employees’ affective bonds to an organization tend to match an organization’s investments in the social exchange relationship (e.g., through training and development opportunities; Blau, 1974; Kehoe & Wright, 2013). In addition, HCI translates to greater value embedded in employees, who are better able and more motivated to contribute to a firm’s goals.

Three insights on resource orchestration (Sirmon et al., 2011) help to situate these ideas in the broader strategic context of a firm. First, financial investments into a resource represent inputs into capability building at the firm level (Maritan & Lee, 2017), such that HCI represents investment both in employees themselves and in the capabilities orchestrated from their contributions. Second, path dependence in firms’ resource investments influences the attractiveness of subsequent resource orchestration activities (Bentley & Kehoe, 2020). As a result, greater investment in employees’ human capital leads to a greater loss if employees are let go. Third, interdependencies in resource stocks entail that the implications of investments in one resource stock (e.g., employees) can be fully understood only in the context of a firm’s investments in other resources (Sirmon et al., 2011).

Research Context and Hypotheses

Pandemic Financial Pressures and Workforce Reductions in U.S. Banks

In the banking industry, turbulent economic conditions, government-mandated shutdowns, and public health concerns brought on by the pandemic have threatened many banks’ earnings and revenue streams from multiple sources. These impacts have been broadly cited in major media outlets, such as in reports that “Rock-bottom interest rates and preparations for a spike in loan defaults are hitting big banks” which are “stockpiling billions of dollars to hedge against bad debt.” (White, 2020) and concerns that “After Covid-19, banks . . . are more vulnerable than during the last financial crisis” (Soares et al., 2020).

The convergence of several financial pressures has exerted strain on many banks in this period. First, repayment of nonperforming loans (NPLs; loans on which payment is 90 days past due) has posed an increased threat (increasing 187%, relative to the 2 years prior to the pandemic), even relative to prior financial crises (Soares et al., 2020). This is due both to the reduced financial security of borrowers and to pandemic period legislation limiting the recourse available to banks facing nonpayment on loans backed by the federal government (Federal Student Aid, 2020; Loftsgordon, 2020). While banks set aside reserves based on the risk in their loan portfolios, surges in the number and charge-off rate of NPLs have rendered many banks’ reserves inadequate during the pandemic. Second, emergency interest rate cuts by the Federal Reserve have diminished banks’ interest

revenues (with interest revenues decreasing 36% during this period) and raised concerns that further cuts may lead to negative interest rates (Davies, 2020). Third, decreased branch traffic and utilization of banking services resulting from shutdowns and reduced business activity have undermined many banks' noninterest revenues (Klein, 2020), which decreased 41% during the pandemic period. Finally, shocks to the money and equity markets have reduced the value of many banks' earning assets (e.g., stocks, bonds, income from rental properties) by 15% (Liang, 2020, Otani, 2021), threatening both their liquidity and abilities to originate loans, which serve as a key revenue stream (Logan, 2021). These effects are further exacerbated both by broad uncertainty associated with the longevity of the economic impact of the pandemic (which may dampen banks' appetites for attempting to stand by and weather the financial storm) and by government-imposed restrictions on banks' responses to loan-related losses in this period (which magnify the bottom line effects of NPLs in particular). On these bases, as well as the significant costs associated with labor, the precedent of banks making workforce reductions in response to financial precarity in the 2008 economic crisis (de la Merced, 2008), and suggestions by industry experts that workforce reductions have again been made by banks facing strain during the pandemic (Marshall et al., 2020), we predict:

Hypothesis 1: PFPs will be positively related to workforce reductions and layoffs during the pandemic.

The Mitigating Effect of Investments in Human Capital

While workforce reductions may offer a swift approach to reducing costs, we argue that banks that have made greater investment in employees' human capital will view workforce reductions as a less attractive cost-cutting response to high levels of PFPs. First, we highlight that workforce reductions made in response to PFPs differ in important ways from those made as part of a broader strategic plan to lean out a firm's workforce, the latter of which are more likely to be premeditated and paired with targeted HCI intended to enable workforce streamlining. In particular, the pandemic was unforeseen, such that banks considering workforce reductions or other cost-cutting responses in the face of high levels of PFPs have largely had to do so without the luxury of tailoring prior investments with this purpose. That is, more often, firms' HCI is likely to be tailored to the development of key employee and organizational capabilities that are critical to value creation, such that the decision to make workforce reductions to cope with PFPs is likely to undermine—rather than leverage—a bank's prior investments in employees.

More specifically, HCI increases the quality and firm-specificity (Gardner et al., 2011) of employees' KSAs and fosters employees' motivation to contribute to a bank's goals. In banks, employees create value by fulfilling clients' service requests and matching clients' unique needs with the bank's offerings (Hunter et al., 2001). By enabling more selective hiring and strengthening employees' KSAs through ongoing development, HCI may enhance employees' contributions through improvements in communication skills, customer service orientation, and industry knowledge. Additionally, because HCI enables firms to tailor employees' development to firm-specific needs, HCI may enhance employees' specialized knowledge of a bank's proprietary systems, product offerings,

and clientele (Reed et al., 2006; Sirmon & Hitt, 2009). Moreover, such firm-specific investments may support the emergence of a shared mindset and collective understanding of a bank's routines (Ployhart et al., 2011), enabling employees to more effectively work interdependently to create value (Collins & Smith, 2006). The combination of enhanced employee competencies, increased motivation to work toward the firm's goals, and shared mental models positions employees to contribute greater value in a bank's operations—and results in a more significant loss should employees be let go (Lim et al., 2013; Shaw et al., 2013). Importantly, this loss is likely to be exacerbated when workforce reductions occur in a compressed period and without advance planning (e.g., as an urgent response to PFPs), which limits coordination efforts that may otherwise help to buffer the organization from disruption.

Second, the replacement of employees will require more time and resources in banks with higher levels of HCI due to the firm-specificity of employees' KSAs and commitment (Wang et al., 2016), as well as the shared understandings and mental models that are developed among employees as they apply learnings to their interdependent work (Kim & Ployhart, 2014)—which may be (re)developed only through further path-dependent investments. Layoffs in particular, which are likely to breach employee trust, may also undermine the effect of HCI in signaling a bank's commitment to its workforce (Trevor & Nyberg, 2008; Wood & Ogbonnaya, 2018).

Finally, HCI reflects a firm's view of employees as worthy of investment (Tsui et al., 1997)—and as organizational members rather than expendable resources that can be eliminated to reduce costs in response to financial precarity (Aalbers et al., 2014). This logic is consistent with Iverson and Zatzick's (2007) finding that firms' use of high-commitment HR practices predicted the use of more benevolent workforce reduction tactics over layoffs and with Wagar's (1997) finding that firms' commitment to employee job security negatively related to layoffs.

On these bases, we suggest that the very HCI that increases employees' productivity may make firms *less likely* to view workforce reductions as an attractive means to cut costs in response to high levels of PFPs. Rather, efficiency is maintained by *protecting* the firm's investments in employees' human capital, which represents a core value-creating resource in such banks. Importantly, this logic may hold particularly true in the context of banks responding to PFPs, relative to firms responding to financial strain in other periods, which may be more indicative of enduring threats to demand (e.g., due to market maturity and/or saturation) that may necessitate downsizing. Taken together, our arguments suggest that while PFPs are likely to increase banks' propensities to make workforce reductions due to increased pressures to cut costs, HCI will weaken this effect by motivating a search for alternative responses to PFPs.

Hypothesis 2: Prepandemic HCI will attenuate the positive effect of PFPs on workforce reductions and layoffs during the pandemic.

The Role of the Broader Resource Orchestration Context: Physical Capital Investments

Building on the insight that we can best understand the implications of a firm's resource investments with a broader consideration

of the firm's investments in other key resources (Sirmon et al., 2011), we next argue that the attenuating influence of HCI on the effect of PFPs on workforce reductions will be stronger in banks that have also made greater investment in physical capital. As we elaborate below, greater PCI may enhance the value-creating potential associated with high levels of HCI (leading to a greater loss associated with letting employees go) and/or may act as a buffer against PFPs by offering a sought-after alternative area for cost reduction in banks with high levels of HCI.

Banks' key physical capital includes buildings, equipment, and technology. A bank's PCI may enhance the value-creating potential of employees' specialized KSAs in a few ways. First, investments in employee development may result in greater value when they are co-specialized with other resources to better meet a firm's idiosyncratic needs (Campbell et al., 2012). Scholars have highlighted the particular relevance of the co-specialization of employees' human capital with firms' physical capital in the service sector (Hitt et al., 2001)—and in banking in particular (Hunter et al., 2001). This makes sense, as customers' experiences in these contexts are shaped directly by their interactions with employees within the physical and technological environment in which services are situated (Sirmon & Hitt, 2009).

In the present early stages of digital transformation (Shevlin, 2021), banks have begun to direct their PCI toward technological investments in automation, artificial intelligence, and cloud computing (Marous, 2019) to increase efficiency, convenience, and integration in services (Sirmon & Hitt, 2009). There are several ways banks may co-specialize their HCI with such technological investments. For example, banks may pair investments in advanced customer data platforms with training in analytics to support employees in developing data-driven solutions to improve the customer experience with the bank's product offerings (Marous, 2021b). Alternatively, banks may train employees on new mobile or digital platforms to enable them to assist and educate customers accessing the bank's products and services in a new environment (Marous, 2021a).² In these examples, employees' co-specialized human capital creates greater value by enabling banks to more effectively leverage their related investments in technology (Ethiraj & Garg, 2012). At the same time, this co-specialization of employees' KSAs to a bank's PCI means that employees with comparable, co-specialized human capital are not available in external markets (Campbell et al., 2012; Mahoney & Kor, 2015). Thus, the restoration of value-creating potential following workforce reductions will require even greater investment than when employees' value creation is not rooted in such co-specialization.

Even in the absence of co-specialization, banks' PCI may free up highly skilled and motivated employees to invest time in other value-creating activities, such as fostering stronger client relationships. For example, an HR leader we interviewed shared that in his bank, automating and streamlining certain loan processing requirements allowed employees to shift their time away from administrative paperwork in order to offer more personalized support to the customer—investments which may both build customer trust and allow for more opportunities to match the customer's needs with the bank's products. In this case, while the increased value created by employees is not necessarily intertwined with the bank's PCI, the bank's investment in loan processing software nonetheless increased the return associated with the bank's HCI—setting the stage for a greater potential loss in the case of workforce reductions.

We develop these predictions despite some views that technological investments tied to digital transformation in the banking industry will lead to significant job cuts (e.g., Kelly, 2019) for a few reasons. First, countervailing wisdom suggests that while technology may replace employees in some firms, other firms will employ digital transformation strategies that entail a *change*—rather than an elimination—of employees' roles (Ton, 2019). Our theory suggests that those firms that combine high levels of PCI with high levels of HCI are most likely to adopt an emphasis on reskilling—rather than eliminating—employees. Second, industry reports suggest that the banking industry is in the infancy of digital transformation, with only a quarter of banks having begun their digital transformations before 2019 (Shevlin, 2021). Thus, at the onset of the pandemic, it is unlikely that many banks would have yet achieved a level of technological sophistication that would allow for the large-scale replacement of workers with technology.

Finally, even in the absence of interdependence between PCI and HCI, high levels of PCI, in the presence of high levels of HCI, may act as a financial buffer. In particular, PCI, which demonstrates considerable consistency and path dependence in firms' resource allocations (e.g., in the prepandemic period, banks had a mean year-over-year change in PCI of only 2.67%), represents an area in which cost reductions may be made (e.g., by postponing budgeted investments or eliminating recurring expenses) in lieu of letting employees go. In these cases, PCI provides the very alternative that banks with high levels of HCI may seek when faced with high levels of PFPs and will thus still strengthen the attenuating effect of HCI as predicted.

Hypothesis 3: Prepandemic PCI will strengthen the attenuating influence of prepandemic HCI on the positive effect of PFPs on workforce reductions and layoffs during the pandemic.

Method

We tested our hypotheses in a sample of U.S. federal and state-chartered retail banks obtained from the Federal Deposit Insurance Corporation (FDIC). After excluding banks with fewer than 100 employees, as well as custodial and agriculture credit banks (which do not engage in traditional retail banking), our final sample included 1,364 banks with quarterly observations from the first quarter of 2018 through the fourth quarter of 2020. A timeline depicting the specific period(s) in which variables were measured is provided in Figure 1. We obtained Institutional Review Board (IRB) exemption from full review from Cornell University (IRB# 2003009494, "Human Capital in Financial Industries").

For all variables other than layoffs and chief executive officer (CEO) tenure, we relied on banks' quarterly FDIC regulatory reports, which contain information on banks' operations, finances, and performance. We collected data on layoffs in two steps. First, we searched news reports, announcements, and news wires for bank layoffs between March 13th (when COVID-19 was declared a national emergency; Federal Emergency Management Agency, 2020) and December 30th of 2020, using two databases: *Access World News* and *News Bank*. This search resulted in 226 records of 96 layoffs. Second, we collected state Worker Adjustment and Retraining Notifications (WARN) filings for the same period. The WARN Act

² We highlight additional examples from banks' annual reports and interviews with bank leaders in the Appendix.

Figure 1
Measurement Timeline for Study Variables

	2018				2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Dependent Variables												
Workforce reductions & Layoffs												
Predictors												
PFP										Reflecting the financial environment within a bank at the beginning of each of the three quarters in which focal layoff decisions were made		
PCI	Reflecting a bank's cumulative resource orchestration activities over the course of its prepandemic operations over a two-year "normal" operating period											
HCI												
Controls												
State GDP & State political party										Reflecting the economic environment surrounding a bank as it made decisions regarding layoffs in this period		
Branches & Employees										Capturing relevant attributes of a bank's size just prior to the onset of the pandemic		
Client mix	Characterizing a bank's typical clientele in a "normal" operating environment											
Prior performance	Capturing a bank's most recent financial condition prior to the focal period in which layoffs and workforce reductions are examined											
Reserves										Reflecting the financial environment within a bank at the beginning of each of the three quarters in which focal workforce reductions and layoffs were made		
PPP										PPP program began in Q2, 2020		
Past workforce reductions	Reflecting a bank's cumulative resource orchestration activities over the course of its prepandemic operations over a two-year "normal" operating period											
Past layoffs												
Salaries	Reflecting a bank's average expenses for employee salaries over the course of its prepandemic operations over a two-year "normal" operating period											

Note. We do not include *bank charter* in this timeline as this variable remained constant for the duration of the study period. *CEO tenure* is the time since a CEO's appointment as of 2020. HCI = human capital investment; PCI = physical capital investment; PFP = pandemic financial pressures; PPP = Paycheck Protection Program.

requires firms with 100 or more employees to file notifications with State Labor Departments when conducting layoffs that exceed a state-dictated threshold (typically 50 employees). This search yielded an additional 166 layoffs, resulting in 262 layoffs in total. We collected data on CEO tenure through a targeted online search.

Our conceptual model included two outcomes: layoffs and workforce reductions. Layoffs are the harshest downsizing tactic and pose the greatest threat to employee goodwill (Iverson & Zatzick, 2007), while workforce reductions reflect the employment impact of all downsizing tactics. To capture the symbolic considerations tied to layoffs and the practical considerations associated with all workforce reductions, we measured these outcomes using distinct approaches. We operationalized *layoffs* as a dummy variable set equal to one if a bank made at least one layoff in the last three quarters of 2020, zero otherwise.³ We measured *workforce reductions* as the net reduction in employees at a bank in the last three quarters of 2020. We transformed this measure such that positive values reflect a reduction in the number of employees at a bank, with negative values (i.e., employment increases) set equal to zero on the basis that employment increases are likely driven by different factors than reductions (Guthrie & Datta, 2008).⁴

We measured *PFPs* using an unweighted standardized composite index⁵ comprised of the four financial pressures outlined previously: NPLs, earning assets, interest revenues, and noninterest revenues.

NPLs reflect the percentage of loans in a bank's loan portfolio where payment is at least 90 days past due. Earning assets reflect the dollar value of a bank's income-producing assets (e.g., stocks, bonds, rent from properties). Interest revenues are comprised of revenue derived from lending activity (e.g., principal and interest payments). Noninterest revenues capture bank revenues that are not tied to lending activities (e.g., banking and service fees). With the exception of NPLs, the pressures were reverse coded, such that higher values indicated greater financial pressure. We averaged the values of these four components from the end of the first quarter of 2020 to the end of the third quarter of 2020 to capture the financial precarity faced by banks as they considered cost reduction measures in our study period. We measured *HCI* as the financial capital invested in employee training, scaled by the number of employees. The results were consistent when we used Bentley and Kehoe's (2020) measure of HCI, which reflects the sum of financial capital directed to salaries, bonuses, and training, scaled by

³ Analyses predicting magnitude of layoffs yielded consistent results.

⁴ Analyses with positive values not set equal to zero yielded consistent results.

⁵ This approach is consistent with prior research utilizing unweighted standardized composite indices to capture financial pressures faced by banks (Bordo et al., 2000; Singh & Sidhu, 2016).

Table 1
Descriptive Statistics and Correlations

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Layoffs	0.19	0.45	—																			
2. Workforce reductions	56.82	68.77	0.44	—																		
3. PPP	0.08	0.87	0.12	0.08	—																	
4. HCI	5.24	2.06	-0.14	-0.12	-0.09	—																
5. PCI	60.05	95.22	-0.11	-0.11	-0.10	0.11	—															
6. State GDP	3.94	0.87	0.01	0.03	0.02	0.04	-0.04	—														
7. State political party	0.42	0.46	-0.03	-0.02	0.06	0.05	0.02	-0.25	—													
8. Bank charter	2.71	1.38	-0.04	-0.04	-0.03	0.04	-0.01	0.08	-0.06	—												
9. Branches	38.28	148.73	0.09	0.06	-0.03	0.07	0.10	0.02	0.03	-0.03	—											
10. Client mix	0.16	0.11	-0.09	-0.10	0.05	0.13	0.08	-0.05	0.06	-0.07	0.14	—										
11. Prior performance	1.86	7.20	-0.06	-0.09	0.06	0.08	0.04	0.04	-0.02	-0.02	0.12	-0.03	—									
12. Reserves	10.31	17.01	-0.05	-0.04	0.13	0.10	0.04	-0.05	0.06	0.02	0.15	0.12	0.14	—								
13. PPP	1572.03	846.57	-0.09	-0.02	0.03	0.01	0.03	-0.12	0.04	-0.01	0.03	0.09	-0.01	0.06	—							
14. CEO tenure	12.46	14.78	0.05	0.01	-0.03	0.02	0.04	0.08	-0.02	-0.03	0.06	0.05	0.05	-0.03	0.07	—						
15. Past layoffs	0.03	0.12	0.07	0.05	0.03	-0.04	0.01	0.02	-0.01	-0.04	0.03	0.00	0.01	-0.07	-0.07	0.08	—					
16. Past workforce reductions	14.52	19.07	0.04	0.06	0.06	-0.11	-0.04	-0.01	0.04	-0.05	0.02	-0.10	0.01	-0.05	-0.04	0.02	0.21	—				
17. Salaries	52.07	25.63	-0.16	-0.12	-0.08	0.22	0.16	-0.03	0.07	-0.02	0.17	0.17	0.08	-0.04	0.02	0.11	-0.09	-0.13	—			
18. PPP × HCI	0.81	15.28	0.02	0.00	0.11	0.15	0.06	-0.02	-0.01	0.02	0.01	-0.02	0.00	0.00	0.02	0.01	0.01	0.01	0.03	—		
19. PCI × HCI	32.40	174.30	0.04	0.01	0.28	0.20	0.26	-0.03	0.02	-0.01	0.04	0.01	0.01	0.04	0.00	-0.01	0.02	0.01	0.02	0.07	—	
20. PCI × PPP	11.47	117.60	0.05	-0.01	0.29	0.03	0.32	-0.02	0.00	0.00	0.00	-0.01	0.00	0.01	-0.01	0.00	0.01	0.00	0.00	0.16	0.24	—
21. PPP × HCI × PCI	302.48	2352.54	0.04	0.00	0.16	0.13	0.18	-0.02	-0.01	-0.02	0.01	-0.01	0.01	0.02	0.00	0.00	0.01	0.01	0.01	0.19	0.26	0.40

Note. $N = 1,364$. All correlations above $|r| > .05$ are statistically significant at the $p < .05$ level. PPP = pandemic financial pressures; HCI = human capital investment; PCI = physical capital investment; GDP = gross domestic product; PPP = Paycheck Protection Program. HCI is measured in \$1,000 per employee; PCI is measured in \$10,000 per employee; state GDP is measured as the growth rate of state-level GDP; salaries measured in \$1 millions; reserves measured in \$100,000.

Table 2
Censored Regression Results for Models Predicting Workforce Reductions

Variable	Model 1	Model 2	Model 3	Model 4
State GDP	−1.260 (2.045)	−1.203 (2.038)	−0.647 (2.033)	−0.578 (2.018)
State political party	−3.891 (3.941)	−3.889 (3.928)	−3.131 (3.932)	−2.671 (3.896)
Bank charter				
NM	−0.536 (4.663)	−0.482 (4.647)	−0.494 (4.633)	−0.467 (4.590)
SA	−4.889 (7.921)	−2.216 (7.472)	−1.660 (8.044)	−1.561 (7.968)
SB	−4.922 (7.285)	−4.851 (7.260)	−5.378 (7.220)	−4.706 (7.153)
SM	−5.909 (5.539)	−6.009 (5.520)	−5.717 (5.501)	−5.264 (5.541)
Branches	0.051 (0.038)	0.055 (0.034)	0.045 (0.038)	0.050 (0.042)
Client mix	−57.747 (13.033)***	−56.269 (14.979)***	−54.665 (17.928)**	−54.630 (17.802)**
Prior performance	−0.578 (0.041)***	−0.579 (0.043)***	−0.595 (0.049)***	−0.598 (0.051)***
Reserves	−0.002 (0.000)***	−0.002 (0.000)***	−0.003 (0.000)***	−0.003 (0.000)***
PPP	−0.037 (0.040)	−0.031 (0.040)	−0.061 (0.047)	−0.058 (0.040)
CEO tenure	0.004 (0.030)	0.004 (0.037)	0.004 (0.039)	0.006 (0.034)
Past workforce reductions	0.121 (0.094)	0.116 (0.096)	0.118 (0.097)	0.124 (0.093)
Salaries	−0.038 (0.009)***	−0.040 (0.010)***	−0.041 (0.014)**	−0.039 (0.015)**
PFP	16.433 (5.037)**	16.395 (5.084)**	19.433 (7.337)**	20.139 (7.827)**
PCI	−0.097 (0.014)***	−0.066 (0.015)***	−0.035 (0.012)**	−0.038 (0.014)**
HCI	−0.268 (0.071)***	−0.685 (0.165)***	−0.773 (0.196)***	−0.778 (0.204)**
PFP × HCI		−0.409 (0.106)***	−0.121 (0.043)**	−0.126 (0.045)**
PCI × HCI			0.005 (0.002)*	0.005 (0.003)
PCI × PFP			−0.134 (0.048)**	−0.132 (0.048)**
PFP × HCI × PCI				−0.018 (0.004)***
Constant	56.807 (11.022)***	57.356 (11.041)***	62.827 (12.004)***	62.359 (12.007)***
F-stat	38.19	42.23	43.94	45.27
ΔF-stat		4.04	1.71	1.33

Note. $N = 1,364$. Standard errors are in parentheses. GDP = gross domestic product; NM = State-chartered, nonmember commercial banks regulated by the FDIC; SA = State or federal savings institutions regulated by the Office of Thrift Supervision; SB = State savings banks regulated by the FDIC; SM = State-chartered commercial member banks regulated by the Federal Reserve; PPP = Paycheck Protection Program; PFP = pandemic financial pressures; PCI = physical capital investment; HCI = human capital investment.

* $p < .05$. ** $p < .01$. *** $p < .001$, two-tailed tests.

the number of employees. We measured *PCI* as the financial capital invested in the physical capital and premises (e.g., branch locations, technology) of a bank, scaled by employees. For both *HCI* and *PCI*, we computed mean values within a bank over the 2-year period preceding the pandemic (i.e., 2018 and 2019) to capture banks' typical investments in these assets.

We controlled for several factors likely to influence workforce reductions and layoffs. We controlled for state-level gross domestic product growth (*state GDP*) to account for local economic activity likely to influence both demand and threat of nonpayment on loans (Shi & Zhang, 2019). We also controlled for the political affiliation of the state's governor (*state political party*), which has been tied to state-level pandemic period restrictions (e.g., business closures, stay-at-home orders; Cassella, 2020). We controlled for *bank charter* to account for differences in banks' structures and regulatory requirements. To account for bank size, we controlled for the number of retail branches (*branches*), using natural log transformations to adjust for nonnormality. We controlled for *client mix* (i.e., the percentage of commercial loans in a bank's loan portfolio) to account for strategic focus. We controlled for *prior performance* as a bank's average annual return on assets and for *reserves* set aside to absorb loan losses. We controlled for the number of loans processed by a bank in the federal Paycheck Protection Program (*PPP*) in 2020 to account for fees received for processing such loans. We confirmed that no banks in our sample received PPP loans. We controlled for *CEO tenure* to account for CEO influence in decision-making. We controlled for a lagged version of the focal dependent variable in each analysis, with *past layoffs* measured as a dummy indicating whether a bank made layoffs in

2018 or 2019, and *past workforce reductions* measured as a bank's largest workforce reduction in that period. To account for the potential role of compensation in the decision to engage in workforce reductions and layoffs, we controlled for bank salary expenses (*salaries*).

Results

We conducted Durbin–Wu–Hausman tests to determine whether *HCI* or *PCI* were endogenous, using average annual return on equity for a bank's peer group (based on FDIC categories) and net interest margin as instruments.⁶ These tests did not support treating *HCI* or *PCI* as endogenous ($F = 2.10, p = .15$; $F = 1.67, p = .20$, respectively). We estimated our models using logit and censored regression (which is well suited for truncated data) with robust standard errors using Stata (v.16). To avoid potential multicollinearity, we followed grand-mean centering for testing interactions. All Variance Inflation Factors (VIFs) were below 10, reducing concerns of multicollinearity (Greene, 2003).

Descriptive statistics and correlations are reported in Table 1. The results of models predicting workforce reductions and layoffs are reported in Tables 2 and 3, respectively.⁷ Additionally, we provide

⁶ We identified instruments based on tests for validity and effectiveness (Kennedy, 2008; Semadeni et al., 2014). Both instruments were deemed valid, as they were statistically significant predictors of *HCI*, *PCI*, and improved the overall fit of the models. We established effectiveness of the instruments by determining that they were not correlated with residuals of the second-stage models predicting workforce reductions and layoffs.

⁷ We also tested our hypotheses using models that did not include control variables (Carlson & Wu, 2012; Sturman et al., 2021). These results also supported our hypotheses and are provided in an online Supplemental Material.

Table 3*Logistic Regression Results for Models Predicting the Probability of Layoffs*

Variable	Model 1	Model 2	Model 3	Model 4
State GDP	−0.006 (0.089)	−0.011 (0.090)	−0.015 (0.113)	−0.014 (0.116)
State political party	−0.143 (0.169)	−0.136 (0.170)	−0.226 (0.189)	−0.249 (0.195)
Bank charter				
NM	0.169 (0.211)	0.150 (0.210)	0.234 (0.246)	0.367 (0.253)
SA	1.112 (0.313)***	0.998 (0.317)***	1.189 (0.360)**	1.215 (0.374)**
SB	0.816 (0.295)**	0.837 (0.298)**	1.069 (0.332)**	1.150 (0.341)**
SM	−0.319 (0.271)	−0.361 (0.275)	−0.132 (0.298)	−0.107 (0.315)
Branches	−0.002 (0.002)	−0.001 (0.002)	−0.001 (0.003)	−0.001 (0.003)
Client mix	−0.029 (0.001)***	−0.030 (0.002)***	−0.026 (0.004)***	−0.026 (0.006)***
Prior performance	−0.131 (0.006)***	−0.135 (0.008)***	−0.132 (0.008)***	−0.139 (0.009)***
Reserves	−0.001 (0.002)	−0.001 (0.002)	−0.001 (0.002)	−0.001 (0.003)
PPP	0.002 (0.003)	0.002 (0.002)	0.002 (0.002)	0.002 (0.003)
CEO tenure	0.002 (0.001)**	0.002 (0.001)**	0.002 (0.001)**	0.001 (0.002)
Past layoffs	0.806 (0.511)	0.926 (0.535) [†]	0.930 (0.584)	0.907 (0.578)
Salaries	−0.013 (0.003)***	−0.014 (0.003)***	−0.013 (0.003)***	−0.013 (0.005)*
PFP	0.313 (0.035)***	0.318 (0.041)***	0.325 (0.048)***	0.377 (0.061)***
PCI	−0.016 (0.004)***	−0.017 (0.004)***	−0.016 (0.005)**	−0.018 (0.005)**
HCI	−0.018 (0.006)**	−0.024 (0.007)**	−0.028 (0.008)**	−0.031 (0.009)**
PFP × HCI		−0.028 (0.009)**	−0.022 (0.010)*	−0.021 (0.009)*
PCI × HCI			0.004 (0.002)*	0.005 (0.002)*
PCI × PFP			−0.006 (0.002)**	−0.009 (0.003)**
PFP × HCI × PCI				−0.024 (0.003)***
Constant	−2.573 (0.594)***	−2.680 (0.604)***	−3.739 (0.817)***	−4.438 (1.395)***
χ^2	118.02	129.16	133.92	139.08
$\Delta\chi^2$		11.14	4.76	5.16

Note. $N = 1,364$. Standard errors are in parentheses. GDP = gross domestic product; NM = State-chartered, nonmember commercial banks regulated by the FDIC; SA = State or federal savings institutions regulated by the Office of Thrift Supervision; SB = State savings banks regulated by the FDIC; SM = State-chartered commercial member banks regulated by the Federal Reserve; PPP = Paycheck Protection Program; PFP = pandemic financial pressures; PCI = physical capital investment; HCI = human capital investment; FDIC = Federal Deposit Insurance Corporation.

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$, two-tailed tests.

practical interpretations of our findings related to workforce reductions in Table 4. To test Hypothesis 1, we examined the effect of PFPs on workforce reductions and layoffs. As shown in Model 1 in Tables 2 and 3, the effect of PFPs on workforce reductions ($b = 16.433$, $SE = 5.037$, $p = .001$) and layoffs ($b = 0.313$, $SE = 0.035$, $p = .000$) is positive and statistically significant, providing support for Hypothesis 1. To test Hypothesis 2, we entered an interaction between PFPs and HCI. As shown in Model 2 in Tables 2 and 3, the interaction is negative and statistically significant in predictions of workforce reductions ($b = -0.409$, $SE = 0.106$, $p = .000$) and layoffs ($b = -0.028$, $SE = 0.009$, $p = .002$). A plot of the interaction predicting workforce reductions (Figure 2) shows that the positive effect of PFPs on workforce reductions is significantly weaker among banks with higher levels of HCI, relative to those with lower levels of HCI. Likewise, as shown in Table 5, the marginal effect of PFPs on the probability of layoffs is positive and statistically significant at low, mean, and high values of HCI, with this effect decreasing (as predicted) at higher levels of HCI. Thus, Hypothesis 2 was supported. To test Hypothesis 3, we included a three-way interaction for PFPs, HCI, and PCI. As shown in Model 4 in Tables 2 and 3, the three-way interaction is negative and statistically significant in predictions of workforce reductions ($b = -0.018$, $SE = 0.004$, $p = .000$) and layoffs ($b = -0.024$, $SE = 0.003$, $p = .000$). A plot of the interaction predicting workforce reductions (Figure 3) shows that the attenuating effect of HCI on the relationship between PFPs and workforce reductions is significantly stronger in banks with higher—relative to lower—levels of PCI. Likewise, as shown

in Table 5, the mitigating influence of HCI on the marginal effect of PFPs on the probability of layoffs is statistically significant at low, mean, and high values of PCI, with the mitigating effect increasing in strength (as predicted) at higher levels of PCI. Thus, Hypothesis 3 was also supported.

To better illuminate the observed relationships, we ran additional empirical analyses, conducted interviews with 12 bank leaders, and reviewed annual reports for 35 banks in our sample. We report our findings in the Appendix. The empirical analyses provided evidence that (a) PFPs represented a source of increased financial strain during the pandemic, with our composite PFP index offering a better fit to the data in comparison to the disaggregated financial pressures comprising the index; (b) among the individual financial pressures examined, NPLs exerted the greatest shock in the pandemic period; (c) results of regression analyses predicting workforce reductions and layoffs using NPLs as a focal predictor were consistent with our main analyses using PFPs as a focal predictor; (d) banks with higher levels of HCI—relative to those with lower levels of HCI—made larger reductions in other, non-HR expenses (i.e., presumably as an alternative to workforce reductions) when faced with higher PFPs during the pandemic; and (e) among banks facing higher levels of PFPs, those with higher levels of both HCI and PCI made the largest cuts in PCI (i.e., presumably to avoid workforce reductions) and the smallest cuts in HCI. The interviews and annual reports offered rich examples of the tangible resource gains achieved through HCI and PCI and of how their co-specialization can enable firm-specific value-creating potential in the banking context.

Table 4
Interpretation of Results for Models Predicting Workforce Reductions

	Predictors		Practical interpretation	Relevant comparison groups	
	PFP	PFP and HCI	Translations	A 1 SD increase in PFP is associated with an increase in workforce reductions of 16 employees.	All banks
Hypothesis 1					
	Predictors			Higher HCI	Lower HCI
Hypothesis 2					
	PFP slope	PFP slope	PFP slope	24.92	
	Translation	Translation	Translation	A 1 SD increase in PFP results in an increase in workforce reductions from 37 to 62 employees.	
Hypothesis 3					
	Predictors			Higher HCI, Higher PCI	Lower HCI, Higher PCI
	PFP, HCI, and PCI			13.48	30.39
	PFP slope	PFP slope	PFP slope	A 1 SD increase in PFP results in an increase in workforce reductions from 32 to 45 employees.	A 1 SD increase in PFP results in an increase in workforce reductions from 36 to 66 employees.
	Translation	Translation	Translation	A 1 SD increase in PFP results in an increase in workforce reductions from 35 to 36 employees.	A 1 SD increase in PFP results in an increase in workforce reductions from 37 to 56 employees.

Note. High = +1 SD; low = -1 SD. PFP = pandemic financial pressures; HCI = human capital investment; PCI = physical capital investment.

Discussion

We contribute to research on the impact of the COVID-19 pandemic on organizations and individuals. The economic upheaval brought on by the pandemic has created unanticipated financial strain for many organizations, resulting in widespread workforce reductions. Of note, in banks, this pattern was exacerbated by a sharp cut in interest rates and federal legislation that limited the recourse available to banks facing nonpayment of loans, increasing the urgency and constraining the options available to respond to PFPs—which potentially made the use of workforce reductions and layoffs a more prevalent response than it would have otherwise been.

Our article sheds light on how firms’ prepandemic investments in employees’ human capital shaped their propensities to make workforce reductions in response to PFPs. Our findings supported our prediction that HCI would weaken the positive effect of PFPs on workforce reductions, and that prepandemic PCI would enhance the attenuating effect of HCI in this relationship. Further, our supplementary analyses offered support for our expectation that banks with higher levels of HCI made greater cuts to expenses in other areas (i.e., as an alternative to workforce reductions) when faced with higher PFPs. Importantly, these findings provide evidence that the same investments that firms make to support the development of employees’ human capital in normal times also offer a buffer to employees’ job security in the face of financial precarity. That is, those firms whose employees benefit from more extensive training and development opportunities as a rule are also less likely to make workforce reductions as a response to financial pressures in a crisis. Such firms, it appears, are investing in employees “for keeps.” We hope future research will delve further into this possibility, as it points to circumstances under which investments in firm-specific human capital benefit the employees acquiring it—reflecting a divergence from more common assumptions that firms disproportionately benefit from employees’ development of such KSAs (Wang et al., 2009).

Our findings also reinforce the need to view firms’ management of employees in light of the broader resource orchestration context

Figure 2
Plot of the Interaction Between Pandemic Financial Pressures and Human Capital Investment Predicting Workforce Reductions

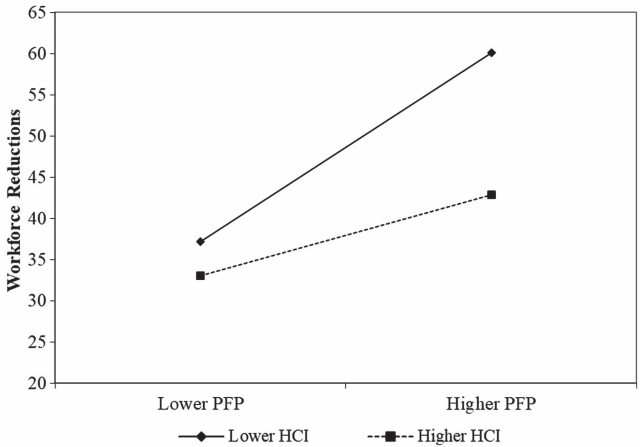


Table 5
Interpretation of Results for Models Predicting Layoffs

Moderator(s)	Level of moderator	Value of moderator	Marginal effect on layoff probability
			IV = PFP
HCI	Low	3.18	4.97***
	Mean	5.24	3.05***
	High	7.30	1.62***
HCI (low PCI)	Low	3.18	6.92***
	Mean	5.24	5.02***
	High	7.30	3.63***
HCI (mean PCI)	Low	3.18	5.18***
	Mean	5.24	2.85***
	High	7.30	1.14***
HCI (high PCI)	Low	3.18	2.08***
	Mean	5.24	1.26***
	High	7.30	0.18**

Note. High = +1 SD; low = -1 SD; PFP = pandemic financial pressures; HCI = human capital investment; PCI = physical capital investment.
** $p < .01$. *** $p < .001$, two-tailed tests.

(Bentley & Kehoe, 2020; Sirmon et al., 2011). In particular, while prior research has emphasized that firms may increase the return on their HCIs through strategic investments in other (complementary) resources (e.g., Hess & Rothaermel, 2011; Rothaermel & Hess, 2007), our findings highlight that firms' non-HR investments may also shape their propensities and abilities to protect their investments in human capital in times of crisis. Specifically, our study suggests that banks with higher levels of prepandemic PCI demonstrated even stronger propensities to protect their investments in employees' human capital through the avoidance of workforce reductions when faced with higher PFPs—either because employees' KSAs were co-specialized to banks' investments in key physical capital resources or simply because higher levels of PCI represented an alternative area where costs

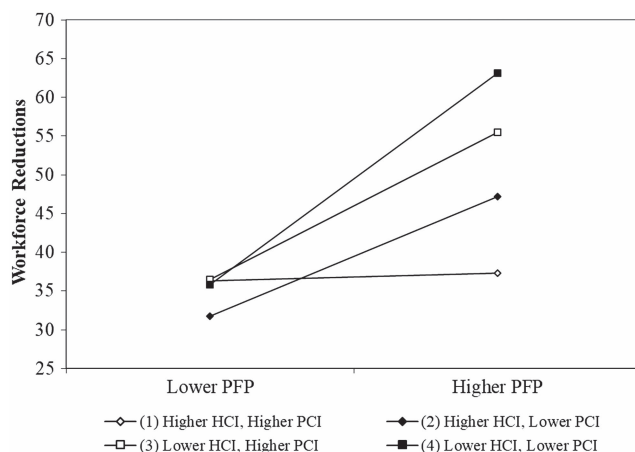
could be cut in lieu of making workforce reductions. Preliminary evidence presented in our Appendix suggests support for both of these explanations, though future research is needed to provide a more robust examination of the underlying dynamics at play.

Although our theory and findings support the idea that high levels of PCI in banks increase the extent to which HCI buffers employees from workforce reductions—particularly in response to financial strain—we note that the pandemic took hold at a time when the banking industry was (and is) still in the infancy of its digital transformation. As such, it is unclear whether these observed patterns will continue—or whether technology will come to replace employees as some have predicted—as the digital transformation progresses in banks.⁸ Thus, importantly, rather than suggesting a universality in the co-specialization of PCI and HCI across all contexts or even indefinitely in the banking industry, we suggest that the key generalizable insight related to this interaction is that firms' investments in employees' human capital may offer greater protection against workforce reductions in the face of financial strain when these investments are made stickier and more valuable through co-specialization with investments in other key resources—physical capital or otherwise.⁹ Here again, we offer a novel insight: while it has been theorized that firms may favor such co-specialization as a means to reap greater returns on their HCI (Molloy & Barney, 2015), our findings suggest that such co-specialization may also benefit employees in the form of increased job security.

We have noted that the financial pressures associated with the pandemic were unique in the sense that they were unprecedented, unanticipated, and enormous—representing a greater shock than most sources of financial strain faced by organizations in typical periods. With that said, our expectation is that organizations' investments in employees' human capital are likely to result in similar protections to employees' jobs in the face of significant financial shocks even outside the pandemic context (albeit in the much rarer instances where true financial shocks occur)—as workforce reductions are less likely to be the result of premeditated strategic planning and more likely to reflect an organization's best available response to the need to reduce costs in light of its recent resource investments in cases where financial shocks occur. Further, this protective effect is likely to be even stronger when HCI is accompanied by investments in other complementary organizational resources.

Our study's limitations highlight fruitful directions for future research. First, our research context was limited to the U.S. banking industry, raising the question of generalizability to other contexts. While additional research is needed to replicate our findings, we have confidence that our theory and findings related to HCI

Figure 3
Plot of the Three-Way Interaction Between Pandemic Financial Pressures, Human Capital Investment, and Physical Capital Investment Predicting Workforce Reductions



⁸ In the prepandemic period, workforce reductions and layoffs were lowest among banks high in both HCI and PCI—for banks facing both high and low levels of financial pressure (reflected by the current ratio, a more relevant indicator of financial health than PFPs in nonpandemic periods).

⁹ Prior work has highlighted the potential co-specialization of human capital with physical capital [e.g., including in the video game industry (Crandall & Sidak, 2006), health care industry (Schwartz et al., 2018), and defense industry (Plummer, 2021)] as well as of human capital with other resources, such as organizations' intellectual capital (Molloy & Barney, 2015), brand equity (Vomberg et al., 2015), alliances (Hess & Rothaermel, 2011), and client relationships (Hitt et al., 2001).

generalize to other professional service contexts where HRs represent both a significant expense and a critical element in firms' success (Sirmon & Hitt, 2009). Second, our data did not allow us to identify how HCI was allocated among employees within an organization or which employees were let go. Related, our measure of HCI captured only a subset of firms' HR-related investments. Thus, future research would benefit from a more comprehensive examination of the effects of firms' HR-related investments with respect to both content and coverage. Third, although in a supplementary analysis, we found preliminary support for our suggestion that banks with higher levels of HCI would be more likely to reduce costs in other areas (e.g., including PCI, as well as other areas such as advertising and marketing, accounting and auditing, legal services, and consulting and advisory) to avoid workforce reductions, future research is needed to examine the feasibility and prevalence of specific alternative cost-cutting responses to financial pressures. Finally, an examination of the performance implications of banks' differential resource investments and use of workforce reductions was beyond our conceptual and temporal scope, leaving ample room for further inquiry into the performance implications of our findings, particularly in light of prior work on firms' HR-related activities surrounding economic crises (e.g., Kim & Ployhart, 2014).

These limitations notwithstanding, our article highlights the effects of firms' pre-pandemic investments in human capital and physical capital on the use of workforce reductions in response to PFPs and underscores the need to account for firms' path-dependent resource orchestration activities in our study of HRs.

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Appendix

Pandemic Financial Pressures as a Source of Increased Financial Strain Among Banks in the Pandemic

Both our theory and the fit of our paper with *Journal of Applied Psychology*'s call for COVID-19 papers rest in part on the assumption that the combination of financial pressures included in our index of PFPs became a significant source of financial strain following the onset of the pandemic. It is from this logic that we develop our arguments for Hypothesis 1, wherein we predict that PFPs will be positively related to workforce reductions and layoffs during the pandemic—a relationship that we would not expect to be as pronounced in typical times.

We took three steps to offer empirical support for our focus on PFPs, each outlined below. Specifically, first, to support the increased significance of PFPs following the onset of COVID-19, we demonstrate that the relationship between PFPs and layoffs and workforce reductions is significantly stronger in the pandemic—relative to the prepandemic—period. Second, to highlight that PFPs not only increased in the impact they exerted on banks but also in their relevance as a financial threat relative to more typical indicators of banks' financial health in the pandemic period, we compared patterns in the correlations between PFPs and the current ratio (i.e., a measure of liquidity) with layoffs and workforce reductions between the prepandemic and pandemic periods. Third, to offer support for the use of our composite PFP index and the inclusion of the four specific financial measures in this index, we compared model fit using our PFP measure relative to multiple combinations of these individual financial pressures.

Evidence of the Increase in Impact of PFPs During the Pandemic

To demonstrate the increased impact of PFPs among banks in the pandemic period, we compared the correlations between our PFP

index—as well as each of the individual financial measures included within it—and both layoffs and workforce reductions for the prepandemic (i.e., the 2 years preceding the pandemic) and pandemic periods.^{A1} Consistent with our expectations, and as shown in Table A1, the correlation between the PFP index and both layoffs and workforce reductions was significantly weaker in the prepandemic ($r = .024$; $r = .021$, respectively)—relative to the pandemic ($r = .121$; $r = .075$, respectively)—period.

Evidence of the Unique Relevance of PFPs During the Pandemic

Our theory also suggests that banks were uniquely impacted by PFPs during the pandemic, with the implication that these financial pressures shed distinct light on the financial strain faced by banks as a function of the unique factors at play following the onset of COVID-19, which may not be captured by typical indicators of banks' financial health. To offer support for this assumption, we compare patterns of relationships associated with PFPs and the current ratio, a common measure of liquidity used in typical periods to assess banks' financial health (Mishkin, 2004). For ease of comparison, we reverse coded the current ratio, such that higher values are indicative of decreased financial health. As illustrated in the comparisons in Table A1, while the correlations between PFPs and layoffs and workforce reductions increased between the

^{A1} Given that the impact of a given level of NPLs depends on how NPLs compare to a bank's overall loan portfolio, we measure NPLs as the percentage of a bank's loan portfolio that are comprised of nonperforming loans.

Table A1

Comparison of Correlations Between PFPs and Layoffs and Workforce Reductions Across Prepandemic and Pandemic Period

Financial pressure	Prepandemic	Pandemic	Difference
Correlation with layoffs			
PFP	.024	.121	.097 ($Z = 2.843, p = .002$)
NPLs (%)	.044	.192	.148 ($Z = 3.358, p = .000$)
NPLs (\$)	.013	.149	.136 ($Z = 3.354, p = .001$)
Interest revenues	.023	.065	.042 ($Z = 1.351, p = .088$)
Noninterest revenues	.020	.044	.024 ($Z = 0.657, p = .255$)
Earning assets	.014	.083	.069 ($Z = 1.955, p = .025$)
Current ratio	.058	.019	-.038 ($Z = -1.203, p = .114$)
Correlation with workforce reductions			
PFP	.021	.075	.054 ($Z = 1.666, p = .048$)
NPLs (%)	.081	.165	.084 ($Z = 2.486, p = .006$)
NPLs (\$)	.014	.106	.092 ($Z = 2.691, p = .005$)
Interest revenues	.012	.054	.042 ($Z = 1.351, p = .088$)
Noninterest revenues	.022	.073	.051 ($Z = 1.489, p = .067$)
Earning assets	.010	-.014	-.027 ($Z = -0.787, p = .216$)
Current ratio	.071	.022	-.049 ($Z = -1.513, p = .065$)

Note. As in our focal analyses, interest revenues, noninterest revenues, and earning assets were reverse coded both as individual measures here and prior to inclusion in the PFP index. Correlations greater than .05 are significant at the $p < .05$ level. PFP = pandemic financial pressures; NPL = nonperforming loans.

prepandemic and pandemic period (as noted above), the correlations between current ratio and layoffs and workforce reductions significantly *decreased* between the prepandemic and pandemic period. Specifically, the correlations between the current ratio and layoffs and workforce reductions are significant in the prepandemic period ($r = .058$; $r = .071$, respectively) and nonsignificant in the pandemic period ($r = .019$; $r = .022$, respectively). While we acknowledge that these are simple correlations that lack the rigor of regression analyses with relevant controls, together, these comparisons offer some support for the ideas that (a) indicators of financial health (i.e., current ratio) used in typical time periods may not effectively capture the financial strain—or be predictive of layoffs and workforce reductions that may have been made in response to this strain—among banks during the pandemic and (b) PFPs address this gap by capturing at least some of the unique financial strain experienced by banks in the pandemic period. For reference, we also report the correlations between PFPs and the current ratio in the prepandemic and pandemic periods in Table A2.

Empirical Support for Use of Composite PFP Index

To empirically evaluate our decision to include the four PFPs identified in the paper in a composite index, we examined the overall fit of our models predicting workforce reductions using more complex (i.e., individual PFP components) versus more parsimonious (i.e., PFP index) approaches. Specifically, we compared the Bayesian information criterion (BIC) and Akaike information criterion (AIC) for the models estimated using our focal PFP measure (i.e., the index comprised of the four financial pressures) against models in which the individual component pressures were kept separate (i.e., disaggregated). As shown in Table A3, the model estimated using the PFP index had lower AIC and BIC values ($AIC = 13,963$; $BIC = 14,062$) relative to the model estimated using the disaggregated components ($AIC = 13,995$; $BIC = 14,089$).

Additionally, the difference between the model statistics is greater than two, which suggests the difference in model fit is statistically significant (Burnham & Anderson, 2004). These comparisons point to a superior model fit and thus preference for the parsimonious model using the index of PFPs (Burnham & Anderson, 2004). To further assess the appropriateness of our focal PFP index, we compared the AIC and BIC of the model using the focal PFP index against models including each possible three-item index with a fourth component rotated out (e.g., one such model included a modified PFP index comprised of NPLs, interest revenues, and noninterest revenues, with earning assets as a separate variable in the model). The results, also shown in Table A3, further illustrate that the model using the focal four-item PFP index has the lowest AIC and BIC values, and that the difference between these values in comparison to all other models is greater than two—providing additional support for the use of the PFP index comprised of all four PFPs (Burnham & Anderson, 2004).

Table A2

Comparison of Correlations Between PFPs and the Current Ratio Across Prepandemic and Pandemic Period

Financial pressure	Prepandemic	Pandemic	Difference
Correlation with current ratio			
PFP	.062	.021	.041 ($Z = 1.265, p = .103$)
NPLs	.052	.026	.026 ($Z = 0.802, p = .211$)
Interest revenues	.030	.006	.024 ($Z = 0.739, p = .230$)
Noninterest revenues	.026	.025	.001 ($Z = 0.031, p = .488$)
Earning assets	.074	.001	.073 ($Z = 2.252, p = .012$)

Note. As in our focal analyses, interest revenues, noninterest revenues, and earning assets were reverse coded both as individual measures here and prior to inclusion in the PFP index. Correlations greater than .05 are significant at the $p < .05$ level. PFP = pandemic financial pressures; NPL = nonperforming loans.

(Appendix continues)

Table A3

Comparison of the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) for Model Selection Across Models Accounting for Pandemic Financial Pressures

Model	AIC	BIC
4-item PFP index	13,963	14,062
Individual PFP components	13,995	14,089
NPL and 3-item PFP index	13,982	14,070
Interest revenues and 3-item PFP index	14,055	14,143
Noninterest revenues and 3-item PFP index	14,017	14,104
Earning assets and 3-item PFP index	14,049	14,136

Note. PFP = pandemic financial pressures; NPL = nonperforming loans.

NPLs as a Unique Pandemic Financial Pressure

While the correlations in Table A1 offer support for our focus on PFPs, a closer examination highlights that the difference in pre-pandemic and pandemic correlations between NPLs and both layoffs and workforce reductions is significantly larger than these differences in the other financial pressures in our PFP index. This pattern is consistent with our sense that, relative to the other items in the PFP index, NPLs introduced a unique financial shock to banks with the onset of the pandemic. First, due to financial insecurity faced by borrowers and pandemic period legislation limiting the recourse typically available to banks in the face of nonpayment on loans, NPLs—a normal cost of doing business in typical periods—drastically increased in both level and associated risk. Indeed, as shown in Table A4, among banks in our sample, mean NPLs have increased 187% (and the mean charge-off rate for NPLs has increased from 14% to 26%) between the prepandemic (i.e., Q1 of 2018 through Q4 of 2019) and pandemic period. This increase is significantly greater than the increase in any of the other financial pressures (interest revenues: 36%, noninterest revenues: 41%, earning assets: 15%) in the PFP index. As another, potentially more intuitive basis for comparison, we also provide these increases in dollar values, where a similar (albeit somewhat less drastic) pattern can be observed. We also note that, while the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) provided direct consumer financial aid for mortgage and student loans that were backed by the Federal government to ameliorate financial hardship associated with loan repayment during the pandemic, among banks in our sample, on average, 8.4% of NPLs were Federal government-backed student

loans and mortgages and thus directly impacted by restructuring or forbearance associated with the CARES Act—leaving banks fully vulnerable to the financial strain tied to over 91% of the NPLs in their portfolios in the pandemic period.

Second, and related, of all of these financial measures, NPLs were the least volatile in the prepandemic period. Specifically, as shown in Table A4, in the eight quarters preceding the pandemic, NPLs had a coefficient of variation equal to 1.59, as compared to coefficients of variation of 3.52 for noninterest revenues, 2.89 for interest revenues, and 2.71 for earning assets. The difference in both the change and prepandemic stability between NPLs and these three alternative measures of financial pressure are statistically significant at the 1% level. In combination, these two sets of comparisons provide evidence that the pandemic-induced spike in NPLs was not only significantly larger than increases in other relevant financial pressures but also represented more of a financial shock because of the relative stability of NPLs in comparison to these other financial pressures prior to the pandemic.

On these bases, we provide the results of regression analyses in Tables A5 and A6 wherein we examined NPL—rather than PFPs—as our focal independent variable, while separately controlling for interest revenues, noninterest revenues, and earning assets—the other three measures in our PFP index. As shown in these tables, the results were consistent with the analyses reported in the paper, which used PFPs as the focal independent variable. We believe these results point to the unique significance of NPLs as a pandemic financial pressure in the banking industry and point to the need for additional research delving into the specific ways that NPLs were factored into decisions about workforce reductions and layoffs in this period.

Inquiry Into Explanatory Mechanisms in Our Model Assessment of Expense Reductions in Alternative Areas

Our theory rests on the idea that because firms with higher levels of HCI have greater value invested in the (often firm-specific) human capital of their employees, they stand to suffer a greater loss associated with employee departures and will thus be less likely to view workforce reductions as an attractive response to pandemic financial pressures (i.e., PFPs)—instead opting for alternative measures to reduce costs. As a preliminary effort to assess the validity of this logic, we sought to determine whether those banks with higher levels of HCI indeed responded to high PFPs with greater cost

Table A4

A Comparison of Prepandemic Stability and Prepandemic to Pandemic Change in NPLs, Interest Revenues, Noninterest Revenues, and Earning Assets

Change comparison	NPLs	Interest revenues	Noninterest revenues	Earning assets
\$ Change prepandemic to pandemic ^a	\$765.55	\$326.99	\$207.99	\$65.91
% Change prepandemic to pandemic	187%	36%	41%	15%
Comparison to NPLs (%)		$t = 102.92$ $p = .000$	$t = 108.03$ $p = .000$	$t = 128.39$ $p = .000$
Prepandemic coefficient of variation (\$)	1.63	3.58	2.94	2.73
Prepandemic coefficient of variation (%)	1.59	3.52	2.89	2.71
Comparison to NPLs (%)		$t = 41.02$ $p = .000$	$t = 31.89$ $p = .000$	$t = 29.92$ $p = .000$

Note. NPL = nonperforming loans.

^ain \$ millions.

(Appendix continues)

Table A5*Censored Regression Results for Models Predicting Workforce Reductions With NPLs as Focal Predictor*

Variable	Model 1	Model 2	Model 3	Model 4
State GDP	−1.017 (1.848)	−0.808 (1.849)	−0.551 (1.954)	−0.281 (1.873)
State political party	−3.400 (3.678)	−4.094 (3.682)	−3.788 (3.855)	−2.335 (3.708)
Bank charter				
NM	−2.598 (5.135)	−2.931 (5.180)	−2.925 (5.211)	−2.868 (5.164)
SA	−1.726 (7.245)	−0.943 (7.005)	−1.049 (7.013)	−0.984 (7.150)
SB	−3.745 (4.821)	−4.179 (4.840)	−3.723 (4.819)	−2.918 (4.886)
SM	−5.278 (5.987)	−5.077 (5.977)	−5.192 (5.983)	−5.849 (6.109)
Branches	0.041 (0.162)	0.009 (0.158)	0.027 (0.158)	0.030 (0.159)
Client mix	−51.382 (14.455)***	−58.506 (15.512)***	59.842 (15.137)***	57.513 (15.959)***
Prior performance	−0.678 (0.031)***	−0.709 (0.035)***	−0.719 (0.039)***	−0.705 (0.036)***
Reserves	−0.001 (0.000)***	−0.002 (0.000)***	−0.002 (0.000)***	−0.001 (0.000)***
Interest revenues	−0.002 (0.001)	−0.002 (0.001)	−0.001 (0.000)*	−0.001 (0.000)
Noninterest revenues	−0.262 (0.017)***	−0.257 (0.019)***	−0.264 (0.021)***	−0.163 (0.022)***
Earning assets	−0.036 (0.211)	−0.083 (0.201)	−0.214 (0.221)	−0.192 (0.227)
PPP	−0.147 (0.164)	−0.101 (0.158)	−0.125 (0.162)	−0.091 (0.160)
CEO tenure	0.005 (0.006)	0.003 (0.007)	0.004 (0.007)	0.002 (0.006)
Past workforce reductions	0.117 (0.104)	0.128 (0.109)	0.119 (0.110)	0.124 (0.108)
NPL	7.588 (1.810)***	7.602 (1.834)***	6.939 (1.990)***	9.098 (2.053)***
PCI	−0.094 (0.014)***	−0.089 (0.021)***	−0.104 (0.023)***	−0.101 (0.021)***
HCI	−0.677 (0.206)***	−0.783 (0.257)**	−0.606 (0.255)	−0.692 (0.258)
NPL × HCI		−0.449 (0.020)***	−0.084 (0.023)***	−0.070 (0.016)**
PCI × HCI			0.026 (0.006)**	0.019 (0.006)**
PCI × NPL			−0.018 (0.005)**	−0.025 (0.006)***
NPL × HCI × PCI				−0.039 (0.004)***
Constant	53.807 (12.187)***	53.897 (13.027)***	53.787 (13.895)***	51.903 (13.826)***
F-stat	36.77	37.80	38.49	39.86
ΔF-stat		1.03	0.69	1.37

Note. $N = 1,364$. Standard errors are in parentheses. NM = State-chartered, nonmember commercial banks regulated by the FDIC; SA = State or federal savings institutions regulated by the Office of Thrift Supervision; SB = State savings banks regulated by the FDIC; SM = State-chartered commercial member banks regulated by the Federal Reserve; PPP = Paycheck Protection Program; NPL = nonperforming loans; PCI = physical capital investment; HCI = human capital investment; FDIC = Federal Deposit Insurance Corporation.

** $p < .01$. *** $p < .001$, two-tailed tests.

reductions in other areas (i.e., presumably, in an effort to avoid workforce reductions). Specifically, for this assessment, we first computed each bank's total pandemic period cuts in expenses across an array of non-HR-related business expenses provided in banks' quarterly reports (including expenses related to advertising and marketing, accounting and auditing, legal services, and consulting and advisory). We then compared the correlation between PFPs and these pandemic period reductions for banks with higher (1 *SD* above the average) versus lower (1 *SD* below the average) levels of HCI. Consistent with our expectations, the correlation between PFPs and total reductions in these other expense areas was significantly higher among banks with higher levels of HCI ($r = .58$), relative to banks with lower levels of HCI ($r = .16$). The difference between these two correlation coefficients is statistically significant ($Z = 12.258$, $p = .000$). While we acknowledge that our selection of these other non-HR-related expenses was based on data availability rather than rooted in a robust theoretical foundation, we believe this difference nonetheless offers preliminary support for our arguments that banks with higher levels of HCI were more likely to seek alternative cost reduction measures (to avoid workforce reductions) in response to high levels of NPLs during the pandemic period.

PCI × HCI × PFP: PCI as a Buffer

One theoretical explanation for the three-way interaction between PCI, HCI, and PFPs is the notion that, among banks with high levels

of PCI, PCI represents another area of significant investment where banks with high levels of HCI may be inclined to cut costs in order to avoid layoffs and workforce reductions. To assess the operation of this mechanism, we examined whether, in the context of financial pressures to reduce costs (i.e., among banks with high levels of PFPs), those banks with high levels of both HCI and PCI made significantly larger reductions in PCI during the pandemic relative to other banks. As shown in Table A7, we found evidence to support this notion: Among banks with high levels of PFPs (i.e., 1 *SD* above the mean), reductions in PCI were significantly higher among banks that were high in both HCI and PCI relative to all other banks (including, notably, banks that were high in PCI but not HCI—which presumably have the same potential buffer available in PCI but which may be less motivated to protect against workforce reductions).

Moreover, although we did not theorize about banks' reductions in HCI, we note that comparisons in this table also suggest that, among banks facing high levels of PFPs, banks that were high in HCI made significantly smaller reductions in HCI than in PCI during the pandemic, while this was not true for banks that were low in HCI. Specifically, banks that were high in HCI during the prepandemic period made an average reduction in HCI of 2.6%, compared to an average reduction of 10.9% in PCI in the pandemic period—a difference that is statistically significant ($t = 47.37$, $p = .000$). Additionally, we note that reductions in HCI were smallest among banks that were high in both HCI and PCI. Specifically, these banks

(Appendix continues)

Table A6*Logistic Regression Results for Models Predicting the Probability of Layoffs With NPLs as Focal Predictor*

Variable	Model 1	Model 2	Model 3	Model 4
State GDP	−0.022 (0.095)	−0.025 (0.096)	−0.034 (0.104)	−0.042 (0.106)
State political party	−0.008 (0.173)	−0.036 (0.178)	−0.093 (0.195)	−0.127 (0.214)
Bank charter				
NM	0.092 (0.215)	0.105 (0.217)	0.310 (0.240)	0.301 (0.234)
SA	1.052 (0.340)***	0.976 (0.352)**	1.218 (0.381)**	1.227 (0.392)**
SB	0.853 (0.314)**	0.928 (0.320)**	1.139 (0.336)**	1.138 (0.333)**
SM	−0.374 (0.279)	−0.420 (0.285)	−0.180 (0.312)	−0.200 (0.302)
Branches	−0.005 (0.004)	−0.002 (0.004)	−0.001 (0.003)	−0.002 (0.002)
Client mix	−0.021 (0.002)***	−0.027 (0.007)***	−0.025 (0.006)***	−0.023 (0.006)***
Prior performance	−0.094 (0.011)***	−0.088 (0.017)***	−0.083 (0.016)***	−0.082 (0.015)***
Reserves	−0.001 (0.001)	−0.001 (0.002)	−0.001 (0.001)	−0.001 (0.002)
Interest revenues	−0.047 (0.011)***	−0.039 (0.010)***	−0.042 (0.012)**	−0.041 (0.012)**
Noninterest revenues	−0.025 (0.015)	−0.037 (0.017)	−0.022 (0.017)	−0.024 (0.020)
Earning assets	−0.253 (0.046)***	−0.308 (0.053)***	−0.273 (0.054)***	−0.245 (0.042)***
PPP	0.002 (0.004)	0.003 (0.004)	0.003 (0.003)	0.004 (0.003)
CEO tenure	0.002 (0.001)**	0.002 (0.001)**	0.002 (0.001)**	0.002 (0.001)**
Past layoffs	1.018 (0.507) [†]	1.138 (0.533) [†]	1.437 (0.743) [†]	1.390 (0.695) [†]
NPL	0.218 (0.068)**	0.257 (0.070)**	0.240 (0.077)**	0.282 (0.116)*
PCI	−0.019 (0.003)***	−0.015 (0.005)**	−0.022 (0.006)**	−0.018 (0.007)**
HCI	−0.023 (0.007)**	−0.024 (0.008)**	−0.025 (0.009)**	−0.021 (0.011)*
NPL × HCI		−0.035 (0.004)***	−0.012 (0.003)***	−0.013 (0.003)***
PCI × HCI			0.004 (0.002)*	0.004 (0.002)*
PCI × NPL			−0.004 (0.001)**	−0.007 (0.002)**
NPL × HCI × PCI				−0.020 (0.005)***
Constant	−2.509 (0.650)***	−3.409 (0.671)***	−5.568 (0.749)***	−6.506 (1.087)***
χ^2	116.87	123.54	131.89	139.81
$\Delta\chi^2$		6.67	8.35	7.92

Note. $N = 1,364$. Standard errors are in parentheses. NM = State-chartered, nonmember commercial banks regulated by the FDIC; SA = State or federal savings institutions regulated by the Office of Thrift Supervision; SB = State savings banks regulated by the FDIC; SM = State-chartered commercial member banks regulated by the Federal Reserve; PPP = Paycheck Protection Program; NPL = nonperforming loans; PCI = physical capital investment; HCI = human capital investment; FDIC = Federal Deposit Insurance Corporation.

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$, two-tailed tests.

made reductions in HCI of approximately 1.6%, which is significantly smaller than reductions in HCI made by all other banks, as well as significantly smaller than the 16.14% reduction in PCI among banks in this group ($t = 56.86, p = .000$). These comparisons lend additional support to our arguments that banks with high levels of both HCI and PCI in the prepandemic period may view PCI as a financial buffer—specifically as an alternative area to cut costs in the face of financial strain—in order to avoid workforce reductions and layoffs (as well as potentially to avoid reductions in HCI). In combination with the co-specialization of HCI and PCI described in quotes from interviews and annual reports noted in the following section, these findings offer evidence that both of the proposed (nonmutually exclusive) mechanisms underlying the

significant moderating effect of PCI may be at play in our research context.

Illuminating Our Research Context With Qualitative Data

To supplement our empirical findings, we sought to shed more light on our research context through interviews with bank leaders and reviews of banks' annual reports. We conducted semistructured interviews by phone or video call with current top leaders at 12 banks in our sample. Interviewee titles included CEO, Chief Human Resources Officer, Executive Vice President, Chief Talent Officer, etc. The average interview length was 25 min. Additionally, we

Table A7*A Comparison of Pandemic Period Reductions in HCI and PCI Among Banks With High PFPs*

Reduction in investment	High HCI, High PCI	High HCI, Low PCI	Low HCI, High PCI	Low HCI, Low PCI
Reductions in PCI	16.14%	5.62%	10.37%	6.03%
Test for high HCI, high PCI mean > μ	N/A	$t = 39.54$ $p = .000$	$t = 18.52$ $p = .000$	$t = 37.82$ $p = .000$
Reductions in HCI	1.60%	3.52%	10.56%	7.36%
Test for difference between HCI and PCI	$t = 56.86$ $p = .000$	$t = 20.09$ $p = .000$	$t = -0.75$ $p = .452$	$t = -7.80$ $p = .000$

Note. Categorizations for “high” and “low” are based on 1 *SD* above and below the average; HCI = human capital investment; PCI = physical capital investment; PFP = pandemic financial pressures.

(Appendix continues)

reviewed the 2019 annual reports filed by 35 banks in our sample. Through these efforts, we gained additional insight into how leaders of the banks in our sample view and approach investments in human capital and physical capital (and their perspectives on the interface and potential co-specialization between them) in pursuit of

competitive advantage. We report a summary of these insights, with italicized font added for emphasis, in [Table A8](#). We note that these insights are intended to be for illustrative purposes only and make no claims regarding their representativeness of our broader sample.

Table A8

Insights on Human Capital and Physical Capital From Interviews and Annual Reports

Themes	Exemplary quotes
	Human capital
Customer service and relationships	“... the leading indicator of our ability to achieve our growth targets remains our ability to attract high-quality talent at all levels, particularly <i>advisors who are equipped to serve our clients with thoughtful advice and earn oversight of their assets</i> ” (Annual report)
- Recommendations and advice	“We’ve invested more in sales training. Not the traditional sales training that’s cold calling to find new customers. It’s training specifically on, as a banker, your position is <i>knowing your customer and making quality recommendations</i> . So our lending officers can deliver on that value proposition. You have a relationship you have someone you can call. After that, the next step is being the <i>trusted advisor</i> , and that’s what we’re trying to get our lending officers.” (CEO)
- Understanding clients’ needs	“As a community bank, we believe it is important to staff our branches with dedicated <i>employees who understand the culture and speak the language of our communities</i> . Our exceptional employees, who speak over 20 languages and are the face of our brand and our connection to our neighborhoods, remain a significant competitive advantage.” (Annual report)
- Speaking clients’ language	“I frequently hear from clients their stories of how an employee exceeded their expectations by their <i>responsiveness and personal attention</i> . It demonstrates our employees’ commitment to our core values by always doing what is in the best interest of our clients—it’s in our DNA.” (Annual report)
- Human touch	[Referring to processing PPP loans]: “We had 500 employees volunteer—some even from my team (HR)—they were from all areas ... to put these loans through. We have story after story of our customers saying, “You did this for me and you did it well!” We created a platform overnight, but it was actual people who got it done so fast because we knew the money was going to run out. It was a <i>human touch</i> where you weren’t trying to call a number where no one called you back.” (HR leader)
	Technological proficiency
- Digital fluency	“We knew we had to get front line colleagues more digitally comfortable. From an HR perspective, we put together a series of <i>digital fluency</i> courses. We needed them to have <i>comfort working in an automated environment</i> .” (HR leader)
- Experience with technology	“For example, as part of our transformation, we recently announced that we’re opening a tech-hub up here. That means that we’re spending a lot of money on building up our tech capabilities, but this also forced our senior leadership to acknowledge that those people that could build it weren’t on the bus and we needed to start attracting them. This meant that we needed to <i>focus on hiring people with tech-related backgrounds</i> and offering pay that allowed for us to get them on the bus.” (HR leader)
- Capabilities in analytics	“We envisioned a more digital automated banking franchise. <i>Less brick and mortar, more automation</i> . We said, from a people perspective, what type of individuals do we need to transform and become that digital bank? <i>People who embrace technology, having the right capabilities around analytics</i> . We knew we had to move away from folks who were doing things by rote or using manual processes to those who were forward thinking.” (HR leader)
- Comfort in an automated environment	“We believe that our ability to successfully implement our retail strategy will require us to <i>retain and attract additional management experienced in banking and financial services</i> , and familiar with the communities in our market.” (Annual report)
	Industry knowledge
- Industry experience	“We (had an opportunity to get into) security based lending so <i>we went out and found two people from [Company Name]’s security based lending team and had them build that business up and build that functionally too</i> .” (HR leader)
- Specialized product/service experience	“There’s this view that the industry is getting more complex, with additional more <i>complicated products</i> that banks can offer, so the training needs to follow to support those products.” (Chairman of the Board))
	Leadership capabilities
- Leadership development	“In 2019 we invested in our talent through the [Development] program, which identifies <i>what the leaders of tomorrow look like and sets a development path to strengthen those skills in our own employees</i> .” (Annual report)
- Tenure in firm	“We are early in the days of thinking about differentiating ourselves through human capital ... <i>We have 64% of our employee basis with 3 years of service or less—and that’s lots of new managers and supervisors who don’t know how to lead or how to manage</i> . This comes out in our employee relations data.” (HR leader)

(Appendix continues)

Table A8 (continued)

Themes	Exemplary quotes
Focus on expanding and redefining roles - Reskilling/upskilling - Re-envisioning the employee profile - Cross-training and role expansion - Flexibility to serve multiple strategic needs/markets	<i>"We repurpose employees—we used to call them tellers, customer services . . . the people who handle cash transactions and deposit checks—because we are not dealing with high traffic environment, this is not the future of the workforce in the branch, they are focused more into building relationships with customers using technology. So we are trying to <i>reskill some of workforce so they can pick up this new skill set so they can transition into what we think the future workforce should be.</i>"</i> (HR leader) <i>"There was a lot of attention on talent development. From that perspective we had to <i>rethink all of the profiles of employees in our organization from a competency perspective.</i> They thought of themselves as shopkeepers—you know, 'I open the door, make sure the lights are on, and everything's working, and then close it at end of day.' We said, 'No, you're like a store owner . . . how do you build business?'"</i> From that perspective, there was a lot of emphasis on development. To the extent that we weren't able to develop there was a focus on acquisition of talent." (HR leader) <i>"Part of the approach is to allow for us to <i>train employees so that we can extend their ability beyond the current role.</i> For example, we have this big push for what's called a 'universal branch' where employees are able to serve in just about every role."</i> (HR leader) <i>"We're also investing a lot in the platforms at the branches. This is where you see a lot of <i>cross-training of employees</i> so that they can understand how to use the systems required for both our traditional clients making deposits, withdrawals, and basic transactions to more advanced stuff like mortgage processing. But part of this approach is then <i>having them also training to use the system required to serve our commercial side.</i>"</i> (HR leader)
Improving process and workflow efficiency - Streamlining workflows - Enabling more flexible work processes	Physical capital <i>"One way we've invested is being able to handle the onslaught of so many loans . . . we were able to <i>create technology to streamline workflows</i> so we could <i>process and close loans quicker.</i> That frees employees up for other things."</i> (HR leader) <i>"We completed over 30 different projects including the launch of <i>new loan origination platforms to improve turnaround time and streamline the process</i> for our small business, mortgage and indirect automobile customers."</i> (Annual report) <i>"We also had to make major investments because the vast majority of employees were working off of desktops, now 75% have laptops. The other 25% are probably in a financial center [branch], so they're using those computers. Even there, we're thinking about <i>using mobile in a different way.</i>"</i> (HR leader)
Convenience for customers - Increased service availability - Personalized customer experience on digital platforms - New (digital) products) - Added security measures	<i>"During the year, we rolled out an <i>upgraded digital banking platform and implemented new technologies to increase productivity and efficiency.</i> Improving our technology not only augments our high-touch client service, but also opens up new channels for growth, particularly with next-generation clients."</i> (Annual report) <i>"New features to be offered include <i>online account opening capabilities, additional money transfer options and enhanced cash management services</i> for businesses of all sizes."</i> (Annual report) <i>" . . . a complete overhaul of our organization's core banking system — ushering in the cutting-edge technology required to deliver a <i>banking experience defined by each client's unique preferences.</i> A key aspect of this immense upgrade allows us to introduce many <i>new banking products and services that have become increasingly relevant to our clients,</i> and to ensure [Company Name] is well-positioned to continue delivering the most <i>sophisticated, technology-based products</i> available."</i> (Annual report) <i>"The <i>new digital platform is highly personalized and thoughtfully simplified,</i> allowing customers to arrange their dashboard in a way that makes the most sense for them, with a <i>more straightforward way to manage accounts, move money and send electronic Person-to-Person (P2P) payments.</i>"</i> (Annual report) <i>"In this time of innovation, <i>attention to security</i> remains critically important. Our <i>new mobile app</i> includes Touch or Face ID, two-factor authentication and real-time transaction alerts. With <i>enhanced card controls,</i> customers can use the app to temporarily disable a misplaced card, turn it back on when located and report it lost or stolen if needed. <i>Mobile payments are made more secure</i> with the launch of [Company Name] <i>Digital Wallet.</i>"</i> (Annual report)
Branch upgrades - Updates of physical service environment - Upgrades to technology in branches	<i>"We also <i>renovated and remodeled the majority of our existing branches</i> which refer to and operate as stores. Further, we embraced critical service changes that reframed the [Company Name] brand and experience in the eyes of the consumer to include expanded hours, absolutely free checking, free coin counting, no ATM surcharges, mobile banking and much more."</i> (Annual report) <i>"We've invested in having a <i>more open, user-friendly branch model with new lounge chairs, a nicer waiting area, we replaced some ATMs that were either outdated or not working.</i>"</i> (Chairman of the Board)
The interface between human capital and physical capital (and corresponding investments) - Using technology to increase efficiency associated with employee-customer service interactions - Using employees to train and support customers in new digital banking environment	<i>"We know that <i>pairing the latest technology with local, personal service</i> has helped to make [Company Name] a top [State] Bank."</i> (Annual report) <i>"Enhancing our technology infrastructure ensures that our employees have the tools necessary to deliver maximum value to our clients, and that clients are able to engage with us in a flexible and efficient environment."</i> (Annual report)

(table continues)

(Appendix continues)

Table A8 (continued)

Themes	Exemplary quotes
- Using technology to streamline standardized processes to free up employees to train and engage in more sophisticated value-creating activities	"That means they [<i>employees</i>] can use the CRM (Customer Relationship Management) systems to get a sense of what else they can do for customers and kind of get into the commercial side of things. In a sense, that means they start having these employees get into sales/service roles, rather than just sales." (VP, Commercial Lending) "So we got the front line employees comfortable with online banking—what they were selling to the clients—and then they went on a calling campaign. We had some resistance. A lot of clients were set in their ways. <i>If a client came into the financial center (branches), the folks who were on the platform would sit down with them and literally hold their hand to walk them through it the digital platform.</i>" (HR leader) "Initially we're using technology investing to improve back office processes . . . That means we need technology to take financial information that the customer gives us and putting it into the right format and using outside data sources to help us with the credit decision. <i>It's back office . . . because the focus for us is on maintaining the human relationship but making sure our processes are as streamlined as they can be.</i>" (HR leader) "Now we're seeing this is the future of work . . . <i>how do you meet customers in a virtual environment? You can invest in digital but if your people don't know how to work in that virtual world, you're kind of lost. It's the skills of the future . . . both technology and how you work.</i>" (HR leader) "... we're leveraging technology so people can go online and answer the questions and upload files, but also continued to ensure that each borrower has a dedicated relationship. <i>Even though we use technology to streamline process, they always have that human connection. I think the quintessential future of community banks is, use technology to make the process efficient but use human connection to provide the best possible experience.</i>" (HR leader)

Note. The summary of these insights were represented with italicized font for emphasis.

Received December 14, 2020
Revision received October 22, 2021
Accepted November 3, 2021 ■