Examining the Relationship between Bonus Pay and Voluntary Turnover

by

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ABSTRACT

The relationship between bonuses and turnover is far from simple because bonuses not only influence the likelihood of turnover occurring, but also the timing at which they occur. Conventional beliefs suggest that bonuses help reduce the level of turnover; however, there are theoretical bases suggesting that such behaviors may simply be delayed, only to reemerge en masse. The current study investigates the turnover patterns surrounding multiple bonus pay periods in a call center context. Consistent with economic and psychological theories, the results show that employee turnover likelihood decreases as bonus payout approaches. However, once group size and potential seasonality effects have been accounted for, the main results do not support the idea of post-bonus turnover clusters that are comprised of high performers. The hypothesis involving varying types and levels of exit reasons surrounding bonus periods was also unsupported. Lastly, the results indicate that neither post-bonus turnover clustering nor average leaver quality are statistically significant moderators of the collective turnover and unit performance relationship. That said, the timing of bonus pay and its relationship with outcomes of interests should still receive careful considerations when designing incentive schemes.

INTRODUCTION

An integral part of the organization's compensation plan, the bonus can broadly be defined as "a lump-sum payment to an employee in recognition of goal achievement" (Milkovich et al., 2013, p.676). The prevalence of bonus pay is undeniable; the 2019 Robert Half survey finds that 76% of American companies provided year-end bonuses and the 2017 Society for Human Resource Management benefits report shows that 51% and 44% of respondent firms offered incentive bonus plans for executives and nonexecutives, respectively. Similar practices also exist across the globe, whether these are the Latin-American *Aguinaldo*, the Japanese semi-annual bonuses, or the Chinese / Lunar New Year bonuses (AON, 2017).

Aside from their prevalence, bonuses can also comprise a substantial portion of workers' earnings. The 2020 Willis Towers Watson survey of 1,010 U.S. companies indicates that performance bonuses are projected to average 11% of salary for exempt employees, 6.8% for nonexempt, and 5.6% for hourly employees (Emerman, 2020). In a more dramatic case, the British investment bank Barclays reportedly paid over two billion pounds in bonuses just as the specter of the Great Recession loomed in the background (BBC, 2010). In fact, bonuses are so important that the reduction in or withholding of bonuses may even compel workers to go on strikes (e.g., AFP, 2012; Chinnawat, 2014; Reuters, 2016).

While the effects of bonuses on employee motivation and performance have garnered much research interest (e.g., Gerhart & Fang, 2015; Gerhart & Rynes, 2003; Nyberg et al., 2016), my dissertation takes a different turn by examining the effects of performance-based, lump-sum bonuses (hereafter referred to as simply "bonus") on voluntary turnover (i.e., workers' quit decisions). Though I consider bonuses based on the performance of individuals, groups, and firms

(e.g., profit-sharing schemes), my theoretical framework does not extend to retention bonuses (Lakhani, 1988), signing bonuses (Van Wesep, 2010), or referral bonuses (Pieper et al., 2018).

Convention beliefs would suggest that bonuses aid in employee retention not least because of its influence on motivation and pay satisfaction, which in turn is negatively associated with turnover intentions (e.g., Blakemore et al., 1987; Chiu et al., 2002; Lum et al., 1998). Nevertheless, the relationship between bonuses and employee turnover may be more complicated than it seems because bonuses simultaneously decrease the desirability and increase the ease of employees' movements (Park & Sturman, 2016). The former would produce a negative effect of bonus on turnover while the latter would yield a positive one. Furthermore, bonuses not only influence the likelihoods of turnover, but also the timing at which they occur. As such, the reduction in turnover may simply be delayed, only to reemerge *en masse*. This could severely disrupt business functions given the difficulty of finding adequate replacements when employees quit in rapid succession (Hausknecht & Holwerda, 2013; Hausknecht & Trevor, 2011). Consequently, I will attempt to reconcile these seemingly countervailing effects that bonuses exert on voluntary turnover by taking advantage of a longitudinal dataset where some workers receive bonuses while others do not. Ultimately, I intend to show that bonuses can engender *both* retention and turnover effects and that these two phenomena are sequentially occurring. Thus, the relationship between bonuses and turnover depends on the exact time at which this relationship is observed.

Beyond this, no studies to my knowledge have examined the characteristics of departing employees surrounding bonus periods or the reasons underlying their departures. Gaining insights into these phenomena is an important goal for turnover and compensation scholars since it will allow us to better understand the impact of these turnover events as well as what organizations can do in response. Accordingly, my principal aim is to answer three key research questions: (1) What

do the patterns of voluntary turnover events surrounding bonus pay periods look like, (2) what are the leaver compositions in terms of performance and exit reasons, and (3) how do these patterns and compositions affect organizational performance?

To answer the first question, I drew on both economic and psychological principles to explain how bonuses affect the patterns of voluntary turnover before and after bonus payments. I investigated the performance characteristics of leavers (i.e., whether those who quit after bonus payments are high- or low-performers) and also explored the factors driving these employees to quit based on reasons given during their exit interviews. I concluded by integrating these factors together to answer the second key question regarding the impact of post-bonus departures on organizational performance. In essence, my dissertation provides us with a deeper understanding of the bonus – voluntary turnover relationship by describing *when* can we expect the retention effects vs. turnover clusters, *who* leaves, *why* do workers quit, and *what* are the consequences of these departures on organizations.

I attempted to assimilate numerous streams of research from the broader turnover and compensation literatures. Some of these are well-established foundations (e.g., expectancy theory in compensation and the unfolding model of voluntary turnover); others are relatively recent developments (e.g., context-emergent turnover and turnover capacity theories). One of the topics is very much nascent (turnover clustering). My dissertation provides a number of theoretical and practical contributions. First, the findings concerning pre-bonus retention and post-bonus turnover effects will help to reconcile preexisting conflicting findings on the bonuses – voluntary turnover relationship. Second, turnover dispersion / cluster (i.e., temporal proximity of turnover events) is an important construct in turnover capacity theory (Hausknecht & Holwerda, 2013), but rarely has this construct been empirically tested. As such, my research contributes to the collective turnover

literature by being the first to highlight the role of bonus as a potential antecedent of turnover clusters. Third, the turnover literature has placed great emphasis on the importance of studying departing employees' quality when ascertaining the outcomes of turnover (e.g., Hausknecht & Holwerda, 2013; Nyberg & Ployhart, 2013; Trevor & Piyanontalee, 2020). Therefore, I progressed from the individual to the collective level of analysis and shed some light on the consequences of post-bonus collective turnover on subsequent organizational performance. In doing so, I hope that my dissertation will make a modicum of contribution to the vast domain of research on human resource (HR) management and organizational performance (Becker & Gerhart, 1996).

LITERATURE REVIEW

The Relationship between Bonuses and Voluntary Turnover

Evidence from Blakemore et al. (1987) suggests that bonuses can improve worker retention by providing compensation flexibility in the face of changing business circumstances and in response to competing offers from outside the firm. Nonetheless, there are also reasons to believe that turnover probability could actually increase subsequent to bonus payments. We can examine these opposing effects of bonuses through the framework of desirability and ease of movement (March & Simon, 1958). Among turnover researchers, desirability of movement has become synonymous with job satisfaction (Jackofsky, 1984). Ease of movement, meanwhile, is often considered in terms of labor market conditions or the individual-level movement capital such as education, cognitive ability, and training (Trevor, 2001).

In their study of pay-for-performance plans, Park and Sturman (2016) identified the conundrum where the exact relationship between bonuses and voluntary turnover can be rendered unclear by bonuses' simultaneous influence on both the desirability and ease of movement. On one hand, the two authors argued that the desirability of movement is reduced because bonuses that are part of a pay-for-performance scheme can increase equity perceptions for high performers (Salamin & Hom, 2005). Moreover, it can provide a positive feedback regarding the worker's future prospect with the organization (Ekinci, 2019; Fuchs, 2015). Profit sharing schemes in particular has shown a positive association with job satisfaction (Bryson et al., 2016), which in turn negatively predicts voluntary turnover (Rubenstein et al., 2018).

On the other hand, workers who have received their bonuses may be more likely to quit to search for new jobs as opposed to securing an offer before quitting. This is because bonuses help

soften the blows of unemployment by providing additional financial security (Engen & Gruber, 2001; Lentz & Tranaes, 2005). In the same vein, I expected that bonuses may actually facilitate job searches by allowing workers to afford additional training and certifications as well as services like resume editing, career counseling, or even childcare. All these reasons together suggest that bonuses should increase the ease of movement for workers.

In the following section, I discuss twenty-eight studies listed on Table 1 that directly examined both bonus pay and voluntary turnover. Six studies examined the relationship between bonuses and turnover intention. Of these six, four found a negative relationship (Barringer & Milkovich, 1995; Gomez-Mejia & Balkin, 1989; Korsakienė et al., 2015; Sturman & Short, 2000) and two were not statistically significant (Altarawmneh & Al-Kilani, 2010; Murphy & Williams, 2005). Of note is the work of Sturman and Short (2000) who studied 419 medical service workers across 5 firms. The researchers found that bonus size is negatively linked to turnover intention and that bonus satisfaction has an additional negative association with turnover intention beyond the effect of bonus size. Interestingly, bonus satisfaction is negatively linked to turnover intention when examined alone but becomes positive when controlling for other pay satisfaction dimensions. This result lends some credence to the idea that bonuses can increase the workers' ease of movement.

Seven studies examined the relationship between bonuses and turnover rate. Though their samples are quite distinct, the findings are remarkably consistent with five studies showing negative associations between group / profit-sharing bonuses and turnover rates (Guthrie, 2000; Miller et al., 2001; Prince et al., 2020; Selden et al., 2013; Wilson & Peel, 1991). Among these studies, Miller et al. (2001) and Selden et al. (2013) also found positive associations between individual performance bonuses and turnover rates. Miller and colleagues hypothesized that this

is because individual rewards may clash with the high collectivism and uncertainty avoidance culture present among the Mexican laborers in their sample. This logic aligns with the findings of Prince et al. (2020) who studied the moderating effects of national culture and found that the individual bonus – turnover linkage is positive when performance orientation is high, when uncertainty avoidance is low, when power distance is high, and when collectivism is low. It must be noted, however, that all of these interaction effects were in the opposite direction from what Prince and colleagues initially hypothesized.

In a rare study paying attention to the importance of payout frequency, Joseph and Kalwani (1998) examined salesforce turnover rates among 266 U.S. firms. Their survey indicates that 43% of the bonus-paying firms have annual payouts, 11% have semiannual payouts, 32% have quarterly payouts, and 15% have monthly payouts. Further analyses show that, among all bonus-paying firms, those with annual bonus payouts experience lower turnover rates than those who pay more frequently. Lastly, a study by Della Torre and Solari (2011) yielded nonsignificant associations.

As for the thirteen studies that examined the relationship between bonuses and turnover events (i.e., quit likelihoods), nine showed negative relationships (Blakemore et al., 1987; Clark-Rayner & Harcourt, 2000; Clotfelter et al., 2008; Ekinci, 2019; Kampkötter & Marggraf, 2015; Nyberg, 2010; O'Halloran, 2012; Salamin & Hom, 2005; Van der Stede et al., 2020). One study found a nonsignificant association in the logistic regression model (Bond, 2020) and one showed a nonsignificant correlation (Marquardt et al., 2011).

The remaining two studies revealed more nuanced findings that warrant further discussion. Specifically, Park and Sturman (2016) studied various forms of pay-for-performance plans (e.g., merit pay increases, bonuses, and stocks) and found that, when considered independently, bonus pay (as % of base salary) is negatively associated with turnover. However, when examined in

conjunction with merit pays and stocks, the bonus and turnover relationship becomes positive. This pattern appears to mirror the findings of Sturman and Short (2000) regarding how the bonus satisfaction effect changes depending on whether other compensation plans are included in the model. As for Ryu and Jinnai (2020), their results indicate that group bonus is negatively associated with turnover likelihood among public school teachers with low salaries but positively associated with turnover among the high-salaried counterparts. In this context, the same bonus amount is paid out to all teachers regardless of their own contribution to the school. And so, to the extent that high salary corresponds to high performance, Ryu and Jinnai believe that high-salaried teachers are more likely to leave due to their perceptions of pay inequity (Adams, 1963, 1965).

Aside from the three types of turnover outcomes discussed earlier, Joseph and Kalwani (1992) used the average tenure of sales employees across 286 firms as a proxy for turnover level. Their logic is that when the average tenure is high, then the focal firm is better at retaining their workforce. What the two researchers found is that the bonus-tenure relationship depends on the average pay level such that the relationship between bonuses and average tenure is positive among firms with above average pay and negative for those with below average pay. Interestingly, this goes against the finding of Ryu and Jinnai (2020) who found the opposite effect when studying turnover probability as influenced by teachers' compensation. Still, differences in the study context along with bonus type may potentially account for this apparent contradiction. It must also be noted that the validity of tenure as a proxy for turnover level may be limited because a growing firm could hire many workers. This would result in a declining average tenure even if the turnover level stays constant. Lastly, in a separate study of 267 Canadian firms, Pohler and Schmidt (2016) found a positive relationship between the percentage of bonus-eligible employees and the count of

turnover events (i.e., turnover level) in their negative binomial model. However, this relationship is no longer statistically significant once the manager's bonus eligibility is controlled for.

In sum, it appears at a glance that the extant literature on bonus pay and turnover is replete with studies showing conflicting relationships. With that said, taking into account the empirical idiosyncrasies of these studies may help to explain the heterogeneity of the bonus – turnover relationship shown in Table 1. These differences include the variation in study samples, longitudinal vs. cross-sectional data, bonus types (i.e., whether bonus amounts depend on the performance of the individual or the group / firm), bonus operationalization (e.g., actual payment amounts, dummy variables indicating whether workers received bonuses, or the percentages of bonus-eligible workers), payout frequency – annually or more frequent, and time clustering (i.e., whether all employees receive the bonus simultaneously or if pay is spread out over time).

THEORY AND HYPOTHESES

Leave When? The Timing of Voluntary Turnover Decisions

Bonus Pay and Individual Voluntary Turnover

To explain when we can expect to observe a positive vs. a negative relationship between bonuses and turnover, we may turn towards the temporal discounting framework (Green et al., 1994; Green & Myerson, 2004; Myerson & Green, 1995). The main idea of this framework is that the value of a reward is discounted as the time delay before payout increases. Such discounting arise because there are inherent risks in waiting for future rewards (Prelec & Loewenstein, 1991; Rachlin et al., 1991). After all, employees' performance could fluctuate due to factors that are entirely outside of their control or the management could simply renege on their earlier promises. And so, longer delays and the accompanying uncertainties would translate to lower expected value of bonuses.

As an illustrative example, consider a hypothetical firm that pays annual holiday bonuses on January 1st. In this case, those who stay with the firm past New Year are eligible for bonuses while those who quit earlier get nothing. In theory it should not matter when workers leave the firm prior to New Year because they will not receive any bonus regardless. However, the length of time that a worker must wait for the next bonus payout is typically the greatest after the last payout. For this reason, the bonus value is heavily discounted in January and less so in December. All else equals, the value of staying with the firm in January is far lower than the value of staying in December because the former case requires waiting almost a year before the next payout while the latter requires only a month.

Thus, the value of staying during the period right before bonus payment imposes upon the worker a far greater cost of quitting and those who intend to quit should do so immediately following bonus payouts to maximize utility (Mobley, 1977). We can observe some indirect evidence of this effect in the literature on pension and retirements (Lazear, 1990; Lazear & Moore, 1988). In such context, "a person continues to work if the option of selecting a better age of retirement in the future is worth more than the value of retiring now" (Stock & Wise, 1988, p.32). Although voluntary turnover and retirements may be distinct constructs with different antecedents (Adams & Beehr, 1998), both decisions nonetheless reflect employees' effort to remove themselves from the organization (Hanisch & Hulin, 1990). Therefore, I posit that the same principle which guides pension values and retirement decisions should also apply to bonus payments and turnover decisions as well. This hypothesized effect is depicted in Figure 1. I expected that the likelihood of individual voluntary turnover events should be weakest right before bonuses and strongest afterwards.

Hypothesis 1. The length of time that a worker must wait before bonus payout is associated with greater likelihood of voluntary turnover.

Bonus Pay and Collective Voluntary Turnover

There are myriad factors that potentially drive voluntary turnover decisions (Rubenstein et al., 2018). As such, aggregating the value of staying principle to the collective level should make the bonus-quit relationship less sensitive to individual level factors and allow clearer trends to emerge. Collective turnover represents "the aggregate levels of employee departures that occur within groups, work units, and organizations" (Hausknecht & Trevor, 2011, p.353). Translated to the current context, we can expect a discontinuous pattern of heightened collective turnover levels post-bonus followed by gradual declines as the next bonus payment approaches. Relatedly, there

should be brief delays in the heightened collective turnover level post-bonus. Such lagged effect is theoretically expected because companies may have in place policies requiring employees to provide advanced notice prior to their departures. Furthermore, some job search periods may be necessary before workers are able to secure new positions. This is an important consideration given that a substantial portion of workers quit their jobs with offers lined up. Indeed, one estimate based on the National Longitudinal Survey of Youth sample indicates that 66% of all voluntary leavers quit their workplaces to take up other jobs after employed searching or did so in response to unsolicited offers (Lee et al., 2008). This overall pattern of reduced collective turnover pre-bonus and delayed increase post-bonus is depicted in Figure 2.

Corroborating this idea, Aldatmaz et al. (2018) studied the impact of employee stock options via a multi-industry panel dataset from the United States. The researchers showed that the absolute turnover rate of the average firm in their sample declined by 2% annually after the options were issued. If a hypothetical firm experiences 10% annual turnover rate, then the relative turnover reduction equals 0.02/0.10 = 20%. Supporting the 'value of staying' logic discussed in Hypothesis 1, Aldatmaz et al. also found that unexpected increases in option values are predictive of stronger retention effects. Nevertheless, once the vesting period lapsed and workers gained full ownership of their options, Aldatmaz and colleagues found that "87% of the reduction in turnover observed in the first three years … is reversed in the subsequent year" (p.144). Since stock options are long-term incentives, it behooves compensation researchers to examine similar effects in the shorter-term bonus pay context. Doing so will help ascertain whether incentive programs with more frequent payouts like annual performance bonuses would produce a similar pattern of improved retention followed by increased turnover level afterwards.

Hypothesis 2. There will be a decrease in collective voluntary turnover during the pre-bonus time periods followed by an increase in collective voluntary turnover post-bonus.

Continuing our discussion of the collective turnover phenomenon, both context-emergent turnover (Nyberg & Ployhart, 2013) and turnover capacity (Hausknecht & Holwerda, 2013) theories have devoted considerable attention to the issue of turnover timing, particularly "the extent to which departures are dispersed over time" (Hausknecht & Holwerda, 2013, p.213). Hereafter, I will use the term 'clustering' to mean the inverse of 'dispersion' when discussing turnover event timing since the idea of clustering is more closely aligned with the phenomenon of heightened collective turnover level post-bonus.

Turnover clustering plays an important role beyond the absolute change in turnover level because the relationship between collective turnover level and unit performance will be more strongly negative under highly clustered turnover conditions. Consider two hypothetical scenarios. In scenario A, a firm loses one employee per each day of the month (low clustering). In scenario B, a firm loses thirty employees in a single week (high clustering). Though the total number of employee departures are the same, we can reasonably expect that the firm in scenario B will observe more dire consequences than in scenario A.

The logic underlying this moderating effect is that, when turnover events are more clustered, there will be fewer experienced members of the work unit remaining during the moment when these clusters occur. More clustered turnover also translates to higher concentration of less experienced workers. This could place further strain on the remaining experienced workers who must shoulder the burden of socializing their less experienced colleagues in addition to handling their own roles (Hausknecht et al., 2009). In sum, given the sudden depletion in human capital resources that accompany clustered turnover events (Nyberg & Ployhart, 2013), the work unit

should be less able to cope with the resulting increase in job demands (Reilly et al., 2014) and routine disruptions (Hale Jr et al., 2016).

Despite studies finding empirical support for this moderation effect (Call et al., 2015; Kim et al., 2019), the antecedents of turnover clustering have neither received theoretical explications nor empirical examinations thus far. Consequently, I will help fill this knowledge gap by using Hausknecht and Trevor's (2011) collective turnover framework to explain why bonus payments can be one avenue through which turnover clusters emerge. This conceptual framework classifies the antecedents of collective turnover into three major categories: (1) HR systems and practices (e.g., selective staffing, incentive system, formal grievance channel, and downsizing); (2) collective attitudes and perceptions (e.g., aggregated leadership perceptions, organizational culture, group cohesion, and justice perceptions); and (3) collective characteristics, which can be further broken down into (3a) member characteristics (e.g., diversity and union membership); (3b) establishment characteristics (e.g., size and location); and (3c) labor market characteristics (e.g., unemployment rate and labor costs). For detailed explanations of how these factors influences collective turnover, I recommend the reader to consult the original article by Hausknecht & Trevor as well as the meta-analyses by Heavey et al. (2013) and Hancock et al. (2017).

I contended that, just as changes in the *levels* of HR practices, collective attitudes, or collective characteristics can lead to different levels of collective turnover, changes in the *timing* of these antecedents should also result in different timing of turnover events. By the timing of antecedents, I refer to *when* the HR practices, collective attitudes, or collective characteristics affect each worker in the work unit or the organization. One example of a time-dispersed HR practice is an employee retirement plan that has individualized vesting schedules based on each worker's hiring date. In this case, workers with varying tenure will have different vesting status at

any given time. Conversely, a time-clustered equivalence would be a retirement plan where the benefits of many workers vest on the same day. Additional examples of time clustered antecedents include layoff announcements (Trevor & Nyberg, 2008), leader departures (Ballinger et al., 2010; Li et al., 2020), and strategic lift-outs of entire work teams (Groysberg & Abrahams, 2006). Though these antecedents may differ categorically and operate through distinct mechanisms, they all share the common theme of affecting multiple workers simultaneously. In the context of post-bonus turnovers, I expected turnover events to be more temporally clustered in the time period after all employees have simultaneously received their bonuses and more dispersed as time elapsed.

Hypothesis 3. Collective voluntary turnover will be more clustered in the time periods immediately post-bonus compared to pre-bonus periods.

Who leaves? Examining the Performance Profile of Leavers

The previous set of hypotheses covered the timing effect that bonuses exert upon quit decisions. The main takeaway here is that bonus-induced turnover clusters could prove to be highly undesirable from an organizational performance standpoint. Since the turnover literature has long emphasized the importance of leavers' characteristics when determining turnover consequences (e.g., Boudreau & Berger, 1985; Dalton et al., 1982; Dess & Shaw, 2001; Hausknecht & Holwerda, 2013; Hollenbeck & Williams, 1986; Nyberg & Ployhart, 2013; Trevor & Piyanontalee, 2020), it is worth examining to what degree is turnover clustering a function of workers' job performance. Answering this question will not only uncover the characteristics of leavers surrounding bonus payments, but also provide us with better insights into the effects of post-bonus turnover clusters.

To this end, Vroom (1964) expectancy theory of motivation can help clarify how performance would affect individual employee's motivation to remain with the firm. The central tenet of expectancy theory is that a person's motivation is a function of his or her *expectancy* (i.e., that one's effort will produced the targeted behavior), *instrumentality* (i.e., that achieving the target behavior will result in a certain outcome), and *valence* (i.e., how valuable said outcome is to the person) (Kanfer, 1990). Since expectancy theory is, at its core, an individual-level theory, my subsequent argument thus emphasizes bonuses that are based on individual performance. Still, it could extend to team-based bonuses assuming that individual contributions are clear and direct.

When adapted to the context of bonus pay, expectancy theory logic suggests that high performers would perceive a high degree of instrumentality from the bonus scheme. In other words, because these workers are already performing well, they have high expectations that they will be amply rewarded. It follows that these high performers should be especially motivated to remain with the firm. In other words, the pre-bonus retention effect should be felt most strongly among high performers who expect to receive proportionally large bonuses. Indirect support for this view can be found in several compensation studies which consistently show that high performers prefer performance-based pay dispersion (Cadsby et al., 2007; Carnahan et al., 2012; Shaw et al., 2009; Shaw & Gupta, 2007; Trevor et al., 2012).

On the flipside, the post-bonus turnover clustering should be heavily comprised of high performers as well. This is because high performers who already intended to quit should be more likely to delay their departure in anticipation of large bonus payouts. Assuming that all workers receive their bonuses simultaneously, these high performers would thus end up leaving together as a cluster once bonuses are paid out. Meanwhile, low performers should perceive low degrees of expectancy and instrumentality; thus, they are more likely to quit at any point in time. Even if

bonus paying firms may generally observe lower levels of high-performing quits compared to firms without performance bonuses, I expected that there will be more high performers among those who leave immediately post-bonus than from other time periods.

Hypothesis 4. Voluntary turnover clusters will be more heavily comprised of high performers during post-bonus periods compared to other time periods.

Why leave? Examining the Exit Reasons of Leavers

Pay and Career Advancements

In addition to looking at who leave post-bonus, it is also important to consider their reasons for leaving. This may offer researchers with a deeper understanding on how post-bonus turnover clusters originate and provide managers with some avenues for alleviating this issue. Just as the characteristics of post-bonus leavers may be distinct from those leaving at other times, the root causes of their departures may differ as well. Recall from earlier discussions that performance contingent pay schemes aid in the retention of high performers. I also argued in Hypothesis 4 that these high performers are more likely to delay their exits until after bonuses are paid because they stand to lose the most by leaving before payouts. This argument rests on the idea that workers are already intent on leaving and bonuses simply serve to delay their exits. Nevertheless, an alternative mechanism may also be driving high performers to leave post-bonus even if they had not consider doing so previously. This mechanism is pay comparison.

To elaborate on this mechanism, high performers are quite sensitive to their levels of compensation given their high levels of performance (Adams, 1963, 1965). Indeed, insufficient salary growth has been shown to predict "extremely high turnover" among high performers (Trevor et al., 1997, p.44). Relatedly, bonus pays are more salient from the workers' point of view

because bonuses are typically paid out as one sizable lump sum whereas base salaries are regularly doled out in smaller amounts (Nyberg et al., 2016). Together, compensation sensitivity and bonus saliency suggest that high performers should pay strong attention to their bonus pay comparisons. That is, beyond how much they are paid, it also matters how the size of their bonuses compare to those of other employees (Trevor & Wazeter, 2006). In cases where high performers perceive that their own bonus outputs are misaligned with their productivity inputs or are inadequate relative to others' bonus outputs, these high performers would experience a sense of relative deprivation (Crosby, 1976, 1984; Sweeney et al., 1990). This, in turn, would lead to dissatisfaction with pay and thus intention to turnover (Dittrich & Carrell, 1979; Telly et al., 1971). In sum, I argued that high performers, by virtue of their outsized performance inputs, are more likely to perceive underpayment inequity during times of bonus payments compared to low performers. Such inequity perceptions should also drive them towards voluntary turnover decisions as well.

In conjunction with compensation, there are reasons to believe that post-bonus leavers will also cite career advancement as the primary cause of their voluntary turnover decisions. This is because promotions not only yield pecuniary rewards, but also contributes to the employees' sense of recognition. Indeed, a typical promotional pay increase is approximately twice as large as a merit pay increase (Milkovich et al., 2013). Moreover, promotions serve to enhance the employees' status within the organization (Magee & Galinsky, 2008). Given that humans have an inherent need for status recognitions along with the natural proclivity towards status comparisons (Fiske, 2011; Frank, 1985; Maslow, 1943), employees whose need for status is unmet may seek to rectify this deficiency by leaving the firms (Bond, 2020).

Assuming that the performance appraisal procedures used for bonus allocations are also the same procedures used to make promotion decisions, the timing of turnover decisions will be

intertwined with the timing of bonuses and promotions. After all, employees will discover simultaneously what the size of their bonus is and whether they received a promotion or not. At this point, perceptions of inadequate compensations coupled with insufficient recognition will serve as a shock that culminates in voluntary turnover (Lee & Mitchell, 1994; Lee et al., 1999).

Entrepreneurship

Aside from compensation and career advancements, I also argued that post-bonus leavers will be more likely to report entrepreneurship as their exit reason compared to those leaving during other times. First, it has been shown that high salaried employees, though being less likely to leave the firm in general, are more likely to create new ventures when they do so (Campbell et al., 2012). Assuming that high performing (and therefore highly paid) employees are those who will most likely quit the firm post-bonus, I also expected these employees to exhibit higher likelihoods of engaging in entrepreneurial exits as well.

Second, a number of seminal works have highlighted the role of financial constraints as barriers against entrepreneurship – whether through the likelihood of becoming entrepreneurs (Dunn & Holtz-Eakin, 2000; Evans & Jovanovic, 1989) or the survival and profitability of entrepreneurial ventures (Holtz-Eakin et al., 1994). New ventures typically require the founders' own wealth as start-up funding (Gartner et al., 2004). As such, the presence of lump-sum cash bonuses may help employees overcome this initial financial hurdle and allow them to quit the company to dedicate themselves fully to their ventures.

Still, even if the financial boon from cash bonuses increases the probability of quitting, it does not explain why leavers should be more likely to quit post-bonus instead of other time periods. The unfolding model of voluntary turnover and its core concept of turnover "shocks" may help

explain why this is so (Lee & Mitchell, 1994). Specifically, the unfolding model delineates four pathways through which turnover occurs. These paths include shocks activating a scripted turnover plan (path 1), negative shocks violating the employees' values or goals and prompting them to reconsider their employment (path 2), individuals quitting in response to unsolicited job offers (path 3), and dissatisfaction driving individuals to quit with or without offers lined up (path 4). Of our particular interest is path 1: scripted turnover plan. I posited that these would-be entrepreneurs already have their turnover scripts in mind (e.g., "If I have $3,000 in my bank account, then I could finally afford the down payment for that food truck.") These scripts, together with the highly salient lump-sum bonuses, serve to explain why entrepreneurial exits would be more likely to occur post-bonus.

Family- and Health-Related Reasons

My theoretical arguments thus far have mainly focused on a subset of employees who delay their turnover decisions in response to the bonus timing. Nevertheless, in spite of the theoretical retention effect that bonus exerts, certain employees may still quit before the payout date. Again, I rely on path 1 of the unfolding model to predict the causes of pre-bonus quits. Akin to how bonuses trigger the mental scripts that lead to entrepreneurial exits, the occurrence of certain non-job-related events such as spousal job changes, pregnancy, or health problems may induce employees to look for new jobs and / or quit their work (Mobley, 1977). To the extent that these events are truly exigent (e.g., family emergencies or personal health), no amount of bonus that the firm could realistically provide would suffice to deter turnover decisions. These cases are what Dalton et al. (1982) called "unavoidable turnover" since exit decisions follow from mental scripts that supersede the retention effect of bonuses. In short, among those who are eligible for bonuses, I expected the causes of turnover pre-bonus to be primarily comprised of non-job-related reasons.

Hypothesis 5. Bonus-related turnover timing will be more strongly influenced by deliberate exit reasons (pay, career advancements, and entrepreneurship) than unavoidable reasons (family and health issues).

What Happens After? Examining the Unit-Level Outcomes of Collective Turnover

Following the discussions on the causes of departures surrounding bonus pay periods, we now turn our attention to the final piece of the puzzle: the organizational consequences of these departures. On average, findings from the collective turnover literature indicate that collective turnover is negatively associated with unit and firm performance (Hancock et al., 2017; Heavey et al., 2013; Park & Shaw, 2013). This is due to the depletion in human capital (Nyberg & Ployhart, 2013) and social capital (Dess & Shaw, 2001), as well as the ensuing workplace disruptions (Hausknecht & Holwerda, 2013). As discussed previously in the lead-up to Hypothesis 3, this negative link is amplified when turnover events are more temporally clustered.

In particular, Call et al. (2015) studied the effect of turnover rates in an American retail chain. The researchers focused on the interaction between turnover clustering (though they used the obverse term, "dispersion") and turnover rate *change*, which is the differences between turnover rate *levels* across observation periods. Operationalizing turnover clusters based on how turnover events deviated from the Poisson distribution, Call and colleagues found that when turnovers are less clustered (i.e., turnover events are more evenly distributed during the focal time period), the turnover rate change – unit performance relationship becomes less negative. In terms of economic outcome, a 1 standard deviation *decrease* in clustering translate to $248,207 reduction in profits lost to turnover rate change. Meanwhile, Kim et al. (2019) conducted a similar study using employee samples from a South Korean insurance company. Unlike Call et al. (2015), Kim and colleagues operationalized turnover clustering / dispersion as standard deviations. Still, a

similar pattern emerged: the net change in performance reduction associated with increased turnover rate is 30% smaller when clustering is 1 standard deviation lower (i.e., more dispersed).

Seeing as both groups of researchers found support for this moderating effect, we may reasonably expect the consequences of turnover clustering to generalize broadly across industries and locales. Even so, there is an implicit assumption in both studies that the turnover clusters are naturally occurring (i.e., that changes in the degree of clustering can be attributed to seasonal variations). As I have discussed in Hypothesis 3, turnover clusters could also be attributed to the timing of management practices. For this reason, examining the effect of turnover clusters as induced by bonuses could potentially reveal a scenario where the disruptive effects of turnover clusters are especially pernicious.

Hypothesis 6. The negative effect of collective voluntary turnover on unit performance will be stronger in units where turnover events are more clustered.

To reiterate earlier points, even though multiple units may be experiencing similar turnover rates, those that lose higher quality members will experience stronger declines in their performance due to greater human capital depletions (Nyberg & Ployhart, 2013), more severe routine disruptions, and stronger reduction in operational capacities (Hausknecht & Holwerda, 2013). Although both Call et al. (2015) and Kim et al. (2019) examined this moderating effect of turnover quality, Call and colleagues' quality measure is based on personality-based selection scores while Kim and colleagues' measure is based on actual performance ratings. Still, both groups of researchers found consistent results indicating that, as turnover quality increases, the negative effect of turnover rate change is exacerbated. Specifically, Call et al. (2015), found that the performance reduction associated with turnover rate change when turnover quality is high (1SD above average) as opposed to low (1SD below average) was $124,856. As for Kim et al. (2020),

they too found that a 1SD increase in quality-weighted turnover rate change is linked to 4.7% reduction in unit financial performance. Since these are the only two studies that have empirically tested the turnover quality moderator, I aimed to replicate their findings in a new context of a telecommunications call center. This will provide us with some insight into the clustering effect when turnover clusters are intertwined with bonuses and when employee performance is directly tied to customer service.

Hypothesis 7. The negative effect of collective voluntary turnover on unit performance will be stronger in units with higher-performing leavers.

Altogether, these hypotheses help elucidate the bonus-turnover relationship by explaining the timing of turnover events, the presence of turnover clusters, the characteristics of leavers, their exit reasons, and the organizational consequences. The list of hypotheses as sorted by their levels of analyses can be found in Table 2 for ease of reference.

METHODS

Sample & Context

My turnover data comes from a telecommunication company call center in Thailand. The call center agents are responsible for dealing with customers issues involving mobile phone, internet, and television services. The observation period is from January 1st, 2016 through June 30th, 2018. This is a suitable research context since the findings should be directly generalizable to the broader call center industry with over 3.4 million workers in the United States along with 3.6 million more in the Philippines, India, and Latin American countries combined (White, 2018).

Table 3 provides the firm level summary statistics of my workforce sample. Overall, there are 3,837.80 workers during an average month. These workers belong to three contract classes: 1-month, 11-month, and permanent. Consistent with what Sterling and Merluzzi (2019) coined "Temp-to-Perms" hiring arrangement, the new hires go through 2-3 months of training before they are given their first 1-month contracts. Contingent on satisfactory performance, they then become eligible for promotion to 11-month contracts and subsequently to permanent positions. Note that workers' tenure may exceed their contract length because the company can choose to renew their current contracts instead of promoting workers. Relatedly, a small subset of multi-lingual workers immediately starts out with permanent contracts. This explains why the tenure of some permanent workers who quit the firm can be as low as 1 month. My analyses focus on the bonus eligible permanent workers with the 11-month contract workers reserved for sensitivity analyses. Unless they are promoted during the observation period, 1-month contract workers are excluded from analyses due to their short tenure and bonus ineligibility.

Although turnover events are recorded daily, I present the monthly-aggregated statistics in Table 3 because the company typically compiles its human resources statistics at a monthly interval. Moreover, the monthly time period is a naturally meaningful unit that is more granular than the commonly employed annual measure (Hancock et al., 2013). The average monthly turnover rate in my sample is 1.90%, which translates to 22.80% annually. This is considerably lower than the 2017 U.S. industry average of 30% (Contact Babel, 2017).

Beyond this, I also have data of exit reasons as recorded by the HR department during exit interviews. The summary and frequencies of exit reasons for the bonus eligible permanent workers can be found in Table 4. Here, the data indicates that the top three most commonly stated reasons, "Family-related issues", "Pursue own business", "Career advancement" together make up 69.28% of all recorded exit reasons. Unfortunately, only the single most important reason was recorded by the interviewing HR personnel, so I cannot examine the combination of factors that may be driving quit decisions.

Another key feature of my call center data is that I have detailed turnover cost information that can be broken down into advertisement, employment testing, interview, training, and productivity loss. The firm estimates that these costs add up to 56,295 Thai baht per each turnover case (approximately U.S. $1,800). As such, it should be possible to calculate the total financial savings from retention as well as the costs of turnover associated with the post-bonus clusters.

Compensation structure

I do not have access to individuals' pay data, though such information can be indirectly deduced from the workers' job level. In 2018, the starting monthly salary of call center agents in my sample is 15,000 baht ($455). This base pay is the same as Thailand's call center industry

average (Adecco Thailand, 2017). Once promoted, the average salary of permanent workers is 25,000 baht ($760), so it is reasonable to assume that the salary of 11-month contract workers lies somewhere in this range. As for bonus pay, at the end of each February, permanent workers receive lump-sum bonuses that are tied to their individual performance while the 1-month and 11-month contract workers do not receive any. Bonus amounts are described in Table 5.

Individual Performance

Since Hypothesis 4 posits that there will be more high performers leaving the firm during post-bonus periods relative to other times, the following section discusses two different performance indicators – each with its own advantages and disadvantages.

Annual supervisor rating. I have supervisor rating data of leavers throughout the entire observation period (January 2016 through June 2018). As shown in Table 5, the call center roughly ranks its workers' performance on a normal distribution and the annual bonus scheme is structured to match this performance distribution. Each worker is assigned an annual performance rating by the supervisor and these ratings are used as part of bonus and promotion determination. Only the top 5% of the workforce are deemed "excellent" and are awarded 8-10% of their annual salary as lump-sum bonuses. Conversely, the bottom 5% fall in the "caution" category and receive no bonus pays. The bulk (65%) of the workers belong to the "good achievement" bin and are awarded 4-7% in bonuses. Figure 3 depicts the annual performance ratings of bonus eligible permanent workers who quit the company. We can see that the performance distribution of these leavers generally aligns with the company's overall performance rating scheme from Table 5.

Monthly KPI. In addition to the annual supervisor ratings, workers also receive monthly key performance indicators (KPIs) that are rated out of 100. Although the exact formula used to

calculate these KPIs are proprietary, company documentations reveal that the indicators are a function of factors such as customer satisfaction and dissatisfaction scores, call handling speed, call resolution rate, and attendance. In terms of descriptive statistics, the average worker has 9.64 months of KPI data out of 12 possible months. The average KPI value is 76.71 (SD = 11.89). Figure 4 presents the histogram for the average KPI values of individual leavers. The ICC(1) value of these KPIs is 0.53 and the ICC(2) value is 0.93[1]. The former value indicates that 53% of the variance in KPI is attributable to the grouping individual. The latter value suggests that the mean KPI value can serve as a fairly reliable measure of individual performance (Bliese, 2000; James, 1982). Nevertheless, despite these seemingly promising statistics, there is a severe missing data problem with the KPI of turnover cases as discussed in the following section.

Missing Data. 99 out of 583 cases (15.78%) of permanent worker voluntary turnover are missing supervisor-rated performance data. Preliminary examination of cases with missing performance ratings suggests that the missingness is spread evenly across all work units. However, those with missing performance ratings have lower average tenure (31.84 months) compared to their non-missing counterparts (76.12 months). Further examination also reveals that 56% of the turnover cases with missing performance ratings occurred during the first and final quarter of each year. Thus, it is plausible that the majority of these workers simply departed from the call center before their supervisors could assign the annual performance ratings. Assuming that these workers who departed the company before their annual evaluations are also those who expected to receive lower performance ratings, the data would be missing as a function of workers' performance. This means that the data are missing not at random (i.e. *non-ignorable*), which violates the assumption

[1] ICC(1) corresponds to ICC(1,1) in Shrout & Fleiss (1979) while ICC(2) has been referred to as ICC(1,k) by Shrout & Fleiss (1979) and as ICC(k) by McGraw & Wong (1996).

of conventional missing data handling techniques like multiple imputation (Allison, 2000). Following the recommendations of Goldberg et al. (2021), I conducted sensitivity analyses using the fixed-value replacement approach to examine the consequences of this missing data problem. The results, along with more details on this approach, can be found in the sensitivity analyses section.

As for the KPI data, due to issues with recordkeeping, my company contact person was only able to provide KPIs for a subset of workers from October 2017 through September 2018 as opposed to the beginning of the observation period in January 2016. There is a serious missing data problem here as 506 out of 583 (86.79%) permanent worker turnover cases are missing their KPI. Furthermore, of the 68 permanent worker turnovers for whom supervisor-rated performance and KPI data are both available, the correlation between their supervisor ratings and KPIs is an abysmal -0.02. Given the magnitude of the KPIs' missingness, my analyses will rely on the supervisor ratings even if these ratings may be less reliable than the monthly KPIs.

Unit Performance

The call center management organizes the monthly performance reports by four call center sections which, in turn, are separated into 14 divisions. Henceforth, all usages of the term 'unit' will refer specifically to these divisions. The performance of these divisions can be considered as simple aggregates of individual worker performances that are largely independent. Still, some interdependencies occur in cases where the failure to adequately resolve a customer issue by one agent may result in an angry customer call that must later be handled by another agent.

In order to ensure satisfactory performance levels, the call center management tracks numerous KPIs in accordance with industry standards. Discussions with my company contact have

led me to focus on four KPIs that are considered the most important: *call answering speed, call abandonment, call resolution,* and *customer satisfaction*. While all divisions perform similar functions of handling calls related to the company's products and services, these divisions differ in terms of the customer segments and the corresponding performance benchmark. For example, certain divisions deal with calls from 'mass-market' customers while others handle 'high-value' customers. Similarly, the *customer satisfaction* target for a 'mass-market' division is 67% while the target for a 'high-value' division is 75%.

Individual level sample size

Hypotheses 1 and 5 were tested at the individual level of analysis. Since this is an unbalanced panel data with workers joining and leaving the firm throughout the observed periods, the total number of observations is 95,206 worker-months based on 5,287 unique workers. Of this pool of workers, there are 3,078 individuals who are (or eventually become) permanent workers and the total number of turnover events among permanent workers is 583.

Collective level sample size

Since I am interested in examining the voluntary turnover patterns of the bonus eligible permanent worker group, Hypotheses 2, 3, and 4 were tested at the firm level of analysis. The sample size here is 120 biweekly periods (60 each for the permanent and contract worker groups). Meanwhile, Hypotheses 6 and 7 which look at turnover consequences were tested at the unit level of analysis. Even though the four KPIs identified earlier are individual level performance at their core, the management aggregates these KPIs to the unit level each month when assessing the overall call center performance. I adopted the same approach in my analysis in order to be

consistent with the call center's own approach. Since the call center only provided 9 months of unit performance data, the unit-level sample size is 14 × 9 = 126 unit-month observations.

Measures

Individual Level

Dependent variable. *Turnover* is a dummy variable coded 0 if the worker remains with the company during focal month *t* and coded 1 after the worker has quit the company. Involuntary turnover cases were included in the analyses but were treated as right-censored data since they were dismissed from the organization before they could voluntarily leave. These cases are coded 0 up until their dismissal. Likewise, workers who remain with the company at the end of June 2018 were also treated as right censored. This coding approach is consistent with that of prior works dealing with voluntary turnover (Lee et al., 2008; Morita et al., 1993; Nyberg, 2010; Trevor, 2001; Trevor et al., 1997). Lastly, I operationalized *exit reasons* as three categorical variables based on the following reasons listed in Table 4: (family and health related issues; entrepreneurship; career advancement and compensation).

Independent variable. *Tenure* is a continuous variable measured as the number of months that the worker has been with the company. *Time-to-bonus* is a time-varying covariate measured as the length of time in months that separates the focal time period and the upcoming bonus payment period. I controlled for the *worker's unit* as an indirect approach to account for each worker's supervisor. Although these workers may perform the same job, working under different supervisors may result in variations in leader-member exchanges, performance reviews (Erdogan & Enders, 2007; Kacmar et al., 2003), and thus very different bonus earnings and turnover likelihoods (Ballinger et al., 2010).

Collective Level

Dependent Variable. Consistent with the extant turnover literature, c*ollective turnover* is measured using the separation rate (Hausknecht, 2017; Price, 1977). Here, the numerator is the sum of voluntary turnover events occurring within each work unit during a particular observation period and the denominator is the total number of permanent workers at the start of that time period. I converted this measure from decimals into percentages in my analyses. Since *turnover clustering* is the dependent variable in Hypothesis 3 (more clustering post-bonus) as well as a moderator variable in Hypothesis 6 (turnover rate effect more negative when turnover events are clustered), I described this measure in the subsequent section on independent variables.

Turnover quality was measured as the average supervisor-rated performance of all quits. The reason I opted to use supervisor ratings instead of KPI is primarily because the KPI data are only available for 68 permanent worker turnover cases out of 583 (88% missing). I converted each leaver's supervisor-rated performance into an ordinal variable; for example, those whose performances are rated "D" are assigned a value of 1 whereas those who are rated "A+" are assigned a value of 6. I then summed up the quality scores of all leavers within a particular two-week period and divided by the total number of leavers. This procedure is similar to the approach of Call et a. (2015) who aggregated employee service orientation scores to get an indicator of turnover quality within units. The ICC(2) value of these mean rating scores is 0.77, which demonstrates considerable reliability for using mean performance ratings of leavers within time periods to capture turnover quality[2] (LeBreton & Senter, 2008). However, when assessing the

[2] We can think about the performance rating of each leaver as a "rating" and each time period as a "target." Since there are different numbers of voluntary turnover events for different time periods (i.e., it is an unbalanced data), this ICC(2) value of 0.77 is calculated from 21 different time periods (out of 60) in which there are at least 10 turnover ratings. Changing the inclusion criteria does not significantly change the

reliability of the unit level turnover quality (as opposed to firm level), the ICC(2) value decreases alarmingly to 0.33. This is because when the data are divided into individual work units, the number of permanent workers turnover ranges from only 0 to 4. Such low ICC(2) value would likely reduce the chance of detecting significant collective level relationships (Bliese, 1998).

For Hypotheses 6 and 7, the following continuous variables are used to capture collective performance: (1) *Answering speed* is the percentage of calls answered within a specified time limit. (2) *Call abandonment* is the percentage of callers who hung up before talking to the customer support agent. (3) *Call resolution* is the percentage of calls in which agents solved the customer's problem without needing to escalate to the supervisor or return the call. (4) *Customer satisfaction* is measured as the percentage of survey responses with overall satisfaction ratings of 4 or 5 on a 1-5 Likert scale. In the first three measures, the denominator for calculating percentages is the total number of calls. For customer satisfaction, the denominator is the total number of randomized surveys completed.

Independent Variable. *Time* is the number of months elapsed during the course of the study. *Bonus* is a dummy variable indicating pre-bonus (coded 0) and post-bonus (coded 1) time periods. There are three dummy variables for each bonus payment over the three years in my sample. *Turnover quality* uses the same measurement approach described in the earlier "Collective Level Dependent Variable" section. I measured *turnover clustering* based on the approach of Call et al.'s (2015). This operationalization uses the χ^2 goodness-of-fit statistic to show the degree to which observe turnover events deviated from the Poisson distribution. In this case, higher values would indicate more days with clustered turnover events. Table 6 provides example cluster

resulting ICC(2) values. For example, looking at time periods with at least 8 and 12 turnover ratings yielded ICC(2) values of 0.75 and 0.77, respectively.

calculations in three scenarios with equal numbers of turnover events but different degrees of clustering. As the example shows, this measure assigns the lowest clustering value for scenario A with 2 days of 2 turnovers. Scenario B, with 3 turnovers in 1 day, receives a higher clustering score. Scenario C has the largest clustering value since it has 5 turnover events on the same day. Since the resulting goodness-of-fit statistics ranged from 0 to 1.29×10^{12}, I dealt with extreme values via the inverse hyperbolic sine transformation (Burbidge et al., 1988), then I standardized the variable for ease of interpretation.

Controls. When estimating the effect of turnover clustering and quality in Hypotheses 6 and 7, I controlled for the following variables: (1) *Call volume* should help account for the varying workload across units as heavier workloads could lead to higher turnover along with poorer unit performance. (2) The *quality of existing workers* could influence both collective turnover as well as various performance outcomes. After all, working alongside a large contingent of poor performers may put pressure on high performers to quit. Therefore, I controlled for '*existing quality*' by taking the standardized average KPI values of workers within each unit. The ICC(2) here is 0.91. The existing quality dataset does not suffer from the same degree of missing data as the turnover dataset: only 70 cases of existing workers are missing their KPI out of 17,688 observations (0.4%). (3) Accounting for the *unit size* (i.e. total headcount at the beginning of the month) can help to identify the effect of turnover clustering and quality moderators since the consequences of turnover may be more strongly felt in smaller work units (Hausknecht et al., 2009). Lastly, (4) the level of *new hires* can make up for the rising job demands that follow from worker departures, thereby potentially reducing future turnovers and improving unit performance.

The summary of all measures can be found in Table 7.

Analyses

Hypothesis 1

This hypothesis predicts that the time until bonus is positively associated with quit likelihood. I employed survival analysis, also known as event history analysis, to test this hypothesis (Allison, 1984). This is an appropriate method for modeling the duration of time until voluntary turnover events occur because this technique takes organizational tenure into account by differentiating between those who quit the firm early in the observation periods vs. those who quit later. Numerous examples of survival analysis' applications abound in the turnover literature (e.g., Davis et al., 2015; Lee et al., 2008; Morita et al., 1993; Trevor, 2001). To estimate the effect of the time until bonus on voluntary turnover probability, I plan to estimate the following proportional hazards model (Cox, 1972; Sturman & Trevor, 2001):

$$h(t;x) = h_0(t)\exp[B_1(X_{controls}) + B_2(X_{Time-until-bonus})] \quad (1)$$

where *h(t;x)* is the conditional turnover probability at time *t* with predictors *x*; $h_0(t)$ is the baseline probability; *B*s are the regression coefficients; and *X*s are the explanatory variables. If the results were supportive, I should find that the hazard ratio for the time until bonus variable is greater than 1. That is, as the time until bonus increases, so does the likelihood of voluntary turnover. Given the repeated measurements of individuals in the data, the current set of analyses utilized robust estimators clustered around individuals for calculating standard errors (Lin & Wei, 1989). Lastly, the Cox regression model can be quite sensitive to *ties*, which occur when multiple events occur at the same time. This can pose an issue given that turnover clusters are expected to occur in my data. For this reason, the Efron (1977) approximation method was used for handling turnover event ties given its superior simulation performance (Hertz-Picciotto & Rockhill, 1997).

Proportionality assumption. Hazard models rest on the assumption that the effect of each predictor does not change over time; this is known as the proportionality assumption (Singer et al., 2003). I utilized a graphical approach as well as a goodness-of-fit approach to assess whether this assumption is tenable. The most popular graphical approach involves plotting the –ln(–ln) survivor curves against the ln(analysis time) for different levels of predictor variables; this is often referred to as the "log-log" plots (Kleinbaum & Klein, 2010). The log-log plot of survival curves for various time-to-bonus are parallel, which indicates that the proportionality assumption is satisfied. Furthermore, I plotted the Schoenfeld residuals over time to examine potential violations of the proportionality assumption. One advantage provided by this approach is that the residuals allow for exploring proportionality when other predictors are included in the model (Singer et al., 2003). The resulting residual plot for the full model appears to be linearly flat, thereby supporting the idea that the proportionality assumption is satisfied.

It must also be pointed out that the bonus eligibility dummy variable appears to violate the proportionality assumption. This variable indicates whether the worker belongs to the bonus eligible permanent worker group. Nevertheless, this variable is mainly used for addressing seasonality concern – a point which I discussed in a subsequent section. Exclusion of this variable from the model does not substantively alter the results for the hypothesized time-to-bonus effect.

Addressing left truncation. When subjects who experienced the phenomenon of interest prior to the study's observation period are excluded from the sample, this is termed "left truncation" (Klein & Moeschberger, 2006). In my case, I cannot observe those workers who voluntarily left the call center prior to January 1st, 2016. Failing to account for left truncation could therefore lead to underestimation of event risks since the sampled workers would end up with higher than average survival rate compared to the larger population of interest (Cain et al., 2011;

Morita et al., 1993). Excluding the left-truncated workers and keeping only those who joined the call center during my observation window will reduce my sample size to 2,138 workers, of which 376 are permanent workers. Though this addresses the bias from truncation, it also reduces the sample size by 61.42%. Since the start time at which subjects become exposed to the risk of turnover (i.e., hiring date) is known, a more appropriate approach is to estimate the conditional survival probability given that the subjects already survived up to the start of the observation period (Guo, 1993; Klein & Moeschberger, 2006). This involves incorporating subjects' tenure at the start of the study window in the survival analysis process. Accordingly, I followed the procedures and STATA codes for estimating conditional survival probability described in Cain et al. (2011).

Hypotheses 2, 3 and 4

I expected in Hypothesis 2 that the pre-bonus retention and post-bonus collective voluntary turnover effects will occur in March or April once the bonuses are administered at the end of February. To borrow from experimental terminologies, since bonuses are paid simultaneously to all permanent workers, we can think of the bonuses as "treatments". Accordingly, I adopted an interrupted time series design which statistically tests the difference in collective turnover levels and slopes before and after bonuses (Linden, 2015). Hypothesis 3, which predicts that turnover will be more clustered post-bonus, was tested via the same procedure except with turnover clustering as the dependent variable. Similarly, Hypothesis 4 involves comparing the leavers' performance level surrounding bonuses and I also tested this hypothesis via the interrupted time series regression with the average turnover quality as the main dependent variable.

Time specification. A daily or weekly measurement period may prove too short to show any meaningful time-clustering of turnover events while an annual time period may obfuscate the timing of departures surrounding bonuses. Accordingly, I chose the biweekly time period because

it provides sufficient granularity for examining turnover patterns while also being extended enough to allow for turnover clusters to occur. Although a monthly time period provides ample opportunity for turnover clusters to build up, it also reduces the functional sample size and thus statistical power. As such, the monthly time period was reserved for supplemental analyses.

Addressing seasonality concerns. Even though I may observe declines in the level, clustering, and quality or collective voluntary turnover pre-bonus followed by sharp increases post-bonus, it is possible that this pattern is not caused by the bonus itself. Instead, the pattern may simply reflect seasonal variations. Perhaps workers in Thailand are more likely to quit their jobs in April because it is the peak of summer. Alternatively, the observed patterns may simply be an inherent characteristic of the Thai call center industry. To alleviate this concern, the subset of 11-month contract workers can be viewed as a control group of sorts. These workers perform similar roles as their permanent contract counterparts even though they are ineligible for bonuses. Consequently, incorporating this non-equivalent control group into my analysis can help to show that changes in turnover levels and clustering is unlikely to be attributable to seasonal effects (Shadish et al., 2002; Wagner et al., 2002). If the 11-month contract workers do not exhibit significant differences in the turnover levels and clustering between pre- and post-bonus periods, then we can place more confidence in the idea that fluctuations in turnover level and clustering is due to bonuses.

For these interrupted time series analyses, I followed the design matrix proposed by Huitema and Mckean (2000) and estimated the following Ordinary Least Squares regression (OLS) model:

$$Y_t = B_0 + B_1T_t + B_2X_t + B_3X_tT_t + B_4Z_t + B_5ZT_t + B_6ZX_tT_t + e_t \quad (2)$$

Here Y_t is the collective voluntary turnover level, clustering, or quality at time t. T_t is the number of biweekly periods since the start of the study. X_t is a dummy variable coded 0 pre-bonus and 1 afterwards. X_tT_t is the time × bonus interaction term. Z_t is a dummy indicating whether the observation belongs to the bonus eligible "treatment" group or the ineligible "control" group. ZT_t and ZX_tT_t are interaction terms while e_t is the error term. Please refer to Table 8 for an example data coding scheme.

As for the coefficient interpretations, B_0 is the intercept. B_1 is the pre-bonus turnover slope. B_2 reflects the post-bonus change in the dependent variable of interest. B_3 reflects the slope-difference between pre- and post-bonus periods. B_4 reflects the pre-bonus level difference of the dependent variable between treatment and controls. B_5 reflects the difference between treatment and control groups in the level of dependent variables immediately post-bonus. Lastly, B_6 represents the slope difference between the two groups post-bonus compared to pre-bonus.

Instead of testing the effect of bonuses individually for each year via three different regression segments, I pooled the observations together such that the same time periods pre- and post-bonus are deemed equivalents between years. For example, the time period of 2 weeks post-bonus in 2016, 2017, and 2018 all share the same coding for time (T_t). To analytically confirm that this was an appropriate decision, I conducted the Breusch–Pagan Lagrange multiplier test with year as the grouping variable. The result ($p = 1.00$) suggests that there are no statistically significant differences across years.

Hypothesis 5

This hypothesis predicts that the timing of voluntary turnover will be more influenced by deliberate exit reasons (pay, career advancements, and entrepreneurship) than unavoidable reasons

(family and health issues). I tested this hypothesis by taking the time at which people leave (i.e., time-to-bonus) and regressing it on the exit reasons indicators using this OLS regression model:

$$Y_t = B_0 + B_1X1 + B_2X2 + e_t \quad (3)$$

where Y_t represents the time-to-bonus measured as the number of months remaining until the next bonus. X1 and X2 are dummy variables representing (1) pay and career advancement and (2) entrepreneurship, respectively. The Family and health category was omitted and used as a baseline comparison. I also included the unit fixed effects in the model to help account for unobserved unit effects (e.g., job demand and supervisory relations) that may be confounding the relationship between exit reasons and turnover timing. B_1 and B_2 coefficients both reflect the extent to which workers with deliberate exit reasons leave at different times of the year relative to those departing for unavoidable reasons. Therefore, higher values for these coefficients would indicate that the worker is quitting earlier before the next bonus (i.e., he or she is departing soon after the previous bonus has been paid out).

To avoid potential confusion, I must emphasize that I am not claiming particular reasons to be more or less frequently cited relative to other reasons. Rather, my argument is that, when focusing individually on each of the aforementioned exit reasons, the time at which people will most often cite such reasons will typically occur right before or after bonus payments. For example, I predicted that people would be most likely to cite entrepreneurship as their exit reason in the post-bonus month of March (long time-to-bonus) rather than in December (short time-to-bonus).

Hypotheses 6 and 7

Hypothesis 6 predicts that the negative turnover rate effect will be stronger when turnover clustering is high while Hypothesis 7 predicts that the negative turnover rate effect will be stronger

when turnover quality is high. For these final hypotheses, I estimated a series of fixed effects OLS regression model for each of the four dependent variables. The Hausman (1978) specification test involving the full model (Model 7 from Tables 18-21) for each of the four dependent variables failed to reject the null hypothesis that the fixed effect estimates are not significantly different from the more efficient random effect estimates. Nevertheless, the random effects assumption that unobserved heterogeneity of each unit is uncorrelated with the independent variables is hardly tenable given the myriad factors that may be driving both collective turnover level, quality, clustering, and the unit level performance outcomes. Thus, I estimated the following fixed effects model.

$$Performance = B_0 + B_1(VTO)_{ti} + B_2(Moderator)_{ti} + B_3(VTO \times Moderator)_{ti} + B_4(Controls)_{ti} + e_{jt} \quad (4)$$

where *t* is the time period and *i* is the work unit; B_0 is the performance intercept; B_1 is the main effect of collective permanent worker voluntary turnover (*VTO*). B_2 is the main effect of the two moderators: *turnover quality* and *clustering*. B_3 is the voluntary turnover × moderators interaction term. B_4 represents the effects of control variables and e_{jt} is the error term. Due to the longitudinal nature of the data, I also used robust standard errors to address potential heteroskedasticity issues.

RESULTS

Survival Analysis Results (Hypothesis 1)

Summary statistics and correlation for the individual level variables are listed on Table 9. Hypothesis 1 states that time-to-bonus is associated with greater likelihood of voluntary turnover. Table 11 Model 1 presents the Cox regression result for the bonus eligible permanent workers only. Here, the number of months to bonus has a positive hazard coefficient (b = 1.07, SE = 0.01). This suggests that the risk of turnover increases by 0.07 times for each additional month that the worker is further away from the following bonus payout date. Models 2 and 3 introduce the bonus ineligible contract workers for comparison. In Model 3, the time-to-bonus × bonus eligibility interaction is positive and significant (b = 1.07, SE = 0.02). This indicates that the time-to-bonus effect is stronger for bonus eligible workers. The left panel of Figure 5 shows that that the time-to-bonus effect affects the voluntary turnover hazard for the bonus eligible permanent worker group such that the turnover hazard is strongest when workers are more temporally distant from the bonus (11 months; black line) and the hazard is weakest when these workers are 1 month away from the payout date (light grey line). In contrast, the right panel of Figure 5 shows that time-to-bonus has no effect on the voluntary turnover hazard for the bonus ineligible contract workers since all three lines directly overlap. Together, these results provide support for Hypothesis 1.

Interrupted Time Series Analysis Results (Hypotheses 2, 3, and 4)

Summary statistics and correlations for the firm level variables involved in this set of analyses can be found in Table 10. Hypothesis 2 predicts that there will be a sudden increase in turnover levels post-bonus followed by gradual decline up until the following bonus. The pooled OLS regression results in Table 12 Model 1 reveal a statistically significant increase in turnover level post-bonus (b = 0.51, SE = 0.24). Although this result lends support to Hypothesis 2, I also

compared the bonus eligible group's turnover pattern against that of the ineligible group in order to address concerns over seasonal variations. Model 2 shows that the post-bonus turnover level difference is not statistically significant (Eligible × Bonus coefficient = -0.50, SE = 0.57). Furthermore, results of additional tests in Table 15 suggest that the post-bonus slope for the bonus eligible group is not significantly different from that of the ineligible group (Δ = 0.00, SE = 0.02). Figure 6 depicts these results in graphical form. Given that the robustness test involving bonus ineligible contract workers (Table 12 Model 2) proved unsupportive, Hypothesis 2 was not supported.

Hypothesis 3 makes similar predictions concerning the pattern of turnover clustering. Table 16 Model 1 shows that the bonus coefficient is not statistically significant (b = 1.09, SE = 0.73). Meanwhile, the post-bonus slope is negative and statistically significant (b = -0.05, SE = 0.03). These results suggest that the hypothesized post-bonus turnover cluster is not large enough to be detected in my sample; nonetheless, there appears to be gradual declines in turnover clustering subsequent to bonus payouts. Turning next to Model 2, none of the model coefficients are statistically significant. This means that the turnover clustering patterns of the bonus eligible group – whether in terms of levels or slopes – do not differ significantly from that of the ineligible groups. As such, Hypothesis 3 is not supported.

Hypothesis 4 posits that the collective turnover will be more heavily comprised of high performers post-bonus. Analyses here only involve the bonus eligible permanent workers since the contract workers do not receive annual supervisor ratings. Table 20 Model 1 shows that the bonus coefficient is not statistically significant (b = 0.32, SE = 0.43). Additionally, the post-bonus slope is not statistically significant (b = -0.02, SE = 0.01). As can be seen in Figure 8, the annual bonus payment does not appear to have any effect on the average supervisor-rated performance pattern.

Hypothesis 4 is therefore not supported. Please note that this hypothesis test contains no comparison with the bonus ineligible contract workers because the performance ratings only exist for permanent workers.

Exit Reason Analysis Results (Hypothesis 5)

Hypothesis 5 states that there will be more leavers with deliberate exit reasons than unavoidable reasons during the immediate post-bonus time periods. For this set of analyses, the higher the time-to-bonus, the closer the turnover timing will be to the previous post-bonus period. For example, if a worker quit the company in March after the February bonus has been paid out, the coded time-to-bonus in this case would be 11 months. When applied to Hypothesis 5, I expected that workers who left the company due to deliberate reasons should do so when the time-to-bonus is longer.

Table 23 presents the results of months-to-bonus regressed on the exit reason dummy variables. The baseline category here is *health and family*; therefore, if subjects are coded 0 in both the *career and pay* as well as the *entrepreneurship* categories, then they would have left the company citing health and family reasons. Model 1 shows that bonus eligible permanent workers quit during slightly longer months-to-bonus periods (b = 0.65, SE = 0.32, $p < 0.05$). Model 2 reveals that neither the coefficients for the career and pay nor the entrepreneurship variables were statistically significant. Likewise, neither of the interaction terms in Model 3 were statistically significant. Examination of the data in Figure 9 also shows that, during the pre-bonus months, unavoidable exits (health and family reasons) constitute a lower proportion of all quits compared to deliberate exits (career, pay, and entrepreneurship). Although the percentage of deliberate exits is higher immediately post-bonus, such difference appears to be a stable trend throughout the year.

As such, the proportion of deliberate vs. unavoidable exit reasons do not appear to be influenced by the bonus payout as expected and Hypothesis 5 was not supported.

Unit Level Outcome Analysis Results (Hypotheses 6 & 7)

Table 24 presents the summary statistics for unit level variables and Table 25 lists their correlations. The four dependent variables (speed, abandonment, resolution, and satisfaction) along with the three collective turnover variables are percentages. Unit size and new hires are sums of workers. Of note, the average permanent worker turnover rate is only 0.60 percent per unit-month. Considering the average unit size of 141.38 workers, this meager level of collective turnover suggests that the departures of these permanent workers are unlikely to cause significant disruptions to the remaining workforce.

As for the correlations, the applied psychology effect size benchmark from Bosco et al. (2015) can be used to describe these relationships.[3] Collective permanent worker turnover shares moderately negative correlations with both answering speed (r = -0.22) and call abandonment (r = -0.14), weakly positive correlation with call resolution (r = 0.08), and practically nonexistent correlation with customer satisfaction (r = 0.01). Contrary to expectation, turnover clustering has a strong positive correlation with answering speed (r = 0.37), though clustering's relationship with call abandonment (r = 0.25), resolution (r = -0.24), and customer satisfaction (r = -0.22) are moderate and in the expected direction (i.e., more clustering is linked to lower performance metrics). Turnover quality has a strong negative link to speed of answer (r = -0.31) and moderately

[3] In Bosco et al.'s analyses of 147,328 correlation effect sizes in applied psychology, the 25th percentile across all relationship types is r = 0.07. The median is 0.16 and the 75th percentile is 0.32.

negative link to call abandonment (r = -0.16). However, it appears that turnover quality is neither linked to call resolution nor customer satisfaction (both r = 0.00).

In terms of existing worker quality, this variable has strongly negative correlations with both speed (r = -0.31) and abandonment (r = -0.54). The former correlation coefficient contradicts the notion that a high-performing call center unit would quickly answer most incoming calls, though one explanation may be that better performers typically spend more time building rapport with customers. As for the remaining performance metrics, existing quality's relationship with call resolution is quite weak (r = -0.04) and its relationship with customer satisfaction is moderately positive (r = 0.19). This pattern of relationships would again be reflected in Tables 18 through 21 which contain the regression results predicting each of the four performance outcomes. Indeed, while most of the control variables do not exhibit any statistically significant effects, existing worker quality is positively associated with answering speed (Table 26) and negatively associated with call abandonment (Table 27).

Moving onto the main results, Hypothesis 6 states that the negative effect of collective voluntary turnover on unit performance will be stronger in units where turnover events are more clustered. Models 4 and 7 of Tables 25-28 all show that none of the collective permanent worker turnover × quality interaction terms are statistically significant. Thus, Hypothesis 6 was not supported. Hypothesis 7 states that the negative effect of collective voluntary turnover rate on unit performance will be stronger in units with higher-performing leavers. In the same vein, none of the collective turnover × clustering interaction terms in Models 6 and 7 of Tables 25-28 are significant. Hypothesis 7 was not supported. In sum, these results point to the idea that the effect of collective permanent worker turnover – regardless of the leavers' quality or the degree to which events are clustered – is simply not large enough to be statistically detected in my context.

SENSITIVITY ANALYSES

Alternative Specifications of the Interrupted Time Series Analyses

While I believe that the primary analyses that I have done are appropriate given the nature of the data and the theoretical problems I am assessing, it must also be said that the nature of turnover patterns surrounding bonus periods is still very much a nascent problem in the broader turnover literature. Indeed, no clear guidelines exist for the optimal model specifications or time unit of analysis. I therefore conducted a series of sensitivity analyses in order to determine how results would be affected by alternative approaches. As a reminder, Hypotheses 2, 3, and 4 respectively predict that there will be immediate post-bonus increase followed by gradual declines in collective turnover, clustering, and quality.

Lagging the Bonus Effect by 1 Month

Due to the fact that my analytical approach tests the level differences at the exact time of bonus as specified in the dataset (see Table 8: when X changes from 0 to 1), the results will be quite sensitive to the chosen bonus time. Given that I theoretically expected to see some delays before the collective turnover spike emerges post bonus due to advanced notice requirements and job searches, I also tested to see how shifting the specified point of bonus effect from March to April will affect my results.

Hypothesis 2. As shown in Table 12 Model 3, the bonus effect on collective voluntary turnover at the beginning of April is small and not statistically significant (b = 0.23, SE = 0.19). Table 12 Model 4 shows that the post-bonus level difference between the bonus eligible and ineligible worker groups is again non-significant (b = 0.14, SE = 0.58). Table 15 further shows

that the bonus eligible group's post-bonus turnover slope is again indistinguishable from that of the ineligible group (Δ = 0.00, SE = 0.03). Hypothesis 2 thus remains unsupported.

Hypothesis 3. Table 16 Models 3 and 4 show that lagging the bonus effect by 1 month does not produce any noticeable differences in the pattern of results. Specifically, both the Bonus coefficient in Model 3 and the Eligible × Bonus term in Model 4 are not statistically significant. Again, Table 19 shows that the negative post-bonus slope for turnover cluster is statistically indistinguishable between the bonus eligible and ineligible groups (Δ = -0.04, SE = 0.04). This result fails to support Hypothesis 3.

Hypothesis 4. The results again did not support Hypothesis 4 as the bonus coefficient of Table 20 Model 2 is non-significant (*b* = 0.09, SE = 0.34). Furthermore, Table 22 shows that the post-bonus turnover quality slope of Table 20 Model 2 is non-significant (*b* = -0.02, SE = 0.02).

Conducting the Analyses Using Monthly Time Unit

As discussed earlier in the Methods section, I initially chose the biweekly time period due to the granularity of turnover patterns and increased sample size. Nevertheless, a monthly time period will allow for larger turnover clusters to emerge (at the expense of total sample size). Thus, I re-analyzed the data using monthly observations to see how this will influence my results.

Hypothesis 2. In Table 13 Models 1 and 2, both the Bonus (*b* =0.55, SE = 0.28) and the Eligible × Bonus (*b* =-0.31, SE = 0.61) terms indicate that bonus itself has a non-significant effect on collective turnover level. Lagging the bonus effect by 1 month does not change this pattern. Table 13 Model 4 shows that the Eligible × Bonus coefficient is not statistically significant (*b* = 0.07, SE = 0.64). Table 15 shows that the slope difference between bonus eligible and ineligible

workers is non-significant for both March bonus (Δ = -0.02, SE = 0.06) as well as April bonus specifications (Δ = -0.05, SE = 0.07). Hypothesis 2 remains unsupported.

Hypothesis 3. As for turnover clustering, Models 1 and 2 from Table 17 show that analyses using the monthly time unit did not produce noticeable changes in the pattern of results since the terms of interest (Bonus and Eligible × Bonus) remained statistically non-significant. Table 19 further reveals that the post-bonus turnover cluster slopes for both bonus eligible and ineligible groups are significantly negative, yet indistinguishable from one another (Δ = -0.05, SE = 0.09). Lagging the bonus effect by 1 month also did not change the pattern of results (Table 17 Models 3 and 4) and Hypothesis 3 remain unsupported.

Hypothesis 4. Table 20 Model 3 shows that bonus has a positive effect on turnover quality when analyzed at the monthly time unit (b = 0.02, SE = 0.01, $p < 0.05$). However, as shown in Model 4, lagging the bonus effect by 1 month revealed an insignificant effect (b = 0.00, SE = 0.01). Table 22 also shows that, in both March and April bonus effect scenarios, the post-bonus slopes of Table 20 Models 3 & 4 are negative (b_{march} = -0.002, SE = 0.000, $p < 0.001$; b_{April} = -0.003, SE =0.001, $p < 0.001$). Thus, only the March bonus specification (Table 20 Model 3) provides support to Hypothesis 4.

Testing the Bonus Effect Individually for Each Year

The pooled OLS approach used in my primary analyses is beneficial in terms of statistical power since it provides 3 observations per each time point surrounding the bonus period. Still, an unexpected pattern during one of the three observed years may inadvertently detract from the overall bonus effect estimates. And so, it may be worth probing into how the results would appear when each year's bonus effect is analyzed separately. Since the data is analyzed as a firm-level

time series, I used the Newey-West standard errors which are robust to autocorrelation and heteroskedasticity in the error terms (Newey & West, 1987).

Hypothesis 2. The regression results in Table 14 Model 1 reveal a statistically significant increase in turnover level during two of the sampled years ($Bonus_{2016}$ coefficient = 0.49, SE = 0.09, $p < 0.001$; $Bonus_{2017}$ coefficient = 0.59, SE = 0.06, $p < 0.001$). Table 14 Model 2, however, shows that the Eligible × Bonus coefficients for all three years are non-significant. This means there are no statistically significant differences between the bonus eligible and ineligible groups in terms of their post-bonus collective turnover. In addition, Table 15 shows that although the post-bonus slopes of the bonus eligible group are significantly negative in 2016 and 2017, these slopes do not differ from that of the ineligible group. In sum, Hypothesis 2 remains unsupported.

Hypothesis 3. Table 18 Model 1 shows that only $Bonus_{2017}$ coefficient is statistically significant (b = 1.28, SE = 0.29, $p < 0.001$), indicating a significant increase in the degree of turnover clustering post-bonus. The bottom half of Table 19 also shows a negative clustering trend post-bonus in 2016 (b = -0.07, SE = 0.01, $p < 0.001$). This slope is significantly different from the bonus ineligible group (Δ_{2016} = -0.05, SE = 0.02, $p < 0.01$). Nonetheless, since the bonus coefficients for the other two years were not significant, Hypothesis 3 is still largely unsupported.

Hypothesis 4. I did not present a separate results table for individual bonus year analyses involving Hypothesis 4 due to missing data problem that prevented proper testing of the $Bonus_{2016}$ coefficient. When testing the effects for each of the two remaining years, only the coefficient for 2017 bonus year predicting turnover quality is consistent with expectation (b = 0.83, SE = 0.28). Nonetheless, given that the 2018 bonus effect is non-significant, I am reluctant to claim support for Hypothesis 4.

Sensitivity to Missing Performance Ratings

Recall from the earlier methods section that 15.78% of permanent worker voluntary turnover cases are missing supervisor-rated performance data and that there is a reason to believe these data are missing not at random. In this section, I tested how the pattern of results would change depending on whether the leavers are poor performers (rating = 2), average performers (rating = 3), or high performers (rating = 5) on a 1 to 6 scale. The results for this fixed-value replacement approach can be found on Table 21. As can be seen, none of the coefficients of interest (Bonus and Time × Bonus) were statistically significant regardless of the missingness assumption. That said, it is worth noting that the *Bonus* coefficient decreases in magnitude as the assumption shifts from missing cases are poor performers (b = 0.33, SE = 0.39) to missing are high performers (b = 0.11, SE = 0.59). This makes sense given that over half of the missing cases fall on the first and final quarters each year – a time period corresponding to several months pre-bonus. If these missing cases were all poor performers, then they would naturally bring down the average turnover quality of pre-bonus time periods, thereby producing a larger *Bonus* coefficient which tests the pre- vs. post-bonus differences in turnover quality. The opposite is true for the assumption that missing cases equal high performers.

DISCUSSION

My primary goal was to ascertain whether bonuses will influence the timing of voluntary turnover decisions and whether there will be a substantial and sudden increase in collective turnover post-bonus followed by a general decreasing turnover trend. Relatedly, I also tried to predict the degree to which turnover events will be clustered before and after bonuses. My explanatory account of these turnover patterns was built on the temporal discounting framework which itself has a wide-ranging application in predicting the discounted value of rewards over time. Next, I used the expectancy theory framework to explain how the performance characteristics of leavers would change around the time of bonuses. I then used equity theory and the unfolding model of turnover to try an explain the potential reasons that pre- vs. post-bonus leavers would cite for their departures. I concluded by analyzing the consequences of these turnover patterns on unit level performance; specifically, how would the turnover rate effect be moderated by turnover clustering and quality.

Utilizing longitudinal HR data from a Thai call center and analytical approaches suited to help minimize seasonality threats, I found evidence showing that there is a relationship between bonuses and workers' turnover timing such that people may choose to delay their quit decisions in order to collect the bonus before departing afterwards (Hypothesis 1). For Hypothesis 2, I found that there is a post-bonus increase in collective turnover; however, this increase was not significantly different from the post-bonus increase in turnover rate among the bonus ineligible contract workers. One interpretation of this finding is that the post-bonus increase in collective turnover among both bonus eligible and ineligible groups is simply due to seasonal fluctuations. Another explanation could be the turnover contagion effect whereby the job search behaviors and subsequent departures of bonus-earning workers will also trigger their colleagues to behave in

similar manners (Felps et al., 2009). A related explanation might be that the departure of bonus earning workers created extra strain on the remaining workforces who must handle larger call volumes than usual. This would also explain the concurrent rise in turnover rates between the two groups. In any case, I can neither rule out the seasonality concerns nor ascertain the existence of turnover contagion, so the evidence supporting Hypothesis 2 is modest at best.

I also failed to find support for Hypotheses 3, and 4 which respectively predict an increase in turnover clustering and turnover quality subsequent to bonus payouts. Supplementary analyses further revealed that the effect sizes and patterns of statistical significance are quite sensitive to alternative model specifications, the choice of biweekly or monthly time unit, and the decisions to test the bonus effect of each year in the sample simultaneously or individually. Nonetheless, the conclusion remains that these hypotheses were not supported.

Interestingly, when the analyses were conducted with turnover level (i.e., the sum of turnover events) instead of turnover rate as the dependent variable, the pattern of findings (not reported here) generally supported Hypothesis 2. One way to interpret this is that bonuses exerted a large enough effect on workers to compel them to leave together shortly post-bonus. However, once group size has been controlled for via the denominator of the turnover rate measure, we no longer see statistically significant differences between the turnover patterns of both worker groups.

As for Hypothesis 4 (predicting turnover quality), one potential reason for the lack of supportive findings could be due to the performance measure itself. Recall that the correlation between the annual supervisor ratings and the monthly KPIs of leavers is essentially nonexistent (r = -0.02). This suggests that workers generally have no reliable indicator of what their annual ratings given by their supervisor – and therefore the resulting bonus amount – will be. As a result, the expectancy theory rationale that underpins Hypothesis 4 will fail to apply to the current context.

Alternatively, it could be that the call center pays high performers enough to dissuade them from quitting (Shaw & Gupta, 2007; Trevor et al., 1997). This is reflected in Table 5 where the top performers' bonuses could almost double those of the average performers.

I also did not find support for Hypothesis 5, which predicts that workers quitting for unavoidable reasons will make up more of the pre-bonus leavers while those quitting due to deliberate reasons will comprise more of the post-bonus leavers. Perhaps this lack of findings stemmed from the poor-quality exit reason data as later discussed in the *limitations* section. Lastly, Hypotheses 6 and 7 involving unit level consequences also were not supported. In a separate set of analyses (not reported here), I tested the moderating effects of overall turnover clustering and quality of the entire workforce instead of modelling the effects of each worker class separately. Although those results indicate that the two moderators significantly influenced the collective turnover and unit performance relationship, it appears that narrowing down the focus to only the bonus eligible permanent workers rendered the effects nonsignificant.

Theoretical Implications

The aim of this paper was to resolve a preexisting conundrum concerning what the effect of bonuses on voluntary turnover decisions and timing might be. The current research thus contributes to both the turnover and compensation literatures by theorizing and testing a model of voluntary turnover patterns surrounding bonus pays. Doing so helps to explain when the relationship between bonuses and voluntary turnover can be expected to be positive (immediately post-bonus) as opposed to negative (pre-bonus).

While a number of studies have examined collective turnover properties such as clustering and quality (e.g., Call et al., 2015, Kim et al., 2019), scholarly attention on their antecedents have

been comparatively lacking. I still believe that my theoretical reasonings were appropriate even if the current endeavor has proven less than fruitful. Indeed, while the findings did not support the vast majority of the hypotheses, the current work nonetheless serves as an initial foray into the potential antecedents of these important turnover properties. In doing so, it also exposed a number of potential boundary conditions to my theoretical framework, namely that the expected effects are unlikely to be found in contexts with relatively small bonus sizes and where turnover patterns are highly subjected to seasonal forces. In short, despite the lack of supportive findings, I believe this work helped to lay out some guideline on why we may expect workers' turnover decisions to be influenced by the timing of compensation practices as well as what the subsequent turnover patterns might look like.

Practical Implications

The estimate from Table 12 Model 1 indicates that the post-bonus permanent worker turnover rate would be around half of a percent. Translated into headcounts, this would approximately equal 12 workers. Considering the fact that there are over 2,400 permanent workers on any given month at the call center in my sample, one cannot help but argue that this level of post-bonus turnover spike is practically insignificant. Nevertheless, the same call center also provided turnover cost estimates that are broken down into categories such as advertisement, employment testing, interview, training, and productivity loss. Altogether, these costs add up to 56,295 Thai baht per each turnover case (around U.S. $1,800), so the total turnover cost of these 12 workers equals U.S. $21,600. When considered from a financial standpoint, the cost of these departures becomes somewhat less negligible. This is especially pertinent when we consider that the average call center's profit only comprises 5-6% of its revenue (IBIS World, 2013).

Continuing on this train of thought, I suspect, though without proof, that the post-bonus turnover cluster will be larger and the subsequent disruptive effects more severe in contexts where the bonus expectancy is higher. Simply put, if the value of bonuses is more substantial and workers know that they are virtually guaranteed to receive these bonuses, then my framework predicts that they would be even more likely to delay their departure decisions until the payout date. Such contexts may include those with outsized bonus pays like the securities industry (Surane, 2021). From an organizational standpoint, one potential solution to this problem of post-bonus turnover spike would be for the call center to pay bonuses more frequently (e.g., semiannually or quarterly). This would provide those workers whose minds are already set on leaving with more opportunities to depart, thereby reducing the size of the turnover clusters.

Nevertheless, there are also reasons why this call center and organizations in general should stick with the current approach of paying annual bonuses. Indeed, there may be additional administrative cost from switching to more complex bonus payment cycles. As an indirect evidence, the University of Wisconsin-Madison recently moved all employees to the biweekly payroll cycle and the chief HR officer stated in the email announcement that "the standardization of the payroll cycle … will bring efficiency and cost savings to the administration of this important function by reducing the number of payroll cycles across all employment groups." Moreover, bonus pay has a larger motivation effect (i.e., stronger association with future performance) precisely because it is more salient in the eyes of the workers (Nyberg, Pieper, & Trevor, 2016). If bonuses were to be split into multiple smaller chunks, then this performance boost may be proportionately diminished. Beyond this, it may also be better for organizations to suffer from one large post-bonus turnover cluster than several smaller clusters if the benefits of retaining workers

for the entire year outweigh the administration and disruption costs from that single large turnover cluster. Whether this is the case remains the subject of future empirical examinations.

Strengths and Limitations

There are several desirable features of this study, namely that it benefits from using field data of call center workers which provides external validity to the findings. The availability of the 11-month contract workers, though not exactly identical to the permanent workers, also helps to address potential seasonality concerns. Furthermore, the extended observation period of 2.5 years allows me to observe multiple bonus payments and have some confidence that the detected patterns are not just a one-time anomaly.

Still, the current work suffers from a number of important limitations. One major limitation concerns the missing data problem involving leavers' KPI. This prevented me from accurately measuring turnover quality. Indeed, I have shown in the Methods section that the monthly KPI scores can be quite a reliable performance indicator; ICC(1) = 0.53 and ICC(2) = 0.93. The fact that I was able to use these KPI scores to measure existing workforce quality may also explain why existing quality turned out to be a statistically significant predictor of answering speed and call abandonment as well (Tables 25 and 26).

The second shortcoming of my data involves the exit reasons recorded by the call center's HR department. Since only one primary reason was listed for each worker's exit reason, in cases where a multitude of reasons may be driving a worker to quit, this additional information would all be lost. Aside from this, previous studies have found that information extracted from exit interviews are notoriously unreliable. For example, Lefkowitz and Katz (1969) found that 59% of the sampled leavers ended up reporting different reasons in their post-exit follow-up questionnaires

compared to their earlier exit interviews. Likewise, another study by Hinrichs (1975) showed that the data collected by the management at the time of turnover differed considerably from post-exit follow-up questionnaires or from exit interviews conducted by external consultants. The same pattern can also be seen in Feinberg and Jeppeson (2000).

Prior research has also shown that workers are generally unwilling to discuss sensitive topics during their exit interviews due to the fear of burning bridges with their previous employers along with the concerns that their remaining colleagues will suffer from potential retaliations (Feldman & Klaas, 1999; Giacalone et al., 1997; Givens-Skeaton & Ford, 2018). This pattern is reflected in my data as can be seen on Table 4. Here, non-controversial exit reasons like family and entrepreneurship are the most popular reasons while potentially sensitive issues like compensation, supervisor, and working condition are much less frequently cited. Assuming that the exit reasons recorded by HR failed to capture the true reason(s) for employee departures, this may partially explain why I could not detect any effect when testing Hypothesis 5.

Other less-pressing limitations concern the lack of major control variables. Specifically, in the test of Hypothesis 1 (survival analysis of turnover events), I did not have data of typical controls used in turnover studies (e.g., gender, age, working hours, and education level). Relatedly, the lack of detailed pay data precludes testing of pay comparison effects among workers. After all, the bonus amount that the focal worker receives relative to his or her peers or relative to other forms of pay may also influence turnover likelihoods due to equity and fairness considerations (Adams, 1963, 1965). Absent such pay data, I am unable to distinguish between those workers who wanted to leave and simply waited for the bonus payout versus those who initially did not want to leave but quit after the bonus payout because of perceived inequity and relative deprivation.

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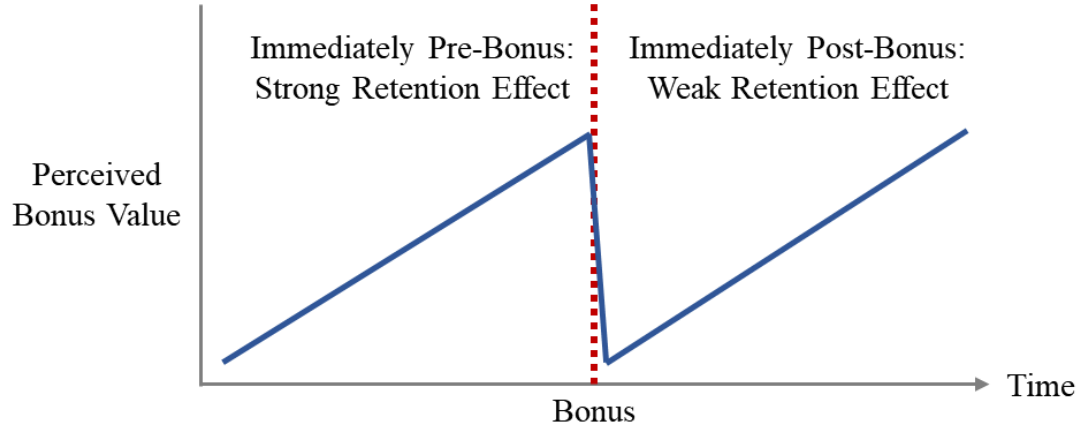
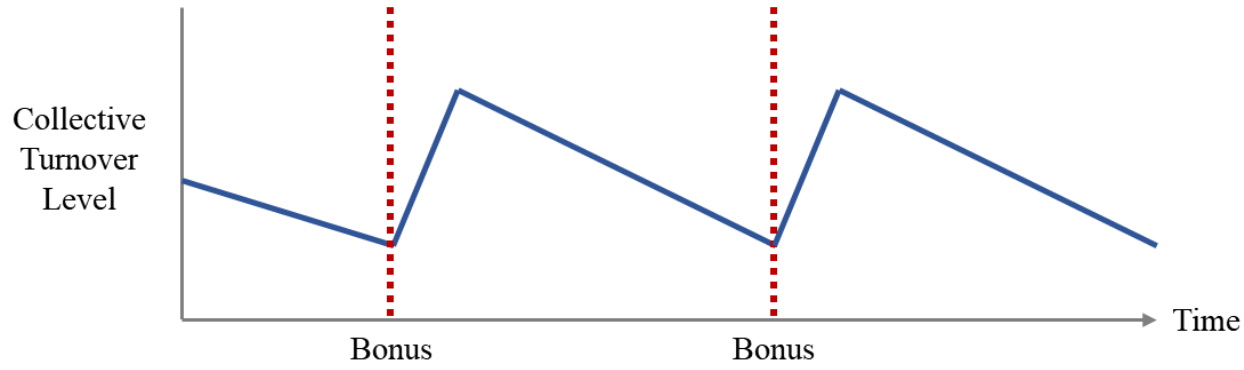
Figure 1. *The Perceived Value of Bonuses Before and After the Payment Date*



Note. Dotted vertical line represents the bonus payment period.

Figure 2. *Hypothesized Effect of Bonuses on Collective Voluntary Turnover Patterns*



Note. Dotted vertical lines represent bonus payment periods.

Figure 3. *Supervisor-Rated Performance Distribution of Bonus-Eligible Voluntary Leavers*

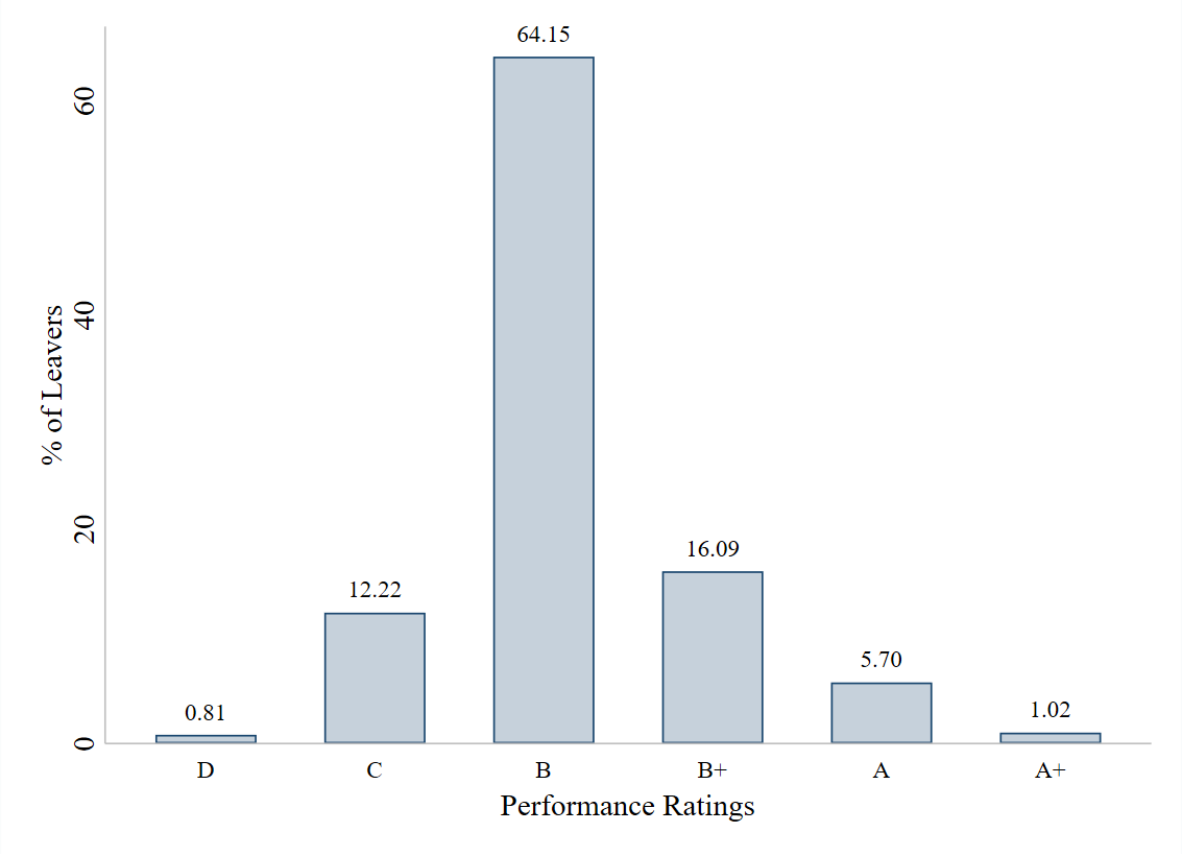


Figure 4. *Average Monthly KPI Distribution of Voluntary Leavers*

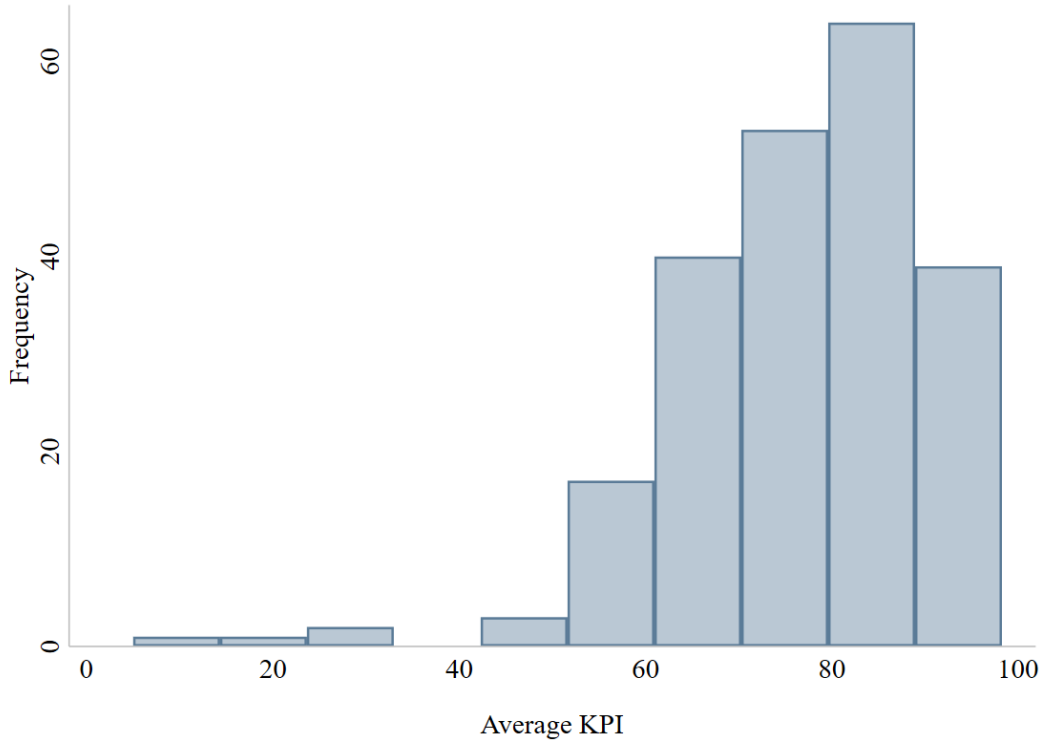


Figure 5. *Estimated Voluntary Turnover Hazard for Bonus Eligible Workers (left) and Bonus Ineligible Contract Workers (right)*

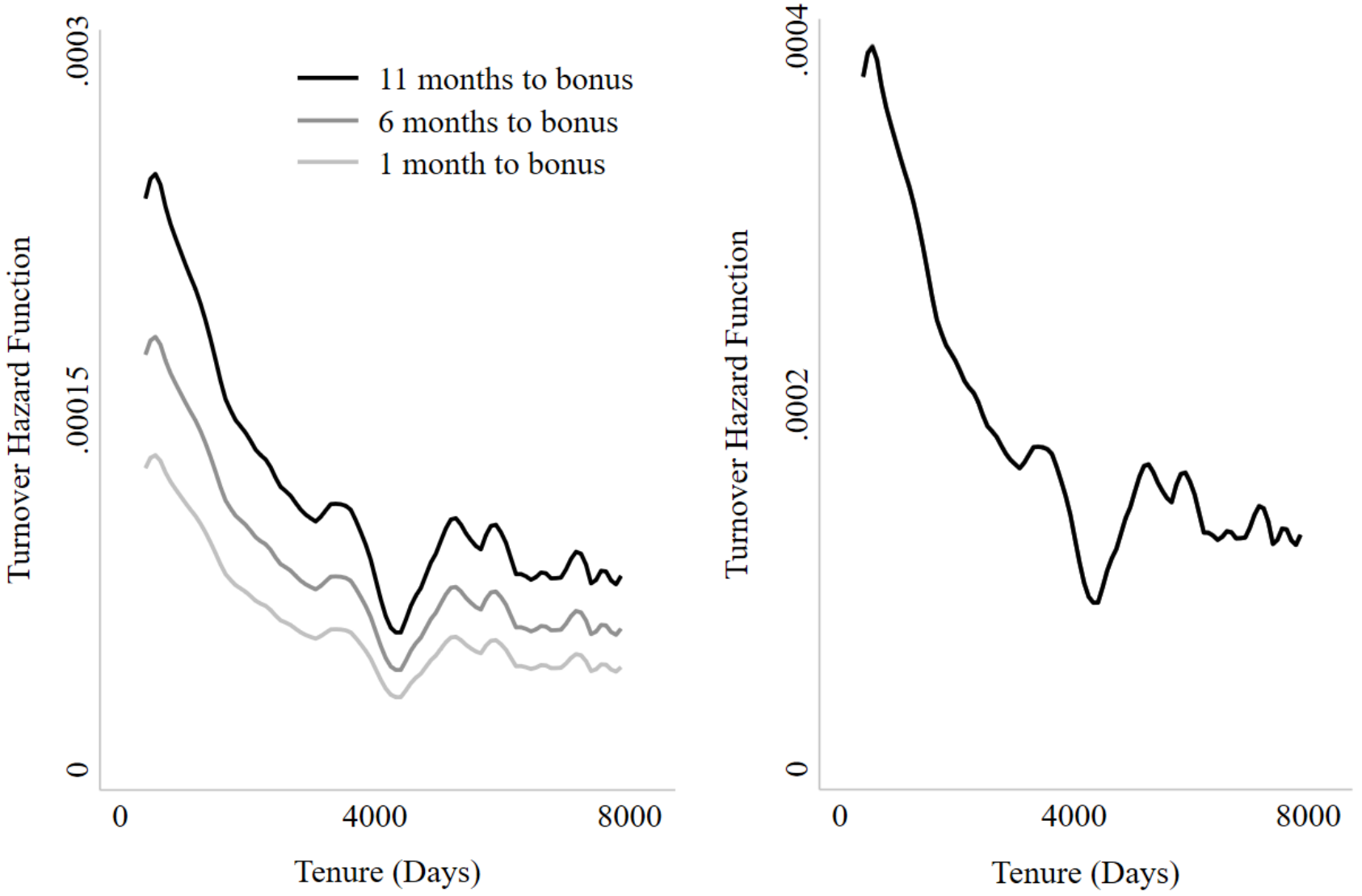
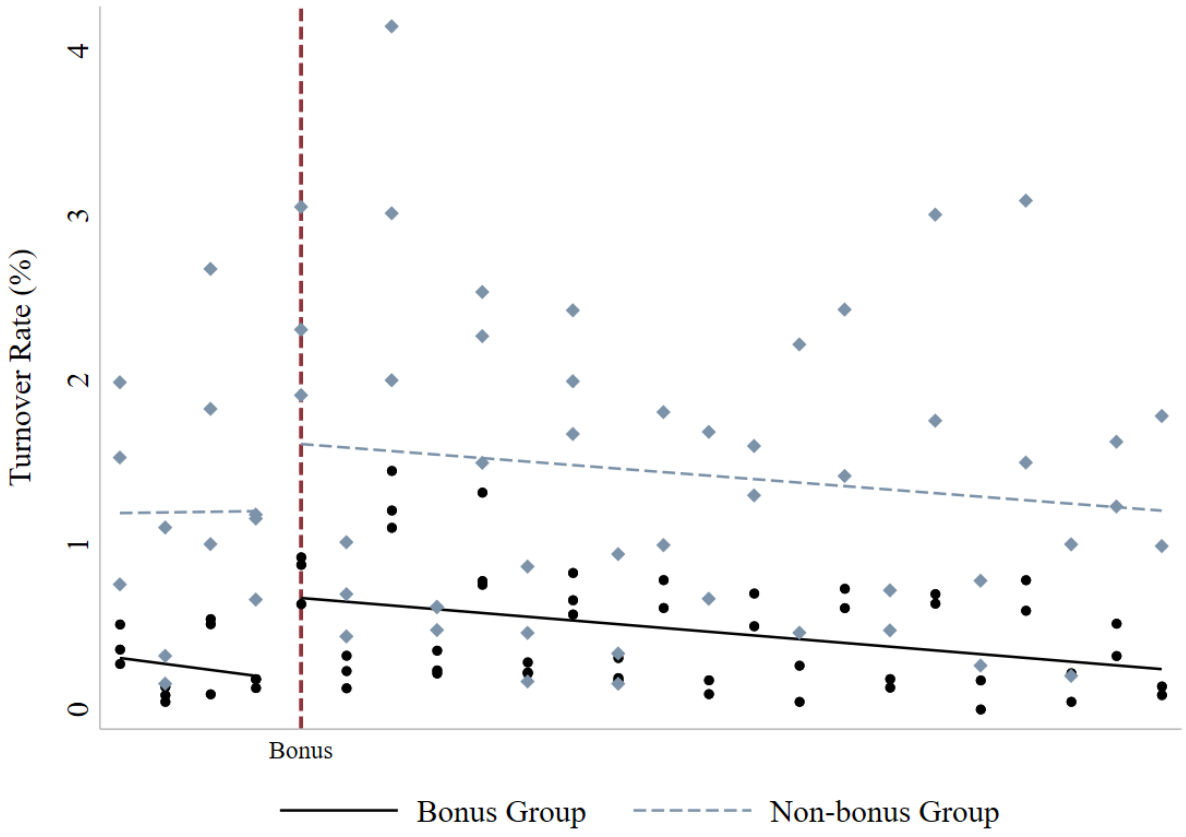
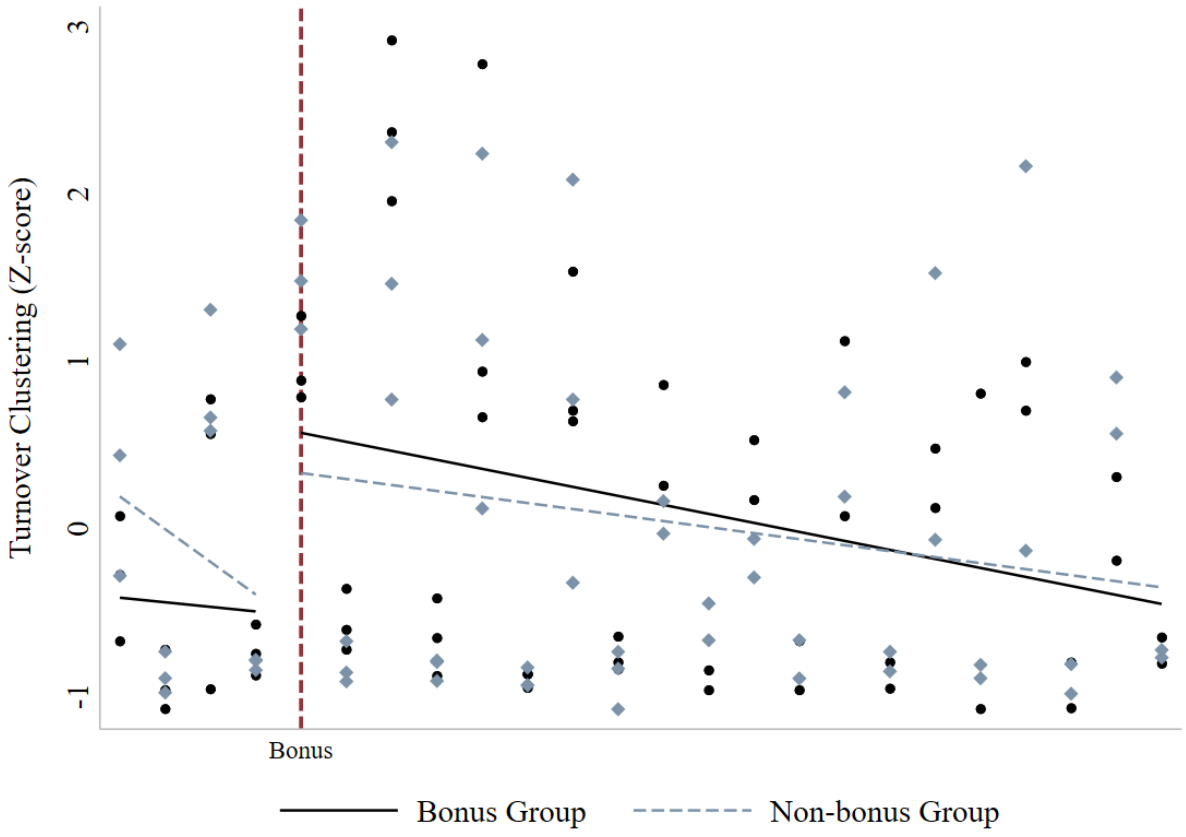


Figure 6. *Actual and Predicted Collective Voluntary Turnover Pattern for Bonus Eligible Permanent Workers and Bonus Ineligible Contract Workers (Biweekly Time Unit)*



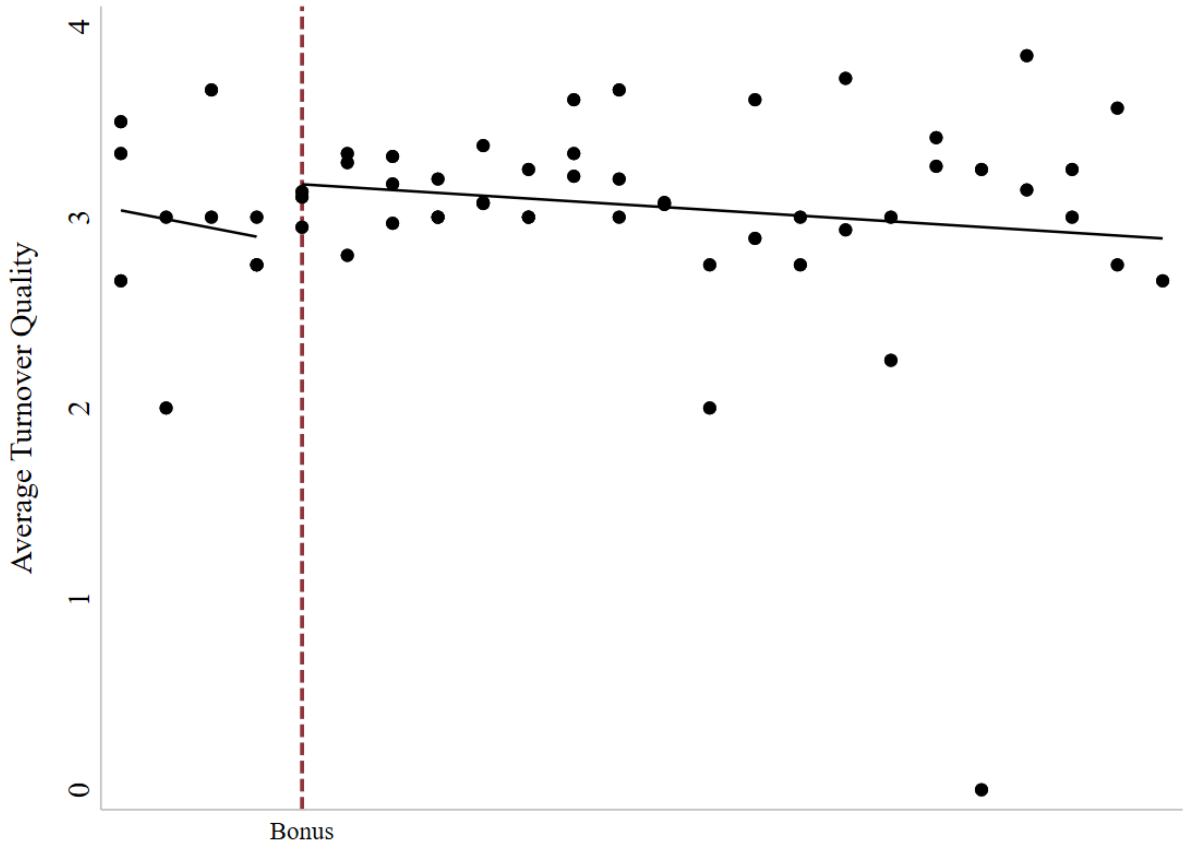
*Note. D*ashed line indicates the time of bonus payment. Time unit is biweekly.

Figure 7. *Actual and Predicted Voluntary Turnover Clustering over Time for Bonus Eligible Permanent Workers and Bonus Ineligible Contract Workers (Biweekly Time Unit)*



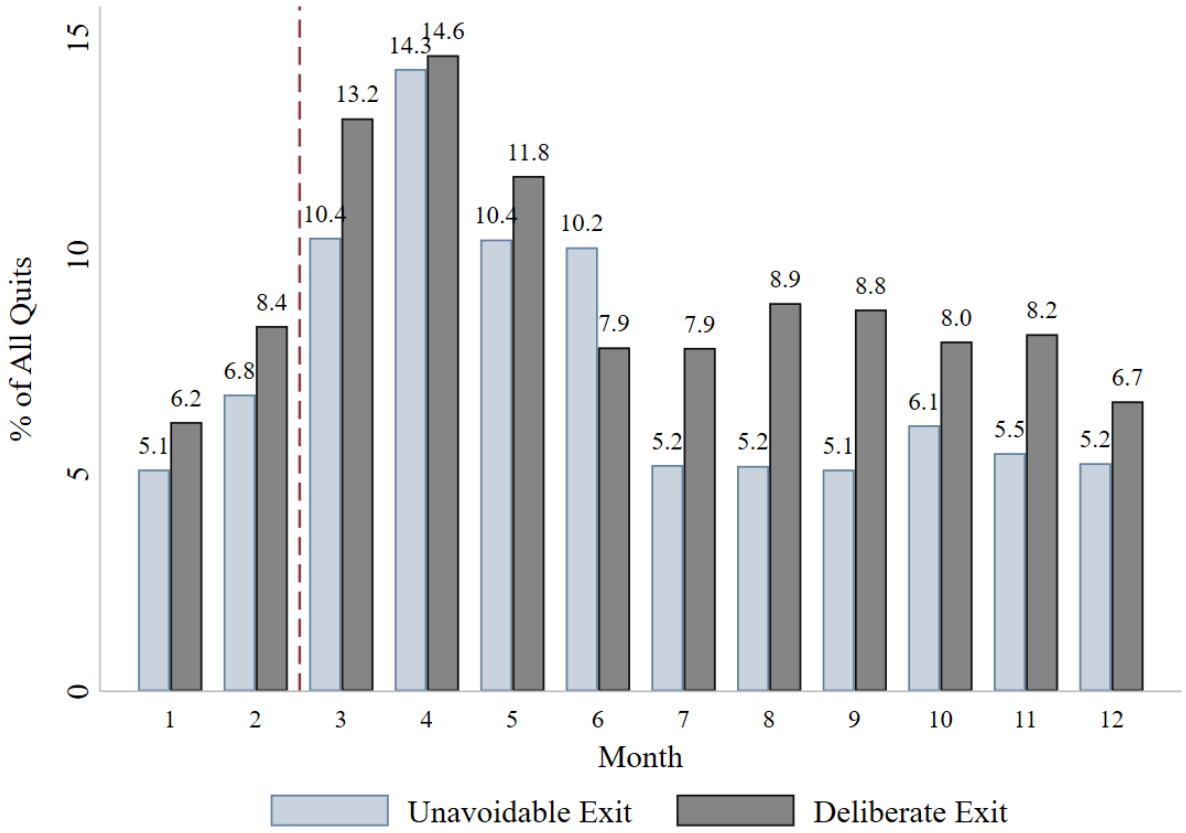
*Notes. D*ashed line indicates the time of bonus payment. Time unit is biweekly.

Figure 8. *Actual and Predicted Voluntary Turnover Quality over Time for Bonus Eligible Permanent Workers (Biweekly Time Unit)*



*Notes. D*ashed line indicates the time of bonus payment. Time unit is biweekly.

Figure 9. *Voluntary Turnover Patterns Split by the Type of Exit Reasons*



Notes. Dashed line indicates the time of bonus payment. Unavoidable exits refer to those citing family or health reasons while deliberate exits refer to those citing pay, career advancement, or entrepreneurship reasons.

Table 1. *Summaries of Studies Examining Bonus Pay and Voluntary Turnover*

Reference	Relationship with Turnover	Turnover Type	Ctrl for Base Pay	Longitudinal	Bonus Type	Bonus Measure	Bonus Frequency	Bonus Time Clustering
Altarawmneh & Al-Kilani (2010)	nonsignificant (n.s.)	turnover intention	no	no	individual	dummy: whether received bonus or not	unclear	unclear
Barringer & Milkovich (1995)	negative; n.s. once retirement plans are controlled for	turnover intention	yes	no	individual	dummy: hypothetical survey scenario where bonus is equal to currently receiving vs. 10% higher than current amount	unclear	unclear
Blakemore et al. (1987)	negative	turnover event	yes	yes	varies by firm	amount	unclear	unclear
Bond (2020)	n.s.	turnover event	no	no	individual	amount	unclear	Unclear
Clark-Rayner & Harcourt (2000)	negative	turnover event	yes	no	individual	dummy: whether received bonus or not	annual	Unclear
Clotfelter et al. (2008)	negative	turnover event	yes, via worker FE	yes	individual	dummy: whether received bonus or not	annual	spread; monthly payout
Della Torre & Solari (2011)	n.s.	turnover rate	yes	no	individual	amount (% salary)	unclear	unclear

Reference	Relationship with Turnover	Turnover Type	Ctrl for Base Pay	Longitudinal	Bonus Type	Bonus Measure	Bonus Frequency	Bonus Time Clustering
Ekinci (2019)	negative	turnover event	yes	no	individual	both amount & dummy: whether received bonus or not	annual	clustered, paid on the same day
Gomez-Mejia & Balkin (1989)	n.s. for individual bonus; negative for group bonus	turnover intention	yes	no	individual & group	amount (% salary)	varies across firms	unclear
Guthrie (2000)	n.s. for individual; negative for group	turnover rate	yes	no	group	% eligible	unclear	unclear
Joseph & Kalwani (1998)	n.s.	turnover rate	no	no	individual	dummy: whether received bonus or not	both annual & multiple	unclear
Joseph & Kalwani (1992)	positive (less turnovers) for firms with above average pay; negative (more turnovers) for firms with below average pay	average tenure	yes	no	individual	dummy: whether received bonus or not	unclear	unclear
Kampkotter & Marggraf (2015)	negative	turnover event	yes	yes	individual	amount	unclear	unclear
Korsakiene et al. (2015)	negative	turnover intention	no	no	individual	unclear	unclear	unclear
Marquardt et al. (2011)	n.s.	turnover event	no	yes	individual	dummy: whether received bonus or not	annual	only one CEO per firm; cannot cluster

Reference	Relationship with Turnover	Turnover Type	Ctrl for Base Pay	Longitudinal	Bonus Type	Bonus Measure	Bonus Frequency	Bonus Time Clustering
Miller et al. (2001)	mixed: positive with individual pay-for-performance; negative with group profit sharing	turnover rate	no	no	individual and group profit sharing	amount: weighted average for each plant	unclear	unclear
Murphy & Williams (2005)	n.s.	turnover intention	yes	no	individual	Likert rating of importance in decision to stay	unclear	unclear
Nyberg (2010)	negative	turnover event	no	yes	individual	amount	annual	unclear
O'Halloran (2012)	negative by itself; n.s. when controlling for other pay plans	turnover event	yes	yes	unclear	dummy: whether received bonus or not	unclear	unclear
Park & Sturman (2016)	positive	turnover event	yes	no	individual	amount (% salary)	annual	unclear
Pohler & Schmidt (2016)	positive	turnover count	yes	no	individual	% eligible	unclear	unclear
Prince et al. (2020)	mixed: depends on national culture	turnover rate	no	no	individual, group, and firm profit sharing	% eligible	unclear	unclear
Ryu & Jinnai (2020)	negative for those with low base pay; positive for high base pay	turnover event	yes	yes	group	dummy: whether received bonus or not	annual	unclear
Salamin & Hom (2005)	negative	turnover event	yes	yes	individual	amount (% salary)	annual	unclear

Reference	Relationship with Turnover	Turnover Type	Ctrl for Base Pay	Longitudinal	Bonus Type	Bonus Measure	Bonus Frequency	Bonus Time Clustering
Selden et al. (2013)	positive for individual bonus; negative for group bonus	turnover rate	yes	no	individual & group	% eligible	unclear	unclear
Sturman & Short (2000)	negative	turnover intention	yes	no	varies by firm	Likert rating of bonus satisfaction	unclear	unclear
Van der Stede et al. (2020)	negative, curvilinear decreasing	turnover event	yes, via worker FE	yes	individual	amount	monthly	unclear
Wilson & Peel (1991)	negative	turnover rate	yes	no	individual	amount (% salary)	unclear	unclear

Notes. *Longitudinal* refers to studies with at least 3 repeated observations (Ployhart & Vandenberg, 2010). *Individual bonus type* refers to plans whose bonus amounts vary as a function of individual performance. *Group bonus type* refers to plans whose bonuses amounts vary as a function of group or firm performance. *Bonus measure* describes how the bonus variable was measured in each study. *Bonus frequency* refers to the frequency of bonus payouts. *Bonus time* clustering describes whether all workers are paid simultaneously or spread out over time.

Table 2. *List of All Hypotheses*

Hypothesis 1. The length of time that a worker must wait before bonus payout is associated with greater likelihood of voluntary turnover.
Hypothesis 2. There will be a decrease in collective voluntary turnover during the pre-bonus time periods followed by an increase in collective voluntary turnover post-bonus.
Hypothesis 3. Collective voluntary turnover will be more clustered in the time periods immediately post-bonus compared to pre-bonus periods.
Hypothesis 4. Turnover clusters will be more heavily comprised of high performers during post-bonus periods compared to other time periods.
Hypothesis 5. Bonus-related turnover timing will be more strongly influenced by deliberate exit reasons (pay, career advancements, and entrepreneurship) than unavoidable reasons (family and health issues).
Hypothesis 6. The negative effect of collective voluntary turnover on unit performance will be stronger in units where turnover events are more clustered.
Hypothesis 7. The negative effect of collective voluntary turnover rate on unit performance will be stronger in units with higher-performing leavers.

Table 3. *Summary Statistics of Monthly Firm-Level Voluntary Turnover Data*

		By worker class	
Variable	**Overall**	**Permanent**	**11-month contract**
Voluntary turnover level	73.27	19.43	28.33
	(19.66)	(7.69)	(10.24)
Voluntary turnover rate	0.019	0.008	0.027
	(0.005)	(0.003)	(0.008)
Total # of workers	3837.80	2,474.28	1,040.16
	(245.67)	(42.98)	(239.86)
Leaver's tenure (in months)	25.38	68.60	14.93
	(40.56)	(55.60)	(15.26)

Notes. Values represent the monthly average across all 30-month time points. Standard deviations are in parentheses. The *Overall* column presents the statistics for all three worker classes (permanent, 11-month contract, and 1-month contract). However, the 1-month contract workers are excluded from my analyses, hence they are omitted from the specific worker class columns. *Turnover level* represents the monthly average sum of all turnover events. Leaver's tenure reflects the average of individual level turnover data (N = 2,198 quits).

Table 4. *Summary of Exit Reasons for Permanent Workers*

Exit Reasons	***N***	**%**
Family-related issues	132	25.83
Entrepreneurship	117	22.90
Career advancement	105	20.55
Health-related issues	50	9.78
Utilization of skill & knowledge	34	6.65
Working conditions	31	6.07
Further Education	20	3.91
Compensation	10	1.96
Work location/distance	10	1.96
Supervisor	2	0.39
Total	511	

Note. 72 cases are excluded from this table because they were inter-department transfers.

Table 5. *Annual Bonus Scheme for Permanent Workers*

Performance Ratings	% of the Workforce	Annual Bonus as % of Salary
A & A+	5%	8-10%
B+	10%	6-8%
B	65%	4-7%
C	15%	2-3%
D	5%	0%

Table 6. *Example Turnover Clustering Calculations based on Call et al. (2015)*

Scenario	Total Turnover Events	# of Days in the month	Daily turnover rates	# of Turnover events in the same day	Observed # of Days	Poisson probability given the daily rates	Expected # of Days	χ^2 goodness of fit	Summed χ^2 goodness of fit
A	8	31	0.26	0	25	0.7700	23.8700	0.05	2.68
				1	4	0.2000	6.2000	0.78	
				2	2	0.0260	0.8060	1.77	
				3	0	0.0022	0.0682	0.07	
				4	0	0.0001	0.0043	0.00	
				5	0	0.0000	0.0002	0.00	
B	8	30	0.27	0	24	0.7700	23.1000	0.04	12.98
				1	5	0.2000	6.0000	0.17	
				2	0	0.0270	0.8100	0.81	
				3	1	0.0024	0.0720	11.96	
				4	0	0.0002	0.0048	0.00	
				5	0	0.0000	0.0003	0.00	
C	8	31	0.26	0	27	0.7700	23.8700	0.41	4360.14
				1	3	0.2000	6.2000	1.65	
				2	0	0.0260	0.8060	0.81	
				3	0	0.0022	0.0682	0.07	
				4	0	0.0001	0.0043	0.00	
				5	1	0.0000	0.0002	4357.20	

Notes. Observed # of days refers to how many days were the number of turnover events in the same rows observed. For example, Unit A has 25 days with 0 turnover, 4 days with 1 turnover, and 2 days with 2 turnovers. Higher goodness-of-fit statistic indicates more clustering.

Table 7. *Descriptions of Variables Used in the Analyses*

Variable	Description
Individual level	
Voluntary Turnover	Dummy coded 0 if the worker remains with the company and 1 if the worker quits the job.
Tenure	The number of months that the worker has been with the company.
Time-to-Bonus	The length of time in months that separates the focal time period and the next bonus payment date.
Work Unit	Categorical variable of the focal worker's unit.
Collective level	
Time	The amount of time periods elapsed since the first observed time period.
Bonus	Dummy variable coded 0 for pre-bonus time periods and 1 for post-bonus time periods.
Answering Speed	% of calls answered within a specified time limit relative to all calls
Call Abandonment	% of callers who hung up before connecting with an agent relative to all calls.
Call Resolution	% of calls whose issues were resolved relative to all calls.
Customer Satisfaction	% of randomized surveys with a rating of ≥ 4 on a 1-5 scale relative to all surveys.
Call Volume	The total number of calls received each time period.
Collective Turnover	The sum of permanent / contract / temporary worker voluntary turnover events at the end of each time period.
Turnover Clustering	The sum of χ^2 goodness-of-fit statistic between the observe daily turnover events versus the expected number of events based on the Poisson distribution (see Table 6 for example calculation).
Turnover Quality	The average performance rating on a 1-6 scale of voluntary leavers within each time period.
Existing Quality	Standardized average KPI of all workers in the unit at the beginning of each time period.
Unit Size	The total number of permanent workers at the start of each time period.
New Hires	The number of new hires at the start of each time period.

Table 8. *Example Coding Scheme for Interrupted Time Series Analyses*

time (*T*)	Bonus (*X*)	*XT*	Treatment (*Z*)	*ZT*	*ZX*	*ZXT*
0	0	0	1	0	0	0
1	0	0	1	1	0	0
2	0	0	1	2	0	0
3	0	0	1	3	0	0
4	1	0	1	4	1	4
5	1	1	1	5	1	5
6	1	2	1	6	1	6
7	1	3	1	7	1	7
8	1	4	1	8	1	8
9	1	5	1	9	1	9
10	1	6	1	10	1	10
11	1	7	1	11	1	11
12	1	8	1	12	1	12
0	0	0	0	0	0	0
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	1	0	0	0	0	0
5	1	1	0	0	0	0
6	1	2	0	0	0	0
7	1	3	0	0	0	0
8	1	4	0	0	0	0
9	1	5	0	0	0	0
10	1	6	0	0	0	0
11	1	7	0	0	0	0
12	1	8	0	0	0	0

Notes. This table presents 13 observations for each of the two worker classes. Bonuses are paid at time = 4 in this example, hence there are 4 pre-bonus and 9 post-bonus observations.

Table 9. *Summary Statistics and Correlations for Individual Level Variables*

#	Variable	Mean	SD	1	2	3
1	Tenure (days)	2089.49	1914.34	-		
2	Months to bonus	5.48	3.70	0.02	-	
3	Work unit	13.12	8.50	-0.05	0.01	-
4	Bonus Eligible	0.69	0.46	0.54	0.01	-0.25

Notes. *N* = 100,970 individual-months. Work unit is an indicator variable ranging from 1 to 29. Bonus eligible is a dummy variable coded 0 for ineligible (contract workers) and 1 for eligible (permanent workers).

Table 10. *Summary Statistics and Correlations for Firm Level Variables*

#	Variable	Mean	SD	1	2	3
1	Time	30.5	17.39	-		
2	Collective Voluntary Turnover	23.88	15.72	0.23	-	
3	Turnover Clustering	0.00	1.00	0.11	0.87	-
4	Turnover Quality	3.03	0.55	0.35	0.40	0.33

Notes. *N* = 120 firm-biweekly observations. The statistics are based on the combination of both bonus eligible and ineligible worker groups.

Table 11. *Results from Proportional Hazards Regression Analyses Predicting Voluntary Turnover (Hypothesis 1)*

	(1)	(2)	(3)
Months-to-bonus	1.07***	1.03**	1.00
	(0.01)	(0.01)	(0.01)
Eligible		0.46***	0.31***
		(0.04)	(0.04)
Months × Eligible			1.07***
			(0.02)
Log pseudolikelihood	-3241.63	-8919.10	-8910.11
Wald χ^2 test[a]	97.21***	226.93***	248.51***
N_{obs}	66,781	95,206	95,206
N_{ind}	3,078	5,287	5,287

Notes. Unit fixed effects included in all models. Hazard ratios (*b*) are reported. Robust standard errors presented in parentheses. *Eligible* is a dummy variable indicating whether the worker is a bonus-eligible permanent worker (coded 1) or a bonus-ineligible contract worker (coded 0). *Months-to-bonus* is the number of months remaining until the next bonus pay date. N_{obs} is the total sample size. N_{ind} is the number of workers.

[a] Global chi-square testing that all regression coefficients are 0.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 12. *Results from Pooled OLS Analyses Predicting Voluntary Turnover Rate (Biweekly Time Unit) – (Hypothesis 2)*

	(1) Bonus Only	(2) Both Groups	(3) Bonus Only	(4) Both Groups
Time Unit	Biweekly	Biweekly	Biweekly	Biweekly
Bonus Timing in Model	March	March	April	April
Time	-0.04 (0.08)	0.00 (0.18)	0.03 (0.04)	0.04 (0.09)
Bonus	0.51* (0.24)	0.40 (0.51)	0.23 (0.19)	0.11 (0.41)
Time × Bonus	0.01 (0.08)	-0.03 (0.18)	-0.06 (0.04)	-0.06 (0.10)
Eligible		-0.88 (0.46)		-0.97* (0.40)
Time × Eligible		-0.04 (0.25)		0.00 (0.13)
Eligible × Bonus		-0.50 (0.57)		0.14 (0.58)
Time × Eligible × Bonus		0.04 (0.25)		0.00 (0.14)
Intercept	0.31* (0.15)	1.19*** (0.33)	0.26* (0.13)	1.23*** (0.29)
N	60	120	60	120
R^2	0.20	0.36	0.18	0.36

Notes. *Time* is the number of biweekly periods elapsed since the start of the observation. *Eligible* is a dummy variable indicating whether the worker group is bonus-eligible permanent worker (coded 1) or bonus-ineligible contract worker (coded 0). *Bonus* is a dummy variable coded 0 for time periods before bonus and 1 after bonus for each of the specified year.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 13. *Results from Pooled OLS Analyses Predicting Voluntary Turnover Rate (Monthly Time Unit) – (Hypothesis 2)*

	(1) Bonus Only	(2) Both Groups	(3) Bonus Only	(4) Both Groups
Time Unit	Monthly	Monthly	Monthly	Monthly
Bonus Timing in Model	March	March	April	April
Time	0.08 (0.17)	0.87 (0.47)	0.26** (0.08)	0.58* (0.23)
Bonus	0.55 (0.28)	-0.67 (0.77)	0.02 (0.19)	-0.87 (0.55)
Time × Bonus	-0.15 (0.17)	-0.91 (0.47)	-0.34*** (0.08)	-0.62* (0.24)
Eligible		-1.52** (0.47)		-1.67*** (0.43)
Time × Eligible		-0.79 (0.66)		-0.32 (0.33)
Eligible × Bonus		-0.31 (0.61)		0.07 (0.64)
Time × Eligible × Bonus		0.77 (0.67)		0.27 (0.34)
Intercept	0.41** (0.12)	1.93*** (0.33)	0.36** (0.11)	2.03*** (0.30)
N	30	60	30	60
R^2	0.59	0.78	0.64	0.78

Notes. *Time* is the number of monthly periods elapsed since the start of the observation. *Eligible* is a dummy variable indicating whether the worker group is bonus-eligible permanent worker (coded 1) or bonus-ineligible contract worker (coded 0). *Bonus* is a dummy variable coded 0 for pre-bonus time periods and 1 post-bonus for each of the specified year.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 14. *Results from Interrupted Time Series Analyses Predicting Voluntary Turnover Rate (Biweekly Time Unit) – (Hypothesis 2)*

	(1) Bonus Only		(2) Both Groups	
Time Unit	Biweekly		Biweekly	
Bonus Timing in Model	March		March	
	b	*SE*	*b*	*SE*
Time	-0.01	(0.02)	-0.03	(0.07)
Eligible			-0.67***	(0.14)
Time × Eligible			0.01	(0.07)
$Bonus_{2016}$	0.49***	(0.09)	0.80***	(0.21)
Time × $Bonus_{2016}$	-0.02	(0.02)	0.00	(0.07)
Eligible × $Bonus_{2016}$			-0.32	(0.22)
Time × Eligible × $Bonus_{2016}$			-0.02	(0.07)
$Bonus_{2017}$	0.59***	(0.06)	0.20	(0.25)
Time × $Bonus_{2017}$	0.02*	(0.01)	0.04	(0.02)
Eligible × $Bonus_{2017}$			0.39	(0.25)
Time × Eligible × $Bonus_{2017}$			-0.02	(0.02)
$Bonus_{2018}$	0.16	(0.13)	-0.12	(0.30)
Time × $Bonus_{2018}$	0.02	(0.02)	0.02	(0.04)
Eligible × $Bonus_{2018}$			0.28	(0.31)
Time × Eligible × $Bonus_{2018}$			0.00	(0.04)
Intercept	0.33***	(0.03)	1.00***	(0.14)
N	60		120	

Notes. Newey-West standard errors in parentheses. *Time* is the number of biweekly periods elapsed since the start of the observation. *Eligible* is a dummy variable indicating whether the employee group is bonus-eligible permanent worker (coded 1) or bonus-ineligible contract worker (coded 0). $Bonus_{year}$ is a dummy variable coded 0 for time periods before bonus and 1 after bonus for each of the specified year.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 15. *Comparisons of Linear Post-Bonus Voluntary Turnover Rate Trends Between Bonus Eligible and Ineligible Workers (Hypothesis 2)*

Table	Model	Time Unit	Bonus Timing	Year	Worker Group	*b* (SE)	Difference
12	2	Biweekly	March	-	Bonus Eligible	-0.02 (0.02)	0.00 (0.02)
					Ineligible	-0.02 (0.02)	
	4	Biweekly	April	-	Bonus Eligible	-0.03 (0.02)	0.00 (0.03)
					Ineligible	-0.02 (0.02)	
13	2	Monthly	March	-	Bonus Eligible	-0.07 (0.04)	-0.02 (0.06)
					Ineligible	-0.05 (0.04)	
	4	Monthly	April	-	Bonus Eligible	-0.08 (0.05)	-0.05 (0.07)
					Ineligible	-0.04 (0.05)	
14	2	Biweekly	March	2016	Bonus Eligible	-0.03*** (0.00)	0.00 (0.01)
					Ineligible	-0.03** (0.01)	
		Biweekly	March	2017	Bonus Eligible	-0.01*** (0.00)	-0.03 (0.02)
					Ineligible	0.01 (0.02)	
		Biweekly	March	2018	Bonus Eligible	0.01 (0.02)	-0.02 (0.04)
					Ineligible	0.03 (0.04)	

Notes. These coefficients represent the post-bonus slopes from various analyses. Tables 12 and 13 contain regression results pooled across all 3 years. Table 14 contains regression results with 3 separate bonus effects.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 16. *Results from the Pooled OLS Analysis Predicting Voluntary Turnover Cluster (Biweekly Time Unit) – (Hypothesis 3)*

	(1) Bonus Only	(2) Both Groups	(3) Bonus Only	(4) Both Groups
Time Unit	Biweekly	Biweekly	Biweekly	Biweekly
Bonus Timing in Model	March	March	April	April
Time	-0.03 (0.25)	-0.20 (0.26)	0.09 (0.13)	-0.02 (0.14)
Bonus	1.09 (0.73)	0.94 (0.74)	0.53 (0.58)	0.25 (0.60)
Time × Bonus	-0.02 (0.25)	0.16 (0.26)	-0.16 (0.14)	-0.01 (0.14)
Eligible		-0.60 (0.67)		-0.57 (0.59)
Time × Eligible		0.17 (0.36)		0.11 (0.19)
Eligible × Bonus		0.90 (0.83)		1.17 (0.84)
Time × Eligible × Bonus		-0.19 (0.36)		-0.15 (0.20)
Intercept	-0.41 (0.47)	0.20 (0.48)	-0.47 (0.41)	0.10 (0.42)
N	60	120	60	120
R^2	0.13	0.09	0.12	0.07

Notes. *Time* is the number of biweekly periods elapsed since the start of the observation. *Eligible* is a dummy variable indicating whether the worker group is bonus-eligible permanent worker (coded 1) or bonus-ineligible contract worker (coded 0). *Bonus* is a dummy variable coded 0 for time periods before bonus and 1 after bonus for each of the specified year.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 17. *Results from the Pooled OLS Analysis Predicting Voluntary Turnover Cluster (Monthly Time Unit) – (Hypothesis 3)*

	(1) Bonus Only	(2) Both Groups	(3) Bonus Only	(4) Both Groups
Time Unit	Monthly	Monthly	Monthly	Monthly
Bonus Timing in Model	March	March	April	April
Time	0.45 (0.65)	0.38 (0.73)	0.73* (0.30)	0.66 (0.36)
Bonus	1.23 (1.06)	0.31 (1.20)	0.19 (0.71)	-1.08 (0.83)
Time × Bonus	-0.64 (0.65)	-0.51 (0.73)	-0.98** (0.31)	-0.77* (0.36)
Eligible		-0.72 (0.73)		-0.72 (0.65)
Time × Eligible		0.08 (1.04)		0.07 (0.50)
Eligible × Bonus		1.17 (0.94)		1.89 (0.97)
Time × Eligible × Bonus		-0.12 (1.04)		-0.21 (0.51)
Intercept	-1.17* (0.46)	-0.45 (0.52)	-1.27** (0.39)	-0.54 (0.46)
N	30	60	30	60
R^2	0.46	0.30	0.52	0.34

Notes. *Time* is the number of monthly periods elapsed since the start of the observation. *Eligible* is a dummy variable indicating whether the worker group is bonus-eligible permanent worker (coded 1) or bonus-ineligible contract worker (coded 0). *Bonus* is a dummy variable coded 0 for time periods before bonus and 1 after bonus for each of the specified year.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 18. *Results from Interrupted Time Series Analyses Predicting Turnover Cluster (Biweekly Time Unit) – (Hypothesis 3)*

	(1) Bonus Only		(2) Both Groups	
Time Unit	Biweekly		Biweekly	
Bonus Timing in Model	March		March	
	b	*SE*	*b*	*SE*
Time	0.18	(0.11)	-0.22***	(0.05)
Eligible			-0.78***	(0.13)
Time × Eligible			0.40***	(0.08)
$Bonus_{2016}$	0.62	(0.47)	0.69*	(0.26)
Time × $Bonus_{2016}$	-0.25*	(0.11)	0.19***	(0.05)
Eligible × $Bonus_{2016}$			-0.07	(0.36)
Time × Eligible × $Bonus_{2016}$			-0.45***	(0.09)
$Bonus_{2017}$	1.28***	(0.29)	0.60**	(0.22)
Time × $Bonus_{2017}$	0.04*	(0.02)	0.03	(0.03)
Eligible × $Bonus_{2017}$			0.68*	(0.30)
Time × Eligible × $Bonus_{2017}$			0.01	(0.03)
$Bonus_{2018}$	0.45	(0.44)	0.04	(0.37)
Time × $Bonus_{2018}$	0.04	(0.07)	0.03	(0.06)
Eligible × $Bonus_{2018}$			0.41	(0.50)
Time × Eligible × $Bonus_{2018}$			0.01	(0.08)
Intercept	-0.61***	(0.16)	0.17	(0.09)
N	60		120	

Notes. Newey-West standard errors in parentheses. *Time* is the number of biweekly periods elapsed since the start of the observation. *Eligible* is a dummy variable indicating whether the employee group is bonus-eligible permanent worker (coded 1) or bonus-ineligible contract worker (coded 0). $Bonus_{year}$ is a dummy variable coded 0 for time periods before bonus and 1 after bonus for each of the specified year.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 19. *Comparisons of Linear Post-Bonus Turnover Cluster Trends Between Bonus Eligible and Ineligible Workers (Hypothesis 3)*

Table	Model	Time Unit	Bonus Timing	Year	Worker Group	*b* (SE)	Difference
16	2	Biweekly	March	-	Bonus Eligible	-0.05* (0.03)	-0.02 (0.03)
					Ineligible	-0.04 (0.03)	
	4	Biweekly	April	-	Bonus Eligible	-0.07* (0.03)	-0.04 (0.04)
					Ineligible	-0.03 (0.03)	
17	2	Monthly	March	-	Bonus Eligible	-0.18** (0.06)	-0.05 (0.09)
					Ineligible	-0.14* (0.06)	
	4	Monthly	April	-	Bonus Eligible	-0.25** (0.07)	-0.14 (0.10)
					Ineligible	-0.11 (0.07)	
18	2	Biweekly	March	2016	Bonus Eligible	-0.07*** (0.01)	-0.05** (0.02)
					Ineligible	-0.02 (0.02)	
		Biweekly	March	2017	Bonus Eligible	-0.03 (0.01)	-0.04 (0.02)
					Ineligible	0.01 (0.02)	
		Biweekly	March	2018	Bonus Eligible	0.01 (0.05)	-0.03 (0.08)
					Ineligible	0.04 (0.06)	

Notes. These coefficients represent the post-bonus slopes from various analyses. Tables 16 and 17 contain regression results pooled across all 3 years. Table 18 contains regression results with 3 separate bonus effects.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 20. *Results from Pooled OLS Analyses Predicting Turnover Quality (Hypothesis 4)*

	(1)	(2)	(3)	(4)
Time Unit	Biweekly	Biweekly	Monthly	Monthly
Bonus Timing in Model	March	April	March	April
Time	-0.05 (0.15)	0.02 (0.08)	0.00 (0.01)	0.01** (0.00)
Bonus	0.32 (0.43)	0.09 (0.34)	0.02* (0.01)	0.00 (0.01)
Time × Bonus	0.03 (0.15)	-0.04 (0.08)	0.00 (0.01)	-0.01*** (0.00)
Intercept	3.03*** (0.28)	2.97*** (0.25)	0.01 (0.00)	0.00 (0.00)
N	57	57	30	30
R^2	0.02	0.02	0.67	0.66

Notes. *Time* is the number of biweekly periods elapsed since the start of the observation. *Eligible* is a dummy variable indicating whether the worker group is bonus-eligible permanent worker (coded 1) or bonus-ineligible contract worker (coded 0). *Bonus* is a dummy variable coded 0 for time periods before bonus and 1 after bonus for each of the specified year. The sample size for Models 1 and 2 is 57 because 3 observation periods are missing performance ratings.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 21. *Results from Pooled OLS Analyses Predicting Turnover Quality with Various Assumptions about Missing Performance Ratings (Hypothesis 4)*

	(1)	(2)	(3)	(4)
Time Unit	Biweekly	Biweekly	Biweekly	Biweekly
Bonus Timing in Model	March	March	March	March
Missing Worker's Performance Assumption	None (No replacement)	Poor	Average	High
Time	-0.05 (0.15)	0.09 (0.13)	0.00 (0.13)	-0.19 (0.20)
Bonus	0.32 (0.43)	0.33 (0.39)	0.25 (0.38)	0.11 (0.59)
Time × Bonus	0.03 (0.15)	-0.12 (0.13)	-0.01 (0.13)	0.20 (0.21)
Intercept	3.03*** (0.28)	2.43*** (0.25)	2.93*** (0.25)	3.90*** (0.38)
N	57	60	60	60
R^2	0.02	0.14	0.04	0.04

Notes. Regarding the missing workers' performance assumption, *Poor* is rated 2, *Average* is rated 3, and *High* is rated 5 on a scale of 1 to 6. *Time* is the number of biweekly periods elapsed since the start of the observation. *Bonus* is a dummy variable coded 0 for time periods before bonus and 1 after bonus for each of the specified year.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 22. *Comparisons of Linear Post-Bonus Turnover Quality Trends (Hypothesis 4)*

Table	Model	Time Unit	Bonus Timing	Missingness Performance Assumption	*b* (SE)
20	1	Biweekly	March	-	-0.02 (0.01)
	2	Biweekly	April	-	-0.02 (0.02)
	3	Monthly	March	-	-0.002*** (0.000)
	4	Monthly	April	-	-0.003*** (0.001)
21	1	Biweekly	March	None	-0.02 (0.01)
	2	Biweekly	March	Poor	-0.03* (0.01)
	3	Biweekly	March	Average	-0.02 (0.01)
	4	Biweekly	March	High	0.01 (0.02)

Notes. These coefficients represent the post-bonus slopes from pooled OLS regression analyses. Model 1 from Tables 20 and 21 are equivalent.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 23. *Results from OLS Analyses of Months-to-Bonus Regressed on Exit Reason Dummy Variables (Hypothesis 5)*

	(1)	(2)	(3)
Tenure	0.01**	0.01**	0.01**
	(0.00)	(0.00)	(0.00)
Bonus eligibility	0.65*	0.65*	0.46
	(0.32)	(0.32)	(0.40)
Career & Pay		-0.45	-0.54
		(0.26)	(0.32)
Career & Pay × Eligible			0.26
			(0.53)
Entrepreneurship		-0.54	-0.77*
		(0.28)	(0.39)
Entrepreneurship × Eligible			0.52
			(0.57)
Intercept	4.98***	5.15***	5.24***
	(0.87)	(0.87)	(0.88)
N	1049	1049	1049
R^2	0.07	0.07	0.07

Notes. Unit fixed effects included in both models. Baseline category (i.e., when all dummy variables' values are 0) represents those quitting for health and family reasons. The sample size here represents 414 bonus eligible permanent workers and 635 contract workers.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 24. *Summary Statistics for Unit Level Variables*

Variable	*N*	Mean	SD	Min	Max
Time	126	26.00	2.59	22.00	30.00
Answering Speed	126	53.14	10.10	32.00	75.00
Call Abandonment	126	5.72	2.69	2.00	12.00
Call Resolution	126	75.79	4.17	60.00	85.00
Customer Satisfaction	126	69.96	6.12	52.00	84.00
Call Volume (1,000s)	126	102.55	36.98	29.08	187.62
Collective Turnover (Permanent)	112	0.60	0.75	0.00	3.41
Collective Turnover (Contract)	112	1.23	1.48	0.00	6.08
Collective Turnover (Temp)	112	1.01	2.29	0.00	10.69
Turnover Clustering	112	0.03	1.03	-0.70	4.56
Turnover Quality (Avg. Supervisor Rating)	112	1.54	1.72	0.00	4.50
Existing Quality (KPI)	112	0.01	1.03	-3.24	1.50
Unit Size	112	141.38	24.79	88.00	197.00
New Hires	112	2.90	7.37	0.00	32.00

Note. Independent variables have 112 observations due to lagging. The four dependent variables (Speed, Abandonment, Resolution, and Satisfaction) along with Collective turnover are presented as percentages.

Table 25. *Correlations for Unit Level Variables*

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Time	-												
2	Answering Speed	0.31	-											
3	Call Abandonment	-0.38	-0.27	-										
4	Call Resolution	-0.06	-0.04	0.05	-									
5	Customer Satisfaction	-0.01	0.01	-0.27	0.12	-								
6	Call Volume (1,000s)	0.19	0.02	-0.32	0.23	-0.01	-							
7	Collective Turnover (Permanent)	0.01	-0.22	-0.14	0.08	0.01	0.01	-						
8	Collective Turnover (Contract)	0.01	0.29	0.37	-0.21	-0.30	-0.22	-0.19	-					
9	Collective Turnover (Temp)	-0.13	0.38	0.25	-0.14	-0.14	-0.10	-0.25	0.34	-				
10	Turnover Clustering	-0.02	0.37	0.25	-0.24	-0.22	-0.18	-0.12	0.68	0.66	-			
11	Turnover Quality (Supervisor Rating)	0.03	-0.31	-0.16	0.00	0.00	0.11	0.75	-0.24	-0.29	-0.23	-		
12	Existing Quality (KPI)	0.18	-0.31	-0.54	-0.04	0.19	0.04	0.33	-0.40	-0.66	-0.54	0.35	-	
13	Unit Size	-0.12	0.21	0.20	0.11	-0.18	0.43	-0.24	0.22	0.16	0.30	-0.12	-0.45	-
14	New Hires	-0.13	0.15	0.42	0.02	-0.18	-0.11	-0.27	0.23	0.34	0.34	-0.30	-0.77	0.32

Note. All correlations ≥ |0.19| are statistically significant at $p < 0.05$.

Table 26. *Results from Fixed Effects Analyses Predicting Answering Speed (Hypotheses 6 & 7)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Controls							
Call Volume	0.12	0.10	0.10	0.10	0.09	0.09	0.09
	(0.09)	(0.09)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
Existing Quality	2.39	6.15*	6.27*	6.26*	5.76*	5.75	5.94*
	(2.96)	(2.62)	(2.60)	(2.60)	(2.65)	(2.68)	(2.68)
Unit Size	-0.12	-0.10	-0.09	-0.09	-0.11	-0.11	-0.10
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)	(0.07)
New Hires	-0.05	0.14	0.14	0.14	0.11	0.11	0.11
	(0.20)	(0.22)	(0.21)	(0.22)	(0.22)	(0.23)	(0.23)
Predictors							
Collective Turnover (Permanent)		-0.78	0.07	0.15	-1.02	-1.01	-0.18
		(0.76)	(0.90)	(0.90)	(0.84)	(0.81)	(1.19)
Collective Turnover (Contract)		-1.35	-1.33	-1.33	-1.70	-1.71	-1.66
		(1.19)	(1.20)	(1.21)	(1.02)	(1.02)	(1.07)
Collective Turnover (Temp)		1.02*	1.04*	1.03*	0.73	0.73	0.76*
		(0.39)	(0.39)	(0.39)	(0.36)	(0.36)	(0.35)
Turnover Quality			-0.50	-0.47			-0.49
			(0.62)	(0.91)			(0.92)
Permanent TO × Quality				-0.08			-0.02
				(1.11)			(1.16)
Turnover Clustering					1.18	1.16	1.18
					(0.72)	(0.89)	(0.91)
Permanent TO × Clustering						0.05	-0.24
						(1.84)	(1.96)
Intercept	58.10***	59.07***	56.84***	56.96**	61.52***	61.47***	59.42***
	(12.89)	(12.87)	(13.03)	(13.74)	(12.74)	(12.60)	(13.18)
N	112	112	112	112	112	112	112
R^2	0.48	0.51	0.52	0.52	0.52	0.52	0.52

Notes. Raw regression coefficients reported. Robust standard errors in parentheses. Unit fixed effects included in all models.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 27. *Results from Fixed Effects Analyses Predicting Call Abandonment (Hypotheses 6 & 7)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Controls							
Call Volume	-0.06*	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Existing Quality	-0.80	-1.82**	-1.84**	-1.86**	-1.74**	-1.75**	-1.79**
	(0.79)	(0.54)	(0.56)	(0.56)	(0.54)	(0.53)	(0.56)
Unit Size	0.02	0.01	0.01	0.01	0.01	0.02	0.01
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
New Hires	0.01	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Predictors							
Collective Turnover (Permanent)		0.13	0.03	0.17	0.18	0.19	0.24
		(0.21)	(0.27)	(0.33)	(0.23)	(0.22)	(0.38)
Collective Turnover (Contract)		0.16	0.16	0.17	0.24	0.24	0.24
		(0.30)	(0.30)	(0.31)	(0.24)	(0.25)	(0.26)
Collective Turnover (Temp)		-0.33*	-0.34*	-0.34*	-0.27	-0.27	-0.28
		(0.15)	(0.15)	(0.15)	(0.14)	(0.14)	(0.14)
Turnover Quality			0.06	0.12			0.13
			(0.13)	(0.17)			(0.18)
Permanent TO × Quality				-0.14			-0.15
				(0.25)			(0.25)
Turnover Clustering					-0.26	-0.28	-0.29
					(0.24)	(0.29)	(0.29)
Permanent TO × Clustering						0.09	0.11
						(0.47)	(0.49)
Intercept	8.46*	8.94**	9.21**	9.42*	8.41**	8.33**	8.81**
	(2.83)	(2.85)	(2.94)	(3.18)	(2.62)	(2.57)	(2.86)
N	112	112	112	112	112	112	112
R^2	0.47	0.51	0.51	0.51	0.51	0.51	0.51

Notes. Raw regression coefficients reported. Robust standard errors in parentheses. Unit fixed effects included in all models.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 28. *Results from Fixed Effects Analyses Predicting Call Resolution (Hypotheses 6 & 7)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Controls							
Call Volume	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Existing Quality	0.96	0.36	0.57	0.60	0.30	0.36	0.75
	(1.13)	(1.66)	(1.72)	(1.71)	(1.66)	(1.69)	(1.73)
Unit Size	0.01	0.00	0.02	0.02	-0.00	-0.00	0.02
	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)
New Hires	0.11	0.07	0.07	0.07	0.06	0.07	0.07
	(0.07)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Predictors							
Collective Turnover (Permanent)		-0.39	1.09*	0.85	-0.42	-0.45	1.00
		(0.36)	(0.50)	(0.52)	(0.38)	(0.38)	(0.56)
Collective Turnover (Contract)		-0.10	-0.07	-0.08	-0.15	-0.13	-0.05
		(0.41)	(0.40)	(0.40)	(0.37)	(0.37)	(0.37)
Collective Turnover (Temp)		-0.25	-0.22	-0.21	-0.30	-0.29	-0.21
		(0.32)	(0.34)	(0.34)	(0.34)	(0.33)	(0.35)
Turnover Quality			-0.88**	-0.97			-1.04*
			(0.27)	(0.47)			(0.46)
Permanent TO × Quality				0.23			0.16
				(0.55)			(0.58)
Turnover Clustering					0.17	0.26	0.31
					(0.52)	(0.54)	(0.49)
Permanent TO × Clustering						-0.33	-0.88
						(0.58)	(0.65)
Intercept	72.30***	73.54***	69.66***	69.32***	73.89***	74.18***	69.89***
	(4.89)	(5.52)	(5.76)	(6.04)	(5.94)	(5.98)	(6.68)
N	112	112	112	112	112	112	112
R^2	0.44	0.45	0.49	0.50	0.45	0.46	0.50

Notes. Raw regression coefficients reported. Robust standard errors in parentheses. Unit fixed effects included in all models.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 29. *Results from Fixed Effects Analyses Predicting Customer Satisfaction (Hypotheses 6 & 7)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Controls							
Call Volume	-0.08	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Existing Quality	1.52	1.65	1.75	1.67	1.75	1.60	1.69
	(1.95)	(2.79)	(2.80)	(2.81)	(2.71)	(2.76)	(2.78)
Unit Size	0.01	0.00	0.01	0.01	0.00	0.01	0.01
	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)
New Hires	-0.09	-0.15	-0.15	-0.15	-0.14	-0.15	-0.15
	(0.17)	(0.20)	(0.19)	(0.20)	(0.18)	(0.18)	(0.18)
Predictors							
Collective Turnover (Permanent)		-0.42	0.27	0.81	-0.36	-0.29	0.84
		(1.10)	(1.40)	(1.83)	(1.14)	(1.17)	(1.77)
Collective Turnover (Contract)		-1.38*	-1.37*	-1.35*	-1.28	-1.32	-1.26
		(0.56)	(0.58)	(0.58)	(0.72)	(0.71)	(0.71)
Collective Turnover (Temp)		-0.36	-0.34	-0.37	-0.28	-0.29	-0.28
		(0.50)	(0.51)	(0.52)	(0.81)	(0.81)	(0.83)
Turnover Quality			-0.41	-0.20			-0.15
			(0.57)	(0.65)			(0.69)
Permanent TO × Quality				-0.53			-0.51
				(0.65)			(0.61)
Turnover Clustering					-0.30	-0.54	-0.55
					(1.64)	(1.66)	(1.69)
Permanent TO × Clustering						0.84	0.55
						(1.15)	(1.23)
Intercept	77.18***	82.05***	80.22***	80.99***	81.42***	80.69***	79.89***
	(9.04)	(9.65)	(9.18)	(9.40)	(10.33)	(10.40)	(10.17)
N	112	112	112	112	112	112	112
R^2	0.20	0.25	0.26	0.26	0.25	0.26	0.26

Notes. Raw regression coefficients reported. Robust standard errors in parentheses. Unit fixed effects included in all models.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$