Exemption and Work Environment

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Abstract

The Labor Standard Act of Japan requires employers to compensate employees based on the hours worked, but exemptions apply to specific occupations with agreements between employers and employees. We assess the impact of being exempted on hours worked, earnings, and the physical and mental health conditions of employees. We find that, on average, exempt workers work longer hours and earn more than non-exempt workers, without hurting their health status. We also find, however, that being exempted exacerbates health status when it is applied to employees who do not have discretion in how and when they work.

1. Introduction

Most labor contracts stipulate that the employer must compensate the worker for her labor service provided to the firm. Since the concept of labor service is vague and the employer can abuse it, labor standard laws typically require employers to compensate employees according to the hours worked. Changes in the labor market, however, such as the spread of pay for performance, the increase in freelance contracts, and the penetration of work from home, undermine the legitimacy of hours as a measurement of labor service. This recognition induces policy proposals to deregulate the strict link between hours worked and compensation. Opponents to such proposals express concern that such a decoupling prolongs work hours without proper compensation and exacerbates the employee's welfare. Despite the importance of addressing this concern, empirical examinations

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of the effect of the decoupling of hours worked and compensation on employees' welfare are scarce. Against this backdrop, this study aims to provide such evidence in the context of Japan.

The Labor Standard Act (LSA) of Japan requires the employer to compensate its employees by the hours worked to protect the rights of employees, whose bargaining position is presumably weaker than the employer's. To enforce this requirement, the Act requires the firm to keep track of the hours worked and the amount of compensation for each employee. Historically, there was no exception for this treatment, but the requirement to compensate employees by hours worked was conceived as not realistic for certain occupations whose labor service is not properly measured by the hours worked. In response, the Act was revised in 1987 to introduce the *discretionary working system* (DWS) in specified occupations. The system virtually allows the employer to relax the tight connection between hours worked and compensation. The percentage of employees working under the DWS, or exempt workers, had been less than two percent of the total employees, because occupation coverage is limited to professionals and employees engaging in corporate planning activities. With the increasing number of tasks where labor service is difficult to measure by the hours worked, representatives of employers have been requesting to expand the scope of the DWS. In contrast, labor union leaders have opposed this proposal for fear of employers abusing the system. Despite heated policy debate, how the DWS affects the working conditions of employees is unknown to date.

To study the impact of exemption under the DWS on working conditions, we use novel data from a large-scale survey implemented by the Ministry of Health, Labor and Welfare (MHLW) in 2019. The LSA requires establishments employing the DWS to register with the MHLW; thus, the ministry holds a list of all DWS establishments. Based on this list, the new survey covers *all* DWS establishments, which constitute the treatment group. To construct the control group, the survey collects a similar number of comparable establishments that employ workers engaged in tasks eligible for the DWS (i.e., professional activities or corporate planning) but do not apply the system. The survey asks establishments to randomly select workers to whom the worker forms are distributed. This study utilizes information taken from the worker form, and thus, the unit of analysis is the individual worker. Our sample covers 47,390 exempt workers and 40,714 non-exempt workers, which is remarkably larger than the sample sizes of extant studies, which range

from a few hundred to thousands of exempt workers. The survey is a single cross-sectional data, but includes a rich set of control variables that may act as confounders. Furthermore, the survey includes questions on the *changes* in exemption status, hours worked, and health status from the previous year to enable us to control for the unobserved heterogeneity of workers using a first-difference estimation.

Before the main analysis, we examine if exempt workers have more discretion than non-exempt workers, because the LSA gives exemption status to workers in certain occupations based on the presumption that exempt workers have more direction to determine how they implement their assigned tasks than non-exempt workers. The results indeed indicate that exempt workers have more discretion than non-exempt workers, on average, but there is a substantial fraction of workers who do not have discretion regardless of their exemption status.

We first analyze differences in the work environment between exempt and non-exempt workers. We find that exempt workers work about 3% longer than non-exempt workers. This tendency is more substantial among employees engaging in corporate planning than those engaging in professional activities, and stronger among non-managerial employees than managerial employees. These findings suggest that when the exemption system is applied to workers who do not have control over hours worked, the exemption system prolongs the hours worked more. We confirm the robustness of our results by estimating the first-difference estimation, exploiting retrospective questions in the survey. We subsequently examine if exempt workers earn more than non-exempt workers in exchange for their longer working hours. The regression estimate with rich observable attributes indicates that exempt workers earn about 13% more than non-exempt workers.

Next, we examine how exemption status affects health conditions and job satisfaction. We find that exempt workers sleep longer hours on both working and non-working days, conditional on workers' and job characteristics. Furthermore, the estimates show that exempt workers tend to have better self-assessed physical and mental health conditions. The first-difference estimation results indicate that workers transitioning from non-exempt to exempt status are more likely to report an improvement in their health status, which reassures the cross-sectional results. Finally,

we investigate the effect of being exempted on workers' job satisfaction to find that exempt workers are overall more satisfied with their jobs compared to their non-exempt counterparts.

In sum, our analysis shows that exempt employees work longer but are not unhealthier, on average. This finding on the average impact, however, masks nuanced policy implications obtained from the heterogeneity analysis. Using a self-assessment of worker's discretion, we find that exempt status increases hours worked only among workers who do not have a sufficient degree of discretion. In accordance with this, we also find that exemption status exacerbates health conditions and job satisfaction among workers with a low degree of discretion, while it improves them among workers with a high degree of discretion. These findings imply that extending the coverage of the DWS to employees who do not have actual discretion risks prolonging working hours and deteriorating workers' well-being.

Our study contributes to the literature on the impact of overtime pay regulation. Existing studies extensively examine the impact of overtime pay regulation on the actual hours worked.[2] Contrary to the thick literature on the impact of overtime regulation on hours worked, few studies examine the impact of exemption from overtime pay regulation, such as white-collar exemption in the US or the DWS in Japan, on the work environment, including actual hours worked. A few exceptional

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[2] These studies report that the regulation on overtime affects the firm's behavior in various ways. For instance, Trejo (1991) tests the conflicting implications of the labor demand and compensating differential models of overtime pay regulation by analyzing Current Population Survey (CPS) data. The results suggest that neither model provides a complete explanation of observed outcomes. Trejo (2003) reports that firms nullify the regulation by adjusting base pay. Crépon and Kramarz (2002) report that firms circumvent the government call to reduce work hours without cutting monthly salaries by replacing the workers to renew the contract. Barkume (2010) finds that lower hourly wages are associated with more use of overtime in a plant, which indicates that overtime pay regulation influences the structure of compensation. Shortening standard work hours is sometimes proposed to create additional employment under the name of work sharing. Skuterud (2007) and Chemin and Wasmer (2009) both report that firms reduce the hours worked per worker but do not increase employment in response to shortening standard work hours and deny the argument for work sharing. Among them, studies on Japan report that the revision of the LSA of 1988 that reduced weekly standard work hours from 48 to 40 hours substantially reduced the actual hours worked (Kawaguchi et al. 2013, Kawaguchi et al. 2017). Kuroda (2010) reports weekly work hours had been relatively stable throughout the 1980s to the 2000s, conditional on the type of employment contract, suggesting that the revision of the LSA resulted in the substitution of part-time workers for full-time workers. Recently, Quach (2022) reports that the expanded coverage of overtime regulation reduced employment and increased the hourly wages of surviving workers. See Brown and Hamermesh (2019) for a survey of studies examining changes in overtime laws in seven different countries.

studies include Kuroda and Yamamoto (2012), which report that the working hours of exempt and non-exempt workers are not statistically significantly different,[3] while Hasebe et al. (2018) and JILPT (2021) find that the exemption indeed increases work hours. The discrepancy in results across studies is arguably due to small sample sizes, which is daunting in this context because the fraction of exempt workers is relatively small.

The contribution of our study to this literature is fourfold. First, we overcome the limitation of small sample size in previous studies by utilizing a remarkably larger data set. Second, our dataset was collected after the 2019 amendment of the LSA. This is in contrast to extant studies, which use survey data collected before 2016, a time when Japan's overtime restrictions were not strict, and many workers subject to overtime regulations allegedly worked hours above the standard work hours without proper overtime compensation.[4] Therefore, our dataset uniquely allows us to compare workers under the DWS with those now subject to stricter overtime restrictions. Third, this paper goes beyond merely assessing the impact on working hours, as in the majority of extant studies, by also considering such outcomes as sleep hours, subjective physical and mental health conditions, and job satisfaction. Last, we pay attention to how the impact of the DWS on working conditions depends on the extent to which employees are able to work in a discretionary manner. As the name implies, the DWS is designed for employees to work at their discretion, but the extent to which exempted employees actually work at their own discretion varies substantially. Our survey includes questions asking employees about the degree of discretion from five perspectives: the determination of objectives and deadlines, the quantity, the frequency of reports to the superiors, the details of implementation, and the time to stay at the office. We then analyze the extent to which those degrees of discretion affect the effect of being exempted on the outcome variables.

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[3] Kuroda and Yamamoto (2012) also find that the exempt group worked significantly longer hours than the non-exempt group during a period of recession. This result implies that employers tend to exploit exempted workers by making them work longer hours during recessions to save overtime payment.

[4] In response to the heightened social attention to *karoshi* (death from overwork), the 2019 revised Act sets a legal limit on overtime hours and requires employers to pay a fine if the limit is exceeded. Before the revision, the legal limit of standard work hours (8 hours per day and 40 hours per week) could be overridden given the mutual consent between the employer and the representative of the employees, under the clause provided in LSA Article 36. While this revision does not directly affect the DWS, employers came to pay even closer attention to keeping track of hours worked by employees.

This study also speaks to the growing literature on alternative work arrangements (see Mas and Pallais (2020) for a review). Mas and Pallais (2017) find that workers in the United States value working from home and dislike an employer's arbitrary control over work scheduling. Bloom et al. (2015) and Angelici and Profeta (2023) experimentally find that more flexible work arrangements enhance worker job satisfaction and well-being.[5] While our findings are aligned with these experimental studies, our study underscores that merely applying the exemption from standard work-hour regulations without actually granting workers sufficient discretion may diminish workers' welfare. Furthermore, despite being non-experimental, by drawing from a data set that spans a multitude of establishments, our study also complements prior experimental studies focused on single-company settings.

The rest of the paper rolls out as follows. Section 2 explains how the Labor Standard Law regulates hours worked and how the DWS allows the exemption in the context. Section 3 introduces the original survey data implemented for the purpose of assessing the effect of being exempted on the work environment. Section 4 introduces the analysis results. The last section concludes.

2. Discretionary Working System (*Sairyo Rodou Sei*)

The LSA allows employers to adopt a *discretionary working system* (DWS) when the nature of the work requires employers to give their employees discretion on the means of executing the work and the determination of time allocation. This nature of specific tasks makes it difficult for the employer to give specific instructions regarding the means of execution and the time allocation,

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[5] Previous studies have also investigated the impact of alternative work arrangements on worker productivity. Bloom et al. (2015) and Angelici and Profeta (2023) find that flexible work arrangements increase productivity, while Dutcher (2012) shows that the effect of flexible work arrangements on productivity is different between routine and non-routine tasks in a lab experiment. Beckmann et al. (2017) show that workers exert greater effort under flexible working time arrangements and that the effect is largely driven by intrinsically motivated workers. In a related context, Green and Heywood (2023) report that the pay for performance prolongs the hours worked for the UK. Artz and Heywood (2022) report similar findings for the US. The so-called job demands=resources (JDR) model of occupational health psychology indicates that the effects on stress and mental health vary greatly depending on the amount of job resources, even when people are engaged in highly demanding jobs (see for example, Karasek 1979, Demerouti et al. 2001). According to these studies, work resources include the availability of discretion to adjust working hours and workload by oneself. The research in this paper can be positioned as an examination of research in a similar context, as it applies to a working-hours system in which discretion is allowed.

therefore, does not fit the usual methods of recording working hours. The DWS is nested within a de facto working time system under which a certain number of hours are deemed to have been worked. A deemed number of hours shall be agreed upon between the employer and the employee. The actual working hours of individual workers covered by the de facto working time system may be longer or shorter than the deemed working hours. Under this system, employers are not required to pay overtime premiums based on the actual hours worked. The LSA allows employers to designate employees under the DWS mainly for two specific types of work: (A) professional work and (B) work in the planning, drafting, researching, and analyzing of particulars involved in business operations.[6]

According to the *Comprehensive Survey of Working Conditions* conducted by the Ministry of Health, Labor and Welfare, which covers private companies that employ 30 or more regular workers, 85.1% of workers were regarded as general workers and about 1% under the DWS applied for professional workers and 0.2% under the DWS applied for planning and related workers in 2019. Meanwhile, according to the *Labor Force Survey* (Statistics Bureau), in 2019, the Japanese labor force stood at 67.72 million people, of which 60.04 million were employees. Therefore, there were around 720,000 people working under the DWS. Besides the DWS, there are several other exceptions. An overview of those systems is provided in Appendix A.1 and Table A1.

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[6] Explanations for the two types of the DWS's are as follows.

A)   Discretionary working system (professional work type)
    This is a system for workers in areas such as research and development, which, due to their nature, make it difficult to give concrete instruction and determine the correct allocation of time worked. The system considers working hours to have been those agreed upon in advance according to the labor-management agreement. It applies to the following 19 areas of work.
B)   Discretionary working system (planning and related work type)
    This system applies to white collar workers engaged in the planning, drafting, researching, and analyzing of particulars involved in business operations. Working hours are deemed to be those agreed upon in the labor-management committee. The labor-management committee is made up of representatives of workers and the employer. It is stipulated that half the members should be taken from the labor union organized by a majority of employees in the workplace, or in cases where there is no union, workers representing a majority of their fellow employees are appointed for a fixed term. To introduce this discretionary working system, a resolution by a four-fifths majority of the members of the committee and the consent of the workers concerned are both required.

3. Data

This study utilizes nationally representative survey data aiming to describe the working conditions of employees operating under the DWS. The survey was conducted by the Ministry of Health, Labor and Welfare between November and December 2019, with the reference date being October 31, 2019. The target population covers all 11,750 establishments that had adopted the exemption system and randomly drawn 15,499 comparable establishments that hire employees engaged in corporate planning or professional activities but had not adopted the exemption system.[7] The survey asks the establishments to randomly select workers to whom the worker forms are distributed. Of 104,985 and 104,375 workers from the targeted establishments with and without the exemption system, respectively, the original sample consists of those who responded to the survey: 49,176 workers from 7,280 establishments with the exemption system (response rate: 46.8%), and 45,894 workers from 9,611 establishments without the exemption system (response rate: 44.0%). The worker forms contain a wide range of questions on working conditions, including exemption status, degree of discretion over work tasks, working hours, earnings, health conditions, job satisfaction, and other background characteristics. This study draws on worker-level information taken from the worker forms.

We construct the analysis sample from the original data set by restricting it to the observations that provide valid responses to all relevant questions. First, we drop observations whose sampling weights are missing or zero. This results in 47,390 exempt workers and 40,714 non-exempt workers. Second, we drop observations if their answers to the questions that we use in the analysis are not clear, missing, or unreasonable (e.g., working hours per day exceeds 24 hours). This process creates the analysis sample that contains 38,869 exempt workers and 33,940 non-exempt workers.

Before presenting the main regression analysis, we first describe the differences in the distributions of hours worked, sleep hours, and annual earnings between non-exempt and exempt workers.

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[7] An establishment is identified to have adopted the exemption system at the time of the survey if it has submitted the Agreement on the Discretionary Working System in the Type of Professional Work as stipulated in the LSA between FY 2015 and FY 2018, or has submitted the Report on the Discretionary Working System in the Type of Planning Work as stipulated in LSA in the second half of FY 2018.

Figure 1 draws the density of weekly hours worked by non-exempt and exempt workers. The figure shows that the distribution of exempt workers is shifted to the right, implying that the exempt workers work longer hours. Figure 2 draws the density of daily sleep hours by exemption status. The distributions largely overlap, and we do not find a clear difference in the distributions. Figure 3 draws the distributions of annual earnings. Apparently, the distribution of exempt workers is located to the right of that of non-exempt workers. Overall, these graphical representations show that exempt workers work longer but earn more than non-exempt workers. In the regression analysis below, we investigate if these relationships sustain after controlling for detailed workers' and job characteristics.

Table 1 reports the descriptive statistics of our analysis sample. For presenting the control means, we report the means and standard deviations of the variables of non-exempt workers in Column (1). Then the differences in the means and the associated standard errors between exempt and non-exempt workers are reported in Column (2).

We first compare the outcome variables between exempt and non-exempt workers. In terms of hours worked, exempt workers work about 2 hours longer per week than non-exempt workers, while non-exempt workers work about 44 hours per week, and the difference is statistically significant. In contrast, sleep hours are not different between exempt and non-exempt workers on both working and non-working days in quantitatively significant ways. Non-exempt workers earn 6.2 million yen annually and exempt workers earn 1.1 million yen more, though the difference is not statistically significant at the conventional level. Moving on to self-reported health status, about 30% of non-exempt workers describe their health status as good, and exempt workers are about three percentage points more likely to do so, which is statistically significant. In contrast, about 33% of non-exempt workers describe their health status as normal, while exempt workers are about four percentage points less likely to do so, which is statistically significant. In terms of mental health conditions, most non-exempt workers report they sometimes or rarely experience such issues as exhaustion, time pressure, and anxiety. While exempt workers are slightly more likely to experience concentration lapses, the overall differences in mental health conditions between exempt and non-exempt workers are subtle. Finally, while 24% of non-exempt workers

express satisfaction with their jobs, exempt workers are 5.5 percentage points more likely to report the same sentiment.

The background variables demonstrate that our analysis sample covers a particular population, because it only covers those who work for establishments hiring employees engaging in professional or corporate planning activities. The average age of non-exempt employees is 41 years old, only 22% of them are female, and as high as 24% of them hold a graduate degree. Exempt workers are less likely to be female, better educated, with shorter tenure, and in lower-level positions, in statistically significant ways. In terms of age, marital status, and having a child, exempt and non-exempt workers are comparable.

The presumption of the DWS is to give workers discretion over designing their job descriptions and the method of implementation. To assess whether the DWS indeed attains the goal, we examine if exempt workers have more discretion than non-exempt workers. The survey questionnaire probes the workers' level of discretion across five key areas:
1. Basic job description regarding objective, goal, and deadline,
2. Details of the job description and amount of job assignment,
3. Frequency of progress report,
4. Method of implementation and time allocation, and
5. Starting and ending times of work hours.

Respondents are asked to choose one of the following options to describe their own situation:
1. Supervisor decides without worker's consultation,
2. Supervisor decides with worker's consultation,
3. Worker decides with supervisor's consultation, or
4. Worker decides without supervisor's consultation.

Table 2 tabulates the distribution of responses to the above questions by exemption status. Panel A shows that about half of exempt and non-exempt workers decide the basic job description via a consultation with supervisors. The comparison of exempt and non-exempt workers reveals that exempt workers indeed have more discretion than non-exempt workers. More specifically, 62.7% (=50.8%+11.9%) of exempt workers decide the job description by themselves, whereas 54.2%

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(=46.4%+7.8%) of non-exempt workers do so. When it comes to the details of the job description and amount of job assignment, Panel B shows that 64.2% of exempt workers decide by themselves, whereas 53.8% of non-exempt workers do so. Panel C shows that 71.8% of exempt workers decide the frequency of progress reports to supervisors by themselves, whereas 70.5% of non-exempt workers do so. Panel D shows that 90.1% of exempt workers decide the method of implementation and time allocation by themselves, whereas 87.9% of non-exempt workers do so. Panel E shows that 87.2% of exempt workers decide the starting and ending times of work hours by themselves, whereas 80.5 of non-exempt workers do so. Overall, workers in the sample, regardless of the DWS status, have a high level of discretion, reflecting the survey design, which targets the employees engaging in corporate planning or professional activities. Furthermore, even within this restricted sample, exempt workers have greater discretion than non-exempt workers, aligning with the system's objectives. It should also be noted that even within the exemption status, there is a considerable amount of variation in the degree of discretion among workers, which we exploit in the heterogeneity analysis.

4. Estimation Results

We examine the effect of being exempted on hours worked, annual earnings, physical and mental health conditions, and job satisfaction, by comparing exempt and non-exempt workers. To do so, we run a regression of the form:

$$Y_i = \alpha + \beta \cdot E_i + X_i'\delta + u_i, \tag{1}$$

where Y_i is the outcome of interest for worker i, E_i is a dummy variable which is equal to one if worker i is exempted from the standard working hour regulation under the DWS, and 0 otherwise, X_i is a vector of the observable characteristics of worker i, and u_i is an error term. The coefficient β is the parameter of interest: the effect of the exemption on the outcome of interest. Observations are weighted using the sampling weight reflecting the particular sampling design.

A natural concern in estimating the above equation to estimate the effect of being exempted is that the selection into exemption is not necessarily random, creating a bias in the estimate of β. For example, the firm may select employees whose job requires long working hours to be exempted.

This selection rule entails a positive correlation between exemption status and the error term. To mitigate this concern, we leverage on the detailed information about workers' backgrounds collected in the survey and include a rich set of observable characteristics to control for the non-random selection into the exemption. The set of control variables includes age, educational background, marital status, the number of children, tenure, position, occupation, and the method for managing attendance. The identifying assumption is that, conditional on these attributes, being exempted is as good as randomly determined. We later relax this assumption, appealing to the first-difference estimation.

4.1. Effect on Hours Worked

First, we investigate the effect of the exemption on weekly hours worked. The estimation results are presented in Table 3. Column (1) shows the result without any control variables. The estimate implies that exempt employees work 2.1 hours longer than non-exempt workers, who work 43.9 hours per week, on average, and the difference is statistically significant. In Column (2), we re-estimate the regression model with the set of control variables described above to mitigate the concern for the omitted variable bias. The estimate gets attenuated but indicates that exempted employees work 1.3 hours longer and it remains statistically significant ($p<.01$). Compared to the mean hours worked of non-exempt workers, exempt workers work longer by about 2.9%.

Next, we investigate the heterogeneity of the effect by occupation and position. The impact of being exempted on hours worked may well be different across the types of jobs. For example, employees engaging in professional activities with a clear performance goal may stop working after attaining the goal because they presumably work individually, while those engaging in corporate planning activities may have less control over hours because they arguably work in a team.

In the following, we examine whether the effect differs by workers' occupation. To do so, we divide the sample into those engaging in professional activities and corporate planning activities, and re-estimate the equation (1) for each subsample separately. The results are presented in Table 4 Columns (1) and (2). The estimates show that the effect of being exempted is statistically significant in both occupations ($p<.01$) but almost twice as large in corporate planning occupations

as it is in professional occupations: The hours worked of exempt workers is 1.171 hours longer relative to non-exempt workers in professional occupations, while the corresponding difference is 2.414 hours in corporate planning occupations.

Furthermore, in Table 4 Columns (3) and (4), we divide the sample into those in managerial positions and non-managerial positions, respectively, to examine whether the effect of being exempted differs by the workers' position. The results show that exempt workers in non-managerial positions tend to work significantly longer than non-exempt workers by about 1.476 hours, while there is no significant difference in the hours worked by the exemption status among workers in managerial positions. In parallel with the professional vs. corporate planning comparison, those in managerial positions presumably have more control over their working hours than those in non-managerial positions.

Altogether, the findings from the subsample analysis suggest that the exemption system prolongs the hours worked, particularly when it is applied to workers who presumably do not have strong control over their own hours worked. We further investigate this possibility in section 4.5, drawing on the direct measurement of the discretion a specific employee has.

While we control for a rich set of workers' observable characteristics to mitigate omitted variable bias, one may still be concerned that the estimated effect is biased due to the selection into the exemption based on workers' unobservable characteristics. To mitigate this concern, we examine the robustness of our main estimation results by performing a first-difference estimation. More specifically, our survey asks respondents about changes in their exemption status and hours worked from the previous year. This enables us to estimate the first-difference model, exploiting within-worker changes in exemption status over time. The first-difference estimation mitigates the concern for the selection on unobservables, because any time-invariant confounding factors are differenced out. An additional benefit of the first-difference model is that we can differentiate between workers who were not exempted in the previous year but exempted in the current year (newly exempted workers) and those who were exempted in both years (always-exempted workers), and examine the dynamic effect of being exempted.

In sum, the regression model takes the form of

$$\Delta Y_i = \alpha + \beta \cdot 1\{E_{it} = 1, E_{it-1} = 0\} + \gamma \cdot 1\{E_{it} = 1, E_{it-1} = 1\} + X_i'\delta + \Delta u_i, \qquad (2)$$

where ΔY_i is the change in hours worked from the previous year, E_{it} is a dummy variable that is equal to one if worker i is exempted from the standard working hour regulation under the DWS in year t, and $1\{\cdot\}$ is an indicator function. β represents the effect of being exempted for newly exempted workers, while γ represents the continuation effect of being exempted. We do not have data on changes in the covariates over time. Note, however, that all the time-invariant covariates are differenced out. We instead include some observable characteristics in level, which control for the potentially time-varying effects of the covariates. The included controls are sex, age, educational background, and occupation.

Table 5 Column (1) shows the results of the first-difference estimation with no control variables. The estimate shows that weekly hours worked increased by about 0.924 hours for newly exempted workers, though the effect is only marginally significant (p=0.12). We also find that the results are qualitatively similar with controls (Column 2). The qualitative results from the first-difference estimation reassure the cross-sectional estimates, although estimates are imprecise. The imprecise estimation is due to the small number of workers who transit from non-exemption to exemption between time t-1 and time t. In the analysis sample, only 6.2% of workers transit from non-exemption to exemption. All the continuation effects are estimated to be negative but not statistically significant.

We further investigate the robustness of the results using a categorical measure of the change in hours worked. More specifically, our survey also asks respondents whether their weekly hours worked had changed from the previous year in a categorical manner, with the possible answers being "decreased," "unchanged," "increased," and "don't know." We construct dummy variables for each of the four possible answers and estimate a linear probability model of the form (2) with each of them as a dependent variable.

Table 6 presents the estimation results of the linear probability model. The estimates show that among newly exempted workers, there is a 10.7 percentage point decline in the proportion of the workers with no change in hours worked (p<.01, Column 2), while there is a 4.2 percentage point increase in the proportion of those with an increase in hours worked (p<.05, Column 3) and a 4.3 percentage point increase in the proportion that answers "do not know" (p<.05, Column 4). On the one hand, the increase in the probability of increased working hours reassures the previous result. On the other hand, becoming exempted presumably makes workers not recognize the change in hours worked between the previous year and the current year, probably because employees pay less attention to their hours worked under the DWS. The estimates for the continuation effect indicate that the proportion of those with an increase in hours worked is significantly smaller among always-exempted workers (p<.01, Column 3). To further examine the robustness of the results, we also estimate the linear probability model with the same sets of subsamples as in the cross-sectional analysis and confirm that the results are qualitatively similar (Appendix Table A2 and A3). Overall, the results using the categorical measure reassure the results using the change in hours worked.

As a final robustness check, we re-run the cross-sectional regression of the effect of being exempted on the weekly hours worked by restricting the sample to those with a valid answer on the change in hours worked from the previous year. The result is reported in Appendix Table A4, and we find the estimate is essentially unchanged.

4.2. Effect on Earnings and Hourly Wage

We next examine the effect of being exempted on annual earnings by estimating equation (1) with the natural log of the annual earnings of an employee as the dependent variable. The results reported in Table 7 consistently show positive and statistically significant effects of being exempted on earnings, both with and without control variables. Even the conservative estimate with controls in Column (2) indicates that exempt workers, on average, earn more than non-exempt workers by 13.1% (p<.01). This increase in earnings is larger than the impact of exemption on hours worked, which is 2.9% according to Column (2) of Table 3 (=1.276/43.89). Combining the estimated impacts on earnings and hours worked, the hourly wage rate increases by about 10.2%. This increase in hourly wage is larger than the increase in earnings expected from the 25%

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overtime premium. The percentage of working hours subject to the overtime premium is 8.9% among non-exempt workers (=3.89/43.89), whereas for exempt workers it is 11.8% (=(3.89+1.276)/43.89). Thus the increase in hours worked would have increased earnings by 3.6% (=(0.118-0.089)*1.25) if the worker continued to work as a non-exempt worker. This back of the envelope calculation demonstrates that the straight hourly wage increases by about 6.6% (=10.2-3.6). We thus conclude that exempt workers earn more than non-exempt workers in terms of straight hourly wage.

4.3. Effects on Health Conditions

The previous subsections have provided evidence that exempt workers tend to work longer and earn more than non-exempt workers. A natural question is whether the longer working hours and higher earnings of the exempt workers are at the expense of their health condition. This subsection, therefore, turns to the effect of the exemption status on workers' health condition. First, we investigate the effect on hours of sleep. Then, we move on to the effect on self-assessed overall and mental health conditions.

We investigate the effect on hours of sleep by estimating equation (1) with daily hours of sleep as a dependent variable. The estimates of the effect are presented in Table 8. While the estimate without controls in Column (1) is small and statistically insignificant, once we control for worker's characteristics in Column (2), we find a positive and statistically significant effect on the hours of sleep ($p<.1$). The magnitude of the estimated effect is small, however: It indicates that exempt workers tend to sleep about 2.4 (=.04 * 60) minutes more per day, which translates into about .6% more than the mean sleeping hours of 6.52 hours among non-exempt workers. This is substantially smaller than the effect on hours worked. In Table 8 Columns (3) and (4), we further investigate the effect of exemption status on the hours of sleep on working and non-working days, separately. The estimates show that exempt workers tend to sleep slightly more than non-exempt workers similarly on both working and non-working days: The effect on hours of sleep on working days is 0.048 ($p<.05$), while that on non-working days is 0.052 ($p<.05$).

Next, we turn to the effect of being exempted on the overall and mental health conditions, exploiting workers' self-assessment in our survey. Regarding the overall health condition, the

survey asks the respondents about their self-assessed overall health condition in a categorical manner, with the five possible answers being "good," "modestly good," "normal," "modestly bad," and "bad." We construct dummy variables for each possible answer and estimate a linear probability model with each of them as a dependent variable.

Table 9 reports the effect on the self-assessed overall health condition. The estimates indicate that exempt workers are 2.3 percentage points more likely to evaluate their overall health condition as "good" compared to the non-exempt workers (p<.10), whose choice probability is 29.3%. The estimated effects on the probability of evaluating the overall health condition as "modestly bad" and "bad" are small in magnitude and statistically insignificant. In the end, we do not find any evidence suggesting that exempt employees' self-assessed overall health condition is worse than non-exempt employees'.

We examine the robustness of the effect on the overall health condition in two ways. First, we confirm that the results do not change substantially even if we restrict the sample to workers with a valid answer regarding the change in their health condition from the previous year (Appendix Table A5). Second, we estimate the first-difference model as in the analysis of the hours worked, exploiting the within-worker variation in exemption status (Appendix Table A6). The estimates indicate that newly exempted workers are more likely to evaluate that their health condition had improved, which is consistent with the cross-sectional analysis here.

Turning to mental health condition, the survey asks five questions on the frequency with which respondents experience the following mental health symptoms: (1) exhaustion from work, (2) time pressure, (3) lack of concentration on personal and family life due to work, (4) sleep deprivation due to work-related stress, and (5) work anxiety. For each question, the possible answers are "often," "sometimes," "rarely," and "never." We construct dummy variables for each possible answer and estimate a linear probability model for the five mental health symptoms separately.

The estimation results are reported in Table 10, with each panel showing the effect on different mental health symptoms. Panel A shows that exempt workers are 2.9 percentage points more likely to answer that they rarely feel exhausted from work than non-exempt workers (p<.05), among

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whom 37.1% choose this response. As for the time pressure shown in Panel B, we do not find any significant difference between the exempt and non-exempt workers. The estimates in Panel C indicate that exempt workers are 2.7 percentage points less likely to answer that it never occurs to them that they cannot concentrate on personal and family life due to work (p<.01), while we do not find any significant increase in the probabilities of the other three responses. Panel D shows that there is no statistically significant difference between exempt and non-exempt workers in terms of the likelihood of experiencing sleep deprivation due to work-related stress. Finally, in Panel E, we find that exempt workers are 1.5 and 3.7 percentage points *less* likely to answer that they feel work anxiety "often" (p<.10) and "sometimes" (p<.01), respectively. We also find associated *increases* in the likelihood of answering that they feel work anxiety rarely (p<.01) and never (p<.01).

Overall, the results on mental health conditions are mixed, but we at least do not find systematic evidence that the exemption deteriorates self-assessed mental health conditions, on average.

4.4. Effect on Job Satisfaction

Finally, we investigate the effect of being exempted on workers' job satisfaction. The survey question asks respondents how satisfied they are with their jobs. The respondents are asked to choose one of the following five responses: "satisfied," "slightly satisfied," "neither," "slightly unsatisfied," and "unsatisfied." We generate dummy variables corresponding to each response and use them as the dependent variable to estimate linear probability models.

The estimation results are reported in Table 11. Column (1) shows that exempt workers are 4.3 percentage points more likely to be satisfied with their job (p<.01) than non-exempt workers, where 24% of them are satisfied. This 18% difference in the choice probability is economically and statistically significant. Conversely, Columns (2) and (4) show that exempt workers are 3.8 percentage points *less* likely to be slightly satisfied (p<.01) and 1.5 percentage points *less* likely to be slightly unsatisfied (p<0.05), respectively. Overall, the estimates suggest that exempt workers are more satisfied with their jobs.

4.5. Degree of Discretion and Heterogeneous Policy Impacts

Thus far, our analysis has focused on estimating the *average* effect of the exemption. As shown in Section 3, however, there exist considerable variations in the degrees of discretion across different tasks among workers, even among those with the same exemption status. Presumably, this can be attributed to the common practice in Japanese workplaces, where the degree of discretion is often determined at the company or workplace level, influenced by factors such as corporate culture and the leadership style of department heads. Consequently, the effect of the exemption may vary depending on the degree of discretion. To explore this possibility, we proceed to estimate the heterogeneous effects of the exemption with respect to the degree of discretion.

We begin the analysis by first calculating a measure of the overall degree of discretion based on the five measures of the degree of discretion introduced in Section 3. Specifically, we have measures of the degree of workers' discretion for the following five tasks: (A) basic job descriptions regarding objectives, goals, and deadlines, (B) details of job descriptions and amount of job assignments, (C) frequency of progress report, (D) method of implementation and time allocation, and (E) starting and ending time. For each of the five discretion measures, we assign a value of -2 if the respondent's response is "supervisor decides without worker's consultation," -1 if it is "supervisor decides with worker's consultation," 0 if it is "neither," +1 if it is "worker decides with supervisor's consultation," and +2 if it is "worker decides without supervisor's consultation." These values are then summed across the five tasks to construct a single measure of the overall degree of discretion, which ranges from -10 to +10, and a higher value represents a greater degree of discretion. Finally, we group the sample into 5 equal-sized groups based on the quintiles of this overall measure of the degree of discretion and estimate the following regression.

$$Y_i = \alpha + \beta \cdot E_i + \sum_{j=2}^{5} \gamma_j E_i \times Q_{ij} + \sum_{j=2}^{5} \theta_j Q_{ij} + x_i' \delta + u_i, \qquad (2)$$

where Q_{ij} is a dummy variable that is equal to 1 if worker i falls into the j-th quintile of the overall degree of discretion. Here, β measures the effect of the exemption in the 1st quintile of the overall degree of discretion, *i.e.,* among the workers with the least discretion, and $\beta + \gamma_j$ ($j = 2, ... ,5$) measures the effect of the exemption in the j -th quintile of the overall degree of discretion. We

present the estimation results in figures, reporting the effects of exemption at each quintile (β and $\beta + \gamma_j, j = 2, ..., 5$).

Figure 4 presents the heterogeneous effect of being exempted on weekly working hours. The results indicate that exempt workers work significantly longer than non-exempt workers in the 1st to 4th quintiles of the overall degree of discretion, but there is no significant difference in weekly working hours between exempt and non-exempt workers in the 5th quintile, *i.e*, those with the highest degree of discretion. This suggests that, while exemption increases working hours when a worker is exempted without sufficient discretion, it does not result in increased working hours when adequate discretion is ensured.

Figure 5 shows the heterogeneous effect on annual earnings. The results show that exempt workers consistently earn more than their non-exempt counterparts across all discretion levels. The earnings advantage of being exempt diminishes slightly, however, for those with higher degrees of discretion. This trend seems to correspond with the observation that the impact on working hours is also less pronounced among workers with more discretion.

We turn to the heterogeneous effects on health conditions in Figure 6 (sleeping hours), Figure 7 (overall health condition), and Figure 8 (mental health conditions). The results consistently indicate that exemption has a positive impact on workers' health conditions if they have sufficient discretion. At the same time, however, when workers have only limited discretion, the exemption can adversely impact their health conditions.

Finally, we investigate the heterogeneous effect on job satisfaction in Figure 9. Consistent with the findings on working hours and health conditions, the results indicate that exemption increases job satisfaction among workers who have a high degree of discretion. When workers do not have sufficient discretion, however, it instead *lowers* job satisfaction.

Overall, the results of the heterogeneity analysis suggest that exemption alone does not necessarily improve workers' working conditions and may even worsen them if workers are not granted adequate discretion. It implies that it is important to grant workers a sufficient degree of discretion

for exemption to improve workers' welfare. As a robustness check, we also investigate the effect heterogeneity with respect to workers' discretion in five different tasks separately. The results are qualitatively similar and reported in Appendix B.

5. Conclusion

We examined the effect of being exempted from standard work hour regulations on the hours worked, earnings, health conditions, and job satisfaction of workers, drawing on a large-scale government survey specifically designed for the formulation of the exemption system. We found that workers exempted from standard work hour regulations under the *discretionary working system* (DWS) work about 3% longer per week and earn about 13% more annually compared to non-exempt workers with similar observed characteristics. Furthermore, we observed that exempt workers have comparable sleep durations to those of non-exempt workers and maintain health levels that are at least on par, if not better. The first-difference estimates using retrospective questions regarding exemption status and the outcome variables confirmed the robustness of the cross-sectional estimates. Finally, we found that exempt workers are more satisfied with their jobs than non-exempt workers.

Although we did not find systematic evidence that the DWS exacerbated working conditions, on average, close examination of the impact by workers' characteristics reveals that the impacts of the DWS are more nuanced. We found that the effect of being exempted on hours worked among workers in non-managerial positions is three times as large as the effect among those in managerial positions. In a similar vein, the DWS impact on hours worked among workers in corporate planning occupations is twice as large as those in professional occupations. We also found that the effect of being exempted is heterogeneous with respect to the degree of discretion. Specifically, while exemption does not increase hours worked if workers have a high degree of discretion, it increases hours worked for workers with a low degree of discretion. In accordance with this, we also find that exemption lowers the health conditions and job satisfaction among workers with a low degree of discretion, while it improves them among workers with a high degree of discretion. These results raise a yellow flag for policymakers considering whether to further extend the coverage of the DWS system to workers who do not have actual discretion on the design and implementation of their jobs.

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Table 1: Descriptive Statistics

Exemption status	(1) Non-exempt		(2) Exempt - Non-exempt	
	Mean	SD	Diff. in means	SE
Panel A. Outcome variables				
Weekly hours worked	43.584	[9.531]	2.152	(0.219)
Sleep hours on working days	6.152	[0.931]	0.013	(0.026)
Sleep hours on non-working days	7.491	[1.203]	0.053	(0.025)
Sleep hours (weighted average)	6.535	[0.858]	0.007	(0.022)
Annual earnings (million yen)	6.204	[2.798]	1.079	(0.069)
Health status:				
Good	0.303	[0.460]	0.026	(0.012)
Modestly good	0.268	[0.443]	0.013	(0.010)
Normal	0.334	[0.472]	-0.042	(0.012)
Modestly bad	0.086	[0.280]	0.003	(0.006)
Bad	0.009	[0.094]	-0.000	(0.002)
Exhaustion from work:				
Often	0.114	[0.318]	0.006	(0.006)
Sometimes	0.423	[0.494]	-0.009	(0.012)
Rarely	0.367	[0.482]	0.012	(0.012)
Never	0.096	[0.294]	-0.009	(0.007)
Time pressure:				
Often	0.276	[0.447]	0.007	(0.011)
Sometimes	0.480	[0.500]	0.011	(0.013)
Rarely	0.192	[0.394]	-0.003	(0.011)
Never	0.052	[0.221]	-0.016	(0.005)
Lack of concentration on personal and family life due to work:				
Often	0.046	[0.209]	0.013	(0.005)
Sometimes	0.302	[0.459]	0.032	(0.011)
Rarely	0.468	[0.499]	-0.002	(0.013)
Never	0.184	[0.388]	-0.042	(0.008)
Sleep deprivation due to work-related stress:				
Often	0.038	[0.191]	0.008	(0.004)
Sometimes	0.252	[0.434]	0.001	(0.010)
Rarely	0.478	[0.500]	0.005	(0.013)
Never	0.232	[0.422]	-0.014	(0.010)
Work anxiety:				
Often	0.139	[0.346]	-0.005	(0.007)
Sometimes	0.358	[0.479]	-0.040	(0.011)
Rarely	0.359	[0.480]	0.031	(0.013)
Never	0.144	[0.351]	0.013	(0.008)
Job satisfaction:				
Satisfied	0.236	[0.424]	0.055	(0.011)
Slightly satisfied	0.421	[0.494]	-0.031	(0.012)

	(1)		(2)	
Neither	0.212	[0.409]	-0.007	(0.011)
Slightly unsatisfied	0.101	[0.301]	-0.016	(0.007)
Unsatisfied	0.030	[0.170]	-0.001	(0.004)
Panel B. Control variables				
Female	0.218	[0.413]	-0.021	(0.009)
Age	41.055	[10.520]	-0.350	(0.226)
Education:				
Junior high school	0.001	[0.032]	-0.000	(0.000)
High school	0.093	[0.290]	-0.053	(0.004)
Vocational school	0.102	[0.303]	-0.032	(0.007)
Junior/technical college	0.053	[0.223]	-0.023	(0.003)
Four-year university	0.515	[0.500]	-0.063	(0.013)
Graduate school	0.236	[0.425]	0.171	(0.011)
Married	0.646	[0.478]	0.018	(0.012)
Having a child	0.491	[0.500]	0.016	(0.013)
Tenure	13.417	[9.808]	-1.050	(0.221)
Director or above	0.227	[0.419]	-0.059	(0.011)

Note: Column (1) reports means among non-exempt workers. Standard deviations are reported in brackets. Column (2) reports the difference in the means between exempt and non-exempt workers. Standard errors are reported in parentheses.

Table 2: The Degree of Discretion by Exemption Status

	Non-Exempt	Exempt
Panel A: Basic job descriptions regarding objective, goal, and deadline		
Supervisor decides without worker's consultation	0.121	0.097
Supervisor decides with worker's consultation	0.266	0.208
Worker decides with supervisor's consultation	0.464	0.508
Worker decides without supervisor's consultation	0.078	0.119
N	33885	38754
Panel B: Details of job descriptions and amount of job assignment		
Supervisor decides without worker's consultation	0.087	0.070
Supervisor decides with worker's consultation	0.303	0.213
Worker decides with supervisor's consultation	0.393	0.410
Worker decides without supervisor's consultation	0.145	0.232
N	33883	38747
Panel C: Frequency of progress report		
Supervisor decides without worker's consultation	0.078	0.086
Supervisor decides with worker's consultation	0.134	0.118
Worker decides with supervisor's consultation	0.501	0.447
Worker decides without supervisor's consultation	0.204	0.271
N	33867	38753
Panel D: Method of implementation and time allocation		
Supervisor decides without worker's consultation	0.017	0.016
Supervisor decides with worker's consultation	0.058	0.038
Worker decides with supervisor's consultation	0.469	0.399
Worker decides without supervisor's consultation	0.410	0.502
N	33892	38765
Panel E: Starting and ending time		
Supervisor decides without worker's consultation	0.104	0.058
Supervisor decides with worker's consultation	0.040	0.019
Worker decides with supervisor's consultation	0.362	0.292
Worker decides without supervisor's consultation	0.443	0.580
N	33887	38762

Table 3: The Effect of Exemption on Weekly Hours Worked

Dependent variable	Weekly hours worked	
	(1)	(2)
Exempt	2.152	1.276
	(0.219)	(0.218)
Control	No	Yes
R-squared	0.009	0.083
Mean non-exempt	43.89	43.89
N	72809	72809

Notes: Robust-standard errors are in parentheses. See the text for the set of control variables. Observations are weighted using the sampling weight.

Table 4: The Effect of Exemption on Weekly Hours Worked by Subsample

Dependent variable	Weekly hours worked			
	Occupation		Position	
	Professional	Corporate planning	Non-managerial	Managerial
	(1)	(2)	(3)	(4)
Exempt	1.171	2.414	1.476	0.044
	(0.226)	(0.515)	(0.240)	(0.461)
p-value		0.001		0.000
Control	Yes	Yes	Yes	Yes
R-squared	0.087	0.091	0.091	0.104
Mean non-exempt	44.11	43.05	43.36	45.23
N	58749	14060	57462	15347

Notes: Robust-standard errors are in parentheses. See the text for the set of control variables. Observations are weighted using the sampling weight.

Table 5: The Effect of Exemption on Weekly Hours Worked: First-Difference

Estimation

Dependent variable	Change in weekly hours worked	
	(1)	(2)
Non-exempt→Exempt	0.924	0.701
	(0.593)	(0.592)
Exempt→Exempt	-0.215	-0.316
	(0.234)	(0.242)
Control	No	Yes
R-squared	0.001	0.015
Mean always-non-exempted	-0.63	-0.63
N	59872	59872

Notes: Robust-standard errors are in parentheses. See the text for the set of control

variables. Observations are weighted using the sampling weight.

Table 6: The Effect of Exemption on Weekly Hours Worked: First Difference

Estimation (Linear probability model)

Dependent variable	Change in weekly hours worked			
	Increased	Unchanged	Decreased	Don't know
	(1)	(2)	(3)	(4)
Non-exempt→Exempt	0.042	-0.107	0.022	0.043
	(0.019)	(0.028)	(0.019)	(0.013)
Exempt→Exempt	-0.021	0.006	0.011	0.003
	(0.008)	(0.013)	(0.011)	(0.005)
Control	Yes	Yes	Yes	Yes
R-squared	.016	.037	.021	.019
Mean always-non-exempt	.13	.59	.19	.09
N	72809	72809	72809	72809

Notes: Robust-standard errors are in parentheses. See the text for the set of control

variables. Observations are weighted using the sampling weight.

Table 7: The Effect of Exemption on Annual Earnings

Dependent variable	Log annual earnings	
	(1)	(2)
Exempt	0.199	0.131
	(0.010)	(0.010)
Control	No	Yes
R-squared	0.035	0.478
Mean non-exempt	15.54	15.54
N	72809	72809

Notes: Robust-standard errors are in parentheses. See the text for the set of control variables. Observations are weighted using the sampling weight.

Table 8: The Effect of Exemption on Hours of Sleep

Dependent variable	Daily hours of sleep			
	All		Working days	Non-working days
	(1)	(2)	(3)	(4)
Exempt	0.007	0.040	0.048	0.052
	(0.022)	(0.021)	(0.024)	(0.023)
Control	No	Yes	Yes	Yes
R-squared	0.000	0.043	0.030	0.102
Mean non-exempt	6.52	6.52	6.16	7.46
N	72809	72809	72809	72809

Notes: Robust-standard errors are in parentheses. See the text for the set of control variables. Observations are weighted using the sampling weight.

Table 9: The Effect of Exemption on Overall Health Conditions (Linear Probability

Model)

Dependent variable	Overall health condition				
	Good	Modestly good	Normal	Modestly bad	Bad
	(1)	(2)	(3)	(4)	(5)
Exempt	0.023	0.005	-0.028	0.001	-0.001
	(0.012)	(0.010)	(0.012)	(0.006)	(0.002)
Control	Yes	Yes	Yes	Yes	Yes
R-squared	.044	.01	.033	.017	.006
Mean non-exempt	.293	.276	.325	.096	.009
N	72809	72809	72809	72809	72809

Notes: Robust-standard errors are in parentheses. See the text for the set of control

variables. Observations are weighted using the sampling weight.

Table 10: The Effect of Exemption on Mental Health Conditions (Linear Probability

Model)

Dependent variable	Often (1)	Sometimes (2)	Rarely (3)	Never (4)
Panel A. Exhaustion from work				
Exempt	-0.006	-0.018	0.029	-0.005
	(0.007)	(0.012)	(0.012)	(0.007)
R-squared	.024	.02	.022	.019
Mean non-exempt	.12	.42	.371	.089
Panel B. Time Pressure				
Exempt	-0.018	0.014	0.012	-0.008
	(0.011)	(0.013)	(0.010)	(0.005)
R-squared	.036	.012	.023	.022
Mean non-exempt	.276	.489	.192	.043
Panel C. Lack of concentration on personal and family life due to work				
Exempt	0.003	0.007	0.017	-0.027
	(0.005)	(0.011)	(0.012)	(0.008)
R-squared	.024	.021	.016	.031
Mean non-exempt	.047	.321	.463	.168
Panel D. Sleep deprivation due to work-related stress				
Exempt	0.005	-0.006	0.011	-0.009
	(0.004)	(0.011)	(0.013)	(0.010)
R-squared	.013	.011	.009	.018
Mean non-exempt	.045	.269	.47	.217
Panel E. Work anxiety				
Exempt	-0.015	-0.037	0.032	0.020
	(0.008)	(0.011)	(0.013)	(0.008)
R-squared	.024	.013	.019	.017
Mean non-exempt	.14	.353	.366	.14
Control	Yes	Yes	Yes	Yes
N	72809	72809	72809	72809

Notes: Robust-standard errors are in parentheses. See the text for the set of control

variables. Observations are weighted using the sampling weight.

Table 11: The Effect of Exemption on Job Satisfaction (Linear Probability Model)

Dependent variable	Job satisfaction				
	Satisfied	Slightly satisfied	Neither	Slightly unsatisfied	Unsatisfied
	(1)	(2)	(3)	(4)	(5)
Exempt	0.043	-0.038	0.008	-0.015	0.000
	(0.012)	(0.012)	(0.010)	(0.007)	(0.003)
Control	Yes	Yes	Yes	Yes	Yes
R-squared	0.040	0.018	0.019	0.013	0.010
Mean non-exempt	0.24	0.41	0.22	0.10	0.03
N	72262	72262	72262	72262	72262

Notes: Robust-standard errors are in parentheses. See the text for the set of control variables. Observations are weighted using the sampling weight.
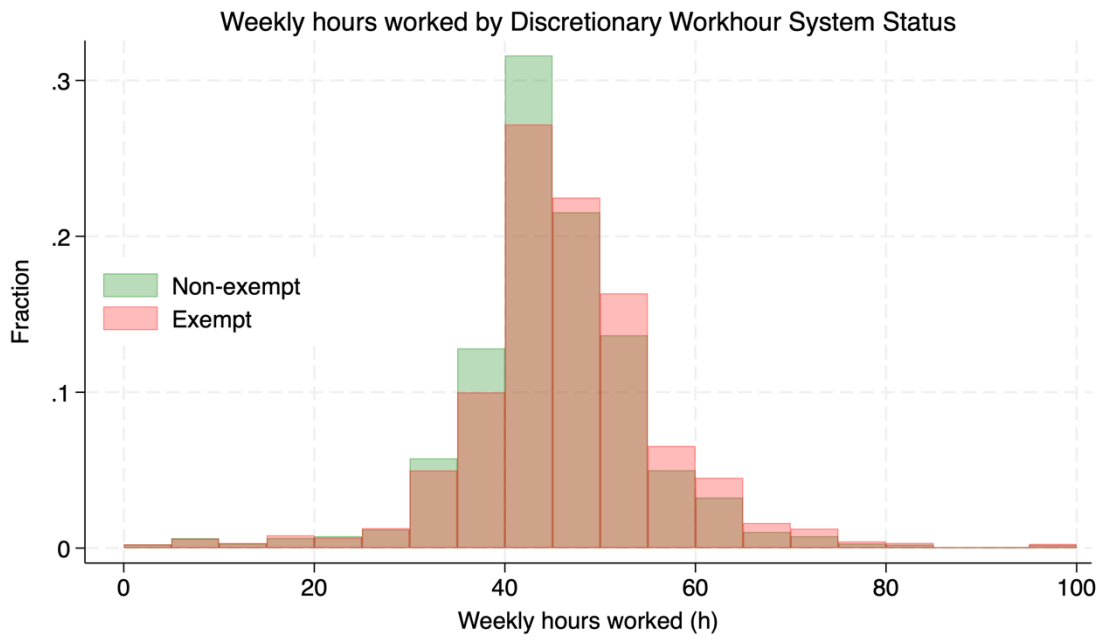
Figure 1: Distributions of Weekly Hours Worked by Discretionary Workhour System Status

Note: Observations are not weighted by the sampling weight.
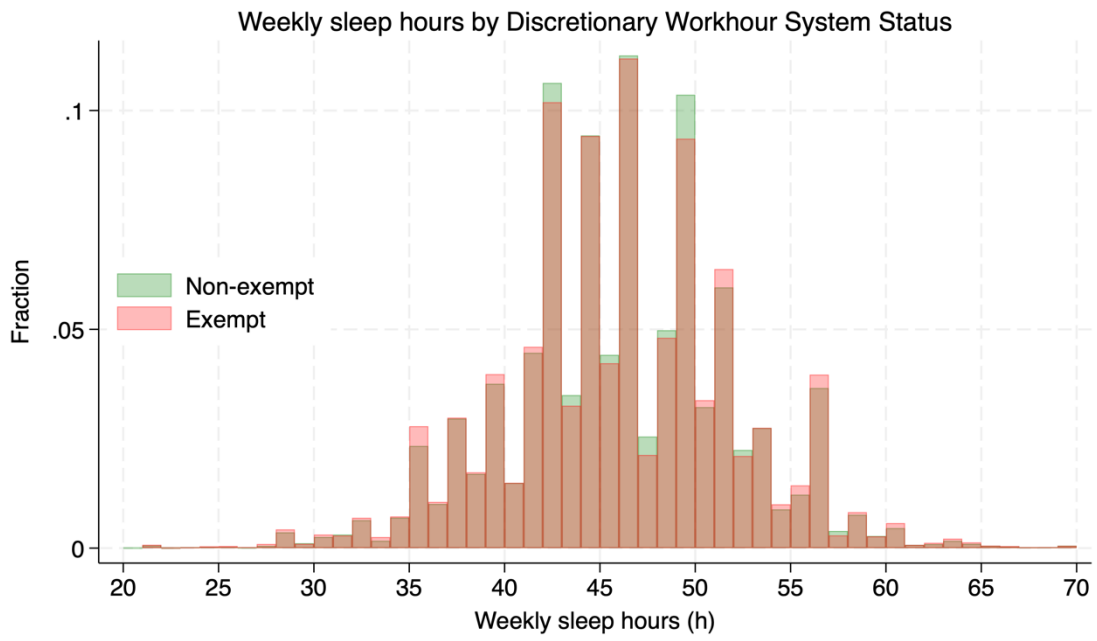
Figure 2: Distribution of Weekly Sleep Hours

Note: Observations are not weighted by the sampling weight.
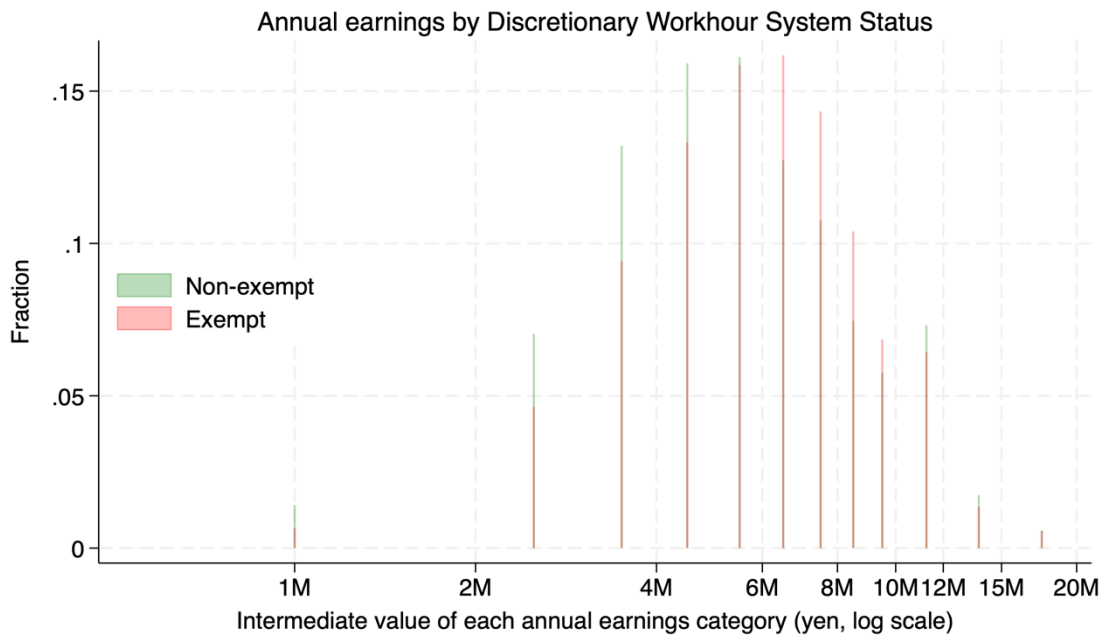
Figure 3: Distribution of Annual Earnings

Note: Observations are not weighted by the sampling weight.

Weekly hours worked

P-value (H$_0$: No heterogeneous effect) = 0.003
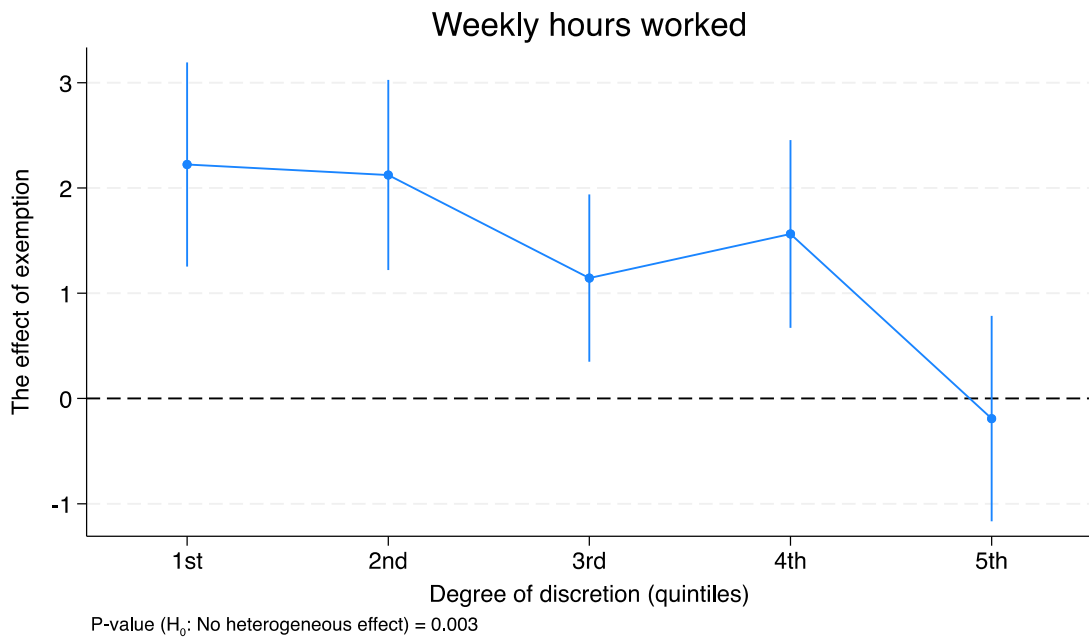
Figure 4. The Heterogeneous Effect of Exemption on Weekly Hours Worked

Notes: This figure presents the effect of exemption across the quintiles of the overall degree of discretion, *i.e.*, the

estimates of β and $\beta + \gamma_j, j = 2, ..., 5$ in Equation (2). The vertical bars denote the 95% confidence intervals. The p-

value reported at the bottom is from the F-test for the null hypothesis that the effect of exemption is not

heterogeneous ($\gamma_j = 0, j = 2, ..., 5$).

Log annual earnings

P-value (H₀: No heterogeneous effect) = 0.047
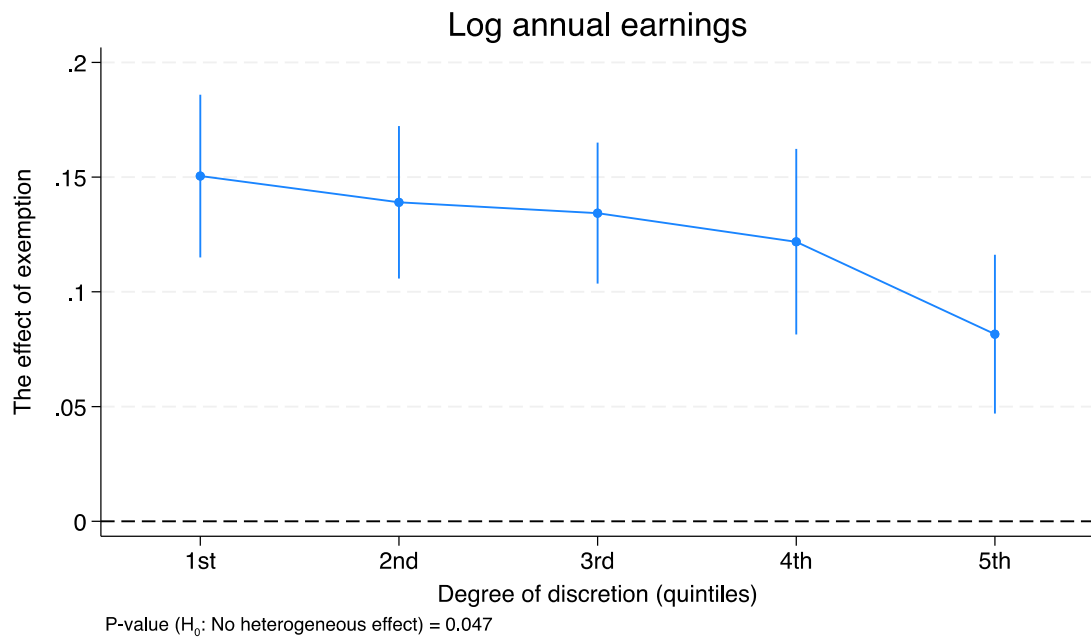
Figure 5. The Heterogeneous Effect of Exemption on Annual Earnings

Notes: See the notes for Figure 4.
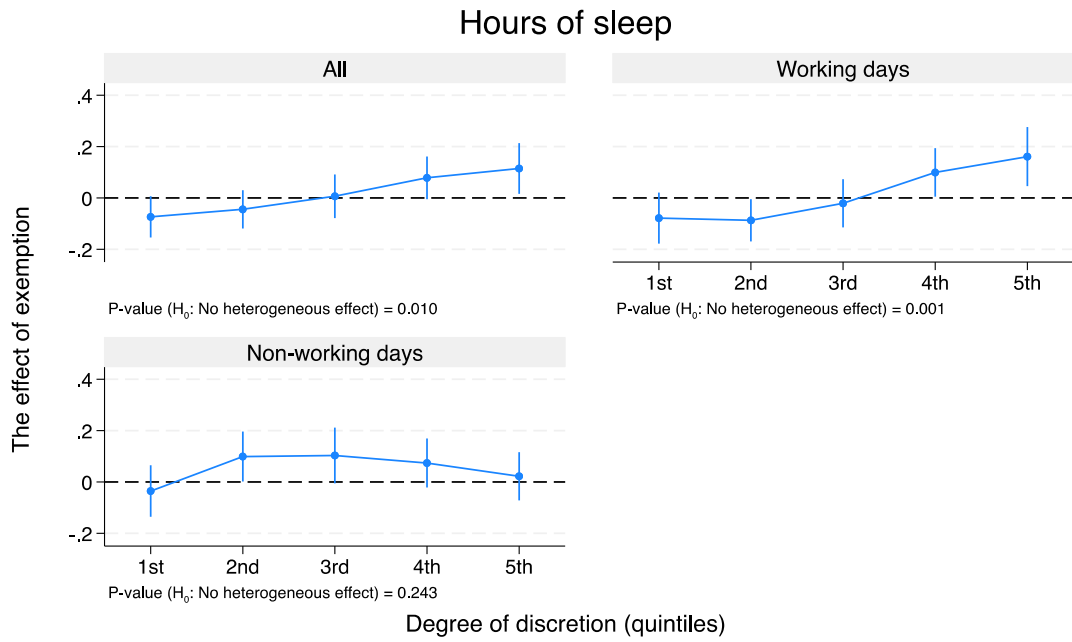
Figure 6. The Heterogeneous Effect of Exemption on Hours of Sleep

Notes: See the notes for Figure 4.
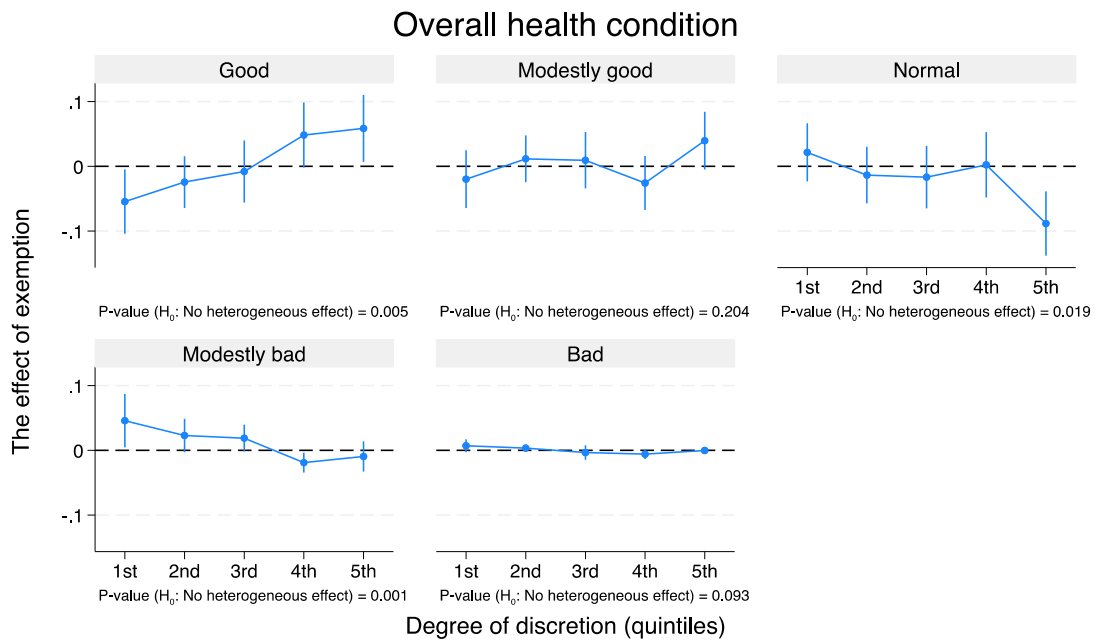
Figure 7. The Heterogeneous Effect of Exemption on Overall Health Conditions

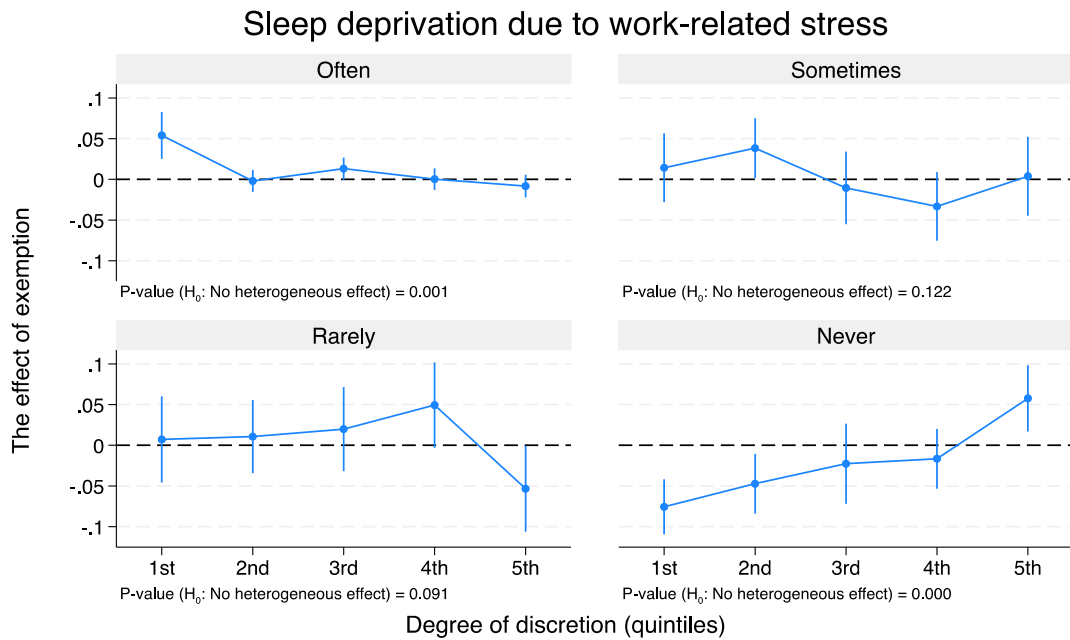Notes: See the notes for Figure 4.
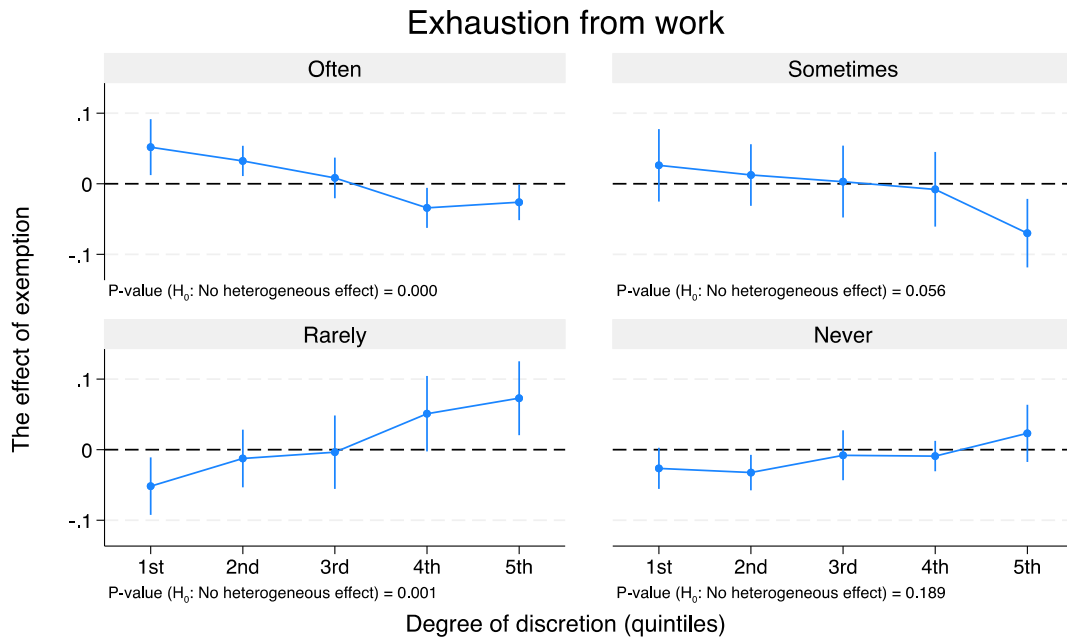
(a) Exhaustion from work
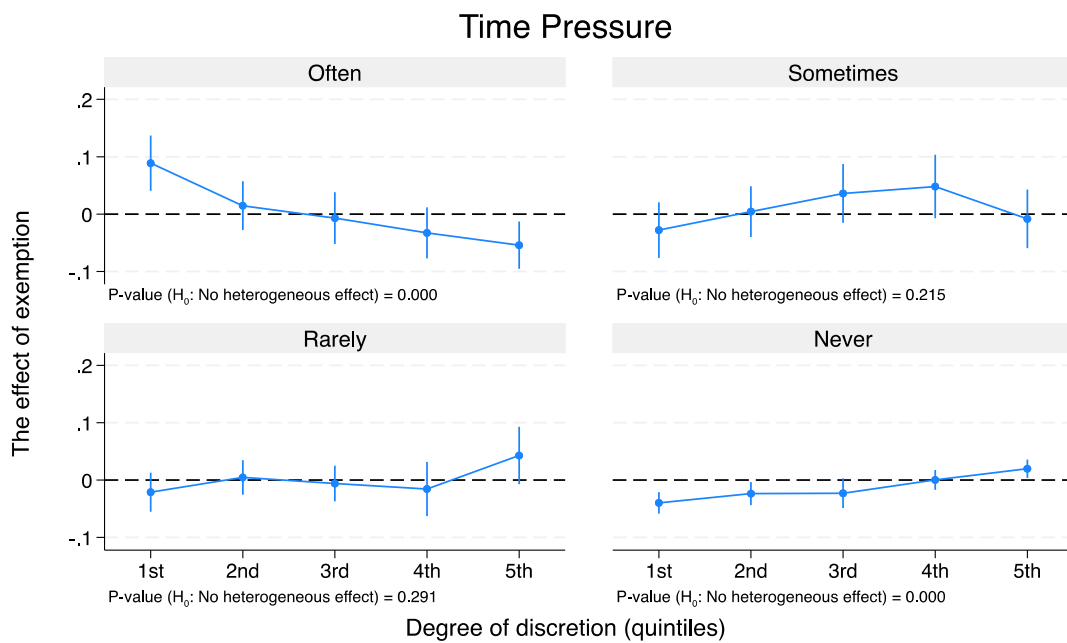
(b) Time pressure

Figure 8. The Heterogeneous Effect of Exemption on Mental Health Conditions
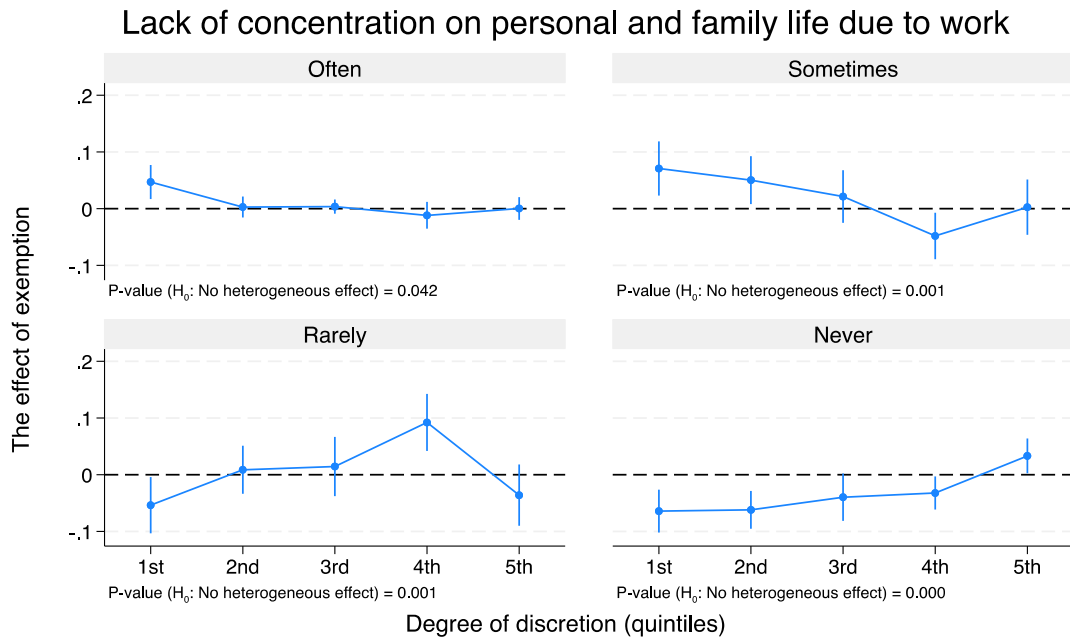
Lack of concentration on personal and family life due to work

(c) Lack of concentration on personal and family life due to work

Sleep deprivation due to work-related stress

(d) Sleep deprivation due to work-related stress

Figure 8. The Heterogeneous Effect of Exemption on Mental Health Conditions
(continued)
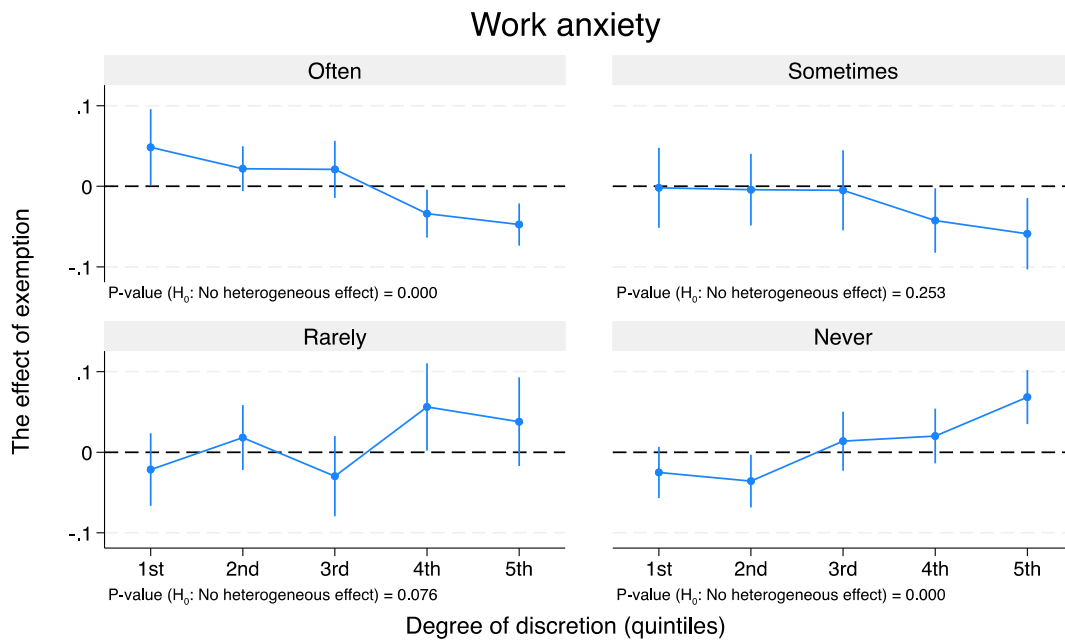
Work anxiety

(e) Work anxiety

Figure 8. The Heterogeneous Effect of Exemption on Mental Health Conditions

(continued)

Notes: See the notes for Figure 4.
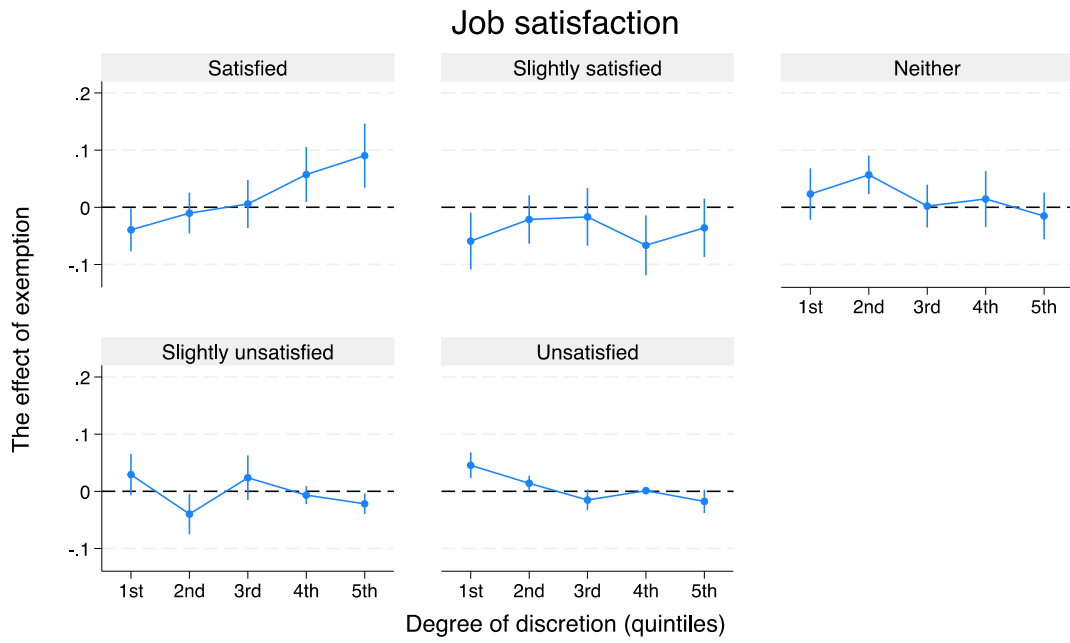
Figure 9. The Heterogeneous Effect of Exemption on Job Satisfaction

Notes: See the notes for Figure 4.

Appendix

A.1. Working time regulations in Japan

To provide background knowledge to understand the exemption system in the context of working time regulations in Japanese labor law, in the following, we explain the regulations on work hours.

Regulations for general workers

Under the Labor Standards Act, statutory working hours are fixed at 40 hours per week and 8 hours per day. If employers make employees work over these hours, they must (i) conclude a labor-management agreement with the cooperation of labor union/employee representative and management, based on Article 36 of the Labor Standards Law (the *36 Agreement; saburoku kyotei*), and (ii) submit the written agreement to the chief of the local Labor Standards Inspection Office.

Overtime that exceeds statutory working hours should be compensated by at least the hourly rate plus 25%, night work (10 p.m. to 5 p.m. the following morning) at a further 25% or above, and holiday work at least 35%.

Different from some other countries, there had been no strict ceiling on working hours until the revision of LSA in March 2019. Until then, when employers foresaw occasions that would necessitate overtime of their employees, they were permitted to do so by inserting "Special Provisions" beforehand into the Article 36 Agreement agreed to by the employers and the representative of employees. The fact that virtually all establishments had the agreement implied that there was no legal ceiling on overtime.

As a result, the rise in the number of industrial accidents thought to have been caused by long working hours, including suicides caused by overwork (*karoshi*), had become a growing concern in Japanese society. This led the government to enact the Revised Labor Standards Law on April 1, 2019, which poses a strict upper limit on overtime hours. The upper limit under the revised law was set at 45 hours per month and 360 hours per year, and this limit can be exceeded only under temporary special circumstances that satisfy all certain conditions, with an agreement between a labor union/employee representative and management. The violation of the provisions results in punitive actions: imprisonment of up to six months in length or a fine of up to ¥300,000. This revision makes employers closely monitor the hours worked in verifiable ways.

Regulations for other groups

Besides general workers and workers under DWS, there are several other types of workers who work under difference regulations. Those regulations include (1) a de facto working time system for job outside the workplace (mainly applied to sales representatives), (2) exemption for managers and supervisors, and (3) a system for high-level professionals. Appendix table A1 summarizes all the regulations mentioned above.

Table A1: Working Time Regulations in Japan

system			occupations	time management	upper limit of work hours	overtime pay	Special considerations so as to ensure workers' health	the number of workers (%)
General workers		Fixed hours or variable working hours system (flexitime)	All workers other than specified below	Working time should be properly recorded, in principle, with the use of an objective method such as a time/IC card, or PC usage records.	strictly specified	Overtime that exceeds statutory working hours should be compensated at at least the hourly rate plus 25%.	Employers are required to ensure workers' health, for example, by having overworked workers consult with an industrial doctor, placing limits on the amount of nighttime work, and giving special holidays.	51.1 million (85.1%)
Discretionary working system	Discretionary working system (professional work type)	Applied to workers where usual methods of work hours calculation are not appropriate due to the nature of the work. It comprises a deemed number of hours.	Workers in areas such as research and development: 19 areas of work	Employers shall be aware of actual working hours by methods such as logs from IC/card or PC, or self-report from emloyees.	none	When setting the deemed working hours in excess of the statutory working hours, overtime hours should be compensated at at least the hourly rate plus 25%.	Eemployers must take measures to secure workers' health and welfare, such as by having overworked workers consult with an industrial doctor.	600,000 (1.0%)
	Discretionary working system (planning and related work type)		White collar workers engaged in planning, drafting, researching, and analyzing		none			120,000 (0.2%)
Other	De facto working time system for job outside the workplace	Applied to workers whose working hours are difficult to calculate. It comprises a deemed number of hours.	Sales representatives and the like who are engaged in work outside the workplace		none			4.56 million (7.6%)
	Managers and supervisors	Employers are not required to compensate managers and supervisors for overtime or for working on holidays	"Managers and supervisors" shall be entrusted by senior management with authority regarding management and giving orders		none	none		3.6 million (6.0%)
	System for high-level professionals	Labor Standards Act provisions on working hours, breaks, holidays, and wage increments for night work do not apply to those workers, subject to the agreement of the labor-management committee and the workers themselves.	Financial product development work, financial dealing, analysis and consulting. Annual income must be at least 10.75 million yen or more		none	none	Employers must take measures to secure workers' health and welfare, such as by guaranteeing at least 104 days off per year.	938 (0.0012%)

A. Additional Tables

Table A2: The Effect of Exemption on Weekly Hours Worked: First Difference Estimation (Linear probability model) by Occupation

Dependent variable	Change in weekly hours worked							
Occupation	Professional				Corporate planning			
	Increased	Unchanged	Decreased	Don't know	Increased	Unchanged	Decreased	Don't know
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-exempt→Exempt	0.033	-0.091	0.007	0.050	0.082	-0.185	0.093	0.009
	(0.022)	(0.032)	(0.021)	(0.015)	(0.035)	(0.042)	(0.036)	(0.021)
Exempt→Exempt	-0.026	0.010	0.009	0.007	0.008	-0.011	0.021	-0.018
	(0.008)	(0.014)	(0.013)	(0.006)	(0.024)	(0.034)	(0.021)	(0.013)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	.017	.038	.023	.02	.015	.024	.007	.026
Mean always-non-exempt	.13	.59	.19	.09	.12	.62	.19	.06
N	58749	58749	58749	58749	14060	14060	14060	14060

Notes: Robust-standard errors are in parentheses. See the text for the set of control variables. Observations are weighted using the sampling weight.

Table A3: The Effect of Exemption on Weekly Hours Worked: First-Difference Estimation (Linear probability model) by Position

Dependent variable	Change in weekly hours worked							
Position	Non-managerial				Managerial			
	Increased	Unchanged	Decreased	Don't know	Increased	Unchanged	Decreased	Don't know
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-exempt→Exempt	0.040	-0.109	0.025	0.045	0.059	-0.042	-0.001	-0.015
	(0.020)	(0.030)	(0.020)	(0.014)	(0.064)	(0.069)	(0.034)	(0.010)
Exempt→Exempt	-0.019	0.003	0.015	0.001	-0.034	0.047	- 0.025	0.013
	(0.009)	(0.014)	(0.012)	(0.006)	(0.013)	(0.029)	(0.024)	(0.009)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	.015	.03	.018	.019	.018	.061	.08	.014
Mean always-non-exempt	.14	.57	.19	.1	.11	.65	.18	.05
N	57462	57462	57462	57462	15347	15347	15347	15347

Notes: Robust-standard errors are in parentheses. See the text for the set of control variables. Observations are weighted using the sampling weight.

Table A4: The Effect of Exemption on Weekly Hours Worked: Restricted Sample

Dependent variable	Weekly hours worked	
	(1)	(2)
Exempt	1.276	1.263
	(0.218)	(0.242)
Control	Yes	Yes
R-squared	0.083	0.090
Mean non-exempt	44.05	43.88
N	72809	59872

Notes: Robust-standard errors are in parentheses. See the text for the set of control variables. Observations are weighted using the sampling weight. Column (1) uses all the sample used in Table 1. Column (2) restricts the sample to those with a valid answer on the change in the hours worked from the previous year.

Table A5: The Effect of Exemption on Overall Health Conditions (Linear Probability Model): Restricted Sample

Dependent variable	Overall health condition				
	Good	Modestly good	Normal	Modestly bad	Bad
	(1)	(2)	(3)	(4)	(5)
Exempt	0.026	0.013	-0.042	0.003	-0.000
	(0.012)	(0.010)	(0.012)	(0.006)	(0.002)
Control	Yes	Yes	Yes	Yes	Yes
R-squared	.001	.000	.001	.00	.000
Mean non-exempt	.293	.276	.325	.096	.009
N	72809	72809	72809	72809	72809

Notes: Robust-standard errors are in parentheses. See the text for the set of control variables. Observations are weighted using the sampling weight.

Table *A6*: The Effect of Exemption on Overall Health Conditions: First-Difference Estimation (Linear probability model)

Dependent variable	Change in overall health conditions			
	Improved	Unchanged	Worsened	Don't know
	(1)	(2)	(3)	(4)
Non-exempt→Exempt	0.035	-0.010	-0.029	0.004
	(0.012)	(0.017)	(0.011)	(0.006)
Exempt→Exempt	-0.005	0.002	-0.003	0.007
	(0.005)	(0.011)	(0.007)	(0.008)
Control	Yes	Yes	Yes	Yes
R-squared	.008	.006	.005	.006
Mean always-non-exempted	.06	.81	.11	.02
N	72809	72809	72809	72809

Notes: Robust-standard errors are in parentheses. See the text for the set of control variables. Observations are weighted using the sampling weight.

B. Robustness Checks for the Heterogeneity Analysis

As a robustness check for the heterogeneity analysis in Section 4.5, we repeat the analysis using measures of the degree of discretion for each of the five different tasks separately without calculating the measure of the overall degree of discretion. Specifically, we create dummy variables for each of the five discretion variables for five different tasks: (A) basic job descriptions regarding objectives, goals, and deadlines, (B) details of job descriptions and amount of job assignments, (C) frequency of progress report, (D) method of implementation and time allocation, and (E) starting and ending time. Then we estimate the following regression model for the five different tasks separately.

$$Y_i = \alpha + \beta \cdot E_i + \sum_j \gamma_j \, E_i \times \text{Discretion}_{ij}^k + \sum_j \theta_j \text{Discretion}_{ij}^k + x_i' \delta + u_i, \tag{1}$$

where $Discretion_{ij}^k$ is a dummy variable equal to one if worker i's level of discretion in task k (=A, B, C, D, E) is equal to j (supervisor decides without worker's consultation, supervisor decides with worker's consultation, worker decides with supervisor's consultation, worker decides without supervisor's consultation, and neither). We present the estimation results in Figure B1 – B6, reporting the effects of exemption at each discretion level (β and $\beta + \gamma_j$) along with the 95% confidence intervals.
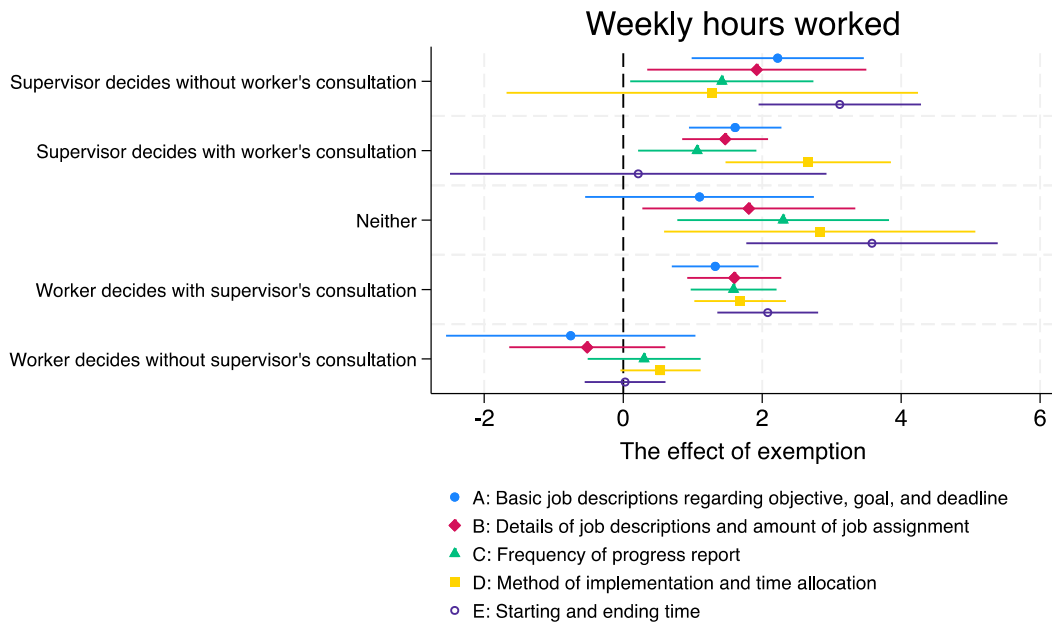
Figure B1. The Heterogeneous Effect of being Exempted on Weekly Hours Worked
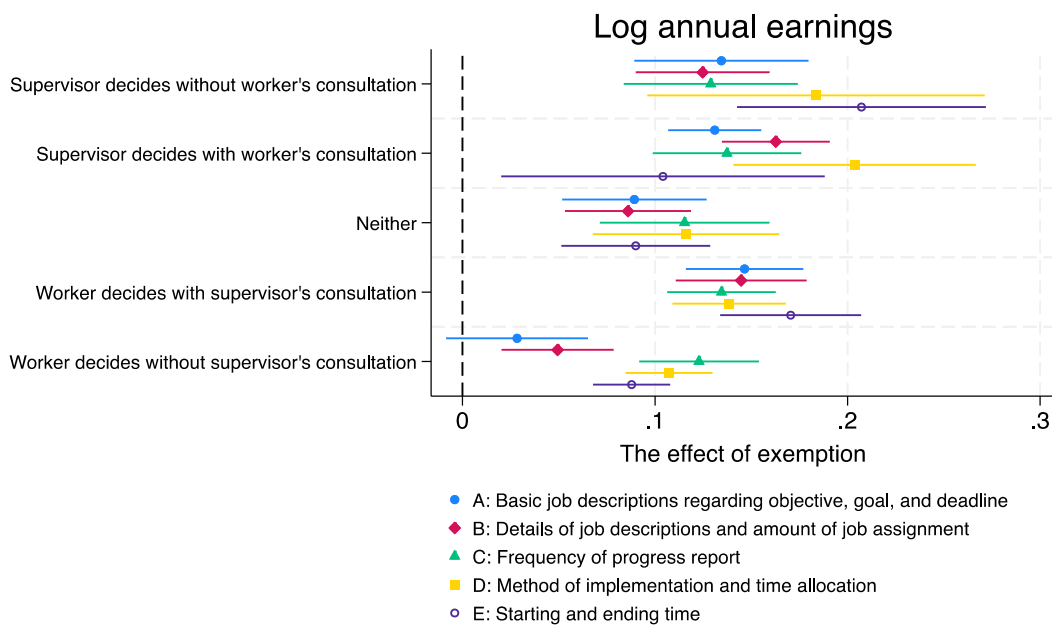
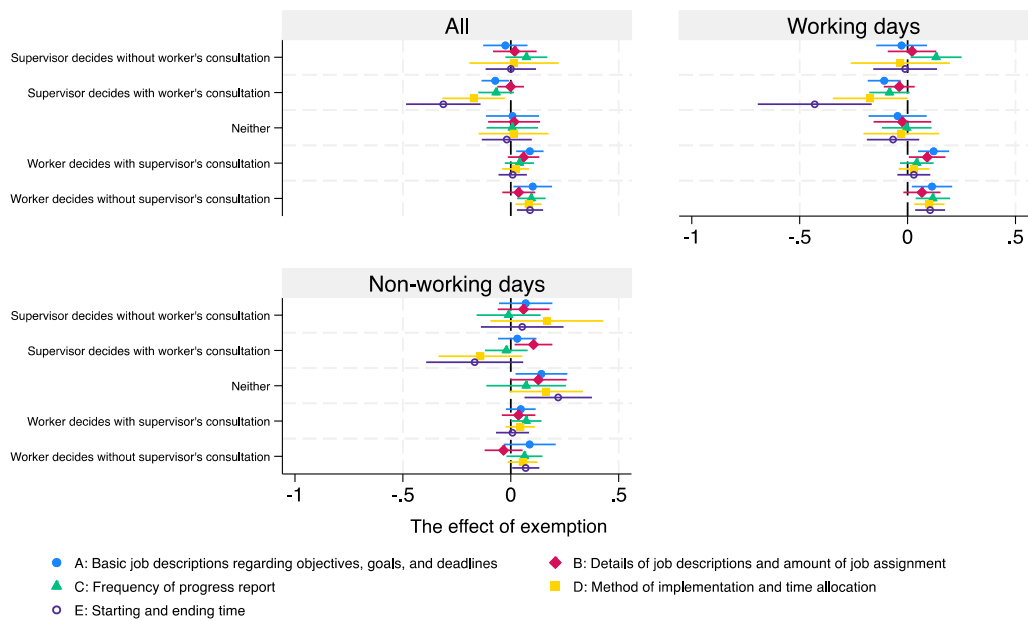Figure B2. The Heterogeneous Effect of being Exempted on Earnings

Figure B3. The Heterogeneous Effect of being Exempted on Hours of Sleep
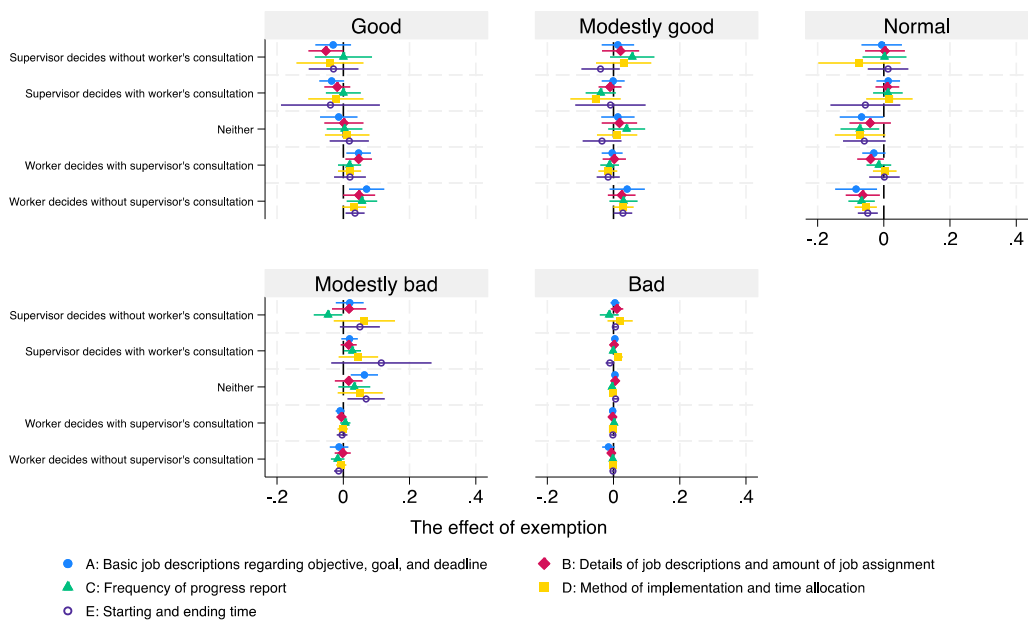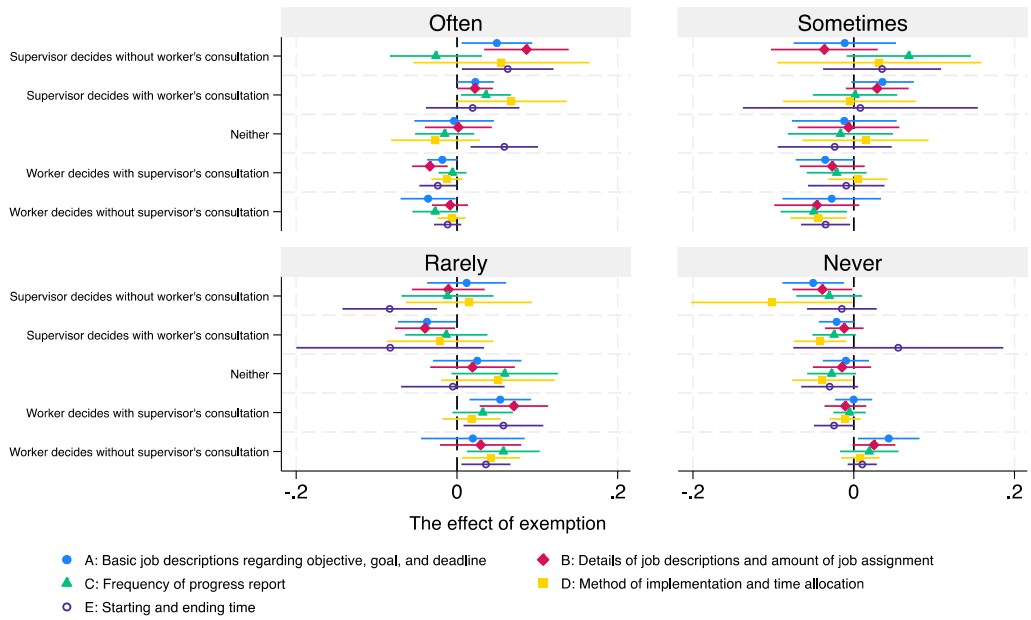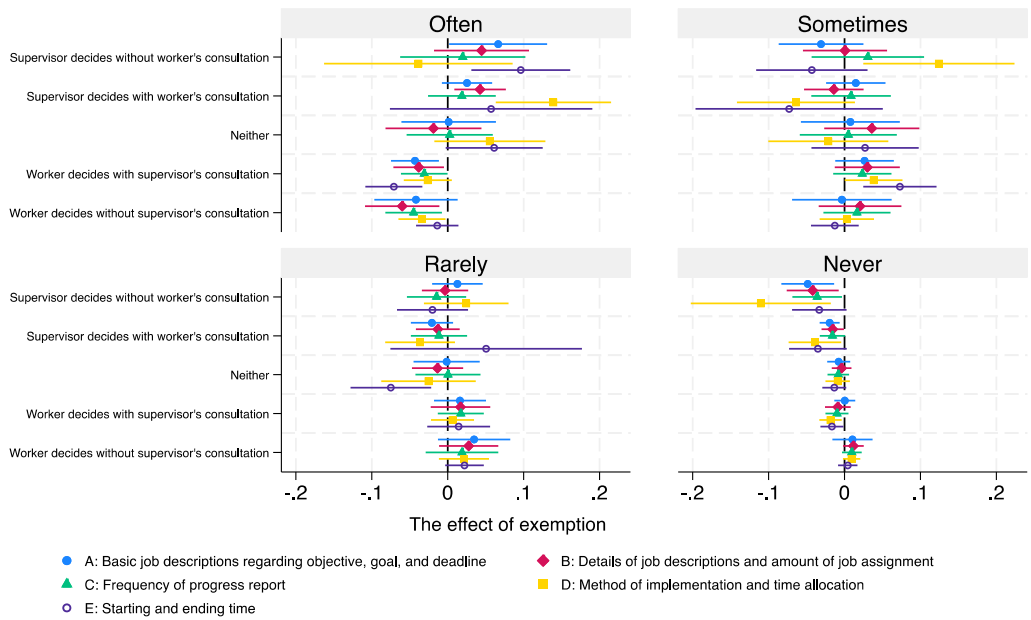

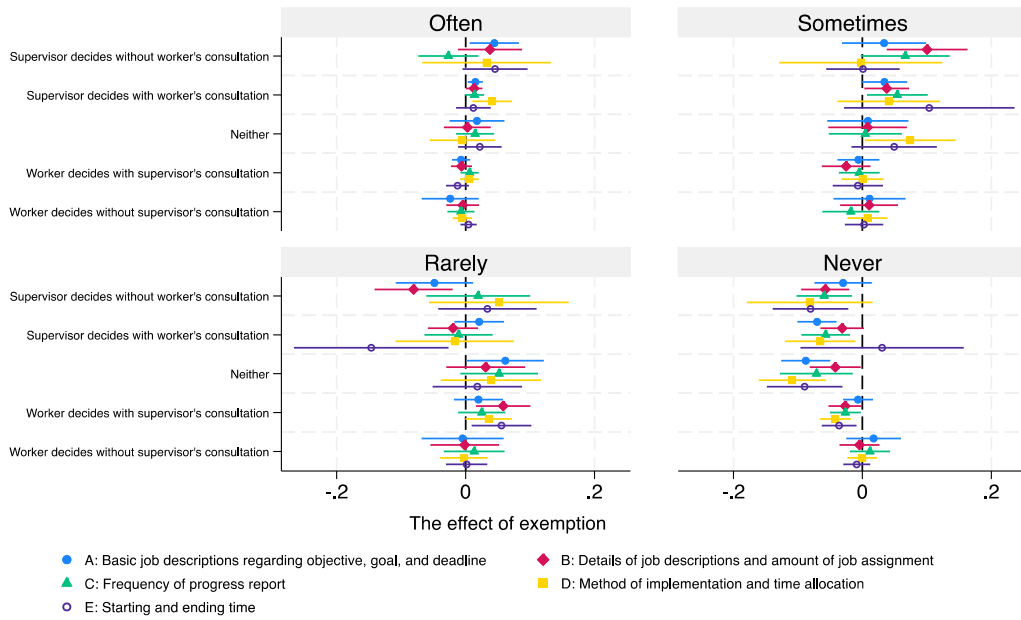Figure B4. The Heterogeneous Effect of being Exempted on Overall Health Conditions
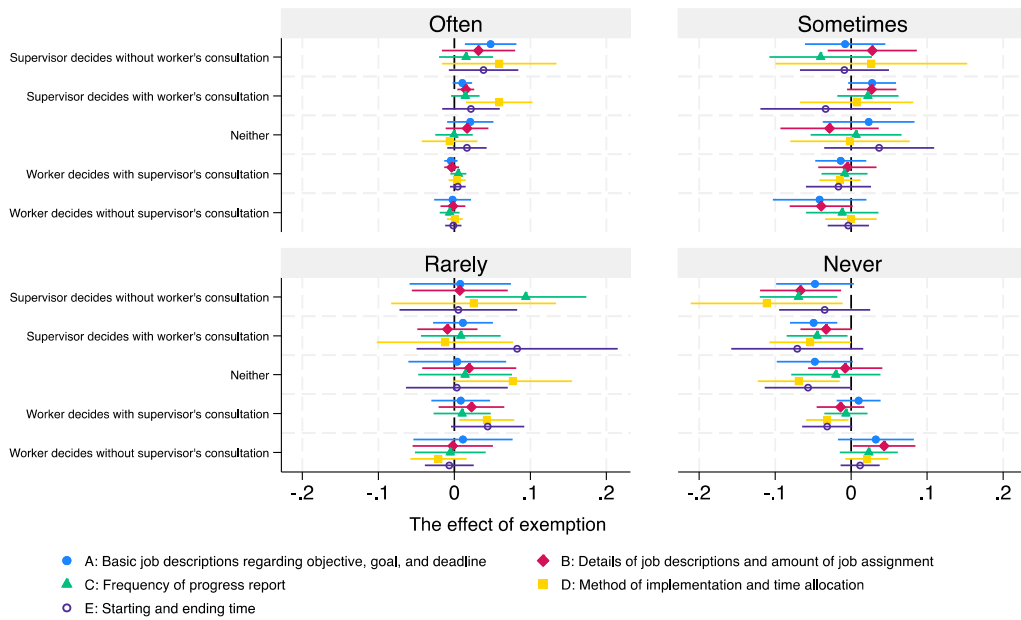
(a) Exhaustion from Work

(b) Time Pressure

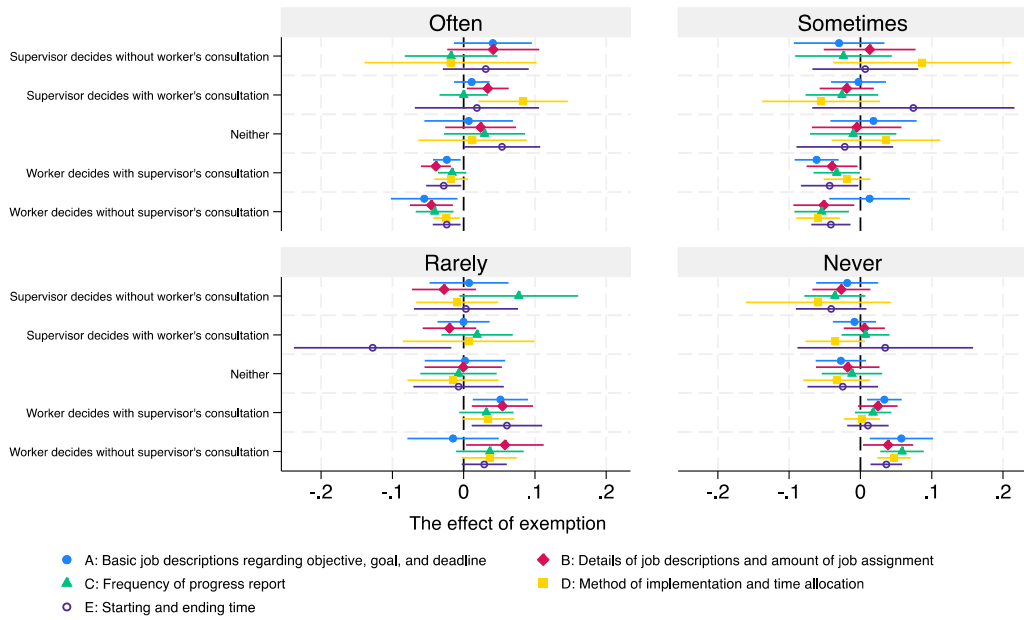Figure B5. The Heterogeneous Effect of being Exempted on Mental Health Conditions

(c) Lack of Concentration on Personal and Family Life due to Work

(d) Sleep Deprivation due to Work-related Stress

Figure B5. The Heterogeneous Effect of being Exempted on Mental Health Conditions (continued)

(e) Work Anxiety

Figure B5. The Heterogeneous Effect of being Exempted on Mental Health Conditions (continued)
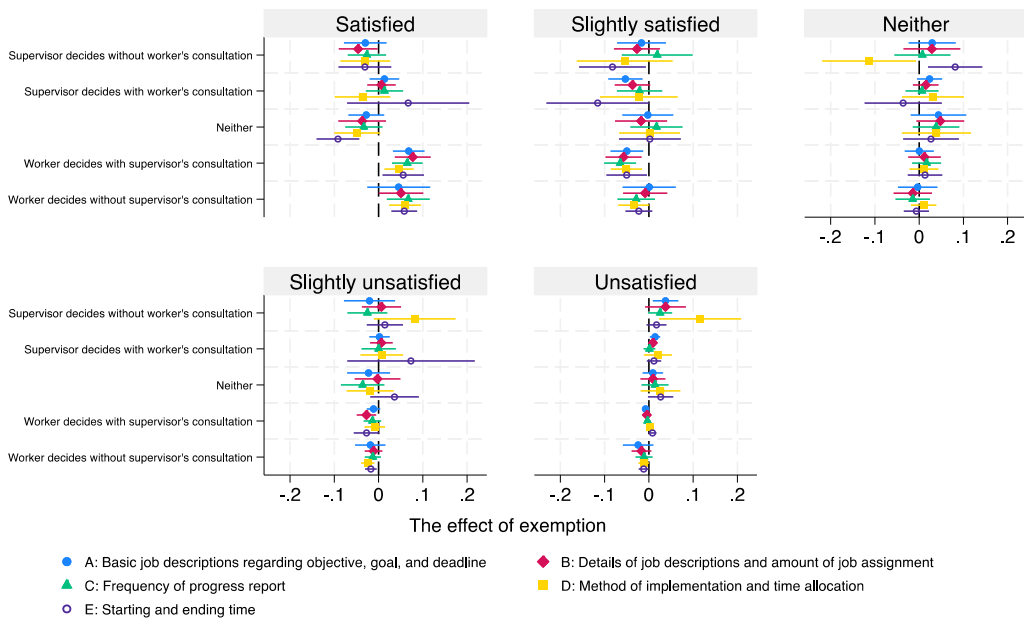

Figure B6. The Heterogeneous Effect of being Exempted on Job Satisfaction