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## Benefits and employees' work effort: An empirical analysis of non-monetary incentives

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# 1228<sup>2025</sup>

**SOEP** papers  
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## Benefits and Employees' Work Effort: An Empirical Analysis of Non-monetary Incentives

Helena Manger

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# Benefits and Employees' Work Effort: An Empirical Analysis of Non-monetary Incentives

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## Abstract

Despite extensive literature on incentives to increase employees' work performance, economic research on employer-provided non-monetary benefits remains rare. This study investigates the relationship between benefits and employees' work effort utilizing data from the German Socio-Economic Panel. The analysis is based on data from eleven survey waves from 2006 to 2022 and considers five benefit types: meal stipends, firm cars, phones and computers for personal use, as well as expense payments exceeding minimum costs. The results reveal a modest positive association between benefit receipt and employees' work effort, measured as the difference between actual and contractual working hours per week. On average, benefit receipt is associated with 13 minutes additional work per week. Furthermore, receiving a greater variety of benefit types is linked to even higher work effort, with two to five or more benefit types associated with an average increase of 27 to 97 minutes of extra work per week. However, the effectiveness of benefits does not seem to be universal but varies depending on the type of benefit as well as individual and organizational characteristics. Notably, the positive association of benefits with work effort appears significantly higher for males than for females, and sectoral differences are evident. These findings underscore the importance of further research to better understand the specific conditions under which benefits can effectively enhance employee work effort.

**Keywords:** Non-monetary incentives, benefits, work effort, motivation, productivity, SOEP, overtime

**JEL Classification:** C83, J32, M52

# 1 Introduction

Employee performance is a key determinant of organizational success. To enhance motivation and productivity, organizations rely on a variety of incentive systems. While traditional economic literature has emphasized monetary incentives such as performance pay and bonuses (Lazear, 2000; Prendergast, 1999), recent research has expanded this view by highlighting the role of non-monetary motivators in shaping employee behavior (Balkin and Werner, 2023; Choi and Presslee, 2023; Ellingsen and Johannesson, 2007; Kelly et al., 2023). German companies are increasingly using benefits as a strategic tool to attract and retain talent, tailoring offerings to employees' life stages and personal needs (Neuen and Klein, 2025).

In this study, compensation and incentives are grouped into three categories (see Table 1). First, pay components include fixed salaries and variable compensation such as piece rates, bonuses, or profit-sharing (Jirjahn and Mohrenweiser, 2025; Lazear, 2000). Second, non-monetary benefits refer to tangible and intangible forms of compensation beyond wages, such as company cars, subsidized meals, or employer contributions to health and pension plans (Dulebohn et al., 2009; McGaughey et al., 2005; Oyer, 2008). Third, flexibility in working time and location – such as remote work or flexible hours – has become increasingly relevant in modern labor markets (Allen et al., 2013; Beckmann et al., 2017; Bloom et al., 2015; Heidt et al., 2023; Rupiotta and Beckmann, 2018).

**Table 1** Compensation and incentive types

Category	Examples
<b>Monetary compensation</b>	Base wage Performance-related pay like piece rates or profit-sharing Additional gross payments like 13th salary, Christmas or vacation bonuses
<b>Benefits</b>	Monetary bonuses like shift or weekend bonuses or bonuses for difficult working conditions Tangible benefits like company cars or computers Employer contributions to health insurance, pensions, or childcare support
<b>Work conditions</b>	Flexible working hours Working from home opportunities

To study the potential impact of benefits on employees' performance, data from the German Socio-Economic Panel (SOEP) is utilized (Socio-Economic Panel, 2024), a representative longitudinal sampling of German households. While the literature on benefits includes a broad range of benefits, such as child care, health insurance, pension schemes, and paid leave (Dulebohn et al., 2009; Fulmer and Li, 2022; McGaughey et al., 2005; Oyer, 2008), these benefit types are not consistently captured in the SOEP

data and are therefore excluded from the analysis. This paper focuses on a subset non-monetary benefits. The data include responses to a question about perceived benefits, including meal stipends, cars, phones and computers for personal use, as well as expense payments exceeding minimum costs.<sup>1</sup> Data from eleven survey waves from the years 2006 to 2022 is analyzed.

This study offers several methodological strengths. First, it draws on a large and heterogeneous sample, enabling more generalizable insights across various occupations and industries compared to studies based on selected samples. Second, the longitudinal nature of the data set enhances panel analysis that allows moving closer towards causality than cross-sectional analysis. Third, the study examines a broad range of non-monetary benefits, providing a nuanced understanding of their potential effects. Further, the SOEP offers multiple measures of employee performance across various occupations and firms. Finally, the inclusion of data up to 2022 ensures that the findings reflect recent developments.

The primary measure of work effort in this study is the amount of additional work performed beyond contractual obligations, calculated as the difference between actual and contractual working hours. Actual working hours refer to the total number of hours an individual reports working on average per week. Contractual working hours represent the working hours agreed upon in the employment contract. The measure is expressed in minutes per week and considered a valid proxy of worker's effort, as investing time at work incurs clear opportunity costs for the worker, and increased time spent at work is likely to enhance worker's output (Beckmann et al., 2017; Bell and Freeman, 2001; Rupietta and Beckmann, 2018). Moreover, working hours are considered a signal of effort and abilities (Spence, 1973). Also, alternative proxies for performance are utilized, such as self-reported overtime and non-standard working time.

The findings indicate a modest positive association between benefit receipt and employees' work effort. Benefit receipt is associated with on average 13 minutes more extra work per week. Furthermore, receiving a greater variety of benefit types is linked

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<sup>1</sup> Expenses refer to reimbursements that go beyond simply covering the costs of work-related expenses, often involving spending during business travel. The inclusion as non-monetary benefit may be subject to debate, primarily due to their nature of being normally disbursed in cash. Following Hammermann and Mohnen (2014b), this study incorporates expenses into the analysis, as they are integral to the broader discussion of benefits. Expenses stand apart from regular payroll components, being directly linked to business trips and thereby associated with specific experiences. Further, while the company covers the costs of accommodation or services, the employee does not possess the complete option value of the money expended.

to even higher levels of work effort. The analysis also highlights that the impact of benefits varies depending on the specific type of benefit received. In addition, the effectiveness of benefits seems to be context-dependent. Specifically, benefits seem to be more effective for male employees and in certain industries, highlighting the importance of gender<sup>2</sup> and organizational context as moderating factors.

This study contributes to the literature on employee incentives by providing longitudinal evidence on the relationship between non-monetary benefits and employees' work effort. Prior research predominantly examines how benefits influence job satisfaction and perceived recognition (e.g., [Artz, 2010](#); [Hammermann and Mohnen, 2014b](#)), or compares the effects on motivation or performance of monetary and non-monetary incentives in experimental or single-firm settings (e.g., [Bareket-Bojmel et al., 2017](#); [Choi and Presslee, 2023](#); [Jeffrey, 2009](#); [Jeffrey and Adomdza, 2011](#); [Sittenthaler and Mohnen, 2020](#)). These studies offer valuable insights but are often limited in external validity due to cross-sectional designs or restricted samples. By using panel data, this study accounts for unobserved individual heterogeneity and captures within-person changes over time. Moreover, this study explores how the effectiveness of benefits varies by gender and organizational factors, offering new insights into the contextual contingencies of compensation packages and incentive design. In doing so, it responds to calls for research that explores how individual and organizational characteristics shape the impact of benefits ([Condly et al., 2003](#); [Fulmer and Li, 2022](#); [Gallus and Frey, 2016](#); [Sageder and Feldbauer-Durstmüller, 2019](#)).

The structure of this paper is as follows. In the next section (Section 2), the hypotheses are developed, followed by a presentation of the utilized data set and the estimation strategy in Section 3. Section 4 summarizes the main results and Section 5 reports a range of robustness checks. Finally, Section 6 concludes.

## 2 Hypothesis Development

### 2.1 Benefits and Work Effort

Organizations use various forms of incentives to motivate employees. Regarding their motivational power and their impact on employees' work effort, monetary incentives have been extensively examined across various forms, including fixed pay, piece rates,

<sup>2</sup> For the purposes of this research, sex (gender) is defined based on self-reported binary categories (male and female).

and individual or team-based bonuses (Condly et al., 2003; Jenkins et al., 1998; Jirjahn and Mohrenweiser, 2025; Lazear and Shaw, 2007; Prendergast, 1999). One reason why benefits have not received high attention in economic research for an extended period is their variable value, contingent on employees' preferences. Additionally, money is often considered superior due to its option value (Jeffrey and Shaffer, 2007).

A notable characteristic of many benefits is their association with luxury items. Employees might find challenging to justify purchasing these luxury goods, even with sufficient funds. Justification is easier when luxuries are provided by the employer. Consequently, the perceived value of non-monetary incentives is likely to increase with the difficulty employees would face in justifying its purchase with their own funds (Jeffrey, 2009; Jeffrey and Shaffer, 2007). Additionally, while discussing a monetary bonus may be perceived as socially unacceptable (Cullen and Perez-Truglia, 2023), it is more enjoyable to talk about a non-monetary incentive (Shaffer and Arkes, 2009). Moreover, non-monetary incentives are generally limited resources and visible to others. As a consequence, they may act as special rewards that recognize exceptional performance, show employer respect, enhance social recognition, and boost employee status (Ellingsen and Johannesson, 2007; Jeffrey and Shaffer, 2007). Employees receiving benefits may experience a sense of recognition and potentially increased satisfaction with their work and wages (Artz, 2010; Hammermann and Mohnen, 2014b; Sittenthaler and Mohnen, 2020). This emotional response may not be triggered to the same extent by a comparatively impersonal monetary salary. In the realm of employer-employee relationships, similar to other social connections, the provision of money may potentially offend the recipient, especially if their motivation is intrinsic (Frey, 1997).

Further, the concept of gift-exchange (Akerlof, 1982) suggests that employers who provide benefits may trigger reciprocal behaviors from employees, such as increased work effort. Reciprocity effects extend beyond the initial receipt of a benefit, as recipients tend to remember and recall tangible rewards more frequently than transactional cash bonuses (Bareket-Bojmel et al., 2017; Dohmen et al., 2009; Fehr et al., 1997; Jeffrey and Adomdza, 2011; Kelly et al., 2017, 2023; Kube et al., 2012; Prendergast and Stole, 2001).

Previous research on tangible incentives (Choi and Presslee, 2023; Heninger et al., 2019; Kelly et al., 2017; Mitchell et al., 2022; Presslee et al., 2013; Sittenthaler and Mohnen, 2020) is based on mental accounting theory (Thaler, 1985, 1999). According to this theory, individuals categorize similar outcomes into the same mental account



([Henderson and Peterson, 1992](#); [Rosch and Mervis, 1975](#)). Crucially, mental accounting theory posits a diminishing marginal value within a mental account. For example, a positive marginal value of gains diminishes with each additional gain categorized into the same mental account ([Thaler and Johnson, 1990](#)). Consequently, individuals perceive a greater subjective value for two types of winnings when categorized into different mental accounts compared to the categorization into the same mental account. Applied to the context of this paper, mental accounting theory suggests that benefits can be less susceptible to the diminishing marginal value associated with gains. This is especially true when employees perceive less similarity between a tangible incentive and their salary compared to the perceived similarity between a cash incentive and their salary. Therefore, employees are expected to be more motivated by tangible benefits when they assess a greater distinctiveness in the incentives they receive.

Previous studies examining incentive types reveal that although a majority of employees may favor cash incentives, money does not consistently emerge as the most effective motivator for desired behavior ([Heninger et al., 2019](#); [Jeffrey, 2009](#); [Shaffer and Arkes, 2009](#)). However, the findings are mixed. Drawing from a study on blood donations, [Lacetera and Macis \(2010\)](#) discovered that benefits may be more effective for acknowledging desired behavior without diminishing intrinsic motivation. Furthermore, benefits can signify the donor's awareness of the recipient's preferences ([Prendergast and Stole, 2001](#)). Adding to the intrinsic value of benefits, employees appreciate the effort employers invest in identifying the right incentives, considering the searching costs. These empirical results align with other studies indicating that tangible incentives result in increased effort ([Jeffrey, 2009](#); [Jeffrey and Adomdza, 2011](#); [Kelly et al., 2017](#); [Schall and Mohnen, 2017](#)). In contrast, other research suggests that tangible goods may lead to lower effort compared to monetary incentives ([Condly et al., 2003](#); [Hammermann and Mohnen, 2014a](#); [Presslee et al., 2013](#)). Additionally, certain studies propose that tangible and cash incentives yield comparable levels of effort ([Bareket-Bojmel et al., 2017](#); [Kelly et al., 2017](#); [Sittenthaler and Mohnen, 2020](#)).

The diverse findings imply that the motivational impact of tangible versus cash rewards is contingent upon contextual factors, as indicated by recent studies ([Choi and Presslee, 2023](#); [Kachelmeier et al., 2023](#); [Schweyer et al., 2018](#)), and underscore the necessity for further studies to assess the effectiveness of benefits in enhancing work effort.

Building on mental accounting theory ([Thaler, 1985, 1999](#)) and previous research, this study hypothesizes that non-monetary benefits serve as a motivator for employees, resulting in increased work effort. This is due to their ability to provide recognition,

enhance social status, and foster feelings of appreciation and respect from the employer (Ellingsen and Johannesson, 2007; Hammermann and Mohnen, 2014b; Jeffrey and Shaffer, 2007). It is expected that benefit receipt is linked to heightened work effort, measured by the difference between actual and contractual working hours.

In addition, mental accounting theory (Thaler, 1985, 1999) suggests that various types of benefits are categorized into different mental accounts. Each benefit type may be perceived as a distinct gain. As a consequence, receiving multiple types of benefits may cumulatively increase work effort. Therefore, this study hypothesizes the following:

**Hypothesis H1a.** *Benefits are positively associated with work effort.*

**Hypothesis H1b.** *A higher number of benefits is positively associated with work effort.*

## 2.2 Benefit Types and Work Effort

The motivational effectiveness of non-monetary benefits may vary depending on the type of benefit offered. Factors such as the perceived attractiveness (Kachelmeier et al., 2023), frequency of thought (Jeffrey and Adomdza, 2011), distinctiveness from regular compensation (Choi and Presslee, 2023), and justifiability (Jeffrey, 2009) may play a critical role in employee responses to benefits.

Mental accounting theory (Thaler, 1985, 1999) posits that individuals categorize and evaluate incentives differently depending on their perceived source and purpose. Benefits such as luxury items are often seen as more distinct from regular compensation and are thus less likely to be mentally integrated with salary. This distinctiveness can make them more salient and motivating (Helion and Gilovich, 2014; Kelly et al., 2017; Mitchell et al., 2022).

Moreover, the justifiability of a benefit plays a crucial role in its effectiveness. According to Jeffrey (2009), employees are more likely to value and respond to benefits that they would not easily justify purchasing for themselves. For instance, a company car or high-end electronics may be perceived as luxurious and status symbol, thereby increasing motivation (Vavasour and Vignali, 1999). In contrast, utilitarian benefits such as meal stipends may be less impactful (Mitchell et al., 2022).

Sittenthaler and Mohnen (2020) found that offering chocolate pralines as a tangible reward did not significantly enhance performance compared to financial incentives. They suggest that the limited impact may stem from the relatively low perceived value or hedonic appeal of the reward. In contrast, Jeffrey (2009) demonstrated that

massage vouchers – despite having the same monetary value as the pralines used by [Sittenthaler and Mohnen \(2020\)](#) – were more effective than cash in boosting performance. This suggests that the type of a non-monetary benefit can substantially influence its motivational power.

[Choi and Presslee \(2023\)](#) show that non-monetary rewards that are emotionally resonant or socially visible can enhance employee engagement more than equivalent cash bonuses. Similarly, [Kelly et al. \(2023\)](#) found that experiential rewards – such as travel or wellness packages – can lead to higher perceived appreciation and effort, especially when they are framed as recognition rather than compensation. [Jeffrey and Adomdza \(2011\)](#) found that performance increases with the frequency of thought about non-monetary incentives like high-end merchandise and travel.

Based on this theoretic background and prior research, this study hypothesizes:

**Hypothesis H2a.** *The relationship between benefits and work effort varies across types of benefits, with those perceived as harder to justify purchasing on one's own relating to greater work effort.*

**Hypothesis H2b.** *The relationship between benefits and work effort varies across types of benefits, with those perceived as more distinct from regular compensation relating to greater work effort.*

## 2.3 Contextual Factors

Workers have heterogenous preferences ([Berger et al., 2025](#); [Card et al., 2018](#); [Lamadon et al., 2022](#); [Němečková, 2017](#)). While benefits may enhance employees' work effort, their effectiveness may be not uniform across individuals or organizational settings, emphasizing the importance of contextual moderators, including demographic, and organizational factors ([Dulebohn et al., 2009](#)).

Prior research highlights differences in job and benefit preferences between females and males, driven by factors such as lifestyle choices and the search for prestige ([Ferriman et al., 2009](#); [Lacetera and Macis, 2010](#); [Němečková, 2017](#)).<sup>3</sup> While males may be more attracted to jobs and companies offering benefits as status symbols due to the higher visibility of tangible goods, females may prioritize a stable income over status symbols ([Hammermann and Mohnen, 2014b](#)).

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<sup>3</sup> For the purposes of this research, gender/sex is defined based on self-reported binary categories (male and female).

Further, prior literature reveals performance and effort differences between men and women depending on the incentive type (Sittenthaler and Mohnen, 2020; Winkler and Hughen, 2012). Studies have shown that women may respond less positively to competitive or performance-based reward structures, potentially due to differences in risk preferences, social norms, or self-perceptions of competence (Gneezy et al., 2003; Niederle and Vesterlund, 2007; Sittenthaler and Mohnen, 2020). In contrast, symbolic rewards or personalized recognition may be more effective for women, as they can fulfill psychological needs for appreciation and social belonging (Ellingsen and Johannesson, 2007; Jalava et al., 2015; Kube et al., 2012).

Moreover, gendered life course responsibilities, such as caregiving, may increase the value of flexible work arrangements and family-supportive benefits for women (Allen et al., 2013; Hammermann and Mohnen, 2014b). These benefits may be perceived not only as practical support but also as signals of organizational care and respect, which can enhance motivation through mechanisms of positive reciprocity (Kube et al., 2012; Prendergast and Stole, 2001).

Taken together, these findings suggest that the motivational impact of benefits may differ by gender. The analyzed benefits in this study include car, computer, and phone benefits. Men may respond more strongly to these visible, status-enhancing benefits. This leads to the following hypothesis:

**Hypothesis H3.** *The positive association between benefits and work effort is stronger for men than for women.*

Organizational characteristics such as firm size and industry context also affect management practices, including employee benefits (Bloom et al., 2019; Burke and Morton, 1990; Gallus and Frey, 2016) and may shape the effectiveness of benefits as motivational tools.

Larger companies can access benefits more economically due to economies of scale, and can offer their employees goods related to their industry at production costs, contributing to an expansion in the company's market share (Hammerrmann and Mohnen, 2014b; Oyer, 2008). Empirical studies show that benefits are more common in larger firms (Hammerrmann and Mohnen, 2014b; Kalleberg and van Buren, 1996; Neuen and Klein, 2025; Wallace and Kay, 2009; Winkler and Hughen, 2012). However, in smaller firms, benefits may be perceived as more personalized and exceptional, thereby enhancing their motivational impact. Smaller firms often rely on informal or flexible incentives tailored to employee needs, while larger firms may offer standardized

packages that are less salient to individual workers. This distinction suggests that the perceived value and motivational effect of benefits may be stronger in small and medium-sized enterprises (SMEs).<sup>4</sup> For example, [Kuen-Hung Tsai et al. \(2005\)](#) found that benefits increase firm productivity in Taiwan's shipping industry, with greater effects in SMEs.

Therefore, this study expects that the effectiveness of benefits to increase work effort is higher in smaller firms which leads to the following hypothesis:

**Hypothesis H4.** *The positive association between benefits and work effort is stronger in smaller enterprises than in large firms.*

Incentive schemes, including benefit packages, are often tailored to the specific demands and expectations of different jobs and industries ([Dulebohn et al., 2009](#); [Fulmer and Li, 2022](#)). For instance, sectors such as technology frequently offer electronics ([Hammermann and Mohnen, 2014b](#)). Despite these differences, empirical research on industry-specific effects remains limited ([Condly et al., 2003](#); [Fulmer and Li, 2022](#); [Gallus and Frey, 2016](#); [Sageder and Feldbauer-Durstmüller, 2019](#)). Some evidence suggests that, in Germany, high-wage industries are more likely to offer comprehensive compensation packages ([Hammermann and Mohnen, 2014b](#); [Neuen and Klein, 2025](#)).

The motivational impact of these benefits may vary. Evidence is mixed: while [Yoopetch et al. \(2021\)](#) report no significant effect of benefits on employee performance in the hospitality sector, [Winkler and Hughen \(2012\)](#) show that benefits increase work effort among real estate agents. Similarly, [Jeffrey and Adomdza \(2011\)](#) finds that tangible non-monetary incentives outperform cash incentives in boosting the performance of call center employees. Moreover, research suggests that certain types of non-monetary rewards are particularly effective in knowledge-intensive organizations ([Gallus and Frey, 2016](#); [Gambardella et al., 2015](#)).

Building on these insights, this study explores whether the relationship between non-monetary benefits and employee work effort differs across industries. Given the limited and sometimes contradictory empirical evidence, this analysis is primarily exploratory in nature. It is expected that the positive association between benefits and work effort varies by industry, with some sectors showing stronger effects than others. The following hypothesis is formulated:

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<sup>4</sup> This study follows the [European Commission \(2003\)](#)'s definition, defining small and medium-sized enterprises (SMEs) as companies with fewer than 250 employees.

**Hypothesis H5.** *The positive association between benefits and work effort is not uniform among industries.*

Despite the growing interest in non-monetary incentives, few studies have examined their effectiveness using longitudinal data across diverse occupations and industries. This study contributes to the literature by leveraging panel data to explore how contextual factors moderate the relationship between benefits and work effort, offering new insights into the effectiveness of employer-provided benefits.

### 3 Data, Variables, and Methodology

#### 3.1 Data Description

The data are sourced from the German Socio-Economic Panel (SOEP), a longitudinal survey of private households in Germany. This survey includes socio-economic and demographic questions. It is conducted annually, with additional specialized questions introduced in specific waves.<sup>5</sup> The SOEP is well-suited to the research questions of this paper as it offers data on benefits received and incorporates variables that reflect employees' work effort. Additionally, it includes information on individuals' socio-economic background and job characteristics. For the empirical analysis, data from the years 2006, 2008, 2010, 2012, 2014-2018, 2020 and 2022 are utilized, as these SOEP waves encompass information on the main variables of interest: work effort and benefits. In these years the following question about employer-provided benefits was included: "Do you receive other benefits from your employer besides your pay?" with the following possible answers:

1. Discount on meals in the employee cafeteria or a meal stipend,
2. company vehicle for personal use,
3. cellular phone for private use or reimbursement of telephone costs,
4. expense allowance beyond reimbursement of expenditures,<sup>1</sup>
5. personal computer or laptop for private use, and
6. other forms of additional benefits.

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<sup>5</sup> For further information on the SOEP, see [Goebel et al. \(2019\)](#).

Since responses are confined to a choice of “yes” or “no”, this analysis is constrained by the absence of data concerning the costs and appearance of the provided benefits. The option “other forms of additional benefits” is not analyzed in this study as its interpretation is not clear.

The focus of this research is on employees working in the private and public sector aged between 18 to 65 years, representing the typical working population in Germany. Following practice in prior literature ([Beckmann et al., 2017](#); [Hammermann and Mohnen, 2014b](#); [Rupietta and Beckmann, 2018](#)), the analysis is restricted to individuals in standard employer-employee relationships, as this is essential for interpreting the potential effects of benefit provision. Several groups of individuals are excluded:<sup>6</sup>

- self-employed individuals due to very irregular working hours,
- civil servants and apprentices as working time is often regulated by law and consequently, they cannot freely decide how much they work,
- employees with a wage of less than 400 euros per month,<sup>7</sup> and
- individuals reporting zero working hours.

As fixed effects estimations require at least two observations per individual, individuals with only a single observation in the data set were excluded from the analysis.<sup>8</sup> After further cleaning and removing incomplete data, this analysis relies on an unbalanced sample consisting of 82,994 observations from 18,345 employees.

### 3.2 Included Variables

This study utilizes employees’ work effort as the dependent variable. Working hours are regarded as a signal of effort and abilities ([Spence, 1973](#)). Therefore, work effort is measured as extra working time, calculated as the difference between average actual working hours and the contractual working hours per week. This difference is transformed in minutes. A positive difference indicates that an employee invests

<sup>6</sup> One could argue that the analysis should be restricted to full-time employees only. However, consistent with prior studies, the full sample is retained to reflect a broader picture of the working population ([Hammermann and Mohnen, 2014b](#); [Kelly et al., 2023](#)). A robustness check in Section 5 examines the implications of this choice.

<sup>7</sup> In Germany, jobs with monthly earnings up to 400 euros (450 euros since January 2013, 520 euros since October 2022) are called “mini-jobs”. Employees who work in a “mini-job” are socially subsidized, such as exemption from the employee contribution to the pension insurance system.

<sup>8</sup> Additional tests suggest that excluding single-observation individuals does not introduce significant selection bias. While the excluded individuals tend to be slightly younger, there are only minor differences in work effort and benefit receipt when compared to those retained in the panel.



additional work effort beyond contractual obligations. Negative values indicate that an employee worked fewer than contractually agreed. The metric is a well-established concept and considered a valid measure of work effort. Investing time in work carries opportunity costs for the individual, and increased time spent at work is likely to enhance productivity (Beckmann et al., 2017; Bell and Freeman, 2001; Dohmen et al., 2009; Rupiotta and Beckmann, 2018). It is expected that receiving benefits increases work effort and therefore positively correlates with additional working time, interpreted as increased work effort. Furthermore, alternative measures for effort and performance are explored to check the robustness of the prior metric and to analyze whether extra time spent at work is used productively (Beckmann et al., 2017).

The variables for the different types of benefits in this context are binary, taking the value of 1 when the surveyed individual acknowledges receiving a specific type of benefit from the employer. This research focuses on the following five types of benefits: employer-provided meals, cars, phones and computers for personal use, as well as expense payments exceeding minimum costs. It is noteworthy that all these benefits are furnished in non-monetary form.<sup>1</sup> Moreover, in order to assess Hypothesis H1a, the dummy variable *benefit* is introduced, taking the value 1 if the surveyed individual received at least one benefit. To test Hypothesis H1b, five dummy variables (*benefits1*, ..., *benefits5*) are defined, indicating the number of benefit types received with *benefits5* indicating the receipt of five or more benefit types.

The analysis incorporates a comprehensive set of control variables following previous research on benefits and work effort utilizing SOEP data (Beckmann et al., 2017; Hammermann and Mohnen, 2014b; Rupiotta and Beckmann, 2018). Various job characteristics are included, including compensation and other incentives. Regarding payment structure, the logarithm of monthly gross wage ( $\ln(\text{income})$ ) and a binary variable for additional gross payments (*additionalPay*) are considered.<sup>9</sup> To capture alternative financial incentives, a dummy variable (*bonus*) is included encompassing shift or weekend bonuses, overtime compensation, bonuses for difficult working conditions, and other additional payments.<sup>10</sup> Given that work effort may also be influenced by temporal flexibility, the model incorporates a binary indicator for flexible

<sup>9</sup> The SOEP provides data on the following additional gross payments received in the previous year: 13th month salary, 14th month salary, additional Christmas bonus, vacation pay, profit-sharing bonuses, or other bonuses.

<sup>10</sup> The binary variable *bonus* is constructed from the SOEP question: "Have you received any of the following types of premiums or bonuses during the last month?" Respondents could select multiple types, including: bonuses for working certain shifts or at weekends; overtime pay; bonuses for difficult working conditions; supplements for additional responsibilities; tips; and other premiums or bonuses. The variable *bonus* equals 1 if any of these categories were selected and 0 otherwise.



working time arrangements (*flexible*). This variable captures whether employees can determine their own working hours, have a working-time account, or otherwise deviate from a fixed schedule. Since this measure is only available in the SOEP for selected waves (2014-2018), missing values for other years are imputed using the nearest non-missing value from adjacent waves under the assumption of temporal stability in individual work-time flexibility.

Other job-related variables include a dummy variable for job change in the previous year, the number of years that an employee has been staying in the company, and a dummy variable for part-time employment with less than 35 working hours per week. Furthermore, variables for occupational categories are included, where “blue-collar” refers to manual or industrial labor, and “white-collar” refers to managerial or office-based work. In addition, the SOEP provides information on firm characteristics like firm size and the type of industry. To account for firm size, a dummy variable is included indicating whether the employee works in a small or medium-sized enterprise (SME) with fewer than 250 employees, based on the [European Commission \(2003\)](#)’s definition. Industry classification is identified using a variable from the SOEP dataset that assigns individuals to one of ten aggregated industry categories based on their main employment. The classification is derived from respondents’ self-reported industry, originally coded using NACE classifications ([European Union, 2025](#)). These detailed codes were collapsed into ten broader categories: agriculture, energy, mining, manufacturing, construction, trade, transport, bank/insurance, services, and other. For analytical purposes, dummy variables were generated for each industry category.

Further, a variable indicating whether the employee lives in the west or east of Germany is considered. To control for socio-economic background, age, marital status and risk tolerance are incorporated as control variables. Additionally, the estimation controls for the presence of children in the household.

### 3.3 Estimation Strategy

To estimate the potential effect of benefits on extra work, fixed effects models with robust standard errors clustered at the individual level are implemented. The empirical model to test Hypothesis [H1a](#) consists of the following equation:

$$\begin{aligned} workEffort_{it} = & \alpha_0 + \alpha_1 \cdot benefit_{it} + X'_{it} \cdot \beta \\ & + \lambda_t d_t + \mu_i + u_{it} \end{aligned} \quad (1)$$

The variable  $workEffort_{it}$  measures the work effort of individual  $i$  in year  $t$  ( $i = 1, \dots, N; t = 1, \dots, T$ ). The term  $\mu_i$  represents the individual fixed effect capturing time-invariant characteristics of each employee that may affect work effort and  $d_t$  are year dummy variables. The binary variable  $benefit_{it}$  captures whether employee  $i$  receives at least one benefit in year  $t$ .  $X_{it}$  represents the vector of control variables including various time-varying factors deemed relevant to the determination of work effort. Controls encompass organizational, job-related, and demographic characteristics, and  $u_{it}$  represents the error term.

To test Hypothesis H1b the following fixed effects model is estimated, using dummy variables ( $benefits1$ ,  $benefits2$ ,  $benefits3$ ,  $benefits4$ ,  $benefits5$ ) indicating the number of benefit types received. The dummy variable  $benefits5$  indicates the receipt of five or more benefit types. The reference category consists of individuals who received no benefits.

$$workEffort_{it} = \alpha_0 + \sum_{k=1}^5 \alpha_k \cdot benefit_{itk} + X'_{it} \cdot \beta + \lambda_t d_t + \mu_i + u_{it} \quad (2)$$

To evaluate variations in the links between the different benefit types and work effort (Hypothesis H2a and H2b) the following approach is used with  $B_{it}$  representing a vector of dummy variables for the different benefit types (*meal*, *car*, *phone*, *computer*, *expenses*):<sup>11</sup>

$$workEffort_{it} = \alpha_0 + B'_{it} \cdot \alpha + X'_{it} \cdot \beta + \lambda_t d_t + \mu_i + u_{it} \quad (3)$$

To investigate whether the effectiveness of benefits varies across subgroups, interaction terms are incorporated into Model 1:

$$workEffort_{it} = \alpha_0 + \alpha_1 \cdot benefit_{it} + S'_{it} \cdot benefit_{it} \cdot \gamma + X'_{it} \cdot \beta + \lambda_t d_t + \mu_i + u_{it} \quad (4)$$

<sup>11</sup> The SOEP survey question regarding employer-provided benefits (“Do you receive other benefits from your employer besides your pay?”) also includes an answer option for “other forms of additional benefits”. This option is not analyzed because its interpretation is not clear.

In this specification,  $S_{it}$  denotes subgroup indicators. To test Hypothesis H3, it represents a dummy variable (*female*, with males as the reference category). To test Hypothesis H4, a firm size dummy variable (*sme*, with larger firms as the reference) is incorporated in the model. Lastly, to test Hypothesis H5, a set of industry dummies (*agriculture*, *energy*, *mining*, *manufacturing*, *construction*, *trade*, *transport*, *bankInsurance*, *otherIndustry*, with *services* as the reference group) is included.

Stata 17.0 (StataCorp LLC, 2021) is employed for estimation. Figures are produced using the *cibar* command from Staudt (2014).

## 4 Results

### 4.1 Benefits and Work Effort

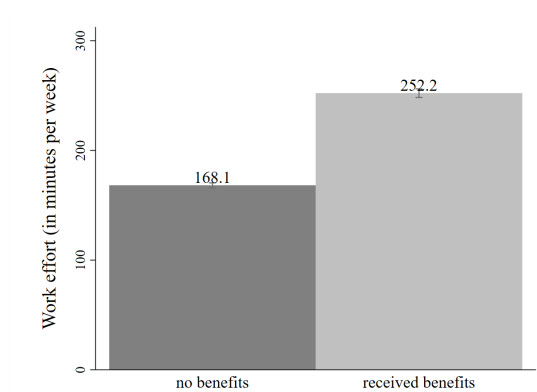
This study examines the relationship between benefits and employees' work effort, measured as the difference between actual and contractual working hours per week. The average work effort in the sample is around 195 minutes (see Table 2), indicating that employees work, on average, 3.3 hours per week more than contractually agreed. 32.2% of observations in the data set indicate that the employee receives at least one benefit. The potential effect of benefits on employees' work effort is expected to be positive (Hypothesis H1a). According to descriptive analysis, employees that receive at least one benefit work on average 252 minutes more per week compared to contractual working time, which is about 84 minutes more than workers that receive no benefits (see Figure 1). Additionally, a two-sample t-test shows a statistically significant difference in work effort between individuals without benefits ( $M = 168.1$ ,  $SD = 276.6$ ) and individuals that receive at least one benefit measured by additional work minutes per week ( $M = 252.2$ ,  $SD = 326.3$ ;  $t(82,992) = -38.550$ ,  $p < 0.001$ ).

Table 3 displays the results of fixed effects regressions. Column 1 reports the estimation results without including the complete set of control variables. Column 2 presents the results for Model 1. The estimation results reveal a significantly positive relationship between the provision of benefits and employees' work effort. On average, receiving one or more benefits is linked to a higher work effort of approximately 13 minutes

**Table 2** Summary statistics

	Obs.	Mean	Std.Dev.	Min.	Max.
<i>workEffort</i>	82,994	195.233	296.207	-2,520	3,300
<i>contractualWorkHours</i>	82,994	34.830	8.062	2	80
<i>actualWorkHours</i>	82,994	38.084	9.918	1	80
<i>benefit</i>	82,994	0.322	0.467	0	1
<i>benefitCount</i>	82,994	0.463	0.812	0	6
<i>benefits1</i>	82,994	0.231	0.421	0	1
<i>benefits2</i>	82,994	0.057	0.232	0	1
<i>benefits3</i>	82,994	0.024	0.152	0	1
<i>benefits4</i>	82,994	0.009	0.095	0	1
<i>benefits5</i>	82,994	0.002	0.047	0	1
<i>meal</i>	82,994	0.193	0.395	0	1
<i>car</i>	82,994	0.053	0.224	0	1
<i>phone</i>	82,994	0.077	0.266	0	1
<i>expenses</i>	82,994	0.023	0.150	0	1
<i>computer</i>	82,994	0.051	0.219	0	1
<i>income</i>	82,994	2,870.134	1,781.992	1	57,000
<i>additionalPay</i>	82,994	0.706	0.455	0	1
<i>bonus</i>	82,994	0.263	0.440	0	1
<i>flexible</i>	82,994	0.579	0.494	0	1

**Notes.** The table shows descriptive statistics. The performance measure is work effort, measured as the difference between actual working hours and contractual working hours (in minutes). The dummy variable *benefit* equals 1 if one or more benefits are received. *benefitCount* measures the number of benefit types received. Dummy variables for the number of benefit types and the different types of benefits are created. The variable *income* represents the monthly income before taxes while *additionalPay* equals 1 if additional gross payments are received. The binary variable *bonus* indicates whether the employee receives a shift bonus, a weekend bonus, overtime pay, a bonus for difficult work conditions or other additional payments. The dummy variable *flexible* indicates whether an employee has flexible work time arrangements rather than a fixed working schedule.

**Figure 1** Work effort by benefit receipt

**Notes.** Descriptive bar graph with 95% confidence intervals; no adjustments for covariates.

per week (significant at the 1% level).<sup>12</sup> Therefore, the estimation results support Hypothesis H1a.

This observed positive relationship between the provision of benefits and increased work effort aligns with prior research emphasizing the motivational role of non-monetary incentives (Ellingsen and Johannesson, 2007; Hammermann and Mohnen, 2014b; Jeffrey, 2009; Lacetera and Macis, 2010). Benefits contribute to a sense of recognition and job satisfaction (Artz, 2010). These aspects are often not as effectively triggered by monetary salaries alone (Frey, 1997). Moreover, the findings are consistent with the principle of positive reciprocity. When employers offer benefits voluntarily, employees may perceive them as a gesture of goodwill, prompting a reciprocal increase in effort (Bareket-Bojmel et al., 2017; Dohmen et al., 2009; Fehr et al., 1997; Kelly et al., 2017, 2023; Kube et al., 2012; Prendergast and Stole, 2001).

Although the effect of benefits on work effort is statistically significant, its magnitude remains modest, averaging additional 13 minutes per week. This finding implies that benefits can play a supportive role in influencing employee behavior, but they are unlikely to serve as the primary driver of work effort. Therefore, other forms of compensation and incentives, such as monetary salaries, bonuses, and flexible working arrangements, may have a more substantial impact on work effort. Indeed, the estimation results suggest that monthly gross income has a highly significantly positive effect on work effort. An increase in monthly salary by 10% is associated with an increase in work effort of approximately 8 minutes per week. Also, additional financial bonuses (e.g., tips, shift bonus) seem to significantly positive influence work effort, with approximately additional 21 minutes per week. In contrast, the estimation results indicate that additional gross payments (e.g., Christmas bonus, 13th month salary) do not significantly impact work effect.

The differentiated effect sizes across compensation types align with the predictions of mental accounting theory (Thaler, 1999), which suggests that individuals categorize income and benefits into separate mental accounts and respond to them differently. Bonuses are likely mentally allocated to a different account than regular salary and carry motivational salience. Additional gross payments may mentally integrated into base salary and thus treated as less salient.

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<sup>12</sup> Results of the fixed effects regression estimation indicate a 13-minutes higher work effort for benefit receipt. In contrast, the descriptive statistics show a difference in work effort by 1.4 hours. This suggests that a considerable part of the variation in work effort is explained by the regression model.

**Table 3** Estimation results

Variables	Dependent variable: <i>workEffort</i>			
	Model 0	Model 1	Model 2	Model 3
<i>benefit</i>	10.42*** (2.80)	12.73*** (2.77)		
<i>benefits1</i>			9.12*** (2.81)	
<i>benefits2</i>			27.30*** (5.27)	
<i>benefits3</i>			45.65*** (8.95)	
<i>benefits4</i>			73.49*** (15.97)	
<i>benefits5</i>			97.41*** (30.47)	
<i>meal</i>				-2.05 (3.45)
<i>car</i>				51.72*** (9.34)
<i>phone</i>				24.69*** (5.94)
<i>expenses</i>				37.32*** (9.83)
<i>computer</i>				13.64** (6.80)
<i>ln(income)</i>	14.89*** (4.53)	75.74*** (5.24)	74.89*** (5.24)	74.21*** (5.23)
<i>additionalPay</i>	7.80** (3.19)	3.79 (3.19)	3.72 (3.19)	4.01 (3.19)
<i>bonus</i>	23.19*** (3.01)	21.31*** (2.98)	21.27*** (2.98)	21.49*** (2.97)
<i>flexible</i>	28.04*** (2.98)	29.43*** (2.96)	29.17*** (2.95)	28.91*** (2.95)
Obs.	82,994	82,994	82,994	82,994
R <sup>2</sup> within	0.004	0.024	0.025	0.026
R <sup>2</sup> overall	0.054	0.018	0.021	0.026
R <sup>2</sup> between	0.094	0.019	0.022	0.028
Controls	NO	YES	YES	YES
Individual FE	YES	YES	YES	YES
Year dummies	NO	YES	YES	YES
Constant	YES	YES	YES	YES
<b>Wald tests</b>				
<i>benefits1 = benefits2</i>			13.08 (1)***	
<i>benefits2 = benefits3</i>			4.36 (1)**	
<i>benefits3 = benefits4</i>			3.16 (1)*	
<i>benefits4 = benefits5</i>			0.56 (1)	

**Notes.** The table shows the results of fixed effects regressions. Standard errors clustered at the individual level are presented in brackets. Dependent variable is work effort measured as the difference between actual and contractual working hours (in minutes). The dummy variable *benefit* equals 1 if one or more benefits are received. Model 2 includes dummy variables for the number of benefits, from 1 to 5 or more benefits. Model 3 includes dummy variables for the benefit types. *ln(income)* is the logarithm of gross income. Two dummy variables for additional payments (*bonus*, *additionalPay*) as well as a dummy variable for flexible working time (*flexible*) arrangements are included. Controls include job-related, organizational and personal factors. Wald tests for significant differences between coefficients are reported, showing the F-statistic and degrees of freedom in brackets.

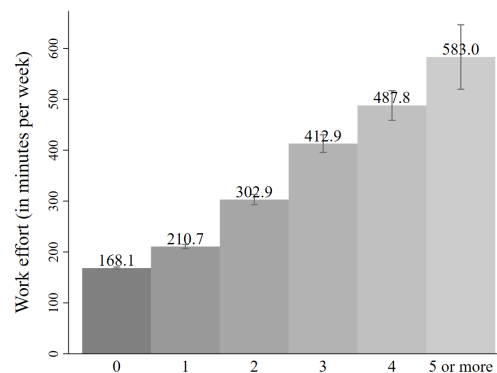
\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

In addition, work conditions, such as flexible working hours, seem to have a highly significant, positive impact on work effort. The results indicate that flexible working hours are on average associated with 29 minutes additional work per week, aligning with prior research (Beckmann et al., 2017).

Benefits, though emotionally salient and often evaluated in isolation (Jeffrey and Shaffer, 2007), exert smaller effects than bonuses or flexible working schedules.

It is expected that an increase in both the diversity and total number of benefits received incentivizes employees to higher work effort (Hypothesis H1b). Overall, 32.2% of observations in the data set indicate receiving at least one benefit. In most of these cases, employees receive only one type of benefit (71.5% among those that receive at least one benefit). 17.6% of observations with at least one benefit receive two benefit types. A few individuals stated that they receive three or more types of benefit. Descriptive analysis indicates a positive, linear relationship between work effort and the quantity of benefit types received (see Figure 2).

**Figure 2** Work effort by number of benefits received



**Notes.** Descriptive bar graph with 95% confidence intervals; no adjustments for covariates.

Column 3 of Table 3 presents the estimation results for Model 2. The results indicate a positive, and statistically significant association between receiving multiple types of benefits and increased work effort. Specifically, receiving exactly one type of benefit is associated with an approximately 9-minutes increase in work effort per week. This effect increases with the number of benefit types. Receiving two types of benefits is associated with approximately 27 minutes of additional work effort per week. Receiving three types of benefits is associated with an increase in work effort by approximately 46 minutes per week. The effect size continues to grow with the number of benefit types received. Receiving four types of benefits is associated with

additional 73 minutes per week. Receiving five or more types of benefits is related to an increase in work effort by approximately 97 minutes per week. All coefficients are significant at the 1% level.<sup>13</sup> These findings align with the descriptive statistics and support Hypothesis H1b: receiving more types of benefits is associated with higher levels of work effort.

The results suggest that both the extensive and intensive margins contribute to the effect of benefits on work effort. Moving from no benefits to receiving any benefit is associated with a positive increase in work effort, while the effect size grows with each additional benefit type. This indicates that the intensive margin – i.e., the cumulative number of benefit types received – is a strong driver of increased work effort.

The positive relationship between the diversity of benefits and increased work effort resonates again with prior research emphasizing the motivational role of non-monetary incentives (Ellingsen and Johannesson, 2007; Lacetera and Macis, 2010). The concept of mental accounting (Thaler, 1985, 1999) substantiates the idea that individuals consider various benefit types separately, contributing to enhanced work effort with an increasing number of benefit types received.

Interestingly, the effect of receiving multiple benefit types surpasses that of bonuses and flexible work arrangements. This suggests that benefit diversity may serve as an effective strategy for employers to enhance employees' effort.

In sum, while the results indicate that offering benefits is associated with increased work effort, the effect size is relatively modest. Nevertheless, the potential advantages of providing benefits extend beyond merely boosting work effort. Benefits can also foster a stronger sense of firm identity, enhance employee commitment, and contribute to lower turnover rates (Hammermann and Mohnen, 2014b; Neuen and Klein, 2025). In particular, certain benefits may act as signals of the company's dedication to supporting employees and addressing their work-related needs. The visibility of such benefits can help cultivate an authentic organizational identity and may reduce mismatches and job vacancies by attracting employees whose values align with those of the firm. Employees are generally drawn to organizations that best match their preferences (Backes-Gellner and Tuor, 2010; Lazear, 1998). Thus, employers can strategically use benefits not only to motivate current employees but also to attract and retain specific types of talent (Hammermann and Mohnen, 2014b). Finally,

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<sup>13</sup> As an alternative specification, a model using the count of benefit types (ranging from 0 to 6) as the independent variable yields similar conclusions. The estimation results suggest that each additional benefit type corresponds to an average increase of approximately 14 minutes of work effort per week, significant at the 1% level.

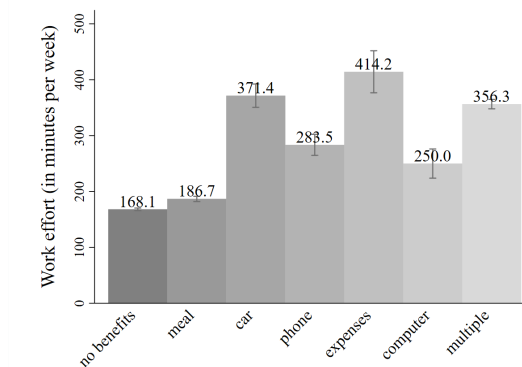


benefits can enhance job satisfaction. This point is supported by earlier studies (Artz, 2010; Hammermann and Mohnen, 2014b) and further discussed in in Section 5 using alternative dependent variables, including work-related satisfaction measures.

## 4.2 Benefit Types and Work Effort

This paper hypothesizes that the impact of benefits on work effort varies across types of benefits. It is expected that those perceived as harder to justify (Hypothesis H2a) and more distinct from regular monetary compensation (Hypothesis H2b) being more effective to heighten work effort. The descriptive analysis indicates that meal benefits – the most commonly provided benefit type – have a minimal impact on work effort. In contrast, less common benefits – such as firm cars, phones, and expenses – seem to be associated with higher work effort (see Figure 3).

**Figure 3** Work effort by type of benefit received



**Notes.** Descriptive bar graph with 95% confidence intervals; no adjustments for covariates.

The regression results (Model 3, Column 4 in Table 3) substantiate these findings. Meal benefits are not significantly related to work effort. On the other hand, the results indicate that receiving benefits in the form of a firm car is linked to significantly higher work effort. On average, a firm car is associated with an increase in work effort by approximately 52 additional minutes per week. Expenses seem to contribute to an increase in work effort by approximately additional 37 minutes of work per week. Phone benefits potentially positively impact work effort, with employees receiving these benefits increasing their weekly extra working time by approximately 25 minutes. Also, the results for benefits in the form of computers indicate a positive association with work effort. On average, individuals receiving these benefits increase their work

effort by approximately 14 minutes per week. All coefficients are significant at the 1% level, except the coefficient for computer benefits (significant at the 5% level).

Benefits in the form of firm cars have the most substantial impact on work effort. The findings resonate with the idea that certain benefits, such as company cars, may be perceived by employees as luxuries, making it challenging for them to justify such purchases, even with sufficient funds, as highlighted by [Jeffrey and Shaffer \(2007\)](#). Consequently, the perceived value of these benefits tends to be higher compared to other types of benefits. These findings support Hypothesis [H2a](#). Moreover, firm cars, computers, and phones are visible, making them more enjoyable topics for discussion. Further, these benefit types may serve as signals of the organization's commitment to addressing employees' challenges ([Lazear, 1998](#)).

Contrary to expectations based on the mental accounting theory ([Thaler, 1985, 1999](#)), the statistically significant impact of expenses on employees' work effort is noteworthy. Expenses, in this context, refer to reimbursements or allowances provided to employees beyond standard compensation, typically covering costs related to business activities. Given that expenses share a high similarity with money compared to other types of benefits, mental accounting theory anticipates a less pronounced effect on work effort. However, the results suggest otherwise, indicating that expenses are positively associated with work effort, contradicting Hypothesis [H2b](#). A possible explanation is that expenses are often tied to specific activities – such as business trips – which carry experiential and symbolic value beyond their monetary content. This may enhance their perceived distinctiveness and motivational salience, thereby boosting work effort.

In contrast, meal benefits are not significantly linked to employees' work effort. This is in line with the findings of [Sittenthaler and Mohnen \(2020\)](#) who found that offering chocolate did not significantly enhance performance compared to financial incentives. One possible explanation is a habituation effect, whereby the impact of such benefits diminishes as employees become accustomed to them. Additionally, meal benefits may be regarded neither as luxury items nor as highly visible perks. Consequently, their perceived value may be lower. Discussing a discount on meals may be perceived as less enjoyable ([Shaffer and Arkes, 2009](#)). Furthermore, meals are relatively easy for employees to justify purchasing themselves, which may reduce the perceived value of receiving them as a benefit ([Jeffrey, 2009](#); [Jeffrey and Shaffer, 2007](#)). Moreover, some employees may prefer eating at home or bringing their own lunch, which can diminish the appeal of meal benefits. The observation may also be explained with mental accounting theory, as the survey question in the SOEP specifies meals as

a “Discount on meals in the employee cafeteria or a meal stipend”. This framing potentially associates meal benefits more closely with a monetary bonus compared to benefits like a company car or a laptop. This would support Hypotheses [H2a](#) and [H2b](#), which posit that incentives that are very similar to monetary compensation and are easier to justify have a lower impact on work effort compared to benefits that diverge from a monetary context.

### 4.3 Contextual Factors

The analysis supports the hypothesis that receiving benefits is positively associated with increased work effort. However, the effect size is rather modest. Therefore, this study explores whether the effectiveness of benefits varies across different subgroups. This analysis helps determine whether certain factors, such as employee characteristics or organizational context, influence the effectiveness of benefits, and acknowledges the heterogeneity of workers’ preferences ([Berger et al., 2025](#); [Card et al., 2018](#); [Lamadon et al., 2022](#)). Table 4 shows the proportion of benefit receipt across sex, firm size and industries. Estimation results are displayed in Table 5.

**Table 4** Proportion of benefit receipt

	No benefits	Benefits
<b>Sex</b>		
<i>male</i>	61.66%	38.34%
<i>female</i>	73.79%	26.21%
<b>Firm size</b>		
<i>larger</i>	59.44%	40.56%
<i>SME</i>	76.77%	23.23%
<b>Economic sector</b>		
<i>agriculture</i>	77.34%	22.66%
<i>energy</i>	46.35%	53.65%
<i>mining</i>	66.05%	33.95%
<i>manufacturing</i>	61.42%	38.58%
<i>construction</i>	76.46%	23.54%
<i>trade</i>	72.23%	27.77%
<i>transport</i>	64.42%	35.58%
<i>bankInsurance</i>	45.52%	54.48%
<i>services</i>	71.58%	28.42%
<i>otherIndustry</i>	77.10%	22.90%

**Notes.** This table presents the percentage of benefit receipt across various subgroups.

Table 5 Subsample analysis for Model 1

Variables	Dependent variable: <i>workEffort</i>		
	Sex	Firm size	Industry
<i>benefit</i>	18.62*** (4.10)	9.49*** (3.37)	4.75 (4.35)
<i>ln(income)</i>	75.68*** (5.24)	75.72*** (5.24)	75.61*** (5.24)
<i>additionalPay</i>	3.74 (3.19)	3.78 (3.19)	3.71 (3.19)
<i>bonus</i>	21.28*** (2.98)	21.31*** (2.98)	21.24*** (2.98)
<i>flexible</i>	29.38*** (2.96)	29.39*** (2.96)	29.36*** (2.96)
<i>benefit</i> × <i>female</i>	-12.33** (5.50)		
<i>benefit</i> × <i>sme</i>		7.62 (5.23)	
<i>benefit</i> × <i>agriculture</i>			24.49 (34.01)
<i>benefit</i> × <i>energy</i>			1.53 (17.59)
<i>benefit</i> × <i>mining</i>			5.19 (44.23)
<i>benefit</i> × <i>manufacturing</i>			18.15*** (6.19)
<i>benefit</i> × <i>construction</i>			20.54 (13.72)
<i>benefit</i> × <i>trade</i>			13.37 (8.25)
<i>benefit</i> × <i>transport</i>			-2.44 (13.46)
<i>benefit</i> × <i>bankInsurance</i>			9.82 (11.06)
<i>benefit</i> × <i>otherIndustry</i>			-8.65 (11.44)
Obs.	82,994	82,994	82,994
R <sup>2</sup> within	0.024	0.024	0.024
R <sup>2</sup> overall	0.019	0.018	0.018
R <sup>2</sup> between	0.020	0.019	0.019
Controls	YES	YES	YES
Individual FE	YES	YES	YES
Year dummies	YES	YES	YES
Constant	YES	YES	YES
<b>Linear combinations of parameters</b>			
<i>benefit</i> + <i>benefit</i> × <i>female</i>	6.28 (3.67)*		
<i>benefit</i> + <i>benefit</i> × <i>sme</i>		17.11 (4.28)***	
<i>benefit</i> + <i>benefit</i> × <i>agriculture</i>			29.23 (33.85)
<i>benefit</i> + <i>benefit</i> × <i>energy</i>			6.28 (17.15)
<i>benefit</i> + <i>benefit</i> × <i>mining</i>			9.93 (44.03)
<i>benefit</i> + <i>benefit</i> × <i>manufacturing</i>			22.89 (4.56)***
<i>benefit</i> + <i>benefit</i> × <i>construction</i>			25.29 (13.10)*
<i>benefit</i> + <i>benefit</i> × <i>trade</i>			18.11 (7.21)**
<i>benefit</i> + <i>benefit</i> × <i>transport</i>			2.31 (12.85)
<i>benefit</i> + <i>benefit</i> × <i>bankInsurance</i>			14.56 (10.23)
<i>benefit</i> + <i>benefit</i> × <i>otherIndustry</i>			-3.90 (11.24)

**Notes.** The table shows the results of fixed effects regressions. The values in parentheses represent robust standard errors clustered at the individual level. The specifications include the same control variables as the corresponding main Model 1. The coefficients for interaction terms with the variable *benefit* and dummy variables representing various subgroups are reported. The variable *sme* is a dummy for small and medium-sized enterprises, indicating firm size. For the type of industry, the *services* sector serves as reference. For linear combinations of parameters, point estimates and standard errors are reported.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Prior research highlights differences in job preferences between females and males, driven by factors such as lifestyle choices and the search for prestige (Ferriman et al., 2009). While males may be more attracted to jobs and companies offering benefits as status symbols due to the higher visibility of tangible goods, females may prioritize a stable income over status symbols (Hammermann and Mohnen, 2014b). In the sample, 38.3% of males receive benefits, compared to only 26.2% of females (see Table 4). Further, prior literature reveals performance differences between men and women depending on the incentive type (Sittenthaler and Mohnen, 2020). This is supported by the estimation results, revealing a statistically significant smaller effect of benefits on work effort for females compared to males. The estimation results indicate a positive and significant association between benefits and work effort for males by approximately 19 minutes per week (significant at the 1% level). For females, the effect is significantly lower. Linear combination of coefficients indicate a moderate effect of 6 additional minutes of work per week (significant at the 10% level). This finding suggests that benefits may be more effective for males than for females, supporting Hypothesis H3.

Additionally, organizational-related factors may influence the effectiveness of benefits. Examining the distribution of benefits among employees in SMEs versus larger companies reveals that employees in larger companies are more likely to receive benefits (see Table 4). More than 40.6% of employees in larger companies receive benefits, whereas only 23.2% of employees in smaller enterprises receive such benefits. This finding suggests that benefits are more common in larger companies. One possible explanation for this disparity is the cost-effectiveness of offering benefits in larger organizations. Larger firms are better positioned to take advantage of tax advantages and economies of scale, and they are often able to provide employees with goods related to their industry at production costs (Hammermann and Mohnen, 2014b; Oyer, 2008; Voßmerbäumer, 2013). The estimation results indicate an increase of approximately 9 minutes of work effort per week for employees in larger firms who receive benefits (significant at the 1% level). In contrast, employees in smaller firms show a positive effect of approximately 17 minutes per week. This suggests that benefits may be more effective in smaller firms, potentially due to the higher perceived value of benefits in these contexts. However, the difference in effect size is not significant, and therefore, does not clearly support Hypothesis H4.

The proportion of employees receiving benefits varies considerably across industries, highlighting differences in compensation and incentive practices (see Table 4). Employees in the finance industry report the highest rate of benefit receipt (54.5%), followed

by the energy sector (53.7%). Manufacturing (38.6%), transport (35.6%), and the mining sector (34.0%) also show relatively high rates of benefit receipt. In sectors such as the services (28.4%), trade (27.8%), and construction (23.5%), employees report lower rates of benefit receipt. The agriculture sector (22.7%) and other industries (22.9%) show the lowest rates of benefit receipt. These figures suggest that benefit provision is more common in knowledge- and capital-intensive sectors.

This industry-level heterogeneity underscores the importance of accounting for sectoral structure when analyzing the relationship between non-monetary benefits and employee behavior. The interaction terms between benefits and industry dummy variables reveal some differences in how non-monetary benefits influence work effort. Using the services sector as the reference category – where benefits are associated with no significant increase of work effort – the estimation results indicate variation across sectors. Linear combinations of coefficients reveal significantly positive effects in the construction sector (25 minutes), the manufacturing sector (23 minutes), and the trade sector (18 minutes). In all other sectors, the estimation results indicate no significant link between benefit receipt and work effort.

The significantly positive effect in the trade sector aligns with the findings of [Winkler and Hughen \(2012\)](#) who studied the link between work effort and benefits among real estate sale agents. For employees working in hospitality, the results indicate a significant link between benefits and work effort, contrasting prior research from ([Yoopetch et al., 2021](#)). This may be due to the grouping into the trade sector. By contrast, in others sector the effect of benefits on extra work seems not to be significant.

Overall, these results support the Hypothesis [H5](#) that the effectiveness of benefits is contingent on industry context. Incentive systems should be tailored to sector-specific norms and employee expectations to be effective ([Dulebohn et al., 2009](#); [Fulmer and Li, 2022](#); [Sageder and Feldbauer-Durstmüller, 2019](#)).

To sum up, the analysis supports the finding that benefits may positively contribute to employees' work effort. Subgroup analysis reveals that gender and organizational factors moderate the positive association of benefits with higher work effort. Therefore, this indicates that personal preferences and contextual factors likely play an important role.

## 5 Robustness Checks

### 5.1 Alternative Estimation Approaches

The main analysis employs a fixed effects (FE) estimation strategy and finds a positive association between benefit receipt and employees' work effort. However, without randomized treatment variation, two concerns appear regarding the causal interpretation of this relationship: (1) (time-invariant) omitted variables; for instance, the pursuit of promotion may simultaneously drive work effort and lead to the receipt of benefits as preparing employees for promotions could necessitate the provision of benefits, such as a company car, and (2) reverse causality, wherein receiving benefits might be influenced by past work effort. For instance, benefits may be provided to employees who demonstrate high work effort, creating a cyclical relationship between work effort and benefit receipt.

To address these concerns, additional estimation strategies are adopted. [Angrist and Pischke \(2009\)](#) demonstrate that FE and lagged dependent variable (LDV) approaches possess a valuable bracketing property which has been increasingly applied in empirical papers ([Beckmann and Kräkel, 2022](#); [Falk et al., 2018](#); [Kampkötter and Sliwka, 2018](#)). If either the FE model or the LDV model accurately captures the true treatment effect, then the true effect falls within the range defined by the estimated treatment coefficients from the two models.

Additional tests indicate that benefit receipt is selected positively on lagged work effort.<sup>14</sup> This suggests that the FE estimator likely provides a lower bound of the treatment effect, while the LDV estimator may represent an upper bound ([Guryan, 2001](#)).

However, [Demetrescu et al. \(2025\)](#) demonstrate that the bracketing property only holds under specific assumptions. The authors suggest “estimating an additional model that includes both FE and an LDV (FE-LDV). Although this model does not allow for bracketing, [...] it can serve to identify the lower bound estimate of the treatment effect.” ([Demetrescu et al., 2025](#), p. 2)

Accordingly, both LDV and FE-LDV models are estimated to assess the robustness of the main findings. As reported in Table [A.6](#) (see Appendix [A](#)), the coefficient for

<sup>14</sup> A linear regression with the dependent variable *benefit* and lagged work effort as the independent variable – using the same covariates as in the main model – yields a significantly positive coefficient for lagged work effort.

the dummy variable reflecting whether an employee receives one or more benefits is highly significant for Model 1.<sup>15</sup> When estimated on the same subsample as the LDV model, the FE regression yields a coefficient of 10.6, while the LDV model produces a coefficient of 15.3. The coefficient from the FE-LDV model is 10.0 (all coefficients are significant at the 1% level).

It is important to note that LDV models are often criticized for attenuating all coefficients except that of the lagged dependent variable (Achen, 2000; Andersen and Mayerl, 2023; Keele and Kelly, 2006; Leszczensky and Wolbring, 2022). However, in this context, the LDV model is used solely as a robustness check. The consistency of results across all three estimation strategies reinforces the credibility of the main finding: benefit receipt is positively associated with increased work effort.

## 5.2 Overestimation of Working Hours

According to Robinson et al. (2011), employees often misjudge their actual working time. Over-reporting may be influenced by a desire to provide socially acceptable responses, difficulties in recalling precise working hours, or a motivation to overstate workload for potential promotion. The study notes that full-time employees – who make up 71.3% of the dataset – tend to overestimate their working time. To address potential measurement errors in the work effort indicator, the regressions are conducted with a correction measure following the approach of Robinson et al. (2011). This involves adjusting actual working time to account for misjudgments by subtracting 5 to 10% of reported working hours.

The empirical results for the potential impact of benefits on employees' work effort, corrected for potential overestimation, yield again highly significant, positive regression coefficients for Model 1 (see Table A.7 in Appendix A). Similarly, the procedure does not affect the estimation results for Model 2 and 3. This suggests that considering measurement errors in working hours does not substantially alter the results reported in Section 4.

<sup>15</sup> Note, this data set has irregular time intervals between reported years. The results for the LDV model are based on all years for which the lagged outcome was computable, excluding the initial observation for each individual. Additionally, individuals with only one remaining observation were excluded to have at least two observations per individual for the fixed effects regressions.



### 5.3 Alternative Measures of Work Effort

A common criticism of utilizing extra working hours to measure employees' work effort is that an increase in working hours may not necessarily translate to more productive work. This concern is addressed by showing results from a series of regressions where the original dependent variable is replaced by alternative measures of individual performance (see Tables A.8, A.9 and A.10 in Appendix A).

Estimation using self-reported hours of overtime as dependent variable aligns with the patterns established in the previous section. For Model 1, the coefficient indicating benefit receipt is highly significant and corresponds to 13.2 minutes of additional overtime per week. This closely matches the main model's estimate of 12.7 additional minutes of work effort associated with benefit receipt. Therefore, the results based on self-reported overtime support the main finding and underscore the robustness of the work effort measure.

As an alternative (inverse) productivity measure, worker absenteeism is employed quantified by the number of days absent from work. The SOEP provides data on various reasons of absence: Absence due to own sickness, due to sickness of child, due to caregiving for relatives, and absence due to other reasons. The findings indicate that benefits reduce absences due to own sickness but not for other reasons like caregiving. This finding suggests a potential increase in work morale associated with benefits. However, the effect size is modest aligning with the previous reported main findings. The estimation results reveal that car benefits slightly decrease absence due to sickness. This result could be linked to the convenience provided by company-provided transportation. Employees with access to a company car may experience greater ease in commuting to work or accessing medical appointments. This enhanced mobility and accessibility may contribute to a lower likelihood of taking sick leave. In contrast, employees using public transportation may be more prone to illness (Troko et al., 2011). Similarly, the results indicate that the receipt of phone benefits is associated with a significant reduction in absenteeism due to sickness. This finding could be explained by the fact that employees with access to a company phone may find it easier to stay connected with their workplace, even when they are not physically present, potentially reducing sick leave.

Fixed-effects regression with a dummy variable for job security<sup>16</sup> as dependent variable reveals that receiving at least one benefit is associated with a significantly reduced probability of expressing concerns about job security. Additionally, a higher number of benefits received aligns with decreased worries about job security.

To further test the robustness of the link between benefits and work effort, this paper examines the impact of benefits on wage and work satisfaction. [Hammermann and Mohnen \(2014b\)](#) showed that employees who receive at least one benefit are more satisfied with their wage and job, using SOEP data from 2006 and 2008. Building upon these prior analysis of SOEP data, this paper contributes by incorporating panel data from eleven waves of the years 2006 to 2022. The results reveal a highly significant impact of benefits on work and wage satisfaction. While meal benefits did not show a significant impact on the primary measure of work effort, they are associated with a significant increase in work and wage satisfaction. This finding suggests that meal benefits may enhance employees' overall job experience, even if they do not directly translate into increased work effort. Moreover, this effect increases with the number of benefit types received.

Moreover, the baseline model is re-estimated, utilizing various measures of non-standard working hours – such as evening shifts, night shifts and weekend work – as alternative dependent variables.<sup>17</sup> The findings indicate that receiving at least one benefit significantly increases the probability that an employee works non-standard working hours. In particular, receiving benefits is associated with a significantly higher probability of working evening shifts and weekend work (i.e., Saturdays and Sundays), while no significant association is found for night shifts. Moreover, the probability of working evening shifts increases with the number of benefit types received. Regarding the different benefit types, car and computer benefits significantly increase the likelihood of working evenings and Saturdays. These findings suggest that benefits may enhance employees' willingness to accept or tolerate less conventional work schedules. One plausible explanation is that benefits are perceived as a form of reciprocal exchange, aligning with gift-exchange theory ([Akerlof, 1982](#)).

As another robustness check, the main models were re-estimated using hourly gross wages as dependent variable. Theoretically, benefits are sometimes seen as substitutes

<sup>16</sup> In the SOEP data, “worries about job security” variable is categorized in three categories: strong worries (value 1), some worries (value 2), and no worries (value 3). The dummy variable for the regression is set to 1 if the categorical variable takes the value 2 or 3.

<sup>17</sup> Note that information on non-standard working hours is only available in the 2015 and 2017 survey waves. Consequently, the estimation is based on a smaller sample.

for wages, implying a potential trade-off between the two components of total compensation. However, the results show a significantly positive coefficient for benefit provision, suggesting that employees who receive benefits also tend to earn higher wages. This finding does not necessarily contradict the theoretically assumed trade-off. It may instead reflect that better-performing or more resource-rich firms can afford to offer both higher wages and more generous benefits. Future research should explore under what conditions benefits substitute or complement wages.

## 5.4 Bad Control Variables

A potential risk in regression analysis arises from including so-called *bad controls* – variables that are themselves potentially affected by the treatment and therefore may bias estimates of causal effects (Angrist and Pischke, 2009). In the context of this study, some variables may appear relevant as controls but could also be outcomes of benefit receipt, making their inclusion as control variable problematic.

To assess the sensitivity of the results to such concerns, Model 1 was re-estimated without any control variables. The coefficient on the benefit dummy remains positive and statistically significant (see Table 3), suggesting that the main finding holds even in a reduced specification.

Further, job satisfaction or concerns about job loss may influence work effort. However, these variables are likely influenced by benefits themselves as reported above. The main models are also re-estimated including these variables as controls (see Table A.11 in Appendix A). The coefficients indicating the receipt of benefits remain positive and significant, suggesting the robustness of the main results.

This study defines work effort as the difference between employees' actual and contractual working time. Interpretations would be wrong if workers reduce contractual working time.<sup>18</sup> To address this concern, contractual working hours are added as a covariate to the baseline model (Model 1). The results are very similar to the previously reported results in Table 3, ruling out the possibility that the main finding of a

<sup>18</sup> A two-sample t-test is conducted to compare contractual working hours between employees receiving at least one benefit and those without any benefits. The analysis revealed a significant difference between employees that receive benefits ( $M = 36.4$ ,  $SD = 6.6$ ) and employees without benefits ( $M = 34.1$ ,  $SD = 8.6$ ;  $t(82,992) = -39.256$ ,  $p < 0.001$ ), but the absolute difference in mean working hours is small.

slightly positive impact of benefits on work effort is driven by systematic changes in contractual working hours.<sup>19</sup>

## 5.5 Alternative Sample Selection

Modifications in the sample reinforce the main finding of a positive, but modest impact of benefits on employees' work effort. Restricting the analysis to employees aged between 18 and 60 yields consistent results to the previous reported findings in Section 4 (see Table A.13 in Appendix A).

Benefit receipt often depends on employment type and hours worked, as documented in prior research (Jaworski et al., 2018). Indeed, 36.4% of full-time employees in the sample receive at least one benefit, compared to only 21.9% among part-time employees.<sup>20</sup> Part-time workers may engage in additional hours for reasons unrelated to benefits, such as income supplementation or job insecurity (Rupietta and Beckmann, 2018). In contrast, full-time employees typically have less flexibility to expand their contractual hours or earnings. For them, non-monetary benefits may serve as a more feasible and attractive form of compensation, potentially enhancing work effort. Excluding part-time employees from the analysis yields a coefficient of 18.6 for the benefit dummy in Model 1 (significant at the 1% level) (see Table A.13 in Appendix A). This result reinforces the main finding: benefits are positively associated with increased work effort. Notably, the estimated effect is larger than in the full-sample analysis, suggesting that the relationship between benefits and work effort may be particularly pronounced among full-time employees.

Moreover, fixed effects regression relies on within-individual variation over time (Baltagi, 2021). Approximately 53.0% of the observations come from individuals who exhibit no change in benefit receipt. Excluding those individuals from the sample reveals consistent results with the main findings.

<sup>19</sup> The coefficient for contractual working hours is highly significant with the anticipated negative sign, aligning with Beckmann et al. (2017)'s work using SOEP data .

<sup>20</sup> Employees with contractual working hours of fewer than 35 hours per week are typically considered part-time workers.

## 6 Conclusion

Utilizing eleven survey waves from the German Socio-Economic Panel (SOEP), this study expands the existing literature on the relationship between benefits and employee work effort, measured by the difference between employees' actual working time and contractual working hours. The results of fixed-effects regression, accounting for job-related, organizational, and personal characteristics, reveal an average of 13 minutes of additional work per week benefit receipt. While the effect size is quite modest, car benefits are associated with a significant increase in work effort of 52 minutes per week on average and receiving multiple benefit types further increases the effect size – up to on average 97 minutes for five or more benefit types. These findings align with theories of positive reciprocity ([Dohmen et al., 2009](#); [Fehr et al., 1997](#)) and mental accounting theory ([Thaler, 1999](#)).

Further, the results indicate that the effectiveness of benefits is not universal but varies by individual and structural characteristics. Specifically, benefits appear to be more effective for males and in industries like manufacturing, construction, or wholesale and retail trade. This suggests that the impact of benefits on work effort is context-dependent, highlighting the importance of considering individual and organizational characteristics when designing incentive systems ([Condly et al., 2003](#); [Fulmer and Li, 2022](#); [Gallus and Frey, 2016](#); [Sageder and Feldbauer-Durstmüller, 2019](#)).

Additional checks confirm that the robustness of the main findings. However, this study has several limitations.

First, the analysis relies on survey data, introducing issues of self-reported data and missing values. Observations with missing values on key control variables had to be excluded. This may introduce selection bias. The issue is particularly relevant for the variable capturing flexible working time arrangements, which was not available in all survey years. As a result, a notable number of observations were excluded due to missing values on this variable. Moreover, because it is assumed to be time-constant unless otherwise reported, its measurement may not fully capture temporal variation in work flexibility. These constraints highlight the trade-offs involved in balancing data completeness with the inclusion of theoretically relevant controls.

Second, the analysis required the exclusion of individuals with only one valid observation, as fixed effects estimation relies on within-person variation. While this exclusion may raise concerns about selection bias, additional analysis suggests that the excluded individuals differ only modestly from those retained in the sample.

Third, the SOEP data lacks specific details about the benefits received, such as their monetary value, appearance, or whether they are considered luxurious or purely practical. Some response categories, such as “expense allowance beyond reimbursement of expenditures” or “other forms of additional benefits”, are vague and open to interpretation, limiting the precision in categorizing benefit types. Additionally, the data set lacks information on whether benefits are provided independently of performance or awarded based on it, potentially impacting workers’ motivation to exert additional effort. In earlier research, benefits were often studied as performance-dependent incentives. Moreover, the question about benefits was only included in specific survey waves.

Fourth, the measure for work effort – extra working hours – does not measure effort in very much detail. It does not capture qualitative aspects of effort, such as intensity or focus, and may not be applicable across all job types or work environments.

Fifth, the analysis could not include other incentive forms, such as employer-sponsored health insurance, pension schemes, or childcare support, due to data limitations. Remote work arrangements are only observed in later SOEP waves and were therefore not included. Although a related variable on working-time flexibility was used, it cannot fully substitute for a dedicated measure of remote work. In addition, the SOEP does not provide detailed or consistent information across all years on the structure of performance pay, which would allow for more nuanced modelling of incentive mechanisms.

Sixth, the results may not be entirely generalizable to the whole working population in Germany. While the SOEP is generally representative of German households, the data may be influenced by potential selection biases due to time restrictions of data collection, missing values, and the exclusion of certain groups, such as civil servants. Moreover, the analysis relies on data from Germany which raises the question whether the results are applicable to other countries and cultures.

Lastly, the data does not allow for a clear separation between voluntary and involuntary overtime or self-motivated versus employer-imposed work intensification, which limits causal interpretation in some parts of the analysis.

As a result, the findings should be interpreted with caution. Additionally, there is the potential for reverse causality. It is plausible that individuals with higher work effort may be more likely to receive certain benefits. However, the study is based on a large, representative data set at the individual level that ensures empirical analysis with high validity.

In sum, this study contributes to the literature on non-monetary incentives by providing longitudinal evidence on their relationship with employee work effort, while most prior research relies on experimental or cross-sectional data (e.g., [Bareket-Bojmel et al., 2017](#); [Choi and Presslee, 2023](#); [Jeffrey, 2009](#); [Jeffrey and Adomdza, 2011](#); [Sittenthaler and Mohnen, 2020](#)). By leveraging rich panel data from the German labor market, this study offers a more robust empirical foundation for understanding how benefits relate to actual work behavior. Importantly, the findings reveal that the effectiveness of benefits is context-dependent, thereby responding to calls for research that examines how individual and organizational characteristics shape the impact of incentives ([Condly et al., 2003](#); [Fulmer and Li, 2022](#); [Gallus and Frey, 2016](#); [Sageder and Feldbauer-Durstmüller, 2019](#)). Specifically, benefits are more strongly associated with increased work effort among male employees and in certain industries. This heterogeneity suggests that a one-size-fits-all approach to incentive design may be suboptimal – an insight that aligns with recent evidence from German firms emphasizing the need for more tailored benefit strategies ([Neuen and Klein, 2025](#)). Together, these findings extend the literature by linking non-monetary benefits to behavioral outcomes in a representative labor market setting and by highlighting the importance of contextual factors in shaping incentive effectiveness.

Further research on employer-provided benefits should explore the specific conditions under which benefits may be effective in increasing employee work effort. The inclusion of firm data instead of self-reported survey data could offer new insights into employer intentions and organizational structures. Gathering information on the appearance and cost of benefits would enable more detailed tests and insights into the cost-effectiveness of benefits. Given the rising popularity of non-monetary compensation components, exploring the intentions behind benefit usage and its impact on various work aspects is essential.

The implications derived from this study are relevant for researchers, management and employee representatives. Although the magnitude of the association between non-monetary benefits and increased work effort is modest, the analysis reveals that the relationship is statistically significant and positive. Non-monetary benefits seem to indeed enhance employees' effort.

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**Funding:** No funding was received for conducting this study.

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**Ethics approval and consent to participate:** No ethical approval was required for this analysis.

**Data availability:** This study uses data from the German Socio-Economic Panel (SOEP), which is administered by the German Institute for Economic Research (DIW Berlin). Access to the SOEP data is restricted and subject to approval by DIW Berlin. Detailed information on data access conditions is available at [https://www.diw.de/en/diw\\_01.c.601584.en/data\\_access.html](https://www.diw.de/en/diw_01.c.601584.en/data_access.html).

**Code availability:** The code used for data cleaning and analysis is available from the corresponding author upon reasonable request.

**Author contribution:** The author solely conceived the study, performed the analysis, interpreted the results, and wrote the manuscript.



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# Appendix A

**Table A.1** Summary of data processing steps

Data processing step	Observations	
	Excluded	Remaining
Initial sample		659,169
Exclude observations prior to 2006	286,910	372,259
Exclude self-employed individuals, civil servants, apprentices	55,256	317,003
Exclude if not employed full-time or part-time	127,315	189,688
Exclude observations with missing contractual working hours	4,096	185,592
Exclude observations with missing actual working hours	9,624	175,968
Exclude survey years without benefit questions (2007, 2009, 2011, 2013, 2019, 2021)	58,216	117,752
Exclude observations with missing responses to any benefit type	10,016	107,736
Exclude observations with missing values for control variables	18,384	89,352
Exclude individuals with only one observation	6,358	82,994

**Table A.2** Summary statistics

	Obs.	Mean	Std.Dev.	Min.	Max.
<i>workEffort</i>	82,994	195.233	296.207	-2,520	3,300
<i>contractualWorkHours</i>	82,994	34.830	8.062	2	80
<i>actualWorkHours</i>	82,994	38.084	9.918	1	80
<i>benefit</i>	82,994	0.322	0.467	0	1
<i>benefitCount</i>	82,994	0.463	0.812	0	6
<i>benefits1</i>	82,994	0.231	0.421	0	1
<i>benefits2</i>	82,994	0.057	0.232	0	1
<i>benefits3</i>	82,994	0.024	0.152	0	1
<i>benefits4</i>	82,994	0.009	0.095	0	1
<i>benefits5</i>	82,994	0.002	0.047	0	1
<i>meal</i>	82,994	0.193	0.395	0	1
<i>car</i>	82,994	0.053	0.224	0	1
<i>phone</i>	82,994	0.077	0.266	0	1
<i>expenses</i>	82,994	0.023	0.150	0	1
<i>computer</i>	82,994	0.051	0.219	0	1
<i>income</i>	82,994	2,870.134	1,781.992	1	57,000
<i>ln(income)</i>	82,994	7.791	0.607	0	11
<i>hourlyWage</i>	82,994	74.965	54.909	0	6,000
<i>additionalPay</i>	82,994	0.706	0.455	0	1
<i>bonus</i>	82,994	0.263	0.440	0	1
<i>flexible</i>	82,994	0.579	0.494	0	1
<i>jobChange</i>	82,994	0.127	0.333	0	1
<i>tenure</i>	82,994	11.242	10.135	0	51

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	Obs.	Mean	Std.Dev.	Min.	Max.
<i>partTime</i>	82,994	0.287	0.452	0	1
<i>blueCollar</i>	82,994	0.247	0.431	0	1
<i>whiteCollar</i>	82,994	0.737	0.440	0	1
<i>manager</i>	82,994	0.016	0.126	0	1
<i>western</i>	82,994	0.775	0.418	0	1
<i>sme</i>	82,994	0.480	0.500	0	1
<i>agriculture</i>	82,994	0.012	0.107	0	1
<i>energy</i>	82,994	0.010	0.100	0	1
<i>mining</i>	82,994	0.002	0.044	0	1
<i>manufacturing</i>	82,994	0.267	0.442	0	1
<i>construction</i>	82,994	0.053	0.223	0	1
<i>trade</i>	82,994	0.129	0.336	0	1
<i>transport</i>	82,994	0.048	0.215	0	1
<i>bankInsurance</i>	82,994	0.042	0.201	0	1
<i>services</i>	82,994	0.403	0.490	0	1
<i>otherIndustry</i>	82,994	0.034	0.182	0	1
<i>female</i>	82,994	0.503	0.500	0	1
<i>age</i>	82,994	44.414	10.388	18	65
<i>married</i>	82,994	0.620	0.485	0	1
<i>riskAversion</i>	82,994	4.835	2.252	0	10
<i>child</i>	82,994	0.549	0.498	0	1
<i>overtimeHours</i>	82,624	2.125	3.208	0	46
<i>workSatisfaction</i>	81,844	7.089	1.933	0	10
<i>wageSatisfaction</i>	82,625	6.673	2.024	0	10
<i>jobSecurityConcerns</i>	82,275	0.442	0.497	0	1
<i>sickLeave</i>	82,992	9.983	24.767	0	365
<i>childCareLeave</i>	70,470	0.496	2.303	0	170
<i>careLeave</i>	50,768	0.070	2.513	0	270
<i>otherLeave</i>	70,456	0.374	5.935	0	365
<i>eveningWork</i>	19,944	0.894	1.120	0	4
<i>nightWork</i>	19,729	0.453	0.910	0	4
<i>saturdayWork</i>	19,992	1.261	1.382	0	4
<i>sundayWork</i>	19,700	0.726	1.174	0	4

**Notes.** The table shows descriptive statistics. The performance measure is work effort, measured as the difference between actual working hours and contractual working hours (in minutes). The dummy variable *benefit* equals 1 if one or more benefits are received. *benefitCount* measures the number of benefit types received. Dummy variables for the number of benefit types and the different types of benefits are created. *income* represents monthly income before taxes (gross wage last month) while *additionalPay* equals 1 if additional gross payments are received. The binary variable *bonus* indicates whether the employee receives a shift bonus, a weekend bonus, overtime pay, a bonus for difficult work conditions or other additional payments. The dummy variable *flexible* indicates whether an employee has flexible work time arrangements rather than a fixed working schedule. Other job characteristics include a dummy variable for job change in the previous year, tenure, a dummy variable for part-time work and dummies for job position. Included organizational characteristics are the region, a dummy variable for small and middle-sized companies (*sme*) and dummies for the type of industry. Personal characteristics include age, marital status, risk-tolerance, and children. Average hours of overtime per week are reported *overtimeHours*. Work satisfaction and dummy variables for job-related burdens are considered. Absence variables include the number of days off work in the previous year due to personal illness, child's illness, caregiving for relatives, and other reasons. Summary statistics of categorical variables for the frequency of evening shifts after 7 p.m., night shifts after 10 p.m. and weekend work are displayed.

Table A.3 Estimation results for main models

Variables	Dependent variable: <i>workEffort</i>			
	Model 0	Model 1	Model 2	Model 3
<i>benefit</i>	10.42*** (2.80)	12.73*** (2.77)		
<i>benefits1</i>			9.12*** (2.81)	
<i>benefits2</i>			27.30*** (5.27)	
<i>benefits3</i>			45.65*** (8.95)	

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Variables	Dependent variable: <i>workEffort</i>			
	Model 0	Model 1	Model 2	Model 3
<i>benefits4</i>			73.49*** (15.97)	
<i>benefits5</i>			97.41*** (30.47)	
<i>meal</i>				-2.05 (3.45)
<i>car</i>				51.72*** (9.34)
<i>phone</i>				24.69*** (5.94)
<i>expenses</i>				37.32*** (9.83)
<i>computer</i>				13.64** (6.80)
<i>ln(income)</i>	14.89*** (4.53)	75.74*** (5.24)	74.89*** (5.24)	74.21*** (5.23)
<i>additionalPay</i>	7.80** (3.19)	3.79 (3.19)	3.72 (3.19)	4.01 (3.19)
<i>bonus</i>	23.19*** (3.01)	21.31*** (2.98)	21.27*** (2.98)	21.49*** (2.97)
<i>flexible</i>	28.04*** (2.98)	29.43*** (2.96)	29.17*** (2.95)	28.91*** (2.95)
<i>jobChange</i>		-16.06*** (3.37)	-16.16*** (3.37)	-15.92*** (3.36)
<i>tenure</i>		0.96** (0.41)	0.97** (0.41)	0.97** (0.41)
<i>partTime</i>		69.74*** (5.75)	69.89*** (5.74)	69.95*** (5.74)
<i>blueCollar</i>		-57.96*** (14.92)	-56.18*** (14.86)	-53.79*** (14.83)
<i>whiteCollar</i>		-52.83*** (14.23)	-51.13*** (14.17)	-49.00*** (14.13)
<i>western</i>		-2.85 (22.55)	-3.50 (22.52)	-3.26 (22.45)
<i>sme</i>		7.91** (3.74)	8.26** (3.74)	7.15* (3.74)
<i>agriculture</i>		56.16*** (18.71)	55.98*** (18.69)	55.50*** (18.67)
<i>energy</i>		-5.01 (13.51)	-6.06 (13.53)	-6.48 (13.46)
<i>mining</i>		6.21 (33.95)	6.03 (33.99)	6.21 (34.03)
<i>manufacturing</i>		-10.07 (6.50)	-10.28 (6.49)	-9.93 (6.47)
<i>construction</i>		26.91*** (9.55)	27.20*** (9.53)	26.21*** (9.52)
<i>trade</i>		-0.14 (6.85)	-0.11 (6.84)	0.01 (6.82)
<i>transport</i>		26.45*** (9.84)	26.21*** (9.84)	25.48*** (9.81)
<i>bankInsurance</i>		7.76 (13.43)	8.00 (13.41)	10.24 (13.32)
<i>otherIndustry</i>		9.32 (5.87)	9.78* (5.87)	10.56* (5.87)
<i>age</i>		-9.56*** (0.60)	-9.63*** (0.60)	-9.70*** (0.59)
<i>married</i>		-5.29 (5.18)	-5.09 (5.18)	-5.24 (5.16)
<i>riskAversion</i>		1.78*** (0.61)	1.75*** (0.61)	1.74*** (0.61)
<i>child</i>		-13.02*** (3.91)	-13.38*** (3.91)	-13.60*** (3.91)
<i>year2008</i>		9.82** (3.86)	9.73** (3.86)	9.55** (3.85)

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Variables	Dependent variable: <i>workEffort</i>			
	Model 0	Model 1	Model 2	Model 3
<i>year2010</i>		-6.80 (4.30)	-6.65 (4.30)	-7.02 (4.29)
<i>year2012</i>		12.91*** (4.26)	13.25*** (4.26)	13.05*** (4.26)
<i>year2014</i>		6.59 (4.55)	6.59 (4.55)	6.37 (4.54)
<i>year2015</i>		6.73 (4.71)	6.73 (4.71)	6.52 (4.71)
<i>year2016</i>		16.89*** (4.90)	17.12*** (4.90)	17.12*** (4.90)
<i>year2017</i>		12.22** (5.08)	12.44** (5.08)	12.42** (5.08)
<i>year2018</i>		13.07** (5.25)	13.16** (5.25)	13.38** (5.25)
<i>year2020</i>		3.63 (5.64)	4.04 (5.64)	4.24 (5.65)
Constant	48.05 (35.09)	15.55 (46.23)	22.69 (46.19)	29.24 (46.11)
Obs.	82,994	82,994	82,994	82,994
R <sup>2</sup> within	0.004	0.024	0.025	0.026
R <sup>2</sup> overall	0.054	0.018	0.021	0.026
R <sup>2</sup> between	0.094	0.019	0.022	0.028
Controls	NO	YES	YES	YES
Individual FE	YES	YES	YES	YES
Year dummies	NO	YES	YES	YES
Constant	YES	YES	YES	YES

**Notes.** The table shows the results of fixed effects regressions. The values in parentheses represent standard errors clustered at the individual level. Dependent variable is work effort measured as the difference between actual and contractual working hours (in minutes). The dummy variable *benefit* equals 1 if one or more benefits are received. In Model 2 dummy variables for the number of benefits are included, ranging from 1 to 5 or more benefits. In Model 3 dummy variables for the types of benefits are included. *ln(income)* stands for the logarithm of income before taxes. Two dummy variables for additional payments as well as a dummy variable for flexible working time arrangements are included. Job characteristics include variables for job change and position (Reference: *manager*). Personnel characteristics include variables for age, marital status, risk-tolerance and children. Organizational characteristics include the region (*western*), a dummy variable for firm size and the type of industry (Reference: *services*).

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Table A.4 Subsample analysis for Model 1

Variables	Dependent variable: <i>workEffort</i>		
	Sex	Firm size	Industry
<i>benefit</i>	18.62*** (4.10)	9.49*** (3.37)	4.75 (4.35)
<i>ln(income)</i>	75.68*** (5.24)	75.72*** (5.24)	75.61*** (5.24)
<i>additionalPay</i>	3.74 (3.19)	3.78 (3.19)	3.71 (3.19)
<i>bonus</i>	21.28*** (2.98)	21.31*** (2.98)	21.24*** (2.98)
<i>flexible</i>	29.38*** (2.96)	29.39*** (2.96)	29.36*** (2.96)
<i>sme</i>	7.87** (3.74)	5.76 (3.97)	8.06** (3.74)
<i>agriculture</i>	56.18*** (18.71)	56.26*** (18.70)	50.25*** (18.47)
<i>energy</i>	-5.19	-4.90	-3.83

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Variables	Dependent variable: <i>workEffort</i>		
	Sex	Firm size	Industry
	(13.54)	(13.50)	(16.40)
<i>mining</i>	5.92	5.94	4.31
	(33.98)	(33.89)	(35.91)
<i>manufacturing</i>	-10.06	-9.99	-16.68**
	(6.50)	(6.50)	(6.81)
<i>construction</i>	26.90***	27.04***	20.39**
	(9.55)	(9.55)	(10.35)
<i>trade</i>	-0.08	-0.13	-4.93
	(6.85)	(6.85)	(7.20)
<i>transport</i>	26.43***	26.49***	27.45**
	(9.83)	(9.84)	(10.67)
<i>bankInsurance</i>	7.77	8.15	3.68
	(13.42)	(13.41)	(13.83)
<i>otherIndustry</i>	9.40	9.34	11.31*
	(5.87)	(5.87)	(6.73)
<i>benefit × female</i>	-12.33**		
	(5.50)		
<i>benefit × sme</i>		7.62	
		(5.23)	
<i>benefit × agriculture</i>			24.49
			(34.01)
<i>benefit × energy</i>			1.53
			(17.59)
<i>benefit × mining</i>			5.19
			(44.23)
<i>benefit × manufacturing</i>			18.15***
			(6.19)
<i>benefit × construction</i>			20.54
			(13.72)
<i>benefit × trade</i>			13.37
			(8.25)
<i>benefit × transport</i>			-2.44
			(13.46)
<i>benefit × bankInsurance</i>			9.82
			(11.06)
<i>benefit × otherIndustry</i>			-8.65
			(11.44)
Obs.	82,994	82,994	82,994
R <sup>2</sup> within	0.024	0.024	0.024
R <sup>2</sup> overall	0.019	0.018	0.018
R <sup>2</sup> between	0.020	0.019	0.019
Controls	YES	YES	YES
Individual FE	YES	YES	YES
Year dummies	YES	YES	YES
Constant	YES	YES	YES
<b>Wald tests</b>			
<i>benefit benefit × female</i>	11.78 (2)***		
<i>benefit benefit × sme</i>		11.08 (2)***	
<i>benefit benefit × agriculture</i>			0.94 (2)
<i>benefit benefit × energy</i>			0.65 (2)
<i>benefit benefit × mining</i>			0.62 (2)
<i>benefit benefit × manufacturing</i>			12.99 (2)***
<i>benefit benefit × construction</i>			2.42 (2)*
<i>benefit benefit × trade</i>			3.64 (2)**
<i>benefit benefit × transport</i>			0.61 (2)
<i>benefit benefit × bankInsurance</i>			1.59 (2)
<i>benefit benefit × otherIndustry</i>			0.73 (2)
<b>Linear combinations of parameters</b>			
<i>benefit + benefit × female</i>	6.28 (3.67)*		
<i>benefit + benefit × sme</i>		17.11 (4.28)***	
<i>benefit + benefit × agriculture</i>			29.23 (33.85)

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Variables	Dependent variable: <i>workEffort</i>		
	Sex	Firm size	Industry
<i>benefit + benefit × energy</i>			6.28 (17.15)
<i>benefit + benefit × mining</i>			9.93 (44.03)
<i>benefit + benefit × manufacturing</i>			22.89 (4.56)***
<i>benefit + benefit × construction</i>			25.29 (13.10)*
<i>benefit + benefit × trade</i>			18.11 (7.21)**
<i>benefit + benefit × transport</i>			2.31 (12.85)
<i>benefit + benefit × bankInsurance</i>			14.56 (10.23)
<i>benefit + benefit × otherIndustry</i>			-3.90 (11.24)

**Notes.** The table shows the results of fixed effects regressions. The values in parentheses represent robust standard errors clustered at the individual level. The specifications include the same control variables as the corresponding main Model 1. The coefficients for interaction terms with the variable *benefit* and dummy variables representing various subgroups are reported. The variable *sme* is a dummy for small and medium-sized enterprises, indicating firm size. Wald tests for joint significance are reported, showing the F-statistic and degrees of freedom in brackets. For the type of industry, the *services* sector serves as reference. For linear combinations of parameters, point estimates and standard errors are reported.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Table A.5 Subsample analysis for Model 3

Variables	Dependent variable: <i>workEffort</i>		
	Sex	Firm size	Industry
<i>meal</i>	-2.81 (4.91)	-3.86 (3.83)	-9.67* (5.66)
<i>car</i>	53.78*** (10.30)	64.91*** (12.69)	40.12** (16.23)
<i>phone</i>	26.68*** (6.90)	13.70* (7.31)	20.87** (9.83)
<i>expenses</i>	36.44*** (11.62)	23.76* (12.50)	35.50** (17.18)
<i>computer</i>	16.83** (8.17)	16.68** (7.82)	14.04 (10.34)
<i>ln(income)</i>	74.22*** (5.23)	74.19*** (5.23)	74.25*** (5.24)
<i>additionalPay</i>	4.00 (3.19)	3.94 (3.19)	4.05 (3.19)
<i>bonus</i>	21.44*** (2.97)	21.41*** (2.97)	21.54*** (2.97)
<i>flexible</i>	28.92*** (2.95)	28.85*** (2.95)	28.71*** (2.95)
<i>sme</i>	7.15* (3.74)	5.04 (3.92)	7.42** (3.74)
<i>agriculture</i>	55.59*** (18.67)	56.07*** (18.65)	52.96*** (19.02)
<i>energy</i>	-6.70 (13.47)	-6.23 (13.45)	-12.78 (15.57)
<i>mining</i>	5.95 (34.06)	5.49 (33.94)	13.01 (34.72)
<i>manufacturing</i>	-9.91 (6.47)	-9.78 (6.46)	-16.47** (6.73)
<i>construction</i>	26.12*** (9.52)	26.69*** (9.51)	23.34** (10.11)
<i>trade</i>	0.00 (6.82)	0.11 (6.82)	-4.34 (7.12)
<i>transport</i>	25.51*** (9.81)	25.35*** (9.81)	23.50** (10.72)
<i>bankInsurance</i>	10.48 (13.32)	10.30 (13.33)	2.90 (13.69)
<i>otherIndustry</i>	10.53* (10.53)	10.63* (10.63)	11.63* (11.63)

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Variables	Dependent variable: <i>workEffort</i>		
	Sex	Firm size	Industry
	(5.87)	(5.88)	(6.47)
<i>meal</i> × <i>female</i>	1.57		
	(6.85)		
<i>car</i> × <i>female</i>	-9.41		
	(23.46)		
<i>phone</i> × <i>female</i>	-8.77		
	(13.60)		
<i>expenses</i> × <i>female</i>	2.98		
	(21.41)		
<i>computer</i> × <i>female</i>	-9.42		
	(14.68)		
<i>meal</i> × <i>sme</i>		7.58	
		(6.90)	
<i>car</i> × <i>sme</i>		-24.31	
		(16.20)	
<i>phone</i> × <i>sme</i>		25.68**	
		(10.93)	
<i>expenses</i> × <i>sme</i>		32.16	
		(20.42)	
<i>computer</i> × <i>sme</i>		-6.26	
		(13.64)	
<i>meal</i> × <i>agriculture</i>			0.36
			(34.28)
<i>car</i> × <i>agriculture</i>			-40.72
			(76.64)
<i>phone</i> × <i>agriculture</i>			-33.93
			(50.75)
<i>expenses</i> × <i>agriculture</i>			168.32
			(119.04)
<i>computer</i> × <i>agriculture</i>			56.47
			(68.25)
<i>meal</i> × <i>energy</i>			13.75
			(18.74)
<i>car</i> × <i>energy</i>			57.15
			(43.04)
<i>phone</i> × <i>energy</i>			-21.38
			(20.91)
<i>expenses</i> × <i>energy</i>			54.48
			(65.27)
<i>computer</i> × <i>energy</i>			8.79
			(34.06)
<i>meal</i> × <i>mining</i>			30.57
			(58.31)
<i>car</i> × <i>mining</i>			244.13*
			(126.76)
<i>phone</i> × <i>mining</i>			5.45
			(52.83)
<i>expenses</i> × <i>mining</i>			-180.45***
			(41.64)
<i>computer</i> × <i>mining</i>			-301.85**
			(127.58)
<i>meal</i> × <i>manufacturing</i>			12.14
			(7.47)
<i>car</i> × <i>manufacturing</i>			29.11
			(20.67)
<i>phone</i> × <i>manufacturing</i>			10.58
			(13.81)
<i>expenses</i> × <i>manufacturing</i>			17.85
			(24.43)
<i>computer</i> × <i>manufacturing</i>			-6.62
			(15.21)
<i>meal</i> × <i>construction</i>			7.14
			(22.50)
<i>car</i> × <i>construction</i>			-24.89

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Variables	Dependent variable: <i>workEffort</i>		
	Sex	Firm size	Industry
			(25.32)
<i>phone</i> × <i>construction</i>			27.41
			(20.23)
<i>expenses</i> × <i>construction</i>			-16.86
			(36.26)
<i>computer</i> × <i>construction</i>			25.58
			(31.85)
<i>meal</i> × <i>trade</i>			23.05**
			(10.84)
<i>car</i> × <i>trade</i>			12.48
			(24.46)
<i>phone</i> × <i>trade</i>			-13.06
			(24.12)
<i>expenses</i> × <i>trade</i>			-22.60
			(29.61)
<i>computer</i> × <i>trade</i>			2.77
			(23.39)
<i>meal</i> × <i>transport</i>			-11.47
			(17.18)
<i>car</i> × <i>transport</i>			35.79
			(41.49)
<i>phone</i> × <i>transport</i>			-12.29
			(20.78)
<i>expenses</i> × <i>transport</i>			-4.81
			(36.24)
<i>computer</i> × <i>transport</i>			53.67*
			(31.05)
<i>meal</i> × <i>bankInsurance</i>			10.48
			(13.05)
<i>car</i> × <i>bankInsurance</i>			76.50
			(47.58)
<i>phone</i> × <i>bankInsurance</i>			15.23
			(28.17)
<i>expenses</i> × <i>bankInsurance</i>			-40.57
			(46.60)
<i>computer</i> × <i>bankInsurance</i>			-10.89
			(22.33)
<i>meal</i> × <i>otherIndustry</i>			11.08
			(11.31)
<i>car</i> × <i>otherIndustry</i>			-16.07
			(46.97)
<i>phone</i> × <i>otherIndustry</i>			-12.16
			(29.20)
<i>expenses</i> × <i>otherIndustry</i>			-26.77
			(37.63)
<i>computer</i> × <i>otherIndustry</i>			-53.61
			(39.09)
Obs.	82,994	82,994	82,994
R <sup>2</sup> within	0.026	0.026	0.027
R <sup>2</sup> overall	0.026	0.026	0.027
R <sup>2</sup> between	0.029	0.029	0.029
Controls	YES	YES	YES
Individual FE	YES	YES	YES
Year dummies	YES	YES	YES
Constant	YES	YES	YES

**Notes.** The table shows the results of fixed effects regressions. The values in parentheses represent robust standard errors clustered at the individual level. The specifications include the same control variables as the corresponding main Model 3. The coefficients for interaction terms with the benefits type variables and dummy variables representing various subgroups are reported. The variable *sme* is a dummy for small and medium-sized enterprises, indicating firm size. For the type of industry, the *services* sector serves as reference.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Table A.6 Lagged dependent variable model

Variables	Dependent variable: <i>workEffort</i>								
	Model 1			Model 2			Model 3		
	FE	LDV	FE-LDV	FE	LDV	FE-LDV	FE	LDV	FE-LDV
<i>lagWorkEffort</i>		0.49*** (0.01)	0.06*** (0.01)		0.49*** (0.01)	0.06*** (0.01)		0.49*** (0.01)	0.06*** (0.01)
<i>benefit</i>	10.64*** (2.99)	15.32*** (2.33)	10.00*** (2.96)						
<i>benefits1</i>				6.72** (3.02)	5.42** (2.42)	6.20** (3.00)			
<i>benefits2</i>				27.40*** (5.68)	31.05*** (4.86)	26.15*** (5.64)			
<i>benefits3</i>				43.83*** (9.80)	62.28*** (7.78)	42.48*** (9.73)			
<i>benefits4</i>				76.94*** (16.96)	91.87*** (13.29)	74.43*** (16.73)			
<i>benefits5</i>				95.94*** (34.18)	149.15*** (32.06)	97.30*** (34.25)			
<i>meal</i>							-1.54 (3.70)	-6.53** (2.68)	-1.83 (3.67)
<i>car</i>							40.16*** (10.12)	59.74*** (6.84)	38.17*** (9.99)
<i>phone</i>							24.34*** (6.41)	22.09*** (5.53)	23.85*** (6.34)
<i>expenses</i>							39.84*** (10.64)	62.55*** (9.22)	39.73*** (10.54)
<i>computer</i>							16.19** (7.25)	12.91** (6.16)	15.35** (7.19)
<i>ln(income)</i>	79.63*** (6.11)	70.75*** (3.26)	78.41*** (6.11)	78.77*** (6.12)	66.39*** (3.29)	77.58*** (6.12)	78.17*** (6.11)	64.55*** (3.28)	77.00*** (6.11)
<i>additionalPay</i>	3.05 (3.42)	-14.53*** (2.61)	2.97 (3.39)	2.98 (3.41)	-14.07*** (2.62)	2.91 (3.39)	3.18 (3.41)	-13.26*** (2.63)	3.10 (3.39)
<i>bonus</i>	20.36*** (3.20)	29.15*** (2.48)	20.06*** (3.19)	20.28*** (3.20)	30.63*** (2.48)	19.98*** (3.19)	20.32*** (3.20)	31.57*** (2.47)	20.01*** (3.18)
<i>flexible</i>	27.92*** (3.12)	29.22*** (2.19)	26.63*** (3.08)	27.66*** (3.11)	28.09*** (2.19)	26.38*** (3.08)	27.42*** (3.11)	27.87*** (2.18)	26.16*** (3.08)
Obs.	69,000	69,000	69,000	69,000	69,000	69,000	69,000	69,000	69,000
R <sup>2</sup>	0.024	0.349	0.027	0.025	0.351	0.028	0.026	0.353	0.029
LDV	NO	YES	YES	NO	YES	YES	NO	YES	YES
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Individual	YES	NO	YES	YES	NO	YES	YES	NO	YES
FE									
Year	YES	YES	YES	YES	YES	YES	YES	YES	YES
dum-									
mies									
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES

**Notes.** The table shows the results of three specifications: fixed effects model (FE) regressions, lagged dependent variable (LDV) model regressions, and models that include both FE and a LDV (FE-LDV). The values in parentheses represent robust standard errors clustered at the individual level. Dependent variable is work effort measured as the difference between actual and contractual working hours (in minutes). Work effort of the previous reported year is included (*lagWorkEffort*) in the LDV and FE-LDV models. The original FE models are re-estimated based on the same sample as the LDV and FE-LDV models – excluding observations where the lagged work effort was not available. The specifications include the same control variables as the corresponding original models.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.



**Table A.7** Estimation results with corrected work effort

Variables	Dependent variable: <i>workEffort</i>								
	Model 1			Model 2			Model 3		
	100% of reported	95% actual working hours	90% actual working hours	100% of reported	95% actual working hours	90% actual working hours	100% of reported	95% actual working hours	90% actual working hours
<i>benefit</i>	12.73*** (2.77)	12.16*** (2.64)	11.58*** (2.52)						
<i>benefits1</i>				9.12*** (2.81)	8.68*** (2.68)	8.25*** (2.55)			
<i>benefits2</i>				27.30*** (5.27)	26.16*** (5.03)	25.02*** (4.79)			
<i>benefits3</i>				45.65*** (8.95)	43.68*** (8.54)	41.71*** (8.13)			
<i>benefits4</i>				73.49*** (15.97)	70.70*** (15.29)	67.90*** (14.63)			
<i>benefits5</i>				97.41*** (30.47)	93.01*** (28.97)	88.62*** (27.49)			
<i>meal</i>							-2.05 (3.45)	-1.83 (3.29)	-1.62 (3.13)
<i>car</i>							51.72*** (9.34)	49.42*** (8.91)	47.11*** (8.50)
<i>phone</i>							24.69*** (5.94)	23.77*** (5.66)	22.85*** (5.39)
<i>expenses</i>							37.32*** (9.83)	35.17*** (9.39)	33.01*** (8.97)
<i>computer</i>							13.64** (6.80)	13.19** (6.48)	12.73** (6.17)
<i>ln(income)</i>	75.74*** (5.24)	59.66*** (4.92)	43.58*** (4.65)	74.89*** (5.24)	58.84*** (4.92)	42.79*** (4.65)	74.21*** (5.23)	58.19*** (4.91)	42.16*** (4.65)
<i>additionalPay</i>	3.79 (3.19)	3.88 (3.05)	3.98 (2.91)	3.72 (3.19)	3.82 (3.05)	3.92 (2.91)	4.01 (3.19)	4.10 (3.04)	4.18 (2.90)
<i>bonus</i>	21.31*** (2.98)	20.66*** (2.84)	20.01*** (2.70)	21.27*** (2.98)	20.62*** (2.84)	19.97*** (2.70)	21.49*** (2.97)	20.83*** (2.83)	20.16*** (2.70)
<i>flexible</i>	29.43*** (2.96)	28.04*** (2.83)	26.65*** (2.70)	29.17*** (2.95)	27.79*** (2.82)	26.41*** (2.69)	28.91*** (2.95)	27.54*** (2.82)	26.17*** (2.69)
Obs.	82,994	82,994	82,994	82,994	82,994	82,994	82,994	82,994	82,994
R <sup>2</sup> within	0.024	0.027	0.033	0.025	0.027	0.034	0.026	0.029	0.036
R <sup>2</sup> overall	0.018	0.012	0.013	0.021	0.015	0.015	0.026	0.019	0.020
R <sup>2</sup> between	0.019	0.010	0.009	0.022	0.013	0.012	0.028	0.018	0.016
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES

**Notes.** The table shows the results of fixed effects regressions. The values in parentheses represent robust standard errors clustered at the individual level. The specifications include the same control variables as the corresponding main models. The models consider overestimation of actual working time using corrected indicators of work effort, according to [Robinson et al. \(2011\)](#).

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Table A.8 Estimation results with alternative dependent variables for Model 1

Variables	Dependent variable: <i>Work leave</i>				Dependent variable: <i>Work-related satisfaction</i>				Dependent variable: <i>Non-standard working hours</i>				Dependent variable: <i>Others</i>			
	Sick	Child	Care	Other	Work	Wage	Evening	Night	Saturday	Sunday	Overtime	Job worries	Hourly wage			
<i>benefit</i>	-0.55** (0.25)	-0.03 (0.02)	0.02 (0.03)	-0.03 (0.09)	0.11*** (0.02)	0.09*** (0.02)	0.03** (0.01)	-0.00 (0.01)	0.02* (0.01)	0.02** (0.01)	0.22*** (0.03)	-0.01*** (0.00)	2.00*** (0.73)			
<i>ln(income)</i>	-3.01*** (0.66)	0.01 (0.04)	0.06 (0.04)	-0.13 (0.13)	0.21*** (0.03)	1.00*** (0.04)	0.06** (0.02)	0.03 (0.02)	0.04* (0.02)	0.05** (0.02)	0.86*** (0.06)	-0.01 (0.01)				
<i>additionalPay</i>	-1.87*** (0.37)	0.12*** (0.03)	-0.09* (0.05)	-0.33*** (0.12)	0.11*** (0.02)	0.18*** (0.02)	0.00 (0.01)	-0.00 (0.01)	0.02 (0.01)	0.01 (0.01)	-0.00 (0.04)	-0.03*** (0.01)	2.33*** (0.80)			
<i>bonus</i>	-1.71*** (0.30)	0.07*** (0.02)	-0.00 (0.02)	0.07 (0.10)	0.05** (0.02)	0.11*** (0.02)	0.08*** (0.01)	0.07*** (0.01)	0.07*** (0.01)	0.07*** (0.01)	0.43*** (0.04)	-0.01*** (0.00)	1.58*** (0.51)			
<i>flexible</i>	0.07 (0.31)	0.03 (0.03)	-0.05 (0.04)	-0.07 (0.11)	-0.04** (0.02)	-0.01 (0.02)	0.09*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.28*** (0.03)	-0.01* (0.00)	0.65 (0.42)			
Obs.	82,992	70,470	50,768	70,456	81,844	82,625	19,944	19,729	19,992	19,700	82,624	82,275	82,994			
R <sup>2</sup> within	0.011	0.009	0.001	0.002	0.034	0.058	0.033	0.020	0.024	0.024	0.023	0.046	0.055			
R <sup>2</sup> overall	0.010	0.000	0.000	0.000	0.011	0.130	0.035	0.042	0.023	0.011	0.043	0.007	0.022			
R <sup>2</sup> between	0.017	0.000	0.000	0.001	0.007	0.162	0.036	0.043	0.022	0.011	0.056	0.003	0.026			
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			
Individual FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			

**Notes.** The table presents results from fixed effects regressions. Robust standard errors clustered at the individual level are reported in parentheses. The dependent variables span the following domains:

*Work leave:* Number of days absent due to sickness, child care, caregiving for relatives, and other reasons.

*Work-related satisfaction:* Satisfaction with work and satisfaction with wage, ranging from 0 to 10.

*Non-standard working hours:* Binary variables indicating working evenings, nights, Saturdays, and Sundays.

*Other work outcomes:* Self-reported overtime hours, a binary variable indicating job security worries, and hourly gross wage.

Individuals with only one observation for the dependent variable are excluded. All specifications include the same set of control variables as the corresponding main model. For the model with the logarithm of hourly wage as dependent variable, the logarithm of monthly gross wage is excluded from the independent variables.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Table A.9 Estimation results with alternative dependent variables for Model 2

Variables	Dependent variable: <i>Work leave</i>				Dependent variable: <i>Work-related satisfaction</i>				Dependent variable: <i>Non-standard working hours</i>				Dependent variable: <i>Others</i>			
	Sick	Child	Care	Other	Work	Wage	Evening	Night	Saturday	Sunday	Overtime	Job worries	Hourly wage			
<i>benefits1</i>	-0.52** (0.26)	-0.03 (0.02)	0.02 (0.03)	-0.06 (0.09)	0.09** (0.02)	0.08*** (0.02)	0.02** (0.01)	-0.00 (0.01)	0.02* (0.01)	0.03** (0.01)	0.18*** (0.03)	-0.01*** (0.00)	1.83** (0.79)			
<i>benefits2</i>	-0.83** (0.35)	-0.00 (0.04)	-0.02 (0.04)	0.19 (0.19)	0.20** (0.03)	0.15*** (0.03)	0.07*** (0.02)	0.02 (0.02)	0.00 (0.02)	0.02 (0.02)	0.31*** (0.07)	-0.02** (0.01)	2.63*** (0.87)			
<i>benefits3</i>	-0.34 (0.59)	-0.06 (0.06)	0.07 (0.06)	-0.08 (0.15)	0.31*** (0.05)	0.24*** (0.04)	0.02 (0.04)	-0.03 (0.04)	0.03 (0.04)	0.01 (0.04)	0.64*** (0.11)	-0.04*** (0.01)	3.56*** (1.22)			
<i>benefits4</i>	-0.99 (0.66)	-0.11 (0.09)	0.05 (0.04)	-0.10 (0.18)	0.35*** (0.07)	0.31*** (0.06)	0.13** (0.07)	0.06 (0.05)	0.05 (0.07)	0.04 (0.06)	0.87*** (0.21)	-0.01 (0.02)	5.28** (2.37)			
<i>benefits5</i>	0.23 (1.96)	0.13 (0.13)	0.03 (0.04)	-0.19 (0.41)	0.35** (0.14)	0.38*** (0.11)	0.01 (0.06)	0.13 (0.13)	0.08 (0.12)	0.01 (0.08)	0.94** (0.43)	0.02 (0.03)	6.68 (4.16)			
<i>ln(income)</i>	-3.01*** (0.66)	0.01 (0.04)	0.06 (0.04)	-0.14 (0.13)	0.20*** (0.03)	1.00*** (0.04)	0.06** (0.02)	0.03 (0.02)	0.04* (0.02)	0.05** (0.02)	0.86*** (0.06)	-0.01 (0.01)				
<i>additionalPay</i>	-1.87*** (0.37)	0.12*** (0.03)	-0.09* (0.05)	-0.33*** (0.12)	0.11*** (0.02)	0.18*** (0.02)	0.00 (0.01)	-0.00 (0.01)	0.02 (0.01)	0.01 (0.01)	-0.00 (0.03)	-0.03*** (0.01)	2.32*** (0.80)			
<i>bonus</i>	-1.71*** (0.30)	0.07*** (0.02)	-0.00 (0.02)	0.07 (0.10)	0.05** (0.02)	0.11*** (0.02)	0.08*** (0.01)	0.07*** (0.01)	0.07*** (0.01)	0.07*** (0.01)	0.43*** (0.04)	-0.01*** (0.00)	1.58*** (0.51)			
<i>flexible</i>	0.07 (0.31)	0.03 (0.03)	-0.05 (0.04)	-0.07 (0.11)	-0.04** (0.02)	-0.01 (0.02)	0.09*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.28*** (0.03)	-0.01* (0.00)	0.64 (0.42)			
Obs.	82,992	70,470	50,768	70,456	81,844	82,625	19,944	19,729	19,992	19,700	82,624	82,275	82,994			
R <sup>2</sup> within	0.011	0.009	0.001	0.002	0.035	0.058	0.035	0.021	0.024	0.024	0.024	0.046	0.055			
R <sup>2</sup> overall	0.010	0.000	0.000	0.000	0.011	0.131	0.036	0.043	0.023	0.011	0.047	0.007	0.023			
R <sup>2</sup> between	0.017	0.000	0.000	0.001	0.007	0.163	0.037	0.043	0.022	0.011	0.062	0.003	0.027			
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			
Individual FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			

**Notes.** The table presents results from fixed effects regressions. Robust standard errors clustered at the individual level are reported in parentheses. The dependent variables span the following domains:

*Work leave:* Number of days absent due to sickness, child care, caregiving for relatives, and other reasons.

*Work-related satisfaction:* Satisfaction with work and satisfaction with wage, ranging from 0 to 10.

*Non-standard working hours:* Binary variables indicating working evenings, nights, Saturdays, and Sundays.

*Other work outcomes:* Self-reported overtime hours, a binary variable indicating job security worries, and hourly gross wage.

Individuals with only one observation for the dependent variable are excluded. All specifications include the same set of control variables as the corresponding main model. For the model with the logarithm of hourly wage as dependent variable, the logarithm of monthly gross wage is excluded from the independent variables.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Table A.10 Estimation results with alternative dependent variables for Model 3

Variables	Dependent variable: <i>Work leave</i>				Dependent variable: <i>Work-related satisfaction</i>				Dependent variable: <i>Non-standard working hours</i>				Dependent variable: <i>Others</i>			
	Sick	Child	Care	Other	Work	Wage	Evening	Night	Saturday	Sunday	Overtime	Job worries	Hourly wage			
<i>meal</i>	-0.31 (0.30)	-0.04 (0.03)	0.04 (0.03)	-0.14 (0.09)	0.11*** (0.02)	0.08*** (0.02)	0.02 (0.02)	-0.01 (0.01)	0.00 (0.02)	0.01 (0.01)	0.04 (0.04)	-0.01 (0.01)	1.08** (0.49)			
<i>car</i>	-1.16** (0.55)	-0.03 (0.05)	0.01 (0.03)	0.01 (0.12)	0.10* (0.05)	0.03 (0.04)	0.08* (0.04)	-0.03 (0.03)	0.09*** (0.03)	0.00 (0.04)	0.59*** (0.11)	-0.01 (0.01)	3.42*** (1.03)			
<i>phone</i>	-0.86** (0.40)	-0.00 (0.04)	-0.03 (0.05)	-0.02 (0.18)	0.03 (0.03)	0.08*** (0.03)	0.02 (0.03)	0.03 (0.03)	-0.03 (0.03)	0.05** (0.03)	0.29*** (0.07)	-0.01 (0.01)	2.62** (1.11)			
<i>expenses</i>	0.11 (0.53)	0.06 (0.05)	-0.08 (0.08)	-0.13 (0.11)	0.21*** (0.05)	0.20*** (0.04)	0.01 (0.04)	-0.03 (0.03)	-0.01 (0.04)	-0.01 (0.04)	0.40*** (0.12)	0.00 (0.01)	-1.10 (0.92)			
<i>computer</i>	0.14 (0.45)	-0.06 (0.05)	-0.02 (0.07)	0.01 (0.14)	0.09** (0.03)	0.10*** (0.03)	0.05* (0.03)	0.03 (0.02)	0.09*** (0.03)	0.01 (0.03)	0.12 (0.08)	-0.01 (0.01)	1.11 (1.17)			
<i>ln(income)</i>	-2.99*** (0.67)	0.01 (0.04)	0.06 (0.04)	-0.13 (0.13)	0.20*** (0.03)	1.00*** (0.04)	0.05** (0.02)	0.03 (0.02)	0.04* (0.02)	0.05** (0.02)	0.85*** (0.06)	-0.01 (0.01)				
<i>additionalPay</i>	-1.88*** (0.37)	0.12*** (0.03)	-0.09* (0.05)	-0.32*** (0.12)	0.11*** (0.02)	0.18*** (0.02)	0.00 (0.01)	-0.00 (0.01)	0.02 (0.01)	0.01 (0.01)	0.00 (0.03)	-0.03*** (0.01)	2.35*** (0.82)			
<i>bonus</i>	-1.72*** (0.30)	0.07*** (0.02)	-0.00 (0.02)	0.07 (0.10)	0.05** (0.02)	0.11*** (0.02)	0.08*** (0.01)	0.07*** (0.01)	0.07*** (0.01)	0.06*** (0.01)	0.44*** (0.04)	-0.01*** (0.00)	1.62*** (0.50)			
<i>flexible</i>	0.07 (0.31)	0.03 (0.03)	-0.05 (0.04)	-0.07 (0.11)	-0.04** (0.02)	-0.01 (0.02)	0.09*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.27*** (0.03)	-0.01* (0.00)	0.64 (0.43)			
Obs.	82,992	70,470	50,768	70,456	81,844	82,625	19,944	19,729	19,992	19,700	82,624	82,275	82,994			
R <sup>2</sup> within	0.011	0.009	0.001	0.002	0.035	0.059	0.034	0.021	0.026	0.024	0.025	0.046	0.055			
R <sup>2</sup> overall	0.010	0.000	0.000	0.000	0.011	0.130	0.038	0.041	0.023	0.012	0.053	0.007	0.024			
R <sup>2</sup> between	0.018	0.000	0.000	0.001	0.007	0.163	0.038	0.042	0.022	0.011	0.070	0.003	0.028			
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			
Individual FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES			

**Notes.** The table presents results from fixed effects regressions. Robust standard errors clustered at the individual level are reported in parentheses. The dependent variables span the following domains:

*Work leave:* Number of days absent due to sickness, child care, caregiving for relatives, and other reasons.

*Work-related satisfaction:* Satisfaction with work and satisfaction with wage, ranging from 0 to 10.

*Non-standard working hours:* Binary variables indicating working evenings, nights, Saturdays, and Sundays.

*Other work outcomes:* Self-reported overtime hours, a binary variable indicating job security worries, and hourly gross wage.

Individuals with only one observation for the dependent variable are excluded. All specifications include the same set of control variables as the corresponding main model. For the model with the logarithm of hourly wage as dependent variable, the logarithm of monthly gross wage is excluded from the independent variables.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

**Table A.11** Estimation results with additional control variables

Variables	Dependent variable: <i>workEffort</i>		
	Model 1	Model 2	Model 3
<i>benefit</i>	13.76*** (2.82)		
<i>benefits1</i>		9.89*** (2.86)	
<i>benefits2</i>		30.36*** (5.35)	
<i>benefits3</i>		46.68*** (9.06)	
<i>benefits4</i>		76.70*** (16.31)	
<i>benefits5</i>		99.94*** (30.93)	
<i>meal</i>			-0.97 (3.48)
<i>car</i>			53.50*** (9.48)
<i>phone</i>			26.24*** (6.01)
<i>expenses</i>			35.68*** (9.88)
<i>computer</i>			13.72** (6.88)
<i>ln(income)</i>	78.71*** (5.37)	77.82*** (5.37)	77.14*** (5.36)
<i>additionalPay</i>	4.77 (3.24)	4.71 (3.24)	5.06 (3.24)
<i>bonus</i>	22.68*** (3.00)	22.63*** (3.00)	22.85*** (2.99)
<i>flexible</i>	29.09*** (2.99)	28.81*** (2.98)	28.56*** (2.98)
<i>workSatisfaction</i>	-6.19*** (0.71)	-6.27*** (0.71)	-6.27*** (0.71)
<i>jobSecurityConcerns</i>	-4.77** (2.40)	-4.75** (2.40)	-4.71** (2.39)
Obs.	81,146	81,146	81,146
R <sup>2</sup> within	0.026	0.027	0.028
R <sup>2</sup> overall	0.019	0.023	0.028
R <sup>2</sup> between	0.021	0.025	0.031
Controls	YES	YES	YES
Individual FE	YES	YES	YES
Year dummies	YES	YES	YES
Constant	YES	YES	YES

**Notes.** The table shows the results of fixed effects regressions. The values in parentheses represent standard errors clustered at the individual level. Dependent variable is work effort measured as the difference between actual and contractual working hours (in minutes). The dummy variable *benefit* equals 1 if one or more benefits are received. In Model 2 dummy variables for the number of benefits are included, ranging from 1 to 5 or more benefits. In Model 3 dummy variables for the types of benefits are included. *ln(income)* stands for the logarithm of income before taxes. Two dummy variables for additional payments as well as a dummy variable for flexible working time arrangements are included. Job characteristics include variables for job change and position (Reference: *manager*). Personnel characteristics include variables for age, marital status, risk-tolerance and children. Organizational characteristics include the region (*western*), a dummy variable for firm size and the type of industry (Reference: *services*). In addition, a categorical variable to control for job satisfaction and a dummy variable for job security concerns is included.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

**Table A.12** Accounting for contractual working hours

Variables	Dependent variable: <i>workEffort</i>		
	Model 1	Model 2	Model 3
<i>benefit</i>	12.55*** (2.76)		
<i>benefits1</i>		9.05*** (2.80)	
<i>benefits2</i>		26.58*** (5.25)	
<i>benefits3</i>		44.68*** (8.87)	
<i>benefits4</i>		70.76*** (15.65)	
<i>benefits5</i>		95.93*** (30.51)	
<i>meal</i>			-2.40 (3.43)
<i>car</i>			50.83*** (9.26)
<i>phone</i>			23.71*** (5.93)
<i>expenses</i>			38.21*** (9.70)
<i>computer</i>			12.94* (6.75)
<i>ln(income)</i>	114.21*** (6.47)	113.30*** (6.46)	112.61*** (6.44)
<i>additionalPay</i>	2.89 (3.18)	2.82 (3.18)	3.13 (3.18)
<i>bonus</i>	20.01*** (2.97)	19.97*** (2.97)	20.21*** (2.96)
<i>flexible</i>	29.17*** (2.94)	28.93*** (2.93)	28.67*** (2.93)
<i>contractualWorkHours</i>	-9.39*** (0.57)	-9.36*** (0.57)	-9.36*** (0.57)
Obs.	82,994	82,994	82,994
R <sup>2</sup> within	0.036	0.037	0.038
R <sup>2</sup> overall	0.018	0.021	0.025
R <sup>2</sup> between	0.016	0.019	0.024
Controls	YES	YES	YES
Individual FE	YES	YES	YES
Year dummies	YES	YES	YES
Constant	YES	YES	YES

**Notes.** The table shows the results of fixed effects regressions. The values in parentheses represent standard errors clustered at the individual level. Dependent variable is work effort measured as the difference between actual and contractual working hours (in minutes). The dummy variable *benefit* equals 1 if one or more benefits are received. In Model 2 dummy variables for the number of benefits are included, ranging from 1 to 5 or more benefits. In Model 3 dummy variables for the types of benefits are included. *ln(income)* stands for the logarithm of income before taxes. Two dummy variables for additional payments as well as a dummy variable for flexible working time arrangements are included. Job characteristics include variables for job change and position (Reference: *manager*). Personnel characteristics include variables for age, marital status, risk-tolerance and children. Organizational characteristics include the region (*western*), a dummy variable for firm size and the type of industry (Reference: *services*). In addition, contractual working hours are included as control variable.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

**Table A.13** Estimation results with alternative data selections

	Dependent variable: <i>workEffort</i>								
	Model 1			Model 2			Model 3		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
<i>benefit</i>	13.10*** (2.84)	18.57*** (3.32)	13.10*** (2.78)						
<i>benefits1</i>				9.54*** (2.89)	14.08*** (3.39)	8.91*** (2.85)			
<i>benefits2</i>				26.70*** (5.39)	33.73*** (5.84)	27.81*** (6.43)			
<i>benefits3</i>				47.97*** (9.18)	53.12*** (9.52)	58.82*** (13.24)			
<i>benefits4</i>				74.87*** (16.07)	78.05*** (16.41)	90.62*** (29.19)			
<i>benefits5</i>				93.49*** (31.27)	101.54*** (30.52)	155.10** (67.87)			
<i>meal</i>							-2.01 (3.54)	-3.78 (4.06)	-1.48 (3.51)
<i>car</i>							53.32*** (9.55)	53.36*** (9.60)	47.39*** (10.87)
<i>phone</i>							23.99*** (6.04)	27.79*** (6.28)	23.49*** (7.09)
<i>expenses</i>							36.92*** (9.87)	36.01*** (10.33)	46.99*** (13.09)
<i>computer</i>							15.23** (6.96)	18.07** (7.10)	21.76** (8.63)
<i>ln(income)</i>	76.77*** (5.40)	75.19*** (8.15)	87.79*** (8.04)	75.87*** (5.40)	73.61*** (8.12)	86.14*** (8.02)	75.14*** (5.40)	71.93*** (8.07)	85.06*** (7.99)
<i>additionalPay</i>	4.05 (3.25)	4.60 (4.01)	5.26 (4.62)	3.99 (3.25)	4.55 (4.01)	5.00 (4.62)	4.34 (3.25)	4.89 (4.00)	5.41 (4.61)
<i>bonus</i>	21.54*** (3.05)	21.70*** (3.53)	19.29*** (4.21)	21.50*** (3.05)	21.67*** (3.53)	19.16*** (4.21)	21.78*** (3.04)	22.19*** (3.51)	19.46*** (4.19)
<i>flexible</i>	29.84*** (3.05)	32.33*** (3.72)	32.91*** (4.24)	29.59*** (3.04)	31.99*** (3.71)	32.43*** (4.22)	29.31*** (3.04)	31.63*** (3.71)	32.04*** (4.21)
Obs.	79,051	59,191	38,978	79,051	59,191	38,978	79,051	59,191	38,978
R <sup>2</sup> within	0.023	0.025	0.031	0.024	0.027	0.033	0.025	0.028	0.034
R <sup>2</sup> overall	0.018	0.012	0.012	0.021	0.015	0.013	0.027	0.019	0.017
R <sup>2</sup> between	0.017	0.010	0.008	0.021	0.013	0.010	0.027	0.017	0.013
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES

**Notes.** The table shows the results of fixed effects regressions. The values in parentheses represent robust standard errors clustered at the individual level. The specifications include the same control variables as the corresponding main models using alternative data selections. Robustness checks include subsamples restricted to: (1) individuals aged 18–60, (2) full-time workers, excluding employees with contractual working hours of fewer than 35 hours per week, and (3) employees with variation in benefit receipt.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

**Table A.14** Comparison of excluded and included observations

	Included observations			Excluded observations			Difference
	Obs.	Mean	Std.Dev.	Obs.	Mean	Std.Dev.	
<i>workEffort</i>	82,994	195.23	296.21	24,742	174.90	385.65	-20.34 (3.05)***
<i>benefit</i>	82,994	0.32	0.47	24,742	0.32	0.47	-0.00 (0.00)
<i>benefitCount</i>	82,994	0.46	0.81	24,742	0.47	0.83	0.01 (0.01)
<i>ln(income)</i>	82,994	7.79	0.61	24,528	7.72	0.75	-0.08 (0.01)***
<i>additionalPay</i>	82,994	0.71	0.46	24,742	0.54	0.50	-0.16 (0.00)***
<i>bonus</i>	82,994	0.26	0.44	24,742	0.26	0.44	-0.00 (0.00)
<i>flexible</i>	82,994	0.58	0.49	13,234	0.55	0.50	-0.03 (0.01)***
<i>sme</i>	82,994	0.48	0.50	22,784	0.52	0.50	0.04 (0.00)***
<i>age</i>	82,994	44.41	10.39	24,742	39.32	11.63	-5.10 (0.11)***
<i>female</i>	82,994	0.50	0.50	24,735	0.48	0.50	-0.02 (0.01)***
<i>year2006</i>	82,994	0.06	0.25	24,742	0.10	0.29	0.03 (0.00)***
<i>year2008</i>	82,994	0.07	0.26	24,742	0.04	0.20	-0.03 (0.00)***
<i>year2010</i>	82,994	0.07	0.25	24,742	0.06	0.24	-0.01 (0.00)***
<i>year2012</i>	82,994	0.07	0.26	24,742	0.06	0.23	-0.02 (0.00)***
<i>year2014</i>	82,994	0.11	0.32	24,742	0.07	0.26	-0.04 (0.00)***
<i>year2015</i>	82,994	0.12	0.33	24,742	0.04	0.20	-0.08 (0.00)***
<i>year2016</i>	82,994	0.11	0.31	24,742	0.04	0.20	-0.07 (0.00)***
<i>year2017</i>	82,994	0.13	0.33	24,742	0.04	0.19	-0.09 (0.00)***
<i>year2018</i>	82,994	0.12	0.32	24,742	0.06	0.24	-0.05 (0.00)***
<i>year2020</i>	82,994	0.10	0.29	24,742	0.14	0.35	0.05 (0.00)***
<i>year2022</i>	82,994	0.04	0.20	24,742	0.35	0.48	0.30 (0.00)***

**Notes.** This table compares excluded and included observations. Exclusion is based on either missing values in key control variables or having only one observation across the entire panel period. The final column reports the estimated mean difference between excluded and included groups, based on linear regression. The values in parentheses represent standard errors clustered at the individual level.

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01.



**Table A.15** Variable description

Variable	Description
<b>Work effort and benefits</b>	
<i>workEffort</i>	Measure of work effort, calculated as the difference between actual and contractual weekly working hours (in minutes)
<i>lagWorkEffort</i>	Lagged work effort; based on work effort in the previous available year
<i>benefit</i>	Received at least one benefit (dummy variable)
<i>benefitCount</i>	Number of benefit types received; from 0 to 6
<i>benefits1</i>	Received exactly one benefit (dummy variable)
<i>benefits2</i>	Received exactly two benefits (dummy variable)
<i>benefits3</i>	Received exactly three benefits (dummy variable)
<i>benefits4</i>	Received exactly four benefits (dummy variable)
<i>benefits5</i>	Received five or more benefits (dummy variable)
<i>meal</i>	Received a meal stipend (dummy variable)
<i>car</i>	Received a company car (dummy variable)
<i>phone</i>	Received a company phone (dummy variable)
<i>expenses</i>	Received expense reimbursements (dummy variable)
<i>computer</i>	Received a personal computer (dummy variable)
<b>Income and compensation</b>	
<i>income</i>	Gross monthly income before taxes
<i>additionalPay</i>	Additional gross payments: 13th/14th salary, Christmas bonus, vacation pay, profit-sharing (dummy variable)
<i>bonus</i>	Shift bonus, weekend bonus, overtime pay, bonus for difficult work conditions or other bonuses (dummy variable)
<i>hourlyWage</i>	Calculated gross hourly wage (monthly income divided by actual working hours)
<b>Job characteristics and satisfaction</b>	
<i>flexible</i>	Flexible working hours (e.g., time accounts, self-determined schedules) (dummy variable)
<i>overtimeHours</i>	Self-reported average number of overtime hours worked per week
<i>jobChange</i>	Changed job or started a new one during last year (dummy variable)
<i>tenure</i>	Years with current employer
<i>blueCollar</i>	Employed in a blue-collar occupation (dummy variable)
<i>whiteCollar</i>	Employed in a white-collar occupation (dummy variable)
<i>manager</i>	Employed in a managerial or supervisory position (dummy variable)
<i>workSatisfaction</i>	Satisfaction with work; from 0 (dissatisfied) to 10 (satisfied)
<i>wageSatisfaction</i>	Satisfaction with personal income; from 0 (dissatisfied) to 10 (satisfied)
<i>jobSecurityConcerns</i>	Worried about job security (dummy variable)
<i>contractualWorkHours</i>	Contractual weekly working hours (in hours)
<i>actualWorkHours</i>	Actual weekly working hours (in hours)
<i>partTime</i>	Works less than 35 hours per work (dummy variable)
<i>evening work</i>	Works in the evening (between 7 p.m. and 10 p.m.) (dummy variable)
<i>nightWork</i>	Works at night (after 10 p.m.) (dummy variable)
<i>saturdayWork</i>	Works on Saturdays (dummy variable)
<i>sundayWork</i>	Works on Sundays (dummy variable)
<b>Organizational characteristics</b>	
<i>western</i>	Lives in Western Germany (dummy variable)
<i>sme</i>	Works in small and middle sized enterprise (dummy variable)
<b>Industry group dummies</b>	
<i>agriculture</i>	Agriculture, hunting, forestry, and fishing (dummy variable)
<i>energy</i>	Energy production and utility supply (dummy variable)
<i>mining</i>	Extraction of raw materials such as coal, oil, gas, stone, earth (dummy variable)
<i>manufacturing</i>	Manufacturing of food, textiles, chemicals, pharmaceuticals, rubber, plastics, vehicles, electronics, furniture, paper, glass, etc. (dummy variable)
<i>construction</i>	Construction (dummy variable)
<i>trade</i>	Wholesale and retail trade, hospitality (dummy variable)
<i>transport</i>	Transportation, logistics, telecommunication (dummy variable)
<i>bankInsurance</i>	Banking, finance, insurance (dummy variable)
<i>services</i>	Service industries such as education, health, public administration, real estate (dummy variable)
<i>otherIndustry</i>	Industries not covered by the other categories (dummy variable)
<b>Absences from work</b>	
<i>sickLeave</i>	Number of days off work due to sickness in the previous year
<i>childCareLeave</i>	Number of days off work due to child sickness in the previous year
<i>careLeave</i>	Number of days not worked due to care for a relative in the previous year
<i>otherLeave</i>	Number of days off work due to other reasons in the previous year

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Variable	Description
<b>Personnel characteristics</b>	
<i>female</i>	Gender is female (dummy variable)
<i>age</i>	Current age (in years)
<i>married</i>	Is married (dummy variable)
<i>riskAversion</i>	Risk aversion; from 0 (extremely risk averse) to 10 (risk seeking)
<i>child</i>	Lives with children in the household (dummy variable)
<b>Year dummies</b>	
<i>year2006</i>	Year 2006 (dummy variable)
<i>year2008</i>	Year 2008 (dummy variable)
<i>year2010</i>	Year 2010 (dummy variable)
<i>year2012</i>	Year 2012 (dummy variable)
<i>year2014</i>	Year 2014 (dummy variable)
<i>year2015</i>	Year 2015 (dummy variable)
<i>year2016</i>	Year 2016 (dummy variable)
<i>year2017</i>	Year 2017 (dummy variable)
<i>year2018</i>	Year 2018 (dummy variable)
<i>year2020</i>	Year 2020 (dummy variable)
<i>year2022</i>	Year 2022 (dummy variable)