DISCUSSION PAPER SERIES

Domestic Outsourcing and Worker Outcomes: Evidence from Staffing Firms

Maarten Goos
Anna Salomons
Bas Scheer
Wiljan Van Den Berge

Domestic Outsourcing and Worker Outcomes: Evidence from Staffing Firms

Maarten Goos
Tilburg University and Utrecht University

Anna Salomons
Tilburg University, Utrecht University and IZA

Bas Scheer
CPB Netherlands Bureau of Economic Policy Analysis

Wiljan Van Den Berge
Tilburg University, CPB Netherlands Bureau of Economic Policy Analysis and IZA

OCTOBER 2025

ABSTRACT

Domestic Outsourcing and Worker Outcomes: Evidence from Staffing Firms[*]

The rising incidence of alternative work arrangements, such as outsourcing, raises important questions about worker outcomes in such non-standard labor contracts. We study this question in the Netherlands, a country with a rapid rise in flexible labor contracts, using administrative employer-employee data from 2006--2019. To identify the causal impact of outsourcing, we take advantage of a legal arrangement called "payrolling", where workers hired by one firm are placed on a staffing firm's payroll while maintaining their job duties at the original firm. We find that outsourced workers experience worse labor market outcomes compared to a matched control group. These include persistently lower employment probability, lower hourly wage growth, a lower incidence of permanent contracts, and strikingly reduced pension contributions. This suggests that outsourcing erodes employment protection and job quality and leads to long-term scarring of labor market outcomes.

Corresponding author:
Wiljan van den Berge
CPB Netherlands Bureau for Economic Policy Analysis
P.O. Box 80510
2508 GM The Hague
The Netherlands
E-mail: w.van.den.berge@cpb.nl

1. Introduction

Modern-day labor markets are witnessing a growing incidence of non-standard contracts, including the use of outsourced labor hired through various intermediaries such as (sub)contractors, staffing firms, and temporary help agencies. This rise in these alternative work arrangements raises important questions about worker outcomes and labor market inequality (Mas and Pallais 2020, 2017; Weil 2014; Katz and Krueger 2019).

This paper provides novel causal evidence on these questions by leveraging a unique institutional setting in the Netherlands, a country characterized by one of the highest incidences of flexible labor contracts in the OECD. We focus on "payrolling", a legal framework that allows us to overcome common measurement and identification challenges in studying the causal impacts of alternative work arrangements.

Unlike typical outsourced or contracted labor, where the original firm-worker match can be lost in administrative data, payrolling ensures the continuity of the original match. Under this arrangement, a worker initially hired by and performing work for a client firm has their formal employment contract transferred to a third-party intermediary—a specialized staffing firm that becomes the worker's legal employer of record. Crucially, the worker continues their tasks at the original client firm's location. This distinct feature allows us to precisely track workers' outcomes after the outsourcing event, which is often infeasible in standard administrative datasets.[1] The intermediary staffing firms assume formal employer responsibilities, including payroll, pension contributions, and sickness benefits, while offering the client firm increased contractual and scheduling flexibility.

A key feature of this arrangement within our study's context is that, until 2020, these firms operated under a less stringent labor law regime than regular employers, similar to temporary help agencies. This facilitates a form of regulatory arbitrage for client firms seeking to reduce employment protection costs (e.g., severance pay or pensions). It is important to distinguish these firms from traditional temporary help agencies: in the Dutch context, staffing firms take over pre-existing worker-client relationships rather than providing recruitment or job matching services. For the remainder of this paper, we refer to this practice as 'outsourcing' and to the intermediary as a 'staffing firm'.[2]

---

[1]While our setting provides unique advantages, notable exceptions with similar tracking capabilities for temporary help agencies include Drenik et al. (2023) and Bergeaud et al. (2024).

[2]The specific institutional details of the Dutch payrolling context are further elaborated in Section 2.

We investigate the consequences of this outsourcing practice in the Netherlands, where such labor contracts have rapidly expanded. Our analysis employs rich quarterly administrative employer-employee data from 2006 to 2019, observing more than 25,000 transitions where workers were outsourced from a direct contract with their client firm to a staffing firm. For causal identification, we use a difference-in-differences event study methodology. To establish a credible counterfactual, we compare the outcomes of outsourced workers to a carefully matched control group of workers who remained directly employed at client firms that also engaged in outsourcing, albeit at a later time. This comparison strategy is designed to mitigate potential biases arising from firm-level selection into the use of outsourcing arrangements.

Our findings reveal significant and persistent negative consequences for outsourced workers. First, outsourced workers experience a substantial and lasting reduction in total wage earnings, decreasing by approximately 6.5% relative to the control group and preventing a return to their pre-outsourcing earnings growth path. This earnings deficit is largely driven by persistently higher rates of non-employment: outsourced workers are 3 to 4 percentage points more likely to be unemployed or reliant on benefits, indicating long-term labor market scarring likely due to weaker employment protections. Second, even among continuously employed workers, outsourcing leads to an immediate 2% reduction in hourly earnings relative to the control group, aligning with our finding that staffing firms offer lower firm-specific pay premiums (measured via AKM fixed effects), which fall by approximately 75 cents relative to controls. Third, outsourcing profoundly impacts job quality beyond wages. Outsourced workers are significantly less likely to secure permanent contracts (a 10 percentage point gap after three years) and face strikingly reduced pension contributions (an initial 80% drop). Although workers partially close these job quality gaps through job mobility away from the staffing firm (rather than improving conditions at the staffing agency itself), the long-term scarring effects on employment probability endure. We also identify important heterogeneities, with adverse effects exacerbated during recessions and disproportionately impacting older, male, and less educated individuals.

We contribute to the literature on alternative work arrangements in several ways. First, our unique institutional setting guarantees that workers continue performing the same duties at the original client firm post-outsourcing. This is an important advantage for causal identification over studies in which workers may change jobs or duties (e.g. Goldschmidt and Schmieder 2017; Drenik et al. 2023). This allows us to precisely identify the mechanisms driving adverse worker outcomes, highlighting that they primarily

stem from long-term lower employment rates and sharply deteriorated secondary employment conditions (such as contract type and pensions), rather than only hourly wage cuts (consistent with recent evidence in Daruich et al. 2024). Second, by studying a widely accessible form of outsourcing available to every firm in the Netherlands, our analysis covers a broader segment of the labor market than previous studies focusing on specific occupations such as cleaners or security guards (e.g. Dube and Kaplan 2010; Goldschmidt and Schmieder 2017; Felix and Wong 2021). We document that this type of outsourcing predominantly affects the low-wage labor market across various service sectors, including retail trade and accommodation services. Third, we apply a stacked difference-in-differences design exploiting the timing of outsourcing events at the firm level. This strategy addresses concerns about firm selection into using outsourcing.

The paper proceeds as follows. Section 2 outlines our data, including the Dutch institutional context of payrolling, and presents worker- and firm-level descriptive statistics. Section 3 explains our empirical approach, and Section 4 discusses our findings on the effect of outsourcing to a staffing firm for individual workers. Section 5 concludes.

2. Data and measurement

2.1. Institutional context

A dual labor market. The Dutch labor market is characterized by strong employment protection legislation (EPL) for regular ("open-ended") labor contracts, contrasting with weaker protections for temporary ("fixed-term") contracts, a common feature in many dual labor markets. For instance, dismissal of workers on permanent contracts typically requires agreement from the public employment office based on "reasonable cause" (e.g., long-term loss of work or inadequate performance), alongside mandatory severance pay. Firms also face a substantial obligation for sickness payments, covering 70% of wages for up to two years before dismissal can occur.

The incidence of temporary contracts has increased substantially in the Netherlands over the past decades (OECD 2019), partly driven by the 1998 regulation of temporary help contracts (Bolhaar, Zijl, and Scheer 2018). Temporary help agencies are allowed to offer workers more back-to-back temporary contracts and with a longer cumulative length— up to 5.5 years in total, as compared to 3 years (pre-2015) and 2 years (post-2015) for standard employment contracts. Additionally, workers hired through temporary help agencies can be dismissed without severance pay.

Payrolling. Payrolling is an intermediated work arrangement provided by specialized staffing firms. These firms act as the formal (*de jure*) employer of workers, while workers continue to perform their job duties at another firm (the *de facto* employer, or "client firm") that has hired the staffing firm.[3] Legally, payrolling is identical to temporary agency work in the period we study: both sectors fall under the same labor law and collective bargaining agreements. However, a critical distinction is that, unlike temporary help agencies, staffing companies offering payrolling do not match workers and firms (Zwemmer 2016): instead, they take over the formal employment contract for pre-existing worker-firm matches, thus placing the worker on their payroll, rather than the original firm's. Appendix A provides an excerpt of the relevant legal texts, including the legal definition of a staffing firm.

This unique feature of payrolling directly addresses a persistent identification challenge in the literature on alternative work arrangements, where linking workers to their actual job duties at the client firm is often impossible. Payrolling arrangements, by contrast, legally mandate that workers remain exclusively employed at the original firm while their employment contract is administered by a third-party staffing agency. This triangular arrangement enables precise identification of three key actors: the individual worker, the firm where productive activities occur (the client firm), and the staffing agency providing the employment contract. Since the client firm outsources only the legal employment relationship—not the actual work performance— to this third party, we refer to payrolled workers as outsourced workers throughout the paper.

The institutional similarities between payrolling and temporary help arrangements enhance the external validity of our findings. During our analysis period, employment protection legislation was identical for both payrolled and temporary help workers, suggesting that our results are also relevant to the broader temporary help sector, which covers more workers in the Netherlands and is also prevalent internationally.

2.2.   Data sources

We use administrative employer-employee records from Statistics Netherlands, covering the universe of workers and firms in the Netherlands over the period 2009–2019.[4] The

---

[3]It is crucial to distinguish Dutch payrolling firms from US payroll *processing* firms. In the US, the latter provide only an administrative function without altering the underlying employment relationship. In the Netherlands, payrolling involves outsourcing of the legal employment to a third party.

[4]While the data begin in 2006, firms primarily providing payrolling services can be distinctly identified using a specific sector code starting from 2009.

raw data measure all jobs at a monthly frequency, with each observation representing a unique worker-firm-month spell. To ensure stable time series and facilitate comparisons between contracts with varying pay periods (e.g. monthly versus four-weekly), we aggregate these monthly data to the quarterly level. For workers simultaneously holding multiple jobs, we retain the job that provides the main source of income in each quarter. Our main measure of wage income is total base earnings (i.e. excluding holiday payments, bonuses, and other incidental payments) across all jobs. All earnings are deflated using the CPI with 2015 as the base year.

Workers are classified into payrolling, temporary agency work, or other sectors based on their main employer's sector code.[5] We then supplement the employment records with administrative data on worker demographics (from municipal registrations), social security benefits, education level[6], and enrollment in education to distinguish students from non-students.

2.3.   The staffing sector and outsourcing events

The top panel of Figure 1 illustrates the rapid expansion of employment within Dutch payrolling firms ('staffing firms') between 2009–2019. Despite a modest overall size, the number of workers employed in these outsourced contracts has risen from 40,000 to around 120,000 workers annually over this decade. The bottom panel shows that the share of workers in these outsourced arrangements, as a share of total employment, rises from 0.6% to 1.3%; and that this share is higher and rising more strongly for young workers (aged 18–24) and those earning close to the minimum wage, reaching 3.8% and 5.1% respectively. Over the entire period, the number of workers employed in this type of staffing firm is around 14% of the number of workers employed in temporary help agencies.

Characteristics of outsourced workers. Table 1 presents the characteristics of workers employed in staffing firms, in temporary help agency firms, and all other firms. This highlights that workers employed in staffing firms and temporary help agencies

---

[5]The sector code we use is the so-called *Standaard Bedrijfsindeling 2008* (SBI 2008) from Statistics Netherlands. The first 4 digits of this classification fully align with NACE Rev.2, and the first 2 digits correspond to ISIC Rev.4. The sector code 7830 identifies firms providing payrolling services, while 7820 denotes temporary help agencies.

[6]Due to limitations in the administrative registrations, complete education level data are not available for all individuals. In particular, older and/or lower-educated workers are less likely to be observed in the education administration.

represent the bottom of the labor market. Their average hourly wages are 12.22 euros and 12.82 euros, respectively, substantially below the average hourly wage of 21.62 euros of workers in other firms. Workers in staffing firms and temporary help agencies hold smaller jobs, working 864 and 1,018 hours annually, respectively, compared to 1,507 hours annually for workers in other firms.

A striking feature is the prevalence of temporary contracts: nearly 90% of workers in staffing firms and temporary help agencies are on fixed-term contracts (with similar firm tenures of a little over a year), as opposed to only 28% for all other workers. Demographically, workers in staffing firms and temporary help agencies are also more likely to be younger, less educated, and to have a migration background. The share of first-generation migrants is especially high for workers in temporary help agencies: 45% compared to 13% in other firms.

Characteristics of staffing firms. Table 2 compares the characteristics of staffing firms providing payrolling services to those of temporary help agency firms and all other firms. Consistent with the worker-level characteristics, staffing firms pay lower annual and hourly wages on average. The staffing firm sector is characterized by relatively few, but large, firms.

Where do outsourced workers come from? An important advantage of the data is that we can identify outsourced workers by analyzing firm-to-firm flows. Specifically, we identify outsourced workers as those who move from a regular firm —i.e. not a staffing firm nor a temporary help agency — to a staffing firm without an intervening non-employment spell. Because these outsourced workers keep their original job duties, we can identify the firms from which outsourced workers originate.

Appendix Table B1 shows that outsourcing events most frequently occur in Food and beverage service activities; Retail trade (especially Supermarkets, department stores, and clothing stores); Facility management (including catering, cleaning, and landscaping services); Accommodation; Arts; and Other business services.

3.   Empirical approach

We estimate the causal impact of outsourcing on individual workers' outcomes using a stacked difference-in-differences design. In this section we describe our empirical approach and its underlying identifying assumptions.

Treatment group. An outsourcing event is defined as a worker's transition from employment in a regular firm in quarter t to employment in a staffing firm in quarter t+1.

Crucially, Dutch labor law ensures that workers undergoing this transition continue to perform the same tasks at the firm they came from, with only their formal employment contract transferred to the staffing firm. To isolate outsourcing events from other job transitions (e.g. layoffs), we apply several restrictions. We exclude workers who receive unemployment benefits around the event quarter, have a non-employment gap of at least one month between the two contracts, or have more than 3 months' overlap between their origin and staffing firm jobs. To mitigate the influence of outliers, we further drop workers earning less than 80% of the age-specific minimum wage or more than 200 euros per hour. The remaining 41,089 workers are our treated sample.

Control group. The control group consists of matched workers, who, in quarter t are not outsourced themselves, but are employed in firms that at some point in the future also outsource workers. This setup is similar to the displaced worker literature (e.g. Jacobson, LaLonde, and Sullivan 1993) where workers displaced in t are compared to a control group of workers not displaced in t. The critical additional condition in our design— that control workers originate only from firms that eventually engage in outsourcing— further accounts for selection of firms into using outsourcing.

Stacked Difference-in-Differences. We use a stacked difference-in-differences design, as advocated by Cengiz et al. (2019) and others for staggered treatment settings.[7] Specifically, we construct separate datasets for each cohort of workers whose first outsourcing event occurs in quarter c, where $c \in$ 2009Q1, ..., 2016Q4. We define event time τ as the calendar quarter t minus the cohort's outsourcing quarter c ($\tau \equiv t - c$). Within each cohort-specific dataset, we restrict our event window to $\tau \in$ –11, ..., 13 to ensure a balanced panel in event time. For each cohort, we then add its corresponding control group, which comprises all workers observed over the same event window (e.g., 2006Q1 to 2012Q1 for the 2009Q1 cohort) who are employed at a firm that eventually outsources workers but are not themselves outsourced within that window. Finally, these cohort-specific datasets are stacked, aligning observations by event time $\tau \in$ –11, ..., 13.

This stacked design addresses concerns raised by recent literature regarding bias in Two-Way Fixed Effects (TWFE) regressions with staggered treatment timing (Callaway and Sant'Anna (2021), de Chaisemartin and D'Haultfoeuille (2020), Goodman-Bacon (2021), Sun and Abraham (2021)). By creating a balanced panel in event time and not using already-treated units as control units, the stacked approach resolves issues re-

---

[7]This setup has been widely adopted in recent economic literature; see, for example, Goldschmidt and Schmieder (2017), Deshpande and Li (2019), Clemens and Strain (2021), and Baker, Larcker, and Wang (2022), and Bessen et al. (2025). Also, see Baker et al. (2025) for a recent overview of DiD designs.

sulting from staggered timing. As demonstrated by Baker, Larcker, and Wang (2022), a stacked DiD setup reliably recovers true treatment effects in staggered settings, similar to alternative estimators developed by Callaway and Sant'Anna (2021) and Sun and Abraham (2021). We ensure that control workers are not used as control after being treated, and that each control worker is matched to a treated worker at most once.

Matching. To enhance comparability between treated and control groups, we additionally employ coarsened exact matching (CEM, Iacus, King, and Porro 2012) within each cohort c. Our matching variables are: (1) employment over the past three years; (2) average quarterly hours worked and average hourly earnings for the past year and separately for the quarter before the outsourcing event; (3) age group; (4) gender; (5) 1-digit sector of origin; (6) contract type at the origin firm (permanent or temporary); and (7) tenure at the origin firm.[8] We restrict each treated worker to have at most five matches, and weight each matched control by $1/n_i$ with n_i the number of controls for treated worker i.

On average, we find at least one match for 59% of treated workers.[9] Following the matching procedure, our final sample comprises 25,210 treated and 97,160 control workers, originating from 13,991 and 28,995 firms respectively. Treated workers are subsequently employed by 280 distinct staffing firms. Appendix D shows that descriptives on the matched samples of treated and control group workers are very similar.

Estimating equation. Using the stacked data, we regress the following TWFE model:

$$(1) \qquad Y_{it} = \alpha + \sum_{\tau=-10}^{13} \beta_\tau \times I_\tau + \sum_{\tau=-10}^{13} \delta_\tau \times I_\tau \times \text{treat}_i + \eta_i + \theta_t + \varepsilon_{it},$$

where i subscripts individual workers, t denotes calendar time in quarters, and τ is event-time in quarters relative to the payrolling event. I_τ are event time indicator dummies, treat_i is a treatment dummy that equals 1 if a worker is outsourced, η_i are individual fixed effects, and θ_t are calendar-time fixed effects. Standard errors are clustered at the firm that employs a worker in the quarter before treatment, accounting for potential

---

[8] For hourly earnings and hours worked we use deciles and a separate bin for zero earnings. For employment, we count the number of quarters worked per year. We define age groups as 18–24, 25–34, 35–44, and 45–60 years. For tenure, we use 3 groups: 0–3, 4–7, and more than 7 quarters, reflecting the predominantly young and short-tenure composition of our sample.

[9] While less restrictive matching criteria increase the share of matched treated workers, this meaningfully reduces match quality, and our results remain qualitatively robust across alternative specifications. See additional results in Appendix C

correlation within origin firms.

Treatment timing. We define $\tau = 1$ as the first quarter a worker's main (i.e. highest-earning) job is at a staffing firm. Therefore, at $\tau = 0$, workers still have their main job at the origin firm. This implies that the outsourcing event— the transfer of formal employment— could have occurred either in quarter $\tau = 0$ or $\tau = 1$. For example, a worker might have switched to a staffing firm in the last month of the quarter $\tau = 0$, such that for the majority of that quarter, the job at the origin firm remains the highest-paid. This implies that in our event-study plots, the effect of outsourcing could already be partly observed in $\tau = 0$. To reflect the immediate post-treatment impact, we therefore normalize our figures assuming that $\tau = 0$ is the first post-treatment quarter.

Identifying assumptions. We require three identifying assumptions to interpret the estimates of δ_τ as average treatment effects on treated workers (ATTs) (e.g. Callaway and Sant'Anna 2021; Borusyak, Jaravel, and Spiess 2024). First, we assume that treated and control workers would have followed parallel trends in the absence of treatment. We provide evidence consistent with this assumption by demonstrating similar pre-event trends for outsourced workers compared to their matched controls. Second, we assume no anticipation of outsourcing events, meaning that future treatment should not affect current outcomes. By focusing on workers already employed for at least one quarter at the firm before being outsourced, we mitigate concerns that they are hired specifically in anticipation of outsourcing them. Furthermore, in heterogeneity analyses, we distinguish workers by tenure at the originating firm and find that impacts on employment are very similar across different tenure durations. Third, we assume no spillover effects from treatment to controls. This assumption is very plausible in our context, as we examine individual transitions into outsourcing rather than identifying outsourcing as large-scale firm-level events that affect a substantial fraction of the workforce simultaneously. Indeed, on average we observe 1.8 outsourced worker per origin firm.

4.   The impact of outsourcing on worker outcomes

This section presents our empirical findings on how outsourcing affects workers. We begin by analyzing its immediate impact on key labor market outcomes, specifically employment and labor income. Subsequently, we broaden our analysis to include job quality metrics beyond wages. We differentiate between the short-run impacts and workers' longer-run adjustments after an outsourcing event.

4.1. Impacts on earnings and employment

Short-run impact. Figure 2 shows a pronounced and immediate impact of outsourcing on worker's labor market outcomes. As shown in panel A, outsourced workers experience a drop in employment probability of about 1.5 percentage points in the first quarter. The decline increases to 3 percentage points after a year.

Panel B of Figure 2 focuses on workers who remain employed: here, we observe an initial decrease in hours worked of 15 hours per quarter compared to the control group, representing a 6% decline relative to their pre-outsourcing hours. This reduction in hours could reflect firms using staffing firms as a way to increase flexibility in hours.

Furthermore, panel C shows that hourly earnings conditional on employment decline by 25 cents (2.5% relative to an average of 10 euros). Notably, this decline in hourly earnings begins approximately two quarters before the outsourcing event.

Combined, these declines in employment probability, conditional hours worked, and hourly earnings translate into a substantial reduction in quarterly earnings, which is approximately 200 euros as shown in panel A of Appendix Figure E1. This represents a loss of approximately 7% relative to the outsourced workers' average pre-event quarterly earnings of 2,949 euros.

Longer-run impact. The adverse effects of outsourcing on worker outcomes are persistent, extending well beyond the immediate post-event period. Specifically, the negative impact on employment probability shows no signs of recovery within our observation window. Three years after outsourcing, affected workers remain 4 percentage points less likely to be employed than their control group counterparts. This translates to a 5% reduction relative to the control group's 87% employment probability at the three-year mark (Figure 2, panel A), indicating significant and durable labor market scarring.

In contrast, hours worked conditional on employment recover. While initially reduced, hours worked for those who remain employed return to pre-outsourcing levels, and even show a slight, though statistically insignificant, increase relative to the control group over the longer run (Figure 2, panel B).

Despite the recovery in hours if employed, hourly earnings conditional on employment demonstrate only partial recovery, remaining approximately 15 cents lower than the control group throughout the observed period. This sustained differential contributes to a long-run cumulative negative effect on total quarterly earnings, estimated at about 200 euros per quarter relative to the control group (Appendix Figure E1, panel

A). Note that both the outsourced and control groups show earnings growth on average. This means that the percentage loss in total earnings declines over time. The average wage growth over time reflects the young age of both groups. However, there remains a significant absolute earnings gap.

Consistent with these findings, panel C of Appendix Figure E1 shows that workers increasingly rely on unemployment benefits following outsourcing. Approximately half of those without employment rely on unemployment benefits[10], while the remaining half either become ineligible for benefits or exit the labor force altogether following the outsourcing event.

In sum, our findings show long-term negative impacts of outsourcing on workers' careers. The persistent decline in employment probability, coupled with sustained lower hourly earnings for those who secure new positions, results in a consistent and significant negative effect on total earnings and an increased reliance on social safety nets. This evidence points to long-term scarring from outsourcing events.

4.2. Impacts on non-wage dimensions of job quality

In addition to the direct effects on employment and earnings, outsourcing impacts several important dimensions of job quality. Immediately following outsourcing, workers experience a marked deterioration in employment security and associated benefits.

Panel A of Figure 3 shows that the probability of holding a permanent contract, which offers greater employment protection than temporary contracts, decreases by approximately 35 percentage points. This sharp reduction in job security is consistent with the hypothesis that firms may utilize outsourcing partly to bypass regulations or reduce costs associated with permanent employment. This mechanism aligns with findings by Autor (2003) on outsourcing and employment protection in the U.S., although direct evidence for this specific motivation remains beyond the scope of our data. This erosion of employment protection also contributes to, and is reflected in, the persistently lower employment probabilities discussed above and shown in panel A of Figure 2.

Beyond contract type, other key job quality indicators deteriorate immediately following outsourcing. Panel B of Figure 3 shows that employer pension contributions, conditional on continued employment, decrease by a striking 80% upon outsourcing. Furthermore, our measure of firm-specific pay premiums—firms' AKM fixed effect

---

[10]Employment probability declines by about 4 percentage points, while the likelihood of being on unemployment benefits increases by about 2 percentage points.

based on hourly wages—is approximately 75 cents lower for outsourced workers compared to controls, as shown in panel C of Figure 3. This average decline corresponds to an 8% lower AKM firm fixed effect and 7.5% of workers' average hourly wage. This indicates that staffing firms offer significantly lower baseline wages.

In the longer run, these job quality indicators exhibit a substantial, though incomplete, recovery. This rebound appears to be largely driven by workers transitioning away from the initial staffing firm arrangement into employment at other firms. This interpretation is supported by the gradual increase observed in the average AKM fixed effect over time shown in panel C of Figure 3, which signals workers' movement towards higher-paying employers. However, workers do not attain parity again in our event window. This suggests that outsourcing significantly disrupted their progress on the job ladder. Similarly, the slow rebound in permanent contract rates and pension contributions is likely attributable to workers securing jobs elsewhere, particularly given that staffing firms themselves infrequently offer permanent contracts (as seen from Table 1) and often provide lower initial pension benefits.

4.3.   Heterogeneity in impacts of outsourcing

We examine the heterogeneity of outsourcing's effects across different cohorts and worker characteristics, focusing on key variations in the observed outcomes: results are presented in Appendix Figures F1 (for the employment probability), F2 (for hours worked conditional on employment), and F3 (for hourly earnings conditional on employment).

The most striking heterogeneity is evident in hours worked conditional on employment. We find a sharp divergence based on the prevailing economic climate at the time of outsourcing (Appendix Figure F2). Workers outsourced during the Great Recession (2008–2011) experienced a statistically significant reduction in hours. In contrast, those outsourced in the post-recession period exhibited a small, but statistically significant, increase in hours. This suggests that labor market tightness significantly modulates outsourcing's impact on hours. Furthermore, the adverse effects on hours worked are notably larger for older workers compared to younger workers.

For employment probability, we observe qualitatively similar patterns of heterogeneity, with a tendency for larger negative impacts among those outsourced in recessionary periods (Appendix Figure F1). However, due to less precise estimates, we cannot conclusively distinguish the magnitudes of these effects across all groups. Despite this, our

analysis robustly shows that all workers, regardless of cohort or age, face a reduced employment probability following outsourcing.

Regarding hourly earnings (Appendix Figure F3), the effects are predominantly negative across all groups, though often statistically insignificant. Important exceptions where significant negative impacts are observed include women, native-born workers, and older workers. This indicates that these demographic groups bear a disproportionate burden of the earnings decline.

In summary, our results demonstrate that outsourcing to a staffing firm imposes substantial and multifaceted costs on workers. It generates a lasting increase in the risk of non-employment for all demographic groups. Even for those who remain employed, especially in the initial period, outsourcing reduces hours worked, lowers hourly wages, and significantly diminishes job quality as characterized by reduced employment security, lower pension benefits, and lower firm pay premiums. These adverse effects are more pronounced for workers outsourced during the Great Recession and among older workers. While job mobility offers a pathway for workers to eventually improve their situation relative to the initial outsourcing conditions, persistent long-term scarring effects on overall employment probability remain. These findings corroborate recent work by Estefan et al. (2024) on outsourcing in Mexico, which similarly suggests that firms leverage such arrangements to suppress wages and potentially enhance their monopsony power.

Our empirical findings can be interpreted through the lens of a stylized model of outsourcing to staffing firms, which we report in Appendix G. In this framework, workers may consent to outsourcing contracts despite the observed deterioration in job security, hours, wages, and pension contributions when they face worse outside options. For instance, during a recession, firms might offer fewer regular contracts, compelling workers towards outsourcing as a less undesirable alternative. This theoretical mechanism is consistent with our empirical finding that adverse impacts are more severe for workers who are outsourced during recessions. Alternatively, workers with a stronger preference for specific aspects of outsourcing contracts, such as flexible work scheduling, might also accept such terms even if other labor market outcomes worsen. Thus, the model highlights how a decline in workers' alternative opportunities and/or a specific preference for non-standard work arrangements can drive their acceptance of these otherwise inferior contracts.
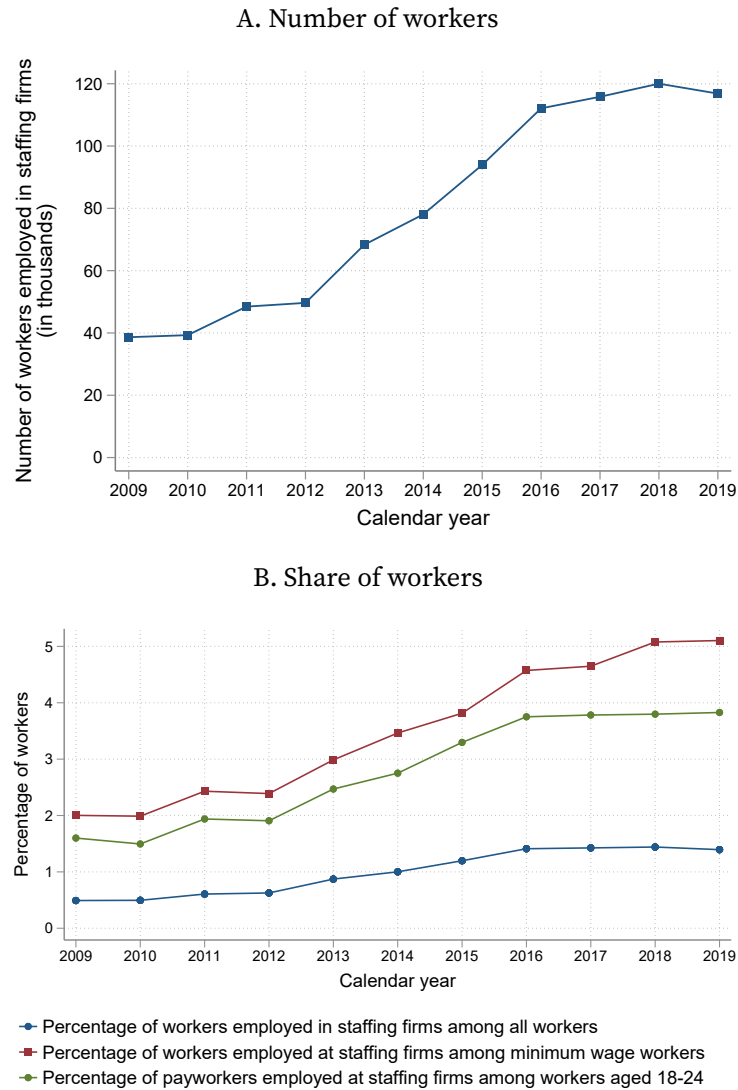
5.   Conclusion

Alternative work arrangements are increasingly common, including in the Netherlands, which has one of the highest incidences of flexible labor contracts in the OECD. To identify the impact of alternative work arrangements on worker outcomes, we study payrolling, a distinct legal outsourcing mechanism involving workers transitioning to a staffing firm's payroll while continuing their pre-existing job functions at the original firm. Like temporary help agencies, staffing firms can offer labor contracts with increased flexibility— but they do so while ensuring the original firm-worker match remains in place.

Leveraging administrative employer-employee data over 2009-–2019 and a stacked difference-in-differences design that exploits the precise timing of outsourcing events, we find robust evidence that workers outsourced to staffing firms experience significantly worse labor market outcomes. These include persistently lower employment stability, reduced hourly wages, and substantially diminished employer pension contributions relative to a matched control group. Our findings underscore that alternative work arrangements, even those designed to maintain job continuity, can lead to substantial and long-lasting scarring effects for workers.
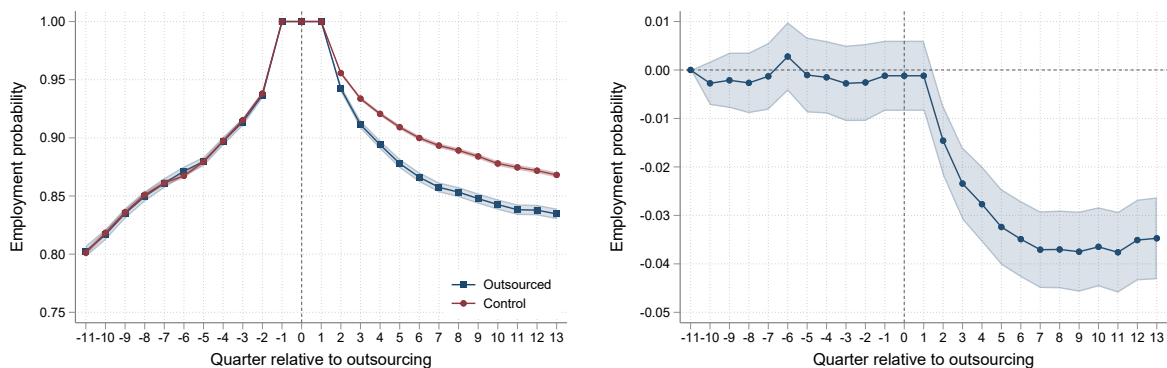
Figures

FIGURE 1. Rising number and share of employees in staffing firms, 2009–2019

A. Number of workers

B. Share of workers

- Percentage of workers employed in staffing firms among all workers
- Percentage of workers employed at staffing firms among minimum wage workers
- Percentage of payworkers employed at staffing firms among workers aged 18-24

Note: Minimum wage workers are defined as workers earning up to 120 percent of the statutory age-specific minimum hourly wage applicable in that year.

FIGURE 2. Employment, hours worked and hourly earnings if employed

A. Employment probability

B. Quarterly hours worked conditional on employment
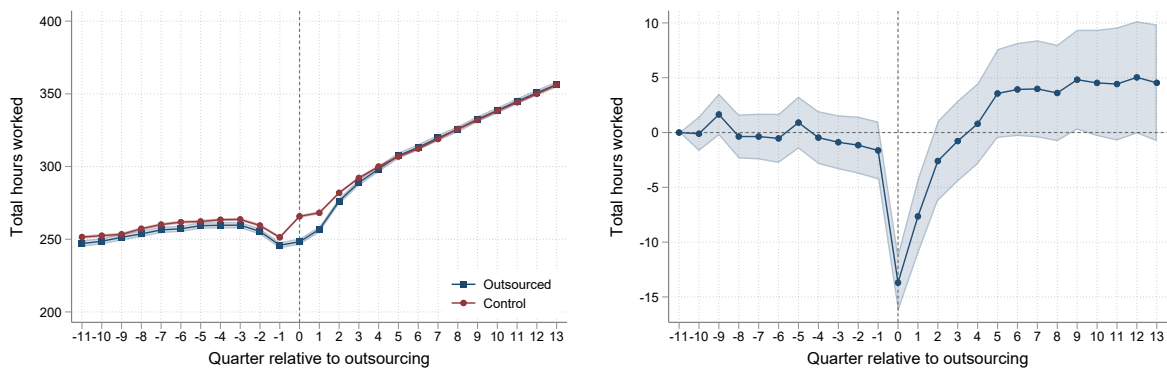
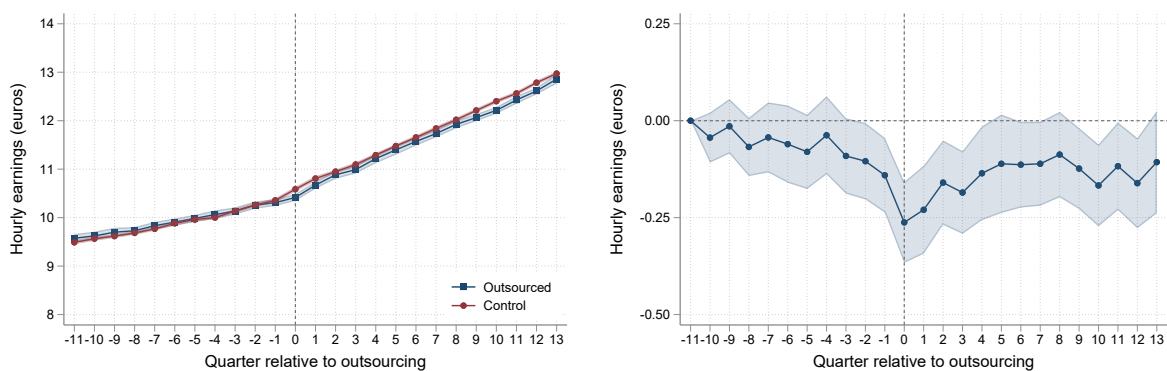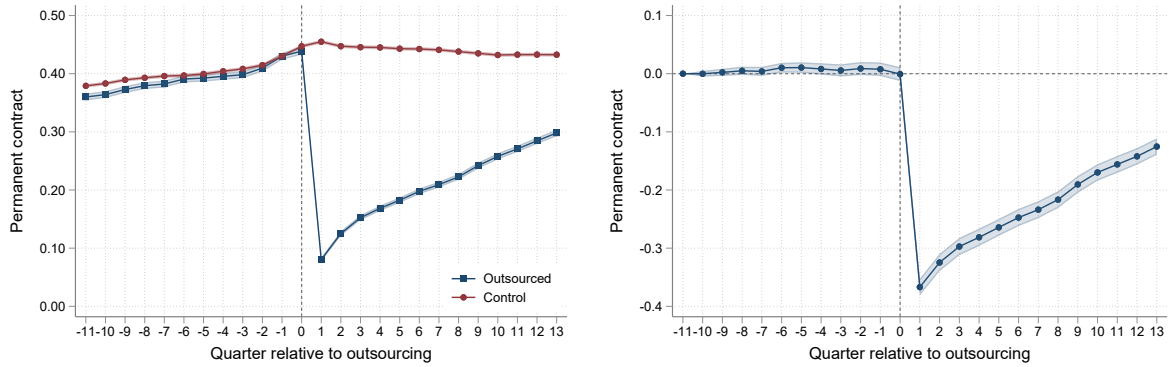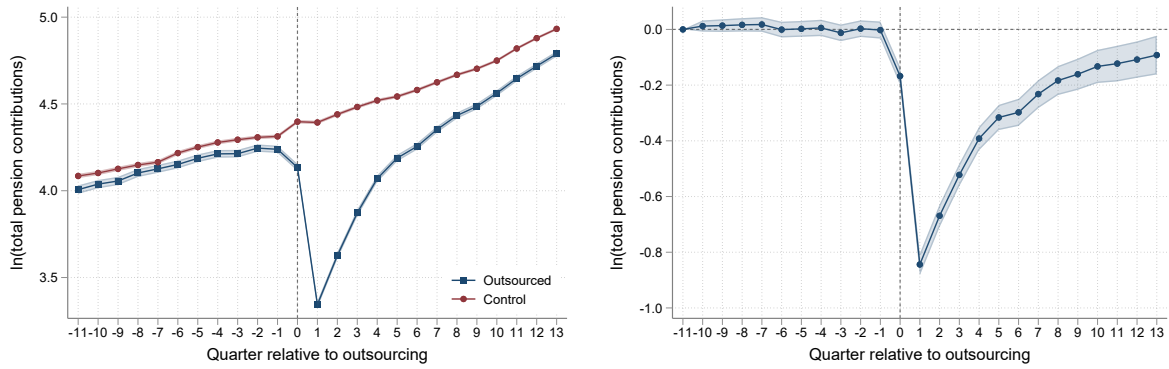
C. Hourly earnings conditional on employment

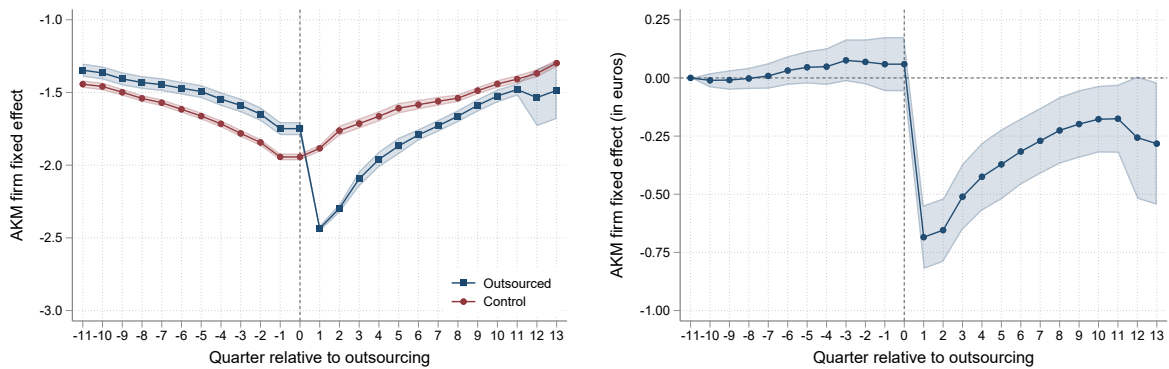## FIGURE 3. Permanent contract, pension contributions, and firm wage premium

A. Probability of a permanent contract (conditional on employment)

B. Pension contributions (conditional on employment)

C. AKM firm wage premium (conditional on employment)

17

Tables

TABLE 1. Worker descriptives by firm type

| | Firm type | | |
	Staffing	Temporary help agency	All other
Annual earnings (euros)	11,159	13,743	34,389
Hourly earnings (euros)	12.22	12.82	21.62
Annual hours worked	864	1,018	1,507
Employment type			
Permanent	0.12	0.10	0.69
Temporary	0.88	0.90	0.28
No data	0.00	0.00	0.03
Firm tenure in days	402	395	1,230
Education			
Low	0.17	0.17	0.10
Middle	0.48	0.33	0.28
High	0.17	0.12	0.23
No data	0.19	0.39	0.38
Female	0.47	0.37	0.47
Age	29.69	33.88	39.92
Migration background			
Native	0.65	0.44	0.79
First-generation migrant	0.21	0.45	0.13
Second-generation migrant	0.14	0.11	0.08
Observations (employed workers × years)	881,153	6,295,603	80,778,038

Notes: Individual employed worker observations, averages over 2009–2019. The columns for staffing and temporary help agency cover all workers who have a main job at a firm with the corresponding sector code. The column for "All other" covers workers with main jobs at all other firms. All earnings are deflated using the CPI with 2015 = 100.

TABLE 2. Firm descriptives by firm type

| | Firm type | | |
	Staffing	Temporary help agency	All other
Annual earnings			
Mean	15,431	18,160	32,317
Standard deviation (within firms)	10,994	10,347	15,765
Hourly earnings			
Mean	16.25	16.43	23.33
Standard deviation (within firms)	7.10	5.37	8.18
Number of workers			
Median	49	13	2
Mean	480	141	18
Standard deviation (between firms)	1,865	2,144	284
Number of firms	622	11,165	1,103,279
Number of firm × year observations	1,850	36,520	4,924,450

Notes: Individual firm observations, averages over 2009–2019. The columns for staffing and temporary help agency cover all firms classified in these respective sector codes. The column for "All other" covers all firms with other sector codes. All earnings are deflated using the CPI with 2015 = 100.

References

Arnold, David. 2020. "Mergers and Acquisitions, Local Labor Market Concentration, and Worker Outcomes." Working Paper.

Autor, David H. 2003. "Outsourcing at Will: The Contribution of Unjust Dismissal Doctrine to the Growth of Employment Outsourcing." *Journal of Labor Economics* 21 (1): 1–42.

Azar, José, Ioana Marinescu, and Marshall Steinbaum. 2019. "Measuring labor market power two ways." In *AEA Papers and Proceedings*, vol. 109: 317–21.

Azar, José, Ioana Marinescu, and Marshall Steinbaum. 2020. "Labor Market Concentration." *Journal of Human Resources*: 1218–9914R1. Publisher: University of Wisconsin Press.

Baker, Andrew C., David F. Larcker, and Charles C. Y. Wang. 2022. "How much should we trust staggered difference-in-differences estimates?" *Journal of Financial Economics* 144 (2): 370–395.

Baker, Andrew, Brantly Callaway, Scott Cunningham, Andrew Goodman-Bacon, and Pedro H. C. Sant'Anna. 2025. "Difference-in-Differences Designs: A Practitioner's Guide." *forthcoming in the Journal of Economic Literature*.

Bergeaud, Antonin, Pierre Cahuc, Clement Malgouyres, Sara Signorelli, and Thomas Zuber. 2024. "The Wage of Temporary Agency Workers." CEP Discussion Paper CEPDP2014, Centre for Economic Performance.

Bessen, James, Maarten Goos, Anna Salomons, and Wiljan Van den Berge. 2025. "What happens to workers at firms that automate?" *Review of Economics and Statistics* 107 (1): 125–141.

Blair, Roger D., and Jeffrey L. Harrison. 2010. *Monopsony in Law and Economics*.: Cambridge University Press.

Bolhaar, Jonneke, Marloes Zijl, and Bas Scheer. 2018. "Three Perspectives on the Dutch Growth of Flexible Employment." *De Economist* 166 (7).

Borusyak, Kirill, Xavier Jaravel, and Jann Spiess. 2024. "Revisiting event-study designs: robust and efficient estimation." *Review of Economic Studies* 91 (6): 3253–3285.

Callaway, Brantly, and Pedro HC Sant'Anna. 2021. "Difference-in-differences with multiple time periods." *Journal of econometrics* 225 (2): 200–230.

Card, David, Ana Rute Cardoso, Joerg Heining, and Patrick Kline. 2018. "Firms and labor market inequality: Evidence and some theory." *Journal of Labor Economics* 36 (S1): S13–S70.

Cengiz, Doruk, Arindrajit Dube, Attila Lindner, and Ben Zipperer. 2019. "The effect of minimum wages on low-wage jobs." *The Quarterly Journal of Economics* 134 (3): 1405–1454.

de Chaisemartin, Clément, and Xavier D'Haultfoeuille. 2020. "Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects." *American Economic Review* 110 (9): 2964–96.

Clemens, Jeffrey, and Michael R Strain. 2021. "The Heterogeneous Effects of Large and Small Minimum Wage Changes: Evidence over the Short and Medium Run Using a Pre-Analysis Plan." Working Paper 29264, National Bureau of Economic Research.

Dal Bó, Ernesto, Frederico Finan, and Martín A Rossi. 2013. "Strengthening state capabilities: The role of financial incentives in the call to public service." *The Quarterly Journal of Economics* 128 (3): 1169–1218.

Daruich, Diego, Martino Kuntze, Pascuel Plotkin, and Rafaelle Saggio. 2024. "The Consequences

of Domestic Outsourcing on Workers: New Evidence from Italian Administrative Data." Working paper.

Deshpande, Manasi, and Yue Li. 2019. "Who Is Screened Out? Application Costs and the Targeting of Disability Programs." *American Economic Journal: Economic Policy* 11 (4): 213–48.

Drenik, Andres, Simon Jäger, Pascuel Plotkin, and Benjamin Schoefer. 2023. "Paying outsourced labor: Direct evidence from linked temp agency-worker-client data." *Review of Economics and Statistics* 105 (1): 206–216.

Dube, Arindrajit, Jeff Jacobs, Suresh Naidu, and Siddharth Suri. 2020. "Monopsony in online labor markets." *American Economic Review: Insights* 2 (1): 33–46.

Dube, Arindrajit, and Ethan Kaplan. 2010. "Does outsourcing reduce wages in the low-wage service occupations? Evidence from janitors and guards." *ILR Review* 63 (2): 287–306.

Dube, Arindrajit, Alan Manning, and Suresh Naidu. 2018. "Monopsony and employer mis-optimization explain why wages bunch at round numbers."Technical report, National Bureau of Economic Research.

Estefan, Alejandro, Roberto Gerhard, Joseph P. Kaboski, Illenin O. Kondo, and Wei Qian. 2024. "Outsourcing Policy and Worker Outcomes: Causal Evidence from a Mexican Ban." NBER Working Paper 32024, National Bureau of Economic Research.

Felix, Mayara, and Michael B. Wong. 2021. "Labor Market Consequences of Domestic Outsourcing: Evidence from Legalization in Brazil." Working paper.

Goldschmidt, Deborah, and Johannes F Schmieder. 2017. "The rise of domestic outsourcing and the evolution of the German wage structure." *The Quarterly Journal of Economics* 132 (3): 1165–1217.

Goodman-Bacon, Andrew. 2021. "Difference-in-differences with variation in treatment timing." *Journal of Econometrics* 225 (2): 254–277. Themed Issue: Treatment Effect 1.

Iacus, Stefano M., Gary King, and Giuseppe Porro. 2012. "Causal Inference without Balance Checking: Coarsened Exact Matching." *Political Analysis* 20 (1): 1–24.

Jacobson, Louis S, Robert J LaLonde, and Daniel G Sullivan. 1993. "Earnings Losses of Displaced Workers." *The American Economic Review* 83 (4): 685–709.

Katz, Lawrence F, and Alan B Krueger. 2019. "The rise and nature of alternative work arrangements in the United States, 1995–2015." *ILR Review* 72 (2): 382–416.

Krueger, Alan B., and Orley Ashenfelter. 2022. "Theory and Evidence on Employer Collusion in the Franchise Sector." *Journal of Human Resources* 57 (S): S324–S348.

Lipsitz, Michael, and Evan Starr. 2022. "Low-Wage Workers and the Enforceability of Noncompete Agreements." *Management Science* 68 (1): 143–170.

Manning, Alan. 2003. *Monopsony in Motion: Imperfect Competition in Labor Markets.*: Princeton University Press.

Manning, Alan. 2021. "Monopsony in labor markets: A review." *ILR Review* 74 (1): 3–26.

Marinescu, Ioana, Ivan Ouss, and Louis-Daniel Pape. 2021. "Wages, hires, and labor market concentration." *Journal of Economic Behavior & Organization* 184: 506–605.

Marinescu, Ioana, and Eric A Posner. 2019. "Why Has Antitrust Law Failed Workers?" *Cornell Law Review* 105 (5).

Mas, Alexandre, and Amanda Pallais. 2017. "Valuing Alternative Work Arrangements." *American

Economic Review 107 (12): 3722–59.

Mas, Alexandre, and Amanda Pallais. 2020. "Alternative Work Arrangements." *Annual Review of Economics* 12 (1): 631–658. NBER Working Paper 26605.

OECD. 2019. "OECD Input to the Netherlands Independent Review Committee on the Future of the Labour Market." Report prepared for the Netherlands Independent Review Committee on the Future of the Labour Market.

Starr, Evan P, James J Prescott, and Norman D Bishara. 2021. "Noncompete agreements in the US labor force." *The Journal of Law and Economics* 64 (1): 53–84.

Sun, Liyang, and Sarah Abraham. 2021. "Estimating dynamic treatment effects in event studies with heterogeneous treatment effects." *Journal of Econometrics* 225 (2): 175–199. Themed Issue: Treatment Effect 1.

Webber, Douglas A. 2015. "Firm market power and the earnings distribution." *Labour Economics* 35: 123–134.

Weil, D. 2014. *The Fissured Workplace.*: Harvard University Press.

Zwemmer, J.P.H. 2016. *Payrolling in the Netherlands.* vol. 94 of Bulletin of comparative labour relations, chap. 9, 117–127: Wolters Kluwer.

Appendix A.   Legal Text Relating to Payrolling

The text below consists of a translated selection of the Dutch legal text for dismissal law. In this selection, the focus is on the text that describes the practice of payrolling. The text describes the dismissal law as it was active in 2019.[11]

Article 1. Definitions

Payroll employer: the employer who, based on an agreement with a third party, which has not been concluded in the context of bringing together supply and demand on the labor market, makes an employee available to perform work on the instructions and under the supervision and direction of that third party, whereby the employer who makes the employee available is only entitled to make the employee available to another firm with the consent of that third party;

Temporary employment agency: the employer whose objective is to make employees available to third parties in the context of a profession or business to work under their direction and supervision and thus to bring supply and demand on the labor market together and whose wage bill subject to social security contributions is realized on an annual basis for at least 50% in the context of temporary employment contracts as referred to in Article 690 of Book 7 of the Civil Code;

§7. Rules relating to the dismissal of the payroll employee

Article 20. Reasonable grounds for dismissal of payroll employee

If an agreement between a payroll employer and a client is terminated, it will be determined on the basis of the client's circumstances whether there are reasonable grounds for terminating the employment contract of the payroll employee, whereby:
  – for the purposes of paragraphs 2 to 5, the payroll employee is deemed to be employed by the client; and
  – the client is deemed to be the employer referred to in Article 671a, fifth paragraph, of Book 7 of the Civil Code.

---

[11]For the full legal text of the dismissal scheme (in Dutch), see https://wetten.overheid.nl/BWBR0036599/2019-01-01/

Article 21. Deviation from the principle of reflection

Insofar as the rules for determining the order of termination in the event of the loss of jobs at the client deviate from paragraph 4, the application of that paragraph will be based on the deviating rules.

Article 22. Re-employment condition for payrolling

If the employment contract with a payroll employee is terminated or dissolved after the agreement between a payroll employer and a client has been terminated, the client is deemed to be the employer who has the same work performed by another person, as referred to in Articles 681(1)(d) and 682(4) of Book 7 of the Dutch Civil Code.

Article 23. Termination of payroll agreement in the event of non-performance

If the agreement between the payroll employer and the client is terminated at the initiative of the payroll employer, because the client has not fulfilled the financial obligations arising from the agreement at all for a period of at least three months and the payroll employer has made sufficient efforts to enforce compliance with the agreement:
  – Articles 11, 20 and 22, as well as Articles 681, first paragraph, parts d and e, and 682, fourth and fifth paragraphs, of Book 7 of the Civil Code do not apply; and
  – permission to terminate an employment contract for an indefinite period can be granted on the basis of Article 669(3)(a) of Book 7 of the Dutch Civil Code without the payroll employer having terminated employment relationships or hiring agreements as referred to in Article 671a(5).

Appendix B.   Additional descriptives on the staffing sector and outsourcing events

FIGURE B1. Annual number of outsourced workers, origin firms, and staffing firms (right axis) involved in events used for estimation of effects.
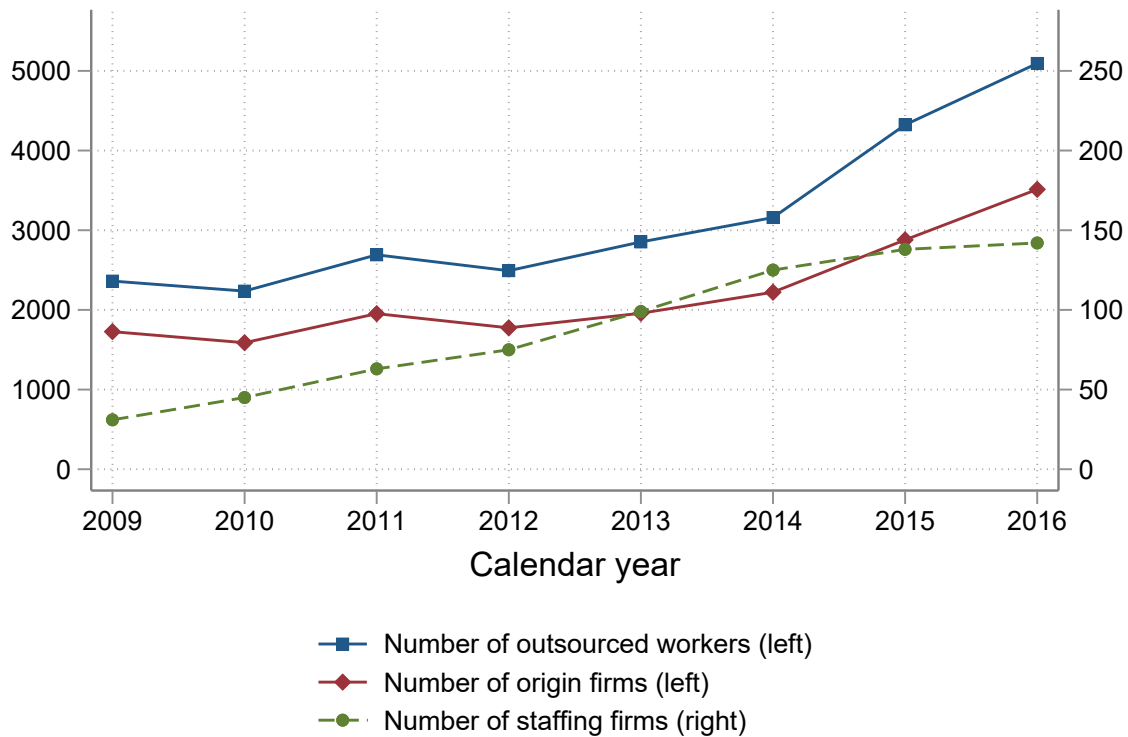
FIGURE B2. Firm size of firms that use staffing firms in $t = 0$ compared to firms control group workers are at.
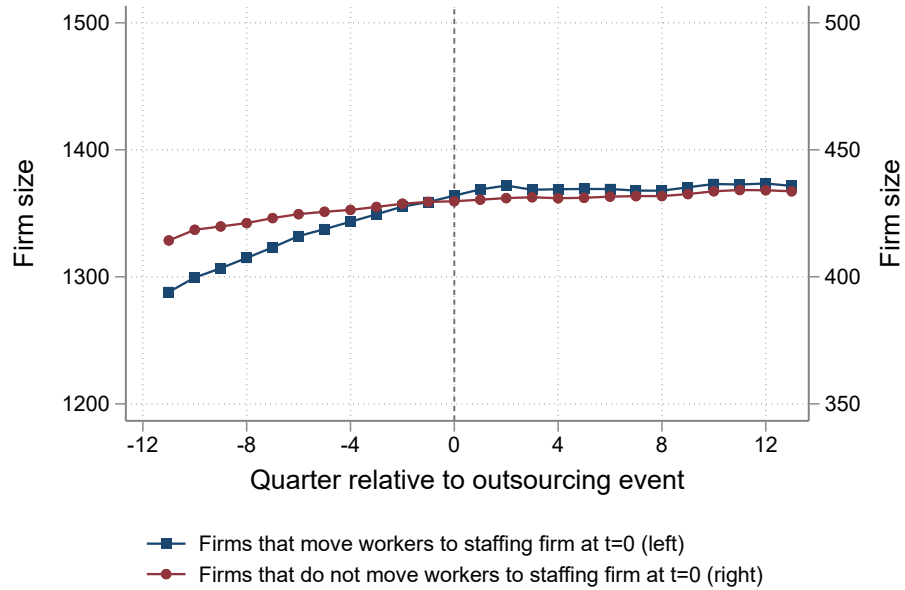

- Firms that move workers to staffing firm at t=0 (left)
- Firms that do not move workers to staffing firm at t=0 (right)

FIGURE B3. Average hourly wage of firms that use staffing firms in $t = 0$ compared to firms control group workers are at.

- Firms that move workers to staffing firm at t=0
- Firms that do not move workers to staffing firm at t=0
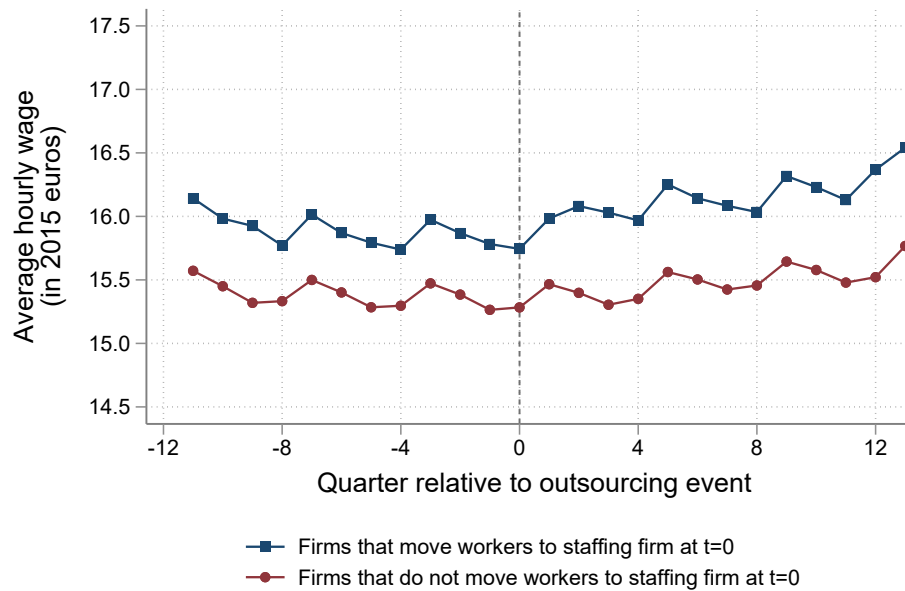
TABLE B1. Outsourcing events by sector

Sector	Nr of outsourced workers	Outsourced workers as % of all workers in sector	As % of all outsourced workers in sample
Food and beverage service activities	8,165	2.82%	21.46%
Accommodation	1,379	1.93%	3.62%
Arts	431	1.63%	1.13%
Other business services	645	1.62%	1.70%
Industrial design, photography, translation and other consultancy	386	1.53%	1.01%
Motion picture and television programme production and distribution; sound recording and music publishing	222	1.52%	0.58%
Advertising and market research	593	1.25%	1.56%
Programming and broadcasting	90	1.15%	0.24%
Sports and recreation	872	1.14%	2.29%
Retail trade (not in motor vehicles)	7,664	1.01%	20.14%
Postal and courier activities	655	0.90%	1.72%
Wellness and other services; funeral activities	495	0.80%	1.30%
Renting and leasing of motor vehicles, consumer goods, machines and other tangible goods	241	0.79%	0.63%
Facility management	1,220	0.73%	3.21%
Security and investigation	249	0.71%	0.65%
Repair of computers and consumer goods	41	0.66%	0.11%
Agriculture and related service activities	655	0.63%	1.72%
Travel agencies, tour operators, tourist information and reservation services	127	0.56%	0.33%
Holding companies (not financial)	889	0.55%	2.34%
Water transport	82	0.51%	0.22%

Notes: Sectors are classified with two-digit SBI-2008 codes, which correspond to NACE rev 2 and ISIC rev 4. The sectors are sorted by the share of outsourced workers as a % of all workers in a sector and only contains the top 20 sectors.

Appendix C.   Outcomes for alternative match specification

In this section we present the difference-in-differences outcomes using two different matching specification of the CEM procedure. The main matching specification presented in this paper and a simpler alternative matching specification.

Full matching specification. The main matching specification makes use of seven matching variables: (1) employment over the past three years; (2) average quarterly hours worked and average hourly earnings for the past year and separately for the quarter before the outsourcing event; (3) age group; (4) gender; (5) 1-digit sector of origin; (6) contract type at the origin firm (permanent or temporary); and (7) tenure at the origin firm. On average. For hourly earnings and hours worked we use deciles and a separate bin for zero earnings. For employment, we count the number of quarters worked per year. We define age groups as 18–24, 25–34, 35–44, and 45–60 years. For tenure, we use 3 groups: 0–3, 4–7, and more than 7 quarters, reflecting the predominantly young and short-tenure composition of our sample. Using this main specification we find at least one match for 59% of treated workers. In this section we refer to this specification as the 'Full matching specification'.

Simpler matching specification. Alongside this main specification we present the results of an alternative matching specification, which we refer to as the 'Simpler matching specification'. First, this specification uses six matching variables; employment history is excluded from the specification. Instead, the average quarterly working hours per year for the last three years is used. Second, the matching requirements for quarterly hours worked are loosened. Instead of deciles we use four large bins: 0 hours worked (non-employed), between 1 and 200 hours, between 200 and 400 hours and more than 400 hours. Finally, information on the quarterly hours worked and hourly earnings in the quarter before the outsourcing event is excluded from the matching procedure. Using this specification we find at least one match for 93% of treated workers.

The graphs below present the results of the difference-in-differences estimation using these two matching specifications. While less restrictive matching criteria increase the share of matched treated workers, the match quality is reduced. However, our results remain qualitatively robust across these two specifications.

FIGURE C1. Employment, hours worked and hourly earnings if employed
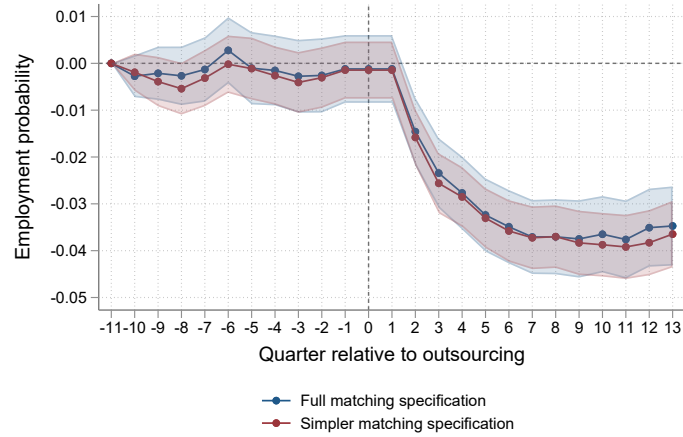
A. Employment probability

B. Quarterly hours worked conditional on employment
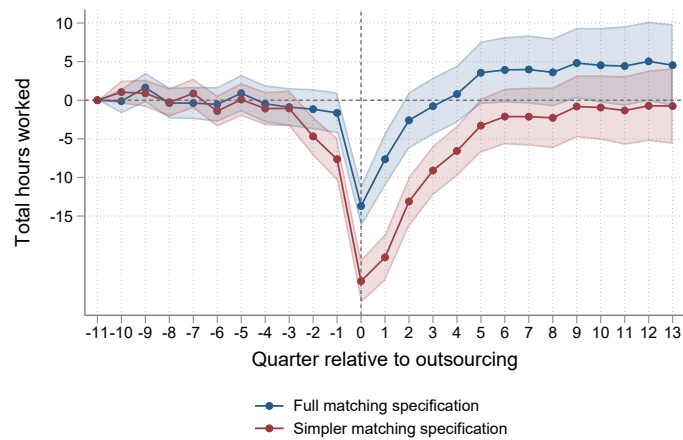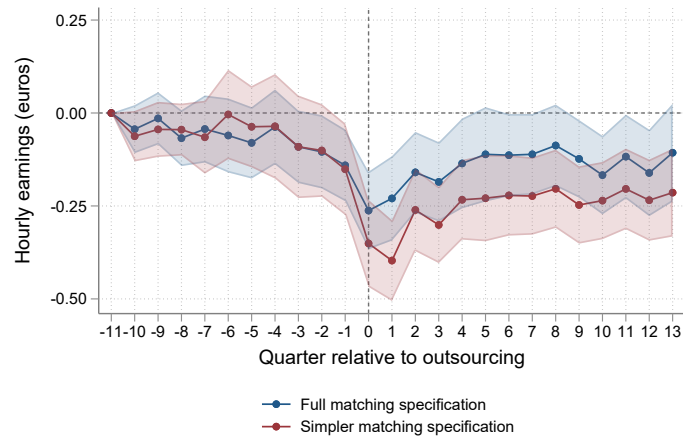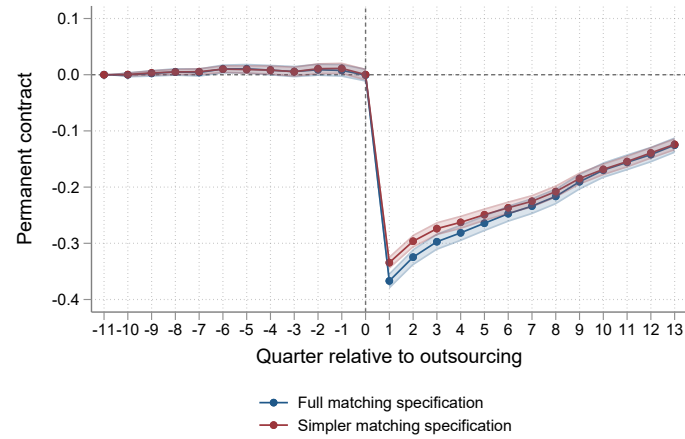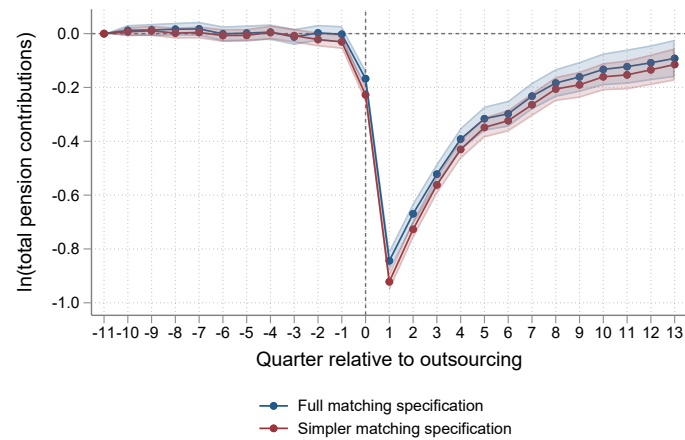

C. Hourly earnings conditional on employment

FIGURE C2. Permanent contract, pension contributions, and firm wage premium

A. Probability of a permanent contract (conditional on employment)

B. Pension contributions (conditional on employment)
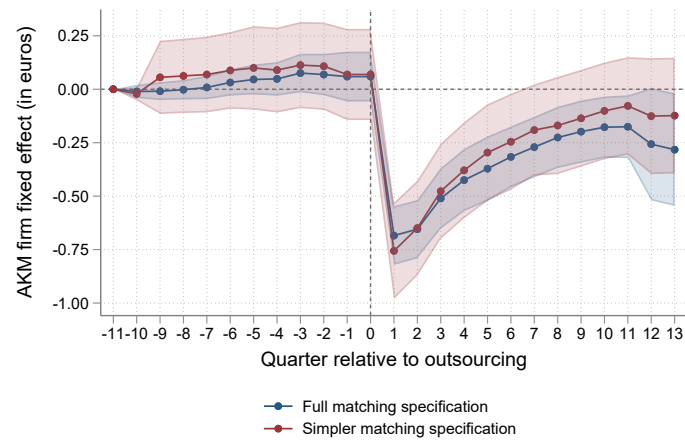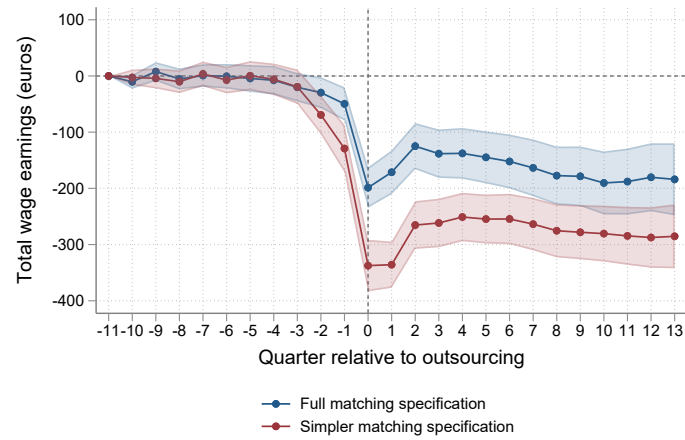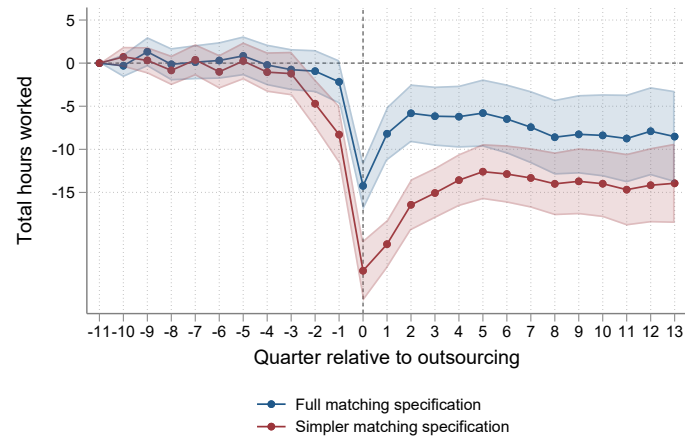

C. AKM firm wage premium (conditional on employment)

FIGURE C3. Total quarterly earnings (including zeros), total hours worked (including zeros) and and probability of receiving unemployment benefits
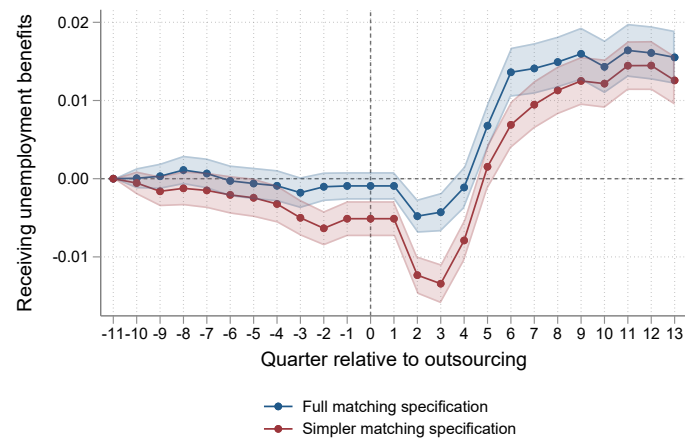
A. Total earnings

B. Hours worked (quarterly)

C. Receiving unemployment benefits

Appendix D.   Matched worker sample descriptives

TABLE D1. Matched worker descriptives by treatment group status

	Outsourced	Control
Quarterly earnings (euros)	2949	3,019
Quarterly hours worked	246	251
Hourly earnings (euros)	10.31	10.36
Employment type		
Temporary contract	0.57	0.57
Open-ended contract	0.43	0.43
Firm tenure in days	732	767
Education level		
Low	0.19	0.20
Middle	0.56	0.55
High	0.12	0.10
No data	0.13	0.15
Female	0.54	0.54
Age	26.0	26.1
Enrolled in education	0.45	0.48
Immigration background		
Native	0.79	0.78
First generation immigrant	0.08	0.10
Second generation immigrant	0.13	0.12
Firm characteristics		
Average hourly wage (euros)	13.44	13.64
Firm size	4,206	769
Number of workers	25,210	97,160

Notes: Matched worker sample. Averages in $\tau = -1$, the quarter used for matching and weighted by matching weights.

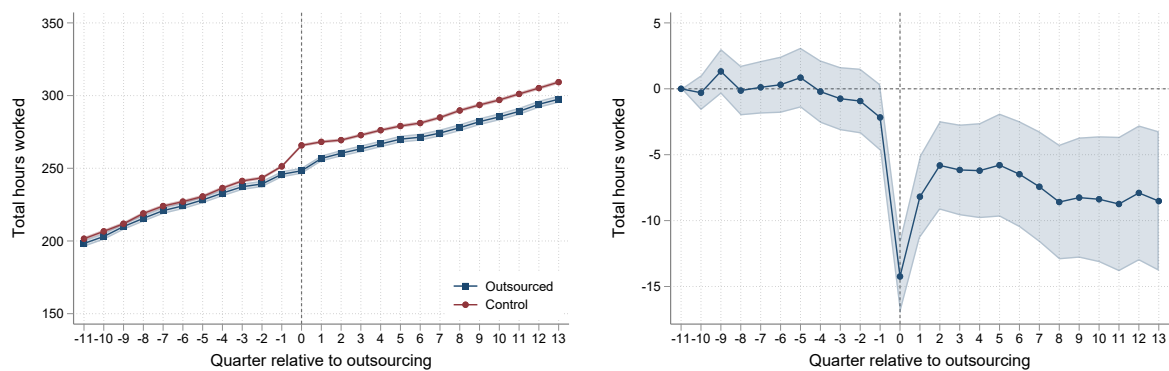# Appendix E.   Outsourcing impacts on additional worker outcomes

FIGURE E1. Total quarterly earnings (including zeros), total hours worked (including zeros) and and probability of receiving unemployment benefits
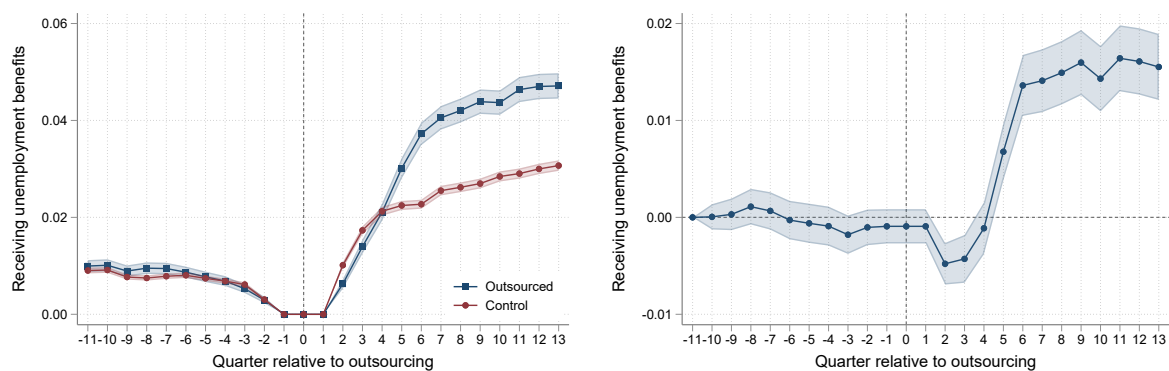
A. Total earnings
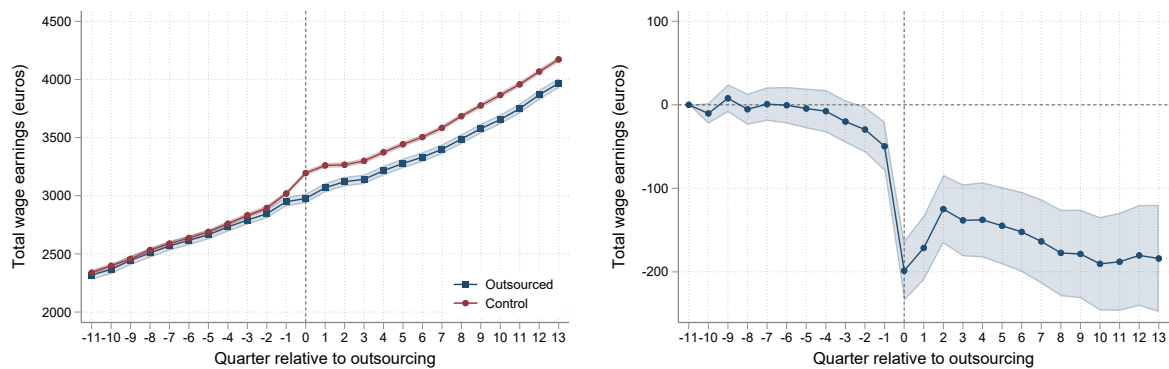
B. Hours worked (quarterly)

C. Receiving unemployment benefits

Appendix F.   Heterogeneity results
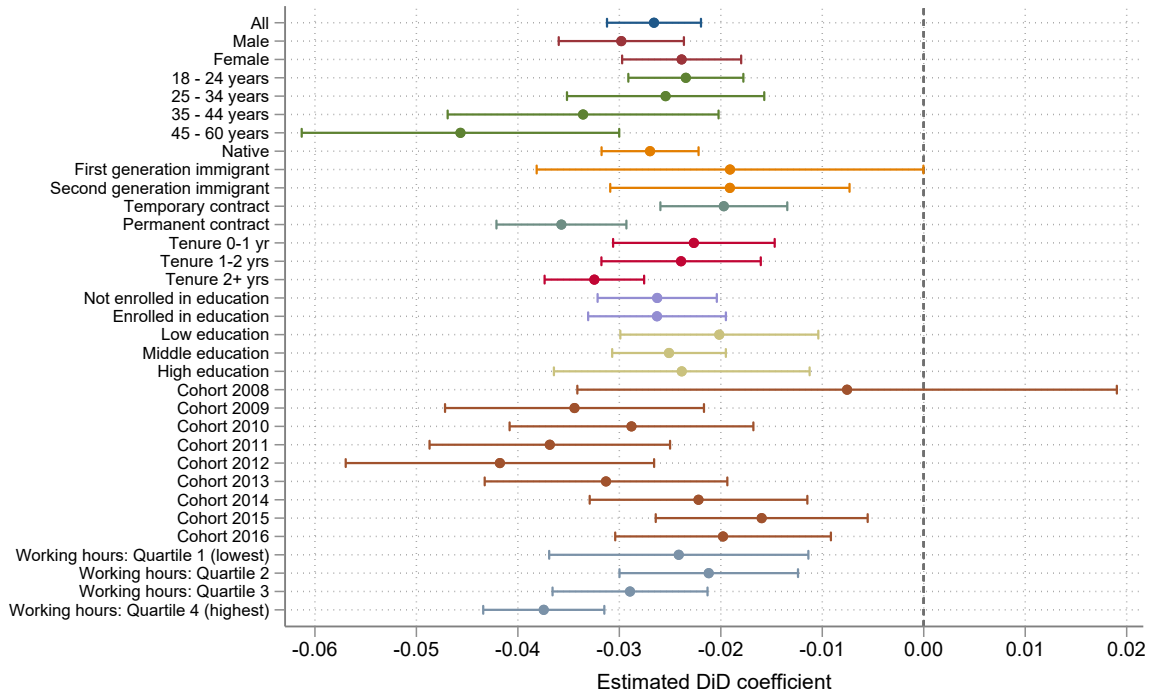
FIGURE F1. Probability of being employed

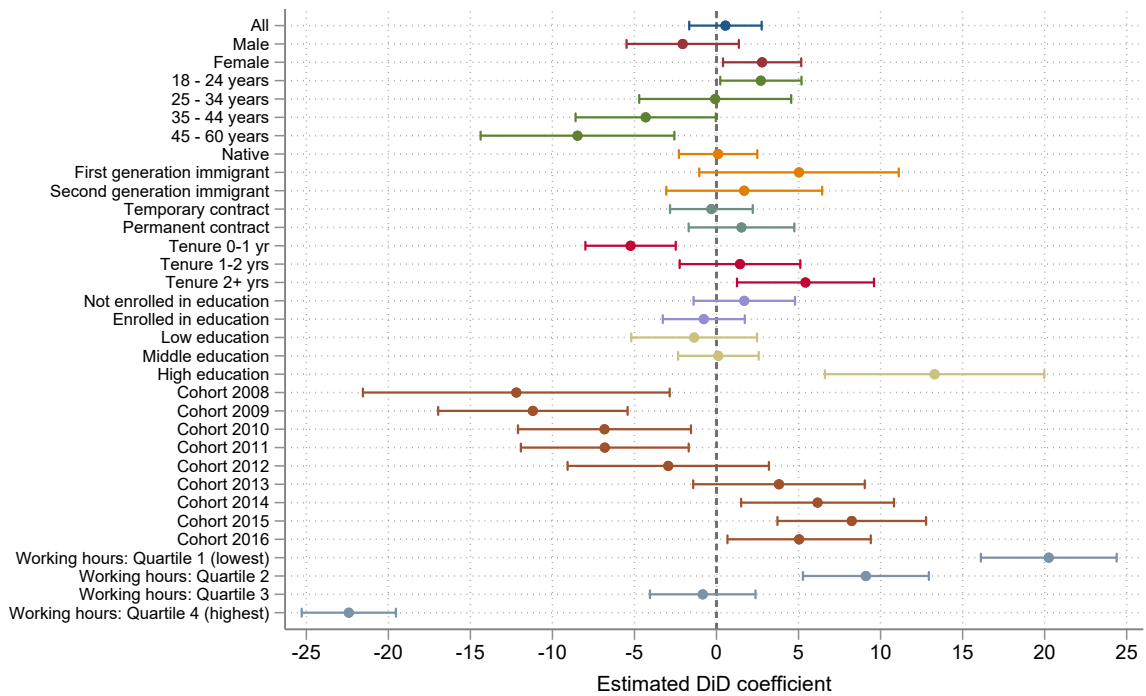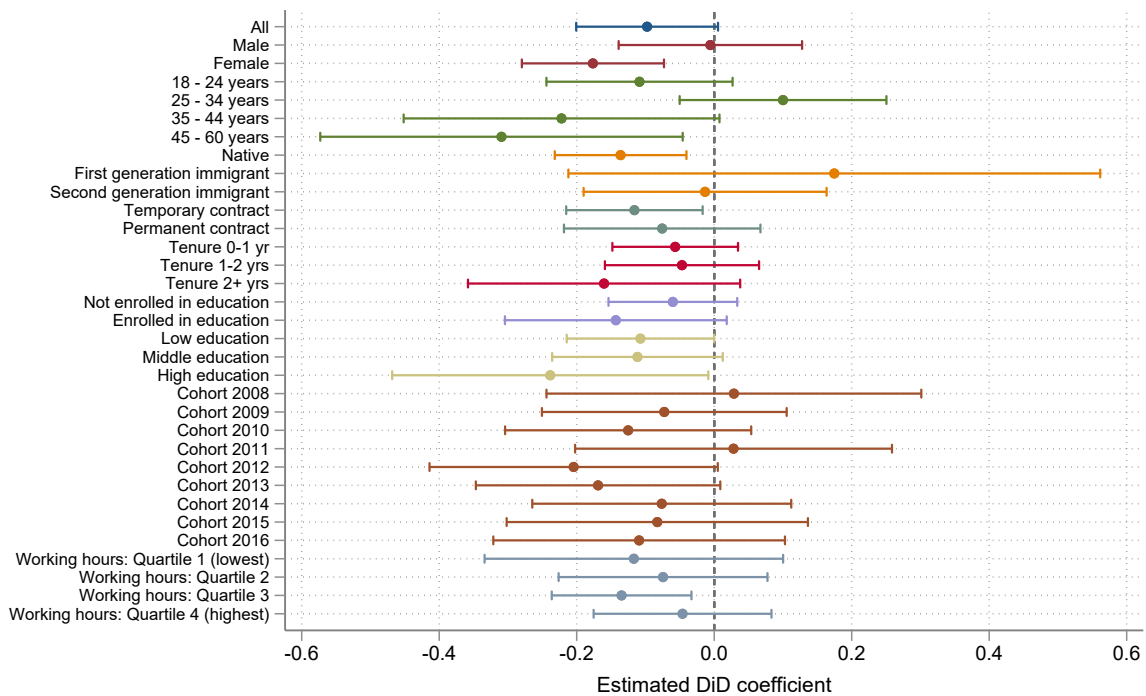FIGURE F2. Quarterly hours worked conditional on employment

FIGURE F3. Hourly earnings conditional on employment (in euros)

Appendix G.   A model of outsourcing

This section presents a simple model of outsourcing to interpret our empirical findings: this models helps explain why workers would consent to being moved to outsourced contracts in equilibrium.

G.1.   Regular and outsourced contracts

Consider a firm that employs n workers, perhaps in a certain occupation. The firm can directly employ a worker by offering her a regular contract. However, a staffing firm offers firm to take over part of its labor contracts. Also, assume that it would always be profitable for the firm to outsource a worker's contract to the staffing firm if it could convince the worker to consent to it. This is the case because staffing firms are not required to provide outsourced workers the same protections and benefits that cover standard employment relationships, and competition among staffing firms is limited. This is consistent with our empirical observation that there is a small number staffing firms offering payrolling services, with average staffing firm size greatly exceeding that of other firms (see Table 2).

G.2.   Workers' valuations of outsourced contracts

Assume that workers are heterogeneous in their valuations of an outsourced contract. Define v^w as the valuation by worker w of an outsourced contract if the staffing firm would not charge the worker a fee for its service (see below). Valuations v^w differ between workers. For example, some workers can have worse alternative job opportunities (such as students who can only find weekend jobs through a staffing firm) or workers can have different tastes for working irregular hours.

Assume that the staffing firm maximizes profits by (implicitly) charging each outsourced worker a flat fee p. Examples could be that the staffing firm reduces each outsourced workers' hourly wage, restricts their working hours, or both. Further, p could capture that the staffing firm is not legally obligated to pay severance costs, employer pension contributions, or wages during sickness.

Define the valuation by worker w of an outsourced contract including the staffing firm's fee p as:

(G1)
$$u^w = v^w - p$$

and only workers with $u^w > 0$ will consent to signing an outsourced contract.

G.3. Workers' inelastic supply to outsourced contracts

Assume that the density of valuations v^w is given by the density function $g(v^w)$ and distribution function $G(v^w)$. For a mass n of potential workers being outsourced and for a given p, the number of workers that opt for the outsourced contract is:

(G2)
$$N = n[1 - G(p)]$$

which gives labor supplied to outsourced contracts.

Define the hazard rate of labor supply to outsourced contracts as:

(G3)
$$\mu(p) = \frac{g(p)}{1 - G(p)}$$

This hazard rate is the fraction of workers desiring an outsourced contract but who would opt out of being outsourced if p would marginally increase. If this hazard rate is high (low), labor supplied to outsourced contracts will be more (less) elastic.

G.4. Optimal fee charged by the staffing firm

The staffing firm chooses the fee p that it (implicitly) charges the outsourced worker by maximizing its profits:

(G4)
$$\max \Pi(p) = pN$$

subject to equation (G2). For simplicity, we assume that the staffing firm has no costs. The first-order conditions of profit maximization give the following proposition:

Proposition *The fee that the staffing firm (implicitly) charges the outsourced worker is given by:*

(G5)
$$p = \frac{1}{\mu(v^{\tilde{w}})} = \frac{1}{\mu(p)} = \frac{1 - G(p)}{g(p)}$$

with $\tilde{w}$ defined by $v^{\tilde{w}} \equiv p$ to denote the marginal worker who is just indifferent between an outsourced contract or not.

Equation (G5) shows that the staffing firm maximizes profits by setting p equal to

the inverse hazard rate of labor supply evaluated at p. If the hazard rate is generally low such that labor supply is more inelastic, the staffing firm charges a higher fee to its workers. That is, the staffing firm acts as a monopsonist that reduces each worker's utility (given by $u^w = v^w - p$) if the labor supplied to outsourced contracts is more inelastic. In this sense our work relates to other papers studying monopsony in a legal context, including non-compete clauses (Krueger and Ashenfelter 2022; Lipsitz and Starr 2022; Starr, Prescott, and Bishara 2021; Marinescu and Posner 2019; Blair and Harrison 2010). However, a key distinction is that in our framework, the source of monopsony power comes from the regulation of labor market intermediation rather than from (tacit) collusion among employers that breaches antitrust laws.[12] This argument is also consistent with Estefan et al. (2024)'s finding of reduced wage markdowns following an outsourcing ban.

G.5. Equilibrium and comparative statics

Panel A in Figure G1 illustrates the equilibrium, assuming that $g(v^w)$ is a normal density function. The density $g(v^w)$ is shown on the left, where the shaded area is the share of potential workers who agree to sign an outsourced contract given by $1 - G(p)$. The determination of the fee p is illustrated on the right-hand side of panel A. The downward sloping curve is the inverse hazard rate given by $[1 - G(v^w)]/g(v^w)$.[13] The equilibrium value for p is found where this downward sloping curve intersects the upward sloping 45-degree line.

We can also use Figure G1 to illustrate what happens to the fraction of workers who want an outsourced contract and to the equilibrium fee (implicitly) charged by the staffing firm to workers if the environment changes. Assume, for example, a worsening of the outside options of workers over time (perhaps because there are fewer regular contracts offered in a recession) such that $g(v^w)$ shifts to the right, as illustrated in gray on the left in panel B. It shows that the fraction of workers who want an outsourced contract increases, despite a higher (implicit) fee p'. The image on the right shows that

---

[12]There is a growing interest in the importance of monopsony power in modern labor markets (Manning 2003, 2021; Dal Bó, Finan, and Rossi 2013; Webber 2015; Dube, Manning, and Naidu 2018; Dube et al. 2020; Azar, Marinescu, and Steinbaum 2019, 2020; Arnold 2020; Marinescu, Ouss, and Pape 2021). In some models, firms exploits workers' idiosyncratic tastes for non-wage amenities (Card et al. 2018), implying that only a small number of firms are offering a particular package of wages and amenities. Our framework fits into this literature.

[13]The inverse hazard rate of $g(v^w)$ is decreasing in v^w if $g(v^w)$ is a logarithmically concave density function. Many common density functions are logarithmically concave, including normal and uniform densities.

the optimal fee increases from p to p' because the inverse hazard rate increases for any given v^w and the downward sloping curve shifts upward.

In sum, our model predicts that a worsening of workers' outside options (in the near future) will result in worsening labor market outcomes for outsourced contracts (such as a reduction in hourly wages, a restriction in hours worked, a loss in severance pay entitlement, reduced employer pension contributions, or no wages during sickness), which workers are nonetheless willing to accept.

G.6.   Numerical example

Consider a two-period labor market. In the first period, workers employed in a firm earn a wage W and there is no outsourcing. However, all contracts expire at the end of period 1. In period 2, the firm has the option of extending workers' contracts at cost C that the firm has to pay at the end of period 2 to each worker who has been employed by the firm in both periods. This cost could for example result from having to offer a permanent contract, which is accompanied by (potential) future firing costs.

Alternatively, at the end of period 1, the firm and each worker could extend their match through a staffing firm. The staffing firm does not have to pay cost C at the end of period 2, and it pays an outsourced worker a wage of $W - p$. Assume that the staffing firm also charges a fee to the firm and that this fee is small relative to C, so that it is profitable for the firm to never offer a contract extension to a worker but to retain that worker on an outsourced contract.

In addition, assume that workers generally dislike having to work irregular work schedules when on an outsourced contract. Define e^w as worker w's dislike of irregular work schedules, and assume that e^w is uniformly distributed over the interval $[0, W]$: $e^w \sim U[0, W]$. In addition, assume that worker w's valuation of an outsourced contract excluding p is given by $v^w = W - e^w - Z^w$ with $W - e^w$ her gross valuation of the outsourced contract excluding p and Z^w her outside option.

In period 1, each worker's outside option is $Z^w = W$ because the firm employs each worker on a regular contract and pays her a wage of W. Consequently, $v^w = W - e^w - W = -e^w$ such that v^w is uniformly distributed over the interval $[-W, 0]$. If $p > 0$ (i.e. the staffing firm will never subsidize workers to sign an outsourced contract), we get that $u^w = v^w - p = -e^w - p$ will always be negative such that no worker is willing to sign an outsourced contract in period 1. Given that $v^w \sim U[-W, 0]$, we also get $g(v^w) = 1/W$ and $G(v^w) = 1 + v^w/W$. Therefore, the inverse hazard rate is given by $[1 - G(v^w)]/g(v^w) = -v^w$

with $v^w \in [-W, 0]$. The equilibrium for period 1 is graphically illustrated in black in panel C of Figure G1.
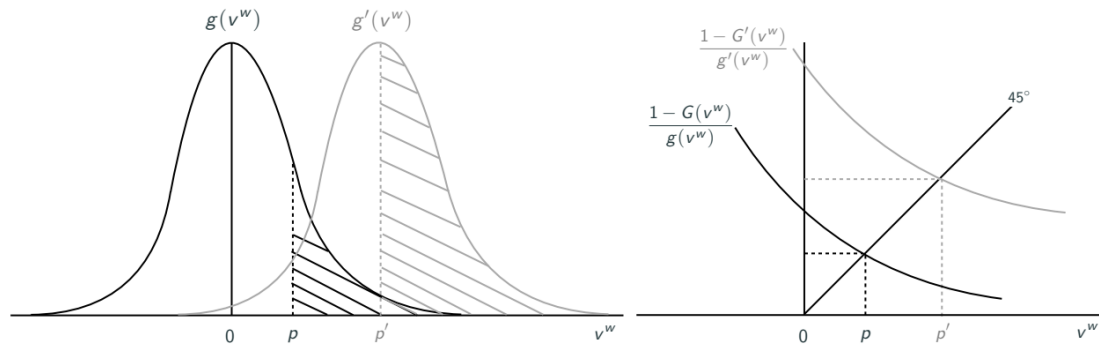
In period 2, each worker's outside option decreases to $Z^w = 0$ because the firm no longer wants to employ any worker on a regular contract. Consequently, $v^w = W - e^w$ such that v^w is uniformly distributed over the interval $[0, W]$. Given $v^w \sim U[0, W]$, we get $g'(v^w) = 1/W$ and $G'(v^w) = v^w/W$. Therefore, the inverse hazard rate is now given by $[1 - G'(v^w)]/g'(v^w) = W - v^w$ with $v^w \in [0, W]$. Using the proposition above, the optimal fee p is given by $p = W - v^{\tilde{w}} = W - p$ such that $p = W/2$. Consequently, all workers with $u^w = v^w - p = W - e^w - W/2 = W/2 - e^w > 0$ or with $e^w < W/2$ will sign n outsourced contract (and all other workers will be without a contract in period 2). For workers who sign an outsourced contract, the wage decreases from W in period 1 to $W/2$ in period 2. The equilibrium for period 2 is graphically illustrated in gray in panel C of Figure G1.

FIGURE G1. Outsourcing equilibrium, comparative statics and numerical example

A. Outsourcing equilibrium
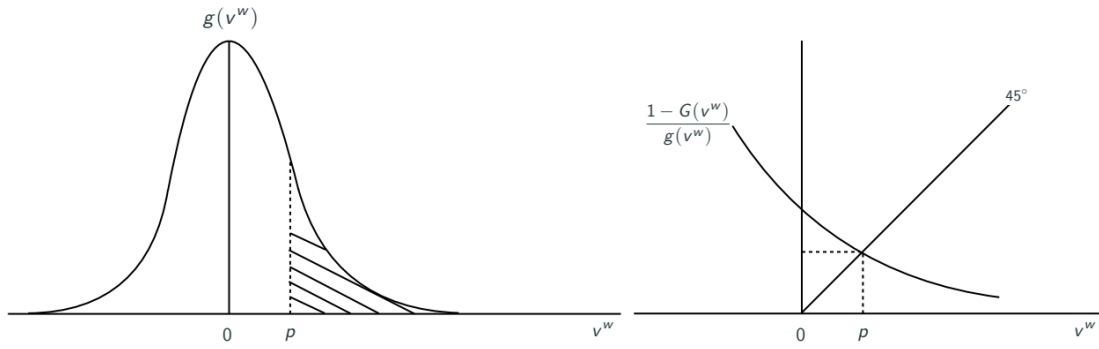
B. Comparative statics

C. Numerical example