Istituto Nazionale Previdenza Sociale

ottobre 2024 – numero 84

WorkINPS *Papers*

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ISSN 2532 -8565

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Tommaso Nannicini

The Consequences of Domestic Outsourcing on Workers: New Evidence from Italian Administrative Data

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The Consequences of Domestic Outsourcing on Workers: New Evidence from Italian Administrative Data*

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September 5, 2024

Abstract

We exploit a novel identifier of outsourcing events present in Italian administrative data. This information permits us to estimate the effects of outsourcing across a wide set of occupations without restricting the analysis to workers who remain employed after being outsourced. We find that outsourcing leads to substantial earnings losses, primarily driven by the extensive margin—a margin not fully analyzed by previous research—as several outsourced workers become non-employed shortly after joining the contracting firms. Outsourced workers in non-routine manual jobs have the largest earnings losses, while those in jobs involving abstract, cognitive tasks experience some earnings gains following the outsourcing event. Our evidence is consistent with some Italian firms using outsourcing to bypass the country's strict employment protection legislation.

Keywords: Outsourcing, Employment Protection, Task Content, Structure of Wages, Displacement

JEL Codes J24, J31, J42, J53, L24.

*This project was made possible thanks to the sponsorships and donations in support of the "VisitINPS Scholars" program. The findings and conclusions expressed are solely those of the authors and do not represent the views of the Italian Social Security Institute (INPS). We are grateful to Adrien Bilal, Zoe Cullen, Arin Dube, Andy Garin, Francois Gerard, Susan Houseman, Peter Hull, Lorenzo Lagos, Max Risch, Johannes Schmieder, and Michael Wong, and seminar and conference participants at the Outsourcing Research Network Workshop, Brown University, Hong Kong University, Queen Mary University in London and Queens University. We are grateful to the INPS Research Division, in particular Edoardo Di Porto, Maria De Paola, and Paolo Naticchioni, for assisting with data access. Raffaele Saggio gratefully acknowledges financial support from the Sloan Foundation (Grant # G-2019-12543).

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Le Conseguenze delle Esternalizzazioni sui Lavoratori: Nuovi Risultati basati su Dati Amministrativi Italiani

Questo articolo utilizza una nuova chiave per identificare pratiche di esternalizzazione nei dati amministrativi, sfruttando l'informazione sul motivo di cessazione di un rapporto di lavoro riportata nei dati amministrativi di fonte INPS. Nello specifico, l'analisi si focalizza su cessazioni di rapporti di lavoro dovuti a "trasferimento di ramo d'azienda". Questo metodo di identificazione permette di studiare l'effetto delle esternalizzazioni su un ampio ventaglio di occupazioni e non impone – a differenza delle diverse strategie di identificazione utilizzate in letteratura – di limitare l'analisi ai lavoratori che rimangono occupati a seguito del processo di esternalizzazione. L'analisi empirica rileva che l'esternalizzazione comporta mediamente una perdita sostanziale di salario, effetto in gran parte dovuto al margine estensivo, ovvero al fatto che molti dei lavoratori coinvolti perdono il proprio posto di lavoro in seguito al processo di esternalizzazione. L'analisi evidenzia inoltre che l'impatto dell'esternalizzazione varia notevolmente a seconda del tipo di occupazione in questione: i lavoratori esternalizzati che in precedenza svolgevano lavori manuali non di routine (es. cuochi) sembrano subire le perdite di salario maggiori, mentre i lavoratori esternalizzati in impieghi con una elevata componente cognitiva (es. sviluppatori di software) non sembrano subire perdite di salario. Nel loro complesso, i risultati empirici suggeriscono che le imprese utilizzino la pratica del trasferimento di ramo d'azienda come strumento per aggirare la rigida legislazione in materia di protezione dell'occupazione.

Parole Chiavi: Esternalizzazioni, Trasferimento di Ramo Azienda, Occupazione, Monopsonio, Salari

1 Introduction

Outsourcing is a landmark of contemporaneous labor markets (Dey et al., 2010). This business practice allows firms to outsource tasks (e.g., cleaning, HR, IT services) to external providers that may have a comparative advantage in performing them. Critics of outsourcing, however, argue that this comparative advantage is often overstated and firms use outsourcing to simply reduce costs, sometimes by circumventing existing labor laws (Weil, 2014; The New York Times, 2023). Both hypotheses are reasonable ex ante, highlighting the importance of an empirical analysis that could assess the potential costs and benefits of outsourcing for workers.[1]

In this paper, we provide a novel quantification of the effects of outsourcing by using an explicit identifier of outsourcing events encoded in Italian administrative data. This identifier provides an improvement relative to the existing literature along two dimensions. First, while existing estimates of the effect of outsourcing are confined to specific occupations or sectors (e.g., Dube and Kaplan, 2010; Goldschmidt and Schmieder, 2017), we can precisely compute the effects of outsourcing across a wide range of occupations. Second, this identifier allows us to study the impact of outsourcing along the extensive margin, an aspect typically not addressed in the current literature. The latter can be particularly relevant in contexts of high employment protection—like Italy—where anecdotal and court evidence suggests that some firms use outsourcing to effectively terminate workers (Speziale et al., 2006; Fisac-CGIL, 2014).

We find that outsourcing has large and persistent negative effects on earnings and

[1] As highlighted by our paper's title, our analysis focuses on domestic outsourcing, as opposed to offshoring.

these losses are primarily driven by job loss. Five years after being outsourced, workers' cumulative earnings losses map to around €13,500 in present discounted value (PDV) terms, corresponding to about two-thirds of their pre-outsourcing annual earnings. These earnings losses are mainly driven by the extensive margin; ignoring this margin, as much of the existing literature does, would lead us to underestimate the earnings losses by a factor of four. These losses are also very heterogeneous. Outsourced workers in non-routine manual jobs—such as cooks or beauticians—have the largest earnings losses, while workers in jobs involving abstract, cognitive tasks—such as software developers or consultants—experience some earnings gains following the outsourcing event.

Our analysis uses data from Italian social security records, which require employers to provide explicit justifications for terminating employment contracts. This information is key for determining severance payments and other benefits that might accrue to the worker. Among possible reasons for separation, employers can list outsourcing. We leverage this specific detail recorded in the social security administrative records to identify outsourcing events. Over two-thirds of workers in our data are outsourced to a daughter firm whose sector code does not match that of a business service firm.[2] As a result, a wide range of jobs are part of our outsourcing events, from janitors and security guards (as in Goldschmidt and Schmieder (2017) and Dube and Kaplan (2010)) to blue-collar workers in the manufacturing sectors (as in Dey et al. (2012)) to consultants, accountants, or software developers.

The data also reveal that several outsourced workers are not working for the daughter firm one year after being outsourced. This finding aligns with existing lawsuits in which

[2]Following the literature, we refer to the firm that outsources the worker as the "mother firm," while "daughter firm" refers to the firm receiving the worker.

workers claim that being outsourced led to an unlawful termination (Corte di Cassazione, 2006, 2017*a*). Relatedly, some legal scholars have expressed concerns about the inconsistency of Italian labor laws where it is very difficult for firms to directly fire workers but relatively easy instead to outsource employees to companies that might go out of business shortly after or may have stronger economic and legal justifications to eventually fire the outsourced workers (Speziale et al., 2006).

We use a matched difference-in-differences approach to study the causal impact of outsourcing on workers. Outsourced workers are matched to individuals who never experienced an outsourcing event and who share similar observable characteristics. We find that outsourcing leads to a loss in earnings of around €5,000 (approximately 23% of their pre-outsourcing earnings) one year after the event. These earnings losses continue to persist five years after the event and amount to roughly 10% of the pre-outsourcing earnings. Job loss is a key driver of these losses. Employment decreases by 22 percentage points the year after the event, and the negative effect remains significant at almost 8 percentage points five years later.

We then compare the estimated earnings losses using the outsourcing identifier with those computed when applying the outsourcing definition of Goldschmidt and Schmieder (2017) (GS henceforth), which focuses on transitions of workers from a given employer to a business service firm in the food, cleaning, logistics, and security (FCSL) sector. Outsourced FCSL workers identified by the flow approach of GS in our data have cumulative earnings losses (over five years) of around 11% of their pre-outsourcing yearly earnings, while outsourced FCLS workers flagged by our identifier of outsourcing events have cumulative losses of around 45%. These differences arise because the flow approach esti-

mates null effects on employment. In this method, a treated/outsourced worker must be employed by the mother firm in year t and by the daughter firm in year $t + 1$. Consequently, it excludes workers who lose their jobs between these years, thus underestimating employment losses due to outsourcing.

But why are many outsourced workers eventually without a job after being outsourced in our setup? A relevant fraction of workers are outsourced to daughter firms that are created precisely in the outsourcing event year, with many shutting down right after. Daughter firms also tend to offer jobs with fewer hours (e.g., a part-time job to a worker who used to have a full-time job with the mother firm) and lower employment protection (e.g., a temporary job to a worker who used to have a permanent job with the mother firm), and apply a different collective bargaining agreement (CBA) relative to the one applied by the mother firm. As a result, we also see an increase in the number of outsourced workers who voluntarily resign from these jobs. Taken together, this suggests that the primary reason outsourcing leads to non-employment stems from the considerable instability of outsourced positions, combined with workers' reluctance to accept these lower-quality jobs.

The effects of outsourcing tend to vary considerably across occupations. For example, outsourced cooks tend to experience very large negative earnings losses, while outsourced software developers experience slightly *positive* increases in earnings. Computing the effects of outsourcing according to the outsourced job's task content—using the classification of Autor et al. (2003)—shows that the immediate losses of outsourcing are three times higher for workers in routine or non-routine manual jobs relative to those in non-routine analytical or interactive jobs. The analysis at the sectoral level of the mother

firm yields comparable results, with large negative effects in the food/restaurant sectors (and in some manufacturing sectors), null or slightly positive effects in IT-intensive sectors, and positive effects in the consulting sector.

We view these heterogeneous effects as the manifestation of different motives driving a firm's decision to outsource (a point previously highlighted in a structural framework by Bilal and Lhuillier, 2021). Some jobs may be outsourced simply because firms need to reduce firing and other related costs (Goldschmidt and Schmieder, 2017; Drenik et al., 2023; Daruich et al., 2023). Outsourcing could, however, also be pursued by some firms to directly increase productivity, for instance, by exploiting economies of scale or comparative advantages, factors that may eventually lead to higher pay for outsourced workers (Bergeaud et al., 2021; Bostanci, 2021). This latter motive seems to be more prevalent when analyzing workers in jobs involving more cognitive and abstract tasks, such as consultants and software developers.

Consistent with the heterogeneous effects by sectors and occupations, we also find that the negative effects of outsourcing are concentrated in low-value-added firms with a relatively high labor share. This result is somewhat surprising given GS's findings that wage losses due to outsourcing are concentrated in workers outsourced by firms with high wage premiums (and thus firms that tend to be more productive; see Card et al., 2018). We believe this discrepancy arises because GS could not account for the possibility that firms use outsourcing to reduce firing costs (as highlighted by Autor, 2003), due to both data limitations and differences in labor market institutions between Germany and Italy (Boeri, 2011). The negative effects of outsourcing on employment that we find are consistent with outsourcing being used as a cost-cutting strategy that might allow low-

value-added and high labor share firms to remain viable and avoid closure (Acabbi and Alati, 2023; Dustmann et al., 2022).

The fact that Italian firms tend to use outsourcing practices to circumvent firing costs is also apparent when analyzing the trends of firm-level outcomes of outsourcing firms. Five years before the outsourcing decision takes place, these firms tend to have higher value added per worker than non-outsourcing firms in the same location and industry. However, three to four years before the outsourcing decision, outsourcing firms appear to be hit by a relatively persistent negative revenue shock. Interestingly, while this negative shock drives down sales and value-added, these firms essentially seem unable to adjust their size and labor costs, most likely due to high employment protection in the country. It is only after the outsourcing decision that size and labor costs effectively decrease. Therefore, it appears that the average firm does not use outsourcing in "good" times to directly increase productivity. Instead, it is predominately used to cope with a negative downturn.

The dynamic evolution of revenues and other financial variables of outsourcing firms raises the question of what is the relevant counterfactual for an outsourced worker. Our baseline estimates leverage non-outsourced workers who had a similar career trajectory as outsourced workers to construct this counterfactual. This follows the original design of GS and is similar in spirit to the research design used in the job displacement literature (Jacobson et al., 1993; Schmieder et al., 2023; Bertheau et al., 2023) that computes what would have happened to the worker if the displacement/outsourcing event had not occurred. However, another interesting counterfactual to consider is one in which the worker is not outsourced but their employer has experienced a negative trajectory

in revenues similar to the one faced by outsourcing employers. Interestingly, when we match workers based also on their employer's revenue trends before outsourcing, our earnings estimates remain virtually identical. Therefore, workers employed by firms that are also experiencing a downturn trajectory in revenues but did not resort to outsourcing have significantly higher earnings than outsourced workers after the outsourcing event. This suggests that firms can pursue other strategies to cope with the negative shock that do not lead to persistent earnings losses for workers.

More broadly, the partial-equilibrium effect of outsourcing on workers that we estimate is important when considering the general equilibrium effects of this business practice (Bostanci, 2021; Bertrand et al., 2021; Bilal and Lhuillier, 2021; Deibler, 2022; Felix and Wong, 2023). Our estimated negative effects are higher than the ones typically used in this literature, which are often based on the analysis of a few selected sectors or do not consider the extensive margin. Our results therefore suggest that any efficiency gains due to outsourcing must be substantially higher than originally thought to offset the negative effects faced by workers.

2 Outsourcing in Italy

Section 2.1 describes the Italian labor market and the evolution of labor laws on domestic outsourcing. Section 2.2 introduces the Italian administrative data, and Section 2.3 explains how these data are used to measure outsourcing.

2.1 Institutional Background

The Italian labor market has historically been considered a very rigid one. Wages are determined by employers' organizations and unions via nationwide sectoral CBAs

that provide limited scope for firm-level adjustments (Devicienti et al., 2019; Boeri et al., 2021). In turn, this rigid wage structure is coupled with one of the highest employment protection legislation in Europe (Boeri, 2011). In the mid-1990s, Italy began implementing a series of reforms aimed at enhancing the flexibility of its labor market (Cappellari et al., 2012).[3]

A landmark from this wave of reforms is Decree 18/2001, which reformed outsourcing practices. Before this reform, Italian firms were prohibited from outsourcing some of their existing employees to other firms. The only way to formally transfer a worker from firm A to firm B was via a full merger between both firms (i.e., a situation in which *all* employees of one firm joined the other firm). This changed with Decree 18/2001, which made it possible for Italian firms to outsource just "pieces" of its business to other firms (Emanuele et al., 2012).[4] Decree 276/2003 introduced an additional element of discretionality by stating that the branch to be outsourced can be identified at the time of transfer, whereas before this reform, the branch had to be "pre-existing" within the organization. Importantly, firms can engage in this outsourcing practice without workers' approval. Workers who refuse to transfer to the daughter firm can be fired for just cause by the daughter firm (Corte di Cassazione, 2017*b*).

Two legal guardrails were adopted to avoid the indiscriminate use of this practice by

[3]Three reforms were of particular significance. The "Treu Package" in 1997 introduced temporary work agencies, and Decree 368/2001 relaxed several restrictions on the usage of temporary employment contracts. Additionally, Decree 30 of 2003 ("Biagi Law"), followed by Decree 276/2003, reformed the apprenticeship contract and introduced new temporary contracts limited to specific "projects" (often referred to as "independent contractors" in labor law, or "Co.Co.Pro" in Italian). These reforms contributed to creating a dual labor market where highly protected employment contracts—the so-called permanent contracts that remain the most common contract in Italy—co-exist with temporary ones—which are typically used to hire new, young workers (Daruich et al., 2023).

[4]In Italian, this practice is called *trasferimento di ramo di azienda* and is disciplined by article 2112 in the Italian civil law.

employers (Pedrazzoli et al., 2004). First, firms can only outsource well-defined "branches," i.e., parts that have a clear task within the organization (e.g., providing customer support). Second, the outsourced worker should not experience any significant worsening of their employment conditions. However, it is unclear whether these guardrails were truly effective in protecting workers. In fact, several labor courts since the mid-2000s have presided over lawsuits filed by outsourced workers against their employers for illegal outsourcing practices (e.g., Corte di Cassazione, 2017*a*; Tribunale Ordinario di Milano, 2016; Undiemi, 2008).

The typical case is one in which firms are accused of using outsourcing as a loophole to essentially fire workers, thus violating Italian employment protection laws (Meucci, 2015). Firms in Italy can appeal to either "subjective" or "objective" motives to *legally* fire workers. Subjective motives refer to situations where the worker's conduct violated the employment relationship, while objective reasons constitute situations where the firm is experiencing financial difficulties and must fire part of its workforce. Firing for both reasons is heavily regulated, and the burden of proof relies entirely on firms. For instance, companies seeking to implement a mass layoff must first communicate their intentions to a labor court, which verifies that all necessary conditions for the mass layoff have been met. These requirements include verifying that the firm is facing some pre-existing poor economic conditions, proving that none of the fired workers can be relocated within the firm, and proving that the layoff is not "discriminatory" (i.e., targeting a few, selected, workers).

Conversely, outsourcing does not require any pre-approval from a labor court and can only be appealed after the outsourcing event. In practice, there are three common reasons

why outsourced workers may lose their jobs shortly after being outsourced (all of which can occur in both a premeditated and unexpected manner). First, the worker may be outsourced to a firm with financial difficulties, which could thus shut down shortly after the outsourcing event (see, e.g., Corte di Cassazione, 2006 and Gragnoli, 2006). Second, outsourced workers may join new and/or smaller firms with less than 15 employees or worker cooperatives with less stringent employment protection laws (Kugler and Pica, 2008) and would thus be easier to be fired. Last, outsourcing may involve an agreement where the daughter firm supplies a particular service (e.g., call center) to the mother firm using the outsourced workers. When the contract expires, these workers can be fired, as the economic rationale for their employment no longer exists (see, e.g., the Barcalys-Engo case study analyzed in Fisac-CGIL, 2014).

While the definition of illegal outsourcing practices remains a topic of debate among labor law scholars (Scarpelli, 2012; Iacobucci, 2023), there has never been a systematic accounting of, say, how many outsourced workers are non-employed after being outsourced. This paper aims to fill that gap.

2.2 Data

We use administrative data from the Italian Social Security Institute (*Istituto Nazionale di Previdenza Sociale*, INPS) on the universe of employer-employee matches and social security payments in the private sector from 1983 to 2019, made available through the Visit-INPS scholar program. For each employment spell recorded in a given year, we have data on earnings, number of days worked, the type of employment contract (e.g., temporary versus permanent, part versus full time), the employer's identity, and some demographic

information about the employee.[5] From 2009, it is possible to measure the occupation of a job that was either created or destroyed in a given year. Firms are defined based on their national tax identifier (*codice fiscale*). The latter is used to merge the financial records of firms collected by CERVED, which are available for the universe of non-financial incorporated firms.[6]

2.3 Measuring Outsourcing

Since 2005, employers have been required to report the reason for a job separation to the INPS.[7] Among the potential reasons listed by the INPS is the outsourcing practice ("trasferimento di ramo di azienda") described in Section 2.1.[8,9] We thus measure outsourcing events by focusing on separations where the underlying reason behind the job separation is "outsourcing" according to official INPS records.[10]

Comparison with Goldschmidt and Schmieder (2017). Our approach in measuring outsourcing events in administrative data differs from that of GS. GS identify outsourc-

[5]Earnings include overtime payment, bonuses, and shift work. We convert them to real euros (2015 CPI) and top code them at €400.000.

[6]The CERVED dataset is derived from standardized reports that firms are required to file annually to their local chamber of commerce.

[7]This requirement, affecting pension contributions and severance payments, officially began in 2005 but has only been reliably enforced since 2008. Thus, we start measuring outsourcing events from 2008.

[8]The other most common reasons for a job termination are that (i) the worker resigned, (ii) the worker was fired due to the firms' financial difficulties (objective reason), (iii) the temporary contract ended, (iv) (full) mergers, and (v) the worker was fired due to misconduct (subjective reason). Data on reasons for job separations are available for approximately 75% of all separations observed in a given year among jobs that lasted at least three months. Two key factors associated with missing data on reasons for separation are (i) the separation occurring in December and (ii) the employer disappearing from the INPS data in the year of separation.

[9]Di Addario et al. (2023) test the validity of the reason for separation variable in the INPS data, concluding that it accurately distinguishes between voluntary and involuntary job separations.

[10]The INPS also supplies data on reasons for hiring, which include outsourcing. This information allows us to isolate cases where the outsourced worker effectively joins the "designated" daughter firm associated with its outsourcing event.

ing events in Germany by focusing on large flows of workers moving from a particular establishment to a business service firm. They focus on five types of business service firms (those in the FCLS sector and temporary agencies) for which it is relatively easy to find proper business service sector codes in the German data, reducing the likelihood of flagging non-outsourcing flows of workers.

There are two key advantages of our approach of using the INPS identifier to measure outsourcing relative to the GS approach based on worker flows. First, the INPS flag allows us to study the effects of outsourcing beyond the FCLS categories considered by GS. Table A1 shows the most common occupations associated with outsourcing events in the INPS data. Salespersons operating in the retail and mass-retail sector (e.g., a product sampler in a supermarket) represent the most common outsourced occupation. The table also shows that outsourcing can extend to occupations that are typically considered better paid, such as IT jobs.

Second, our approach does not require outsourced workers to be employed by the daughter firm (a requirement that instead must be imposed by the flow approach); it only requires them to be outsourced by the mother firm. This is extremely important because, as described in Section 2.1, abundant anecdotal evidence and lawsuits suggest that several workers no longer have a job shortly after being outsourced. Overall, we find that the vast majority (79%) of workers are either outsourced to a non-business-service-providing firm or end up not working for the daughter firms (i.e., two cases that would not be captured by GS's flow approach).

Defining Outsourcing Events. The outsourcing events that we seek to analyze correspond to situations where the mother firm outsources to an *external* firm some of its

workers. Ideally, these outsourced workers continue to perform the same job as before but are now hired by the daughter firm (which GS labeled as "on-site outsourcing").

One important caveat of the outsourcing identifier from the INPS data is that it might flag situations different from the outsourcing event just highlighted. First, the flag is sometimes used when workers are transferred within the firm. For example, a worker is transferred from "Firm A - Production" to "Firm A - IT," and these two firms have different national tax identifiers despite being controlled by the same owner. Additionally, some mother firms shut down right after the outsourcing event. This is puzzling under an outsourcing framework, as it leaves no tasks to be performed for the mother firm anymore.

We thus exclude from our definition of outsourcing events situations where either of the following happens: (a) the mother and daughter firm share the same six-digit industry code, (b) worker flows are also observed from the daughter to the mother firm, and (c) 90% or more workers are flagged as outsourced by the mother firm in year t and the mother firm is dissolved between year t and $t + 1$. Restrictions (a) and (b) are imposed to ensure that the daughter firm is an external firm and, in particular, that the outsourcing event does not represent a transition of workers occurring within an internal labor market (Cestone et al., 2023). Restriction (c) is imposed to ensure that the mother firm continues to exist at least immediately after the outsourcing event.[11] These restrictions identify 267,030 workers involved in an outsourcing event in our data.[12] Imposing these

[11] A similar condition is imposed by GS, who focus on mother firms that continue to be alive in the year after the outsourcing event and whose firm size does not shrink by more than 50%. Figure A5 shows the effects of outsourcing for various degrees of exposure, defined as the fraction of the wage bill of the mother firm related to outsourced workers.

[12] Table A2 presents details on the share and total number of observations dropped by the three restrictions.

conditions does not ensure that outsourced workers will continue performing the same tasks once employed by the daughter firm, a caveat also shared with the flow approach of GS. However, the qualitative evidence in (Emanuele et al., 2012)—of interviews with HR representatives of companies involved in outsourcing events—suggests that this is the case in most situations.

3 Econometric Framework

We study the effects of outsourcing using a matched difference-in-differences research design akin to the one originally proposed by GS. This approach compares the changes in labor market outcomes of an outsourced worker relative to a matched control worker with a similar labor market history.

Matching Strategy. To construct our matched sample, we begin by considering the pool of workers who experienced an outsourcing event—as defined in Section 2.3—and had at least two years of tenure with their mother firm when they were outsourced.[13] Each worker treated/outsourced in year t^* is then matched with a control worker who never experienced an outsourcing event in their career and in year t^*; had the same gender, tenure, CBA, and employment contract; lived in the same region; and worked for a firm in the same quartile of firm size (measured in $t^* - 1$). To perform a one-to-one match between treated and control workers, we conduct a caliper matching method (Stepner and Garland, 2017) without replacement, using earnings in $t^* - 3$ and $t^* - 2$ (with a bandwidth of ± €500) as well as age (with a bandwidth of ± 2 years).

[13] This restriction is also used by GS and mimics the one typically imposed in the job displacement literature (e.g., Jacobson et al., 1993; Schmieder et al., 2023; Bertheau et al., 2023).

Summary Statistics. As shown in Table 1, the matching algorithm successfully matches 61,849 outsourced workers. The characteristics of matched outsourced workers are relatively similar relative to the overall sample of outsourced workers (see differences between Columns 2 and 3). Most outsourced workers are male, have a permanent and full-time contract, and have been at the mother firm for around six to seven years. They are relatively low paid, with yearly gross earnings and daily wages of approximately €20,600 and €75, respectively.[14] These workers tend to work for large firms and represent a significant part of the mother firm's wage bill the year before the outsourcing event, as measured by the exposure coefficient.

Event Study. To isolate the impact of outsourcing on workers' careers, we fit the following event-study specification on the matched sample of treated and control workers represented in Table 1:

$$y_{it} = \alpha_i + \lambda_t + \sum_{k=a}^{b} \beta_k R_{it}^k + \sum_{k=a}^{b} \theta_k (R_{it}^k \times Outsourced_i) + X_{it}'\gamma + r_{it}, \tag{1}$$

where y_{it} is the outcome of interest (e.g., total earnings) for individual i in year t, and α_i and λ_t capture worker and time fixed effects, respectively. X_{it} is a quadratic in age, $Outsourced_i$ is an indicator for whether worker i is outsourced, and $R_{it}^k = \mathbf{1}\{t_i^* = t + k\}$ represent the event-study indicators with t_i^* being the outsourcing year for worker i.[15] The event-study indicators are binned at $a = -4$ and $b = 5$ and are normalized relative to

[14] Average earnings and daily wages in Italy for this period are approximately €28,077 and €97. Moreover, Figure A1 shows that outsourced workers tend to have lower earnings and daily wages relative to their coworkers who did not experience an outsourcing event. The latter is particularly true among higher-paying mother firms.

[15] In the case of a control worker, t_i^* represents the outsourcing event year of the treated worker matched to the control worker. In the rare cases where an outsourced worker is outsourced more than once, we let t_i^* be the earliest outsourcing year.

θ_{-1}. Therefore, the coefficients θ_k for $k \geq 0$ capture the effect of outsourcing on outcome y_{it}, k years after the outsourcing event relative to the year before outsourcing. Standard errors are clustered at the worker level.

Identification. The coefficients θ_k identify the causal effect of outsourcing under a parallel trend assumption; i.e., differences in outcomes between outsourced and control workers would have remained constant absent the outsourcing event. Although this identification assumption cannot be tested directly, our analysis leverages data from years before the outsourcing event and rich microdata to maximize its plausibility. First, counterfactual earnings differences in our research design are based on narrowly defined pairs of treated and control workers who share the same tenure-gender-region-contract type-CBA-quartile of firm size up to the moment of the outsourcing event. Second, we check the evolution of outcomes in the years leading up to the outsourcing event by computing the coefficients θ^k for $k < 0$.

4 The Effects of Outsourcing on Workers

This section shows how outsourcing impacts the employment and earnings of outsourced workers. Section 4.1 introduces the baseline estimates, and Section 4.2 contextualizes why outsourcing has large and negative effects on employment. Section 4.3 compares our estimates to those obtained when applying the flow approach of GS to identify outsourcing events.

4.1 Main Results

Earnings Trajectories of Outsourced and Control Workers. Figure 1, panel (a) presents the evolution of average annual earnings for both outsourced workers and their matched

controls. Before the outsourcing event, the earnings of treated and control workers follow a similar trend.[16] After the event, the earnings of treated workers start diverging as they experience a substantial and persistent drop in pay.[17] Figure 1, panel (c) shows that a substantial part of the earnings drop may be driven by outsourced workers being without a job. Treated workers see a roughly constant 30% decline in their employment probability after being outsourced.

Event-Study Estimates. We now analyze the event-study estimates from equation (1). Panel (b) of Figure 1 shows that the annual earnings of outsourced workers decrease by €4,500 on impact (i.e., the year after outsourcing), or about 22% of pre-outsourcing average earnings. These losses are reduced over time but persist five years after outsourcing, at about €2,000, or 10% of pre-outsourcing average earnings. Our main results on earnings and employment are also presented in Table 2, Column 1. Summing the earnings losses across the five years following the outsourcing event leads to PDV losses of around €13,500, corresponding to roughly two-thirds of the average pay observed in the year before the outsourcing event.

Panel (d) of Figure 1 shows that employment is heavily affected after outsourcing, with the probability of being employed decreasing by 22 percentage points one year after. This is equal to between a quarter and one-third of the employment shares observed in the

[16] Recall that while earnings at $t_i^* - 2$ and $t_i^* - 3$ are directly targeted in our matching algorithm, the other pre-periods are not.

[17] Because we imposed a tenure restriction in $t_i^* - 1$ and t^*, both control and treated workers are, by construction, employed in these two periods. However, this restriction is no longer imposed after the outsourcing event (or in periods before $t_i^* - 1$). This implies that some control workers are now going to be non-employed after the outsourcing event, and it explains their drop in average earnings at $t_i^* + 1$ and in subsequent periods. The resulting hump-shaped earnings profile shown in Figure 1, panel (a) is common when imposing tenure restrictions in matched difference-in-differences strategies (see, e.g., the discussion in Schmieder et al., 2023) and will be captured by the coefficients β_k in the event-study specification of equation (1).

years before outsourcing for which we did not impose a tenure restriction. Over time, the loss in employment decreases but remains significant, even five years after outsourcing, at almost 8 percentage points. To put these estimates in context, Bertheau et al. (2023) recently found that Italian workers subject to a mass layoff are 30 percentage points less likely to be employed immediately after the mass-layoff event (18 percentage points after five years). Thus, our estimates suggest that outsourcing leads to an immediate negative employment effect that, while smaller, is comparable to that of mass layoffs (i.e., 22 versus 30 percentage points).

Appendix Figure A2, panel (a) reports the results in log daily wages. Outsourcing leads to a decrease in wages of roughly 2 to 3 log points, a small share of the total earnings loss. However, one concern with this analysis is outsourcing's large impact on the extensive margin, which makes this decomposition nontrivial. To account for this, panel (b) reports estimates from equation (1) on log daily wages after dropping pairs where the outsourced worker is not employed but the control worker is. We assume that this control worker represents a "complier," i.e., a worker who, if exposed to outsourcing, would be non-employed (Lee, 2009). Dropping these compliers from the estimating equation (1) thus allows us to evaluate the impact of outsourcing on log daily wages just among "always-takers," i.e., workers who remain employed even when outsourced. Overall, the estimates on this balanced sample reported in panel (b) are quite similar to the ones reported in panel (a), suggesting that the large negative effect of outsourcing on earnings is mostly due to employment losses. The next section investigates why several workers are without a job after being outsourced.

4.2 Factors Contributing to Non-Employment Following Outsourcing

In this section, we discuss potential reasons why outsourcing might lead to large job losses.

Mislabeling. Employers may incorrectly report situations as "outsourcing" that are actually mass layoffs or plant closures, which are shown to have large negative employment effects, especially in Italy (e.g., Bertheau et al., 2023). To address this, Appendix Figure A3 reports the results after fitting equation ((1)) on the subsample of events where the mother firm does not shut down in $t^* + 1$. The point estimates are very similar to our baseline estimates shown in Figure 1, suggesting that the mother firm's closure is not the primary driver of our effects.

Appendix Figure A5 expands on this finding by reporting the effects of outsourcing one or five years after the event across different exposure deciles (i.e., the fraction of the mother firm's pre-event wage bill allocated to outsourced workers; see Appendix Figure A4 for the histogram of this measure). The graph shows that the negative effect of outsourcing on earnings is qualitatively similar in events where exposure is relatively low (i.e., where presumably only a handful of workers are being outsourced) and in events where outsourced workers instead constitute a large fraction of employment (mass-layoff events).

Overall, the evidence presented in both figures does not suggest that our results are driven by employers that misclassify outsourcing events to the INPS. This also aligns with the fact that the INPS issues a distinct identifier for job separations resulting from mass layoffs.

Never Attached to Daughter Firm. To further confirm that we are capturing outsourcing events and that these events lead a sizable share of workers to be without a job, we re-estimate equation (1) for outsourced workers who report working for the daughter firm for at least a day in the outsourcing event year (which occurs for about 76% of our outsourced workers).[18] Panel (b) of Figure 2 shows that even after imposing this employment restriction, several outsourced workers employed by the daughter firm in the outsourcing event year are non-employed in the following years. The negative employment effect one year after the event is around 10 percentage points and remains significant at around 3 percentage points five years later. Panel (a) shows a qualitatively similar pattern for earnings, while Table 2, Column 2 summarizes the estimates on earnings and employment just described.

We draw two conclusions from the evidence presented in Figure 2. First, about half of the baseline employment effect (as shown in Figure 1 and reproduced in Figure 2) is driven by workers not joining the daughter firm (as shown by the difference between the baseline employment effects and those restricted to individuals who do work for the daughter firm), potentially because they rejected the "new" outsourced job. Second, the remaining half of the employment effect is driven by individuals who do work (shortly) for the daughter firm but are then found to be non-employed according to INPS records in the years following the outsourcing event. We next discuss reasons why outsourced workers might refuse or accept the job at the daughter firm only to find themselves non-employed shortly after.

[18] Recall that the INPS provides data on the reasons for both job separations and job hirings (a specific flag in the data indicates when hiring by the daughter firm is the result of an outsourcing event).

Characteristics of Post-Outsourcing Jobs. According to Italian laws, outsourced workers cannot decline the outsourcing "offer" and remain employed with their mother firm. The rationale for this condition is that, in principle, the job at the daughter firm must have the same attributes as the job at the mother firm. In practice, however, we often find that this is not the case. Figure 3, panel (a) shows that outsourced workers who had a permanent employment contract before being outsourced are significantly more likely to be employed with a temporary contract after the outsourcing event. Similarly, outsourced full-time workers have a significant increase in the probability of being employed part time after being outsourced.

The worsening of employment conditions following an outsourcing event could be driven by the fact that CBAs are allowed to change after an outsourcing event according to Italian laws. Panel (b) of Figure 3 shows that outsourcing significantly increases the probability of workers being employed under a different CBA than the one observed before outsourcing. A typical situation involves an outsourced worker initially hired under a "standard" CBA (i.e., signed by one of the main unions in Italy; see Lucifora and Vigani, 2021) but is then outsourced to a job governed by a CBA designed for temporary agencies or cooperative-type employers (Pencavel, 2013). Both situations correspond to cases where the new CBA is likely to offer the outsourced worker much less protection and fewer other amenities.

Figure 3 thus shows that outsourcing leads to jobs with fewer hours, lower employment protection, and with a different CBA that might provide lower wage floors and fewer amenities relative to the workers' original CBA with the mother firm.[19] These fac-

[19]Part of this effect could be attributed to workers rejecting the outsourced job and reallocating to another job. However, using a standard revealed preferences argument, this would then suggest that our

tors contribute to why workers might reject employment with the daughter firm, as these outsourced jobs generally offer inferior conditions compared to their previous job with the mother firm. This is also confirmed by panel (a) of Figure 4, which shows that the probability of a worker resigning from their dominant job in year t significantly increases after the outsourcing event.[20]

However, outsourcing might lead to non-employment for reasons other than voluntary resignation. Panels (b) and (c) of Figure 4 show that the probability of involuntary separations significantly increases after outsourcing. First, outsourced workers are more likely to experience a mass layoff, consistent with anecdotal evidence and labor court cases where workers report being outsourced to financially unstable companies, leading to job displacement shortly thereafter. Additionally, these workers are also more likely to experience a job separation due to their new employers' reluctance to renew temporary contracts (which are also more common after outsourcing, as shown in panel (c)).

Last, panel (d) shows that outsourced workers are systematically more likely to work for an employer that was created in the outsourcing event year. This is important for two reasons. First, it provides a rationale for the results in Figure 3, panel (b). It is often easier for newly created firms to adopt non-traditional CBAs (Card et al., 2013; Dustmann et al., 2024) or impose conditions that might be illegal, such as converting permanent contracts to temporary ones, which might be difficult for workers to challenge (or even recognize) given the lack of union representation in these firms (Naidu, 2022). Second, newly created firms are typically more unstable or less likely to survive (e.g., Mata et al.,

estimates in Figure 3 are a lower bound of the changes in job quality associated with the outsourced job created by the daughter firm.

[20]Note that the INPS reports resignation as the reason behind a job separation only in situations where the outsourced worker is employed for at least a day by the daughter firm.

1995; Caves, 1998; Agarwal and Gort, 2002), which can help explain the reduction in employment experienced by outsourced workers. In our sample, about 13% of daughter firms shut down the year after the outsourcing event, a much higher number than the unconditional 3% shutdown probability for firms that we find in Italian data.

Summary. Being outsourced leads to large and persistent negative earnings losses, primarily explained by the extensive margin. Many outsourced workers are employed only briefly (or not at all) by daughter firms, which are often created the year in which the outsourcing event takes place and often shut down shortly thereafter. These daughter firms tend to offer jobs with fewer hours and lower employment protection (e.g., due to changed CBAs and economic conditions at the daughter firm). Taken together, these findings suggest that the primary reason for non-employment following outsourcing is the considerable instability of outsourced positions and workers' reluctance to accept these lower-quality jobs.

4.3 Estimates Based on the Flow-Based Approach of GS

One relevant question is why we find a much more negative impact of outsourcing on workers' earnings compared to the findings of GS. To explore this, we compute the effects of outsourcing using GS's definition of outsourcing events with Italian data. We then compare these estimates with our baseline results, which are based on outsourcing events explicitly flagged by INPS. The goal is to determine whether the two sets of outsourcing events ultimately lead to similar effects on Italian workers (i.e., suggesting that the difference between our findings and those of GS might stem from contextual differences between Germany and Italy) and, if disparities instead emerge, investigate potential reasons behind these differences.

We implement the same steps as GS to identify outsourcing events in the FCSL sector. First, we identify flows of at least 10 workers moving between the mother firm in year t and the daughter firm in year t+1.[21] We then drop events if the mother firm is a temporary agency, if it had less than 50 employees the year before, if it dies the year after, if it shrinks by more than 50%, or if the flow represents more than 30% of the mother firm's size the year before. Next, we drop events if the daughter firm is new and the flow represents less than 65% of its size, and drop events if daughter and mother firms share the same four-digit industry code. Last, we drop events if the daughter firm does not belong to the business service associated with FCSL industries. As with our previous analysis, we focus on workers with at least two years of tenure. To compare our results with those from the flows approach, we restrict estimation of equation (1) to workers whose resulting daughter firm operates within an FCSL business service firm.

Figure 5 presents the results. Panel (a) shows that our outsourcing identification strategy yields an estimate of the drop in total earnings the year after outsourcing that is more than three times larger than that produced by GS's flow approach. This difference is persistent over time, though the magnitudes become relatively smaller. Panel (b) shows that the difference in employment outcomes is driving the difference in earnings. We estimate employment losses between 10% and 5% over time, while the flow-based approach leads to much smaller losses. Table 2, Columns 3–4 compute the associated PDV losses from each of the two approaches, and our methodology estimates these losses to be around four times larger—when scaled by pre-outsourcing earnings—than those found using the flow approach.

[21] Following GS, we take a snapshot of employment at the firm in a particular moment in time, which in our case corresponds to January of each year.

The assumptions required to identify each approach are precisely what leads to this difference.[22] While our approach does not require outsourced workers to work for the daughter firm the year after the outsourcing event, the flow approach does. As a result, the latter approach significantly underestimates the impact of outsourcing on the extensive margin.

5 Heterogeneity

A key advantage of our method for measuring outsourcing is that it provides a sufficiently large sample, allowing us to study the heterogeneous impact of outsourcing across various characteristics, including occupations (and their task content) and sectors.[23] This analysis will shed light on the different motives behind firms' decisions to outsource and how these motives might ultimately impact a worker's career trajectory.

Worker Demographics. Panels (a) and (b) of Figure 6 display the effects of outsourcing by age and gender.[24] One year after outsourcing, the effects across age groups exhibit a reverse U shape, with the most pronounced negative effects on younger and older workers. In contrast, five years after outsourcing, the effects are more homogeneous across all groups except for those aged 50 and over, where we observe small and insignificant effects. This trend appears to be driven by older workers in the control group retiring

[22] Note that our estimates on earnings loss based on the GS approach for Italy (of approximately 4%) are qualitatively comparable to the ones of GS for Germany (though noisier toward the end) that show a 4%–7% effect on earnings (see their Appendix Figure A.6). Appendix Figure A6 computes the effects on log daily wages using the GS design. The coefficients present a pattern similar to the earnings results found in Figure 5, though these estimates are smaller than the ones reported by GS for Germany.

[23] Recall that the GS approach focuses on outsourcing events for only five types of occupations (FCSL agencies). Moreover, our sample size is about three times the one of GS (despite being a shorter panel).

[24] All the heterogeneous effects presented in this section are computed by only re-estimating equation (1) for the set of treated and control workers belonging to the particular category under investigation (e.g., women). The reported event-study coefficients are then rescaled by the average level of earnings observed in the year before outsourcing for that particular group.

from the workforce. Panel (b) shows slightly more negative effects for women, especially on impact.

Labor Contract and Relative Pay. We find significantly more heterogeneity when examining workers with different contracts or relative pre-outsourcing wages. Panel (c) of Figure 6 compares part-time outsourced workers with those who work full time (in the year before the outsourcing event). Part-time workers experience larger earnings losses, especially on impact (30% versus 20%). Large gaps also emerge when comparing workers in different quartiles of log daily wages observed at $t^* - 1$. Panel (d) shows that low-wage workers (i.e., those in the first quartile of the pre-outsourcing log wage distribution) experience a 35% earning loss on impact compared to high-wage workers (i.e., those in the fourth quartile), who experience a 20% loss. These differences, however, tend to converge over time. Overall, these results suggest that the cumulative negative effects of outsourcing are more pronounced among workers who have a weaker attachment to the labor market, such as women, young/older, part-time, and low-wage workers.

Sector and Occupation. Figure 7 presents the effect of outsourcing one year (panel (a)) and five years later (panel (b)) by sector of the mother firm, showing considerable heterogeneity in impact on earnings. Initially, the points estimates across sectors range from −60% to +5%, with a standard deviation of 12 percentage points after accounting for sampling error. While there is less dispersion in the effects five years post-outsourcing, the heterogeneity still remains considerable. The negative effects are very pronounced in the food/restaurant sector but are also present in several manufacturing-intensive sectors (e.g., manufacturing of leather or vehicles). On the other hand, there are close to null effects on impact and slightly positive (but relatively imprecise) effects in the medium-run

for workers in more IT-intensive sectors (e.g., IT services, software production, repair of computers). Another sector that does not appear to suffer from outsourcing is consulting: the effects on impact are virtually zero and five-years out become positive with a magnitude of approximately 17%. The effects by occupations—reported in Figure 8—complement the analysis for sectors. For example, when a cook is outsourced, it leads to large negative effects on their earnings both on impact (−40%) and in the medium run (−20%). In contrast, when a software developer is outsourced, their earnings are virtually unchanged right after the outsourcing event and increase (by around 15%) five years after, though this estimate is somewhat noisy.

Task Content. To better understand the potential structural differences driving the heterogeneous effects of outsourcing across occupations, we use the task-based occupation classification of Autor et al. (2003). Figure 9 shows the effects of outsourcing for non-routine analytical, non-routine interactive, non-routine manual, routine cognitive, routine manual jobs (as defined by their most prevalent task content). The effect of outsourcing varies considerably depending on the outsourced job's task content. Earnings losses one year after outsourcing are two-thirds smaller for workers in non-routine analytical/interactive jobs compared to those in mainly (routine or non-routine) manual jobs (e.g., cooks, beauticians, truck drivers). Five years post-outsourcing, the differences are still striking: workers in non-routine cognitive jobs return to their earnings levels, whereas those in manual jobs still earn significantly less.[25]

[25]Table A3 shows that the results from Figure 9 are not driven by the decision to assign a job to a task based on the highest task content associated with that given occupation. Running a regression of average losses from outsourcing against the various task contents associated with a particular job shows that jobs involving non-routine cognitive tasks experience the smallest earnings losses due to outsourcing.

Summary. The estimates by sector and occupation suggest that the effects of outsourcing vary significantly depending on the type of job being outsourced—something that previous research has not been able to fully quantify. This heterogeneity may be attributed to the diverse motives for outsourcing, which vary across sectors and occupations, as previously highlighted in a quantitative structural framework by Bilal and Lhuillier (2021). Some jobs may be outsourced simply because firms need to cut down firing and other costs (Goldschmidt and Schmieder, 2017; Drenik et al., 2023). However, other firms could use outsourcing to directly increase productivity, for instance, by exploiting economies of scale or comparative advantages, factors that may eventually result in higher pay for workers (Bergeaud et al., 2021; Bostanci, 2021). This latter motive seems to be more prevalent when analyzing workers whose jobs involved more cognitive and interactive tasks, such as consultants and software developers (Autor et al., 2003).

6 The Role of Firms

The heterogeneous effects by occupation and sector point to different motives that might drive a firm's decision to outsource. This section builds on these results by further examining the role played by (mother) firms in driving the effects of outsourcing.

Firm Productivity and Labor Share. Figures 7 and 8 suggest that low-value-added occupations/sectors might be driving the negative effects of outsourcing. Figure 10, panel (a) confirms this by showing the effects of outsourcing one and five years out by different deciles of mother firms' value added per worker, measured in the year before the outsourcing event. A worker being outsourced by a firm at the bottom of the productivity distribution leads to earnings losses of more than 30%, while being outsourced by a firm at the top results in earnings losses that are about two-thirds smaller ($\approx$ 11%). A similar

pattern is also observed when examining the effects five years post-outsourcing. While earnings losses remain large and statistically significant for workers outsourced by firms at the bottom of the productivity distribution, the effects are smaller and sometimes insignificant for those outsourced by firms at the higher end of the productivity ladder. Consistent with the evidence shown on occupations and sectors, outsourcing appears to lead to more pronounced earnings losses when workers are outsourced by low-productivity firms.

Figure 10, panel (b) complements this finding by reporting estimates based on the labor share of the mother firm, calculated in the year before the outsourcing event. The negative effects of outsourcing are concentrated in highly labor-intensive firms, which, following our previous discussion of outsourcing as a firing mechanism, may be more motivated to cut labor costs. Conversely, workers outsourced by firms with a relatively small labor share experience smaller losses in earnings on impact and nearly zero earnings losses in the medium run.

The concentration of negative effects in low-productivity firms may seem surprising, as previous research has shown that firms paying higher wages (and therefore more likely to have higher value added per worker, as noted by Card et al., 2018) are the ones driving the negative effects of outsourcing on pay (Goldschmidt and Schmieder, 2017). We believe this potential discrepancy relates to our measure of outsourcing and its ability to capture events where workers lose their jobs shortly after being outsourced. As mentioned in Section 2.1, anecdotal and court-level evidence suggest that firms use outsourcing to separate from workers and bypass Italy's strict employment legislation, see also the related evidence for the US provided by Autor (2003). The large negative em-

ployment effects shown in Figure 1 align with the fact that some Italian employers often use outsourcing to basically fire workers. Figure 10 strengthens this conclusion by highlighting that the negative impact of outsourcing on pay is most significant for workers outsourced by low-productivity and labor-intensive firms. These firms may be particularly motivated to use outsourcing as a cost-cutting strategy that allows them to remain viable and thus potentially avoid closure. In the next paragraph, we further elaborate on this point by showing trends in various firm-level characteristics in the years leading to the outsourcing decision.

Trends of the Average Outsourcing Firm. Figure 11 shows how various firm-level outcomes were trending in the years leading up to an outsourcing event. For comparison, we also report these averages for firms that do not outsource and are in the same two-digit sector and province of outsourcing firms. Five years before the outsourcing decision, outsourcing firms have a higher value added per worker than an average non-outsourcing firm in the same region by sector cell. However, this changes in later years, as they experience a downward trajectory in value added per worker (or revenues) of approximately 5% in each year. Despite this downward trajectory, we observe little adjustments in the firm in terms of labor costs per worker or firm size, likely due to Italy's strict employment protection rules. These rules hinder firms' ability to quickly adjust their employment in response to negative demand shocks. Faced with these institutional constraints, firms might turn to outsourcing to counteract the effects of such shocks. Overall, the evidence suggests that firms typically do not use outsourcing in "good times" to directly increase productivity. Instead, they often resort to it as a way to manage the combination of negative firm-level shocks and high firing costs.

An Alternative Counterfactual for the Outsourced Worker. One question that emerges from the previous analysis on firm-level trends pertains the relevant counterfactual of an Italian worker being outsourced. In our baseline estimates, we construct this counterfactual by examining the outcomes of a non-outsourced worker who had a similar career trajectory of an outsourced worker up to the moment of the outsourcing decision. This research design mimics the one used by GS for German outsourced workers and is based on the idea of using non-outsourced workers to infer what would have happened if the outsourced worker remained employed (at time $t^* = 0$) with the mother firm.[26]

However, this counterfactual does not necessarily account for the *dynamic* firm-level trajectory displayed in Figure 11. An alternative counterfactual might be constructed by looking at a worker whose employer is experiencing a negative trajectory similar to the ones shown in Figure 11 but ultimately has decided *not* to outsource the worker. This approach addresses whether outsourcing is generally a "lesser evil" from a worker's perspective, compared to other events that might unfold at the mother firm during challenging times (e.g., mass layoffs, plant closure).

We now augment our research design to include in the matching variables the trends in value added per worker of a given employer, and report the results in Figure 12.[27] The point estimates on earnings are remarkably close to the ones obtained with our baseline event-study specification. The key conclusion from this analysis is that the negative effects of outsourcing shown in Figure 1 are driven by the outsourcing decision itself, rather than by the negative firm-level shock impacting the mother firm. Workers employed by

[26] This type of approach is also used by the job displacement literature (Jacobson et al., 1993; Lachowska et al., 2020; Schmieder et al., 2023; Bertheau et al., 2023).

[27] Specifically, we now also match on values of log value added per worker in $t^* - 3$ and $t^* - 2$.

firms experiencing a similar negative trajectory in sales as outsourcing firms—but who are ultimately not outsourced by their employer—have significantly better labor market outcomes than outsourced workers. This suggests that employers in the control group are more effective at shielding their workers from the negative impacts of such shocks. This may occur if, instead of relying on a cost-cutting strategy like outsourcing, these employers decide to invest in other forms of firm-level restructuring that could eventually raise revenues.

7 Conclusion

This paper studies the impact of outsourcing on a worker's career trajectory, using a novel identifier of outsourcing events directly encoded in Italian social security records. This identifier allows us to study outsourcing events previously unexplored. For instance, we can study events where the worker is outsourced to a non-business service firm and/or becomes non-employed, shortly thereafter. The latter is particularly important in the Italian context, given the extensive anecdotal and court evidence suggesting that firms use outsourcing as a strategy to essentially fire workers.

Our results suggest that the negative effects of outsourcing on workers' pay are larger than those documented in previous research. Thanks to our outsourcing identifier's ability to capture effects along the extensive margin of employment, we show that outsourced workers experience sizable earnings losses largely because they often lose their job soon after being outsourced. These employment outcomes stem from daughter employers providing lower-quality, less stable jobs. The richness of our outsourcing identifier also reveals interesting patterns of heterogeneity: earnings losses from outsourcing are particularly pronounced in low-value-added sectors or occupations (e.g., cooks) but are null

or even positive in other occupations with a high non-routine cognitive task component (e.g., software developers). By analyzing the dynamics of firms that opt to outsource, we note that these employers seem to resort to it as a response to negative shocks, likely due to the employment protections that prevent them from quickly adjusting in-house employment. Importantly, however, workers employed by firms experiencing similar negative firm-level shocks but choosing not to outsource have much higher earnings than outsourced workers following the outsourcing event.

There are three main takeaways from our analysis. First, our work shows that several outsourcing practices by Italian firms do eventually lead to workers becoming non-employed shortly thereafter. Absent the employment effects, the negative effect on workers' earnings would be 75% smaller. It would be useful to combine the information on outsourcing from Italian social security data with additional investigations on outsourcing firms to understand whether these outsourcing practices are actually legal according to the most recent court orders (Corte di Cassazione, 2017*a*). A recent Italian labor reform introduced stricter rules and harsher sanctions against illegal outsourcing (Tagliabue, 2024), thus implicitly recognizing that firms may have been using outsourcing to circumvent employment protection. It will be interesting to evaluate this reform's impact in the coming years and compare it to similar recent reforms conducted in other countries (Estefan et al., 2024; Elias and Silva, 2024).

Second, the heterogeneity that we document across occupations, sectors, and firm productivity suggests that the reasons behind firms' decision to outsource can vary. While low-productivity firms seem to rely on outsourcing as a cost-cutting strategy to bypass some of the strict Italian employment protection laws, more productive firms en-

gaging in outsourcing tend to achieve better outcomes for their workers. Understanding the determinants of the outsourcing decision conducted by heterogeneous firms—and how it ultimately impacts key firm-level outcomes, such as firm size, productivity, and labor compensation—is an interesting avenue for future research.

Last, we view our results as a manifestation of the second-best theorem. Policies that allow firms to outsource part of their workforce to an external firm are often viewed as efficiency-enhancing by their advocates. However, this view often overlooks restrictive labor market conditions in many countries like Italy (or France, Spain, Portugal, among others), which include stringent employment protection legislation and rigid wage structures. As a result, allowing firms to outsource in such a heavily regulated labor market might actually reduce welfare. Our results speak directly to this outcome by showing that workers unaffected by outsourcing, yet employed by firms with similar declining revenues, experience significantly better labor market outcomes than outsourced workers. Fully exploring the interaction between firm strategies, labor market frictions, and existing labor regulations is an important avenue for future research.

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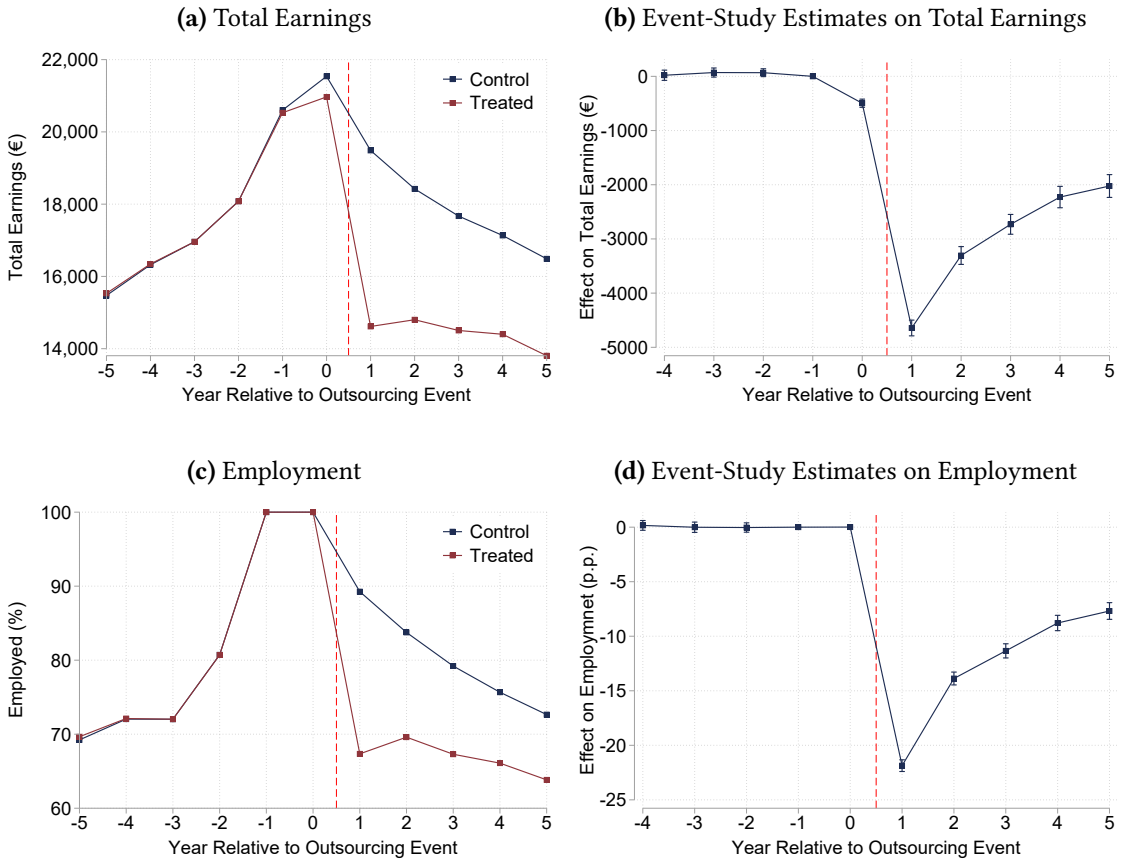
Figures

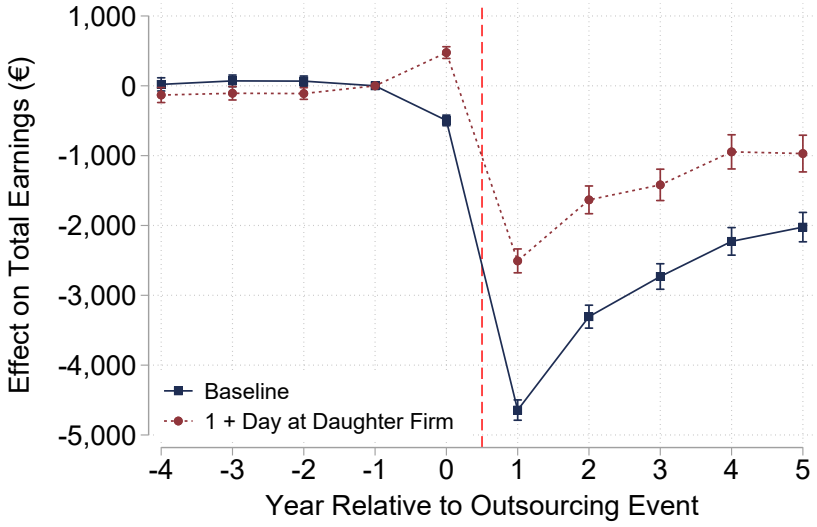
Figure 1: Earnings and Employment of Outsourced and Non-Outsourced Workers



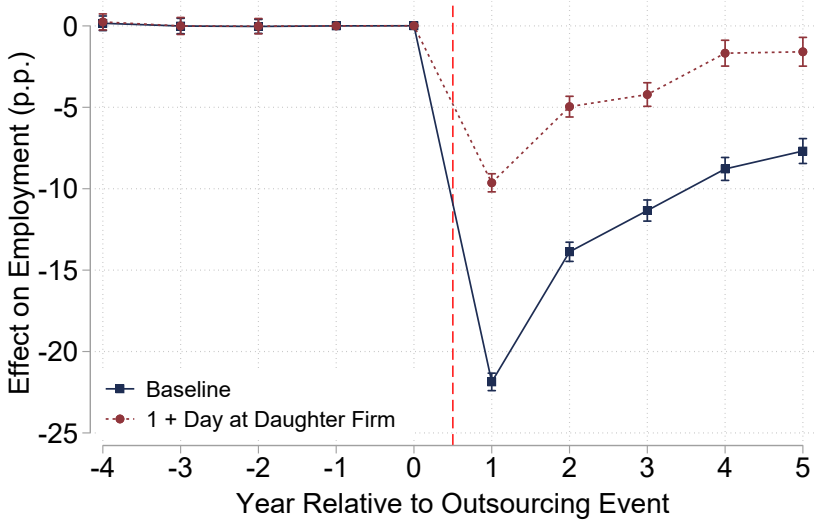
Notes: Panels (a) and (c) report the trajectories of earnings (panel (a)) and employment (panel (c)) of outsourced workers and their matched controls. Panels (b) and (d) report the corresponding event-study estimates obtained after fitting equation (1) on annual earnings (panel (b)) or employment (panel (d)). Year 0 is when the outsourcing event takes place. A worker is defined as employed if they have at least one day of work recorded in the Italian social security data. Total earnings represent the labor income of a given individual and equal zero if they are not employed according to official social security records in a particular year. Earnings are expressed in real terms (2015 CPI). Panels (b) and (d) report 95% confidence intervals based on standard errors clustered at the worker level.

Figure 2: Earnings and Employment of Outsourced and Non-Outsourced Workers, after Conditioning on Outsourced Workers Being Employed by the Daughter Firm in the Outsourcing Event Year

(a) Total Earnings



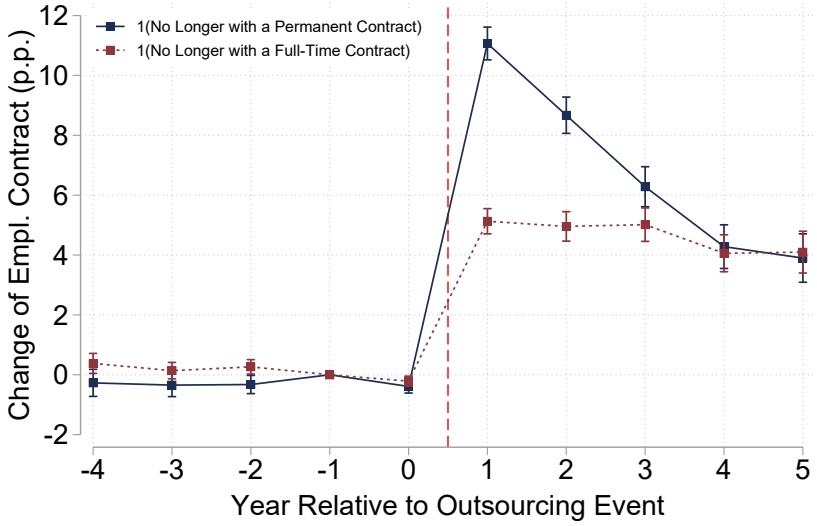
(b) Employment



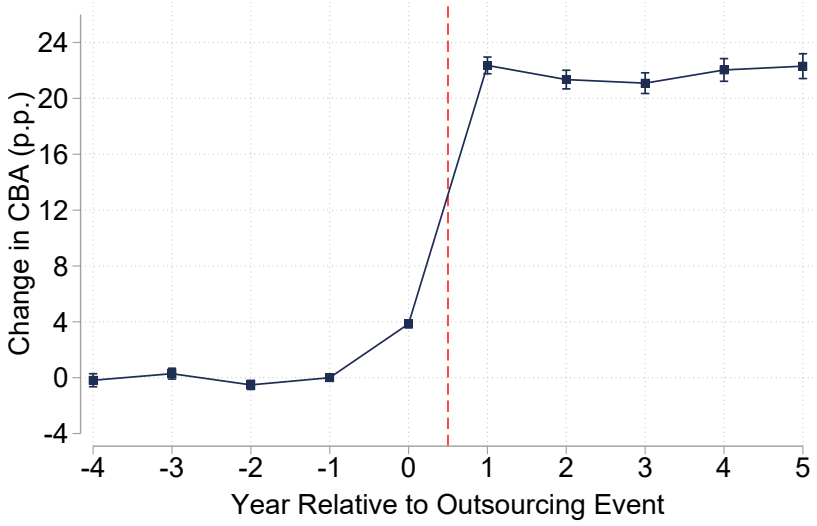
Notes: This figure reports event-study results on total earnings (panel (a)) and employment (panel (b)) obtained from equation (1). The figure reproduces the baseline event-study estimates from Figure 1 in blue and includes event-study estimates computed only for outsourcing events where the outsourced worker was employed by the daughter firm for at least one day in the outsourcing event year. The mean of earnings in the year before the outsourcing event for the baseline specification is €20,566 and €21,898 when conditional on working at the daughter firm. Both panels report 95% confidence intervals based on standard errors clustered at the worker level.

Figure 3: The Effect of Outsourcing on Employment Contract and CBA

(a) Employment Contract

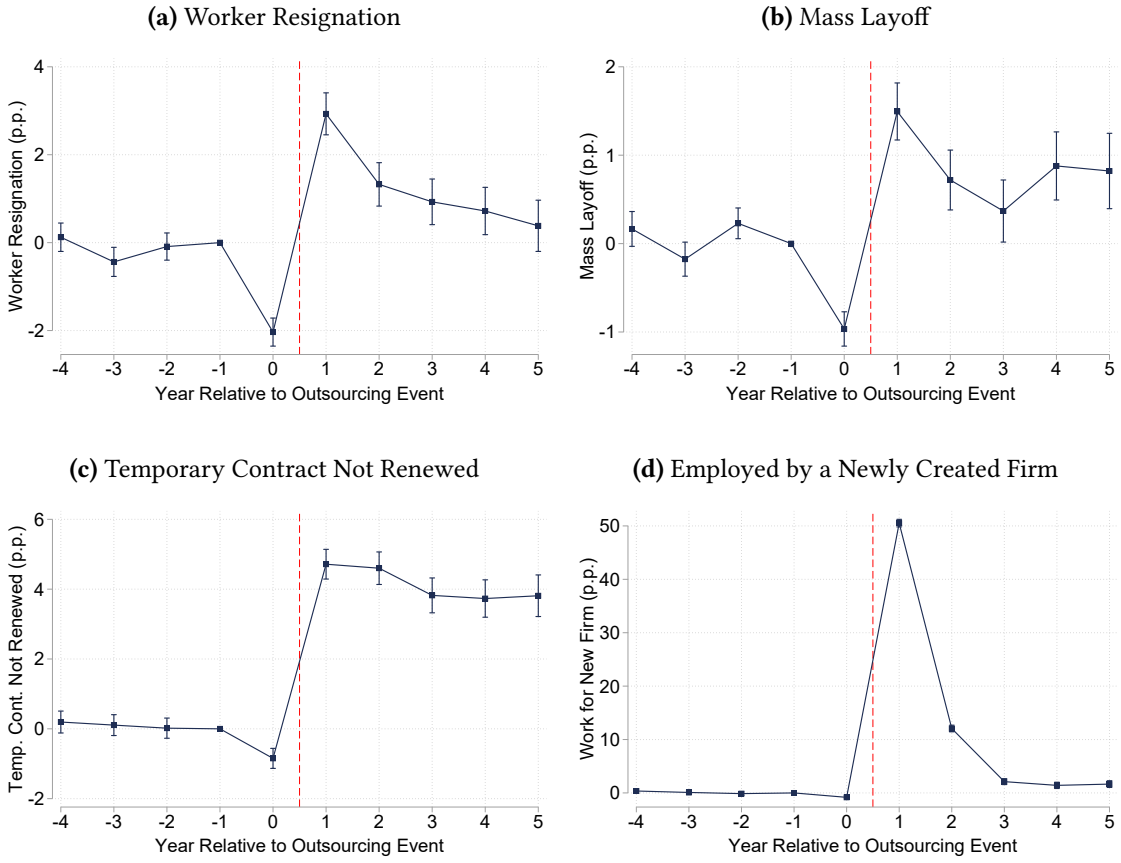


(b) Collective Bargaining Agreement



Notes: The blue event studies in panel (a) are constructed by estimating equation (1) on all outsourced workers with a permanent contract the year before the outsourcing event, and where the outcome is a dummy equal to 1 if the worker is on a temporary contract and zero if they remain employed with a permanent contract. The red event studies in panel (a) are constructed by estimating equation (1) on all outsourced workers with a full-time contract the year before the outsourcing event, and where the outcome is a dummy equal to 1 if the worker is on a part-time contract and zero if they remain employed with a full-time contract. Panel (b) reports estimates from equation (1) where the outcome variable is an indicator equal to 1 if the CBA observed the year before the outsourcing event differs from the current one. This regression, as well as the ones used to construct Panel(a), is estimated on the sample of employed individuals. Both panels report 95% confidence intervals based on standard errors clustered at the worker level.

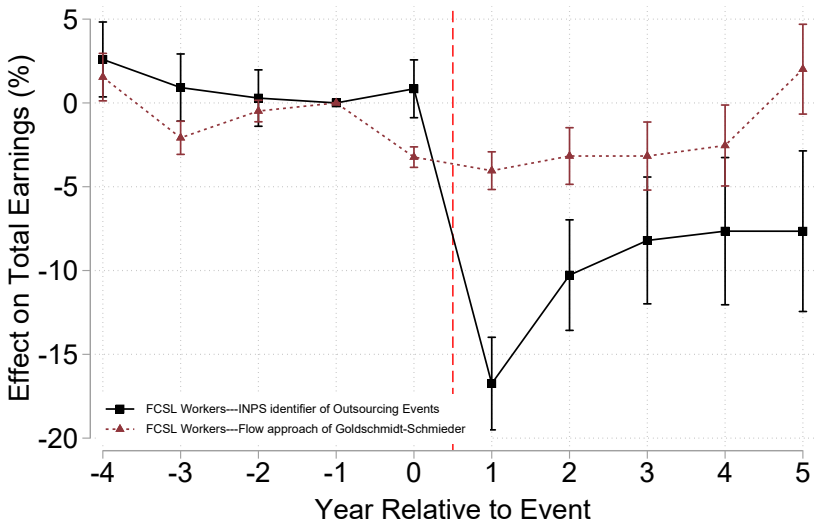
Figure 4: Reason for Job Separation after Outsourcing



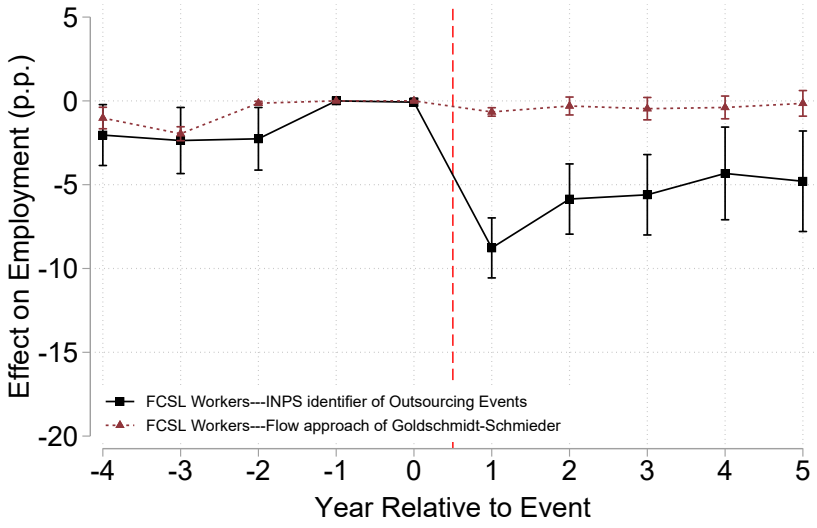
Notes: Panel (a) reports estimates from equation (1) where the outcome variable is an indicator equal to 1 if the worker has resigned in year t from their dominant job observed in that year. Panel (b) reports estimates where the outcome variable is an indicator equal to 1 if the worker experiences a job separation due to a mass layoff. Panel (c) reports estimates where the outcome variable is an indicator equal to 1 if the worker experiences a job separation because their temporary work contract was not renewed. Finally, panel (d) reports event-study estimates where the outcome is an indicator equal to 1 if the dominant employer at time t was created in year t or year $t-1$. The fraction of newly created firms in our matched sample in the year before the outsourcing event is equal to 0.09. All panels report 95% confidence intervals based on standard errors clustered at the worker level.

Figure 5: Comparison with the Flow-Based Approach of Goldschmidt and Schmieder (2017)

(a) Total Earnings

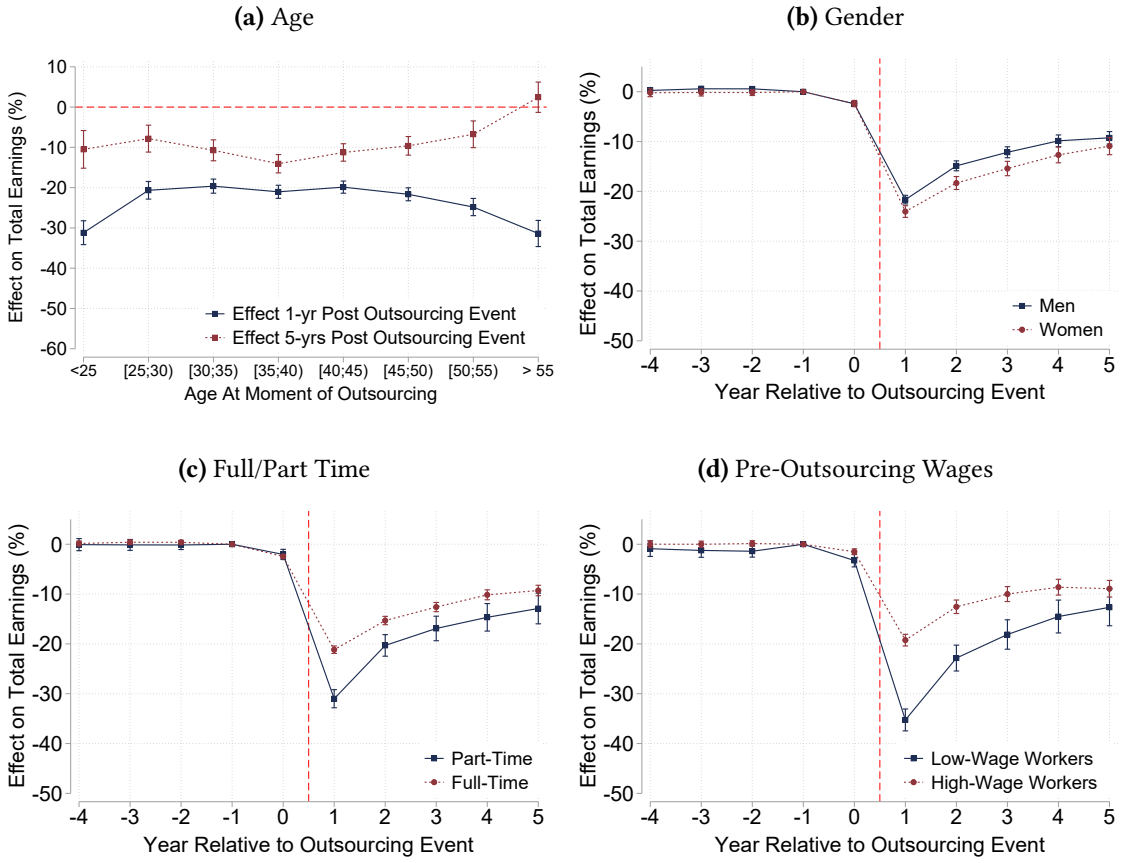


(b) Employment



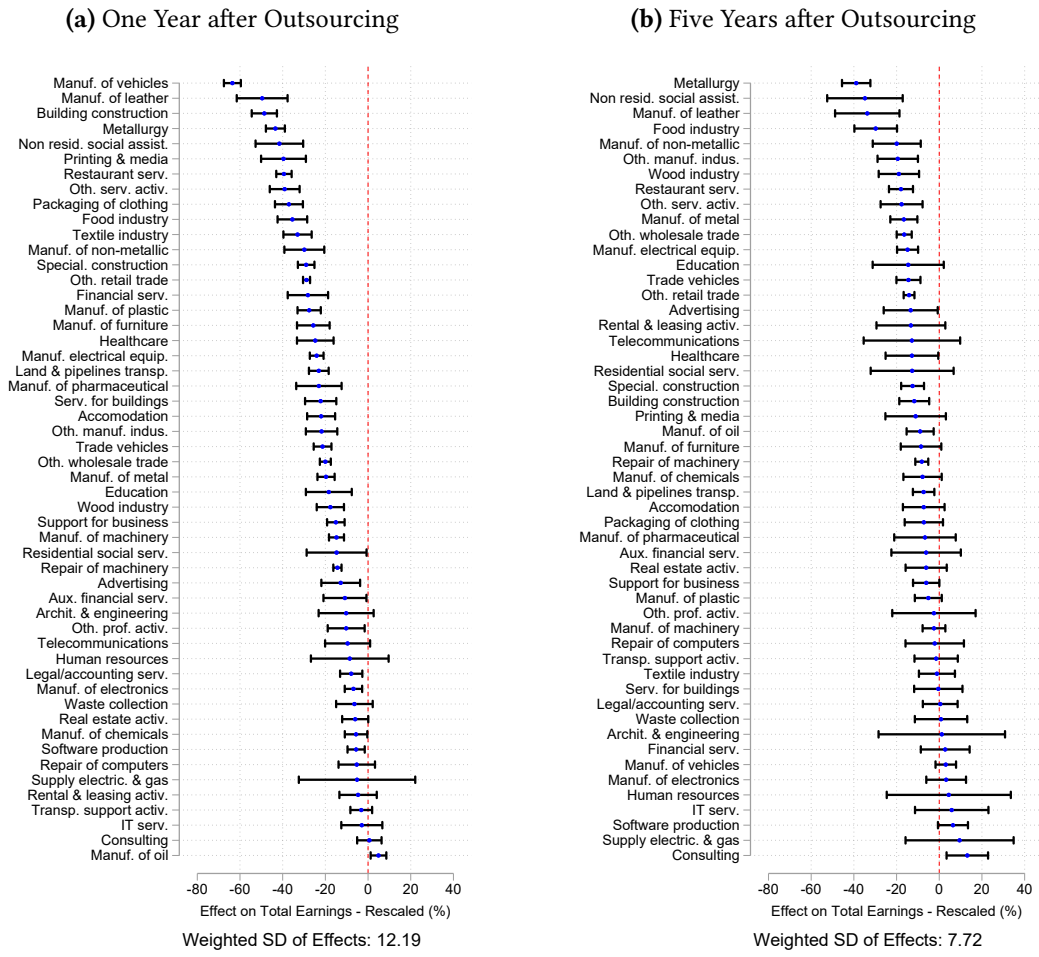
Notes: The event-study coefficients in blue are computed by fitting equation (1) on the sample of outsourced workers whose daughter firm in the year of the outsourcing event is a business service firm in the FCSL sector. The event-study coefficients in red are computed after identifying outsourcing events using the flow-based approach of Goldschmidt and Schmieder (2017), where an outsourcing event corresponds to a situation where a group of workers are employed in year t by a non-business firm and in year $t+1$ are instead employed by a FCSL business service firm (see Section 4.3 for details). Panel (a) reports event-study coefficients on total earnings, rescaled by the average total earnings the year before the event observed in each of the two samples. Panel (b) reports event-study coefficients on employment, defined as a dummy equal to 1 if the worker has at least one day of employment according to official social security records. Both panels report 95% confidence intervals based on standard errors clustered at the worker level.

Figure 6: The Effects of Outsourcing by Worker Characteristics



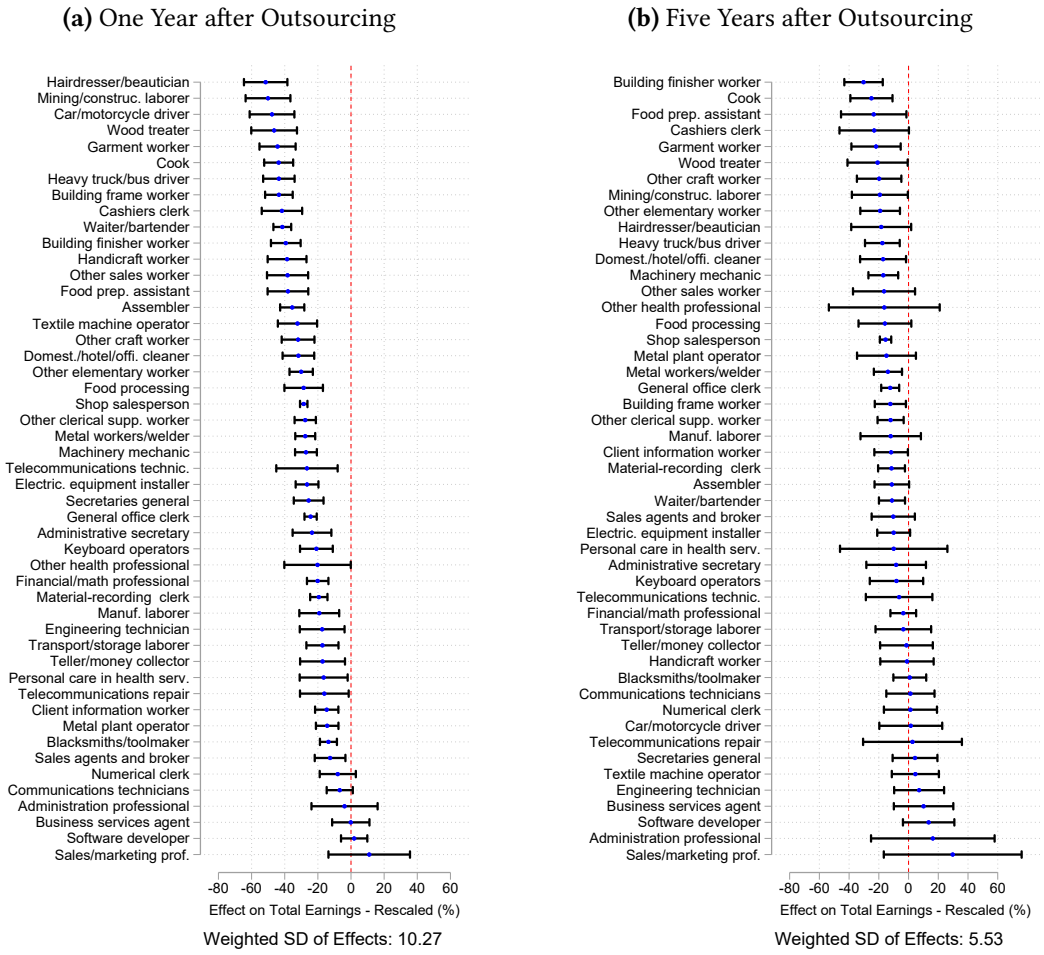
Notes: This figure reports event-study estimates after fitting equation (1) separately for a given group of workers (e.g., women) and using total earnings as an outcome. Panel (a) presents results by age bin, panel (b) plots the estimated coefficients by gender, and panel (c) presents results for workers who held either a part- or full-time job before the outsourcing event. Panel (d) presents results for workers belonging to the first quartile of the log daily wages ("Low-Wage Workers") distribution observed in the year before the outsourcing event. The red line reports estimates for workers who instead belong to the fourth quartile ("High-Wage Workers"). All event-study coefficients are rescaled by the average total earnings observed in the year before the outsourcing event in the reference group. Also reported are 95% confidence intervals based on standard errors clustered at the worker level.

Figure 7: The Effect of Outsourcing by Sector



Notes: This figure presents event-study estimates derived from equation (1), fitted separately depending on the mother firm's two-digit ATECO sector code of the outsourced worker. We include estimates for sectors that have at least 100 outsourced workers. Panel (a) presents the estimated event-study coefficients for the year following the outsourcing event, and panel (b) displays the estimated coefficients for five years after the outsourcing event. Both sets of coefficients are normalized by the sector-specific mean of total earnings observed in the year before outsourcing. Additionally, both panels report 95% confidence intervals based on standard errors clustered at the worker level. We also report the weighted standard deviation of these rescaled effects (net of sampling error) where the weights are given by the number of person-year observations in a given sector.

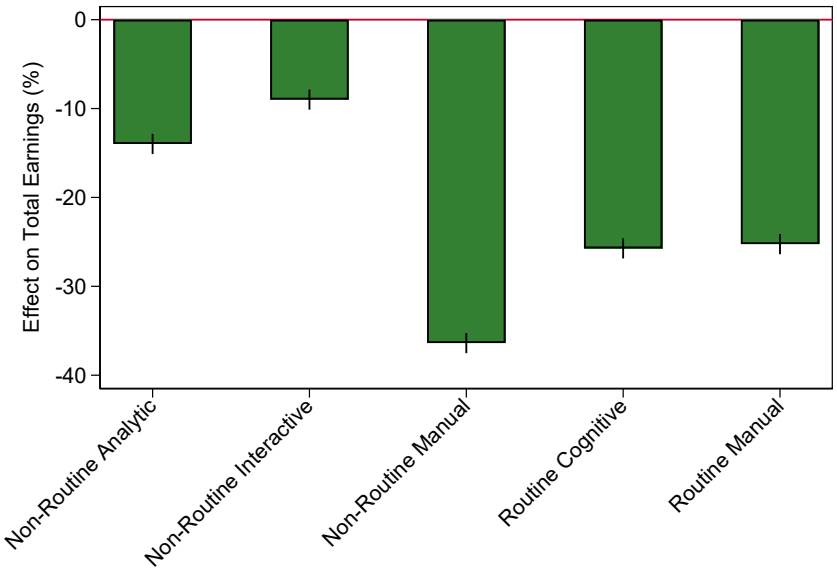
Figure 8: The Effect of Outsourcing by Occupation



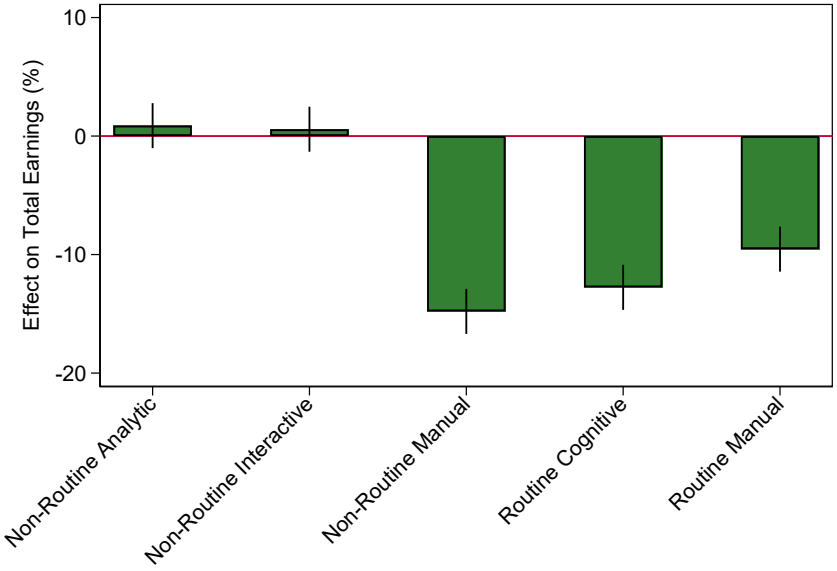
Notes: This figure presents event-study estimates derived from equation (1), fitted separately based on the occupation code of the outsourced worker. We report estimates for occupations that have at least 100 outsourced workers. A job in our data is classified according to five-digit CP ("Classificazione delle professioni") codes from the INPS data, which are then cross-walked and aggregated to three-digit ISCO codes. Panel (a) presents the estimated event-study coefficients for the year following the event, and panel (b) displays the estimated coefficients for five years after the event. Both sets of coefficients are normalized by the occupation-specific mean of total earnings observed in the year before outsourcing. Additionally, both panels report 95% confidence intervals based on standard errors clustered at the worker level. We also report the weighted standard deviation (net of sampling error) of these effects where the weights are given by the number of person-year observations in a given occupation.

Figure 9: The Effect of Outsourcing by Task Content

(a) One Year after Outsourcing



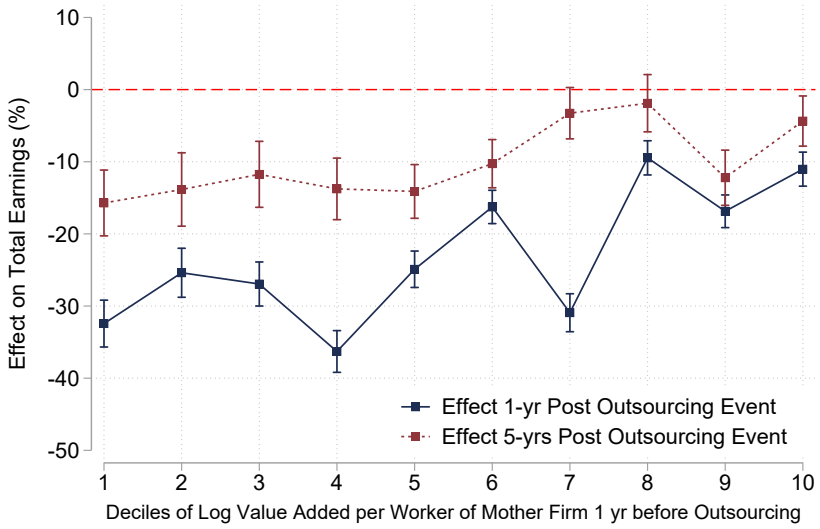
(b) Five Years after Outsourcing



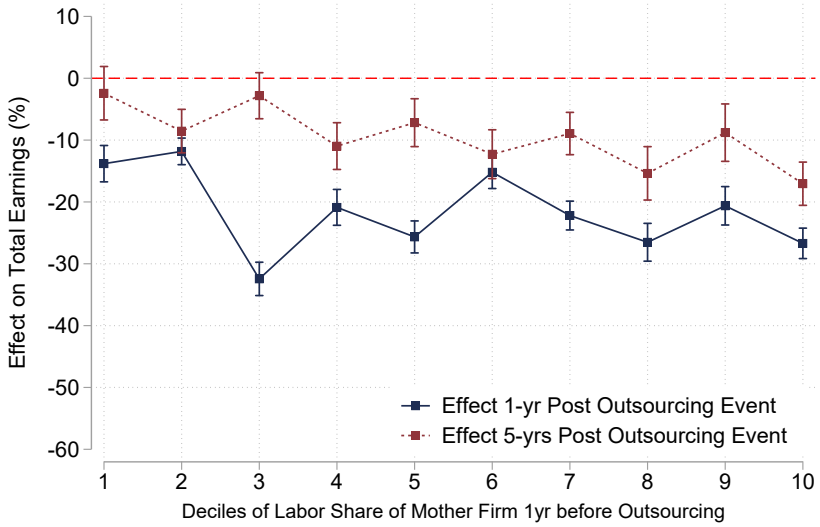
Notes: This figure reports the losses from outsourcing depending on the task content of an outsourced job. A job in our data is classified according to five-digit CP ("Classificazione delle professioni") codes from the INPS data, which are then cross-walked and aggregated to three-digit ISCO codes. We next measure the tasks associated with each job using the classification of Mihaylov and Tijdens (2019), which extends the methodology of Autor et al. (2003) for ISCO codes. This provides a task content measured for each job, i.e., how much of the job involves routine versus non-routine tasks and whether it requires analytical, interactive, or manual skills. We assign a job to either non-routine analytical, non-routine interactive, non-routine manual, routine cognitive, or routine manual, depending on the most prevalent task of the job. We then average the occupation-specific effects of outsourcing for a given task content, weighting by the number of observations associated with a given occupation. The effects on earnings are rescaled by the average level of earnings observed in a given occupation, one year before the outsourcing event. Ninety-five percent confidence intervals are based on standard errors calculated via the delta method and are clustered at the worker level.

Figure 10: The Effect of Outsourcing Depending on Value Added per Worker of Mother Firm or Labor Share

(a) Log Value Added per Worker

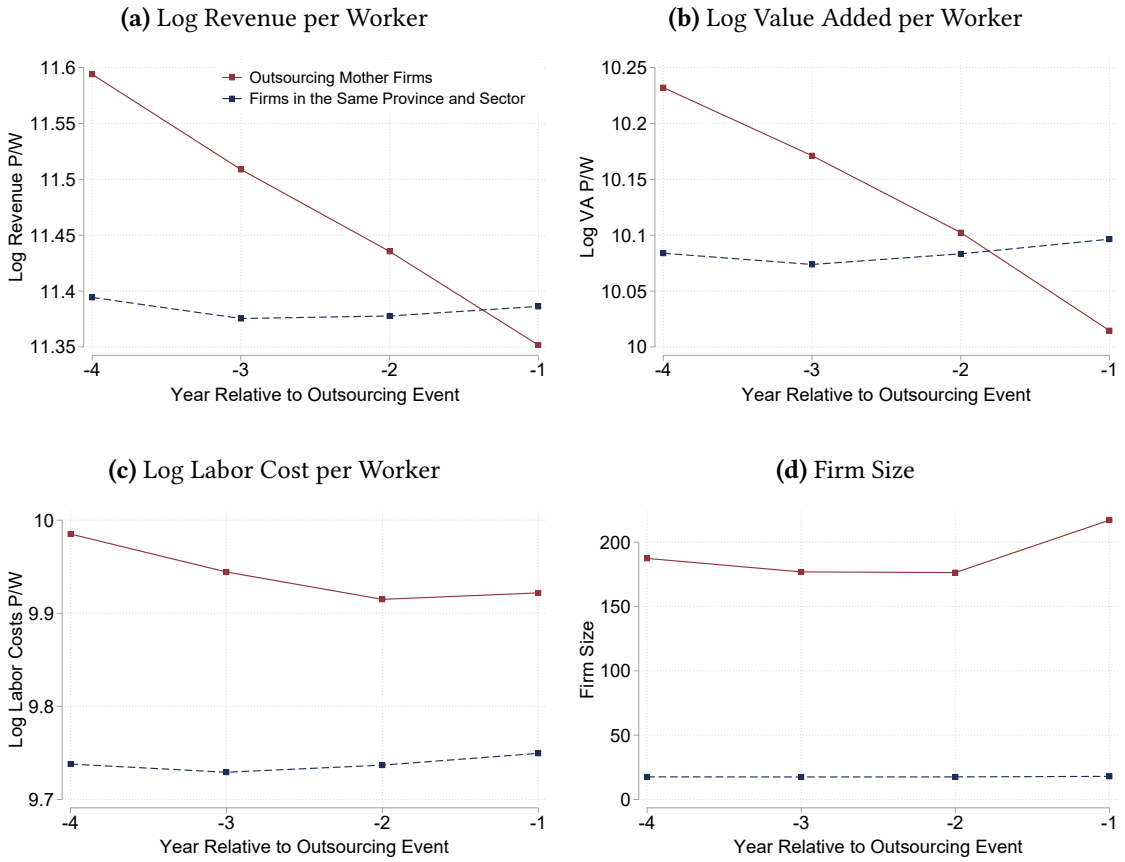


(b) Labor Share



Notes: This figure reports event-study estimates after fitting equation (1) separately for each decile of the mother firm's log value added per worker (panel (a)) or labor share (panel (b)), where both quantities are measured the year before the outsourcing event. The blue coefficients capture the effects one year after the outsourcing event, and the red coefficients capture the effects five years after. All reported coefficients are scaled by the mean of total earnings observed in the year before the outsourcing event. The plot reports 95% confidence intervals based on standard errors clustered at the worker level.

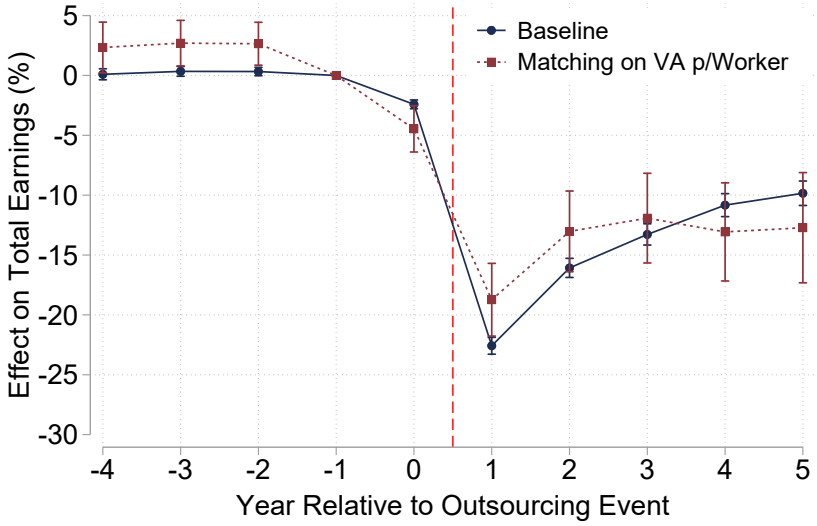
Figure 11: Trends of Outsourcing Firms



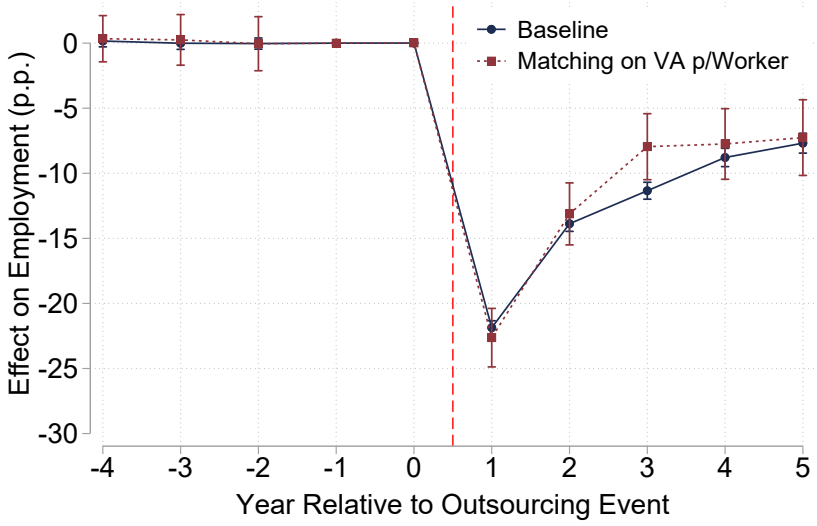
Notes: This figure reports (in red) the evolution of revenues, value added per worker, labor costs, and firm size in the years before an outsourcing event. For comparison, we report in blue the trajectories of these outcomes for firms that do not conduct an outsourcing event but are in the same region and two-digit sector code of outsourcing firms. The graph is computed on a balanced panel; i.e., we condition on firms that are alive and report financial statements to CERVED for each of the four years before the outsourcing event.

Figure 12: Effects of Outsourcing after Matching on Trends of Value Added per Worker

(a) Total Earnings



(b) Employment



Notes: This figure reports event-study estimates from equation (1). The blue line represents baseline effects reported in Figure 1. The red line reports the event-study coefficients, computed after augmenting our matching strategy to also include matches based on log value added per worker in $t^* - 3$ and $t^* - 2$. The effects on earnings are reported after rescaling the event-study coefficients by the average earnings observed in the year before the outsourcing event. Both panels report 95% confidence intervals based on standard errors clustered at the worker level.

Tables

Table 1: Summary Statistics

	(1) **Matched Control**	(2) **Matched Outsourced**	(3) **All Outsourced**
Age	38.59	38.62	40.31
	(10.74)	(10.77)	(10.77)
Female	0.43	0.43	0.44
Temporary contract	0.22	0.22	0.17
Working full time	0.73	0.73	0.68
Current tenure at firm	7.07	7.07	5.81
	(5.34)	(5.34)	(5.11)
Total earnings	20,602	20,530	22,624
	(13,007)	(12,812)	(23,099)
Daily wage	75.53	75.08	81.20
	(40.23)	(42.56)	(80.07)
Firm size	1,352	1,146	973
	(5,197)	(3,760)	(3,120)
Exposure	-	0.58	0.57
		(0.31)	(0.32)
Number of workers	61,849	61,849	267,030
Number of firms	40,694	20,248	55,024

Notes: Column 2 presents the summary statistics of the outsourced workers who have at least two years of tenure when outsourced and for whom we can find a matched control worker. These summary statistics are calculated in the year before the outsourcing event, i.e., in $t_i^* - 1$. Potential matched control workers are those who never experienced an outsourcing event in their career and, in $t_i^* - 1$, had the same tenure, region, CBA, gender, employment contract, and quartile of firm size as their corresponding outsourced worker (defined as the unique combination of the full-time and permanent contract indicators). A caliper matching method based on earnings in $t^* - 3$, $t^* - 2$, and age is then conducted to assign exactly one matched control worker for each treated worker without replacement ((Stepner and Garland, 2017)). Column 1 reports the characteristics of matched control workers, and Column 3 reports the summary statistics for the entire set of outsourced workers identified in the INPS data (without imposing a two-year tenure restriction). Total earnings is the sum of labor earnings obtained by the worker in that year and are expressed in real 2015 euros. Exposure is defined as the fraction of the mother firm's total wage bill paid to outsourced workers in $t_i^* - 1$. All statistics are person-year-weighted, and standard deviations are reported in parentheses.

Table 2: Summary of Main Results

	(1) Baseline Estimates	(2) At Least 1 Day w/ Daughter Firm	(3) FCSL Workers Only	(4) FCSL Workers: Flow-Based approach	(5) Matching on Value Added p/ Worker
Panel (a): Effects on Annual Earnings (Real 2012 Euros)					
1 year after the outsourcing event	-4,643.2	-2,507.03	-2,257.3	-780.0	-3,144.2
	(74.1)	(87.2)	(189.9)	(110.7)	(260.1)
2 years after	-3,305.8	-1,633.03	-1,385.0	-611.3	-2,185.9
	(83.8)	(101.4)	(226.8)	(166.2)	(288.7)
3 years after	-2,730.8	-1,418.4	-1,106.1	-611.7	-2,000.0
	(93.2)	(114.6)	(260.2)	(200.0)	(320.7)
4 years after	-2,227.5	-945.8	-1,031.5	-490.3	-2,193.5
	(100.7)	(124.8)	(302.1)	(237.8)	(351.0)
5 years after	-2,023.5	-970.2	-1,031.8	388.7	-2,134.4
	(107.2)	(134.1)	(329.6)	(263.8)	(394.1)
Panel (b): Effects on Employment					
1 year after the outsourcing event	-.219	-.096	-.088	-.007	-.226
	(.003)	(.003)	(.009)	(.001)	(.011)
2 years after	-.139	-.050	-.059	-.003	-.131
	(.003)	(.003)	(.011)	(.003)	(.012)
3 years after	-.113	-.042	-.056	-.005	-.080
	(.003)	(.004)	(.012)	(.003)	(.013)
4 years after	-.088	-.017	-.043	-.004	-.077
	(.004)	(.004)	(.014)	(.003)	(.014)
5 years after	-.077	-.016	-.048	-.001	-.073
	(.004)	(.005)	(.015)	(.004)	(.015)
Number of person-year observations	1,062,058	791,480	83,627	86,224	71,660
Average Earnings one year before outsourcing event	20566.2	21898.3	13481.1	19298.7	16783.9
PDV value losses in earnings	-13,515.9	-6,787.3	-6,164.1	-1,958.6	-10,451.6

Notes: This table presents the main results of the paper. Column 1 displays the estimated coefficients for total earnings (panel (a)) and employment (panel (b)), also reported in in Figure 1. Column 2 displays the estimated coefficients for outsourced workers who were employed for at least one day with the daughter firm, as presented in Figure 2. Columns 3 and 4 display the estimated coefficients for FCSL workers, using our identifier of outsourcing events from the INPS data (Column 3) and when using the flow-based definition of outsourcing events used by Goldschmidt and Schmieder (2017) (Column 4); see also Figure 5. Column 5 displays the estimated coefficients when matching on value added trends of the mother firm, as presented in Figure 12. The PDV of earnings losses is calculated using a discount factor of 4%.

A Additional Tables

Table A1: Outsourced Workers' Occupations and Sector

(1) **Occupation**	(2) **Mother Industry**	(3) **Workers**
Shop salesperson	Retail trade in non-specialized stores with a prevalence of food and drink products	9,461
Waiters and bartenders	Bars and other similar establishments without kitchens	3,219
Waiters and bartenders	Restaurants and mobile food service activities	3,163
Shop salesperson	Retail sale of articles of clothing in specialized stores	2,506
Shop salesperson	Retail trade in other non-specialized stores	2,160
Other craft and related workers	Other cleaning activities	2,118
Domestic, hotel and office cleaners and helpers	Other cleaning activities	1,934
Cooks	Restaurants and mobile food service activities	1,836
Tellers, money collectors, and related clerks	Other monetary intermediation	1,231
Building frame and related trades workers	Construction of residential and non-residential buildings	1,147
Hairdressers, beauticians, and related workers	Hairdressing and other beauty treatment services	1,089
Transport and storage laborers	Other business support services	994
Food preparation assistants	Restaurants and mobile food service activities	925
Heavy truck and bus drivers	Transportation of goods by road	902
Manufacturing laborers	Trade in electricity	901
Financial and mathematical associate professionals	Other monetary intermediation	877
Shop salespersons	Retail sale of furniture, lighting, and other household items in specialized stores	801
Car, van, and motorcycle drivers	Transportation of goods by road	774
Other elementary workers	Cargo handling	772
Information and communications technology operations and user support technicians	Other service activities related to information technology	720

Notes: This table reports the distribution of the most common occupations and sector (of the mother firm) of outsourced workers. Occupations are defined based on five-digit CP ("Classificazione delle professioni") codes from the INPS data, which are then cross-walked into three-digit ISCO codes. Sectors are based on ATECO four-digit codes.

Table A2: Sample Construction

Steps to Construct Sample	Share Dropped	Workers Remaining
Starting point		1,336,193
Mother & daughter diff industry	38.9%	816,935
Flows restriction	60.8%	320,241
Restriction on mother closure	16.6%	267,030
2-year tenure restriction	19.4%	215,337
Matching algorithm	71.3%	61,849
Final Sample		61,849

Notes: The first row counts the number of (unique) workers registered in the INPS data who, between 2005 and 2019, experienced a job separation and where the reason is "outsourcing," as recorded by INPS records. We then remove from this sample outlier events; specifically, situations where exposure exceeds 125% (defined as the wage bill of outsourced workers relative to the mother firm's total wage bill in the year before the outsourcing event). This is our starting point. From this sample, we remove events where the mother and daughter firm have the same six-digit ATECO code or where the INPS data show a transition of workers going from the daughter firm to the mother firm. Finally, we remove events where the mother firm is outsourcing 90% or more of its workers and is dissolved between year t and $t+1$. In the next-to-last row, we consider only workers who have at least two years of tenure with the mother firm at the moment of outsourcing. The last row counts the number of outsourced workers for whom we can match with a similar control worker who did not experience an outsourcing event, where the matching algorithm is defined in Section 3.

Table A3: Effects by Task Content of Outsourced Jobs

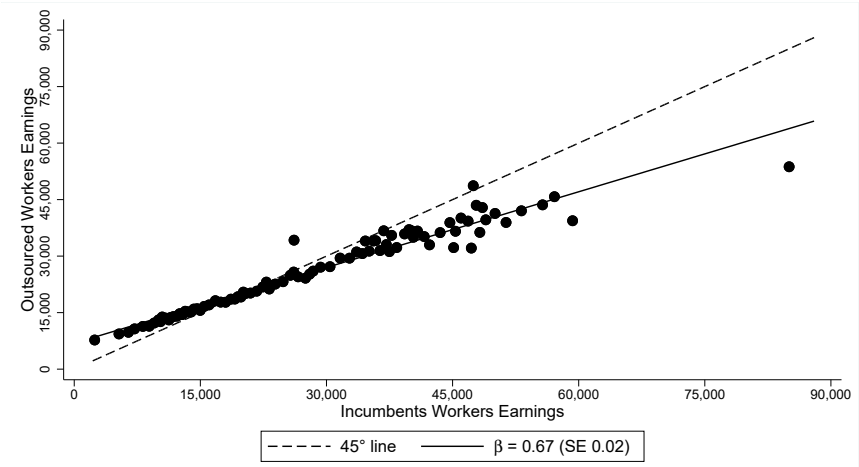
	(1)	(2)
	Earnings, 1 Yr after Outsourcing	Earnings, 5 Yrs after Outsourcing
Non-routine manual	-0.2565	-0.1173
	(0.0589)	(0.0594)
Routine cognitive	-0.1496	-0.0973
	(0.0565)	(0.0717)
Routine manual	-0.0936	-0.0504
	(0.0731)	(0.0788)
Constant	-0.1452	-0.0445
	(0.0439)	(0.0527)
Number of jobs	99	99

Notes: This table presents regression results where the outcome is the average losses from outsourcing on the various task contents associated with the outsourced job. The omitted category is non-routine cognitive (non-routine analytical plus non-routine interactive). The effects on earnings are rescaled by the average level of earnings observed in a given occupation, one year before the outsourcing event. The regression weights by the number of person-year observations associated with a given job, and robust standard errors are shown in parentheses.

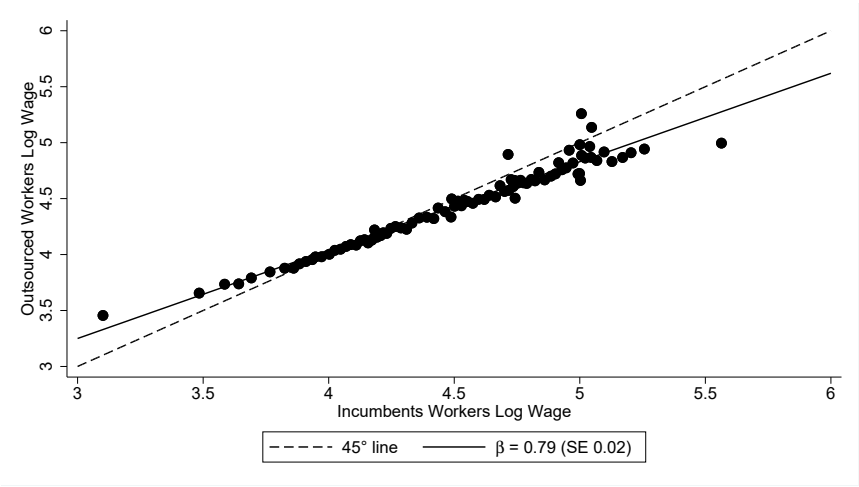
A Additional Figures

Figure A1: Selection of Outsourced Workers within the Firm

(a) Total Annual Earnings



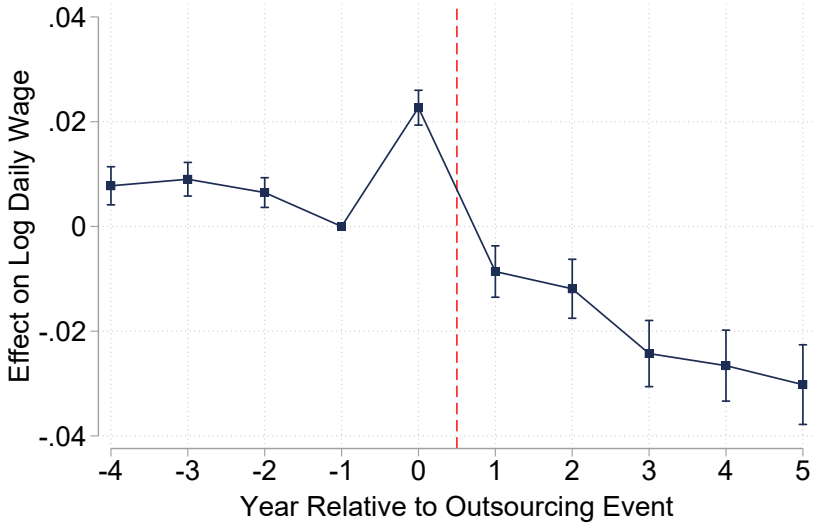
(b) Log Daily Wages



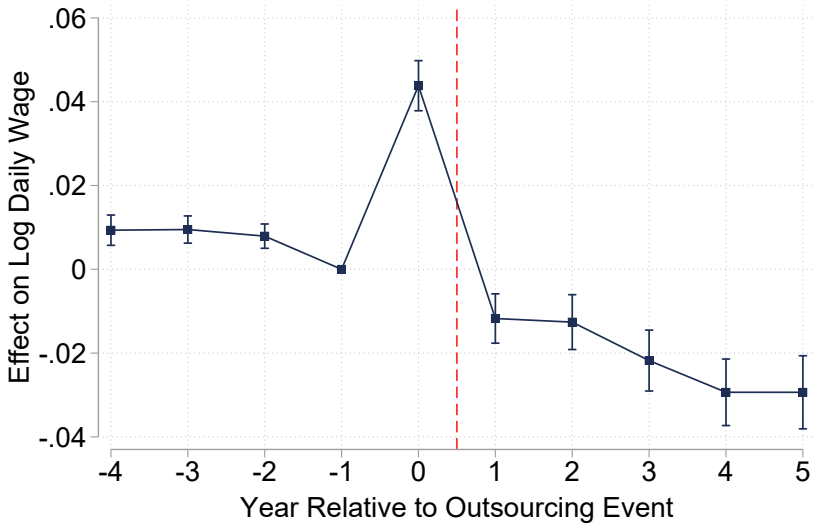
Notes: This figure presents a binscatter plot of the earnings and wages of outsourced and non-outsourced workers ("incumbent workers") in the year before the outsourcing event. The black line is a linear fit, while the dotted line is the 45-degree line. Each dot represents the average earnings/wages of outsourced workers and incumbent workers within the firm the year before the outsourcing event.

Figure A2: Effect on Log Daily Wages

(a) Log Daily Wages: Full Sample



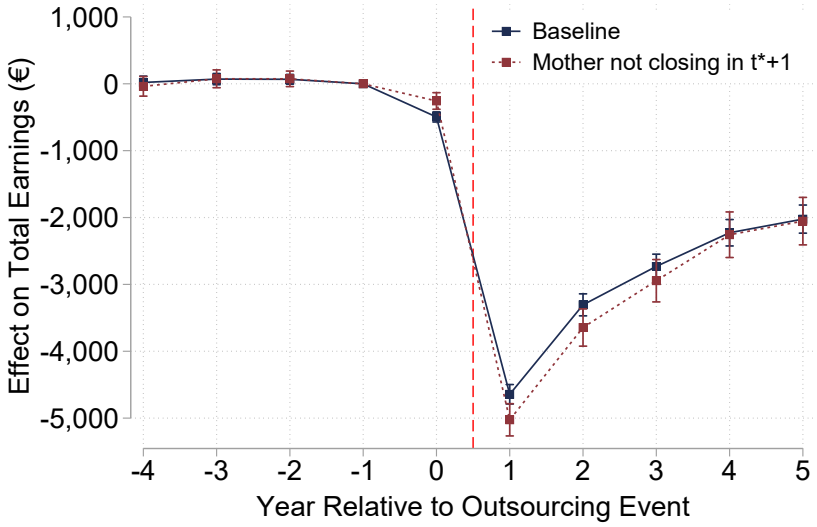
(b) Log Daily Wages: Dropping Compliers



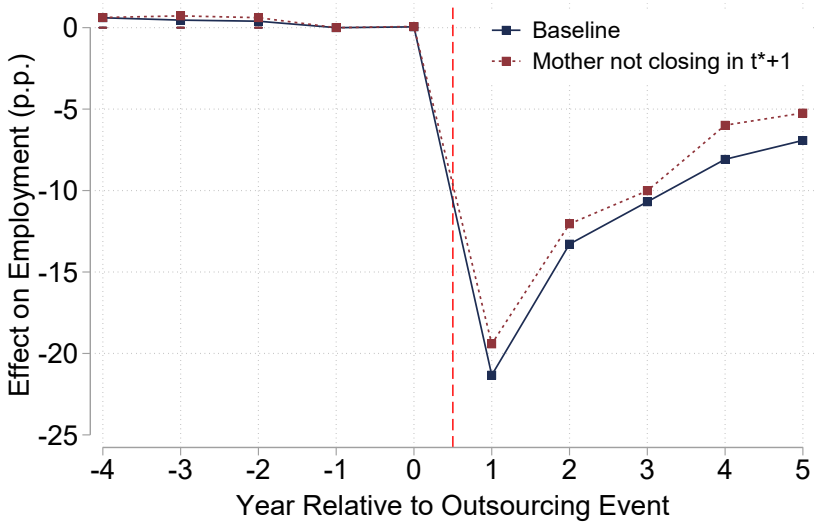
Notes: This figure reports event-study results on log daily wages (panel (a)) obtained after fitting equation (1) on the log daily wage of individual i in period t. Panel (b) estimates this equation after dropping from the sample pairs where the treated worker is not employed but the control worker is. We label this control worker as a "complier", one who would not be employed if exposed to outsourcing. The log daily wage corresponds to the daily wage paid by the dominant employer, i.e., the employer that paid a given worker the most in that particular year. Both panels report 95% confidence intervals based on standard errors clustered at the worker level.

Figure A3: Conditioning on Mother Firm Survival

(a) Annual Earnings

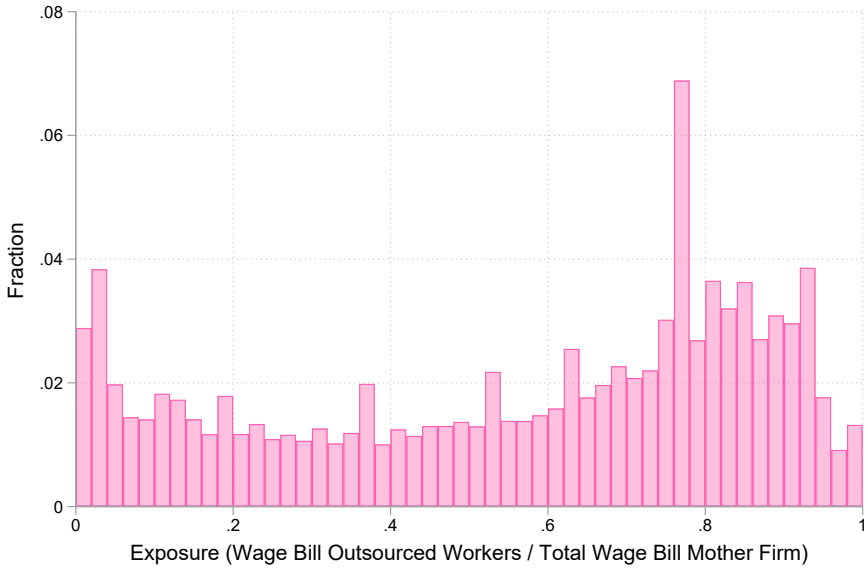


(b) Employment



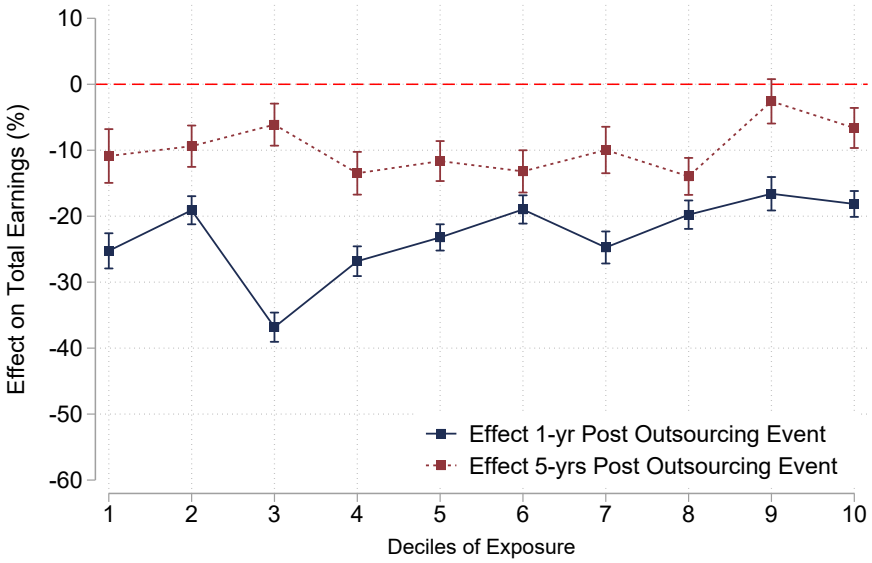
Notes: This figure reports event-study results on total earnings (panel (a)) and employment (panel (b)). The figure reports the baseline event-study estimates on these outcomes (see Figure 1) in blue along with event-study estimates computed for outsourcing events where the mother firm remains open the next year after an outsourcing event. The mean of earnings at $t^* - 1$ for baseline is €20,566 and €22,669 when conditional on the mother firm not closing. Year 0 is the year of the outsourcing event. Both panels report 95% confidence intervals based on standard errors clustered at the worker level.

Figure A4: Distribution of Exposure across Outsourcing Events



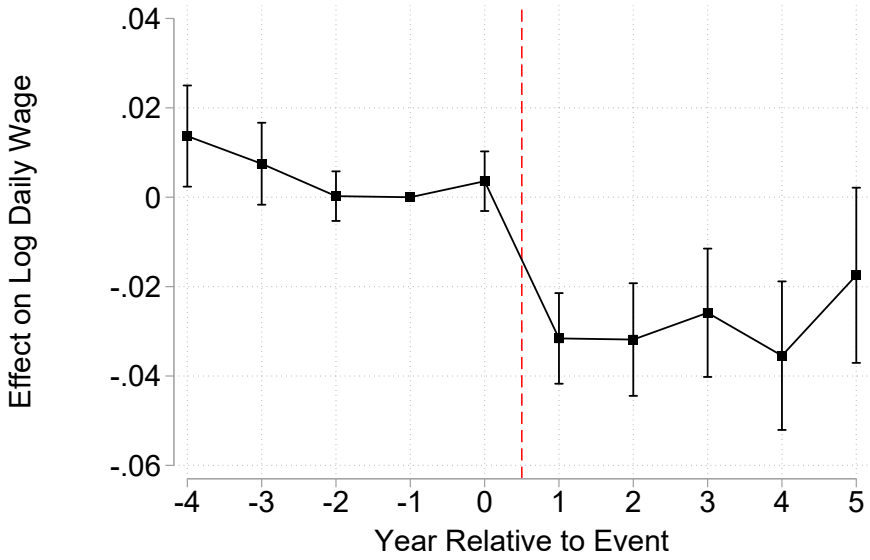
Notes: This figure reports the exposure measure for outsourcing firms in the matched sample described in Table 1. Exposure is calculated as the share of the wage bill paid to outsourced workers the year before the outsourcing event. All statistics are person-year weighted.

Figure A5: Effects by Exposure



Notes: This figure reports event-study coefficients on total earnings, obtained by fitting equation (1) separately for each decile of exposure of the outsourcing event. Recall that exposure is defined as the share of the wage bill paid to outsourced workers the year before the outsourcing event. The blue line reflects the percent impact of outsourcing on total earnings in $t_i^* + 1$ (i.e., the event-study coefficient θ_1 from equation (1), rescaled by the pre-outsourcing mean of earnings observed in year $t_i^* - 1$). The red line reflects the percent impact of outsourcing on annual earnings in $t_i^* + 5$. The figure displays 95% confidence intervals based on standard errors clustered at the worker level.

Figure A6: Effect on Log Daily Wages Using the Flow-Based Approach of Goldschmidt and Schmieder (2017)



Notes: This figure reports event-study estimates on the effects of outsourcing on log daily wages following the flow-based approach of Goldschmidt and Schmieder (2017), where an outsourcing event corresponds to a situation where a group of workers are employed in year t by a non-business firm and in year t+1 are instead employed by an FCSL business service firm (see Section 4.3 for details). Both panels report 95% confidence intervals based on standard errors clustered at the worker level.