Labor Market Effects of Private Provider Entry in Social and Health Services*

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Abstract

We examine the effects of private sector expansion on local labor markets for social and health care workers using comprehensive administrative data and a difference-in-differences design based on the staggered entry of private providers. Entry increases private sector employment, crowding out public employment with little change in total employment. Public sector wages remain largely unchanged, while private sector wages rise modestly. Public providers mitigate staffing shortages by purchasing more services from private providers without raising workloads for remaining workers. The decline in the public wage bill largely offsets higher private service spending, leaving total public expenditure on social and health services almost unchanged.

Keywords: professional labor markets, entry, mixed markets, outsourcing, municipalities
JEL Classification: H44, L33, I11, J21, J44, C23

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1 Introduction

Social and health services are often publicly provided or funded, with low or no out-of-pocket costs for users, to guarantee access to these vital services even for individuals with limited financial resources. However, these systems tend to be under-resourced relative to the demand for low-priced services, causing workforce shortages, which are widely documented. (OECD/European Commission 2024; National Center for Health Workforce Analysis 2024).[1] In congested service systems, public sector workers may face exhausting workloads without being adequately compensated.

However, markets for social and health services are typically mixed, featuring both public and private providers. In these settings, private sector expansion may draw skilled workers away from public services, exacerbating public sector labor shortages and raising concerns about the public sector's capacity to deliver services. Public sector wages are typically more rigid than those in the private sector (Quadrini and Trigari 2007; Caponi 2017; Rasmussen and Ejrnæs 2025), limiting the ability of public sector employers to attract and retain qualified workers and to respond to changing labor market conditions. Despite these concerns, the impact of private sector expansion on labor markets and whether the public sector adjusts through wages, workloads, or other margins remain poorly understood.

In this paper, we address this evidence gap by examining the local labor market effects of private sector expansion through entry. Our institutional context is Finland, where social and health services are mainly publicly provided, but private sector involvement has considerably increased in the past few decades. Building on Propper and Van Reenen (2010), who show that wage rigidity and private sector competition can undermine public service quality, we shift the focus to local labor market outcomes and study how they change after a private provider of social and health services enters a market. We consider the effects of entry in both the public and private sectors, as well as the implications for the local public social and health service expenditure.

We consider four primary responses to private provider entry. First, the increase in private sector employment due to entry may crowd out public sector employment. Second, it may raise workloads and working hours for the remaining public sector employees, which may reduce the attractiveness of working in public social and health services. Third, as the public sector remains responsible for organizing social and health care services, it may compensate for reduced service provision capacity by purchasing services from the private sector. Fourth, as in standard models of labor market power (Azar and Marinescu 2024), increased competition for skilled workers could push up their wages in both sectors. In addition, we explore how institutional features, such as wage rigidity, affect how incumbent

1. Public sector labor shortages are widespread, e.g., in the English National Health Service (Government of the United Kingdom 2024) and in U.S. public schools (Cooper and Hickey 2022).

public and private providers respond to entry.

We use population-wide administrative data covering employment and wages of Finland's social and health service professionals, who represented approximately 11 percent of the country's total employment in 2019. Our empirical strategy uses a Difference-in-Differences (DiD) design exploiting the staggered entry of private providers across municipalities, comparing municipalities with entry to those where no entry took place during our observation period. Entry and comparison municipalities were fairly similar in pre-entry market conditions and socioeconomic characteristics, with little evidence of differential pre-trends. To mitigate potential spatial spillovers across entry and comparison municipalities after entry, we exclude comparison group municipalities located near entry municipalities.

We find that private provider entry increases private sector employment of social and health care professionals by 34 percent while decreasing the corresponding public sector employment by 10 percent. In absolute terms, private sector employment increases by 2.9 workers per 1,000 residents, and public sector employment decreases by 2.3 workers per 1,000 residents. Therefore, total industry employment in local municipal markets for social and health care professionals remains almost unchanged and the private employment gains are almost entirely crowded out from the public sector employment. Our findings suggest a key policy trade-off in private expansion: when labor is scarce, such expansion may draw workers from the public sector and weaken public sector service capacity.

Our analysis of sectoral labor flows, however, shows only little direct reallocation of workers from the public sector to the private sector in social and health services. The private sector mostly receives the additional labor resources from other industries and non-employment (e.g., graduates, the unemployed). Conversely, the public sector loses only few workers directly to the private sector. Instead, the reduced public sector employment is mostly caused by a decline in net worker flows coming from other labor markets.

We find no clear effect on total public expenditure on social and health services after entry. However, as public sector employment declines, the total wage bill paid to public sector workers falls, and purchases from the private sector increase. The public sector offsets its employment losses and reduced service capacity by contracting with private providers, rather than by increasing the working hours of the remaining public sector employees or hiring more unqualified workers. The rise in private sector purchases, together with the decline in public employment and the increase in private employment in both entering and incumbent firms, suggests that private sector expansion leads the public sector to reorganize service provision through outsourcing.[2] In our setting, entry occurs first, followed by a gradual increase in outsourcing, which may partially replace

2. Although we observe little or no change in total public social and health service expenditure, we cannot study whether the shift from in-house provision to outsourcing has affected the amount of publicly funded services or their unit costs because we lack data on service output.

public production.

We also find that private sector wages for social and health care professionals increase by approximately one to two percent following the entry, also in the incumbent private firms. Thus, private sector wages respond to entry, which may increase demand and competition for labor. However, in the public sector, we find no clear effect on wages, indicating greater wage rigidity than in the private sector. Consistent with this interpretation, our descriptive analyses confirm that public sector wages in social and health services vary less between and within individuals than private sector wages.

Our heterogeneity analyses reveal that the private sector expands at the expense of the public sector even in local labor markets with relatively few social and health care workers. This suggests that private entry reshapes sectoral employment also in tighter labor markets. We further show that the employment and wage effects of entry are concentrated primarily among less-educated care workers. Most private entrants in our sample provide residential care services, where vocationally trained nurses and other less-educated workers constitute the majority of the workforce, emphasizing the demand for their labor input. The supply of these less-educated workers (relative to demand) may also be greater than that of more highly-educated professionals.[3]

By studying the labor market effects of entry across sectors and over time, we contribute to several strands of literature. We add the literature on labor market (monopsony) power and competition (Azar and Marinescu 2024; Ashenfelter, Card, Farber and Ransom 2022; Yeh, Macaluso and Hershbein 2022) and to the reduced-form literature using entry or exit events (Duggan, Gruber and Vabson 2018; Einav, Finkelstein and Mahoney 2023) and mergers (Craig, Grennan and Swanson 2021; Lewis and Pflum 2017) as shocks to the competitive environment to study their effects on product market outcomes. Empirical evidence on the labor market effects of these shocks remains much more limited. Notable exceptions include Prager and Schmitt (2021), Arnold (2025) and Thoresson (2024), who show that increases in employer concentration due to shocks depress wages. However, these papers abstract from public–private interactions, which are the focus of our study. In labor markets where both public and private sectors operate, private entry may not only increase wage competition among private providers, but also reallocates workforce across sectors and induces additional responses from the public sector. Contrary to standard models of labor market power, our results suggest that the public sector does not engage in wage competition with private providers but instead adjusts its production by contracting with them. By documenting these responses, we also advance the literature on public service outsourcing and privatization (Andersson, Jordahl and Josephson 2019; Knutsson and Tyrefors 2022).

3. For instance, in each of the years 2008–2025, the average number of unemployed vocationally-trained practical nurses relative to open vacancies for them was higher than the same ratio of bachelor's-equivalent nurses (KEHA Centre, Employment Service Statistics 2026).

Our analysis of public–private interactions in labor markets also contributes to the literature on mixed markets with public and private provision, which has largely focused on product market interactions in industries such as health care services (Pita Barros and Siciliani 2011; Russo 2024; Markkula 2024), pharmacies (Atal, Cuesta, González and Otero 2024), and education (Dinerstein and Smith 2021; Andrabi, Bau, Das, Karachiwalla and Ijaz Khwaja 2024). Moreover, our study is related to the literature on local multipliers, where additional jobs in one (tradable) sector stimulate employment in another (non-tradable) sector (Moretti 2010; Faggio and Overman 2014; Faggio, Schlüter and Berge 2025). We instead find evidence of labor reallocation and crowding out of public sector employment in social and health services, where labor resources are scarce and wage rigidities are common.

Finally, our study is related to the literature on labor markets for social and health service workers, whose wages account for more than half of total health care expenditure in several OECD countries (OECD 2016). This literature has examined labor shortages, which are a major policy concern and can be detrimental to patient outcomes (Friedrich and Hackmann 2021; Schlenker 2025). The literature has also examined various policies, such as expanding education programs and providing targeted subsidies, to alleviate these shortages (Costa, Nunes and Sanches 2024; Holmes 2005; Gandhi, Olenski, Ruffini and Shen 2024). We contribute to this literature by studying the labor market effects of private sector expansion and showing that it reduces public sector employment. At the same time, our results indicate that the public sector mitigates labor shortages by purchasing services from the private sector, promoting the outsourcing of public services without increasing total public expenditure after entry.

The remainder of the article is structured as follows. In Section 2, we present the relevant institutions and regulatory environment. We introduce our data and show descriptive statistics in Sections 3 and 4 respectively. Section 5 outlines the econometric approach and the results of estimating the effects of entry on municipality-level outcomes. The individual-level wage effects are presented in Section 6. Mechanisms, heterogeneity, and robustness analyses are presented in Section 7. Section 8 concludes.

2 Institutional Background

2.1 Finnish Social and Health Service System

The Finnish legislation requires that adequate social and health services are provided to residents, regardless of their financial situation, in the form of a universal social and health care system. Although public social and health care services are not often completely free of charge, the user fees are regulated by the national legislation (Act on Client Charges in Healthcare and Social Welfare 734/1992) and cannot exceed the production costs.

The regulation aims to enhance affordability and access to public social and health care services even for low-income individuals.[4] In Finland, social and health services are largely publicly funded. For example, in 2019, expenditure on health care and long-term care for the elderly and disabled alone was 22 billion euros (4,000 euros per capita, nine percent of the GDP) of which 77 percent was publicly funded (The Finnish Institute for Health and Welfare 2021).

Finland has a mixed system in which both public and private sectors provide social and health care services. During our study period (2007–2019), municipalities (local governments) were responsible for organizing social and primary health care services to their residents.[5] Municipalities fund the services for their residents and many of them also produce the services in-house.[6] Municipalities can also provide the services jointly with other municipalities or purchase them from the private sector through procurement contracts or service vouchers. Some municipalities even decide to completely outsource their services to the private sector.

Private providers can sell services directly to customers at unregulated fees, which are partly offset by state-funded reimbursements. These private direct-to-consumer services are usually more expensive for customers than the public ones, where the fees are regulated or even set to zero (Markkula 2024). In 2016, the public sector accounted for approximately two-thirds of social and health service provision, though its share has been declining over time (Kotakorpi and Seuri 2019).

Social and health care employment in Finland. Social and health care services are major employers in Finland.[7] Based on our individual-level data on employment relationships, 270,000 professionals with degree qualifications for social and health services worked in these industries in 2019, which was 11 percent of total employment in Finland. 189,000 of them were employed in the public sector and 81,000 in the private sector.[8]

4. The public service fees, mainly health services, have an upper limit per calendar year (692 euros in 2023) after which the services are free-of-charge. The user fees of some services (e.g., round-the-clock residential care) are income dependent, and customers may also apply for a reduction in or exemption from charges due to their financial situation. (Ministry of Social Affairs and Health 2025)

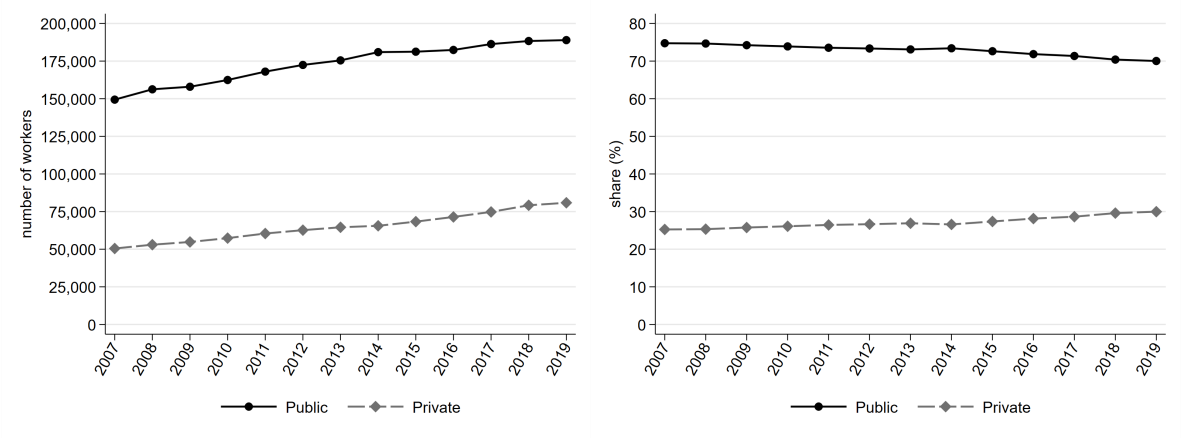
5. During our study period, there were approximately 300 municipalities in mainland Finland. In addition, 20 regional authorities, called hospital districts, were responsible for providing public specialized health care services (e.g., surgeries).

6. Municipal income sources are mainly local income and property taxes, service fees, and grants received from the central government. Grants are based on predetermined demographic and geographic characteristics of the municipalities and are not earmarked for any particular purpose, meaning municipalities generally cannot affect the amount of grants they receive. Municipalities can run budget deficits and borrow funds from the market.

7. In this paper, social and health services consist of industry classes 86, 87, 88 (excluding subcategory 8891, which is children's daycare) in Statistics Finland's *TOL2008* industry classification, which is equivalent to *NACE Rev. 2*.

8. Considering also support staff (e.g., administration and maintenance), public sector social and health services employed 228,000 and the private sector employed 111,000 workers. Taken together, these 339,000 workers were 14 percent of all employment in Finland.

Figure 1 shows employment trends for qualified social and health service workers in 2007—2019. The left panel presents total employment by sector, while the right panel shows each sector's share of workers. Both sectors grew in employment, but the growth was faster in the private sector, especially since the mid-2010s. The private sector's employment share increased from 25 percent in 2007 to 30 percent in 2019, highlighting its expansion during our study period.



(a) Number of workers

(b) Shares

Figure 1: Employment in Finnish social and health services over time

Professional occupations in Finnish social and health care are licensed. Only professionals licensed by the National Supervisory Authority for Welfare and Health can legally work in these occupations. We categorize professionals working in social and health services into three distinct categories based on their completed degrees, using the degree codes of the National Classification of Education 2016. The first category consists of workers who have master's-equivalent or higher degrees (licentiate or doctorate). We refer to this group as individuals with master's degrees. The category includes, e.g., physicians, psychologists, dentists, and social workers. The second consists of workers who have bachelor's-equivalent degrees. These professionals include, e.g., nurses, midwives, laboratory technicians, and social work instructors. The third category consists of workers with vocational secondary degrees, and this category mostly comprises of practical nurses.[9] We refer to this group as individuals with vocational degrees. Online Appendix Table A.1 presents descriptive statistics on worker allocation between public and private sectors by education. In all education groups, over 70 percent of social and health service workers were employed by the public sector. In social services, however, the private sector's share of total employment was considerably larger than in health services, although the public sector still employed the majority.

9. In Finland, it is possible to choose either academic high school or vocational school after the nine-year compulsory primary education, usually at the age of 16. Vocational degrees can also be started in adult age. A vocational degree still gives students the chance to enter tertiary education, but it is far less common than among those who went to academic high school.

2.2 Labor Market Regulation

In Finland, national legislation provides a general framework for employment terms and conditions, but terms specific to industries and occupations are mostly set in collective bargaining agreements between employer associations and labor unions. These agreements have large implications for labor markets, because they cover even non-unionized workers if employer associations participating in the agreement represent a large enough share of the total industry employment. All public sector employees are covered by a collective bargaining agreement, and 90 percent of the private sector social and health care employees were covered in 2021 (Ahtiainen 2024).[10]

There are three key aspects of pay regulation in Finnish labor markets that are particularly relevant to the social and health care industry. First, private and public sector workers are covered by different collective bargaining agreements, which allows for sectoral differences in compensation and other employment conditions. Second, Finland has a strict equal-pay regulation (Ombudsman for Equality 2025). Employers are required to pay equal wages for the same work or for work of equal value, which substantially limits within-employer wage variation. Pay can be conditioned on performance, but in occupations where it is hard to measure output, wages in similar tasks can often vary only based on objectively observable employee characteristics, such as work experience and education levels. Third, wages for similar occupations may vary across employers, as collective bargaining agreements set only minimum standards, and employers are free to offer more favorable terms. Previous research shows that regional wage variation in Finland is substantially greater in the private sector than in the public sector (Maczulskij and Isotalo 2021).

Labor market institutions related to equal-pay regulation create wage rigidities and may restrict especially large employers, who might be forced to apply wage increases to a large stock of employees if they wanted to attract new hires with an elevated compensation. Public employers in social and health care are typically large and there is often only one of them within a local labor market (a municipality), while many smaller private providers operate in the same market. As a result, wages might be more flexible and wage competition may be easier for private sector employers than for public providers.

Wages in public social and health services tend to be slightly higher than those in the private sector, at least in nursing occupations (Statistics Finland 2024). However, once employee characteristics and job tasks are taken into account, public and private sector wages are very similar (Kauhanen, Maczulskij and Isotalo 2020). Full-time weekly working hours are also broadly similar across sectors, although annual paid leave is longer in the public sector. Despite these similarities, work in the public sector may be more demanding than in the private sector. Because the public sector is mandated to provide services such

10. The overall coverage for private sector employees in 2021 was 84 percent

as inpatient care and residential care, working hours are likely to be more irregular. In 2019, one third of employees in public sector social and health services worked more than two night shifts per month, and 14 percent of all shifts exceeded nine hours (Härmä 2019).

The public service mandate may lead to more frequent exposure to complex and demanding cases.[11] This is reflected in sectoral differences in service provision (Table 1). The public sector employs the vast majority of healthcare workers in hospitals (95 percent) and primary care (76 percent), where patients often have severe, urgent, or chronic conditions. By contrast, the private sector dominates in other health services, such as physiotherapy, with over 90 percent of employment, typically serving less acute needs. Social care is more evenly distributed across sectors, but residential and outpatient services for the elderly and disabled remain predominantly public.

Table 1: Service mix in Finnish social and health services in 2010

Industry classification (TOL2008)	Description	Share of sectoral employment		Share of total employment	
		Public	Private	Public	Private
	Health services, total	68.1%	47.9%	80.1%	19.9%
861	Hospital care	41.5%	6.7%	94.6%	5.4%
862	Primary medical services	25.9%	23.2%	76.0%	24.0%
869	Other health services (physiotherapy, radiology, etc.)	0.6%	17.9%	8.8%	91.2%
	Social services, total	31.9%	52.1%	63.4%	36.6%
871&873	Residential care for the elderly and disabled	13.1%	23.6%	61.1%	38.9%
872&879	Other residential care	5.5%	18.0%	46.2%	53.8%
881	Outpatient social services for the elderly and disabled	9.9%	4.2%	86.9%	13.1%
889	Other outpatient social services	3.6%	6.4%	61.1%	38.9%
	All services, total	100.0%	100.0%	73.9%	23.1%

Three-digit numbers refer to Statistics Finland's TOL2008 industry classification (equivalent to NACE Rev. 2). Column "Share of sectoral employment" tells how large a share of public and private sector employees worked in a given industry. For instance, 41.5% of public sector employees worked in industry 861. Column "Share of total employment" tells how large a share of the employees in a given industry worked in the public/private sector. For instance, 94.6% of all employees working in industry 861 were public sector workers.

2.3 Entry Regulation in Social and Health Care Markets

During our study period, Finnish legislation regulated how new providers could start offering private social and health services. The purpose of this regulation was to ensure that services met minimum statutory quality and safety requirements, rather than to limit the number and location of potential providers. The system relied on stricter ex ante controls for higher-risk activities (e.g., social services provided 24/7) and lighter procedures for lower-risk activities (e.g., non-24/7 social services), under the supervision of the Regional State Administrative Agencies and the National Supervisory Authority

11. Salaried employees are usually entitled to private occupational health care, while the public sector must care for unemployed individuals and retirees, who often have more severe health problems than the employed population.

for Welfare and Health.

A key practical implication for how quickly a private provider can begin operations is that activities requiring a prior license and authority checks typically involve longer lead times (preparing the application, processing, and any required inspections). By contrast, notification-based activities can usually start faster once the notification has been filed, although providers must still meet baseline legal requirements from day one and remain subject to supervision. Regulation also effectively front-loads staffing: providers must be able to demonstrate sufficient qualified staff relative to planned capacity before service delivery starts, although capacity and staffing can be adjusted over time as long as statutory requirements continue to be met.

For social services, entry depended heavily on whether the service was round-the-clock (24/7). Under the Act on Private Social Services (922/2011), a provider offering 24/7 social services had to obtain a license before starting (or making essential changes), and the licensing process included an authority inspection to verify that statutory operating conditions were met (e.g., suitable premises and equipment, adequate staffing, and a designated responsible person). By contrast, non-24/7 social services did not require a prior licensing decision but were subject to a written notification procedure to the municipality, which typically enabled a quicker start, subject to compliance and subsequent oversight.

For health care, entry regulation was also front-loaded. The legislation required private service provision to be organized so that facilities, equipment, staffing/competence, and patient safety requirements were satisfied, with oversight shared between Regional State Administrative Agencies and the National Supervisory Authority for Welfare and Health. In addition, before operations began, the premises and equipment were inspected, and the provider's start notification to the permit authority had to include the inspection report. Because starting operations depended on completing these pre-start steps and documentation, regulation could materially affect how quickly a new provider could begin delivering services.

3 Data

3.1 Data and Variables

Our empirical analysis is based on population-wide administrative registers, which can be linked to one another at the individual level. We complement the individual-level administrative datasets with aggregate data on municipal social and health service expenditure. All datasets cover our study period, 2007–2019.

The main data source is Statistics Finland's *FOLK Employment*, an annual employer-employee dataset that includes all the Finnish residents and information on their employment relationships at the end of the year. The data provide one end-of-the-year

employment relationship per individual and include information on, e.g.,, an individual's employer and place of work, starting and ending dates of the employment relationship, and the employer's industry and sector. Based on the industry classification (Statistics Finland's *TOL2008*[12], equivalent to *NACE Rev. 2*) in the dataset, we identify providers of social and health care services and individuals working for them. Social and health services are defined as business locations with industry classes 86, 87, 88 (excluding 8891, which is children's daycare). Employers are classified as private and public based on ownership information reported in the employment register. We consider employers owned by private entities as private sector, including non-profit ones. Public sector employers are those owned by public sector entities.

The employment data are linked to datasets on education degrees (*FOLK Degree/Qualification*), income (*FOLK Income*) and background demographic characteristics, such as age and sex (*FOLK Basic*). We use the degree data to identify qualified social and health professionals and classify them into three educational groups (master's equivalent, bachelor's equivalent, and vocational).

The employer-employee dataset is used to identify the entry events, which are described in Section 3.2. The main outcome variable constructed from this dataset is the number of qualified social and health service workers employed in the municipality at the end of the year, measured for the public and the private sector separately and in total. The number of workers is measured per 1,000 residents of the municipality to make municipalities of different population sizes comparable.

In addition to measuring the number of workers, we examine yearly net flows of workers in the private and public sector. Net flow is the difference between the number of workers arriving from and leaving for a given destination (defined in Section 5.2). A positive net flow means that more workers arrived to the sector than left. Worker flows reveal which channels are behind the changes in sectoral employment. Flows are also expressed per 1,000 residents of the municipality.

We also assess the intensive margin of employment, using mean monthly working hours per municipality's public sector worker and the share of part-time workers in the public sector. The data on working hours are obtained from Statistics Finland's *Structure of Earnings Statistics*. Working hours are measured for public sector employees only, because the dataset covers working hours in the private sector very poorly.[13]

We also measure outcomes related to the provision of local public social and health care services. By reallocating labor and possibly affecting wages, entry could have local fiscal implications and lead to the restructuring of public services. First, we measure the total municipal expenditure on social and health services (including in-house production and

12. https://stat.fi/en/luokitukset/toimiala/toimiala_1_20080101 (accessed March 4, 2026).

13. In our sample, working hours are observed for 78 percent of public sector workers and only for 34 percent of private sector workers.

purchases). Second, to assess whether the private sector expansion shifts the provision of publicly funded services to the private sector (outsourcing), we measure the value of social and health services purchased by the municipality from the private sector. The data on municipal social and health service expenditure and private sector purchases are obtained from Statistics Finland's public data sources.[14] Third, changes in the municipality's in-house service production are assessed using the annual wage bill paid to public sector social and health service workers employed in the municipality. The annual wage bill is obtained from Statistics Finland's *FOLK Income* dataset. All three variables describing expenditure are measured per municipal resident.

The *FOLK Income* dataset is also used to measure individual-level wages of social and health service workers in the public and private sectors. We use information on individual's total annual wage income and include only workers who were employed with the same employer for the entire year because we observe only employment relationships valid at the end of the year. By focusing on workers employed by the same employer for the entire year, we reduce the likelihood of including wages earned from other employers or municipalities.

All monetary-valued variables (municipal expenditure and wages) are measured in real terms, in year-2023 euros. The outcome variables are described in detail in Online Appendix Section A.1.

3.2 Private Provider Entry

We estimate how the entry of private providers shapes local labor markets for social and health service workers. A local labor market is defined as a municipality, because municipal authorities were responsible for providing public social and health services to their residents during our analysis period.[15] Before defining our entry and comparison municipalities, some sample restrictions are made. First, we include only municipalities that had at least 10 social and health service workers in both the public and private sectors in each of the years before any of the entry events (2007–2010). It would not be reasonable to compare entry municipalities to those that had practically no services in these sectors. Second, municipalities in the autonomous and geographically isolated island region of Åland are excluded. Third, we exclude municipalities that fully outsourced their public social and health services at some point during 2011–2019, based on the listing provided by Jokinen (2020). In these cases, municipalities purchase all their services from private providers, increasing private employment and reducing public employment without expanding the number of providers or business locations. Partial outsourcing can, however, still precede and trigger entry. Although our administrative data cannot identify the exact

14. The data are available at: https://pxdata.stat.fi/PxWeb/pxweb/fi/Kuntien_talous_ja_toiminta/.
15. We use the constant year-2023 municipality classification.

reason for entry (market-driven or outsourcing), we show the robustness of our results to excluding (the relatively few) municipalities where partial outsourcing occurred just before entry. We also use private sector purchases as an outcome and provide descriptive evidence on market conditions in municipalities with and without entry (Section 4).

We define an entry event as follows: a privately owned provider sets up a new business location that provides social or health care services and has at least ten workers at the end of the entry year.[16] We impose the threshold of at least ten workers to ensure the economic significance of the entry events. The new unit may be established by an entity already operating in the municipality, but almost all events reflect an entry by a new provider into the local market. Entry events are identified from the employee-employer dataset, based on the business location identifiers and the number of employees working in them at the end of the year. The entry year of a business location is the year when it appears in the data for the first time.[17] We observe that the entry took place at some point during the year but do not know the exact date.

We further require that the total number of private business locations in the municipality increases in the entry year, to ensure that events reflect genuine entry rather than ownership and/or location changes. We also exclude six municipalities where the entry event coincides with another business location losing at least half of its pre-entry workforce and at least ten workers, as such large employment shifts likely reflect recoding of unit identifiers rather than genuine changes.

The entry (treatment) group consists of municipalities that received an entry between 2011–2016 and had at least four years of no entry before that. The first entry event in that time window is used as the entry (treatment) year. Using data from 2007–2019, we follow the entry municipalities from four years before the entry to four years after it (including the entry year). Comparison municipalities are those that received no entry during the sample period (2007–2019).

Spatial spillovers between entry and comparison municipalities may exist. To address spillovers that may bias comparisons, we drop a comparison municipality starting from the year in which an entry event occurs within 25 kilometers. Seventeen of the 47 comparison group municipalities receive such a nearby entry. The distance to the entry municipality is defined as the straight-line distance between the population-weighted centroids of the municipalities. We consider 25 kilometers an adequate buffer zone because the population centers of Finnish municipalities, where services are concentrated, are mostly isolated and do not form contiguous urban areas with neighboring municipalities. In 2010, only 12 percent of the social and health care workers in our sample municipalities had a straight-line commuting distance of more than 25 kilometers, which we therefore choose

16. In Appendix Section A.2.2 we present descriptive statistics on the entrants.

17. Although we use data from 2007–2019 in our analysis, we check the first appearance of a business location identifier using the entire history of the dataset, going back to 1987

for our buffer zone for spatial spillovers.

Our main sample consists of 54 entry and 47 comparison municipalities.[18] Entry municipalities are observed from four years before to four years after entry (including the entry year), totaling 432 municipality-year observations. Comparison municipalities are observed from 2007–2019, excluding years after a nearby entry, resulting in 505 municipality-year observations.

Table 2 summarizes the types of services provided in the new business locations established by the entrants, using Statistics Finland's *TOL2008* industry classification. The vast majority, approximately 70 percent, of the entry events took place in residential social services. Only six events were in health services. Generally, the provided health services in our sample municipalities are almost exclusively primary health care rather than hospital care. The rest of the events were in outpatient social services.[19]

Table 2: Entry events by service type

Industry classification (TOL2008)	Description	Number of events
86	Health services	6
871 & 873	Residential care for the elderly and disabled	20
872 & 879	Other residential care	19
881	Outpatient social services for the elderly and disabled	3
889	Other outpatient social services	6
	Total	54

This table lists the industries of the entering private providers. The two- or three-digit numbers refer to Statistics Finland's TOL2008 industry classification (equivalent to NACE Rev. 2). TOL categories 881 and 889 cover social services without accommodation. Industry class 889 does not include subclass 8891, which is children's daycare.

Online Appendix Table A.2 presents descriptive statistics on the entering private providers and their employment, in the year before entry. Approximately one-third of entrants employed no qualified social and health service workers before entry, indicating that they were new to the social and health care industry. The remaining entrants are

18. The total population (733,358) of the 54 entry municipalities was approximately 14 percent of the total Finnish population in 2010, and the total population (270,696) of the 47 comparison group municipalities was approximately five percent of the total population.

19. Here, industry 889 does not include children's daycare activities (8891), which are excluded from the entry events and our analyses altogether, because the services offered and labor input needed by daycare centers differ quite a bit from those of other social and health care activities. In Finland, children's daycare is formally called "early childhood education", to emphasize its role as a part of the education system. The regulation and legislation concerning these services belong to the Ministry of Education and Culture, instead of the Ministry of Social and Health Affairs, which governs other social and health services. Municipalities are responsible for providing daycare services.

grouped by pre-entry employment using the thresholds of European Union's firm-size classification.[20] Among providers already active in social and health services, entrants are fairly evenly distributed across size groups. In the year before the entry, entrants operated in an average of ten municipalities. Only one-tenth of entrants already operated in the entry municipality, meaning that the entry events are driven by providers entering the market for the first time, instead of expanding operations by opening a new business location. On average, the entrant's pre-entry share of all Finnish private sector social and health service workers was 0.5 percent, indicating that the average entrant was a small national provider prior to the entry. Approximately one-third of entrants are non-profit entities.

4 Pre - Entry Descriptive Statistics

Table 3 presents the descriptive statistics of our main outcome variables. Means are measured for the years 2007–2010, prior to any of the entry events in the sample. When measuring employment, municipal social and health service expenditure, and working hours, the observation unit is municipality-year. For wages, the unit is individual-year.

The number of social and health care workers per 1,000 residents is very similar between the entry and comparison groups, in both the public and private sectors. The public sector accounts for almost 75 percent of the total employment in the entry and comparison municipalities.

Total municipal expenditure on social and health services per resident is the same in the two municipality groups. The mean wage sum paid to public sector workers is also rather similar. The entry municipalities bought more services from the private sector than the comparison municipalities (344 versus 256 euros per 1,000 residents) but the difference is small in absolute value and relative to the total expenditure.

Mean monthly working hours and overtime hours in the public sector are very similar in the entry and comparison municipalities. The comparison municipalities have somewhat more part-time workers, but the standard deviation is relatively large.[21]

In both municipality groups, public sector wages (logs) are slightly higher than private sector wages. In addition, entry municipalities have higher wages than comparison municipalities in both sectors, but the differences are just a few percentage points. Mean log wages are unconditional, so employee and employment characteristics may explain the differences between municipality groups and sectors.

20. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Enterprise_size (accessed February 24, 2026).

21. The definition of a part-time worker is that regular monthly hours are at most 90 percent of ordinary full-time hours in the given occupation and industry, so some part-timers have hours close to full-time workers.

Table 3: Pre-entry descriptive statistics on main outcome variables

	Entry		No entry	
	Mean	SD	Mean	SD
Social and health care workers per 1,000 residents				
Private sector	8.59	6.67	7.46	4.01
Public sector	22.50	9.70	21.91	6.19
Total	31.08	11.29	29.37	7.98
Municipal social and health expenses				
Total expenses per resident (€)	2,577	676	2,606	1,033
Purchases from private sector per resident (€)	344	211	256	218
Wage sum per resident (€)	1,547	659	1,445	419
Public sector working hours				
Mean total monthly hours	159.9	3.0	156.8	7.0
Mean monthly overtime hours	1.1	0.8	1.2	1.2
Share of part-time workers (%)	11.1	5.1	16.7	13.0
Mean annual wage (log)				
Public	10.61	0.34	10.57	0.32
Private	10.56	0.38	10.53	0.38
Total	10.59	0.35	10.56	0.33
Number of municipalities	54		47	

Descriptive statistics on the main outcome variables concern years 2007–2010, a period before the entry events in the sample took place. Wages are measured at the individual level and the other outcome variables are measured at the municipality level. Monetary variables are measured in year-2023 value of money. Total expenses and purchases from private sector are not observed for five municipalities of the comparison group, and they are left out of those analyses. Private sector working hours are excluded from our analysis due to limited data coverage and concerns about representativeness.

Table 4 compares pre-entry employment and worker characteristics between the two municipality groups and private and public sectors. The variables are measured at the individual level. All variables (except age) are binary indicators, so we report only their shares (means).

The public services of the entry municipalities have relatively more workers with master's or bachelor's degrees than those of the comparison municipalities, but the difference is not striking. The education mixes in private services are very similar. Overall, the majority of workers in both groups and sectors are vocationally trained, while the share of employees with master's degrees is below ten percent.

In the entry municipalities, public sector workers are somewhat more likely to work in health instead of social services than their counterparts in the comparison municipalities. In the private sector, the shares of social and health services are the same between the

two municipality groups. Compared to public sector workers, private sector employees work more often in social services.

Public sector workers are more experienced than private sector employees. We measure experience with a binary indicator for having worked in social and health services for at least ten years (not necessarily in consecutive years). The share of these more experienced workers is 65 percent in the public sector and slightly less than half in the private sector.

Approximately 95 percent of public sector workers are women. The private sector employs relatively more men, although the vast majority of workers are still female (five in six). Public sector workers are, on average, also a little older than private sector employees. Experience, sex composition, and mean age do not differ much between the entry and comparison municipalities.

In sum, private and public sector workers differ to some extent but are still rather similar. Therefore, the two sectors can utilize and compete for the same labor resources, meaning that we can expect the public sector to be affected by private provider entry. The worker composition in the entry and comparison municipalities is also rather similar.

Table 4: Pre-entry worker and employment characteristics

	Public		Private	
	Entry	No entry	Entry	No entry
Education (shares)				
Master's degree	0.09	0.06	0.09	0.07
Bachelor's degree	0.38	0.33	0.40	0.40
Vocational degree	0.54	0.61	0.51	0.54
Type of services (shares)				
Health services	0.54	0.50	0.42	0.42
Social services	0.46	0.50	0.58	0.58
Worker characteristics				
At least 10 years of experience (share)	0.65	0.65	0.48	0.45
Age	44.3	45.0	41.5	41.5
Female (share)	0.94	0.95	0.84	0.83
Worker-year observations	65,373	23,493	24,320	7,436
Number of municipalities	54	47	54	47

Descriptive statistics cover years 2007–2010, a period before the entry events in the sample took place. Variables are measured at the individual level.

Finally, Table 5 shows the means of some demographic and economic characteristics of the entry and comparison municipalities. The mean population of the entry municipalities is larger than that of the comparison group, although the standard deviation in the

entry municipalities is large and a few bigger municipalities increase the average in the treatment group. Nevertheless, both groups consisted mainly of small towns.[22] The entry municipalities have somewhat fewer over 64-year-old residents and more tertiary-educated residents than the comparison municipalities. Unemployment rates, median household incomes, net migration rates and, the number of jobs (all, not only social and health service jobs) per working-aged population are quite similar. Market (population) size appears to be a key factor influencing entry decisions, but besides the population size there seems to be no considerable differences in the demographic and economic characteristics of the entry and comparison municipalities.

Table 5: Pre-entry descriptive statistics on other municipality characteristics

	Entry		No entry	
	Mean	SD	Mean	SD
Population	13,581	8,672	5,759	3,329
Share of population aged over 64 years (%)	19.3	5.3	23.2	4.9
Share of individuals aged 15 or older with a tertiary degree (%)	23.6	7.4	18.2	4.1
Unemployment rate (%)	10.4	3.4	11.1	4.1
Jobs per 1,000 working-aged residents	530	103	532	86
Median household income per consumption unit (€)	23,895	3,235	21,858	1,994
Within-country net migration rate (%)	-0.26	0.93	-0.22	0.71
Number of municipalities	54		47	

Values are measured in 2010, the last year before any of the entry events in the sample took place.

5 Effects of Entry on Municipality-Level Outcomes

5.1 Econometric Approach

We estimate the effects of private provider entry on municipal employment and sectoral worker allocation in social and health services, using municipality-year level data and a DiD design based on the staggered entry of private providers into local labor markets. In addition, we estimate the effects on public sector working hours and municipal social and health service expenditure. We consider a municipality as treated starting from the year of the first private provider entry event during the study period and until the end of the study period. We use the DiD estimator proposed by Callaway and Sant'Anna (2021) to address potential biases in the traditional two-way fixed effects (TWFE) estimator in a staggered DiD design with heterogeneous dynamic treatment effects (Baker, Larcker and

22. Due to the sample restrictions listed in Section 3.2, no regional centers with central hospitals are included in the sample, because in large cities entry events take place frequently, making it hard to find enough pre-entry years.

Wang 2022).

Specifically, we use the Callaway and Sant'Anna (2021) estimator for the following group-time Average Treatment Effect (ATT), using never treated municipalities (units) as a comparison group:[23]

$$ATT(g,t) = E[Y_{it} - Y_{i,g-1} \mid G_i = g] - E[Y_{it} - Y_{i,g-1} \mid C_i = 1] \tag{1}$$

Where $t \geq g$ is the time period and g is the group, defined by the time period when municipality i becomes treated, and $\mathcal{T}$ denotes the final year (last period) observed in the sample. G_i is the time period when municipality i first becomes treated and equals g. C_i is an indicator variable for whether municipality i is in the never-treated comparison group. Y_{it} is the outcome of municipality i in period t (e.g., the number of qualified social and health care workers per 1,000 residents). The expression for ATT resembles how the ATT-term is defined in the canonical case of two periods and two groups (treated and untreated). We do not use control variables in the estimation.[24] Standard errors are clustered at the municipal level in all analyses.

The Average Treatment Effect (ATT) of entry for municipalities in group g is identified by taking the path of outcomes (that is, the change in outcomes between the current period and the last period before the treatment) actually experienced by that group and adjusting it by the path of outcomes experienced by the comparison group. Under the parallel trends assumption, discussed in detail in De Chaisemartin and D'haultfœuille (2023), this latter path is the path of outcomes that municipalities in group g would have experienced in the absence of the treatment.

Equation (1) can be estimated by replacing expectation with sample analogs where $N_{g,t}$ and $N_{C,t}$ denote treatment and comparison group sample sizes and sets $\mathcal{S}_{g,t}$ and $\mathcal{S}_{C,t}$ define municipalities observed in both periods t and $g-1$:

$$\widehat{ATT}(g,t) = \frac{1}{N_{g,t}} \sum_{i:G_i=g,\, i\in\mathcal{S}_{g,t}} (Y_{it} - Y_{i,g-1}) - \frac{1}{N_{C,t}} \sum_{i:C_i=1,\, i\in\mathcal{S}_{C,t}} (Y_{it} - Y_{i,g-1})\,, \tag{2}$$

After ATTs are calculated for each g,t pair using Equation (2), we use formulas derived in Callaway and Sant'Anna (2021) to aggregate group time ATTs into an overall average effect of entry and event studies.

23. Using only never-treated, instead of not-yet-treated, municipalities as the comparison group may be more robust to compositional changes and the anticipation of the treatment. Below, we address potential limitations of using never-treated municipalities as the comparison group such as their differences with treated municipalities.

24. Callaway and Sant'Anna (2021) estimator follows the DiD best practices by not allowing time varying control variables (Sant'Anna and Zhao 2020).

There are two key threats related to our identification strategy. The first threat relates to the nature of the treatment. Firms are likely to enter those geographic markets, where the expected profits, unobserved to the econometrician, are the largest. Firms may also take into account labor market characteristics in their entry decisions. However, we did not find considerable differences in the pre-entry characteristics of the entry and comparison municipalities, apart from population size (Section 4 Tables 4 and 5). Moreover, our econometric approach takes into account time-invariant market or municipality specific factors, such as the time-invariant parts of the population and unobserved profitability, as they cancel out in the differencing over time in Equation (1). We also use an event study specification to show that even without control variables, entry and comparison municipalities do not have major differences in their outcome trends in the pre-entry periods that might arise from time varying municipality differences and endogenous entry. Specifically, to test parallel trends and study the dynamic effects of entry, we follow Callaway and Sant'Anna (2021) and use the event study aggregate of ATTs at a specific event time $e = t - g$ periods since the municipality became treated:

$$\widehat{\theta}_{es}(e) = \sum_{g \in \mathcal{G}} \mathbf{1}\{g + e \leq \mathcal{T}\}\, \widehat{\omega_g}(e)\, \widehat{ATT}(g, g+e), \tag{3}$$

The set $\mathcal{G}$ is the set of treated cohorts (values of g such that some municipalities have $G_i = g$). The term $\omega_g(e)$ is the weight, which is determined as the share of municipalities in cohort g for which $g + e$ is observed. Equation 4 defines the weights:

$$\omega_g(e) = \Pr(G = g \mid G + e \leq \mathcal{T})\,. \tag{4}$$

The second threat to identification is spatial spillovers from private provider entry, which can affect nearby municipalities in the comparison group. As described in Section 3.2, our main analyses address this by excluding municipalities located within 25 kilometers of an entry municipality. We further test the robustness of our results by extending this exclusion radius to 40 kilometers (Section 7.3).[25] We also document spatial spillovers and the extent of worker reallocation to entry municipalities from other municipalities (Section 5.2).

5.2 Employment Effects and Worker Reallocation

The number of social and health care workers. Figure 2 presents our main estimates of the effects on the number of social and health care workers employed in the municipality.

We find that private sector employment increases by 1.2 workers per 1,000 residents in

25. In 2010, only 12 percent of social and health care professionals in our sample municipalities had a straight-line commuting distance exceeding 25 kilometers, and only approximately four percent exceeded 40 kilometers.

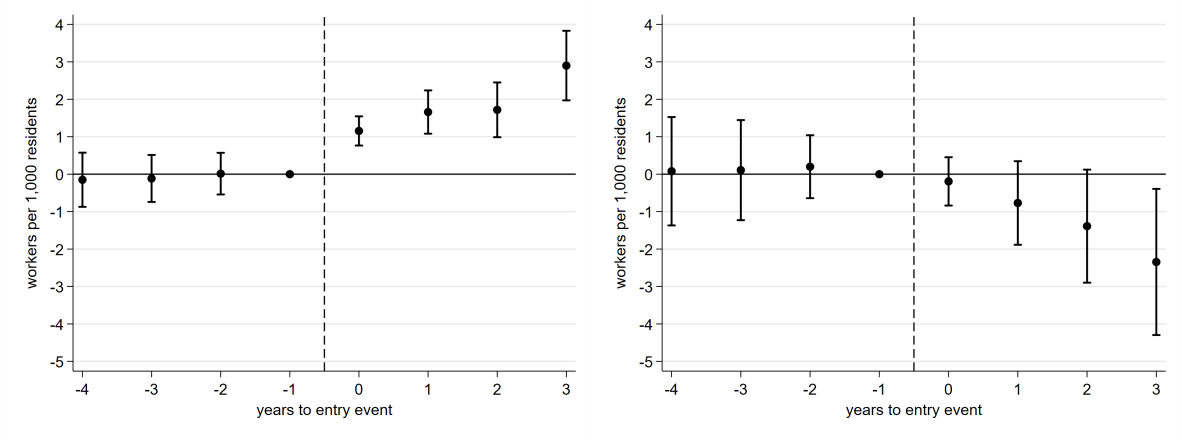
the entry year and grows gradually thereafter. By the third year after entry, private sector employment has increased by 2.9 workers per 1,000 residents, relative to the comparison municipalities. This corresponds to a 34 percent increase compared to the pre-entry mean. In addition to delays in recruitment, entry regulation can partly explain why the employment effect increases over time, as most of the entries are in industries in which entrants cannot expand capacity (hire more workers) without regulatory approvals. The pre-entry coefficients are close to zero, showing little evidence of differential trends in the outcomes between the entry and comparison groups before entry.

For public sector employment, the pre-entry differences between the entry municipalities and the comparison group are also very close to zero based on the coefficient estimates. After entry, public sector employment declines gradually over time, coinciding with a gradual increase in private sector employment. Three years after entry, public sector employment has decreased by approximately 2.3 workers per 1,000 residents (10 percent relative to the pre-entry mean), almost corresponding the observed increase in private sector employment after entry. This means that the increase in private sector employment almost entirely crowds out public sector employment.

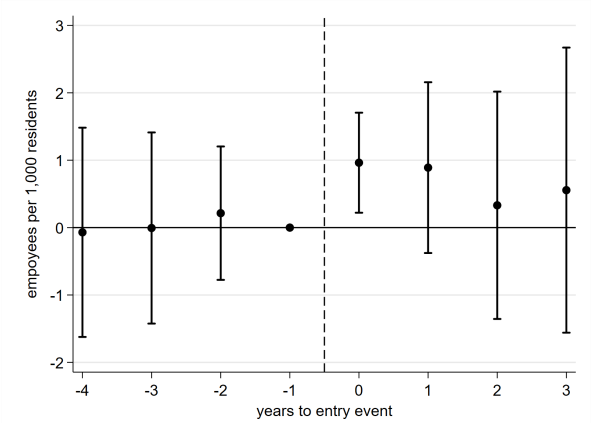
As can be seen by summing up the event study coefficients of private and public sectors, the total social and health service employment in the municipality increases right after the entry, relative to the comparison municipalities, but the difference is close to zero in later years with wide confidence intervals. The event study coefficients are imprecise, but they suggest that the entry eventually does not have much effect on total employment. Based on the 95 percent confidence intervals of the corresponding DiD estimates (Table 6), we can rule out effects larger than than two workers per 1,000 residents or roughly six percent compared to the mean.

The observed increase in private sector employment may be driven by changes in employment in both the entering unit and incumbent units. In Online Appendix Section A.4.1, we present estimates of the effect of entry on private sector employment excluding workers employed by the entrant. While entry could, in principle, reduce employment at incumbent units through the reallocation of workers to the entering unit, we instead find that employment at incumbent units increases, albeit with some delay after entry. A comparison of the total private sector employment effect in Figure 2a and the effect excluding the entering unit in Online Appendix Figure A.1 shows that only approximately one third of the overall increase in private sector employment is attributable to the entrant itself. This finding suggests that private sector entry generates positive externalities in local labor markets, with incumbent firms responding to entry by expanding service capacity.[26]

26. This is in contrast with, e.g., Neumark, Zhang and Ciccarella (2008), who find that the entry of Wallmart into a local labor market decreases retail employment in the competing firms and in the local labor market overall.



(a) Private (b) Public



(c) Total

Figure 2: Effect on the number of workers per 1,000 residents

Table 6: Average treatment effects on the number of workers per 1,000 residents

	Estimate	SD	Baseline mean
Private	1.86	0.28	8.59
Public	-1.17	0.61	22.50
Total	0.69	0.69	31.08

The dependent variable is the number of workers per 1,000 residents. The baseline mean is calculated for the entry municipalities during 2007–2010, a period before the entry events in the sample took place.

Worker flows and reallocation. Next, we examine the worker reallocation driving the observed rise in private sector employment alongside the decline in public sector employment after entry. This crowding-out effect can operate through two channels. First, it may arise from direct reallocation of workers from the public to the private sector

within the municipality. Such reallocation may occur if the private sector offers better working conditions with similar or higher pay than the public sector, or if the public sector partially outsources its service provision to private firms. Second, crowding out may occur indirectly, through a reduction in worker flows to the public sector from other sources.

We estimate the effects of entry on yearly net worker flows per 1,000 residents by sector and in total. Net worker flow is the difference between the number of arriving and leaving workers, measured at the level of sector-municipality.[27] We consider four sources of worker flows: (i) within-municipality flows between public and private social and health services, (ii) public social and health services of other municipalities, (iii) private social and health services of other municipalities, and (iv) other industries and non-employment (e.g. schooling, retirement, unemployment). Table 7 reports the estimated ATTs, with corresponding event study figures shown in Online Appendix Section A.4.3.

There is only a fairly small increase in the number of workers moving from the public to the private sector within the municipality's social and health services. Thus, the direct crowding-out effect explains changes in sectoral employment only to a limited extent. The net worker flows coming to the private sector from the social and health services of other municipalities increases a little. However, the small effect on the flow coming from the public services of other municipalities means that entry causes only small negative spillover effects on them. The largest single source of net worker flow to the private sector is other industries and non-employment. The decrease in public sector employment is mostly explainable by the decrease in the number of workers coming from the public social and health services of other municipalities. Private and public sectors combined, the social and health services of the entry municipalities receive additional labor resources from other industries and non-employment but loses employment flows from the social and health services of other municipalities.

The Online Appendix event study Figures A.5–A.7 show that the change in the within-municipality net flow of workers between sectors takes place only in the third year following the entry. The net flows from other sources to the private sector are, quite naturally, the largest in the entry year, but net flows remain mainly positive also in the subsequent years, consistent with the gradual expansion observed in Figure 2. The public sector experiences a sustained reduction in net worker flow from the public social and health services of other municipalities.

The flows are rather small and imprecisely estimated because the number of workers moving between given destinations per year is usually small. However, these flows accumulate to substantial changes in the stock of employees, as shown in Figure 2.

27. This means that a worker switching between two employers of the same sector in social and health services within the municipality is not arriving or leaving.

Table 7: Effects on yearly net flows of workers

	Public		Private		Total	
	Estimate	SD	Estimate	SD	Estimate	SD
Within municipality's social and health	-0.10	0.08	0.10	0.08		
Public social and health of other municipalities	-0.41	0.17	0.11	0.07	-0.30	0.19
Private social and health of other municipalities	-0.01	0.06	0.10	0.11	0.08	0.14
Other industries and non-employment	0.09	0.37	0.37	0.24	0.46	0.44
Total net flow	-0.44	0.46	0.67	0.32	0.24	0.52

The dependent variable is the yearly net worker flow per 1,000 residents of the municipality. Net flow is the difference between the number of workers arriving from and leaving for the given destination.

Employment effects by worker and service type. There are more social and health care workers with lower levels of education, and their labor demand and supply may respond more to entry than that of highly educated workers. We therefore examine whether the employment effects of entry differ by education and experience. The estimated ATTs are reported in Table 8. The event study estimates are shown in Online Appendix Section A.4.4.

We find that workers with vocational degrees (lowest level of education) account for approximately two-thirds of the private sector employment increase and nearly all of the public sector losses. Vocationally educated workers are not only the largest group, explaining the large absolute effects, but also experience the largest effects in relative terms: the estimated ATTs show an eight percent decline in public sector employment and a 27 percent increase in the private sector.[28] The employment of workers with bachelor's degrees also increases in the private sector, but the effect is only slightly negative in the public sector. No statistically significant effect on the most educated workers is observed.

Public sector employment declines for all experience groups, but the decline is smaller in absolute terms for workers with less than ten years of experience than for more experienced ones (a decline of 0.52 versus 0.65 workers per 1,000 residents). In relative terms, however, the effect is larger for less experienced workers, who make up only approximately one-third of the pre-entry workforce.[29] In the private sector, the employment of workers with less than ten years of experience increases slightly more than the employment of more experienced workers. The private sector employment of less experienced workers increases more also in relative terms, meaning that their share of the private sector employment grows.[30] Overall, the total number of more experienced workers in the municipality

28. Mean public sector employment before entry (2007–2010) in the entry municipalities: 1.84 (master's), 8.08 (bachelor's), 12.57 (vocational). The corresponding numbers in the private sector: 0.70, 3.48, 4.41.

29. Mean public sector employment before entry (2007–2010) in the entry municipalities: 14.55 (at least ten years of experience), 7.94 (less than ten years of experience).

30. Mean private sector employment before entry (2007–2010) in the entry municipalities: 4.68 (at least ten years of experience), 3.91 (less than ten years of experience).

remains almost unchanged and that of less experienced ones slightly increases.

We also examine whether the employment effects of entry differ between social and health services. Because approximately 90 percent of the entry events occur in social services, we expect larger effects in these services, although entry may also affect health services employment given shared labor inputs, particularly nurses. The results in Table 8 show that the post-entry increase in private sector employment is driven by social services, which also account for most public sector job losses. In health services, the estimates indicate a small, statistically insignificant decline in public employment and no significant change in private employment.

Table 8: Effect of entry on employment by worker and service type

	Public		Private		Total	
	Estimate	SD	Estimate	SD	Estimate	SD
Education						
Master's degree	0.02	0.07	0.08	0.05	0.10	0.08
Bachelor's degree	-0.15	0.24	0.59	0.11	0.44	0.29
Vocational degree	-1.04	0.39	1.19	0.23	0.15	0.44
Total	-1.17	0.61	1.86	0.28	0.69	0.69
Experience						
Years of experience < 10	-0.52	0.32	1.04	0.17	0.52	0.39
Years of experience ≥ 10	-0.65	0.36	0.82	0.19	0.16	0.40
Total	-1.17	0.61	1.86	0.28	0.69	0.69
Type of services						
Health	-0.25	0.41	0.16	0.25	-0.09	0.51
Social	-0.92	0.44	1.69	0.34	0.77	0.52
Total	-1.17	0.61	1.86	0.28	0.69	0.69
Support workers	-0.01	0.28	0.94	0.23	0.93	0.36

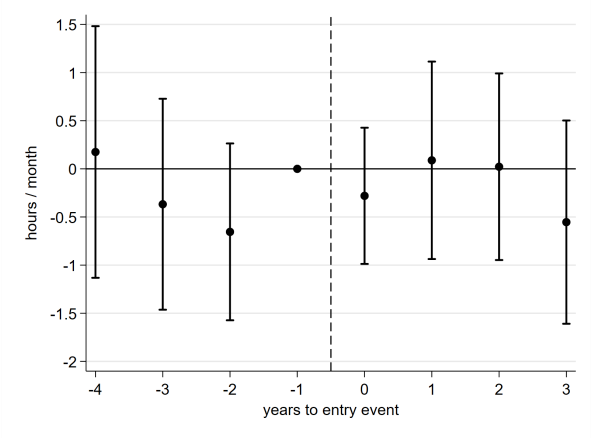
The dependent variable is the number of workers in the employee or service group per 1,000 residents of the municipality.

Finally, while we focus on qualified social and health care workers, we also examine support staff working in social and health services. Support staff such as secretaries, cleaners, and assistants typically work in non-licensed occupations and across industries. If demand for qualified workers rises, demand for support staff may also increase, reflecting complementarities in labor demand. Conversely, non-licensed nursing assistants, without degree qualifications for social and health services, may substitute for qualified staff to

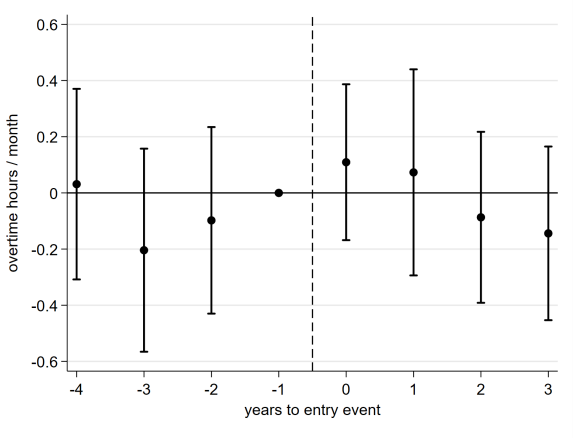
some extent. Table 8 shows the ATT estimates for support workers and Online Appendix Section A.4.5 presents the corresponding event study estimates. We find that in the private sector, support staff employment increases after entry. This increase coincides with higher employment among qualified workers (Figure 2, Table 6), consistent with complementarities. In the public sector, we find no clear effects, although there is some evidence of pre-entry trends. Entry of private providers does not appear to induce skill downgrading, as the public sector does not increase the employment of non-licensed or unqualified workers to offset the losses of qualified personnel. On the other hand, support staff in the public sector are not reduced despite a possible decrease in service provision implied by the decline in qualified employment, meaning that support staff in the public sector are to some degree a fixed input.

Public sector working hours and part-time work. Private provider entry may affect public sector working hours through two opposing channels. First, as public employment declines after entry, remaining public sector employees may need to work longer hours to maintain service provision. Second, if competition for labor increases, the public sector may need to improve working conditions by reducing working hours or overtime work. We therefore examine the effects of entry on total and overtime working hours per worker in the public sector. In addition, we analyze how the share of part-time workers changes in the public sector. The effect on this share is, however, ambiguous: it may increase if the public sector hires new part-time workers, or it may decrease if the public sector increases employment by offering more full-time posts. Working part time is also often an individual choice due to, e.g., having young children.

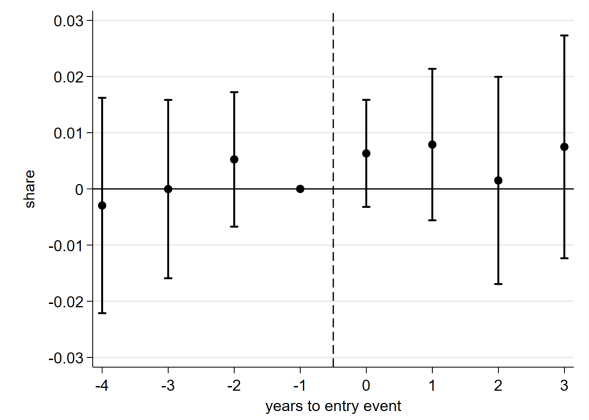
Entry has little effect on total or overtime hours per worker in the public sector (Figure 3 and Table 9). We also find no statistically significant change in the share of part-time workers; the 95 percent confidence interval around the DiD estimate rules out effects larger than two percentage points (less than 20 percent relative to the baseline mean). Overall, our results suggest that private sector expansion does not increase labor supply at the intensive margin among remaining public sector workers. Therefore, we find little support for the hypothesis that declining public employment after entry forces remaining employees to work longer hours. We cannot, however, show whether unchanged hours mask a higher workload per hour, as we lack direct measures of output or task intensity. Nonetheless, there is little evidence of increased working hours that could raise job dissatisfaction and contribute to declining public sector employment.



(a) Total monthly hours per worker



(b) Monthly overtime hours per worker



(c) Share of public sector part-time workers

Figure 3: Effects on public sector working time

Table 9: Average treatment effects on public sector working hours

	Estimate	SD	Baseline mean
Total public sector monthly hours per worker	-0.181	0.373	159.9
Monthly public sector overtime hours per worker	-0.012	0.146	1.1
Share of public sector part-time worker	0.006	0.006	0.111

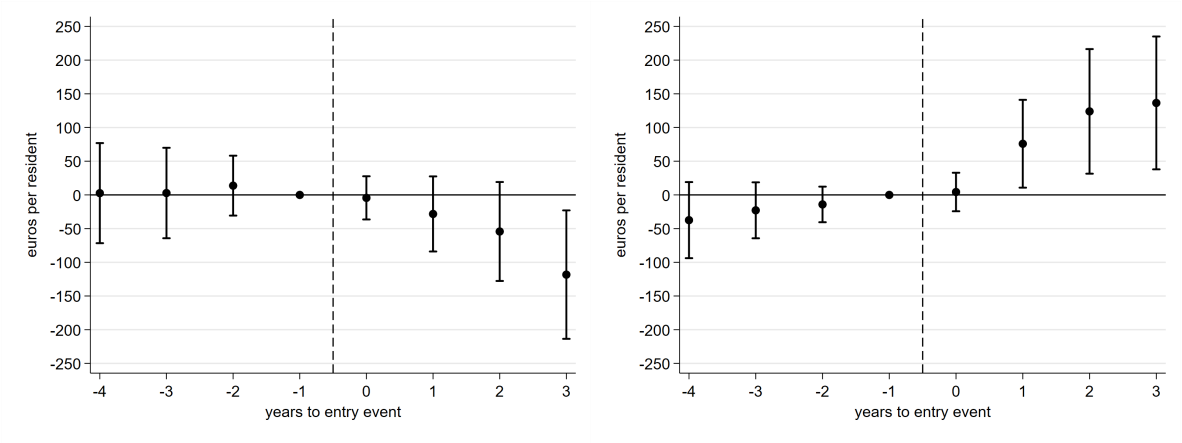
The dependent variables are municipality-level means of the working time measures. The baseline mean is calculated for the entry municipalities during 2007–2010, a period before the entry events in the sample took place.

5.3 Effects on Municipal Social and Health Service Expenditure

As public sector employment of social and health care workers declines after private provider entry, municipalities, legally responsible for organizing these services, are likely to adjust when public staffing falls. Since our earlier analyses show no increase in

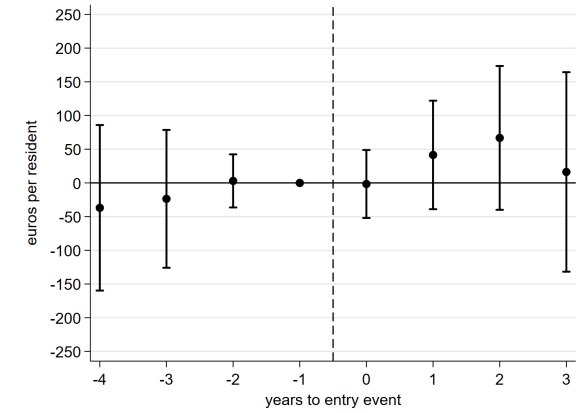
working hours of remaining public sector workers or in the number unlicensed workers, the adjustment margin might be greater reliance on private sector purchases. Figure 4 confirms this hypothesis: as the public sector wage bill declines after entry, expenditure on services purchased from private providers rises gradually. We interpret these results as evidence that entry leads municipalities to rely more on privately produced services.

The ATT estimate in Table 10 implies that service purchases increase by 85.2 euros per resident, or 25 percent relative to the baseline mean. In contrast, total public expenditures on social and health services rise by only 30.7 euros per resident (approximately one percent relative to the baseline mean), and the estimate is not statistically significant. Overall, entry has little effect on total municipal spending, but it shifts public funds from direct public provision toward purchases from private providers.



(a) Wage sum

(b) Purchases from the private sector



(c) Total social and health service expenditure

Figure 4: Effects on municipal social and health service expenditure

Table 10: Average treatment effects on municipal social and health service expenditure

	Estimate	SD	Baseline mean
Wage sum (€ per resident)	-51.3	29.5	1,547
Purchases from the private sector (€ per resident)	85.2	32.8	344
Total social and health service expenditure (€ per resident)	30.7	44.8	2,577

The dependent variables are measured in real euros (year-2023 value of money) per resident. The baseline mean is calculated for the entry municipalities during 2007–2010, a period before the entry events in the sample took place.

6 Effects of Entry on Individual-Level Wages

6.1 Econometric Approach

We next examine how private provider entry affects individual wages. We apply the Callaway and Sant'Anna (2021) approach to our individual-level data, using the same entry and control municipalities as in the aggregate analyses in Section 5. Analyzing outcomes at the individual level involves compositional challenges, because workers can change jobs both within and across municipalities. We address these issues by estimating two complementary wage specifications.

Our first specification uses the full sample of workers and the repeated cross-sectional estimator of Callaway and Sant'Anna (2021), where the treatment (entry event) is defined at the municipality level as in Equation (1). The repeated cross-section approach proceeds similarly to the estimation of the panel version when control variables are not included in the model. However, the repeated cross-section estimator uses differences in average outcomes across municipalities, whereas the panel estimator uses within-municipality or within-treatment-unit differences over time. Therefore, municipality-level time-invariant factors are not differenced out in the repeated cross-section specification, and cannot be controlled for using municipality fixed effects.[31] To account for these municipality-level factors, we use the residuals from a linear regression of log individual wages on municipality fixed effects as the outcome in all repeated cross-section wage analyses. The results remain similar when using log wages without residualization as an outcome.

Our second specification complements the cross-sectional analyses by using the panel version of the Callaway and Sant'Anna (2021) estimator and individual-municipality-sector as treatment units. We refer to this as a fixed effects specification. The specification takes into account time-invariant individual-specific factors and restricts the sample to

31. The estimators by Callaway and Sant'Anna (2021) use propensity scores to introduce control variables. However, municipality fixed effects cannot be used as control variables because they would predict treatment status perfectly. This leads to problems in estimation as estimated propensity scores are zero for control units and one for treated units. We clarify this issue and the estimation with control variables further in Online Appendix Section A.3.

stayers, including those who worked in the same municipality and sector before entry and remained there after entry. Because we focus on stayers, compositional changes and selection into a given sector are not an issue in the fixed effects specification. The standard errors are clustered at the municipality level in all wage analyses.

6.2 Results

Entry might increase demand and competition for workers, which may push up wages in both public and private sectors. Based on the cross-sectional estimates, vocationally trained workers experience a 1–2 percent wage increase in the private sector after entry, while their public sector wages increase right after entry and then decline (Figure 5). Wages of workers with bachelor's degrees decline by approximately 1–3 percent after entry in both sectors (Figure 6).

When accounting for individual fixed effects, we still find a 1–2 percent increase in private sector wages for vocationally educated workers, although the point estimates are less precisely estimated than in the cross-sectional specification (Online Appendix Figure A.16).[32] The point estimates of the public sector wage effects remain small and close to zero, and the negative wage effects for workers with bachelor's degrees disappear, suggesting that the wage declines observed in the cross-sectional approach are partly driven by compositional changes (Online Appendix Figure A.17).

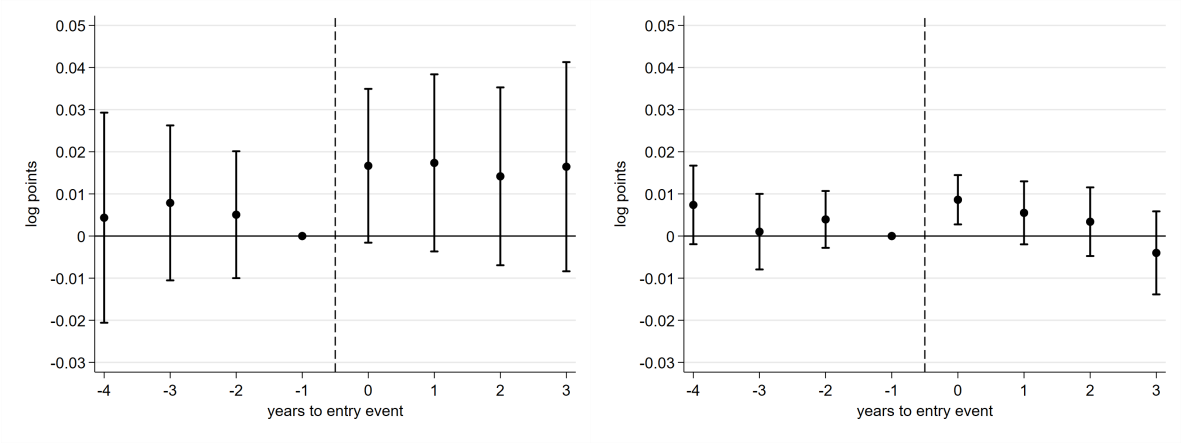
When using the fixed effects specification, compositional changes (on top of selection) are not an issue, and we can show the results for wage effects using all qualified social and health care workers (Figure 7, Table 11). There is a small increase in private sector wages after entry. In the public sector, the coefficient estimates are close to zero with narrow confidence intervals, allowing us to rule out wage changes larger than one percent.

Finally, excluding the entering firm from the private sector sample yields nearly identical estimates (Online Appendix Figures A.2 and A.3). This indicates that the wage increase is not driven solely by the entrant offering higher wages, but also reflects wage growth among incumbent private providers. The finding complements our earlier evidence showing that entry induces incumbents to hire additional workers.

Labor market regulation, especially equal pay laws, can make wages for social and health care workers more rigid in the public sector than in the private sector. Our results indicate that public sector wages are indeed more rigid and less responsive to local labor market conditions and entry than private sector wages, even though entry affects both sectors. In Online Appendix Section A.4.7, we provide descriptive evidence supporting greater public sector wage rigidity by examining sector-specific wage dispersion, using pre-entry data. Following Lemieux (2006), we measure residual wage variance, which

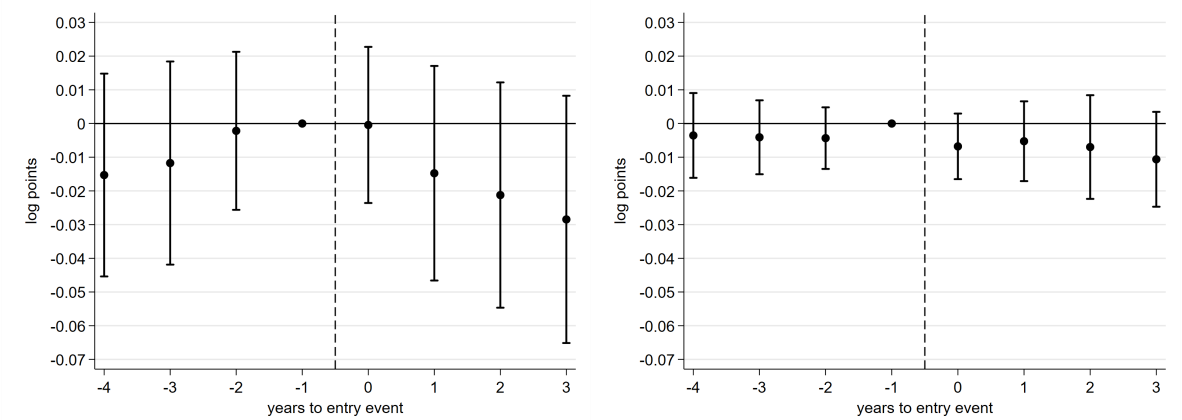
32. Fixed effects estimation is done with a fewer number of workers because each of the event study coefficients are estimated using only those individuals who were working in the same sector and municipality the year before entry.

shows that private sector wages are more variable between-individuals. In addition, the variance of individual year-on-year wage changes is also higher in the private sector. This greater public sector wage rigidity may partly explain why the public sector wages are less responsive to the increase in competition induced by entry.



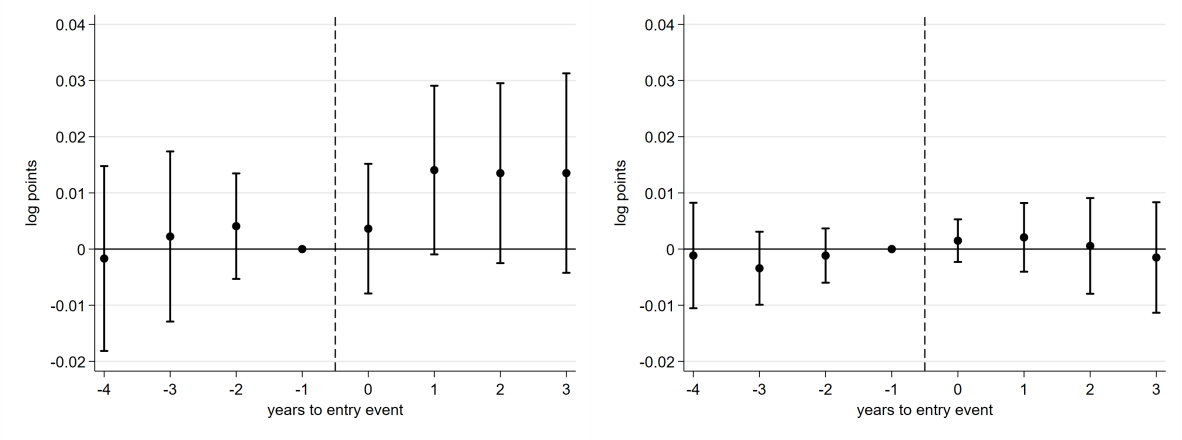
(a) Private (b) Public

Figure 5: Wages of workers with vocational degrees, cross-section



(a) Private (b) Public

Figure 6: Wages of workers with bachelor's degrees, cross-section



(a) Private (b) Public

Figure 7: Wages of all workers, individual-municipality-sector fixed effects

Table 11: Average treatment effects on wages

	Vocational, cross-section	Bachelor's, cross-section	Vocational, fixed effects	Bachelor's, fixed effects	All workers, fixed effects
Private	0.016	-0.016	0.013	0.006	0.011
	(0.009)	(0.014)	(0.008)	(0.011)	(0.006)
Public	0.003	-0.007	0.003	-0.006	0.001
	(0.003)	(0.006)	(0.003)	(0.005)	(0.003)

In all the regressions, the dependent variable is the log of annual wage income. The two first columns use repeated cross-sections, separated by education group, and the dependent variable residualized by municipality fixed effects. The three last columns take into account individual-municipality-sector fixed effects.

7 Mechanisms, Heterogeneity, and Robustness

7.1 Entry Through Partial Outsourcing

Entry into municipalities can occur through two primary channels. First, entry could be market-driven, so that private providers enter in response to better market opportunities. Consistent with this, we observe that the mean population size in the entry municipalities is larger than in the comparison municipalities without entry (Section 4). Second, although we exclude municipalities with total outsourcing of social and health services (Section 3.1), entry could still occur through partial outsourcing, where municipalities contract out social and health services to private providers. Distinguishing between different channels of entry matters for interpreting our results: outsourcing primarily reallocates activity and employment from the public to the private sector, whereas market-driven entry may

also induce competitive responses in local labor markets. However, regardless of the entry channel, our estimates capture the labor market effects of private provider entry.

To assess the possible role of entry through outsourcing, we use data on municipalities' public procurement calls for residential social services, where most entry events occur (Table 2).[33] In Finland, outsourcing of public services typically occurs through public procurement. We consider procurement calls that take place in the entry year or the year before as possible sources of entry. Only 10 of the 54 treatment municipalities issued a procurement call in the entry year or the preceding year.

In Online Appendix Section A.4.8, we assess the robustness of our results regarding employment and municipal expenditure to excluding these ten municipalities. Estimates concerning municipal expenditure (Online Appendix Figure A.19 and Table A.5) change somewhat more than employment estimates (Online Appendix Figure A.18 and Table A.4), but the results remain qualitatively similar to our main estimates. These findings suggest that our main conclusions are not solely driven by outsourcing-related entry, though we cannot separately identify the exact reasons underlying private provider entry using our data.

7.2 Labor Availability

The availability of workers in local labor markets may affect the ability of entrants to recruit and compete for workers. When labor is scarce, recruitment becomes more difficult and competition for workers intensifies. Entrants might be less able to find workers, and the upward pressure on wages might be larger.

We therefore assess whether the effects of entry differ by the pre-existing relative labor availability in the municipality. As a coarse measure of relative labor availability, we use the number of social and health service workers (public and private combined) per resident in 2010 (last year before any of the entry events) and compare relative labor availability to the national median. The sample municipalities are divided into two groups: 1) number of workers per resident at or below the national median, 2) number of workers per resident above the national median.[34] We compare entry municipalities of a given labor availability group to the comparison municipalities belonging to the same group.

33. The information comes from the Hilma public procurement registry, provided by the Ministry of Employment and the Economy via the Finnish Social Science Data Archive. We thank Helena Rantakaulio for collecting and cleaning the data. The data include the procuring municipality and the call year but not whether contracts were made. We consider mostly only procurement calls of single municipalities. We include the calls of joint municipal authorities if the municipality of the procured service location is given, but often it is not stated in the call. The data cover years 2010–2018, ensuring at least one pre-entry year for each entry municipality.

34. 26 entry and 23 comparison group municipalities had employment at or below the national median. 28 entry and 24 comparison group municipalities had employment above the national median. The entry and comparison municipalities are split almost exactly half-and-half, meaning that relative labor availability does not seem to be associated with entry events.

The results in Online Appendix Figure A.20 show that the increase in private employment after entry does not differ substantially by pre-entry labor availability, although the effect appears slightly stronger in municipalities with fewer workers per resident. Online Appendix Figure A.21 indicates that the decline in public sector employment is somewhat more pronounced in municipalities with more workers per resident, although the confidence intervals of the estimates do not allow us to rule out similar effects across municipality groups. Overall, private entrants are able to expand even in municipalities with more limited local labor resources, while the public sector experiences employment losses even where labor availability is higher.

Limited labor availability can also affect wage setting for social and health care professionals by intensifying wage competition for workers. In Online Appendix Figures A.22 and A.23, we re-estimate the fixed effects wage specifications separately for municipalities with low versus high pre-entry labor availability. We find that wages in both sectors tend to increase more in municipalities that had relatively fewer workers prior to entry than in municipalities with more abundant labor resources. Although these differences are not statistically significant, the pattern provides suggestive evidence that wage setting is less rigid and competition for workers is more intense in local labor markets with less available labor resources.

7.3 Robustness Checks

We conduct several robustness checks to ensure that our main results are not driven by spatial spillovers, changes in control group composition, or repeated entries. To limit spatial spillovers, we expand the exclusion radius from 25 to 40 kilometers.[35] While confidence intervals are wider due to a smaller sample size, the point estimates for the employment effects remain similar to the main estimates, indicating that spatial spillovers are not driving our results (Online Appendix A.4.10, Figure A.24, Table A.6).

We also use a fixed (balanced) control group instead of excluding municipalities from the control group once a nearby entry occurs. The effects on employment and municipal expenditure are similar in comparison with our main estimates, ruling out compositional changes as drivers of the results (Online Appendix A.4.11, Figures A.25 and A.26, Tables A.7 and A.8).

Finally, 28 of the 54 entry municipalities receive additional entry events after the first one, and this could partially explain the gradually increasing positive effect on private employment. Restricting the observation window to only the first entry per municipality[36]

35. Under the 25-kilometer buffer, 17 of the 47 control municipalities experience a nearby entry during the follow-up period; under the 40-kilometer buffer, this number increases to 27. In 2010, the year preceding our first entry event, approximately 96 percent of the social and health care workers had a straight-line commuting distance less than 40 kilometers.

36. This means that we drop the entry municipality out of the sample when the second entry takes place.

reduces the magnitude of the estimated employment effects but leads to qualitatively similar results compared to our main results, while the confidence intervals widen somewhat due to the smaller sample (Online Appendix A.4.12). We conclude that repeated entry events are not driving our main employment results.

8 Conclusions

During the last two decades, Finland has seen a substantial increase in private provision of social and health care services, alongside a gradual decline in the share of publicly produced services (Kotakorpi and Seuri 2019). In this paper, we focus on parts of this broader trend by studying the entry of private providers across municipalities over several years. We examine how this private sector expansion affects the allocation of social and health care workers across sectors and what it implies for labor market outcomes and public expenditure on social and health services. We focus on the labor markets effects of entry, an adjustment margin that has received relatively little attention in the earlier literature on entry and mixed markets.

Using a staggered difference-in-differences design, we show that private provider entry into local labor markets (municipalities) reduces public sector employment of social and health care workers. Private social and health service employment increases, even in incumbent firms, but this expansion largely crowds out public sector employment, meaning that the total social and health service employment in the municipality increases only slightly. Our finding of a rather small total employment effect in a setting with scarce labor resources contrasts with the predictions of standard labor theory, which suggest positive employment effects from increased labor market competition (Azar and Marinescu 2024).

Only a fairly small share of increased private employment reflects direct worker reallocation from the public sector. Instead, the private sector draws qualified workers into social and health care mostly from other industries and non-employment. The decline in public sector employment appears to arise mainly from reduced net inflows from these alternative sources, rather than from increased direct exits of public sector workers to private employers.

Private sector wages rise modestly after entry in both entering and incumbent firms, consistent with private providers responding to increased labor demand and competition. Public sector wages, instead, show no clear effect. These findings are in line with the evidence that public wages are more rigid and less responsive to local labor market conditions than private sector wages.

Rather than competing for workers using higher wages, increasing the workloads (working hours) of remaining staff, or hiring unqualified labor, public providers respond to entry and their declining employment by increasing service purchases from private

providers. The increased purchases roughly offset the decrease in the public wage bill, leaving total public expenditure on social and health services almost unchanged.

Our analyses highlight labor markets and public expenditures as key channels through which public–private interaction shapes the production of essential welfare services. The results advance understanding of how markets for qualified health and social care workers operate in mixed systems with public and private provision, while also pointing to important open questions. First, private provider entry may shift consumer demand from public to private services, which could explain the observed decrease in public sector employment and the increase in private sector employment. This would be in line with earlier research showing that entry in one sector induces some consumers to substitute away from incumbent providers in another sector (Atal, Cuesta, González and Otero 2024).

Second, our results indicate that under labor shortages and rigid public sector wages, private entry may weaken the public sector's capacity for in-house production. Consistent with this interpretation, we observe reduced public sector employment without changes in working hours per employee, suggesting that the public sector is providing less services. At the same time, entry has little impact on total municipal social and health service expenditure as the decline in the public sector wage bill largely offsets higher public expenditure on private sector services. If private firms deliver comparable or better output at similar cost, the shift from public in-house production towards services purchased from the private sector does not necessarily imply inefficient use of public funds. Establishing whether this is the case, however, requires data on service volumes and quality that are beyond the scope of our study. A full welfare assessment of entry must therefore consider its effects on consumer demand and outputs, including service quantity and quality, alongside the distributional consequences across different population groups.

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A Online Appendix

A.1 Outcome Variables

In this Section, we explain how our main outcome variables are constructed and defined. All outcome variables except wages are constructed at the municipality-year level.

Number of social and health care workers. The number of qualified social and health care workers is measured at the end of the year. To make municipalities of varying population sizes comparable, we use the number of workers per 1,000 residents of the municipality. This definition allows us to directly assess the degree of crowding out: if private employment per 1,000 residents increases by 2 and that of the public sector decreases by 0.5, it means that 25 percent of the increase in private employment is crowded out from the public sector. In more detailed analyses, we also measure the number of workers per 1,000 residents by, e.g., education and experience level.

Worker flows. In addition to measuring the number of workers, we examine yearly net flows workers in the private and the public sector. Net flow is the difference between the number of workers arriving from and leaving for a given destination. A positive net flow means more workers arrived in the sector than left. Worker flows reveal which channels are behind changes in sectoral employment. Flows are also expressed per 1,000 residents of the municipality. We consider four sources of net flows: (i) within-municipality flows between public and private social and health services, (ii) public social and health services of other municipalities, (iii) private social and health services of other municipalities, and (iv) other industries and non-employment.

Working hours. We use three indicators of working hours, measured at the municipality level: mean total monthly hours per worker, mean monthly overtime hours worked per worker, and the share of part-time workers.[37] Only the public sector is considered because private sector workers are very poorly covered in the data, as explained in Section 3.1. Even though public sector workers are mostly included, it is not a total sample, so we cannot reliably measure the total amount of hours worked in the municipality. Mean working hours per worker measure the intensive margin of public sector labor input, which complements our analysis of the extensive margin response (the number of workers). If the public sector loses workers when private entry increases the competition for them, the remaining workers might need to work more hours to replace the lost labor resources.

Municipal expenditure. We use two variables from publicly available data on municipal

37. Part-time workers are those with monthly hours at most 90 percent of the regular full-time hours in their industry and occupation.

expenditure on social and health services.[38] The first variable measures total municipal expenditure on social and health services. This includes all municipal expenditure related to social and health services, covering both the municipality's own service provision and services purchased from other providers. Only operational expenditure is included, not investment.

The second variable measures the municipality's social and health service purchases from the private sector. These include only service purchases, not goods. Services bought from the private sector indicate to what degree the municipality relies on outsourcing in its service provision.

In addition, we use our individual-level data to measure the annual wage bill paid to public sector social and health service workers employed in a municipality. This wage sum is the sum of annual wage income of workers who were employed in the municipality's public social and health services at the end of the year.[39] The wage sum includes only the gross wage, not employer contributions (mainly pension, unemployment , and health insurance). To account for these additional costs, we multiply the wage sum by the average percentage of employer contributions in the municipal sector.[40] The contribution percentage varies year-to-year; in 2010 the average in the municipal sector was 29.8 percent of the gross wage.

Wages. We use information on individuals' total annual wage income and include only workers who were employed with the same employer the entire year because we observe only employment relationships valid at the end of the year. By focusing on workers employed by the same employer the entire year, we reduce the likelihood of including wages earned from other employers or municipalities. Because we cannot reliably measure yearly working hours, we exclude individuals who were likely to be part-time workers.[41]

38. We exclude specialized health care because specialized health care was provided by hospital districts, and municipalities just paid the costs of the services used by their residents, with little ability to control the use of these services.

39. This wage sum measure does not precisely quantify the wage bill paid by the municipality, because the worker did not necessarily work for the same employer the entire year, and some who worked earlier in the observation year do not do so anymore at the end of the year.

40. Data on average employer contributions are based on Association of Finnish Cities and Municipalities 2009 (years 2007–2008), Association of Finnish Cities and Municipalities 2010 (year 2009), Punakallio 2024 (years 2010–2019)

41. On top of including only individuals having worked for the same employer the entire year, we drop workers with implausibly low wage income (less than 12,000 in year-2023 euros) to be a full-time worker. Despite this restriction, we are probably left with some part-time workers, but the issue is not likely to be large, because part-time work in Finnish social and health services is not very common (Lukkarinen 2018).

A.2 Additional Descriptive Statistics

A.2.1 Education Mix by Sector and Service Type

Table A.1: Education mix for qualified social and health care workers in Finland in 2010 by sector and service type

	Share of sectoral employment		Share of total employment	
	Public	Private	Public	Private
Health services				
Master's degree	17.0%	26.5%	72.2%	27.8%
Bachelor's degree	56.0%	48.1%	82.4%	17.6%
Vocational degree	27.0%	25.5%	81.0%	19.0%
Social services				
Master's degree	5.2%	4.1%	68.7%	31.3%
Bachelor's degree	26.7%	36.0%	56.2%	43.8%
Vocational degree	68.2%	59.9%	66.4%	33.6%
Total				
Master's degree	13.3%	14.8%	71.7%	28.3%
Bachelor's degree	46.6%	41.8%	76.0%	24.0%
Vocational degree	40.1%	43.4%	72.3%	27.7%

Table A.1 shows the education mix in public and private services. The first two columns tell the share of sectoral employment with a given education level. For instance, 17.0 percent of public sector employees in health services had a master's degree. Or, 43.4 percent of all private sector employees were vocationally educated. The last two columns tell, what was sector's share of employment in a given education level and industry. For instance, public sector employed 72.2 percent of health service workers with a master's degree. Or, private sector employed 27.7 percent of all vocationally educated.

A.2.2 Descriptive Statistics on the Entering Private Providers

Table A.2: Pre-entry descriptive statistics on the characteristics of the entering private providers

	Share/mean
Number of workers in the whole country	
0	30%
1–9	8%
10–49	21%
50–249	18%
250–	23%
Share of private employment in the whole country	0.5%
Number of municipalities where operates	9.6
Already operating in the entry municipality	10%
Non-profit	28%

This table describes the entering private providers. Only consider social and health service units and qualified social and health care workers are concerned. Non-profit status is determined based on the entry year, all other variables based on the year before the entry. If a provider did not operate in social and health services in the year before the entry, all variables are set to zero and included in the shares/means. Worker counts, the share of private employment and the number of municipalities of operation are measured at the national level.

A.3 Callaway and Sant'Anna (2021) Repeated Cross-Section Estimator with Control Variables

In this section, we present the Callaway and Sant'Anna (2021) repeated cross-section estimator and discuss how it incorporates controls. We also clarify why municipality fixed effects cannot be used as controls when treatment (entry) is assigned at the municipality level. Specifically, all individuals in municipality i share the same treatment adoption date G_i. Consequently, an individual's treatment-timing group membership is fully determined by the municipality.

Following the notation in Appendix B.2 of Callaway and Sant'Anna (2021), each observation in the pooled sample is observed in a single period $T \in \{1, \ldots, \mathcal{T}\}$. Let $T_t = \mathbf{1}\{T = t\}$ denote the time indicator. For each observation, we observe $(Y, G_2, \ldots, G_{\mathcal{T}}, C, T, X)$, where G_g is the indicator for belonging to treatment-timing group g (first treated in period g) and C is the indicator for never-treated units. Expectations are taken with respect to the repeated cross-section mixture distribution and are denoted by $E_M[\cdot]$.

In our application, for an individual j in municipality i (and sector s), Y corresponds to Y_{ijst} when $T = t$. Group membership and never-treatment status are at the municipality-level:

$$G_g \equiv G_{gi} = \mathbf{1}\{G_i = g\}, \qquad C \equiv C_i = \mathbf{1}\{G_i = \infty\},$$

and X collects observed covariates (e.g., individual controls).

As with the panel estimator of Callaway and Sant'Anna (2021), control variables enter the estimation equation through propensity scores and outcome regressions. With never-treated controls, Appendix B.2 of Callaway and Sant'Anna (2021) defines the generalized propensity score as

$$p_g(X) \equiv E_M[G_g \mid X,\ G_g + C = 1]\,, \tag{5}$$

and the time-specific outcome regressions :

$$\begin{aligned} m_{g,t}^{rc,treat}(x) &\equiv E_M[Y \mid X = x,\ G_g = 1,\ T = t]\,, \\ m_{c,t}^{rc,nev}(x) &\equiv E_M[Y \mid X = x,\ C = 1,\ T = t]\,. \end{aligned} \tag{6}$$

The repeated cross-section estimator models level outcomes by time and group, using two time-specific outcome regressions for each group (treated and untreated). The panel version of the estimator requires only one outcome regression, because the same unit can be observed in adjacent time periods.

Appendix B.2 Callaway and Sant'Anna (2021) further introduces the (normalized) treated-group and never-treated comparison weights as.

$$w^{treat}(g,t) = \frac{T_t\, G_g}{E_M[T_t\, G_g]}, \qquad w^{comp,nev}(g,t) = \frac{T_t \dfrac{p_g(X)\, C}{1 - p_g(X)}}{E_M\left[T_t \dfrac{p_g(X)\, C}{1 - p_g(X)}\right]}. \tag{7}$$

Assuming no anticipation ($\delta = 0$), the pre-period used for group g is $g - 1$. The repeated cross-section doubly robust estimand (never treated control units) for $ATT(g,t)$ is

$$\begin{aligned} ATT_{dr,rc}^{nev}(g,t;0) = {} & E_M\left[\frac{G_g}{E_M[G_g]}\Big((m_{g,t}^{rc,treat}(X) - m_{g,g-1}^{rc,treat}(X)) - (m_{c,t}^{rc,nev}(X) - m_{c,g-1}^{rc,nev}(X))\Big)\right] \\ & + E_M\Big[w^{treat}(g,t)\big(Y - m_{g,t}^{rc,treat}(X)\big) - w^{treat}(g,g-1)\big(Y - m_{g,g-1}^{rc,treat}(X)\big)\Big] \\ & - E_M\Big[w^{comp,nev}(g,t)\big(Y - m_{c,t}^{rc,nev}(X)\big) - w^{comp,nev}(g,g-1)\big(Y - m_{c,g-1}^{rc,nev}(X)\big)\Big]. \end{aligned} \tag{8}$$

In practice, $\widehat{ATT}_{dr,rc}^{nev}(g,t;0)$ is obtained by replacing $E_M[\cdot]$ with sample averages and plugging in estimates $\widehat{p}_g(\cdot)$ and $\widehat{m}(\cdot)$.

Why municipality fixed effects break the repeated cross-section estimator when treat-

ment is defined at the municipal level? Suppose we include municipality fixed effects in X, i.e. $X = (\widetilde{X}, \alpha_i)$ where α_i is a full set of municipality indicators (or an equivalent municipality identifier). Because treatment timing is defined at the municipality level, α_i almost perfectly predicts G_i and therefore $G_g = \mathbf{1}\{G_i = g\}$ within the comparison sample $\{G_g + C = 1\}$. This degeneracy immediately breaks the weighting terms in (7) because they use the ratio $p_g(X)/(1 - p_g(X))$. For never-treated municipalities, $p_g(X) = 0$, so

$$T_t \frac{p_g(X)\, C}{1 - p_g(X)} = 0 \quad \text{and} \quad E_M\left[T_t \frac{p_g(X)\, C}{1 - p_g(X)}\right] = 0,$$

making $w^{comp,nev}(g,t)$ a 0/0 normalization (ill-defined). In finite samples, estimating (5) with municipality dummies typically leads to (near) perfect separation and fitted probabilities extremely close to 0/1, which yields numerically unstable weights.

Because municipality fixed effects can almost perfectly predict municipality-level treatment timing, they violate the overlap requirement in Callaway and Sant'Anna (2021) that underpins the repeated cross-section estimator with covariates, and they render the propensity-score weights ill-defined or numerically unstable. For this reason, we cannot include municipality fixed effects as covariates in the Callaway and Sant'Anna (2021) repeated cross-section estimator. Instead, we remove time-invariant municipality-level differences by demeaning outcomes.

A.4 Additional Results

In this Section we show results that complement our main findings or support the robustness of our findings. We also present event study results for the outcomes with the estimated ATTs presented in the main text.

A.4.1 Private Sector Excluding the Entering Firm

These supplementary analyses estimate the effect of entry on the private sector employment and wages, excluding the entering provider.

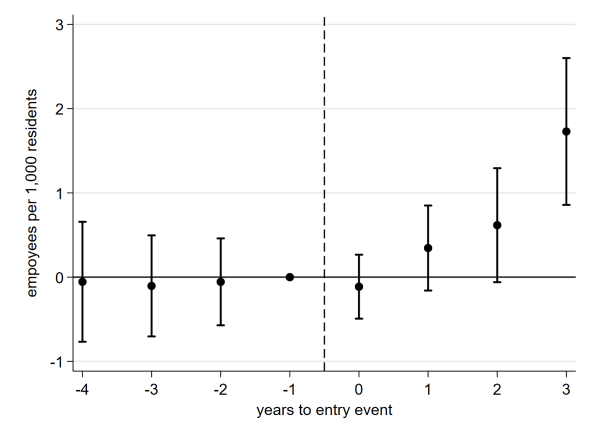
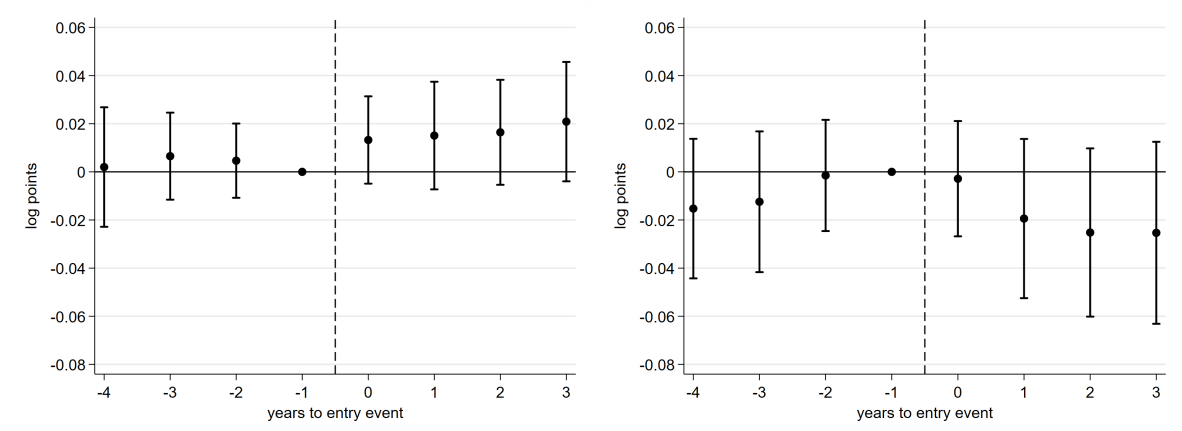


Figure A.1: Number of private sector workers per 1,000 residents: excluding the entering provider



(a) Workers with vocational degrees

(b) Workers with bachelor's degrees

Figure A.2: Private sector wages, excluding the entering provider: cross-section

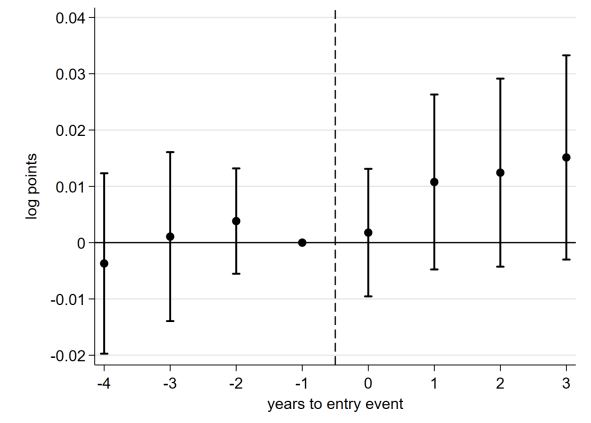


Figure A.3: Private sector wages, excluding the entering provider: all workers using worker fixed effects

A.4.2 Spillovers to Other Public services

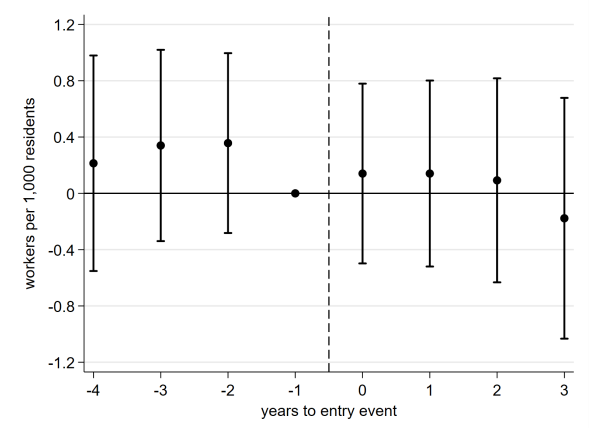
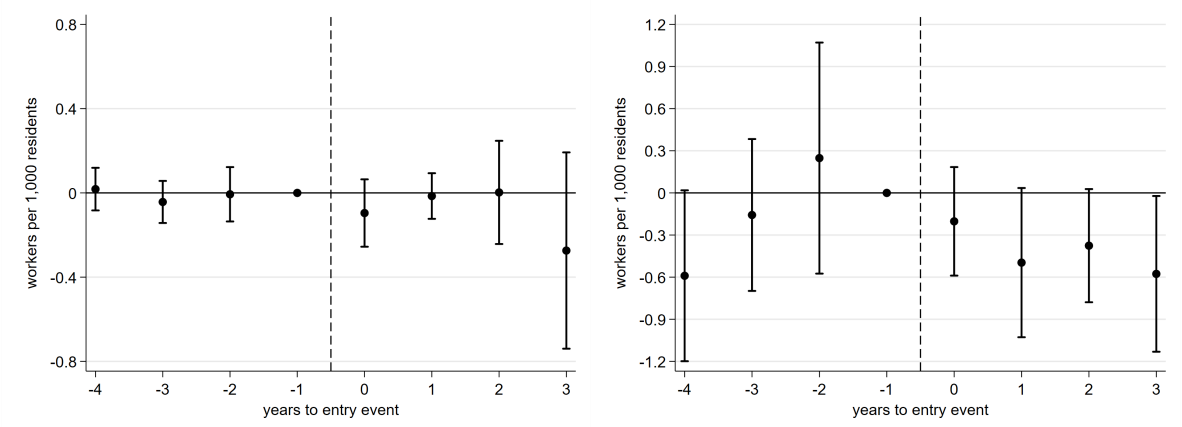


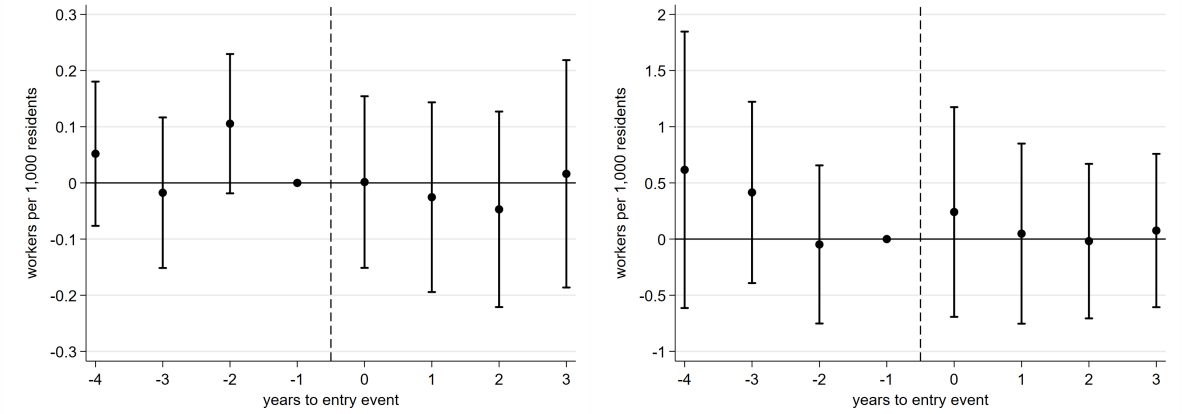
Figure A.4: Number of workers per 1,000 residents: public administration, schooling and daycare

A.4.3 Event Study Figures of Employment Flows

In these supplementary analyses, we complement the employment flow analysis presented in Table 7 of the main text by showing the corresponding event studies. The event study estimates indicate the yearly net flow of workers from a given source. In the captions, "services" refers to social and health services.

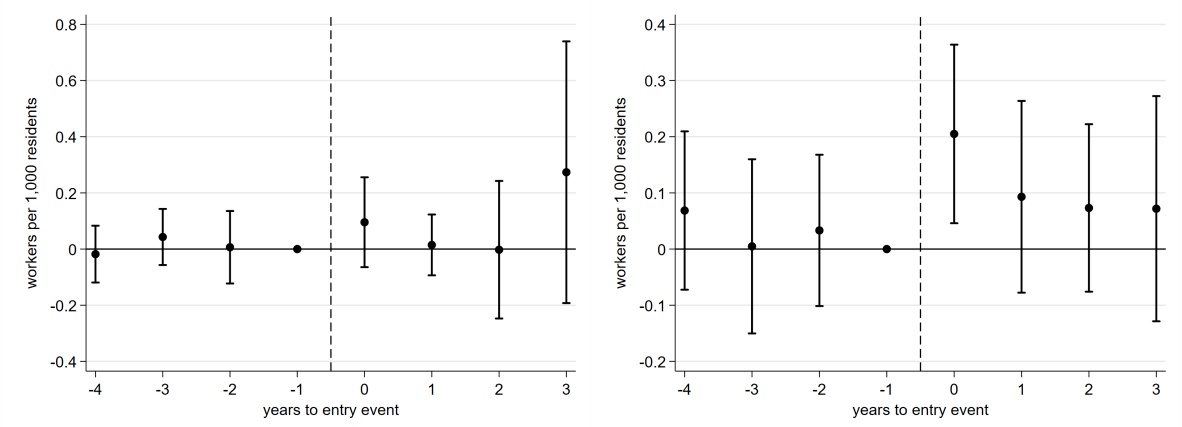


(a) Private services of the same municipality (b) Public services of other municipalities



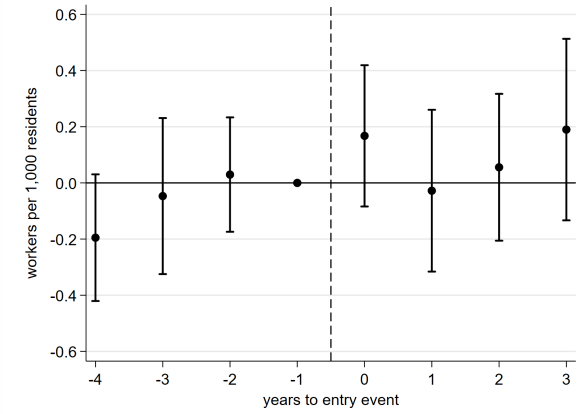
(c) Private services of other municipalities (d) Other industries and non-employment

Figure A.5: Yearly net worker flows in the public sector

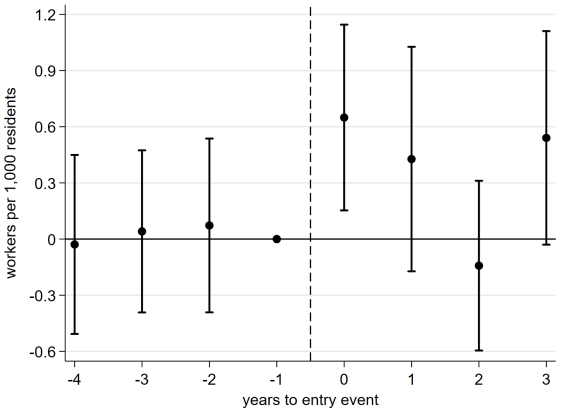


(a) Public services of the same municipality

(b) Public services of other municipalities

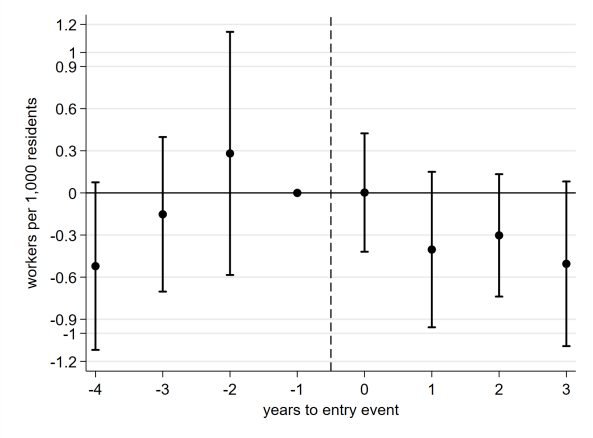


(c) Private services of other municipalities

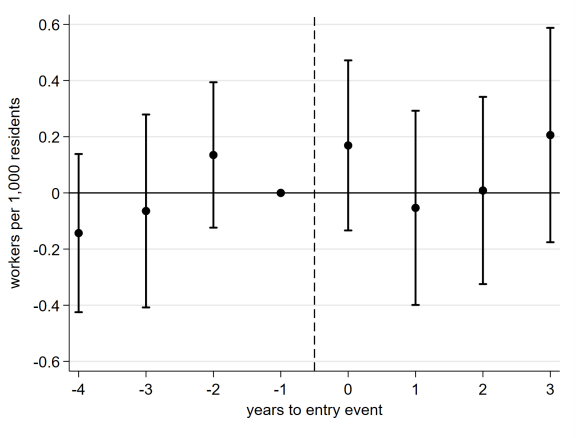


(d) Other industries and non-employment

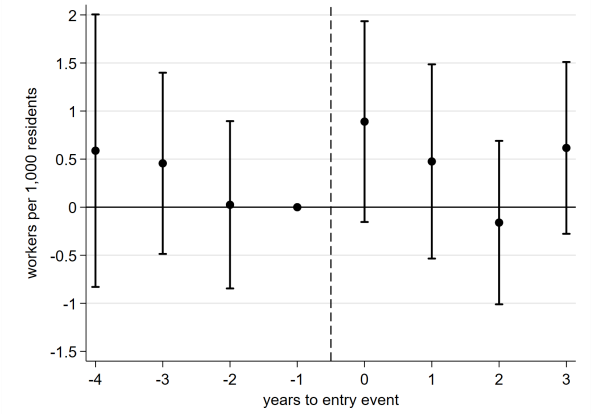
Figure A.6: Yearly net worker flows in the private sector



(a) Public services of other municipalities



(b) Private services of other municipalities

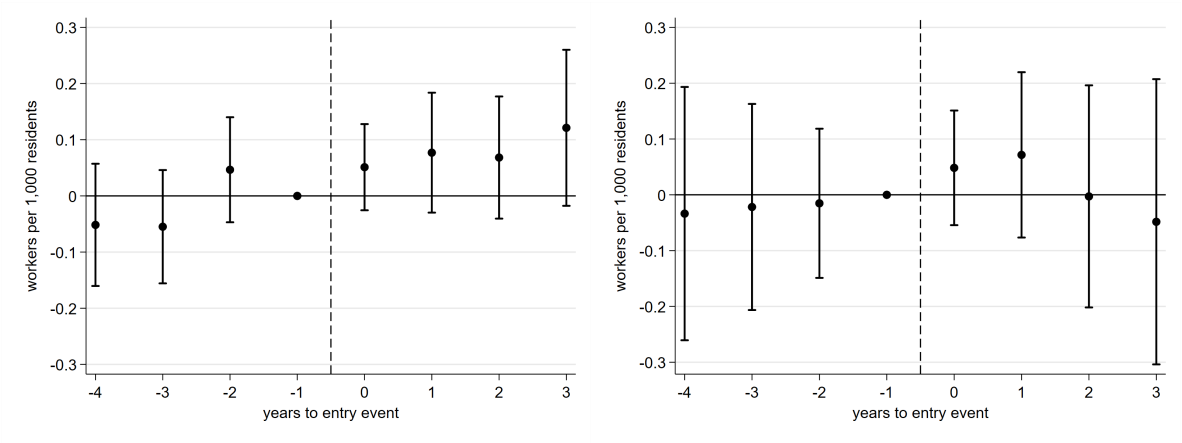


(c) Other industries and non-employment

Figure A.7: Yearly net worker flows in total

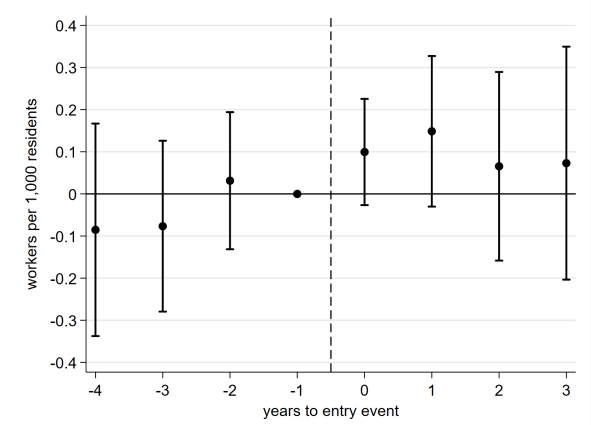
A.4.4 Employment Effects by Worker Type and Industry

In these supplementary analyses, we present event study results by workers' education, work experience, and type of services. In the main text, these results were presented in Table 8 and here we show the corresponding event studies. Figure A.8 presents results for workers with a master's or higher degrees. Figure A.9 presents results for workers with bachelor's degrees. Figure A.10 presents results for workers with vocational degrees. Figures A.11 and A.12 show the employment effects for workers with at least 10 and less than 10 years of work experience, respectively. Figures A.13 and A.14 presents the results separately for social and health services, respectively.



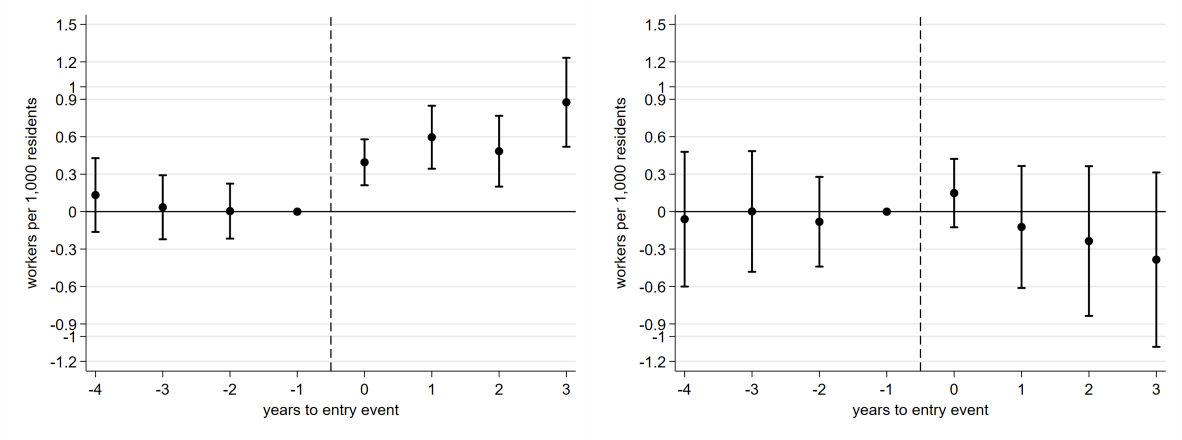
(a) Private

(b) Public



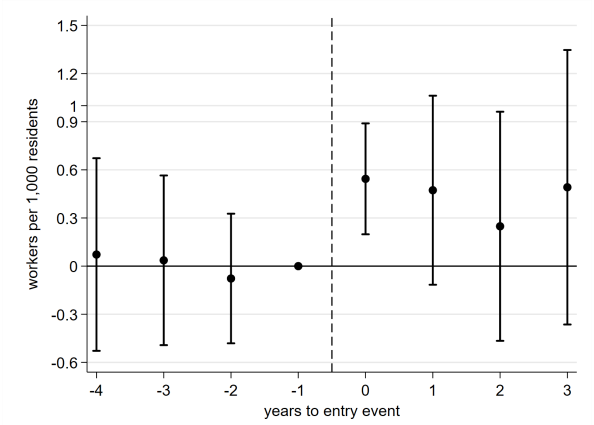
(c) Total

Figure A.8: Number of workers with master's degrees per 1,000 residents



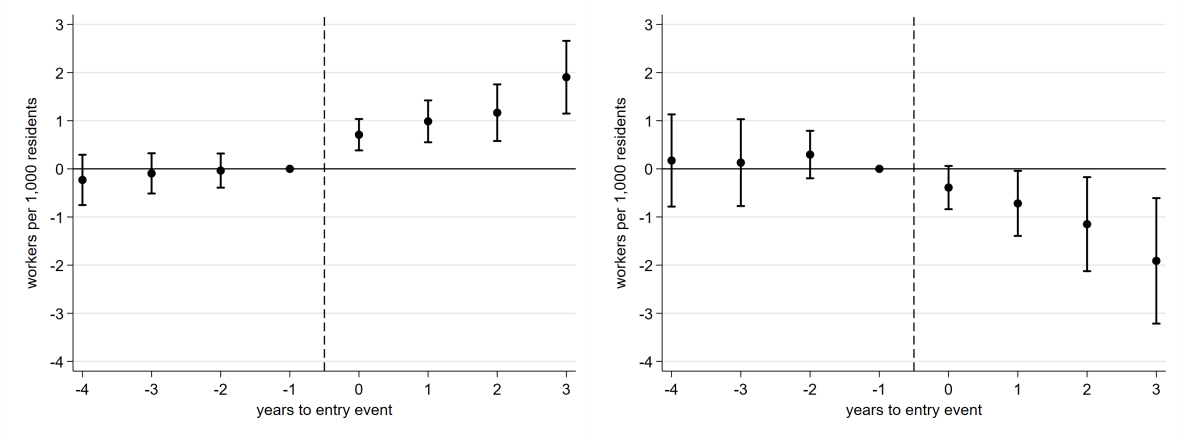
(a) Private

(b) Public



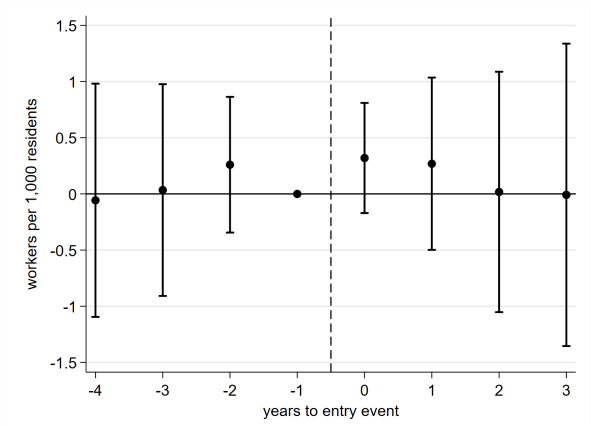
(c) Total

Figure A.9: Number of workers with bachelor's degrees per 1,000 residents



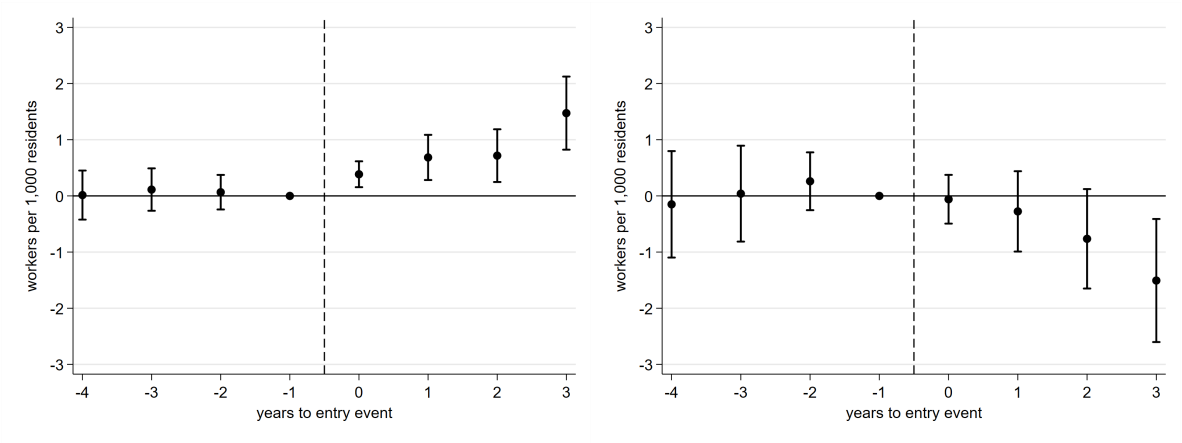
(a) Private

(b) Public



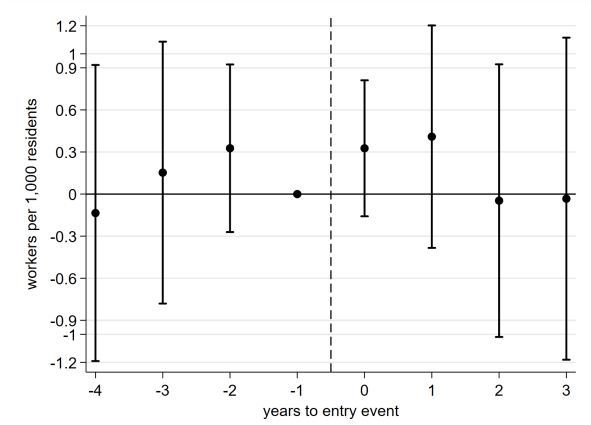
(c) Total

Figure A.10: Number of workers with vocational degrees per 1,000 residents



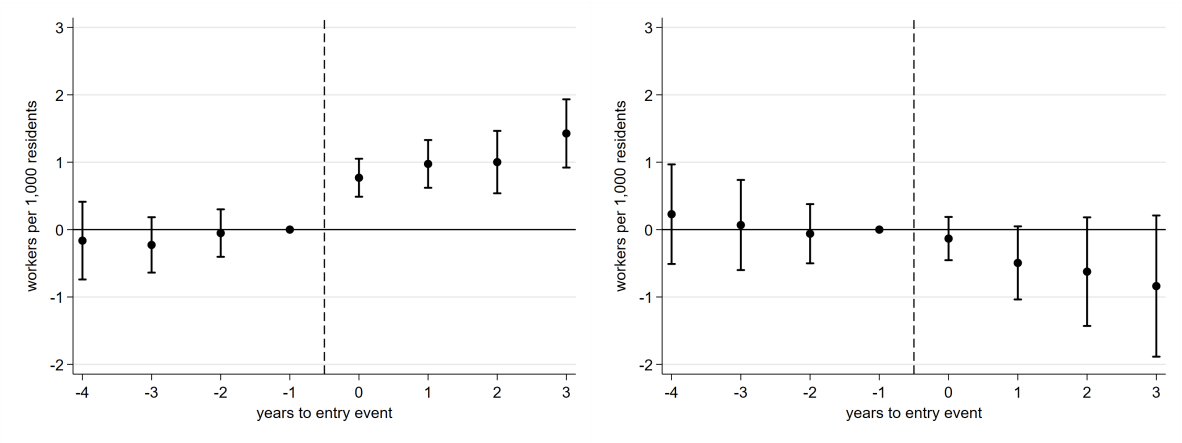
(a) Private

(b) Public



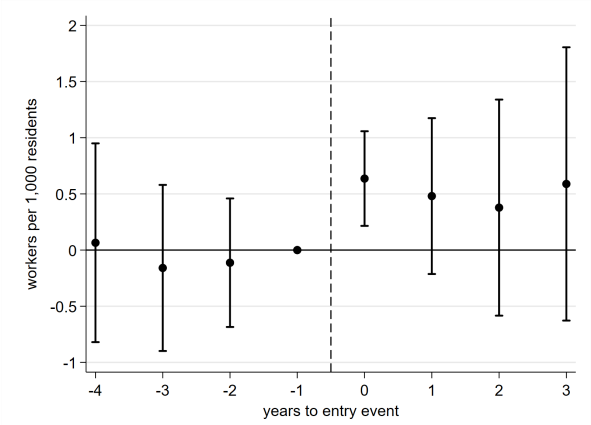
(c) Total

Figure A.11: Number of workers with at least 10 years of work experience, per 1,000 residents



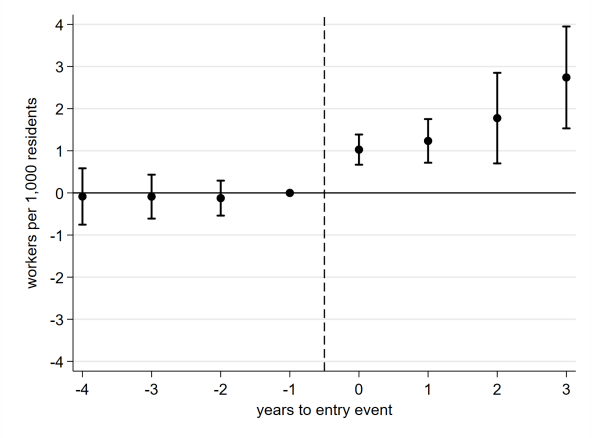
(a) Private

(b) Public

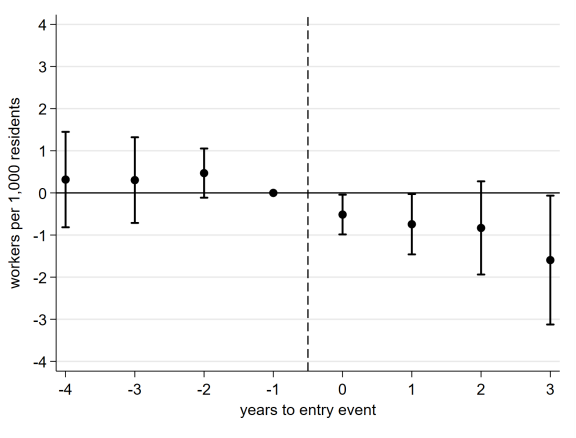


(c) Total

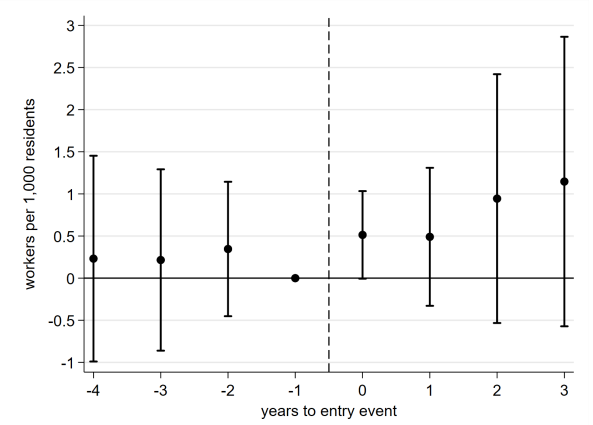
Figure A.12: Number of workers with less than 10 years of work experience, per 1,000 residents



(a) Private

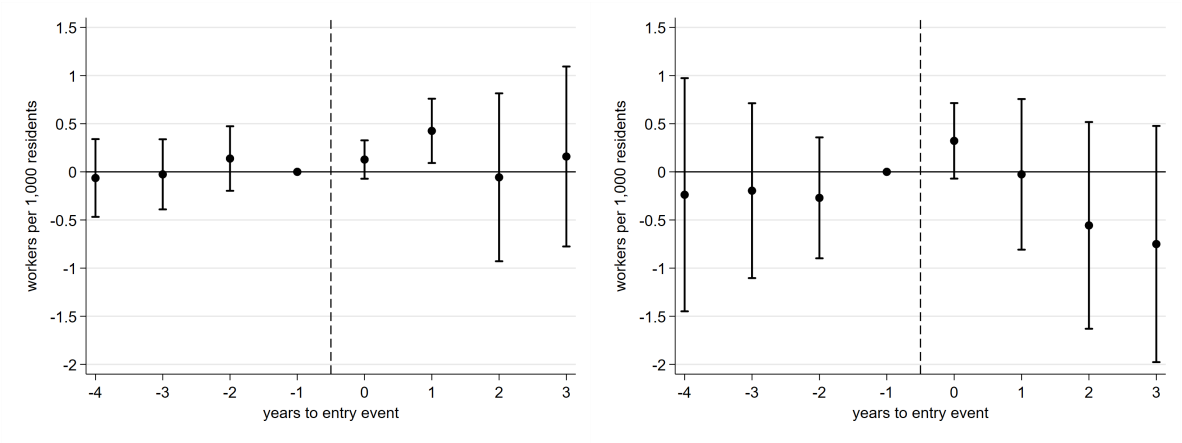


(b) Public



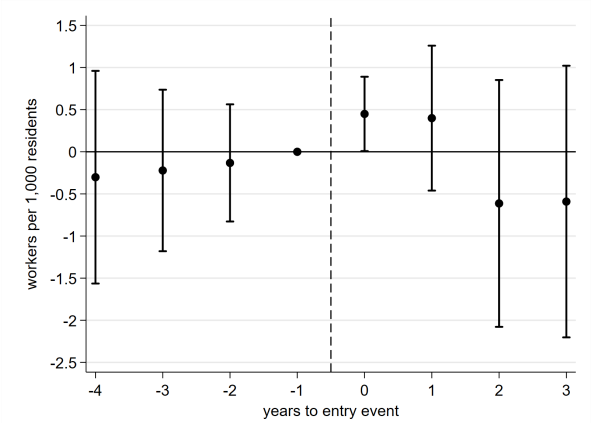
(c) Total

Figure A.13: Number of workers in social services, per 1,000 residents



(a) Private

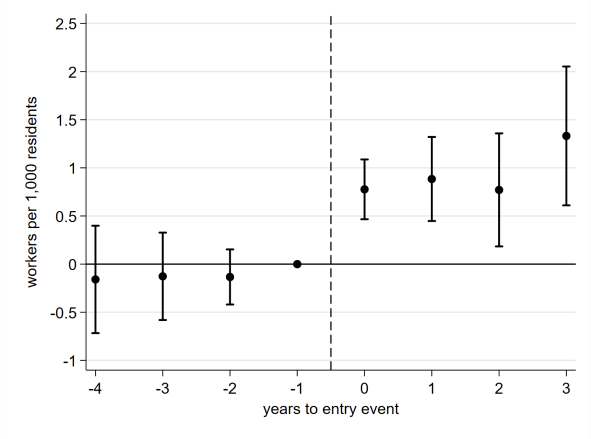
(b) Public



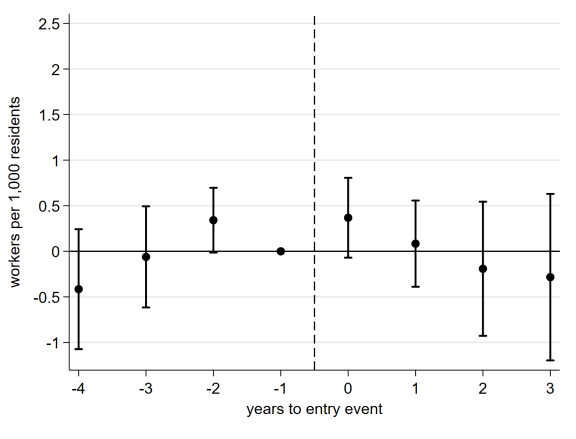
(c) Total

Figure A.14: Number of workers in health services, per 1,000 residents

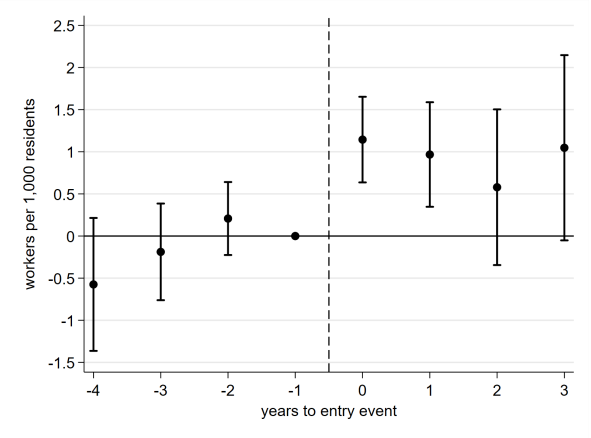
A.4.5 Event Study Results for Support Workers



(a) Private



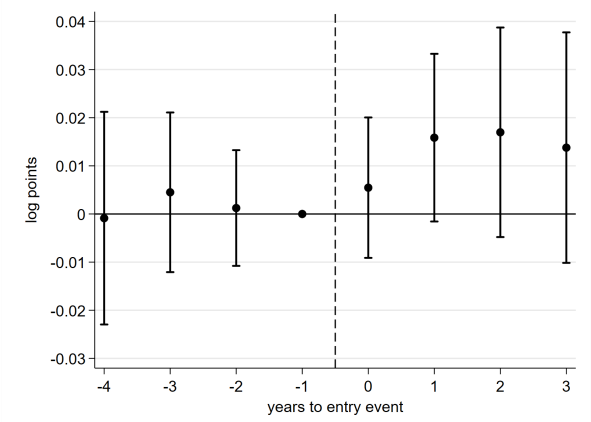
(b) Public



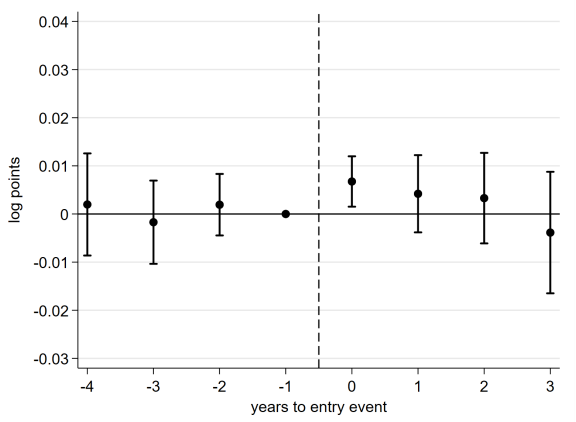
(c) Total

Figure A.15: Number of support workers (no qualifications) per 1,000 residents

A.4.6 Additional Wage Analyses

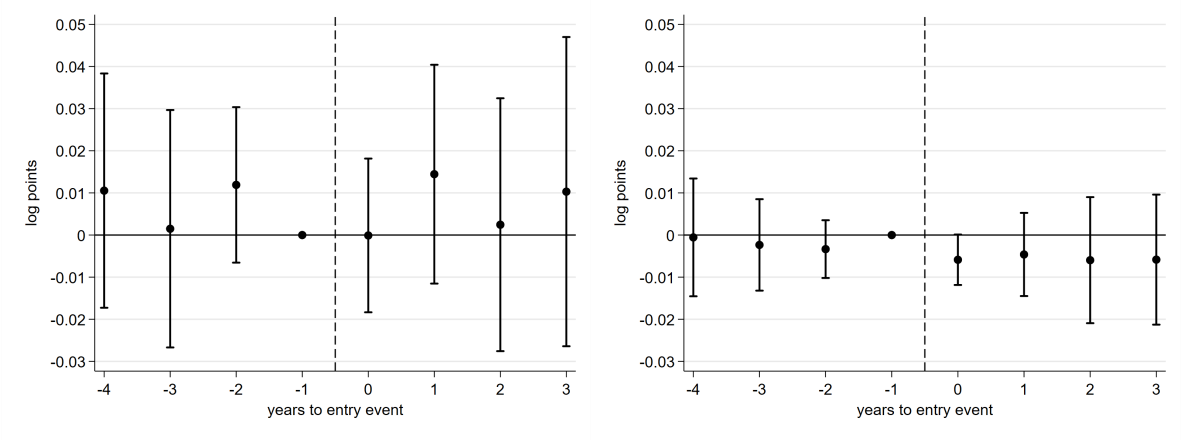


(a) Private



(b) Public

Figure A.16: Wages of workers with vocational degrees, worker fixed effects



(a) Private (b) Public

Figure A.17: Wages of workers with bachelor's degrees, worker fixed effects

A.4.7 Wage Rigidity

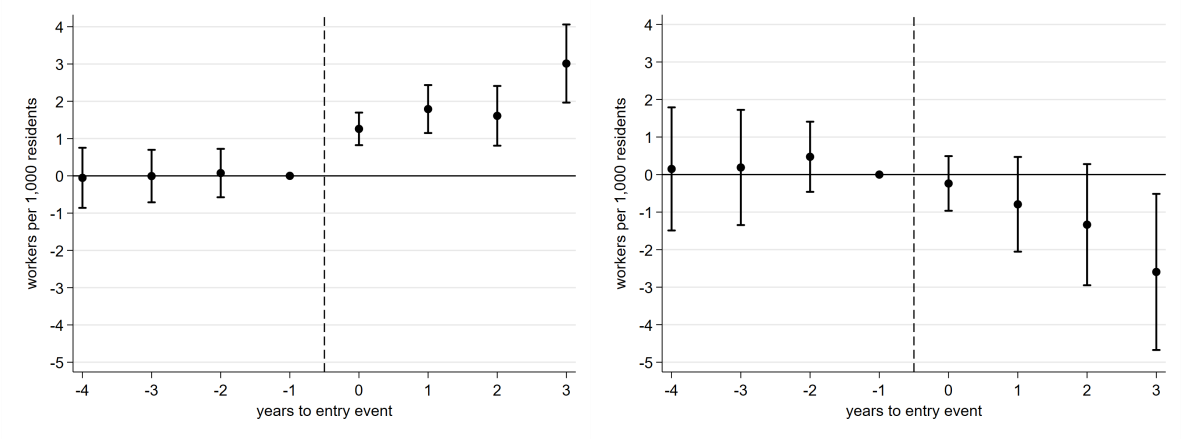
Table A.3 shows measures of sector specific wage variation in the studied entry municipalities prior entry events. The first row shows the variance of the residual from regressions in which we regress the log annual wage on several employment and worker characteristics, estimated separately for the private and public sector. Variance of the wage residuals, the so called "residual wage inequality", is a common measure for wage dispersion (see, e.g., Lemieux 2006). The second row shows the variance of individual-level year-on-year wage changes, using workers who remain with the same employer. This measures how much individual wages vary yearly. Both the residual wage variance and the variance of individual-level wage changes are higher in the private sector.

Table A.3: Measures of wage variation in the entry municipalities, before entry events

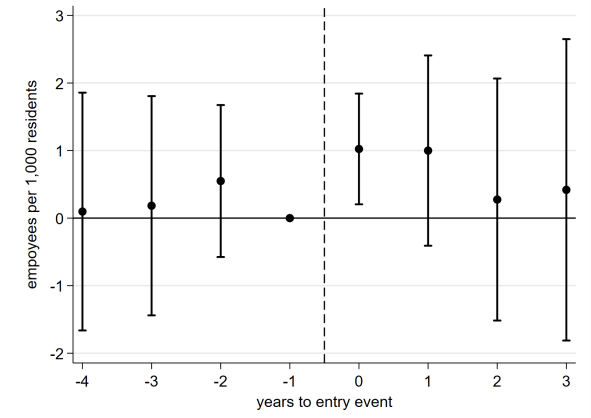
	Public	Private
Residual wage variance	0.062	0.096
Variance of year-on-year wage change	0.036	0.051

Wage variation measures are calculated using the entry municipalities of the sample and years before the entry events. Residual wage variance is the variance of the error terms from a wage regression where we regress the log annual wage on worker and employment characteristics (education, occupation code, precise industry classification, experience year, age, sex, year dummies, municipality fixed effects). Year-on-year wage change is calculated using workers who remain with the same employer.

A.4.8 Partial Outsourcing



(a) Private (b) Public



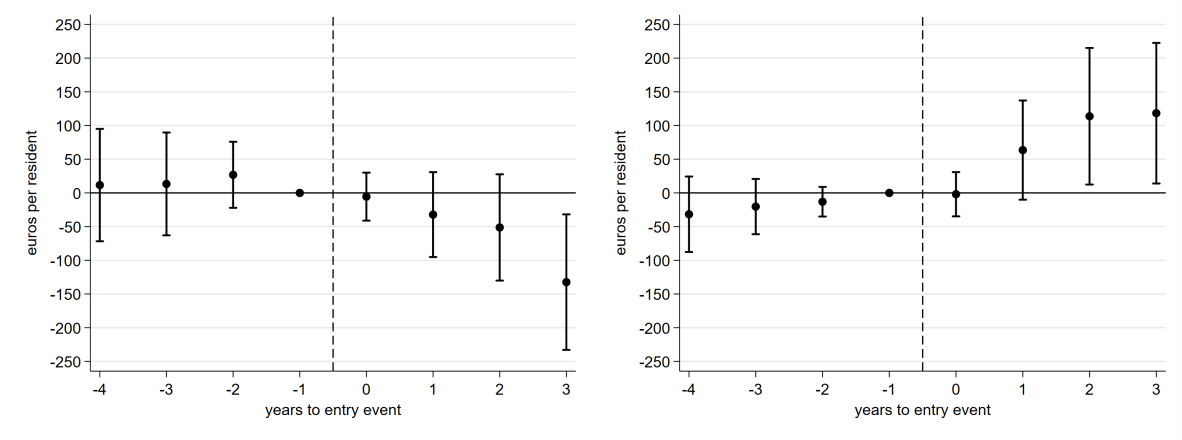
(c) Total

Figure A.18: Effect on the number of workers per 1,000 residents: dropping 10 entry municipalities with a procurement call just before the entry

Table A.4: Average treatment effects on the number of workers per 1,000 residents: dropping 10 entry municipalities with a procurement call just before the entry

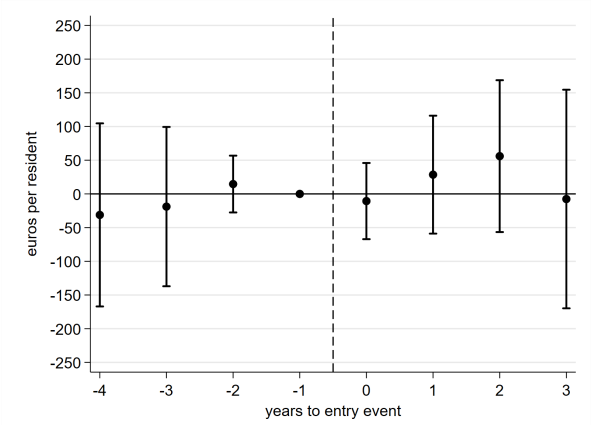
	Estimate	SD	Baseline mean
Private	1.92	0.30	8.82
Public	-1.24	0.66	22.29
Total	0.68	0.73	31.11

The dependent variable is the number of workers per 1,000 residents. The baseline mean is calculated for 2007–2010, a period before the entry events in the sample took place, using the subsample of entry municipalities with no procurement call just before the entry.



(a) Wage sum

(b) Purchases from the private sector



(c) Total social and health service expenditure

Figure A.19: Effects on municipal social and health service expenditure: dropping 10 entry municipalities with a procurement call just before the entry

Table A.5: Average treatment effects on municipal social and health service expenditure: dropping 10 entry municipalities with a procurement call just before the entry

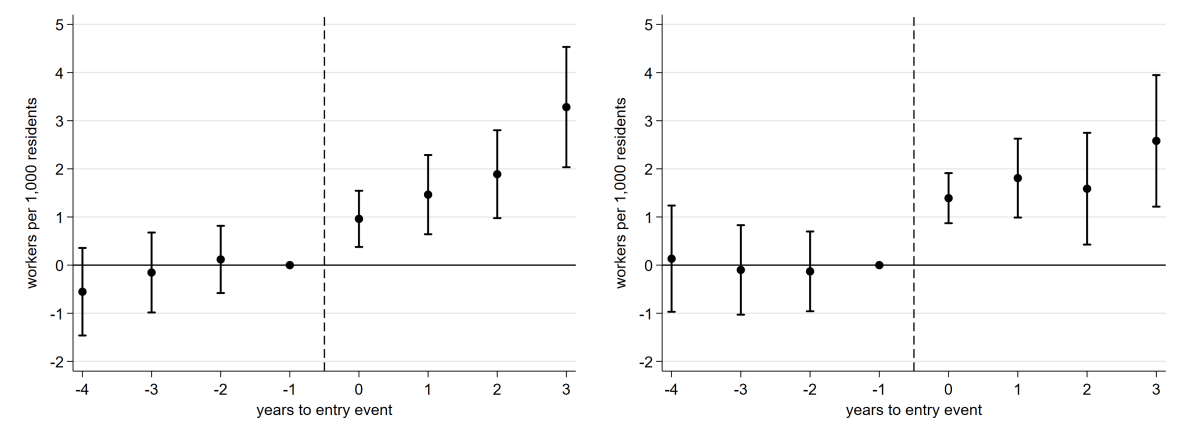
	Estimate	SD	Baseline mean
Sum of wages (€ per resident)	-55.3	31.7	1,527
Purchases from the private sector (€ per resident)	73.4	35.6	318
Total social and health service expenditure (€ per resident)	16.6	47.9	2,546

The dependent variables are measured in real euros (year-2023 value of money) per resident. The baseline mean is calculated for 2007–2010, a period before the entry events in the sample took place, using the subsample of entry municipalities with no procurement call just before the entry

A.4.9 Labor Availability

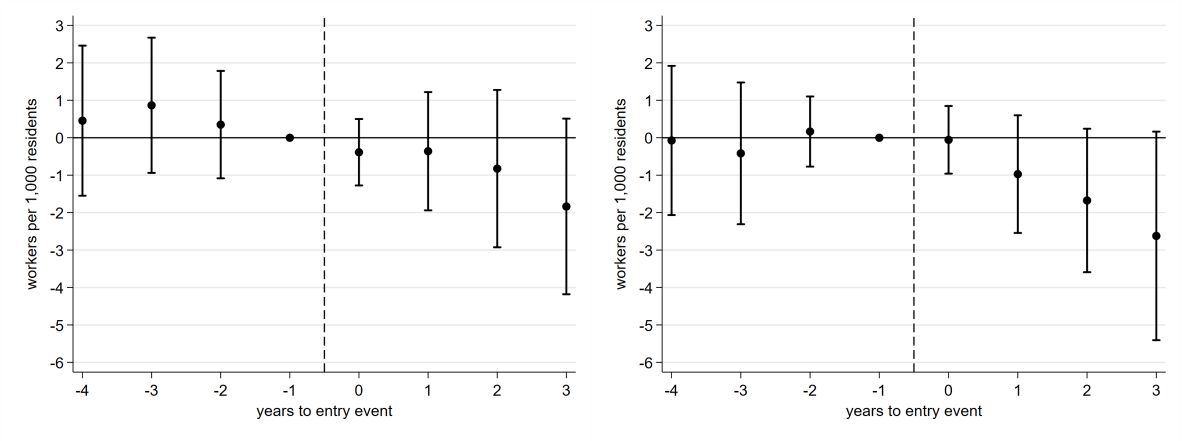
In these supplementary analyses, we show the results of the labor availability analysis that was discussed in main text Subsection 7.2. Municipalities are split into two groups based on the pre-entry total number of workers in social and health services per municipality's

resident: municipalities with employment at or below the national median and municipalities with employment above the national median. Heterogeneity analyses are presented for private sector employment (Figure A.21a), public sector employment (A.21b), private sector wages with worker fixed effects (Figure A.22), and public sector wages with worker fixed effects (Figure A.23).



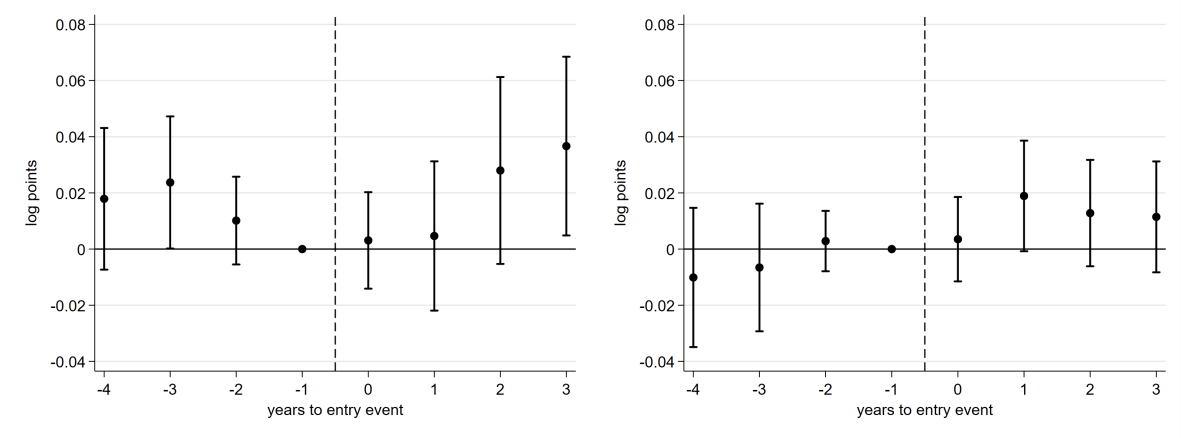
(a) At or below median (b) Above median

Figure A.20: Effect on the number of private sector workers per 1,000 residents: median-split by pre-entry labor availability



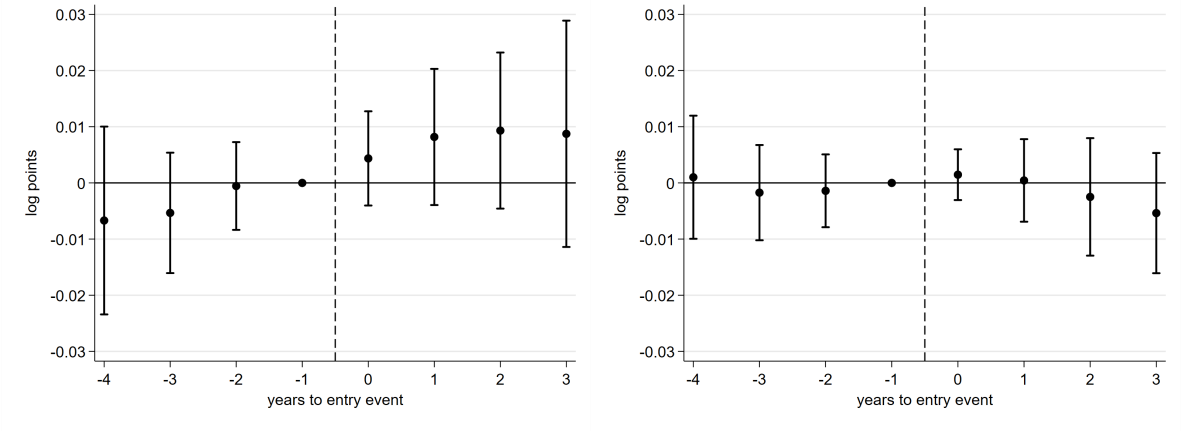
(a) At or below median (b) Above median

Figure A.21: Effect on the number of public sector workers per 1,000 residents: median-split by pre-entry labor availability



(a) At or below median (b) Above median

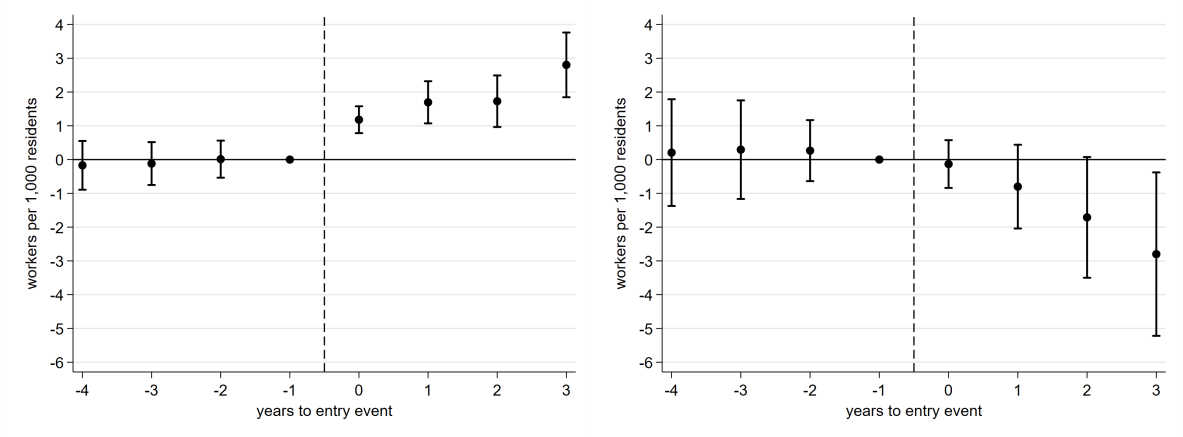
Figure A.22: Effect on private sector wages (all workers, fixed effects): median-split by pre-entry labor availability



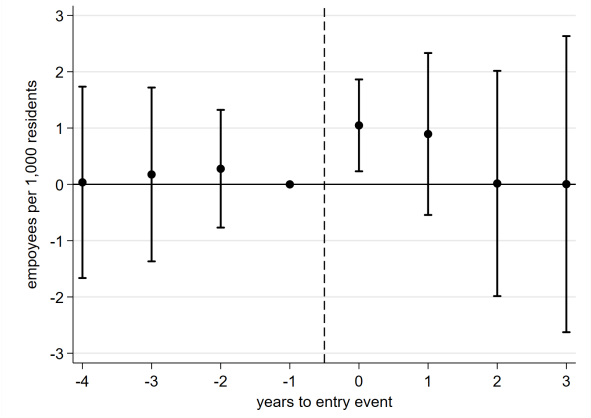
(a) At or below median (b) Above median

Figure A.23: Effect on public sector wages (all workers, fixed effects): median-split by pre-entry labor availability

A.4.10 Larger Buffer Zone For Spatial Spillovers



(a) Private (b) Public



(c) Total

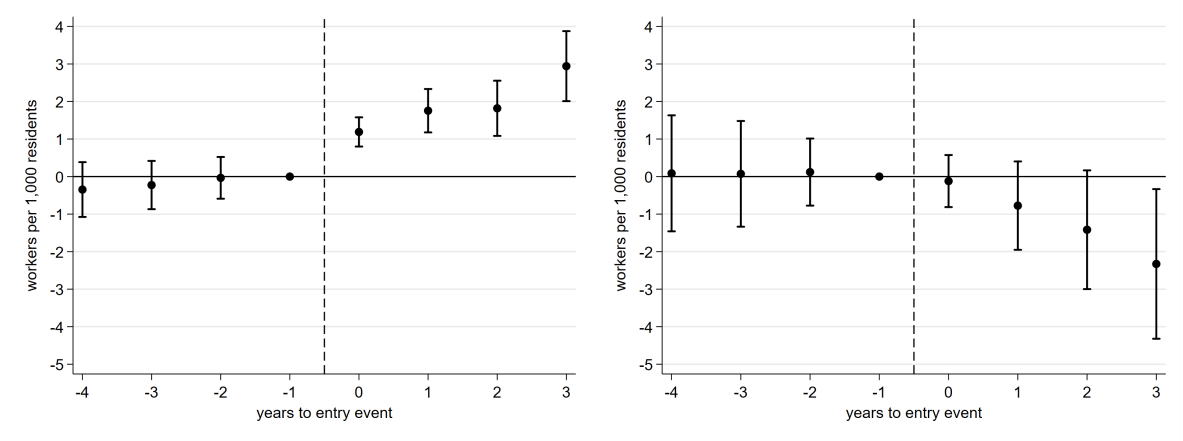
Figure A.24: Effect on the number of workers per 1,000 residents: larger buffer zone exclusion for the control group

Table A.6: Average treatment effects on workers per 1,000 residents: larger buffer zone exclusion for the control group

	Estimate	SD	Baseline mean
Private	1.85	0.29	8.59
Public	-1.36	0.73	22.50
Total	0.49	0.82	31.08

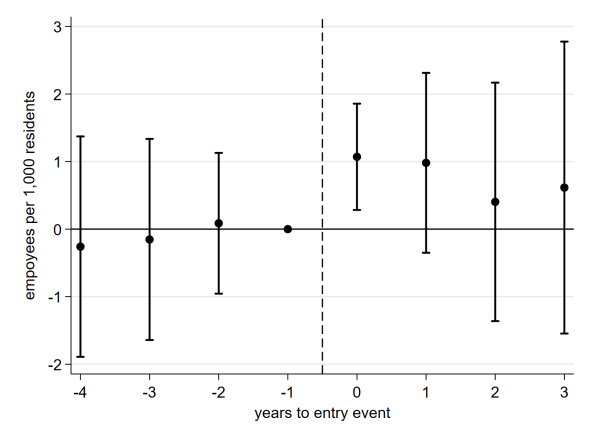
The dependent variable is the number of workers per 1,000 residents. The baseline mean is calculated for the entry municipalities during 2007–2010, a period before the entry events in the sample took place.

A.4.11 Balanced Panel of Municipalities



(a) Private

(b) Public



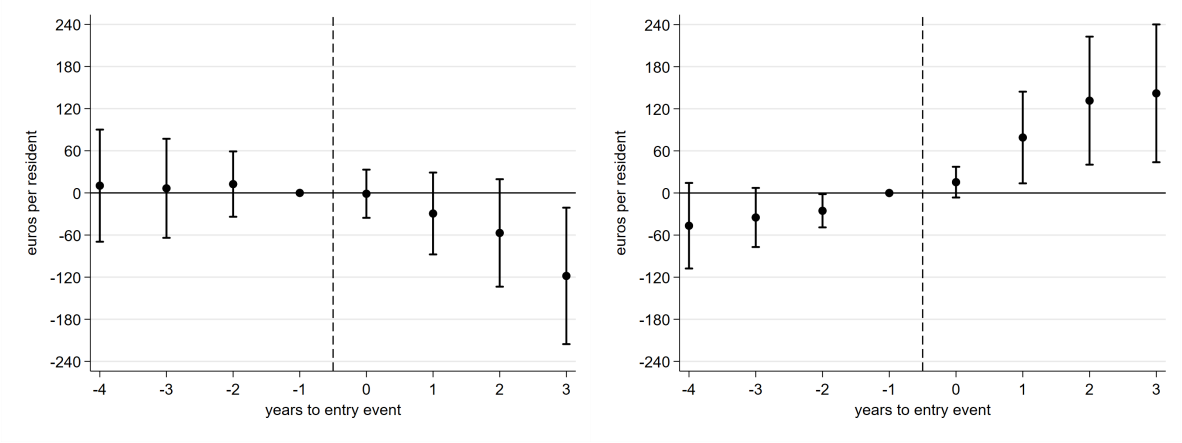
(c) Total

Figure A.25: Effect on the number of workers per 1,000 residents: balanced panel

Table A.7: Average treatment effects on workers per 1,000 residents: balanced panel

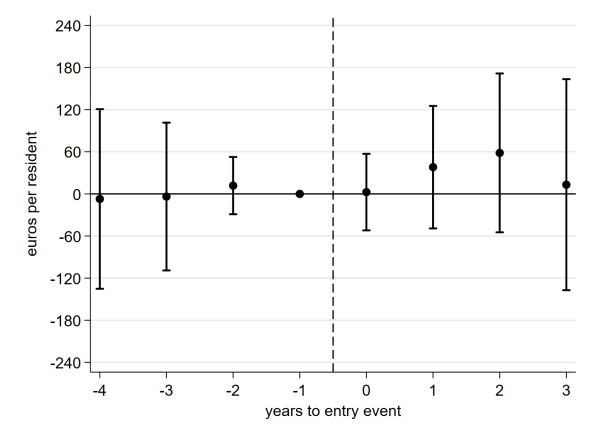
	Estimate	SD	Baseline mean
Private	1.93	0.28	8.59
Public	-1.16	0.64	22.50
Total	0.77	0.72	31.08

The dependent variable is the number of workers per 1,000 residents. The baseline mean is calculated for the entry municipalities during 2007–2010, a period before the entry events in the sample took place.



(a) Wage sum

(b) Purchases from the private sector



(c) Total social and health service expenditure

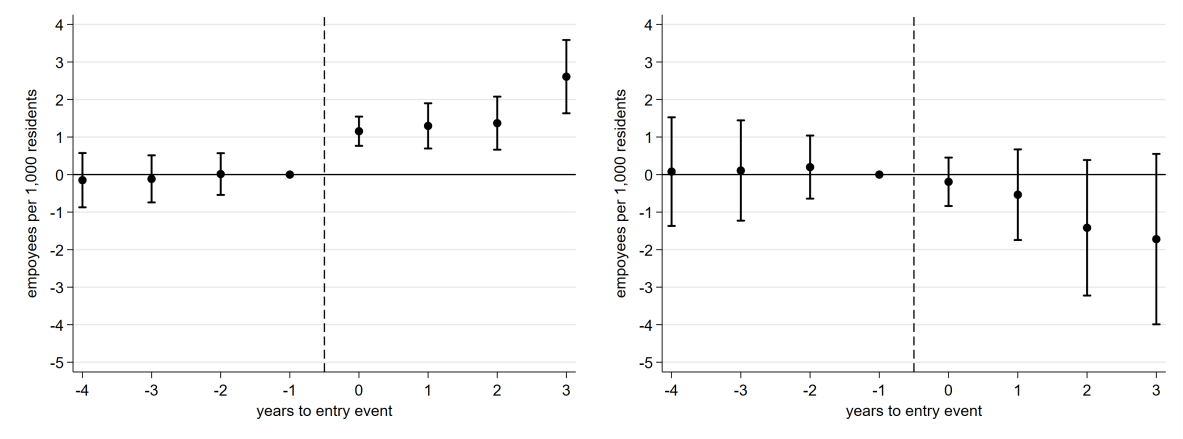
Figure A.26: Effects on municipal social and health service expenditure: balanced panel

Table A.8: Average treatment effects on municipal social and health service expenditure: balanced panel

	Estimate	SD	Baseline mean
Total social and health service expenditure (€ per resident)	28.1	47.3	2,577
Purchases from the private sector (€ per resident)	92.0	32.4	344
Sum of wages (€ per resident)	-51.5	30.8	1,547

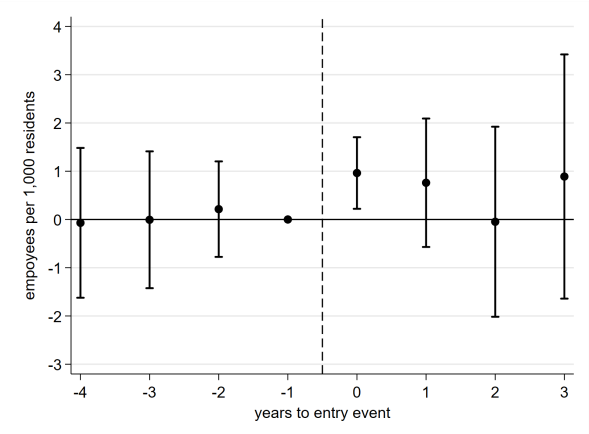
The dependent variables are measured in real euros (year-2023 value of money) per resident. The baseline mean is calculated for the entry municipalities during 2007–2010, a period before the entry events in the sample took place.

A.4.12 Sequential Entry Events



(a) Private

(b) Public



(c) Total

Figure A.27: Effect on the number of workers per 1,000 residents: eliminating sequential entry events

Table A.9: Average treatment effects on workers per 1,000 residents: eliminating sequential entry events

	Estimate	SD	Baseline mean
Private	1.48	0.25	8.59
Public	-0.80	0.62	22.50
Total	0.68	0.68	31.08

The dependent variable is the number of workers per 1,000 residents. The baseline mean is calculated for the entry municipalities during 2007–2010, a period before the entry events in the sample took place.