Paper IV

Has privatization improve the wage bargain of welfare workers?

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Abstract

Introducing private firms to a labor market previously dominated by a single public employer should improve the wage bargain of workers; by breaking up a public monopsonist, demand-side competition for scarce labor inputs should lift wages closer to competitive rates. Here, I study how the wages and incomes of blue collar care workers and white collar nurses in Sweden are impacted when more employers are introduced as a result of welfare privatization, employing a wage-concentration model and a difference-in-difference event study model of privatization events, using detailed employer-employee matched administrative data. Employer concentration has a relatively strong negative effect on the wages and incomes of nurses, but a much smaller effect on care workers. Privatization events have no significant impact to nurses incomes, while care workers' incomes decrease by 11 to 12 percent. The results suggest heterogeneous effects from privatization based on worker skills; ”lower skill” blue collar care workers have been adversely affected by privatization, whereas higher skill white collar nurses have not. The differences are likely rooted in sectoral collective bargaining agreement provisions.

JEL-codes: J42, J30, J50, I11 **Key words:** Monopsony, Wages, Collective Bargaining, Healthcare Labor Markets

1 Introduction

In the Swedish context, privatization is largely synonymous with private entities providing welfare services that are tax-financed by a public principal at the municipal or regional level[1], defining welfare services as services provided by the welfare state. Public principals impose few (or no) profit restrictions on private welfare service providers, so long as their operations comply with relevant rules and regulations. Apart from supply and demand, local political bodies have some decision making power over the availability of private welfare providers in their constituency.

Over the past three decades, the share of private entities providing welfare services have increased significantly in Sweden. In figure 1 we can follow the share of municipal and regional expenditure paid to private firms. Since 1990, the share of all expenditure paid by regional and municipal entities (1) have risen from less than 3 percent, to close to 25 percent and 15 percent respectively in the past three decades. The share of healthcare expenditure (2) has continued to rise in municipalities since 2010, but remains stable in regions. Looking at the two largest welfare occupations – nurses[2] (3) and care workers workers[3] (4) – the share of workers employed by private welfare providers have more than doubled between 2001 and 2021. From 69,228 persons in 2001 to 182,309 in 2021 private employment, implying an increase from 12.6 percent in 2001 to 26.7 percent in 2021.

Privatization of welfare services provides an interesting backdrop to study labor market competition (employer monopsony power[4]) and the impact on wages. Welfare services, and in particular healthcare, have long been used to model classical monopsony in labor markets, as they constitute markets that are "naturally" dominated by a single employer such as large regional hospitals (e.g. Link and Landon 1975, Sullivan 1989, Hirsch and Schumacher 1995).

Thus, classical monopsony predicts that if privatization adds more employers to a labor market that was previously dominated by a single public monopsonist, we should expect privatization to have a positive impact on the wage bargain. If privatization implies more outside options to workers, the increase of outside employer options should improve demand-side competition for scarce labor.

Then, has privatization improved the wage bargain of welfare workers?

Here, I explore how privatization has impacted the wages and incomes of large groups of welfare workers between 2002 and 2020. I focus on the two largest occupational groups presented in figure 1 (3 and 4); care workers and nurses. The occupational groups are heterogeneous in terms of skills, qualifications, licensing

[1] Municipalities and regions are the two forms of self-governing political entities that provide residents with tax financed welfare services.

[2] SSYK96 level 3-codes 223+323

[3] SSYK96 level 3-code 513

[4] Monopsony defines a single buyer, whereas the more familiar term monopoly defines a single seller.

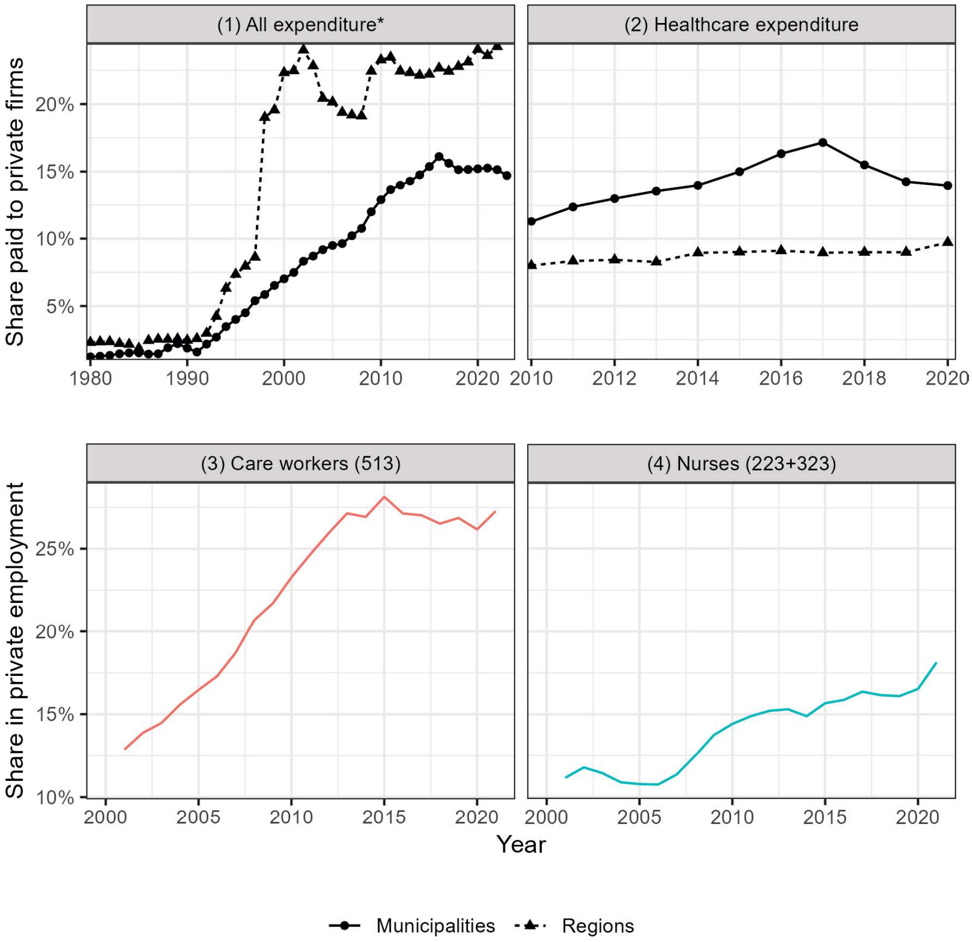

Figure 1: (1) shows municipal and regional share of all yearly expenditure paid to private firms. (2) shows the share of municipal and regional share of healthcare expenditure paid to private firms. (3) and (4) shows private sector share of employment in the two occupational groups "nurses" (SSYK3-96 codes 223 + 323) and personal care and related workers (SSYK3-96 code 513). The share is calculated as the yearly sum of all workers in the two defined occupations in private sector employment (where private sector is defined as "joint-stock corporations not controlled by the government sector", "other corporations not controlled by the government sector", or "other organisations") divided by the sum of all workers in the defined occupations, excluding workers with missing sectoral data. Occupations (in brackets) are 3-level SSYK96 definitions. For 2014-2021 I use Yakymovych's (2022) crosswalk to convert SSYK2012-codes to SSYK96-equivalents. Sources: (1) Statistics Sweden: National Accounts and Public Finances; (2) Statistics Sweden: Public Finances; (3) and (4) Statistics Sweden: Occupational Registry. * Indicates total expenditure excluding drug subscription subsidies, except years 2005 and 2009 when such expenses are included.

requirements, and union affiliation, but are similar in terms of collective agreement regulations on wage setting.

To assess the impact to wages and incomes I employ two methods. First, a using wage-concentration-model from Söderqvist and Eklund (2024), following Schubert et al.'s (2024) approach, to assess how wages and incomes are impacted from employer concentration on hires, under the explicit assumption that privatization has reduced employer concentration. And second using an event-study approach to assess impacts to wages and incomes when workers are subject to privatization processes, following the on-site domestic outsourcing approach developed by Goldschmidt and Schmieder (2017).

Empirical evidence is mounting that labor markets are far from competitive, leaving employers with considerable wage setting power in many (if not most) labor markets (e.g. Manning 2021, Card 2022). Previous studies find that employer concentration has a negative impact on the wage bargain in a diverse range of settings (e.g. Azar et al. 2019, Bassanini et al. 2023, Schubert et al. 2024). In Söderqvist and Eklund 2024 we find that concentration has a negative impact on wages overall, but a *positive* effect on the wage bargain of blue collar workers. This counter-intuitive result predicts that fewer employers can imply higher wages and earnings, which by extension also implies that by adding more employers, could have adverse effects to the wage bargain.

Domestic outsourcing (Weil 2014) provides one explanation to this phenomena. Firms have increasingly focused on core competencies in the past decades, resulting in the domestic outsourcing of tasks[5]. Workers in lower skill jobs subject to domestic outsourcing have experienced relatively large negative effects to wages and incomes (e.g. Dube and Kaplan 2010, Goldschmidt and Schmieder 2017, Bilal and Lhuillier 2021).

Although welfare privatization may not be rationalized by ”core competency” motivations in the political discourse, I argue that the process of privatization – where groups of workers move from a large employer to a subset of smaller employers – is conceptually related to the extant domestic outsourcing literature, as it implies large groups of workers making a passive (or involuntary) move from a larger to a smaller employer. If profit-maximizing private welfare service providers have wage setting power, they may seek to extract rents from the wage bill by exercising monopsony power. Lest such employers are constrained by outside factors such as collective bargaining, positive effects to wages stemming from adding more outside options may be counteracted.

To my knowledge, there are only two recent Swedish studies looking at concentration effects from welfare privatization for similar groups, both considering white collar occupations. Zhao and Matti (2018) find a modest increases to midwife earnings when an additional private maternity ward was opened in central Stockholm, and a modest decrease to earnings when the same ward was closed. Thoresson (2024) similarly finds positive earnings effects to pharmacists when the Swedish pharmacy monopoly (and hence labor market monopsony) was dissolved in 2009, resulting in lower employer concentration and improved outside options for specialist groups.

[5]A separate, vast literature of international outsourcing also exists, but is outside the scope of this study.

This study adds a ”lower skill” blue collar perspective to this literature, and is largely motivated by the Söderqvist and Eklund (2024)-results, where I want to explore the causes behind the positive wage-concentration effect on blue collar occupation groups.

Looking to the main results, the descriptive data shows that wages are higher in private sector employment for both groups. Working hours and incomes are slightly lower in the private sector for nurses, which is consistent with less average working time. For care workers, however, both higher wages and working hours still result in much lower incomes in the private sector. This reveals a salient inconsistency with relatively large implications. Not least in research using popular variables from the Wage Structure Statistics.

Second, using the wage-concentration approach, I find that concentration is negative for wages and incomes for nurses, implying positive effects from lower concentration, and in extension privatization. For care workers, employer concentration has a much smaller negative or insignificant impact on wages and incomes. This may reflect that employer concentration among nurses is very high; concentration on hires have decreased since 2006, but the Herfindahl-Hirschman index in 2020 is still high[6] at just above 0.4. Employer concentration among care workers is low, suggesting diminishing marginal returns on wages from reducing employer concentration.

Third, the event-study approach – focusing on the subset of workers which are more or less ”transferred” from public to private employers – yields interesting results; I find no significant impact on incomes for nurses, but a large negative impact to care worker incomes at approximately 11 to 12 percent after 3 and 6 years after the privatization event.

The most plausible explanation behind the negative income effects for privatized care workers relates to material differences in public and private sector collective agreements found outside more directly observable wage parameters.

A salient limitation in the study relates to the relatively coarse occupational definitions. This is motivated by poor availability of finer-grained occupation statistics before 2005. A possible implication is found in unobserved heterogeneity between the treatment and control groups in the event study, which might explain the slight pre-trend observable in the event study. Another limitation relates to the studied time period; figure 1 shows that the greatest increase in privatization events occurred between 1993 and 2000, yet my data only goes back to 2002.

My contribution shows that worker heterogeneity is an important dimensions to consider in both the concentration and domestic outsourcing literature, suggesting that groups with relatively strong individual bargaining power may stand to benefit from reduced concentration (privatization), while those with less bargaining power

[6]The US Department of Justice, in its capactiy as a competition authority, defines an HHI of 0.25 as a highly concentrated market.

may stand to lose. Privatization is no panacea to improve the wage bargain, as the evidence points to asymmetric effects between groups.

The rest of the paper is structured as follows; first I begin by motivating my case selections and provide an institutional background to Swedish welfare labor markets and the political economy of privatization; second, I present previous research, and how I will operationalize models from previous research in my analysis; third, I present data; fourth, I present my results; and fifth, conclude with a discussion of the findings.

2 Case selection and institutional background

The aim of this paper is to use privatization as a natural experiment to asses how wages and incomes are impacted by privatization for two heterogeneous groups of workers: nurses, a white collar occupation; and care workers, a blue collar occupation. Below, I describe the labor market institutions which affect the wages and working conditions for these two heterogeneous groups, followed by a brief description to Swedish welfare privatization.

2.1 Worker groups and the industrial relations systems

Nurses are classified as a white collar profession (*tjänstemän*) and care workers as a blue collar occupation (*arbetare*) in the Swedish industrial relations system, where "collar color" is defined by union affiliation and the union's affiliation to a central union congress.

Nurses are represented by The Swedish Association of Health Professionals (*Vårdförbundet*), a union which is affiliated to white collar umbrella organization The Swedish Confederation of Professional Employees (TCO). Personal care workers and related workers[7] (henceforth care workers) are represented by the Swedish Municipal Workers' Union (*Kommunal* or formally *Svenska Kommunalarbetareförbundet*), which is affiliated to the blue collar Swedish Trade Union Confederation (LO).

Union affiliation is highly relevant when determining wage bargaining outcomes in the Swedish labor market. Sweden has a voluntarist industrial relations system which implies that wages and working conditions are largely an affair between workers and their unions, and employers and their employer associations (e.g. Andersen et al. 2014, Kjellberg 2017). There are no legislated minimum wages, for example. Approximately 90 percent of employed workers – 100 percent in the public sector – are covered by collective agreements. Wages, and the terms and conditions of employment are extensively regulated in national or local collective agreements, with legislation playing a secondary role in the regulation of labor markets and labor contracts (e.g. Kjellberg 2019).

Apart from representing the largest groups of welfare occupations, the selection criteria also rests on relevant differences and similarities between the groups. The groups are heterogeneous in terms of qualifications, skills, and licensing requirements. Nurses require a relevant college degree, whereas care workers often require secondary schooling requirements (but not always). In terms of similarities, both groups are represented by separate unions, but use the same type of wage setting procedures according to the Swedish National Mediation Office's wage setting taxonomy (Medlingsinstitutet 2023), which delegates a relatively high level of individual agency to individual workers in yearly wage negotiations[8]. As both groups use

[7]Which includes among others, assistant nurses, elderly caretakers and other caretaker occupations.

[8]Type 4: "wage pot individual and differentiated" is used in both private and public sector collective

similar wage setting procedures, I can largely discount differences in outcomes stemming from collective agreement wage setting practices (Bhuller et al. 2022), although I cannot control for possible divergence in local negotiations.

2.2 On privatized welfare services

Swedish municipalities and regions are the two forms of self-governing political entities that are mandated to provide residents with tax financed welfare services. In 2024 there are a total of 290 municipalities and 21 regions in Sweden.

Municipalities provide a broad spectrum of welfare services, such as schooling (preschool up to secondary school and adult education), social services, and elderly care, while regions provide most healthcare services such as district healthcare centers and hospitals[9]. The studied occupational groups are found in both entities, but care workers are mostly employed in municipal welfare services[10], whereas nurses are mostly employed in regional welfare services[11].

Since the 1990's municipal and regional public principals have increasingly procured welfare services from private actors (e.g. Elinder and Jordahl 2013). Municipal or regional political majorities choosing to include private options in welfare services can do so through two channels; direct public procurement following the Swedish Procurement Act (LOU 2016:1145), or by applying a resource allotment framework, called The Act on System of Choice, which allow private welfare services firms to freely enter and market their services directly, provided that elected officials have chosen to activate this framework in their constituency. The Act on System of Choice was passed in 2010, and give residents the possibility to choose between private or public welfare service providers within specified areas of welfare services. For private welfare providers, the act lowered the barriers to entry significantly. The number of municipalities that have activated the choice systems framework have increased from 45 in 2010 to 159 municipalities in 2023[12]. (e.g. Wingborg 2017)

In figure 1 square (2), we note that the share of healthcare expenditures paid to private actors by municipal and regional principals grew significantly between 2010 and 2020; from 24 to 42 billion (nominal) SEK, which corresponds to 11.3 percent and 14.0 percent of all municipal healthcare expenditure, respectively. Between the same years, healthcare expenditure paid to private providers grew from 21 billion to

agreements for both groups of workers.

[9]Regions also provide and procure public transportation. Regardless if one define such services as being a part of the welfare state, such services are not considered in this study.

[10]63.2 percent of care workers were employed by municipal public employers and 9.7 percent by public regional employers in 2020.

[11]63.4 percent of nurses were employed by regional public employers and 19 percent by public municipal employers in 2020.

[12]From SKR's website *Utveckling av LOV i Sverige* (accessed 2023-09-03).

36 billion (nominal) SEK, which corresponds to 8.0 and 9.7 percent of regional costs, respectively. In 2013 there were 9,764 unique private healthcare firms providing services for municipalities and regions, whereas the number was 11,239 in 2021. We also note infigure 1 square (1) that the share of municipal expenditure paid to private welfare providers has leveled out since 2016.

Thus, over the past three decades a private healthcare industry has firmly established itself in Sweden, and has grown in terms of market size and by taking market shares from publicly provided services.

Opinions over the merits and demerits of privatization are contested and typically follow Sweden's left-and-right political divide. As a result we can observe differences in the share of privatized workers depending on regional or municipal political majorities. Figure 2 shows the share of nurses in private employment in regions (1), and share of care workers employed in private employment in municipalities (2) by the color of the political majority.

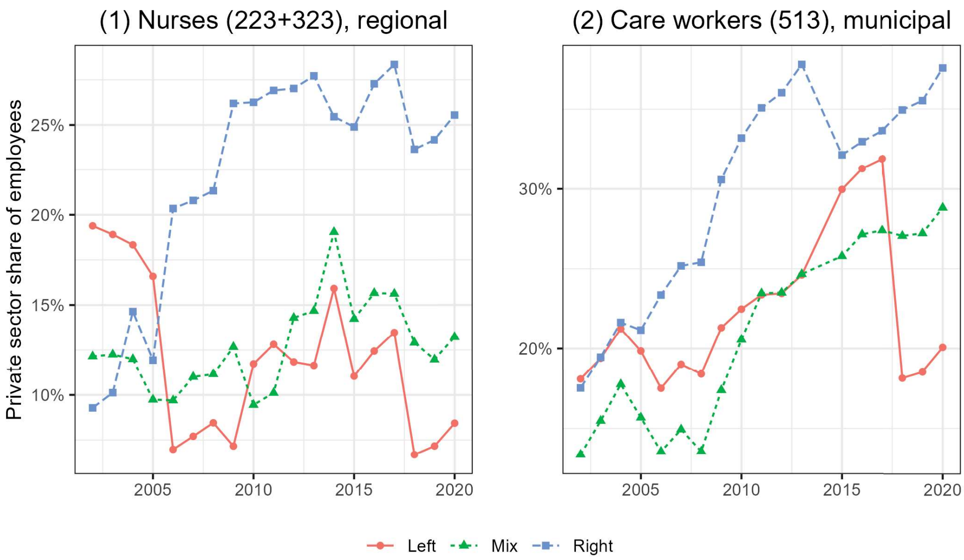

Figure 2: Share of private sector employment in regions for nurses (1) and in municipalities for care workers (2) depending on the color of their respective political majority. "Left" indicates a political leadership which is composed of one or a combination of the Social Democratic Labor Party, Left Party, and Green party. In a similar manner, right indicates The Moderate Party, Center Party, Christian Democrats, Liberal Party, and Sweden Democrats. Coalitions with local parties are excluded. Mix indicates at least one party from each block is included in the local political leadership.

The share of private employment increases over time, but is heterogeneous over the political spectrum. Left-ruled regions tend to have a lower share of privatized employment compared to right-ruled regions, with a similar result in municipalities. Mixed political majorities, indicating a majority from both the left and right of the political center, often have private shares that fall between the left and right majorities. Further, large increases (and drops) in both regional and municipal shares in private employment reflect changes in political majority – left-leaning majorities are unlikely to directly reverse the share of private actors in their constituency.

3 Previous research and empirical strategy

Since the early 1990's, privatization has largely broken up the public monopoly in welfare service provision. Thus, public employment monopsony has been reduced in large labor markets, and privatization has added more outside employer options to workers. But does adding more outside options always improve the wage bargain?

3.1 Employer Concentration

By adding even a small number of (private) outside employer options to a labor market dominated by a single (public) employer, employer concentration is reduced. If reduced concentration implies increased competition for workers, we expect employers to raise wages above previous monopsony levels, bringing wages closer to market clearing levels. (e.g. Robinson 1933)

This prediction is in line with a recent strand of new classical monopsony literature (Manning 2021) which attempts to estimate employer wage setting power by assessing the wage impact from employer concentration, while accounting for workers having idiosyncratic tastes for jobs. If the wage bargain is seen as a result of workers continuously searching for and considering offers from outside options (e.g. Manning 2011), then an increase (a reduction) of outside options from reduced (increased) local employer concentrations should improve (worsen) the bargaining position of workers, and increase (decrease) wages.

A growing literature estimating concentration as a Herfindahl-Hirschman Index (HHI) of employer concentration supports the notion that employer concentration can have a negative impact on the wage bargain (e.g. Azar et al. 2022, Schubert et al. 2024, Bassanini et al. 2023, Thoresson 2024).

However, recent research shows that concentration can also have a positive impact on the wage bargain. Névo (2024) finds that in France, when large, more productive firms enter labor markets, they hire a larger share of workers and increase employer concentration, but also pay higher wages, reduce labor turnover, and crowd out less productive firms in the labor market. This suggests there may be a positive connection between efficiency wages (Akerlof 1982) and concentration.

In the Swedish labor market, Söderqvist and Eklund (2024) find that concentration has a comparatively small effect on wages, consistent with Manning's (2003) prediction that "the wages set by very powerful unions will be independent of the extent of monopsony power in the labor market". But also a positive wage effect from concentration for blue collar occupations, which represents almost half the working population. This rather counter-intuitive result is likely an effect stemming from collective bargaining coverage and individual bargaining power dynamics; less concentrated labor markets are often dominated by smaller firms, which are less likely to be signatories to collective agreements. The negative impact from no collective bargaining coverage is likely to have a larger negative impact on workers with less individual bargaining power. The model follows Névo (2024) to correct for firm size effects by including a value added-concentration interaction. But as the public sector does not generate value added values in the national accounts, firm size remains unaccounted for, making it possible that part of the positive concentration effects on blue collar wages stem from higher wages at public employers.

Concentration-wage models come with advantages and disadvantages. They can provide an intuitive empirical venue to test how privatization affects wages and earnings effects for healthcare professions. However, concentration models suffer from well-established faults. Concentration does not necessarily provide a credibly causal relationship between price and competition (Miller et al. 2022), and to calculate market shares and market concentration, the market must be explicitly defined, raising concerns about market definition (Schubert et al. 2024).

Wage and employer concentration-approach

To estimate wage effects from concentration, I apply Schubert et al.'s (2024) new classical monopsony Nash bargaining model using the same empirical approach and data as Söderqvist and Eklund (2024). The model takes the perspective of labor supply, capturing supply side mobility and payoffs in defined labor markets, where demand-side dynamics are largely treated as exogenous[13].

To summarize, the model maximizes the wage bargain of a worker at firm i choosing to accept a share of her productivity wage p_i or take some outside option (oo_j) at firm j. The intuition is that the employer will only pay the productivity wage p_i if the value of the outside option exceeds the productivity wage. Thus, if there are no equivalent outside options, the wage will be lower than the productivity wage. Estimating the wage in this simple setup yields:

$$w_i = \beta p_i + (1 - \beta) oo_j$$

The Schubert et al. (2024)-framework expands the outside option-variable (oo_j) in two steps. First, expressing the probability of matching with some employer j as an intuitive Herfindahl-Hirschman Index (HHI), which takes the square value of employer j's market share of all hires in a defined labor market (occupation o, region r, at time t) and summarizing the square of market shares of each employer in the entire defined labor market, yielding:

$$HHI_{o,r,t} = \sum_{j=1}^{N} s_{j,o,r,t}^2$$

[13] See Bustos (2023) for a study including demand-side aspects of wage setting power can affect the wage bargain and labor demand.

where $s_{j,o,r,t}$ is the number of hires in occupation o by employer j, divided by the sum of all hires in occupation o the defined labor market[14].

The second expansion of the outside option variable addresses the fact occupation o may be a relatively poor labor market definition. Workers may differ in the availability of nearby occupations to *exit* to if an employer set their wage below market rates. Schubert et al. (2024) addresses this concern by introducing an Outside Occupation Index ($OOI_{o,r,t}^{o \to p}$) which addresses the labor market definition concern in a flexible manner.

The outside occupation index is attained by multiplying the probability of a worker switching from occupation o to occupation p ($\pi_{o \to p,t}$) by the observed mean wage of workers observed changing occupation ($\bar{w}_{o \to p,r,t}$):

$$OOI_{o,r,t}^{o \to p} = \sum_{p \neq o}^{occs} \pi_{o \to p,t} \cdot \bar{w}_{o \to p,r,t}$$

Thus, a high Outside Occupation Index reduces the negative impact on the wage from employer concentration, whereas a low Outside Occupation Index vale does not.

Further, endogeneity and identification concerns are addressed by including an interaction between concentration and firm-value added (Névo 2024), and an instrumental variable for the OOI variable, addressing concerns that the value of the outside occupation option is influenced by effects from Sweden's extensive collective bargaining coverage and centralized wage formations (see Söderqvist and Eklund 2024 for details).

The approach allows for a flexible, probability-based solution to salient market-definition problems, present in many previous wage-concentration-studies. We operationalize the model for our observed occupational groups as:

$$\begin{aligned} log(w_{o,r,t}) = \alpha_{o,t} + \alpha_{r,t} + \gamma_1 log(HHI_{o,r,t}) + \gamma_2 log(OOI_{o,r,t}) \\ + \gamma_3 log(VA_{o,r,t}) + \gamma_4 log(HHI_{o,r,t}) \times log(VA_{o,r,t}) + \varepsilon o, r, t \end{aligned} \tag{IV.1}$$

where $\alpha_{o,t}$ and $\alpha_{r,t}$ are occupational and regional time fixed effects. The fixed effects estimates captures the impact from Swedish collectively bargained wage formation well in Söderqvist and Eklund 2024, addressing identification concern relating to the model's ability to separate individual bargaining power components (outside options) from collective bargaining power components (*voice*, Hirschman 1970).

The output from the wage-concentration model provide us with an indication of whether privatization has improved the wage bargain for the two studied occupation

[14] $s_{j,o,r,t} = \frac{H_{j,o,r,t}}{\sum_{j=1}^{N} H_{j,o,r,t}}$ where the numinator indicates the number of hires by firm j, and the denominator the sum of hires by all firms in the defined labor market o, r, t.

groups. Assuming municipal and regional employer ”firm” boundaries are intact, lower concentration should reflect an increase of private actors. A negative concentration coefficient indicates that adding outside options (privatized employers) to the labor market has a positive effect on the wage bargain, whereas a positive concentration coefficient indicates a negative effect on the wage bargain.

3.2 Fissurization and domestic outsourcing

> *"wage discrimination is rarely seen in large firms despite the benefits it could confer. As long as workers are under one roof, the problems presented by horizontal and vertical equity remain. But what if the large employer could wage discriminate by changing the boundary of the firm?"*
>
> (Weil 2014)

Does adding more employers to a labor market always imply an improvement of a worker's outside options? If firms redefine their boundaries by outsourcing tasks and activities to external actors in the domestic labor market, this would imply an increase in the number of employers in the relevant labor market, yet may have negative effects to the wage bargain.

Weil (2014) argues that domestic outsourcing has had adverse effects to both wages, benefits, and working conditions in the United States, defining such processes as *fissurization*, resting on the observation that employers increasingly focus on core competencies by externalizing non-core activities to external firms, while retaining a level of control over the outsourced tasks through contracts.

Empirical evidence suggests that domestic outsourcing has had detrimental effects to outsourced workers in a variety of settings. Goldschmidt and Schmieder (2017) find that the outsourcing of tasks in Germany in the 1990's saw affected workers' wages decrease between 10 to 15 percent compared to non-outsourced workers with similar individual characteristics, contributing up to 9 percent of wage inequality[15] in the observed period. Similarly, Dube and Kaplan (2010) finds that janitors and security guards in the United States received a 4 to 7 percent wage penalty due to domestic outsourcing in the 1980's and 1990's. In France, Bilal and Lhuillier (2021) find wage penalties to lower-skilled outsourced workers of approximately 1.5 percent, find indications that outsourced workers possibly reduce their efforts compared to non-outsourced workers, and that domestic outsourcing attributed to a 3 percentage point reduction of the labor share of GDP.

Card et al. (2018) proposes that wages may decrease for lower skilled outsourced workers as they lose out from the wage premium associated with redistribution of surpluses in the larger outsourcing firms. The firm is then free distribute a larger

[15] Measured as domestic outsourcing-attributable changes in inequality between the 15th and 85th percentile in the wage distribution.

proportion of its surpluses to higher-skilled workers performing ”core” tasks (e.g. Autor et al. 2020) or pay more dividends to shareholders, as indicative of the labor share results in Bilal and Lhuillier (2021).

But is privatization equivalent to domestic outsourcing?

I argue that there exists a sufficiently clear conceptual connection between welfare service privatization and domestic outsourcing to make the case that the two can be treated as equivalent, despite differences in stated political motivations behind privatization[16]. Swedish municipalities and regions are mandated to provide residents with specified welfare services. If public principals procure or encourage private firms to provide welfare services rather than producing them themselves, it amounts to a ”make or buy” decision to externalize production of said services, redefining the boundary of the firm.

The Lindbeck Commission, chaired by the prominent Swedish economist Assar Lindbeck, provided the intellectual grounds on which Swedish privatization was rationalized. Their 1993 public inquiry proposed that ”All public production that does not imply an exercise of authority should over time be exposed to competition” (SOU 1993, proposal no. 61). According to this logic, private welfare services should not be considered a ”core competency” lest it is defined as an ”exercise of authority”. Turning back to figure 1 square (1), we see that the share of public funds paid to private firms started growing after this influential policy program was released, growing at a rapid pace after 1993.

Weil’s ”core competency”-motivation can also be useful in other dimensions. For example, when considering the rationality behind *which* tasks or services are chosen to be privatized (rather than the politically motivated *why*). If tasks or operations require less complex labor inputs, such tasks may be easier to specify and enforce in a contractual relationship with an external agent compared to more complicated tasks (e.g. Grossman and Hart 1986). Thus, the propensity to outsource simpler tasks may be greater.

In sum, privatization can amount to a ”make-or-buy” firm boundary problem which may have an effect the distribution of rents; although public providers are non-profit, the introduction of for-profit welfare service providers implies that surpluses will be generated, resulting in a subsequent distribution of rents. And thus, privatization is sufficiently similar to domestic outsourcing to be treated as such.

[16]Proponents of privatization have often used public choice and consumer welfare to motivate such decisions (e.g. Svanborg-Sjövall 2014), although core competency arguments are also common (e.g. Rapp 2006).

Observing privatization as a domestic outsourcing event-study

In periods, privatization has implied an existing public service being sold to a private entity, where the outsourced entity may ”include” the employed workers[17]. If privatization implies a transfer of employees, the positive impact on wages are likely subdued as the observed job changes are not a result of some proactive search process in an open labor market – as may be implied by search-and-matching models – but is rather the result of a passive decision to stay at the same workplace when there is a change of principal[18].

If we treat privatization as a firm boundary problem we also need to identify that there exists some contractual (or regulatory) relationship between the public principal and the private agent. Although rich in information, employer-employee matched administrative data do not provide comprehensive information about contractual relationships between organizations.

To work around this problem, Goldschmidt and Schmieder (2017) provide an innovative solution to identify ”on-site” domestic outsourcing events. By applying an algorithm which tracks year-on-year flows in commonly outsourced occupations away from non-service to service industry firms, plausible domestic outsourcing processes and outsourced individuals can be identified, along with control groups of non-outsourced workers.

To identify privatization processes, I use a similar algorithm-based approach, building on the intuition that domestic outsourcing events should imply that a sufficiently large ”chunk” of workers move from a public entity to a private firm between year $t-1$ and t. If the identified workers are preforming similar tasks at the new private employer, this ”chunk” of workers constitute a treatment group. The public employer that they leave is identified as a ”mother” firm, from which I draw control groups sharing characteristics with the treated group.

Table 3.2 outlines the logic and application of the algorithm itself, and how the treatment and control groups are identified.

[17]It can also imply the opening of an entirely new establishment without the purchasing of a previous public entity.

[18]From an empirical standpoint, the data used in the concentration-wage studies discussed above cannot differentiate passive from active and passive changes of employer.

Table 1: Description of the algorithms used to identify "on-site" privatization outsourcing events

"Onsite" domestic outsourcing is identified as significantly large outflows from public (i) to private employers (j) between $t-1$ and t, where outflow workers make up a significantly large percentage of the workforce at j.

- Workplace i at $t-1$ must be PUBLIC and workplace j at t must be PRIVATE.
- Calculate the number of employees who were in occupation o at PUBLIC employer i at $t-1$, who are in a PRIVATE workplace j at t ($\sum n_{o,j,t}^{i \to j}$).
- Calculate the share of identified inflows ($s_{o,j,t-1}^{i \to j}$) as a proportion of the number of employees in private workplace j, ($s_{o,j,t}^{i \to j} = \sum n_{o,j,t}^{i \to j} / \sum n_{j,t}$).
- Conditions for TREATED depends on **IF**
  1. 3 or more employees from public employer i are observed at the new private employer j
  ($\sum n_{o,j,t}^{i \to j} \geq 3$) **AND**
  2. the share of the inflow employees from public is more than $1/3$ of the new labor force ($s_{o,j,t}^{i \to j} \geq 1/3$)
  3. **THEN** TREATED $= 1$ at time t^*
- Conditions for CONTROL are
  1. Employees in occupation o at employer i **at** $t-1$ when a TREATED is observed, and remain in occupation o at employer i in $t^* \leq t$.
- TREATED individuals no longer observed at employer j, and CONTROL individuals no longer observed at employer i at $t^* \leq t$ are removed from the sample.
- TREATED individuals will only be used in the analysis if they are assigned occupation o at time $t^* \leq t$. This allows me to pick up individuals who may not be assigned occupation codes immediately after the outsourcing event at time t^*. Occupations are assigned in the Wage Structure Statistics survey, which aims to cover each individual at least every four years. Thus, TREATED individuals may appear in the analysis as late as four years after the observed treatment.

Although being assigned an occupation in $t^* \leq t$ is not a prerequisite to be treated, only workers in occupation o are used in the regressions. This allows outsourced workers that receive an occupation code some time after the privatization-event to be included in the data. It also removes ”false” treated individuals that have changed occupations in the post-privatization period.

Having identified treatment and control groups using the algorithm set out in table 3.2 above, we can estimate the effect on the wage bargain following Goldschmidt and Schmeider's approach, correcting for observable and unobservable characteristics, as:

$$log(w_{i,j,t}) = \delta_k(t = t^* + k)Outsource_{i,t} + \alpha_i + \theta_t + \xi_j + \boldsymbol{x}'_{i,t}\beta + \varepsilon_{i,t} \quad \text{(IV.2)}$$

where $Outsourced_{i,t}$ denotes a dummy variable signifying treated (1) or control (0) individuals identified in an outsourcing event at t^*, α_i are individual fixed effects, θ_t are time-fixed effects, and $x_{i,t}$ are time-varying individual characteristics, which in our case are gender, age, and years of schooling.

4 Data

I use employer-employee matched Swedish administrative data from Statistics Sweden, linking individuals to firms via personal identification and firm identification numbers. This data includes yearly taxed labor incomes, employer geographical location, and more.

Wage data comes from the Wage Structure Survey, which is individually linked survey data. Public employers (i.e. state, municipal, and regional) complete the survey covering all employees on a yearly basis. Private employers that are members of an employer association will collect wage and hours data on a yearly basis, via the Swedish Confederation of Enterprise. Unorganized (often small) employers receive a survey based on a rolling sample, implying that each individual in the labor market should be covered by the survey at least every four years.

Regions are defined as commuting zones (r) using Tillväxtanalys (2016) 60 functional labor market regions (FA-regions), which are matched to workplace municipal codes.

Occupations are from the Occupation Registry, which, among other sources, collects data from the wage structure survey, and apply statistical inference to estimate the most probable occupational codes for workers in years without occupational for individuals data. The three occupational groups defined in the introduction are composed of two SSYK3-level occupational healthcare groups between 2001 to 2020. Nurses are identified by the SSYK3-codes 223 and 323, and care workers by 513. SSYK3 is the second finest level after SSYK4. The choice to use the coarser level rests on poor sample coverage of the finest SSYK4-level codes from 2001 to 2005.

Occupational groupings are based on the older SSYK96 standard of occupational reporting, rather than the current (ISCO08-compatible) SSYK2012-standard, introduced in 2014. This is motivated by the two occupational standards being officially incompatible, but where the lesser granularity in the SSYK96 standard allows for a relatively accurate backward translation of newer occupation codes. As in paper Söderqvist and Eklund (2024), I use Yakymovych's (2022) crosswalk to bridge the change of occupation standards from 2014 and onwards. In the wage-concentration framework, the year 2014 is removed (see Söderqvist and Eklund 2024 for a motivation).

4.1 Dependent variables: wages, hours, and incomes

To study outcomes to the wage bargain from working for a public or private entity, I consider the gross mean monthly wages[19], working hours[20], and gross mean monthly incomes from the primary employer[21] of the two occupational groups. Their mean values are presented for workers in public (blue line) or private (red line) sector employment in figure 3.

Between 2001 and 2020, the mean full time equivalent wage (including overtime and other pay supplements) is approximately 7 percent higher for nurses (223+323) in private employment compared to public employment throughout the studied period, whereas for care workers (513), wages are approximately 2.8 percent higher. In terms of working time, the mean percentage of full time employment is, on-average, 2.6 percent lower in private employment for nurses, but 1.5 percent higher for care workers.

Looking to the mean monthly gross labor incomes, nurses in private sector employment report approximately 4.8 percent lower labor incomes in private employment compared to public employment. Care workers, on the other hand, report just over 10.0 percent lower incomes in private employment for the entire period. We note also note that this difference is reduced to 6.0 percent lower incomes in private employment after 2015.

The large difference in private and public care worker incomes are surprising as private wages and working hours are both higher than in public employment. If the Wage Structure Statics, containing wages and hours, are consistent between the private and public sector, monthly incomes should be higher in the private sector than what the data suggests. This indicates that there are inconsistencies between public and private Wage Structure Statistics which are of serious concern. Are full-time equivalent wages a reliable statistic when the product of wages and hours overestimate incomes by a large factor?

[19] Gross full-time equivalent wages, including variable and expected overtime pay, etc.

[20] Measured as a percentage of full-time employment.

[21] Gross mean monthly labor incomes reported to the tax authority, attained by dividing yearly reported gross taxable labor incomes from the prime employer, divided by 12.

Figure 3: The panels represent mean full-time equivalent gross wage levels (Wage), wokring time as a percentage of 100 percent (Hours %), and gross average monthly incomes from the primary employer (Income), for occupational groups nurses (223+323, top row), and care workers (513, bottom row). The red lines show the mean values in the private sector, and blue line mean values in the public sector.

Answering this question requires careful consideration as the discrepancy between private and public wages and incomes is contested. The union representing care worker have highlighted the inconsistencies between wages, hours, and incomes (Kommunal 2021) in response to the Association of Private Care Providers' (a private sector employer associations) claim that both registered nurses and assistant nurses (the large occupational subset in the care worker group) receive higher wages in private employment (Vårdföretagarna 2022).

The inconsistency motivates using incomes as the primary dependent variable in our analysis. However, I will present regression outcomes for all three dependent variables. Incomes are a more reliable statistic, as it represents the gross incomes reported to the Tax Authority at the end of each year, whereas full-time wages and hours are collected in a sampling procedure.

4.2 Outside option data

The variables used to estimate the wage impact from outside options are primarily based on employer concentration on hires, and an Outside Occupation Index to address labor market definition concerns in a flexible manner. In figure 4 we follow the key variables employer concentration on hires (1), the Outside Occupation Index on wages (3), and the OOI for incomes (4). The probability of changing occupations (2) are also included to give an indication of how the share of workers in each group move to other occupations within a given year (which is a key component of the Outside Occupation Index).

The values are the point estimated weighted means from yearly occupation-regional labor markets in Söderqvist and Eklund (2024), based on SSYK4-level definitions, which include occupation changes within the SSYK3-occupations of care workers (513) and nurses (223+323). Such within SSYK3-level changes are counted as observed occupational changes.

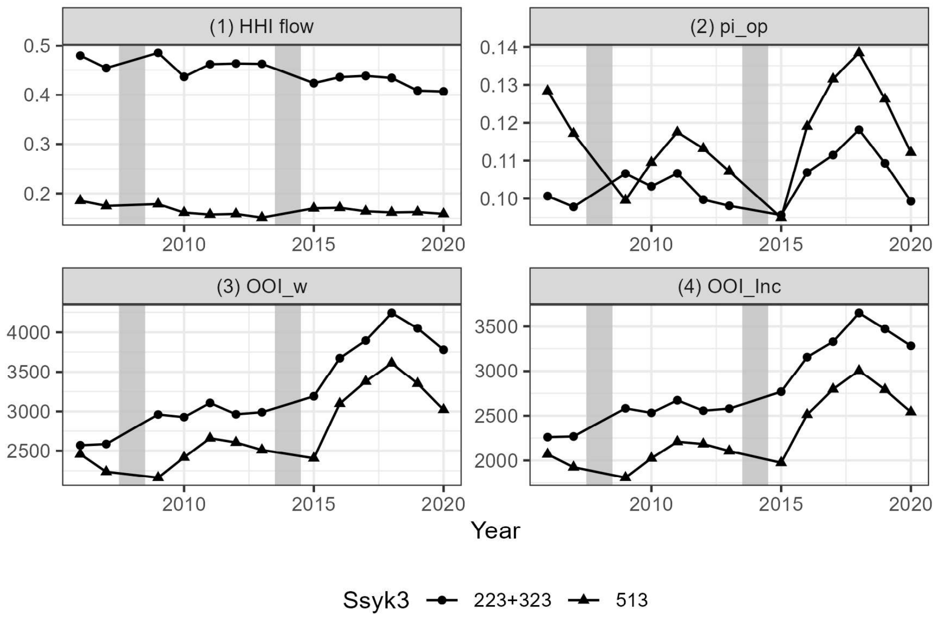

Figure 4: The figure shows developments in outside option parameters for the two occupation groups used in this study (nurses: SSYK3-code 223+323; care workers 513) between 2006 and 2020 from Söderqvist and Eklund (2024). The values represent weighted averages of SSYK4-occupations, which make the values comparable to Söderqvist and Eklund. "(1) HHI flow" Captures the mean Herfindahl-Hirschman Index over time as employer concentration on hires, "(2) pi_op" the mean probability of the observed groups changing occupations between years, "(3) OOI_w" the Outside Occupation Index of gross wages, and "(4) OOI_y" the Outside Occupation Index on gross incomes from the primary employer. SSYK3 codes use the SSYK96 standard, using Yakymovych (2022) crosswalk for SSYK2012-standard values from 2014 and onward. 2014 is censored in the diagram and omitted from the analysis (see Söderqvist and Eklund for motivation). 2008 is censored from the diagram due to an outlier value (see figure 8 in the appendix to view results including 2008.).

We note that employer concentration on hires (1) is steadily decreasing for both occupation groups, but from a much higher level for the nurses group (223+323). The high HHI-value for nurses (0.44) reflects a large share of workers within highly concentrated labor markets, likely a result of large employer shares in public regional employment, which often cover larger geographical areas than municipalities, and larger workplaces such as hospitals.

For both groups, the share (and probability) of workers changing occupation in a year is 13 percent for nurses and 12 for care workers. Both mobility statistics are slightly larger or similar to the national average during the period (12.0 percent). Both the Outside Occupation Indices (3 and 4) increase with wages and incomes, while noting the probability of switching occupations produces much of the variation in the two OOI-variables.

The summary statistics for the wage-concentration regressions are presented in table 2 below.

Table 2: Summary Statistics, wages and outside options variables

Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
		Occupation_type: 223+323					
Year	777	2013	4.5	2006	2009	2017	2020
FA15	777	29	17	1	14	43	60
mean_wage	777	30934	4397	22216	27353	34948	42540
mean_KUInc	777	26990	3929	12958	23738	30353	38093
VA	777	533110	738973	587	73823	669113	5980636
HHI_flow	777	0.61	0.17	0.16	0.5	0.71	1
pi_occ	777	0.13	0.11	0.02	0.082	0.13	0.7
mean_wage_p	777	30934	4397	22216	27353	34948	42540
mean_wage_p.tminus1	777	29777	4212	21699	26341	33691	39750
OOI	777	4016	2840	548	2435	4327	18772
mean_KUInc_p	777	26990	3929	12958	23738	30353	38093
mean_KU1nc_p.tminus1	777	25433	3883	7067	21994	28764	37348
OOI_Inc	777	3677	2597	530	2204	4012	18386
N	777	1662	3574	2	135	1685	24438
		Occupation_type: 513					
Year	840	2013	4.5	2006	2009	2017	2020
FA15	840	30	17	1	16	45	60
mean_wage	840	23716	2681	18255	21928	26171	28543
mean_KUInc	840	20011	2299	15258	18307	21975	26050
VA	840	515522	404096	2617	263153	650906	3472573
HHI_flow	840	0.37	0.21	0.034	0.19	0.55	0.92
pi_occ	840	0.12	0.032	0.039	0.099	0.13	0.36
mean_wage_p	840	23716	2681	18255	21928	26171	28543
mean_wage_p.tminus1	840	22963	2774	17490	20923	25582	27637
OOI	840	2759	797	852	2188	3200	7497
mean_KUInc_p	840	20011	2299	15258	18307	21975	26050
mean_KU1nc_p.tminus1	840	18389	2359	13394	16754	20369	24290
OOI_Inc	840	2441	715	761	1931	2842	6733
N	840	7398	15197	117	1080	7695	116411

4.3 Domestic outsourcing data

The on-site domestic outsourcing-approach of privatization results in a total of 3350 treated individuals identified by the algorithm in table 3.2, between 2002 and 2020, of which 701 are nurses and 2649 are care workers (figure 5).

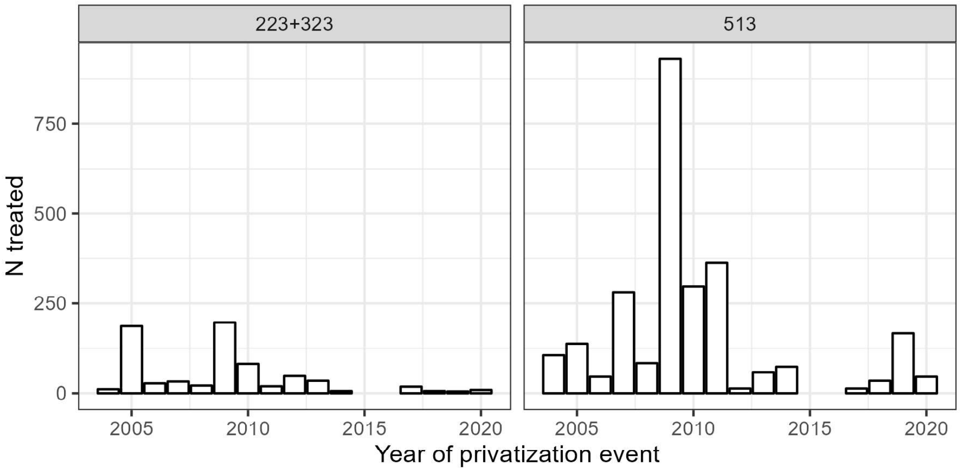

Figure 5: Number of yearly observed treated nurses (223+323) and care workers (513) from the "on-site" domestic outsourcing algorithm.

The algorithm identifies the greatest number of events in 2009, the year before the The Act on System of Choice was passed and implemented. We also note that the number of privatization events decreases from 2011 and onward. This is consistent with the share of municipal and regional entities paid to private firms decreasing in the 2010's (see figure 1, 1).

Breaking these numbers down to follow the years of the event study, table 6 shows the number of observed individuals in the pre- and post privatization event for the treatment and control groups.

In the treated group, we note that there are very few treated individuals in year 0. This is due to no or few workers being assigned occupation codes in the initial post-outsourcing year.

Further, we note that the (large) control groups shrink after the outsourcing events, reflecing labor turnover, and that our algorithm only observes individuals in the control group who were employed at the same public employer as the treated group in $t^* = -1$.

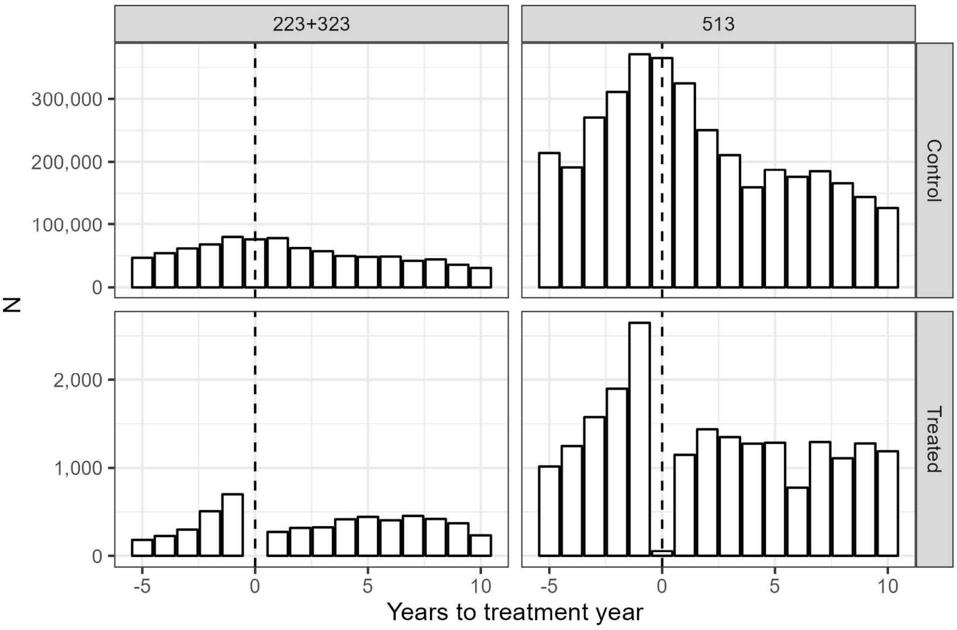

Figure 6: The figure shows the size of the control and treatment groups 5 years prior to, the year of, and 10 years after a privatizaiton event (t^*) is identified by my algorithm. The control and treated groups are further divided into nurses (223+323) and care workers (513).

The summary statistics of the treatment and control groups for nurses and care-workers are presented in table 3.

Table 3: Summary statistics for the treatment and control groups

Outsourced	Treated, Nurses			Control, Nurses			Treated, Care workers			Control, Care workers		
Variable	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Wage	5182	29784	6619	819222	30958	6865	18525	21352	6874	3281992	21939	7065
Hours	5182	79	29	819208	81	28	18525	75	31	3281961	79	30
Income	5571	25713	10996	883723	26879	11002	20579	18246	8389	3653672	18644	8133
Gender	5571			883723			20579			3653672		
... Female	5020	90%		801131	91%		18057	88%		3173826	87%	
... Male	551	10%		82592	9%		2522	12%		479846	13%	
Age	5571	50	10	883723	49	11	20579	44	12	3653672	46	12
Education	5571			883389			20567			3648467		
... < PS (8)	0	0%		6	0%		244	1%		93074	3%	
... PS (9)	0	0%		206	0%		1196	6%		282074	8%	
... SS (12)	2	0%		1862	0%		16141	78%		2768833	76%	
... 3 yrs < PSS (14)	0	0%		249	0%		1165	6%		165819	5%	
... 3 yrs $\geq$ PSS (16)	5569	100%		878943	99%		1815	9%		337008	9%	
... PhD (18)	0	0%		2123	0%		6	0%		1659	0%	

Wages are gross full-time equivalent wages, including variable components. Hours indicate a percentage working measure of full time employment. Incomes are gross average monthly incomes from the primary employer. Education indicates highest attained educational level: Income PS = public school (less than or graduate); SS = secondary school (graduate); PSS = post-secondary school (less than or more than 3 years); PhD is self-explanatory.

5 Results

Wages, incomes, and outside option results

To estimate the impact on wages and incomes from employer concentration I use the identical weighted log-log regression[22] approach from Söderqvist and Eklund (2024). In table 5 the results following the value-added and instrumental-variable approach are presented for wages and incomes.

Table 4: Regression output for the wage-concentration models

	log w		log y	
	(1) Nurses	(2) Care workers	(3) Nurses	(4) Care workers
log HHI × log VA	0.0012	-0.0032***	0.0011	-0.0020***
	(0.0008)	(0.0005)	(0.0008)	(0.0006)
log HHI	-0.0385**	0.0600***	-0.0276*	0.0384***
	(0.0152)	(0.0100)	(0.0152)	(0.0127)
log VA	-0.0005	-0.0036***	-0.0003	-0.0030***
	(0.0006)	(0.0007)	(0.0007)	(0.0008)
log OOI^{w}_{IV}	0.0007	0.0031**		
	(0.0023)	(0.0014)		
log OOI^{y}_{IV}			-0.0003	0.0002
			(0.0021)	(0.0017)
log h			0.4250***	0.6062***
			(0.0250)	(0.0220)
Observations	4,570	4,504	4,570	4,504
R^2	0.98355	0.99339	0.97764	0.98887
Within R^2	0.05343	0.04252	0.16937	0.31402
Wald (joint nullity), p-value	4.87e-12	1.05e-11	2.79e-66	3.15e-162
F-test (projected)	51.281	39.716	148.16	327.39
FA15t fixed effects	✓	✓	✓	✓
SSYK4t fixed effects	✓	✓	✓	✓

The regression table shows the log-log weighted regressions from model IV.1, comparing estimated results from using (log) wages for nurses (1) and careworkers (2), and (log) incomes for nurses (3) and care workers (4).

As in Söderqvist and Eklund (2024), to interpret the interaction effects for concentration (log HHI), we hold value added (log VA) constant by taking its partial derivative on wages or incomes:

$$\frac{\partial w}{\partial VA} = \gamma_3 + \gamma_4 log(HHI)$$

where γ_3 is taken from log VA regression output in table 5, and log HHI from the log HHI × log VA regression output.

For nurses (1 and 3) concentration has no significant impact on wages or incomes when holding value added constant. The largest effect on incomes are working hours, reflecting that observed increased working hours for both groups have had the greatest impact on incomes during the observed period.

For care workers (2 and 4), concentration has a negative but modest impact on both wages and incomes. A one percent increase in concentration results in a (modest) -0.68 percent reduction to the wage, and -0.50 percent reduction to incomes.

[22]Natural logarithms.

However, as indicated in the data section, the wage variable lacks internal consistency when comparing private and public sector wages due to its inability to correctly estimate average incomes. We also note an even greater effect on incomes from hours for care workers, also reflecting a relatively large increase in working hours from 2006 to 2020. The OOI-instruments from Söderqvist and Eklund (2024) are strong, as indicated by the Wald and F-tests statistics.

Correcting for firm size by interacting value-added with employer concentration on hires is probably unnecessary, as it is probable that large changes to employer concentration are an effect of privatization. Thus, removing the interacted value added dimension, table 5 considers the same model as above, but without correcting the model for firm size.

Table 5: Regression output for the wage-concentration models -- without value added

	log w		log y	
	(1) Nurses	(2) Care workers	(3) Nurses	(4) Care workers
log HHI	-0.0147***	-0.0042***	-0.0056**	-0.0011
	(0.0023)	(0.0010)	(0.0022)	(0.0014)
log OOI^{w}_{IV}	0.0006	0.0044***		
	(0.0023)	(0.0015)		
log OOI^{y}_{IV}			-0.0004	0.0009
			(0.0021)	(0.0017)
log h			0.4239***	0.6107***
			(0.0251)	(0.0220)
Observations	4,570	4,504	4,570	4,504
R^2	0.98348	0.99322	0.97760	0.98880
Within R^2	0.04952	0.01826	0.16769	0.31018
Wald (joint nullity), p-value	2.91e-10	2.68e-6	1.12e-63	6.38e-160
F-test (projected)	94.721	33.274	244.11	536.28
FA15t fixed effects	✓	✓	✓	✓
SSYK4t fixed effects	✓	✓	✓	✓

Similar to table 5, the regression table shows the log-log weighted regressions from model IV.1, comparing estimated results from using (log) wages for nurses (1) and careworkers (2), and (log) incomes for nurses (3) and care workers (4), but excluding the interacted value-added component.

The regression yields a negative effect from concentration on wages for nurses (1), showing that a 1 percent increase in concentration reduces the wage by 1.47 percent. Care workers are estimated to have relatively small, but significant, negative effect on wages by 0.42 percent from a 1 percent increase in concentration.

Income effects for nurses (3) are now significant, but much smaller (-0.56 percent), and yields an almost identical estimate from the effects on incomes from working hours. The concentration results for care workers (4) are small and insignificant, implying that concentration has no effect on incomes. Again, we note a large and almost identical boosts to incomes from improving working hours for care workers.

Domestic outsourcing results

The regression outputs for the domestic outsourcing event-study are presented in table 5, showing the difference-in-difference outcomes for treated and control groups using model IV.2, for (log) gross full time-equivalent wages, percent of full time, and (log) average monthly gross incomes from the primary employer as dependent variables. The model is applied to each occupation group (nurses 223+323 and care workers 513).

Of central interest are the post-outsourcing (Post-OS) coefficients, where I follow Goldschmidt and Schmeider's convention of reporting short run outcomes as 3 years post-OS, and long run outcomes at 6 years post-OS.

Table 6: Regression table for model AG1 (indivudal fixed effects)

	Monthly full-timn wage (log)		Percent full time (%)		Monthly income (log)	
SSYK3	223+323	513	223+323	513	223+323	513
	(1)	(2)	(3)	(4)	(5)	(6)
Post-OS short run (3)	0.0105	0.0145	4.360*	-0.8731	-0.0139	-0.1121**
	(0.0154)	(0.0088)	(2.527)	(1.633)	(0.0614)	(0.0555)
Post-OS long run (6)	-0.0118	-0.0146	-0.4262	-0.2218	0.0212	-0.1261**
	(0.0169)	(0.0203)	(3.577)	(1.840)	(0.0557)	(0.0579)
Gender	0.9547	-1.230	-95.86	-12.97	-0.1110	-0.3216
	(118.2)	(70.30)	(145,882.6)	(13,859.4)	(164.0)	(328.5)
Age	0.0382***	0.0316***	-0.3018	0.8494***	0.0210***	0.0337***
	(0.0009)	(0.0006)	(0.2627)	(0.2085)	(0.0060)	(0.0040)
Years of education	0.0042	0.0047**	-5.590**	-0.7093	0.0832***	-0.0308**
	(0.0117)	(0.0022)	(2.684)	(0.7526)	(0.0089)	(0.0132)
Observations	8,722	36,710	8,786	39,280	9,823	45,772
R^2	0.90024	0.83471	0.45652	0.51298	0.58070	0.58721
Within R^2	0.71911	0.60749	0.00342	0.00617	0.02388	0.02347
Individual FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓

All regressions follow equation 3 based on Card et al. (2013), using yearly and individual fixed effects. Standard errors are clustered with firm identification numbers. Dependent variable full time equivalent monthly wage (regressions 1 and 2), and percent full time employment in percent (regressions 3 and 4) are from the individual-matched wage structure survey. Monthly gross reported labor income is the yearly taxed labor income from universe of data (regressions 5 and 6). SSYK3 indicates occupations 223+323 (nurses, regressions 1,3, and 5) and 513 (care workers, regressions 2,4,and 6). Post-OS short and long run indicates the 3 and 6 years post the outsourcing/privatization event. Gender is female = 1 and male = 0. Years of education indicates the number of years corresponding to the highest attained degree.

Looking to wages (1 and 2), the coefficients indicate a positive but insignificant effect to the wage bargain for the treatment group in both occupations. Hours as a percentage of full time employment (3) indicate a 4 percentage point increase among nurses (significant at the 95 percent-level), but a barely noticeable and insignificant effect in the long run. The impact on hours for care workers are insignificant and close to zero in both the short and long run (4).

In terms of gross monthly incomes, the negative impact on earnings for care workers (6) yields a significant -11.1 percent decrease in income compared to the control group in the short run (3 years), and a significant -12.6 percent decrease in the long run (6 years). Both yield a level of significance at the 99 percent-level. The results for nurses (5) are insignificant.

In figure 7 the results are visualized, beginning five years prior to the outsourcing event ($t^* = -5$) and ending 10 years after the outsourcing event ($t^* = 10$), with the final year before the outsourcing event ($t^* = -1$) indicated by a dashed line, following nurses in **black** and care workers in **red**.

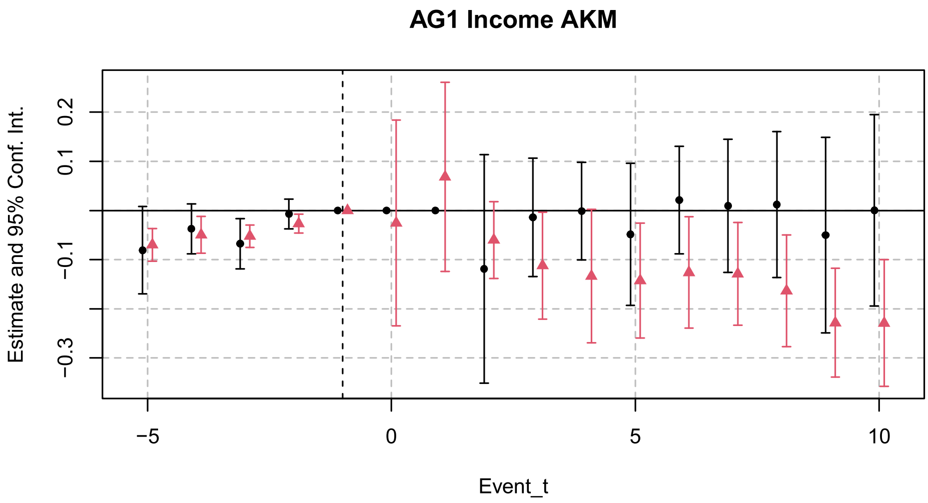

Figure 7: The chart shows the diff-in-diff regression outputs for the privatization event study and standard errors for nurses (**black**) and care workers (**red**), indicating the difference between privatized (treated) workers and workers who remain in public employment, with 0 marking the event study's first post-privatization year.

We note a small but significant pre-trend for both groups, indicating that there may be some selection issues[23], indicating possible heterogeneity between the treatment and control groups. This is a likely result from using coarser occupational codes, where there may exist relatively large occupational differences within the defined SSYK-code.[24] We also note that after 9 and 10 years the income differences between the treated private group and public control group reach their greatest extent at over 20 percent on average.

From event year 0 to 2, the standard errors are large, but are reduced after year 3. This is an effect of the algorithm not relying on identifying occupation o in the immediate post treated period, allowing treated individuals that are assigned occupations some time after the outsourcing event to be included in the analysis. Thus, we note that from year 3 the number of identified treated workers start appearing in the correct occupational code.

[23]Which may require attention in future versions of this study.

[24]This pre-trend effect is likely greatest for the care worker occupation code, which has the most diverse composition of occupations.

6 Discussion

I have discussed plausible causes and estimated some wage and income effects deriving from the privatization of Swedish welfare services in the past three decades, comparing how these outcomes have affected two large, yet heterogeneous groups of workers – white collar nurses and blue collar care workers. Earlier research suggest that nurses and other similar white collar occupations associated with the Swedish welfare state have benefited from privatization (Zhao and Matti 2018, Thoresson 2024). However, to my knowledge there are no Swedish studies on effects to blue collar occupation groups in similar sectors. If privatization can yield similar negative effects for blue collar groups as domestic outsourcing in other settings (Dube and Kaplan 2010, Goldschmidt and Schmieder 2017, Bilal and Lhuillier 2021), exploring occupational and skill heterogeneity is important.

A wage-concentration regression model, based on results from Söderqvist and Eklund (2024), and applied to nurses and care workers, shows that adding more employers to nurses' labor markets has a relatively large and positive impact to wages, but a smaller impact on incomes. Studying the mean wages and working hours (figure 3) shows fewer working hours among nurses in the private sector but higher wages. Thus, the relatively small but negative impact on incomes could reflect nurses using higher private sector wages to reduce working hours. The greater positive impact to nurses' incomes and wages are consistent with similar findings in the Swedish literature.

For care workers, the effects from concentration on wages are much smaller compared to the nurses occupation group. Income effects are also small or insignificant, suggesting that the observed reduction in concentration between 2006 and 2020 (figure 4) has not benefited care workers to a high extent.

The results for care workers should be interpreted with caution, however. As noted in figure 3, wages and hours are greater in the private sector, but average monthly incomes are lower than in the public sector, suggesting that private and public wage and hour statistics yield inconsistent approximations of incomes. This descriptive finding has broad implications for research using Swedish administrative data coupled with popular variables found in the Wage Structure Statistics.

The "on-site" domestic outsourcing event observes and compares the incomes and wages of workers that have undergone privatization processes, comparing their outcomes with those that were employed (and remained) at the public employer in the same occupation from which the private entity was spun out.

The event study yields heterogeneous results with regards to occupations. The impact to the earnings of nurses is insignificant and close to zero, whereas the impact to care workers earnings are large; treated care workers have 11.1 percent lower incomes in the short run (3 years) and 12.6 percent lower incomes in the longer run (6 years). The results indicate a large penalty to incomes, and are similar in size to Goldschmidt and Schmieder's (2017) estimates of German domestic outsourcing events for other blue collar occupation groups.

What drives these results?

First, figure 7 indicates that there exists a small but significant pre-trend for both occupation groups. This pre-trend needs to be addressed in future versions of this paper to control for possible selection effects. Studying the selection effects could yield interesting results. Weil's (2014) definition of fissurization includes a principal's motivation to ”focus on core competencies”. Aside from privatization being motivated by limiting the welfare state's core competencies, the public principals' choice of what to externalize, and which markets that private agents choose to enter, could reflect a ”make or buy”-decision. Tasks which are easier to specify and regulate contractually are more likely to be privatized, whereas more complicated tasks may remain within the public's ”firm boundary” (Grossman and Hart 1986).

Treating privatization as a firm boundary problem could yield interesting and politically salient insights relating to the ”make or buy”-problems faced by public principals in many topics. Such findings should have high political relevance in the contested political discourse over the pro's and con's of privatization.

Second, we note in figure 4 that concentration is on average much higher for nurses than fore care workers. Thus, the relatively small concentration elasticities on wages and incomes among care workers might suggest that there are a decreasing returns to reducing employer concentration. The figure also reveals limitations to the data sets used within. Figure 1 reveals that the largest increases of privatization occurred between 1993 and 2000, but my data set is limited to the post-2002 period.

Third, the inconsistency between private and public wages, working percentages, and incomes not only reflect possible data problems in the Wage Structure Statistics. It may also reveal material differences in private and public collective agreements. For example, if regulations in private and public collective agreements differ in terms of when or how overtime pay is applicable, or if transportation to and from clients is compensated, then achieving a full-time equivalent wage in private sector employment is less likely than in public sector employment, where such provisions are perhaps more generous in the collective agreements. Differences in both the wage and terms and conditions provisions in the respective collective agreements are therefore important and interesting subjects for future research.

In conclusion, the study yields results which may be counter-intuitive from an economists perspective; adding more outside options may not always improve the wage bargain. Labor shortages in welfare services are and have long been endemic, in Sweden and elsewhere (World Health Organization 2020). Labor shortage problems appear to have gotten worse after the Covid19-pandemic. If these labor markets are signified by monopsonistic competition, the labor shortage may be traced to the employer paying below market wages. Young people choosing careers may find welfare occupations less and less attractive, if outside options in occupations outside of welfare services increasingly offer better wages, benefits, and working conditions. The amenities received from being an essential worker in a meaningful job may then become less and less appetizing when considering career paths. However, improving wages by adding more private *exit* options to these labor markets does not appear to have improved the wage bargain by much for nurses and care workers over the past 20 years, who by some margin are the largest occupation groups in the welfare sector. The labor shortage remains and it is likely explained by outcomes reflecting bargaining power differentials. Privatization is no panacea to leveling the bargaining asymmetries resulting from monopsonistic competition in welfare labor markets.

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Appendix Paper IV

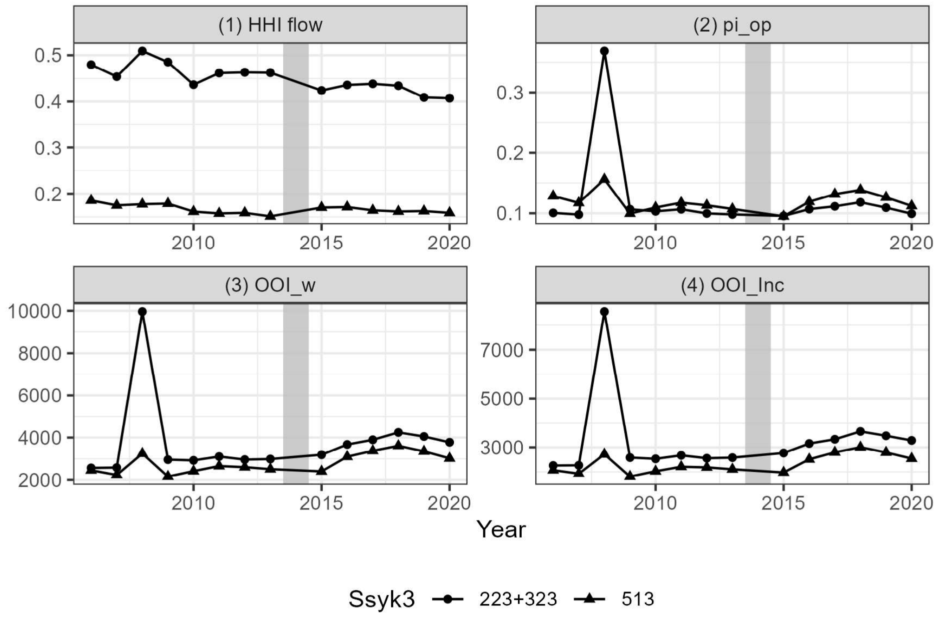

Figure 8: The figure shows developments in outside option paramters for the two occupation groups used in this study (nurses: Ssyk3-code 223+323; care workers 513) between 2006 and 2020 from Söderqvist and Eklund (2024). The values represent weighted averages of Ssyk4-occupations, which make the values comparable to Söderqvist and Eklund. "(1) HHI flow" Captures the mean Herfindahl-Hirschman Index over time as employer concentration on hires, "(2) pi_op" the mean probability of the observed groups changing occupations between years, "(3) OOI_w" the Outside Occupation Index of gross wages, and "(4) OOI_y" the Outside Occupation Index on gross incomes from the primary employer. Ssyk3 codes use the Ssyk96 standard, using Yakymovych (2022) crosswalk for Ssyk2012-standard values from 2014 and onward. 2014 is censored in the diagram and omitted from the analysis (see Söderqvist and Eklund for motivation).