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The Effects of the Decentralization of Collective Bargaining on Wages and Wage Dispersion:

EVIDENCE FROM THE FINNISH FOREST AND IT INDUSTRIES

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Abstract

Recently, Finnish forest industries shifted from sectoral collective bargaining to firm-level bargaining, and the IT services industry shifted to a hybrid of sector- and firm-level bargaining.

Using administrative data on monthly wages and the synthetic difference-in-differences method, I study the causal effects of collective bargaining decentralization on the level and dispersion of wages. Despite the substantial change in the level of collective bargaining, I generally find muted effects on the level and dispersion of wages. I find positive and economically and statistically significant effects on wage levels and within-firm wage dispersion only for blue-collar workers in the paper industry.

The results are, in many respects, similar to those reported previously, especially by studies using credible designs. A possible explanation for the modest changes in the level and dispersion of wages is that employers still face fairly strong unions. Unions also have substantial bargaining power locally, which limits the scope of changes due to bargaining decentralization. It should also be noted that these results are short-term results and long-term results may be different.

Tiivistelmä

Neuvottelujärjestelmän hajautumisen vaikutus palkkojen tasoon ja niiden hajontaan: tuloksia metsäteollisuudesta ja ohjelmistoalalta

Metsäteollisuus siirtyi äskettäin liittokohtaisesta sopimisesta yrityskohtaiseen sopimiseen ja ohjelmistoala siirtyi hybridimalliin, jossa alalla on yhtä aikaa valtakunnallinen työehtosopimus ja yrityskohtaisia sopimuksia.

Tutkin tämän neuvottelujärjestelmän hajautumisen vaikutusta palkkojen tasoon ja niiden hajontaan hyödyntäen tulorekisteriä ja synthetic difference-in-differences -menetelmää. Huolimatta siitä, että työehtosopimusjärjestelmässä tapahtui merkittävä muutos, havaitsen vain vähäisiä vaikutuksia palkkojen tasoon ja niiden hajontaan. Ainoastaan paperiteollisuuden työntekijöille havaitsen pienen positiivisen ja tilastollisesti merkitsevän vaikutuksen palkkojen tasoon ja niiden hajontaan yritysten sisällä.

Tulokset ovat samankaltaisia kuin aiemmassa kirjallisuudessa, erityisesti kun verrataan tutkimuksiin, joissa on samankaltainen tutkimusasetelma. Eräs mahdollinen selitys havaituille vaikutuksille on se, että työnantajat kohtaavat yrityskohtaisestikin vahvat ammattiliitot. Ammattiliitoilla on neuvotteluvoimaa myös paikallisesti, ja se rajoittaa yrityskohtaisen sopimisen edellytyksiä muuttaa työsuhteen ehtoja. On myös huomattava, että nämä tulokset ovat lyhyen aikavälin tuloksia. Pidemmällä aikavälillä tulokset voivat olla toisenlaisia.

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Keywords: Collective bargaining, Decentralization, Local bargaining, Wage dispersion

Asiasanat: Työehtosopimukset, Neuvottelujärjestelmän hajautuminen, Paikallinen sopiminen, Palkkahajonta

JEL: J31, J52, J53

Introduction

In October 2020, the Finnish forestry sector announced that it would abandon the sectoral collective bargaining system and move to firm-level bargaining. This represented a drastic change, breaking with the long tradition of sectoral bargaining in Finland and ending generally binding collective agreements in this sector. Moreover, the old contracts were not extended to cover the period before new contracts were signed (no ultra-activity). These changes meant that all issues previously covered by sectoral agreements would now be negotiated at the firm level, which could lead to notable contract changes. In March 2021, technology industries followed suit, announcing that they would move to a hybrid model of sector- and firm-level bargaining.

These developments are an example of collective bargaining decentralization, which has been taking place in most European countries over the past few decades (Visser 2016). Decentralization can take several forms, depending on the institutional setting. Traxler (1995) considers decentralization to be organized when it occurs within a sectoral bargaining system. Examples of organized decentralization are the opening clauses that are prevalent in German collective agreements (e.g. Ellguth et al. 2014) and the Scandinavian two-tiered bargaining models (Barth et al. 2014). In Traxler's terminology, disorganized decentralization refers to cases in which bargaining shifts to the firm level, with sectoral agreements playing no role. This is the case examined in this study.

Several studies have assessed the impacts of increasing decentralization on the level and dispersion of wages. Theoretically, the effects are unclear. On the one hand, decentralization may increase wage dispersion because the bargained wages reflect more firm- and individual-level factors (Dahl et al. 2013). On the other hand, the preferences and bargaining power of the parties involved also influence the impact of decentralization on wage dispersion (Dell'Aringa and Pagani 2007). Decentralization may affect the level of wages if the parties' bargaining power differs at the sectoral and firm levels. For example, firm-level bargaining may lead to lower wages if trade unions have less bargaining power at the firm level than at the sector level. However, in many countries (for example, Belgium), firm-level bargaining may only increase wages relative to sectoral agreements.

The impact of decentralization on the level and dispersion of wages is ultimately an empirical question. Studies have shown that decentralization is associated with higher wages, but the

findings on wage dispersion are mixed (see the next section for a more detailed literature review). Despite the substantial body of relevant literature, many open questions remain. One central issue is the difficulty of establishing causality in this line of research. Many studies (e.g., Canal Domínguez and Gutiérrez 2004, Card and de la Rica 2006, Plasman et al. 2007) have used cross-sectional data, which does not allow clean identification of the impact of decentralization.

More recent studies have used panel fixed-effects methods (Dahl et al. 2013, Gürtzgen 2016, Addison et al. 2017). However, these studies have also had difficulty establishing causality. First, different pre-trends of treated and control units pose a threat to identification. For example, in Germany, firms can choose industry-level bargaining, firm-level bargaining, or no bargaining at all, and their choices may depend on their financial success (Gürtzgen 2016). Indeed, Gürtzgen (2016) shows that firms abandoning sectoral bargaining had worse wage development before the shift than the control group. Second, these studies have examined settings in which decentralization does not occur at a single point in time; instead, units are treated at different points in time (staggered adoption) and may revert to the control state. These features and the likely heterogeneity in treatment effects mean that two-way fixed-effects methods cannot identify average treatment effects (de Chaisemartin and d'Haultfoeuille 2020, Callaway and Sant'Anna 2021, Goodman-Bacon 2021, Sun and Abraham 2021, Baker et al. 2022).

Another key issue is that the likely impact of decentralization depends heavily on the institutional framework. For example, its impact on wage levels depends crucially on its form. In Germany, the increasing prevalence of opening clauses may lead to lower wages, whereas in Belgium, the increased prevalence of firm-level bargaining can only increase wages relative to sectoral agreements. In Spain, firm-level bargaining is associated with a stronger union presence than sectoral bargaining, which may lead to lower wage dispersion under firm-level bargaining (Plasman et al. 2007). This heterogeneity in the forms of decentralization partly explains the conflicting empirical results reported in the literature.

This study contributes to the literature on the impacts of decentralization by studying Finnish industries that have decentralized their collective bargaining systems. I use monthly administrative data covering the entire Finnish workforce and employ a synthetic difference-in-differences method (Arkhangelsky et al. 2021) to study the causal effect of decentralization on the level of wages and on the wage dispersion within and between firms.

This study differs from prior studies in that it examines a recent and clean event of collective agreement system decentralization in some sectors. A considerable part of the literature has used data from the 1990s or early 2000s and has examined settings in which firms are able to move between different bargaining levels. A setting in which large sectors move from sectoral to firm-level bargaining is unique in the literature and arguably represents a more substantial change in the collective bargaining system than those typically studied previously. The institutional change is such that extensive changes in the content of contracts are possible. The setting in question and the data and methods that I use allow more credible estimates of the impacts of decentralization than previously reported.

Related literature

The extant literature has mostly used cross-sectional individual-level data to study the association between collective bargaining decentralization and wages. Several studies have examined single-employer versus multiemployer bargaining in Spain. Using the 1995 wage structure survey, Card and de la Rica (2006) and Canal Domínguez and Gutiérrez (2004) find that single-employer bargaining is associated with higher wages than multiemployer bargaining. The difference is in the range of 5%–10%. Canal Domínguez and Gutiérrez (2004) also find that wage dispersion is lower under single-employer bargaining. Similarly, using the 1995 European Structure of Earnings Survey, Plasman et al. (2007) find that single-employer bargaining is associated with higher earnings in Denmark, Spain, and Belgium. The differences are 3%–4%. Using the same data, Dell'Aringa and Pagani (2007) study the association between collective bargaining decentralization and wage dispersion and find that the results are mixed in Spain, predominantly negative in Belgium, and slightly negative in Italy. Fitzenberger et al. (2013) use the 2001 German Structure of Earnings Survey and find that collective bargaining at both the firm and industry levels is associated with higher wages. A simple comparison between firm- and industry-level bargaining shows that wages are higher when bargained at the firm level.[1] Thus, previous studies using cross-sectional data have concluded that decentralized bargaining is associated with higher earnings. However, the results concerning wage dispersion are mixed.

The problem with cross-sectional data is that it is very difficult to establish causality. For this reason, more recent studies have used panel data. Using linked employer–employee panel data,

[1] Table 2, column 1 in Fitzenberger et al. (2013).

Dahl et al. (2013) examine the decentralization of collective bargaining in Denmark over the period 1992–2001, during which industries' wage-setting systems were decentralized. They classify collective agreements into three categories: 1. industry-level contracts, 2. two-tiered contracts (industry- and firm-level bargaining), and 3. pure firm-level bargaining. They identify the effects of decentralization using a panel regression that includes job spell dummies. Thus, the identification is based on changes in the type of collective agreement within a job spell. They find that decentralization increases wages by about 5% and that it also increases wage dispersion.

Also using linked employer–employee panel data, Gürtzgen (2016) studies decentralization in settings in which firms change their collective bargaining status in Germany. She classifies collective agreements into three categories: 1. industry-level contracts, 2. firm-level contracts, and 3. no contract. Her regression model includes both firm and individual fixed effects, which means that the effects are identified based on the variation in collective bargaining status within a job spell. The results show that collective bargaining status does not affect wages.[2] The estimated magnitudes are close to zero and statistically nonsignificant. However, while these two studies represent a clear improvement over studies using cross-sectional data, they do not necessarily identify causal effects either. This is because in both studies, industries or firms decentralize at different time points. Moreover, recent research has shown that fixed-effects regression models do not necessarily identify treatment effects in this case (de Chaisemartin and d'Haultfoeuille 2020, Callaway and Sant'Anna 2021, Goodman-Bacon 2021, Sun and Abraham 2021, Baker et al. 2022).

Overall, based on the extant literature, it can be said that decentralization is associated with higher—but not necessarily considerably higher—wages, whereas the findings concerning wage dispersion are mixed.

Institutional setting

In Finland, collective bargaining takes place at the sectoral level, and the parties involved are employer federations and trade unions. Collective agreements cover, for example, wage formation, working times, holidays, social provisions, and parental leave (e.g., Jonker-Hoffrén 2019).

[2] Table 2, column 3.

The contracts are often extended to non-signatory parties. The decision to extend a contract is made by an independent committee that operates under the Ministry of Social Affairs and Health. Although there are no strict extension criteria, the decisive factor is the coverage of a contract. Typically, a contract is extended if it covers at least 50% of the employees in a sector (see Jonker-Hoffrén 2019 for more details). The coverage of collective agreements is about 90%.

The Finnish collective bargaining system has traditionally been quite centralized (e.g., Andersen et al. 2015). From 1968 to 2006, the dominant agreement type was a centralized tripartite collective agreement (the so-called incomes policy or TUPO). Central organizations first negotiated an agreement, and sectoral organizations then decided whether to follow it. The government often made its tax and social policies conditional on the coverage of collective agreements. The centralized bargaining rounds meant that wage increases were very similar across sectors. Occasionally, there were also purely sectoral bargaining rounds. This happened when some sectors did not accept a centralized collective agreement and decided to negotiate themselves. The typical contract duration was about two years.

In 2007, the Confederation of Finnish Industries (EK) announced that it would no longer participate in centralized bargaining (Andersen et al. 2015, p. 144). Its aim was a pattern bargaining model led by the export sector. In the 2007–2008 and 2009–2010 bargaining rounds, the negotiations took place at the sectoral level. In 2007–2008, the pattern bargaining model failed, and wage increases became higher later in the round. In hindsight, these increases were too high, given that the 2008 financial crisis ensued soon after the negotiations. In 2009–2010, the economic environment in the wake of the financial crisis was different, and wage increases were low—about 1% per year. However, the competitiveness problem caused by the prior bargaining round persisted.

In 2011, a national centralized agreement provided guidelines for industry-level bargaining (the so-called Framework Agreement). This was similar in flavor to prior incomes policy agreements. Jonker-Hoffrén (2019) calls this and the following two agreements "new centralized agreements." Another national centralized agreement, called the Pact for Employment and Growth, followed in 2013. This agreement attempted to solve the competitiveness problem created by the high wage increases of the 2007–2008 bargaining round and stipulated very low wage increases.[3] In 2016,

[3] €20 + 0.4% after 12 months (24-month period), or €16 or at least 0.43% (12-month period).

the so-called Competitiveness Pact extended this agreement with no wage increases. It also extended working times (by about 24 hours per year), shifted part of the social contributions from the employer to the employees, and cut public sector holiday pay by 30% for three years.

The “new centralized agreements” came to an end in 2017, when EK changed its rules so that it could not negotiate contracts for its members. This decision led to two industry bargaining rounds in 2017–2018 and 2019–2020 characterized by pattern bargaining in which the export sector contracts set the wage norm. This pattern bargaining took place with no formal agreements or guidelines (Jonker-Hoffrén 2019, p. 202).

The Finnish system of collective bargaining has left very little room for firm-level contracts or other forms of decentralization. The main form of decentralization has been the so-called local pots. These are wage increases negotiated and implemented locally according to the rules set in sectoral collective agreements. Their prevalence has varied over time and across industries (see Kauhanen et al. 2020 for more details and analysis). Employers have wished for more decentralized bargaining since at least the beginning of the millennium (Heikkilä and Piekkola 2005, Pekkarinen and Alho 2005). However, as seen above, the collective bargaining system has not evolved as employers would have liked. This led some sectors to abandon the sectoral bargaining system in late 2020.

Developments in 2020–2021

In October 2020, the Finnish Forest Industries Federation (FFIF) announced that it would not continue sectoral bargaining when the running contracts expired (December 31, 2021, in the paper industry and February 28, 2022 in the mechanical forest industry). This meant that the sector would shift to firm-level bargaining with no generally binding collective agreement. This was a notable announcement since the forest sector is a major industry in the Finnish economy. In 2020, it accounted for 1.9% of the Finnish GDP and 17.9% of exported goods and employed about 40 000 people.

The FFIF’s shift to firm-level bargaining was unexpected, and even other employer associations were unaware of its plans. The Finnish Paper Workers’ Union (the blue-collar workers’ union in the paper industry), the Finnish Industrial Union (the blue-collar workers’ union in the mechanical forest industry), and the Trade Union Pro (the white-collar workers’ union in both sectors) condemned the decision. Nevertheless, firm-level negotiations started, and the first firm-level

contracts were signed in October 2021 and came into force at the beginning of 2022. Subsequently, many firms in the paper and mechanical forest industries signed firm-level collective agreements. This is not to say that all negotiations went smoothly. UPM, one of the largest firms operating in both the paper and mechanical forest industries, signed contracts for its subsidiaries in the mechanical forest industry well before the running contracts expired, but in its paper industry subsidiaries, strikes lasting almost four months started on January 1, 2022. Eventually contracts were signed also for these subsidiaries.

In March 2021, the Technology Industries of Finland also announced that they would move to a hybrid model of sector- and firm-level bargaining.[4] However, their decision differed markedly from that of the forest sector in that they created a new organization that would negotiate sectoral collective agreements. In principle, this meant that firms could choose between firm- and sector-level contracts. However, if sectoral contracts were deemed generally binding, the scope of firm-level contracts was narrowed, as they could not go below the levels stipulated in the sectoral agreement. Thus, if many firms chose the generally binding sectoral contracts, the changes would be minimal compared to the previous system.

Technology industries have different contracts for manufacturing (the largest in terms of employment), metal ore mining, IT services, and consulting services. The contracts in these industries expired at the end of November 2021. In manufacturing, consulting, and mining, new sectoral collective agreements were signed in January 2022. The contracts covered such a large share of employees in these sectors that they became generally binding. Thus, the collective agreement system in these sectors was not decentralized. Conversely, in IT services, the sectoral agreement did not become generally binding, and many firms negotiated firm-level agreements. To summarize, the collective bargaining system was substantially decentralized in three industries: the paper industry, the mechanical forest industry, and IT services.

Data

The main data set used in this study is the Incomes Register from Statistics Finland.[5] The Incomes Register is a national database maintained by the Finnish Tax Authority. It contains information on

[4] https://teknologiateollisuus.fi/en/ajankohtaista/press-release/technology-industries-finlands-activities-be-divided-between-two

[5] https://www.vero.fi/en/incomes-register/about-us/
https://taika.stat.fi/fi/aineistokuvaus.html#!?dataid=TAX_INCOMES_jua_delivery_002.xml

wages, pensions, and benefits. Information on wages is available as of January 2019. Due to their nature, these data are accurate and reliable. The register also contains unique person and firm identifiers, which makes it possible to follow individuals and firms over time. The data are released for research purposes at monthly frequency.

I aggregate the data to the industry level or the industry × worker (blue- or white-collar) group level for the analyses. I use Statistics Finland's Standard Industrial Classification TOL 2008 and perform the aggregation at the two-digit level (78 industries), at which the extensions of collective agreements are typically defined. Because blue- and white-collar workers have different collective agreements in the manufacturing industries, I perform the aggregation separately for these two groups. In the IT industry separation between blue- and white-collar employees is not needed, since there is only one collective agreement. I define blue- and white-collar workers as employees falling under Statistics Finland's National Classification of Occupations categories 5–9 and 1–4, respectively.[6]

The wage concept that I use is the total amount of wages. This includes all taxable earnings from an employment relationship.[7] The main dependent variable is the average wage in an industry. I also study the standard deviation of wages and decompose the industry-level standard deviation to within- and between-firm components[8] to examine whether firm-level bargaining affects wage dispersion within firms (e.g., by affecting the wage structure) and between firms (by affecting how a firm's economic performance is reflected in wages).

Treatment and control groups

The treatment groups are the paper industry (TOL 17), the mechanical forest industry (16), and IT services (62 and 63, except 639). The control group consists of all non-treated industries except industries 31 and 32. I exclude the manufacturing of furniture (31) and other manufacturing industries (32) from the analyses because they used to have two generally binding collective agreements—one with the Technology Industries of Finland and one with the FFIF—and the impact of the FFIF's decision to switch to firm-level bargaining on these industries is unclear. I also

[6] This classification is based on the International Standard Classification of Occupations ISCO-08.
[7] Wages can be reported to the Incomes Register either as total amounts or in an itemized manner. In the case of itemized reporting, I add up the different items to obtain the total amounts. More details can be found at https://www.vero.fi/en/incomes-register/companies-and-organisations/detailed-guidance/62696/reporting-data-to-the-incomes-register-monetary-wages-and-items-deducted-from-wages5/#1.1-wage-concept.
[8] I calculate standard deviations on a monthly basis and perform the decomposition using the Stata command xtsum.

exclude programming and broadcasting activities (60) and gambling and betting activities (92) from the analyses of blue-collar workers due to the small number of such workers in these industries. The treatment periods start in January 2022 for the paper industry, March 2022 for the mechanical forest industry, and December 2021 for IT services.

Descriptive statistics

To provide an overview of the magnitudes of the level and dispersion of wages, Table 1 shows the averages of the dependent variables by industry for selected industries. The paper industry stands out in terms of average wage, especially for blue-collar workers, with considerably higher wages than in the other manufacturing industries. The within-firm standard deviations of the total wage are somewhat larger than the between-firm standard deviations in the manufacturing industries, whereas in the service industries the reverse tends to be more common.

Table 1 Descriptive statistics of selected industries

Industry (2-digit code)	Blue-collar workers				White-collar workers			
	Average wage	Between-firm SD	Within-firm SD	N	Average wage	Between-firm SD	Within-firm SD	N
10: Food products	2931	936	1152	21 969	3961	1588	1686	9246
16: Mechanical forest industries	2841	962	1003	12 571	4342	1470	1697	5068
17: Paper and paper products	4607	1237	1335	11 173	5325	1515	2310	7171
22: Rubber and plastic products	3133	911	1005	7511	4601	1548	1886	3831
25: Fabricated metal products	3010	1029	1045	25 308	4245	1541	1619	9779
28: Machinery and equipment	3322	1059	1094	19 074	4955	1664	2068	25 425
49: Land transport and transport via pipelines	3116	1258	1022	46 890	3485	1575	1191	7631
62: Computer programming, consultancy and related activities	2876	2122	1110	703	4930	2103	1922	55 724
63: Information service activities	3017	1804	993	129	4869	2365	2311	4024
69: Legal and accounting activities	1618	1443	906	411	3912	1797	2007	20 169
71: Architectural and engineering activities; technical testing and analysis	3148	1570	1195	3319	4249	1864	1696	36 868

Figure 1 shows the average monthly wages in the treatment industries from January 2019 to January 2023. Wages are higher in the paper industry than in the mechanical forest industry, especially for blue-collar workers. In the paper industry, there are also substantial monthly variations in the average wage. This reflects both the cyclical nature of production and the collective agreement, which stipulates substantial compensation for work during periods such as Christmas holidays and midsummer. Vacation pay also affects the average wage in the summer, as these payments are typically made in June. In IT services, most employees are white-collar workers, which is reflected in the level of wages. Temporal variation is limited and is mostly due to vacation pay.

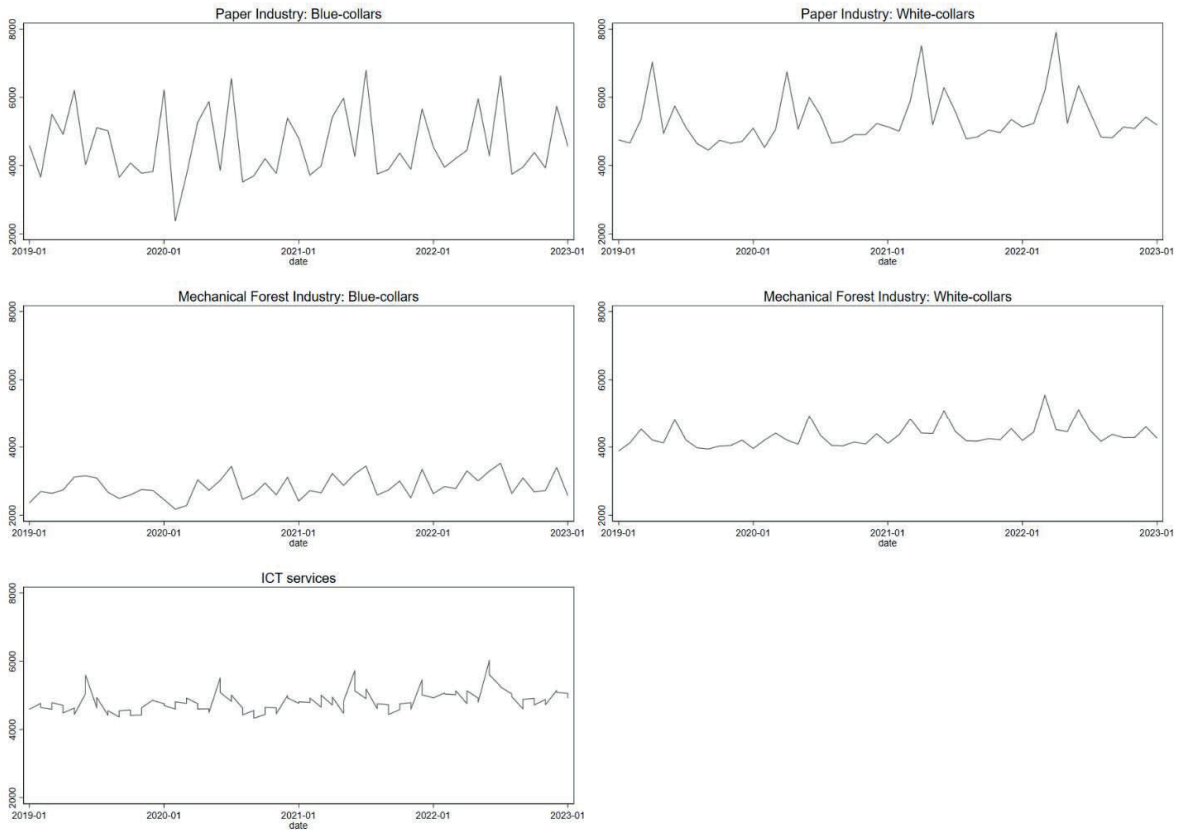

Figure 1 Average monthly wages in the treatment industries from January 2019 to January 2023

Methods

To estimate the causal effects of decentralization, I use the synthetic difference-in-differences method (Arkhangelsky et al. 2021), which generalizes and unifies the difference-in-differences and

synthetic control methods. Like the synthetic control method, it matches the pretreatment trends of treatment and control units, and like the difference-in-differences method, it allows for additive unit-level shifts. Given the few treated industries, many control industries, and relatively many periods included in this study, this method suits the purpose of the analysis.[9]

The synthetic difference-in-differences method estimates the following weighted two-way fixed-effects regression:

$$\left(\hat{\tau}^{sdid}, \hat{\mu}, \hat{\alpha}, \hat{\beta}\right) = \text{argmin}_{\tau\mu,\alpha,\beta}\left\{\sum_{i=1}^{N}\sum_{t=1}^{T}\left(Y_{it} - \mu - \alpha_i - \beta_t - W_{it}\tau\right)^2 \hat{\omega}_i^{sdid}\lambda_t^{sdid}\right\}$$

where Y_{it} is the dependent variable (average wage and within-firm and between-firm standard deviation of wages), α_i is the industry fixed effect, β_t is the time fixed effect, W_{it} is a binary treatment indicator, and τ measures the average causal effect of the treatment. The weight $\hat{\omega}_i^{sdid}$ is intended to balance the pretreatment trends between the treatment and control units, while the weight λ_t^{sdid} is intended to balance the pretreatment and posttreatment periods. Together, these weights make the identifying assumptions needed in difference-in-differences analysis more plausible.

The treatment assignment needs to be a so-called block treatment assignment, in which some units are treated after a given date, while other units remain untreated throughout the period of observation. For this reason, I perform separate analyses for the treated industries since the decentralization of collective bargaining occurs at different time points in different industries. I use the placebo variance estimation to calculate standard errors, which is the only option given that there is only one treated unit per estimation (Arkhangelsky et al. 2021, Algorithm 4). Arkhangelsky et al.'s (2021) simulation studies show good properties, with similar numbers of cross-sectional units and periods to those in my analysis.

Results

Table 2 shows the results for the paper industry[10]. As shown in Panel A, for blue-collar workers, the treatment effect on wages is positive and significant. The effect is €174, which is about 4% of the average wage in the industry. This magnitude is similar to previous estimates (e.g., Dahl et al.

[9] For example, the standard difference-in-differences model requires many treated and control industries for valid inferences, whereas here, there is only one treated industry.
[10] Graphical representations of the results are in the Online Appendix.

2013). In terms of wage dispersion, the effect on the between-firm standard deviation is negative but nonsignificant. Conversely, the effect on the within-firm standard deviation is positive, substantial, and statistically significant. The average within-firm standard deviation is about €1340, and the estimate of €214 can be considered comparatively large. This magnitude is larger than that reported by Addison et al. (2017) for Germany.

Table 2 Synthetic difference-in-differences: paper industry

	Wage level €	Between-firm standard deviation	Within-firm standard deviation
	A. Blue-collar workers		
Treatment Effect	174.134***	−84.800	227.963***
	(58.532)	(112.198)	(48.597)
Observations	3577	3577	3577
	B. White-collar workers		
Treatment Effect	18.336	47.981	71.353
	(241.031)	(116.137)	(214.150)
Observations	3675	3675	3675

Note. The table reports the treatment effects and standard errors estimated using the synthetic difference-in-differences method. * p < 0.1, ** p < 0.05, *** p < 0.01.

Panel B shows the results for white-collar workers. All estimates are smaller than those for blue-collar workers, and none of them are significant. The estimate of the impact on the wage level is small, but the confidence interval is very wide. The effects on between- and within-firm wage dispersion are positive but small in magnitude and imprecisely estimated.

Table 3 shows the results for the mechanical forest industry. As shown in Panel A, the estimated treatment effect on wages is −€29 but not statistically significant. The estimated effects on between- and within-firm wage dispersion are positive, small, and statistically nonsignificant. As shown in panel B, the estimated impact on wages for white-collar workers is larger (€76) but with a substantial confidence interval. Similarly, the effects on wage dispersion between and within firms are positive but statistically nonsignificant.

Table 3 Synthetic difference-in-differences: mechanical forest industry

	Wage level €	Between-firm standard deviation	Within-firm standard deviation
	A. Blue-collar workers		
Treatment Effect	−28.929	37.472	11.289
	(69.935)	(100.379)	(44.314)
Observations	3577	3577	3577
	B. White-collar workers		
Treatment Effect	76.192	34.251	45.174
	(205.170)	(114.184)	(258.692)
Observations	3675	3675	3675

Note. The table reports the treatment effects and standard errors estimated using the synthetic difference-in-differences method. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table 4 shows the results for IT services. Here, I do not distinguish between blue- and white-collar workers since collective agreements do not make such a distinction. The results again show positive but nonsignificant effects on wage levels and dispersion. The coefficients are quite large in magnitude, but the standard errors are also substantial.

Table 4 Synthetic difference-in-differences: IT services

	Wage level €	Between-firm standard deviation	Within-firm standard deviation
Treatment Effect	158.186	38.449	158.566
	(142.821)	(79.651)	(101.966)
Observations	3724	3724	3724

Note. The table reports the treatment effects and standard errors estimated using the synthetic difference-in-differences method. * p < 0.1, ** p < 0.05, *** p < 0.01.

Overall, the main drawback of the analysis is that the effects are quite imprecisely estimated. This is due to the large monthly variations in the dependent variables in a given industry (this variability can be seen in the figures in the Online Appendix). This inherent variability makes precise effect estimations difficult, at least with the given number of observations.

Conclusion

The decision of the Finnish forestry sector to move from sectoral collective bargaining to firm-level bargaining was drastic, ending the decades-long tradition of sectoral bargaining in Finland. It also prompted the IT service industry to shift to a hybrid model of sector- and firm-level bargaining. I examine how the substantial decentralization of collective bargaining in these sectors affects the level and dispersion of wages. I use monthly administrative data on wages and the synthetic difference-in-differences method. Despite the substantial change in the level of collective bargaining, I generally find muted effects on the level and dispersion of wages. Only for blue-collar workers in the paper industry do I find positive and economically and statistically significant impacts on the level of wages and within-firm wage dispersion.

The results are, in many respects, similar to those reported previously, especially by studies using credible designs. For example, Gürtzgen (2016) finds an economically small and statistically nonsignificant impact of firm-level bargaining on wages, and Addison et al. (2017) find little evidence that abandoning collective bargaining increases within-firm wage dispersion.

A possible explanation for the modest changes in the level and dispersion of wages is that employers still face fairly strong unions. Unions also have substantial bargaining power locally, which limits the scope of changes due to bargaining decentralization. Another potential explanation for the modest impacts observed in this and other recent studies is the role of market pressures: competition in the labor market may make it difficult for firms or even sectors to differentiate their working conditions.

This analysis concerns short-term effects. The long-term effects may differ for several reasons. First, firm-level bargaining makes it easier for firms to develop their own wage policies, which may affect wage formation and thus wage differentials. However, the results of new wage policies will likely take several years to emerge. Second, firm-level bargaining may also lead to productivity gains if firms are better able, for example, to tailor working time arrangements to their needs. Potential productivity gains may affect wage levels, but again, such gains are unlikely to be realized in the short term.

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Online Appendix, not for publication

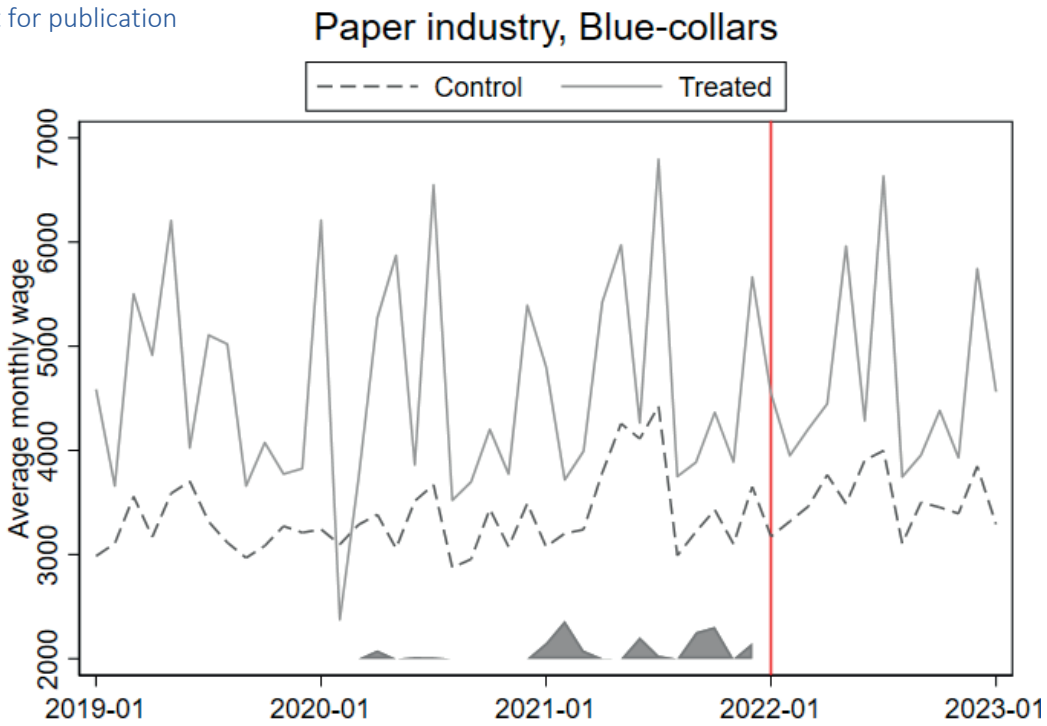

Figure A1 Average monthly wages in the paper industry and weighted average control industries for blue-collar workers

Note. The gray areas show the weights on control periods—that is, the lambda weights in Arkhangelsky et al. (2021).

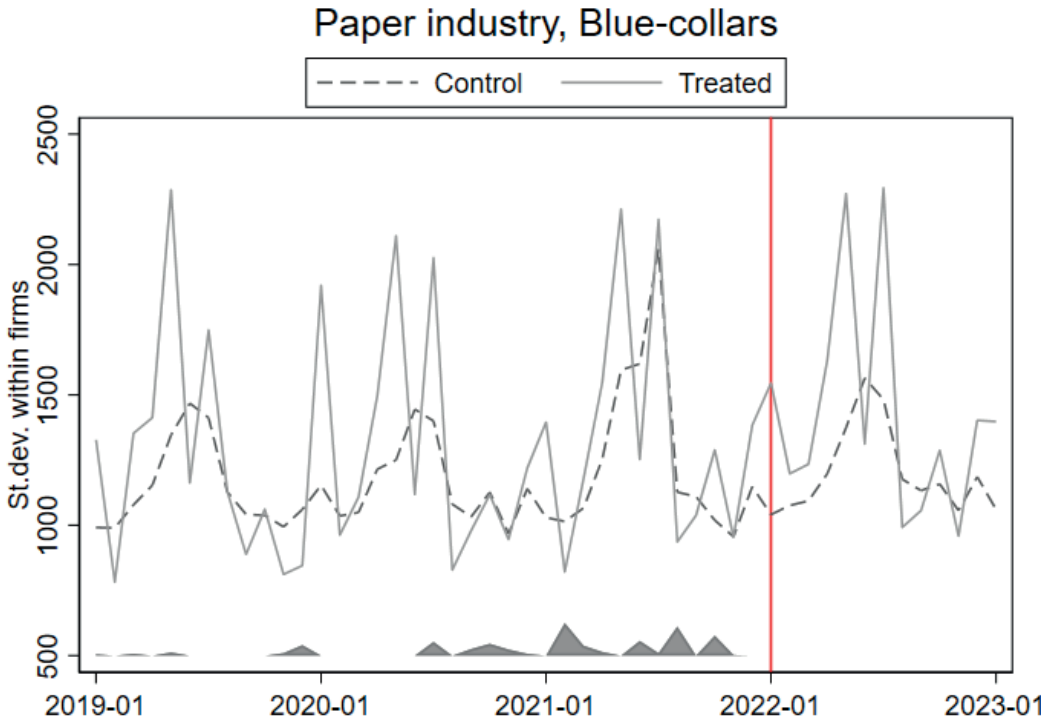

Figure A2 Within-firm standard deviations in the paper industry and weighted average control industries for blue-collar workers

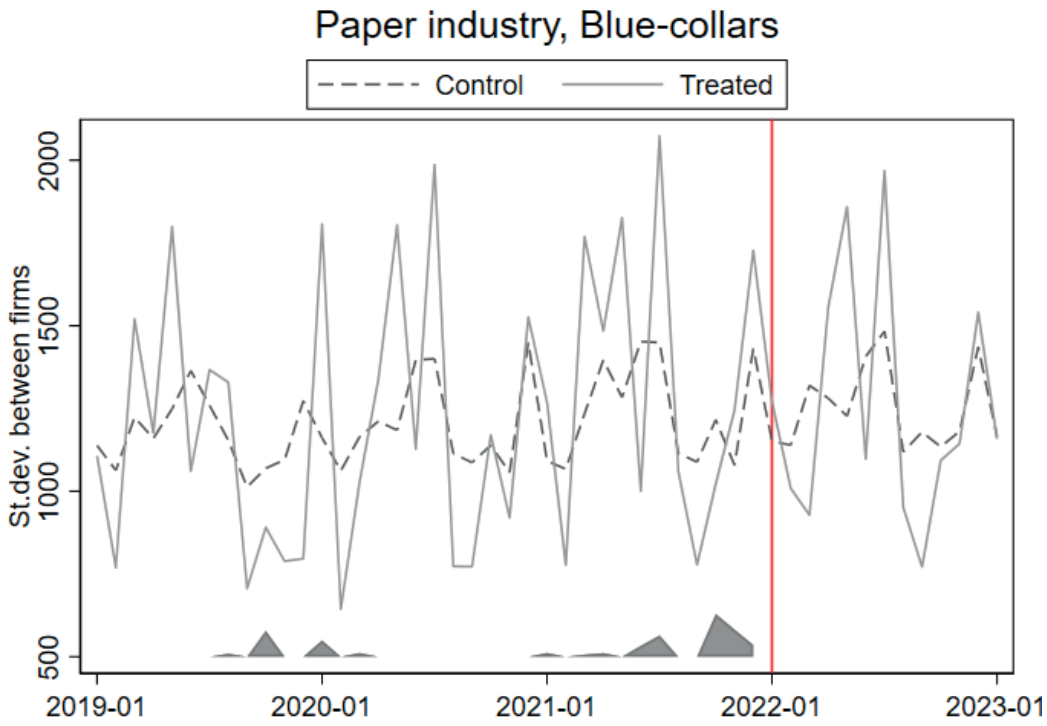

Figure A3 Between-firm standard deviations in the paper industry and weighted average control industries for blue-collar workers

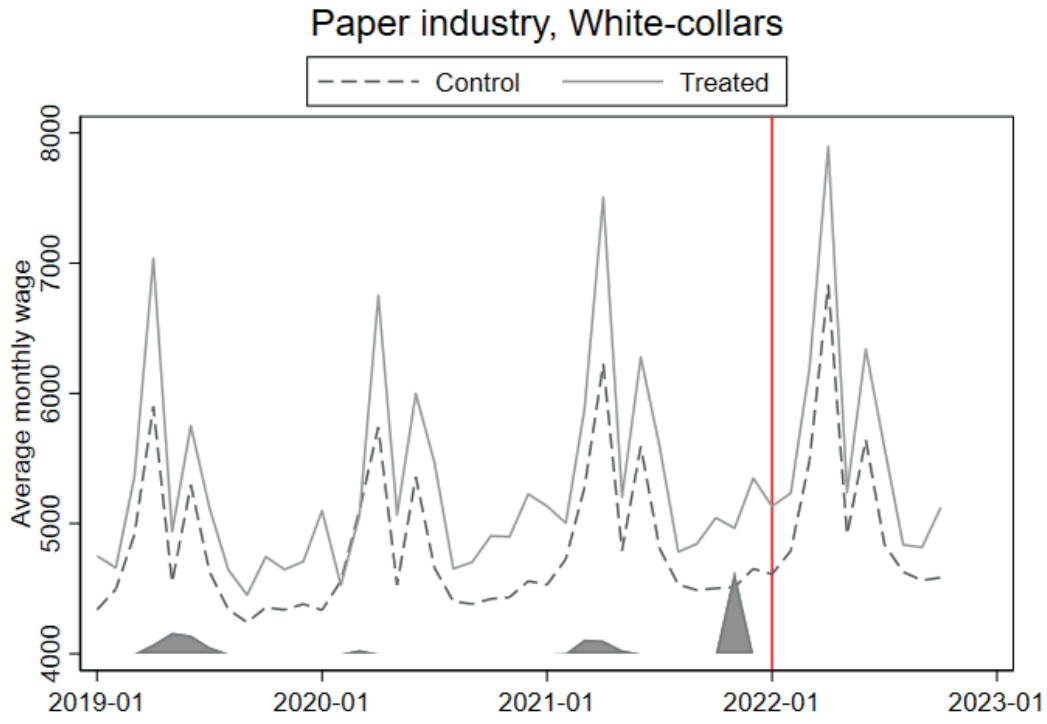

Figure A4 Average monthly wages in the paper industry and weighted average control industries for white-collar workers

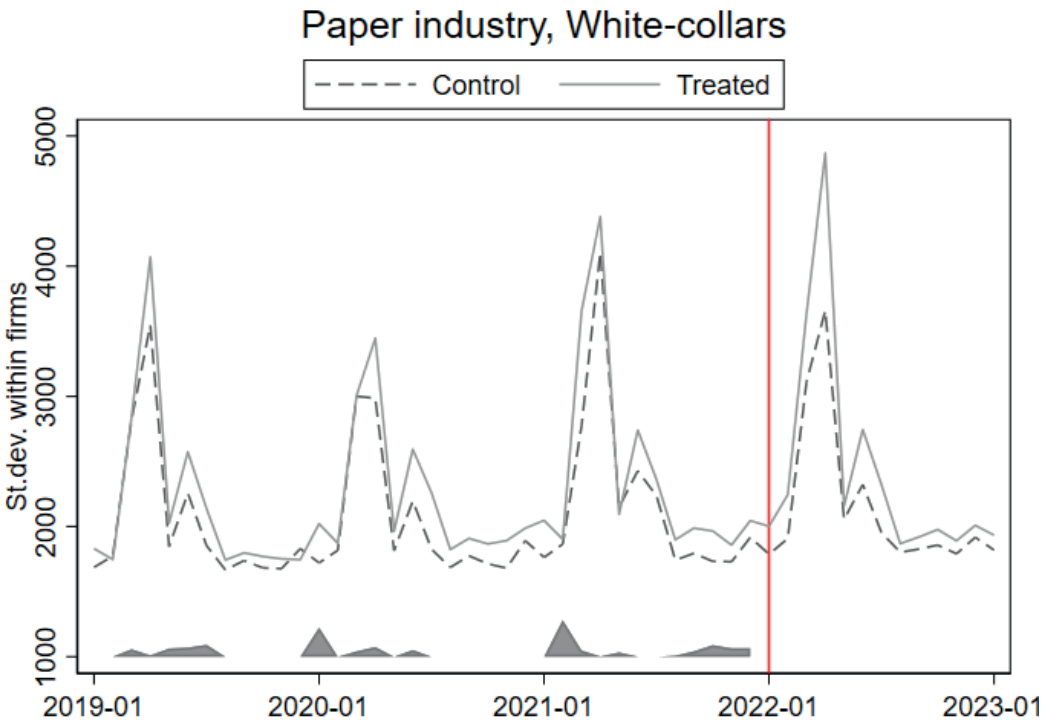

Figure A5 Within-firm standard deviations in the paper industry and weighted average control industries for white-collar workers

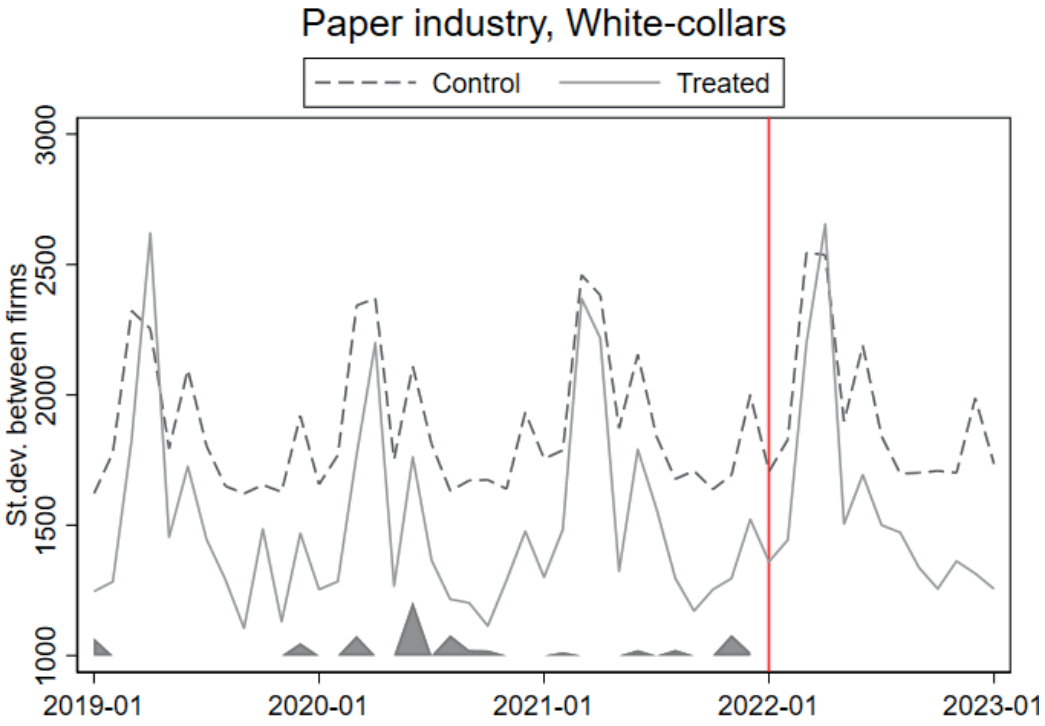

Figure A6 Between-firm standard deviations in the paper industry and weighted average control industries for white-collar workers

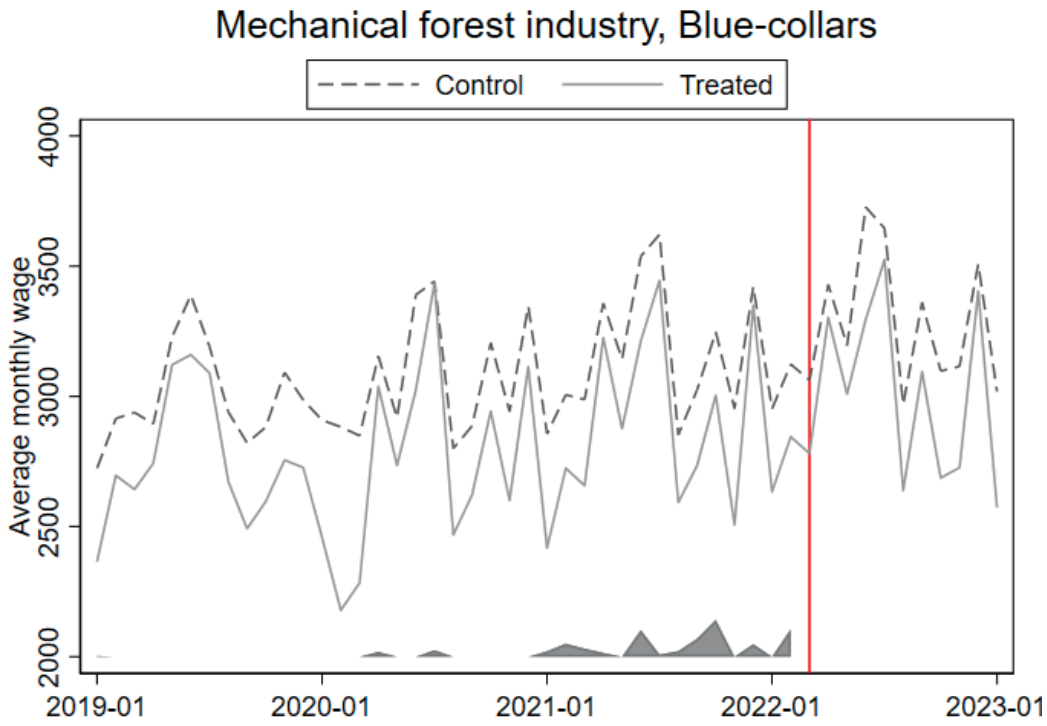

Figure A7 Average monthly wages in the mechanical forest industry and weighted average control industries for blue-collar workers

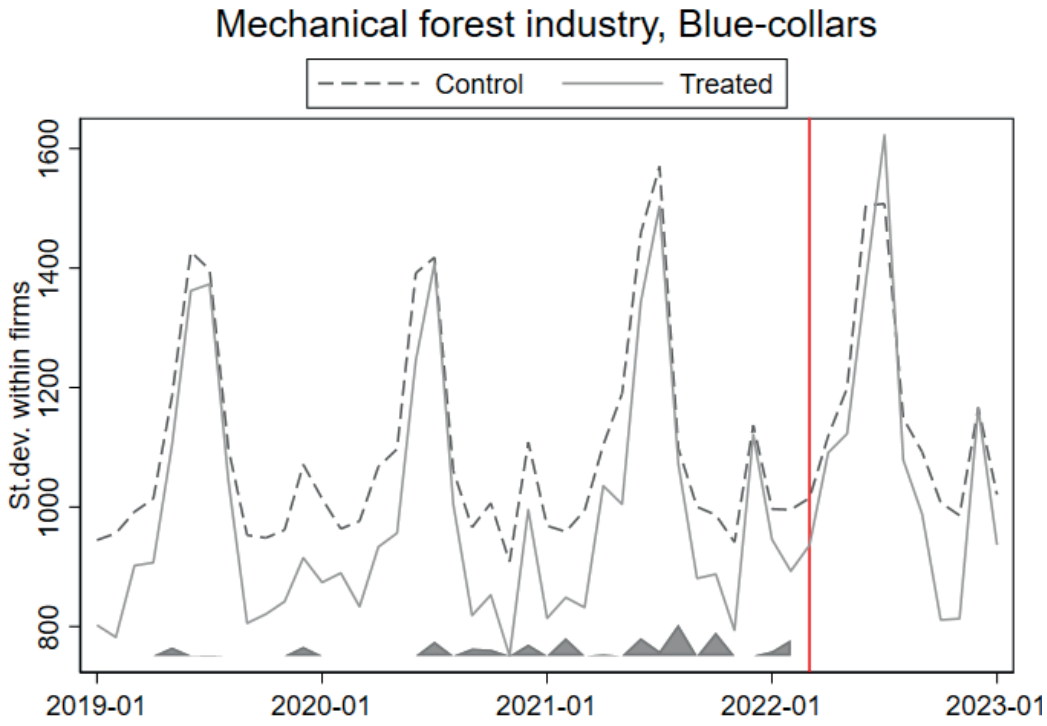

Figure A8 Within-firm standard deviations in the mechanical forest industry and weighted average control industries for blue-collar workers

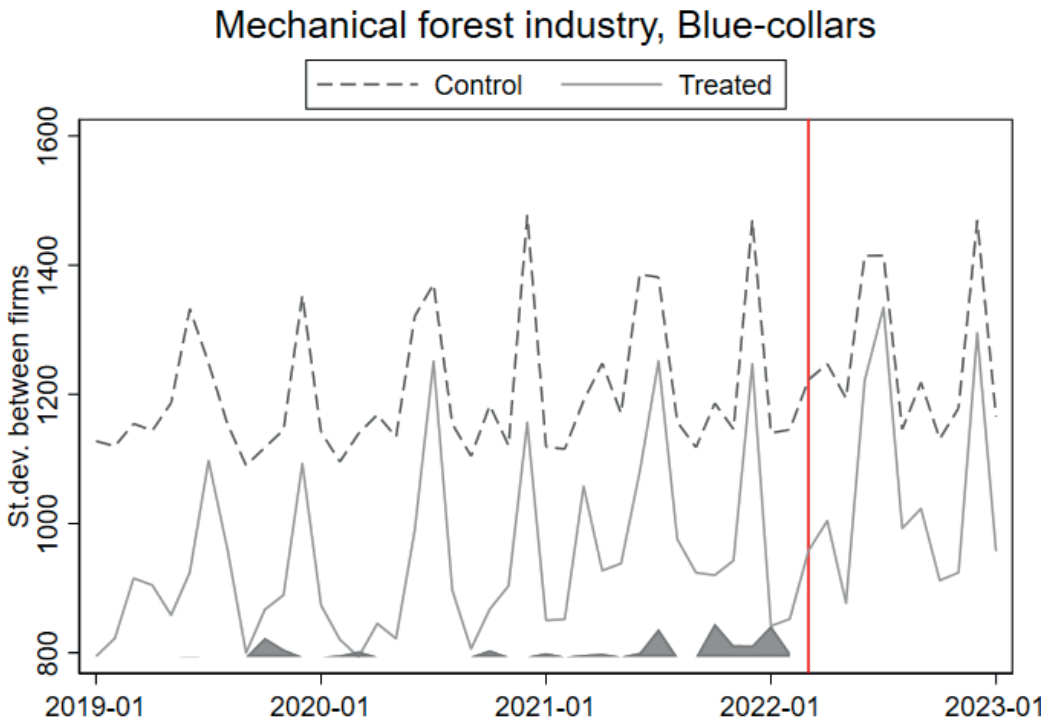

Figure A9 Between-firm standard deviations in the mechanical forest industry and weighted average control industries for blue-collar workers

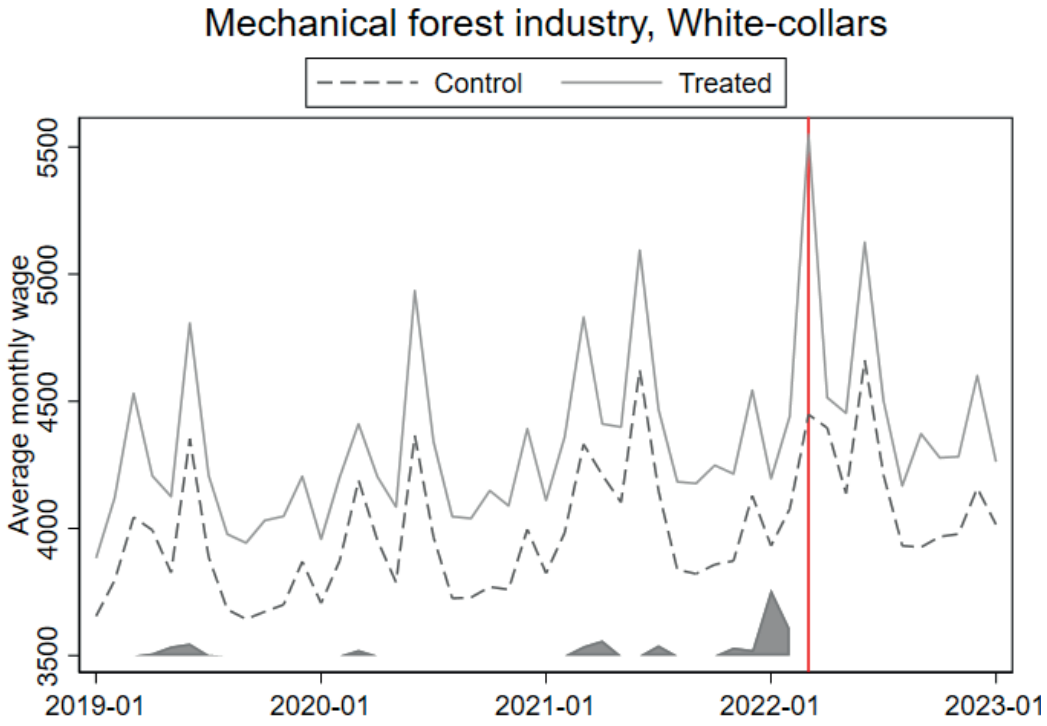

Figure A10 Average monthly wages in the mechanical forest industry and weighted average control industries for white-collar workers

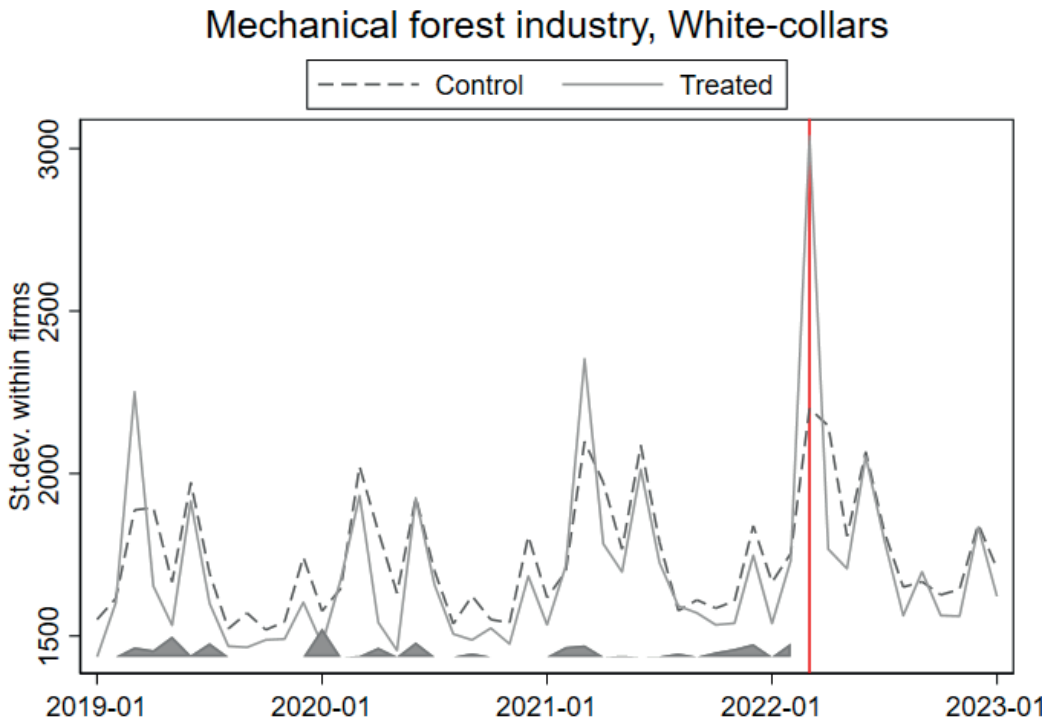

Figure A11 Within-firm standard deviations in the mechanical forest industry and weighted average control industries for white-collar workers

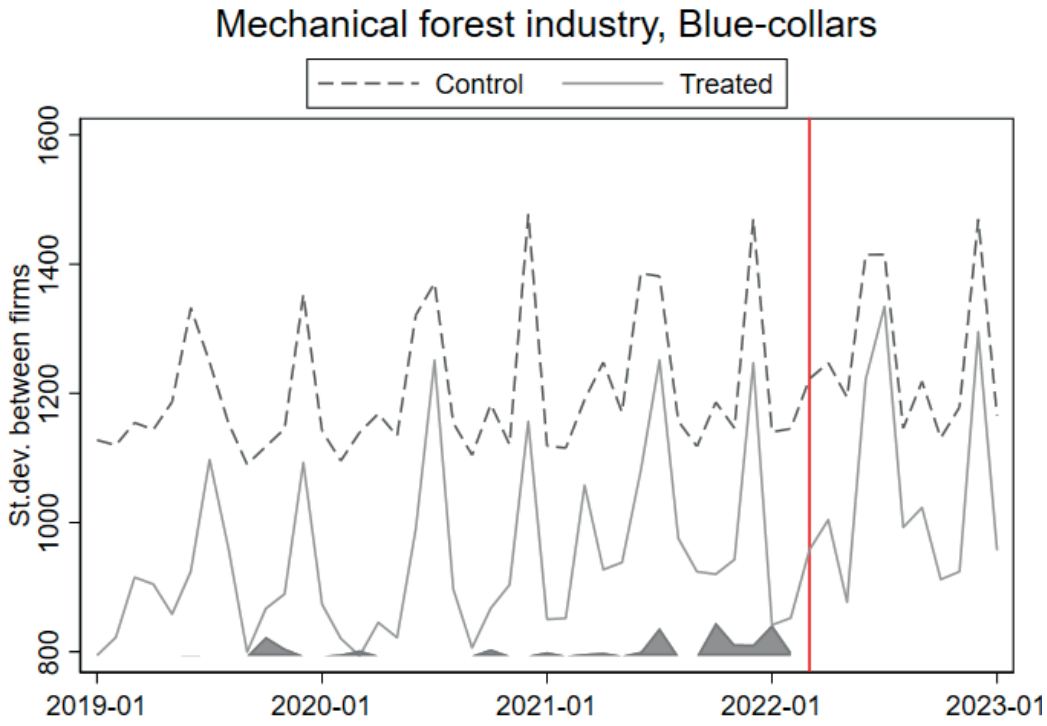

Figure A12 Between-firm standard deviations in the mechanical forest industry and weighted average control industries for white-collar workers

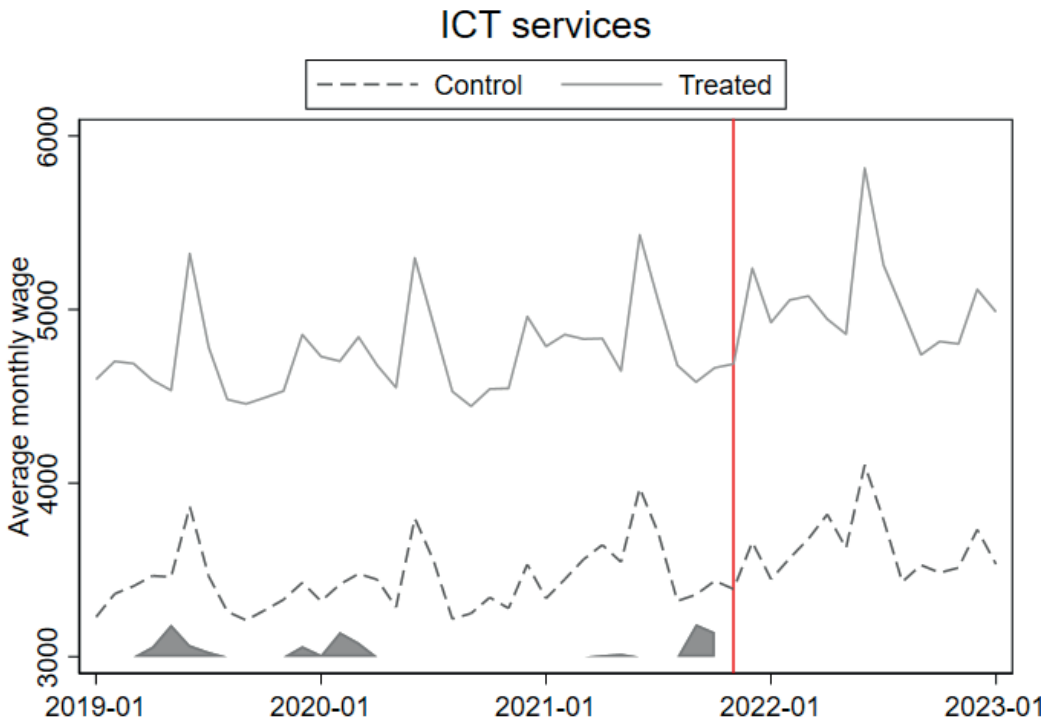

Figure A13 Average monthly wages in IT services and weighted average control industries

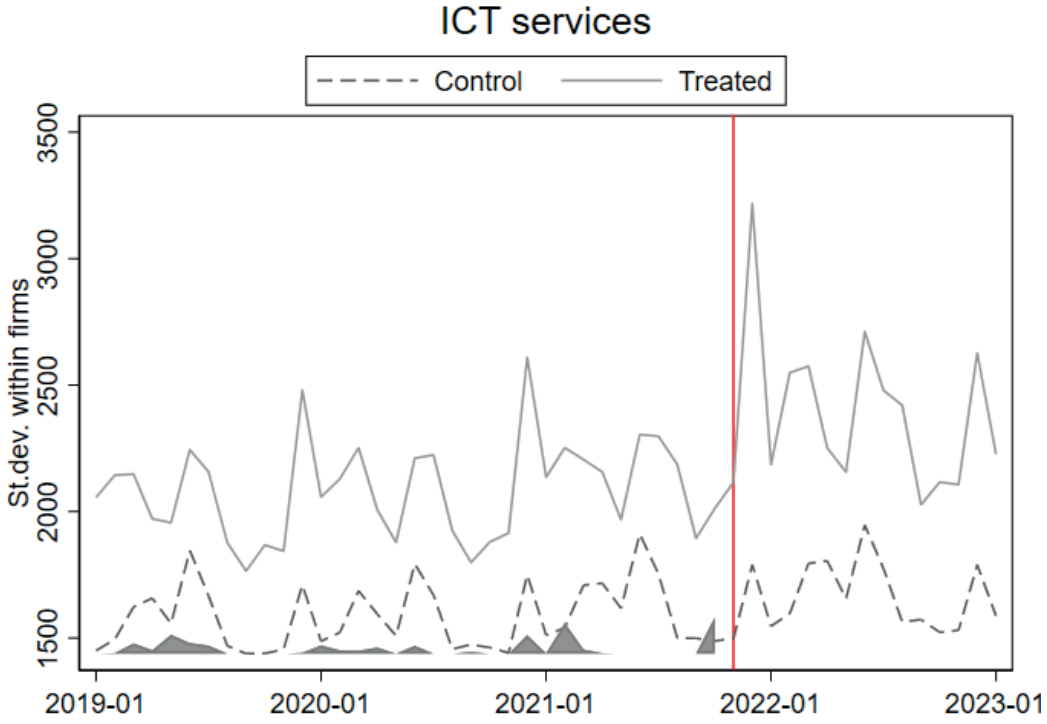

Figure A14 Within-firm standard deviations in IT services and weighted average control industries

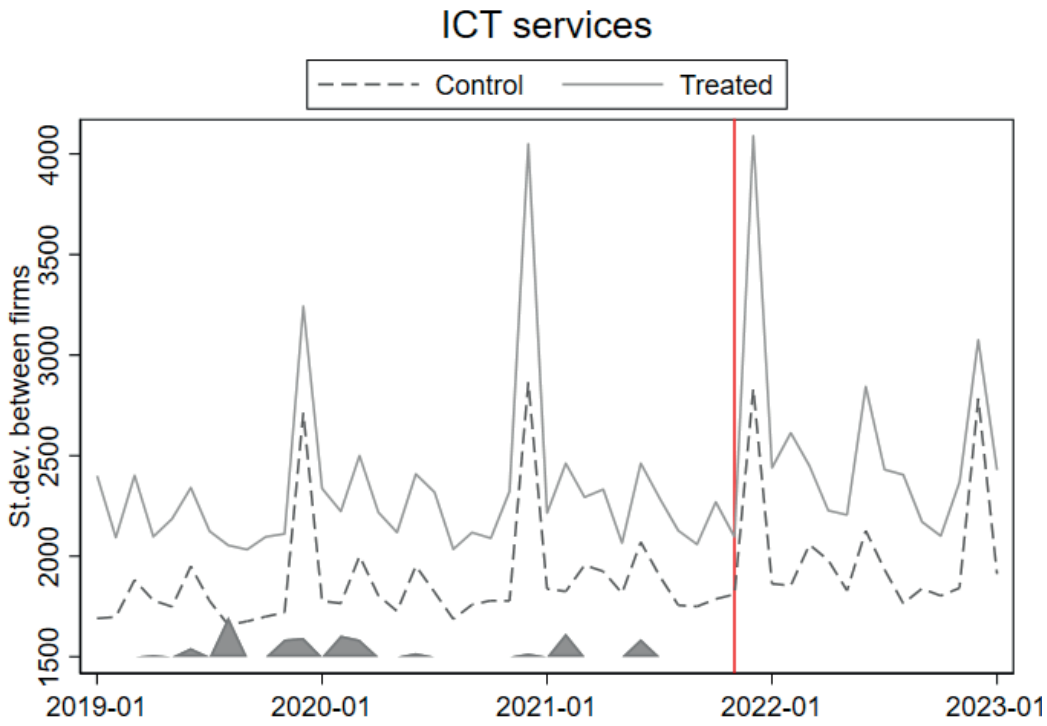

Figure A15

Between-firm standard deviations in IT services and weighted average control industries

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