Online Appendices for

"Outsourcing, Labor Market Frictions, and Employment," by

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A   Conceptual Framework: Details

Proof of Proposition 1

Let $y_p = b/(\pi + (1 - \pi)p)$, $y_q = b/(\pi + (1 - \pi)q)$, and $\bar{y} = b/\pi$.

Suppose $p < q$. There are four cases:

1. Suppose $y_j < y_q$. It is never profitable for the firm to hire a worker.

2. Suppose $y_j \in (y_q, y_p)$. It is never profitable to hire an incumbent or a direct-hire entrant. If the firm hires an outsourced entrant worker, the firm's profit is $\beta\left([\pi + (1 - \pi)q]y_j - b\right) - c$. It is optimal for the firm to outsource if and only if $\beta\left([\pi + (1 - \pi)q]y_j - b\right) > c$.

3. Suppose $y_j \in (y_p, \bar{y})$. Under direct employment, firm j contracts with incumbent worker with $\sigma_{ij} = y_j$ but hires no worker if $\sigma_{ij} = 0$. The firm's profit is $\pi\beta\left([\pi + (1 - \pi)p]y_j - b\right)$. However, under outsourcing, firm i always hires the entrant worker. The firm's profit is $\beta\left([\pi + (1 - \pi)q]y_j - b\right) - c$. It is optimal for the firm to outsource if and only if $\beta\left([\pi + (1 - \pi)q]y_j - b\right) - \pi\beta\left([\pi + (1 - \pi)p]y_j - b\right) > c$.

4. Suppose $y_j > \bar{y}$. Under direct employment, firm j contracts with incumbent worker with $\sigma_{ij} = y_j$ and hires entrant worker if incumbent has signal $\sigma_{ij} = 0$. Under direct employment, firm j's profit is $\pi\beta\left([\pi + (1 - \pi)p]y_j - b\right) + (1 - \pi)\beta\left(\pi y_j - b\right)$. Under outsourcing, firm j's profit is $\beta\left([\pi + (1 - \pi)q]y_j - b\right) - c$. It is optimal for the firm to outsource if and only if $\beta\left([\pi + (1 - \pi)q]y_j - b\right) - \pi\beta\left([\pi + (1 - \pi)p]y_j - b\right) - (1 - \pi)\beta\left(\pi y_j - b\right) > c$.

In this case, as c falls, firms switch to outsourcing, the employment of entrant workers increases, and the employment of total workers increases. The employment of incumbent workers falls.

Now suppose $p > q$. There are four cases:

1. Suppose $y_j < y_p$. It is never profitable for the firm to hire a worker.

2. Suppose $y_j \in (y_p, y_q)$. It is strictly optimal that a firm j contracts with incumbent worker with $\sigma_{ij} = y_j$ and hires no worker otherwise. Under direct employment, the firm's profit is $\pi\beta\left([\pi + (1 - \pi)p]y_j - b\right)$. Under outsourcing, its profit

is $\pi\beta\left(\left[\pi+(1-\pi)\,p\right]y_j-b\right)-c$. It is strictly optimal to directly hire. Suppose $y_j\in(y_q,\bar{y})$. Under direct employment, firm j contracts with incumbent worker with $\sigma_{ij}=y_j$ and hires no worker otherwise. The firm's profit is $\pi\beta\left(\left[\pi+(1-\pi)\,p\right]y_j-b\right)$. However, under outsourcing, the firm contracts with incumbent worker with $\sigma_{ij}=y_j$ and hires an entrant worker otherwise. The firm's profit is $\pi\beta\left(\left[\pi+(1-\pi)\,p\right]y_j-b\right)+(1-\pi)\,\beta\left(\left[\pi+(1-\pi)\,q\right]y_j-b\right)-c$. It is optimal for the firm to outsource if and only if $(1-\pi)\,\beta\left(\left[\pi+(1-\pi)\,q\right]y_j-b\right)>c$.

3. Suppose $y_j>\bar{y}$. Under direct employment, firm j contracts with incumbent worker with $\sigma_{ij}=y_{ij}$ and hires an entrant worker if incumbent has signal $\sigma_{ij}=0$; firm i's profit is $\pi\beta\left(\left[\pi+(1-\pi)\,p\right]y_j-b\right)+(1-\pi)\,\beta\left(\pi y_j-b\right)$. Under outsourcing, firm j incumbent worker with $\sigma_{ij}=y_{ij}$ and hires an entrant worker otherwise; firm i's profit is $\beta\left(\left[\pi+(1-\pi)\,p\right]y_j-b\right)+(1-\pi)\,\beta\left(\left[\pi+(1-\pi)\,q\right]y_j-b\right)-c$. It is optimal for the firm to outsource if $(1-\pi)^2\,\beta q y_j>c$.

In this case, as c falls, firms switch to outsourcing, the employment of entrant workers increases, and the employment of total workers increases. The employment of incumbent workers remains the same.

B Institutional Setting: Details

The fact that Brazil's regional courts differed in their permissiveness to outsourcing prior to Súmula 331 is well-known to industry insiders, but is poorly documented. During a field trip in September 2019, we conducted interviews with managers of security service firms, managers of businesses that either employed or outsourced security services, numerous security guards, labor lawyers, and staff of a security guard union in Recife. In one interview, we asked the CEO of a family-run security service firm incorporated in the 1970s how the legalization of outsourcing by Súmula 331 in 1993 affected her firm. She insistently responded that outsourcing had never been considered illegal. This response contradicted various legal articles that suggest outsourcing had been declared illegal by Súmula 256 in 1985 (da Cruz 2009; Biavaschi and Droppa 2011; Cooney et al. 2015).

We consulted several labor lawyers, who informed us that local courts in Brazil's South, which had historically been friendlier to labor, likely enforced the ban on outsourcing much more vigorously than courts in the rest of Brazil. To further investigate local court permissiveness toward outsourcing, we submitted formal requisitions to all 24 regional labor courts asking if: (1) lawsuits from 1985-1993 were available, (2) it would be possible for us to have a list of all lawsuits concerning outsourcing, and (3) they still had the cases listed as precedents for Súmula 256 and 331. Sadly, we received answers in the negative for almost all local courts. Most no longer kept cases before 1993.

Given the obstacles in obtaining individual rulings within each regional labor court, we gathered available primary and secondary sources to glean as much information on the stances of regional courts as possible. The materials include interviews and review of individual cases appealed to the Superior Court and cited by Súmula 331. We classify the regional courts based on our best reading of these materials. We say that a court is restrictive if the materials suggest that the regional courts consistently ruled against the legality of the outsourcing arrangement. We say that a court is permissive either if they did not, or if materials are unavailable.

Appendix Table B.1 summarizes our classification of Brazil's 24 regional labor courts. Columns (5) and (6) summarize the information from legal precedents, while columns (7)–(9)

summarize the information from available interview transcripts. Columns (10)–(12) then show the prevalence of outsourcing of security guards before and following legalization for each region.

One set of supporting documents for the classification comes from research performed by Magda Biavaschi and Alisson Droppa, two Brazilian legal historians who interviewed prominent judges and lawyers regarding the history surrounding Súmula 331, as well as a set of 28 interview transcripts that they generously provided. Appendix Tables B.2 and B.3 display all quotes from these interviews concerning Courts' interpretation on the legality of outsourcing.

Another set of supporting documents are regional labor court precedent rulings that were appealed to the Superior Labor Court between 1986 (when Súmula 256 was in place) and 1993 (when Súmula 331 took place), as these were centrally stored at the Superior Labor Court's archives. Appendix Table B.4 summarizes the key decisions in each ruling. Column (6) shows that Southern regional labor courts tended to find a direct employment link with the end-firm, meaning that it did not recognize the legality of the outsourcing arrangement. In contrast, Column (7) shows that the Superior Labor Court tended to reverse these regional courts' decisions, finding the direct employment link with the contract-firm instead.

The interviews and legal precedents point to very restrictive interpretations in Brazil's geographic South,[50] including the states of Rio Grande do Sul (4th regional court), Paraná (9th), and Santa Catarina (12th), and a restrictive—though to a lesser extent—interpretation in the countryside of the state of São Paulo (15th region, Campinas), in contrast with the permissive city of São Paulo (2nd region).

At the same time, we found little scholarship and written record about the legality of outsourcing during the pre-legalization period for most regions ultimately classified as permissive. The lack of written record is likely driven by outsourcing being less contested/litigated outside Brazil's South or major urban centers, like the city of São Paulo (2nd region), where courts were permissive.

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[50]While evidence that Southern courts were more restrictive abound, the reasons why are less clear. One possibility is the South's leftist legal tradition, Rio Grande do Sul being the center of the Alternative Law Movement, an intellectual movement that emerged in the 1980s and was grounded on Marx's critical theory of law (Barreto and de Lyra, 2016). Another possibility is the influence of Italian and German immigration on the region's positive attitude toward labor unions (Batistella, 2009).

Based on these findings, we define regional courts 4, 9, 12, and 15 as restrictive toward outsourcing prior to legalization, while the remaining regional courts are defined as permissive toward outsourcing. As mentioned in the main text, we are uncertain about the correct classification of the 15th region, but our local labor market results are robust to dropping observations from the São Paulo state (see Appendix Table D.5).

Table B.1: Classification of regional labor courts: count summary of qualitative classification materials

| | | | | Count summary of Regional Labor Court classification materials | | | | | | | |
| | | | | Regional Labor Court rulings on outsourcing appealed to Superior Labor Court before Súmula 331 | | Interviews about Regional Labor Courts' rulings on outsourcing before Súmula 331 | | | Prevalance of security guard outsourcing across Regional Labor Court's jurisdictions | | |
Regional Labor Court (1)	States under jursidiction (2)	Classification (3)	Geographic Region (4)	Total appeals (5)	Apeals where Regional Labor Court ruled the end-firm as the employer (6)	Total Interviews (7)	Interviews where legality of outsourcing is discussed (8)	Court's interpretation of outsourcing is described as Restrictive (9)	1992 contract-firm share of guard employment (10)	1992-1999 change in contract-firm share (11)	Chow test p-value (12)
4	Rio Grande do Sul	Restrictive	South	3	2	8	7	7	0.36	0.19	0.00
9	Paraná	Restrictive	South	3	3	6	4	4	0.31	0.13	0.00
12	Santa Catarina	Restrictive	South	1	0	1	1	1	0.36	0.20	0.00
15	Campinas (São Paulo state, excl. capital)	Restrictive	Southeast	0		5	4	3	0.30	0.23	0.00
1	Rio de Janeiro	Permissive	Southeast	1	0	0			0.45	0.12	0.32
2	São Paulo (capital)	Permissive	Southeast	2	1	3	3	0	0.36	0.20	0.29
3	Minas Gerais	Permissive	Southeast	0		0			0.32	0.14	0.02
5	Bahia	Permissive	Northeast	0		0			0.41	0.22	0.09
6	Pernambuco	Permissive	Northeast	0		1	1	0	0.41	0.06	0.74
7	Ceará	Permissive	Northeast	1	1	0			0.42	0.07	0.04
8	Amapá and Pará	Permissive	North	0		0			0.50	0.09	0.07
10	Distrito Federal and Tocantins	Permissive	Central-West	0		0			0.51	0.09	0.01
11	Amazonas and Roraima	Permissive	North	0		0			0.41	0.23	0.89
13	Paraíba	Permissive	Northeast	0		0			0.35	0.08	0.00
14	Acre and Rondônia	Permissive	North	0		1	1	0	0.54	-0.03	0.00
16	Maranhão	Permissive	Northeast	0		0			0.49	0.03	0.34
17	Espírito Santo	Permissive	Southeast	0		0			0.42	0.02	0.02
18	Goiás	Permissive	Central-West	0		0			0.35	0.15	0.48
19	Alagoas	Permissive	Northeast	0		0			0.39	0.10	0.29
20	Sergipe	Permissive	Northeast	0		0			0.33	0.12	0.00
21	Rio Grande do Norte	Permissive	Northeast	0		0			0.40	0.04	0.21
22	Paiuí	Permissive	Northeast	0		0			0.35	-0.01	0.02
23	Mato Grosso	Permissive	Central-West	0		0			0.36	0.09	0.09
24	Mato Grosso do Sul	Permissive	Central-West	0		0			0.43	-0.07	0.52

Notes: Column (5) lists the number of regional court rulings on outsourcing brought to the Supreme Labor Court between 1986 (Súmula 256 in place) and December 1993 (Súmula 331 in place). See Appendix Table A1 for a summary of each ruling. Column (7) lists the number of interviews (with regional labor court justices, jurists, lawyers, circuit court judges, and union leaders) conducted by the authors and/or by Brazilian jurist and former regional labor court justice Magda Biavaschi and legal historian Alisson Droppa, concerning Regional Courts' interpretation of the legality of outsourcing prior to Súmula 331. See Appendix Tables B.2 and B.3 for summary quotes, and Barros Biavaschi and de Andrade Baltar (2013) for the legal research documenting regional disparities across regional labor courts' rulings on outsourcing prior to Súmula 331. Columns (10)–(12) show the prevalence of security guard outsourcing in each regional labor court's jurisdiction, as measured by the baseline share of all guards that are employed by contract-firms in column (10), the 1992-1999 change in that share in column (11), and the p-value on the chow-test detecting a trend break in that share after 1993.

Table B.2: Quotes from interviewees who worked in Restrictive regions prior to Súmula 331

Interviewee's position at the time (1)	Regional Labor Court (2)	Original quote (3)	English translation (4)	Interpretation (5)	Interview date (6)	Source (7)
Regional Labor Court Justice	4	"Na época, os juízes da 4ª Região aplicavam - seguindo a linha do magistério do mestre de todos nós, João Antônio Guillembernard Pereira Leite – o entendimento da Súmula 256 do TST que levava ao reconhecimento da relação de emprego direta entre trabalhador e tomador dos serviços, seu real beneficiário. E, dessa forma, reconhecia-se a produção dos efeitos jurídicos que a fraude visava a impedir, retirando-se a máscara e responsabilizando-se diretamente a empresa tomadora dos serviços."	"At the time, judges at the 4th Regional Labor Court upheld - in line with the juridical practice of our master João Antônio Guillembernard Pereira Leite - the understanding that the Superior Court's Súmula 256 recognized a direct employment relationship between the worker and the services-contracting firm, which is the actual beneficiary [of the employment relationship]. And, in this way, we accepted as valid the legal consequences that the fraud[lent] [outsourcing relationship] aimed to avoid, taking off its mask and ruling the services-contracting firm to be directly responsible [for such legal consequences]."	Restrictive	Feb 2008	2
Prosecutor for the District Attorney's Labor Office	4	"E o entendimento era o stricto sensu do Enunciado 256: [a terceirização] só era permitida no serviço de vigilância bancária e no trabalho temporário. Adotava-se integralmente esse entendimento."	"And the interpretation of Enunciado 256 was strictu sensu: [outsourcing] was only allowed in the case of security services for banks and for temporary work. That interpretation was wholeheardetly adopted."	Restrictive	Jul 2008	2
Regional Labor Court Justice	4	"... naquele momento tínhamos o Enunciado 256 do TST que só excluía aquele trabalho temporário e, depois, os vigilantes [bancários]."	"... at that time we had Enunciado 256 from the Superior Labor Court which only made exceptions for temporary work and, afterwards, for [banking] security."	Restrictive	Jul 2008	2
Regional Labor Court Justice	4	"Os vigilantes do quadro estavam sendo substituídos por vigilantes contratados via agora essas empresas... Nós entendíamos que aqui a legislação ressalvada pela 256 não se aplicava... Então eu econhecia a natureza do vínculo de emprego diretamente com os bancos. Muitas dessas minhas decisões foram confirmadas pelo Tribunal e depois no Tribunal Superior do Trabalho, que era quem editava a súmulas. Se foram reformadas, eu não sei porque não acompanhava... nós não nos preocupávamos muito em acompanhar o andamento das nossas decisões, mas não eu não julgava sozinha."	"Security guards were being replaced by guards contracted now via these firms... Our understanding was that the exceptions made under 256 were not applicable here... so I recognized the employment link directly with banks. Many of my decisions were upheld by the Regional Labor Court and then by the Superior Labor Court, which edited súmulas. If they were revised, I do not know because I did not follow... we did not concern ourselves with what happened after our decisions, but no I did not rule alone."	Restrictive	Apr 2020	1
Labor judge	4	"Nas minhas decisões, eu não me apego muito à teoria, à doutrina... Gosto de analisar o caso concreto. E naquele processo [de 1991], ao analisar a forma pela qual havia sido feita a terceirização, (...) o que me levou a entender que o que estava sendo praticado (...) não era correto (...) é o fato de que não poderia admitir que um empregado que estava integrado no corpo da empresa, galgando uma carreira, com esperança de subir na vida, fosse, de repente, excluído daquele processo. Uma empresa deve crescer, mas é obrigatório que leve seus empregados a crescer junto com ela. Não aceito outra forma de empresariado. (...) Colocava-me na pele de um empregado, por exemplo, na pele do chefe do departamento de pessoal. Que havia, enfim... Era um excelente empregado, merecia estar no quadro de empregados, com todas as vantagens decorrentes, sendo um bom empregado." "Então, não posso dizer que no meu íntimo seja favorável à terceirização. Não sou. A empresa deve ser uma grande família em que todos evoluam juntos. Todos. "	"In my decisions, I don't cling much to theory, to doctrine... I like to analyze each specific case. And that [1991] case, in analyzing the way in which outsourcing had been done, (...) what made me understand that what was actually being practiced (...) was not right (...) is the fact that I could not accept that an employee who had been part of the staff, who was building a career, with hopes to ascend in life, could, out of a sudden, be excluded from that process. A company needs to grow, but it is compulsory that it allows it brings its employees to grow with it. I cannot accept any other form of business. (...) I put myself in the employee's shoes, for example, (...) in the shoes of the human resources department's head. That had, anyway... He was an excellent employee, he deserved to be in the employee roster, with all its advantages, being a good employee." "So, I cannot say that deep inside I am favorable to outsourcing. I am not. The firm must be a great family in which all grow together. All."	Restrictive	May 2008	2

Notes: Source 1 in Column (5) are interviews conducted by authors, whereas Source 2 are transcripts from interviews conducted by (now retired) Regional Labor Court Justice Magda Biavaschi and legal historian Alisson Droppa.

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Table B.2: Quotes from interviewees who worked in Restrictive regions prior to Súmula 331 (Cont.)

Interviewee's position at the time (1)	Regional Labor Court (2)	Original quote (3)	English translation (4)	Interpretation (5)	Interview date (6)	Source (7)
Journalist and lawyer. Representative for Worker Syndicates at RS court (1985-1991), Representative of Worker Syndicates at Superior court (1993 onwards)	4	"Mas penso que no Rio Grande do Sul (e aqui não tem bairrismo ou gauchismo) temos uma visão mais esclarecida sobre a questão. Até sobre o papel da Justiça do Trabalho. Esta existe justamente para assegurar aos trabalhadores os direitos previstos na CLT, para que a lei seja cumprida. Se querem modificar a decisão da Justiça do Trabalho, mudem-se as leis, no Congresso Nacional, democraticamente. Mas o que não pode acontecer é que determinadas interpretações sejam complacentes." "Pessoalmente, como advogado e como pessoa que conhece a Justiça do Trabalho, como eu conheci, que conhece as relações de trabalho, não vejo como alguém pode se beneficiar com a locação de mão-de-obra, com a terceirização. Algum passe mágico nessa contratação acontece. Não posso compreender que uma empresa que deixa de contratar telefonistas para contrá-las por uma terceira, locadora de mão-de-obra, pague para essa locadora X e ela pague o seu empregado. O que ela vai pagar ao empregado seu? Qual o lucro? Por evidente, há lucro nessa intermediação. Mas quem ganha? Quem perde? Alguém sai lesado. O trabalhador, possivelmente. (...) É uma matemática que não fecha. É a minha conclusão. Por isso, não consigo entender, ainda, a razão de ser da terceirização."	"But I think that in Rio Grande do Sul (and here I mean no state chauvinism) we have a much clearer understanding of this topic. Even of the role of Labor Courts. The courts exist precisely to assure workers of their rights according to labor laws, so that the law be followed. If they want to change the Labor Courts' decision, then they must change the laws, in Congress, democratically. But what cannot happen is that certain interpretations be complacent." "Personally, as a labor lawyer and as someone who understands the Labor Courts as I do, that knows labor relationships, I don't see how someone can benefit from the contracting of labor, from outsourcing. Some magical step in this form of contracting must happen. I cannot understand how one firm that stops to directly hire phone operators to outsourcing them from an outsourcing firm instead, can pay this outsourcing firm X and then this firm pays its employee. What is the outsourcing firm going to pay its employee? What is the profit? Evidently, there is profit in this intermediation. But who wins? Who loses? Someone gets hurt. The worker, possibily. (...) This is math that doesn't make sense. This is my conclusion. For that reason, I cannot understand, still, outsourcing's raison-dêtre."	Restrictive	Jul 2008	2
Jerônimo Leiria, laywer for large end-firm in Rio Grande do Sul; Creator of word "terceirização" to denote outsourcing, with the goal of avoiding explicit violations of Súmula 256	4	"E como havia o entendimento da Súmula 256 do TST, que proibia a contratação de serviços, era necessário que houvesse uma nomenclatura para essas atividades contratadas que não recebesse o título de prestação de serviços. E, ainda, que não tivesse uma tradução em qualquer outra língua. Era necessário achar uma palavra oca, que não tivesse significado nenhum... Aí eu criei umas 40 palavras: [dentre elas a] terceirização (a partir da idéia de que se contrato uma empresa, vêm os empregados de outra empresa, eles são alheios, terceiros)... Então se procedeu a uma votação... Daí a palavra mais simpática e mais "nada a ver" foi terceirização. "O que é que vocês estão fazendo?", perguntariam. E responderíamos: "Estamos fazendo terceirização". Como a fábula roupa nova do rei (...) Como era uma palavra nova, que não estava registrada em lugar nenhum, eu media os centímetros quadrados quando a mesma era publicada, pois tinha sido inventada por nós. Tenho o registro de que ela [a palavra] foi publicada pela primeira vez em 23 de janeiro de 1991, pela revista Exame." "Pergunta: Mas havia resistências internamente a Justiça do Trabalho, não? Resposta: Sim. Pergunta: Eram importantes, eram significativas essas resistências na época? Resposta: Sim, era a totalidade."	"Because there was an understanding from Súmula 256, which forbade the contracting of services, it was necessary for that to be a nomenclature for contracted activities that did not use that [exact] term. And, still, it had to be a term that did not have a translation from any other language. It was necessary to find a hollow word, devoid of meaning... So I created 40 words: [among which was *terceirização* (starting from the idea that if I contract with a company, the employees from that company are the ones who come, they are third-parties)... Then we coted... and the more sympathetic word and the one that had 'nothing to do with anything' was *terceirização* [, which can be translated as outsourcing]. They would ask: 'What are you guys doing?', and we would answer 'We are outsourcing'. It is like the fable of the Emperor's New Clothes (...) Because it was a new word, that was not registered anywhere, I was able to track whenever it was published, as the word had been created by us. I have records that show that the first time it [the word] was published was on Januart 23, 1991, by the Exame magazine." "Question: But was there important internal resistance from the Labor Courts? Answer: Yes. Question: Were they important, were this resistence significant at the time? Answer: Yes, they were all there was.	Restrictive	Sep 2008	2
Regional Labor Court Justice	9	"A Terceirização é um processo que veio para ficar, em que a classe trabalhadora se subdividiu e se fracionou, dificultando a ação sindical... buscando uma acomodação com o movimento do capital que continua avançando em seu sistema de exploração... Pela análise daquele processo, cuja cópia digital vocês me enviaram antes da entrevista, percebi que a Juíza de primeiro grau... concluía pala ilegalidade da Terceirização... No Tribunal, mantínhamos a ilegalidade e [reconhecíamos] o vínculo de emprego."	"Outsourcing is a process that is here to stay, in which the working class got subdivided and fractiored, making it harder for unions to operate... searching for its place with the capital movement that keeps advancing in its exploitation system... According to [my] analysis of that case, whose three digital copies you sent me before this interview, I noticed that the district judge... ruled that outsourcing was ilegal. At the Regional Court, we would uphold this ilegality and [recognized] the employment link with the end employer."	Restrictive	May 2011	2

Notes: Source 1 in Column (5) are interviews conducted by authors, whereas Source 2 are transcripts from interviews conducted by (now retired) Regional Labor Court Justice Magda Biavaschi and legal historian Alisson Droppa.

Table B.2: Quotes from interviewees who worked in Restrictive regions prior to Súmula 331 (Cont.)

Interviewee's position at the time (1)	Regional Labor Court (2)	Original quote (3)	English translation (4)	Interpretation (5)	Interview date (6)	Source (7)
Labor judge	9	"Então a terceirização, a meu ver, não deixa de ser uma precarização fruto dessa modernização onde se abrem as portas para um novo formato da prestação de serviço. (...) [E]u diria que 99% das ações questionavam sim a terceirização e buscavam vínculo com a [tomadora de serviços]... bom, não preciso nem te dizer que todas as sentenças foram no sentido de reconhecer o vínculo e a responsabilização ali acho que dei solidaria em todos, devido ao ato ilícito, a fraude, eu 'canetiei' pesado, as sentenças foram confirmadas pelo Tribunal, não sei se chegou ao TST, mas eu lembro que não teve nenhuma dúvida"	"Outsourcing, in my view, is nothing but a worsening of working conditions that is a product of this modernization where doors are open to a new way of services contracting (...) [I] would say that 99% of cases did question outsourcing and wanted a direct employment link with [the end-firm]... well, I don't even need to say that all of our rulings were to recognize the direct employment link and find the end-employer jointly liable ['responsabilidade solidária'], I think I found joint liability on all cases, due to the ilicit nature, the fraud, I 'ruled' heavily, the rulings were upheld by the Regional Court, not sure if they were brought to the Superior Court, but I remember we had no doubts about it."	Restrictive	Nov 2011	2
Labor lawyer	9	"Nos idos de 1979, 1980, assessorava a categoria dos vigias e vigilantes que, à época, não tinha legislação especifica... Nessa época, os vigilantes trabalhavam nas portas dos bancos como vigilantes e exerciam diversas funções. Na verdade, eles eram porteiros: davam informações, ajudavam a abrir conta bancária, fichários, arquivos. Então, comecei a ajuizar reclamatórias... invocando que quem exercia serviços de portaria [em bancos] era bancário... Em decorrência desse trabalho, as serventes que trabalhavam em bancos começaram a me procurar. Comecei, assim, a ajuizar reclamatórias contra os bancos advogando a tese de que, na realidade, essas serventes eram bancárias e não "locadas". Sendo a locação de mão de obra ilegal, essas ações começaram a ser vitoriosas."	"Around 1979, 1980, I assisted security guards, for which, at the time, there was no specific legislation... At that time, security guards worked in front of banks as security guards and took on a variety of tasks. In truth, they were doormen: they gave out information, helped customers open accounts, filing, archival. So, I began filing lawsuits... arguing that who exercised doorman services [at banks] was a bank employee... Because of this work, servers who worked in banks started seeking me out. I started, then, filing lawsuits against banks arguing that, in reality, these servers were bank employees and not "outsourced". Given that outsourcing was ilegal, I started winning these lawsuits."	Restrictive	Dec 2012	2
Laywer and Congressman. Helped found Workers Party with Lula.	9	"Pergunta: Então, vimos que nas sentenças da Vara, da Junta, eram nesse sentido. Reconheciam o vínculo direto com [uma grande empresa do Paraná]. O Tribunal, em regra, a mantinha. Mas [essa empresa] recorria para o TST, não mais questionando sua condição de empregadora, mas o mérito. [Por quê?] Resposta: Não adiantava, porque ela ia perder."	"Question: So, we saw that the District Court rulings were in line with this. They would recognize the direct link with [a large firm in Paraná]. The Regional Court, in general, upheld that decision. But [the firm] would appeal to the Superior Court, no longer questioning that it was the direct employer, but only [questioning] the allaged damages. [Why?] Answer: Because it was to no avail, the firm knew it would lose."	Restrictive	May 2011	2
Layer of large end-firm in Paraná and Santa Catarina	12	"[A empresa] passou nesse tempo por processos de terceirização, nessa década de 1980 e início de 2000, mas verificasse o seguinte as terceirizações que foram para baratear não deram certo, as terceirizações que foram para adquirir tecnologia, essa deram certo e estão ai até hoje... [T]emos [essa discução sobre terceirização] em Santa Catarina... porque [lá houveram] várias terceirizações anuladas, é um problema isso. "	[The firm] went over a process of outsourcing during this time, between the 1980s and early 2000, but we found out the following: the outsourcing decisions made to cut costs didn't work out, the outsourcing made to acquire technology did and are here through today... [W]e have [this discussion about outsourcing] in Santa Catarina... because [there, there were] many nulled outsourcing decisions, this is a problem."	Restrictive	Aug 2011	2
President of worker syndicate	15	"Depois da regulamentação...we could outsource in some activities. For example, security services which, today, is legal, was not. Security services, food services, cleaning, all activities our our syndicate. (...) Outsourcing, I think, is a fraud to work relationships. It masks the relationship. Its firms make use of it to reduce costs and, also, to bypass labor laws for those workers. (...) In all conventions we pushed for the end of outsourcing..."	"After legalization...we could outsource in some activities. For example, security services which, today, is legal, was not. Security services, food services, cleaning, all activities our our syndicate. (...) Outsourcing, I think, is a fraud to work relationships. It masks the relationship. Its firms make use of it to reduce costs and, also, to bypass labor laws for those workers. (...) In all conventions we pushed for the end of outsourcing..."	Restrictive	Apr 2009	2
Prosecutor for the state of São Paulo from 1990 to 1993	15	"O 256 era perfeito. Havia dois tipos de trabalho que poderiam ser terceirizado: vigilância [bancária] e de caráter temporário, em casos excepcionais, tudo documentado, fundamentado, perfeito. Quanto veio a Súmula 331 ela abriu "a porteira" para o empregador usar um instrumento de administração e de excelência, como se fosse uma ferramenta de precarização[.]"	"256 was perfect. There were two types of jobs that could be outsourced: [banking] security and temporary work, in exceptional cases, everything documented, argued, perfect. When Súmula 331 arrived it opened the "flood gates" for the employer to use an exceptional administrative provision as a tool for worsening labor conditions[.]"	Restrictive	Jun 2009	2

Notes: Source 1 in Column (5) are interviews conducted by authors, whereas Source 2 are transcripts from interviews conducted by (now retired) Regional Labor Court Justice Magda Biavaschi and legal historian Alisson Droppa.

Table B.2: Quotes from interviewees who worked in Restrictive regions prior to Súmula 331 (Cont.)

Interviewee's position at the time (1)	Regional Labor Court (2)	Original quote (3)	English translation (4)	Interpretation (5)	Interview date (6)	Source (7)
Labor judge	15	"Na carreira de magistrado deparei-me com... pouquíssimos processos questionando a terceirização, buscando o reconhecimento do vínculo com a tomadora do serviço. Isso é muito raro. Nem me recordava, aliás, do processo em que atuei, cujas cópias vocês me encaminharam previamente e, muito menos, da decisão que então prolatei. Não me recordava porque são muito esporádicos."	"In my career as a judge I enountered very few lawsuits questioning outsourcing, asking for recognition of the employment link with the end firm. That is very rare. In fact, I did not even remember the lawsuit I ruled on, whose copies you previously forwarded me, let alone the decision I ruled on it then. I did not remember because they are very few and far-between."	Unclear	Apr 2009	2
Clerk (1987-1991), laywer (1991-1995), judge (1995 onwards)	15	"Por princípio, penso que a terceirização é negativa, porque descategoriza e precariza os trabalhadores, além de prejudicar a própria dimensão da responsabilidade patrimonial pelos créditos trabalhistas."	"In principle, I think that outsourcing is negative, because it makes worker groups more disconnected and fragile, in addition to harming the very dimension of employer responsibility for labor claims."	Restrictive	Jul 2007	2
		"Por aqui na 15ª, a impressão que eu tenho é que, com a mudança da Súmula (da 256 para 331), as pessoas passaram a assimilar a ideia de que a terceirização era sempre lícita, sem atentar para as próprias ressalvas feitas pelo TST. "	"Here at the 15th, the impression I have is that, once the Súmula changed (from 256 to 331), people started to accept the idea that outsourcing was always licit, even disregarding the exceptions made by the Superior Labor Court."			
		"[E]m 1985, o Estado de São Paulo contava com 60.476 trabalhadores terceirizados, número que ampliado para 129.951 em 1993 e saltou para 179.836 em 1994... Esse aumento foi intensificado a partir de 1994, quando da implantação do Plano Real mas também época em que houve a modificação do entendimento predominante no TST a respeito do tema. (...) É claro que esse não foi o único fator que levou a esse fenômeno amplificador da terceirização, mas não se pode subestimar a capacidade que as decisões judiciais possuem de influenciar as diretrizes de atuação empresarial."	"[I]n 1985, the State of São Paulo had 60.476 outsourcing workers, a number that expanded to 129.951 in 1993 and jumped to 179.836 in 1994... This increase was intensified starting in 1994, at time of the Real Plan, but also the time when there was a change in the Superior Court's understanding of the topic. (...) Of course this was not the only factor that led to the expansion of outsourcing, but one cannot underestimate the ability that legal decisions have to influence how firms behave."			

Notes: Source 1 in Column (5) are interviews conducted by authors, whereas Source 2 are transcripts from interviews conducted by (now retired) Regional Labor Court Justice Magda Biavaschi and legal historian Alisson Droppa.

Table B.3: Quotes from interviewees who worked in Permissive regions prior to Súmula 331

Interviewee's position at the time (1)	Regional Labor Court (2)	Original quote (3)	English translation (4)	Interpretation (5)	Interview date (6)	Source (7)
Regional Labor Court Justice	6	"The parameter we would use (to judge outsourcing cases) was [that] a bank could have as an employee, an armed guard, but we would consider in terms of outsourcing it to legal or not if the company, the intermediate company was a company specialized in armed security. So he could be outsourcing to a bank or to any other sort of company and it would be legal."	N/A	Permissive	May 2020	1
Public Prosecutor's Labor Office	14	"Para mim, o problema não está na terceirização em si, como disse antes, há hipótese em que ela é admissível e, até certo ponto, necessária em momentos muito específicos da atividade empresarial. O problema está na terceirização da atividade fim, o que acontece com muita freqüência."	"To me, the problem is not with outsourcing per se, as I said before, there are cases in which it is admissible and, up to a certain point, needed at very specific moments of firms' [lifecycles]. The problem is with outsourcing of end-activities, which happens frequently."	Permissive	Mar 2011	2
Labor judge	2	"Na verdade, isso começou em 1974 com a lei do trabalho temporário, alastrando-se, depois, para a vigilância [bancária], o que possibilitou a "Terceirização" no trabalho bancário dos vigilantes. A idéia era exatamente essa e ela não se vinculou apenas aos bancos. Acabou se estendendo para outras atividades [econômicas]."	"Actually, this started in 1974 with the temporary law work, spreading, afterwards, to [banking] security, which allowed "Outsourcing" of security services for banks. The idea was exactly this and it did not restrict itself just for banks. It ended up spreading to other [economic] activities."	Permissive	Sep 2009	2
Regional Labor Court Justice	2	"[A] terceirização é importante para maior eficiência da empresa, para maior produtividade da empresa, para baratear custo... É preciso haver uma justificativa para a terceirização: a busca da maior produtividade, da maior eficiência e não do menor custo da mão de obra... O gaúcho tem uma postura mais contenciosa mesmo em relação à vida e as coisas... O paulista tem talvez uma visão mais econômica, mais pragmática..."	"Outsourcing is important for firm efficiency, for more productivity, for cutting costs... There must be a justification for the outsourcing: a search for productivity, for more efficiency and not cutting labor costs [specifically]... the Southerner has a more contencious view even with regards to other things in life... The paulista perhaps has a more economical, more pragmatic view..."	Permissive	May 2009	2
Union leader	2	"Quando o Sindicato questionava, a empresa dizia que precisa de pessoas especializadas em determinadas atividades... O mesmo diziam para a vigilância, treinar guardas, ter problemas com porte de arma, então seria ideal que tivesse uma empresa de segurança... Houve sim questionamentos na Justiça do Trabalho em alguns momentos, mas as sucessivas derrotas judiciais serviram para desanimar os Sindicatos, uma vez que nós não conseguimos êxito nas ações que sindicatos ingressavam e os patrões faziam questão de propagandear isso – 'está vendo! A Justiça do Trabalho considera legal a terceirização'."	"When the Union questioned, the firm said it needed specialized people in certain activities... They said the same for security, train guards, face issues with gun licensing, so it would be ideal if there was a security services firm... Yes, the Labor Court questioned this at times, but the high frequency of lawsuit losses ended up wearing down the Unions, because as we could not win lawsuits the employers made sure to promulgate -- 'you see! The Labor Court considers outsourcing legal!'"	Permissive	Apr 2009	2

Notes: Source 1 in Column (5) are interviews conducted by authors, whereas Source 2 are transcripts from interviews conducted by (now retired) Regional Labor Court Justice Magda Biavaschi and legal historian Alisson Droppa.

Table B.4: Variation in dissent over legality of outsourcing across regional labor court precedents appealed to the Superior Labor Court prior to Súmula 331

Regional Precedent Number	Regional Court (1)	Year of Superior Court ruling (2)	What type of job did the plaintiff worker do? (3)	Party that appealed Regional Court's ruling to Superior Court (4)	End employer type (5)	Rulings: Which firm was found to have the direct employment link?	
						Regional Court (6)	Superior Court (7)
Panel A: Precedents by Regional Labor Courts classified as Restrictive							
RR 35607-78.1991.5.04.5555	4	1992	Cleaning services	End employer	Federal Agency	End employer	Outsourcing Firm
RR 45956-68.1992.5.09.5555	9	1992	Security services	End employer	Federal Agency	End employer	Outsourcing Firm
RR 41486-28.1991.5.09.5555	9	1992	Cleaning services	End employer	Federal Government	End employer	Outsourcing Firm
RR 24086-98.1991.5.09.5555 [1]	9	1992	Cleaning services	Outsourcing firm	Bank	End employer	Outsourcing Firm
RR 41974-21.1991.5.04.5555	4	1993	Cleaning services	End employer	State Government	End employer	Outsourcing Firm
RR 43279-06.1992.5.04.5555	4	1993	Security services	Worker	Federal Agency	Outsourcing Firm	Outsourcing Firm
ERR 211-52.1990.5.12.5555	12	1993	Cleaning services	Worker	Bank	Outsourcing Firm	Outsourcing Firm
Panel B: Precedents by Regional Labor Courts classified as Permissive							
RR 226-34.1989.5.02.5555	2	1989	Cleaning services	Worker	Bank	Outsourcing Firm	Outsourcing Firm
RR 42286-78.1991.5.01.5555	1	1992	Cleaning services	End employer	Federal Agency	Outsourcing Firm	Outsourcing Firm
RR 44058-74.1992.5.07.5555	7	1992	Not mentioned	End employer	State-owned firm	End employer	Outsourcing Firm
RR 62835-48.1992.5.02.5555	2	1993	Not mentioned	End employer	City Government	End employer	Outsourcing Firm

Notes: [1] The outsourcing firm appealed this case to the Superior Labor Court because the regional labor court found the outsourcing firm, Orbram Organizacao E Brambilla Ltda, jointly liable for demages the worker was suing for, despite the fact that the court established a direct employment link was established with the end employer. The Superior Court found the outsourcing firm solely liable as it dissented from the regional labor court's decision on which firm had the direct employment link with the worker.

C   Data and Descriptive Statistics: Details

Microregion definition.   We use the "microregion" definition of the Brazilian Statistical Agency (IBGE), which groups together economically integrated contiguous municipalities (counties) with similar geographic and productive characteristics (IBGE 2002), to define the boundaries of local labor markets. To ensure that we consistently define microregions over time, we combine microregions whose boundaries changed during our sample period, following Kovak (2013). This process leads to a set of 494 consistently identifiable microregions within the period 1985-2006.

Sample restrictions.   Our sample includes all workers between the ages of 18 and 64 who were employed as of December 31 of each year. If a worker is seen working for more than one firm, we keep the employment link with the highest-paying firm, and drop employment records with missing earnings data. We drop workers in public administration and those without valid information on their industry of employment. For our analysis of local labor markets for security guards, we restrict our sample to the large occupational groups listed in Table C.1, and only include local labor markets with at least 30 security guards and 30 cleaners in every year between 1985-2002, yielding an analysis sample of 265 local labor markets, covering 98 percent of all security guards. Given the high prevalence of outsourcing among cleaners, we exclude them from estimation of treatment effects for security guards.

Variable definitions.   We use the establishment's geographic location (municipality) and industry, and worker-level information including gender, age group (five categories), education (nine categories), occupation, and December earnings, reported as multiples of that year's federal minimum wage. To convert those into total real earnings, we multiply the RAIS multiples-of-the-minimum-wage earnings variable by each year's federal minimum wage, available from Brazil's Instituto de Pesquisa Econômica Aplicada (IPEA) and converted to 2017 reais. Reported earnings include regular salary payments, holiday bonuses, tips, performance-based bonuses, commission, and profit-sharing agreements.

Table C.1: Included occupations

Occupation	Contract-firm share	Mean log wage	Mean schooling	Male	National employment
Security guards	0.39	6.91	4	0.99	494776
Technicians	0.04	7.82	10	0.87	384837
Electricians and electronics workers	0.03	7.50	6	0.97	265208
Cashiers and tellers	0.04	7.49	11	0.50	481360
Machine installers and mechanics	0.05	7.39	10	0.58	1845970
Office administration	0.02	7.19	6	0.99	377638
Drivers, sailers, conductors	0.02	7.08	5	1.00	689230
Secretaries and typists	0.06	6.80	11	0.15	167401
Food and beverage processing workers	0.00	6.69	5	0.84	307684
Other manual or uncommon occupations	0.05	6.64	5	0.83	1471090
Salesmen	0.01	6.51	8	0.66	1099564
Cooks, waiters, bartenders	0.03	6.49	5	0.31	466541
Cleaners (excluded)	0.31	6.49	4	0.42	746155
National	0.06	7.14	8	0.74	14789180

Note: Table lists all 2-digit CBO occupations included in our main triple-difference specification and their mean characteristics in 1992.

Measuring outsourcing using industry and occupation codes We use the 1994 *Código Brasileiro de Ocupações* (CBO 94) at the two-digit level to define occupations, which is consistent with predecessor (CBO) occupational codes. We identify whether an establishment in the RAIS dataset is part of an contract firm based on the establishment's economic activity code, which follows the *Classificação Nacional de Atividades Econômicas* (CNAE) system. We identified contract firms as those with CNAE95 numbers 74608 ("Atividades de investigação, vigilância e segurança"), 74160 ("Atividades de assessoria em gestão empresarial"), 74500 ("Seleção, agenciamento e locação de mão-de-obra"), 74705 ("Atividades de limpeza em prédios e domicílios"), and 74993 ("Outras atividades de serviços prestados principalmente às empresas"), which fall under occupational class 74 "Serviços prestados principalmente às empresas." For firms that exited prior to 1995 and therefore do not have a CNAE code, we used a concordance between "IBGESUBATIVIDADE" codes (reported prior to 1995) and CNAE codes, constructed using firms that are present in the data before and after 1995 and report the former code before, the latter after.

Crime data. We use homicide rates available from the replication files of Dix-Carneiro et al. (2018).

PNAD household survey. We compute the share of security guards that are formally employed using PNAD household survey.

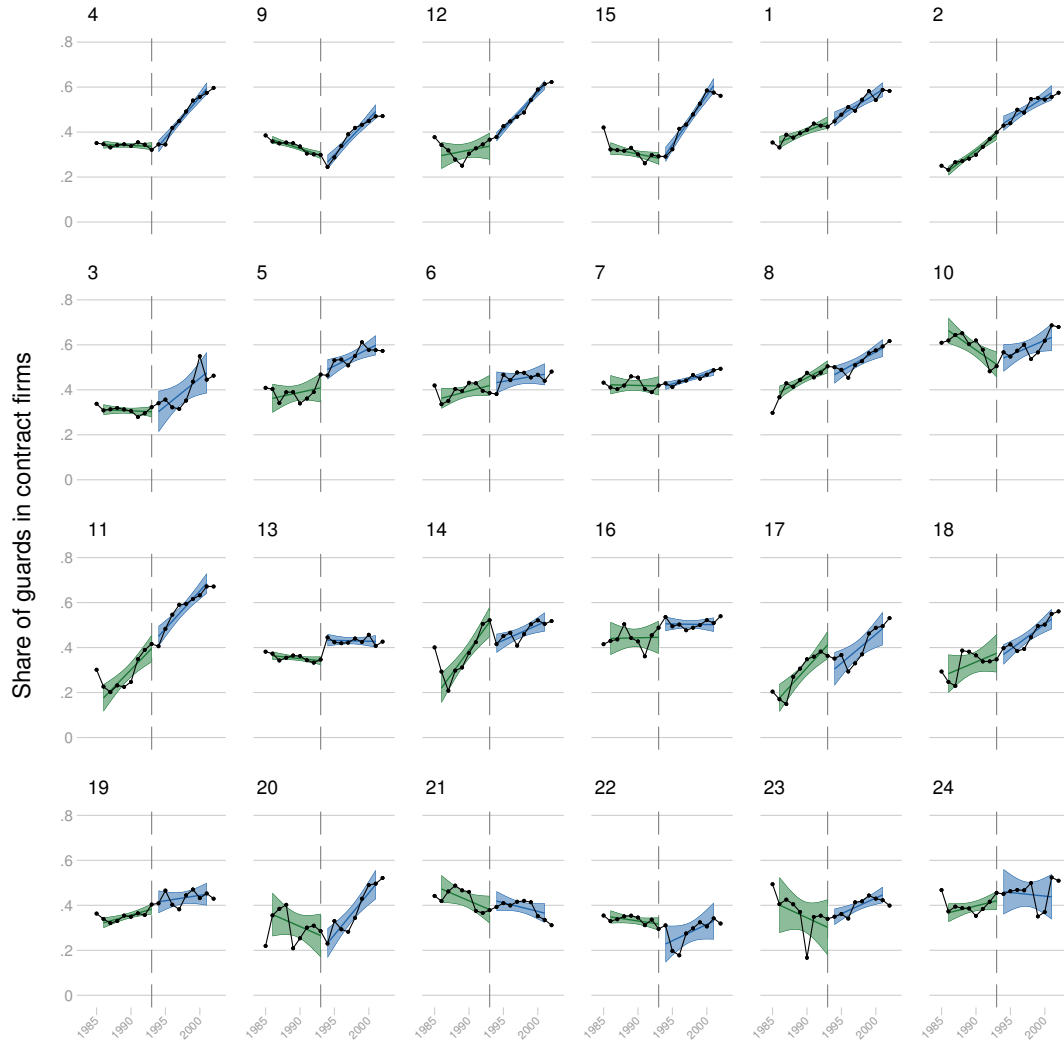Figure C.1: Share of security guards formally employed, over time

A. Share of guards formally employed

B. Guard share of total formal employment
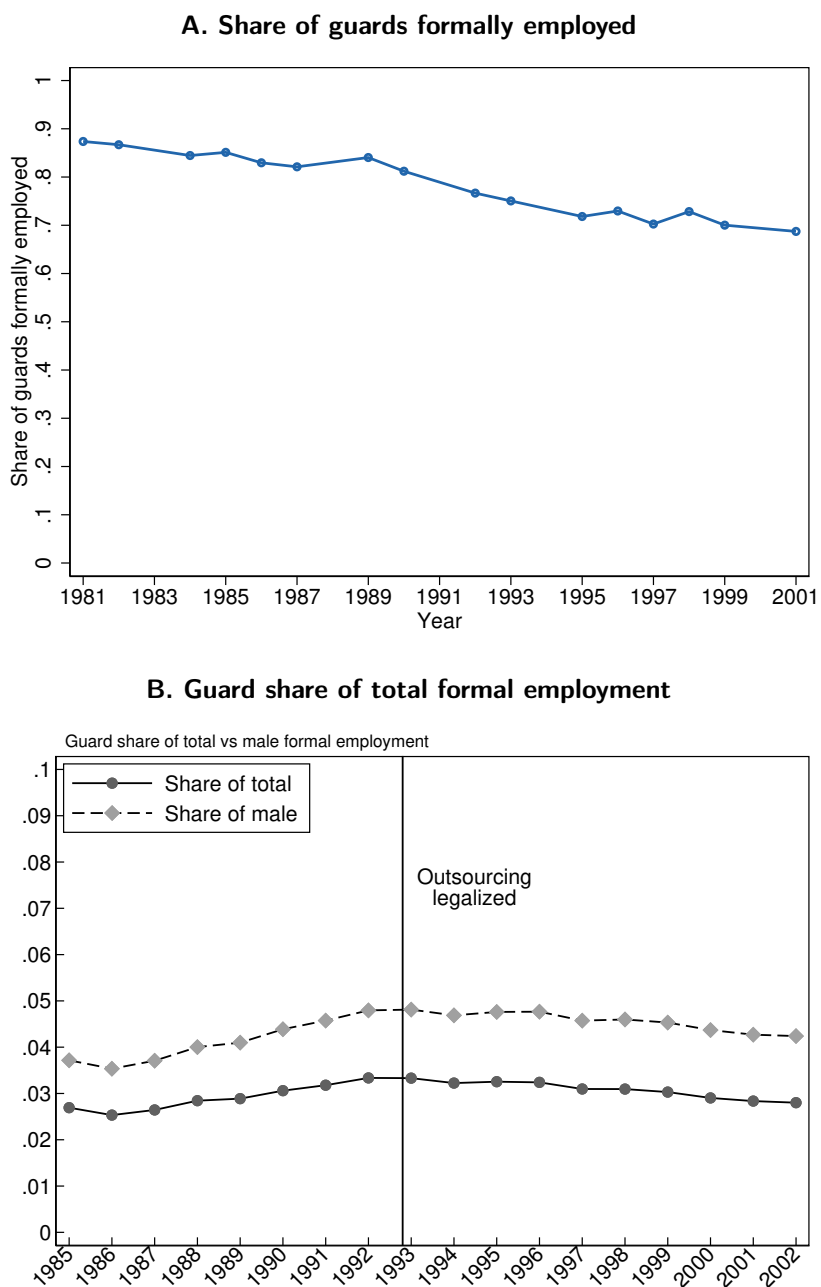
Note: Panel A plots the share of guards (aged 18-65) that are formally employed based on Brazil's Pesquisa Nacional por Amostra de Domicílios (PNAD) household survey. Pabel B plots the guard share of all total private sector formal employment, separately for all workers versus for male workers only, based on RAIS.

Figure C.2: Total formal employment of security guards, police, and other private-sector occupations
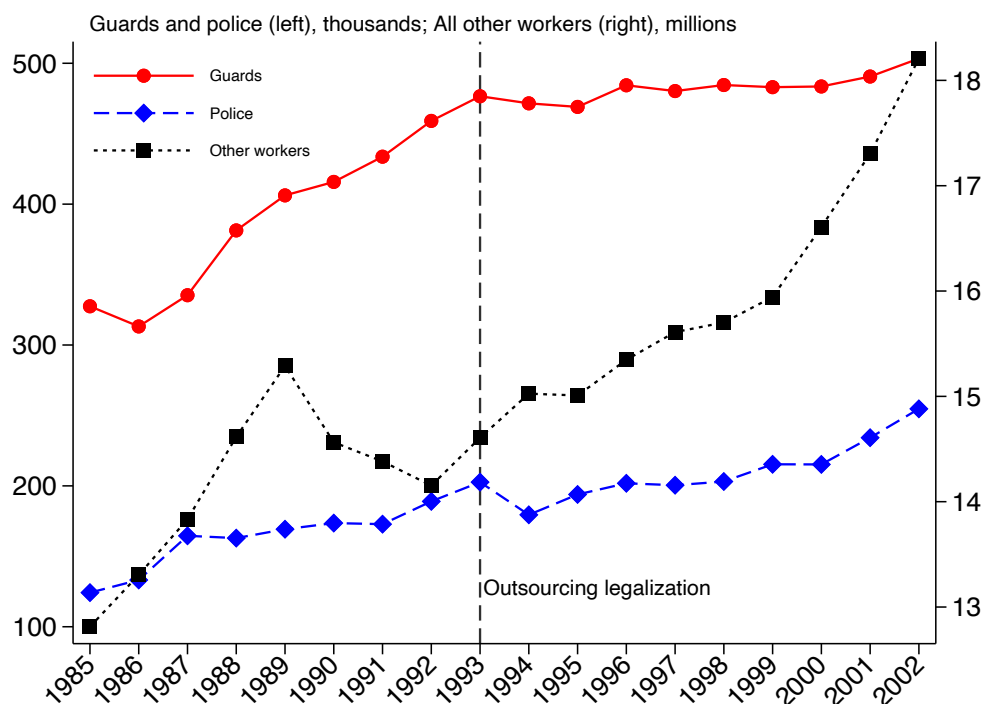
Note: This figure plots total formal employment of security guards (CBO 2-digit code 58, excluding CBO 3-digit code 583), police officers (CBO 3-digit code 583), and other formal sector occupations based on RAIS.

Figure C.3: Trends in security outsourcing, by regional labor court

Note: Figure plots the trend in outsourcing prevalence, as measured by the share of security guards in the formal sector working for contract firms, separately for each jurisdiction of the 24 regional labor courts. Courts 4, 9, 12, and 15 are classified as restrictive.

Table C.2: Predictors of outsourcing prevalence in a microregion, 1992 and 1999

Dependent variable: Microregion security guard contract-firm share in year t				
	t=1992		t=1999	
Log(mkt size in year t)	0.090***	0.090***	0.129***	0.130***
	(0.007)	(0.007)	(0.007)	(0.007)
Restrictive region		-0.037*		0.045**
		(0.020)		(0.021)
Obs	266	266	266	266
R^2	0.38	0.39	0.55	0.56

Notes: Sample is all microregions with at least 25 security guards and 25 cleaners, weighted by average microregion formal-sector employment between 1985-2006. Market size is measured by the number of private-sector security guards in the formal sector. Standard errors are clustered at the microregion level and presented in parentheses, with * = significant at the 10% level, ** = significant at the 5% level, and *** = significant at the 1% level.

D Market-level effects of legalization: Details

Table D.1: Baseline descriptive statistics of analyzed microregions by regional labor court restrictiveness

| Microregion characteristics in 1992	Restrictive		Permissive		
Outsourced share of guards	0.124	0.111	0.155	0.141	0.150
	(0.182)	(0.154)	(0.224)	(0.193)	(0.212)
Establishments directly hiring guards	239	220	377	647	497
	(337)	(283)	(1317)	(2177)	(1728)
HHI	0.062	0.056	0.074	0.063	0.068
	(0.08)	(0.066)	(0.09)	(0.06)	(0.078)
Average log(wage), guards	7.21	7.22	6.96	6.99	6.97
	(0.21)	(0.22)	(0.29)	(0.23)	(0.27)
Guards per 1000 formal workers	23.14	24.18	31.28	24.43	28.69
	(25.56)	(22.12)	(20.92)	(13.28)	(18.66)
By employment type:					
Direct-hire guards	17.51	19.54	22.77	18.87	21.29
Contract-firm guards	5.64	4.63	8.51	5.57	7.40
By age group:					
Age 18-24	1.84	2.15	3.18	2.27	2.83
Age 25-29	3.41	3.51	5.45	3.77	4.81
Age 30-39	6.23	6.62	9.11	6.63	8.19
Age 40-49	5.48	5.64	6.92	5.61	6.43
Age 50-64	6.19	6.25	6.63	6.15	6.43
Used for entropy balancing:					
Log formal-sector employment	10.7	10.6	10.4	10.7	10.5
Homicide rate (per 100K population)	11.6	13.2	16.4	11.6	14.5
Unemployment rate	0.026	0.036	0.043	0.026	0.036
Share of employment in tradeable sector	0.46	0.42	0.42	0.46	0.43
Import tariff competition exposure	-0.145	-0.146	-0.146	-0.145	-0.146
Weights	Uniform	Inv. prop. Score	Uniform	Entropy-balancing	Inv. prop. Score
TRT regional courts	4	4	20	20	20
N	107	107	158	158	158

Notes: Sample includes all microregions with at least 30 guards and 30 cleaners in all years between 1985 and 2006. Standard deviations are in parentheses.

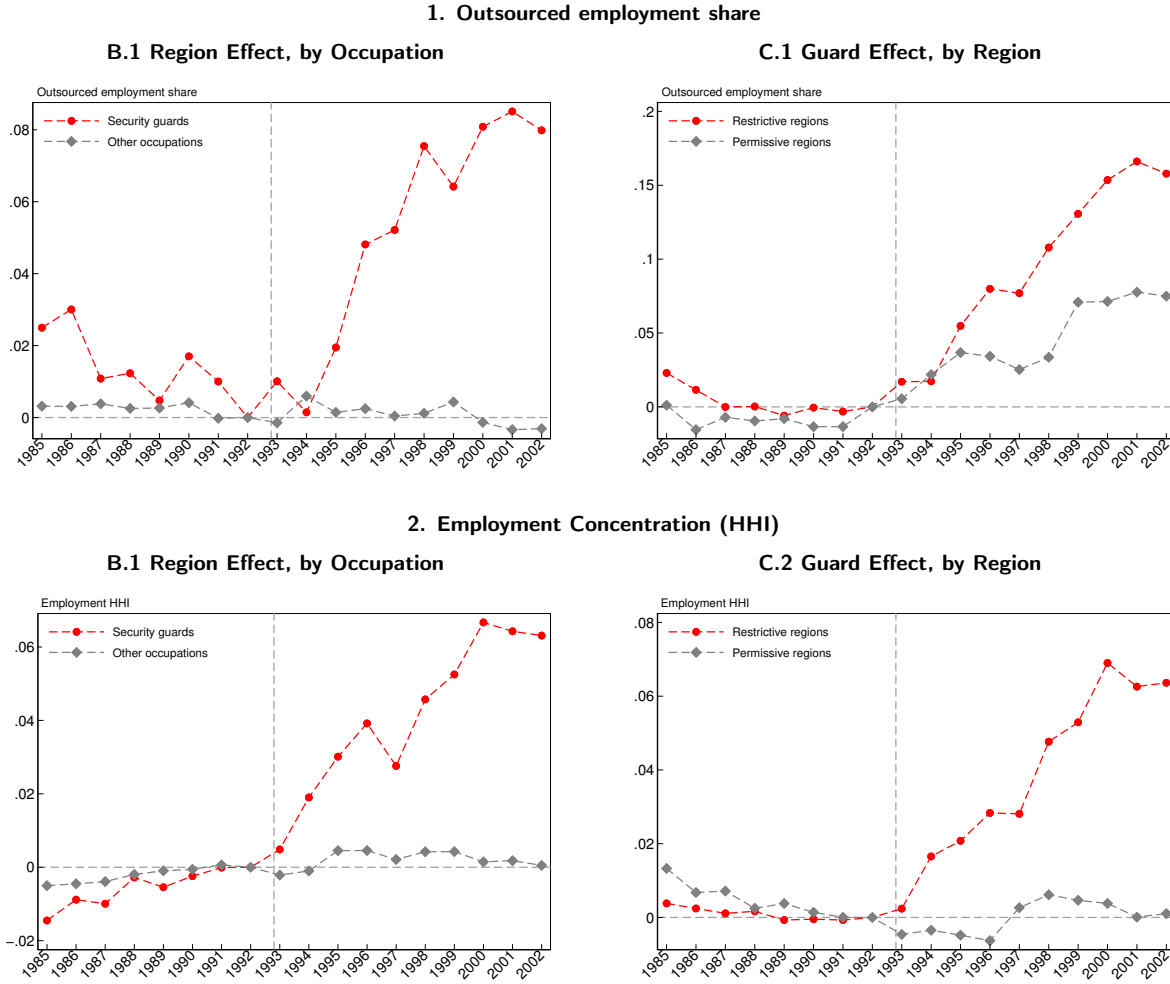Figure D.1: Map of microregions with entropy-balancing weights
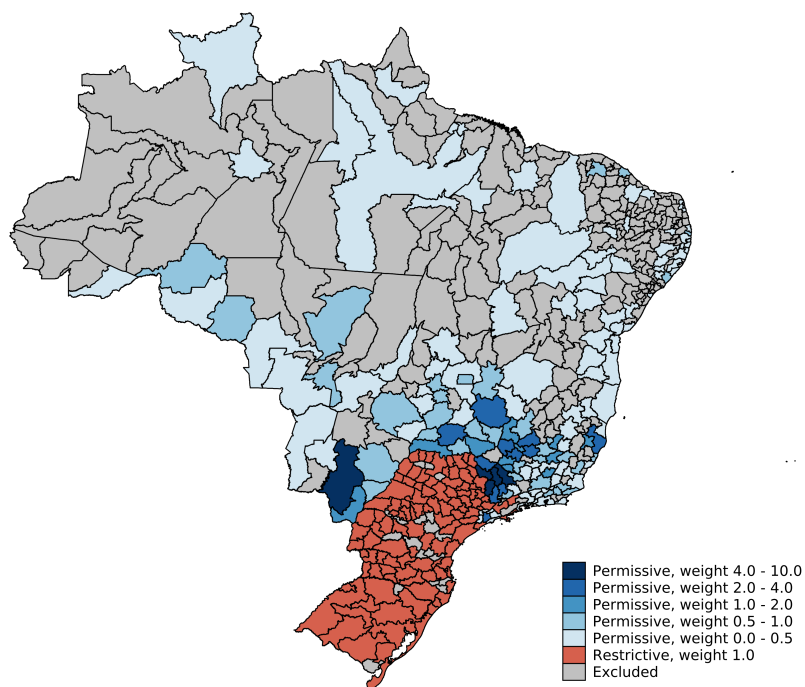
Note: Map shows microregions used in our main specifications, where observations are weighted using entropy balancing weights. Entropy balancing weights are computed using log employment, homicide rate, unemployment rate, share of employment in tradable industries, log formal employment of importers, and local import tariff competition exposure in 1992.

Figure D.2: Changes in outsourcing prevalence and distance to the state border

A. Relative change in contract-firm share

B. Relative change in occupational HHI
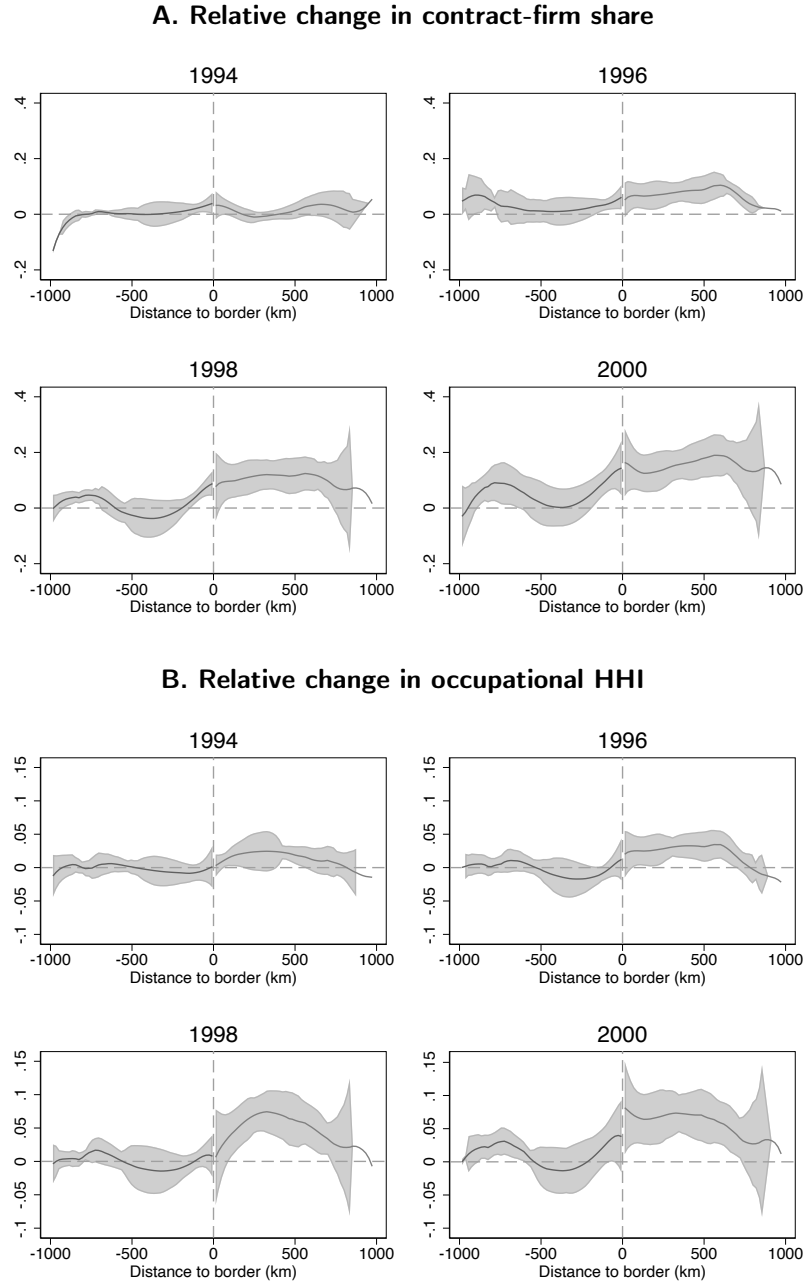
Note: We estimate kernel-weighted local polynomial regressions of the relative change of an outcome in year X on distance to border, using the Epanechnikov kernel, polynomials of degree 2, and a bandwidth of 200km, separately for restrictive and permissive microregions. We define the relative change of an outcome in year X = (outcome in year X - outcome in year 1992) – (mean outcome among comparison occupations in year X - mean outcome among comparison occupations in year 1992). Sample includes all microregions within 1000 km of the border between restrictive and permissive jurisdictions, but excludes the 2nd region. We display a graph of the smoothed values with 95% confidence bands, where restrictive regions given positive distance and permissive regions are given negative distance.

Figure D.3: Differences in outsourcing prevalence: Region Effect (Restrictive vs. Permissive, "Court Restrictiveness") and Guard Effect (Guards vs. Others, "Law Bindingness").
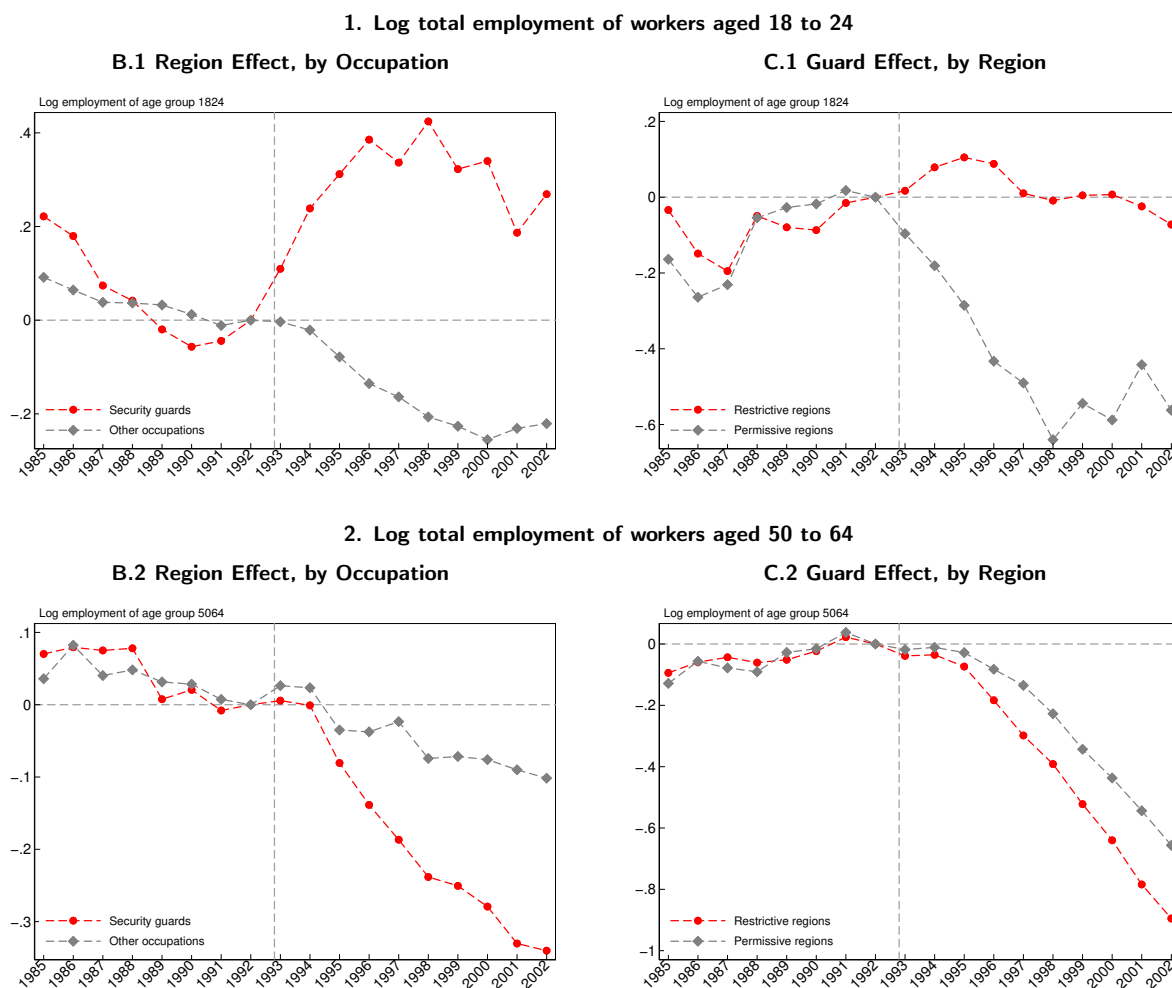
1. Outsourced employment share

B.1 Region Effect, by Occupation　　　　**C.1 Guard Effect, by Region**

2. Employment Concentration (HHI)

B.1 Region Effect, by Occupation　　　　**C.2 Guard Effect, by Region**

Note: Panel B repeats Figure 4 Panel B. Panel C plots α_τ coefficients from the DD regression $y_{ot} = \sum_{\tau=1985;\tau\neq1992}^{2002} \alpha_\tau \left(T_o \times 1_{t=\tau}\right) + \delta_o + \delta_t + \epsilon_{ot}$ where $T_o = 1$ if occupation o is security guards, zero otherwise, δ_o and δ_t are occupation and year fixed effects, respectively, separately estimated for the occupations in restrictive versus permissive microregions. Occupation-level outcomes are averages across microregions, with microregion balancing weights. The resulting occupation-level regressions weigh occupations equally. Results in both panels are based on a balanced sample of 265 microregions and 12 large 2-digit occupational groups, with positive employment in all microregions in all years, accounting for over 98% of all security guards in the data. See Appendix C for details. Legalization's baseline year of 1992 is omitted in both panels.
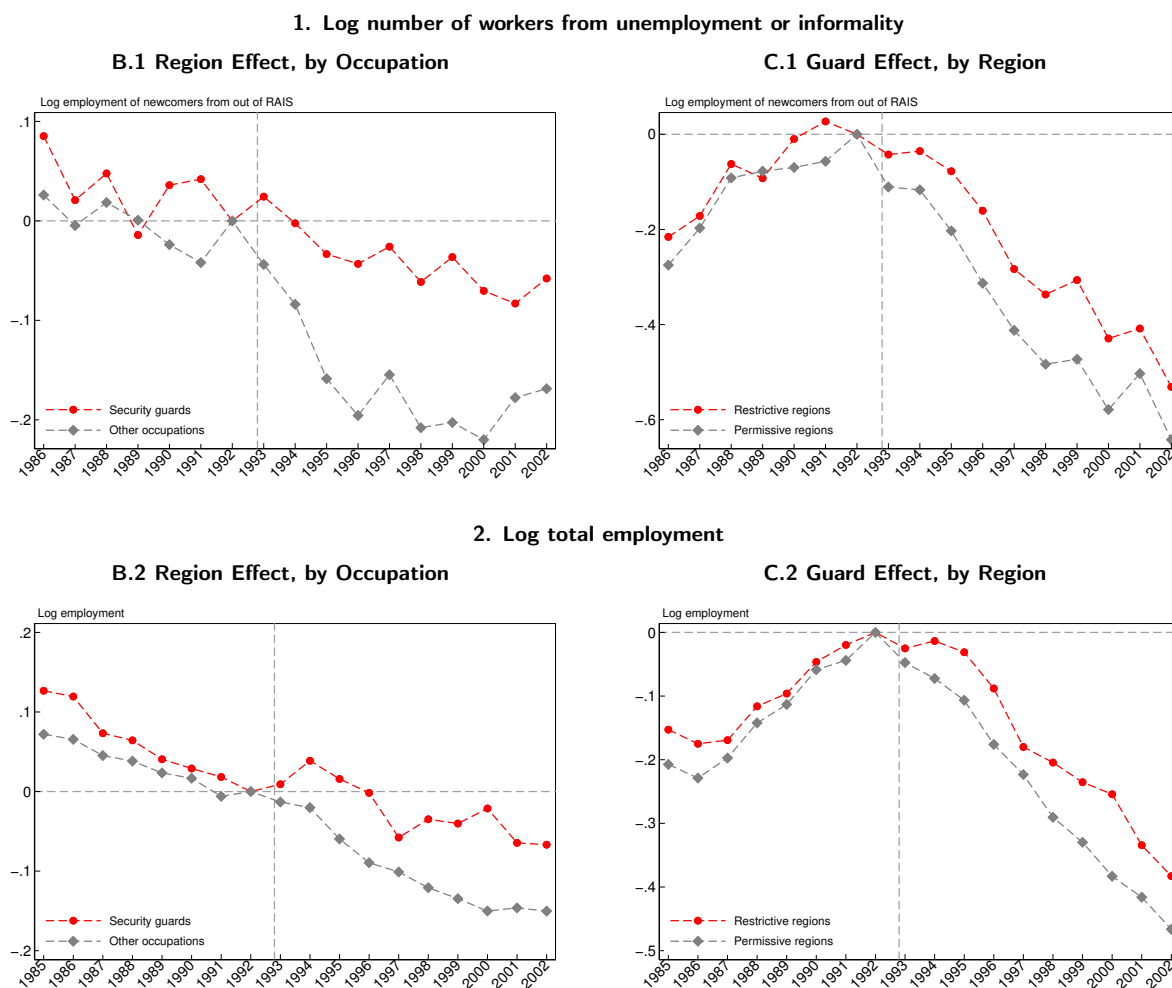
Figure D.4: Differences in employment by age groups: Region Effect (Restrictive vs. Permissive, "Court Restrictiveness") and Guard Effect (Guards vs. Others, "Law Bindingness").

1. Log total employment of workers aged 18 to 24

B.1 Region Effect, by Occupation

C.1 Guard Effect, by Region

2. Log total employment of workers aged 50 to 64

B.2 Region Effect, by Occupation

C.2 Guard Effect, by Region

Note: See footnotes to Figure D.3.

Figure D.5: Differences in employment: Region Effect (Restrictive vs. Permissive, "Court Restrictiveness") and Guard Effect (Guards vs. Others, "Law Bindingness").
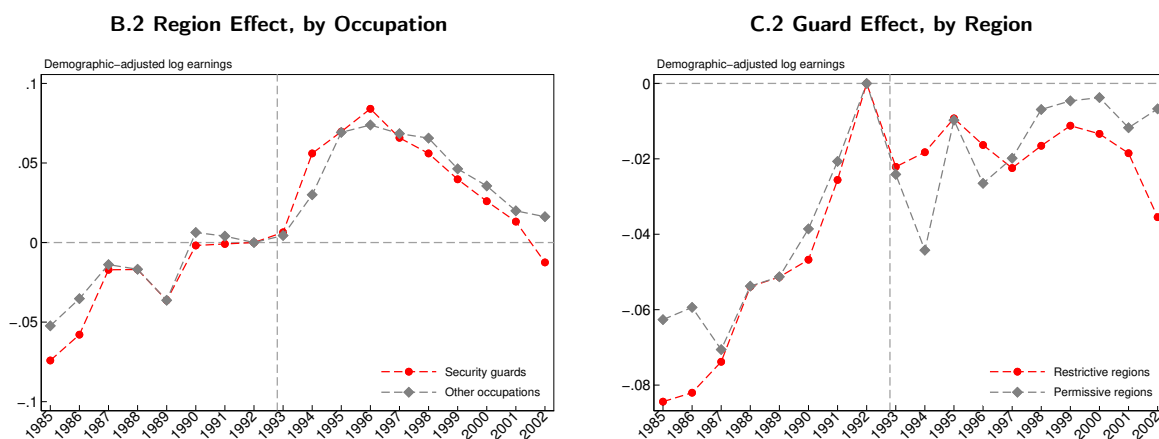
1. Log number of workers from unemployment or informality

B.1 Region Effect, by Occupation   **C.1 Guard Effect, by Region**

2. Log total employment

B.2 Region Effect, by Occupation   **C.2 Guard Effect, by Region**

Note: See footnotes to Figure D.3.

Figure D.6: Differences in wages: Region Effect (Restrictive vs. Permissive, "Court Restrictiveness") and Guard Effect (Guards vs. Others, "Law Bindingness").

1. Log earnings (as reported, unadjusted)

B.1 Region Effect, by Occupation

C.1 Guard Effect, by Region
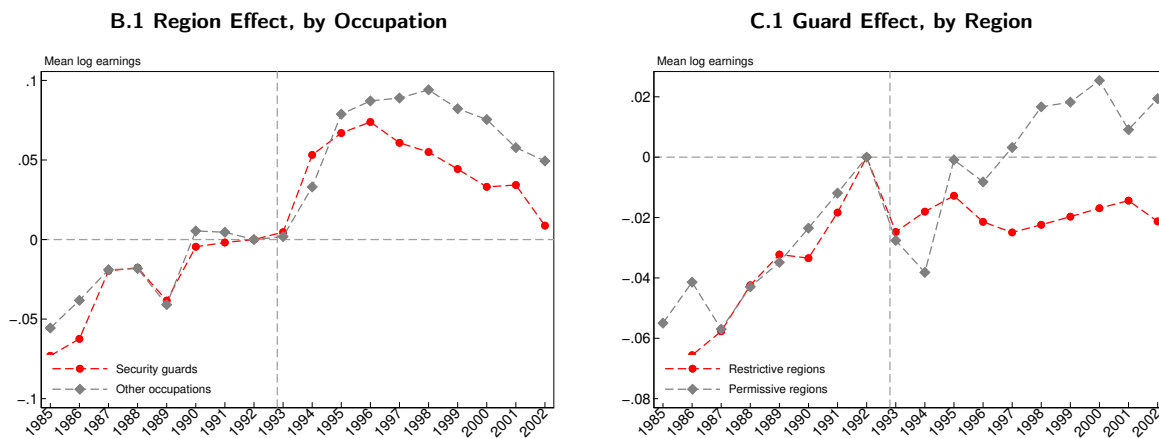
B. Log earnings conditional on demographics (age, education, gender)

B.2 Region Effect, by Occupation

C.2 Guard Effect, by Region

3. Log earnings conditional on worker fixed-effects and time-varying

B.3 Region Effect, by Occupation

C.3 Guard Effect, by Region
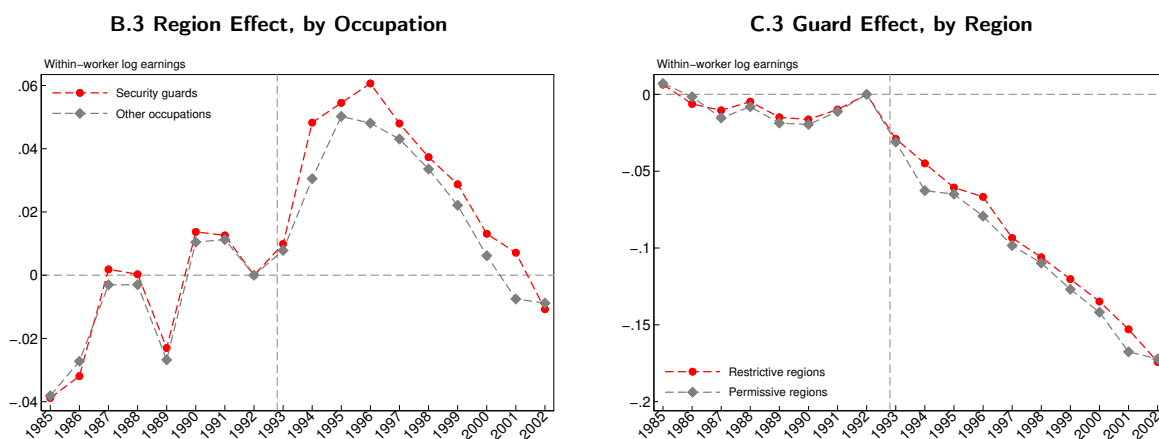
Table D.2: Robustness to balancing baseline covariates: Effect of legalization on employment

	Main specification	Adding balancing on informality	Not balancing on unemp. rate	Not balancing on trade exposure	Observations (region x occup x year)
	(1)	(2)	(3)	(4)	(5)
Panel A: Log total employment					
Log total employment	0.052	0.059	0.031	0.028	57240
	(0.011)	(0.020)	(0.009)	(0.013)	
Panel B: Log employment by contract type					
Direct-hire	-0.048	-0.054	-0.061	-0.067	57240
	(0.019)	(0.024)	(0.018)	(0.021)	
Outsourced	0.099	-0.373	0.193	0.136	57240
	(0.145)	(0.195)	(0.145)	(0.144)	
Panel C: Log employment origins					
Workers from outside RAIS (e.g.,	0.093	0.048	0.044	0.075	54060
unemployment, informality, nilf)	(0.026)	(0.024)	(0.022)	(0.026)	
Workers from inside RAIS	0.032	0.061	0.023	0.004	54060
	(0.010)	(0.022)	(0.013)	(0.013)	

The header "Legalization effect (Weighted DDD)" spans columns (2)–(4).

Notes: See notes to Table 2. Log employment is expressed in natural logs.

Table D.3: Robustness to balancing baseline covariates: Effect of legalization on employment composition

	Main specification	Adding balancing on informality	Not balancing on unemp. rate	Not balancing on trade exposure	Observations (region x occup x year)
			Legalization effect (Weighted DDD)		
	(2)	(2)	(3)	(4)	(5)
Log employment by worker age group					
18-24	0.422	0.289	0.410	0.379	57240
	(0.036)	(0.031)	(0.025)	(0.030)	
25-29	0.193	0.218	0.202	0.153	57240
	(0.031)	(0.022)	(0.023)	(0.025)	
30-39	0.060	0.066	0.043	0.034	57240
	(0.023)	(0.037)	(0.023)	(0.023)	
40-49	-0.050	-0.058	-0.106	-0.081	57240
	(0.031)	(0.046)	(0.026)	(0.032)	
50-64	-0.140	-0.159	-0.198	-0.144	57240
	(0.023)	(0.036)	(0.006)	(0.020)	

Notes: See notes to Table 2. Log employment is expressed in natural logs.

Table D.4: Robustness to balancing baseline covariates: Effect of legalization on wages

| | Legalization effect (Weighted DDD) | | | | |
	Main specification	Adding balancing on informality	Not balancing on unemp. rate	Not balancing on trade exposure	Observations (region x occup x year)
	(2)	(2)	(3)	(4)	(5)
Panel A: Real December log earnings					
As reported (i.e., unconditional)	-0.016	-0.002	-0.007	-0.026	57240
	(0.015)	(0.022)	(0.014)	(0.016)	
Conditional on worker demographics	0.003	0.019	0.013	-0.006	57240
	(0.015)	(0.018)	(0.014)	(0.015)	
Conditional on worker FEs	0.004	0.020	-0.005	-0.005	57240
and time-varying demographics	(0.012)	(0.012)	(0.011)	(0.012)	
Panel B: Real December log earnings					
by contract type, as reported					
Direct-hire	-0.011	-0.007	0.005	-0.016	57240
	(0.014)	(0.016)	(0.013)	(0.014)	
Outsourced					
	0.003	-0.036	0.011	-0.008	43628
	(0.020)	(0.029)	(0.020)	(0.020)	

Notes: See notes to Table 6.

Table D.5: Robustness to excluding São Paulo: Effect of legalization on key outcomes

	Legalization effect (Weighted DDD)		
	Main specification	Exclude São Paulo metro	Exclude São Paulo state
	(1)	(2)	(3)
Outsourced share	0.052	0.056	0.035
	(0.011)	(0.011)	(0.011)
Log employment	0.052	0.056	0.035
	(0.011)	(0.011)	(0.011)
Log employment by worker age group			
18-24	0.422	0.427	0.344
	(0.036)	(0.037)	(0.044)
50-64	-0.140	-0.138	-0.120
	(0.023)	(0.024)	(0.026)
Log real December log earnings	0.003	-0.007	0.034
conditional on worker demographics	(0.015)	(0.016)	(0.010)

Notes: See notes to Table 6.

Figure D.7: Effect of legalization on employment of direct-hire incumbent guards
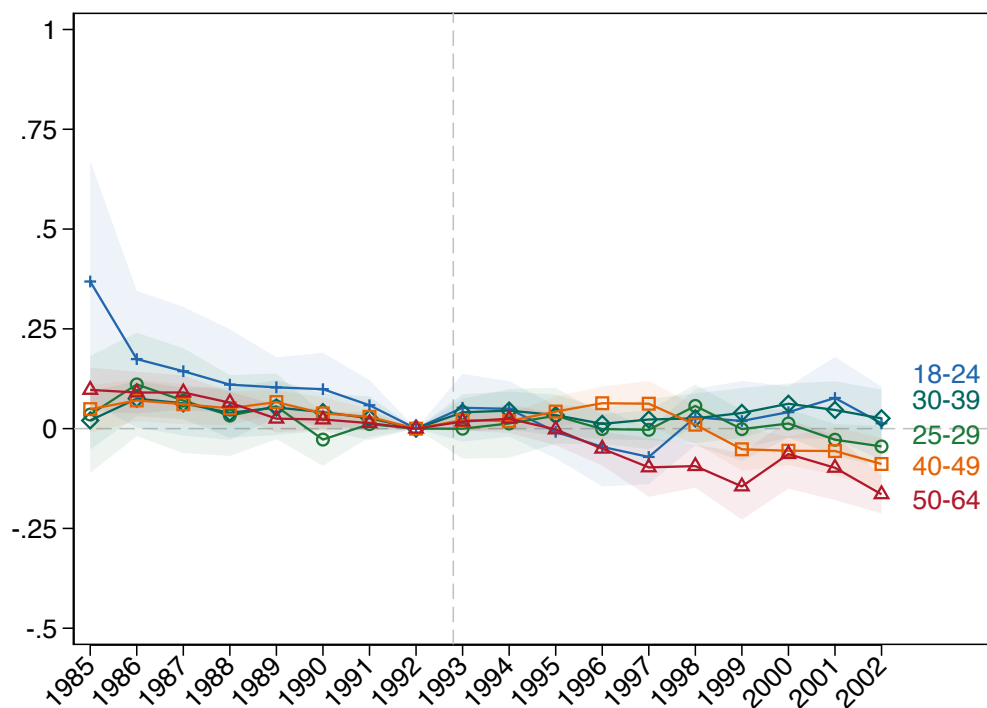
Note: See notes to Figure 7. The sample includes all workers in guard and control group occupations who were directly employed in 1992.

Figure D.8: Effect of outsourcing legalization on worker transitions
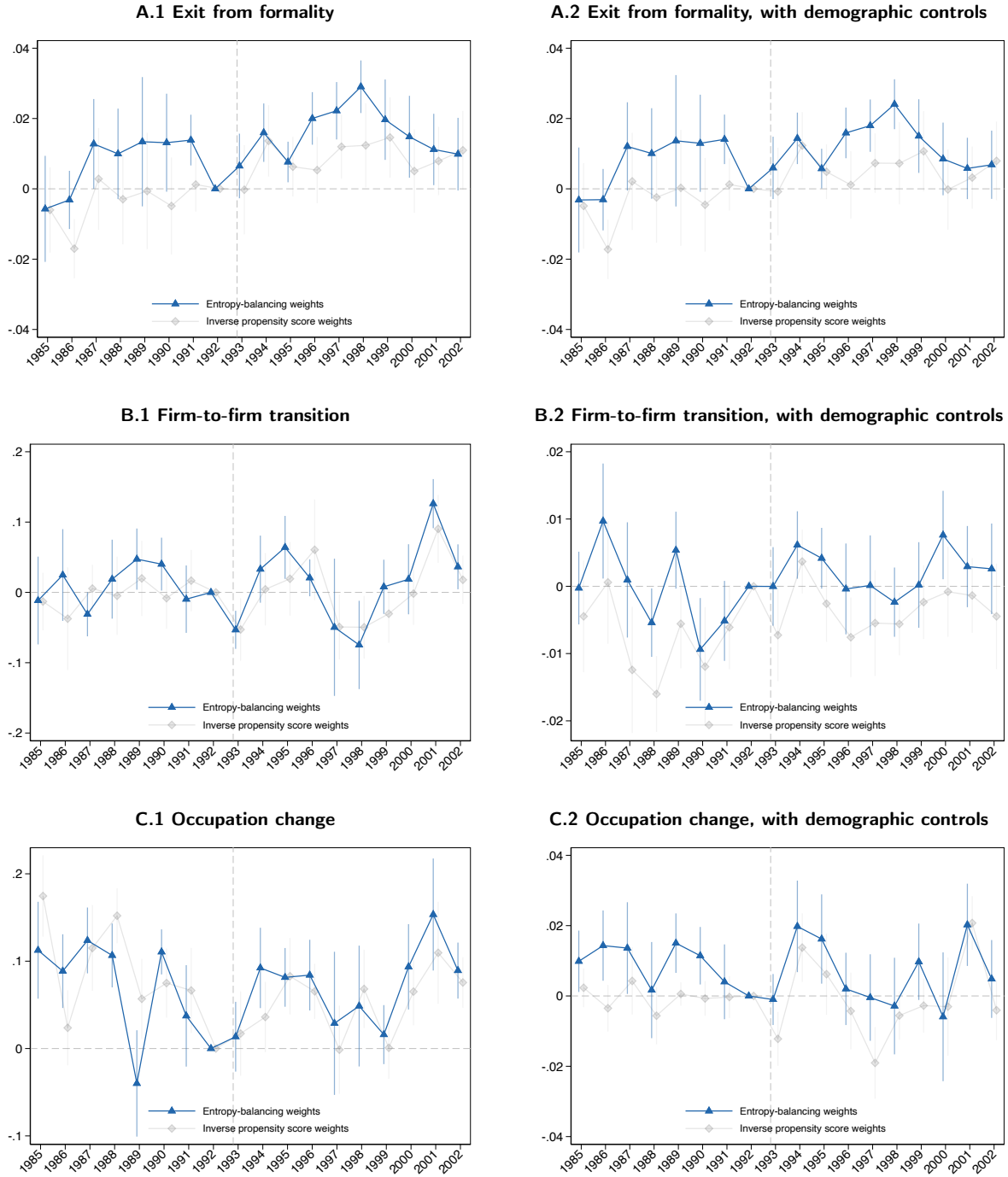
A.1 Exit from formality

A.2 Exit from formality, with demographic controls

B.1 Firm-to-firm transition

B.2 Firm-to-firm transition, with demographic controls

C.1 Occupation change

C.2 Occupation change, with demographic controls

Note: See notes to Figure 4. The outcome variable in panel A is worker age. The outcomes variables in panel B are log employment by different age groups. Age groups are defined according to the age group variable consistently reported throughout the period. The omitted year is 1992. Sample is weighted by entropy balancing weights. Standard errors for 95% confidence intervals are two-way clustered by regional labor court and occupation.

Figure D.9: Effect of outsourcing legalization on within-worker wage growth

A.1 Wage growth, conditional on formal employment
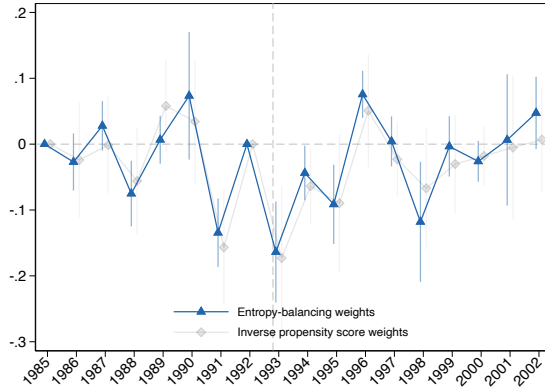
A.2 Wage growth, conditional on formal employment, with demographic controls
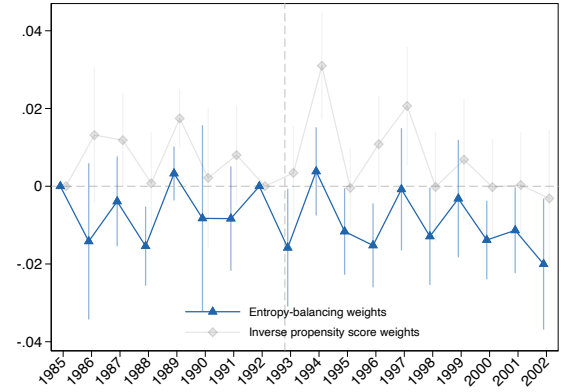

B.1 Within-firm wage growth
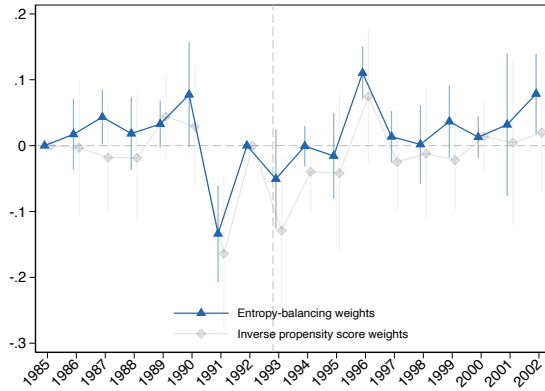
B.2 Within-firm wage growth, with demographic controls
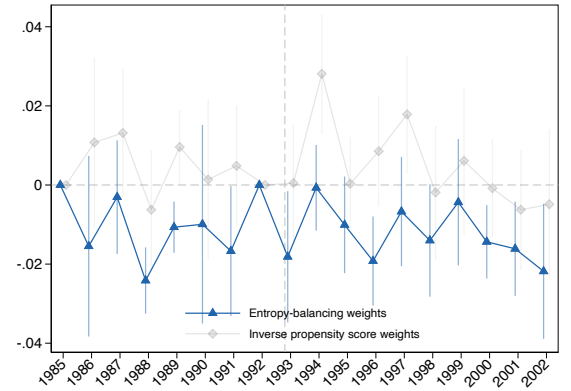
Note: See notes to Figure 4. The outcome variable in panel A is worker age.The outcomes variables in panel B are log employment by different age groups. Age groups are defined according to the age group variable consistently reported throughout the period. The omitted year is 1992. Sample is weighted by entropy balancing weights. Standard errors for 95% confidence intervals are two-way clustered by regional labor court and occupation.

Figure D.10: Regional differences in homicide rates

A. Raw trend

A. Diff-in-diff estimates
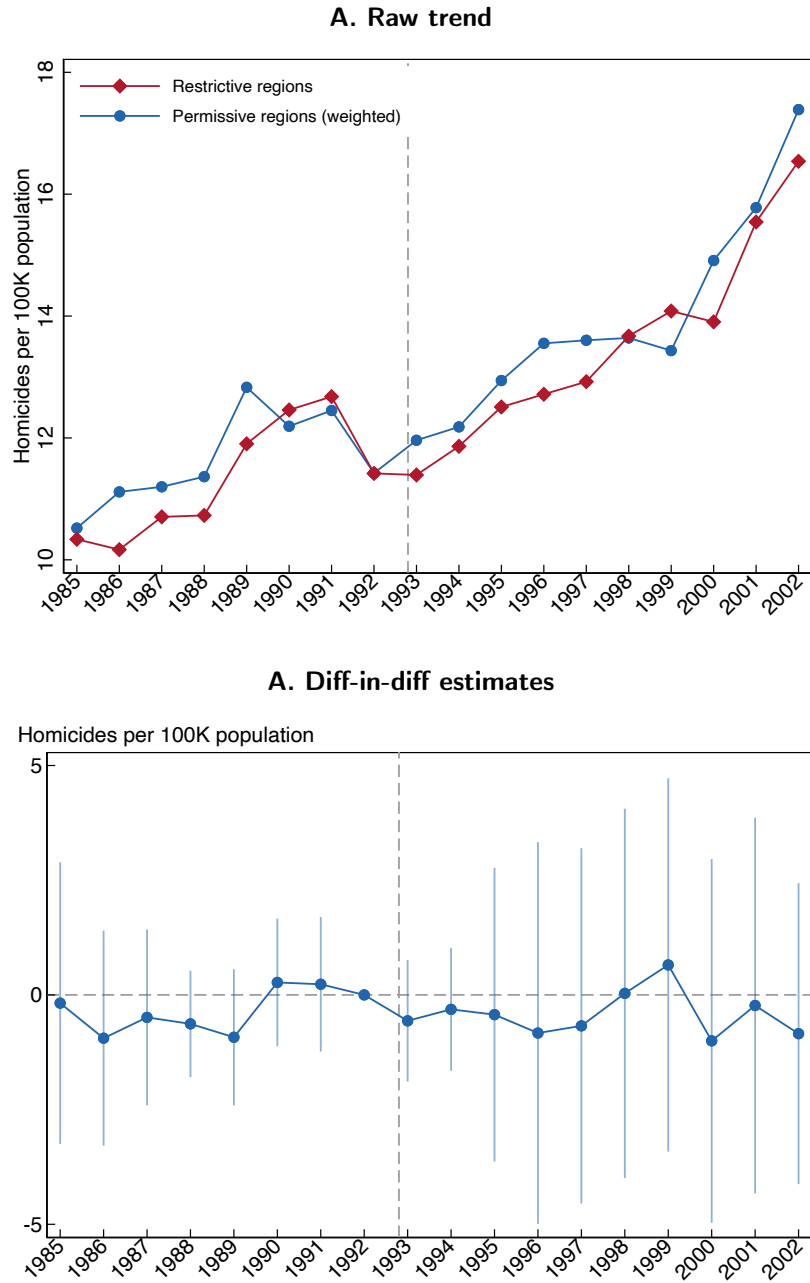
Note: Panel A plots the mean homicide rate for restrictive and permissive microregions, respectively. Panel B plots the coefficients from a DD regression that comparing restrictive microregions to permissive microregions, with controls for year and microregion fixed effects. The omitted year is 1992. Sample is weighted by entropy balancing weights. Standard errors are clustered at the regional labor court level.

Figure D.11: Effect of legalization on direct-hire employment, alternative definitions
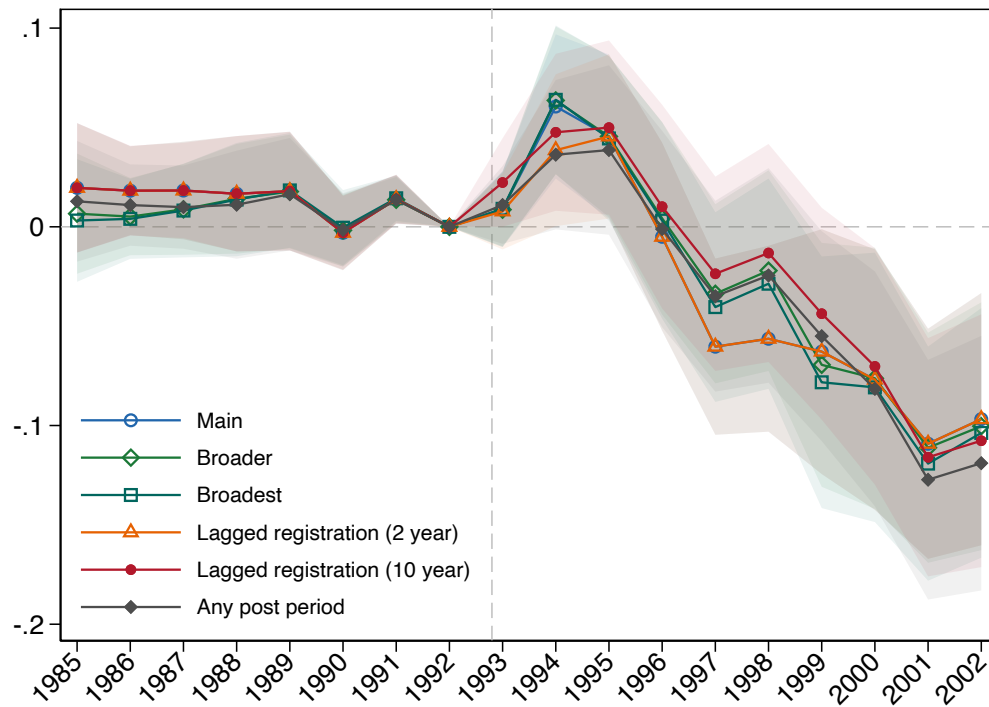
Note: See notes to Figure 7. "Main" uses the same contract firm definition used throughout the paper. "Broader" uses a broader definition, including a larger set of 6-digit CNAE codes. "Broadest" uses an even broader definition, including almost all 6-digit codes within the CNAE class 72 and 74. "Lagged registration (2 year)" allows for up to 2 years of delay in registration as business service firm" (since CNAE95 starts two years after legalization). "Lagged registration (10 year)" allows for up to 10 years of delay in registration as business service firm. "All post period" defines contract firms as any firm that registers as a business service firm in any post-period year.

E   Differences in Wages and Transitions between Outsourced and Direct-hire Workers

Table E.1: Outsourcing wage differential

| | Dependent variable: Log real monthly wage | | | |
	(1)	(2)	(3)	(4)
Outsourced	-0.016	-0.019	0.059	-0.007
	(0.001)	(0.001)	(0.001)	(0.001)
Outsourced X Tenure			-0.020	-0.008
			(0.000)	(0.000)
Tenure			0.050	0.026
			(0.000)	(0.000)
Observations	2870865	2456800	2870865	2456800
R2	0.34	0.91	0.45	0.91

Note: Sample is all guards between ages 18-64 employed between 1997-2002. All regressions include controls for year FE, microregion FE, and education level interacted with age, age squared and age cubed. Standard errors are clustered at the individual level and presented in parentheses.

Table E.2: Outsourcing hazard differential

	(1)	(2)	(3)	(4)
Dependent variable: Exit from formality				
Outsourced	0.004	0.003	-0.010	-0.007
	(0.001)	(0.001)	(0.001)	(0.001)
Outsourced X Tenure			0.003	0.002
			(0.000)	(0.000)
Tenure			-0.012	-0.009
			(0.000)	(0.000)
AKM Worker FE		X		X
Observations	2870865	2836925	2870865	2836925
R2	0.30	0.31	0.31	0.32

Note: Sample is all guards between ages 18-64 employed between 1997-2002. All regressions include controls for year FE, microregion FE, and education level interacted with age, age squared and age cubed. Standard errors are clustered at the individual level and presented in parentheses. The dependent variable is equal to one if and only if the worker does not remain formally employed in the following year.

Table E.3: Outsourcing occupation switching differential

	(1)	(2)	(3)	(4)
	Any firm		Same firm	Different firm
Outsourced	-0.026	-0.026	-0.027	0.001
	(0.000)	(0.000)	(0.000)	(0.000)
Outsourced X Tenure		-0.000		
		(0.000)		
Tenure		-0.000		
		(0.000)		
Observations	2870865	2870865	2870865	2870865
R2	0.02	0.02	0.02	0.00

Note: Sample is all guards between ages 18-64 employed between 1997-2002. All regressions include controls for year FE, microregion FE, and education level interacted with age, age squared and age cubed. Standard errors are clustered at the individual level and presented in parentheses. In Columns (1) and (2), the dependent variable is equal to one if and only if the worker remains employed and the 2-digit CBO94 occupation code in the following year is different from the current year. In Column (3), the dependent variable is equal to one if the worker additionally remains in the same firm. In Column (4), the dependent variable is equal to one if the worker instead moves to a different firm.

Table E.4: Outsourcing managerial promotion differential

	(1)	(2)	(3)	(4)
	Any firm		Same firm	Different firm
Outsourced	-0.001	-0.001	-0.001	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Outsourced X Tenure		0.000		
		(0.000)		
Tenure		0.000		
		(0.000)		
Observations	2870865	2870865	2870865	2870865
R2	0.00	0.00	0.00	0.00

Dependent variable: Managerial promotion

Note: Sample is all guards between ages 18-64 employed between 1997-2002. All regressions include controls for year FE, microregion FE, and education level interacted with age, age squared and age cubed. Standard errors are clustered at the individual level and presented in parentheses. In Columns (1) and (2), the dependent variable is equal to one if and only if the worker remains employed and the 2-digit CBO94 occupation code in the following year is a managerial occupation. In Column (3), the dependent variable is equal to one if the worker additionally remains in the same firm. In Column (4), the dependent variable is equal to one if the worker instead moves to a different firm.

F   Firm-level Outsourcing Events: Details

F.1   On-site and Occupational Layoff Outsourcing Events

We define an "on-site outsourcing" event as a situation where a group of 3 security guards were all employed in a non-business service establishment with at least 10 employees in one year and then in the following year were all employed in a business service establishment. To avoid misclassifying mass layoffs, we exclude establishments who non-guard employment fell by more than 10 percent. These events are called *on-site* outsourcing events, because the workers were presumably transferred to a contract firm but continued to perform the same job.

Goldschmidt and Schmieder (2017) use a more stringent definition for on-site outsourcing. In their definition, the predecessor establishment must have at least 50 employees in the year prior to the event, continue to exist in the following year, and not shrink by more than 50%. The flow must also represent less than 30% of employment in the predecessor in the previous year, such that outsourced workers represent only a small part of the predecessor's business.

We say that establishment j had an "occupational layoff" in year t if: (1) establishment j had at least 10 total employees; (2) establishment j employed at least three guards in years $t-1$ and $t-2$; (3) the number of guards at establishment j in year t fell by at least two-thirds compared to year $t-1$; (4) the number of guards fell to zero in year t if j employed fewer than six guards in year $t-1$; (5) establishment j's non-guard employment shrinks by less than 10 percent between $t-1$ and t; and (6) establishment j was not a contract firm nor government entity in year $t-1$. Note that to avoid misclassifying normal fluctuations in headcount, we require that the number of security guards must fall to zero for establishments initially with 5 or fewer guards. To avoid misclassifying mass layoffs, we also exclude establishments who non-guard employment fell by more than 10 percent. Figure F.1 visualizes this definition by plotting the average number of security guards and non-security guard employees at the establishment level during the years before and after an occupational layoff.

Figure F.1: Establishment employment before and after occupational layoff

A. Employment of security guards

B. Employment excluding security guards
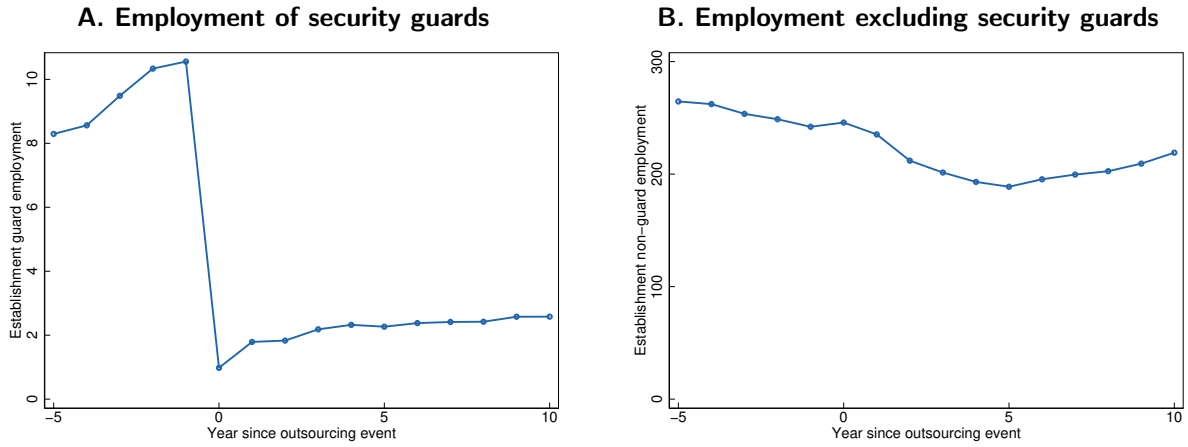
Note: Figure plots the number of security guards and non-security guard employees for the years before and after an occupational layoff.

Figure F.2: Frequency of occupational layoffs by region restrictiveness
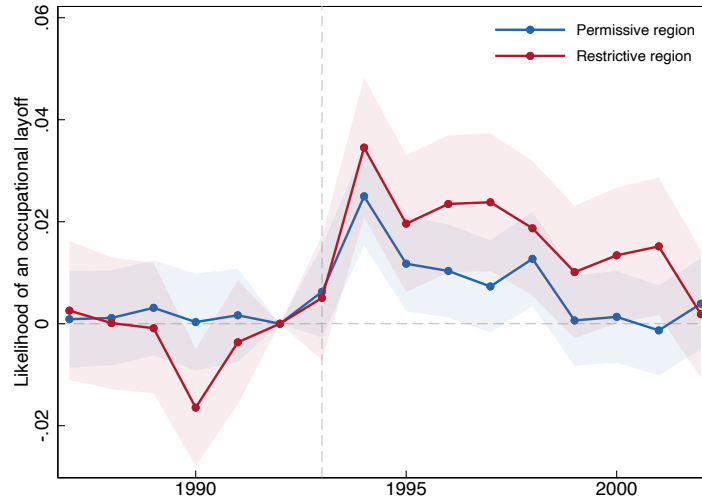
Note: This figure plots coefficients from a linear probability model with separate year fixed effects for restrictive and permissive regions. We cluster standard errors at the establishment level.

F.2 Matching Workers Affected by Occupational Layoff to a Control Group

We define non-outsourcing establishments as those with no occupational layoffs between 1990 and 2000. For each treated worker, we take the set of workers employed by non-outsourcing establishments in the same 2-digit industry, 5-digit occupation, and regional court jurisdiction to be our potential control group. For both treated and control groups, we restrict to workers who were employed at the same establishment as a security guard for three consecutive years prior to outsourcing. We then estimate a probit regression of whether a worker is experienced an occupational layoff, controlling for wages two and three years prior, as well as tenure and AKM firm effect in the year prior to outsourcing. For each treated worker, we then choose the non-outsourced worker with the closest propensity score to the comparison worker. Table F.1 presents summary statistics for the matched worker sample.

Table F.2: Effects of occupational layoffs on incumbent workers

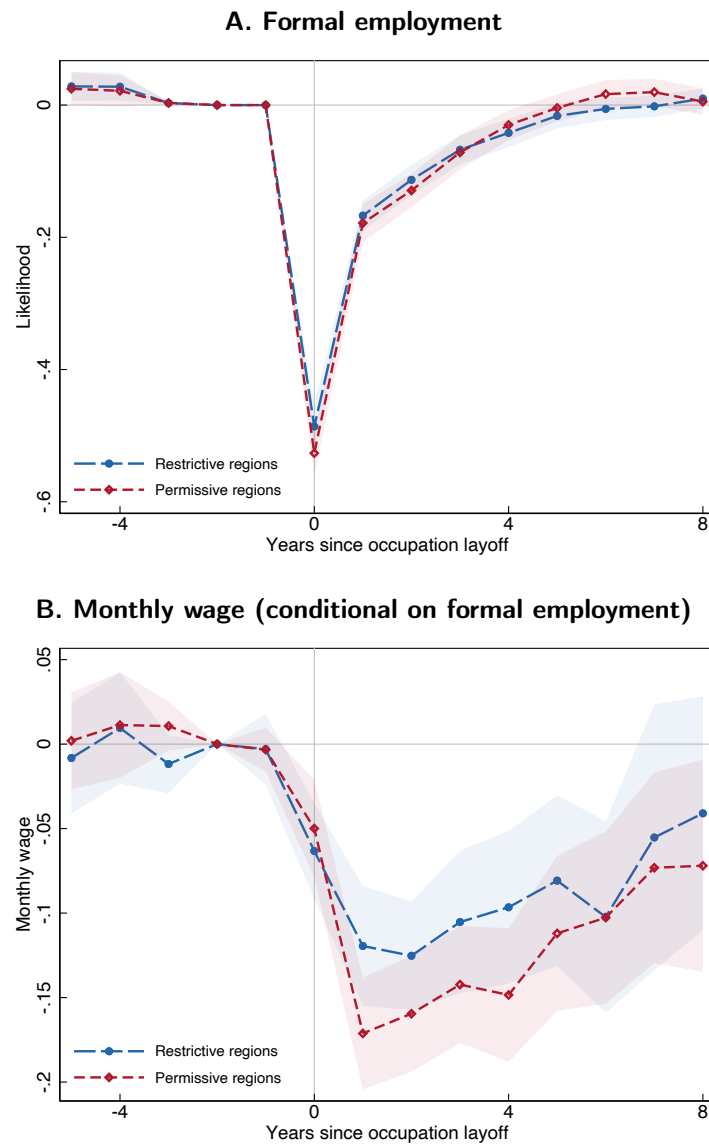|	Years since occupational layoff		
	Y0	Y1	Y5
Formally employed	-0.493	-0.159	-0.025
	(0.013)	(0.010)	(0.010)
Formally employed in same occupation	-0.761	-0.399	-0.117
	(0.007)	(0.011)	(0.010)
Formally employed in contract firm	0.002	0.077	0.041
	(0.001)	(0.005)	(0.005)
Monthly wage (relative to base year)	-0.064	-0.136	-0.090
	(0.012)	(0.014)	(0.019)
Log monthly wage	-0.078	-0.185	-0.112
	(0.010)	(0.011)	(0.017)
Firm AKM FE effect	-0.032	-0.080	-0.052
	(0.005)	(0.006)	(0.011)
As fraction of wage losses	41%	43%	46%

Notes: Entries give estimated effects of occupational layoff on the indicated outcome in years zero (Y0), one (Y1) and five (Y5) after the event. Employment effects are estimated on a balanced sample of incumbents and their matched control workers. Wage effects are estimated conditional on workers remaining in RAIS. Wage losses due to firm effects shown both as log points and as a percentage of wage losses (e.g., -.032/-0.78 = 41% in Y0). Standard errors clustered at the firm level are in parentheses.

Table F.1: Descriptive Statistics, Matched worker sample

| Worker characteristics in year t-1	Impacted worker	Control worker
Male	0.97	0.98
	(0.2)	(0.1)
Years of schooling	5.4	5.1
	(2.8)	(2.8)
Imputed age	41.6	42.6
	(10.2)	(10.7)
Tenure	5.1	4.9
	(4.6)	(4.5)
Average monthly wage (2017 $R)	2363	2301
	(1359)	(1419)
Establishment Size	462	468
	(720)	(964)
Firm FE	0.23	0.21
	(0.28)	(0.3)
Sector:		
Manufacturing	0.32	0.32
Industrial utility	0.13	0.13
Retail	0.12	0.12
Wholesale	0.04	0.04
Finance	0.00	0.00
Service	0.11	0.10
Medical	0.03	0.03
Mining	0.03	0.03
Construction	0.04	0.04
Real estate and transportation	0.13	0.14
Other	0.05	0.05
N	12443	12443

Notes: Sample includes all matched security guards used to estimate the effects of occupational layoffs.

Figure F.3: Effect of occupational layoff on incumbent guards, by region

A. Formal employment

**B. Monthly wage (conditional on formal employment)**

Note: Figure replicates Figure 11, Panels B and D using subsamples including only restrictive and permissive microregions, respectively.

Figure F.4: Effect of occupational layoff on incumbent guards, alternative matching strategies

A. Formal employment

B. Monthly wage (conditional on formal employment)
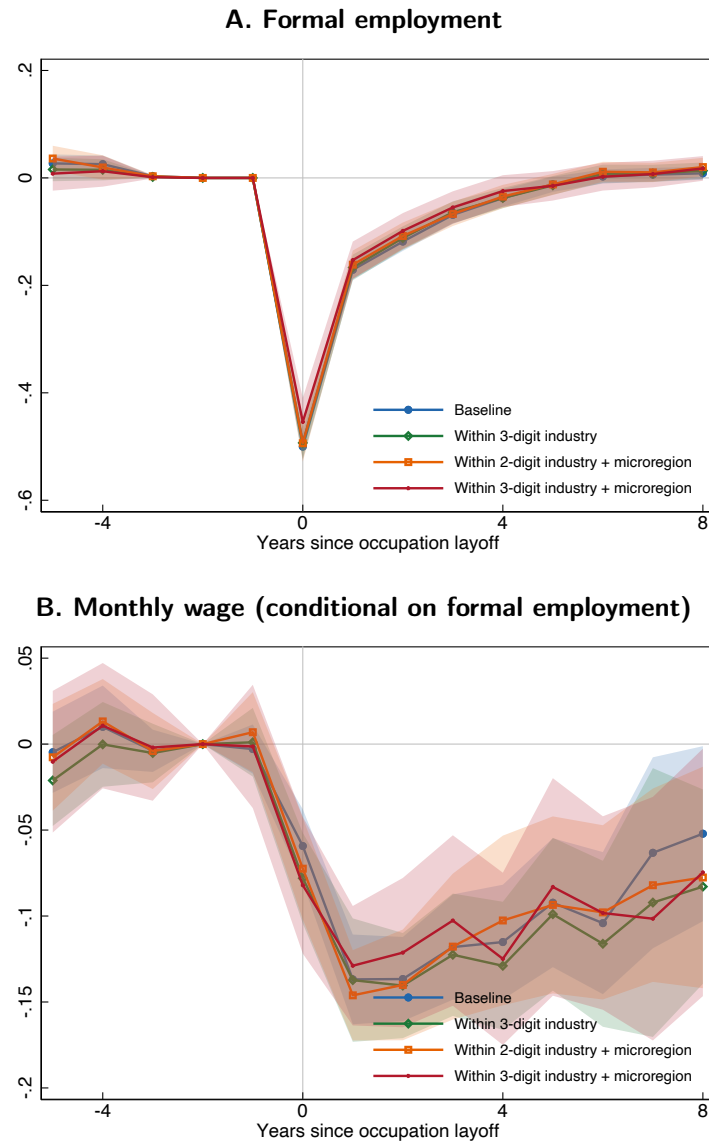
Note: Figure replicates Figure 11, Panels B and D with alternative matching strategies. The baseline specification matches workers within the 2-digit industry and local regional court jurisdiction. The alternative specifications matches within the 3-digit industry and local regional court jurisdiction (in green), within the 2-digit industry and microregion (in orange), and within the 3-digit industry and microregion (in red).

Figure F.5: Effect of occupational layoff on incumbent guards, alternative definitions

A. Formal employment

B. Monthly wage (conditional on formal employment)
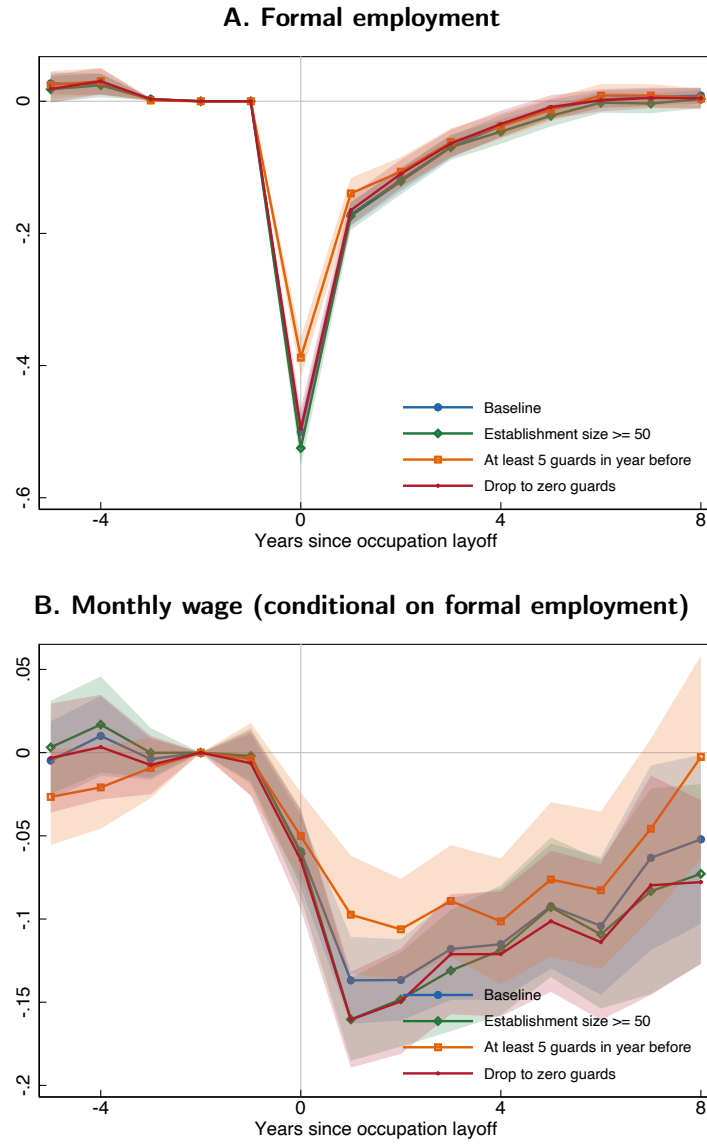
Note: Figure replicates Figure 11, Panels B and D with alternative definitions of occupational layoffs. The alternative specifications restricts to outsourcing establishments with at least 50 employees (in green), at least 5 security guards (in orange), or considers events where the number of security guards drops to zero (in red).
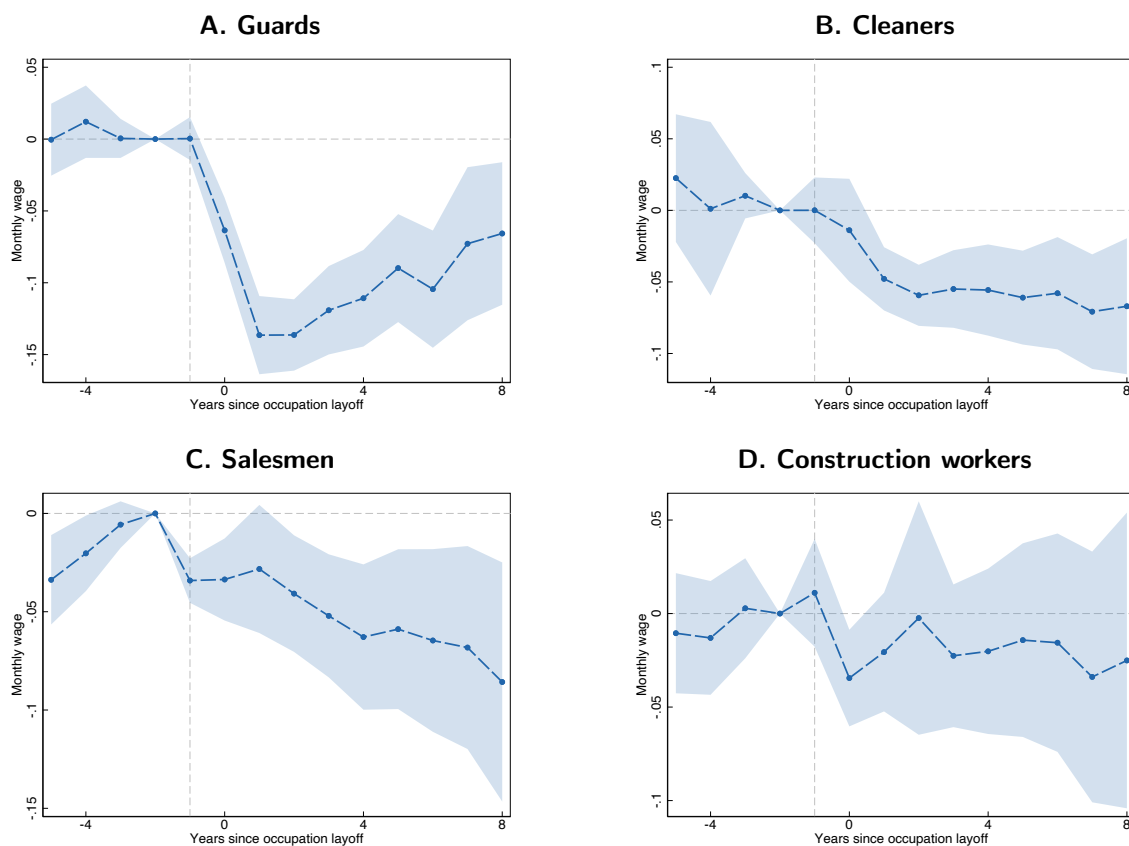
Figure F.6: Effect of occupational layoff on incumbent employment, other occupations
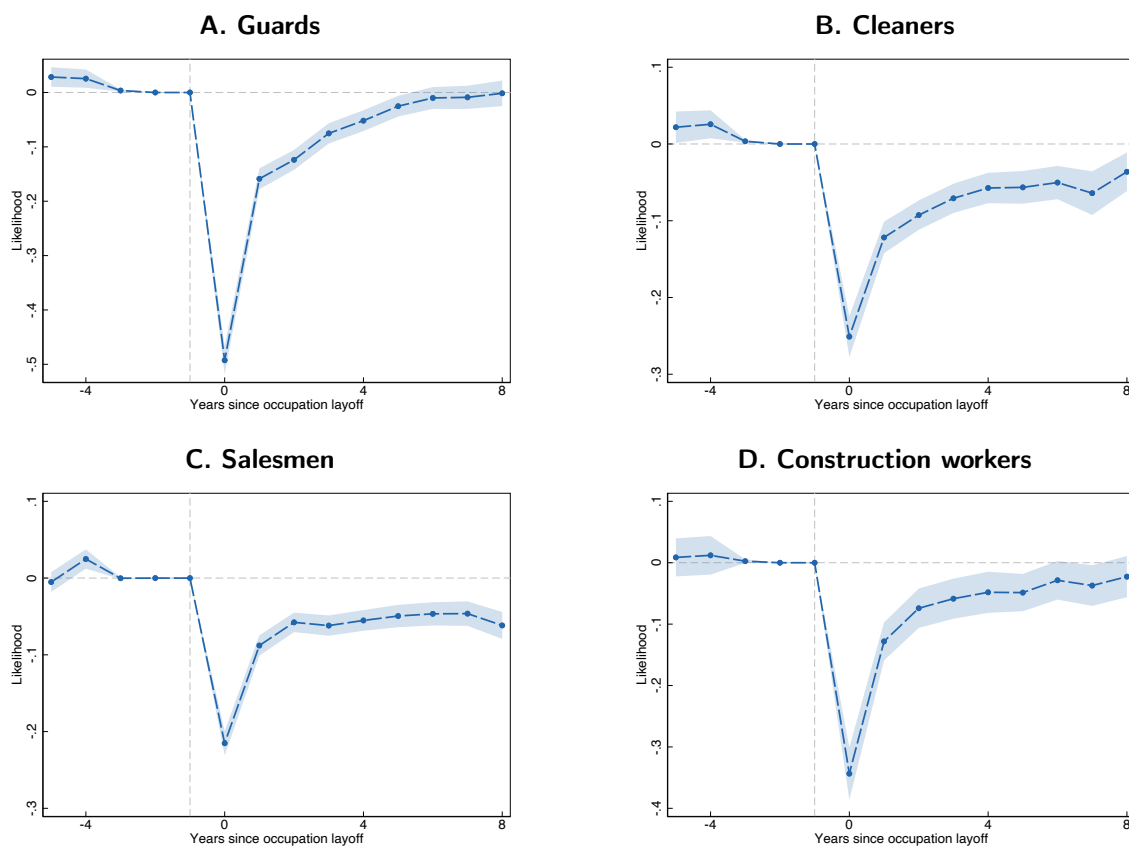
Note: Figure replicates Figure 11, Panel B for occupational layoffs in other occupations.
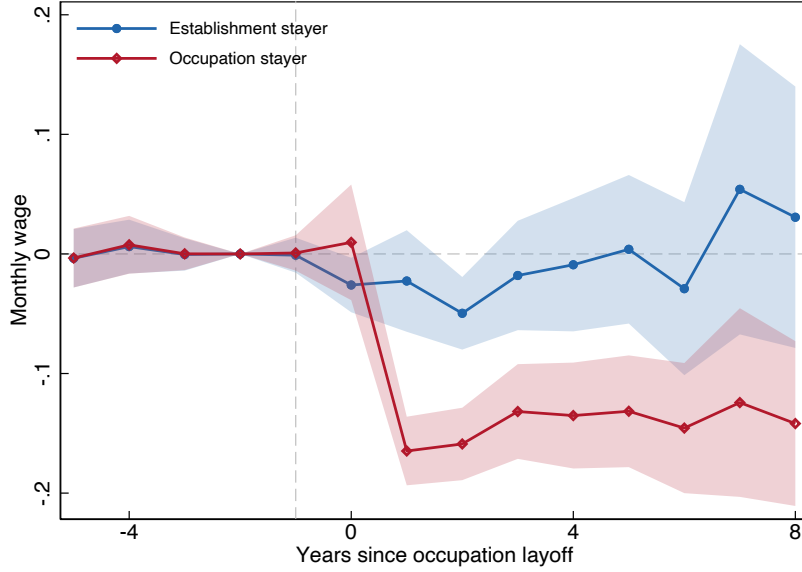
Figure F.7: Effect of occupational layoff on incumbent wage, other occupations

A. Guards

B. Cleaners

C. Salesmen

D. Construction workers

Note: Figure replicates Figure 11, Panel D for occupational layoffs in other occupations.

Figure F.8: Effect of occupational layoffs on establishment and occupation stayers

Note: Figure plots coefficient γ_τ from a DD regression measuring the impact of a firm occupational layoff on incumbent direct-hire security guards, where the control group are similar workers in establishments that did not have an occupational layoff. The outcome variable is monthly wage, as measured as a fraction of wage two years prior to the outsourcing event, and observations are included only if either (a) the worker remains at the same establishment or (b) the worker remains in the same occupation. Our sample includes all occupational layoffs, as identified by sudden drops in an establishment security guard count, between 1990 and 2000. We include controls for individual and year fixed effects, and time-varying demographics. Shaded bands indicate 95% confidence intervals, with standard errors clustered at the establishment level.

F.3   Estimation of Present Discounted Value of Earnings Losses

To estimate the present discounted value (PDV) of earnings losses, we follow the methodology of Davis and von Wachter (2011). We use a real interest rate of 5 percent, and sum the discounted losses over a 20-year period starting with the year of the occupational layoff. Because we do not observe the full 20 years of earnings after an occupational layoff, we impose a common rate of decay past the 8th year. The estimated mean PDV earnings losses for occupational layoffs is

$$PDV_{Loss} = \sum_{k=0}^{8} \hat{\delta}_k \frac{1}{(1+r)^k} + \sum_{k=8}^{19} \hat{\delta}_8 \frac{\left(1+\hat{\lambda}\right)^{k-8}}{(1+r)^k} \tag{6}$$

where $\hat{\delta}_k$ is the average estimated earnings loss in year k after occupational layoff, estimated using equation (5), and $\hat{\delta}_8 \left(1 + \hat{\lambda}\right)^{k-8}$ is an extrapolated earnings loss using the common decay rate $\hat{\lambda}$. We calculate the decay rate as the average of annualized log differences in earnings losses from years 5 to 6 to years 7 to 8 after displacement.

A complication in our setting is that we do not observe earnings for workers who are employed in the informal sector. To impute earnings for missing observations, we use a range of methods that make different assumptions about what an unobserved worker would have earned. Appendix Table F.3 summarizes our results according to these various methods:

Table F.3: PDV of earnings losses, as multiple of baseline earnings

PDV of earnings losses (as a multiple of annual pre-event earnings)	
Assuming zero earnings for unobserved workers	1.40
Assuming unobserved workers earn half min wage	1.32
Assuming unobserved workers earn min wage	1.24
Using monthly wage estimates from observed workers	1.06

The first method assumes that workers earn nothing if they unobserved in our data. The second method assumes that unobserved workers earn half the minimum wage. The third method assumes that unobserved workers earn exactly the minimum wage. The final method assumes that unobserved workers had the same earnings as observed workers, so we simply use the monthly wage estimates from the non-missing data that we reported in the previous section as the estimates for earnings losses. While the first method yields a strict upper bound on total earnings losses, the final method is likely to understate them, since earnings in the informal sector are lower on average (Bargain and Kwenda, 2014).

F.4 Measuring Firm Wage Premia using AKM Decomposition

To measure firm-specific wage premia, we use the decomposition method of Abowd et al. (1999) (henceforth, "AKM firm effects"). Using data on all formal workers in RAIS spanning 1985-2002, we estimate:

$$\log w_{it} = \psi_{J(i,t)} + \alpha_i + \theta_t + X_{it}\beta + \epsilon_{ijt}$$

where w_{it} represents real monthly wage, α_i is a individual fixed effect (capturing the general productive characteristics of workers), $\psi_{J(i,t)}$ is a firm fixed effect (capturing the wage premia for all workers at the firm), θ_t is a year fixed effect, $X_{it}\beta$ are the effects of time-varying observable worker characteristics (such as education and age), and ϵ_{ijt} is a composite error that may include idiosyncratic worker-firm match effects. The estimated firm fixed effect $(\hat{\psi}_j)$ can be thought of as representing time-invariant policies of a given firm with respect to compensation.

To ensure that firm and worker fixed effects are identified, we restrict our analysis to the largest connected set of firms that are linked by workers moving between them. Identification of the AKM model also requires that workers do not move across firm in a manner that is systematically correlated with unmeasured productivity (Gibbons and Katz 1992). Alvarez et al. (2018) provide evidence that this assumption is justified in Brazilian RAIS data. A further concern when estimating the AKM model is limited mobility bias, which may generate misleading variance decompositions, as discussed by Andrews et al. (2008). However, limited mobility bias is likely to be small in our setting since we use a long panel (Lachowska et al. 2020a; Bonhomme et al. 2020).

Table F.4: Establishment-level predictors of security guard outsourcing decisions, 1993-1998

|	Dependent variable: Outsourcing decision			
Log(estab size)	0.004			
	(0.005)			
Log(estab mean wage)		0.057***		
		(0.008)		
Log(estab mean guard wage)			0.018*	
			(0.009)	
AKM firm FE				0.088***
				(0.016)
N	7682	7682	7682	7682
R^2	0.04	0.05	0.04	0.04

Note: Sample includes establishments with at least 50 employees and at least three security guards in 1993. We exclude establishments whose total non-security guard headcount declines by more than 10 percent by 1998. The dependent variable takes indicates whether the number of security guards at the establishment dropped by more than two thirds in 1998 (and dropped to zero if the initial number of guards is fewer than six). We include controls for log number of security guards at the establishment in 1993, as well as microregion fixed effects.

Figure F.9: Effect of occupational layoff on incumbent employment, by initial firm wage premia

Formal employment
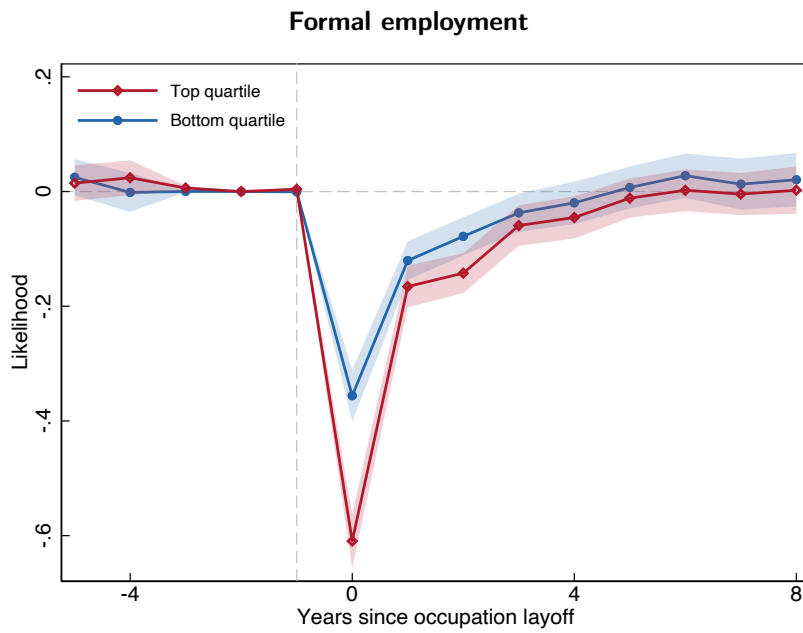
Note: Figure replicates Figure 11, Panel B using subsamples that include only workers initially in the top and bottom quartile of the AKM firm effects distribution, respectively.

Figure F.10: Trends in average firm-specific wage premia among security guards
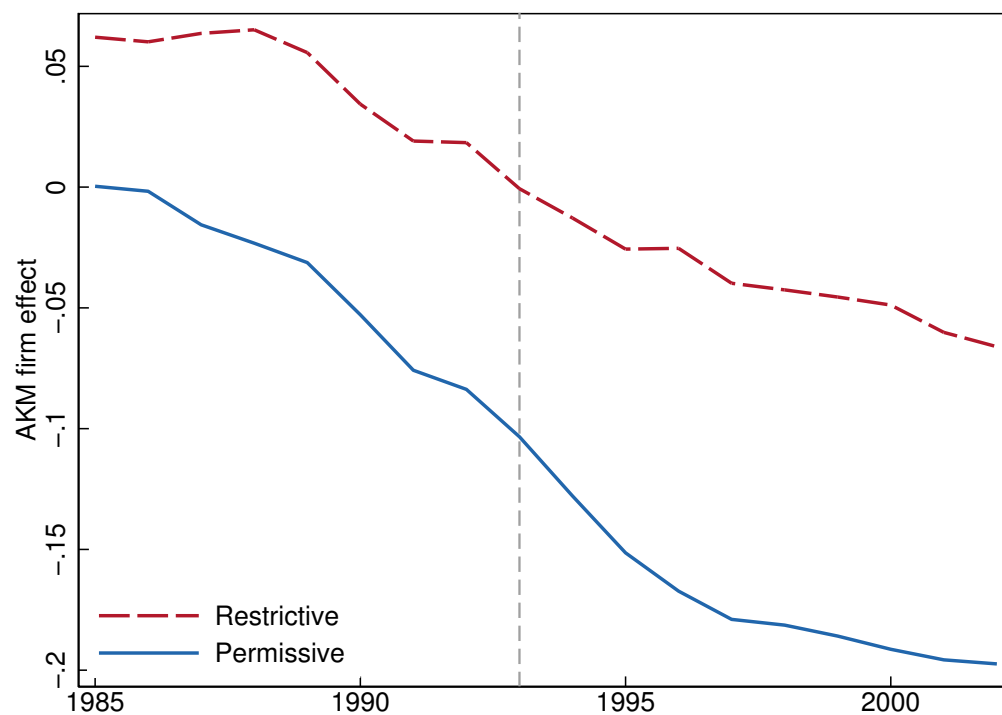
Note: Figure plots the trend in the mean AKM firm effect among security guards, averaged over microregions in our estimation sample with equal weights, separately for permissive and restrictive regions.