Displacement effects of the Finnish hiring subsidy Evidence from a funding discontinuity Appendices

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Contents

Appendix A Other simultaneous changes

The changes to the hiring subsidy in 2015 really consisted of two simultaneous reforms: the changes to the subsidy's funding, and changes to its structure and targeting. For the latter part, the main goal of the institutional reform was to increase the share of the subsidy going to private sector.

The main changes included:

- Changing the subsidy amounts from an array of flat sum subsidies to a percentage of wages
- Relaxing the constraints for the use of the subsidy for the disabled and those with long-term illnesses
- Increasing access to the subsidy based on an individual assessment by the public employment services, rather than constrained to specific strict criteria
- Allowing for longer-term subsidies for those with disabilities, long-term illnesses, or particularly long-term unemployment

The main text listed some of the changes in the composition of the subsidized workers. The predictions for employment and subsidy among participants, using models trained on earlier years, provided a summary measure of the potential significance of these changes. Tables 1–2 list some additional characteristics for participants.

Figures 1–3 plot the estimated *change* in the effects of the subsidy on participants from year to year in the selected regions. While there do appear to be some differences across years, any differences from 2014 to 2015 appear to be relatively modest.

Overall, it seems that the reform to the subsidy's structure did not fundamentally change it in the short-term. In particular, it appears reasonable to expect that in the absence of the funding halt, the subsidy would not have different effects (on participants or non-participants) across the two region groups used to study the displacement effects.

Table 1: Changes in the characteristics of subsidy participants from 2013 to 2015 and 2016.

Variable	Sector	Latter year	Value in base year, not depleted	Value in base year, depleted	Value in latter year, not depleted	Value in latter year, depleted	Diff-in-diff estimate
Age	Municipality	2015	34.4 (12.8)	33.7 (12.3)	36.3 (12.5)	37.9 (11.4)	0.18 (0.05)
		2016			34.1 (12.3)	37.7 (11.6)	0.35 (0.05)
	Private	2015	30.2 (11.8)	30.6 (11.5)	33.2 (11.9)	34.4 (12.1)	0.06 (0.05)
		2016			35 (12.1)	34.6 (11.8)	-0.07 (0.05)
	Third	2015	41.1 (11.6)	40 (11)	40.8 (11.3)	39.8 (10.9)	0.01 (0.05)
		2016			40.3 (11.1)	40.2 (10.7)	0.09 (0.05)
Education, years	Municipality	2015	11.5 (1.9)	11.6 (1.94)	11.6 (1.93)	11.8 (2.03)	0.03 (0.05)
		2016			11.6 (1.93)	11.8 (2.05)	0.06 (0.05)
	Private	2015	11.4 (1.84)	11.7 (2.01)	11.5 (2.03)	11.9 (2.19)	0.02 (0.05)
		2016			11.6 (2.08)	11.8 (2.15)	-0.02 (0.05)
	Third	2015	11.5 (2)	11.6 (2.15)	11.6 (2.17)	11.6 (2.16)	-0.08 (0.06)
		2016			11.5 (1.97)	11.7 (2.1)	-0.01 (0.06)
Female	Municipality	2015	0.558 (0.497)	0.533 (0.499)	0.531 (0.499)	0.451 (0.498)	-0.11 (0.05)
		2016			0.548 (0.498)	0.467 (0.499)	-0.11 (0.05)
	Private	2015	0.384 (0.487)	0.376 (0.484)	0.343 (0.475)	0.344 (0.475)	0.02 (0.05)
		2016			0.366 (0.482)	0.379 (0.485)	0.05 (0.05)
	Third	2015	0.525 (0.5)	0.553 (0.497)	0.497 (0.5)	0.55 (0.498)	0.05 (0.06)
		2016			0.543 (0.498)	0.548 (0.498)	-0.04 (0.06)
Days worked, last 3 years	Municipality	2015	25.1 (52.1)	26.1 (51.6)	18.1 (44.3)	12.9 (32.9)	-0.09 (0.04)
		2016			20.6 (49)	16.2 (40.8)	-0.08 (0.04)
	Private	2015	50.6 (78.2)	68.3 (91.1)	48.3 (77.4)	55.9 (85.8)	-0.15 (0.07)
		2016			45.8 (76.3)	53.8 (82.9)	-0.14 (0.06)
	Third	2015	23.8 (49)	28 (53)	18.4 (43.6)	15.2 (42.1)	-0.11 (0.04)
		2016			19.7 (46.8)	16.9 (43.3)	-0.1 (0.04)
Wages, last 3 years (eur)	Municipality	2015	2570 (18200)	2260 (4970)	1550 (3850)	1130 (2810)	-0.01 (0.06)
		2016			1840 (4990)	1490 (4000)	0 (0.06)
	Private	2015	4690 (8110)	7030 (11700)	4570 (8060)	6020 (10900)	-0.1 (0.06)
		2016			4480 (8210)	5930 (11300)	-0.1 (0.05)
	Third	2015	2190 (5150)	2450 (5580)	1640 (4020)	1400 (4300)	-0.06 (0.03)
		2016			1730 (4260)	1450 (3920)	-0.06 (0.03)
Reg. unempl. days, 3 years	Municipality	2015	192 (125)	190 (120)	236 (117)	265 (105)	0.25 (0.05)
		2016			224 (117)	259 (107)	0.3 (0.05)
	Private	2015	130 (120)	128 (116)	179 (128)	181 (117)	0.04 (0.05)
		2016			195 (122)	197 (119)	0.03 (0.05)
	Third	2015	245 (104)	235 (102)	260 (103)	272 (87)	0.18 (0.05)
		2016			266 (97)	271 (91.9)	0.13 (0.05)
Days in subs. jobs, last 3 years	Municipality	2015	17 (40.6)	13.9 (36.1)	10.4 (31)	7.7 (25.2)	0.01 (0.05)
		2016			11.4 (29.5)	11.7 (29.4)	0.1 (0.05)
	Private	2015	5.6 (22.2)	3.68 (18)	5.5 (24.2)	5.37 (22.6)	0.05 (0.04)
		2016			8.77 (28.4)	8.45 (26.2)	0.05 (0.04)
	Third	2015	22.9 (44.9)	21.3 (43.9)	17 (39.6)	19.3 (41.4)	0.12 (0.07)
		2016			18.8 (40)	21.3 (41.2)	0.12 (0.07)

Base year is 2013. The numbers are means, with standard deviations in parentheses. All means include zeros. The difference-in-differences estimates are as in the main text. Subsidy participants refer to persons who enter a subsidized job in the twelve months between July of a given year and the following June.

Table 2: Changes in the characteristics of subsidy participants from 2013 to 2015 and 2016 (continued).

Variable	Sector	Latter year	Value in base year, not depleted	Value in base year, depleted	Value in latter year, not depleted	Value in latter year, depleted	Diff-in-diff estimate
Duration of unempl. spell, weeks	Municipality	2015	59.2 (64.2)	59.5 (59.9)	87 (82.2)	101 (83.2)	0.2 (0.06)
		2016			76.1 (77.3)	95.7 (85.3)	0.28 (0.06)
	Private	2015	35.5 (47.6)	34.1 (47)	59.6 (70.9)	54 (61.4)	-0.06 (0.05)
		2016			66.2 (73)	61.8 (67.3)	-0.04 (0.04)
	Third	2015	81.1 (63.2)	74.5 (58)	98.8 (80.4)	103 (77.1)	0.16 (0.06)
		2016			98.1 (84.8)	102 (85.1)	0.15 (0.06)
LM training days, last 3 years	Municipality	2015	11.5 (31.7)	13.7 (35.4)	14.4 (36.1)	17.1 (39.9)	0.01 (0.06)
		2016			10.5 (28.7)	15.1 (36.3)	0.07 (0.05)
	Private	2015	14.2 (36.9)	14.7 (36.3)	13.9 (35.6)	16.5 (40.5)	0.06 (0.06)
		2016			12.5 (33.9)	16 (39)	0.09 (0.05)
	Third	2015	15.3 (34.6)	13 (31.5)	10.6 (27.5)	7.5 (21.6)	-0.02 (0.05)
		2016			10.4 (27.3)	10.7 (28.3)	0.07 (0.05)
Reg. unempl. days, since 1991	Municipality	2015	2050 (1940)	1930 (1850)	2350 (1960)	2670 (1960)	0.23 (0.05)
		2016			2180 (2000)	2650 (1990)	0.32 (0.06)
	Private	2015	1130 (1470)	1040 (1320)	1550 (1650)	1490 (1460)	0.02 (0.04)
		2016			1730 (1660)	1610 (1520)	-0.01 (0.04)
	Third	2015	2980 (1950)	2720 (1800)	2960 (1970)	2970 (1900)	0.14 (0.06)
		2016			2920 (1940)	3010 (1900)	0.19 (0.06)
Wages, since 1987 (eur)	Municipality	2015	160 k (2 M)	106 k (192 k)	121 k (218 k)	136 k (217 k)	0.12 (0.09)
		2016			106 k (208 k)	145 k (228 k)	0.16 (0.09)
	Private	2015	124 k (230 k)	168 k (285 k)	162 k (265 k)	220 k (341 k)	0.02 (0.03)
		2016			194 k (309 k)	216 k (333 k)	-0.04 (0.02)
	Third	2015	146 k (225 k)	158 k (233 k)	149 k (230 k)	137 k (221 k)	-0.04 (0.02)
		2016			152 k (231 k)	149 k (232 k)	-0.03 (0.02)

Base year is 2013. The numbers are means, with standard deviations in parentheses. All means include zeros. The difference-in-differences estimates are as in the main text. Subsidy participants refer to persons who enter a subsidized job in the twelve months between July of a given year and the following June.

Figure 1: Changes in wage differences by region and offset, from 2012 to 2013. The plotted number is the change from base year 2012 to base year 2013 in the estimated effect on wages for subsidies. The estimated effect is the difference in wages between treated subsidy participants and matched control units, three years after the base dates of July 1st 2012 and July 1st 2013.

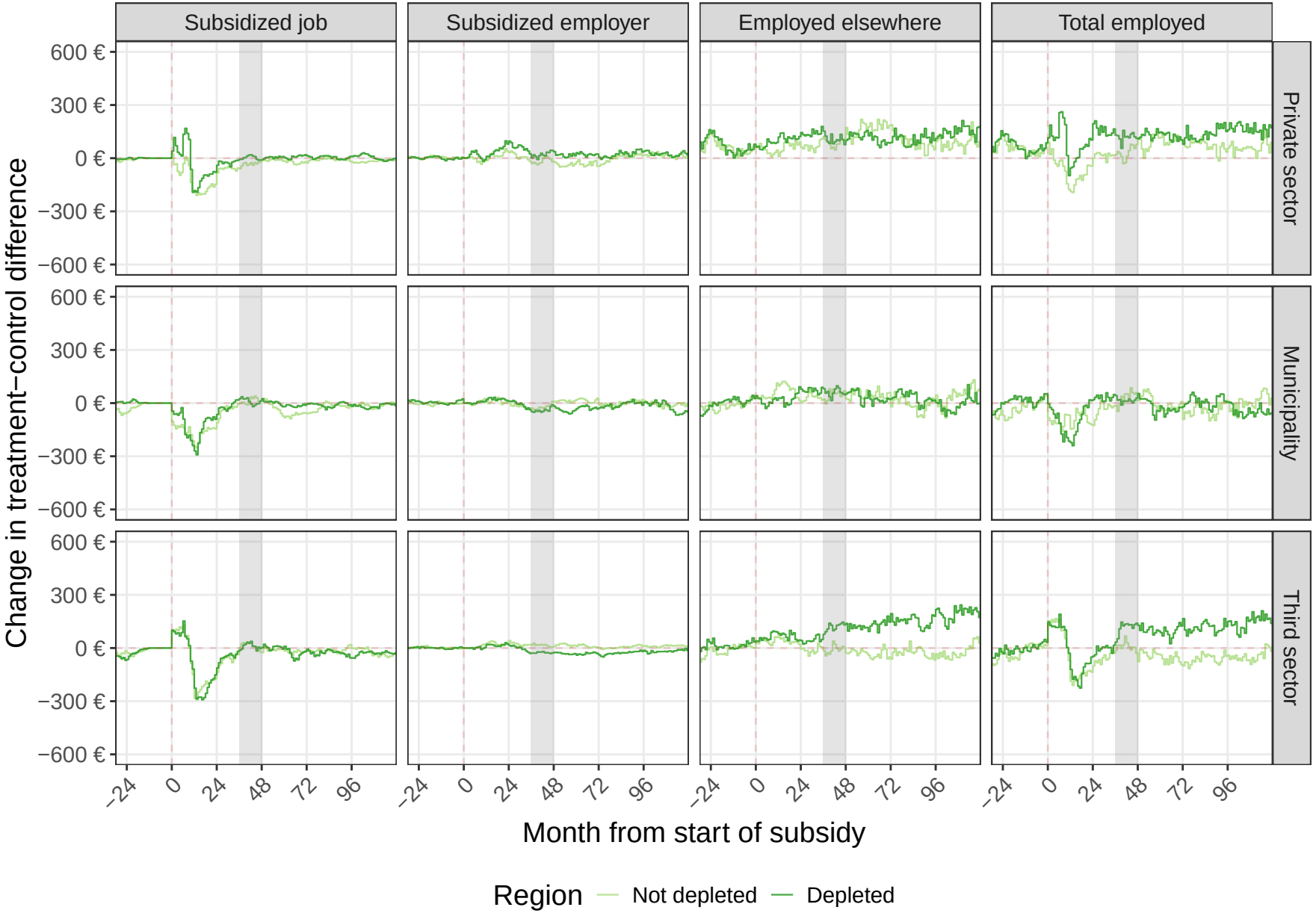


Figure 2: Changes in wage differences by region and offset, from 2014 to 2015. The plotted number is the change from base year 2014 to base year 2015 in the estimated effect on wages for subsidies. The estimated effect is the difference in wages between treated subsidy participants and matched control units, three years after the base dates of July 1st 2014 and July 1st 2015.

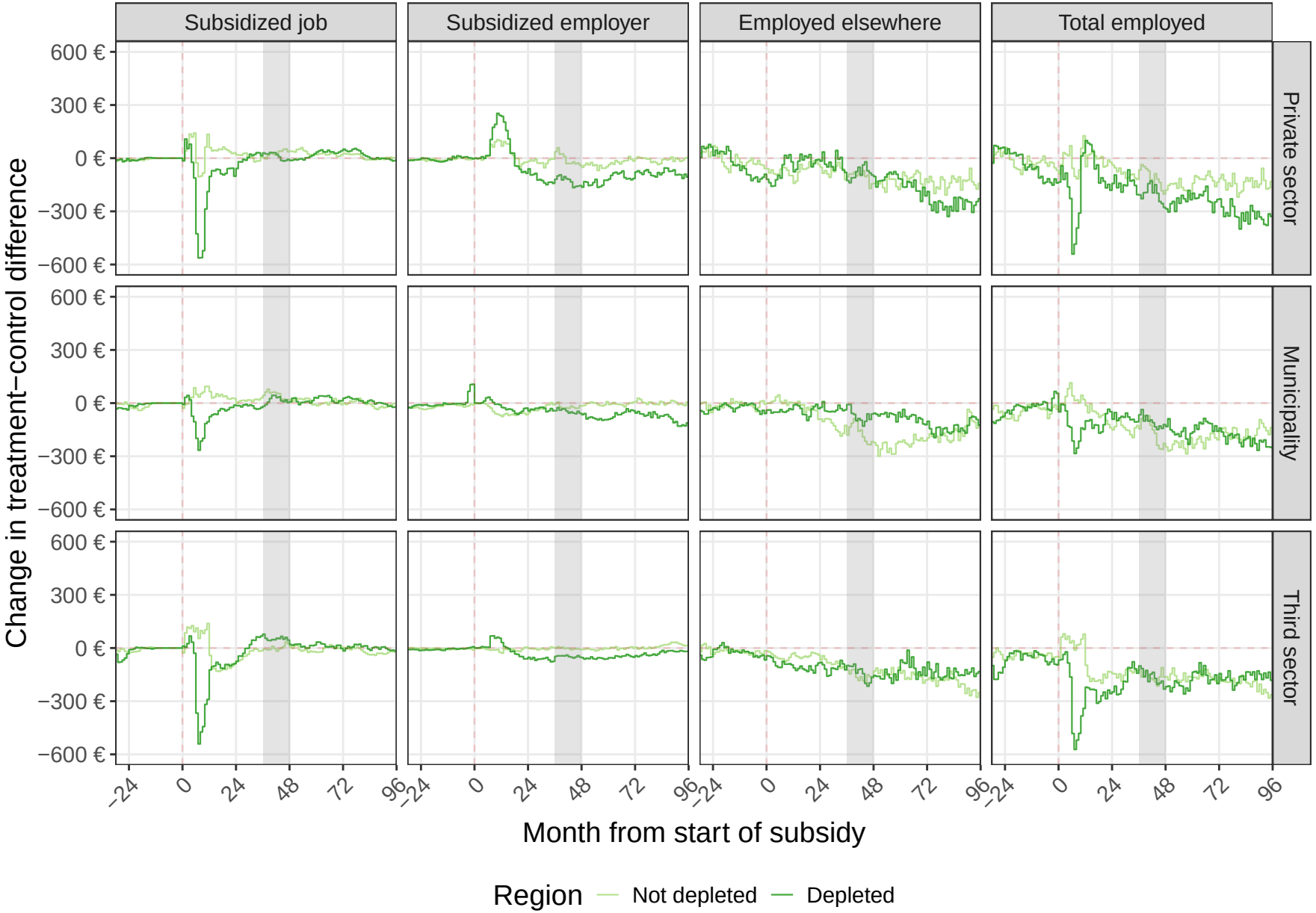
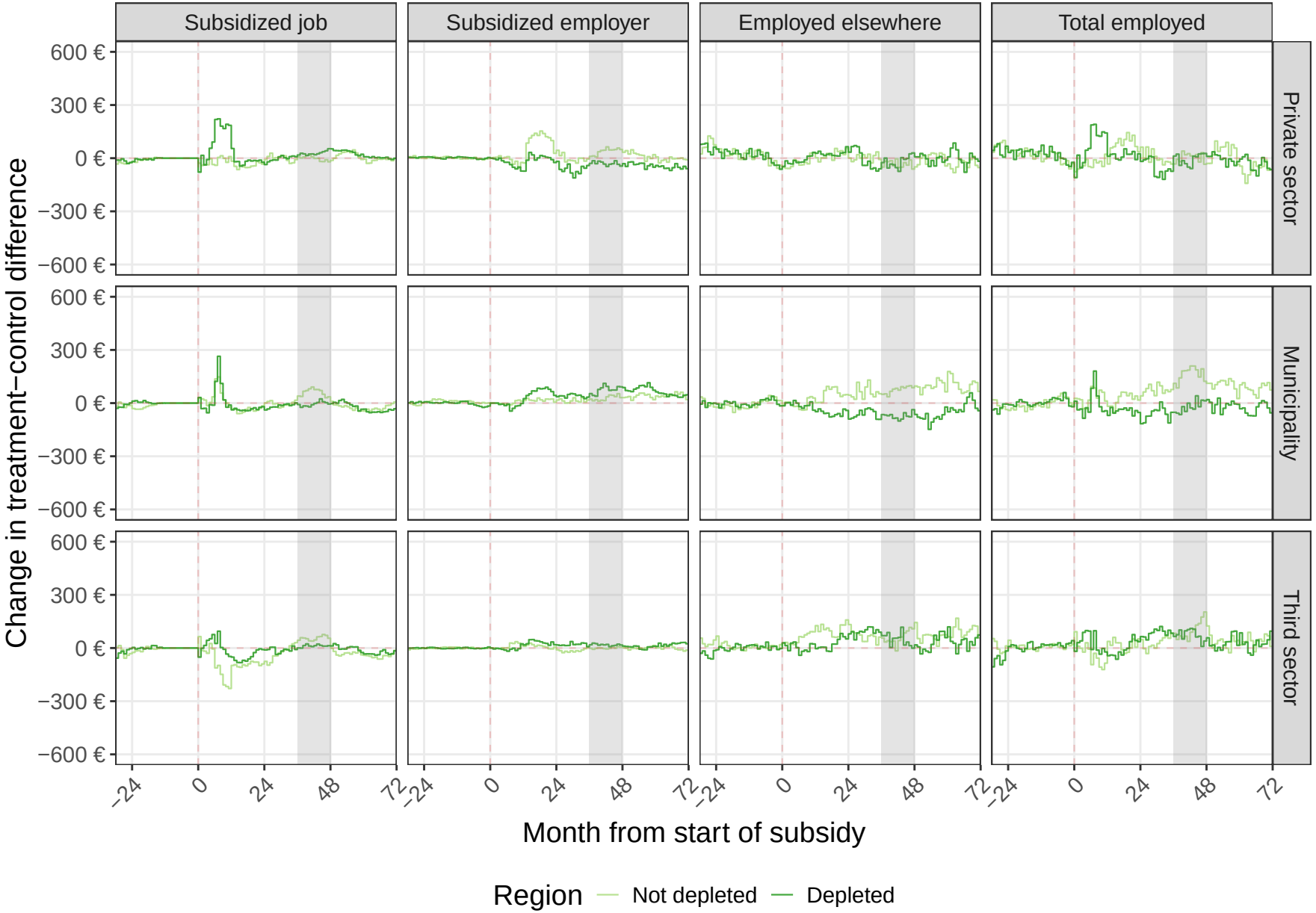


Figure 3: Changes in wage differences by region and offset, from 2016 to 2017. The plotted number is the change from base year 2016 to base year 2017 in the estimated effect on wages for subsidies. The estimated effect is the difference in wages between treated subsidy participants and matched control units, three years after the base dates of July 1st 2016 and July 1st 2017.



Appendix B Individual subsidy entitlements

As noted in the main text, municipalities had an obligation to provide employment to the older long-term unemployed under specific circumstances from 1997 to 2025. These individual mandates applied to persons who were above a given age threshold, ranging from 55 to 60 over the years, at the time of reaching the maximum duration of their UI entitlement. Previously, long-term unemployed who reached these age thresholds while collecting UI benefits had been entitled to a special old-age extension to their benefits, with UI lasting until minimum retirement age. Since then, the minimum age threshold to reach the extension system has been gradually increased. The municipal employment mandates were established to compensate younger cohorts for these changes.

In most cases outside the individual mandates, each jobseeker-job pair are individually scrutinized. The subsidy can only be granted if the job can be expected to improve the worker's probability of becoming employed in the open market. This requirement is waived for the individual mandates.

There are a number of reasons to consider the mandated subsidies a special case. Their purpose appears to have been quite different from the other subsidized jobs: to shield jobseeker's incomes rather than to boost long-term employment. The mandated jobs were required by law to last long enough that the worker could accrue a new UI entitlement. Empirically, these job placements were typically carefully matched to the employment condition to unemployment insurance; when this condition changed from 34 weeks worked to 26 weeks, the durations of the subsidized jobs followed suite. More than half re-entered the unemployment benefit system after the subsidy period ended, and only about 10% continued in employment. These empirical patterns are examined by Korpela (2023) (appendix E.1).[1]

[1] A wealth of descriptive evidence is also provided in chapter 2.3.2 of the government bill HE 13/2024.

Appendix C Source documents regarding the funding discontinuity

The description of the institutional setting that led to the halt of new subsidies is based on several sources, listed below.

Overall, the documents paint a picture of substantial uncertainties over 2015 about how much money had been committed. There also appear to have been some disagreements between the ministry and the regional authorities about how the situation should be assessed. Ultimately, the availability of the subsidy was governed by the local authorities' evaluation of uncommitted funds still available, whether or not this assessment ended up being correct.

Statements by the ministry and the regional authorities to parliamentary committees over the year constitute the bulk of the source documents. Additionally, the documents concerning the regional allocation of funds from January 2015, October 2015 and January 2016 were used.

Finally, since not all authorities submitted written statmenets to the Parliament, a July newspaper article that directly interviewed each of the regional authorities provided an assessment of how the regions saw their situation in the middle of the year. Additional searches were made in archives of the largest Finnish newspapers to find the earliest warning signals about the looming subsidy halt. The searches yielded one opinion piece in May which warned of such difficulties, but no other articles before July.

It is, however, possible that some of the jobseekers or potential employers may have received warnings from local officials or through word of mouth earlier than this; in such cases, they might have changed their strategies before July. The likely bias in the estimates related to displacement effects is, however, relatively small. First, most of the relevant jobseekers with low observed employment prospects are likely to have limited options in the short-term. Second, most recruitment and application processes take some time, and many of the subsidy grants in July in any given year are likely to be related to processes started one or more months prior.

Finally, a 2020 report by the the National Audit Office and direct personal correspondance with a ministry official filled some of the gaps regarding the system.

Main sources assessing the availability of funds mid-2015 were:

- *EDK-2015-AK-7303*[2], 2015-06-22, Employment and Economic Development Office in Satakunta, on available funds: "Kuluvan vuoden työllisyysmäärärahojen riittävyys Satakunnan TE-toimistossa"

- *EDK-2015-AK-7306*, 2015-06-22, Employment and Economic Development Office

[2]All the documents with identifiers of the form 'EDK-' refer to written statements submitted to parliamentary budget hearings in 2015.

in Northern Karelia, on available funds: "Pohjois-Karjalan TE-toimiston vastaus asiantuntijalausuntopyyntöön"

- *EDK-2015-AK-7309*, 2015-06-22, Employment and Economic Development Office in Lapland, on available funds: "Asiantuntijalausunto työllisyysmäärärahojen riittävyydestä"
- *EDK-2015-AK-7312*, 2015-06-22, Employment and Economic Development Office in Uusimaa, on available funds: "Uudenmaan TE-toimiston kirjallinen asiantuntijalausunto"
- *EDK-2015-AK-7315*, 2015-06-22, Ministry of Employment and Economics Affairs, on available funds: "Kuluvan vuoden työllisyysmäärärahojen riittävyys"
- *EDK-2015-AK-7318*, 2015-06-23, Employment and Economic Development Office in Central Finland: "Lausunto"
- *Helsingin Sanomat 2015-07-11*, an interview of all the regional offices: "Kuinka työllisyysmäärärahat riittävät eri puolilla Suomea?"
- *Ministry proposal for supplementary budget*, 2015-08-24, Ministry of Employment and Economic Affairs: "Vuoden 2015 kolmannen lisätalousarvioesityksen valmistelu"
- *EDK-2015-AK-12180*, 2015-09-16, joint statement by the managers of the regional offices on the bookkeeping systems: "Työllisyysmäärärahojen seuranta saatava pikaisesti luotettavaksi"
- *EDK-2015-AK-11569*, 2015-09-22, Employment and Economic Development Office in Uusimaa, on available funds: "Arvio määrärahojen ja resurssien riittävyydestä"
- *EDK-2015-AK-11581*, 2015-09-23, Employment and Economic Development Office in South-Western Finland, on available funds: "Tiivistelmä asiantuntijapuheenvuoroista"
- *EDK-2015-AK-12296*, 2015-09-24, Ministry of Employment and Economics Affairs, on available funds and bookkeeping systems: "Työllisyysmäärärahat ja URA-järjestelmä"
- *EDK-2015-AK-12389*, 2015-09-24, Ministry of Employment and Economics Affairs, on available funds and bookkeeping systems: "Työllisyysmäärärahat ja URA-järjestelmä"
- *EDK-2015-AK-15309*, 2015-10-06, Ministry of Employment and Economics Affairs, on operating costs in the regional offices: "ELY-keskusten toimintamenot 32.01.02"

- *EDK-2015-AK-15323*, 2015-10-06, Employment and Economic Development Office in South-Western Finland, on operating costs: "Pääluokka 32.01 ELY-keskusten toimintamenot"
- *EDK-2015-AK-15294*, 2015-10-07, Employment and Economic Development Office in Häme, on available funds: "Pääluokka 32.01 ELY-keskusten toimintamenot"
- *EDK-2015-AK-16536*, 2015-10-08, Ministry of Employment and Economic Affairs, on budget changes: "Työllisyys- ja yrittäjyyspolitiikka"
- *EDK-2015-AK-19172*, 2015-10-12, Employment and Economic Development Office in Uusimaa, on various budget-related topics: "Lausunto"
- *EDK-2015-AK-17643*, 2015-10-13, Ministry of Employment and Economic Affairs, on budget changes: "JTS:n pääkohdat, TEM, pääluokka 32"
- *EDK-2015-AK-17857*, 2015-10-13, Employment and Economic Development Office in Southern Ostrobothnia, on operating costs: "Pääluokka 32.01 ELY-keskusten toimintamenot"
- *EDK-2015-AK-17861*, 2015-10-13, Employment and Economic Development Office in Northern Savo, on operating costs: "Pääluokka 32.01 ELY-keskusten toimintamenot"
- *EDK-2015-AK-17866*, 2015-10-13, Employment and Economic Development Office in Pirkanmaa, on available funds
- *Government decision*, 2015-10-15, on the regional allocation of additional funds: "Päätös julkisten työvoima- ja yrityspalvelujen määrärahojen ja työvoimakoulutuksen myöntämisvaltuuden jaosta"
- *EDK-2015-AK-19978*, 2015-10-20, Employment and Economic Development Office in Lapland, on available funds: "Työllisyysmäärärahojen riittävyys ja kohdentuminen"
- *EDK-2015-AK-19987*, 2015-10-20, Employment and Economic Development Office in Northern Ostrobothnia, on various topics: "Lausunto"
- *EDK-2015-AK-20023*, 2015-10-20, Employment and Economic Development Office in Southern Ostrobothnia, on available funds: "– – kirjallinen asiantuntijalausunto koskien vuoden 2016 talousarvion työllisyysmäärärahojen riittävyyttä ja talousavion vaikutuksia erityisesti nuorten työttömyyteen ja pitkäaikaistyöttömyyteen"
- *Government bill HE 131/2018*, 2018-09-14, on (again) allowing benefit funds to be used for ALMPs

- *Government bill HE 155/2020*, 2020-10-05, on continuing the arrangement from bill 131/2018

Additional source documents on the funding structure included:

- *Budget proposal* for 2014, 32.30.51: "Työllisyys ja yrittäjyyspolitiikka" (ALMP appropriations under employment policy), 33.20.52: "Valtionosuus työmarkkinatuesta" (ALMP appropriations under unemployment benefits)
- *Government decision*, 2014-01-23, on the regional allocation of funds: "Valtioneuvoston päätös julkisten työvoima- ja yrityspalvelujen määrärahojen ja työvoimakoulutuksen myöntämisvaltuuden jaosta vuonna 2014"
- *Budget proposal* for 2015, 32.30.51: "Työllisyys ja yrittäjyyspolitiikka" (ALMP appropriations under employment policy)
- *Government decision*, 2015-01-29, on the regional allocation of funds: "Päätös julkisten työvoima- ja yrityspalvelujen määrärahojen ja työvoimakoulutuksen myöntämisvaltuuden jaosta vuonna 2015"
- *Ministry decision*, 2015-02-02, on the regional allocation of funds: "Vuoden 2015 talousarvion momentin 32.30.51 (julksiet työvoima- ja yrityspalvelut, siirtomääräraha 2v) määrärahan jako ELY-keskuksille"
- *Ministry memo*, 2016-01-12, on the regional allocation of additional funds: "Vuoden 2016 talousarvion momentin 32.30.51 (julkiset työvoima- ja yrityspalvelut) määrärahojen ja myöntämisvaltuuden jako"
- *Government decision*, 2016-01-28, on the regional allocation of additional funds: "Päätös jakaa valtion vuoden 2016 talousarvion momentin 32.30.51 (Julkiset työvoima- ja yrityspalvelut) määrärahaa elinkeino-, liikenne- ja ympäristökeskuksille"
- *National Audit Office*, 2020-06-04, on the overall effectiveness of the ALMP management: "Työvoimapalvelujen tarjonta ja uudistukset 20152019"

Appendix D Maps of treatment and controls regions

Figure 4: Treatment areas

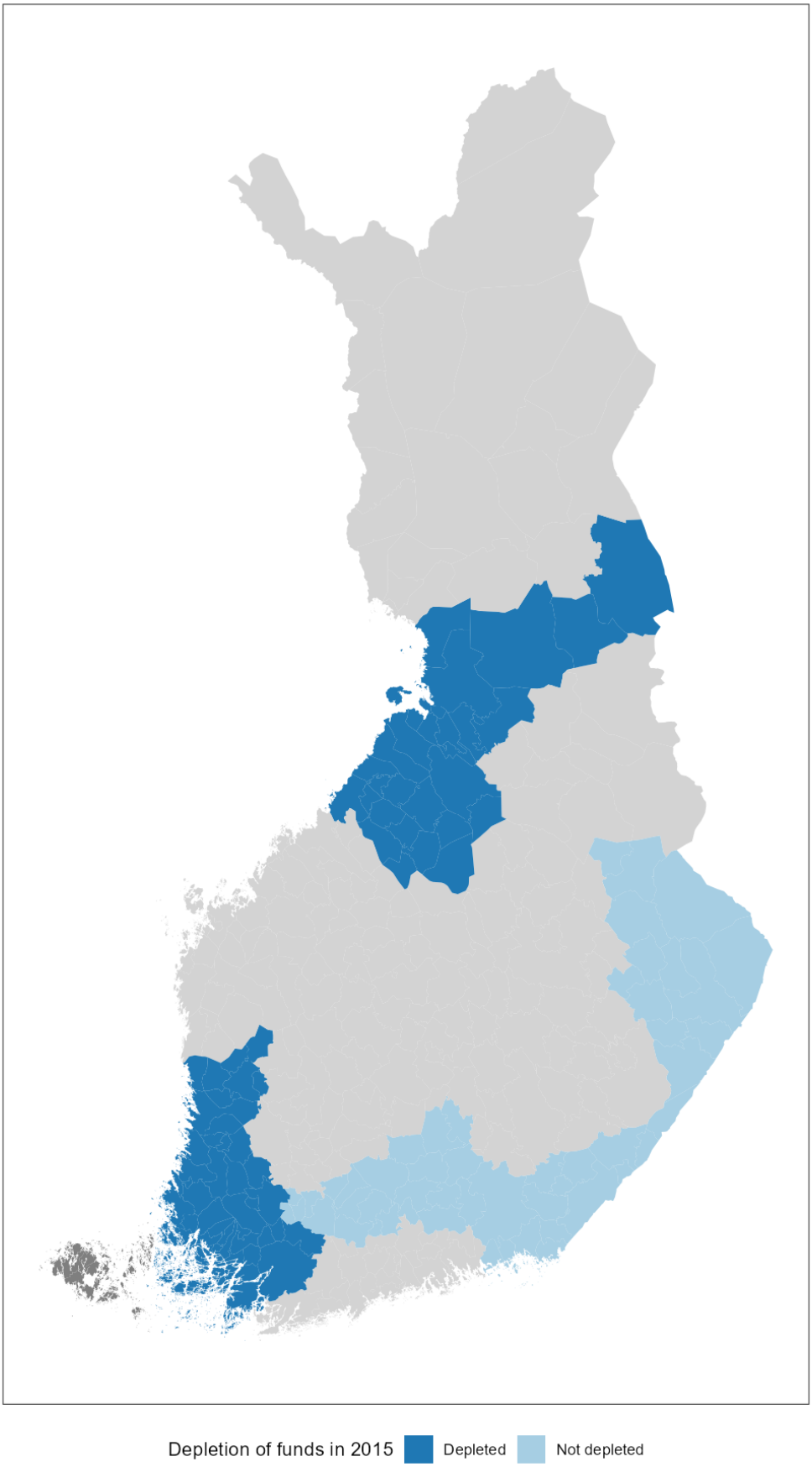
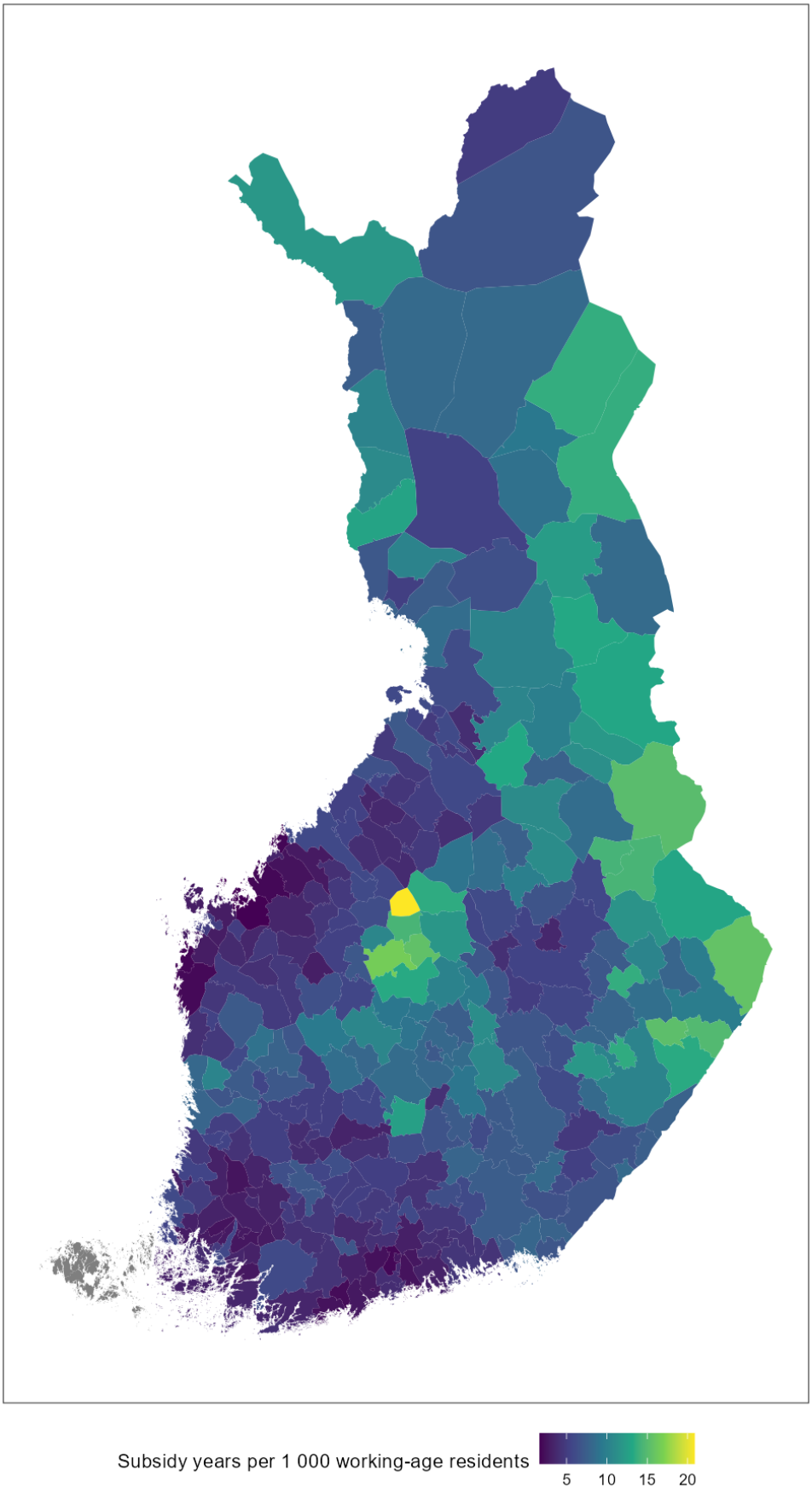


Figure 5: Subsidy years in municipalities



Appendix E Persistence of belonging to the at-risk group

The at-risk groups in this study are not static. As the risk of non-employment is recalculated for each year, about a quarter of those who were estimated to be at high risk in the previous year leave the group.

To understand the drivers behind the employment process, the at-risk population was divided into subgroups by a small number of observables. These groups were not themselves used for risk estimation; rather, they were chosen on an ad-hoc basis, mostly based on convention. The groups were defined as follows, in the following hierarchical order:

1. Pensioners: classified as a pensioner at the year's end by Statistics Finland (`FOLK_BASE` dataset, variable `ptoim1`); this includes both old-age pensions and other pensions such as the disability pension
2. Students: classified as a student at the year's end by Statistics Finland (`FOLK_BASE, ptoim1`)
3. Child homecare: collecting child homecare or parental leave benefits during the year
4. Foreign background: classified as having a foreign background by Statistics Finland (`FOLK_BASE, syntyp2`)
5. New entries: below 21 years of age or otherwise not previously observed
6. Persistently unemployed: spent more than half of the previous 3 years in registered unemployment
7. Persistently non-employed: received no wages from open market employment over the previous 3 years
8. Low education: no post-primary education observed
9. Below-median wage: average wage from open market employment was below half the median wage over the last 3 years (non-employment counts as a wage of zero)
10. Other waged > 54
11. Other

Figure 6 shows the numbers for each subcategory in July 2015 and illustrates the persistence of belonging to the risk group. There are distinct differences between the groups: only 25% of students remain in the group at the end of the observation period,

while more than a half of those who have been persistently unemployed or non-employed in the past remain in it in the same period.

While the risk groups themselves were not used as direct inputs to the model, figure 7 illustrates that the employment predictions created by the model have been quite accurate also for each group. In most cases, the share of those receiving reasonable wages from the open market are close to the average predicted probability per group.

Not all of the groups have equal probability of entering subsidized employment; for example, the subsidy is not targeted at pensioners or students unless they satisfy some other eligibility criterion. Recall that the risk group is primarily built to measure potential displacement effects, and it is quite plausible that the subsidy could be displacing job opportunities outside the subsidy's target group: for example, instead of the subsidized worker, an employer might hire a low-wage student instead. Figure 8 shows that those with most persistent unemployment or non-employment have the highest probability of entering subsidized jobs.

The employment outcome used for the risk group also had some duration and wage restrictions. More specifically, the person needed to have 180 days of employment, with an average daily wage in 2019 levels exceeding the labour market subsidy of that year, or equivalent entrepreneurial income, to count as employed in the open market. These restrictions were meant to count individuals with long job contracts but very little work as also having low employment prospects. Figure 10 shows that these distinctions are meaningful, especially for the youngest persons who often do some work along their studies.

Figure 6: Persistence of being in the risk group among those in the group in mid-2015. The residual group, not shown with a separate fill area, consists of those who remain in the risk group.

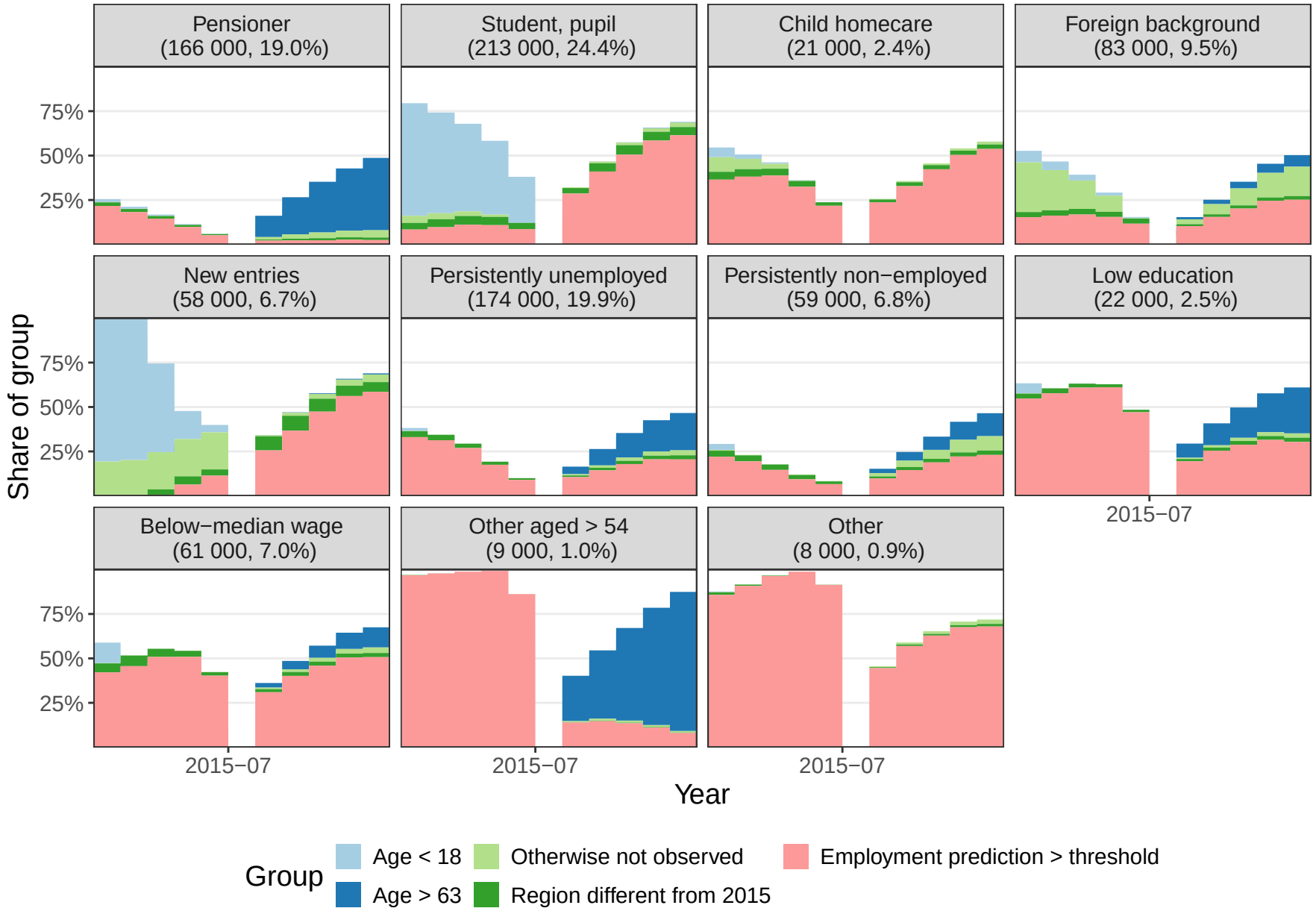


Figure 7: Employment over time for those in the risk group in 2015.

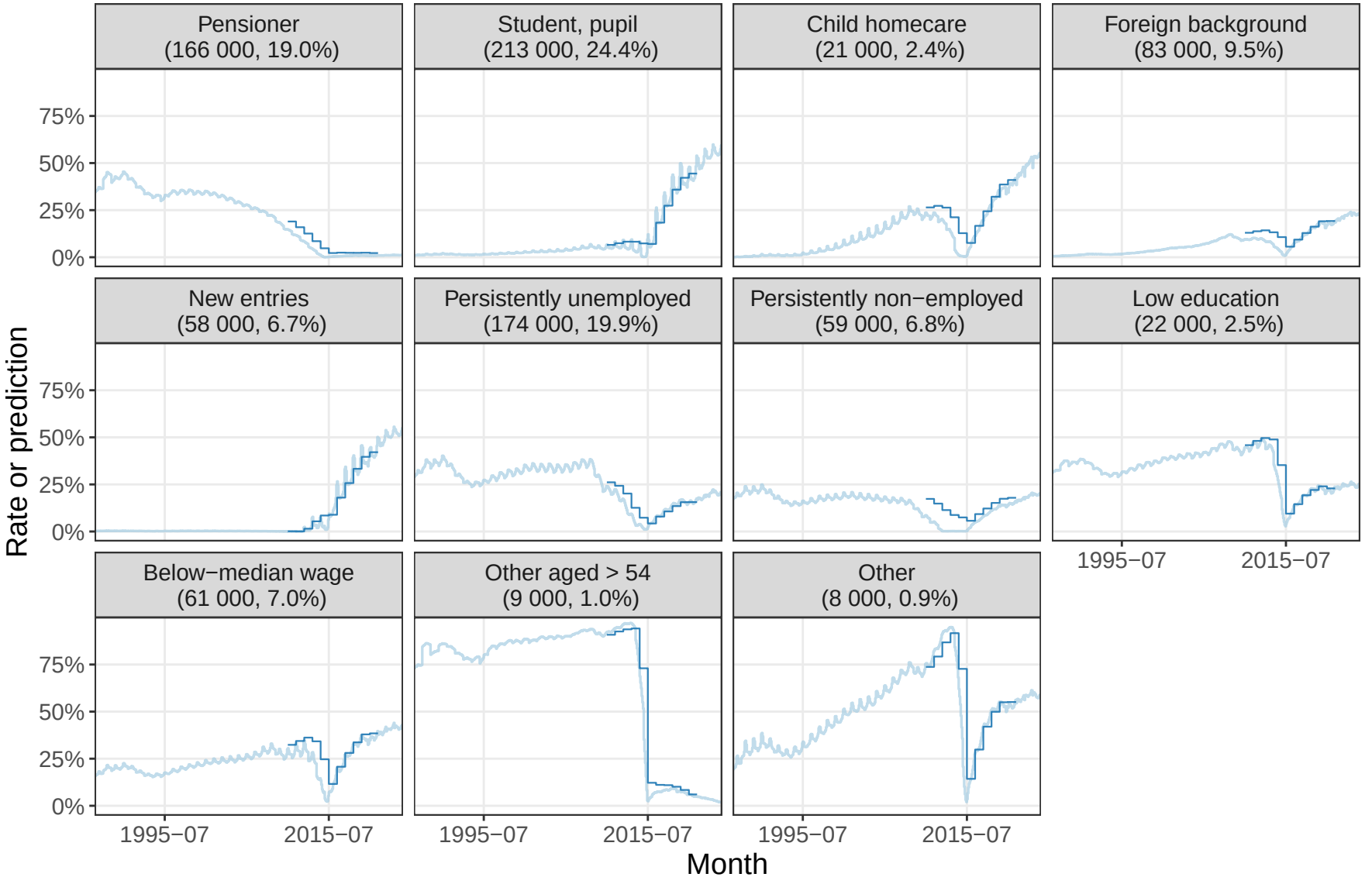


Figure 8: Risk group subsidized employment

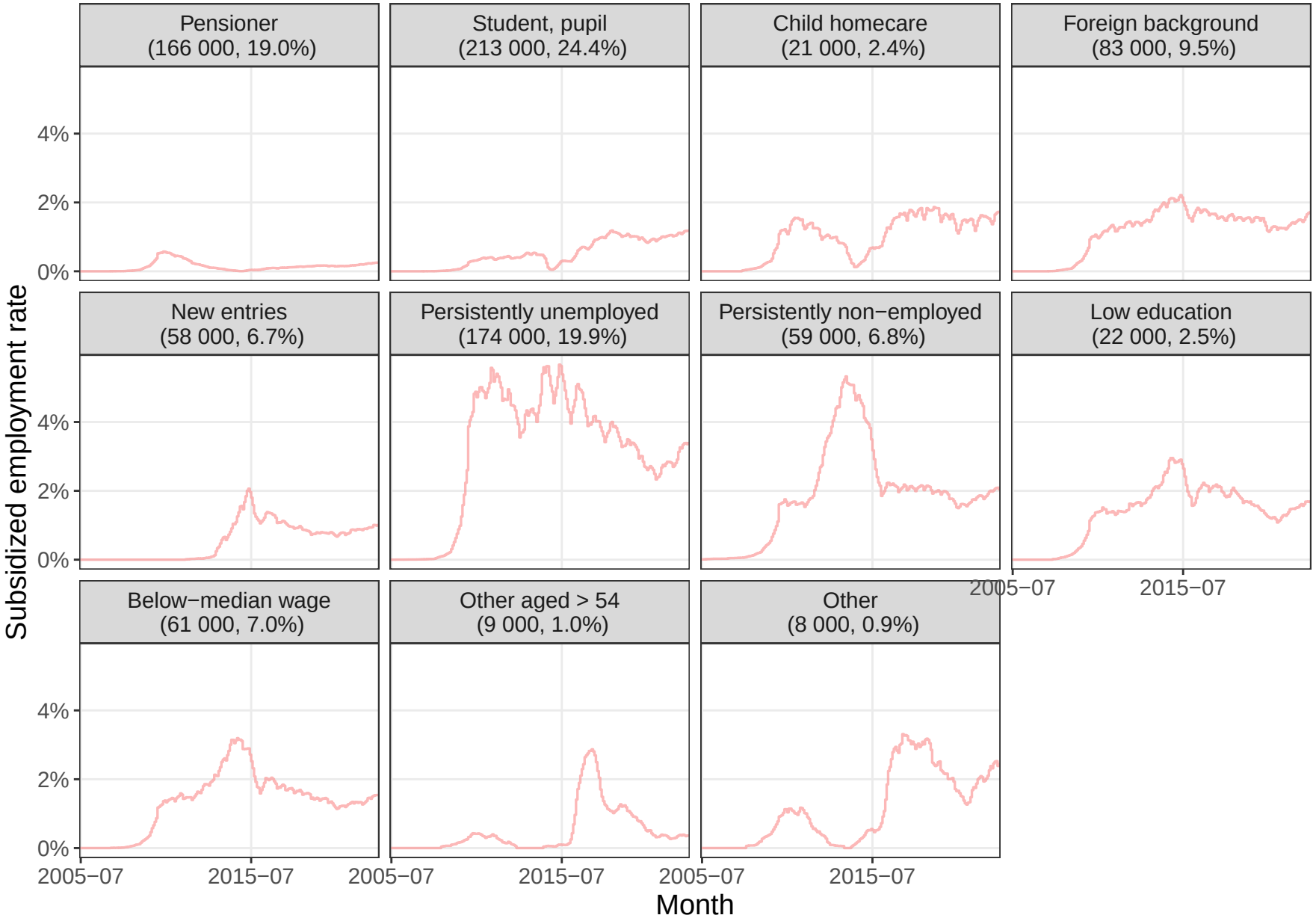


Figure 9: Predictions among treated

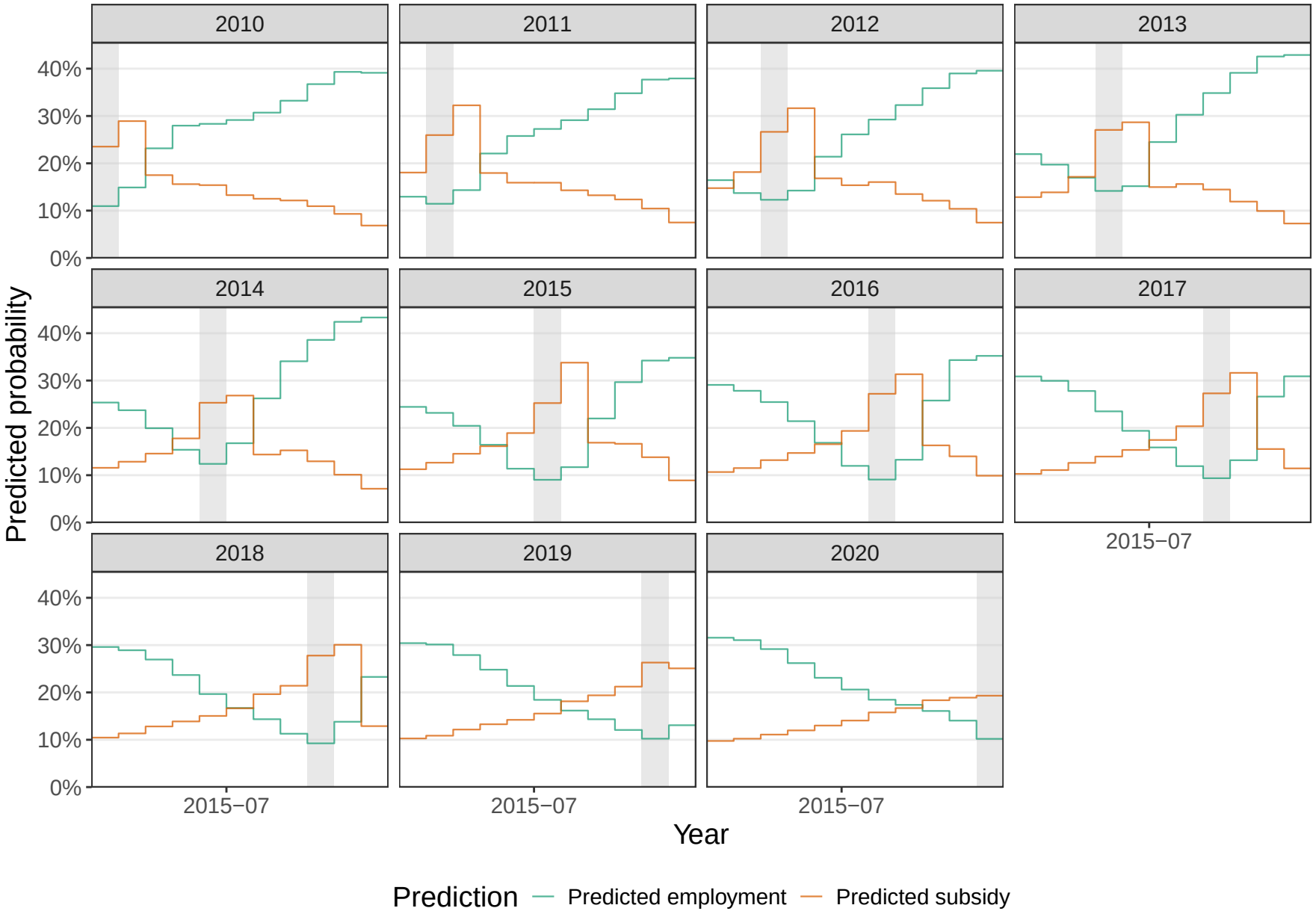
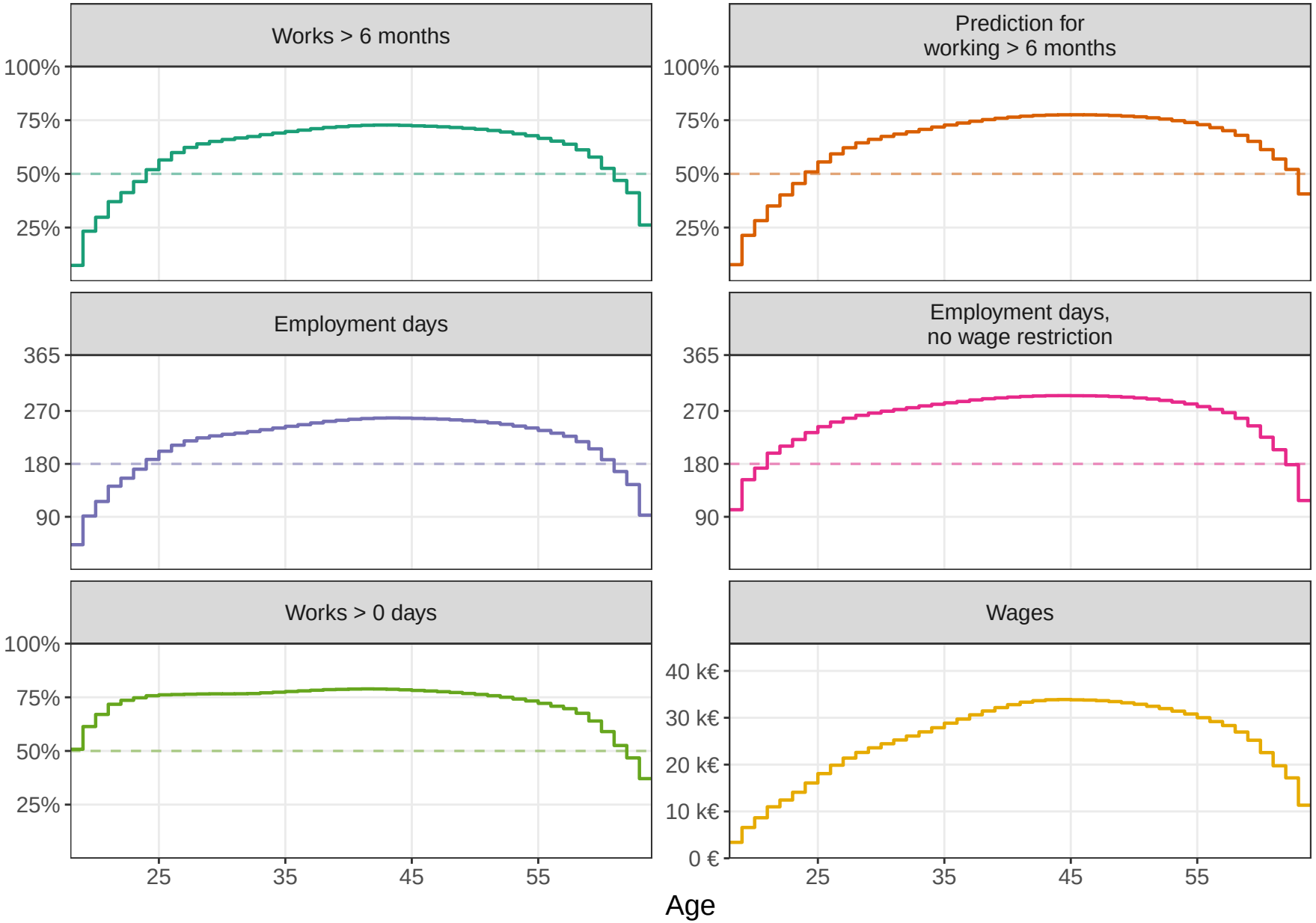


Figure 10: Employment probability by age in 2010–2020. For employment days and wages, non-employment are counted as zeroes.



Appendix F Definitions of observables of the subsidized individuals

The definitions for the observables in table 5.1 of the main text, when not self-explanatory, are as follows:

- For the subsidized persons, the means are for the characteristics at start of a subsidy spell i (the polling date t). If a person has two or more spells, each spell i contributes one observation towards the mean.
- For the working-age population, providing a benchmark for comparisons, a random person was picked for each spell i at the same date t.
- *Subsidy spells* consist of continued subsidized work. A new spell starts when there is a gap of at least 30 days between such jobs. The spell may consist of one or more subsidy decisions, which may be formally distinct decisions for technical reasons or because the employer applies for an extension.
- *Subsidy amounts* are inferred from characteristics (before 2015) or calculated from observed wages, estimated supplementary costs and the observed subsidy percentage (since 2015).
- *Professions* come from subsidy data.
- *Past employment duration* counts employment days since 1987 where the person earned more than the unemployment assistance per day. Past wages are similarly since 1987.
- *Collects UI* refers to the situation immediately preceding the start of the subsidy.
- *Collects part-time benefits soon* refers, instead, to whether the person will be collecting part-time unemployment benefits soon after the polling date.
- *Current unemployment duration* refers to the duration of registered jobseeking in unemployment at the polling date. Zeroes are not included.
- *Past unemployment duration* refers to cumulative registered jobseeking days in unemployment since 1991.
- *Years of education* are estimated from obtained degrees since 1987.
- *Educational field* is the top-level field of education of the highest completed degree.

Figures 11–12 provide two complementary age distributions: cumulative participation in subsidized jobs for population aged 18–70 at the end of 2022, and age distribution when entering a subsidized job for such jobs started between 2006 and 2022.

Table 3 complements the mostly continuous descriptives in the main text with categorical variables.

Figure 11: Cumulative participation in subsidized jobs by age at the end of 2022.

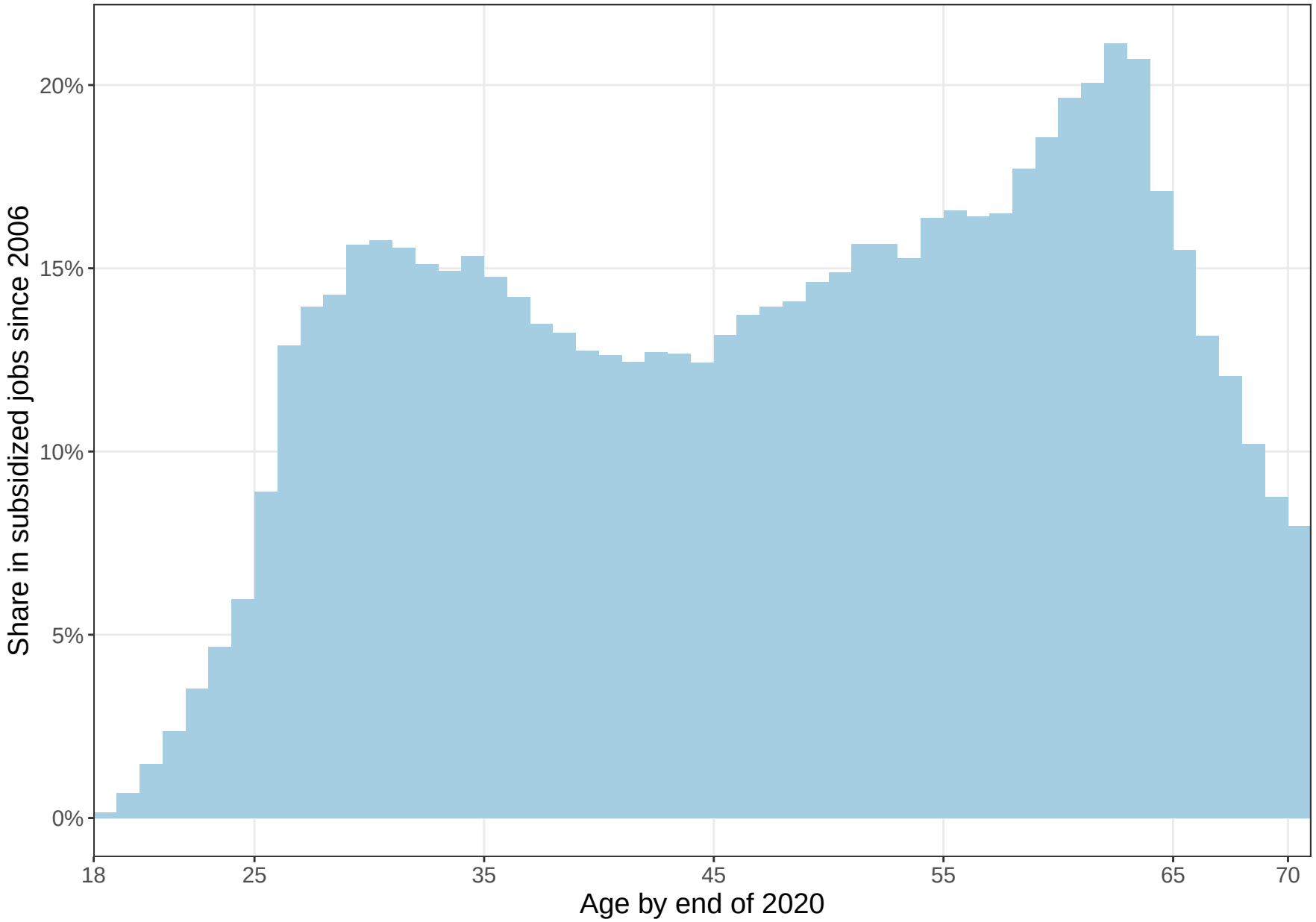


Figure 12: Age distribution at the time of entering a subsidized job between 2006 and 2022. Each subsidy spell contributes one observation. Working-age population is the distribution of repeated resampling of populations at the start of each subsidized job.

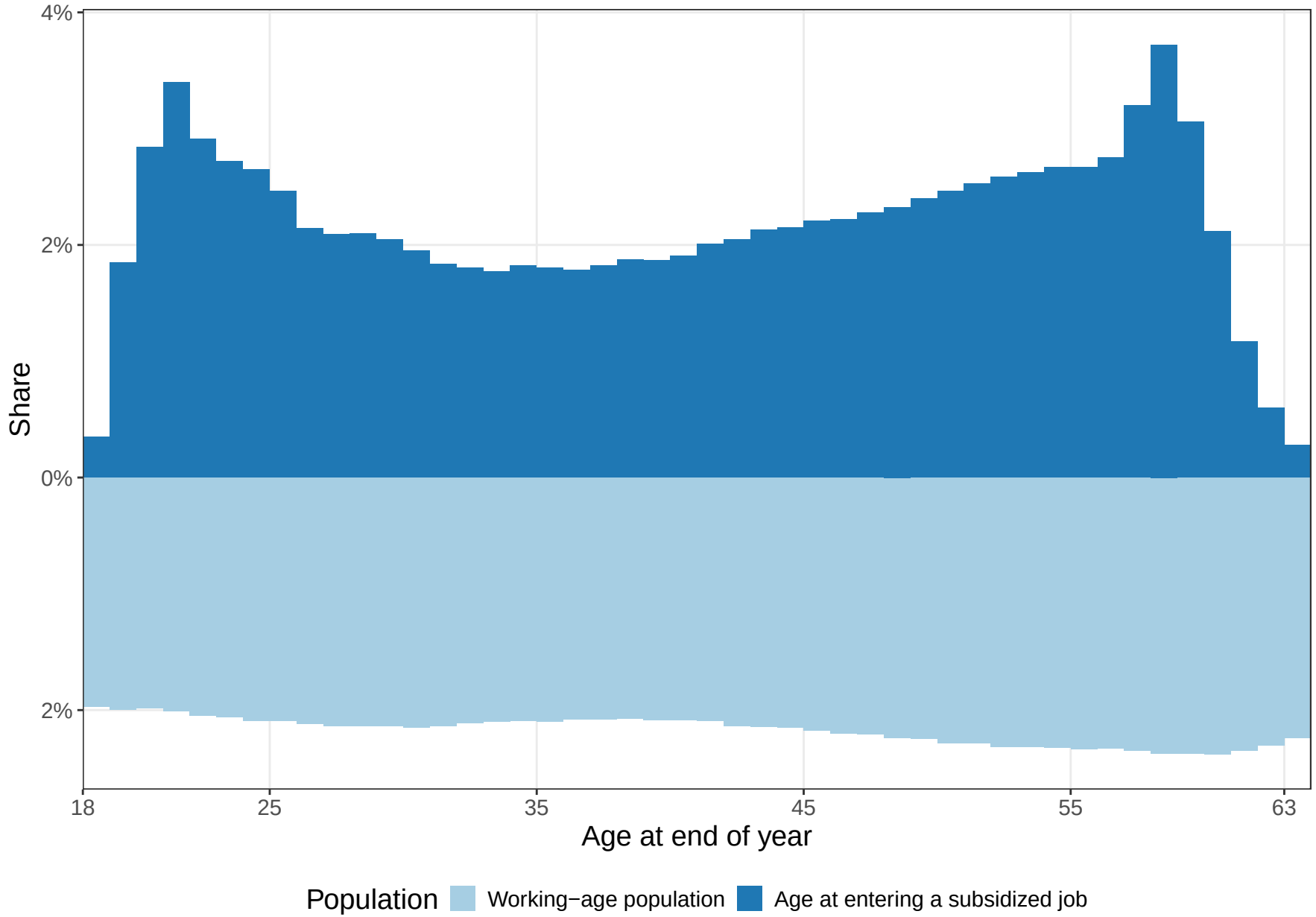


Table 3: Categorical descriptives for subsidized individuals

Variable	Value	Private sector	Municipality	Third sector	Working-age population
Target groups	Unemployment duration	39.2%	60.6%	75.7%	
	Others	27.1%	16.8%	8.6%	
	Young	19.7%	9.1%	3.4%	
	Sickness	12.9%	9.8%	10.9%	
	Above 55	1.2%	3.7%	1.3%	
Professions	Building caretakers	4.0%	8.7%	7.4%	1.2%
	Child care workers	2.0%	14.1%	4.1%	2.0%
	Health care assistants	1.9%	6.8%	2.6%	4.0%
	Secretaries (general)	3.8%	5.2%	6.8%	2.3%
	Shop sales assistants	9.6%	0.4%	8.9%	5.2%
	Social work associate professionals	0.8%	6.1%	7.8%	1.5%
Industries	Construction of buildings	5.8%			2.2%
	Food and beverage service activities	5.6%			2.6%
	Retail trade, except of motor vehicles and motorcycles	12.7%			6.2%
Education fields	Engineering and engineering trades	18.5%	11.0%	10.7%	13.6%
	Personal services	9.1%	12.4%	12.6%	7.5%
Urban-rural	Inner and outer urban	54.8%	54.9%	59.5%	61.5%
	Rural areas	28.3%	30.5%	25.7%	22.4%
Partnership	In a partnership	26.4%	31.4%	30.3%	43.8%
Status in family	Head	31.3%	24.3%	24.9%	34.1%
	Spouse	21.4%	31.0%	29.1%	30.9%
	Child	12.7%	8.1%	6.7%	8.0%
	Not belonging to a family	33.2%	35.4%	38.1%	25.5%
Current unempl. benefit	None	23.5%	10.2%	10.4%	88.6%
	Insurance	22.4%	17.5%	10.0%	4.9%
	Assistance (labour market subsidy)	45.8%	67.4%	75.0%	5.4%
	Assistance (basic allowance)	8.4%	4.9%	4.6%	1.1%

The same sample is covered as in table 1 of the main text. Percentages refer to the shares of individuals in a given group indicated by the column title (e.g. subsidized workers in the private sector). Professions and industries are progressively coarsened from the most precise level to capture classes with significant shares of either overall employment or subsidized employment.

Appendix G Definitions of observables of the at-risk groups by region

The definitions for the observables in table 5.2 of the main text are mostly similar to the definitions for table 5.1 listed in appendix F, with the following additions:

- *Recent LM training* refers to labour market training.
- *Unemployment benefits* refers to days for which the person collected unemployment benefits (either unemployment assistance or unemployment insurance).
- *Years from last subsidy* refers to years from last subsidy spell, if any, since 1992. In the context of this variable, the subsidies also include earlier versions of the subsidy scheme.

Table 4 complements the mostly continuous descriptives in the main text with categorical variables.

Figure 13: Age distribution by region in 2015 for the working-age population at the end of the year.

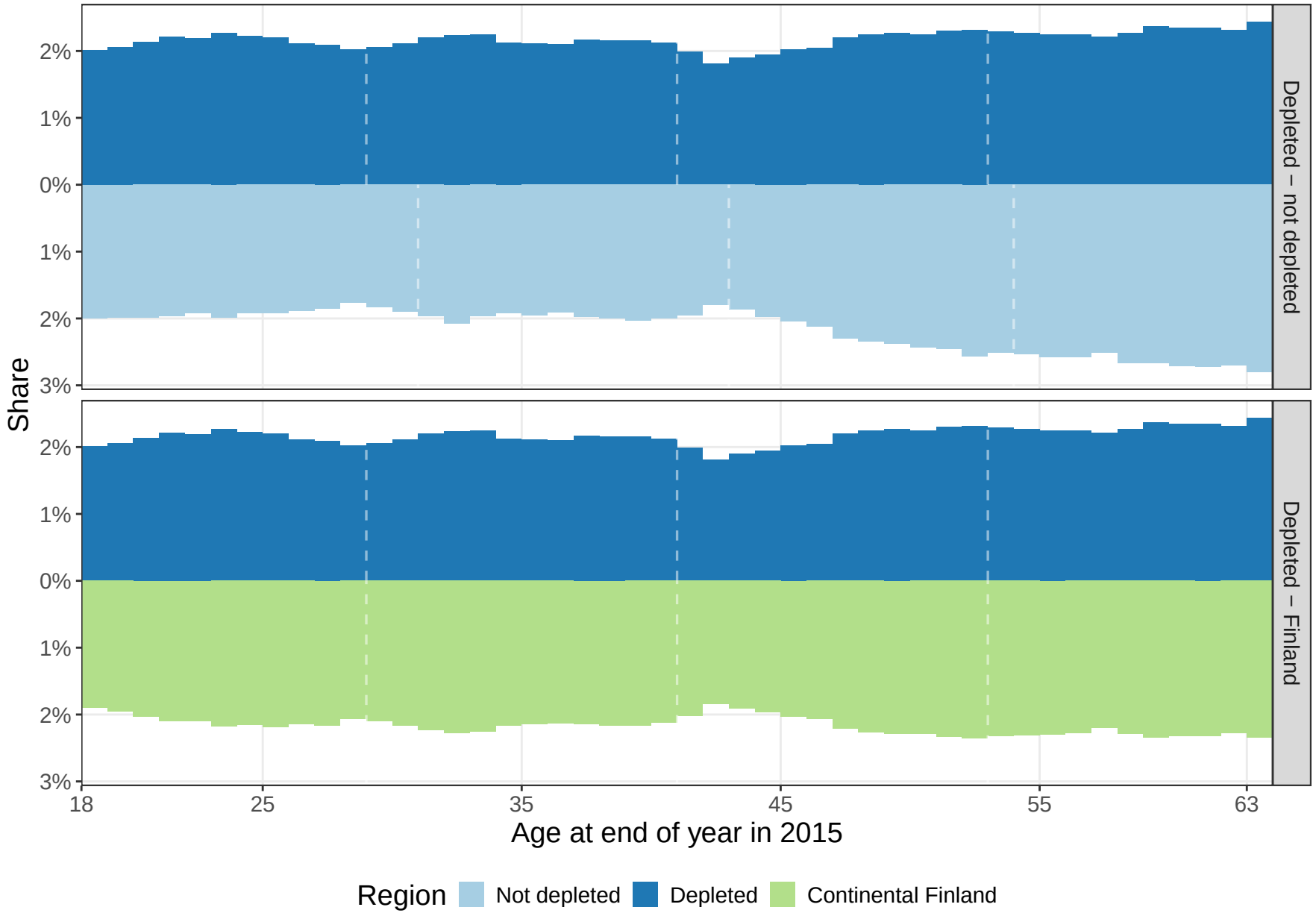


Table 4: Categorical descriptives for at-risk groups

Variable	Value	Depleted, 2014	Depleted, 2015	Not depleted, 2014	Not depleted, 2015
Main income source	Unemployment ben.	22.5%	24.6%	25.7%	27.8%
Main income source	Pensions	22.6%	21.8%	23.2%	22.3%
Main income source	Below UA min.	16.0%	15.7%	15.5%	15.5%
Main income source	Low wages	12.1%	11.4%	10.2%	9.6%
Main income source	Wages	9.9%	9.8%	10.1%	9.7%
Main income source	Study grants	8.7%	8.7%	7.3%	7.3%
Main income source	Social ass.	2.5%	2.4%	3.3%	3.0%
Main income source	Child homecare ben.	3.1%	3.1%	2.5%	2.4%
Main income source	Other	2.6%	2.6%	2.2%	2.2%
Urban-rural	Inner and outer urban	55.7%	56.6%	59.9%	60.4%
Urban-rural	Rural areas	25.8%	25.1%	23.2%	22.8%
ELY region	North Ostrobothnia	38.5%	38.3%		
ELY region	Southwest Finland	42.3%	42.6%		
ELY region	Satakunta	19.2%	19.1%		
ELY region	Häme			41.0%	41.1%
ELY region	Southeast Finland			36.7%	36.8%
ELY region	North Karelia			22.3%	22.1%
Industries	No data	52.1%	52.6%	54.3%	54.5%
Industries	Manufacturing (n.e.c.)	5.3%	4.9%	5.1%	4.6%
Industries	Services (n.e.c.)	4.3%	4.3%	4.3%	4.3%
Industries	Building services, landscape	3.1%	3.0%	2.7%	2.8%
Professions	No data	72.2%	72.9%	72.8%	72.7%
Professions	Cleaners and helpers	2.8%	2.8%	2.7%	2.6%
Professions	Clerical support workers (n.e.c.)	2.0%	2.0%	1.8%	1.8%
Professions	Elementary occupations (n.e.c.)	2.0%	1.9%	2.0%	2.0%
Main activity, end of prev. year	Pensioner	21.8%	20.7%	22.7%	21.4%
Main activity, end of prev. year	Others	14.3%	14.1%	15.1%	14.7%
Main activity, end of prev. year	Employed	12.6%	12.1%	11.9%	11.7%
Main activity, end of prev. year	Unemployed	24.7%	26.7%	27.2%	29.1%
Main activity, end of prev. year	Student, pupil	26.1%	25.9%	22.7%	22.6%
Main activity, end of prev. year	Conscript	0.4%	0.4%	0.4%	0.4%

The same sample is covered as in table 2 of the main text. Percentages refer to the shares of individuals in a given group indicated by the column title (e.g. at-risk groups in 2014 in the regions with depleted funds for the subsidy). Professions and industries are progressively coarsened from the most precise level to capture classes with significant shares of either overall employment or subsidized employment.

Appendix H Regional trends in employment and unemployment

Figures 14–17 complement the trends for employment and wages examined in the main text. Overall, there are some clear differences between the control and treatment areas, with the control areas where subsidy funds continued to be better available exhibiting higher unemployment rates. However, the differences generally seem quite stable over time. Figure 16 also shows that the net effect on subsidized work was the product of two types of effects: a reduction in new subsidies granted and a reduction in their duration.

Figure 14: Unemployment benefits per region. The measure is calculated as total unemployment benefit days divided by potential days, where potential days are the days in a month multiplied by the working-age population. The lower panel plots the difference between control and treatment regions, with dashed line for monthly values and solid line for the annual average.

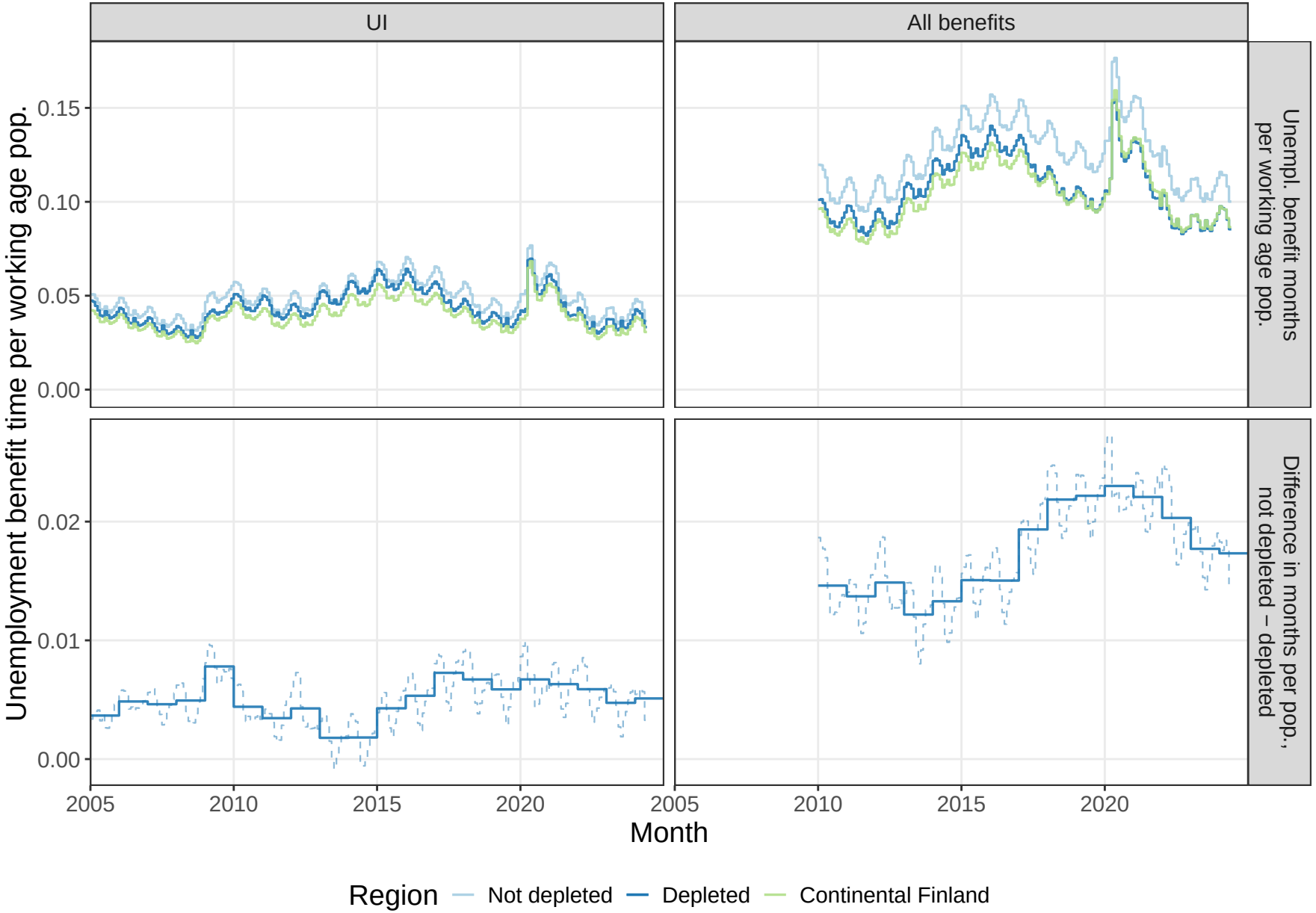


Figure 15: Participation in labour market training. The age-adjusted figure in the top panel is calculated by multiplying the per-age days in LM training with the age shares in continental Finland. Share of age x is the population aged x divided by working-age population. The solid line is a 12-month moving average. The dashed lines are monthly measures.

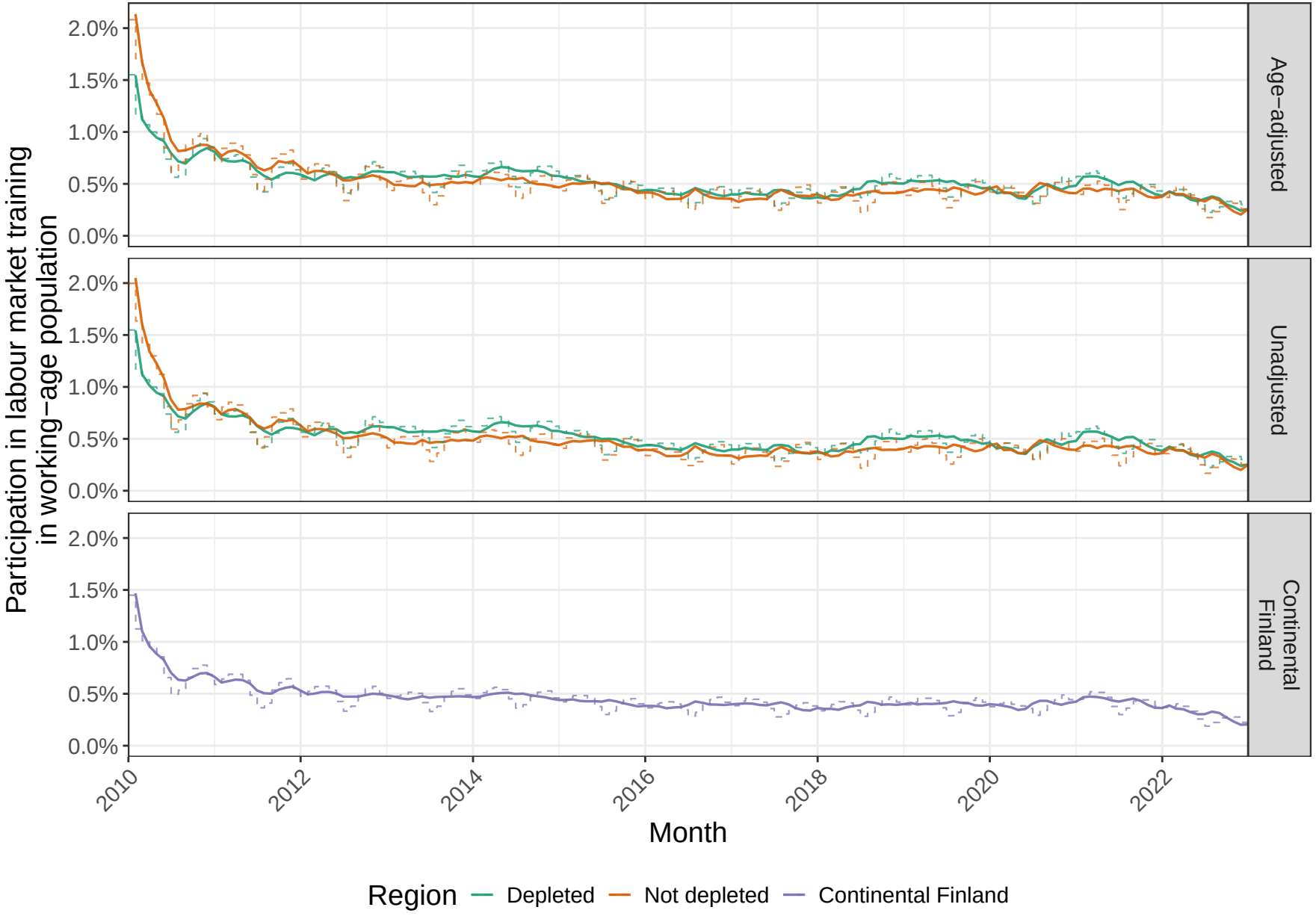


Figure 16: Entries into subsidies across regions. New subsidies refer to new subsidy decisions that occur after a gap of at least 30 days per worker. Duration of new subsidies refer to the forward-looking durations of new subsidy spells.

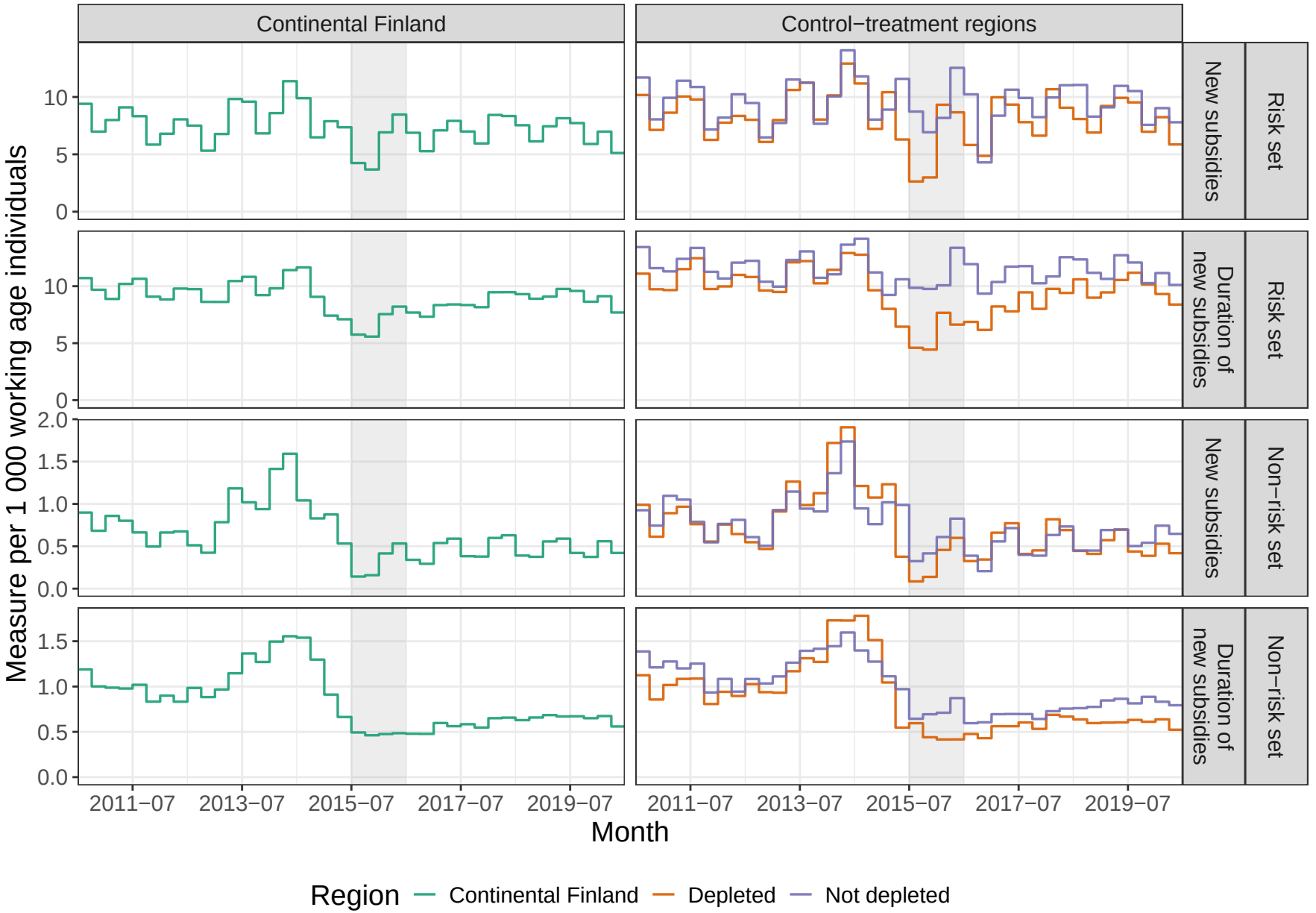
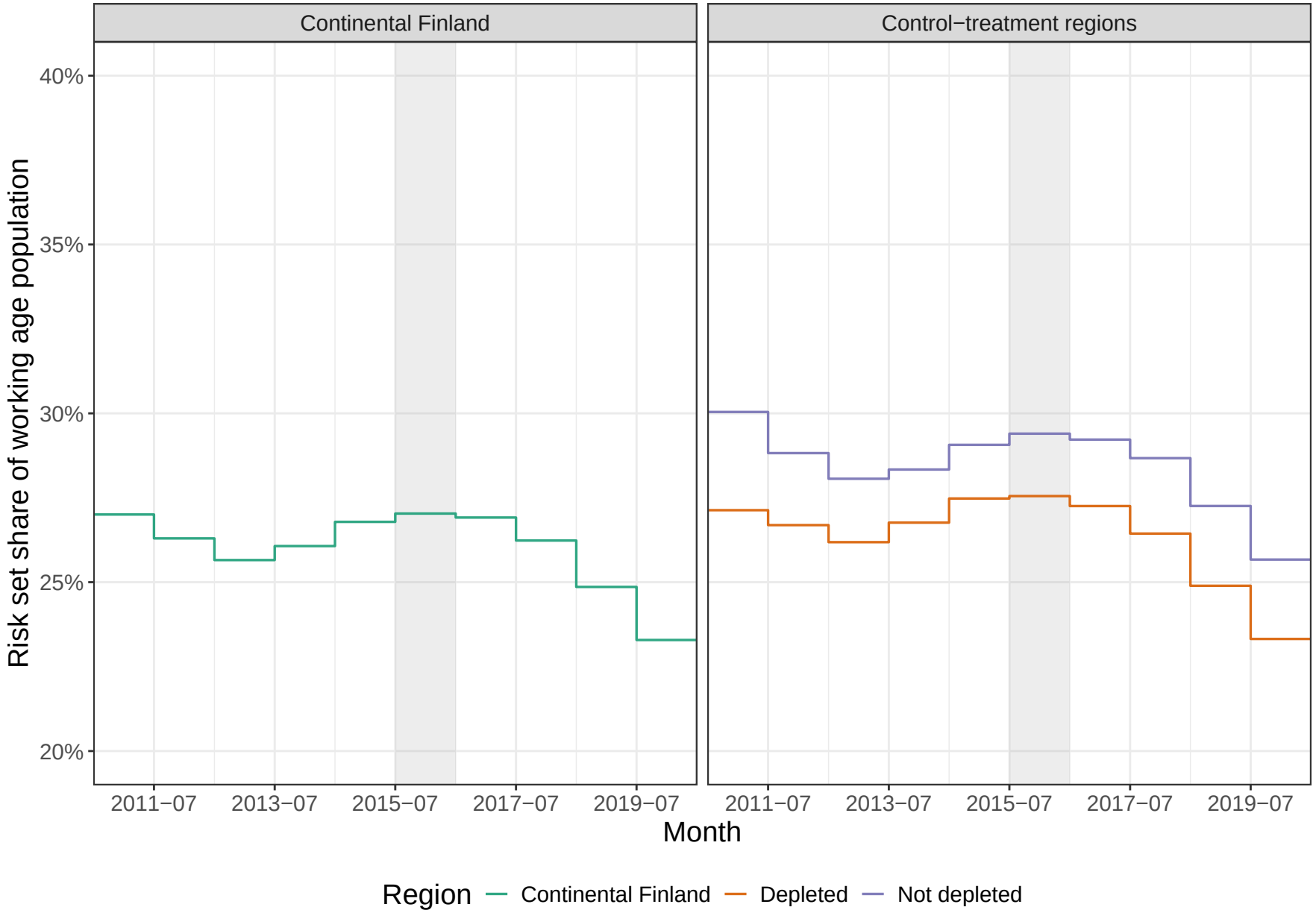


Figure 17: Risk group shares across regions



Appendix I Hazard into subsidized employment

The (sub)hazard profile from unemployment into subsidized jobs depends heavily on the type of benefits the person is entitled to. Those collecting unemployment insurance start with low propensity to enter subsidized jobs, followed by a sharp increase around benefit exhaustion, typically 100 days for most of the period observed. The reverse is true for those collecting unemployment assistance (UA). Figures 21 –18 illustrate the empirical subhazards and cumulative incidence in different populations of the unemployed.

The patterns are probably related to a number of distinct factors. First, the eligibility rules for insurance cause jobseekers to select into different types of benefits based on their recent work experience. The insured individuals are usually more able to find open market jobs on their own on average; however, either through dynamic selection or because of human capital depreciation, those persisting in insured unemployment for long face more difficulties in getting employed in the open market. Additionally, older UI recipients who exhaust their maximum insurance duration (usually 100 weeks) have historically been individually entitled to a subsidized job, and this job was guaranteed to provide them with a new UI entitlement.

In contrast, many of those initially entering unemployment assistance are young jobseekers with little recent work experience. These individuals might be suitable candidates for the subsidy early on; in this group, dynamic selection might be stronger, leaving individuals for whom even a subsidized job might not be a realistic option.

How did the reduction in the availability of the subsidy interact with ongoing spells? Generally speaking, the funding halt reduced entries into subsidized jobs in a *persistent* way for most of the individuals who were in unemployment in the latter half of 2015. Figure 22 shows the long-term cumulative entry rates into subsidized jobs by period, region and phase of unemployment at the time of sampling. Some of the effects of the funding halt may have been absorbed by queuing, where the unemployed would wait for funds for subsidized jobs to become available again. However, there were also clear lasting effects, as the cumulative entries into the subsidized jobs continued to be lower for long after the funding situation normalized.

Figure 18: Subhazard into subsidized jobs among jobseekers. Data for registered unemployment started in 2006–2016. The second column of figures covers those predicted eligible to an old-age UI extension, which provides earnings-related benefits until retirement age. The third column plots those predicted eligible to an individual subsidized job mandate at the 100 weeks mark.

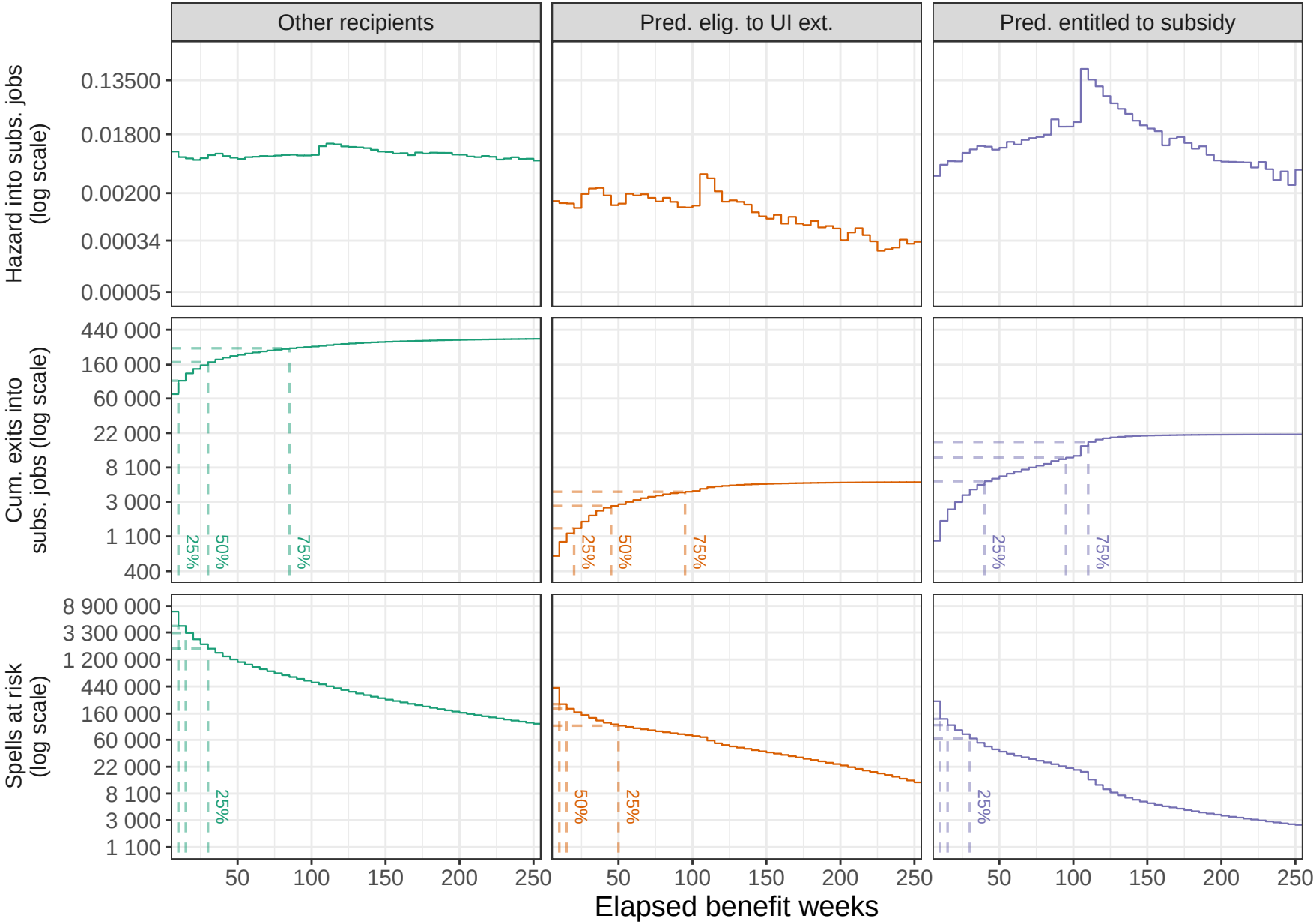


Figure 19: Subhazard into subsidized jobs, by benefit days. Data for spells started in 2010–2016. Hazard is calculated per four benefit weeks.

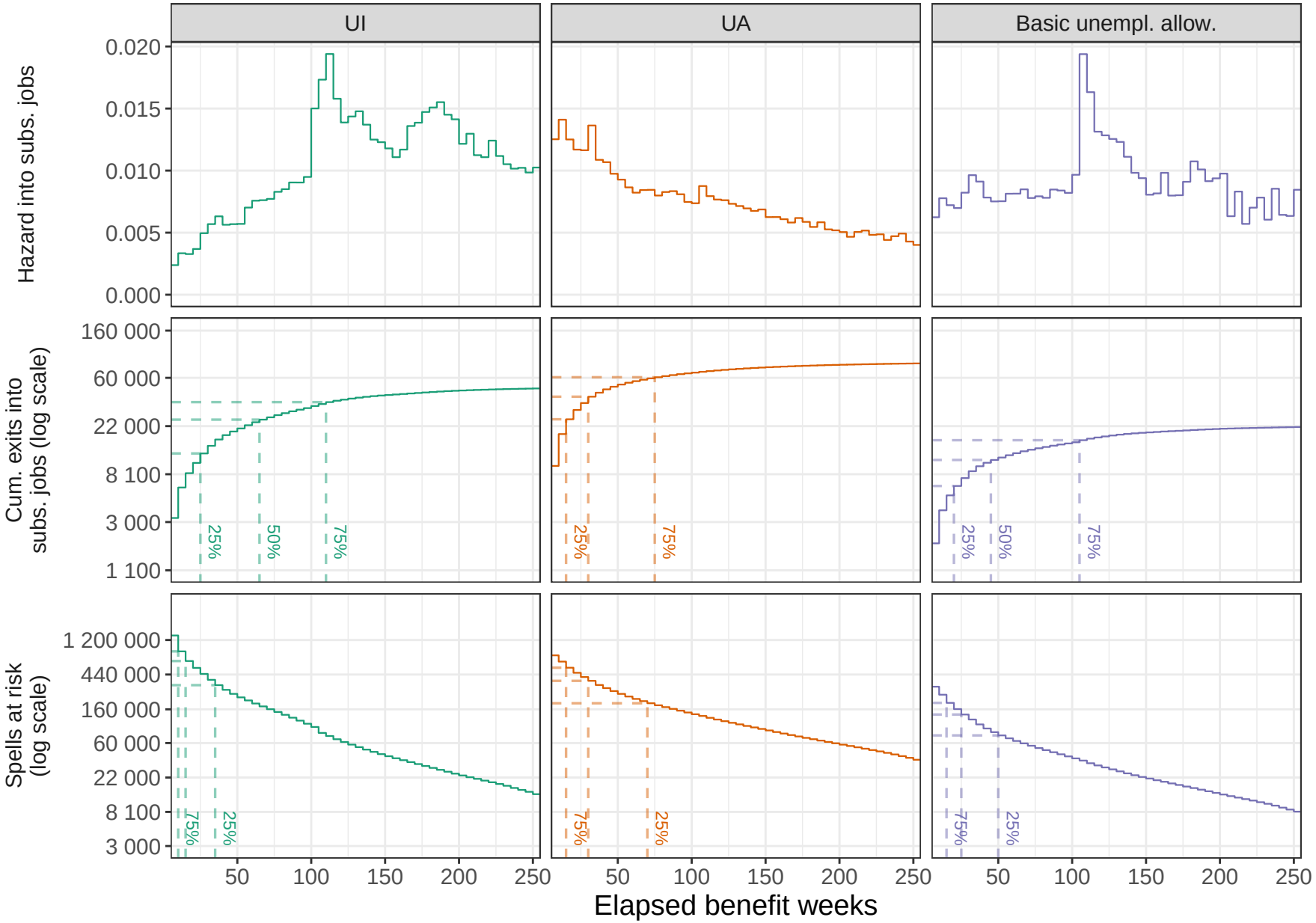


Figure 20: Subhazard into subsidized jobs, UI recipients. Data for UI spells started in 2010–2016. The elapsed benefit weeks counts weeks towards the maximum insurance duration. Data includes both fresh and reopened (left-censored) claims.

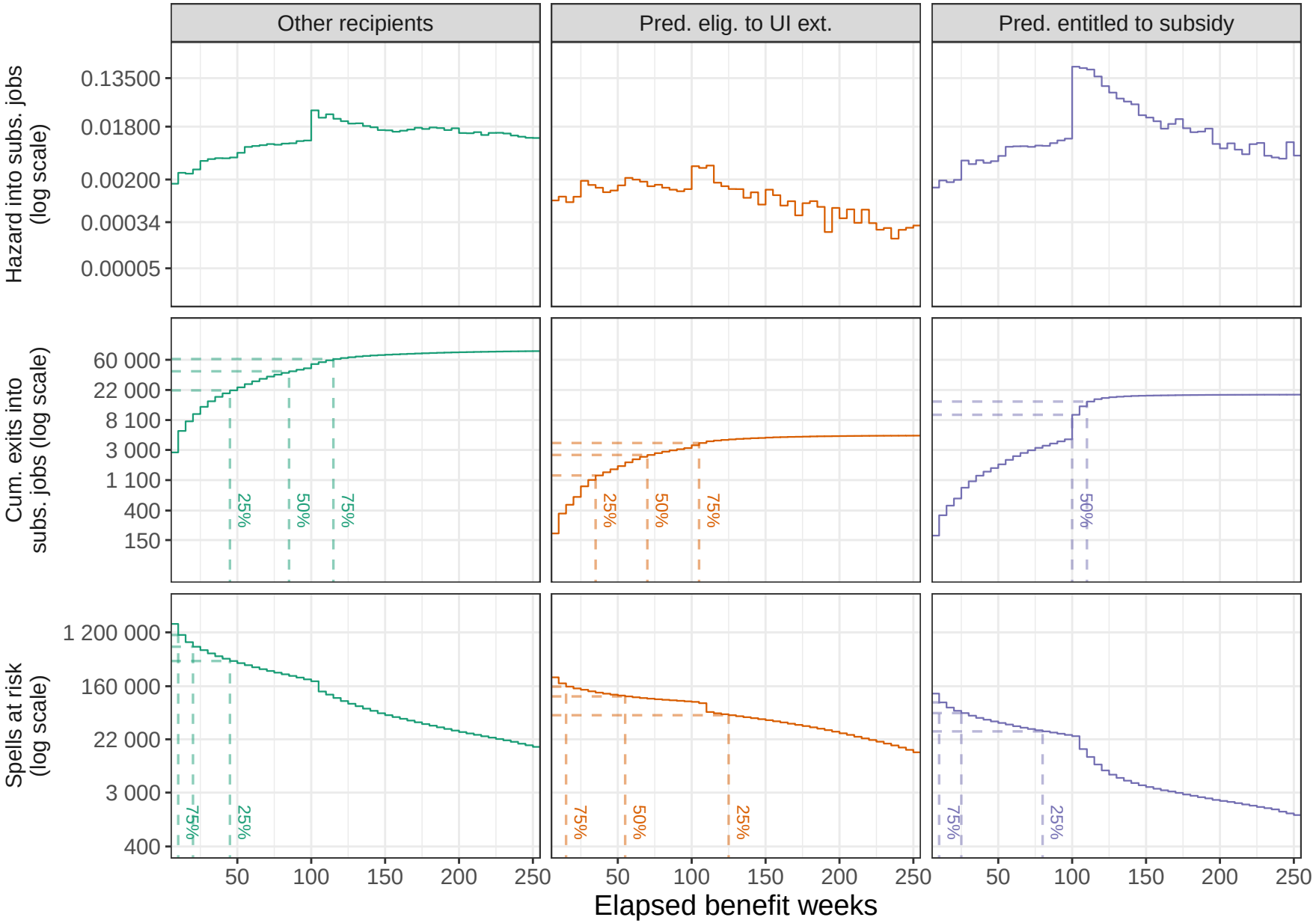


Figure 21: Cumulative exits into subsidized jobs, by benefit days and start year

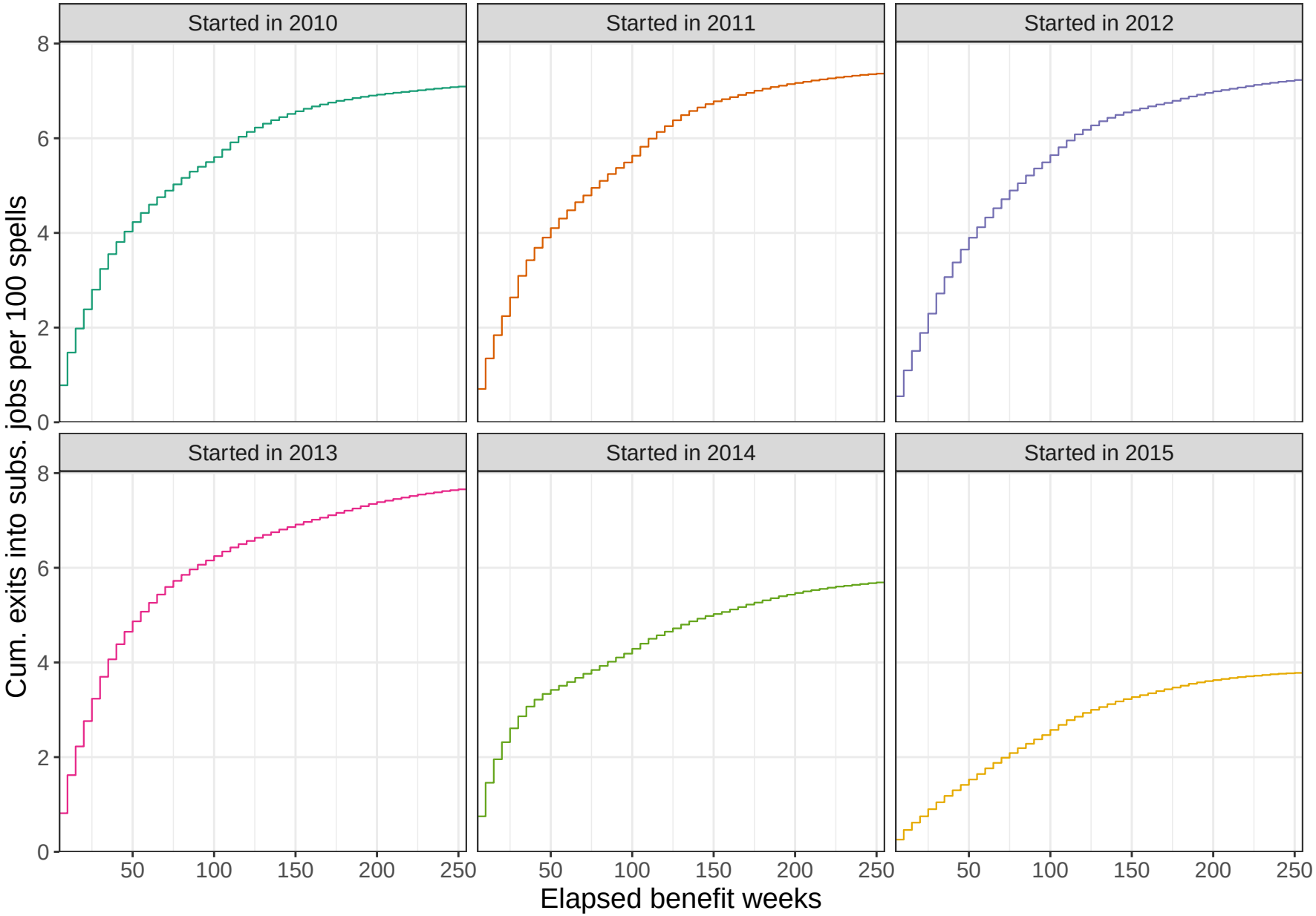
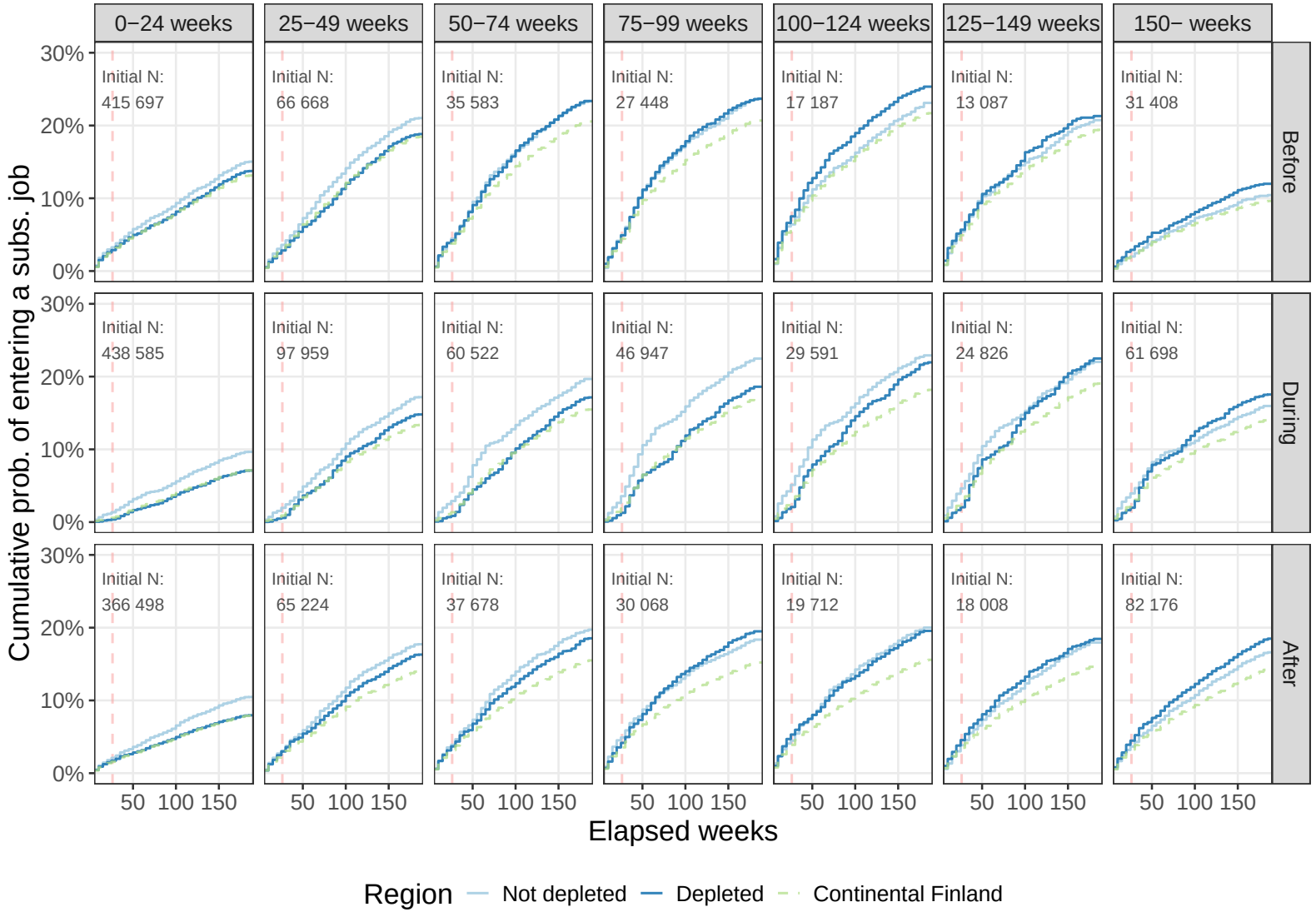


Figure 22: Cumulative exits into subsidized jobs, by jobseeking days (excl. mandates). "Before" refers to spells ongoing in July or started between July and December 2011, "during" to spells between July and December 2015, and "after" to spells between July and December 2019. The columns refer to the elapsed benefit duration in July for ongoing spells; fresh spells started later in the year are considered to have an initial elapsed duration of 0 weeks.



Appendix J Instrumental variables estimation of the effects of the subsidy

In this appendix, alternatives for estimating the effects of the subsidy are discussed.

The proneness to the subsidy exhibits both persistency and intermittency. While the subsidy targets the longer-term unemployed, they are not the only target group. Furthermore, while many persist in long-term unemployment year after year, many also enter and exit this status each year. Thus, any identification strategies that require either a clearly fixed group or a clearly distinct and renewed sample of observation units will run into difficulties.

However, in the probabilistic sense, there is a clear window of unemployment durations where the subsidy (sub)hazard clearly peaks, as shown in appendix I. Thus, a feasible estimation strategy can be constructed by interacting a window of ongoing unemployment duration with region and time dummies, with time dummies defined similarly as for the study on the displacement effects. The interaction is used as an instrument for entering the subsidy. Under this strategy, the treatment is defined as reducing the availability of the subsidy *at the time in a person's unemployment when they are most likely to enter subsidized jobs*.

A proneness window is defined as having 70 to 120 weeks of elapsed unemployment duration at the sampling time on July 1st, ensuring that each individual will only experience the above treatment only once. Otherwise, the sample is restricted by the predicted employment probability similarly to the matching approach used in the main text. The same exclusions are also applied (in particular, those predicted to be entitled to old-age UI extensions or mandated subsidies are excluded).

The observed subpopulations are collected from cross-sections on July 1st 2014 (the pre-period) and July 1st 2015 (the post-period), as before. The first-stage outcome is the binary outcome of entering a subsidy, and the second-stage result are wages in a window of three to four years from the base period. The first-stage is measured over 12 months following the base sampling date.

Table 5 collects the tentative results from this estimation strategy. The point estimates for the longer follow-up period are in line with the results from matching, but the setup is clearly underpowered due to the relatively weak first stage. Due to the lack of power and the fuzzy nature of the strategy, this design does not appear to provide robust complementary evidence for the results of the subsidy on participants, and is considered to be of only minor interest.

Table 5: Estimation results for the instrumental approach.

	First stage (receiving subsidy)	Estimated effect of the subsidy on wages	N	Pre-reform probability of subsidy	Test score for weak instruments
12 months initial follow-up	−0.077	+1572 (6730)	17997 0.187	49.6	
24 months initial follow-up	−0.047	+2534 (10868)	17997	0.285	13.8

Estimates are for wage sums over the four year (36th to 47th month after the base date). Bootstrapped standard errors in parentheses.

Appendix K Subsidy spells excluded from matching

For the matching approach that examined the effects of the subsidy on participants, a number of exclusions from the risk set were deemed necessary. These restrictions were not applied to the risk set covered when assessing the aggregate or indirect effects of the subsidy. Table 6 collects the restrictions in terms of how many subsidized individuals were excluded (although the exclusions were applied to both the treatment and the control group before matching).

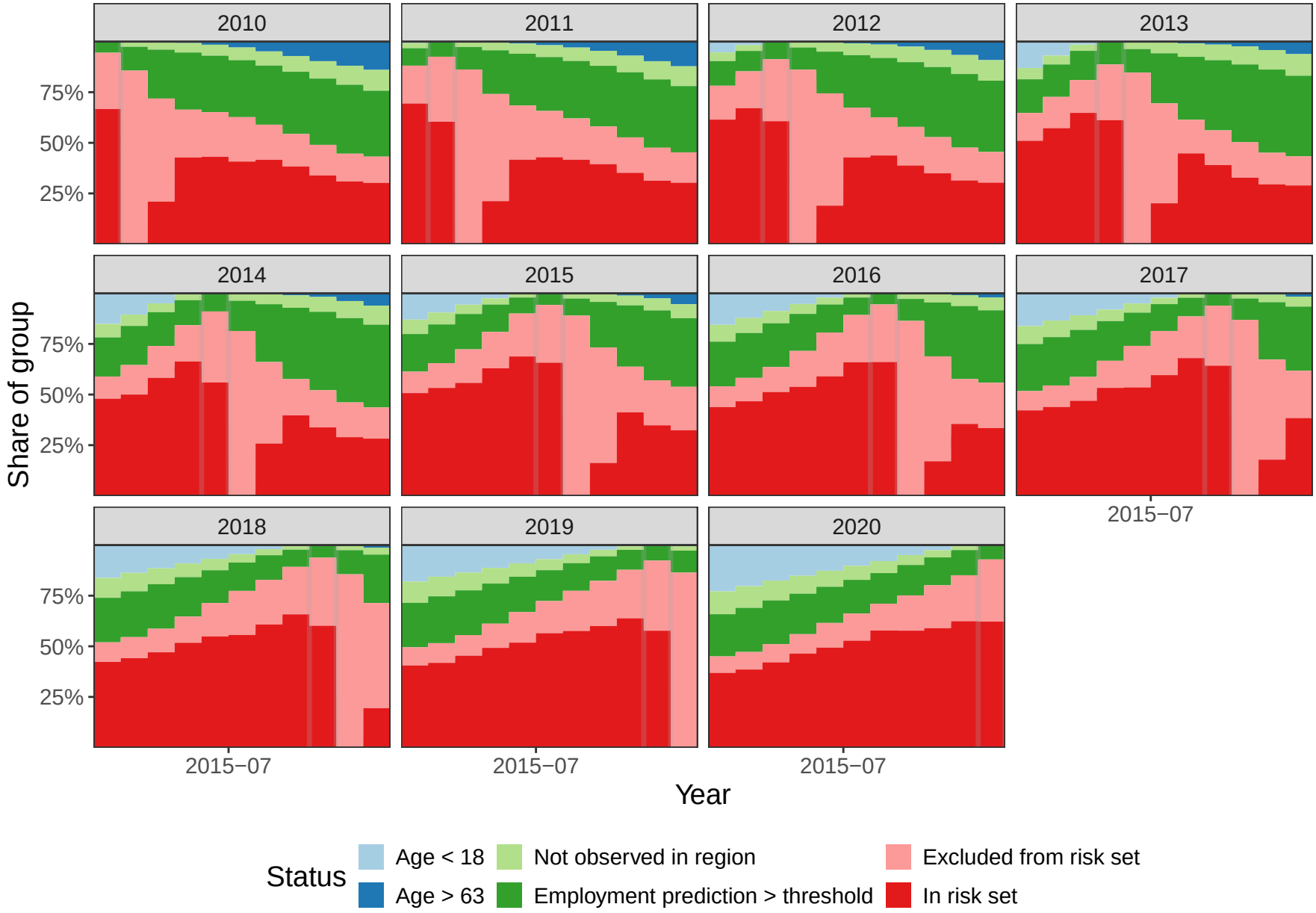
Persons (predicted to be) eligible to old-age UI extensions were excluded mainly as they rarely enter the subsidy, and including them as controls would likely produce biased results, as persons with unlimited insurance duration might behave very differently from those with only a limited UI duration. Those eligible to mandated subsidies constitute the counterpart of individuals who are mechanically eligible to a specific type of subsidy which is not subject to the normal discretionary approval process (also implying that those who then do not enter subsidized jobs might be a highly selected group). Those having distinct subsidy spells in the last year are excluded both to improve comparability and simplify comparisons in later years, as it ensures that each treatment unit can only appear once in the selection. Those in subsidized jobs refer to individuals who were in ongoing subsidized jobs in July of a given year and later received an extension or entered a different subsidized job.

Figure 23 shows how the composition of the individuals subsidized in a given year change over time.

Table 6: Exclusions from the risk group, in exclusion order

Restriction	N	Share
All treated 18-63 years old	30,804	100.00%
Currently in a subsidized job	5,825	18.91%
Potentially eligible to UI extension	26	0.08%
On UI extension	33	0.11%
Previously on mandated subsidies	96	0.31%
Furloughed	217	0.70%
Enters mandated subsidies	2,728	8.86%
Potentially eligible to subsidy mandate	934	3.03%
Recently in a subsidized job	1,924	6.25%
Predicted employment above threshold	2,381	7.73%
Total after exclusions	16,640	54.02%

Figure 23: Risk group among subsidized workers. Each subfigure follows the individuals acquiring subsidies in a given half-year and shows how the group's composition changes over time. For example, the subfigure for the year 2014 includes those who acquired a subsidy decision (a fresh subsidized job or an extension) between July 2014 and June 2015.



Appendix L Matching balance

The table 7 and figures 24–27 complement the assessment of the balance after matching in the main text.

Table 7: Characteristics of the treatment and matched control groups for assessing the effect of the subsidy on participants.

Variable	Treatment group	Matched units	Enter subsidized jobs	Risk set	Narrower risk set	All working-age
Subsidy prediction	0.2250 (0.1490)	0.2200 (0.1580)	0.2490 (0.1680)	0.0491 (0.0894)	0.0666 (0.1140)	0.0251 (0.0712)
Employment prediction	0.0691 (0.0775)	0.0704 (0.0803)	0.1270 (0.1870)	0.0905 (0.0934)	0.0574 (0.0536)	0.6260 (0.4060)
Reg. unempl. days, 3 years	212.0 (122.0)	200.0 (126.0)	201.0 (120.0)	83.3 (119.0)	105.0 (130.0)	44.0 (91.0)
Reg. unempl. days, since 1991	2 110 (1 890)	2 120 (2 020)	2 150 (1 910)	1 160 (1 680)	1 420 (1 840)	787 (1 260)
Days worked, last 3 years	33.7 (64.5)	35.4 (66.1)	46.4 (78.3)	39.0 (75.7)	27.2 (62.8)	203.0 (159.0)
Wages, last 3 years	3 240 (7 350)	3 380 (7 790)	4 500 (8 920)	3 870 (9 830)	2 740 (8 730)	22 600 (23 000)
Wages, since 1987	150 k (252 k)	153 k (712 k)	214 k (317 k)	179 k (346 k)	188 k (375 k)	455 k (485 k)
Income, last 3 years	12.40 k (9.59 k)	12.30 k (9.82 k)	14.80 k (11.20 k)	12.20 k (20.50 k)	11.70 k (10.80 k)	30.50 k (35.10 k)
Duration of unempl. spell, days	73.10 (72.70)	68.30 (77.00)	57.60 (69.60)	21.70 (54.30)	28.50 (61.10)	9.27 (36.40)
Transfers, last year	11.10 k (7.13 k)	10.90 k (7.52 k)	10.60 k (7.17 k)	9.63 k (8.81 k)	10.40 k (8.70 k)	5.06 k (7.35 k)
Subsidized days, last 3 years	10.90 (32.30)	10.30 (31.60)	31.40 (59.00)	2.38 (15.50)	7.91 (30.10)	3.64 (21.20)
Debt	8.37 k (22.30 k)	8.05 k (22.20 k)	10.10 k (25.50 k)	8.16 k (23.50 k)	6.44 k (19.70 k)	30.60 k (52.00 k)
LM training, last 3 years, days	13.90 (35.40)	13.30 (36.00)	12.20 (32.90)	4.92 (22.20)	5.36 (22.90)	3.30 (18.70)
Pension income	202 (1.800 k)	374 (2.420 k)	229 (1.810 k)	3.490 k (7.430 k)	3.590 k (7.420 k)	1.380 k (5.100 k)
Education, years	11.700 (2.060)	11.700 (2.070)	11.800 (2.130)	11.300 (2.170)	11.100 (2.110)	12.500 (2.560)
Household size	2.500 (1.480)	2.450 (1.490)	2.420 (1.420)	2.510 (1.530)	2.430 (1.500)	2.670 (1.460)
Children	0.552 (1.010)	0.521 (0.984)	0.484 (0.954)	0.459 (0.970)	0.417 (0.935)	0.636 (1.050)
Business income, 3 years	281 (1.85 k)	269 (1.86 k)	502 (2.98 k)	366 (16.80 k)	244 (1.69 k)	3.39 k (27.30 k)
Age	35.9 (12.2)	35.8 (12.6)	39.0 (13.7)	37.3 (15.5)	39.0 (15.9)	41.4 (13.5)
Female	0.469 (0.499)	0.465 (0.499)	0.478 (0.500)	0.494 (0.500)	0.486 (0.500)	0.490 (0.500)
In partnership	0.245 (0.430)	0.227 (0.419)	0.280 (0.449)	0.259 (0.438)	0.264 (0.441)	0.429 (0.495)
N	16 007	16 007	30 804	671 447	632 691	2 239 098
Individuals	16 007	16 007	28 951	422 594	389 068	1 173 874

Data from July 2014 and July 2015; in the case of data only available for the end of year, data from the previous year's end (number of children, household size, partnership status, debt, pension income, total income, business income). Treatment refers to persons who enter a subsidized job in the twelve months between July of a given year and the following June (third column), minus the exclusions listed in the previous section. Base year is 2013. The numbers are means, with standard deviations in parentheses. All means include zeros.

Figure 24: Age distributions across groups. The different panels use different comparison groups. Left to right and top to bottom, the panels compare treatment and control units, treatment group and all subsidized workers, matched units and the entire at-risk group and the at-risk group and all working-age individuals in July 2014 and July 2015.

Figure 25: Education fields of different groups. Data from last completed degree per individual. The different panels use different comparison groups. From top left, the panels compare treatment and control units, matched units and the entire at-risk group and the at-risk group and all working-age individuals in July 2014 and July 2015.

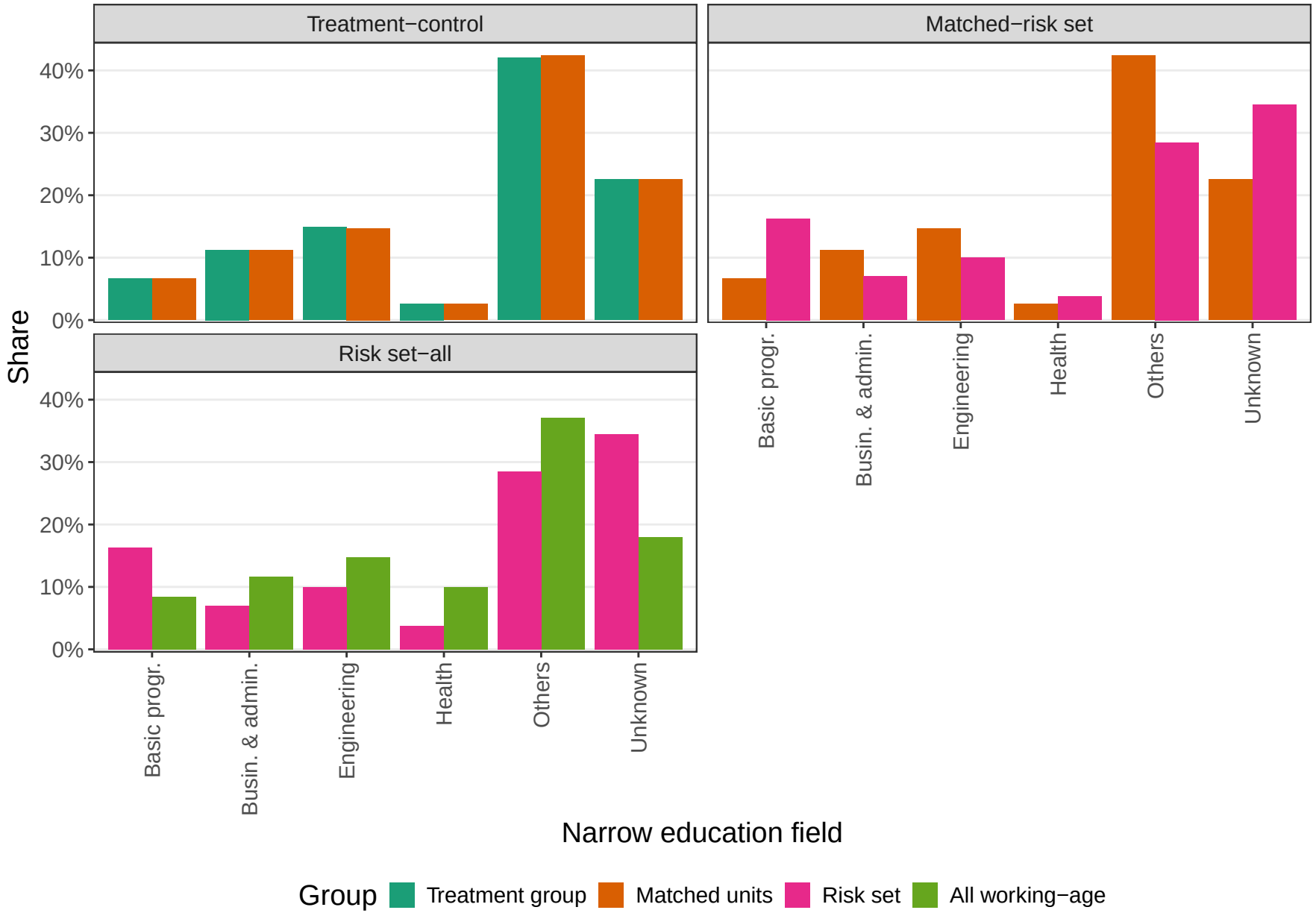


Figure 26: Unemployment status of different groups. Data for July 2014 and July 2015. "No data" means the individual was not observed as being in the unemployed jobseeker register at the time. The different panels use different comparison groups. From top left, the panels compare treatment and control units, matched units and the entire at-risk group and the at-risk group and all working-age individuals in July 2014 and July 2015.

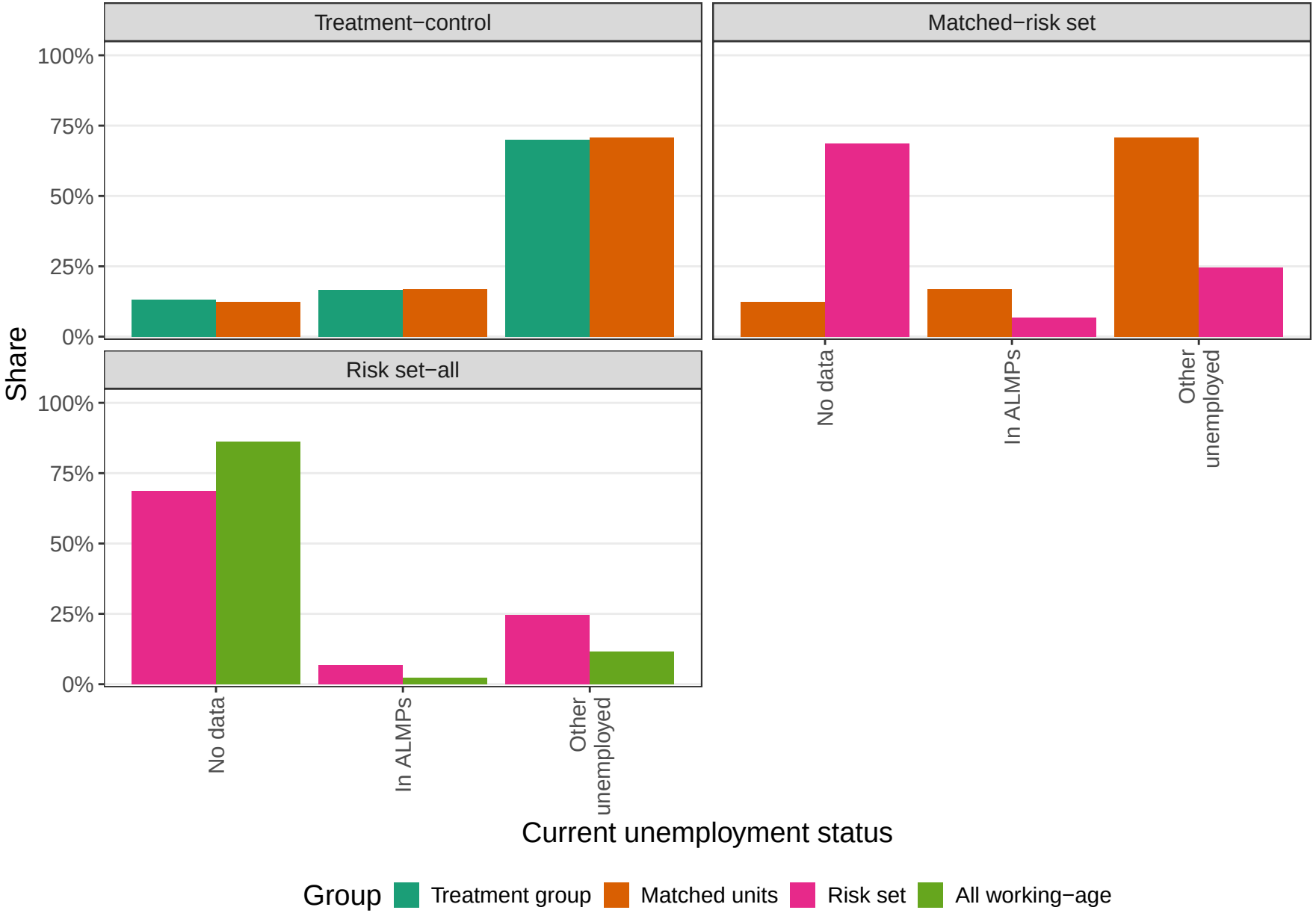
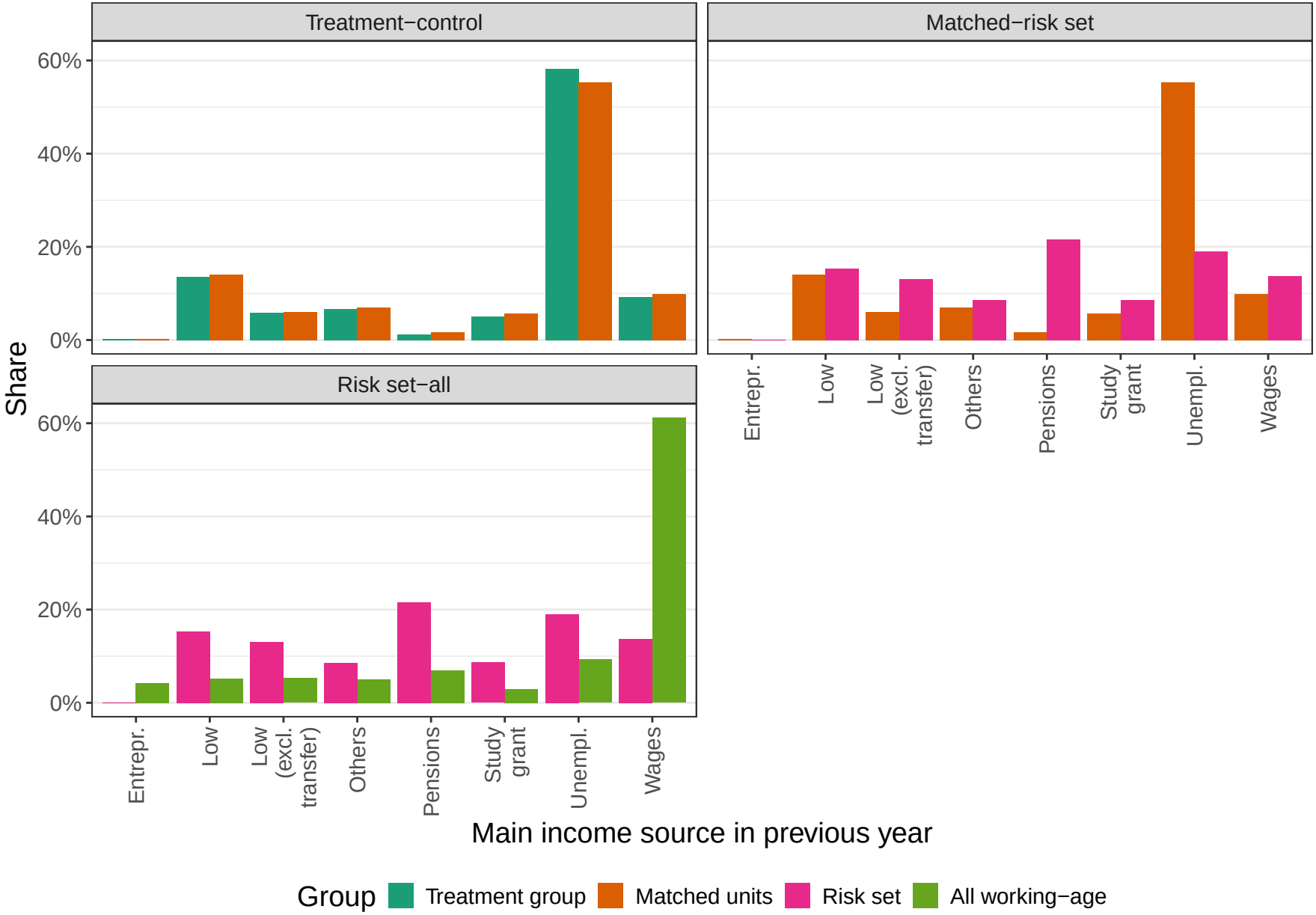


Figure 27: Main income source in different groups. The different panels use different comparison groups. From top left, the panels compare treatment and control units, matched units and the entire at-risk group and the at-risk group and all working-age individuals in July 2014 and July 2015.



Appendix M Matching, control and at-risk group prediction covariates used

For the matching approach which assessed the effect of the subsidy on participants, the control units were matched with propensity score matching based on the following variables: the aggregate employment prediction from the ensemble model, age, time from last job, income in the previous 1 and 3 years, main income source in the previous year, wages in the last year, lifetime wages, subsidy duration in the last 3 years, time from last subsidy, participation in work tryouts in the previous year, date and type of the latest re-employment plan if any, type of unemployment (in ALMPs or otherwise), total unemployment duration since 1987, duration of current unemployment spell, elapsed benefit days towards the maximum insurance duration, time from latest degree, educational field, and inverse labour market tightness in the profession/commuting area cell.

Continuous variables with potential missing data were discretized by empirical quartiles, with a distinct category for missingness. In the outcome regression, dummies for gender, coarsened industry, age of the youngest child, reason for the termination of the last job, foreign background and customer type assigned by the public employment services were also added.

Using the same set of covariates, Coarsened Exact Matching and entropy balancing weights were also tested as alternatives. These alternatives produced very similar estimates of the treatment effect.

For the employment prediction performed by the ensemble model, the algorithm settled on the following variables, in the order of variable importance[3]:

- days employed (in open market jobs, at estimated wages exceeding a minimum wage) over the previous year
- wages over the previous year
- coarse employment status in the previous calendar year (wage earner or self-employed)
- business income over the previous calendar year
- business income over the previous 3 calendar years
- days employed over the previous 3 years
- wages over the previous 3 years
- total income in the previous calendar year
- activity preceding current unemployment spell

[3]Using the `varImp` procedure from the `caret` package for the gradient boosting method.

- age
- coarsened profession
- unemployment status (furloughed, in ALMPs, others)
- year of latest completed education
- age of the youngest child
- total income over the previous 3 calendar years
- narrow educational field of the highest degree
- debt
- total days employed since 1987
- number of distinct past employment spells since 1987
- wages since 1987
- transfers in the previous calendar year
- socioeconomic status in the previous calendar year (Statistics Finland classification)
- days of registered unemployment since 1991
- time from last job
- full-time equivalent unemployment benefit days of the ongoing unemployment spell
- inverse tightness in the region and profession
- start of the latest pension spell
- registered unemployment days in the last year
- type of ongoing pension (disability, old-age and family pensions)
- educational attainment in years
- population in commuting area
- registered unemployment days in the last 3 years
- coarsened industry over the last year
- gender

- jobseeker group assignments by public employment services (PES)
- duration of the current "customer segment" assignment by PES
- reason for the termination of the last job
- social assistance in the last calendar year
- duration of the ongoing unemployment spell
- time from latest re-employment plan
- number of past calendar years with collected unemployment benefits since 1987
- full-time equivalent days elapsed towards the maximum UI duration
- labour market training days over the past 3 years
- subsidized employment days over the last year
- duration of ongoing subsidized job
- time from last subsidized job
- subsidized employment days over the last 3 years
- duration spent in work tryouts since 2006
- unemployment benefit type (unemployment assistance or insurance)
- total days in subsidized jobs
- days of labour market subsidy collected in the previous year
- time from the last active labour market program
- type of employment plan
- duration spent in work tryouts in the last 1 and last 3 years
- residence permit dummy for immigrants
- health issues proxied through labour market statements from the last year

For any relevant continuous variables, missingness was encoded separately. Profession and industry were coarsened progressively from the most precise classifications, picking industry and profession categories which had either large shares of subsidized jobs or large numbers of workers overall.

Local labour market tightness was calculated over a grid of ISCO level 4 professions and commuting areas, using data for vacancies[4] and registered unemployment from the public employment services, with a rolling sum over 9 months used for both vacancies and the unemployed. Grid cells with less than 3 average seekers were iteratively coarsened to the region level or a coarser profession level. The construction of the grid was governed by the ability of the lag of the resulting tightness estimate to predict unemployment durations. Potential grids were tested over combinations of different profession levels, regional coarsening and windows (from 1 month to 24 months).

Table 8 illustrates the performance of the prediction models. The models perform much better predicting overall unsubsidized employment than the exact identity of those who enter subsidized jobs. Near-term employment prediction performs well on all the available metrics. Figure 28 shows the cumulative shares of the working-age population, their actualized unsubsidized wages and their entries into subsidized jobs. Roughly 26%–29% of the working-age population with the lowest open market employment predictions collect roughly 2% of unsubsidized wages, but the clear majority of the subsidies.

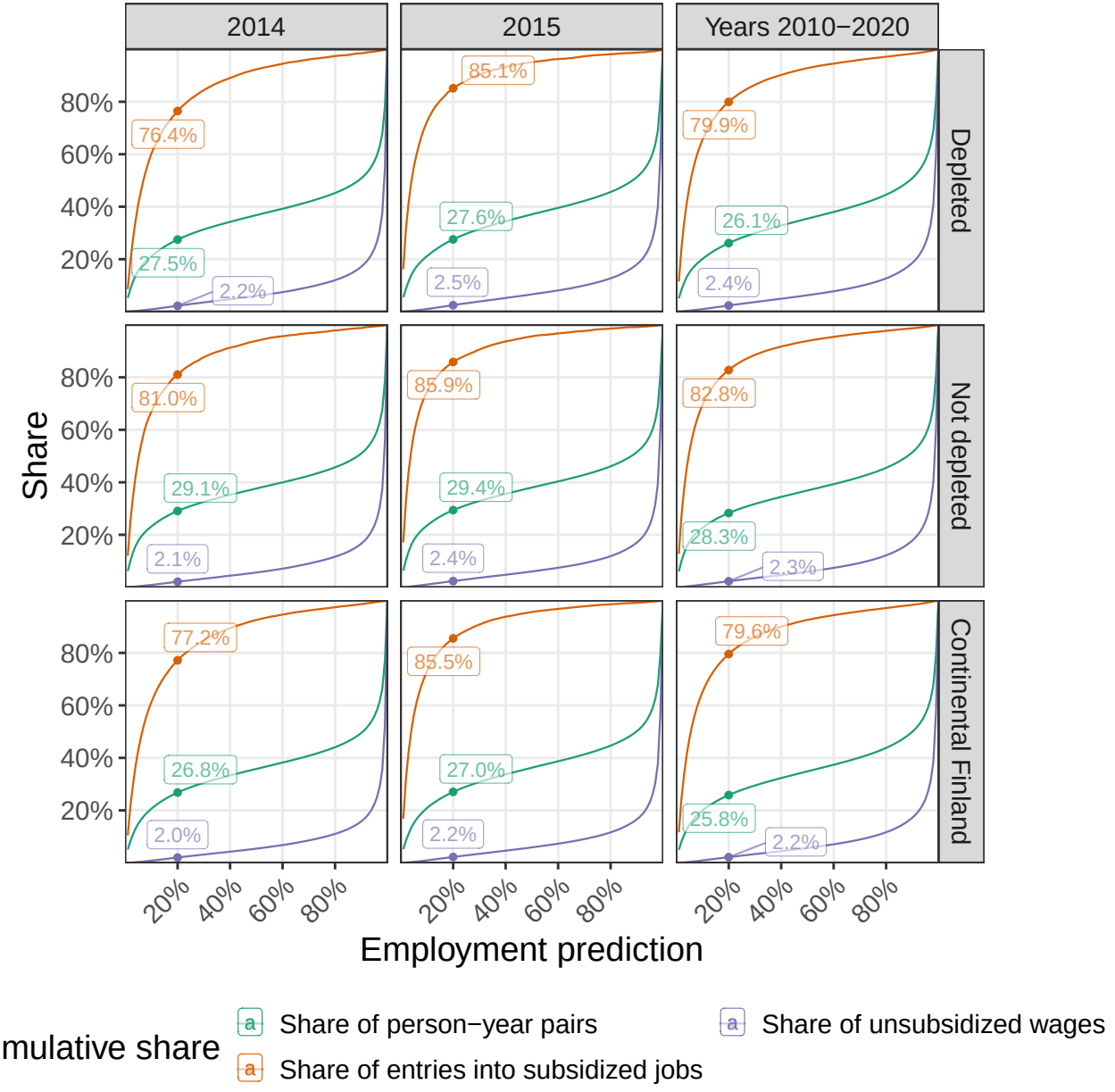
[4]All part-time vacancies were multiplied by 0.5. Short-term jobs with a posted duration of less than 11 days were multiplied by 10/90 and those with a duration of between 10 days and 1 month by 1/3.

Table 8: Employment and subsidy prediction performance.

Prediction	Base years	Regions	Threshold	Sensitivity	Specificity	Balanced accuracy	Accuracy	Informedness	Jaccard index	F_1 score	Person-year pairs
Employment	All years	All regions	0.500	0.934	0.772	0.853	0.869	0.705	0.810	0.895	35 562 100
Employment	Years 2014-2015	Treatment and control areas	0.500	0.935	0.786	0.861	0.871	0.721	0.806	0.893	2 239 098
Subsidy	All years	All regions	0.040	0.913	0.891	0.902	0.891	0.804	0.042	0.081	35 562 100
Subsidy	Years 2014-2015	Treatment and control areas	0.040	0.927	0.869	0.898	0.870	0.796	0.043	0.083	2 239 098
Subsidy	All years	All regions	0.500	0.143	0.998	0.571	0.994	0.141	0.105	0.190	35 562 100
Subsidy	Years 2014-2015	Treatment and control areas	0.500	0.129	0.997	0.563	0.992	0.127	0.090	0.165	2 239 098

Ensemble models trained on year 2013 data for working-age resident population. Predictions based on observables in July. Outcomes are over the following 12 months. Thresholds indicate the probability cut-off point to calculate true and false positives and negatives.

Figure 28: Cumulative shares of population, subsidies and wages as a function of the employment prediction. Each panel plots the cumulatives shares of the population in July of a given year, of their open market wages over the following 12 months, and of their entries into subsidized jobs over the following 12 months. Predictions come from an ensemble model trained on year 2013 data.



Appendix N Comparison to earlier matching studies

Aho et al. (2018) estimate the employment responses of participants in subsidized jobs in 2010 by matching. They divide their participation sample to entries after 1, 6 or 12 months of unemployment, to municipality and private sector participants, and to those aged at most or above 50 years of age. For public sector participants below the age of 50, they find wage effects of −374, +261 and +1565 euros in annual wages in the fourth year after the base date, depending on the duration of unemployment, or +194 euros as a weighted average. For private sector participants, they find effects of +3041, +4084 and +7778 euros on annual wages, or +4036 euros as a weighted average. The effects for private sector jobs are reassuringly close to those in this study. The effects in the public sector differ somewhat, although the effects are qualitatively similar: in both cases, the estimates are quite close to zero and not statistically significant for public sector subsidies.

The differences in the estimated effects for the public sector may stem from different sampling approaches, as Aho et al. (2018) split the group at a different age threshold. This study included participants above the age of 50 as long as they were not predicted to be eligible to the individually mandated subsidy or to a UI extension in the near future.

Asplund et al. (2018) estimate the effects for participants in subsidized jobs in 2011–2013 and 2015 through matching. Effects are estimated separately for the private sector, the third sector and the public sector. They estimate effects on annual wages in 2015 and 2016 respectively. Thus, the results for participants in year 2015 in particular might be confounded by the fact that the subsidy spell itself might extend to the outcome year. The authors find effects of +4320, +1433 and +746 for private, third and public sector participants respectively, but emphasize that the third sector result is purely due to a small number of outliers. Again, the effects for private sector subsidies appear to be in line with this study, while the effects for other sectors are only qualitative similar, showing small and statistically insignificant results. The quantitative differences might be related to different restrictions applied to the base group.

Appendix O Cumulative re-entries to the first employer and the choice of the outcome measure

Many workers may re-enter the service of an initial employer with a long delay, or several times. Figures 29–fig:Cumulative re-entry probability to the first employer, base year 2012 (Split) show the cumulative probability and number of cumulative re-entries to the "first" employer for a specific subset of subsidized workers.

Here, first employer refers to either the subsidized employer (for the treatment group) or to the initial employer (for the controls). Only those control units, and their matched treatment units, are included who entered an unsubsidized employer during the initial year after the base date in July 2012. There are no guarantees that these groups are particularly well balanced or that either group is avoid of different selection mechanisms, so the control units should be understood as only an illustrative benchmark case.

Figure 29: Cumulative re-entries to the first employer, base year 2012.

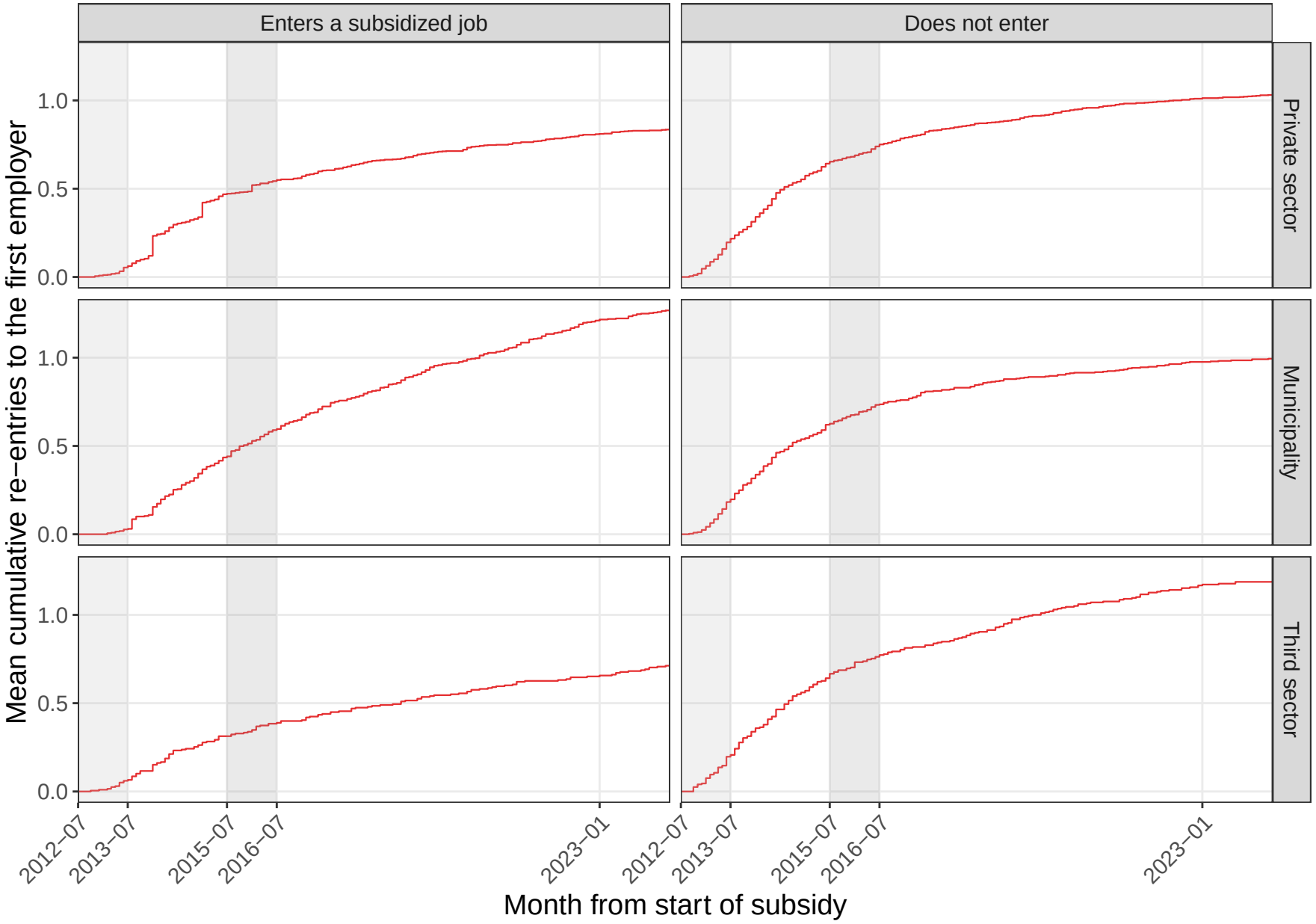
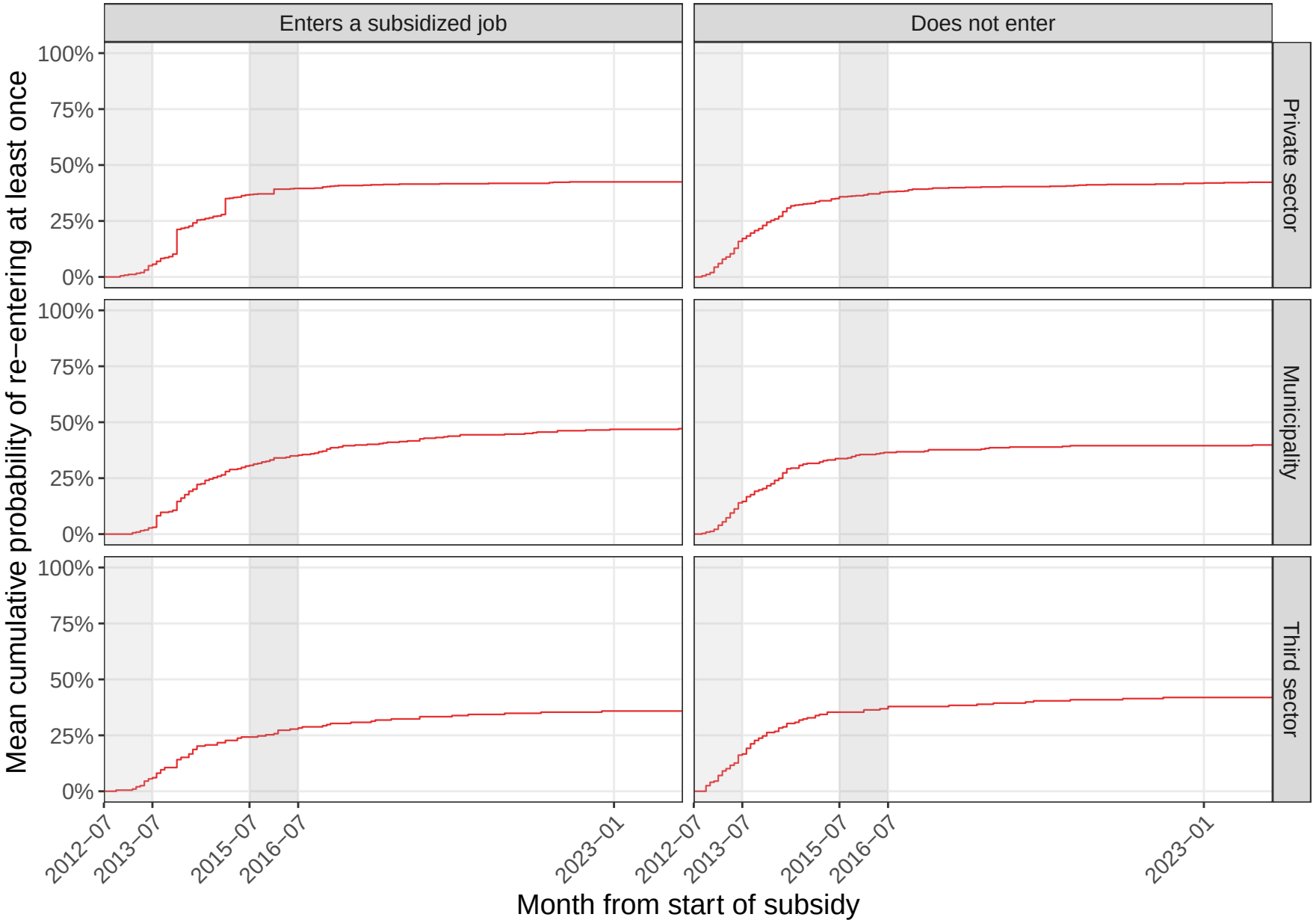


Figure 30: Cumulative re-entry probability to the first employer, base year 2012



The choice of the exact wage or employment outcome measure for the subsidy's effects on participants is somewhat arbitrary. Some individuals in the control group will enter subsidized jobs later, potentially during the outcome period. If such cases are common among the control and rare among the treatment group, and wages from these jobs are included in the outcome, the wages of these units will be artificially inflated, since the subsidized jobs will mechanically but temporarily increase wage income of individuals who would not have found a job otherwise. If wages are only measured from open market employment, then the wages for individuals in subsidized jobs in the outcome period will be artificially decreased.

The easiest way to assess how much this matters is to use wages for both potential outcome measures and see whether the effect estimates differ. From table 12, we can see that the estimates are not particularly sensitive to the choice of the outcome measure.

Figures 58–59 illustrate the intensity at which control and treatment units experience the treatment after the initial treatment phase.

Table 9: Effects of the subsidy on participants by outcome measure.

Sector	Open market wages	Wages including subsidized jobs	N
Private sector	4 458.4 (183.8)	4 461.9 (190.1)	38,674
Municipality	365.3 (148.2)	419.2 (150.0)	33,262
Third sector	-133.1 (161.1)	-255.0 (194.4)	28,876

Effects are replicated using the same matching approach as in the main text. Effects are estimated using treatment units and matched counterparts from July 1st on years 2012–2017.

Figure 31: Cumulative months in subsidized jobs, base year 2014

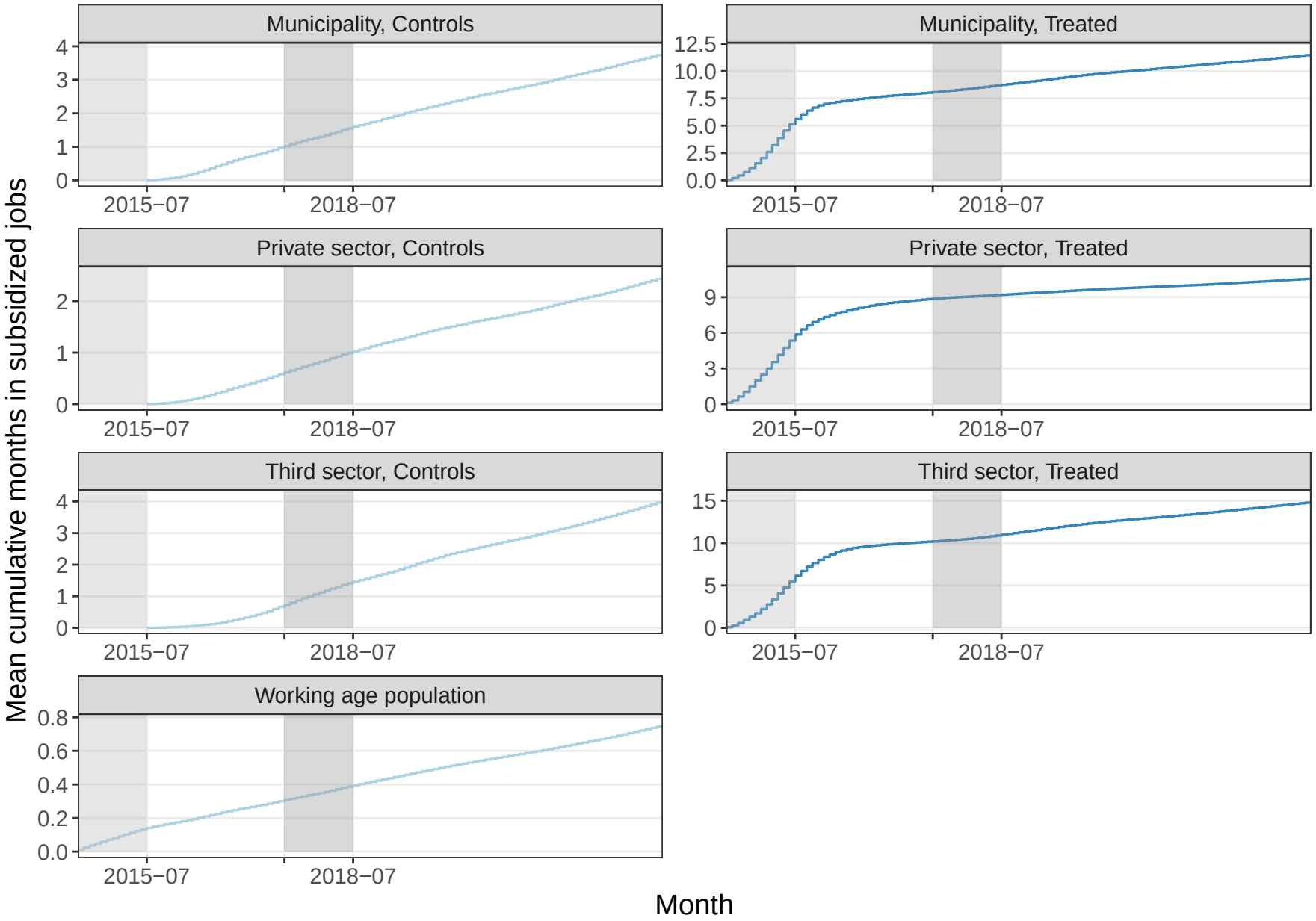
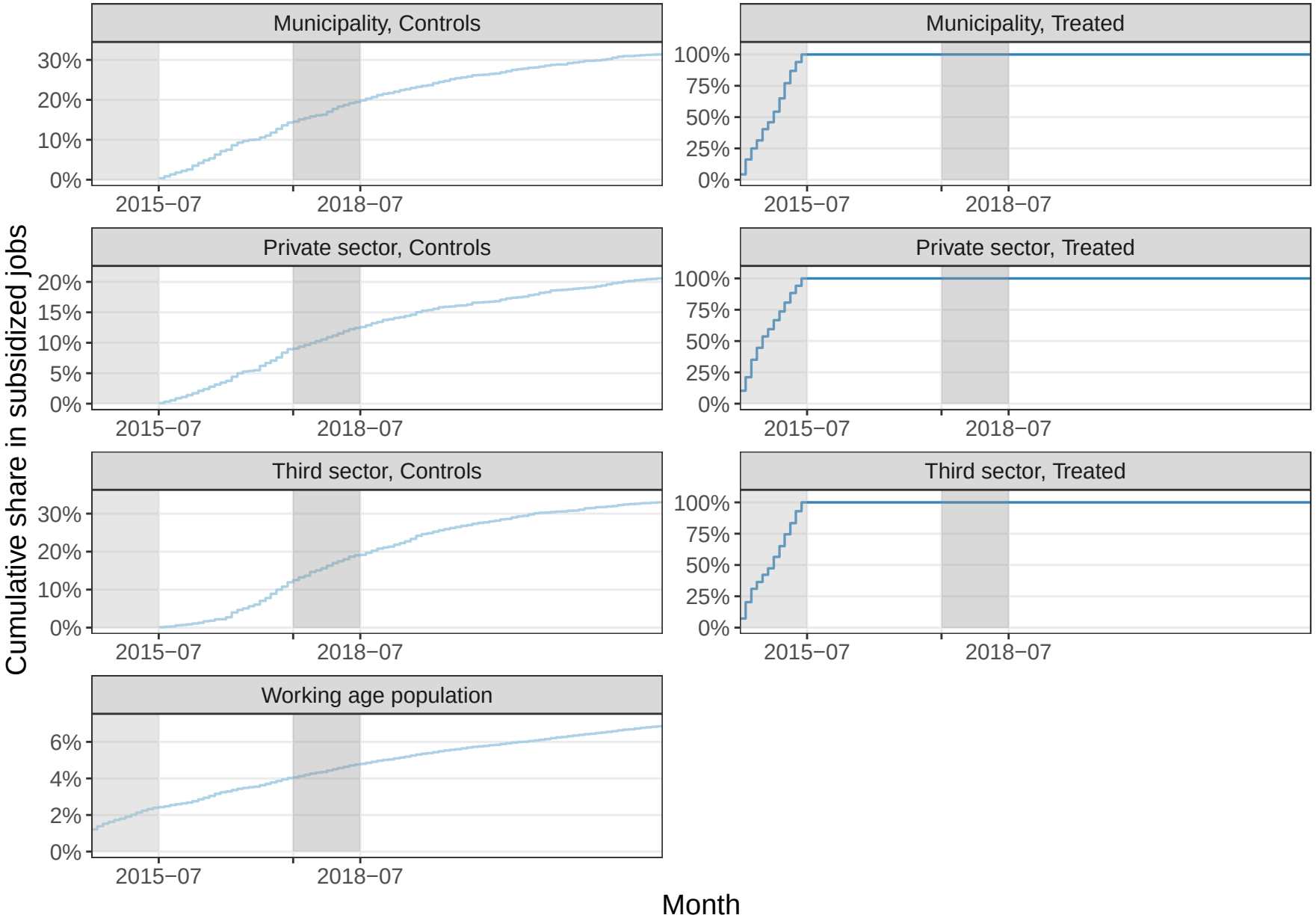


Figure 32: Cumulative participation in subsidized jobs, base year 2014



Appendix P Calculating the effects on fiscal balance

The effects of the subsidy on the contributions and pressure on public finances was calculated using a combination of direct and indirect sources. Table 9 lists the main data sources used.

Consumption taxes were estimated based on memoes by Parikka (2019) and Riihelä (2010) of average consumption tax shares of gross income by income decile. The shares in these memoes are estimated based on the household budget survey by Statistics Finland, combined with typical tax rates by consumption category. The income deciles for each observation unit were approximated by multiplying their observed disposable annual income by 1.16[5] and using the decile thresholds from aggregate statistics. As all of these estimates and approximations are very rough, the result from combining them should be treated as only indicative.

Table 10 shows the treatment-control difference by tax and transfer type for treated subsidy participants and matched controls for base years 2014 and 2015. Figure 31 illustrates an even longer follow-up that starts from a base date on July 1st 2012.

[5]The average household size in Finland is roughly 2.3, with an average number of children of 0.5. It was assumed that the household would have 1.8 adults on average with similar disposable income.

Table 10: Sources for assessing the effects on fiscal balance

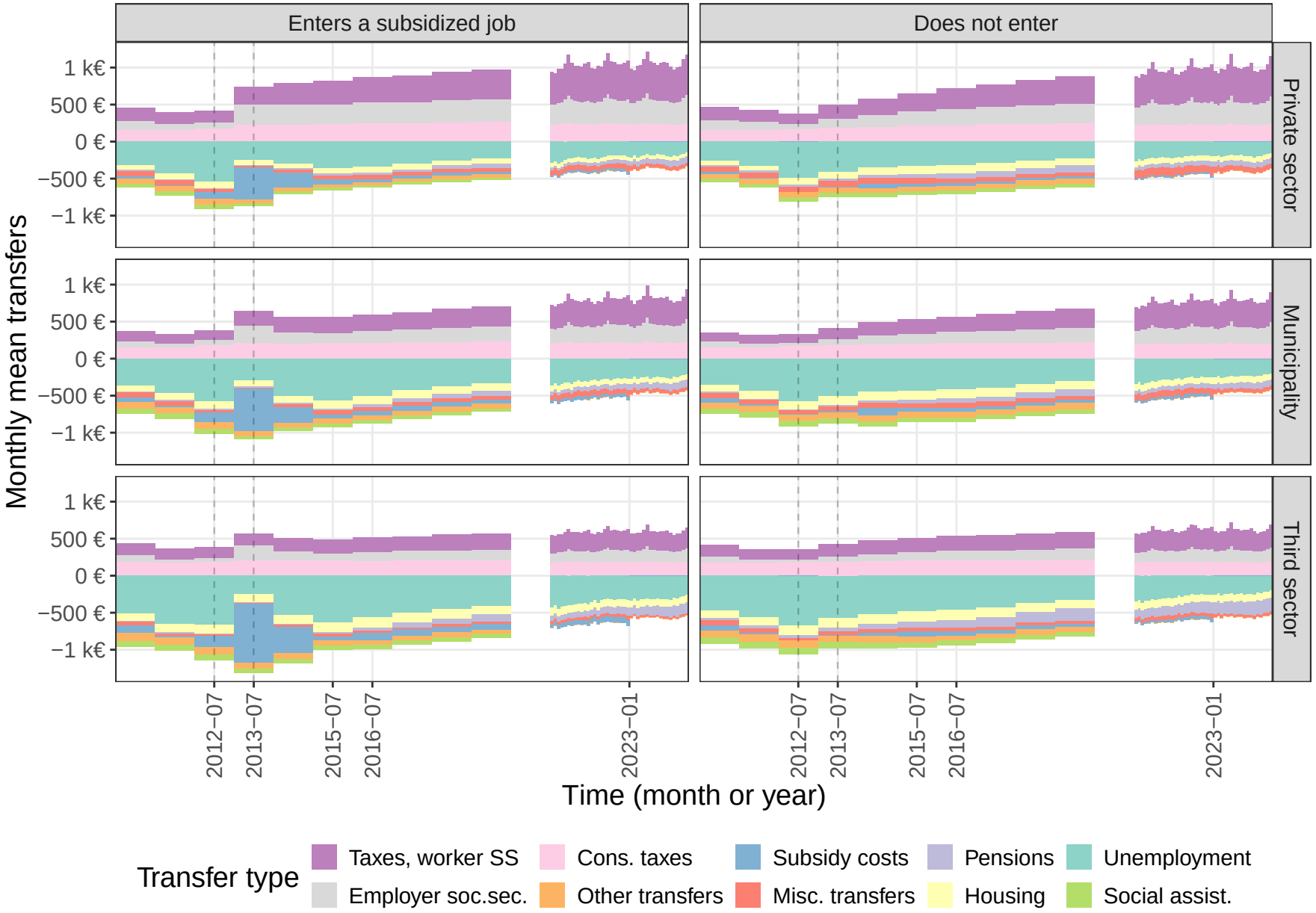
Tax or transfer	Years	Sources	Notes
All individual taxes and employee social security contributions	2010–2018	Statistics Finland `FOLK_TULO` module	
Taxes on wages and employee social security contributions	2019–2024	The Finnish Incomes Register	Does not include taxes on property or business income
Employer social security contributions	2010–2024	Own estimates	Estimates based on wages and annual aggregate ratios of payroll taxes to wages from GDP statistics
Consumption taxes	2010–2024	Own estimates	Estimates based on income deciles and prior research
Subsidy costs	2010–2014	Own estimates	Estimates based on observed subsidy spell characteristics and legal rules for the year
Subsidy costs	2015–2022	Own estimates	Subsidy percentages and wages observed directly, but costs supplementary to wages that are covered by the subsidy have been estimated
Unemployment assistance	2010–2021	Social Security Institution	
Unemployment insurance	2010–2021	Financial Security Authority	
Unemployment benefits	2022–2024	The Finnish Incomes Register	
Other benefits received	2010–2020	Statistics Finland `FOLK_TULO` module	
Other benefits received	2022–2024	The Finnish Incomes Register	Covers roughly 90% of aggregate benefit sums; does not include disability pensions, illness-related transfers and social assistance (*toimeentulotuki*)

Table 11: Treatment-control difference for taxes and transfers.

Base year	Contribution type	Private sector	Municipality	Third sector
2014	Taxes, worker SS	+10 100 (47 700)	+4 000 (29 900)	+2 400 (26 800)
2014	Cons. taxes	+3 300 (28 400)	+1 900 (24 400)	+1 000 (23 500)
2014	Employer soc.sec.	+11 000 (34 800)	+5 200 (20 200)	+4 200 (16 100)
2014	Social assist.	+1 500 (-2 000)	+1 700 (-3 200)	+2 200 (-3 500)
2014	Other transfers	+700 (-4 100)	0 (-5 800)	+1 100 (-5 500)
2014	Subsidy costs	-7 000 (-9 300)	-6 100 (-9 700)	-13 900 (-17 500)
2014	Pensions	+3 700 (-2 800)	+2 800 (-3 300)	+5 900 (-4 500)
2014	Misc. transfers	+800 (-6 200)	-500 (-6 500)	+500 (-4 400)
2014	Housing	+3 300 (-6 400)	+3 400 (-10 900)	+3 300 (-12 500)
2014	Unemployment	+8 000 (-31 300)	+600 (-46 800)	-300 (-53 700)
2014	Fiscal balance	+35 400 (48 900)	+13 000 (-11 600)	+6 300 (-35 300)
2015	Taxes, worker SS	+5 800 (38 300)	+1 400 (25 600)	-1 000 (22 300)
2015	Cons. taxes	+2 100 (24 400)	+900 (21 600)	+200 (20 700)
2015	Employer soc.sec.	+6 300 (27 100)	+2 000 (16 600)	+300 (13 000)
2015	Social assist.	+900 (-2 100)	+1 400 (-2 600)	+700 (-3 300)
2015	Other transfers	-100 (-3 600)	+200 (-4 900)	+300 (-5 000)
2015	Subsidy costs	-7 500 (-9 900)	-5 900 (-9 400)	-14 500 (-18 700)
2015	Pensions	+2 300 (-2 900)	+1 000 (-2 700)	+2 200 (-3 600)
2015	Misc. transfers	+1 000 (-4 800)	+600 (-4 700)	+400 (-4 400)
2015	Housing	+2 800 (-6 500)	+2 700 (-10 200)	+400 (-12 800)
2015	Unemployment	+1 400 (-33 300)	-3 900 (-46 200)	-3 700 (-50 100)
2015	Fiscal balance	+14 800 (26 600)	+400 (-16 900)	-14 600 (-41 800)

Calculated for the same sample in the selected regions as the main matching results for the effects of the subsidy on participants. The same timeframe as for the effects on wages and employment is approximated by taking the average of the third and fourth calendar years after the initial sampling dates on July 1st 2014 or July 2015.

Figure 33: Taxes and transfers, base year 2012



Appendix Q Subsidized employers

Table 11 reports the shares of subsidies going to specific industries. With few exceptions, most industries do not appear to rely heavily on repeat use of subsidies. High reliance on subsidies is observed for the "Activities of other membership organizations" industry[6] and retail sale in specialised stores. Subsidy use in the latter group is probably largely dominated by operating second-hand stores.

Figure 32 illustrates the shares of subsidies and wages going to employer of a specific class.

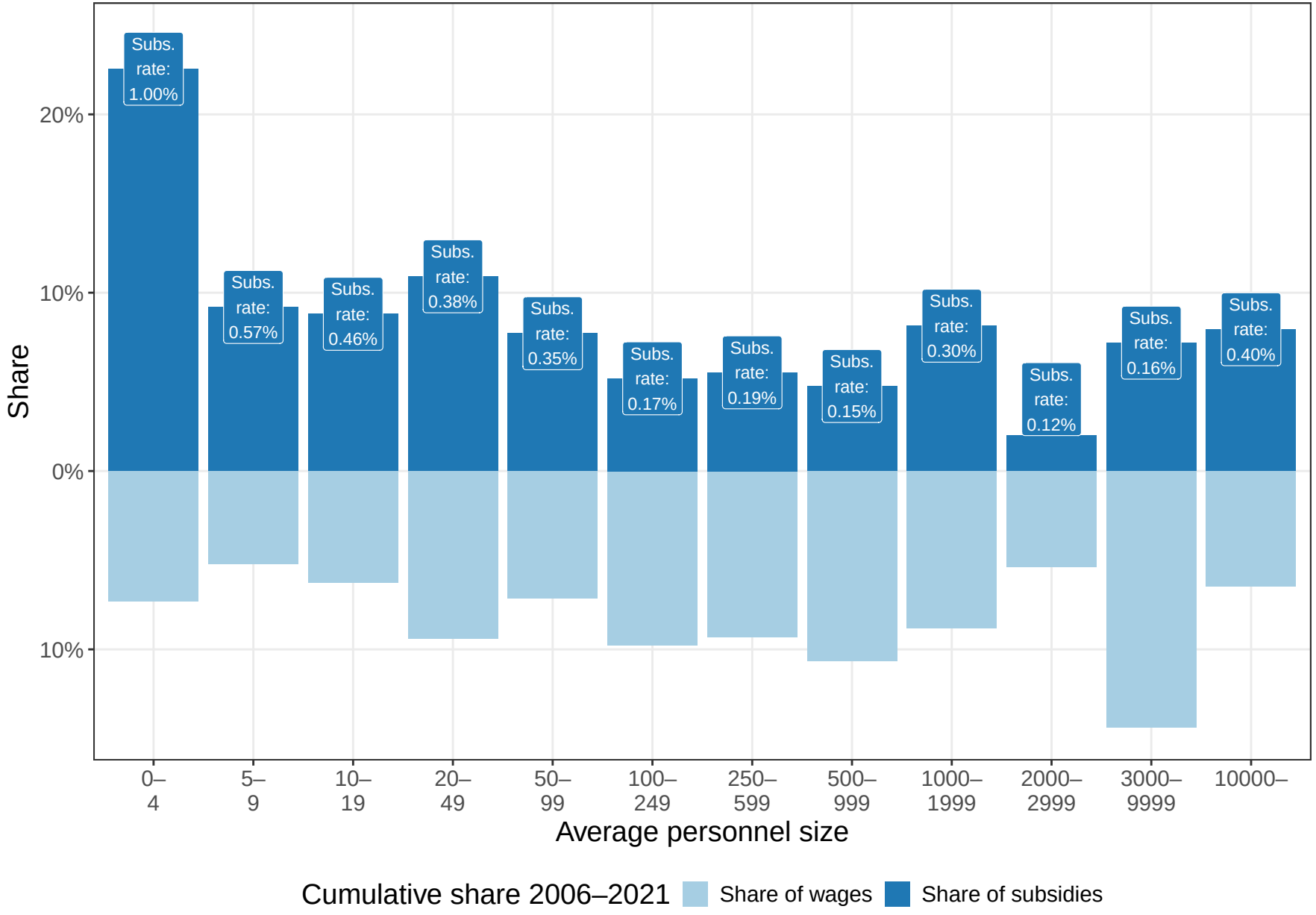
[6]See https://stat.fi/en/luokitukset/toimiala/toimiala_1_20080101/code/8899 for a description

Table 12: Subsidies in selected industries, from 2006 to 2022.

Industry	Share of wages	Share of subsidies	Subsidy ratio threshold: lowest 50%	Threshold: 80%	Threshold: 90%	Wag share of intensive users	Industry's aggregate subsidy ratio
Activities of other membership organisations n.e.c.	0.4% of wages	12.7% of subsidies	67.3%	82.8%	96.5%	27.4%	10.9%
General medical practice activities	6.3% of wages	13.3% of subsidies	0.7%	1.2%	1.5%		0.7%
Hospital activities proper	5.1% of wages	1.3% of subsidies	0.9%	0.9%	0.9%	0.0%	0.1%
Manufacturing	16.8% of wages	4.7% of subsidies	1.0%	5.4%	18.1%	0.2%	0.1%
Other human health activities	0.5% of wages	2.9% of subsidies	11.5%	11.5%	11.5%	16.7%	2.1%
Other social work activities without accommodation n.e.c.	0.3% of wages	6.1% of subsidies	30.6%	75.8%	76.3%	23.6%	6.2%
Professional, scientific and technical activities	6.0% of wages	2.6% of subsidies	2.1%	8.1%	18.3%	0.4%	0.1%
Retail sale of other goods in specialised stores	1.0% of wages	3.8% of subsidies	36.3%	60.8%	68.3%	3.3%	1.3%
Sports activities	0.4% of wages	2.4% of subsidies	19.3%	71.9%	97.5%	8.1%	2.0%
Transportation and storage	5.4% of wages	1.6% of subsidies	1.5%	5.2%	10.0%	0.2%	0.1%
Services (n.e.c.)	8.3% of wages	7.1% of subsidies	3.5%	19.4%	47.5%	0.9%	0.3%

Industry for employers identified from Statistics Finland FOLK modules. Subsidy sums estimated by combining wage and subsidy spell data. *Subsidy ratios* refer to the ratio of hiring subsidies to wages, calculated at the employer level over the entire period. The ratio *thresholds* at 50% (or 90%) mean that 50% (90%) of subsidies within the industry were collected by employers who had a ratio lower than the threshold. Wage share of *intensive users* reports the total wage share within an industry for intensive employers, defined as having an overall subsidy-wage ratio of 5% or higher. Finally, the aggregate ratio of all subsidies to all wages within an industry is reported in the last column. The industries reported are selected by coarsening industries progressively from the most precise classification and picking industries which pay either significant shares of subsidized wages or overall wages.

Figure 34: Shares of wages and subsidies by employer size. Employer size is its average personnel size over the years it is observed as paying wages. Shares of wages and subsidies refer to the shares of all wages and hiring subsidies collected by employers in a given size class. The subsidy rates in the labels are the aggregate ratios of subsidies to wages in a given size class.



Appendix R Descriptive evidence from the Incomes Register

Figures 33–53 illustrate further empirical patterns in the use of the hiring subsidy from January 2019 to June 2024. The data includes follow-ups for chained subsidy spells that started between 2019 and 2021 and ended by December 2022. The payment-level data comes from the Incomes Register, which was matched to the subsidy data by employer, employee and time.

Figures 34–46 follow a common presentation logic, where time offset 0 stands for the end of a subsidized job. Each figure consists of several subplots arranged by characteristics of the subsidy, the employer or the employee. The plotted areas represent average wage contributions (persons earning no wages are included as having a wage of zero) from either the subsidized employer or other employers. The colour coding follows the legend in figure 33. The percentage numbers in each subfigure sum up to 100% per row.

The purely descriptive evidence suggests the following tentative conclusions. First, from figure 48, it appears that the subsidized individuals are generally earning similar wages from the subsidized and other jobs, whether or not they switch employers after the subsidy period ends. Second, figures 38 and **??** suggest that smallest firms are somewhat less likely to offer for the employment to be continued after the subsidy is over, but there is a less clear relation between employer profitability and retaining subsidized workers after the subsidy period ends. Based on figure 42, very short subsidy durations appear to be followed by lower employment rates, but this may be due to either initial selection or to workers being let go during an initial trial period. Similar selection arguments apply to subsidy percentages, target groups and working hours.

Figure 35: Status after the end of subsidy. Monthly status for persons after subsidized jobs.

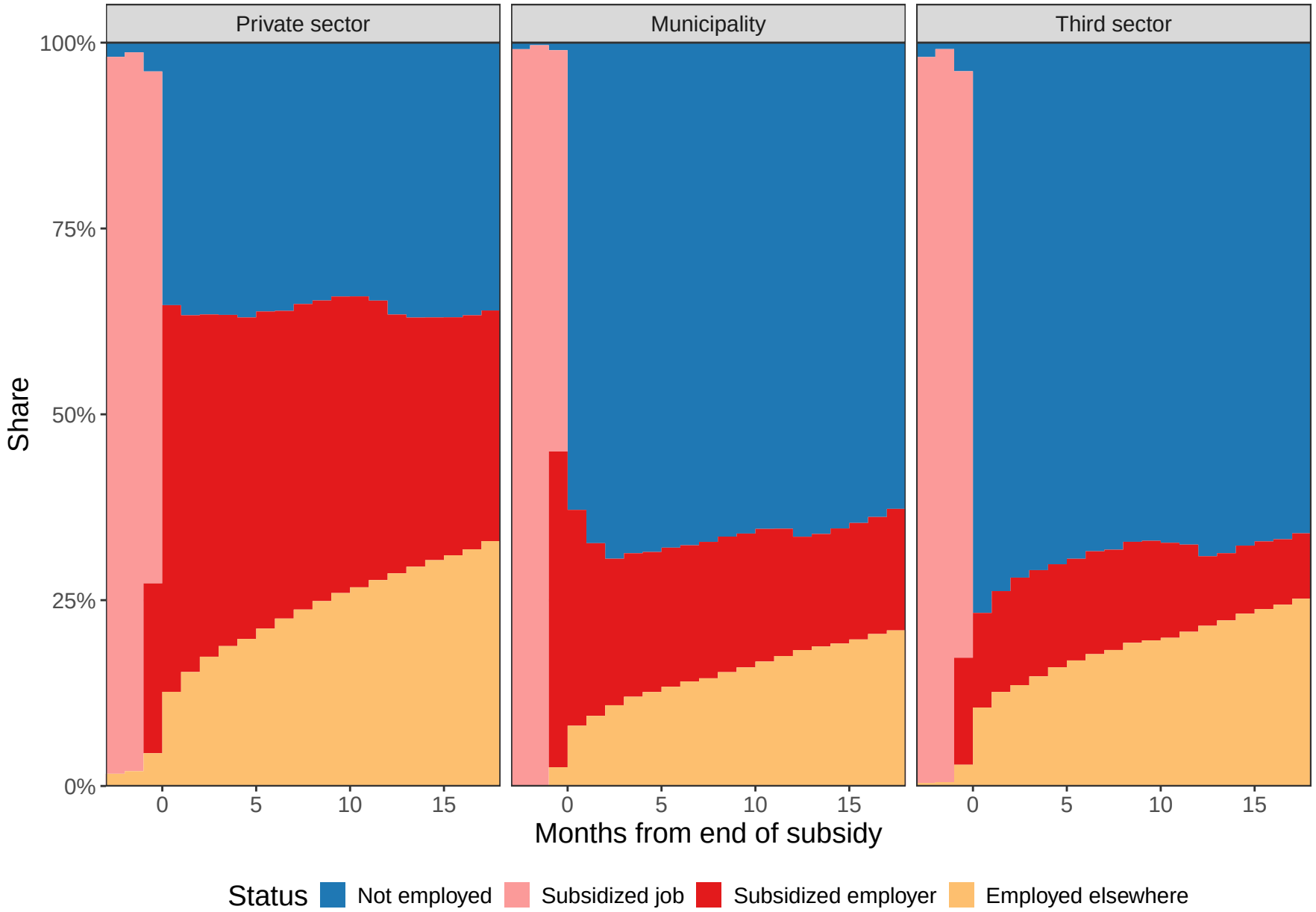


Figure 36: Wages by age and mandate. Mandates refer to individuals entitled to a subsidized job after exhausting the maximum duration of their unemployment insurance.

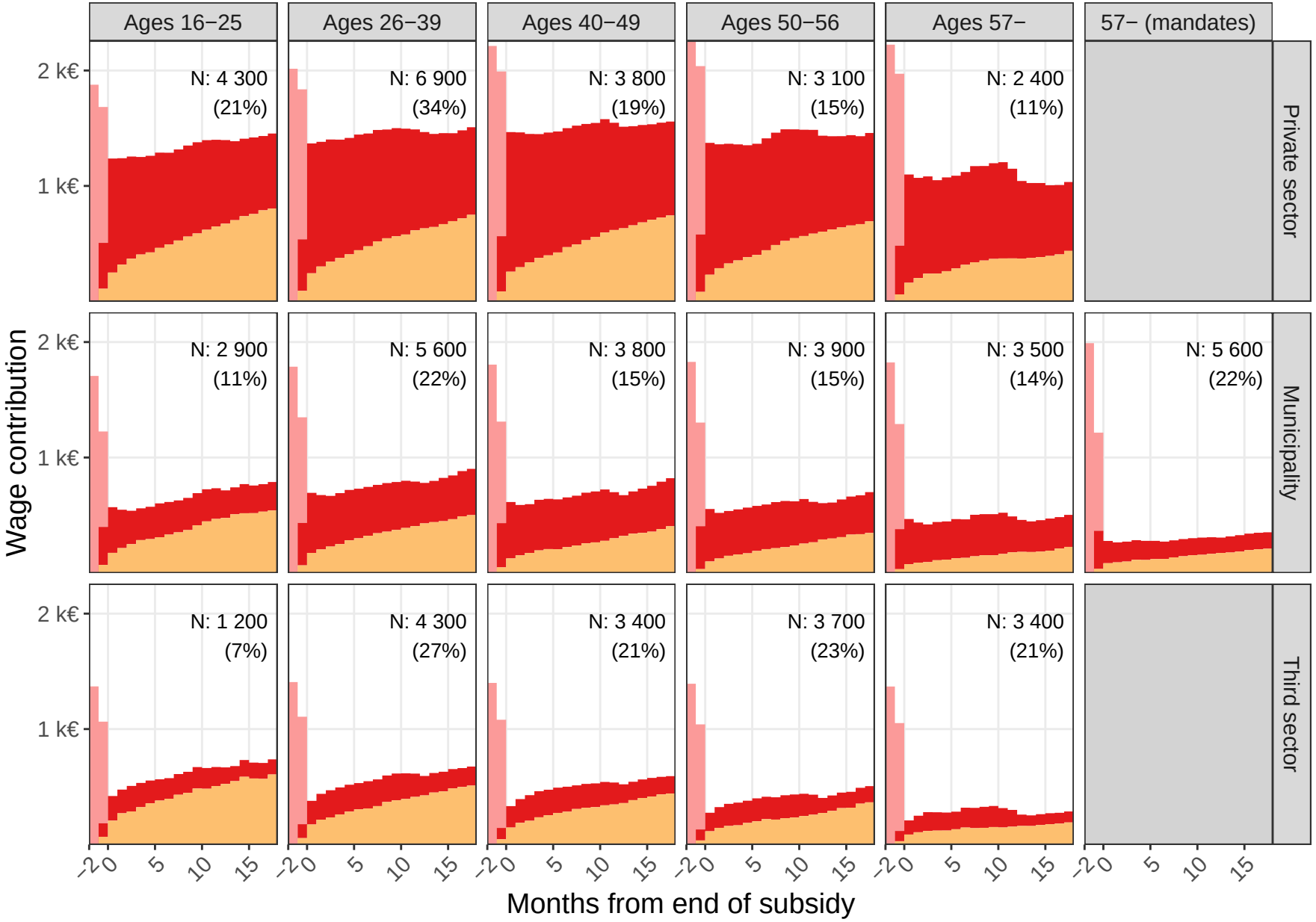


Figure 37: Wages by employer prior subsidy percentage. The prior subsidy percentage refers, for each individual, to the ratio of prior hiring subsidies to wages for the employer since 2006.

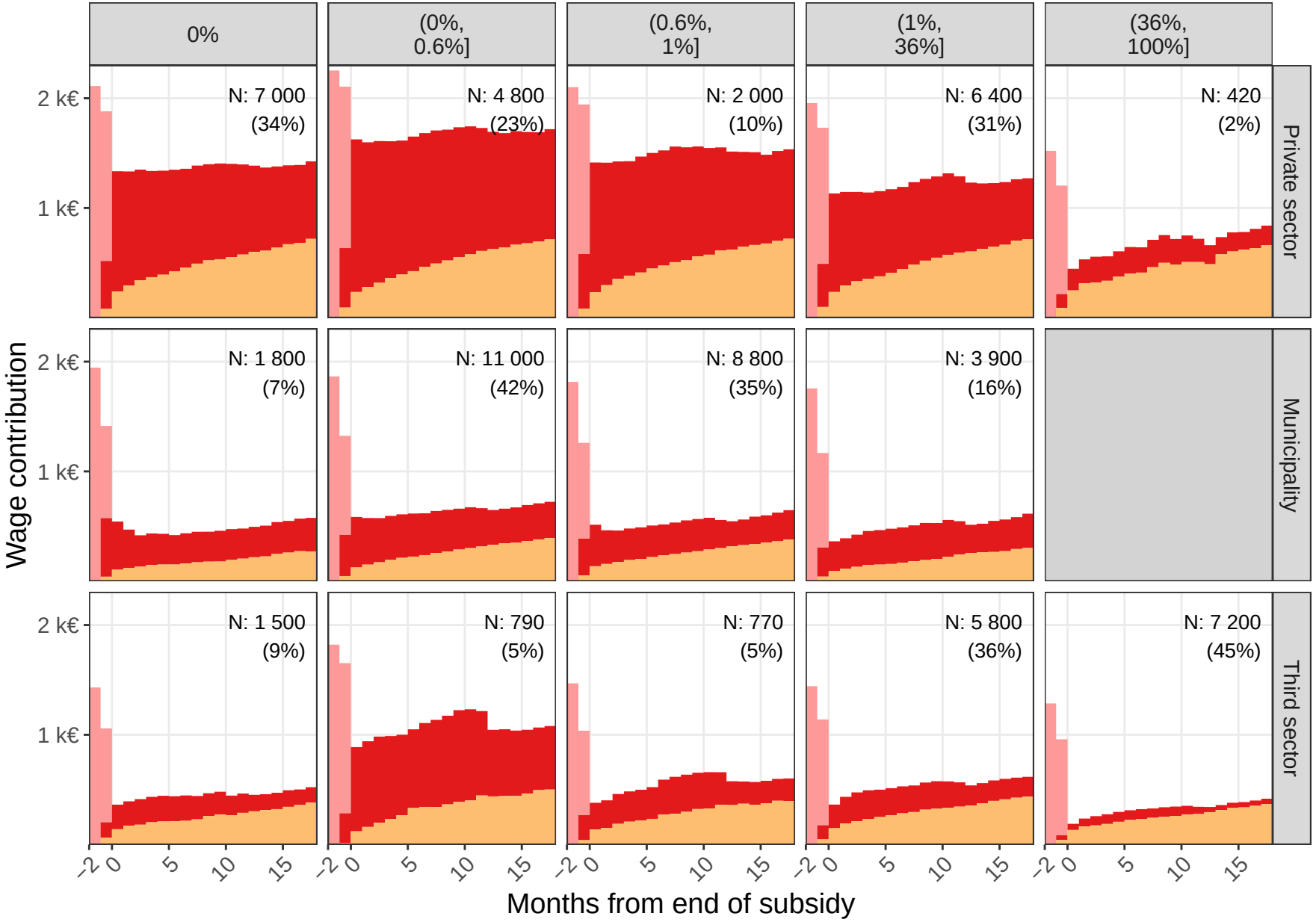


Figure 38: Wages by end type. The end type of the subsidy refers to the data collected by the public employment services.

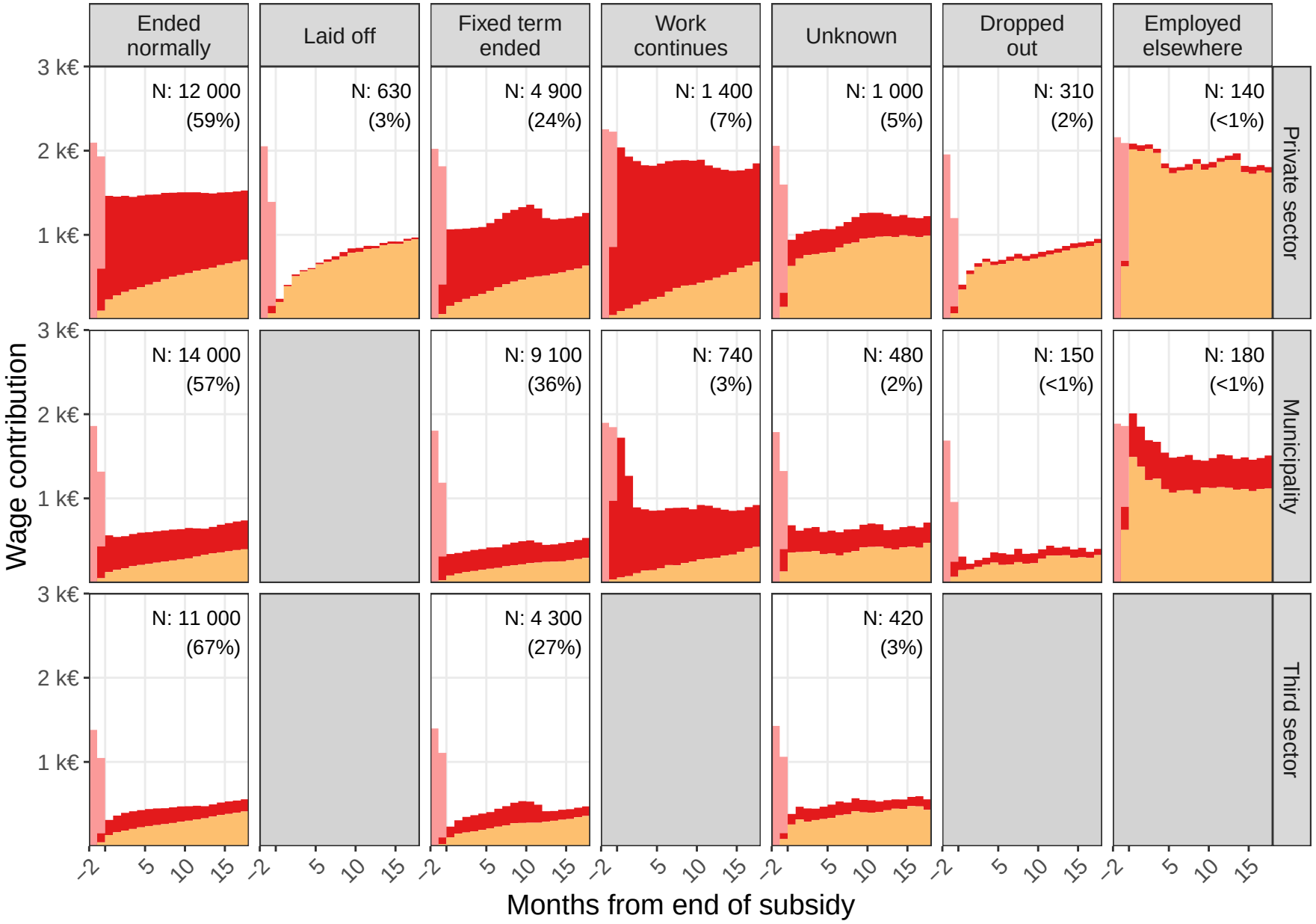


Figure 39: Wages by preceding subsidies by employee. The months refer to the accumulated duration in subsidized jobs for the individuals prior to the subsidized job here examined.

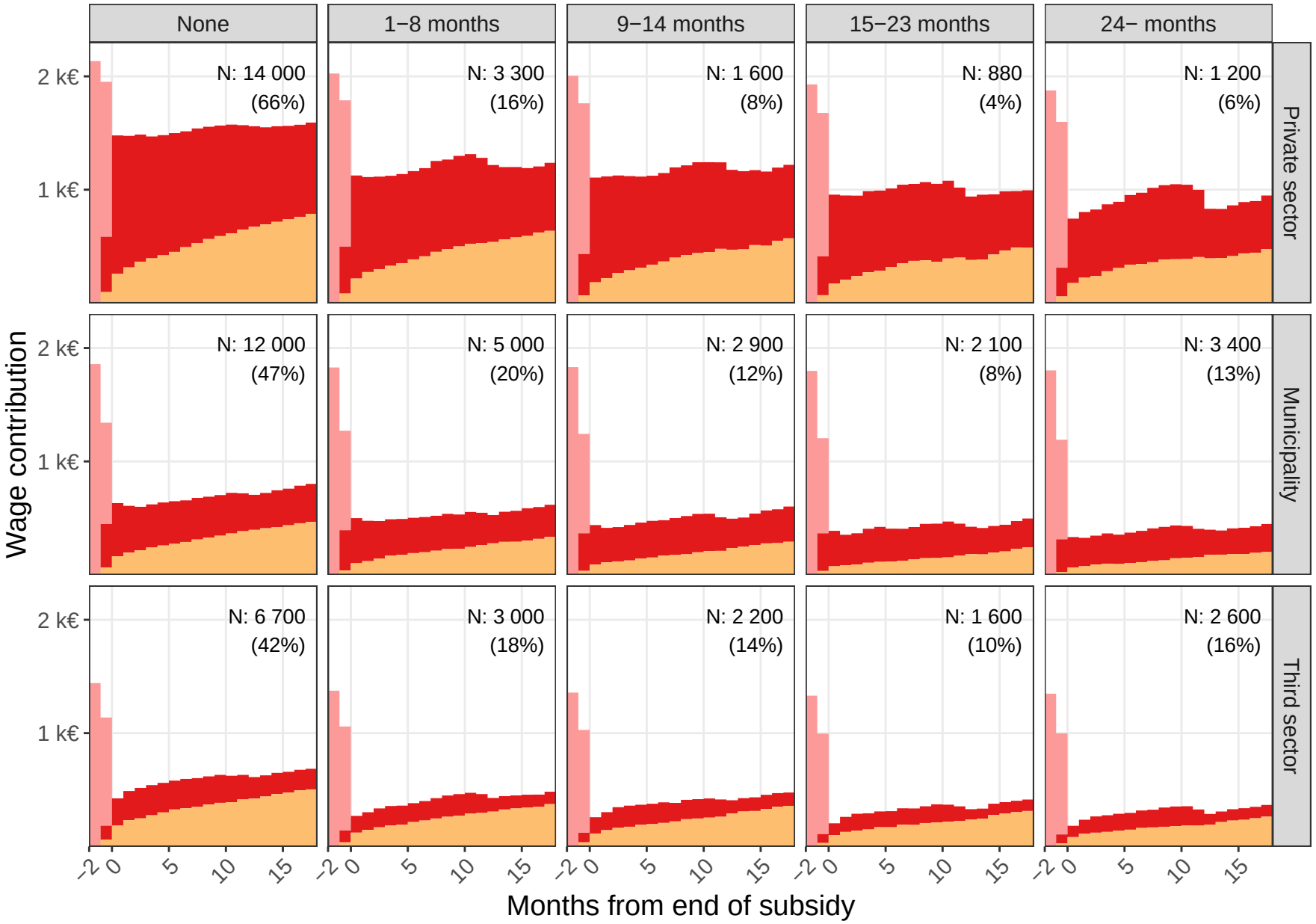


Figure 40: Wages by return on assets. Return on assets is calculated for private sector firms only. The data comes from Statistics Finland. The rows refer to annual turnover classes.

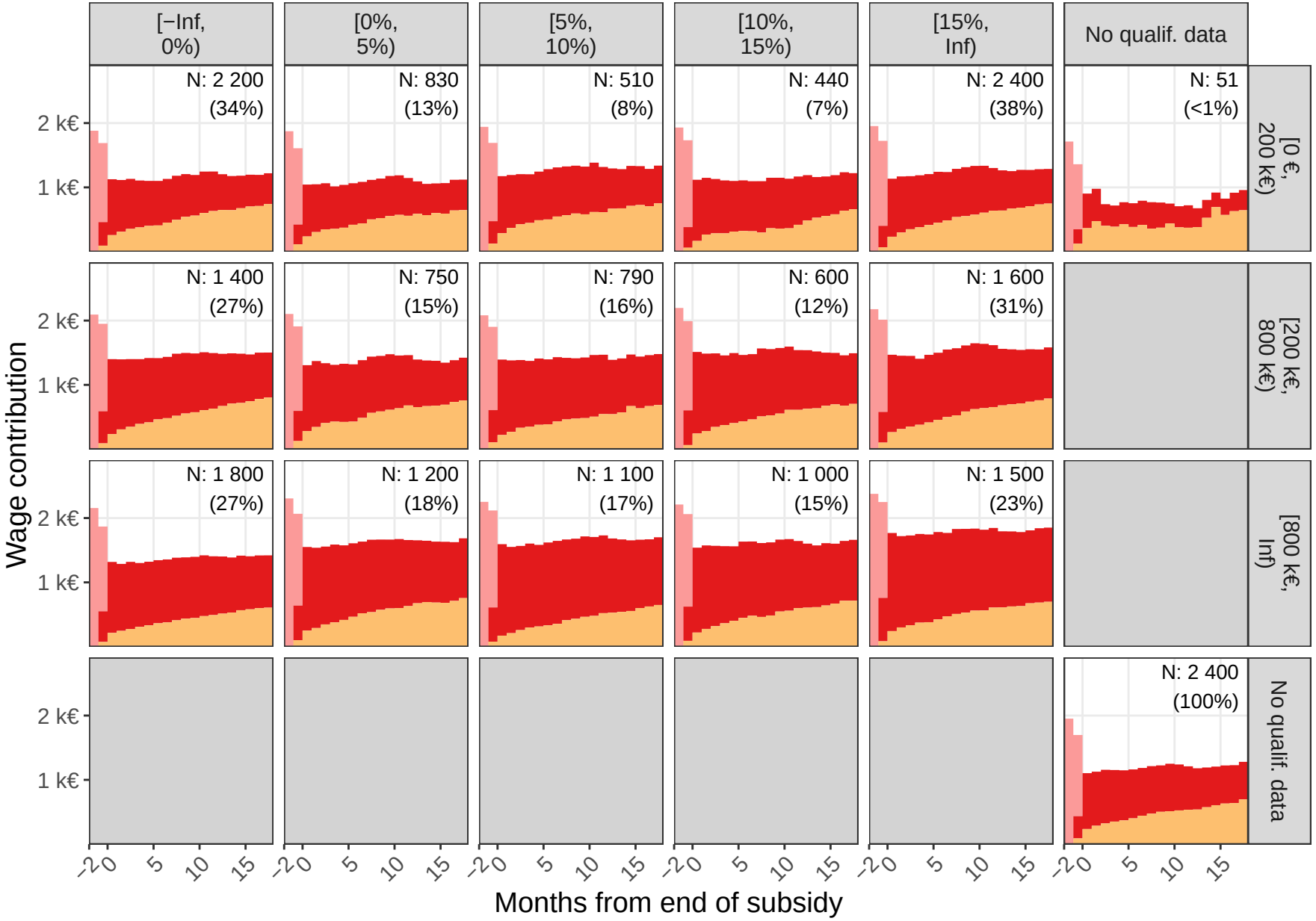


Figure 41: Wages by size of subsidized employer. Employer personnel size is calculated as an annual average per employer.

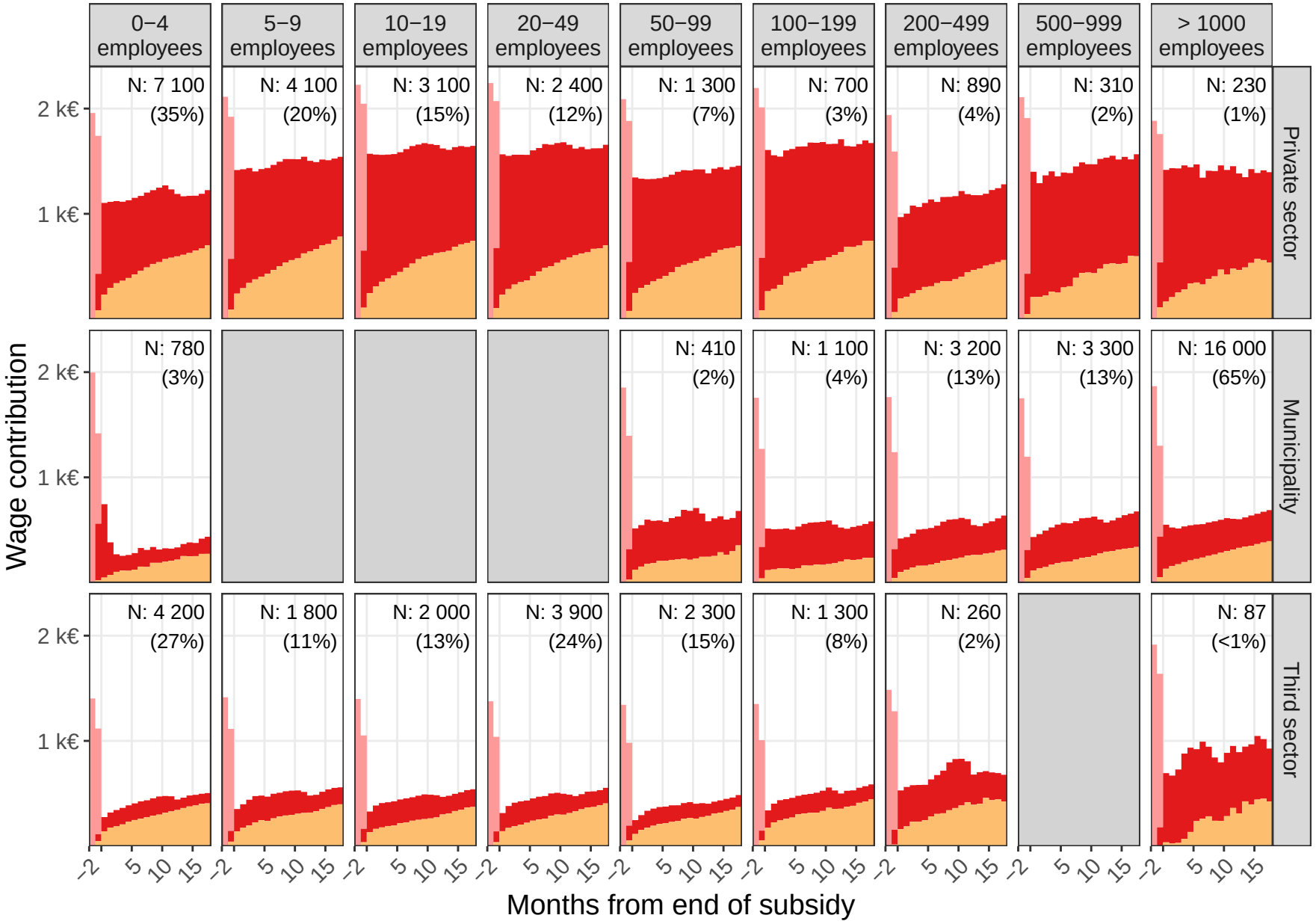


Figure 42: Wages by subsidized industry. Industry data comes, in this case, from the public employment services.

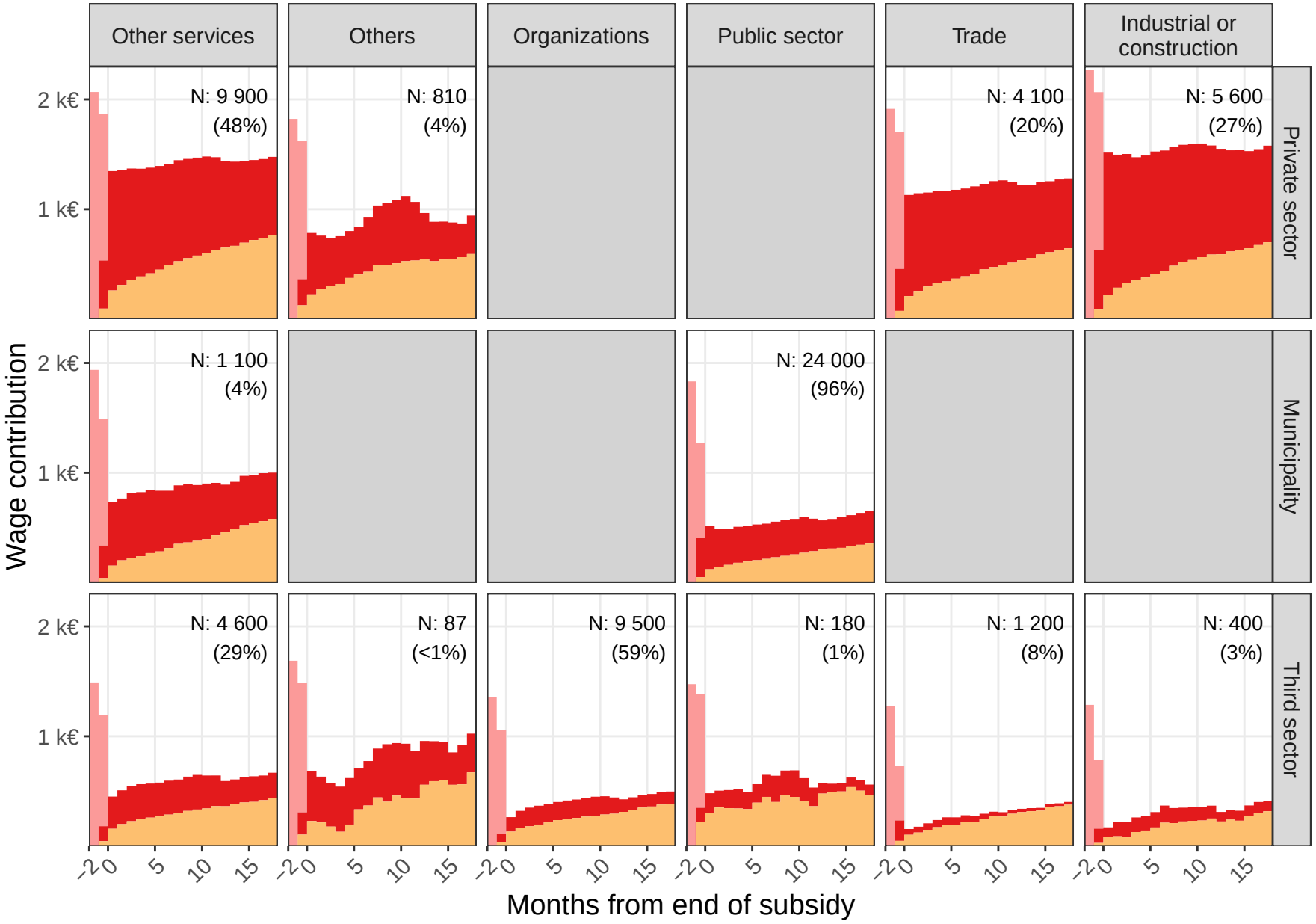


Figure 43: Wages by subsidized profession. Profession data from subsidy data.

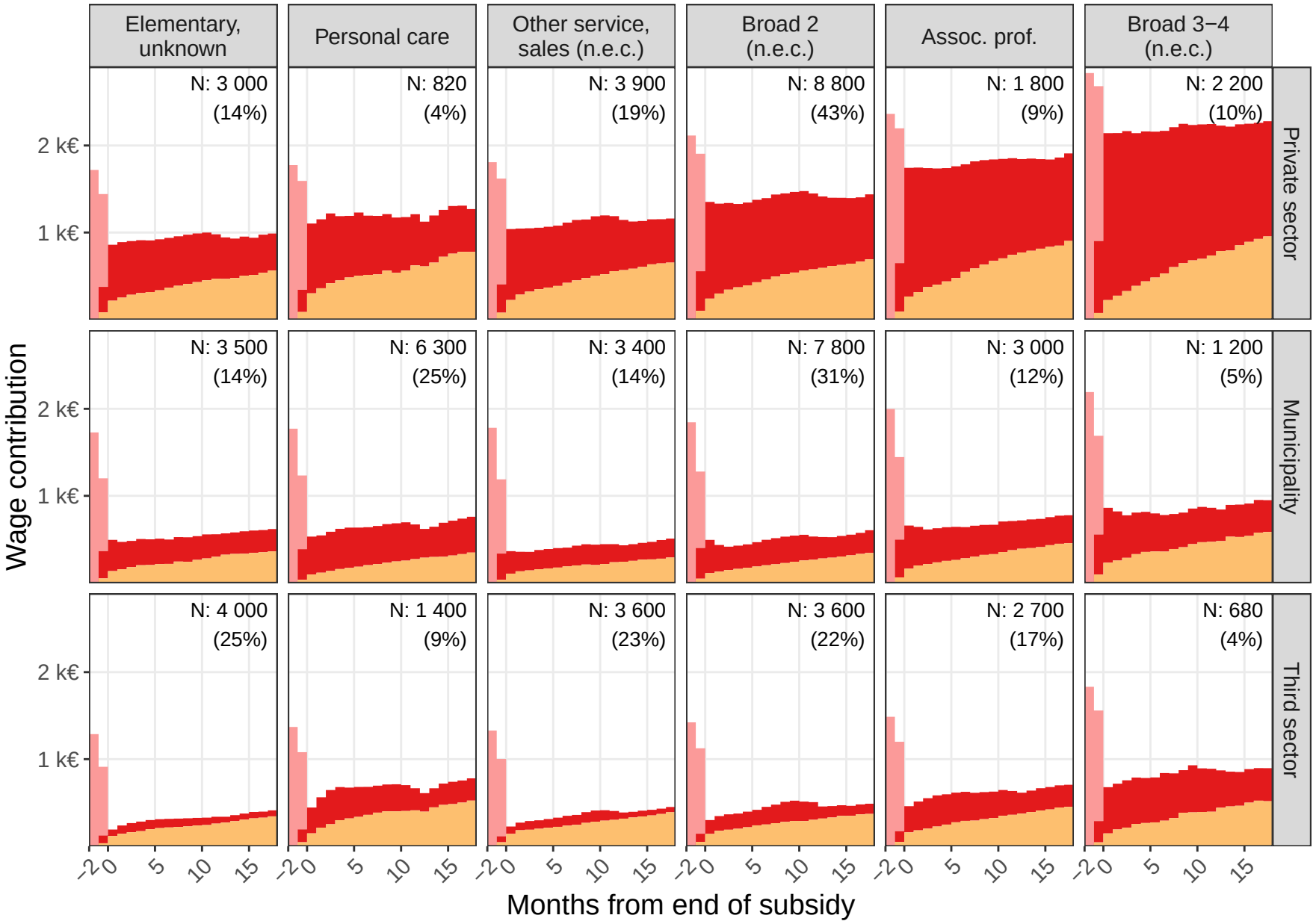


Figure 44: Wages by subsidy duration. Subsidized periods with gaps of no more than 30 days are chained together.

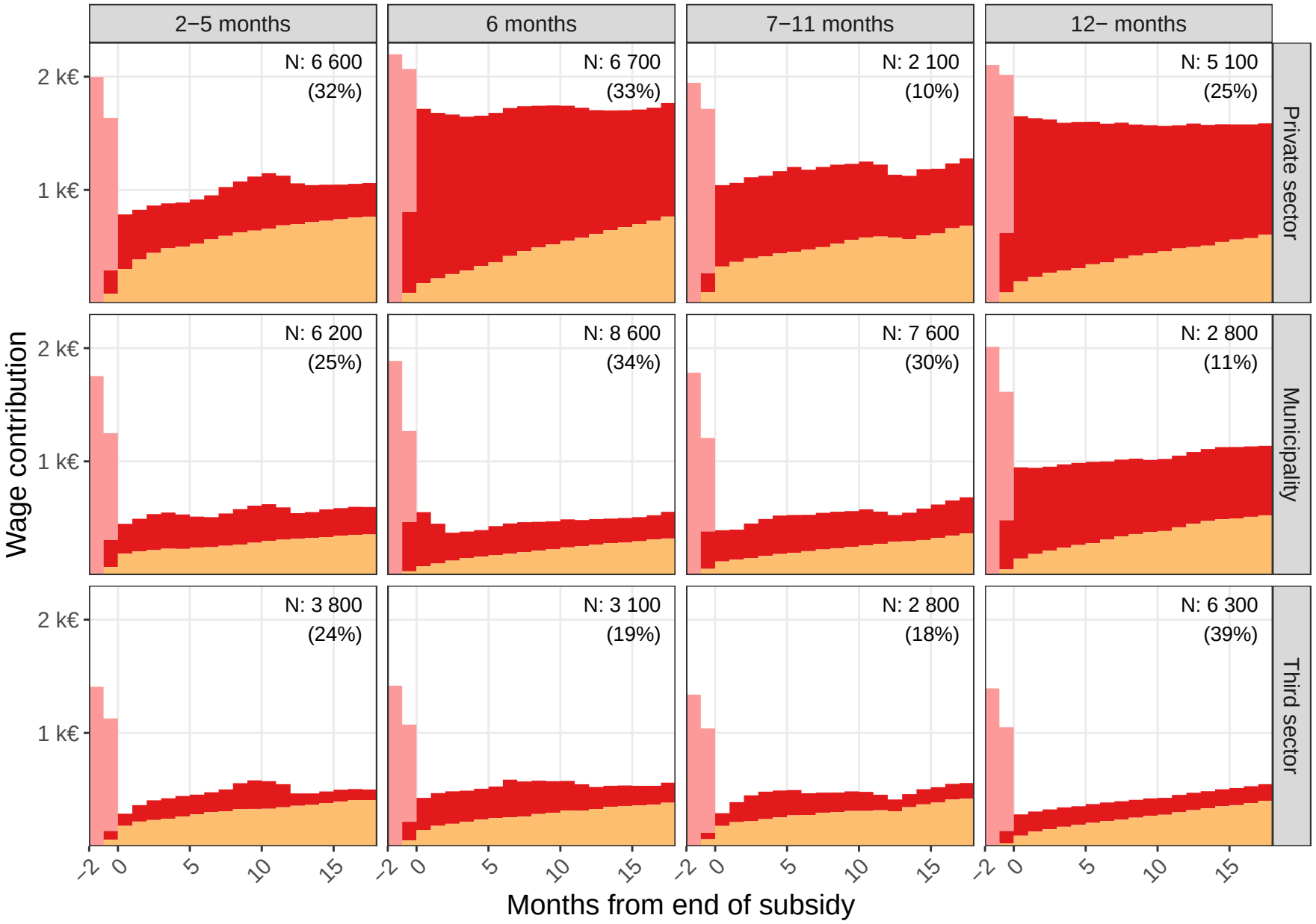


Figure 45: Wages by subsidy end year

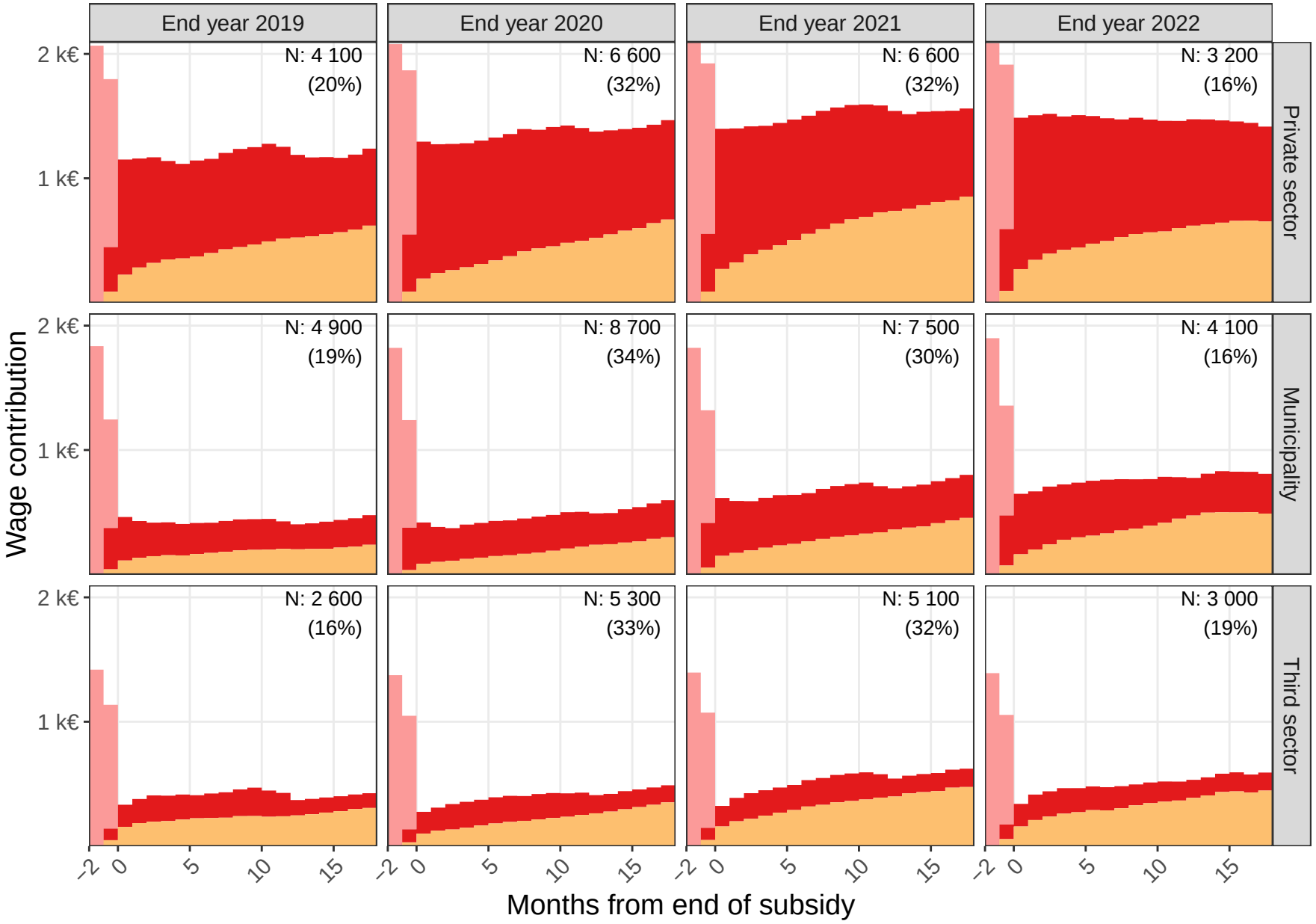


Figure 46: Wages by subsidy percentage

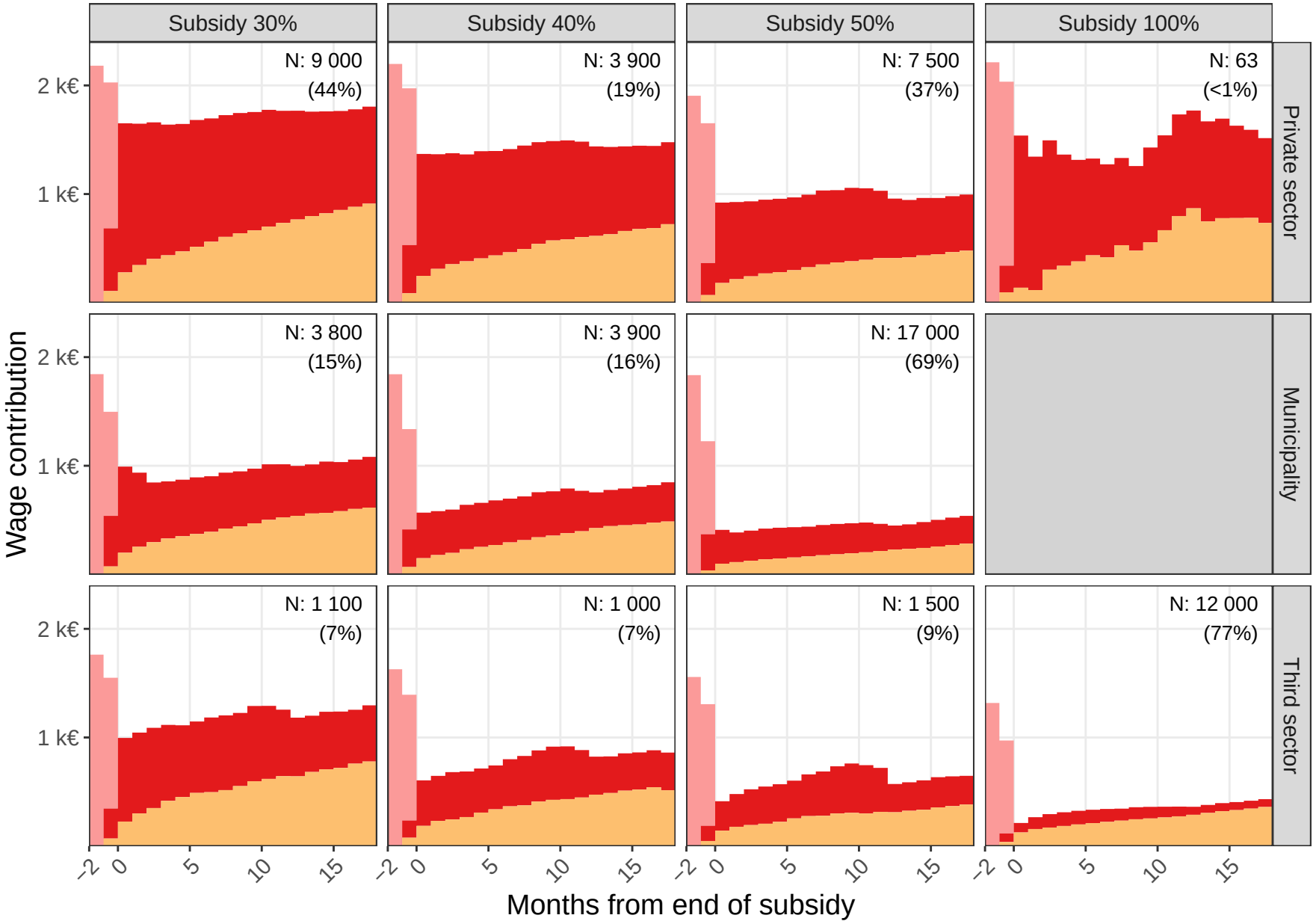


Figure 47: Wages by target group. The target groups refer to the target groups determined by the public employment services in the subsidy data.

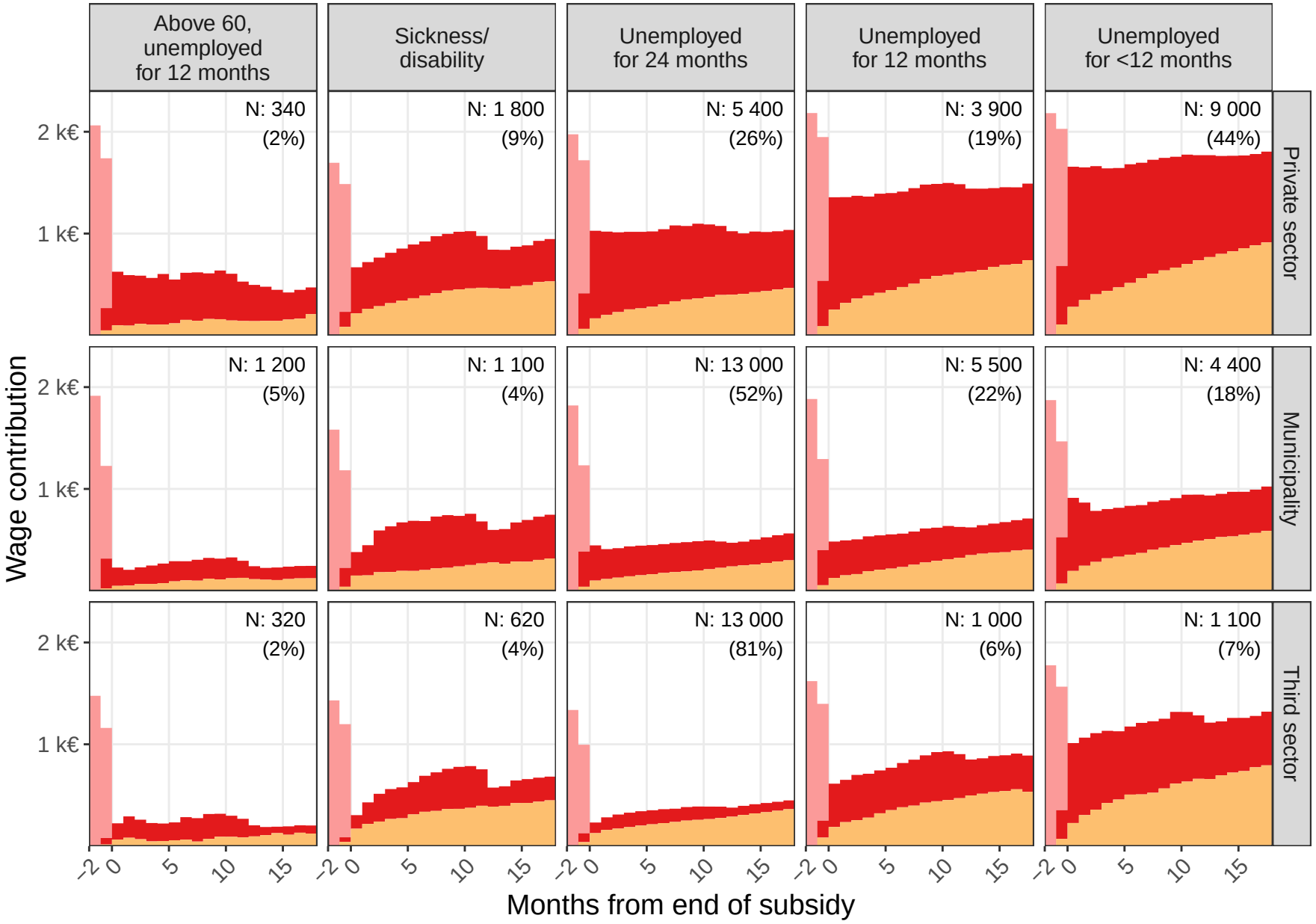


Figure 48: Wages by working hours. The working hours are from the subsidy records.

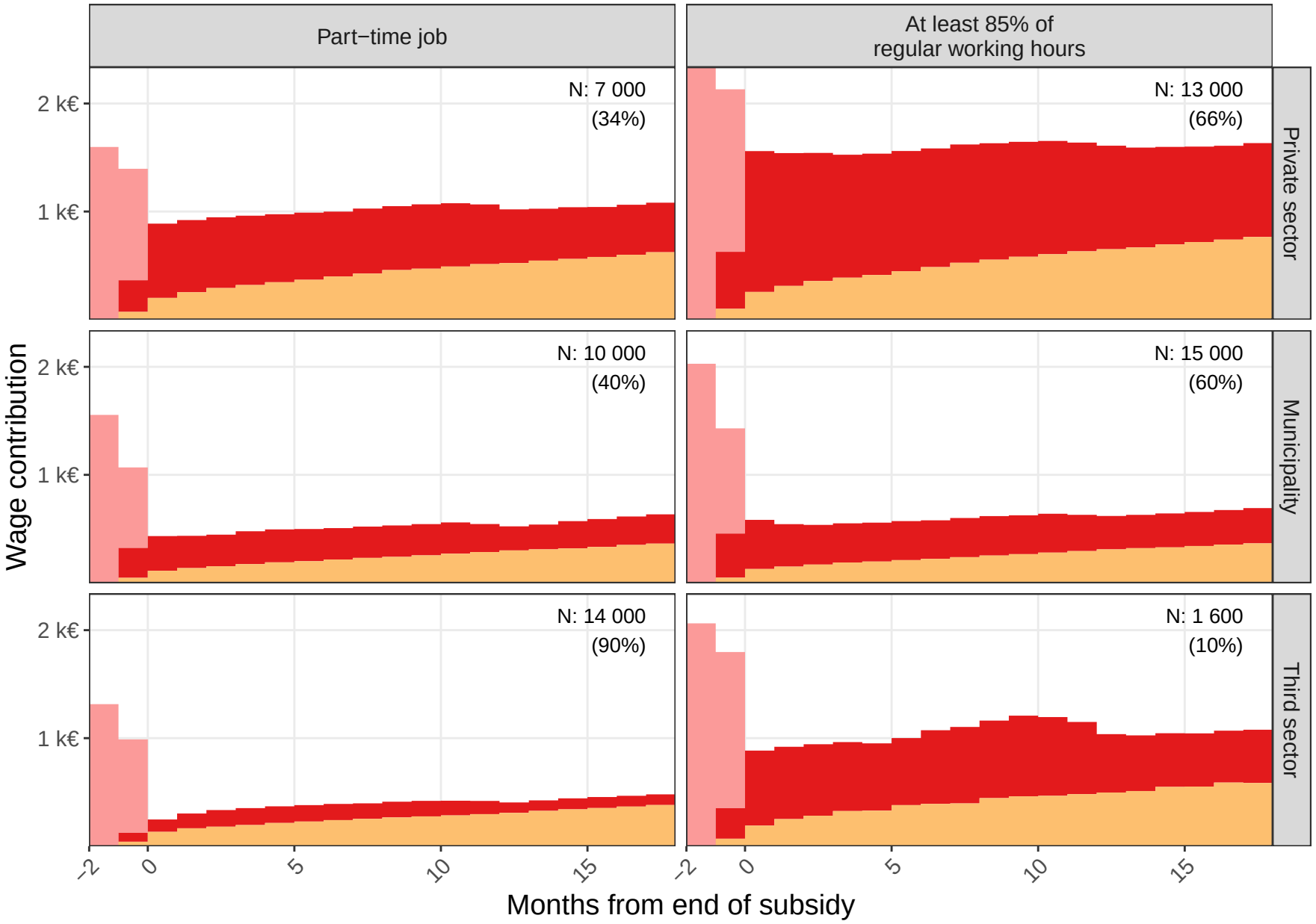


Figure 49: Wage shares by contract type. Contract types come from Incomes Register. Reporting the contract type is voluntary for employers.

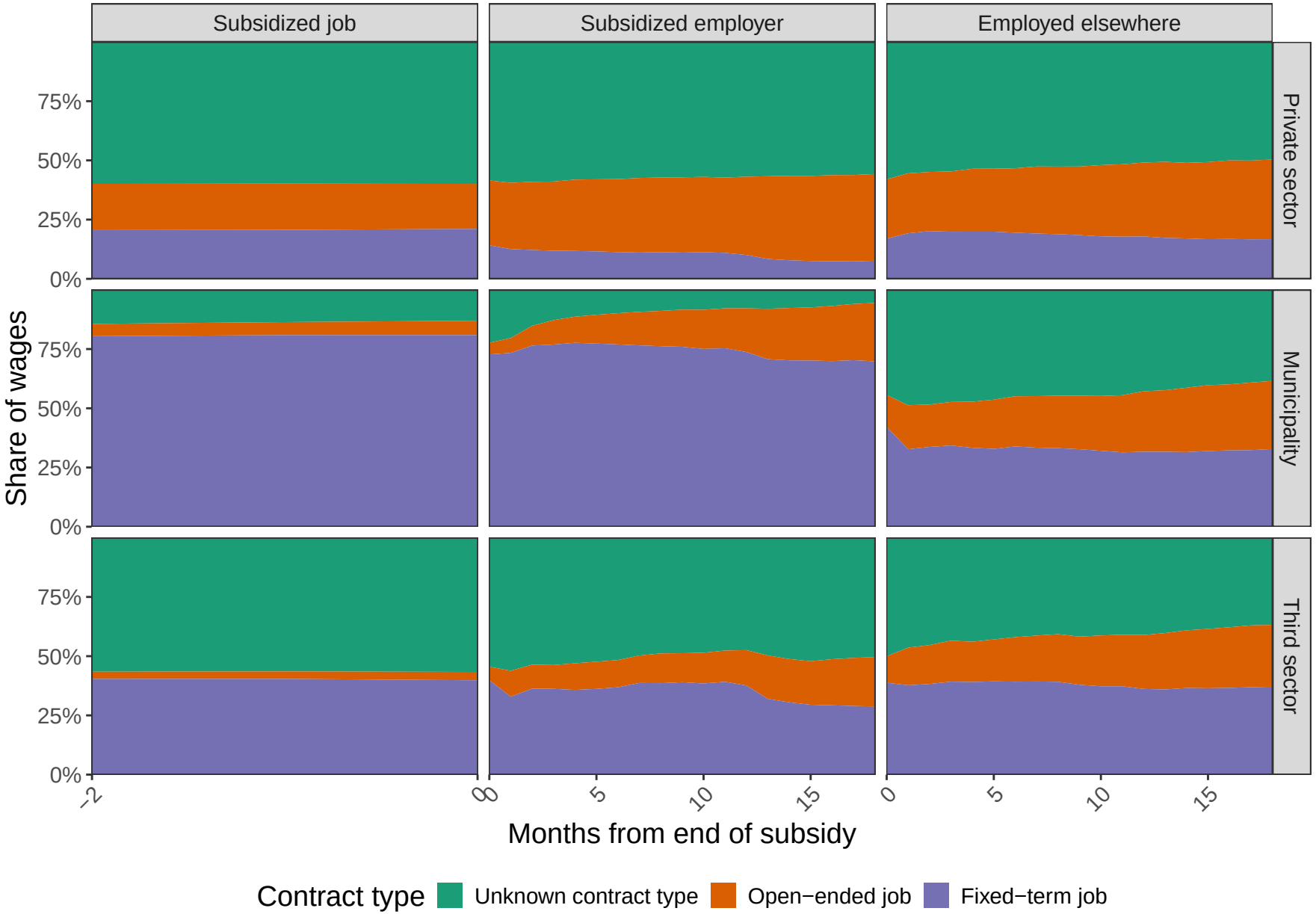


Figure 50: Wages after the end of subsidy, relative to average subsidized wage. The average subsidized wage is calculated by dividing the observed wages by observed months worked.

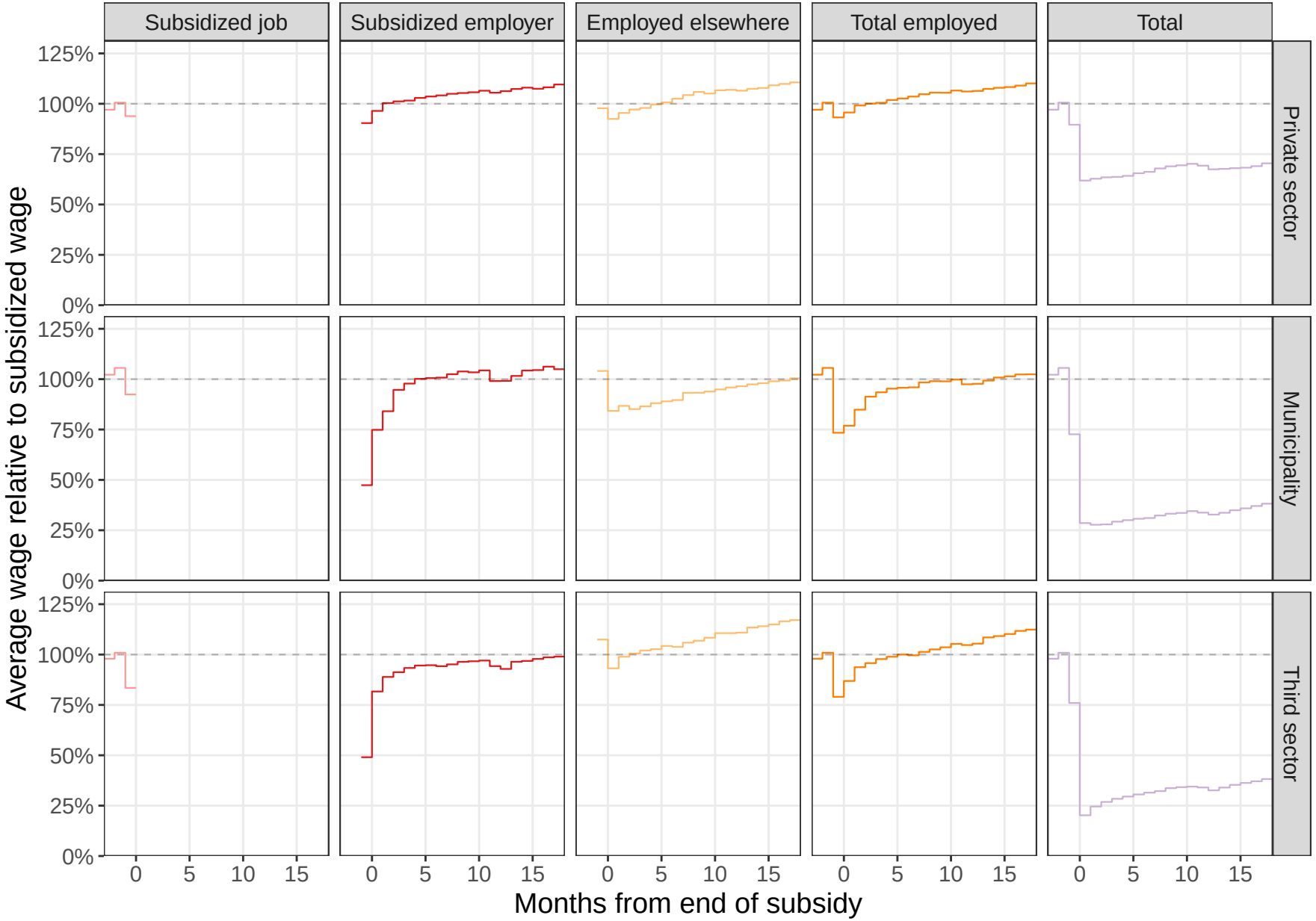


Figure 51: Wages by profession changes. A profession change indicates that the top-level profession classification in the incomes register changes from the one that the worker was last observed having in the subsidized job.

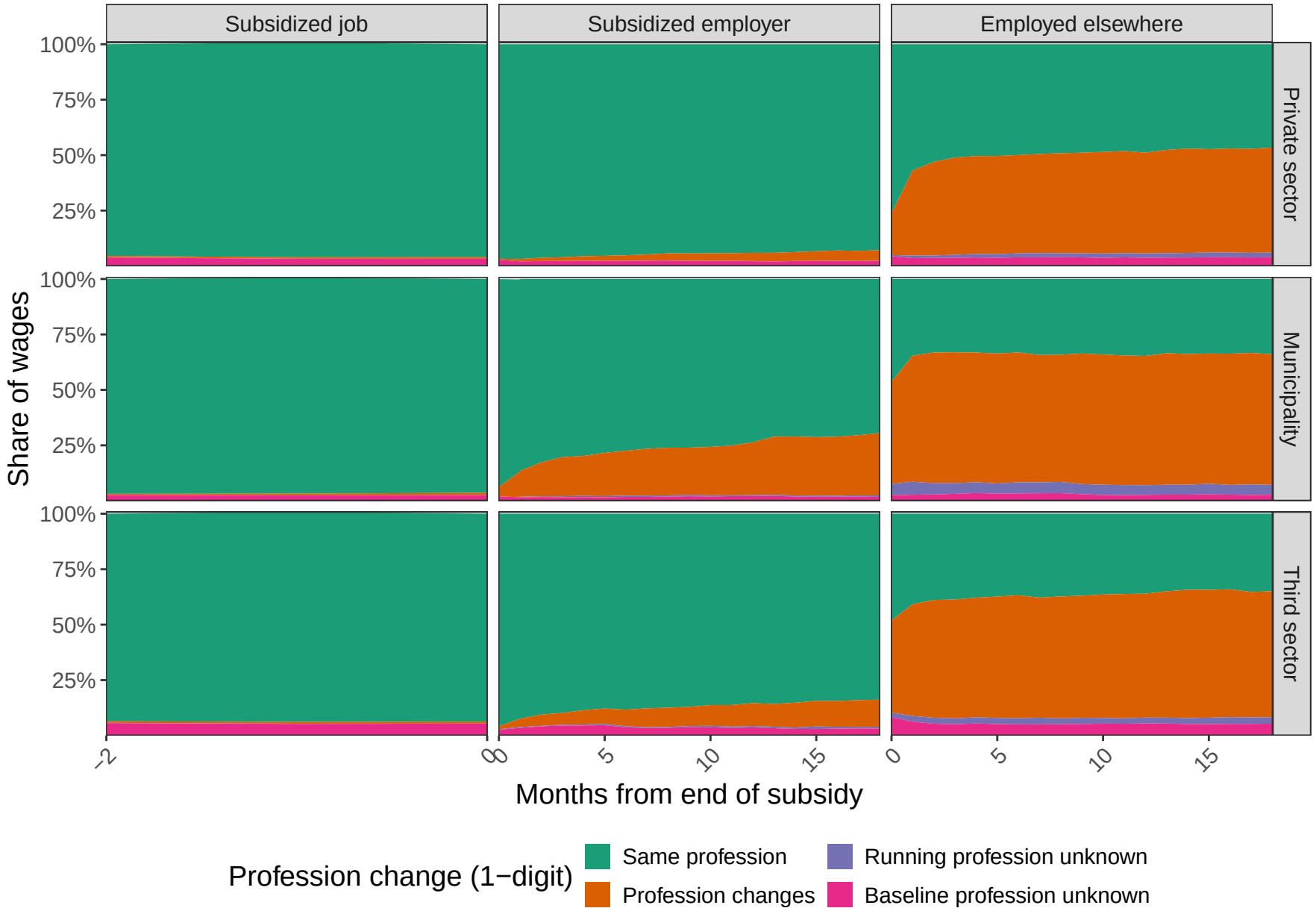


Figure 52: Wages by running industry. Industry is determined for employed individuals at the employer level.

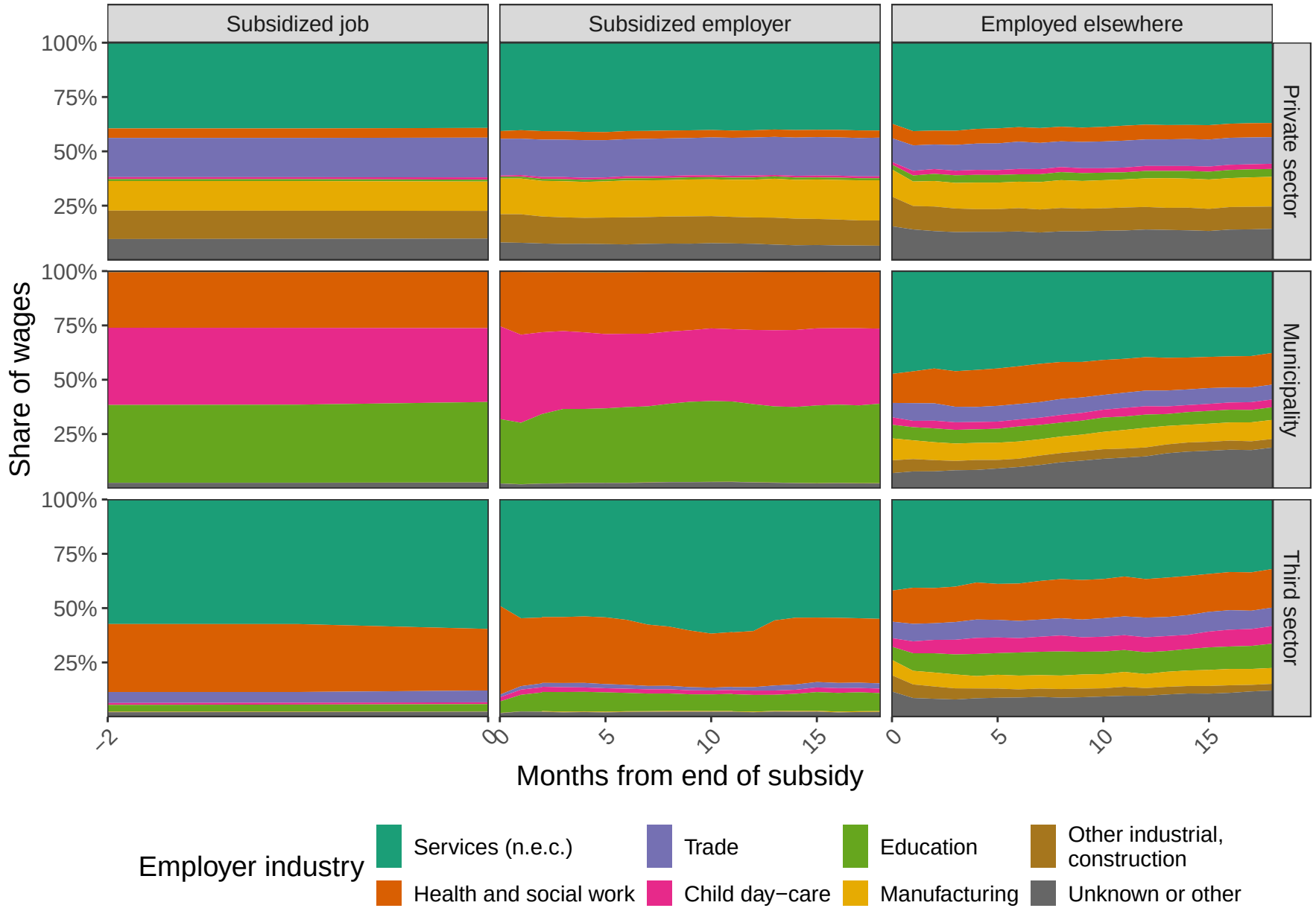


Figure 53: Wages by running personnel size. Employer personnel size is calculated as an annual average per employer.

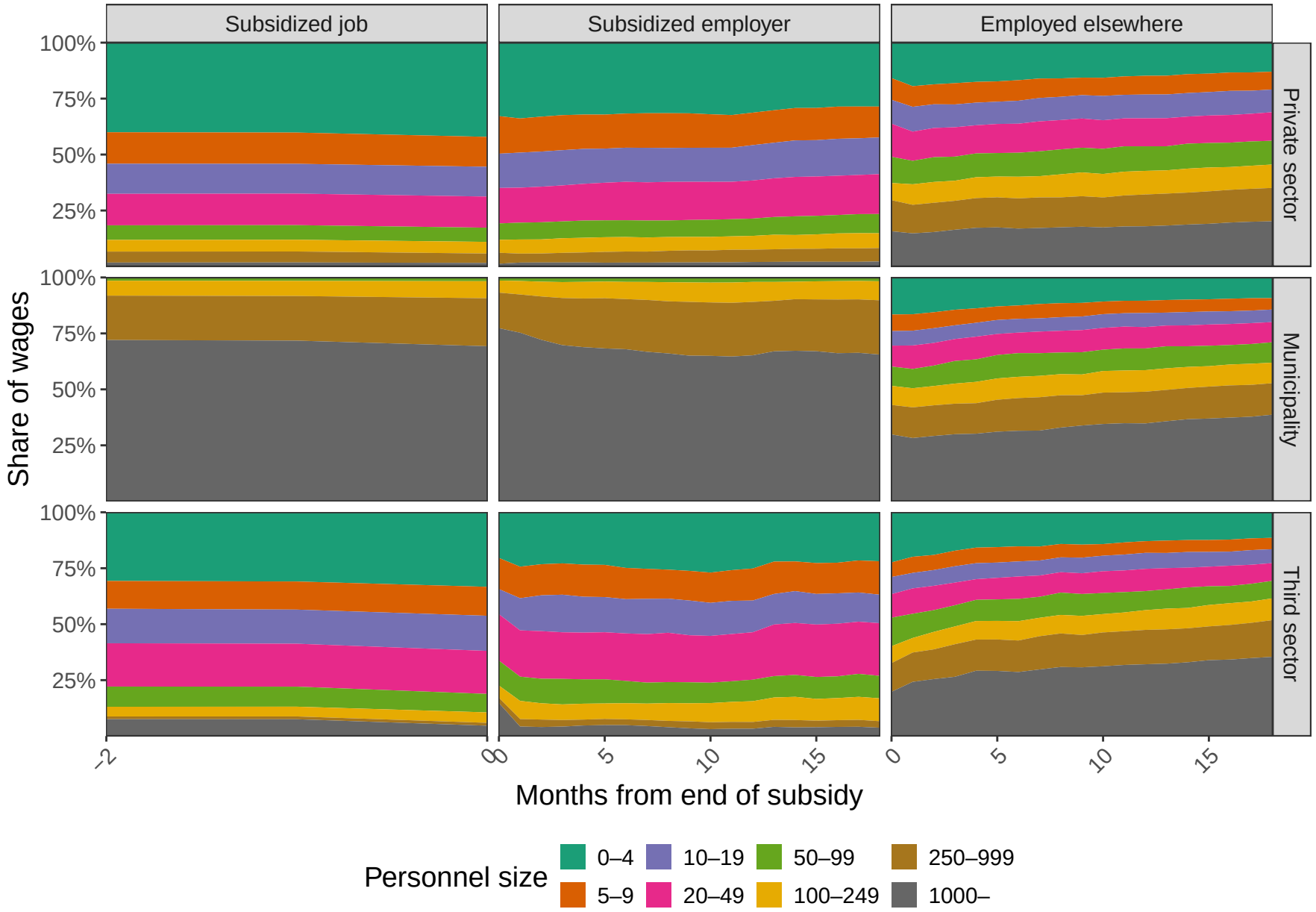


Figure 54: Wages by running profession. Profession data from Incomes Register. The employers report the profession to the Register.

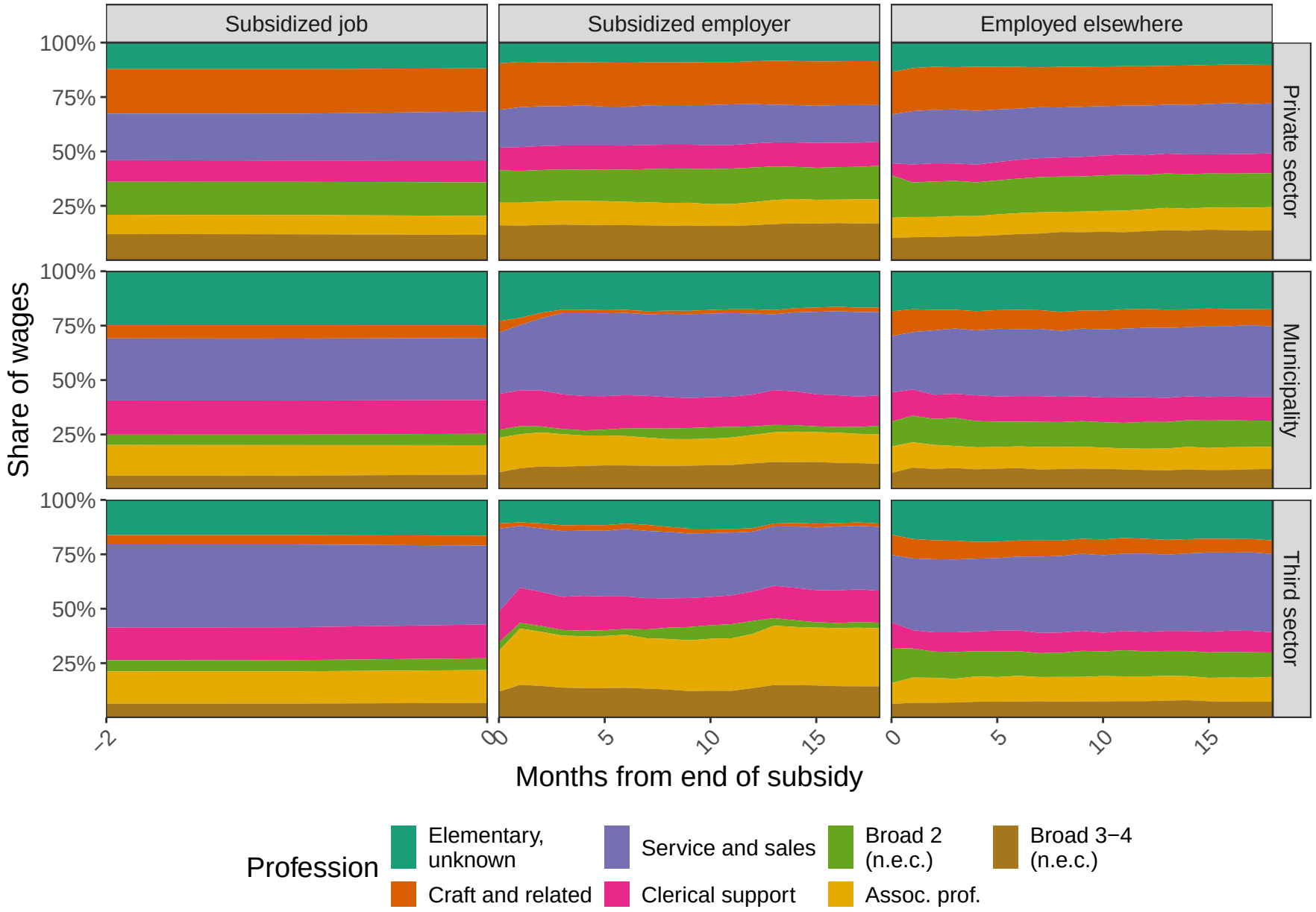
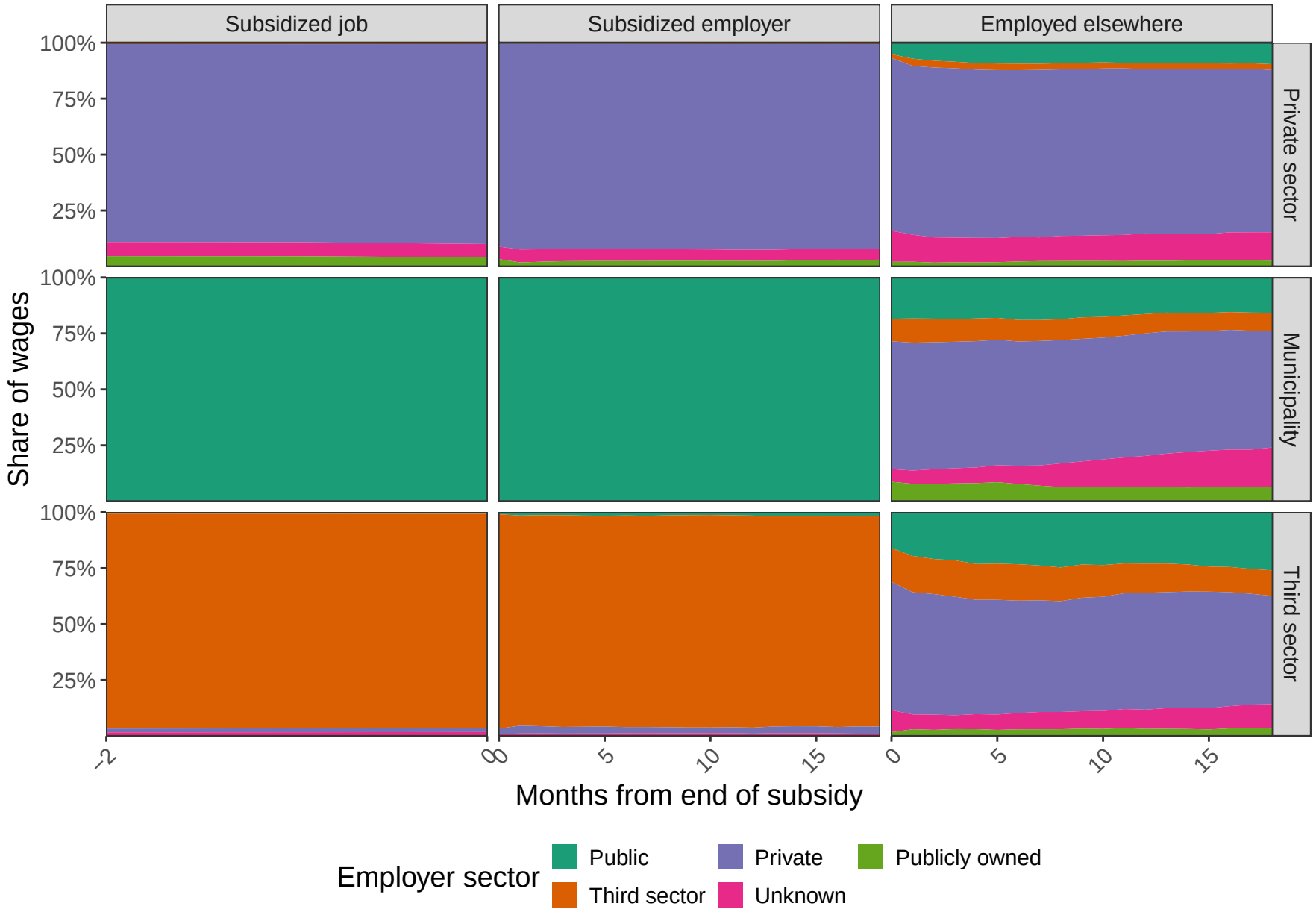


Figure 55: Wages by running sector



Appendix S Additional descriptives regarding the effects of the subsidy

Figures 54–57 complement the matching analysis in the main text. The first two figures 54–fig:Status by treatment, region and offset, base year 2015 (Split) decompose the treatment and control groups in the different regions into different status categories for each observed date since entry into the subsidized job. (For control units, time zero is this entry date of their matched treatment unit.)

Figures 56–57 plot the average wage contributions from different employers per region type, subsidy sector and separately for control and treatment units.

Figure 56: Status by treatment, region and offset, base year 2014

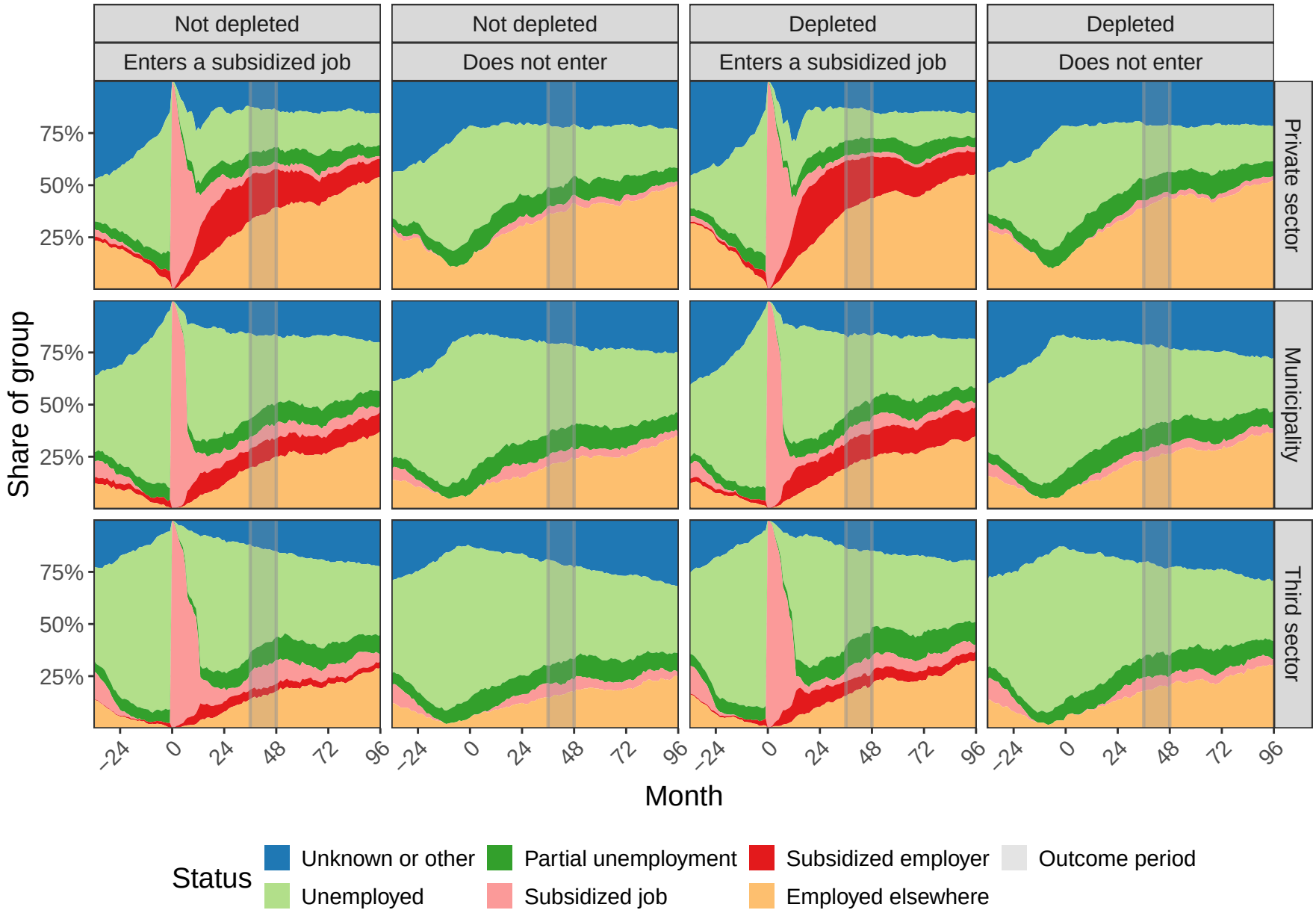


Figure 57: Status by treatment, region and offset, base year 2015

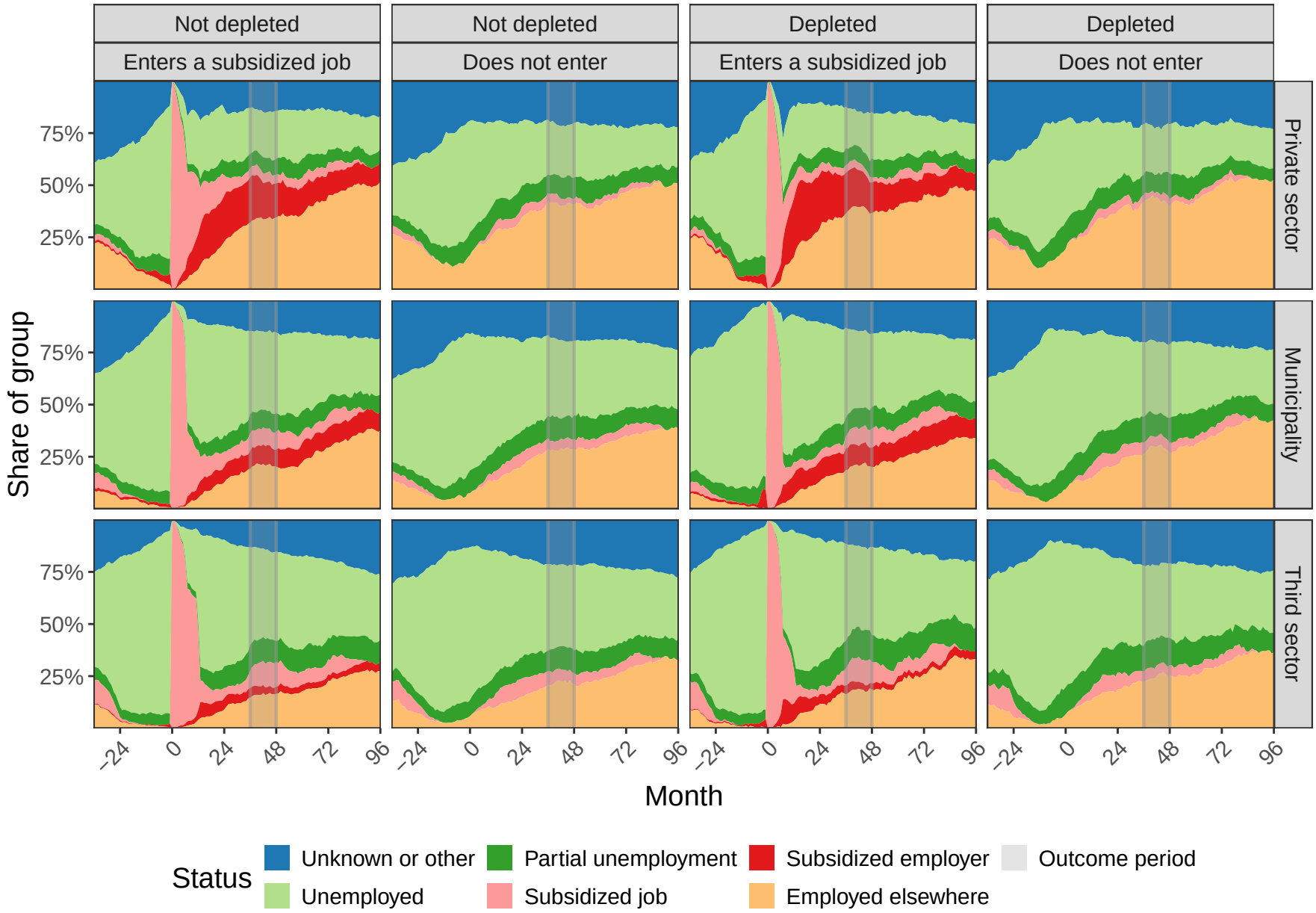


Figure 58: Wages by region and offset, base year 2014. Non-employed persons contribute a zero wage towards the mean. The treatment-control pairs are identified from July of each year, but the zero offset is defined as the entry into subsidy for each pair separately. The shaded area is the fourth year from the base date. *Subs. empl.* refers to unsubsidized work at the initial subsidized employer. *Subs. job* refers to the subsidized job.

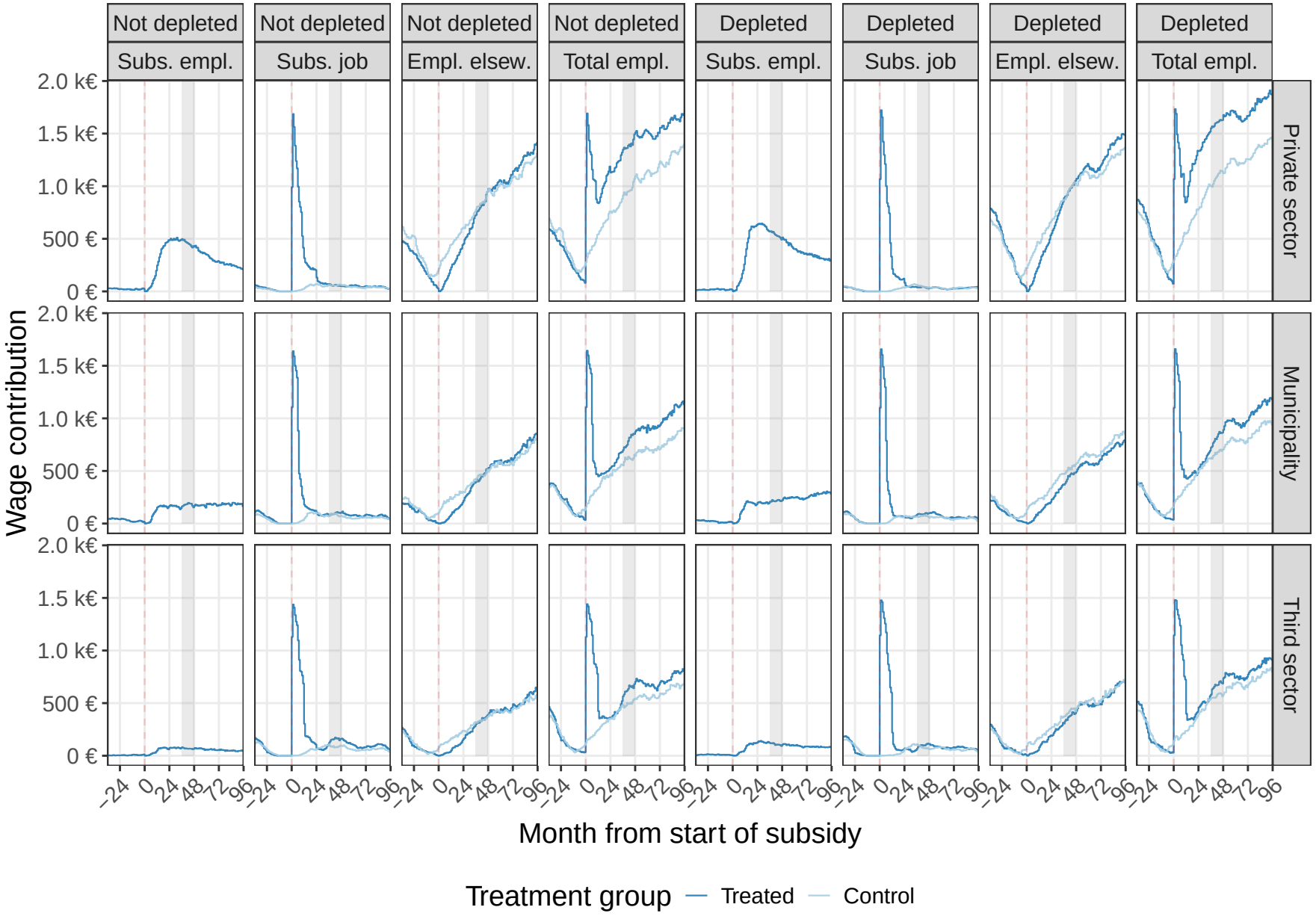
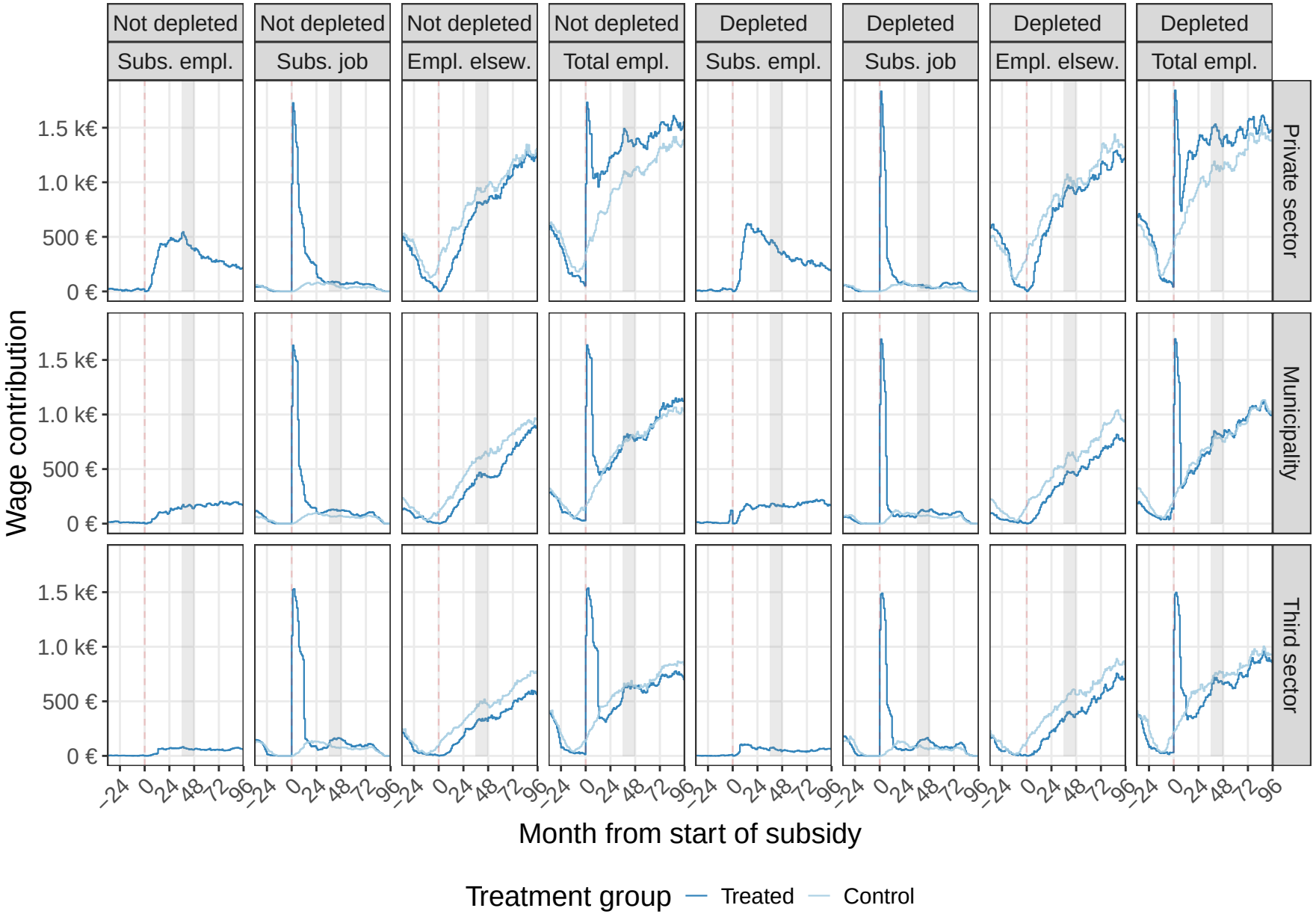


Figure 59: Wages by region and offset, base year 2015



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