

FIRMBACKBONE: Employment data characteristics (2019-2022)

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Introduction

This document provides some descriptive analyses of organisation and establishment data made available by FIRMBACKBONE. The data consists of anonymized records from the LISA Foundation matched and enriched with additional data from the Dutch Chamber of Commerce. The data ranges from 2019 to 2022.

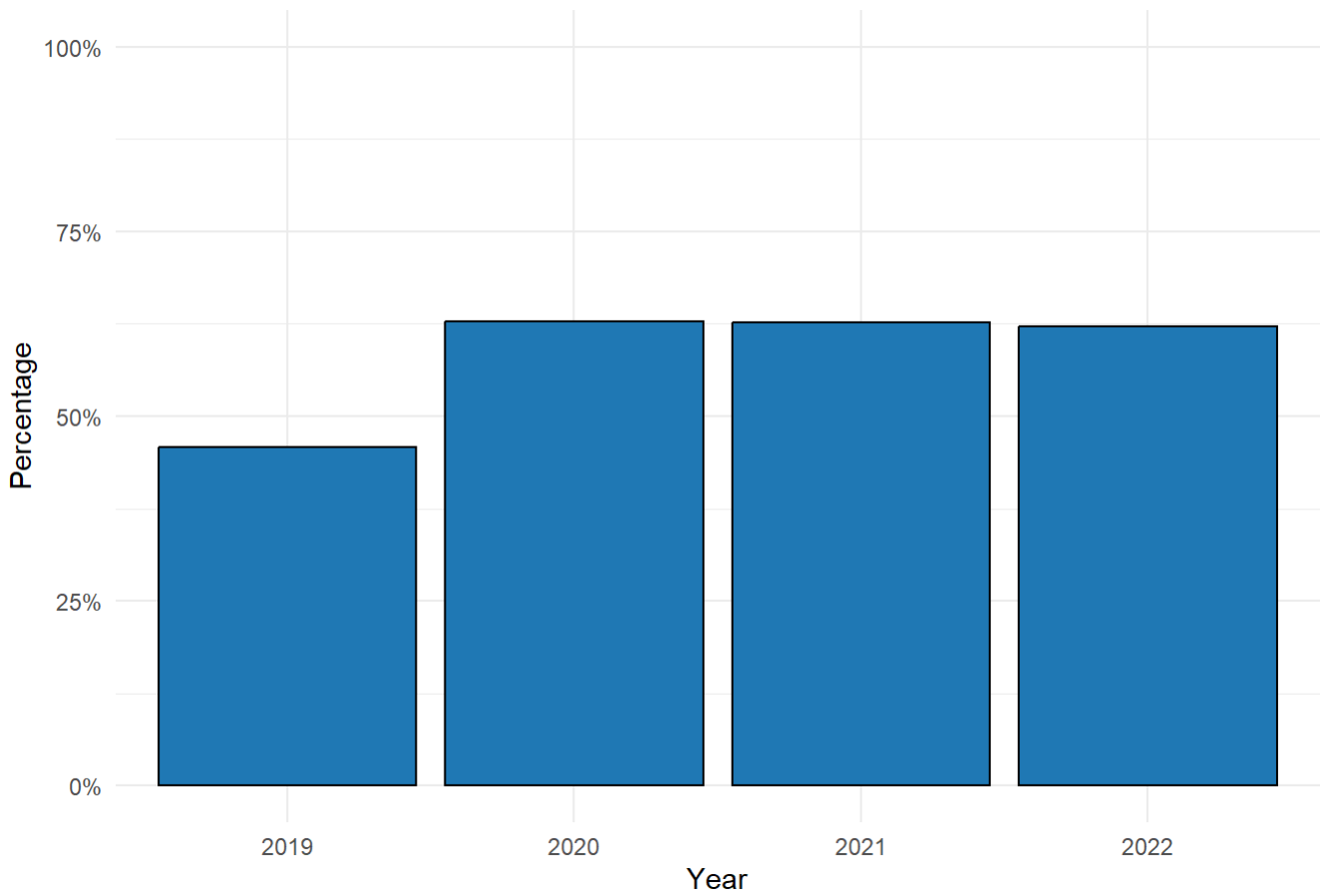
Employee counts

The following table contains employee counts per sector as in the LISA Gold data sets and as per the official statistics from Netherlands Statistics.

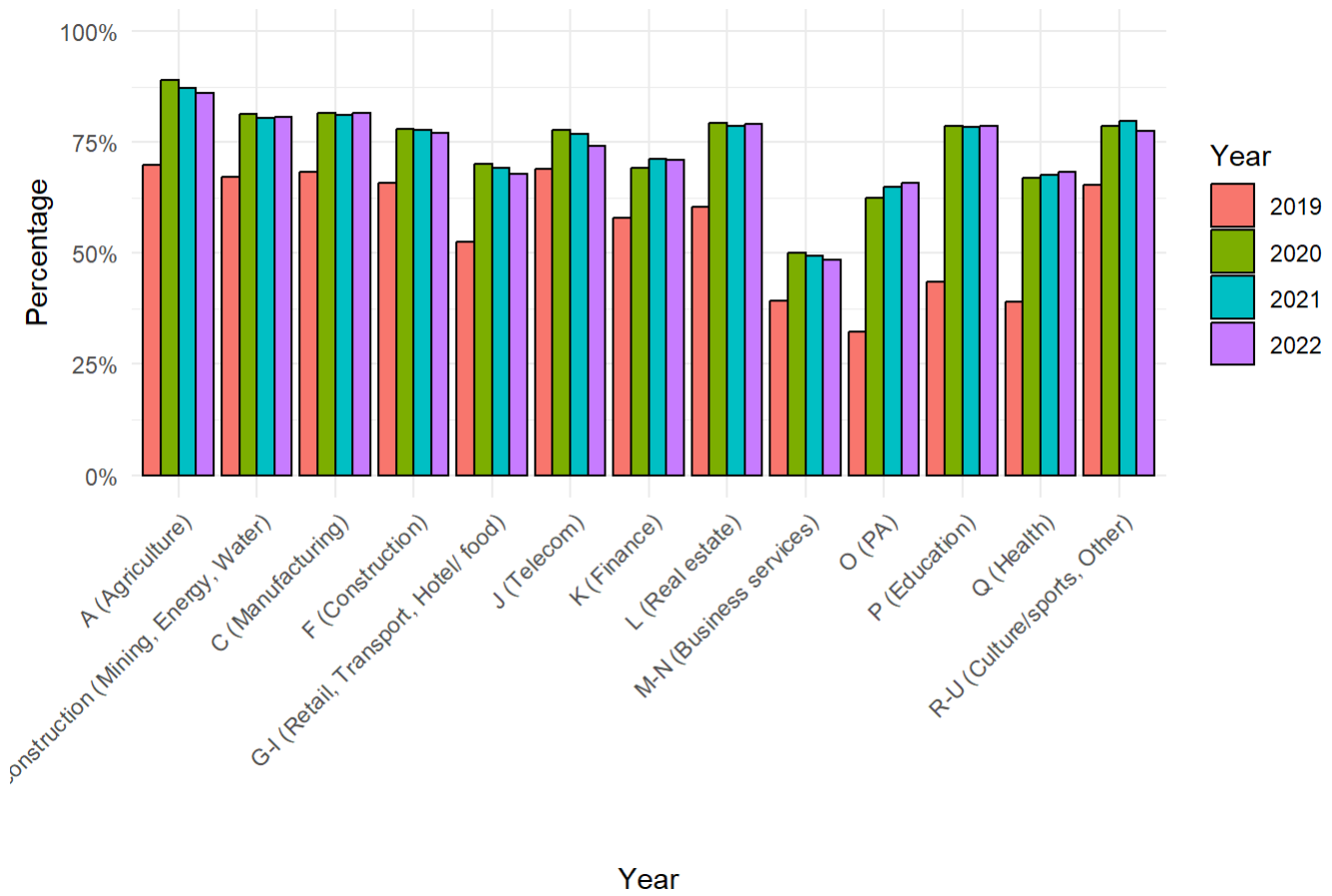
SBI	Employment count by source and year							
	2019		2020		2021		2022	
	LISA	CBS	LISA	CBS	LISA	CBS	LISA	CBS
A (Agriculture)	140,402	201,000	178,848	201,000	176,764	203,000	175,437	204,000
B-E, excl. construction (Mining, Energy, Water)	587,986	875,000	710,835	874,000	704,428	875,000	720,758	893,000
C (Manufacturing)	547,965	803,000	653,441	801,000	648,803	800,000	664,559	814,000
F (Construction)	337,798	514,000	410,386	527,000	420,626	541,000	438,729	570,000
G-I (Retail, Transport, Hotel/ food)	1,248,968	2,382,000	1,646,651	2,347,000	1,652,213	2,386,000	1,681,500	2,475,000
J (Telecom)	220,544	320,000	255,635	329,000	263,315	343,000	269,999	364,000
K (Finance)	117,418	203,000	143,347	207,000	149,692	210,000	153,390	216,000
L (Real estate)	44,685	74,000	59,433	75,000	59,709	76,000	61,634	78,000
M-N (Business services)	824,515	2,095,000	1,002,837	2,001,000	1,014,057	2,057,000	1,046,954	2,156,000
O (PA)	158,578	492,000	318,341	509,000	341,757	526,000	355,467	540,000
P (Education) ¹	240,188	553,000	444,431	565,000	459,664	586,000	483,378	614,000
Q (Health)	583,275	1,493,000	1,027,708	1,536,000	1,067,670	1,577,000	1,102,691	1,616,000
R-U (Culture/sports, Other)	275,186	421,000	325,700	414,000	327,266	410,000	334,628	432,000
Total	4,779,543	10,426,000	6,524,152	10,386,000	6,637,161	10,590,000	6,824,565	10,972,000

¹Note: LISA does not include public and administrative organizations.

LISA employment counts as percentage of CBS counts



LISA employment counts as percentage of CBS counts, per sector



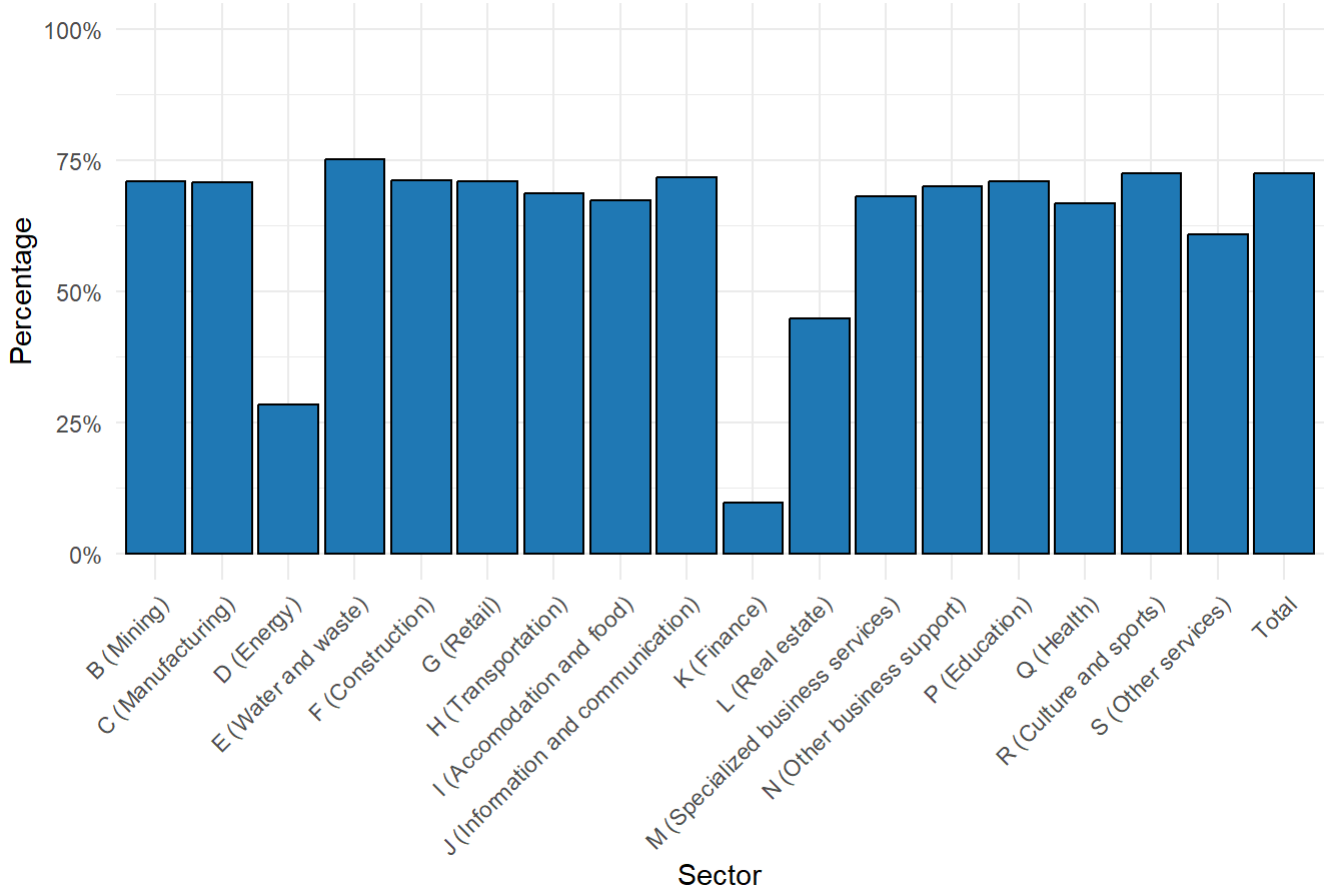
Comparison of organisation counts

The following table contains organisation counts per sector as in the LISA Gold data sets and as per the official statistics from Netherlands Statistics.

SBI	Organisation count by source and year							
	2019		2020		2021		2022	
	LISA	CBS	LISA	CBS	LISA	CBS	LISA	CBS
A (Agriculture)	47432	NA	59850	NA	60134	NA	60553	NA
B (Mining)	331	549	410	583	460	588	490	653
C (Manufacturing)	47764	73609	55109	76346	57444	78662	61227	83511
D (Energy)	511	1731	628	2112	677	2359	712	2764
E (Water and waste)	1437	2240	1586	2042	1597	1998	1649	2086
F (Construction)	135500	203549	159315	217460	168782	231679	183092	254389
G (Retail)	171220	262873	199370	278018	213601	290093	220166	300125
H (Transportation)	33147	52476	39102	55622	42191	59170	45718	65359
I (Accommodation and food)	39587	66829	50055	70081	50952	71973	52725	77874
J (Information and communication)	72545	106735	80941	111594	83508	113469	88725	122007
K (Finance)	9820	NA	11634	NA	11517	113912	11480	122380
L (Real estate)	12673	30700	14605	31609	15009	32499	15877	34604
M (Specialized business services)	250999	395117	286617	413127	292732	417435	306730	443617
N (Other business support)	56955	88100	67817	94162	72029	98920	78713	112005
O (Public administration) ¹	518	NA	708	NA	711	NA	715	NA
P (Education)	64583	102392	78711	110882	86053	115047	94478	125825
Q (Health)	104438	178673	129990	189145	139246	198380	153773	221203
R (Culture and sports)	78463	121188	89367	125458	91794	118801	94576	123543
S (Other services)	67686	117879	78410	121902	81654	NA	85116	NA
U (Extraterritorial organizations)	4	NA	5	NA	2	NA	2	NA
NA	0	4	0	4	0	4	0	4
Total	1195613	1804644	1404230	1900147	1470093	1944989	1556517	2091949

¹Note: LISA does not include public and administrative organizations.

LISA organisation counts as percentage of CBS counts, per sector



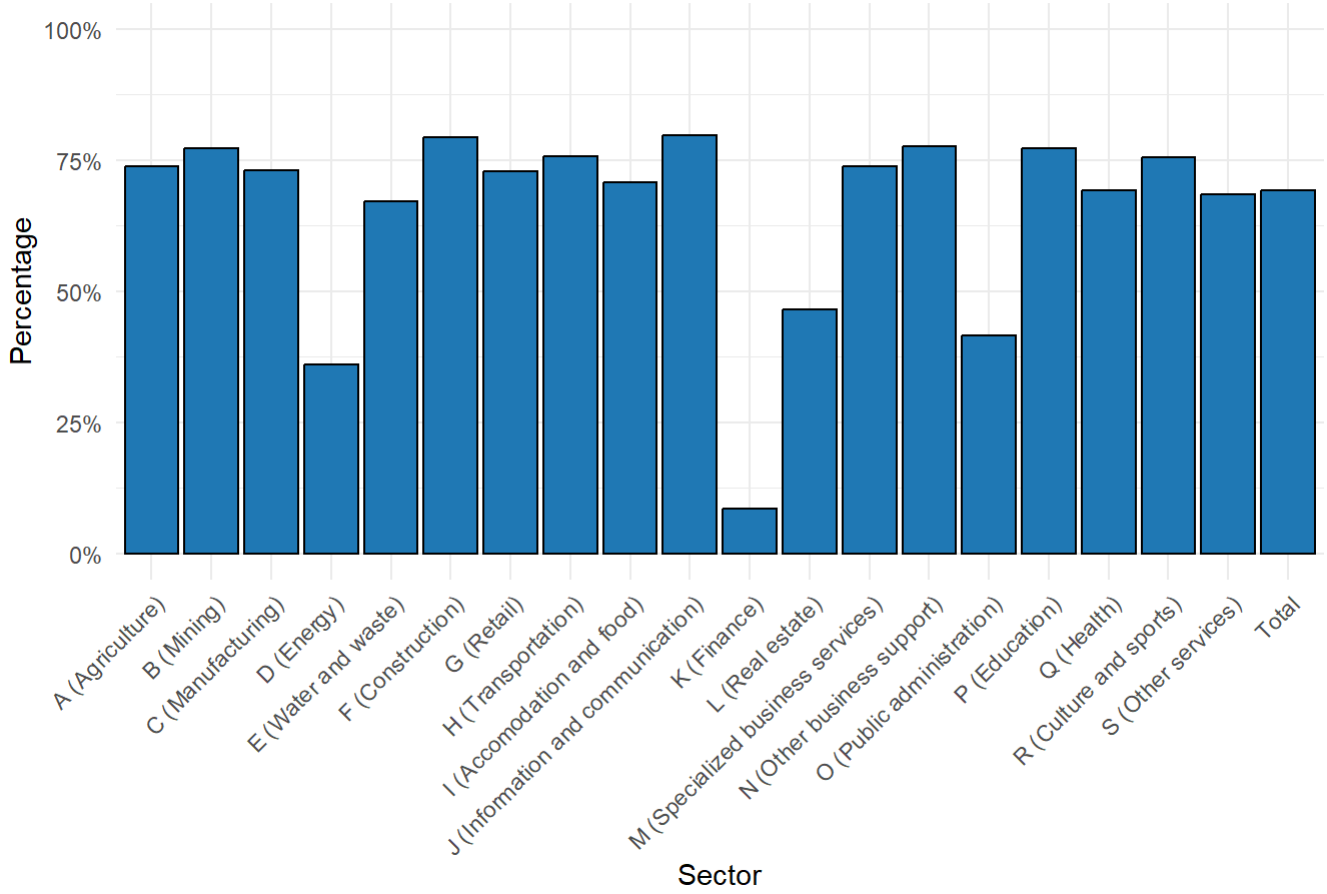
Comparison of establishment counts

The following table contains establishment counts per sector as in the LISA Gold data sets and as per the official statistics from Netherlands Statistics.

SBI	Establishment count by source and year							
	2019		2020		2021		2022	
	LISA	CBS	LISA	CBS	LISA	CBS	LISA	CBS
A (Agriculture)	47732	76100	60347	76905	60670	77875	61130	79965
B (Mining)	336	495	416	530	465	560	496	625
C (Manufacturing)	48419	77140	56048	73990	58394	75475	62248	81475
D (Energy)	536	1400	673	1685	717	1995	749	2515
E (Water and waste)	1593	2725	1873	2660	1885	2685	1934	2790
F (Construction)	135900	181715	159893	197170	169354	208945	183695	228990
G (Retail)	178938	273565	211088	280520	225169	291840	231583	315120
H (Transportation)	33632	48415	39885	51790	42985	54605	46575	60060
I (Accommodation and food)	40673	64530	51853	68660	52809	72235	54659	76295
J (Information and communication)	72855	95545	81340	100580	83944	102265	89181	112195
K (Finance)	10334	132580	12458	135840	12290	136930	12176	150240
L (Real estate)	12915	30205	14991	31235	15391	31670	16253	34525
M (Specialized business services)	252395	361570	288680	381740	294793	387370	308833	418825
N (Other business support)	58009	80960	69237	87295	73407	91585	80111	100640
O (Public administration) ¹	869	4115	1921	4065	1921	4045	1983	3955
P (Education)	66981	97530	85101	106385	92430	114820	100884	126365
Q (Health)	111627	189430	145155	202455	155134	213860	170482	231935
R (Culture and sports)	79085	111405	90332	116845	92818	119705	95636	124850
S (Other services)	68398	109655	79465	112880	82775	115935	86269	123715
U (Extraterritorial organizations)	4	130	5	125	2	125	2	130
NA	0	0	0	0	0	0	0	0
Total	1221231	1939210	1450761	2033355	1517353	2104525	1604879	2275210

¹Note: LISA does not include public and administrative organizations.

LISA establishment counts as percentage of CBS counts, per sector



Employment change

The following tables and graphs map the distribution of changes in the number of employees within organisations and establishments.

Establishments by absolute change in employment

Δ	'19-'20	'20-'21	'21-'22
(-Inf,-50]	9,712	15,067	14,923
(-50,-10]	40,020	54,765	54,508
(-10,-5]	38,739	48,676	47,875
(-5,-2]	78,837	96,065	95,627
(-2,-1]	83,147	99,820	106,225
(-1,0]	621,434	725,259	790,552
(0,1]	84,721	99,481	101,207
(1,4]	79,766	87,403	86,941
(4,9]	39,798	43,377	43,441
(9,49]	44,383	49,473	50,435
(49, Inf]	12,322	13,638	14,006

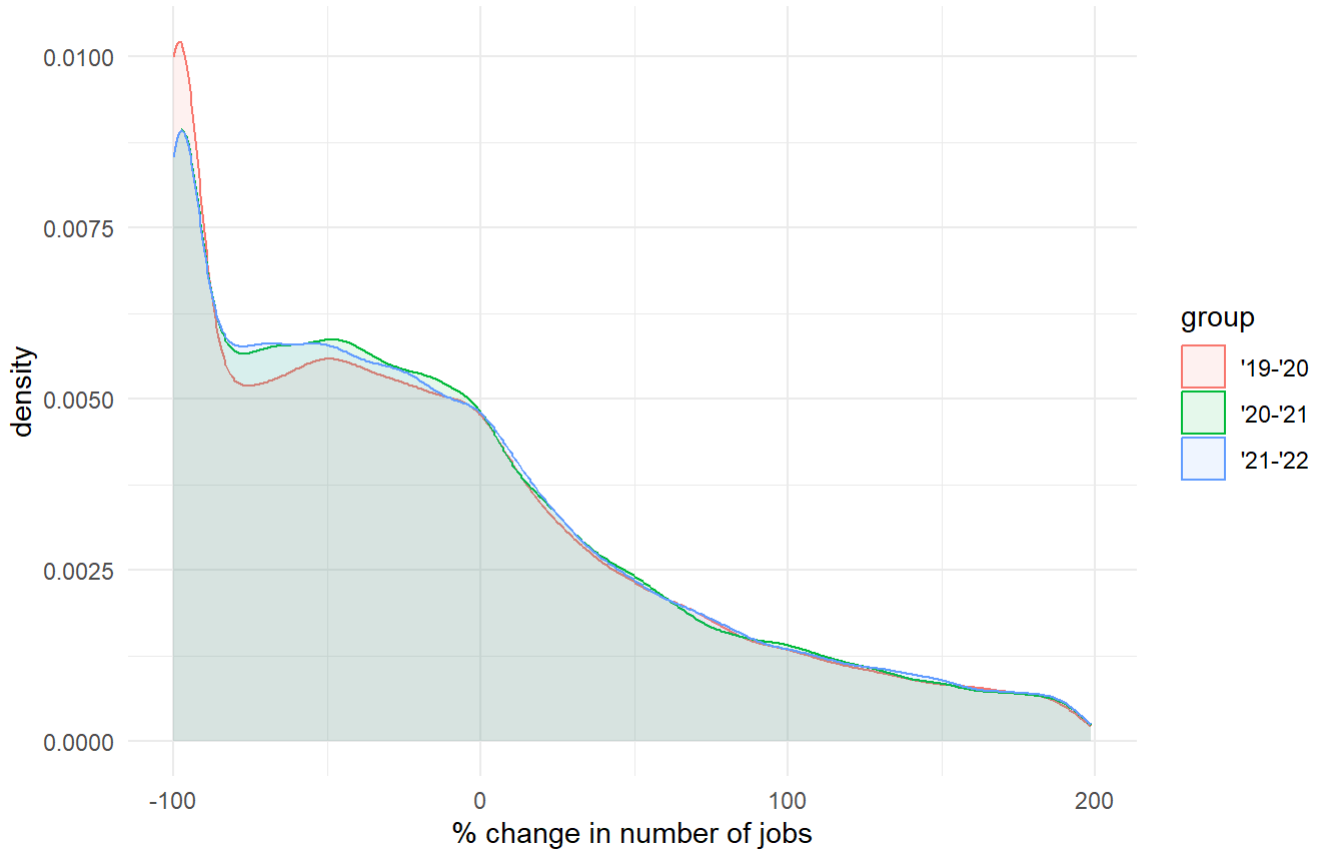
Establishments by relative change in employment

Δ	'19-'20	'20-'21	'21-'22
(-101,-100]	99,385	126,118	118,787
(-100,-50]	240,230	302,039	307,747
(-50,-10]	9,980	12,027	11,103
(-10,-1]	117	183	159
(-1,0]	621,434	725,260	790,552
(0,10]	131	182	145
(10,25]	1,262	1,466	1,343
(25,50]	6,931	7,805	7,251
(50,100]	83,405	98,072	99,990
(100,1e+03]	123,120	135,057	134,643
(1e+03,1e+04]	41,112	45,377	47,015

The following graphs provide a kernel density estimation to approximate the distribution in employment change at the establishment level. Only establishments with ten employees or more were included.

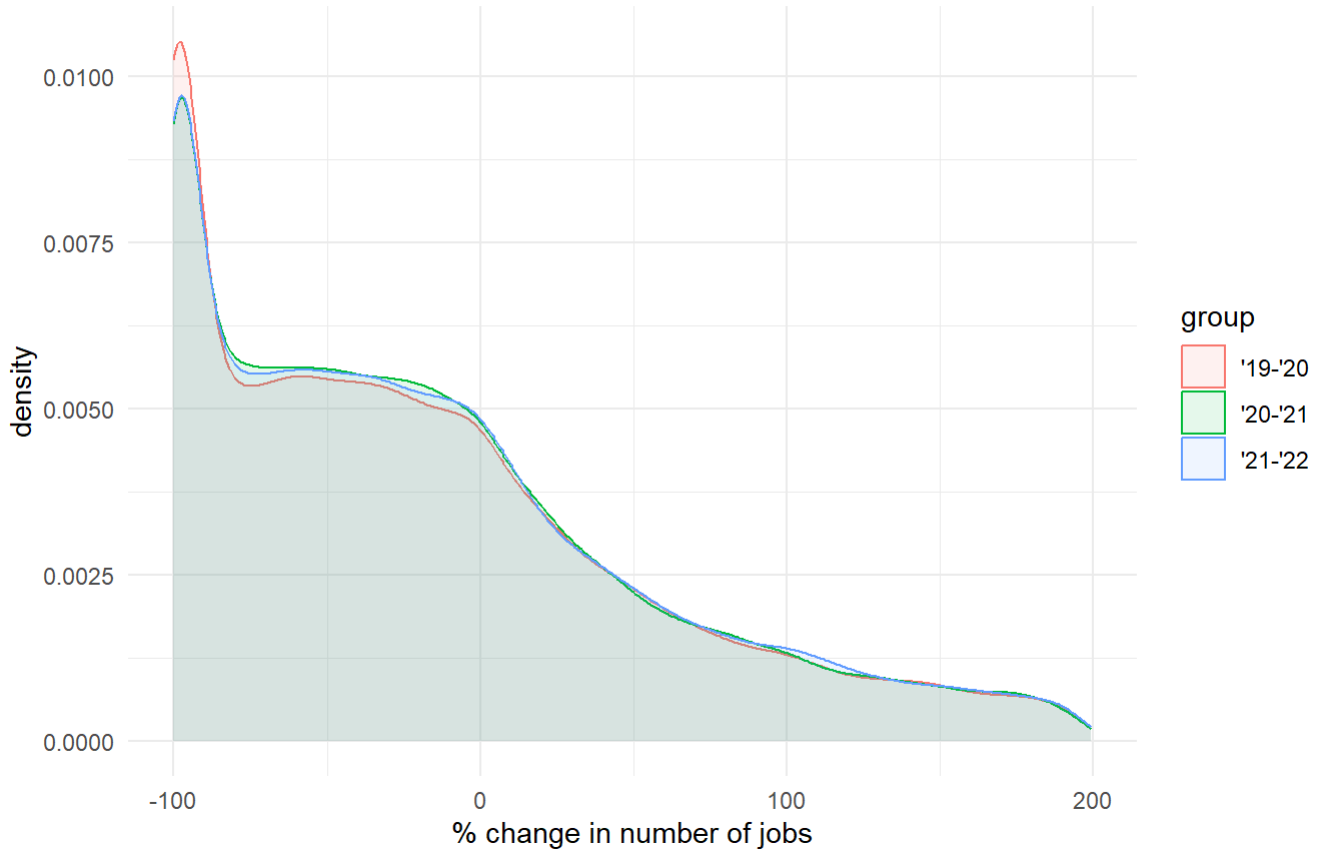
Establishment-level relative employment change

Kernel density estimate, cutoff at 200%



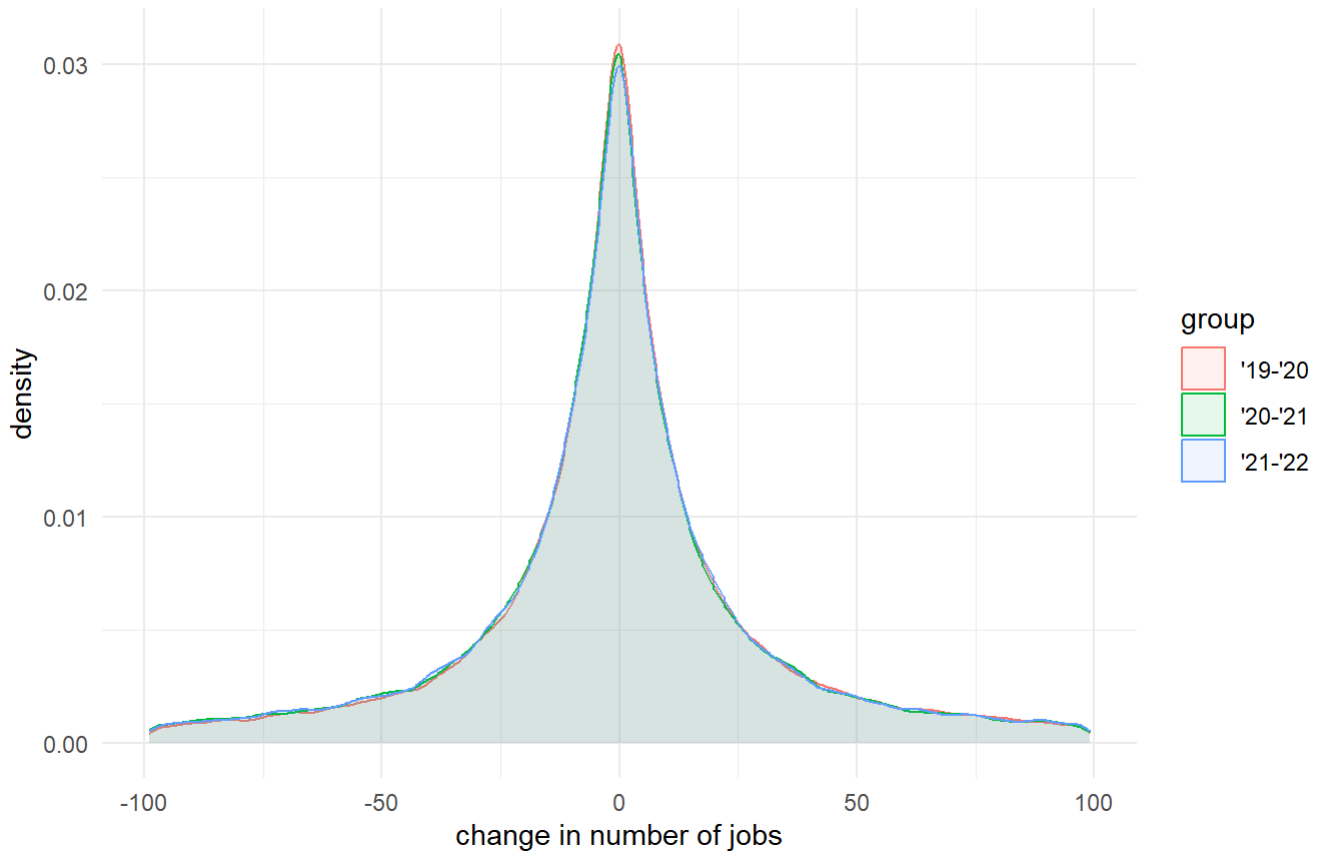
Firm-level relative employment change

Kernel density estimate, cutoff at 200%



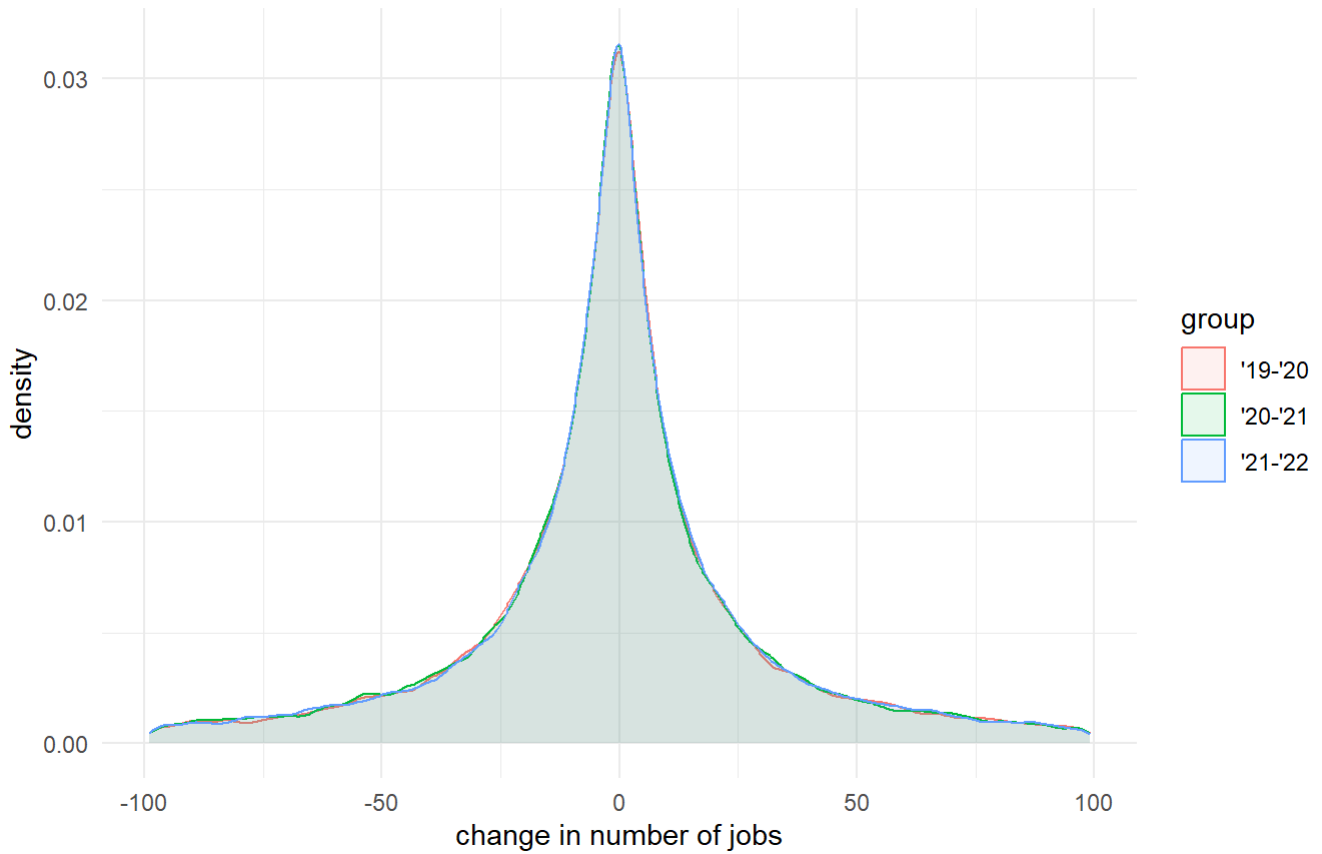
Establishment-level absolute employment change

Kernel density estimate, cutoff at ± 100



Firm-level absolute employment change

Kernel density estimate, cutoff at ± 100



Changes in location and ownership.

Percentage of establishments that relocated, by sector and level

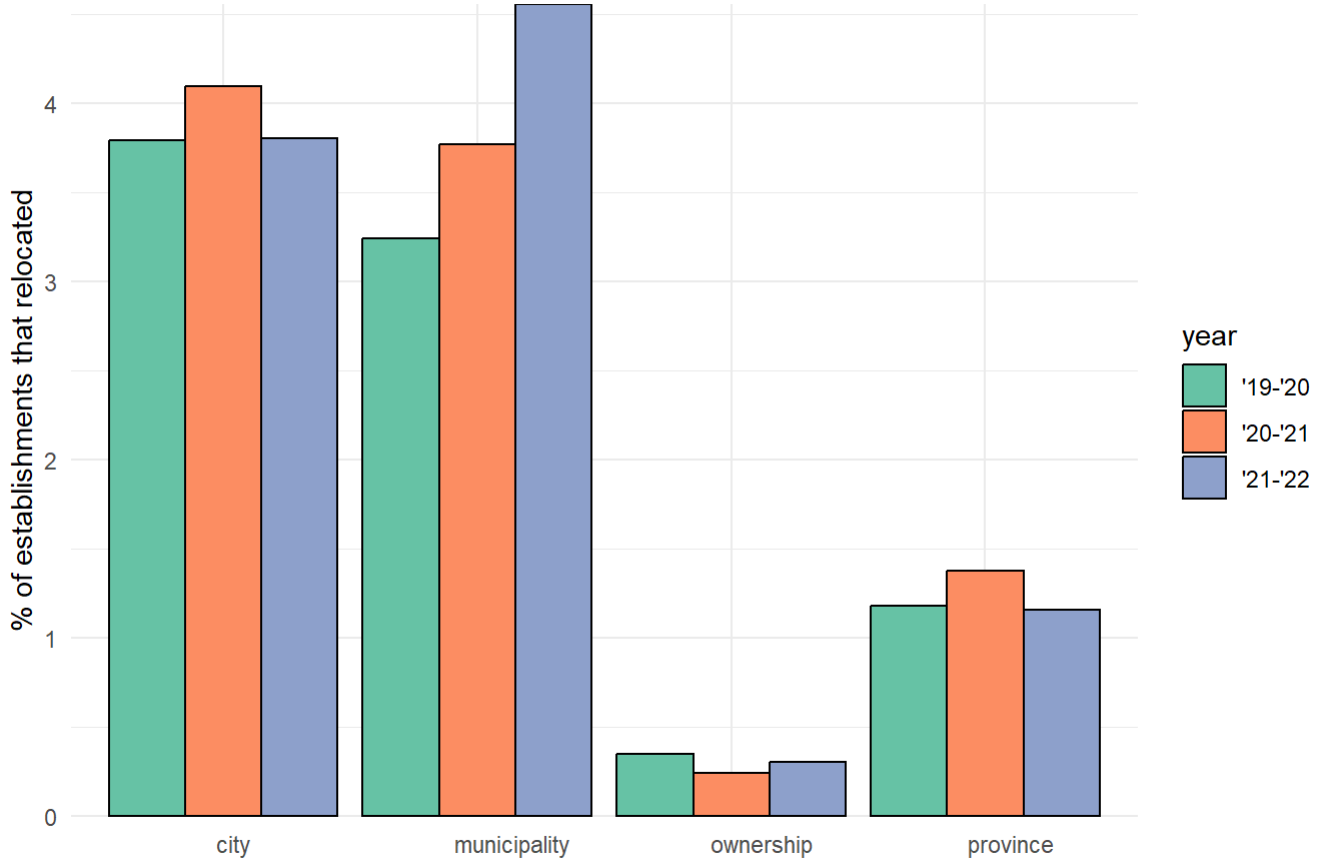
sector	city			municipality			province		
	'19-'20	'20-'21	'21-'22	'19-'20	'20-'21	'21-'22	'19-'20	'20-'21	'21-'22
A (Agriculture)	2.00	1.77	1.74	1.39	1.96	3.26	0.63	0.47	0.45
B (Mining)	3.64	5.49	2.05	2.98	4.40	4.10	0.66	0.73	1.23
C (Manufacturing)	3.36	3.45	3.10	2.74	3.10	4.10	0.83	0.98	0.74
D (Energy)	4.74	4.29	2.37	4.74	5.00	4.22	2.06	2.38	0.53
E (Water and waste)	4.29	4.37	4.28	3.81	4.52	4.59	0.97	0.96	1.03
F (Construction)	4.06	4.21	3.93	3.23	3.64	4.81	0.89	0.96	0.79
G (Retail)	3.57	3.37	3.14	3.03	3.11	4.16	1.08	1.01	0.85
H (Transportation)	4.19	4.13	4.22	3.63	4.21	4.76	1.13	1.28	1.16
I (Accommodation and food)	2.53	2.23	1.75	2.20	2.19	2.65	0.86	0.66	0.53
J (Information and communication)	5.00	5.74	5.48	4.50	5.39	5.88	1.90	2.38	2.07
K (Finance)	2.99	3.12	2.89	2.60	2.95	3.83	0.74	1.00	0.73
L (Real estate)	2.89	2.93	2.86	2.41	2.73	3.54	0.62	0.81	0.74
M (Specialized business services)	3.98	4.67	4.53	3.51	4.29	5.11	1.39	1.80	1.59
N (Other business support)	4.23	4.69	4.35	3.59	4.26	5.01	1.18	1.44	1.16
O (Public administration)	2.57	2.15	1.70	1.71	2.53	2.22	0.61	0.76	0.65
P (Education)	4.32	4.86	4.37	3.83	4.39	4.99	1.48	1.70	1.48
Q (Health)	3.66	3.94	3.47	3.12	3.60	4.07	1.15	1.30	1.07
R (Culture and sports)	4.28	5.35	4.85	3.89	5.04	5.28	1.65	2.39	1.88
S (Other services)	3.04	3.11	2.61	2.43	2.72	3.55	0.75	0.76	0.60
Total	3.79	4.09	3.80	3.24	3.77	4.56	1.18	1.38	1.16

Percentage of establishments that changed ownership, by sector

sector	'19-'20	'20-'21	'21-'22
A (Agriculture)	0.90	0.75	0.99
B (Mining)	0.33	0.37	0.00
C (Manufacturing)	0.37	0.20	0.36
D (Energy)	0.00	0.24	0.00
E (Water and waste)	0.14	0.22	0.08
F (Construction)	0.26	0.24	0.24
G (Retail)	0.57	0.38	0.53
H (Transportation)	0.38	0.22	0.23
I (Accommodation and food)	1.18	0.52	0.73
J (Information and communication)	0.16	0.15	0.21
K (Finance)	0.30	0.28	0.23
L (Real estate)	0.31	0.31	0.35
M (Specialized business services)	0.18	0.14	0.18
N (Other business support)	0.35	0.15	0.27
O (Public administration)	0.37	0.38	0.26
P (Education)	0.16	0.13	0.15
Q (Health)	0.37	0.32	0.26
R (Culture and sports)	0.14	0.08	0.11
S (Other services)	0.31	0.13	0.21
Total	0.35	0.24	0.31

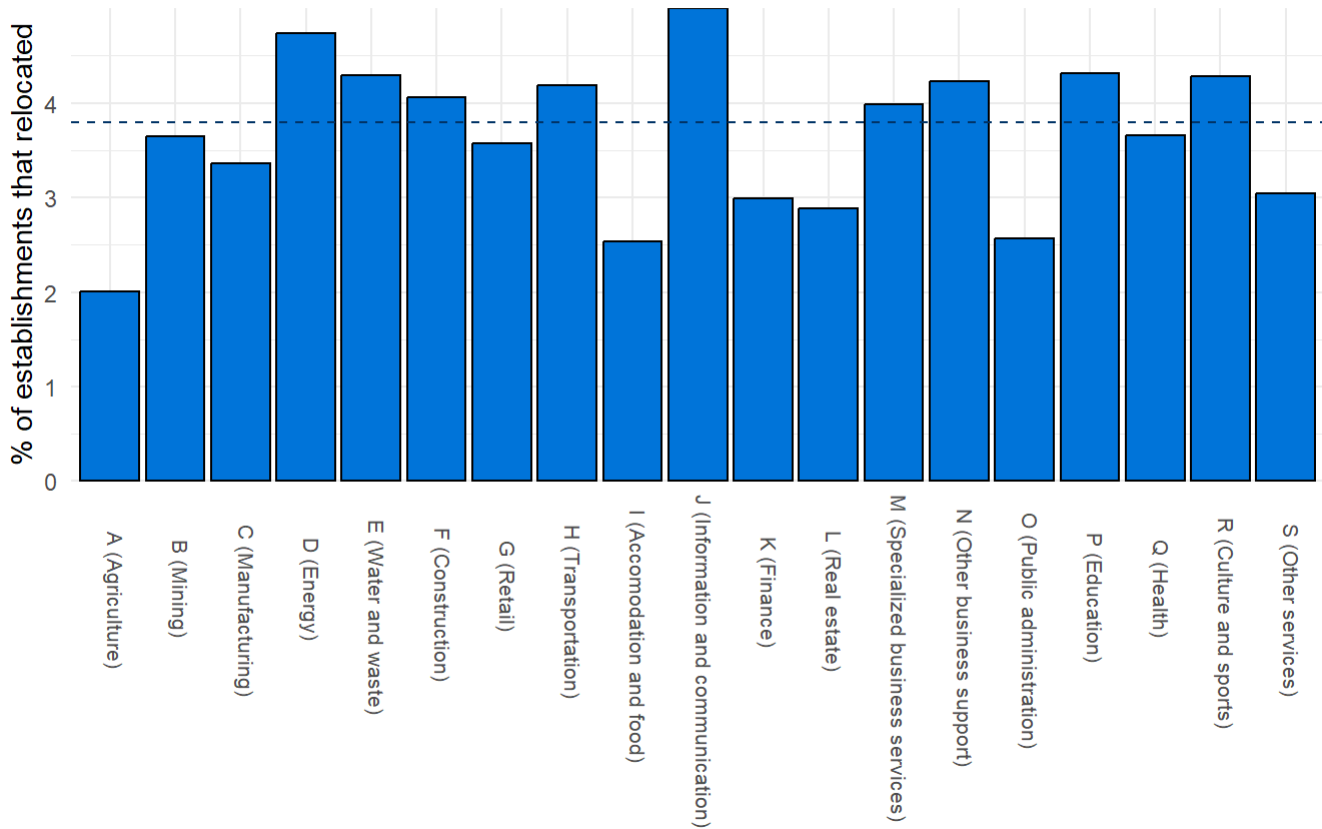
Note that municipality changes can also be due to administrative changes. Hence, the number of municipality-level relocations can in these cases be greater than the number of city-level relocations.

Establishment year-on-year relocation from 2019-2022

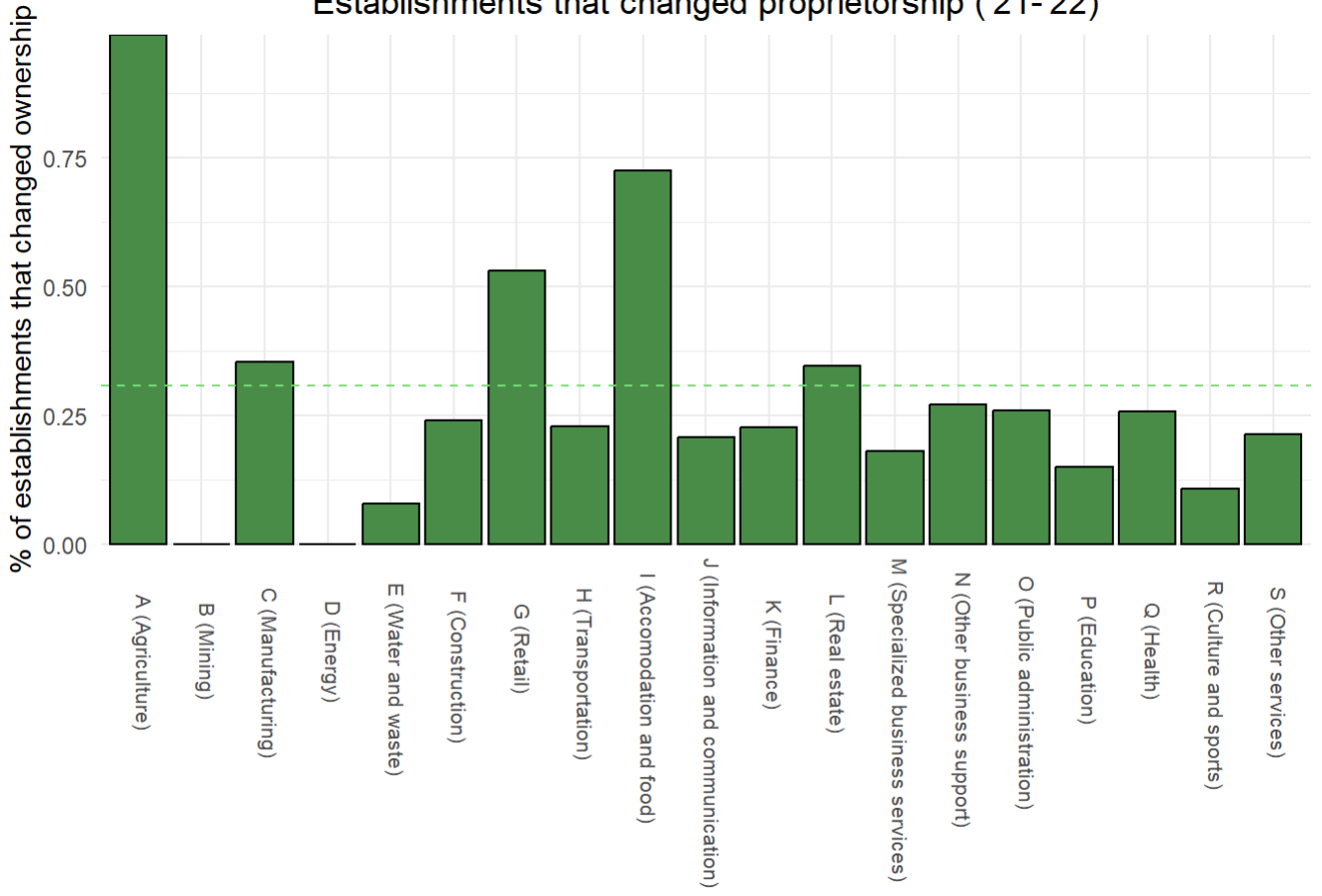


Establishment relocation to another city ('19-'20)

By sector, dashed line gives percentage for total

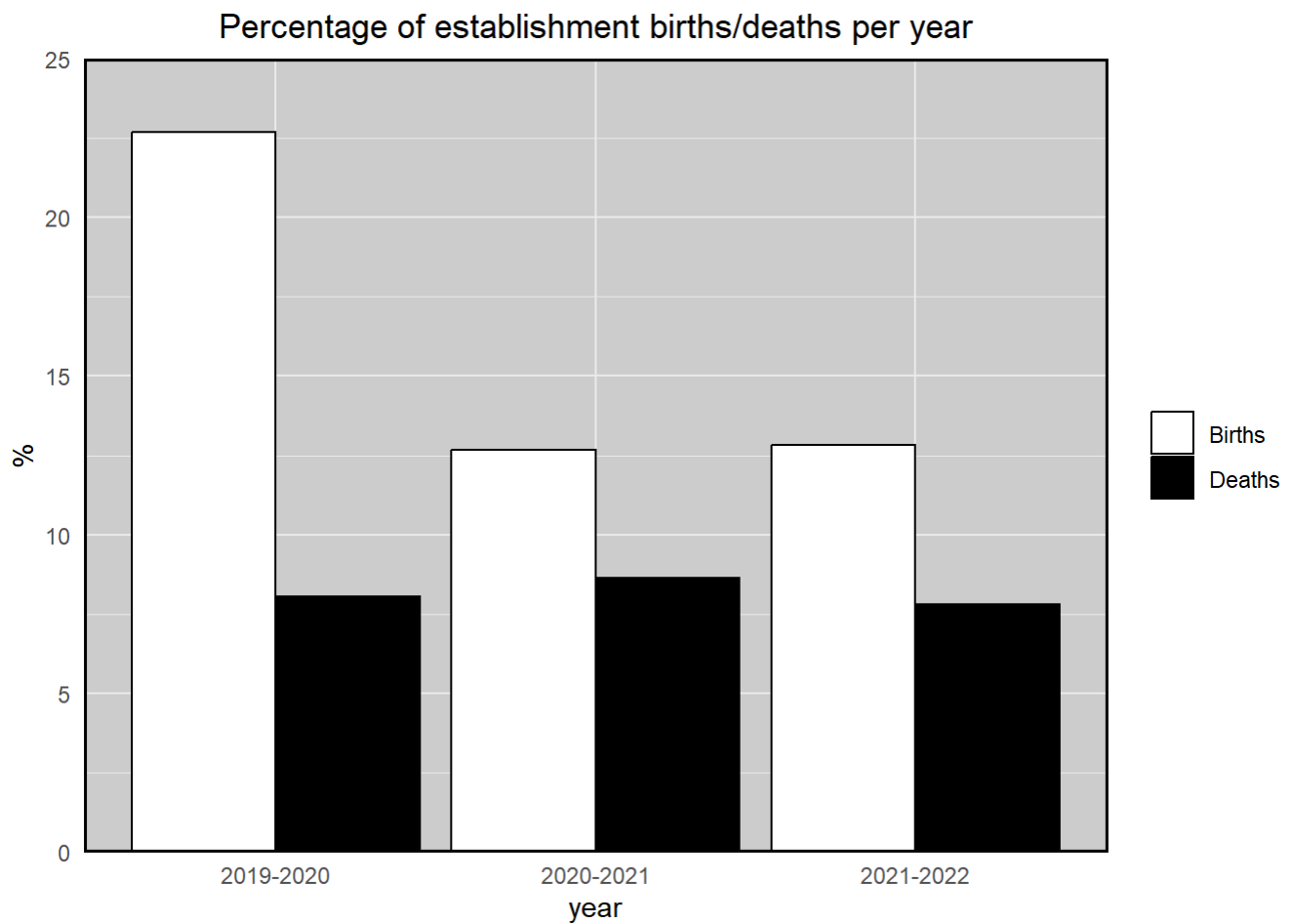


Establishments that changed proprietorship ('21-'22)



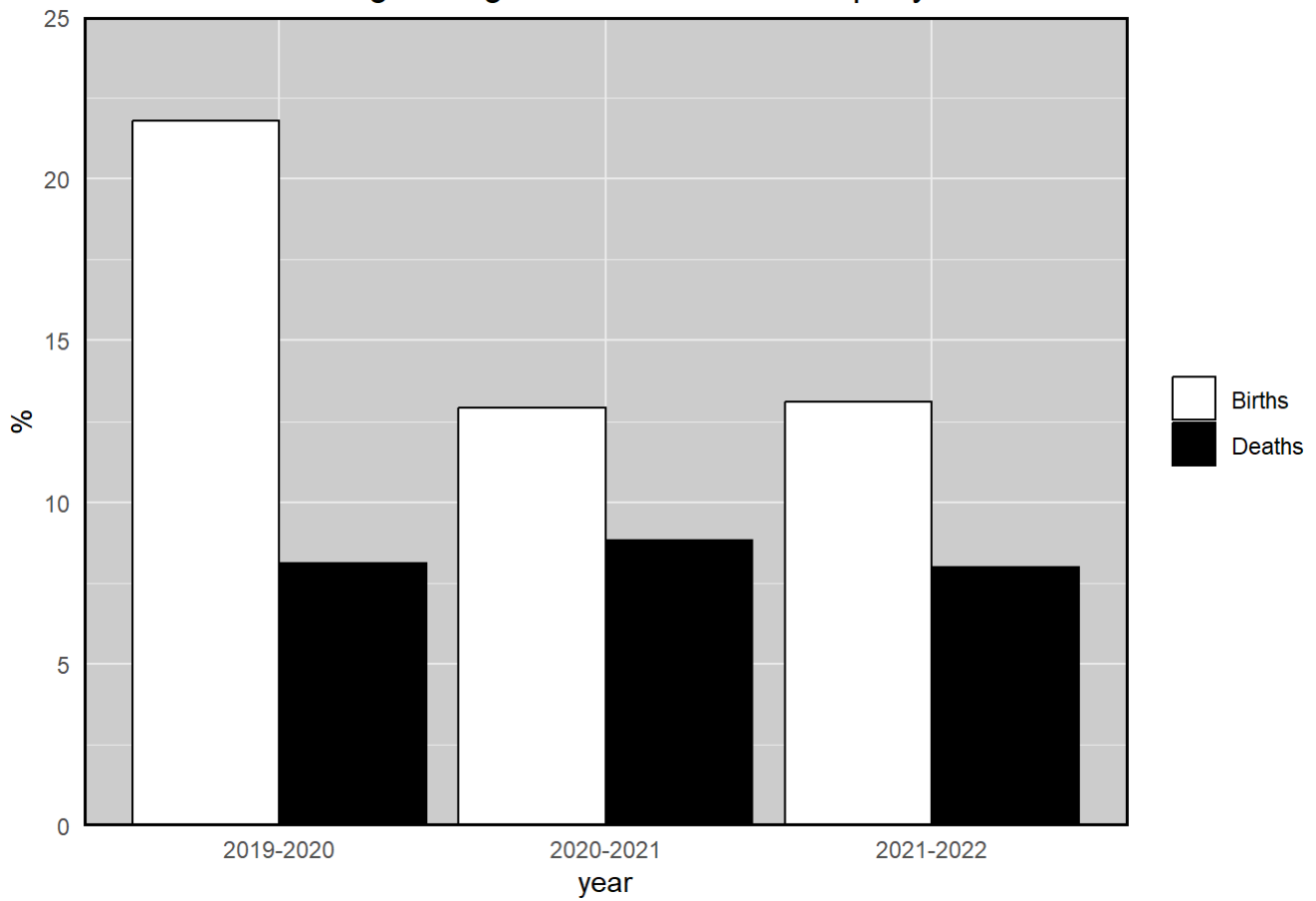
Establishment births/foundings and deaths/dissolutions

The following graph gives establishment births and deaths by year.



The following graph gives organisation births and deaths by year.

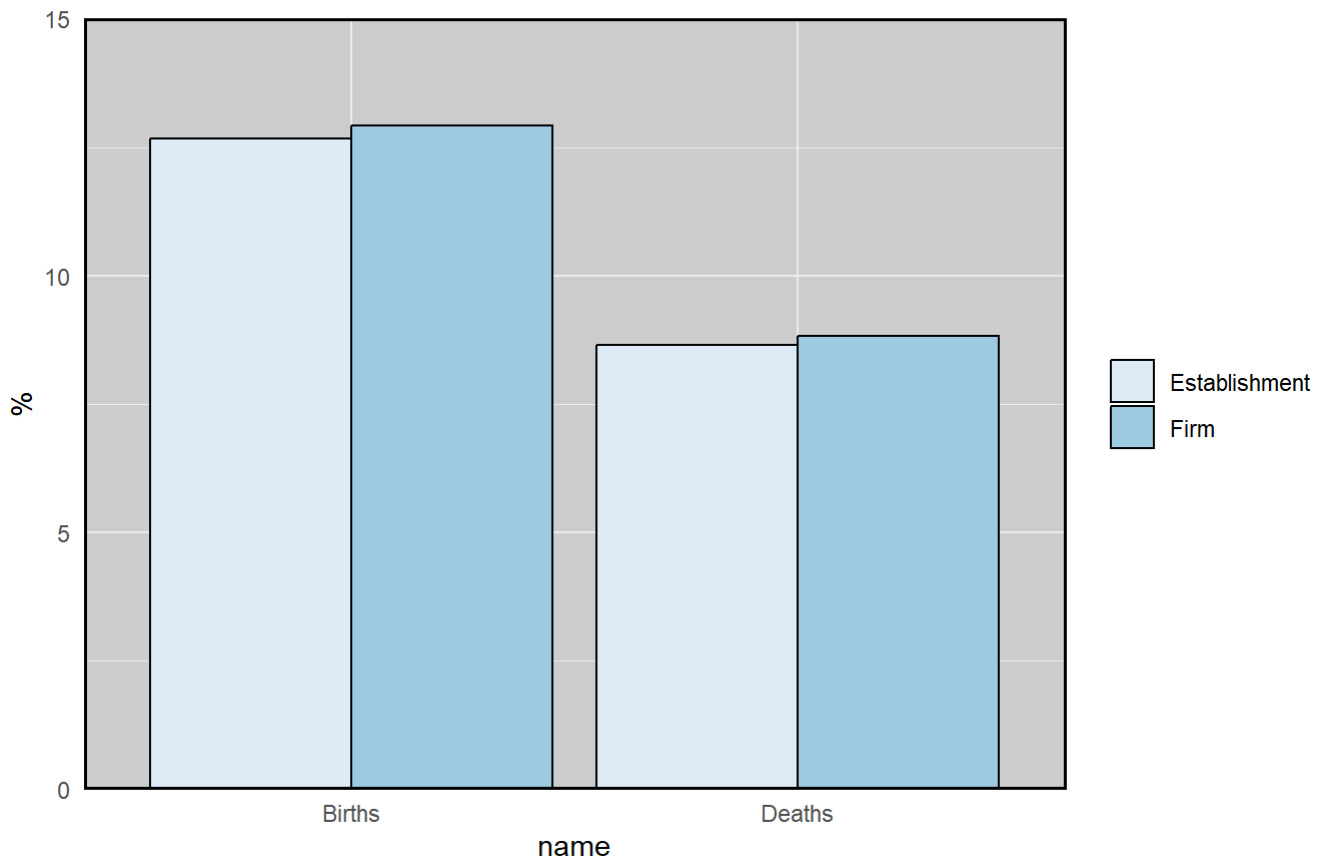
Percentage of organisation births/deaths per year



The following graph compares birth/death rates between organisations and establishments.

Percentage of organisation & establishment births/deaths

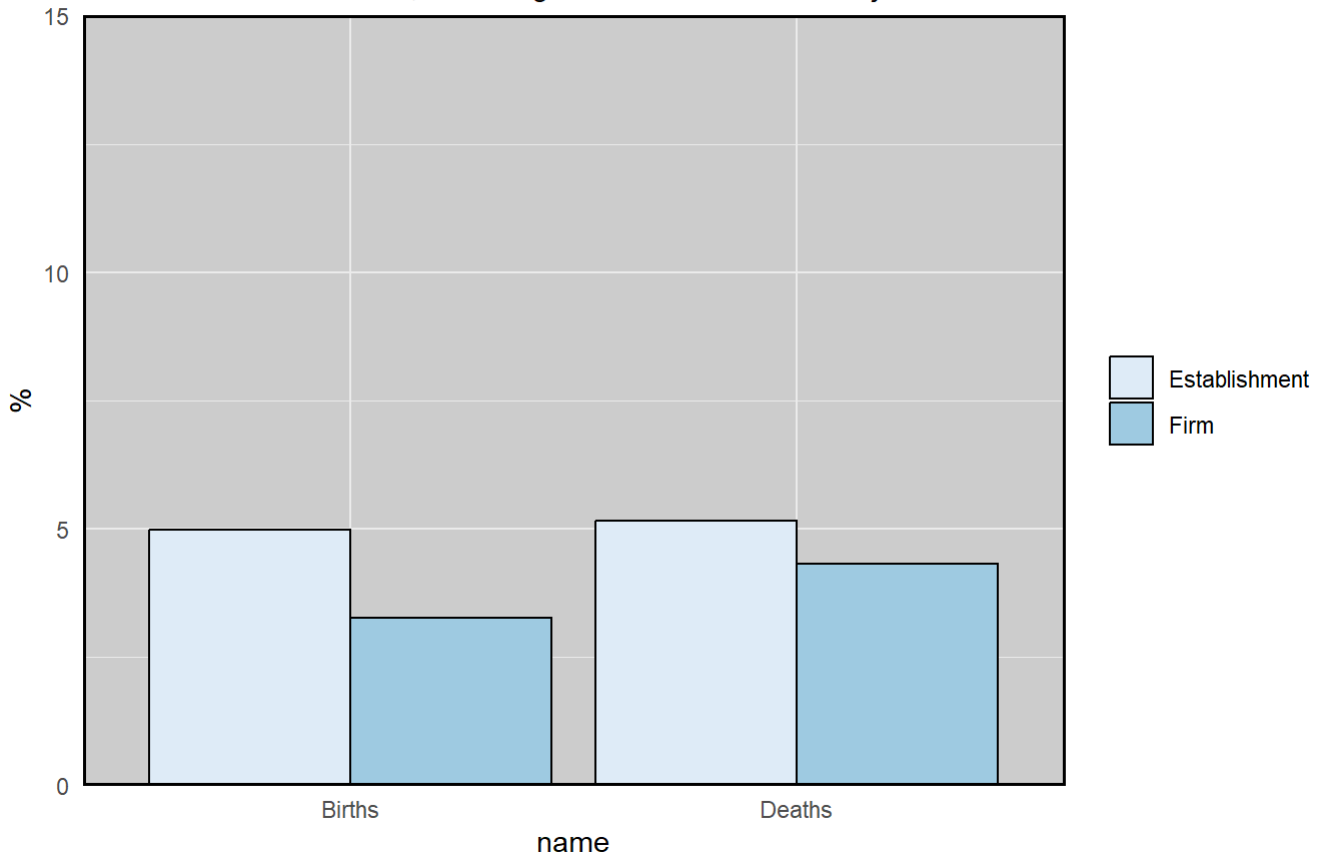
For 2020-2021



Now we do the same for organisations with over 20 employees to filter out the smaller organisations.

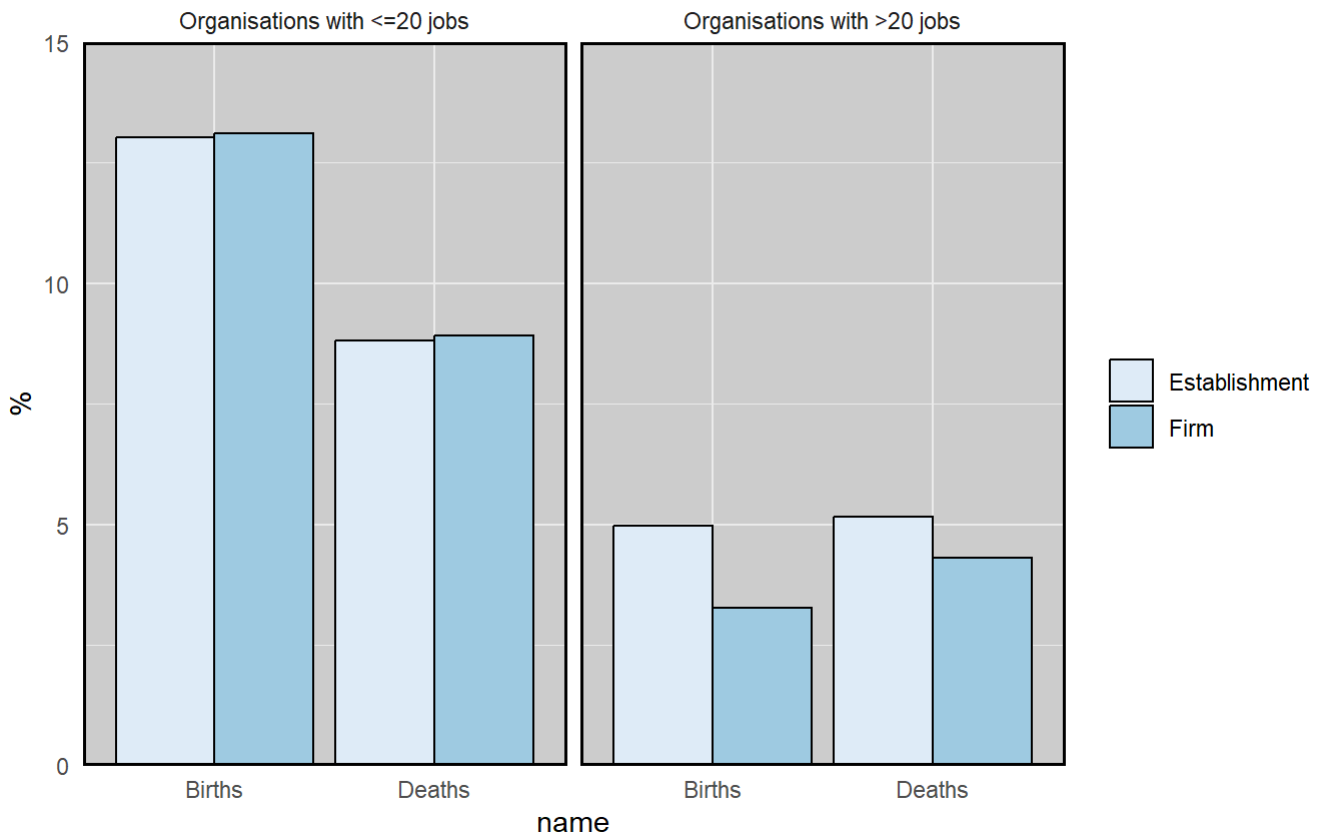
Percentage of organisation & establishment births/deaths

For 2020-2021, excluding firms with fewer than 20 jobs



Percentage of organisation & establishment births/deaths

For 2020-2021



The following table gives organisation and establishment birth/death rates by sector.

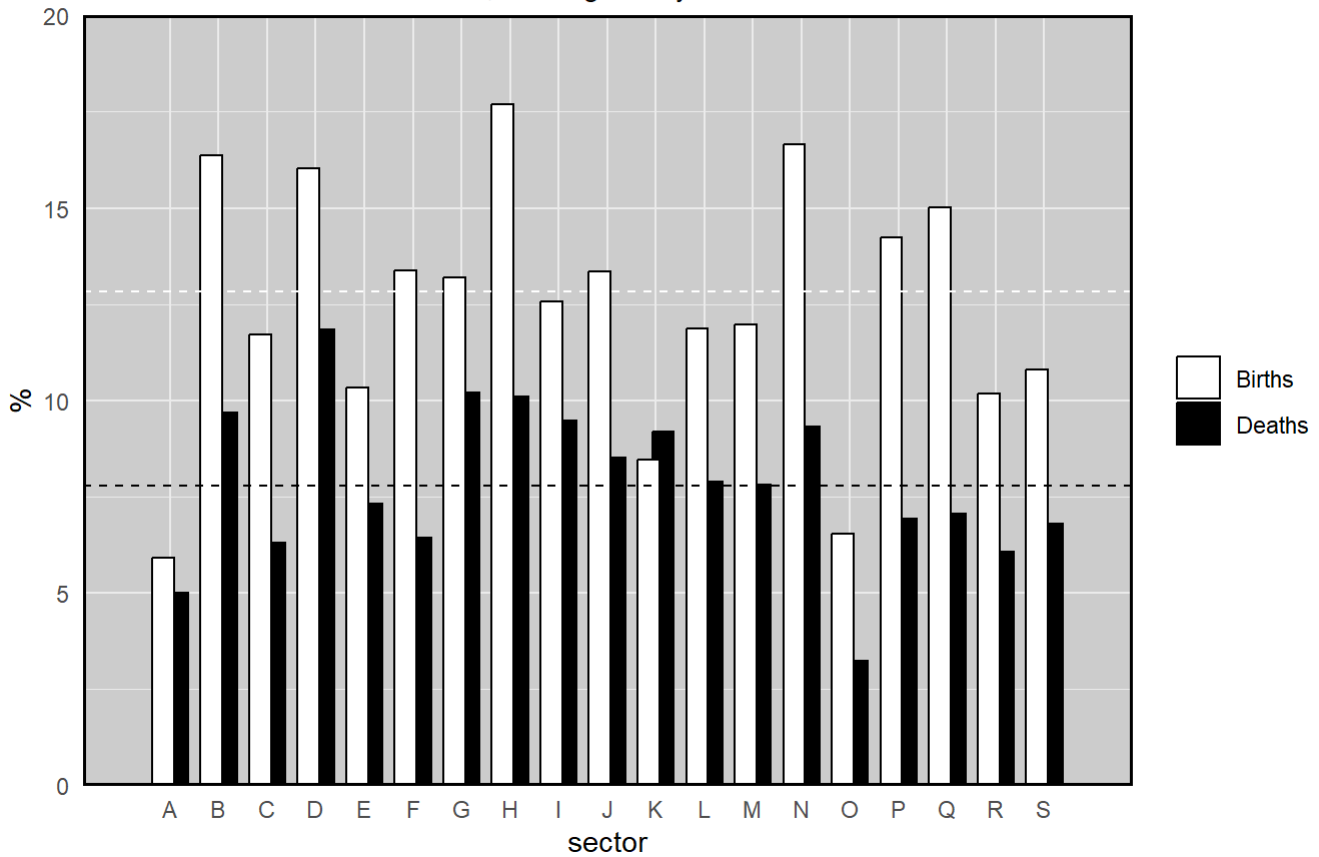
Establishment and organisation births/deaths (2021-22, per sector)

sector	Establishments		Organisations	
	Deaths	Births	Deaths	Births
A	5.011634	5.915396	5.856344	6.684674
B	9.677419	16.363636	9.843400	16.806723
C	6.291788	11.717029	6.529336	11.920682
D	11.854951	16.021362	11.738484	16.524217
E	7.328731	10.326933	7.899807	11.533666
F	6.435301	13.369345	6.628240	13.569588
G	10.202594	13.203080	10.592252	13.804698
H	10.110345	17.690655	10.176008	17.800009
I	9.488719	12.579618	9.804972	12.862729
J	8.509624	13.339840	8.614897	13.455999
K	9.187164	8.451167	8.782958	8.604977
L	7.888918	11.867956	7.957061	12.078580
M	7.807691	11.960638	7.908181	12.078633
N	9.332352	16.655839	9.455915	16.918032
O	3.247774	6.548223	4.754098	5.987055
P	6.931261	14.236841	7.274232	15.020484
Q	7.049765	15.011648	7.023139	15.367617
R	6.079391	10.187984	6.188362	10.273820
S	6.798651	10.801378	6.878404	10.932931

The following graphs display these results as a barplot.

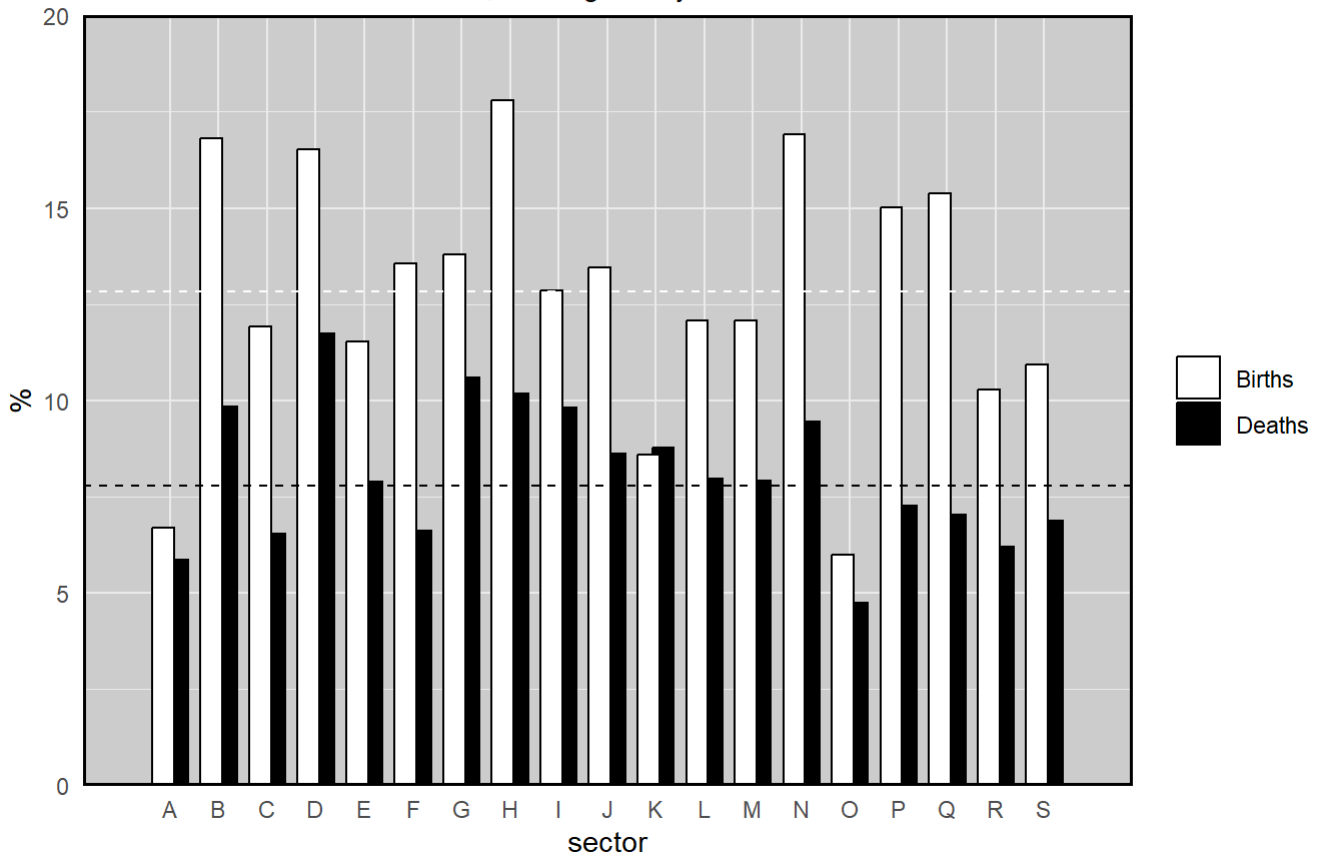
Percentage of establishment births/deaths for '21-'22

Per sector, mean given by dashed lines



Percentage of organisation births/deaths for '21-'22

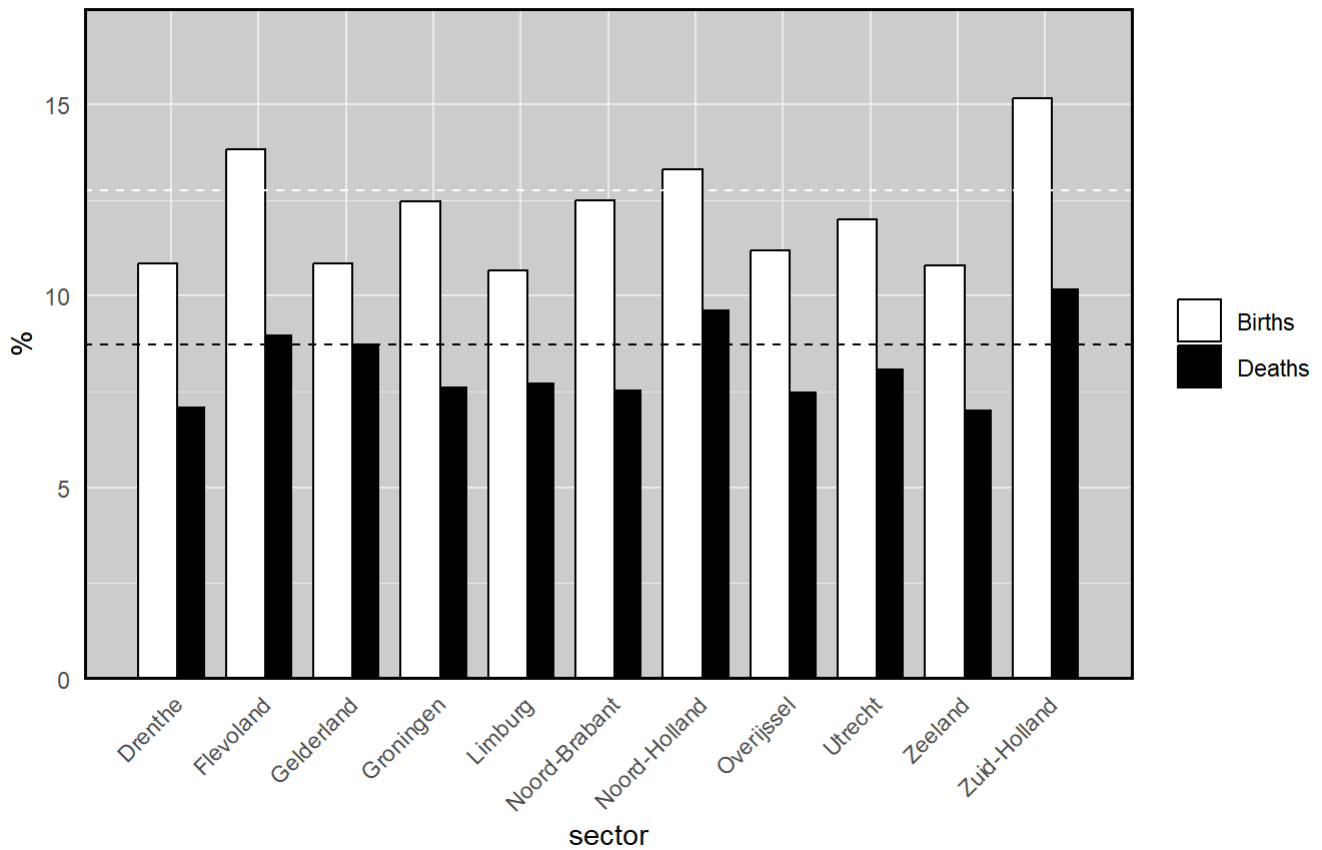
Per sector, mean given by dashed lines



The following graph visualizes establishment births and deaths by province.

Percentage of establishment births/deaths for '20-'21

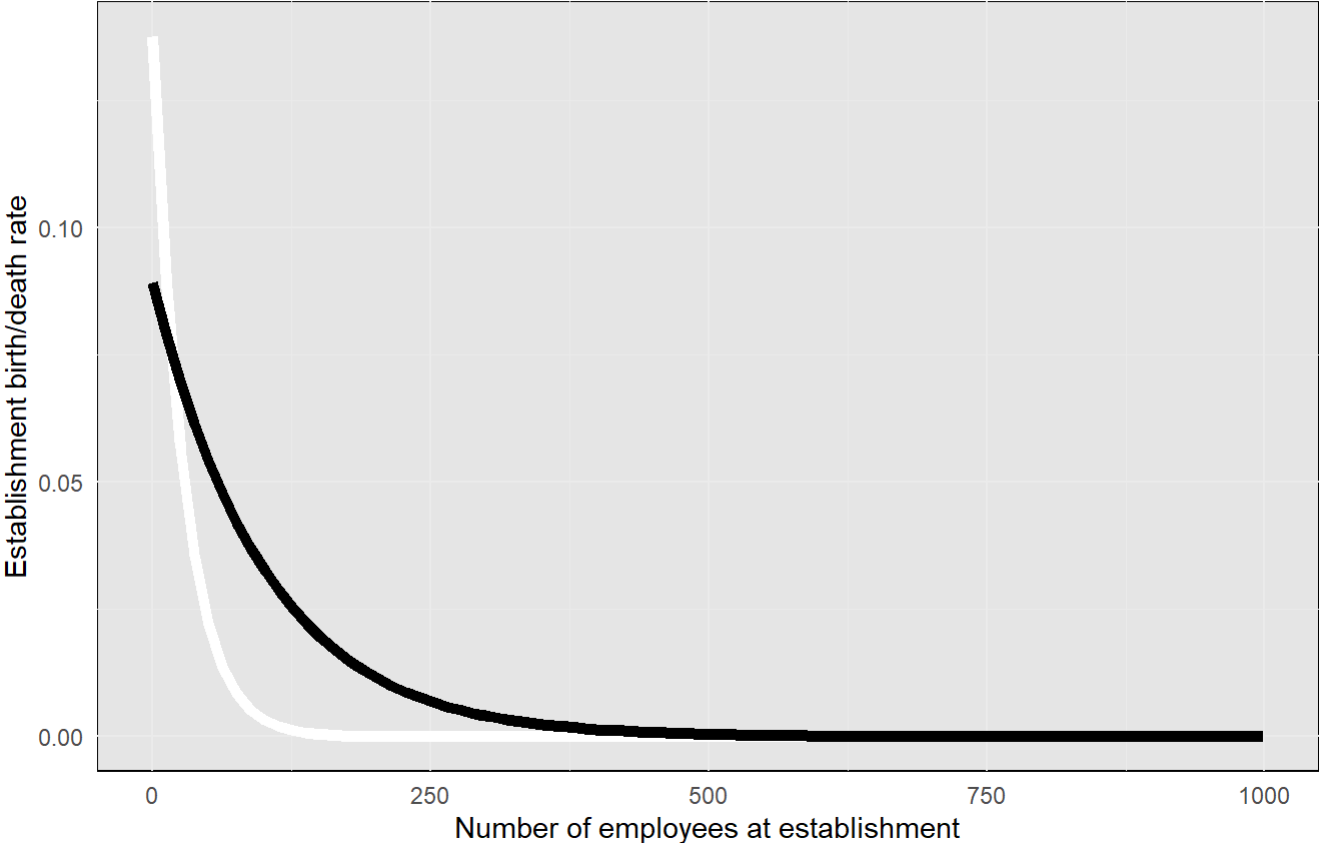
Per province, mean given by dashed lines



The following graph approximates the proportion of births/deaths based on the number of employees at the establishment with odds-ratios. The steepness of the birth curve relative to the death curve may be interpreted as new establishments mostly starting out very small with just a few employees and expanding later, while larger establishments may still be liable to dissolution.

Proportion of establishment births/deaths (2020-2021)

Curves estimated with a binomial model

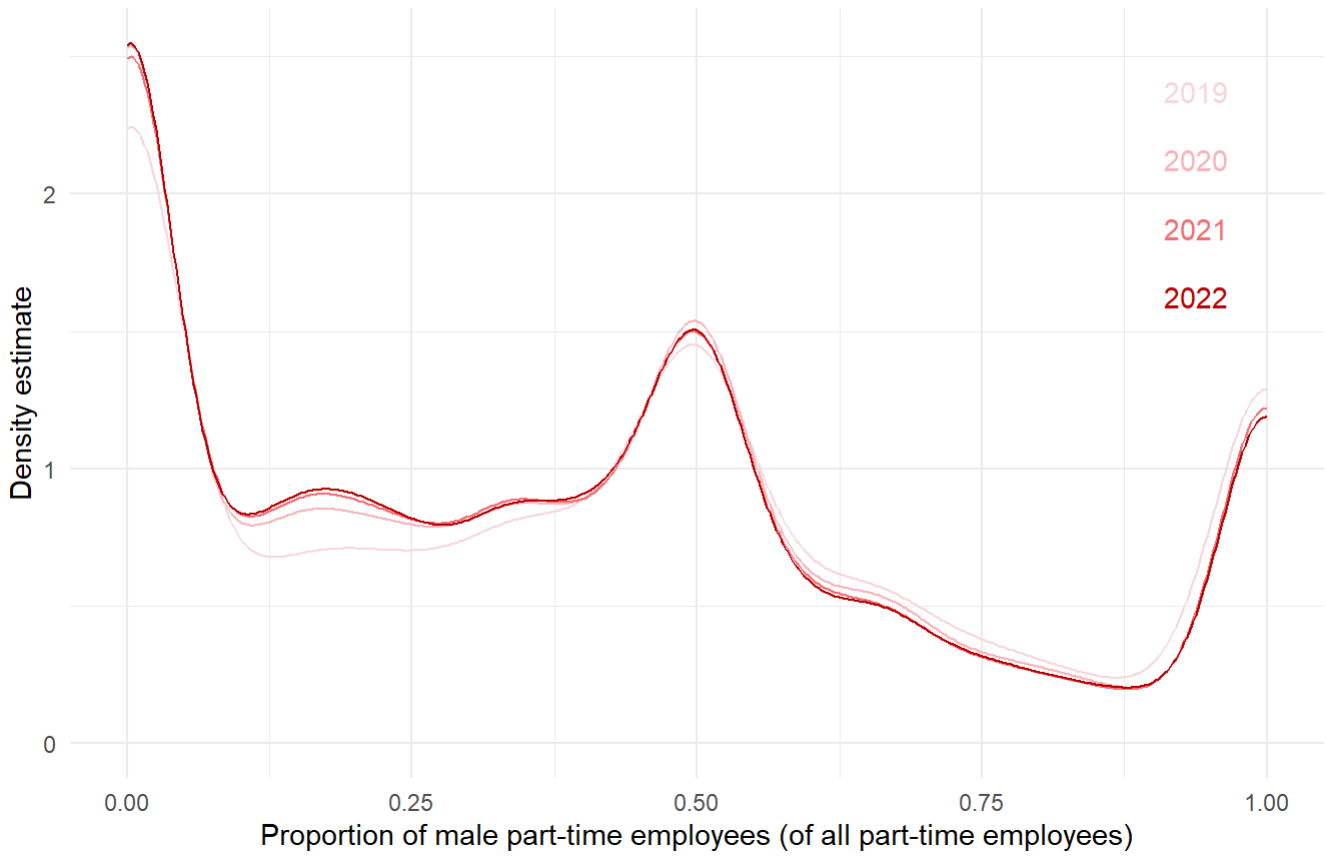


Gender comparison

The following graphs provide kernel density estimates for the distribution of gender proportions at the establishment level. These estimates are derived as follows: Gender proportions are calculated per establishment for full-time, part-time, and total employment. This is done by taking the number of male (full-time/part-time) employees and dividing it by the number of (full-time/part-time) male and female employees. E.g., if the proportion for part-time employees is 1, then all part-time employees at the establishment are male. Hence, we can see which proportions occur most and whether there are multiple peaks.

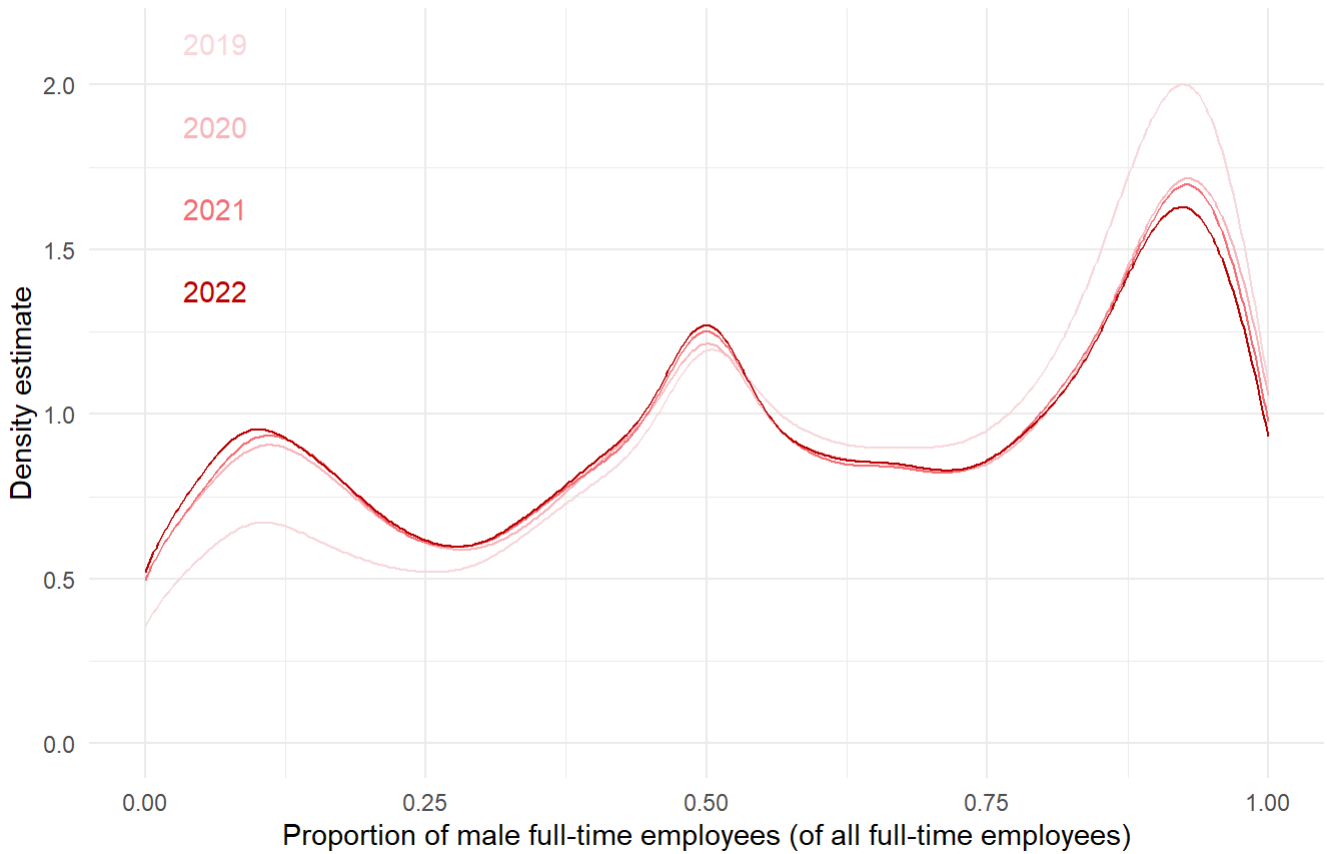
Establishment share of male part-time employees (2019-2022)

Kernel density estimate, excl. establishments < 20 employees



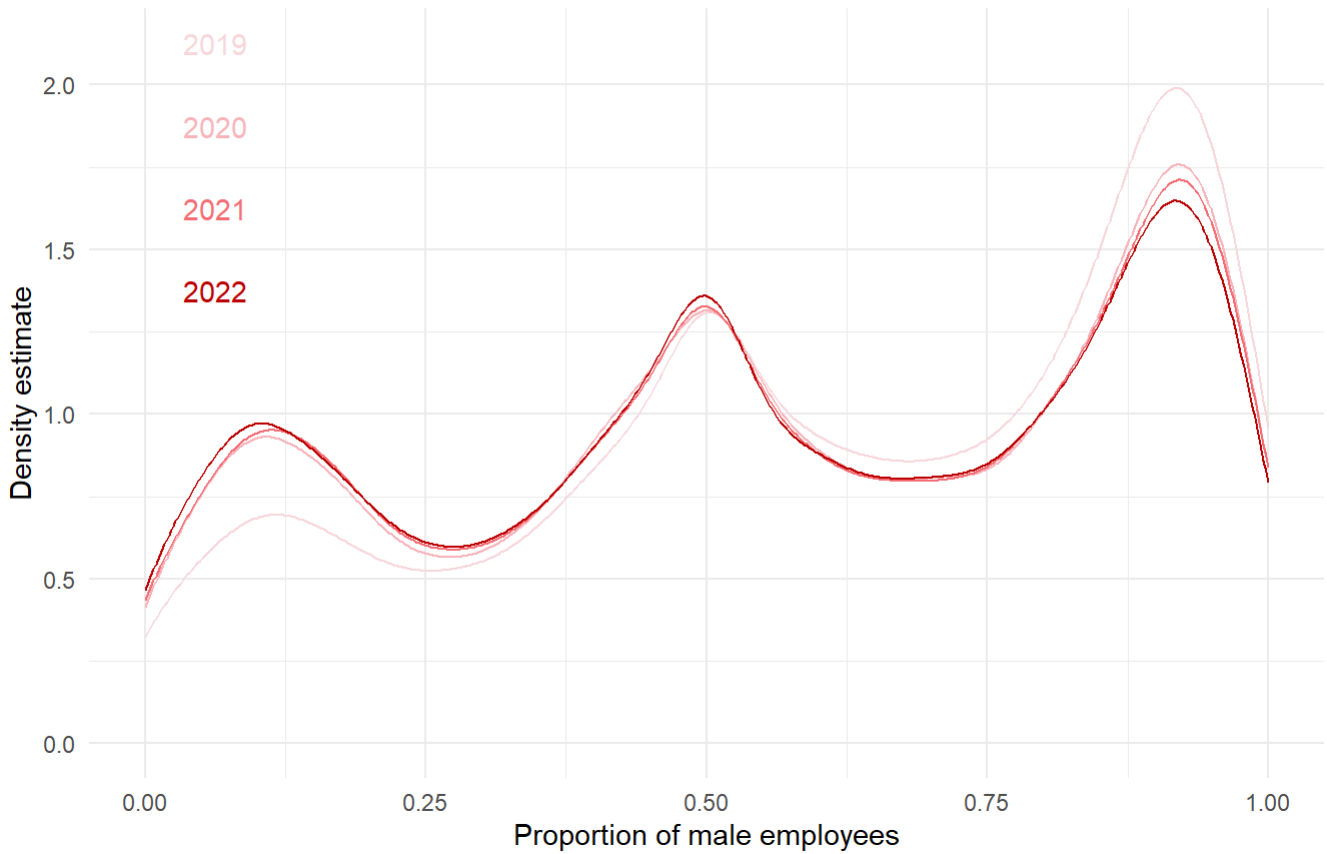
Establishment share of male full-time employees (2019-2022)

Kernel density estimate, excl. establishments < 20 employees



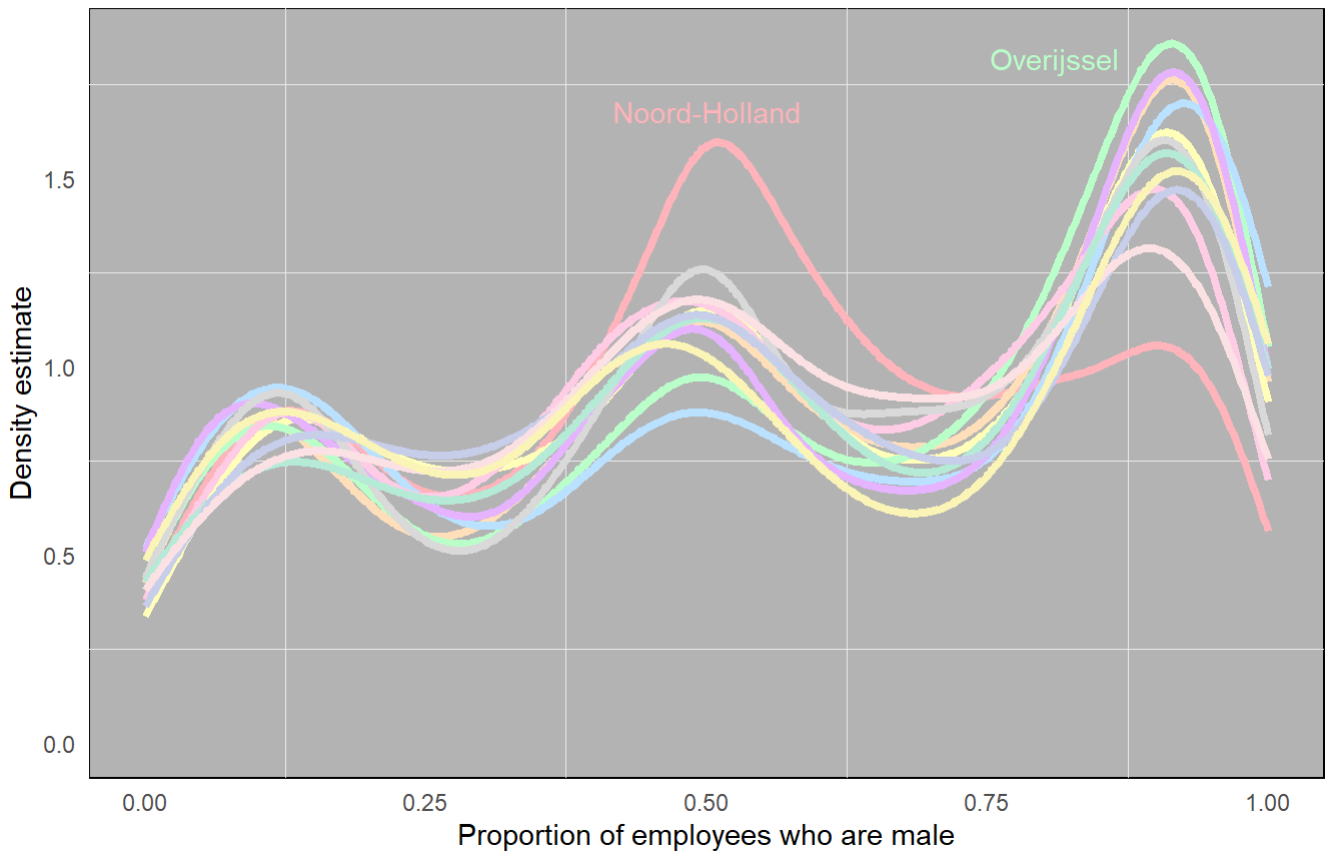
Establishment share of male employees (2019-2022)

Kernel density estimate, excl. establishments < 20 employees



Establishment share of male employees per province

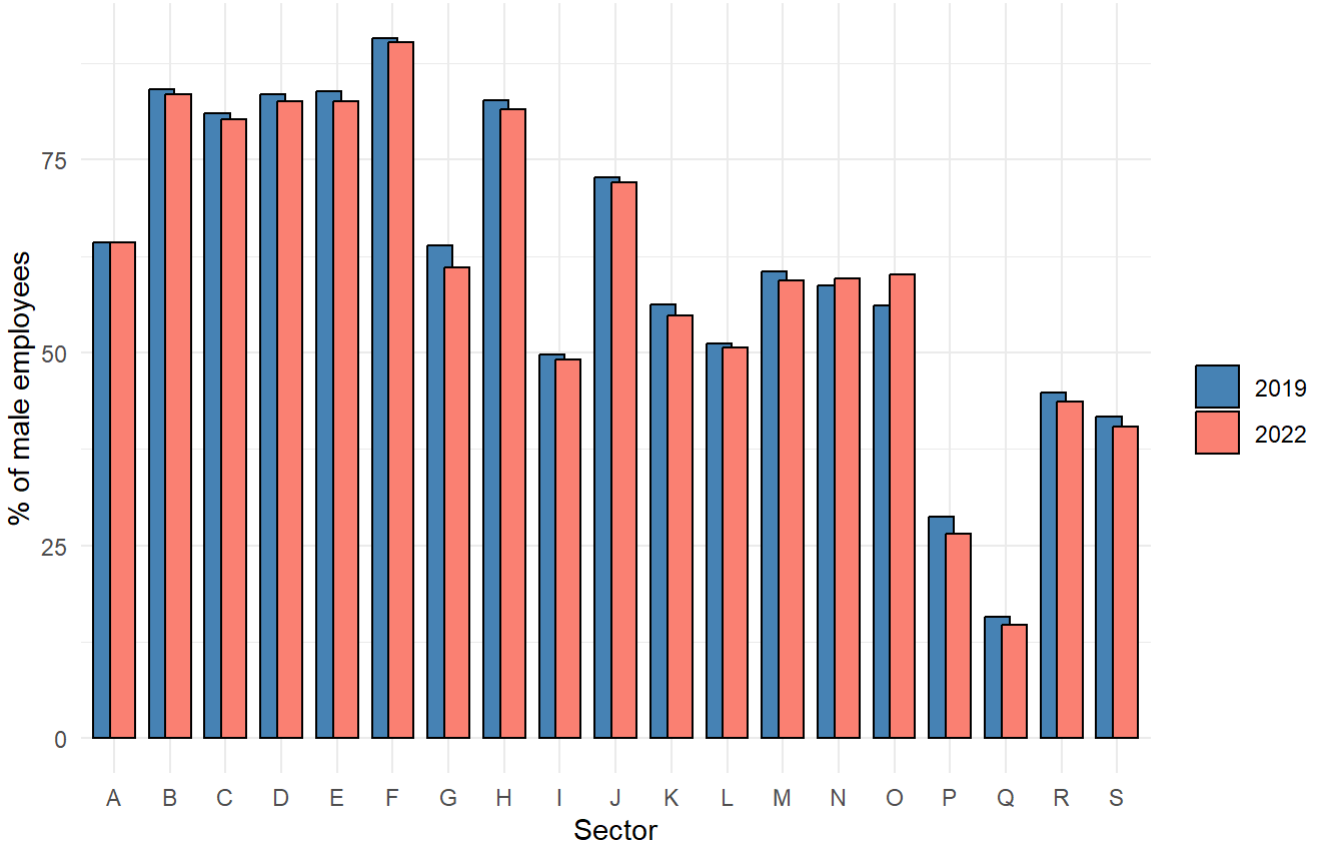
Kernel density estimate, excl. establishments < 20 employees



The following graphs give the mean gender proportion per sector in 2019 and 2022, to illustrate the change over this period. Note that these are unweighted averages.

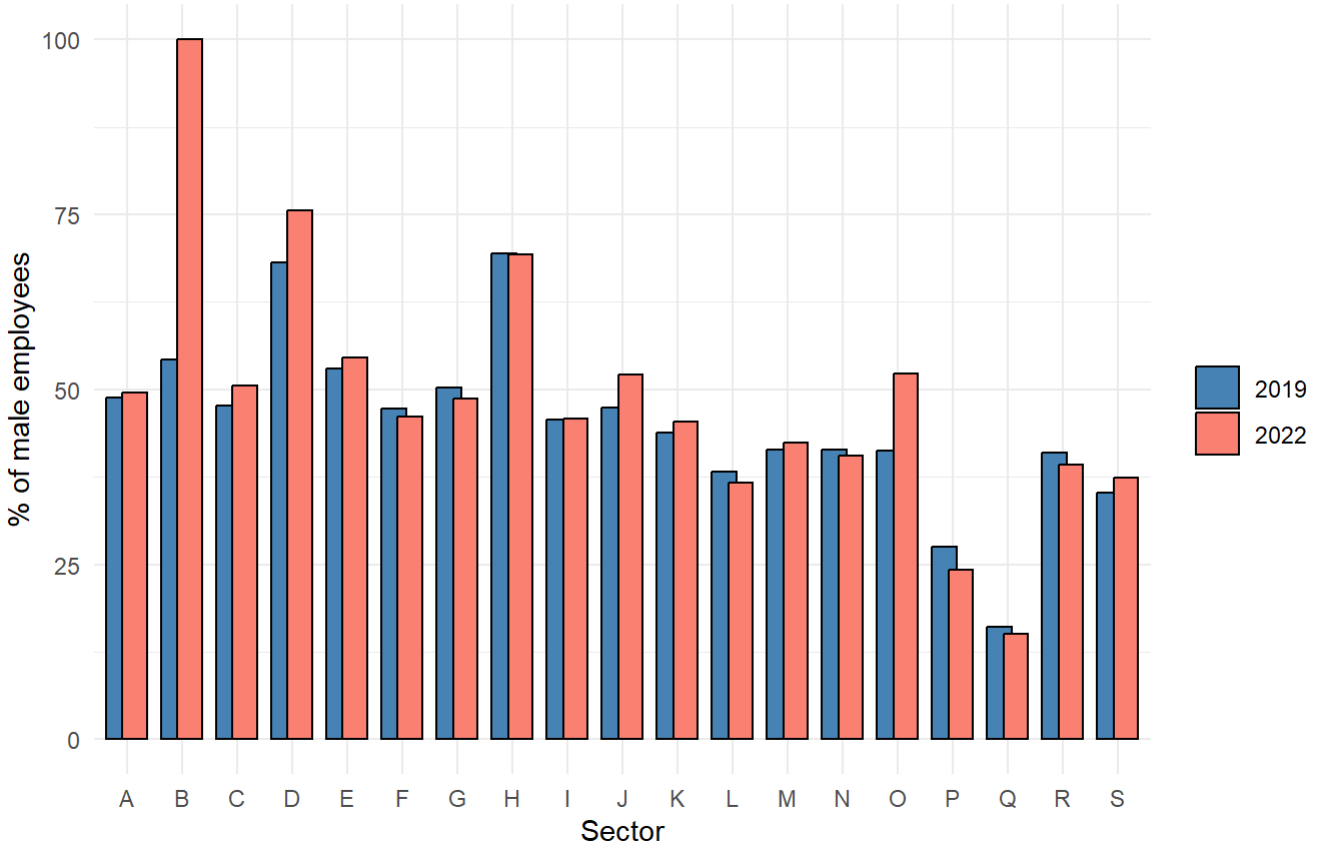
Proportion of male employees by sector

Bars give 2019, arrows give change from 2019-2022, excl. establishments with <20 employees



Proportion of male part-time employees by sector

Bars give 2019, arrows give change from 2019-2022, excl. establishments with <20 employees



Proportion of male full-time employees by sector

Bars give 2019, arrows give change from 2019-2022, excl. establishments with <20 employees

