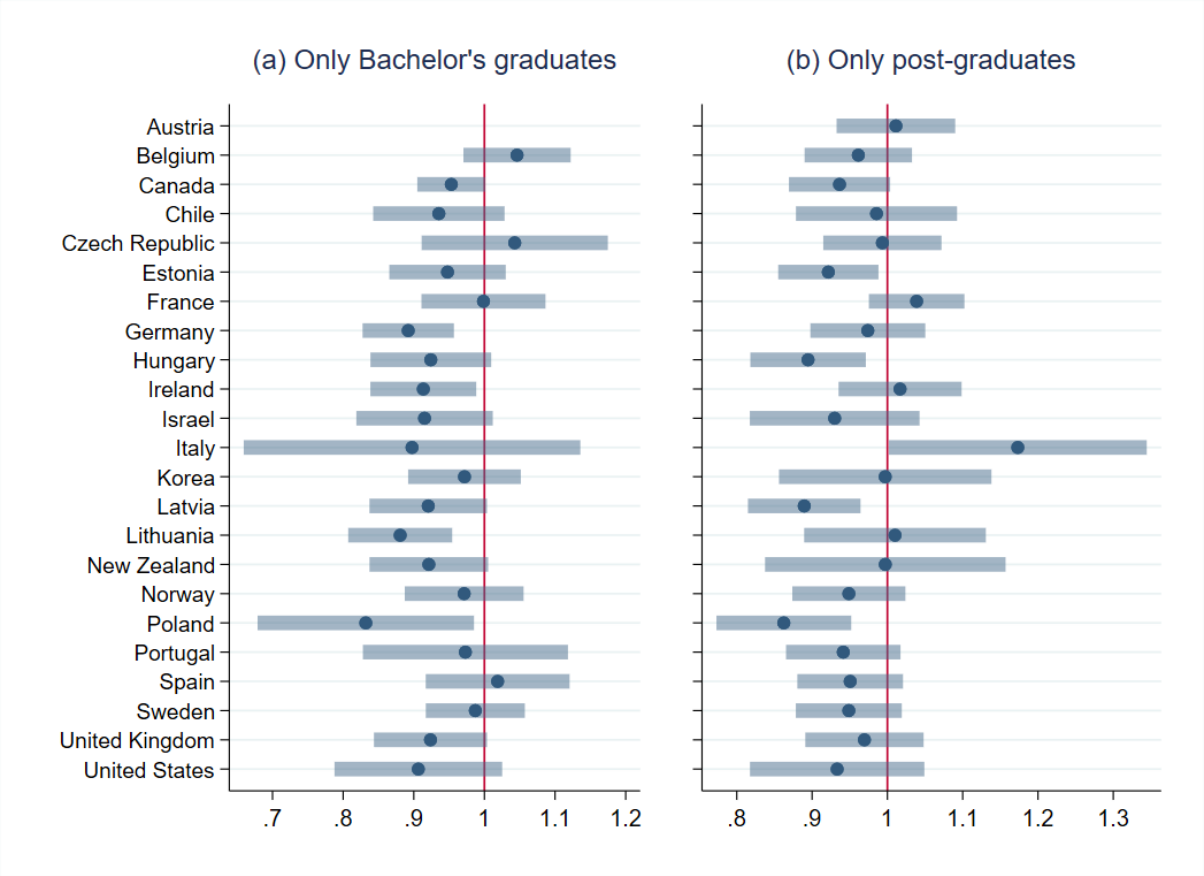
Appendix A. Additional results

Figure A.1: Relative Earnings in hourly wages

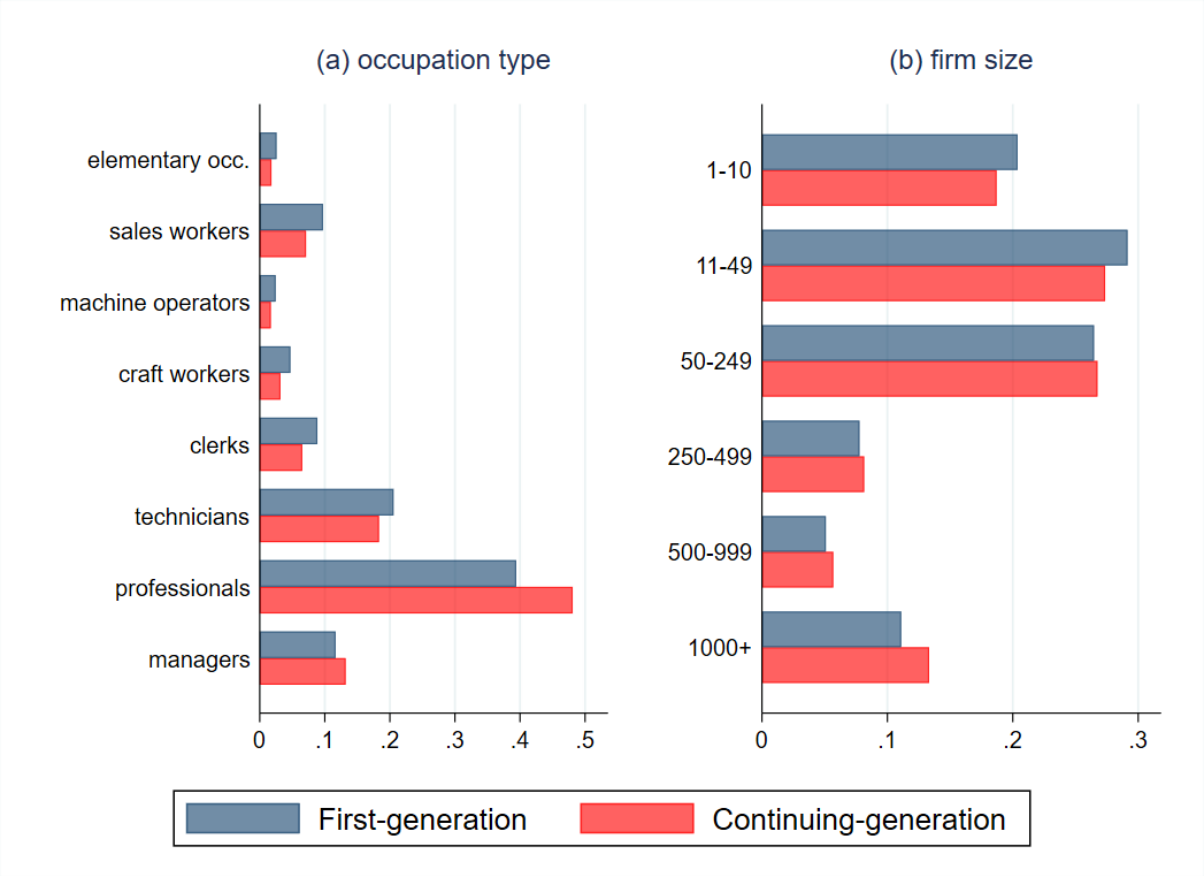
Note: The figure shows the ratios of the hourly wages of first- over continuing-generation graduates (conditional on age and gender). A number smaller than one indicates that first-generation graduates earn less than continuing-generation graduates. The shaded bars represent 95% confidence intervals.

Figure A.2: Relative Earnings for graduates with the same type of degree



Note: The figure displays the earnings ratios for first-generation graduates relative to continuing-generation graduates. A ratio below one indicates that first-generation graduates' earnings are smaller than that of continuing-generation graduates. The shaded bars represent 95% confidence intervals. Austria is an outlier: the earnings ratio for those with only a bachelor is 1.26 (not displayed to ease readability).

Figure A.3: Occupation types and firm size



Note: The figure shows the distribution of graduates (conditional on age, gender and country fixed effects) by type of occupation (panel (a) and firm size (panel (b)) separately for first- and continuing-generation graduates. The classification of occupation types is based on the authors' recoding of the official ISCO-2008. The categories for firm size are taken from PIAAC.

Table A.1: Summary Statistics (averages)

	numeracy	male	graduate	NoCollege NoCollegeParent	NoCollege CollegeParent	College NoCollegeParent	College CollegeParent	observations
AUT	279.9	0.46	0.45	0.46	0.09	0.24	0.22	2251
BEL	290.1	0.47	0.59	0.33	0.08	0.27	0.32	1884
CAN	281.7	0.48	0.62	0.26	0.12	0.27	0.35	5770
CHL	225.2	0.43	0.47	0.46	0.07	0.31	0.16	2331
CZE	275.1	0.42	0.32	0.57	0.11	0.19	0.13	2802
EST	289.3	0.47	0.52	0.32	0.17	0.22	0.29	3260
FRA	273.1	0.48	0.54	0.39	0.06	0.32	0.23	2977
DEU	287.6	0.48	0.47	0.36	0.17	0.18	0.29	2409
HUN	258.0	0.49	0.36	0.57	0.07	0.20	0.16	2620
IRL	267.4	0.43	0.66	0.28	0.06	0.36	0.30	2243
ISR	247.2	0.50	0.49	0.40	0.11	0.21	0.27	3042
ITA	243.0	0.46	0.23	0.75	0.02	0.18	0.06	2348
KOR	261.4	0.48	0.67	0.30	0.03	0.45	0.22	3594
LVA	262.8	0.45	0.48	0.42	0.10	0.26	0.22	2933
LTU	249.9	0.40	0.48	0.37	0.15	0.19	0.29	2890
NZL	257.2	0.42	0.53	0.35	0.12	0.22	0.31	1987
NOR	299.6	0.46	0.69	0.22	0.09	0.29	0.40	2029
POL	241.9	0.50	0.31	0.67	0.02	0.24	0.07	2861
PRT	259.5	0.41	0.45	0.51	0.04	0.29	0.16	1723
ESP	258.7	0.46	0.49	0.45	0.06	0.32	0.17	3116
SWE	297.4	0.52	0.56	0.26	0.18	0.20	0.36	1678
GBR	280.5	0.43	0.60	0.32	0.08	0.33	0.27	2376
USA	256.0	0.47	0.52	0.31	0.17	0.18	0.34	1738
Total	264.0	0.46	0.52	0.39	0.09	0.28	0.24	2610

Note: The table reports the means of the indicated variables in the samples used in our main analysis.

Table A.2: Average earnings conditional on gender and age

	NoCollege NoCollegeParent	NoCollege CollegeParent	College NoCollegeParent	College CollegeParent
AUT	3633	3975	5516	5521
BEL	3829	4496	6175	6434
CAN	3458	3819	4879	5334
CHL	1104	1064	2150	2522
CZE	2182	2395	3033	3037
DEU	3533	4193	5956	6566
ESP	1900	2170	3485	3717
EST	2298	2739	3523	3931
FRA	2540	2867	4311	4420
HUN	1823	2058	3191	3595
IRL	2836	3019	5456	5845
ISR	1632	2182	3397	4040
ITA	1955	2359	3171	3083
KOR	3232	3352	4085	4320
LTU	1958	2111	3153	3527
LVA	1441	1961	2834	3147
NOR	3981	3461	6674	7082
NZL	2472	2913	4166	4581
POL	1845	2004	2728	3182
PRT	1705	2110	3207	3462
SWE	3823	4159	4994	5390
GBR	2777	3092	4696	5015
USA	2539	3221	5573	6606

Note: the table reports the average predicted earnings for each of the indicated population groups in each country. These are the quantities that we describe in Section 5 as $\widehat{y}^{00}, \widehat{y}^{01}, \widehat{y}^{10}, \widehat{y}^{11}$.

Table A.3: Average numeracy score conditional on gender and age

	NoCollege NoCollegeParent	NoCollege CollegeParent	College NoCollegeParent	College CollegeParent
AUT	254	272	304	312
BEL	251	276	306	320
CAN	252	273	288	302
CHL	201	215	245	261
CZE	259	275	299	311
DEU	256	285	302	320
ESP	237	247	281	279
EST	261	281	302	315
FRA	242	258	293	304
HUN	235	263	287	302
IRL	237	251	276	288
ISR	218	244	263	279
ITA	234	259	267	277
KOR	238	258	267	281
LTU	229	242	261	273
LVA	239	261	278	291
NOR	270	281	305	317
NZL	219	246	269	295
POL	232	243	260	270
PRT	234	255	283	298
SWE	273	285	313	319
GBR	256	269	290	302
USA	214	238	269	297

Note: The table reports the average predicted numeracy scores for each of the indicated population groups in each country. These are the quantities that we describe in Section 5 as $\widehat{n}^{00}, \widehat{n}^{01}, \widehat{n}^{10}, \widehat{n}^{11}$.

Table A.4: Results from interval regression of monthly earnings

	AUT	BEL	CAN	CHL	CZE	EST	FRA	DEU	HUN	IRL	ISR	ITA
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
NoCollege&CollegeParent	342	667	361	-40	214	442	327	660	235	184	550	405
	(195)	(247)	(130)	(126)	(98)	(112)	(159)	(167)	(132)	(301)	(168)	(253)
College&NoCollegeParent	1,883	2,346	1,421	1,046	851	1,225	1,771	2,423	1,368	2,620	1,765	1,216
	(136)	(166)	(102)	(73)	(79)	(103)	(91)	(163)	(83)	(171)	(136)	(107)
College&CollegeParent	1,888	2,605	1,876	1,418	855	1,634	1,879	3,033	1,772	3,010	2,408	1,128
	(141)	(161)	(97)	(91)	(90)	(96)	(102)	(143)	(91)	(181)	(126)	(182)
1=male	2,181	1,551	1,470	835	1,233	1,351	1,036	2,006	877	1,891	1,219	1,495
	(108)	(129)	(75)	(63)	(60)	(76)	(76)	(114)	(64)	(139)	(103)	(80)
1=age 35-44	103	721	660	310	246	150	508	247	132	446	203	451
	(132)	(158)	(94)	(75)	(75)	(95)	(97)	(140)	(82)	(175)	(119)	(100)
1=age 45-54	722	1,180	795	266	298	-101	823	634	278	580	507	647
	(134)	(160)	(95)	(78)	(74)	(95)	(97)	(142)	(78)	(183)	(123)	(95)
N	2,094	1,765	5,585	2,061	2,607	2,942	2,738	2,310	2,354	2,080	2,586	1,997

	KOR	LVA	LTU	NZL	NOR	POL	PRT	ESP	SWE	GBR	USA
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
NoCollege&CollegeParent	120	520	153	441	-519	158	405	270	335	314	683
	(342)	(117)	(114)	(200)	(335)	(215)	(213)	(163)	(147)	(228)	(286)
College&NoCollegeParent	853	1,393	1,195	1,695	2,694	883	1,503	1,585	1,171	1,918	3,035
	(128)	(84)	(105)	(160)	(234)	(76)	(92)	(86)	(139)	(141)	(280)
College&CollegeParent	1,088	1,706	1,569	2,109	3,101	1,337	1,757	1,817	1,567	2,238	4,067
	(159)	(88)	(92)	(146)	(224)	(133)	(118)	(105)	(124)	(149)	(237)
1=male	2,070	905	928	1,645	2,766	878	663	995	925	1,654	1,548
	(107)	(69)	(77)	(120)	(164)	(62)	(82)	(75)	(95)	(116)	(191)
1=age 35-44	385	56	-47	506	1,058	192	325	578	430	342	613
	(138)	(88)	(93)	(146)	(203)	(75)	(100)	(97)	(118)	(139)	(230)
1=age 45-54	543	-281	-237	692	1,573	223	517	675	677	379	903
	(143)	(87)	(90)	(147)	(206)	(78)	(99)	(95)	(119)	(145)	(240)
N	3,508	2,572	2,539	1,846	1,171	2,055	1,551	2,749	1,408	2,262	1,637

Note: the table reports the coefficients and the standard errors of the interval regression model described in Section 5.

6 Appendix B. Literature Review

While extensive research has been conducted on the undergraduate experiences of first-generation college students, their labour market outcomes post-graduation remain largely unexplored. The existing literature predominantly focuses on the United States ([4, 5, 2, 3]) and England ([1]), leaving a gap in our understanding of first-generation graduates in other countries. Additionally, most of this evidence is derived from cohort studies, which may not reflect experiences broadly applicable across different cohorts and can be challenging to generalise. Furthermore, existing studies typically examine labour market outcomes within a narrow timeframe of 1 to 10 years after graduation, an interval too brief to fully encompass the peculiar career trajectories of first-generation graduates.

The first available evidence on first-generation graduates' outcomes comes from [5]. Analysing the outcomes of those who completed their bachelor's degrees in 1992/1993 in the US, they find a small and insignificant wage penalty for first-generation graduates 1 year after graduation, which, however, increases to 4% and becomes significant at the end of the fourth year in the labour market. Larger gaps of 11% and 9%, respectively, for men and women are found by [4] for the same cohort 10 years after graduation. The gap, especially for men, is well explained by first-generation graduates' different labour market choices (industry, occupation, hours worked, and location), which suggests that labour market factors, rather than educational ones, largely contribute to this gap.

In England, the only existing evidence on the labour market outcomes of first-generation graduates comes from [1]. Analysing data of the cohort born in 1989/1990, they find a 7.4% wage penalty for first-generation female graduates at age 25/26, but not for men. Two-thirds of the wage penalty for first-generation women is accounted for by factors like lower pre-university educational attainment, not attending elite universities, choosing degree courses with lower expected earnings, working in smaller firms, employment in non-degree-requiring jobs, and motherhood. First-generation men are different from continuing-generation men in their characteristics (working in jobs that do not require their degree and working in smaller firms), but they have higher returns on those characteristics. This could be because men are generally less likely to graduate, hence first-generation male graduates might be a more select group.

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