

Online Appendix of "Dual Returns to Experience"

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(not intended for publication)

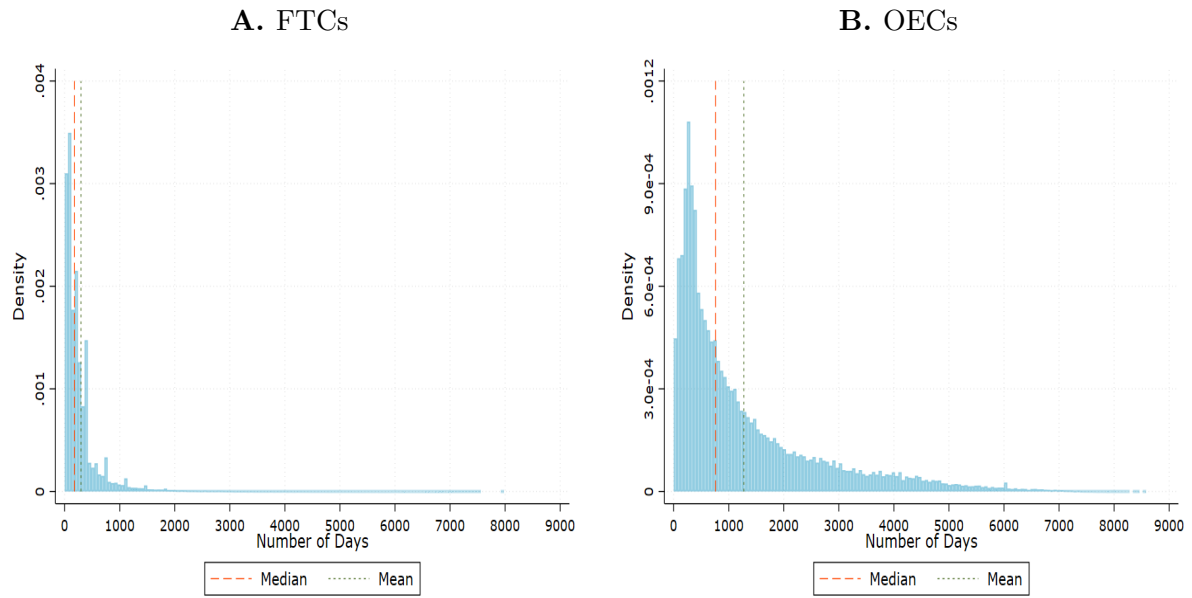
A Additional Results and Robustness Checks

Table A.1: Descriptive Statistics

	(1)	(2)	(3)
	All	FTC Entry	OEC Entry
Age	22.41	22.29	23.04
Female	0.523	0.516	0.558
College	0.367	0.339	0.506
LM Entry Outcomes			
Daily Wage	39.51	38.82	43.02
Days Worked	189.56	176.28	256.38
under OEC	33.71	2.05	193.01
under FTC	155.85	174.23	63.37
No. Jobs	3.33	3.46	2.68
Long-Term Outcomes			
Years in the Labor Market	10.50	10.52	10.40
Years of Actual Experience	5.82	5.67	6.56
under OEC	3.22	2.82	5.21
under FTC	2.60	2.85	1.35
No. Jobs	10.49	11.05	7.71
Never on FTC	0.093	0	0.558
Annual Wage Growth	0.065	0.063	0.077
Workers	242,774	202,514	40,260

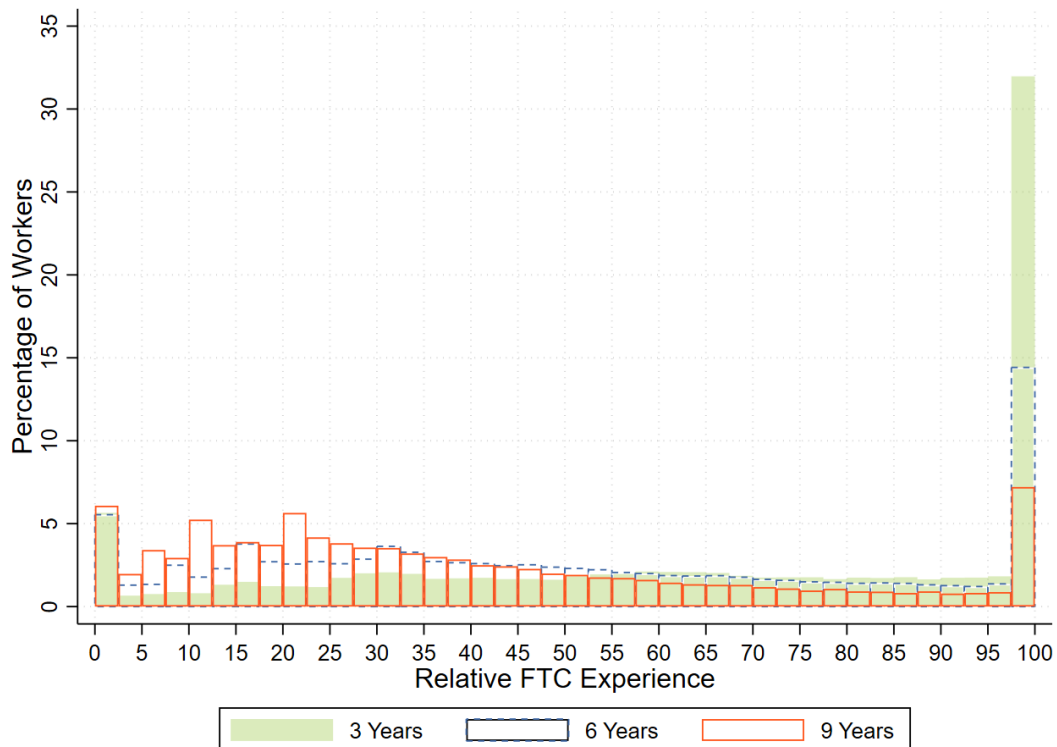
Notes: FTC (OEC) entry column refer to individuals who had a fixed-term (open-ended) contract during the first year of employment after the predicted year of graduation. Age measured at entry into the labor market (LM), i.e., the first year of employment after the predicted year of graduation. LM entry outcomes refer to the first year of employment. Long-term outcomes correspond to the last worker observation. Years in the labor market stand for years after predicted graduation. Actual experience measured at the last individual observation using daily information and converted into years. Annual wage growth stands for year-on-year wage growth averaged over all observations. Wages are expressed in 2018:12 euros deflated using the Spanish monthly consumer price index.

Figure A.1: Distribution of Contract Duration



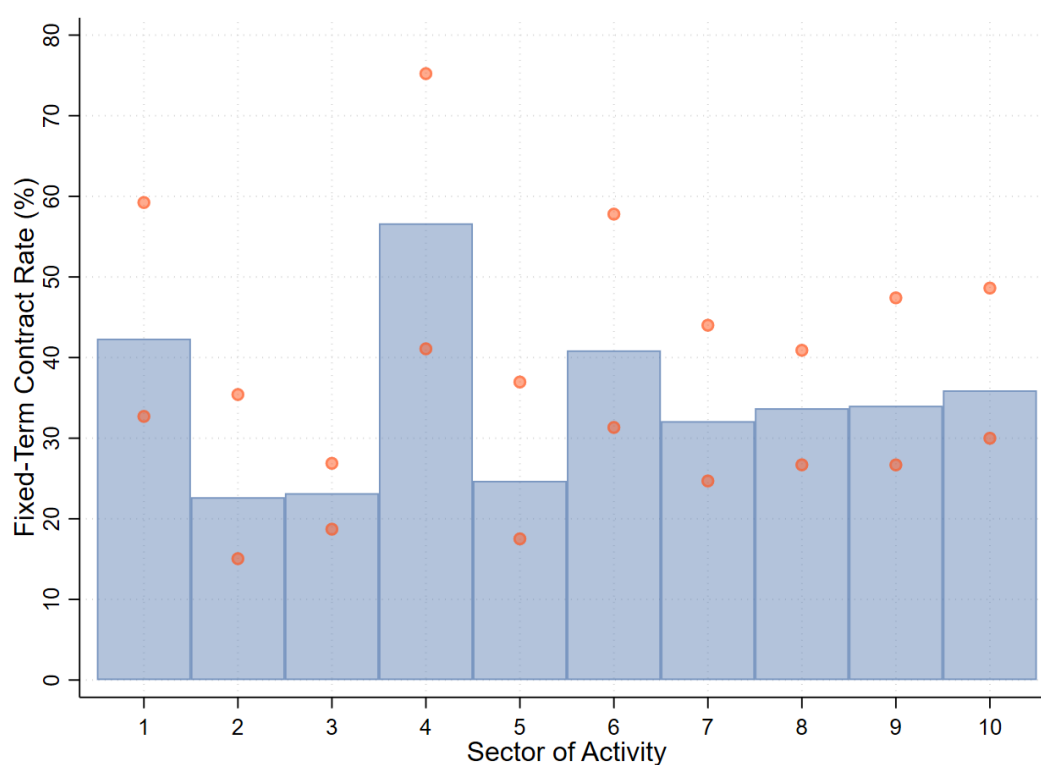
Notes: The figure plots the distribution of duration of fixed-term (Panel A) and open-ended (Panel B) contracts. Vertical lines represent the median (dashed line) and the mean (dotted line) of each distribution.

Figure A.2: Distribution of Workers by Relative FTC Experience



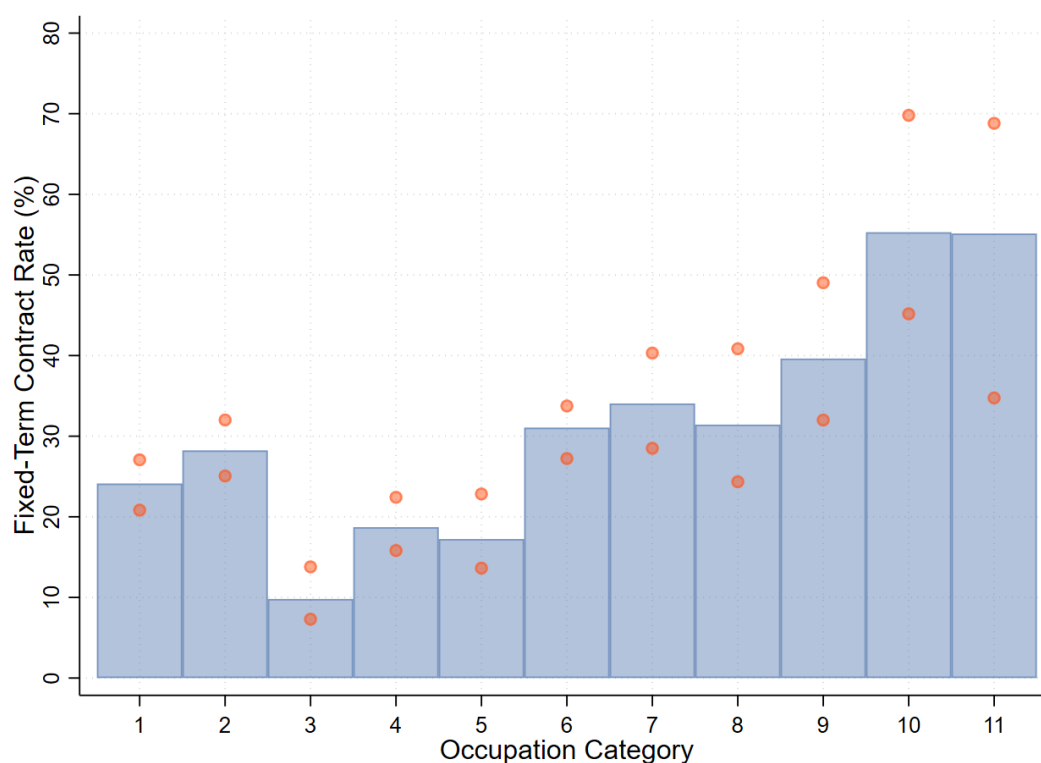
Notes: The figure shows the percentage of workers according to their relative experience in FTC after accumulating 3, 6 and 9 years of overall experience. Relative FTC experience refers to the percent of experience accumulated under fixed-term contracts relative to overall experience.

Figure A.3: Fixed-Term Contract Rate across Sectors



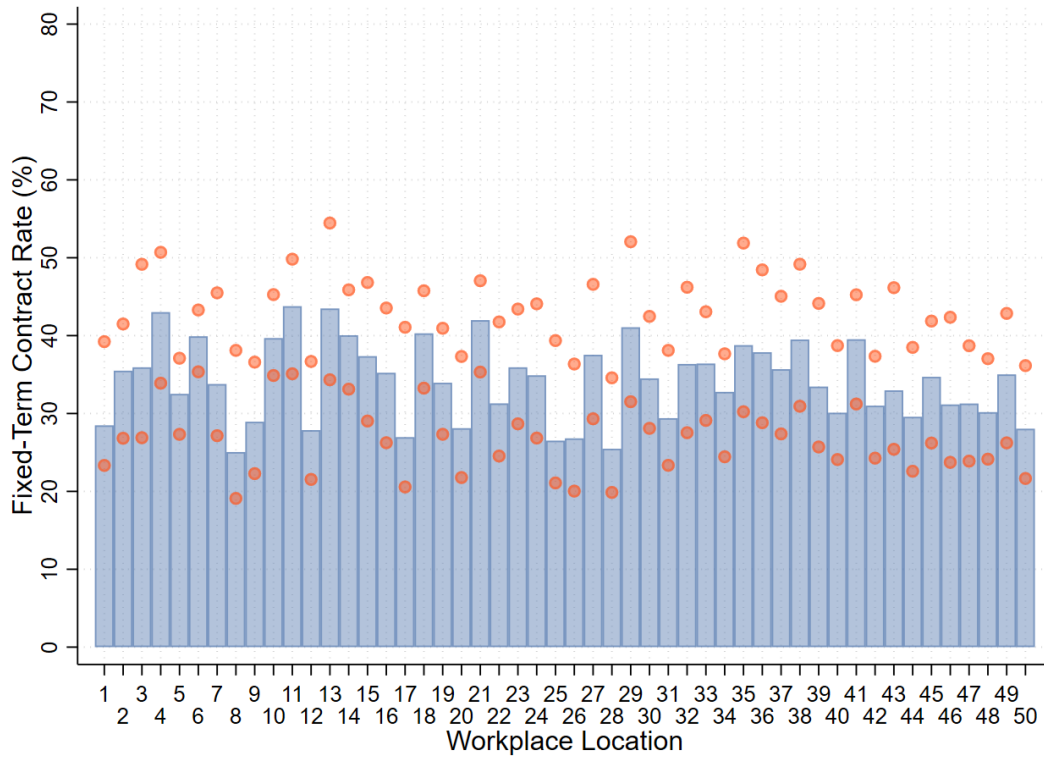
Notes: The figure plots the average fixed-term contract rate (employees on fixed-term contract relative all employees) over the period 1997-2018 along with minimum and maximum values across sectors using all workers in the MCVL. Sector of activities: 1. Primary sector, 2. Manufacturing, 3. Utilities, 4. Construction, 5. Trade and transport, 6. Accommodation and restaurants, 7. Business services, 8. Public sector, 9. Private health institutions and education, and 10. Other services.

Figure A.4: Fixed-Term Contract Rate across Occupations



Notes: The figure plots the average fixed-term contract rate (employees on fixed-term contract relative all employees) over the period 1997-2018 along with minimum and maximum values across occupation groups using all workers in the MCVL. Occupation groups: 1. College/Senior managers, 2. Technicians, 3. Administrative managers, 4. Managerial assistants, 5. First grade administrative workers, 6. Second grad administrative workers 7. Auxiliary administrative staff 8. First and second grade manual workers, 9. Third grade manual workers, and 10. Unqualified workers.

Figure A.5: Fixed-Term Contract Rate across Locations



Notes: The figure plots the average fixed-term contract rate (employees on fixed-term contract relative all employees) over the period 1997-2018 along with minimum and maximum values across provinces using all workers in the MCVL. Provinces: 1. Alava, 2. Albacete, 3. Alicante, 4. Almeria, 5. Avila, 6. Badajoz, 7. Baleares, 8. Barcelona, 9. Burgos, 10. Caceres, 11. Cadiz, 12. Castellon, 13. Ciudad Real, 14. Cordoba, 15. A Coruna, 16. Cuenca, 17. Girona, 18. Granada, 19. Guadalajara, 20. Guipuzcoa, 21. Huelva, 22. Huesca, 23. Jaen, 24. Leon, 25. Lleida, 26. La Rioja, 27. Lugo, 28. Madrid, 29. Malaga, 30. Murcia, 31. Navarra, 32. Ourense, 33. Asturias, 34. Palencia, 35. Las Palmas, 36. Pontevedra, 37. Salamanca, 38. Tenerife, 39. Cantabria, 40. Segovia, 41. Sevilla, 42. Soria, 43. Tarragona, 44. Terual, 45. Toledo, 46. Valencia, 47. Valladolid, 48. Vizcaya, 49. Zamora, and 50. Zaragoza.

Table A.2: Dual Returns to Experience: Gap in Returns to Experience

	OEC vs FTC (1)	Male vs Female (2)	College vs Non-college (3)
Experience OEC	0.0500*** (0.0005)		
Experience FTC	0.0421*** (0.0006)		
Experience \times		0.0519*** (0.0005)	
Experience \times Female		-0.0044*** (0.0003)	
Experience \times			0.0439*** (0.0005)
Experience \times College			0.0082*** (0.0003)
Gap in Returns (%)	18.52*** (1.05)	9.16*** (0.53)	18.65*** (0.65)
Observations	1,954,097	1,954,097	1,954,097
R-squared	0.3064	0.3062	0.3074

Notes: Experience is measured in days and then it is converted into years. OEC and FTC stand for experience acquired under open-ended and fixed-term contracts, respectively. All specifications control for the same variables as the fixed effect panel data model estimates in Column (4) in Table 1. Standard errors clustered at the individual level in parenthesis. Gap in contract-specific returns is computed as $100 \times (\frac{\gamma_{oec}}{\gamma_{ftcc}} - 1)$ and standard errors are obtained using the Delta method. The gaps in returns to experience between men and women, and between college and non-college educated individuals, are constructed similarly, without including contemporaneous wage gaps. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The R-squared reported is within workers.

Table A.3: Dual Returns to Experience: Robustness to Income Measure

	Censored	Tax Data	Pooled Income
Experience OEC	0.0398*** (0.0004)	0.0474*** (0.0006)	0.0495*** (0.0005)
Experience FTC	0.0371*** (0.0006)	0.0410*** (0.0007)	0.0439*** (0.0006)
Observations	1,954,097	1,508,948	1,954,097
R-squared	0.3112	0.2306	0.2684

Notes: Experience is measured in days and then it is converted into years. OEC and FTC stand for experience acquired under open-ended and fixed-term contracts, respectively. Censored specification uses original labor income without correcting for top-coding. Tax data uses information on income coming from tax records for the period 2005-2018. Pooled income consider as measure of daily wages income earned from *all* employers in a given year divided by total days worked in such year. All specifications control for the same variables as the fixed effect panel data model estimates in Column (4) in Table 1. Standard errors clustered at the individual level in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The R-squared reported is within workers.

Table A.4: Dual Returns to Experience: Robustness to Life-Cycle Control

	Cubic Potential Exp.	Excl. Potential Exp	Age Effects
	(1)	(2)	(3)
Experience OEC	0.0514*** (0.0005)	0.0456*** (0.0005)	0.0481*** (0.0005)
Experience FTC	0.0433*** (0.0006)	0.0394*** (0.0006)	0.0414*** (0.0006)
Observations	1,954,097	1,954,097	1,954,097
R-squared	0.3152	0.3080	0.3089

Notes: Experience is measured in days and then it is converted into years. OEC and FTC stand for experience acquired under open-ended and fixed-term contracts, respectively. Potential experience stands for number of years after labor market entry. All specifications control for the same variables as the fixed effect panel data model estimates in Column (4) in Table 1 except for potential experience fixed effects. Column (1) controls parametrically for potential experience but includes only the squared and cubic terms of potential experience, as the linear term is not identified in the presence of year and individual fixed effects. Column (2) does not include any control for life-cycle differences. Column (3) includes as control fixed effects for age-categories. Standard errors clustered at the individual level in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The R-squared reported is within workers.

Table A.5: Dual Returns to Experience: Robustness to 2012 EPL Reform

	OLS		Fixed-Effects	
	(1)	(2)	(3)	(4)
Experience	0.0296*** (0.0004)		0.0547*** (0.0005)	
Experience $\times \mathbf{1}[t \geq 2012]$	-0.0003 (0.0003)		-0.0053*** (0.0003)	
Experience OEC		0.0353*** (0.0005)		0.0535*** (0.0005)
Experience OEC $\times \mathbf{1}[t \geq 2012]$		-0.0003 (0.0004)		-0.0032*** (0.0003)
Experience FTC		0.0221*** (0.0005)		0.0513*** (0.0007)
Experience FTC $\times \mathbf{1}[t \geq 2012]$		-0.0024*** (0.0004)		-0.0114*** (0.0004)
Observations	1,954,097	1,954,097	1,954,097	1,954,097
R-squared	0.6330	0.6343	0.3062	0.3073

Notes: Experience is measured in days and then it is converted into years. OEC and FTC stand for experience acquired under open-ended and fixed-term contracts, respectively. All specifications control for the same variables as the fixed effect panel data model estimates in Column (4) in Table 1. OLS regressions include additional controls for education and gender. Standard errors clustered at the individual level in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The R-squared reported in columns (3) and (4) is within workers.

Table A.6: Dual Returns to Experience: Robustness to Cohort Analysis

	Graduation year cohorts			
	1996	1997	1998	1999
Experience OEC	0.0491*** (0.0018)	0.0513*** (0.0018)	0.0522*** (0.0018)	0.0537*** (0.0017)
Experience FTC	0.0421*** (0.0022)	0.0450*** (0.0022)	0.0448*** (0.0022)	0.0449*** (0.0022)
Observations	154,435	158,164	160,100	161,174
R-squared	0.3050	0.2993	0.2990	0.3039

Notes: Experience is measured in days and then it is converted into years. OEC and FTC stand for experience acquired under open-ended and fixed-term contracts, respectively. All specifications control for the same variables as the fixed effect panel data model estimates in Column (4) in Table 1. Standard errors clustered at the individual level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. The R-squared reported in columns (3) and (4) is within workers.

Table A.7: Dual Returns to Experience: Robustness to Contract-Specific Tenure

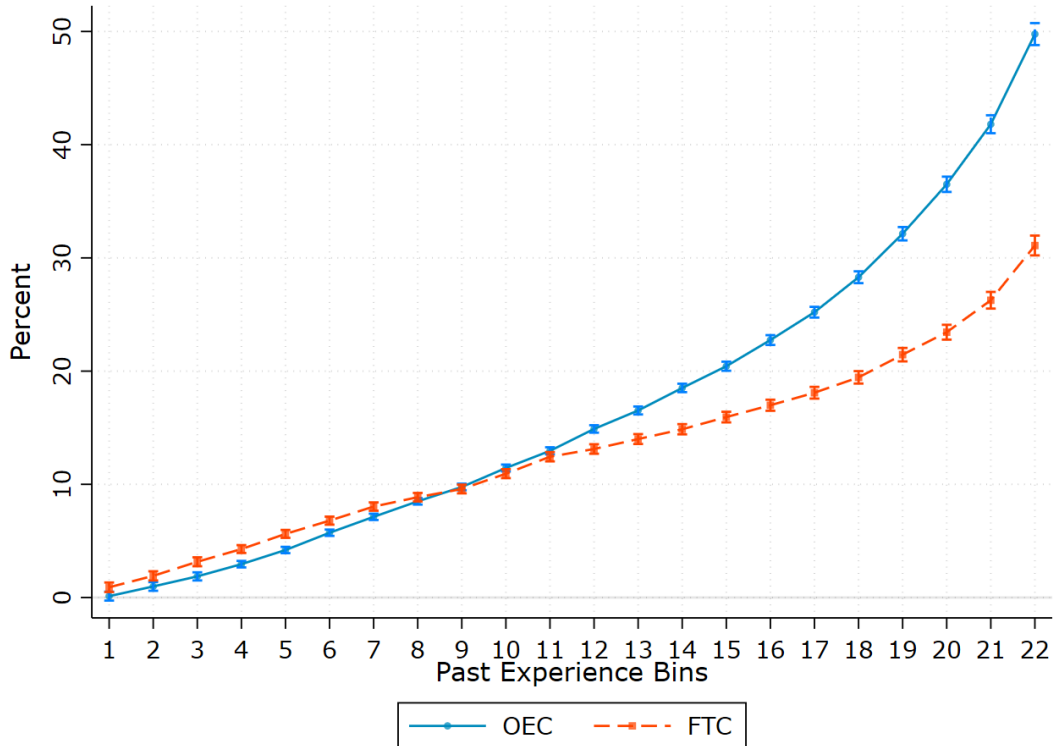
	OLS		Fixed-Effects	
	(1)	(2)	(3)	(4)
Experience OEC	0.0357*** (0.0004)	0.0357*** (0.0004)	0.0499*** (0.0005)	0.0502*** (0.0005)
Experience FTC	0.0200*** (0.0004)	0.0210*** (0.0004)	0.0431*** (0.0006)	0.0433*** (0.0006)
Observations	1,954,097	1,954,097	1,954,097	1,954,097
R-squared	0.6344	0.6343	0.3064	0.3066

Notes: Experience is measured in days and then it is converted into years. OEC and FTC stand for experience acquired under open-ended and fixed-term contracts, respectively. Specifications (1) and (3) include contract-specific quadratic polynomials in tenure. Specification (2) and (4) include contract-specific cubic polynomials in tenure. All specifications control for the same variables as the fixed effect panel data model estimates in Column (4) in Table 1, except for tenure. OLS regressions include additional controls for education and gender. Standard errors clustered at the individual level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. The R-squared reported in columns (3) and (4) is within workers.

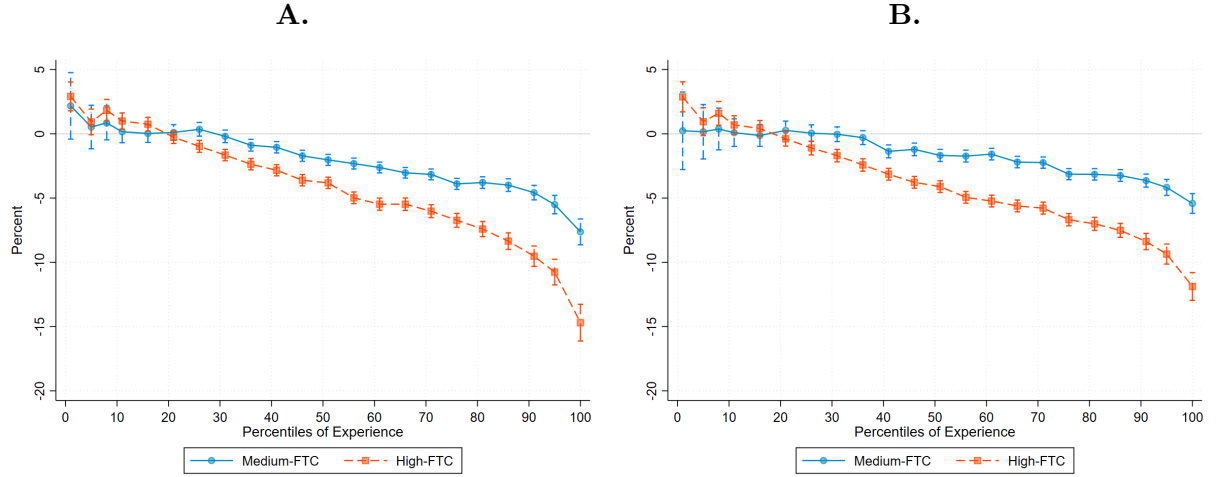
Table A.8: Dual Returns to Experience: Robustness to Gender-Specific Returns

	Males		Females	
	OLS	FE	OLS	FE
	(1)	(2)	(3)	(4)
Experience OEC	0.0418*** (0.0005)	0.0507*** (0.0007)	0.0385*** (0.0005)	0.0490*** (0.0007)
Experience FTC	0.0234*** (0.0006)	0.0406*** (0.0008)	0.0232*** (0.0006)	0.0427*** (0.0008)
Observations	934,294	934,294	1,019,803	1,019,803
R-squared	0.6073	0.2870	0.6282	0.3242

Notes: Experience is measured in days and then it is converted into years. OEC and FTC stand for experience acquired under open-ended and fixed-term contracts, respectively. All specifications include controls for a quadratic polynomial in tenure, type of contract, a dummy for part-time jobs, indicators for occupation-skill category (2), sector of activity (10), workplace location (50), small and medium enterprises (plant size < 50), young organizations (plant age < 10), potential experience dummies (5), and year dummies (22). OLS regressions include additional controls for education. Standard errors clustered at the individual level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. The R-squared reported in Columns (3) and (4) is within workers.

Figure A.6: Robustness to Non-Parametric Experience: Returns to Experience Accumulated under Different Contracts

Notes: Estimates ($\times 100$) and 95% confidence intervals of return to experience in fixed-term (FTC) and open-ended (OEC) contracts. Standard errors are clustered at the individual level. Contract-specific experience is measured in days, converted into years, and then discretized into 22 bins. Number of bins are chosen to have a sufficient and balanced number of observations within each cell. The model controls for the same variables as the fixed effect panel data model in Column (4) in Table 1.

Figure A.7: Robustness to Thresholds: Incidence of Temporary Employment

Notes: Estimates ($\times 100$) and 95% confidence intervals of the scarring effects of temporary employment, $\beta_{2(q)}$ and $\beta_{3(q)}$, from equation 8. Standard errors are clustered at the individual level. Medium-FTC (High-FTC) incidence refers to individuals whose actual experience on a temporary contract relative to overall actual experience is in Panel A between 0.5 and 0.9 (above 0.9) and in Panel B between 0.3 and 0.6 (above 0.6).

Table A.9: Dual Returns to Experience: Continuously Employed Workers

Actual experience, % of potential experience	$\geq 0\%$ (1)	$\geq 50\%$ (2)	$\geq 80\%$ (3)	$\geq 90\%$ (4)	$= 100\%$ (5)
Current FTC	-0.0370*** (0.0009)	-0.0418*** (0.0012)	-0.0540*** (0.0018)	-0.0611*** (0.0024)	-0.0716*** (0.0059)
Share of Experience FTC	-0.1984*** (0.0023)	-0.1670*** (0.0030)	-0.1348*** (0.0041)	-0.1233*** (0.0050)	-0.1001*** (0.0076)
Observations	1,954,097	1,235,490	636,241	411,096	183,045
R-squared	0.3047	0.2899	0.2751	0.2621	0.2305

Notes: Experience is measured in days and then it is converted into years. Share of Experience FTC stands for experience acquired under fixed-term contracts divided by 1 + total actual experience. All specifications include individual fixed effects, a quadratic polynomial in tenure, a dummy for part-time jobs, indicators for occupation-skill category (2), sector of activity (10), workplace location (50), small and medium enterprises (plant size < 50), young organizations (plant age < 10), potential experience dummies (5), and year dummies (22). Standard errors clustered at the individual level in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The R-squared is within workers.

Table A.10: Worker Observed in the Matched Sample

	(1)
Actual Experience	0.0047*** (0.0002)
College	0.0722*** (0.0019)
Female	0.0302*** (0.0016)
High-Skill	0.1255*** (0.0024)
Part-Time	-0.0120*** (0.0015)
FTC	0.1110*** (0.0014)
Tenure	0.0101*** (0.0004)
Manufacturing	0.0538*** (0.0067)
Construction	0.2760*** (0.0123)
Services	0.1267*** (0.0065)
Big City	0.0191*** (0.0015)
Observations	1,954,097
R-squared	0.0593

Notes: The table reports the results of a linear probability model where the dependent variable is an indicator for workers observed in the matched sample for which firm fixed effects are obtained, as explained in Section 5.4. FTC is an indicator variable for fixed-term contracts. Big city includes the largest four cities in Spain: Madrid, Barcelona, Valencia, and Sevilla. Standard errors clustered at the individual level in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.11: Dual Returns to Experience: Firm-cluster fixed effects (BLM, 2022)

	Baseline Sample		BLM Restricted Sample		
	(1)	(2)	(3)	(4)	(5)
Experience OEC	0.0500*** (0.0005)	0.0575*** (0.0011)	0.0570*** (0.0011)	0.0562*** (0.0011)	0.0564*** (0.0011)
Experience FTC	0.0421*** (0.0006)	0.0440*** (0.0013)	0.0448*** (0.0013)	0.0444*** (0.0013)	0.0446*** (0.0013)
Gap in Returns (%)	18.51*** (1.05)	30.50*** (2.21)	27.18*** (2.05)	26.45*** (2.05)	26.43*** (2.03)
Observations	1,954,097	456,364	456,364	456,364	456,364
R-squared	0.3064	0.2372	0.2212	0.2180	0.2174
Firm-clusters	NO	NO	$K = 5$	$K = 50$	$K = 100$

Notes: Firm-clusters are defined following Bonhomme et al. (2022b) using a k -means clustering minimization algorithm over the empirical distributions of log earnings, after controlling for time, age, education and part-time status fixed effects. The classification is based on all workers in the MCVL employed by firms for which we observe at least 10 workers each year between 1997-2018. Experience is measured in days and then it is converted into years. All specifications include the same set of controls as the fixed effect panel data model estimates in Column (4) in Table 1. Standard errors clustered at the individual level in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The R-squared is within workers.

Table A.12: Dual Returns to Experience: Match Quality - First stage

	Experience OEC	Experience FTC	Tenure	Tenure squared
Experience OEC, deviation	0.6185*** (0.0010)	-0.2690*** (0.0009)	-0.0030** (0.0013)	-0.0771*** (0.0118)
Experience FTC, deviation	-0.4866*** (0.0013)	0.6706*** (0.0011)	0.0029* (0.0016)	-0.1428*** (0.0140)
Tenure, deviation	0.0529*** (0.0006)	0.0233*** (0.0006)	0.7992** (0.0009)	-1.5503*** (0.0078)
Tenure squared, deviation	0.0014*** (0.0001)	0.0008*** (0.0001)	0.0093** (0.0001)	1.0715*** (0.0006)
Observations	1,929,990	1,929,990	1,929,990	1,929,990
Partial R-squared	0.2116	0.2117	0.5511	0.8357
Kleibergen-Paap rk Wald F statistic		10722.75		
Sanderson-Windmeijer F statistics	53399.94	53796.77	2.9e+06	1.7e+07

Notes: Experience is measured in days and then it is converted into years. All specifications include individual fixed effects, a quadratic polynomial in tenure, a dummy for part-time jobs, indicators for occupation-skill category (2), sector of activity (10), workplace location (50), small and medium enterprises (plant size < 50), young organizations (plant age < 10), potential experience dummies (5), and year dummies (22). Standard errors clustered at the individual level in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.13: Dual Returns to Experience: Match Quality - First stage

	Experience OEC	Experience FTC	Tenure	Tenure squared
Experience OEC, deviation	0.4899*** (0.0015)	-0.3355*** (0.0013)	0.1638*** (0.0013)	1.1866*** (0.0104)
Experience FTC, deviation	-0.5443*** (0.0015)	0.6156*** (0.0012)	0.1332*** (0.0015)	0.9268*** (0.0119)
Tenure, deviation	0.0965*** (0.0011)	-0.0355*** (0.0009)	0.7144*** (0.0013)	-2.1725*** (0.0113)
Tenure squared, deviation	0.0005*** (0.0001)	0.0034*** (0.0001)	0.0064*** (0.0001)	1.0510*** (0.0005)
Observations	1,929,990	1,929,990	1,929,990	1,929,990
Partial R-squared	0.0091	0.0091	0.0128	0.0860
Kleibergen-Paap rk Wald F statistic		1547.810		
Sanderson-Windmeijer F statistics	6225.21	6448.12	18306.89	2.6e+05

Notes: Experience is measured in days and then it is converted into years. All specifications include individual fixed effects, a quadratic polynomial in tenure, a dummy for part-time jobs, indicators for occupation-skill category (2), sector of activity (10), workplace location (50), small and medium enterprises (plant size < 50), young organizations (plant age < 10), potential experience dummies (5), and year dummies (22). Standard errors clustered at the individual level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1.

Table A.14: Dual Returns to Experience: Match Quality - First stage

	Experience OEC	Experience FTC	Tenure	Tenure squared
Experience OEC, deviation	0.6185*** (0.0010)	-0.2690*** (0.0010)	-0.0030*** (0.0013)	-0.0769** (0.0118)
Experience FTC, deviation	-0.4865*** (0.0013)	0.6706*** (0.0011)	0.0029* (0.0016)	-0.1429*** (0.0140)
Tenure, deviation	0.0529*** (0.0006)	0.0233*** (0.0006)	0.7992*** (0.0009)	-1.5505*** (0.0078)
Tenure squared, deviation	0.0014*** (0.0001)	0.0008*** (0.0001)	0.0093*** (0.0001)	1.0716*** (0.0006)
Subsidies availability	0.0130*** (0.0016)	0.0034** (0.0014)	-0.0032 (0.0026)	-0.0351 (0.0224)
Observations	1,929,990	1,929,990	1,929,990	1,929,990
Partial R-squared	0.2117	0.2117	0.5512	0.8357
Kleibergen-Paap rk Wald F statistic		8592.661		
Sanderson-Windmeijer F statistics	26735.09	26930.80	1.4e+06	8.4e+06

Notes: Experience is measured in days and then it is converted into years. All specifications include individual fixed effects, a quadratic polynomial in tenure, a dummy for part-time jobs, indicators for occupation-skill category (2), sector of activity (10), workplace location (50), small and medium enterprises (plant size < 50), young organizations (plant age < 10), potential experience dummies (5), and year dummies (22). Standard errors clustered at the individual level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1.

Table A.15: Dual Returns to Experience: Match Quality - First stage

	Experience OEC	Experience FTC	Tenure	Tenure squared
Experience OEC, deviation	0.4896*** (0.0015)	-0.3354*** (0.0013)	0.1638*** (0.0013)	1.1867*** (0.0104)
Experience FTC, deviation	-0.5442*** (0.0015)	0.6155*** (0.0012)	0.1331*** (0.0015)	0.9267*** (0.0119)
Tenure, deviation	0.0968*** (0.0011)	-0.0356*** (0.0009)	0.7144*** (0.0013)	-2.1727*** (0.0113)
Tenure squared, deviation	0.0005*** (0.0001)	0.0034*** (0.0001)	0.0064*** (0.0001)	1.0511*** (0.0005)
Subsidies availability	0.0621*** (0.0035)	-0.0294*** (0.0027)	-0.0064*** (0.0026)	-0.0556*** (0.0223)
Observations	1,929,990	1,929,990	1,929,990	1,929,990
Partial R-squared	0.0093	0.0093	0.0132	0.0897
Kleibergen-Paap rk Wald F statistic		1268.399		
Sanderson-Windmeijer F statistics	3189.16	3307.31	9478.40	1.3e+05

Notes: Experience is measured in days and then it is converted into years. All specifications include individual fixed effects, a quadratic polynomial in tenure, a dummy for part-time jobs, indicators for occupation-skill category (2), sector of activity (10), workplace location (50), small and medium enterprises (plant size < 50), young organizations (plant age < 10), potential experience dummies (5), and year dummies (22). Standard errors clustered at the individual level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1.

Table A.16: Dual Returns to Experience: Involuntary Movers

	All (1)	Within Industries (2)	Across Industries (3)
Experience OEC	0.0428*** (0.0011)	0.0444*** (0.0017)	0.0355*** (0.0020)
Experience FTC	0.0353*** (0.0013)	0.0323*** (0.0020)	0.0357*** (0.0023)
Gap in Returns (%)	21.17*** (3.03)	37.62*** (5.41)	-0.72 (5.09)
Observations	307,637	161,468	146,169
R-squared	0.3238	0.3004	0.3381

Notes: Experience is measured in days and then it is converted into years. OEC and FTC stand for experience acquired under open-ended and fixed-term contracts, respectively. All specifications include the same set of controls as Column (4) in Table 1 of the manuscript except for the polynomial in tenure. In these specifications we use only the first re-employment observation after a job change. Standard errors clustered at the individual level in parenthesis. Gap in returns is computed as $100 \times (\gamma_{\text{OEC}}^{\text{OEC}} - 1)$ and standard errors are obtained using the Delta method. *** p<0.01, ** p<0.05, * p<0.1. The R-squared reported is within workers. Job switchers = 167,702.

Table A.17: Industry Mobility and Skills for Involuntary Movers

	(1)
Distance	-0.0768*** (0.0059)
Experience OEC	0.0434*** (0.0011)
Experience FTC	0.0343*** (0.0013)
Experience OEC \times Distance	-0.0092*** (0.0020)
Experience FTC \times Distance	0.0031*** (0.0017)
Observations	307,637
R-squared	0.3259

Gap in Returns (%)

Minimum distance (= 0)	26.35*** (3.36)
Maximum distance (= 0.7439)	-0.16 (5.30)

Notes: Experience is measured in days and then it is converted into years. OEC and FTC stand for experience acquired under open-ended and fixed-term contracts, respectively. The specification includes the same set of controls as Column (4) in Table 1 of the manuscript except for the polynomial in tenure. We use only the first re-employment observation after a job change. Standard errors clustered at the individual level in parenthesis. Gap in returns is computed as $100 \times (\frac{\gamma^{oec} + \beta^{oec} \times \text{dist}}{\gamma^{ftc} + \beta^{ftc} \times \text{dist}} - 1)$ and standard errors are obtained using the Delta method. *** p<0.01, ** p<0.05, * p<0.1. The R-squared reported is within workers. Job switchers = 167,702.

Table A.18: Dual Returns to Experience: Expanded Heckman Correction

	All	Within Industries		Across Industries	
	(1)	(2)	(3)	(4)	(5)
Experience OEC	0.0521*** (0.0011)	0.0522*** (0.0017)	0.055*** (0.0017)	0.0455*** (0.0020)	0.0440*** (0.0020)
Experience FTC	0.0436*** (0.0014)	0.0376*** (0.0022)	0.0388*** (0.0021)	0.0456*** (0.0024)	0.0452*** (0.0024)
Inverse Mills Ratio (job switching)	0.0431*** (0.0025)	0.0044*** (0.0037)		0.0377*** (0.0045)	
Inverse Mills Ratio (industry/job switching)			0.0352*** (0.0055)		0.0960*** (0.0055)
Gap in Returns (%)	19.53*** (2.26)	38.69*** (4.48)	41.74*** (4.49)	-0.23 (3.56)	-2.74 (3.47)
Observations	338,983	177,888	177,888	161,095	161,095
R-squared	0.3174	0.2928	0.2920	0.3361	0.3383

Notes: Experience is measured in days and then it is converted into years. OEC and FTC stand for experience acquired under open-ended and fixed-term contracts, respectively. All specifications include the same set of controls as Column (4) in Table 1 of the manuscript except for the polynomial in tenure. In these specifications we use only the first re-employment observation after a job change. Standard errors clustered at the individual level in parenthesis. Gap in returns is computed as $100 \times (\frac{\gamma_{OEC}}{\gamma_{FTC}} - 1)$ and standard errors are obtained using the Delta method. *** p<0.01, ** p<0.05, * p<0.1. The R-squared reported is within workers.

Table A.19: Industry Mobility and Skills with Expanded Heckman Correction

	(1)
Distance	-0.0581*** (0.0052)
Experience OEC	0.0528*** (0.0011)
Experience FTC	0.0429*** (0.0014)
Experience OEC \times Distance	-0.0092*** (0.0016)
Experience FTC \times Distance	0.0021*** (0.0016)
Inverse Mills Ratio	0.0427*** (0.0025)
Observations	338,983
R-squared	0.3190

Gap in Returns (%)	
Minimum distance (= 0)	23.06*** (2.44)
Maximum distance (= 0.7439)	3.36 (3.92)

Notes: Experience is measured in days and then it is converted into years. OEC and FTC stand for experience acquired under open-ended and fixed-term contracts, respectively. The specification includes the same set of controls as Column (4) in Table 1 of the manuscript except for the polynomial in tenure. We use only the first re-employment observation after a job change. Standard errors clustered at the individual level in parenthesis. Gap in returns is computed as $100 \times (\frac{\gamma_{oec} + \beta_{oec} \times \text{dist}}{\gamma_{ftc} + \beta_{ftc} \times \text{dist}} - 1)$ and standard errors are obtained using the Delta method. *** p<0.01, ** p<0.05, * p<0.1. The R-squared reported is within workers.

Table A.20: Job Switching Selection Equation

	Baseline $1[j_{it} \neq j_{it-1}]$ (1)	Expanded $1[j_{it} \neq j_{it-1}]$ (2)
Δ Employment share $_{k(it)}$		5.8369*** (0.4148)
Cohabitant $\in[0,6]_{it-1}$	-0.0639*** (0.0046)	-0.0508*** (0.0054)
Cohabitant $\in[7,15]_{it-1}$	0.0101* (0.0052)	0.0111* (0.0061)
Cohabitant $\in[16,64]_{it-1}$	0.0075** (0.0037)	0.0078* (0.0044)
High-school $_i$	0.0020 (0.0053)	0.0015 (0.0062)
College $_i$	0.0235*** (0.0059)	0.0181*** (0.0069)
Female $_i$	-0.0120*** (0.0027)	-0.0118*** (0.0031)
Mid-Skill $_{it-1}$	-0.0984*** (0.0031)	-0.1000*** (0.0036)
High-Skill $_{it-1}$	-0.1968*** (0.0043)	-0.1976*** (0.0051)
FTC $_{it-1}$	0.6102*** (0.0028)	0.6211*** (0.0033)
Part-Time $_{it-1}$	0.0782*** (0.0029)	0.0590*** (0.0035)
Small-medium Firm $_{it-1}$	0.2890*** (0.0027)	0.3014*** (0.0031)
Young Firm $_{it-1}$	0.0538*** (0.0024)	0.0597*** (0.0028)
Tenure $_{it-1}$	-0.1263*** (0.0018)	-0.1383*** (0.0021)
Tenure $^2_{it-1}$	0.0052*** (0.0002)	0.0066*** (0.0002)
Potential Experience $\in[4,6]_{it-1}$	0.0064* (0.0037)	-0.0052 (0.0041)
Potential Experience $\in[7,9]_{it-1}$	-0.0072* (0.0041)	-0.0264*** (0.0047)
Potential Experience $\in[10,12]_{it-1}$	-0.0277*** (0.0046)	-0.0441*** (0.0054)
Potential Experience $\in[13,15]_{it-1}$	-0.0564*** (0.0053)	-0.0584*** (0.0066)
Observations	1,626,148	1,225,573

Notes: Province, sector, and year fixed effects are also included as additional controls. Small and medium firms are plants with plant-size below 50. Young firms refer to firms with less than 10 years of activity. Standard errors clustered at the individual level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1.

Table A.21: Conditional Industry Switching Selection Equation

	Baseline		Expanded	
	$\mathbf{1}[k_{it} = k_{it-1} j_{it} \neq j_{it-1}]$	$\mathbf{1}[j_{it} \neq j_{it-1}]$	$\mathbf{1}[k_{it} = k_{it-1} j_{it} \neq j_{it-1}]$	$\mathbf{1}[j_{it} \neq j_{it-1}]$
	(1)	(2)	(3)	(4)
Δ Employment share $_{k(it)}$			1.4837*** (0.5323)	6.3380*** (0.4058)
Cohabitan $t \in [0, 6]_{it-1}$		-0.0543*** (0.0042)		-0.0442*** (0.0047)
Cohabitan $t \in [7, 15]_{it-1}$		0.0029 (0.0045)		0.0030 (0.0053)
Cohabitan $t \in [16, 64]_{it-1}$		0.0045 (0.0032)		0.0052 (0.0037)
Hign-School $_i$	-0.0401*** (0.0069)	0.0012 (0.0053)	-0.0506*** (0.0080)	0.0011 (0.0062)
College $_i$	-0.1002*** (0.0085)	0.0210*** (0.0058)	-0.1021*** (0.0094)	0.0164** (0.0069)
Female $_i$	0.0383*** (0.0041)	-0.0105*** (0.0027)	0.0375*** (0.0046)	-0.0097*** (0.0031)
Mid-Skill $_{it-1}$	0.0228*** (0.0057)	-0.0954*** (0.0031)	0.0107* (0.0058)	-0.0972*** (0.0036)
High-Skill $_{it-1}$	0.0386*** (0.0123)	-0.1900*** (0.0044)	0.0054 (0.0117)	-0.1911*** (0.0051)
FTC $_{it-1}$	0.3450*** (0.0114)	0.6123*** (0.0028)	0.3545*** (0.0108)	0.6230*** (0.0033)
Part-Time e_{it-1}	0.0082 (0.0052)	0.0773*** (0.0029)	-0.0025 (0.0056)	0.0582*** (0.0035)
Small-Medium Firm $_{it-1}$	0.2792*** (0.0036)	0.2903*** (0.0027)	0.2877*** (0.0040)	0.3030*** (0.0030)
Young Firm $_{it-1}$	0.0757*** (0.0032)	0.0552*** (0.0024)	0.0786*** (0.0036)	0.0609*** (0.0028)
Tenure $_{it-1}$	-0.0575*** (0.0040)	-0.1240*** (0.0018)	-0.0676*** (0.0043)	-0.1358*** (0.0022)
Tenure $^2_{it-1}$	0.0013*** (0.0003)	0.0050*** (0.0002)	0.0023*** (0.0003)	0.0064*** (0.0002)
Potential Experience $\in [4, 6]_{it-1}$	-0.0021 (0.0047)	0.0047 (0.0037)	-0.0075 (0.0051)	-0.0070* (0.0041)
Potential Experience $\in [7, 9]_{it-1}$	-0.0148*** (0.0053)	-0.0100** (0.0041)	-0.0257*** (0.0059)	-0.0291*** (0.0046)
Potential Experience $\in [10, 12]_{it-1}$	-0.0388*** (0.0060)	-0.0317*** (0.0047)	-0.0475*** (0.0070)	-0.0475*** (0.0054)
Potential Experience $\in [13, 15]_{it-1}$	-0.0450*** (0.0071)	-0.0611*** (0.0053)	-0.0513*** (0.0089)	-0.0620*** (0.0066)
(log) Daily wage $_{it-1}$	0.1578*** (0.0051)		0.1600*** (0.0051)	
Error correlation (Fisher's transformation)	1.4665*** (0.0844)		1.524*** (0.0836)	
Observations	1,626,148	1,626,148	1,225,573	1,225,573

Notes: Province, sector, and year fixed effects are also included as additional controls. Small and medium firms are plants with plant-size below 50. Young firms refer to firms with less than 10 years of activity. Standard errors clustered at the individual level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1.

B Censoring Correction

The MCVL reports data on monthly labor income from Social Security contribution, which are either bottom or top-coded.³⁹ In the data, around 13 percent of the log real daily wages of the worker-month observations are top-coded.⁴⁰

Following other studies that face censored earnings in administrative data (Dustmann et al., 2009; Card et al., 2013; Bonhomme and Hospido, 2017), we correct the upper tail by fitting cell-by-cell Tobit models to log real daily wages separately by gender. Each cell, c , is defined according to occupational groups (3 categories), age groups (5 categories), and years (39) for a total of 2×585 cells. Consistent with a vast literature that finds that log-normality provides a reasonable approximation to empirical wage distributions, within each cell, log-daily wages are assumed to follow a Gaussian distribution with cell-specific mean and variance, i.e. $\log w \sim N(X\beta_c, \sigma_c^2)$.⁴¹

The parameters of interest are estimated within each cell by maximum likelihood. Denoting Φ the standard normal cdf, the cell-specific maximum likelihood takes the following form (up to an additive constant).

$$\sum_{cens_{it}=0} \left[-\frac{1}{2} \ln \sigma_c^2 - \frac{1}{2\sigma_c^2} (\ln(w_{ijt}) - X_{it}\beta_c)^2 \right] + \sum_{cens_{ijt}=1} \ln \left(1 - \Phi \left(\frac{\ln(\bar{w}) - X_{ijt}\beta_c}{\sigma_c} \right) \right)$$

where w_{it} represents real log daily wages of individual i in plant j in moment t (a worker-month pair), \bar{w} is the maximum cap, $cens_{ijt} = 1$ if the observation is top-coded. X_{ijt} is a set of controls such as age, categorical variables for full-time jobs, sector of activity (10), workplace location (50), firm age (3), and monthly dummies (12). Following Card et al. (2013), we also include individual-specific components of the wages using the mean log daily wages in other months, fraction of censored wages in other months, and a dummy for individuals observed only once as additional controls. For individuals who are only observed once, we set the mean log daily wages to the sample mean, and the fraction of censored wages to the share of censored earnings in the sample.

³⁹See Appendix C for a more detailed description the labor income concept.

⁴⁰Less than 8 percent of the observations are bottom-coded. However, we do not correct the lower tail due to the existence of a national minimum wage.

⁴¹The choice of the distribution is important and a natural concern is that the results may differ depending on the technique. In this sense, Dustmann et al. (2009) offer an extensive robustness analysis in which they evaluate four different distributional assumptions, and conclude that the results are similar to different specifications. Similarly, Bonhomme and Hospido (2017) use the MCVL to compare the performance of the cell-by-cell Tobit model and a linear quantile censoring correction method with respect to non-censored earnings coming from tax records, and find that the fit is superior with the Tobit model.

After the estimation, we impute an uncensored value for each censored observation using the maximum likelihood estimates of each Tobit model. Specifically, we replace censored observation by the sum of the predicted wages and a random component, drawn from a normal distribution with mean zero and cell-specific variance. The imputation rule is:

$$\ln w_{ijt} = X_{ijt}\hat{\beta}_c + \hat{\sigma}_c \Phi^{-1} \left[\Phi \left(\frac{\ln \bar{w} - X_{ijt}\hat{\beta}_c}{\hat{\sigma}_c} \right) + u_{ijt} \times \left(1 - \Phi \left(\frac{\ln \bar{w} - X_{ijt}\hat{\beta}_c}{\hat{\sigma}_c} \right) \right) \right]$$

where $(\hat{\beta}_c, \hat{\sigma}_c)$ are the maximum likelihood estimates of each cell, Φ denotes the standard normal cdf, and u represents a random draw from the uniform distribution, $U[0, 1]$.

Table B.1: Censored and imputed wage distributions

Percentiles	Censored	Imputed
5th	3.00	3.00
10th	3.33	3.33
25th	3.70	3.70
50th	4.04	4.04
75th	4.43	4.45
90th	4.74	5.17
95th	4.78	5.68

Notes: Wages refer to log real daily wages earned by workers in a given employer each month. Wages are expressed in 2018:12 euros deflated using the Spanish monthly consumer price index. Moments of the the log daily wage distribution are computed over month-worker-firm observations (93,407,145).

C Variables Definition

Birth date. Obtained from personal files coming from the Spanish Residents registry. We select this information from the most recent wave and, if there is any inconsistency, we choose the most common value over the waves for which it is available.

Education. Retrieved from the Spanish Residents registry up to 2009, and from 2009 thereafter the Ministry of Education directly reports individuals' educational attainment to the National Statistical Office and this information is used to update the corresponding records in the Residence registry. Therefore, the educational attainment is imputed backwards whenever it is possible, i.e. when a worker is observed in the MCVL post-2009. In the imputation, we assigned 25 years as the minimum age to recover values related to university education.⁴²

Gender. Obtained from the Spanish Residence registry. We select this information from the most recent wave and, if there is any inconsistency, we choose the mode over the waves in which it is available.

Household composition. Obtained from the Spanish Residence registry. The variable includes the number of individuals living in the household in three age categories: cohabitants under 6 years old, 7 to 15 years old and over 16 years old.

Nationality. Obtained from Spanish Residents registry. The variable reports the link between the individual and Spain in terms of legal rights and duties. This variable allows to distinguish between individuals with Spanish nationality (N00 code) and other worldwide nationalities.

Labor market entry. To define labor market entry, we exploit information on education attainment and compute predicted graduation year of each individual. Specifically, education-specific graduation years are assigned as the years when high-school drop-outs turn 16, people with high-school degrees turn 18, and college graduates turn 23. We track workers after their predicted graduation year to compute time employed and out-of-work.

⁴²The age threshold is the average graduation age for a Bachelor's degree in Spain: <https://www.oecd.org/education/education-at-a-glance-19991487.htm>

Employment status. An individual is considered to be employed in a given year if annual income is at least equal to one quarter of full-time work at half of the national minimum wage.

Experience. Defined as the time actually worked after labor market entry. We compute actual working days using information on all the spells available for each worker in the MCVL since labor market entry. Specifically, at each year, we count the exact number of days worked and compute our measure of experience as the share of time actually worked in the past relative to the potential time that an individual could have worked since labor market entry.

Tenure. Computed as the number of days continuously worked for the same employer, regardless of the type of contract or other characteristics of the work. This measure is reset to zero if there is at least one month between two periods of work with the same employer during which the worker is not an employee or works in another company.

Labor income. The MCVL reports labor income from two different sources: Social Security contribution basis and income tax records. Contribution bases capture gross monthly labor earnings plus one-twelfth of year bonuses.⁴³ Earnings are bottom and top-coded. The minimum and maximum caps vary by Social Security regime and contribution group, and they are adjusted each year according to the evolution of the minimum wage and inflation rate. The data is supplemented with information provided by the Fiscal Authorities on the total wages that employers pay to employees on an annual basis. The advantage of this measure is that it is not censored. However, fiscal information is only included from 2005 onwards and excludes Basque Country and Navarra. Our main analysis relies on labor income coming from Social Security contributions and we correct top-censored earnings fitting cell-by-cell Tobit models to log real daily wages (see Appendix B). Wages are expressed in 2018:12 euros deflated using the Spanish monthly consumer price index.

Contract type. The MCVL contains a long list of contract types (over 100) that are summarized in two broad categories, according to its permanent or temporary nature. Permanent contracts include regular permanent contracts (*contrato indefinido fijo*)

⁴³Exceptions include extra hours, travel and other expenses, and death or dismissal compensations.

and intermittent (seasonal) permanent contracts (*indefinido fijo-discontinuo*). Temporary contracts include specific project or service contracts (*temporal por obra o servicio*), temporary increase in workload (*eventual de produccion*), and substitution contracts (*interinidad o relevo*).

Occupation category. Based on Social Security contribution group. These groups indicate a level in a ranking determined by the worker's contribution to the Social Security system, which is determined by both the education level required for the specific job and the complexity of the task. The MCVL contains 10 different contribution groups that are aggregated according to similarities in skill requirements. High-Skill: Group 1 (engineers, college, senior managers—in Spanish *ingenieros, licenciados y alta direccion*), Group 2 (technicians—*ingenieros tecnicos, peritos y ayudantes*), and Group 3 (administrative managers—*jefes administrativos y de taller*). Medium-Skill: Group 4 (assistants—*ayudantes no titulados*) and Group 5-7 (administrative workers—*oficiales administrativos* (5), *subalternos* (6) and *auxiliares administrativos* (7)). Low-Skill: Group 8-10: (manual workers—*oficiales de primera y segunda* (8), *oficiales de tercera y especialistas* (9) y *mayores de 18 años no cualificados* (10)).

Reason for job spell termination. Reported by the firm to the Social Security Administration. This variable is relevant for determining entitlements to severance pay, unemployment benefits, or family as well as health related benefits. Non-voluntary separations refer to the following codes 54, 77, 91, 92, 93 and 94. These keys identify individual as well as collective dismissals, or terminations of temporary contracts.⁴⁴

Establishment. Defined by its Social Security contribution account (*codigo de cuenta de cotizacion*). Each firm is mandated to have as many accounts as regimes, provinces, and relation types with which it operates. The contribution accounts are assigned by the Social Security administration, and they are fixed and unique for each treble province-Social Security regime-type of employment relation.⁴⁵ Thus, contribution accounts can be thought of as establishments.

⁴⁴Prior to 2012, codes 91 to 94 were included within code 54. Since we cannot differentiate these causes for the entire period, we include them all for consistency.

⁴⁵According to the Social Security administration, around 85 percent of the firms are single unit organizations, i.e. there have just one contribution account per firm. Each firm has typically one account for each treble province-Social Security regime-type of employment relation.

Establishment creation date. Date when the first employee was registered in the contribution account. We rely on this date as a proxy for the workplace creation date to classify employers into age bins.

Establishment size. Number of employees working in the establishment at the moment of data extraction. Unfortunately, this variable is missing before 2005. For the years in which the variable is missing, we assigned the average size observed for that establishment from 2005 onwards. In the case of establishments not observed after 2005, we assigned a value of zero.⁴⁶

Establishment location. The municipality in which the establishment conducts its activity if above 40,000 inhabitants, or the province for smaller municipalities (*domicilio de actividad de la cuenta de cotización*). Based on that, we group all locations into the 50 Spanish provinces.

Sector of activity. The MCVL provides information on the main sector of activity at a three-digit level (*actividad económica de la cuenta de cotización, CNAE*). Due to a change in the classification in 2009, the MCVL contains CNAE93 and CNAE09 for all establishments observed in business from 2009 onwards, but only CNAE93 for those which stop their activity before. We rely on the CNAE09 classification when available, and CNAE93 otherwise. Then, we aggregate the three-digit industry information into 11 categories corresponding to primary sector, manufacturing, utilities, construction, trade and transport, accommodation and restaurants, business services, public sector, private health institutions, education, and other services.

Socio-economic accounts. These accounts are obtained from the Groningen Growth and Development Centre and can be accessed through the following links (i) <https://www.rug.nl/ggdc/valuechain/wiod/wiod-2013-release> and (ii) <https://www.rug.nl/ggdc/valuechain/wiod/wiod-2016-release>.

⁴⁶We tested our results by including a dummy variable in our regressions to identify firms not observed after 2004. However, our main results are not affected, so we avoid including such an indicator.

D Estimates using the Employer-Employee Panel

The Employer-Employee Panel (*Panel de datos de Empresas-Trabajadores*, PET, in Spanish) is an additional source of information constructed from administrative records of the Spanish Social Security. The dataset consists of an extraction of establishments (secondary contribution accounts of the General Regime) and their workers including the characterization of employers and the working lives of the employees. The sample is stratified by establishment size, using the following percentages: from 1-4 and from 5-9 workers, 3%; from 10-14 and from 25-49, 5%; from 50-99 and from 100-249, 8%; from 500-1,499 and from 1,500+, 15%. This extraction choice ensures the representativeness of each of the segments of the population of establishments. The data covers the period 2013 to 2016.

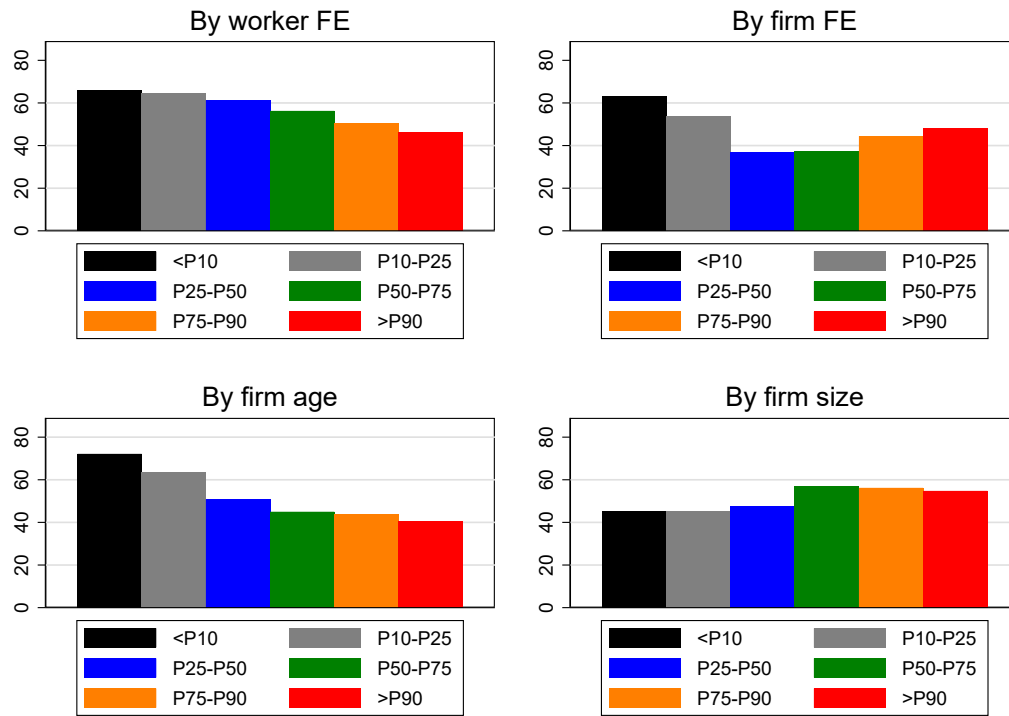
We construct a yearly panel in which the observation unit is the establishment that is part of the sample with the affiliation episodes of its workers in the reference year. We restrict the analysis to those workers born between 1973 and 2000, aged between 20 to 40, and use observations of contribution years from 1997 given that lack of information on the type of contract before that date. Using this sample, we fit linear wage models that include additive worker and establishment fixed effects as in Abowd et al. (1999), further controlling for workers' part-time status, age dummies, and year dummies. More precisely, we estimate models of the following form

$$w_{ijt} = \eta_i + \psi_{j(i,t)} + X_{ijt}\beta + \epsilon_{ijt} \quad (\text{D.10})$$

where w_{ijt} are log-daily wages of worker i at time t in firm j , η_i is the unobserved worker effect, $\psi_{j(i,t)}$ is the unobserved effect of firm j where worker i is employed at t , X_{ijt} are covariates such as part-time status, age and calendar effects, ϵ_{ijt} is the error term.

Figure D.1 shows the FTC rates across worker and firm FE effects estimated from Equation (D.10), as well as the FTC rates across employer's age and size categories. The results confirm previous insights on the incidence of temporary contracts across sectors, occupations and industries, and reinforce the widespread use of temporary contracts in the Spanish economy.

Figure D.1: Fixed-Term Contract Rate across AKM FE and Firm Types



Source: PET dataset and own calculations. The figure shows the share of fixed-term contracts in PET establishments by worker and firm fixed effects (recovered from Equation D.10), firm age and firm size. The sample includes workers born between 1973 and 2000 who are between 20 and 40 years old between 1997 and 2016.