Part-Time Status, Type of Contract, and the Returns to Experience

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Introduction

- Flexible work arrangements may be helpful for workers (e.g. reconciling market and family work, stepping stone to permanent jobs), but they may also be second best jobs (e.g. lower wages, less chances of promotion).

- *Are hourly wages lower in flexible work arrangements after accounting for individual heterogeneity and differences in work experience?*

  Is experience in flexible work arrangements less rewarded?

Introduction

- Two most common forms of flexible work arrangements: part-time (PT) work and fixed-term contracts.
- Look at them together, because
  (1) the combination *PT under fixed-term contract* may be different w.r.t. wages and returns to experience.
  (2) selection into one form of flexible work arrangement may depend on (experience in) the other.
- Spain as an interesting case to study, because fixed-term contracts and the combination of PT and fixed-term contracts are frequent.

Contribution

1. Take full-time (FT) permanent, FT fixed, PT permanent, PT fixed as four different work arrangements (i.e. also comparison across contract-types).
2. Account for work history in a flexible way (wage effects given work history, i.e. thought experiment of selecting any woman in some period and making her work in a particular work arrangement).
3. Disentangle the wage effects of currently working in a particular arrangement given work experience and the returns to experience in that arrangement.
4. Use a trivariate panel data model that a) uses cross-sectional identification along with “within” variation and b) endogenizes the contract decision and the NE/PT/FT decision in all periods w.r.t. unobserved heterogeneity.

Structure of the Presentation

- Literature and institutional background
- Econometric approach
- Data and descriptive statistics
- Results
- Sensitivity analysis
- Conclusion

Literature and institutional background

Literature

- Literature on PT/FT wage differential (“PT penalty”): e.g. Booth and Wood, 2008; Connolly and Gregory, 2009; Fernández Kranz, Rodriguez-Planas, forthcoming; Hirsch, 2005.
- Most recent studies account for unobserved heterogeneity but do not disentangle the effect of currently working PT and different employment histories of PT and FT workers (i.e. less experience in FT, experience in different segments of labor market, more interruptions).
- Exceptions: Hirsch, 2005, suggests that part of PT/FT wage differential in the US may be due to experience; Connolly and Gregory, 2009, find that PT is poorly rewarded in particular in low-skilled jobs in the UK, Paul, 2011, finds that no PT penalty remains given experience in Germany .

Literature

- Literature on fixed-term contracts typically finds wage differential (Spain: permanent workers earn around 10% more, for men, and about 5% more, for women, after controlling for observed heterogeneity and for selection into type of contract using IV (Hernanz, 2002; and De la Rica, 2004).
- Fernández Kranz, Rodriguez-Planas (forthcoming) study the PT/FT wage differential **within** the two segments of the labor market defined by contract type (given the work history that comes along with particular contract type); find a PT penalty which is much stronger under fixed-term contracts.

Institutional background: fixed-term employment and part-time work in Spain

- Since the early 1990s, fixed-term employment represents one third of the Spanish labor force.
- Conversion rate from temporary to permanent is low.
- Dual labor market, unstable, low protected, and poorly paid jobs.

- The share of PT employment is below one tenth.
- PT in Spain traditionally second best job, concentrated in low-skill jobs and industries.
- PT more frequent under fixed-term contracts and (in this case) often involuntary (as opposed to situation in GB, D).

Econometric Approach

Econometric Approach

Objective:

1. estimate PT and contract-type wage effects given work history (modeled in a flexible way),
2. account for unobserved heterogeneity.

To implement this:

- use cross sectional variation in addition to „within“ variation, but
- do not assume exogeneity of history and current work arrangement with regard to time-constant unobserved heterogeneity (like in standard RE)

Econometric Approach

Trivariate RE model

1. **Wage equation (linear RE on log hourly wage),**
2. Contract-type equation (contract decision in each quarter, RE probit, reduced form),
3. Employment equation (decision on FT, PT, NE in each quarter, ordered RE probit, reduced form).

- Present and past NE, PT and contract endogenized w.r.t. time-constant unobserved heterogeneity.
- Buchinsky, Fougère, Kramarz, and Tchernis (2010) use a similar approach to study the returns to seniority.

Trivariate panel data model

(1) Wage equation (linear RE model):

$$\ln W_{it} = \beta^W_0 + \beta^W_1 PT_{it} + \beta^W_2 FIX_{it} + \beta^W_3 H^W_{it} + \beta^W_4 x^W_{it} + \alpha^W_i + \varepsilon^W_{it}$$

(2) Contract-type equation (dynamic RE probit):

$$FIX_{it} = I(FIX^*_{it} > 0),$$

$$FIX^*_{it} = \beta^C_0 + \beta^C_1 PT_{it} + \beta^C_2 H^C_{it} + \beta^C_3 x^C_{it} + \alpha^C_i + \varepsilon^C_{it}$$

(3) Employment equation (dynamic RE ordered probit):

E = 2 for FT, 1 for PT and 0 for NE, E*: latent variable,

$$E^*_{it} = \beta^E_0 + \beta^E_1 H^E_{it} + \beta^E_2 x^E_{it} + \alpha^E_i + \varepsilon^E_{it}$$

- Time-constant unobserved heterogeneity: $\alpha^W_i, \alpha^C_i, \alpha^E_i \sim N(0,\Sigma)$, allows for correlations among them.
- Idiosyncratic errors: $\varepsilon^W_{it} \sim N(0, \sigma^2)$, $\varepsilon^C_{it} \sim N(0,1)$, $\varepsilon^E_{it} \sim N(0,1)$ have to assume independence.

Work history specification (H^W_{it})

- Flexible specification of elapsed work history (FT/PT/NE **and** contract history) building on Light and Ureta, 1995.
- Array of dummies for each lag of NE, PT and FIX (NElag1, NElag2,…).
- Array of dummies if already in sample.
- Dummies for remote t captured in summary variables.
- Interactions.
- Also H^C_{it} , H^E_{it} include FT/PT/NE and contract history (thus also state dependence).

Identification and Estimation

- Identification depends on functional form restrictions and time-varying covariates.
- Model uses both the cross-sectional and the time-series dimension for identification.

- Simultaneous estimation using Markov Chain Monte Carlo (MCMC) Methods, Technique from Bayesian Statistics.
- Gibbs Sampling Algorithm programmed in Stata /Mata.

Data and descriptive statistics

The Continuous Sample of Working Histories (CSWH)

- 4% sample of those registered with the Social Security Administration in 2006.
- Individual and job characteristics (education, age of children, region, type of contract…).
- Use those **highly attached to labor market** (at least 3 years of FT experience), age 25 to 45, born 1961 - 1978.
- Construct a Panel Data set in calendar quarters from 1996 – 2007 (information on PT / FT experience back to 1985).
- Includes contractual hours, impute actual hours as in Fernández Kranz, Rodriguez-Planas (forthcoming) .
- Unbalanced panel of 427,254 observations on 15,138 women, on average 34 quarters.
- 14% experience PT and 28% fixed-term contract in sample period.

Descriptive Statistics (means) Women Highly Attached to Labor Market:

	FT, Permanent	PT, Permanent	FT, Fixed-term	PT, Fixed-term
Dummy of status in t	0.876	0.034	0.077	0.013
Raw wage in Euro	11.77	8.62	11.06	7.44
University degree	0.268	0.166	0.385	0.131
Less than secondary school	0.322	0.455	0.315	0.599
Years of experience in FT, Permanent*	5.011	4.137	1.668	2.597
Years of experience in PT, Permanent*	0.020	2.063	0.022	0.074
Years of experience in FT, Fixed-term*	0.104	0.227	2.457	0.381
Years of experience in PT, Fixed-term*	0.016	0.231	0.048	1.787

*observed since initial period in sample. Average of years observed in sample at t: 5.43 years.

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Results

Penalty of current work arrangement

Wage effect (in %) of currently working PT / fixed-term **given work history** (reference FT permanent):

	All	Mothers (to be)	Childless
PT fixed-term	-5.281 (0.435)	-5.880 (0.556)	-3.660 (0.693)
PT permanent	-0.201 (0.357)	0.731 (0.426)	-3.074 (0.688)
FT fixed-term	2.895 (0.263)	3.502 (0.356)	2.206 (0.392)

- Strong penalty for PT fixed-term and PT permanent for childless.
- No penalty for mothers in PT permanent (law on hours reduction).
- Higher wages in FT fixed-term (given contract history, given FT/PT/NE history and given unobserved heterogeneity).

Cumulative effect (whole sample)

Cumulative effect (in %, reference FT permanent):

	Years in that state						
	0	1	2	3	4	5	6
PT fixed-term	-5.281 (0.435)	-13.181 (0.437)	-13.817 (0.431)	-14.429 (0.446)	-15.041 (0.478)	-15.653 (0.522)	-16.265 (0.577)
PT Permanent	-0.201 (0.357)	-12.159 (0.274)	-12.632 (0.251)	-13.206 (0.243)	-13.780 (0.262)	-14.354 (0.303)	-14.928 (0.357)
FT fixed-term	2.895 (0.263)	1.452 (0.230)	1.289 (0.241)	1.251 (0.256)	1.213 (0.280)	1.176 (0.310)	1.138 (0.345)
NE	NA	-14.542 (0.329)	-24.770 (0.342)	-27.405 (0.357)	-30.040 (0.397)	-32.675 (0.455)	-35.310 (0.526)

- Strong penalty of PT in consecutive years under both contracts, effect mainly from PT in last year.
- Lower returns to experience in FT fixed-term than FT permanent.

Cumulative effect (mothers)

in %	Years in that state						
	0	1	2	3	4	5	6
PT fixed-term	-5.880 (0.556)	-14.111 (0.534)	-15.242 (0.527)	-15.367 (0.550)	-15.491 (0.591)	-15.616 (0.647)	-15.741 (0.714)
PT Permanent	0.731 (0.426)	-10.718 (0.328)	-11.691 (0.293)	-11.824 (0.285)	-11.958 (0.308)	-12.092 (0.356)	-12.225 (0.421)
FT fixed-term	3.502 (0.356)	1.334 (0.308)	1.176 (0.319)	1.185 (0.341)	1.194 (0.375)	1.202 (0.418)	1.211 (0.466)
NE	NA	-13.518 (0.410)	-23.231 (0.428)	-25.175 (0.446)	-27.119 (0.495)	-29.063 (0.565)	-31.007 (0.651)

- Under permanent contracts, mothers do not experience an immediate wage reduction, but compensation through not (or less) moving up the wage scale for some time after switch to PT.

Results on other model parameters

- Strong state dependence in contract equation and employment equation.
- Coefficient of NE and PT in past important in contract equation -> account for history when estimating contract effects.
- Important part of the variance on individual level -> unobserved heterogeneity important.
- $Corr(\alpha^W_i, \alpha^E_i) > 0$, $Corr(\alpha^W_i, \alpha^C_i) < 0$ and $Corr(\alpha^C_i, \alpha^E_i) < 0$, all significant.

Sensitivity Analysis

Sensitivity Analysis

- Results are very robust: standard RE (thus assuming exogeneity) and FE (relying solely on within identification) estimation does not change main picture.
- POLS leads to far too high PT penalties –> unobserved heterogeneity is very important.
- Even with POLS estimation no negative effect of currently working under fixed-term contract:
  Wage effect FT fixed-term: 0, but -4% if covariates capturing contract history dropped and -16% if in addition NE / PT history variables dropped
  -> account for work history when estimating contract effects.

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Conclusion

Main Findings I

- Penalty on current PT work under fixed-term contracts (and under permanent for childless).
- Lower returns to experience in PT than in FT.
- Under permanent contracts, mothers do not experience an immediate wage reduction but do not (or less) move up the wage scale for some time after having switched to PT.
- Lower returns to FT fixed-term than FT permanent but no penalty on current wage given history.

Main Findings II

- Women in different employment arrangements have very different work histories, conditional on histories wages in FT under fixed-term contracts are not bad.
- Suggests: problem are not wages as such but human capital of fixed-termers. But if mobility between labor market segments is limited, few chances to obtain experience in FT permanent and receive these wages.
- When studying PT and contract effects: account for unobserved heterogeneity and work history w.r.t. NE/PT and contract-types.

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Thank you for your attention!

Appendix: Incidence of female PT and temporary employment, OECD 2008

	Incidence of female PT employment	Incidence of female temporary employment
Australia	37.7%	5.9%
Belgium	33.8%	9.7%
Germany	38.6%	14.9%
The Netherlands	59.9%	20%
Norway	30.8%	11.1%
Spain	21.1%	31.2%
The United Kingdom	37.7%	6%
The United States	17.8%	4.2%

Appendix: The Continuous Sample of Working Histories (CSWH)

- Advantages:
  large sample, reliable information on key variables directly from payroll records, non-response is not an issue.

- Main disadvantage:
  only contractual hours reported, leading to differential measurement error by PT (contractual hours consistently underreport actual worked hours for PT workers relative to FT workers), we impute hours as Fernández Kranz, Rodriguez-Planas (forthcoming) suggest.

Appendix: Descriptive Statistics (childless women, 38% of sample):

	FT, Permanent	PT, Permanent	FT, Fixed-term	PT, Fixed-term
Dummy of status in t	0.877	0.021	0.092	0.009
Raw wage in Euro	11.70	8.43	11.75	7.94
University degree	0.290	0.180	0.473	0.175
Less than secondary school	0.293	0.481	0.219	0.531
Years of experience in FT, Permanent*	4.897	4.110	1.525	2.935
Years of experience in PT, Permanent*	0.011	2.064	0.014	0.084
Years of experience in FT, Fixed-term*	0.109	0.197	2.454	0.443
Years of experience in PT, Fixed-term*	0.011	0.151	0.033	1.596

*observed since initial period in sample. Average of years observed in sample at t: 5.01 years.

Cumulative Effects (childless)

in %	Years in that state						
	0	1	2	3	4	5	6
PT fixed-term	-3.660 (0.693)	-10.176 (0.772)	-8.787 (0.768)	-11.105 (0.780)	-13.423 (0.827)	-15.741 (0.903)	-18.059 (1.003)
PT Permanent	-3.074 (0.688)	-16.702 (0.532)	-15.217 (0.494)	-17.422 (0.477)	-19.627 (0.514)	-21.832 (0.595)	-24.037 (0.705
FT fixed-term	2.206 (0.392)	1.717 (0.345)	1.621 (0.369)	1.508 (0.387)	1.395 (0.419)	1.282 (0.461)	1.170 (0.511)
NE	NA	-16.738 (0.549)	-28.021 (0.572)	-32.329 (0.601)	-36.638 (0.677)	-40.947 (0.786)	-45.256 (0.917)

- Stronger cumulative penalty for childless, in particular in permanent contracts and in particular for staying away from FT for a long time.