

Excess worker turnover and fixed-term contracts: Causal evidence in a two-tier system

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FEDEA/FRDB/IZA Conference
Dual Labor Markets and the Single Contract
Milan, April 13, 2012

Synopsis

Portuguese firms engage in **intense reallocation**, comparable with other economies.

High intensity is possible in rigid, but **segmented**, labor markets. It does not mean that most workers rotate (Hall 1982 and Ureta 1992).

Two-tier system: Widening the **protection gap** between contracts causes a large burden of the **excess worker turnover** on **fixed-term contracts**. Strong **substitutability** of contract types.

In line with Abowd et al. (1999), Boeri (2010), Bentolila et al. (2011), and Cahuc et al. (2012).

Outline

- 1 Two-tier systems
- 2 Portuguese labor market institutions
- 3 Data
- 4 Job and worker flows concepts
- 5 Aggregate flows
- 6 Match survival and fixed-term contracts
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1 Two-tier systems

Legislation

The most common labor market reforms involved **fixed-term contracts**, with lower dismissal costs. The regulation of **permanent contracts** was **left unchanged**, generating **two-tier systems**.

Literature

Analyze the **role of fixed-term contracts** (FTC) in the matching process:

1. Abowd, Corbel & Kramarz (1999)
2. Boeri (2010), Bentolila, Cahuc, Dolado & Le Barbanchon (2011), and Cahuc, Charlot, & Malherbet (2012)

2 Portuguese labor market institutions

FTC introduced in **1976**, but revised several times since.

1. Offered **concurrently** with permanent contracts.
2. Can be used for **all levels** of qualifications and most tasks.
3. Could be renewed for **up to 3 years**; in 2004-09, **up to 6**.
4. **Severance payment**: 2 days/month if tenure $>$ 1 year; 3 days otherwise. In permanent contracts typically 2.5 days (1 month/year)
5. **Procedural costs**: largest difference; absent at end of FTC.

Quadros de Pessoal: The **share of FTC** increased from **20.8%** in 2002, to **27.9%** in 2008; +7.1 p.p.

3 Data

Two **employer-employee matched administrative sources**.

1. **Social Security Records**: Monthly, Jan., 2000 – Dec., 2009
 - a) Unique source: **All mandatory** social security contributions.
2. **Quadros de Pessoal**: Annual, 2002 – 2008
 - a) Covers 'all' firms; widely used to study the Portuguese economy.

Cross-validation: 98% of all employer-employee matches are in the two datasets.

4 Job and worker flows concepts

Excess worker turnover (churning)

$$EWT_t = \frac{\text{Hires}_t + \text{Separations}_t - |\text{Hires}_t - \text{Separations}_t|}{(\text{Employment}_{t-1} + \text{Employment}_t)/2}$$

Excess worker turnover by contract type

$$EWT_t \neq EWT_t^{OEC} + EWT_t^{FTC}$$

Example: Firm with 50 workers; replaces **10 OEC** with **10 FTC** workers.

$$EWT = 40\%; EWT^{OEC} = EWT^{FTC} = 0\%$$

5 Aggregate flows

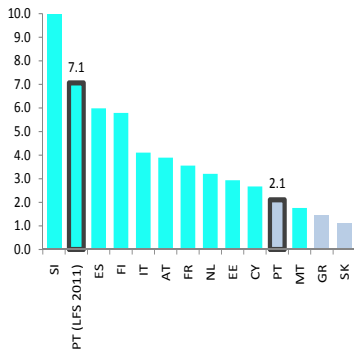
Job and worker flows in Portugal and the United States

	Job Creation (1)	Hiring (2)	Job Destruction (3)	Separation (4)	Hiring/ JC (5)	Separation/ JD (6)
Annual						
(1) Portugal (2001-2009)	12.7	25.2	11.9	24.5	2.0	2.1
(2) Portugal (2001-2006)	12.8	25.4	12.0	24.7	2.0	2.1
(3) USA (2001-2006)	14.6	28.5	13.7	28.0	2.0	2.0
(4) Ratio PT/USA (2001-2006)	0.88	0.89	0.88	0.88		
Quarterly						
(5) Portugal (2001:Q1-2009:Q4)	5.0	9.2	4.9	9.0	1.8	1.8
(6) Portugal (2001:Q1-2006:Q4)	5.2	9.4	5.0	9.2	1.8	1.8
(7) USA (2001:Q1-2006:Q4)	7.9	14.9	7.6	14.8	1.9	1.9
(7a) USA (QWI, 1993:Q1-2010:Q1)	6.1	–	5.9	–	–	–
(8) Ratio PT/USA (2001:Q1-2006:Q4)	0.66	0.63	0.66	0.62		
(8a) Ratio PT/USA (QWI)	0.85	–	0.85	–		

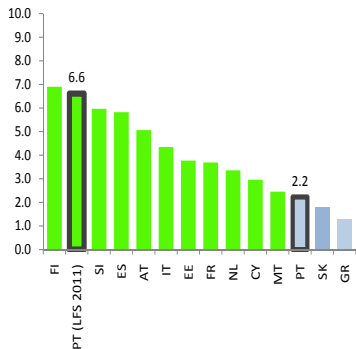
Sources: Portugal: *Social Security*. U.S.: BED and JOLTS in Davis et al. (2006; 2010); Abowd et al. (2011).

E pur si muove: International comparison

$E \rightarrow (U + I)$



$(U + I) \rightarrow E$



Source: LFS, Eurosystem. 2010 data. France 2009. Flows in % of labor force.

Excess worker turnover and firm size

Firm size	Firms with net job		
	creation (1)	destruction (2)	stable (3)
[1, 10]	23.0	19.5	18.1
[11,20] (T)	27.5	22.6	22.5
[21,100] (C)	30.4	24.3	23.6
[101, 250]	28.6	20.8	21.0
[251, 499]	32.1	24.1	19.3
+500	43.5	28.4	22.2
Total	31.5	23.6	19.6
Employment	1,224,738	1,174,261	489,639

Source: *Social Security*, 2001-2009.

1. **EWT**: Expanding > Contracting > Stable.
2. **Expanding**: EWT tends to increase with firm size.
3. **Contracting**: A less monotonic pattern of increase.
4. **Stable employment**: EWT is rather stable.
5. **Quasi-experiment**: Treatment and control firms with similar EWT.

6 Match survival and fixed-term contracts

How do Portuguese firms achieve these levels of employment variability?

High flows and excess turnover do **not** mean that most workers rotate (Hall 1982, Ureta, 1992).

But requires **heterogeneity** in hiring and separation rates across workers.

In two-tier systems, this is accomplished by placing a large share of the adjustment burden on **fixed-term contracts**.

Matches survival and contract type

	Probability holding the same job as in 2002 (1)	Fixed-term contract in 2002 Still fixed-term (2)	Open-ended (3)
2003	70.3	41.4	14.1
2004	58.3	22.3	19.6
2005	53.2	13.8	22.9
2006	46.7	9.7	22.0
2007	42.1	7.5	20.4
2008	38.1	5.8	19.0

Source: *Quadros de Pessoal*, 2002-2008.

Computations for all workers regardless of job tenure.

1. After 6 years, **40%** of the workers are still in the **same firm**.
2. Workers on a **fixed-term contract**, in 2002, have a **lower probability – 25% –** of remaining in the same firm in 2008.

7 Quasi-experiment

In 2004, there was a reform of the employment protection legislation.

Fair dismissals: firms with **11 to 20** workers have to comply with **additional procedural requirements**. Before 2004, only firms with **21+** workers.

- **Difference-in-differences** analysis:
 - **Treatment** firms: 11-20 workers
 - **Control** firms: 21-100 workers
 - **Before:** 2002-2003
 - **After:** 2004-2008

Quadros de Pessoal: Average 2003-2008

Variable (firm level)	Mean	S.D.
Fixed-term contracts (in %)	28.2	27.93
Total excess worker turnover (in %)	24.6	25.71
Fixed-term contract	34.7	36.89
Open-ended contract	12.4	19.75
Educational level, % of workers with:		
9 or less years	69.9	27.31
10-12 years	19.7	18.97
College	10.4	16.56
Firm size (average number of workers)	27.1	18.86
Worker-firm matches (2003-2008)	4 903 529	
Number of firms	45 876	
Number of observations (firm × year)		
Before		
Treatment	14 170	
Control	11 877	
After		
Treatment	81 439	
Control	73 645	
Total	181 131	

Notes: *Quadros de Pessoal*, firm-level values 2003-2008.

1. **More than a quarter** of a typical firm's workforce is on **fixed-term** contracts.
2. On average, **25% of worker turnover** is in excess of amount required to achieve a particular change in employment. The **open-ended** rate is only **12%**. The **fixed-term** rate is 3 times more, **35%**.

Prima facie evidence: Match survival

	Two-year survival probability		Two-year probability that a fixed-term is still fixed-term or is converted to open-ended			
	Before	After	Before	After	Before	After
	(1)	(1')	(2)	(2')	(3)	(3')
Treatment (T, 11-20)	54.6	59.4	22.0	28.9	18.0	15.8
Control (C, 21-100)	58.9	63.1	24.8	29.2	19.4	19.0
Differences (T – C)	-4.3	-3.7	-2.9	-0.4	-1.3	-3.2
Difference-in-differences		0.7		2.5		-1.9
		(0.164)		(0.301)		(0.263)

Source: *Quadros de Pessoal*, 2002, 2004, 2006. Before period: 2002 matches; after period: 2004 matches. Standard errors in parentheses.

Unconditional D-in-D:
More protection of OEC. . .

1. Slight increase in two-year survival (0.7 p.p.), but . . .
2. More likely to **remain on a fixed-term contract** (2.5 p.p) and . . .
3. **Lower conversion rate** (-1.9 p.p.).

Signs of substitutability. . .

Quasi-experimental evidence: Share of FTC and EWT

Treatment units	T:[11, 20]			
Control units	C:[21, 100]			
Dependent variable	SFTC	EFTC	EOEC	EWT
	(1)	(2)	(3)	(4)
After	0.445	-1.213	-1.422	-0.622
	(0.139)	(0.444)	(0.190)	(0.211)
Treat	-1.180	-0.710	0.309	0.153
	(0.232)	(0.800)	(0.319)	(0.353)
After × Treat	1.629	1.306	-0.105	0.292
	(0.182)	(0.649)	(0.250)	(0.277)
Control variables	– Yes. See notes –			
Average of dependent variable	28.2	34.7	12.4	24.6
Number of firms	45 876	34 049	43 708	45 876
No observations	181 131	107 768	171 255	181 131

Firm fixed effects estimates. **SFTC**: share of fixed-term contracts; **EFTC**: excess worker turnover among fixed-term contracts; **EOEC**: excess worker turnover among open-ended contracts; **EWT**: total excess worker turnover (in %).

Firms with 11–20 workers have a **more stringent** OEC fair dismissals law, causing:

1. an **increase** in the share of FTC, 1.6 p.p..
2. **higher** turnover of FTC, 1.3 p.p..
3. **no impact** on OEC and overall turnover.

D-in-D: Endogeneity of treatment response (1)

Treatment assignment	In 'before' period		
Treatment units	T:[11, 20]		
Control units	C:[21, 100]		
Dependent variable	SFTC	EFTC	EOEC
	(1)	(2)	(3)
After × Treat	1.782	1.278	-0.173
	(0.178)	(0.620)	(0.236)
Avg. dep. variable	25.6	31.2	12.3
No. observations	157 446	90 436	151 452

Treatment status defined in the **before period** and **kept the same** each year. The results are robust. . .

1. an **increase** in the share of FTC, 1.8 p.p..
2. **higher** turnover of FTC, 1.3 p.p..
3. **no impact** on OEC and overall turnover.

D-in-D: Endogeneity of treatment response (2)

Treatment assignment	Always the same		
Treatment units	T:[11, 20]		
Control units	C:[21, 100]		
Dependent variable	SFTC	EFTC	EOEC
After × Treat	2.083	2.145	-0.036
	(0.198)	(0.723)	(0.272)
Avg. dep. variable	28.8	35.5	12.3
No. observations	142 636	84 519	135 325

Consider only firms that **never** changed treatment status throughout entire sample period. The results are robust. . .

1. an **increase** in the share of FTC, 2.1 p.p..
2. **higher** turnover of FTC, 2.1 p.p..
3. **no impact** on OEC and overall turnover.

D-in-D: Endogeneity of treatment response (3)

Treatment assignment	Period-by-period		
Treatment units	T:[13, 17]		
Control units	C:[26, 100]		
Dependent variable	SFTC	EFTC	EOEC
After × Treat	1.805	1.264	-0.052
	(0.202)	(0.724)	(0.272)
Avg. dep. variable	25.6	33.6	11.8
No. observations	153 662	95 179	145 438

Exclude from the sample firms close to the before and after **size thresholds**. The results are robust. . .

1. an **increase** in the share of FTC, 1.8 p.p..
2. **higher** turnover of FTC, 1.3 p.p..
3. **no impact** on OEC and overall turnover.

8 Regression analysis

Empirical literature on excess worker turnover and dual labor markets is scarce.

We contribute by performing a systematic analysis of the relationship between **excess worker turnover** and **firm**, **match**, and **worker** characteristics, paying special attention to the role of segmentation.

Excess turnover: Fixed effects estimation

Dependent variable	EFTC (1)	EOEC (2)	EWT (3)
Fixed-term contracts (%)	0.269 (0.007)	-0.189 (0.003)	0.072 (0.003)
Other covariates	– Yes –		
Average excess turnover	32.3	12.2	23.1
Number of firms	48 702	66 455	69 738
Number of observations	162 767	297 346	315 104
Fraction of unobserved variance	0.46	0.44	0.51

Notes: *Quadros de Pessoal*, 2003-2008. Sample of firms with 5 or more workers. Standard errors in parentheses from firm fixed effects estimates. EFTC: excess worker turnover among fixed-term contracts; EOEC: excess worker turnover among open-ended contracts; EWT total excess worker turnover.

We've seen a high substitutability of contract types.

So let's focus on a 10 p.p. increase in FTC. It leads to:

1. 2.7 p.p increase in fixed-term contracts excess turnover. . .
2. . . . but it decreases open-ended contracts excess turnover by 1.9 p.p.
3. Total excess worker turnover increases 0.7 p.p.

Conclusion

1. Portuguese job and worker flows **fit stylized facts**. Despite labor code rigidity, there is an **intense reallocation** of workers.
2. Theoretically, FTC share a larger burden of the adjustment. **Our results adhere to this theoretical framework**.
3. **Stringent OEC** legislation led to **(i)** larger share of FTC; **(ii)** more excess worker turnover among FTC; **(iii)** no impact on excess worker turnover among OEC.
4. Clear signs of a high **substitutability** of contract types. The burden of adjustment falls upon workers on FTC.

Future research

1. **Churning is a productive process.** Schumpeterian view or the interpretation of matches as an “experience good” require churning.
2. Then, churning should be associated with wage increases.
3. Are some workers exposed to **“too much of a good thing”**?
4. They may. But we need to look at what happens after workers separate from firms and/or firms rehire new workers: **reemployment match quality**. Wage distribution.
5. Look at outcomes from the perspective of **firms and workers**.

Thank you (Atletico).