Flexibility at the Margin and Labor Market Volatility in OECD Countries

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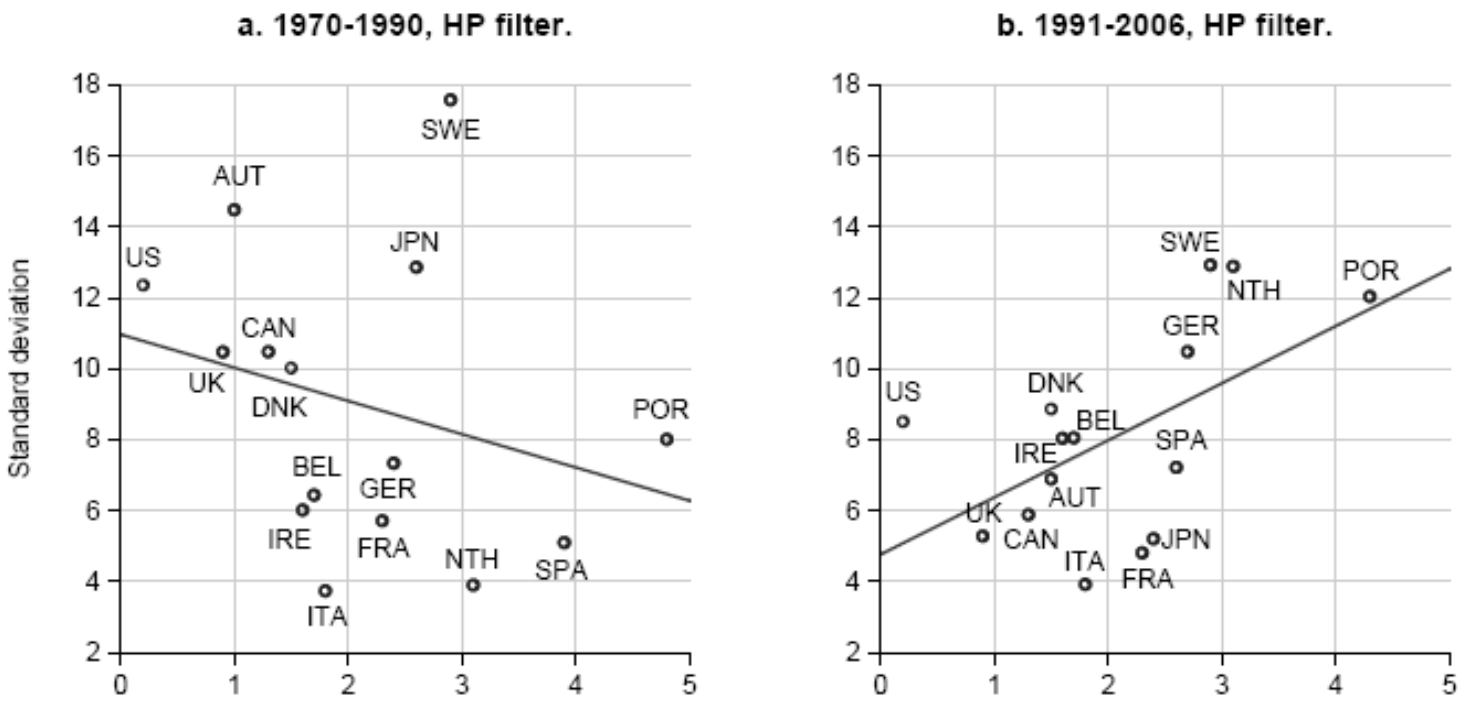
Workshop: Increasing Labor Market Flexibility - Boon or Bane?

What do we do?

- We present a matching and search model (Mortensen & Pissarides, 1994) with temporary and permanent jobs.
  - Temporary jobs: Fixed-term contracts.
  - Permanent jobs: Open-ended contracts.
- Analyze the role of different degrees of restrictions in the labor market on its cyclical behavior:
  - Firing costs for temporal and permanent contracts.
  - Restriction in the use of fixed-term contracts.
- We argue that these two elements are important determinants of the volatility displayed by segmented labor markets.

Motivation

Figure: Unemployment volatility vs. EPL permanent contracts



Related literature

- A number of studies investigate the impact of firing costs on business cycle fluctuations:
  - Veracierto (2007), Thomas (2006) and Zanetti (2007). In general, they find that higher firing costs reduce business cycle fluctuations and employment volatility. The basic intuition is that these costs prevent employment adjustment in response to shocks.
  - None of them distinguish permanent from temporary work. Therefore, there is no space for considering the influence of flexibility at the margin in business cycle fluctuations.
- Our formal framework is not new in the matching literature (see for example Wasmer, 1999; Blanchard and Landier, 2002; Kugler et al., 2002; Cahuc and Postel-Vinay, 2002; Osuna, 2005).
  - In contrast with the long-run perspective generally taken by previous studies, this paper differs in scope and focuses mostly on business cycle fluctuations.

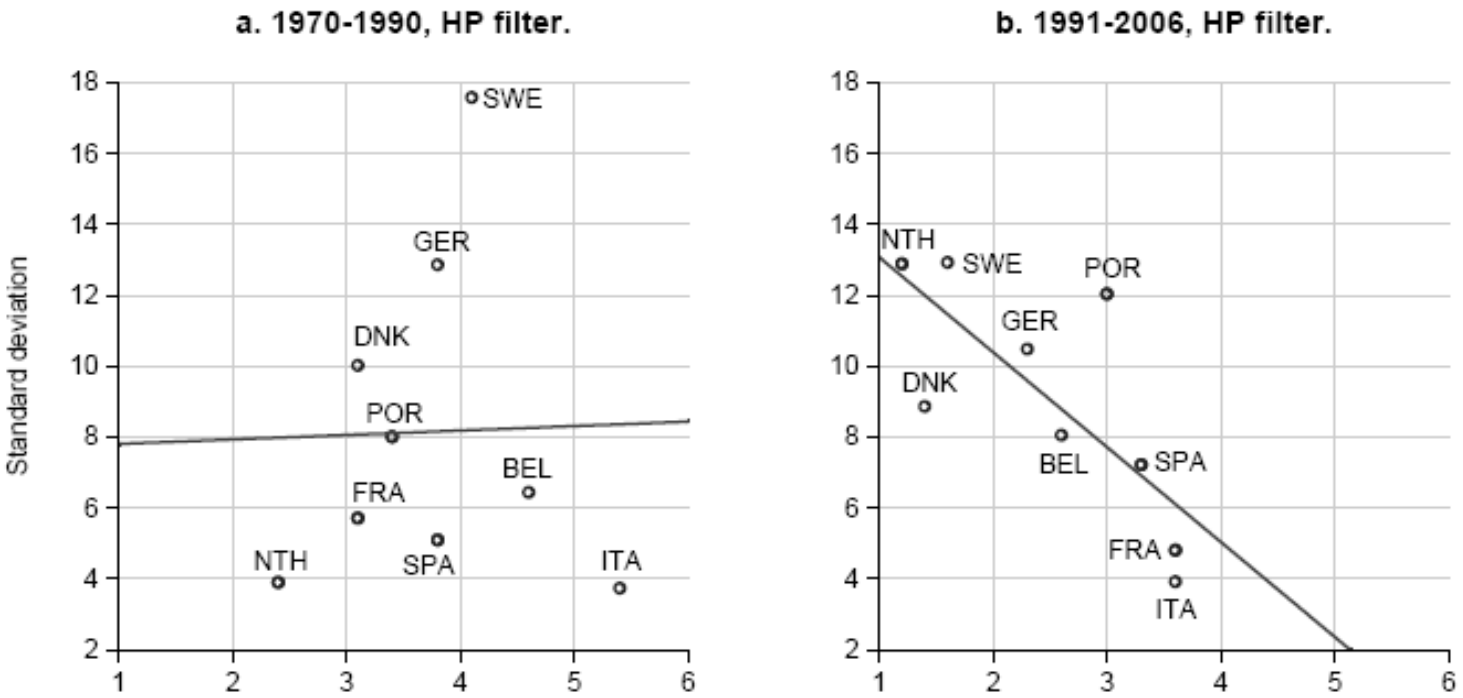
Motivation

Table: Labor contract regulations and unemployment volatility

	Restrictions on TCs	EPL on PCs	Firing costs	Share of TCs	Standard dev. u
Australia	[NL]	1.5	4	5.8	6.9
Belgium	[L]	1.7	16	7.3	8.1
Canada	[NL]	1.3	28	12.3	5.9
Denmark	[L]	1.5	0	10.4	8.9
Finland	[L]	2.3	26	17.3	10.9
France	[L]	2.3	32	12.7	4.8
Germany	[L]	2.7	69	11.8	10.5
Ireland	[NL]	1.6	24	6.8	8.0
Italy	[L]	1.8	11	8.9	3.9
Japan	[NL]	2.4	4	11.6	5.2
Netherlands	[L]	3.1	17	12.5	12.9
Portugal	[L]	4.3	95	16.1	12.0
Spain	[L]	2.6	56	32.9	7.2
Sweden	[L]	2.9	26	14.6	12.9
UK	[NL]	0.9	22	6.3	5.3
US	[NL]	0.2	0	4.5	8.5
Average [L] countries		*2.4*	*34.8*	*14.4*	*9.2*
Average [NL] countries		*1.3*	*13.7*	*7.9*	*6.6*

Motivation

Figure: Unemployment volatility vs. EPL temporary contracts



Main findings

- We show that within the scenario of limited flexibility in the use of temporary jobs, (i) an increase in firing costs for either temporary or permanent jobs, and (ii) tighter restrictions in the use of temporary contracts reduce the volatility of unemployment.
- We find that our benchmark scenario of flexibility at the margin increases the volatility of unemployment relative to a fully regulated labor market with strict EPL and no temporary contracts.
- Finally, we also find that our benchmark scenario of flexibility at the margin provides an intermediate situation, in terms of unemployment volatility, with respect to a fully regulated and a fully deregulated labor market.

Basic environment

Our basic environment follows very closely a discrete-time version of Mortensen & Pissarides' search-and-matching model.

- Risk-neutral and infinitely-lived workers and firms.
- Discount rate β.
- Capital markets are perfect.
- Time is discrete.

Employment relationship

- At the beginning of each period, unemployed workers and vacant jobs meet according to a CRS matching technology $m(u, v)$.
- When they meet they draw a match-specific productivity z_t which is i.i.d. across firms and time with c.d.f. $G(z)$.
- If the match is profitable for both the firm and the worker, they establish an employment relationship.
- Wages are set through Nash bargaining.
- **Firms are allowed to hire a new entrant on a temporary basis with probability α.**
- **Temporary workers may become permanent with probability ι.**
- Matches break exogenously with probability ϕ.
- Each period t, each match pair draws a new z_t.
- **Jobs may also be endogenously terminated, in which case firms with incumbent employees have to pay a firing tax, γ^T or γ^P.**

Firms: The value of ...

... a vacancy is

$$V_t = -c + \beta E_t \left[(1 - q(\theta_t)) V_{t+1} + q(\theta_t) \alpha \left(\int_{\tilde{z}^T_{0,t+1}}^{\bar{z}} J^T_{0,t+1}(z) dG(z) + G(\tilde{z}^T_{0,t+1}) V_{t+1} \right) \right.$$
$$\left. + q(\theta_t)(1 - \alpha) \left(\int_{\tilde{z}^P_{0,t+1}}^{\bar{z}} J^P_{0,t+1}(z) dG(z) + G(\tilde{z}^P_{0,t+1}) V_{t+1} \right) \right].$$

Due to free entry: $V_t = 0$.

Firms: The value of ...

... filled jobs are

$$
\begin{aligned}
J^T_{0t}(z_t) &= A_t z_t - w^T_{0t}(z_t) + \beta E_t \left[(1-\phi)\iota \int_{\tilde{z}^P_{0,t+1}}^{\bar{z}} J^P_{0,t+1}(z) dG(z) \right. \\
&\qquad \left. + (1-\phi)(1-\iota) \left(\int_{\tilde{z}^T_{t+1}}^{\bar{z}} J^T_{t+1}(z) dG(z) - G(\tilde{z}^T_{t+1})\gamma^T \right) \right], \\
J^P_{0t}(z_t) &= A_t z_t - w^P_{0t}(z_t) + \beta E_t \left[(1-\phi) \left(\int_{\tilde{z}^P_{t+1}}^{\bar{z}} J^P_{t+1}(z) dG(z) - G(\tilde{z}^P_{t+1})\gamma^P \right) \right], \\
J^T_t(z_t) &= A_t z_t - w^T_t(z_t) + \beta E_t \left[(1-\phi)\iota \int_{\tilde{z}^P_{0,t+1}}^{\bar{z}} J^P_{0,t+1}(z) dG(z) \right. \\
&\qquad \left. + (1-\phi)(1-\iota) \left(\int_{\tilde{z}^T_{t+1}}^{\bar{z}} J^T_{t+1}(z) dG(z) - G(\tilde{z}^T_{t+1})\gamma^T \right) \right], \\
J^P_t(z_t) &= A_t z_t - w^P_t(z_t) + \beta E_t \left[(1-\phi) \left(\int_{\tilde{z}^P_{t+1}}^{\bar{z}} J^P_{t+1}(z) dG(z) - G(\tilde{z}^P_{t+1})\gamma^P \right) \right].
\end{aligned}
$$

Wage setting

- Wages are the result of bilateral Nash bargaining between workers and firms.
- The Nash solution maximizes the weighted product of the workers' and the firms' net return from the job match. The first-order conditions for the temporary and permanent employees yield the following equations:

$$\begin{aligned}
(1-\eta)(W_{0t}^{T}(z_t) - U_t) &= \eta(J_{0t}^{T}(z_t) - V_t) \\
(1-\eta)(W_{0t}^{P}(z_t) - U_t) &= \eta(J_{0t}^{P}(z_t) - V_t) \\
(1-\eta)(W_{t}^{T}(z_t) - U_t) &= \eta(J_{t}^{T}(z_t) - V_t + \gamma^{T}) \\
(1-\eta)(W_{t}^{P}(z_t) - U_t) &= \eta(J_{t}^{P}(z_t) - V_t + \gamma^{P})
\end{aligned}$$

  where $\eta \in (0,1)$ denotes the workers' bargaining power relative to firms.
- Wages are revised every period upon the occurrence of new shocks.

Job finding and separation rates

- Unemployed workers find jobs with probabilities

$$\begin{aligned} \chi_t^T &= f(\theta_{t-1})\alpha(1-G(\tilde{z}_{0t}^T)), \\ \chi_t^P &= f(\theta_{t-1})(1-\alpha)(1-G(\tilde{z}_{0t}^P)). \end{aligned}$$

- It follows that the temporary and permanent matches separate with probabilities

$$\begin{aligned} \lambda_t^T &= \phi + (1-\phi)\left[(1-\iota)G(\tilde{z}_t^T) + \iota G(\tilde{z}_{0t}^P)\right] \\ \lambda_t^P &= \phi + (1-\phi)G(\tilde{z}_t^P). \end{aligned}$$

- Also, temporary workers become permanent with the following job conversion probability

$$\zeta_t = (1-\phi)\iota(1-G(\tilde{z}_{0t}^P)).$$

Law of motions

- The unemployment rate u_t, and the mass of temporary and permanent workers, n_t^T and n_t^P, evolve according to the following difference equations:

$$\begin{aligned} u_t &= u_{t-1} + \lambda_t^T n_{t-1}^T + \lambda_t^P n_{t-1}^P - \chi_t^T u_{t-1} - \chi_t^P u_{t-1}, \\ n_t^T &= n_{t-1}^T + \chi_t^T u_{t-1} - \lambda_t^T n_{t-1}^T - \zeta_t n_{t-1}^T, \\ n_t^P &= n_{t-1}^P + \chi_t^P u_{t-1} + \zeta_t n_{t-1}^T - \lambda_t^P n_{t-1}^P, \end{aligned}$$

  where χ_t^T and χ_t^P define job finding rates.

- The aggregate job destruction rate is then

$$\lambda_t = \frac{\lambda_t^T n_{t-1}^T + \lambda_t^P n_{t-1}^P}{1 - u_{t-1}},$$

Calibration targets

- Our benchmark economy is a representative European labor market with limited flexibility in the use of fixed-term contracts.
- Model calibrated at quarterly frequencies to be consistent with:
  - An average unemployment rate of 8.4%.
  - An average share of temporary workers of 14.4%.
  - A job finding probability of 0.283 (Elsby et al., 2009)
  - A probability that an unemployed worker finds a permanent job of 0.036 (OECD, 2002)
  - A job conversion probability of 0.085 (OECD, 2002)
  - The steady-state elasticity of the matching function w.r.t unemployment of 0.6 (Pentrogolo and Pissarides, 2001).
  - A firing tax equivalent to 34% of total average firing costs of 35 weeks of wages (OECD, 2004; Garibaldi and Violante, 2005).

Baseline parameters

Table: Baseline parameter values

Parameter		Value	Source
Discount rate	β	0.99	[A]
Standard deviation for the distribution of z	σ_z	0.2	[A]
Workers' bargaining power	η	0.5	[A]
Expiration probability of a temporary contract	ι	0.0936	[C]
Parameter of the matching function	φ	0.424	[C]
Firing tax of permanent contracts	γ^P	1.0466	[C]
Firing tax of temporary contracts	γ^T	0	[A]
Exogenous separation probability	ϕ	0.0182	[C]
Hiring probability of a temporary contract	α	0.87	[C]
Persistence parameter of A	ρ	0.674	[B]
Standard deviation of ϵ	σ_ϵ	0.00684	[B]
Hiring costs	c	0.0169	[C]
Employment opportunity cost	b	0.9687	[C]

[A] Other studies or own assumptions as explained in main text.
[B] Set to match the cyclical volatility and persistence of labor productivity in economies with limited flexibility.
[C] Set to match our seven targets.

Simulation results

Table: Simulated results for a representative European economy with limited flexibility

	u	n^T	n^P	n^T/n	ζ	χ	λ	λ^T	w	y/n
Steady state	**.084**	.132	.784	**.144**	**.085**	**.283**	.026	.072	1.030	1.032
Std. deviation	.062	.027	.004	.023	.017	.036	.060	.158	.006	**.009**
Autocorrelation	.942	.907	.990	.905	.674	.814	.626	.674	.673	**.700**
Correlation matrix										
u	1	-.832	-.737	-.749	-.773	-.902	.729	.773	-.773	-.797
n^T		1	.234	.991	.812	.907	-.753	-.812	.811	.836
n^P			1	.105	.365	.475	-.360	-.365	.366	.379
n^T/n				1	.780	.862	-.720	-.780	.779	.803
ζ					1	.843	-.995	-1.000	1.000	.999
χ						1	-.803	-.843	.842	.861
λ							1	.995	-.995	-.990
λ^T								1	-1.000	-.999
w									1	.999

Simulation exercises

- Lower firing costs for permanent jobs. ($\gamma^P = 0.2 \times w_{ss}^P$).
- Higher firing costs for temporary jobs. ($\gamma^T = 0.75 \times w_{ss}^T$)
- Stricter restrictions on fixed-term contracts (lower α and higher ι).
- No fixed-term contracts ($\alpha = 0$) and $\gamma = 1.015 \times w_{ss}$. This scenario attempts to mimic European labor markets before temporary contracts were introduced.

Business cycle results

Table: Labor market volatility

	u	χ	λ	λ^T	$n^T/(1-u)$
Benchmark case ($\alpha = 0.87, \iota = 0.0936,$ $\gamma^P/w^P_{ss} = 1.015, \gamma^T = 0$)	6.16	3.57	6.02	15.84	2.28
Scenario 1: $\gamma^P/w^P_{ss} = 0.2$	7.33	3.56	7.74	15.83	2.44
Scenario 2: $\gamma^T/w^T_{ss} = 0.75$	3.23	3.77	0.94	5.06	0.78
Scenario 3: $\alpha = 0.2$	3.36	3.75	1.27	15.74	3.14
Scenario 4: $\iota = 1$	3.29	3.70	1.08	16.86	2.92
Scenario 5: $\alpha = 0$					
$\gamma/w_{ss} = 0.2$	3.68	3.79	1.60	—	—
$\gamma/w_{ss} = 1.015$	2.66	3.79	0.00	—	—

Conclusions

- This paper study the behavior of a segmented labor market with flexibility at the margin.
- Within the scenario of limited flexibility in the use of temporary jobs, (i) an increase in firing costs for either temporary or permanent jobs, and (ii) tighter restrictions in the use of temporary contracts reduce the volatility of unemployment.
- This scenario provides an intermediate situation, in terms of labor market volatilities, between the one of full regulation (strict EPL and no temporary contracts) and another one of no regulation (loose EPL).
- Introduction of fixed-term contracts are not the whole story. What else then? Productivity gap, lack of training, etc.
- A final result is the negative correlation we find between job destruction and the business cycle both in a fully deregulated labor market and in a flexibility-at the-margin labor market.