

# Shaping earnings instability: labour market policy and institutional factors

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# Context

- ▶ **Economic security** : "basic social security, defined by access to basic needs infrastructure pertaining to health, education, dwelling, information, and social protection, as well as **work-related security**" (ILO)
  - ▶ **Income security** (ILO)
    - ▶ **Labour market earnings security**(ILO) - earnings instability carries substantial welfare costs (Blundell and Preston, 1998, Creedy and Wilhelm, 2002, Gottschalk and Spolaore 2002)

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- ▶ Earnings instability measure - derived from the transitory component of earnings

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## Background on transitory earnings inequality

### ► Components of earnings inequality

$\ln(\text{Earnings})$	=	<i>Permanent Component</i>	+	<i>Transitory Component</i>
		Personal Characteristics		Individual random factors
		Education		(illness, accidents)
		Training		Volatility in the labour market
		Ability		Measurement error
				Expected to average out over time

$$\text{Earnings Inequality} = I(\text{Permanent}) + I(\text{Transitory})$$

$$\text{Var}(\ln(\text{Earnings})) = \text{Var}(\text{Permanent}) + \text{Var}(\text{Transitory})$$

- Lillard and Willis (1978), Lillard and Weiss (1979), MaCurdy (1982), Abowd and Card (1989), Moffitt and Gottschalk (1995, 1998, 2002, 2008), Baker (1997), Baker and Solon (2003), Dickens (2000), Ramos (2003), Kalwij and Alessie (2003), Cappellari (2003), Gustavsson (2004), Sologon and O'Donoghue (2010)



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# Aim

- ▶ gap in the literature : understanding the factors shaping transitory inequality (earnings instability)
- ▶ we explore the complex relationship between earnings instability and labour market policies and institutions using data for 14 European countries between 1994 and 2001
- ▶ a step towards designing policies and labour market institutions that enable more stable earning profiles
- ▶ Relevant question given the economic reality of the 1990s in Europe :
  - ▶ reforms to increase labour market flexibility
  - ▶ increased cross-country heterogeneity in labour market characteristics (Palier, 2010)

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## Methodology & Data

### ► Measuring earnings instability

- Transitory variance of earnings - Estimated using error component models in Sologon and O'Donoghue (2010)
- Data : the ECHP for 14 EU countries between 1994-2001
  - Measure of earnings : real log hourly wage
  - Male workers aged 20 to 57, born between 1940 and 1975
- ARMA(1,1) process with time and cohort specific shifters :

$$\gamma_c \lambda_t v_{it} = \gamma_c \lambda_t [\rho v_{i,t-1} + \epsilon_{it} + \theta \epsilon_{i,t-1}]$$

$$\epsilon_{it} \sim iid(0, \sigma_\epsilon^2), v_{i0} \sim iid(0, \sigma_{c,0}^2)$$

- aggregate transitory inequality - Shorrocks sub-group inequality decomposition (Shorrocks, 1984, Chakravarty, 2001) :

$$TV = \sum_{c=1}^4 n_c TV_c = \sum_{c=1}^4 n_c Var(\gamma_c \lambda_t v_{it})$$

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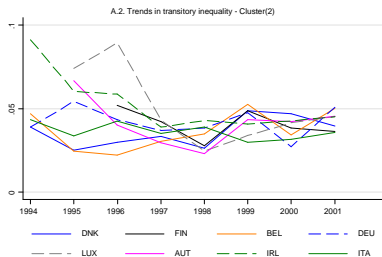
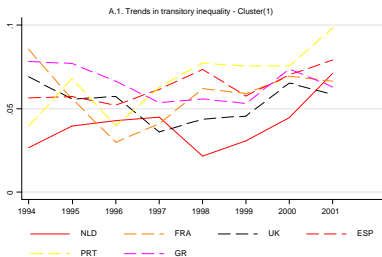
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# Cross-national trends in earnings instability across Europe 1994-2001





- ▶ The link between earnings instability and labour market policy and institutional factors - non-linear least squares
  - ▶ Systemic interactions
  - ▶ Interactions between institutions and shocks
  - ▶ Complex controlled associations, but not causal relationships
  
- ▶ Labour market institutions : OECD labour market indicators (Source : Bassanini and Duval (2006))
  - ▶ Employment protection legislation (EPL) ;
  - ▶ Union density
  - ▶ Degree of corporatism
  - ▶ Tax Wedge
  - ▶ Product market regulation (PMR)
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## Systemic interactions

$$TV_{it} = \left[ \sum_{k=1}^K v_k X_{kit} + \sum_{k=1}^K \varphi_k (X_{kit} - \bar{X}) \left( \sum_{k=1}^K v_k (X_{kit} - \bar{X}_k) \right) \right] + u_{it} \quad (1)$$

$i$  - country index,  $t$  - period index,  $k$  - institution index.

- ▶ partial derivative of  $TV$  wrt policy  $X_k$ , setting the others equal to the average, except  $X_j$  :

$$\frac{\partial TV}{\partial X_k} = f(v_k, \varphi_k, X_k - \bar{X}_k, v_j, \varphi_j, X_j - \bar{X}_j) \quad (2)$$



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## Interactions between institutions and common unobservable shocks

$$TV_{it} = [\tau_t(1 + \sum_{k=1}^K \gamma_k(X_{kit} - \bar{X}_k))] + u_{it} \quad (3)$$

$\tau_t$  - time effect for period  $t$ ,  $\gamma_k$  - interaction effect between the institution/policy  $X_k$  and the overall unobserved shock  $u_{it}$

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## Interactions between institutions and country-specific shocks

$$TV_{it} = \left[ \sum_{s=1}^S \zeta_s Z_{sit} \left( 1 + \sum_{k=1}^K \gamma_k (X_{kit} - \bar{X}_k) \right) \right] + u_{it} \quad (4)$$

$\sum_{s=1}^S \zeta_s Z_{sit}$  - set of observed macroeconomic shocks,  $\zeta_s$  - direct effects of shocks,  $\gamma_k$  - interaction effects between the institution/policy  $X_k$  and aggregate macroeconomic shocks

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## Systemic interactions

Table: Transitory Variance - Systemic interactions across institutions.

Direct effect of institutions	Estimate	t
EPL	-0,014 ***	-3,370
Union density	0,032 **	2,420
High Corporatism	0,017 ***	3,990
Tax wedge	0,176 ***	5,810
PMR	0,006 ***	2,850
ALMPs	0,050 **	2,590
Average replacement rate	-0,040	-1,340
Systemic interactions		
EPL	-0,607 ***	-5,960
Union density	1,460 ***	3,470
High Corporatism	-2,285 ***	-16,340
Tax wedge	6,702 ***	4,840
PMR	0,378 ***	4,050
ALMPs	2,614 ***	5,460
Average replacement rate	-3,305 ***	-3,760
Adjusted $R^2$	0,949	
Observations	93	

Note : High Corporatism equals 1 for a high corporatism and 0 in rest

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## Systemic interactions

Table: Transitory Variance - Simulated relative reforms resulting in 1% decrease in TV relative to the average country with a low corporatism.

Change in institutions relative to their average		Change in TV relative to the average country
EPL	1,66%	-1%
Union density	-4,75%	-1%
Tax wedge	-1,00%	-1%
PMR	-2,61%	-1%
ALMPs	-3,85%	-1%
Average replacement rate	4,00%	-1%
Corporatism	Transition from low to high	-37%

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## Sum up : systemic interactions (1)

- ▶ For a country with an average mix of institutions and a low corporatism, factors negatively associated with earnings instability :
  - ▶ Labour market regulation
  - ▶ The generosity of the unemployment benefit
- ▶ ... factors positively associated with earnings instability :
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  - ▶ The tax wedge
  - ▶ Product market regulation
  - ▶ The spending on ALMPs
- ▶ For the average country, only union density displays a monotonic relationship ; a U-shape relationship for the rest :
  - ▶ e.g. low to moderate levels of EPL offer protection against earnings instability, but strict levels are associated with a higher earnings instability.

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# Interactions between institutions and common unobservable shocks

Table: Transitory Variance - Time effects interacted with institutions.

	[1] Estimates		[2] Range of institutions/ policies		[3] Implied relative change in TV due to an adverse shock which increases TV by 1% for the average country (TV for mean institutions and shocks = 0,0636 )	
		t	Min	Max	Min	Max
Time effects*	0,0118					
EPL	0,0109	0,29	-1,82167	1,4325	-1,01%	2,58%
Union density	0,1089	0,65	-0,27631	0,4212	-2,04%	5,63%
High corporatism	-0,3681***	-6,74	0	1	1,00%	-36,18%
Tax wedge	-0,2774	-0,68	-0,19774	0,1232	6,54%	-2,45%
PMR	0,0572*	1,82	-2,26252	1,8403	-12,07%	11,63%
ALMPs	0,2904*	1,77	-0,25193	0,9610	-6,39%	29,18%
Average replacement rate	-0,4354	-1,43	-0,19437	0,2892	9,55%	-11,72%
Adj. R <sup>2</sup>	0,9366					
Obs.	93					



## Interactions between institutions and country-specific shocks

Table: Transitory Variance - Observed shocks interacted with institutions.

	Estimates	t
EPL	-0,0576	-0,62
Union density	-0,1306	-0,39
High corporatism	-0,2104*	-1,98
Tax wedge	1,1377	1,07
PMR	0,0051	0,11
ALMPs	0,2680	0,99
Average replacement rate	-1,0866***	-2,75
LD shift	0,1094***	3,3
Terms of trade	-0,3146***	-6,94
TFP growth	-0,1789	-1,37
Real interest rate	0,4597***	4,86
Adj. $R^2$	0,9206	
Obs.	80	

## Conclusions

- ▶ a complex system of interactions within the institutional framework affecting earnings instability, where the effects of most institutions/policies depend to a large extent on the institutional mix.
- ▶ most policies/institutions have "costs" and "benefits" - the prevalence of each depends on the policy mix
- ▶ a high corporatism and generous unemployment benefits are found to limit the adverse effect of macro shocks on earnings instability
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- ▶ Corporatism
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  - ▶ Corporatist systems are effective in reducing the adverse effects of macroeconomic shocks on earnings
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  - ▶ the earnings instability associated with developed ALMPs is augmented in periods of adverse macroeconomic shocks
  - ▶ institutional mixes with the potential to counteract this increase in earnings instability :
    - ▶ regulated labour markets,
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- ▶ Labour Market Support as average unemployment benefit RR (UBRR)
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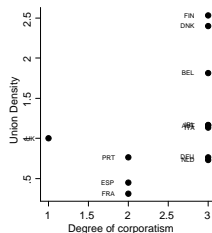
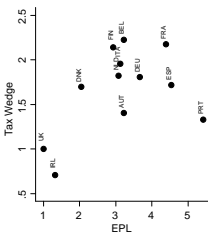
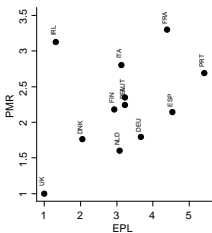
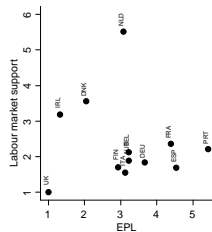
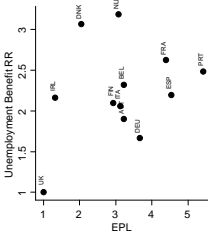
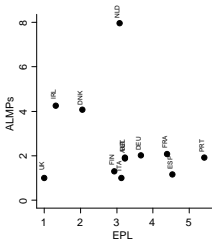
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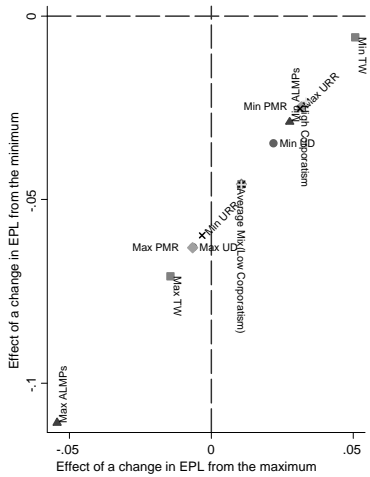
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# Labour Market Institutions in 2001

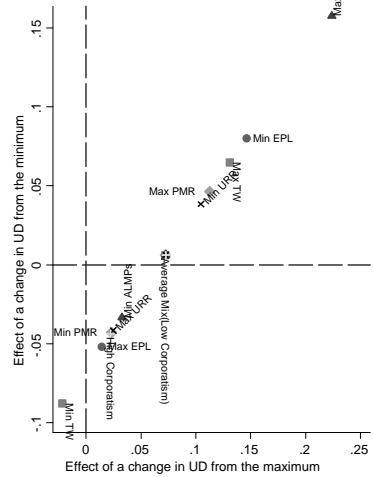


# Partial and Cross-derivatives of TV with respect to the institutional factors evaluated at the average (Table 6)

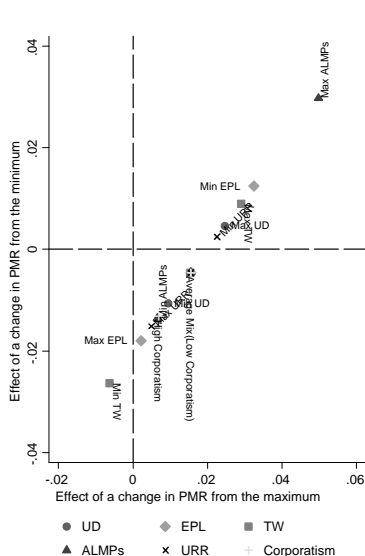
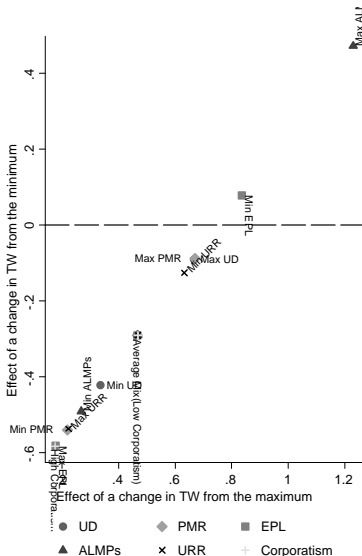
Institution $X_j$		Institution $X_k$											
		EPL		Union density		Tax wedge		PMR		ALMPs		Average replacement rate	
		$X_j^*$	$\frac{\partial TV}{\partial X_k}$	$\frac{\partial^2 TV}{\partial X_j \partial X_k}$	$\frac{\partial TV}{\partial X_k}$	$\frac{\partial^2 TV}{\partial X_j \partial X_k}$	$\frac{\partial TV}{\partial X_k}$	$\frac{\partial^2 TV}{\partial X_j \partial X_k}$	$\frac{\partial TV}{\partial X_k}$	$\frac{\partial^2 TV}{\partial X_j \partial X_k}$	$\frac{\partial TV}{\partial X_k}$	$\frac{\partial^2 TV}{\partial X_j \partial X_k}$	$\frac{\partial TV^2}{\partial X_k}$
EPL	min	-0.0459		0.1064		0.5457		0.0235		0.1728		-0.1700	
	mean	-0.0143	0.0174	0.0325	-0.0406	0.1763	-0.2028	0.0065	-0.0093	0.0497	-0.0676	-0.0399	0.0714
	max	0.0106		-0.0257		-0.1142		-0.0069		-0.0470		0.0625	
Union density	min	-0.0031		0.0063		0.0451		0.0005		0.0062		0.0059	
	mean	-0.0143	-0.0406	0.0325	0.0948	0.1763	0.4750	0.0065	0.0217	0.0497	0.1575	-0.0399	-0.1655
	max	-0.0314		0.0724		0.3763		0.0156		0.1160		-0.1096	
High corporatism	min	-0.0143	0.0226	0.0325	-0.0500	0.1763	-0.2919	0.0065	-0.0086	0.0497	-0.0703	-0.0399	0.0364
	mean	0.0083		-0.0175		-0.1156		-0.0021		-0.0206		-0.0035	
	max	0.0258		-0.0615		-0.2909		-0.0153		-0.1073		0.1282	
Tax wedge	min	-0.0143	-0.2028	0.0325	0.4750	0.1763	2.3629	0.0065	0.1100	0.0497	0.7941	-0.0399	-0.8498
	mean	-0.0393		0.0910		0.4675		0.0200		0.1476		-0.1446	
	max	0.0068		-0.0167		-0.0726		-0.0046		-0.0311		0.0427	
PMR	min	-0.0143	-0.0093	0.0325	0.0217	0.1763	0.1100	0.0065	0.0049	0.0497	0.0357	-0.0399	-0.0365
	mean	-0.0315		0.0724		0.3787		0.0155		0.1154		-0.1070	
	max	0.0027		-0.0072		-0.0238		-0.0025		-0.0158		0.0278	
ALMPs	min	-0.0143	-0.0676	0.0325	0.1575	0.1763	0.7941	0.0065	0.0357	0.0497	0.2600	-0.0399	-0.2685
	mean	-0.0792		0.1838		0.9394		0.0408		0.2995		-0.2979	
	max	-0.0282		0.0646		0.3415		0.0136		0.1019		-0.0911	
Average replacement rate	min	-0.0143	0.0714	0.0325	-0.1655	0.1763	-0.8498	0.0065	-0.0365	0.0497	-0.2685	-0.0399	0.2635
	mean	0.0064		-0.0154		-0.0694		-0.0041		-0.0279		0.0363	
	max												

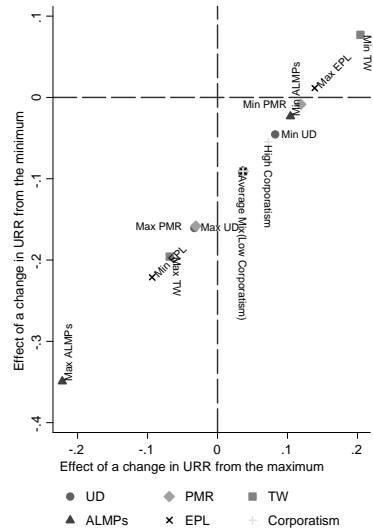
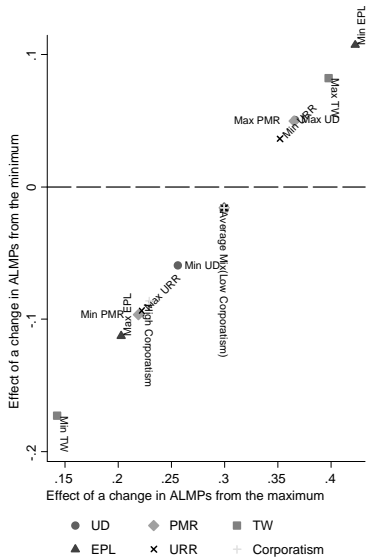


- UD
- ◆ PMR
- TW
- ▲ ALMPs
- × URR
- + Corporatism



- EPL
- ◆ PMR
- TW
- ▲ ALMPs
- × URR
- + Corporatism





# Prediction

