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*Wage inequality in Europe:
structure and inter-temporal change*

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EMPIRICAL LITERATURE

- In recent decades, substantial rise in wage inequality in developed (and developing) countries
- Reasons:
 - Technological changes
 - Changes in the institutional framework
 - International trade
- Welfare implications
- Most studies refer to monthly (or annual) wages and use data that are not strictly comparable across countries

AIMS

- To identify similarities and differences in the structure of earnings inequality across EU member-states using strictly comparable data.

Static analysis; ECHP

- To identify the factors behind the changes in earnings inequality in Europe during the last twenty years.

Dynamic analysis; national data sets

STATIC ANALYSIS

- Data: ECHP, 7th wave, 2000 (income information: 2001, 8th wave)
(UK, 4th wave; France 5th wave – problems with educational variables)
- Countries: All “old” EU countries apart from the Netherlands and Sweden
(no information on months employed during the previous year).
- Sample:
 - Individuals between 18 and 64 years of age
 - Employment outside the agricultural sector
 - Employed between 15 and 84 hours per week
 (“Regular employment”)
 - Truncation for hourly earnings less than 0.1 or more than 10 times
mean earnings.
- Earnings: Net hourly earnings after income taxes and social security
contributions in 2000 (“Regular earnings”).
(Finland and France: data gross of income taxes)

Methodology

- Use additively decomposable inequality measures
Theil, Mean log deviation, Variance of Logs
- Split the population according to:
Education
Age
Sex
Sector
- Attribute aggregate inequality to
disparities “within groups”
and disparities “between groups”
according to each of the above factors
(uni-variate decomposition of inequality)
- Attempt multi-variate decomposition of inequality splitting the
population using all the above factors simultaneously
- Try “multiple classification analysis” to examine the marginal effect
of the participation in each group
- Examine correlations between the level of earnings inequality and
labour market, tax and other variables
(+ tentatively, panel analysis)
- (If possible) link “welfare regimes” and earnings inequality

Four types of decompositions, by:

Education: (3 groups)

Less than upper secondary

Upper secondary

Tertiary

Age: (5 groups)

18-24

25-34

35-44

45-54

55-64

Sex: (2 groups)

Males

Females

Sector: (2 groups)

Industry

Services

TABLE 1. SAMPLE DESCRIPTIVES (ECHP, 7th wave)

	Mean hourly earnings in euro (PPP)	Proportion of females in the sample	Female/ Male mean earnings	Tertiary/ "Primary" mean earnings	Secondary/ "Primary" mean earnings	Industry/ Services mean earnings
AUSTRIA	9.38	0.42	0.84	1.72	1.24	1.03
BELGIUM	9.63	0.45	0.86	1.23	1.03	1.06
DENMARK	9.66	0.48	0.88	1.30	1.13	1.00
FINLAND	11.39	0.50	0.85	1.40	1.01	0.98
FRANCE	9.87	0.46	0.85	1.57	1.21	0.96
GERMANY	9.75	0.41	0.79	1.58	1.12	1.07
GREECE	7.49	0.40	0.84	1.87	1.17	0.87
IRELAND	9.14	0.46	0.82	1.64	1.13	0.92
ITALY	8.60	0.41	0.97	1.83	1.23	0.84
LUXEMBOURG	16.71	0.39	0.77	1.95	1.33	0.81
PORTUGAL	6.02	0.46	0.92	3.09	1.44	0.62
SPAIN	8.20	0.38	0.89	1.65	1.19	0.88
UK	7.58	0.49	0.84	1.36	1.17	0.96

TABLE 2. INEQUALITY IN THE DISTRIBUTION OF HOURLY EARNINGS

	Index of inequality			
	Gini (G)	Theil (T)	Mean log deviat. (N)	Variance of logs (L)
AUSTRIA	0.195 [12]	0.065 [12]	0.064 [12]	0.128 [12]
BELGIUM	0.200 [11]	0.073 [11]	0.069 [11]	0.135 [11]
DENMARK	0.161 [13]	0.055 [13]	0.049 [13]	0.092 [13]
FINLAND	0.225 [9]	0.095 [9]	0.091 [8]	0.184 [8]
FRANCE	0.280 [5]	0.142 [4]	0.132 [5]	0.249 [5]
GERMANY	0.225 [10]	0.086 [10]	0.086 [10]	0.175 [9]
GREECE	0.289 [2]	0.147 [3]	0.136 [3]	0.254 [4]
IRELAND	0.266 [7]	0.122 [7]	0.116 [7]	0.223 [6]
ITALY	0.227 [8]	0.096 [8]	0.089 [9]	0.171 [10]
LUXEMBOURG	0.286 [3]	0.136 [5]	0.132 [4]	0.258 [2]
PORTUGAL	0.326 [1]	0.197 [1]	0.171 [1]	0.293 [1]
SPAIN	0.267 [6]	0.122 [6]	0.116 [6]	0.221 [7]
UNITED KINGDOM	0.285 [4]	0.148 [2]	0.136 [2]	0.256 [3]

Ranks in brackets

TABLE 3. ONE-WAY INEQUALITY DECOMPOSITION
(proportion of aggregate inequality due to “between-group” disparities)

	EDUCATION (3 groups)			AGE (5 groups)			SEX (2 groups)			Sector (2 groups)		
	T	N	L	T	N	L	T	N	L	T	N	L
AUSTRIA	14.0	13.9	11.9	9.4	9.8	8.7	5.6	5.8	5.6	0.3	0.3	0.4
BELGIUM	6.6	6.9	5.9	11.4	12.3	11.6	4.9	5.2	4.8	na	na	na
DENMARK	6.6	7.5	8.6	2.9	3.4	5.1	3.9	4.4	3.4	na	na	na
FINLAND	8.5	8.7	8.6	2.6	2.7	4.7	3.4	3.6	2.8	na	na	na
FRANCE	13.6	14.1	13.3	5.4	6.0	7.0	1.7	1.8	1.9	0.2	0.2	0.0
GERMANY	12.4	11.9	9.7	5.5	5.9	5.0	6.2	6.3	5.9	0.4	0.4	0.4
GREECE	25.3	26.1	22.5	18.8	22.3	21.3	1.6	1.8	2.1	2.2	2.5	1.9
IRELAND	18.1	18.1	13.3	11.6	12.8	10.0	4.0	4.2	4.4	1.2	1.2	0.3
ITALY	22.1	22.1	18.2	11.9	13.4	12.2	0.4	0.5	0.4	3.7	4.1	3.5
LUXEMBOURG	29.4	29.4	27.6	13.5	14.4	12.6	4.5	4.7	5.6	3.2	3.5	2.1
PORTUGAL	42.9	42.0	36.4	9.6	11.7	8.8	0.1	0.1	0.6	6.9	8.4	4.8
SPAIN	17.4	18.1	15.4	14.7	16.0	13.1	1.4	1.5	1.9	1.6	1.7	1.0
U.K.	6.8	7.4	7.0	4.7	5.5	7.5	2.4	2.6	3.0	0.1	0.1	0.0

TABLE 4. MULTIVARIATE DECOMPOSITION OF INEQUALITY
(proportion of aggregate inequality due to “between-group” disparities)

	Index of inequality		
	Theil (T)	Mean log deviation (N)	Variance of logs (L)
AUSTRIA	28.3	27.4	24.6
BELGIUM	26.9	27.6	26.1
DENMARK	14.1	16.0	17.4
FINLAND	16.6	16.6	17.4
FRANCE	27.0	27.2	28.6
GERMANY	22.9	22.3	19.7
GREECE	46.7	49.3	47.4
IRELAND	42.4	41.3	36.8
ITALY	36.3	36.4	33.0
LUXEMBOURG	48.6	48.6	46.7
PORTUGAL	59.0	57.9	52.1
SPAIN	42.0	41.8	38.6
UNITED KINGDOM	15.6	17.0	18.8

Proportion of aggregate inequality due to between groups disparities (ECHP 2000)

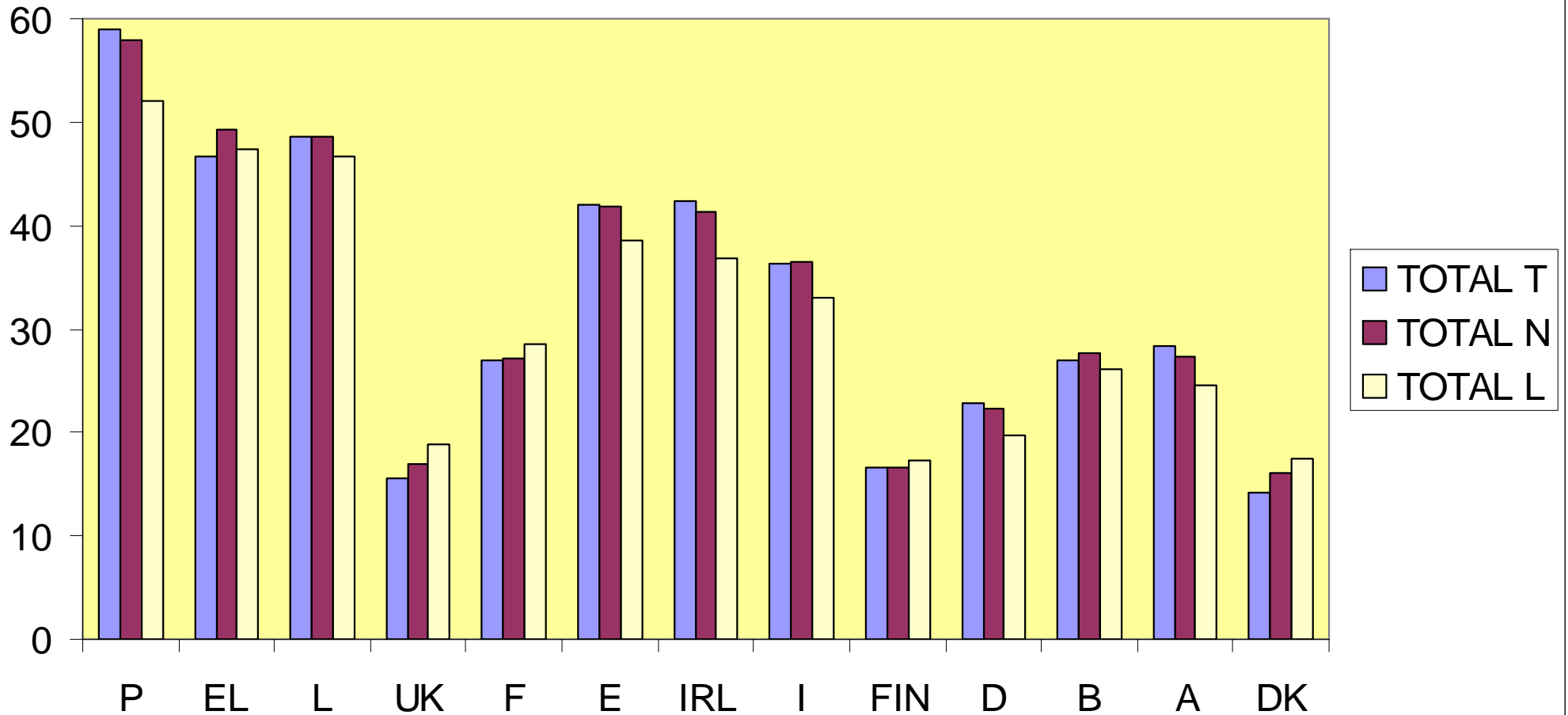


TABLE 5. MULTIVARIATE DECOMPOSITION OF INEQUALITY

(proportion of aggregate inequality due to “between-group” disparities at each level of analysis – L)

	Main effects					Cov.	Total	2-way	3-way	4-way	Model
	EDU (E)	AGE (A)	SEX (S)	SECT. (R)	inter.			inter.	inter.		
AUSTRIA	7.6	4.2	3.7	0.2	5.7	21.4	-	-	-	21.4	
BELGIUM	9.3	11.7	4.6	-	-1.5	24.0	1.7	0.4	-	26.1	
DENMARK	8.0	4.3	3.7	-	0.6	16.6	0.6	0.2	-	17.4	
FINLAND	7.6	3.6	4.0	-	0.5	15.7	1.2	0.5	na	17.4	
FRANCE	15.7	9.0	2.4	0.0	-2.3	24.8	2.3	0.8	0.6	28.6	
GERMANY	7.6	2.9	4.0	0.1	3.4	17.9	1.1	-	-	19.1	
GREECE	18.8	18.0	2.4	0.2	4.9	44.2	2.4	0.6	0.1	47.4	
IRELAND	15.3	10.6	5.2	0.0	-1.0	30.0	4.9	1.4	0.4	36.8	
ITALY	15.5	9.4	1.4	0.4	3.6	30.3	2.2	-	-	32.5	
LUXEMBOURG	22.8	9.9	4.4	1.1	5.0	43.3	1.5	-	-	44.9	
PORTUGAL	34.8	7.6	3.9	0.5	2.0	48.8	2.9	0.4	0.0	52.1	
SPAIN	17.8	13.7	3.3	0.0	-1.1	33.7	3.8	0.8	0.2	38.6	
U.K.	5.7	7.1	2.2	0.0	1.3	16.4	1.7	0.5	0.1	18.8	

DYNAMIC ANALYSIS

- Data: National Data Sets
 - Data every five years since 1975 or 1980 (approximately)
 - Strictly comparable within, but not across countries
- Countries All EDWIN countries (apart from Portugal) :

Finland (1984-1998)	gross
France (1990-2001)	gross
Germany (1984-2000)	gross
Greece (1974-1999)	net
Italy (1987-2000)	net
Norway (1980-2000)	gross
Sweden (1974-2000)	gross
UK (1994-2003)	gross
- Sample restrictions etc., as before (but four educational groups)

Methodology

- Use inequality trend decomposition analysis (additively decomposable indices)
- Allocate overall change in earnings inequality into three components:
 - Changes in inequality “within groups”
 - Changes in inequality “between groups”
 - Changes in the structure of the labour force in terms of changes in:
 - educational qualifications
 - female labour force participation
 - age of the labour force
 - sector of employment

TABLE 6. INTER-TEMPORAL CHANGES IN HOURLY EARNINGS INEQUALITY AND EMPLOYEE CHARACTERISTICS IN EIGHT EUROPEAN COUNTRIES

Country (period)	Change in hourly earnings inequality according to (%)				Change in the sample share of (%)			
	G	T	N	L	Tertiary education graduates	Employees aged 45-64	Female employees	Employees in services
Finland (1984-1998)	-1.3	-2.9	-2.0	-1.5	8.4	11.0	2.9	10.9
France (1990-2001)	-1.3	-3.4	-1.2	-1.3	8.4	8.9	2.6	5.2
Germany (1984-2000)	8.8	18.2	12.5	6.9	10.1	0.0	4.9	11.0
Greece (1974-1999)	3.2	9.9	13.7	21.1	12.2	2.1	10.4	-7.1
Italy (1987-2000)	1.8	3.5	7.5	12.6	2.5	4.0	1.8	-5.0
Norway (1980-2000)	13.0	51.0	37.5	32.3	16.5	-8.5	7.3	12.8
Sweden (1974-2000)	1.7	6.9	3.8	-0.1	22.4	7.4	7.9	16.0
UK (1994-2003)	1.3	5.8	2.0	-0.3	22.4	7.4	7.9	16.0

TABLE 7. TREND DECOMPOSITION OF HOURLY EARNINGS INEQUALITY
(Index of inequality: Mean log deviation, N)

Country / Grouping criterion	Change in hourly earnings inequality due to (%)		
	Changes in inequality "within groups"	Change in population shares	Change in group mean earnings
Education group			
Finland	7.4	-9.0	-0.4
France	1.9	-3.4	0.5
Germany	34.3	-24.3	2.5
Greece	12.8	1.0	-0.1
Italy	6.4	2.3	-1.2
Norway	31.3	6.3	-0.1
Sweden	-6.6	10.9	-0.4
UK	3.0	1.9	-2.9
Age group			
Finland	-1.4	-0.7	0.1
France	-3.8	2.7	-0.1
Germany	20.8	-9.4	1.2
Greece	12.4	1.0	0.2
Italy	12.2	-0.4	-4.3
Norway	40.0	-3.0	0.5
Sweden	-2.3	6.0	0.1
UK	0.5	1.9	-0.4

TABLE 7. TREND DECOMPOSITION OF HOURLY EARNINGS INEQUALITY (cont.)
(Index of inequality: Mean log deviation, N)

Country / Grouping criterion	Change in hourly earnings inequality due to (%)		
	Changes in inequality "within groups"	Change in population shares	Change in group mean earnings
Sex			
Finland	-0.6	-0.2	-1.3
France	-1.0	-0.2	0.0
Germany	13.2	0.0	-0.7
Greece	12.4	1.5	-0.2
Italy	7.4	0.2	0.0
Norway	41.1	-3.0	-0.6
Sweden	5.7	-1.4	-0.4
UK	2.7	-0.1	-0.6
Sector			
Finland	-4.1	2.0	0.1
France	-1.9	0.7	0.0
Germany	10.6	1.8	0.1
Greece	16.1	-2.5	0.1
Italy	8.8	-1.4	0.1
Norway	34.9	2.5	0.1
Sweden	-1.8	5.4	0.2
UK	1.0	0.9	0.1

CONCLUSIONS

- Level of (net hourly) earnings inequality:
Considerable differences across EU countries
- Structure of earnings inequality:
Very substantial cross-country differences, either in single-factor or multivariate analysis
In most countries, of the four factors examined, education and, to a lesser extent, age most closely associated with inequality (Human capital theory)
- Inter-temporal changes in earnings inequality :
In most of the countries examined, modest increase in inequality (in hourly as well as in monthly earnings distributions)
In most cases, changes driven by changes in inequality within groups
Negligible impact of changes in group mean earnings
Ceteris paribus, in most countries, “educational deepening”, “deindustrialisation” and “ageing of the labour force” associated with modest increases in earnings inequality, while no significant impact of increased female labour force participation on inequality was found.

POLICY IMPLICATIONS

- (Aim of this part of the project to describe patterns rather than derive detailed policy implications)
- If a policy implication can be derived from its results, it is probably a negative one. Taking into account the heterogeneity of the European countries regarding their level, structure and patterns of inter-temporal trends in hourly earnings inequality, it is rather unlikely that the same type of policies may have very similar effects across countries.
- Therefore, if – and this is a big “if” - the stated aim of policy is to reduce earnings inequality, different policies are likely to be appropriate in the context of different European countries.

CORRELATIONS AND PANEL ANALYSIS

- Importance of:
 - Tax progressivity
 - Rate of unemployment
 - Institutional framework
(esp. centralisation of wage bargaining)
 - Returns to educationand, to a lesser extent,
 - Share of part-time employment
 - Trade opennessin determining earnings inequality

MOTHLY EARNINGS INEQUALITY

- Analysis also performed for the distribution of monthly earnings.
- Perhaps, important from a policy point of view
- But mixes prices (outside the control of individual workers) and quantities (workers have, at least, some control)
- Results very similar with those of the analysis of hourly earnings inequality, with two exceptions:
 - Structure: Differences between males and females far more important
 - Trends: Inequality rose in all countries and according to all indices examined

TABLE 8. WEEKLY HOURS WORKED PER QUINTILE OF THE EARNINGS DISTRIBUTION

Country	Quintile					All	Ratio 5/1	Correlation coefficient
	1	2	3	4	5			
AUSTRIA	37.7	38.3	38.6	38.4	39.8	38.6	1.06	0.047 *
BELGIUM	40.8	38.6	38.9	37.7	37.6	38.7	0.92	-0.055 **
DENMARK	39.0	36.9	35.9	36.7	37.0	37.1	0.95	-0.049 *
FINLAND	38.9	38.6	38.7	38.7	37.0	38.4	0.95	-0.077 **
FRANCE	37.9	37.5	37.9	38.0	37.7	37.8	1.00	-0.028
GERMANY	41.1	40.0	38.9	39.4	40.5	40.0	0.98	0.010
GREECE	42.9	42.0	40.2	40.2	34.7	40.0	0.81	-0.327 **
IRELAND	37.0	36.8	39.2	37.8	35.6	37.3	0.96	-0.086 **
ITALY	40.1	38.9	37.6	37.8	33.3	37.5	0.83	-0.295 **
LUXEMBOURG	38.2	37.5	38.6	37.8	37.5	37.9	0.98	-0.080 **
PORTUGAL	41.2	40.4	40.3	40.2	37.6	39.9	0.91	-0.210 **
SPAIN	43.4	40.6	39.3	38.9	38.2	40.1	0.88	-0.132 **
UNITED KINGDOM	39.3	39.5	40.0	40.4	40.8	40.0	1.04	0.033

*/** Coefficient significant at the 5%/1% level

Mean log deviation

