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)
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Aim

- Earnings instability measure - derived from the transitory component of earnings
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Background on transitory earnings inequality

▶ Components of earnings inequality

\[
\ln(\text{Earnings}) = \text{Permanent Component} + \text{Transitory Component}
\]

- Permanent Component:
  - Personal Characteristics
  - Education
  - Training
  - Ability

- Transitory Component:
  - Individual random factors (illness, accidents)
  - Volatility in the labour market
  - Measurement error
  - Expected to average out over time

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\text{Earnings Inequality} = I(\text{Permanent}) + I(\text{Transitory})
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- 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^2_\epsilon), v_{i0} \sim iid(0, \sigma^2_{c,0})
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- 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 \operatorname{Var}(\gamma_c \lambda_t v_{it})
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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)
- Active labour market programmes (ALMPs)
- Average unemployment benefit replacement rate
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\[ TV_{it} = \left[ \sum_{k=1}^{K} v_k X_{kit} + \sum_{k=1}^{K} \varphi_k (X_{kit} - \bar{X})(\sum_{k=1}^{K} v_k (X_{kit} - \bar{X}_k)] + u_{it} \right. \]  

\( i \) - country index, \( t \) - period index, \( k \) - institution index.

- partial derivative of \( TV \) wrt policy \( X_k \), setting the others equal to the average, except \( X_j \):

\[ \frac{\partial TV}{\partial X_k} = f(v_k, \varphi_k, X_k - \bar{X}_k, v_j, \varphi_j, X_j - \bar{X}_j) \]
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(2)
Interactions between institutions and common unobservable shocks

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

(3)

\( \tau_t \) - time effect for period t, \( \gamma_k \) - interaction effect between the institution/policy \( X_k \) and the overall unobserved shock, \( \tau_t \)
Interactions between institutions and common unobservable shocks

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Interactions between institutions and country-specific shocks

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

\( \sum_{s=1}^{S} \zeta_s Z_{sit} \) - 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.

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Adjusted $R^2$ 0.949
Observations 93

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

### Systemic interactions

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<td>EPL</td>
<td>1.66%</td>
</tr>
<tr>
<td>Union density</td>
<td>-4.75%</td>
</tr>
<tr>
<td>Tax wedge</td>
<td>-1.00%</td>
</tr>
<tr>
<td>PMR</td>
<td>-2.61%</td>
</tr>
<tr>
<td>ALMPs</td>
<td>-3.85%</td>
</tr>
<tr>
<td>Average replacement rate</td>
<td>4.00%</td>
</tr>
<tr>
<td>Corporatism</td>
<td>Transition from low to high</td>
</tr>
<tr>
<td></td>
<td>-37%</td>
</tr>
</tbody>
</table>
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:
  - Unionization
  - 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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Shaping earnings instability: labour market policy and institutional factors

Results

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Sum up: systemic interactions (2)

- LM protection: EPL
  - when low $\Rightarrow$ (-) across all policy mixes
  - when average $\Rightarrow$ (-) across most policy mixes
  - when high $\Rightarrow$ (+) across most policy mixes, with a few exceptions: e.g. for high ALMPs (-)

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  - its effect depends on corporatism: for the average country with a high corporatism, unionization is negatively associated with earnings instability

- **Corporatism**
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Interactions between institutions and common unobservable shocks

Table: Transitory Variance - Time effects interacted with institutions.

<table>
<thead>
<tr>
<th></th>
<th>[1] Estimates</th>
<th>[2] Range of institutions/policies</th>
<th>[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)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t Min Max</td>
<td>t Min Max</td>
<td></td>
</tr>
<tr>
<td>Time effects*</td>
<td>0.0118</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPL</td>
<td>0.0109 0.29</td>
<td>-1.82167 1.4325</td>
<td>-1.01% 2.58%</td>
</tr>
<tr>
<td>Union density</td>
<td>0.1089 0.65</td>
<td>-0.27631 0.4212</td>
<td>-2.04% 5.63%</td>
</tr>
<tr>
<td>High corporatism**</td>
<td>-0.3681*** -6.74</td>
<td>0 1</td>
<td>1.00% -36.18%</td>
</tr>
<tr>
<td>Tax wedge</td>
<td>-0.2774 -0.68</td>
<td>-0.19774 0.1232</td>
<td>6.54% -2.45%</td>
</tr>
<tr>
<td>PMR</td>
<td>0.0572* 1.82</td>
<td>-2.26252 1.8403</td>
<td>-12.07% 11.63%</td>
</tr>
<tr>
<td>ALMPs</td>
<td>0.2904* 1.77</td>
<td>-0.25193 0.9610</td>
<td>-6.39% 29.18%</td>
</tr>
<tr>
<td>Average replacement rate</td>
<td>-0.4354 -1.43</td>
<td>-0.19437 0.2892</td>
<td>9.55% -11.72%</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.9366</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obs.</td>
<td>93</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Interactions between institutions and country-specific shocks

**Table: Transitory Variance - Observed shocks interacted with institutions.**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Estimates</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPL</td>
<td>-0.0576</td>
<td>-0.62</td>
</tr>
<tr>
<td>Union density</td>
<td>-0.1306</td>
<td>-0.39</td>
</tr>
<tr>
<td>High corporatism</td>
<td>-0.2104*</td>
<td>-1.98</td>
</tr>
<tr>
<td>Tax wedge</td>
<td>1.1377</td>
<td>1.07</td>
</tr>
<tr>
<td>PMR</td>
<td>0.0051</td>
<td>0.11</td>
</tr>
<tr>
<td>ALMPs</td>
<td>0.2680</td>
<td>0.99</td>
</tr>
<tr>
<td>Average replacement rate</td>
<td>-1.0866***</td>
<td>-2.75</td>
</tr>
<tr>
<td>LD shift</td>
<td>0.1094***</td>
<td>3.3</td>
</tr>
<tr>
<td>Terms of trade</td>
<td>-0.3146***</td>
<td>-6.94</td>
</tr>
<tr>
<td>TFP growth</td>
<td>-0.1789</td>
<td>-1.37</td>
</tr>
<tr>
<td>Real interest rate</td>
<td>0.4597***</td>
<td>4.86</td>
</tr>
</tbody>
</table>

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.
- ALMPs and PMR are found to exacerbate the adverse effects of macro shocks.
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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,
    - a high corporatism,
    - low non-wage labour costs and
    - high unemployment benefit replacement rates

- Labour Market Support as average unemployment benefit RR (UBRR)
  - the decrease in earnings instability associated with an increase in the UBRR is the largest when the ALMPs are very developed
  - => developed ALMPs have the potential to counteract the potential adverse effect of increasing the generosity of the unemployment benefit for earnings instability
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Thank you!
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Labour Market Institutions in 2001

Notes: (i) The labour market indicators are rescaled to set the UK as the base; (ii) The labour market support is the arithmetic average of ALMPs and the Unemployment Benefit RR.
Partial and Cross-derivatives of TV with respect to the institutional factors evaluated at the average (Table 6)

<table>
<thead>
<tr>
<th>Institution $X_j$</th>
<th>$X^*_j$</th>
<th>EPL</th>
<th>Union density</th>
<th>Tax wedge</th>
<th>PMR</th>
<th>ALMPs</th>
<th>Average replacement rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$\frac{\partial TV}{\partial X_k}$</td>
<td>$\frac{\partial^2 TV}{\partial X_k \partial X_j}$</td>
<td>$\frac{\partial^2 TV}{\partial X_k \partial X_j}$</td>
<td>$\frac{\partial^2 TV}{\partial X_k \partial X_j}$</td>
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<td>$\frac{\partial^2 TV}{\partial X_k \partial X_j}$</td>
</tr>
<tr>
<td></td>
<td>min</td>
<td>-0.0459</td>
<td>0.0108</td>
<td>0.5457</td>
<td>0.235</td>
<td>0.1728</td>
<td>-0.1700</td>
</tr>
<tr>
<td></td>
<td>mean</td>
<td>-0.1430</td>
<td>0.0174</td>
<td>0.0325</td>
<td>-0.0065</td>
<td>0.0497</td>
<td>-0.0676</td>
</tr>
<tr>
<td></td>
<td>max</td>
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<td>-0.0406</td>
<td>0.1763</td>
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<td>0.005</td>
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<tr>
<td></td>
<td>mean</td>
<td>-0.0143</td>
<td>-0.0406</td>
<td>0.0325</td>
<td>0.1763</td>
<td>0.4750</td>
<td>0.0948</td>
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<tr>
<td></td>
<td>max</td>
<td>0.0314</td>
<td>0.0704</td>
<td>0.0156</td>
<td>0.0116</td>
<td>0.1150</td>
<td>0.0206</td>
</tr>
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<td>-0.1430</td>
<td>0.0226</td>
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Shaping earnings instability: labour market policy and institutional factors

Conclusions

Effect of a change in EPL from the minimum

Effect of a change in EPL from the maximum

Effect of a change in UD from the minimum

Effect of a change in UD from the maximum

Average Mix (Low Corporatism)
Shaping earnings instability: labour market policy and institutional factors

Conclusions

Figure: Effect of the Tax Wedge (TW) (left) / PMR (right) at its maximum/minimum value evaluated for min/mean/max values of other factors, ceteris paribus at the average Mix (Low Corporatism).
Conclusions

Figure: Effect of ALMPs (left) / Unemployment benefit replacement rate (UBRR) (right) at its maximum/minimum value evaluated for min/mean/max values of other factors, ceteris paribus at the average.
Prediction

Figure: Actual vs Predicted Earnings Instability - Models 1, 2, 3.