# Contextualized effects of unemployment and temporary employment on union formation in Europe: Moderating roles of labour market regulations

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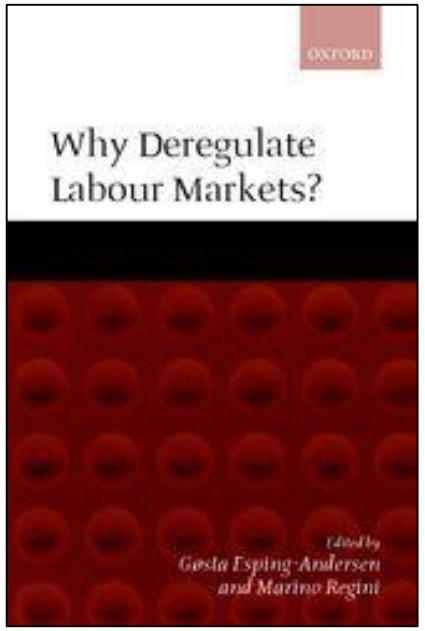
# Background

- Labor market deregulation in Europe during the past three decades have increased individuals' risks of experiencing unstable employment situations, including unemployment and temporary employment (Esping-Andersen & Regini, 2000; Kalleberg, 2009)
- Meanwhile, rising economic uncertainty and employment instability has become a driving force behind the changing family dynamics in Europe (Blossfeld & Mills, 2005; Kreyenfeld et al., 2012; Alderotti et al., 2021).
  - Both literature streams highlight the importance of **macro-level institutions** in either enlarging or mitigating social inequalities across employment status groups.
- Surprisingly, there's only limited discussions linking the two literature streams.
- This study aims to answer 2 questions:
- What are the effects of **unstable employment situations (unemp & temp)** on **union formation (cohabitation & marriage)**?
- How variations in **labour market regulations** moderate such effects?

## Who is harmed by labour market (de)regulations?

(Esping-Andersen & Regini, 2000)

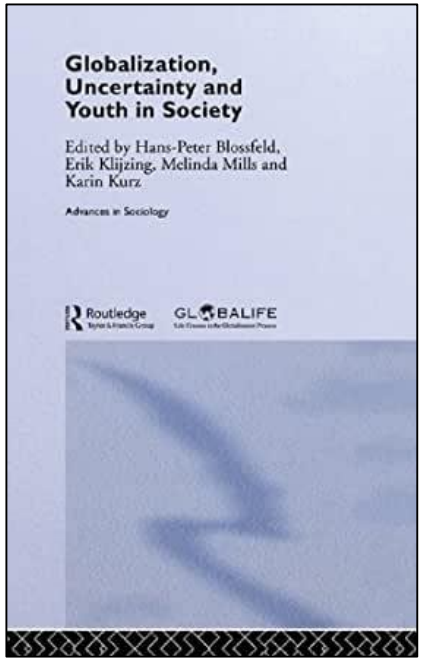



Labour market (de)regulations

→ Social/LM security gaps between different employment groups

## Who is the loser of Globalization and rising economic uncertainty?

(Blossfeld et al., 2005)

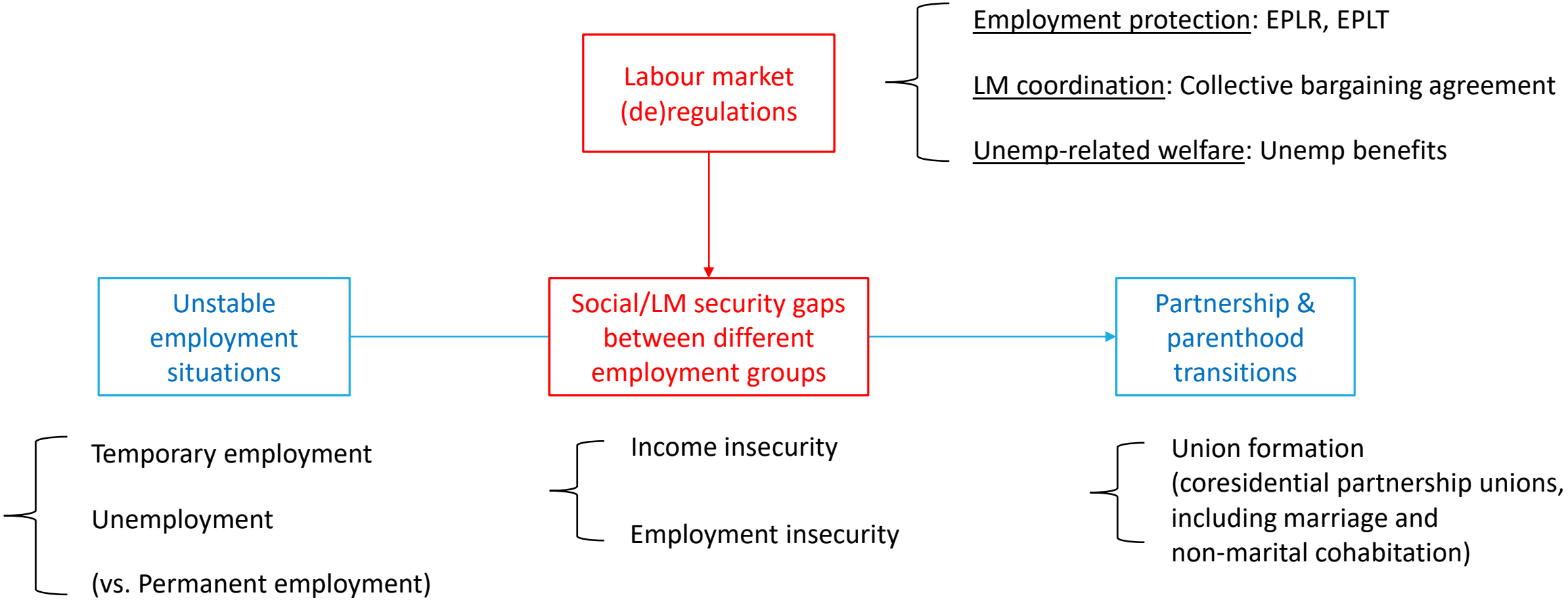



Macro institutions (empl systems, educ systems, welfare regimes, family systems)

Uncertainty resulted from unstable employment situations → Partnership & parenthood transitions

## What are the effects of unstable employment situations on union formation?

## How variations in labour market regulations moderate such effects?



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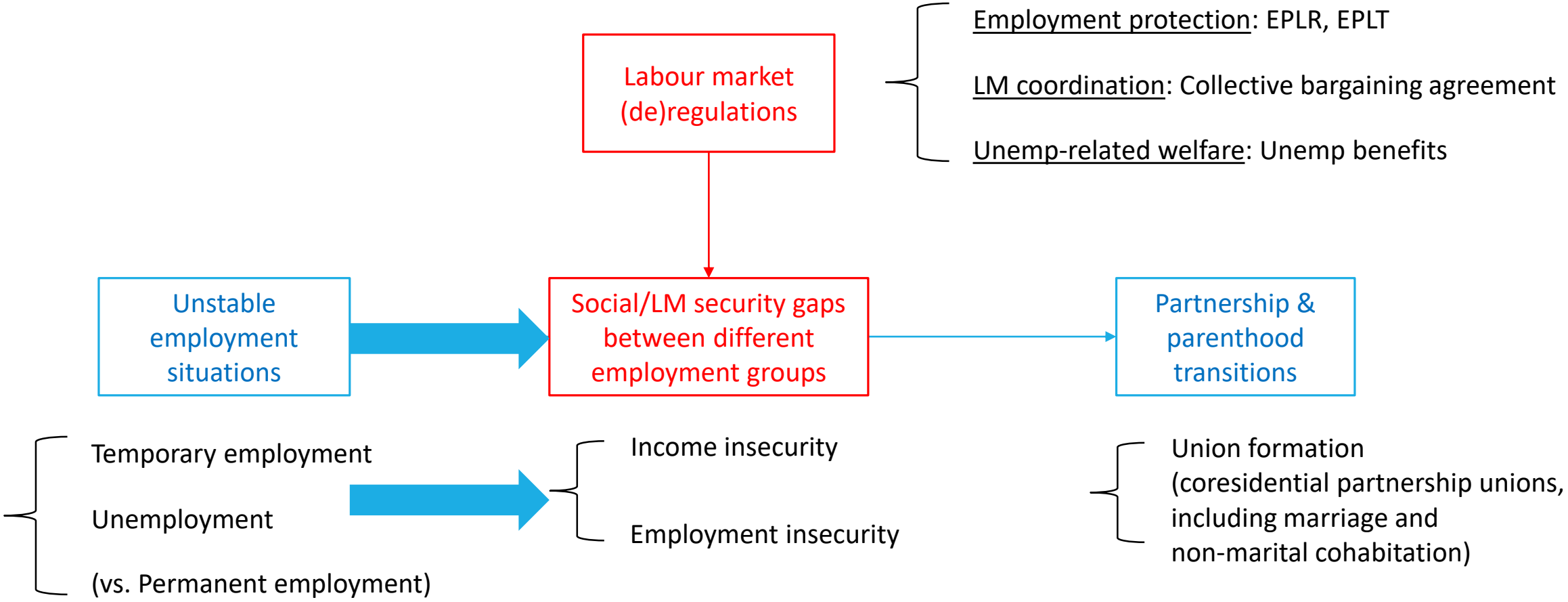


# Micro-level theory (1): Unstable employment situations and insecurities

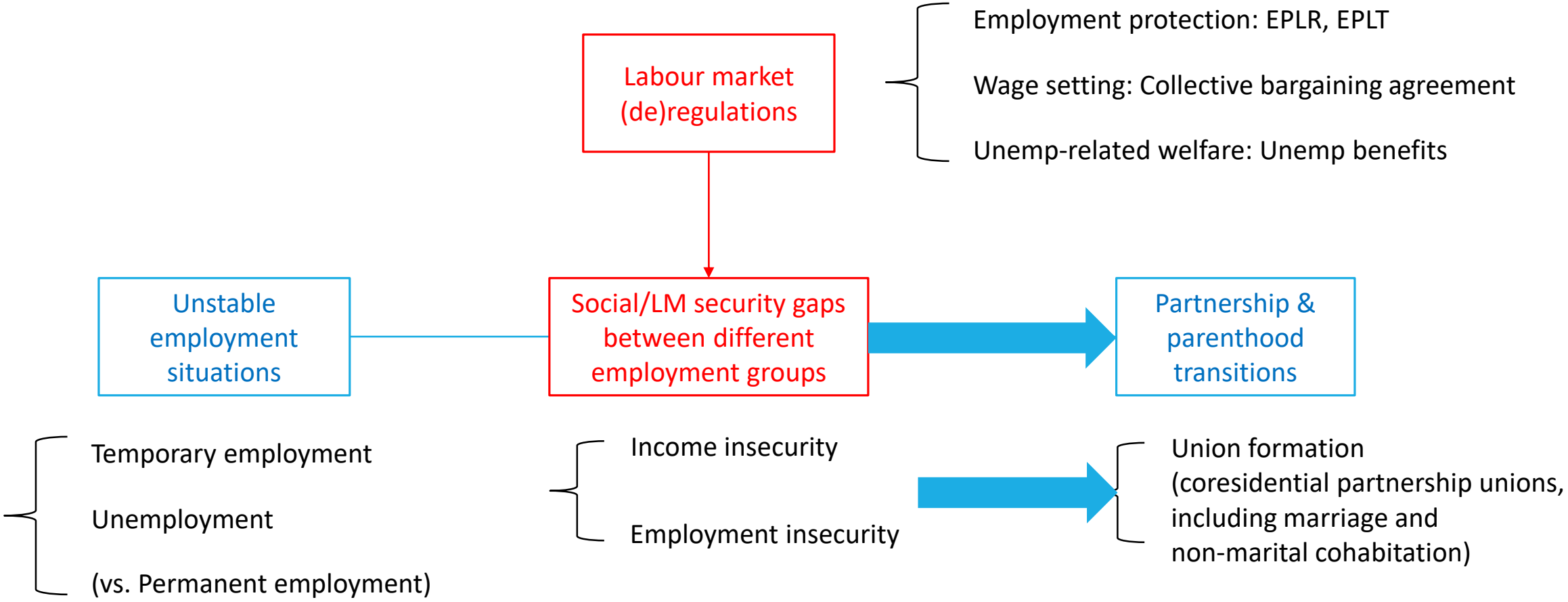
- Comparing to permanent employment, unemployment and temporary employment are characterized by: (Grotti & Scherer, 2014; Olsthoorn, 2014)
  1. **Income insecurity**—the difficulty to secure a sufficient income with which to support a decent standard of living
  2. **Employment insecurity**—the tendency to lose jobs or remain unemployed in the near future

❖Unemp vs. Perm: Higher income and employment insecurities
- Income poverty due to the loss of employment earnings (Gallie & Paugam, 2000; Haataja, 1999)
- Scar effects of unemployment on subsequent incomes and career mobility (Gangl 2004, 2006)

❖Temp vs. Perm: Higher income and employment insecurities
- Lower bargaining power over wages and benefits (Kalleberg, 2009)
- Lower human capital accumulation and employability due to frequent emp interruption and fewer on-job trainings (Forrier & Sels, 2003).
- Insecure employment prospects depending on the chances of temp contract renewal or perm contract transition.

## What are the effects of unstable employment situations on union formation?

## How variations in labour market regulations moderate such effects?



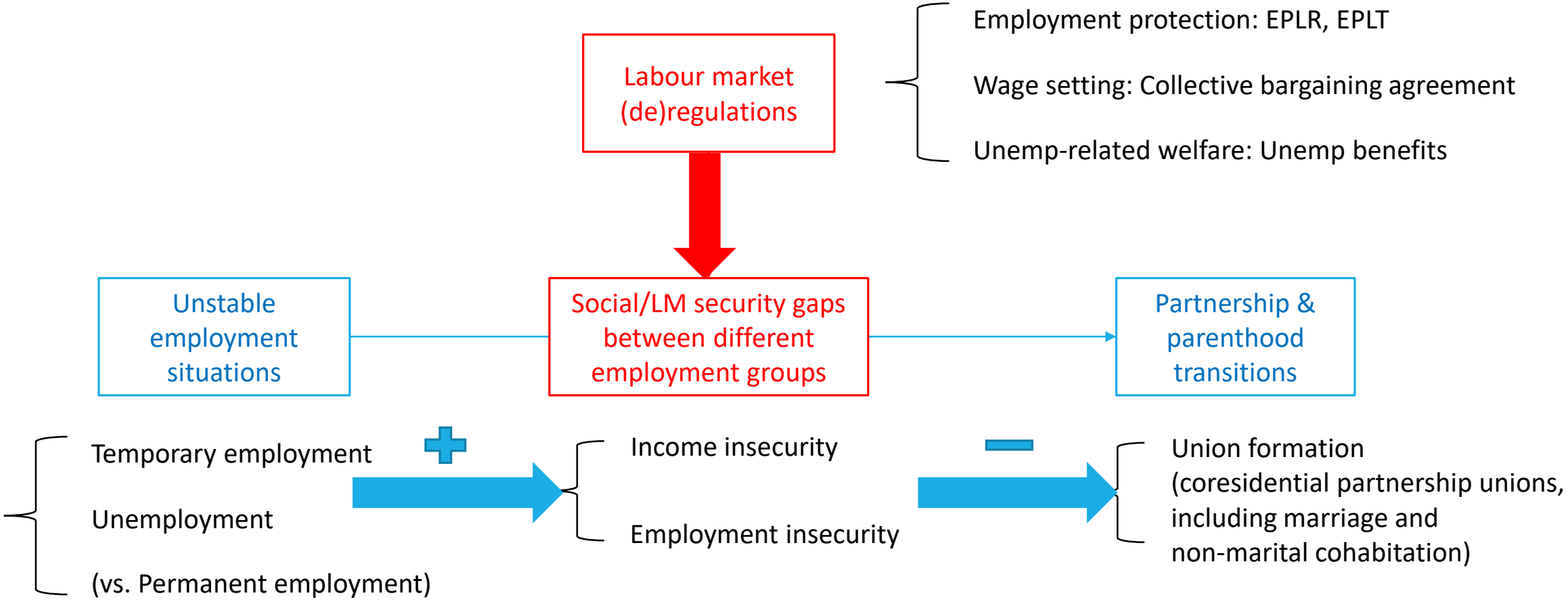
# Micro-level theory (2): Insecurities and union formation

- In family research, both income and employment insecurities serve as key mechanisms behind the delayed or decreased union formation among the unemployed and the temporarily employed (Ekert-Jaffe & Solaz, 2001; Kalmijn, 2011; Oppenheimer, 1988, 2003)
  1. **Becker's New Home Economics** (1985, 1991): Low and insecure incomes decrease the chance of matching a partner in the marriage market (i.e., the income effect)
  2. **Oppenheimer's theory of marriage timing** (1988, 2003): Employment insecurity leads to uncertainty about future career paths and the corresponding lifestyle. As a response, these individuals may perceive their current career stage as "inmature" and choose to postpone union formation until a stable labour market position is achieved.

*H1a: Compared to perm, temp has a negative effect on union formation*
*H1b: Compared to perm, unemp has a negative effect on union formation*

## What are the effects of unstable employment situations on union formation?

## How variations in labour market regulations moderate such effects?



| Labour market regulations (↑) | Insecurity gap between Temp and Perm | Insecurity gap between Unemp and Perm | Hypotheses: moderating effects of LMR |
|---|---|---|---|
| **EPL for dismissing regular workers (EPLR)** | Employment insecurity gap ↑<br>• Higher costs of dismissal discourage temp contract renewal or perm contract transition | Employment insecurity gap ↑<br>• Higher costs of dismissal discourage hiring<br>• Stronger scar effects | *H2a: effect of temp is more negative with higher EPLR*<br>*H2b: effect of unemp is more negative with higher EPLR* |
| **EPL for hiring temporary workers (EPLT)** | Employment insecurity gap ↑(↓)<br>• Reduced temp contract duration and the possibility of temp contract renewal<br>• More comprehensive temp employee protection | Employment insecurity gap ↑<br>• Higher costs of hiring temp discourage reemployment in temp positions | *H3a: effect of temp is more negative in with higher EPLT*<br>*H3b: effect of unemp is more negative with higher EPLT* |
| **Collective bargaining agreement coverage rate (CBC)** | Income insecurity gap (↓)<br>• Higher bargaining power over wages, benefits, and insurance<br>Employment insecurity gap ↑<br>• Enhanced insider-outsider dualism | Employment insecurity gap ↑<br>• Enhanced insider-outsider dualism | *H4a: effect of temp is more negative with higher CBC*<br>*H4b: effect of unemp is more negative with higher CBC* |
| **Generosity of unemployment benefits** | Income insecurity gap ↓<br>• Financial safety net if unemp after the end of contract | Income insecurity gap ↓<br>• Financial safety net<br>Employment insecurity gap ↓<br>• Weaker scar effects by permitting workers to search for adequate reemployment | *H4a: effect of temp is less negative with more generous unemp benefits*<br>*H4b: effect of unemp is less negative with more generous unemp benefits* |

# Data & sample

- Micro-level data:
  - European Union Statistics on Income and Living Conditions (EU-SILC)
  - Longitudinal data from 4-year rotation panels, years 2010 to 2019
- Macro-level data:
  - Time-series yearly data from OECD databases, Eurostat, and ILO
  - 215 country-rounds nested in 26 countries
  - 26 Countries: Austria, Belgium, Switzerland, Czech Republic, Germany, Denmark, Estonia, Spain, Finland, France, Greece, Hungary, Ireland, Iceland, Italy, Lithuania, Luxembourg, Latvia, Netherlands, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, United Kingdom

- Analytical sample
  - Women and men in ages 15-45
  - … who were single-alone (not living with a partner in the household) at the entry of the panel
  - … and were interviewed for at least two waves
  - Two subsamples stratified by gender: 87,918 person-years from 40,543 women; 116,051 person-years from 46,039 men
  - Observations are **right-censored** after the year of union formation, panel attrition, or the date of panel exit

# Method (1)

## 1. Three-level country fixed effects model (cFE)

- Use **within-country estimator** to rule out biases in estimating the parameter $\boldsymbol{\beta_1}$ by conditioning on all country-level time-constant confounders.

$$P\left(y_{j(t+1)i} = 1 \middle| \boldsymbol{X}_{jti}, \boldsymbol{Z}_{jt}\right) = \beta_0 + \boldsymbol{\beta_t} + \boldsymbol{X}_{jti}\boldsymbol{\beta_1} + \boldsymbol{Z}_{jt}\boldsymbol{\beta_2} + \sum_{j=1}^{N-1} \gamma_{0j}\, c_j + u_{0jt} + e_{jti}$$

  - $P\left(y_{j(t+1)i} = 1 \middle| \boldsymbol{X}_{jti}, \boldsymbol{Z}_{jt}\right)$: a person *i*'s probability of union formation *y* in time *t+1* in country *j*, given $\boldsymbol{X}_{jti}\ and\ \boldsymbol{Z}_{jt}$
  - $\beta_0$: grand average of the probability of union formation
  - $\boldsymbol{\beta_t}$: period fixed effect commonly experienced in every country
  - $\boldsymbol{X}_{ti}$: micro−level variables for individual *i* measured in time *t* in country *j*
  - $\boldsymbol{Z}_{jt}$: macro-level variables measured in time *t* in country *j*
  - $\gamma_{0j}c_j$: Country fixed effects (fixed intercepts)
  - $u_{jt}$: country-round level variance (random errors); $e_{jti}$: individual level variance (random errors)
- Least square estimator with country dummy variables (LSDV approach)
- Standard errors clustered at country level

# Method (2)

## 2. Three-level country fixed effects and slopes model (cFES)

- Use **within-country estimator** to rule out the biases in estimating the parameter $\boldsymbol{\beta_3}$ of the cross-level interaction $\boldsymbol{X}_{jti}\boldsymbol{Z}_{jt}$ by conditioning on the country fixed effects and country-specific effect heteroegeneity of $\boldsymbol{X}_{jti}$ as confounders. (Giesselmann & Schmidt-Catran, 2019).
- Strength compared to the mixed effects (random effects) models: Get rid of the biases resulted from unobserved country-level time-constant moderators. E.g., Gender equity and cultural norms (Kalmijn, 2011)

$$P\left(y_{j(t+1)i} = 1 \middle| \boldsymbol{X}_{jti}, \boldsymbol{Z}_{ct}\right) = \beta_0 + \boldsymbol{\beta_t} + \boldsymbol{X}_{jti}\boldsymbol{\beta_1} + \boldsymbol{Z}_{jt}\boldsymbol{\beta_2} + (\boldsymbol{X}_{jti}\boldsymbol{Z}_{jt})\boldsymbol{\beta_3}$$

$$+ \sum_{j=1}^{N-1} \gamma_{0j}\, c_j + \sum_{j=1}^{N-1} \gamma_{1j}\, (c_j \boldsymbol{X}_{jti}) + u_{jt} + e_{jti}$$

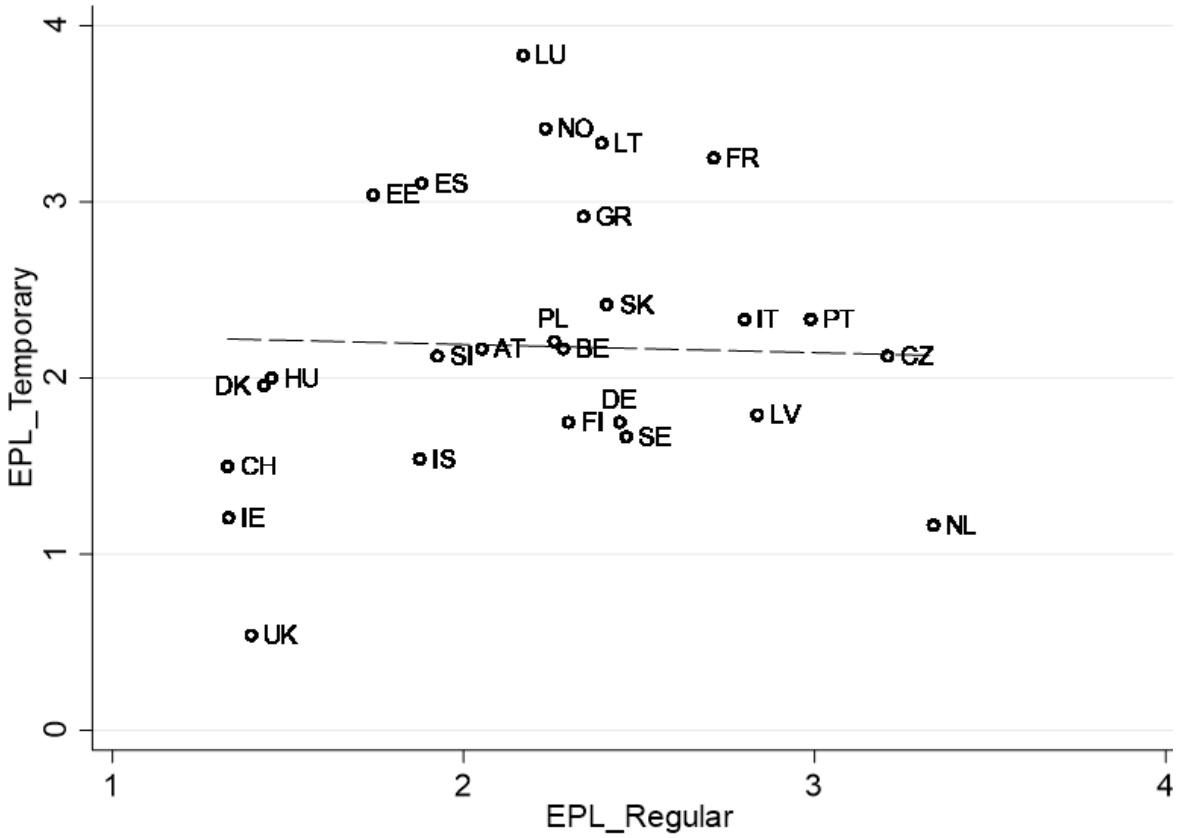
- $\beta_0, \boldsymbol{\beta_t}, \boldsymbol{X}_{ti}, \boldsymbol{Z}_{jt}, u_{jt}, e_{jti}$: same as the previous model
- $\boldsymbol{X}_{jti}\boldsymbol{Z}_{jt}$: cross-level interactions between micro-level employment status and macro-level LMR moderators
- $\gamma_{0j}c_j$: Country fixed effects (fixed intercepts)
- $\gamma_{1j}(c_j\boldsymbol{X}_{jti})$: Country-specific effect heterogeneity of $\boldsymbol{X}_{jti}$ (fixed slopes)

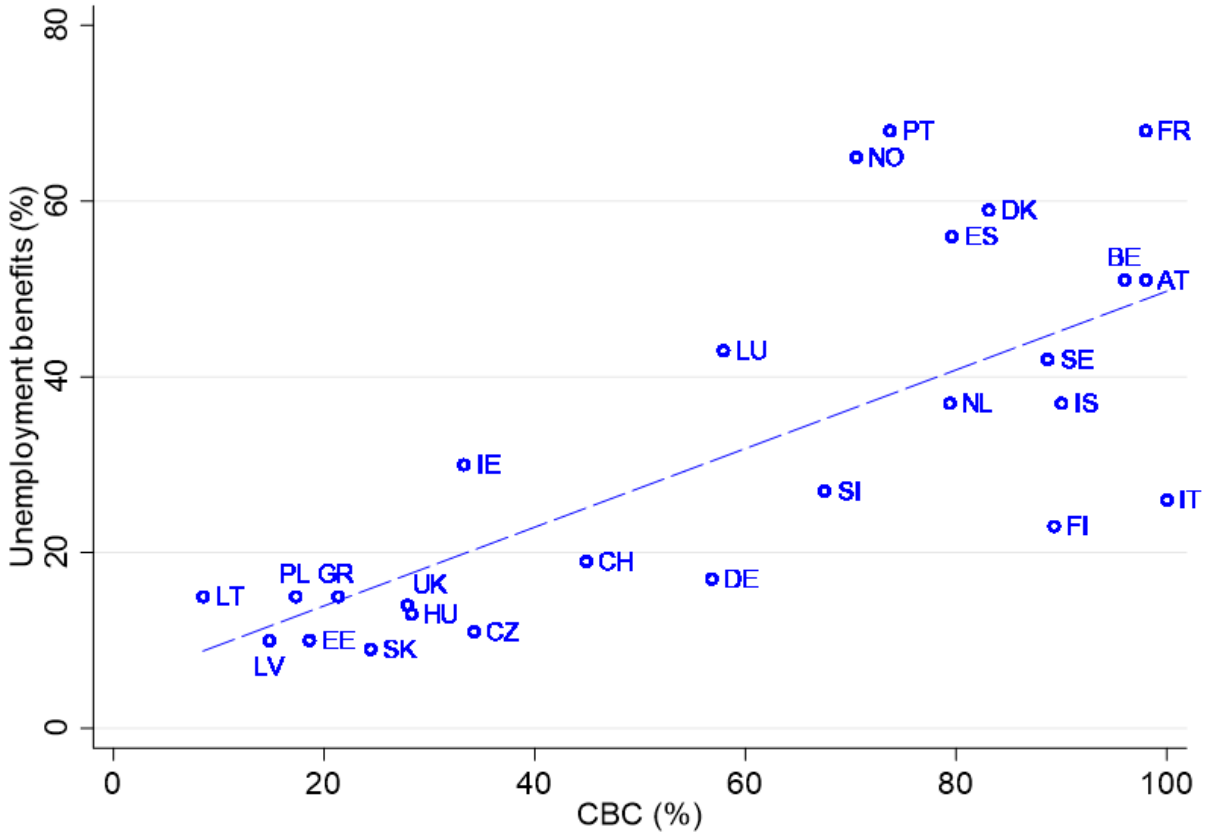
# Variables

- Micro-level:
  - Outcome variable: Binary dummy of union formation event (a transition from single-alone to cohabitation or married) at time ***t+1***
  - Independent variable: Categorical dummies of employment status at time ***t*** : permanent empl. (ref.) / temporary empl. / unemployment / self-employment
  - Controls: age, age^2, education, health status, parenthood status

- Macro-level:
  - Moderators: 4 LMR indicators
    - EPLR: range from 1 to 6, measuring the strictness of EPL of dismissing regular employee
    - EPLT: range from 1 to 6, measuring the strictness of EPL of hiring temporary employee
    - CBC: % of workers covered by collective bargaining agreement
    - Generosity of unemp benefits: net income replacement rate in the 24$^{th}$ month after unemployment, for average-wage workers.
  - Controls: GDPpc (PPP), gender-specific unemp rates, gender-specific temp rate, KOF econ globalization index
  - All macro-level variables are standardized to enhance interpretation

# Descriptive results: LMR context, year 2015



# Results (1): European average effects of temp and unemp compared to perm on union formation (based on 26 European countries)

**Table 1. Three-level cFE models: The effects of employment status on union formation (cohabitation or marriage).**

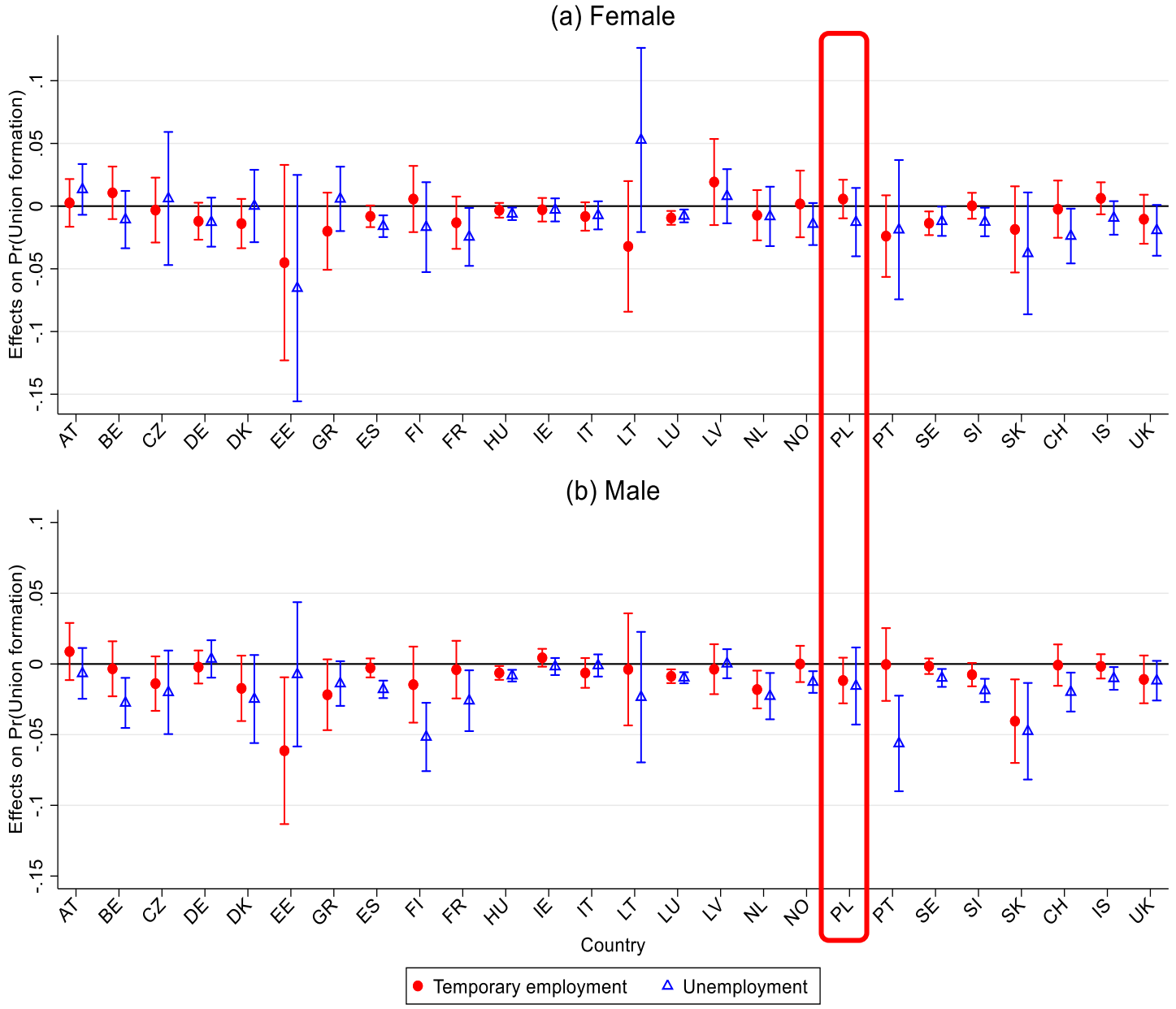
| | Females | | | | Males | | | |
|---|---|---|---|---|---|---|---|---|
| | *Pr(Y)* | *β* | *s.e.* | *p-value* | *Pr(Y)* | *β* | *s.e.* | *p-value* |
| Permanent employment | 0.041 | ref. | | | 0.031 | ref. | | |
| Temporary employment | 0.035 | -0.006 | (0.002) | 0.002 | 0.025 | -0.006 | (0.002) | 0.001 |
| Unemployment | 0.029 | -0.011 | (0.002) | 0.000 | 0.017 | -0.014 | (0.002) | 0.000 |
| Self employment | 0.038 | -0.002 | (0.003) | 0.543 | 0.033 | 0.002 | (0.002) | 0.287 |

*Note*: All models control for country and period fixed effects using the LSDV approach. Micro-level control variables include educational level, health status, parenthood status, age and age squared; and macro-level variables in the model includes standardized GDP per capita, gender-specific unemployment and temporary employment rates, KOF economic globalization index, EPLR, EPLT, CBC, and employment benefits replacement rate.

*H1a: Compared to perm, temp has a negative effect on union formation*
*H1b: Compared to perm, unemp has a negative effect on union formation*

# Results (2): Country-specific effects of temporary employment and unemployment on union formation

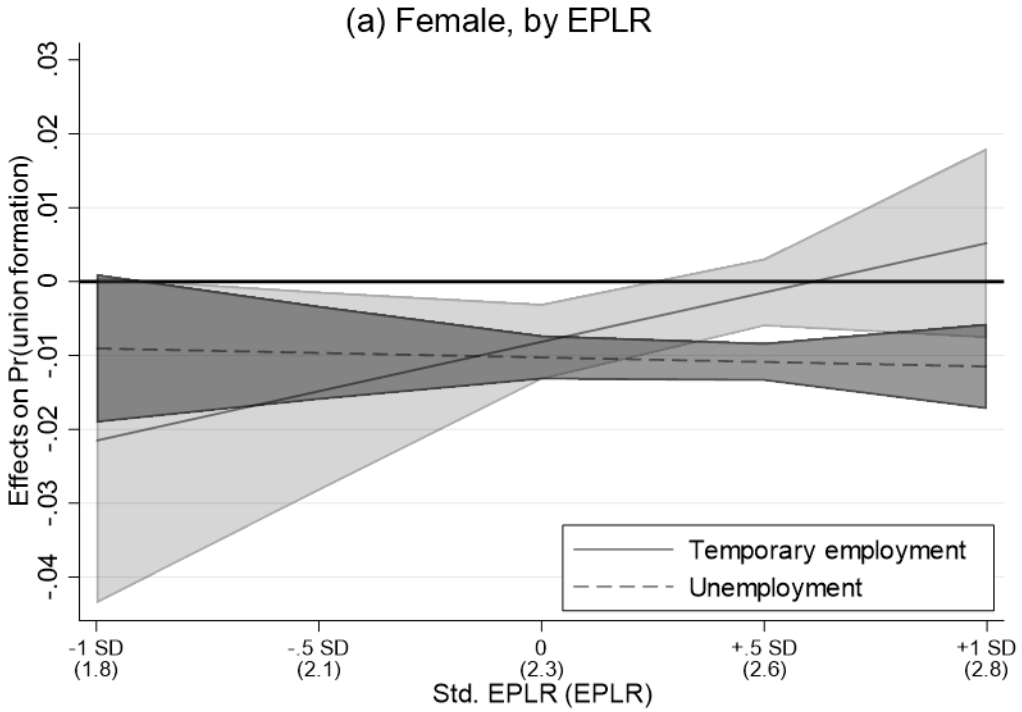
(ref. = permanent employment)

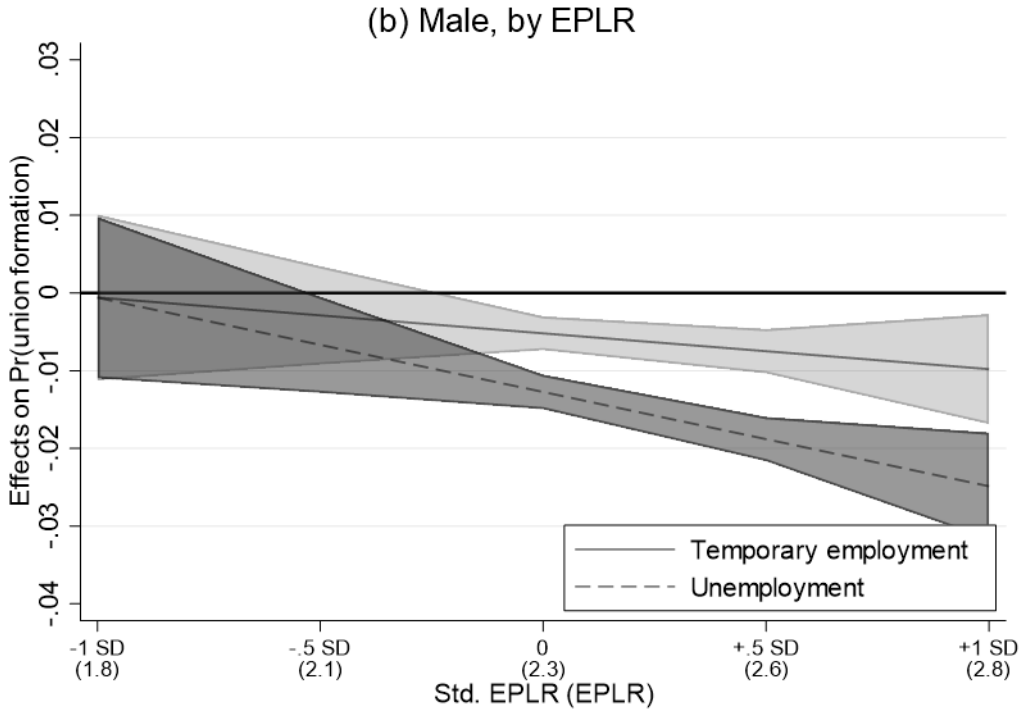



Source: EU-SILC 2010-2019
Coefficient estimates with 95% CI

# Results (3): Moderating effects of EPLR

Source: EU-SILC 2010-2019
Coefficient estimates with 95% CI




*For Females:*

~~*H2a: effect of temp is more negative with higher EPLR*~~

~~*H2b: effect of unemp is more negative with higher EPLR*~~

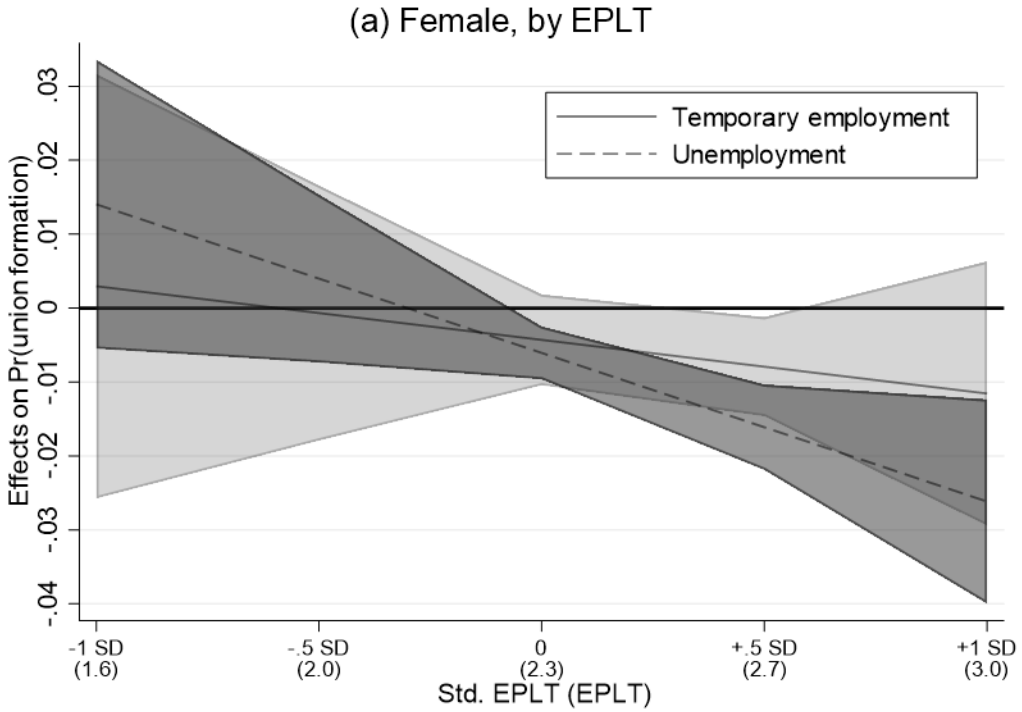
*For Males:*

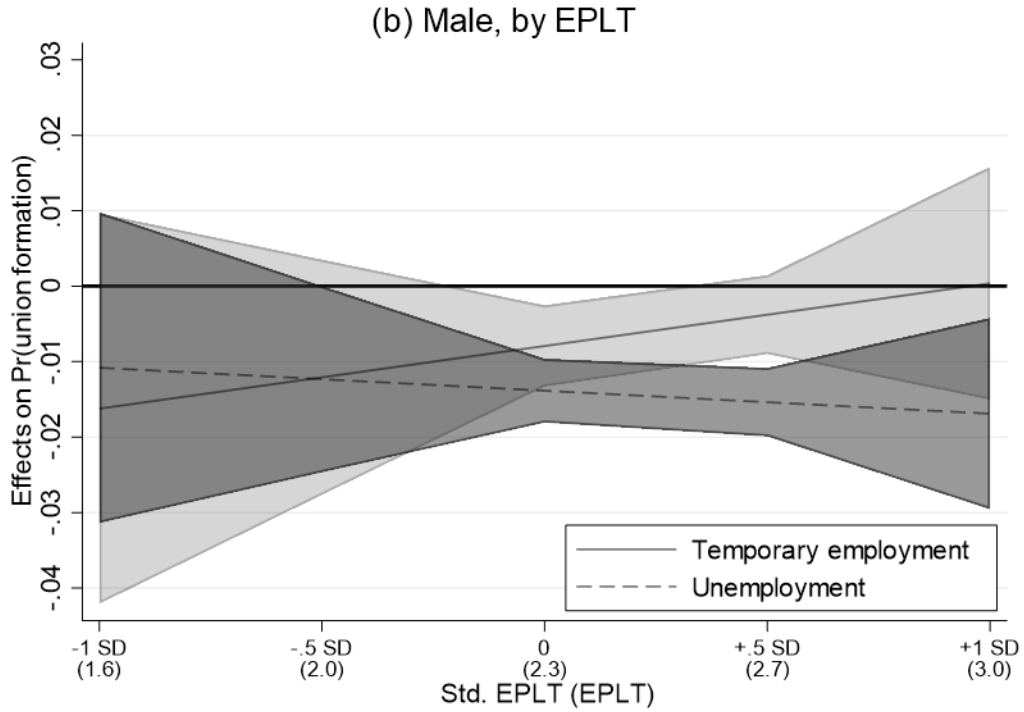
*H2a: effect of temp is more negative with higher EPLR*

*H2b: effect of unemp is more negative with higher EPLR*

# Results (4): Moderating effects of EPLT

Source: EU-SILC 2010-2019
Coefficient estimates with 95% CI




*For Females:*

*H3a: effect of temp is more negative with higher EPLT*

*H3b: effect of unemp is more negative with higher EPLT*

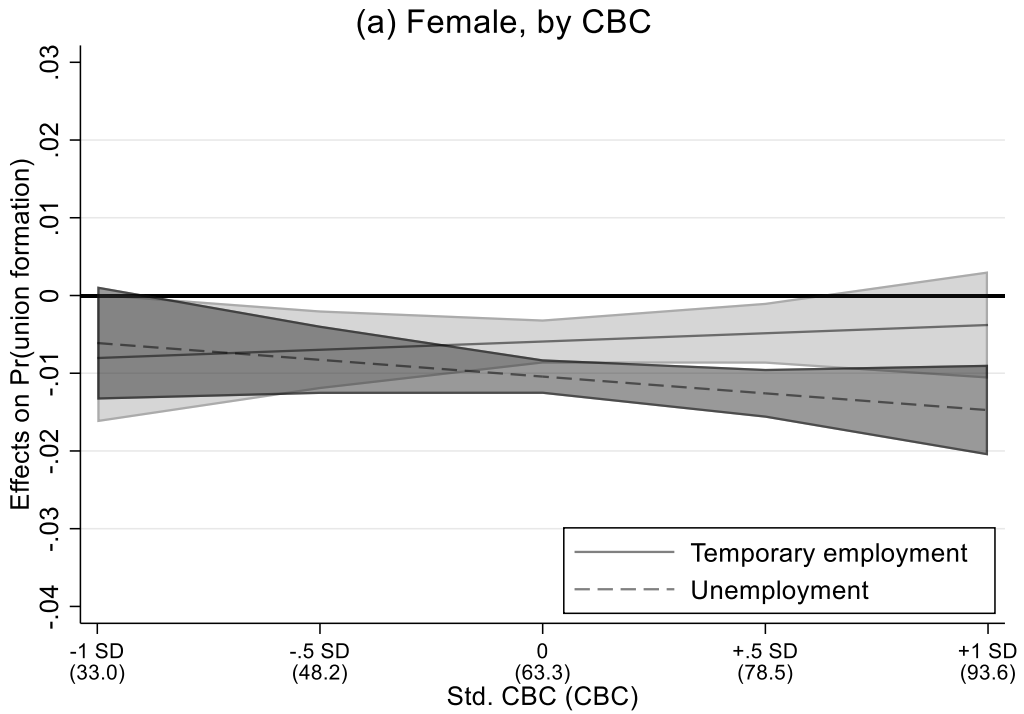
*For Males:*

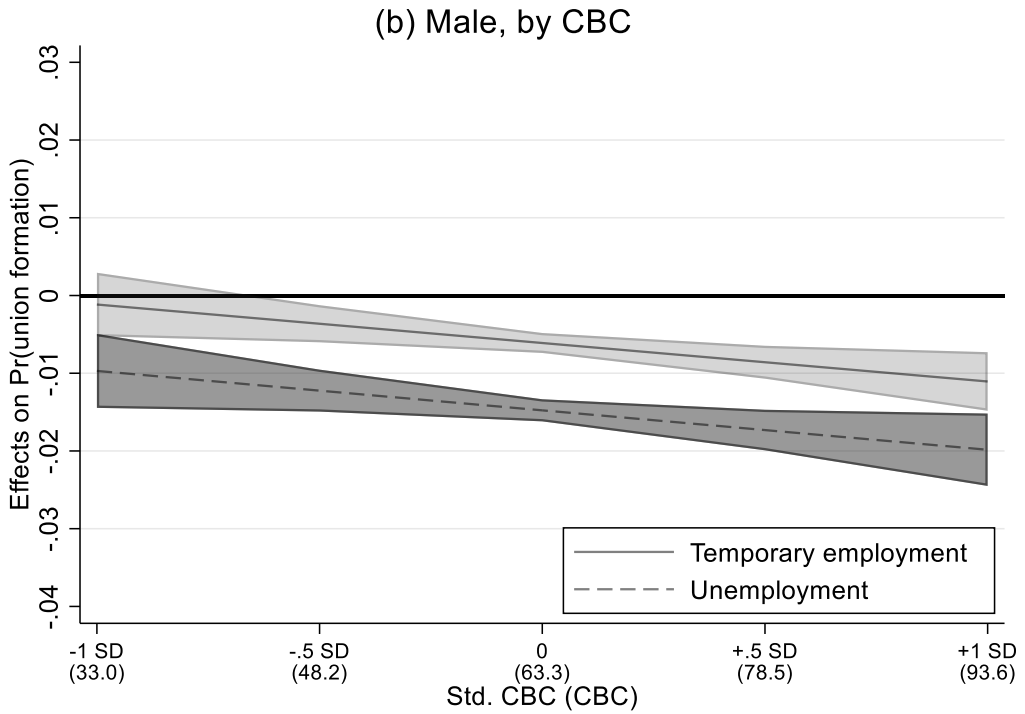
~~*H3a: effect of temp is more negative with higher EPLT*~~

~~*H3b: effect of unemp is more negative with higher EPLT*~~

# Results (5): Moderating effects of CBC

Source: EU-SILC 2010-2019
Coefficient estimates with 95% CI




*For Females:*

~~*H4a: effect of temp is more negative with higher CBC*~~

*H4b: effect of unemp is more negative with higher CBC*

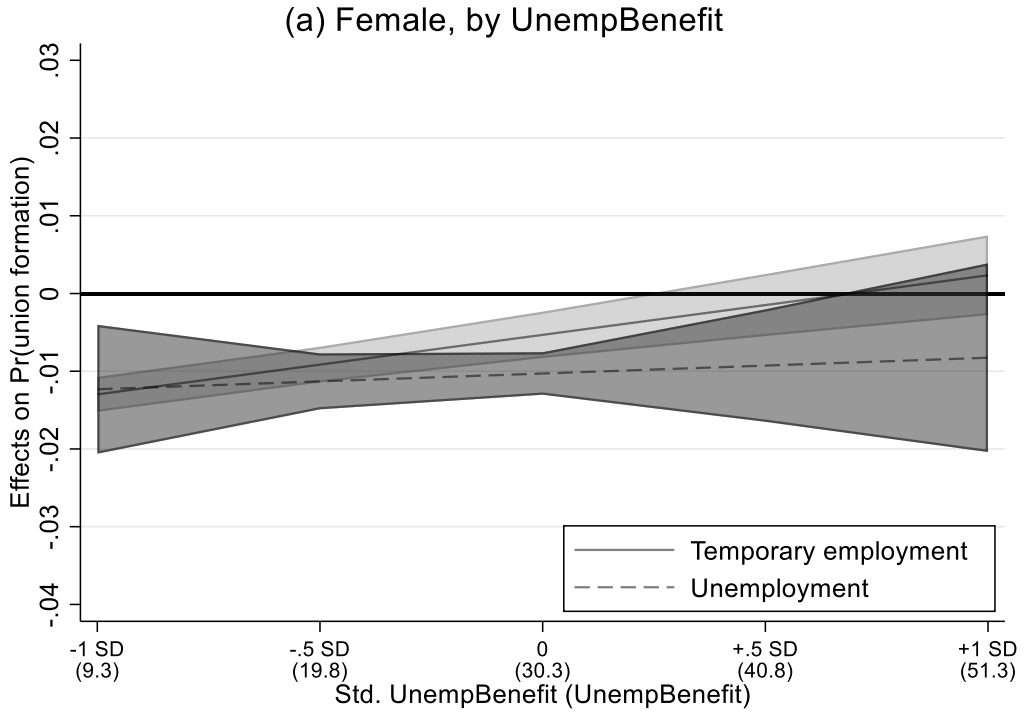
*For Males:*

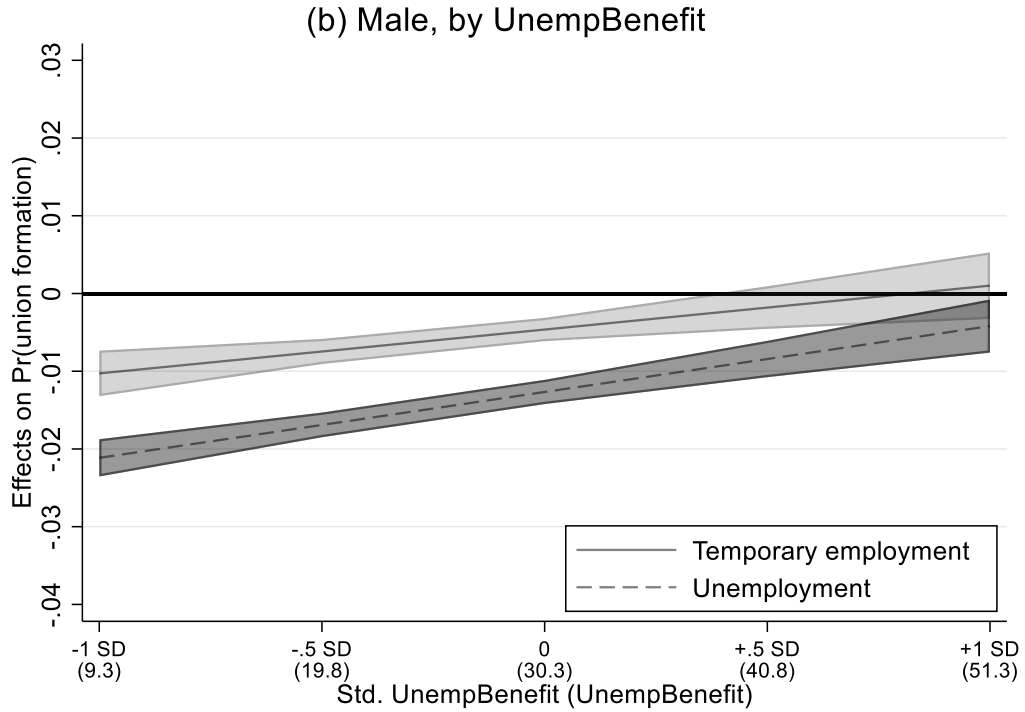
*H4a: effect of temp is more negative with higher CBC*

*H4b: effect of unemp is more negative with higher CBC*

# Results (6): Moderating effects of UnempBenefits

Source: EU-SILC 2010-2019
Coefficient estimates with 95% CI




*For Females:*

*H5a: effect of temp is less negative with more generous UB*

~~*H5a: effect of temp is less negative with more generous UB*~~

*For Males:*

*H5a: effect of temp is less negative with more generous UB*

*H5a: effect of temp is less negative with more generous UB*

# Conclusion & Discussion

- Compared to permanent employment, being temporarily employed or unemployed has, on average, negative effects on union formation for both genders in Europe.
- Mostly in line with our hypotheses, such effects are moderated by variations in labour market regulations, yet with some gender nuances.
  - Stricter EPL **strengthen the negative effects** of unstable employment situations on union formation.
    - ✓Stricter EPLR moderates the effects for men
    - ✓Stricter EPLT moderates the effects for women
  - Higher CBC **strengthen the negative effects** of unstable employment situations on union formation.
    - ✓Particularly for men
  - More generous unemployment benefits **buffer the negative effects** of unstable employment situations on union formation.

# Conclusion & Discussion

- Theoretical and policy implications:
  - In line with the labour market segmentation theory, our findings imply that strict EPL and high CBC might strengthen the insider-outsider segregation in LM outcomes, which eventually spillover to influence people's critical life course transitions such as union formation.
  - Nevertheless, more generous unemployment benefits provide a safety net against the negative LM experiences of unstable employment situations, which might eventually close the gap of union formation between LM insiders and outsiders.

# Limitations

- Unobserved heterogeneity at the individual level may still bias the estimation results of the micro-level effects of temporary employment and unemployment on union formation.
- Potentially inflated moderating effect estimates in cFES
  - Limited changes in LMR, particularly in the EPLs, in some countries between years 2010 and 2019.
- Short-term/spontaneous effect estimates of emp status (t) on union formation (t+1).
  - ✓To investigate the long-term effects, longer panel observational window is needed instead of using the 4-year rotational design.
- We don’t have measurements on people’s subjective perceptions of insecurities

# Thank you for your attention!

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For further questions and comments, please contact

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# Table S1. Descriptive statistics

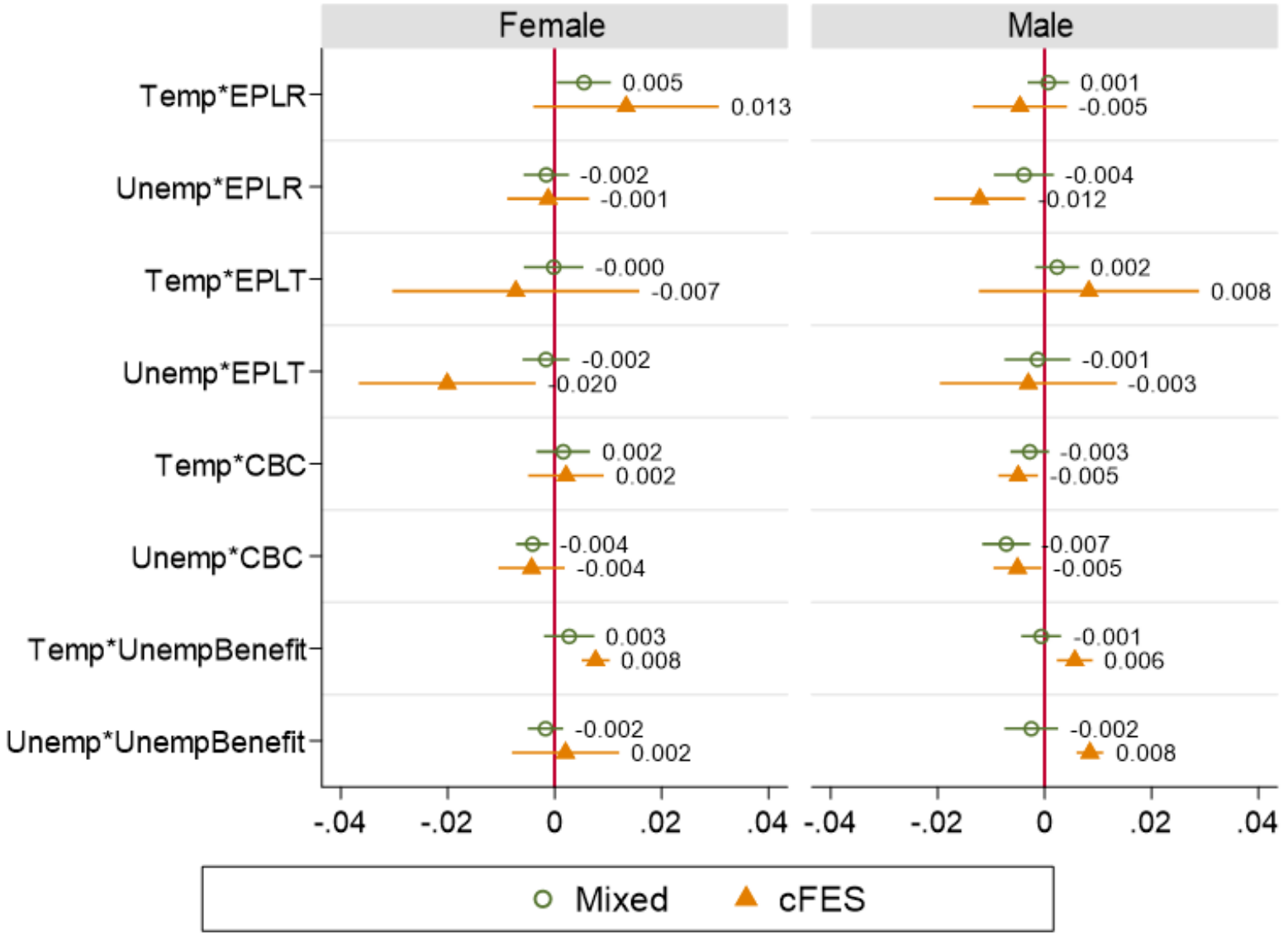
| | Female sample | | Male sample | |
|---|---|---|---|---|
| ***Dependent variable*** | | | | |
| Union formation probability | 3.68% | | 2.67% | |
| Union formation event | 3,233 | | 3,093 | |
| Exposure (person-years) | 87,918 | | 116,051 | |
| | Mean; % | SD | Mean; % | SD |
| ***Independent variables*** | | | | |
| *Micro-level variables* | | | | |
| Employment status | | | | |
| Permanent employment | 50.0% | | 47.0% | |
| Temporary employment | 22.6% | | 18.9% | |
| Unemployment | 21.6% | | 24.2% | |
| Self-employment | 5.8% | | 10.0% | |
| Age | 29.6 | 7.2 | 29.2 | 7.1 |
| Educational level | | | | |
| Low (ISCED 0-2) | 13.4% | | 22.2% | |
| Middle (ISCED 3-4) | 46.2% | | 54.5% | |
| High (ISCED 5-8) | 40.4% | | 23.4% | |
| Health status | | | | |
| Very good | 37.3% | | 39.7% | |
| Good | 49.9% | | 49.6% | |
| Fair | 10.7% | | 8.8% | |
| Bad | 1.8% | | 1.6% | |
| Very bad | 0.3% | | 0.3% | |
| Number of children | | | | |
| No child | 88.6% | | 99.9% | |
| One or more children | 11.4% | | 0.1% | |
| *Macro-level variables* | | | | |
| EPLR | 2.3 | 0.5 | 2.3 | 0.5 |
| EPLT | 2.3 | 0.7 | 2.3 | 0.7 |
| CBC rate | 63.3 | 30.3 | 63.3 | 30.3 |
| UB replacement rate | 30.3 | 21.0 | 30.3 | 21.0 |
| GDP per capita | 27.5 | 9.5 | 27.5 | 9.5 |
| Unemployment rate (by sex) | 11.0 | 6.5 | 10.1 | 5.2 |
| Temporary employment rate (by sex) | 15.3 | 6.5 | 13.7 | 6.3 |
| Economic globalization | 77.6 | 6.4 | 77.6 | 6.4 |

## Table S2. Results from the country FE multinomial logit models, relative risk ratio

| | Women | | Men | |
|---|---|---|---|---|
| | Cohabiting/ Single | Married/ Single | Cohabiting/ Single | Married/ Single |
| Employment status (Ref.=Permanent empl.) | | | | |
| Temporary empl. | 0.891* | 0.764** | 0.810** | 0.809** |
| | (0.047) | (0.078) | (0.062) | (0.060) |
| Unemployment | 0.678*** | 0.665*** | 0.487*** | 0.416*** |
| | (0.046) | (0.029) | (0.048) | (0.044) |
| Self-employment | 0.914 | 0.984 | 1.081 | 1.076 |
| | (0.093) | (0.158) | (0.072) | (0.130) |

*Note*: All models control for country and period fixed effects using the LSDV approach. Micro-level control variables include educational level, health status, parenthood status, age and age squared; and macro-level variables in the model includes standardized GDP per capita, gender-specific unemployment and temporary employment rates, KOF economic globalization index, EPLR, EPLT, CBC, and employment benefits replacement rate. Significance levels: + $p<0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors are clustered at the country level

**Figure S1. Modeling results comparison between cFES models and mixed-effects models: the moderating effects of labour market regulations**




Source: EU-SILC 2010-2019
Coefficient estimates with 95% CI

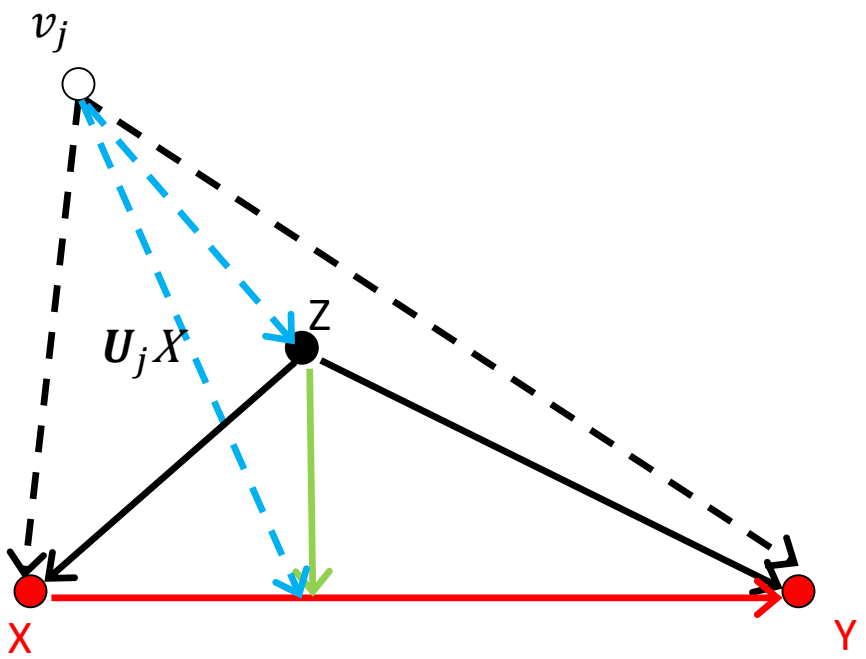
## Table S3. The effects of employment status on the marriage transition for cohabiting females and males

| | Females | | | Males | | |
|---|---|---|---|---|---|---|
| | b | se | p | b | se | p |
| Permanent employment | ref. | | | ref. | | |
| Temporary employment | -0.002 | (0.005) | .731 | -0.010 | (0.005) | .031 |
| Unemployment | 0.002 | (0.005) | .643 | -0.018 | (0.005) | .001 |
| Self employment | -0.006 | (0.006) | .309 | -0.008 | (0.005) | .089 |

*Note*: Models include micro-level variables including own educational level, health status, parity status, age, and partners' educational level, working status, and age. Macro-level variables in the models include standardized GDP per capita, gender-specific unemployment and temporary employment rates, EPLR, EPLT, CBC, and employment benefit rates.

# Appendix 1: Model specification of the country-level heterogeneity, illustrated using DAGs

Mixed effects (random intercepts and slopes)




cFES (fixed intercepts and slopes)