

**THE IMPACT OF REFORMS IN LABOUR MARKETS AND
NETWORK INDUSTRIES ON UNEMPLOYMENT:
NEW EVIDENCE BASED ON BIAS-CORRECTED LOCAL
PROJECTIONS**

With Jakob de Haan and Joao Jalles

RESEARCH QUESTION

- Do reforms in network industries and labour markets affect unemployment?

“Flexible labour and product markets are essential to help euro area countries respond optimally and rapidly to shocks and to avoid the higher costs of lost output and higher unemployment associated with the slower and more protracted adjustment of rigid economies. The gains from reforms will clearly be larger when reforms are more ambitious and when they are implemented jointly with reforms in other areas. In this light, more efforts are warranted to deregulate product markets, where reform effort has been muted in recent years. Further labour market reform is also necessary and will help to reduce structural unemployment.” (ECB, 2014, p. 62).

- Quite a few studies have investigated the impact of structural reforms on unemployment (see Boeri et al., 2015, Parlevliet et al., 2018, and Campos et al., 2018; 2024 for reviews). Based on DSGE models, or panel data analysis (without taking reform selection into account)

PAPER IN A NUTSHELL

- We show that local projection estimations of reform shocks are subject to selection bias
- The bias is economically important concerning unemployment
- We show that unemployment benefit reforms and joint reforms of labour markets and network industries decrease unemployment in a quasi-experimental empirical setup

SAMPLE AND DATA



Note: The total number of observations is 896.

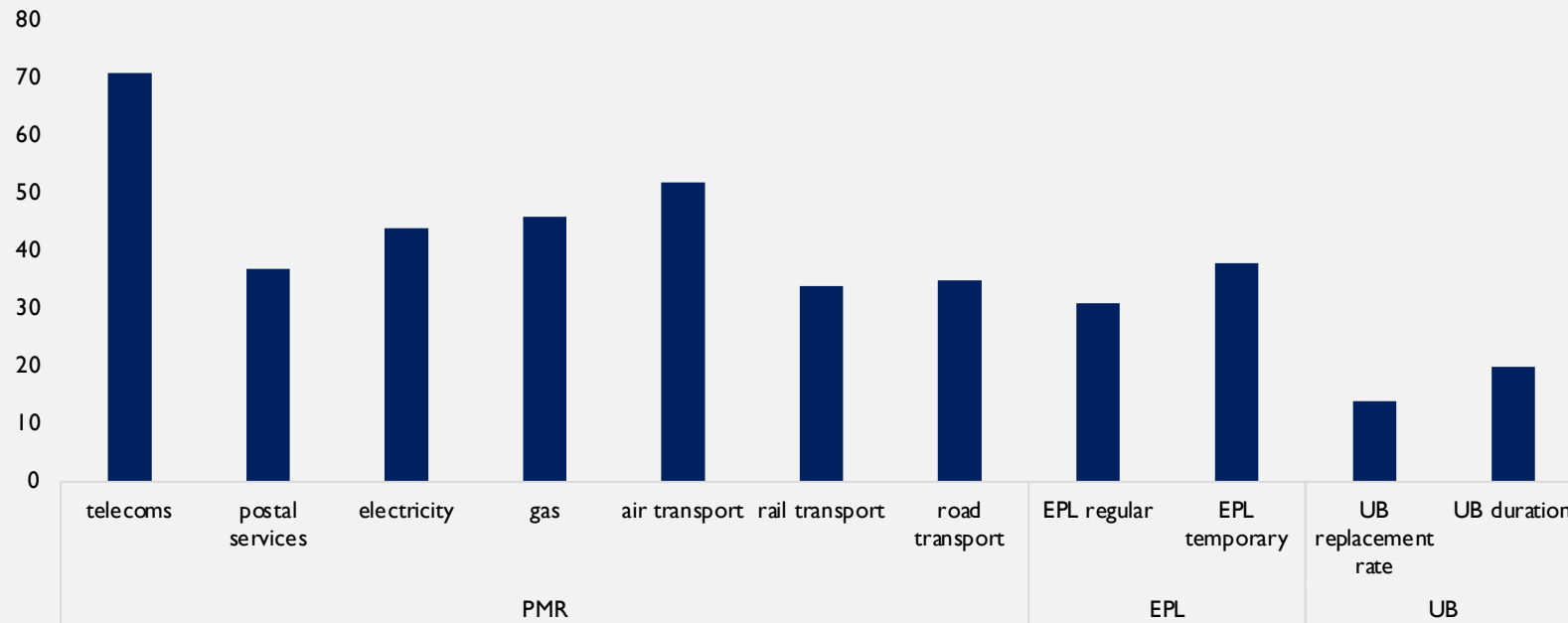
Source: OECD harmonized unemployment rates and IMF narrative reform database

REFORM SHOCKS, DESCRIPTIVES

Reform type	Number of reforms:	Reforms (as % of number of observations):	Number of counter reforms:	Counter reforms (as % of number of observations)
Network industries reforms	233	26.00%	3	0.3%
Labour market reforms	90	10.04%	32	3.6%
Employment protection legislation (EPL) reforms	62	6.92%	20	2.2%
Unemployment benefit (UB) reforms	28	3.13%	12	1.3%
Joint reforms Network industry and labour markets	21	2.34%	0	0%

Source of reform data: IMF's narrative reform database

COVERAGE OF THE REFORM INDICATORS



Source of reform data: IMF's narrative reform database

LOCAL PROJECTIONS

$$\ln U_{i,t+h} - \ln U_{i,t} = \alpha_i + \delta_t + \sum_{j=0}^3 \beta_{jh} d_{i,t-j} + \beta_{0h} \ln U_{i,t} + \sum_{l=0}^2 \beta_{lh} (\ln U_{i,t-l} - \ln U_{i,t-1-l}) + \sum_{h=1}^h \beta_h d_{i,t+h} + \sum_{c=0}^1 \beta'_{ch} X_{i,t-c} + u_{i,t+h}$$

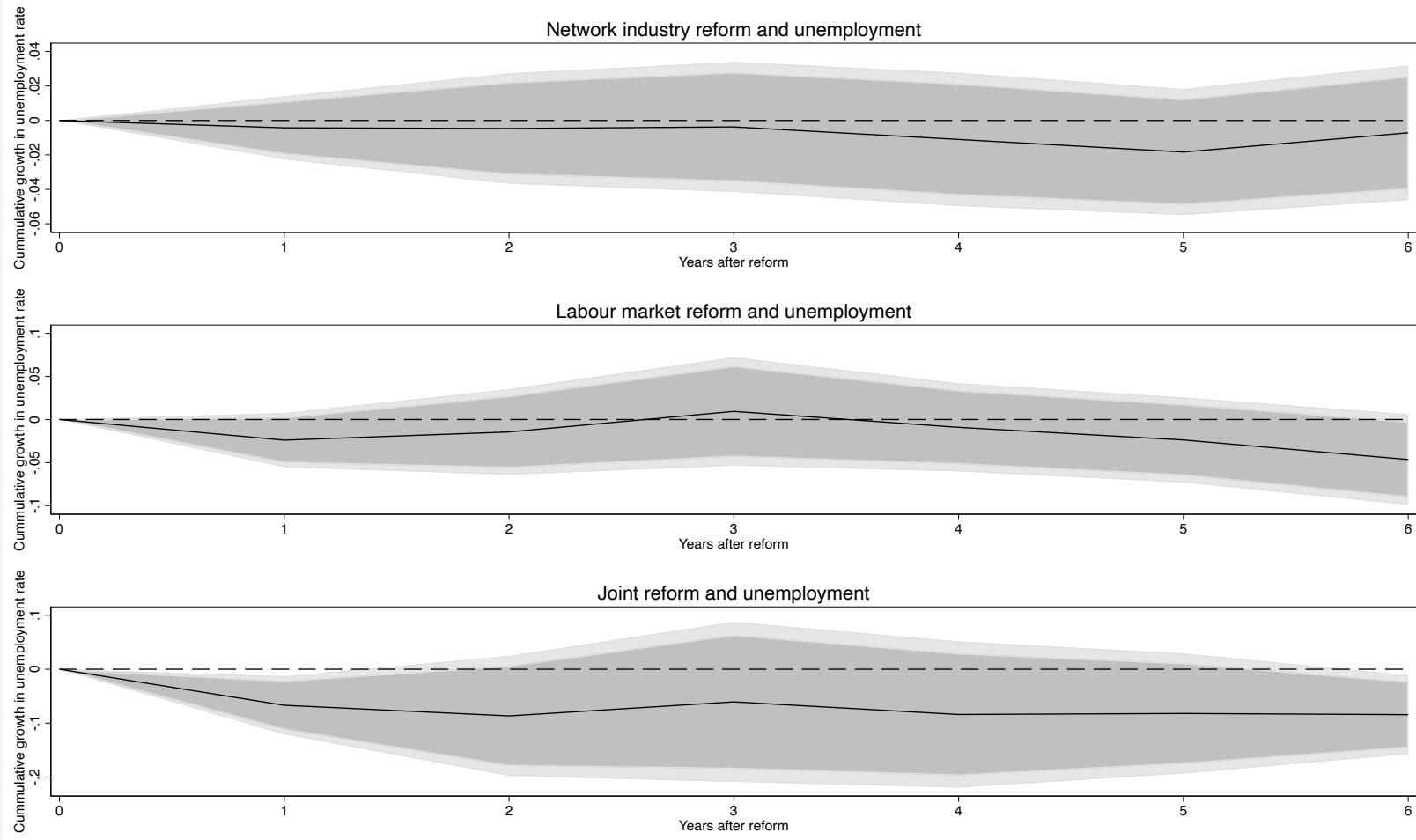
$\ln U_{i,t+h} - \ln U_{i,t}$: Growth rate of the unemployment rate (skewed distribution of unemployment rates)

$\sum_{h=1}^h \beta_h d_{i,t+h}$: Teulings and Zubanov (2014) correction for overlapping forecast horizon. The leads include both reforms and counter reforms

$\sum_{c=0}^1 \beta'_{ch} X_{i,t-c}$: Output gap (Hamilton filter) on real GDP, inflation rate and GDP growth rate per capita

The forecast horizon, h , goes from 1 to 6.

LOCAL PROJECTION IRF'S: EFFECT OF REFORM IN NETWORK INDUSTRIES AND LABOUR MARKETS ON UNEMPLOYMENT



SELECTION BIAS: REFORMS ARE NOT RANDOM EVENTS

Variables	Output gap	Output gap _{t-1}	Inflation	Inflation _{t-1}	GDP growth	GDP growth _{t-1}	Unempl. rate	Unempl. rate, dif. _{t-1}	Unempl. rate, dif. _{t-2}
Network industry reforms	0.083*** (0.022)	0.056** (0.023)	-2.490*** (0.479)	-2.667*** (0.499)	0.003* (0.002)	0.003 (0.002)	0.201*** (0.047)	-0.030** (0.014)	-0.028* (0.014)
Labour market reforms	-0.038 (0.032)	-0.030 (0.033)	-1.391** (0.708)	-1.310* (0.738)	-0.007** (0.003)	-0.008*** (0.003)	0.396*** (0.069)	0.054*** (0.020)	0.054** (0.021)
Joint reforms	0.059 (0.064)	0.030 (0.066)	-1.738 (1.408)	-2.029 (1.467)	0.003 (0.006)	0.000 (0.006)	0.425*** (0.138)	0.008 (0.040)	0.013 (0.042)
Obs.	896	896	896	896	896	896	896	896	896

Robust Standard errors: *** p<0.01, ** p<0.05, * p<0.1

Drazen and Grilli (1993). The benefit of crisis for economic reform.

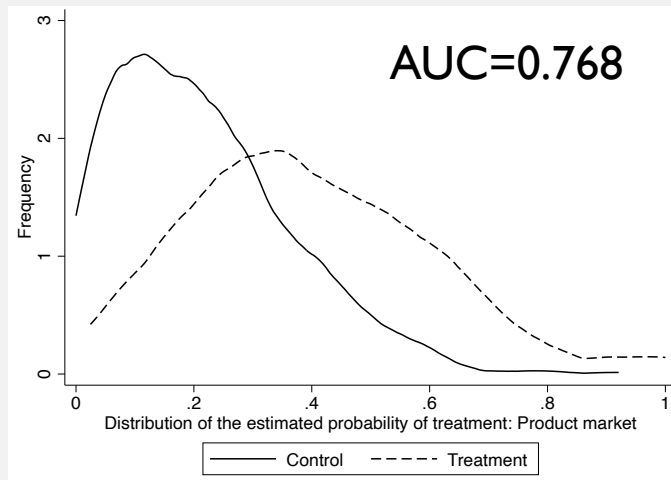
AIPW-LP AUGMENTED INVERSE PROBABILITY WEIGHTED LOCAL PROJECTION

- The basic intuition behind the AIPW-LP estimator is to use an inversely weighted LP regression model to predict unobserved potential outcomes
- So, we follow a two-stage approach where we estimate the probability of treatment in the 1st stage, and weigh observations inversely in the 2nd stage LP (IPW).
- We can estimate the probability of reform using a CRE-logit model and inversely weight the observations in the LP to make the reform look as if they were random events
- Furthermore, observations with a propensity score close to zero or one, gets a smaller weight to avoid truncation (A-IPW)
- When conditioning on observable covariates, we can interpret the IRFs as causal effects (Jorda & Taylor 2016)

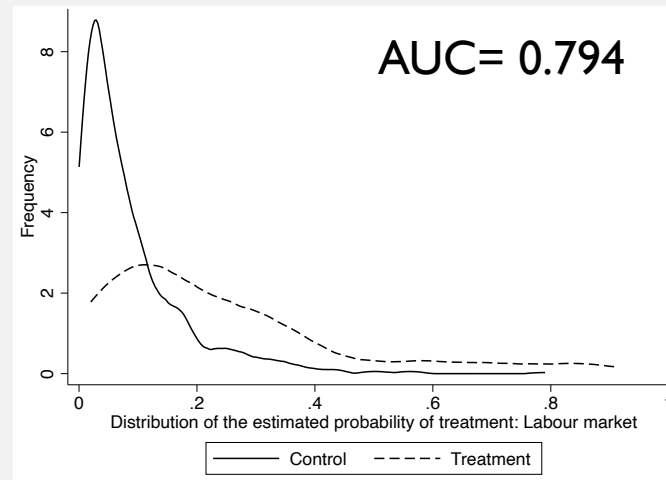
PREDICTING REFORM SHOCKS 1ST STAGE CORRELATED RANDOM EFFECTS LOGIT MODEL FIT

- We include common economic reform predictors in the 1st stage model: X_t 's and political-economy variables from the literature: political colour, fragmentation, tenure etc. We also control for duration dependence and time FEs

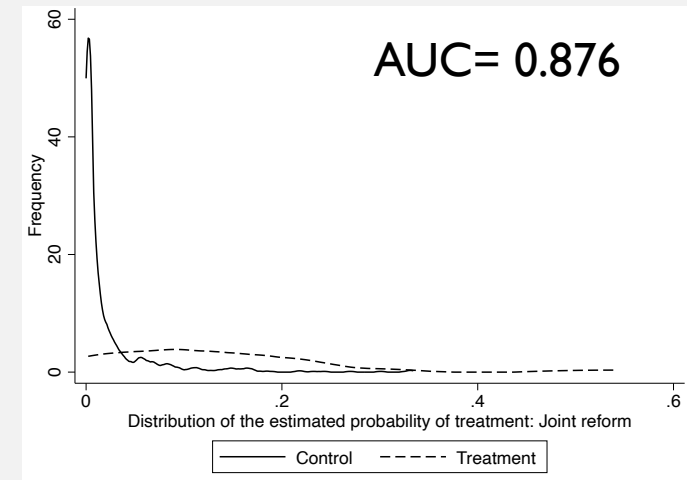
Product market



Labour market



Product and labour market

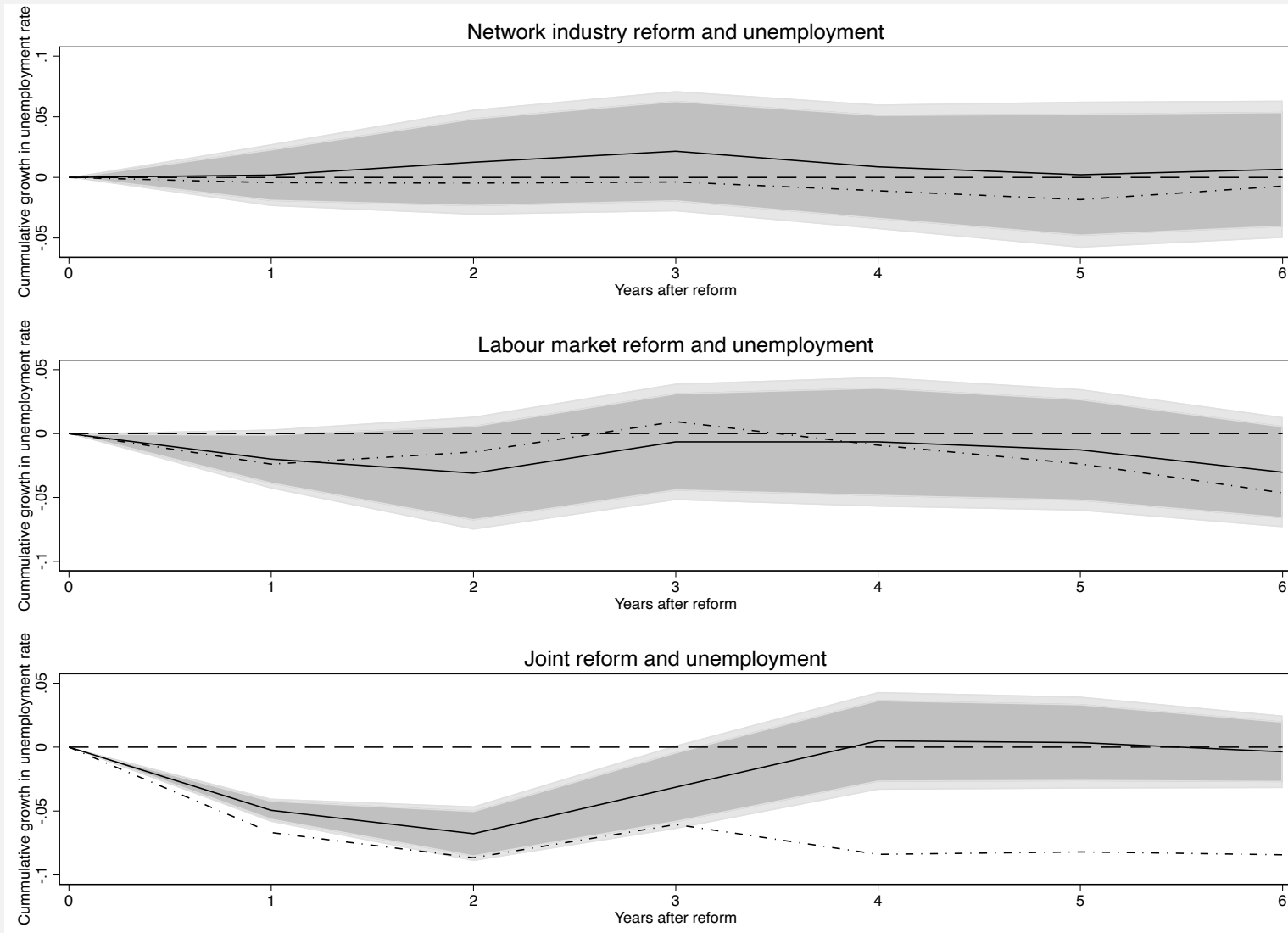


POST-WEIGHTING BALANCE TESTS

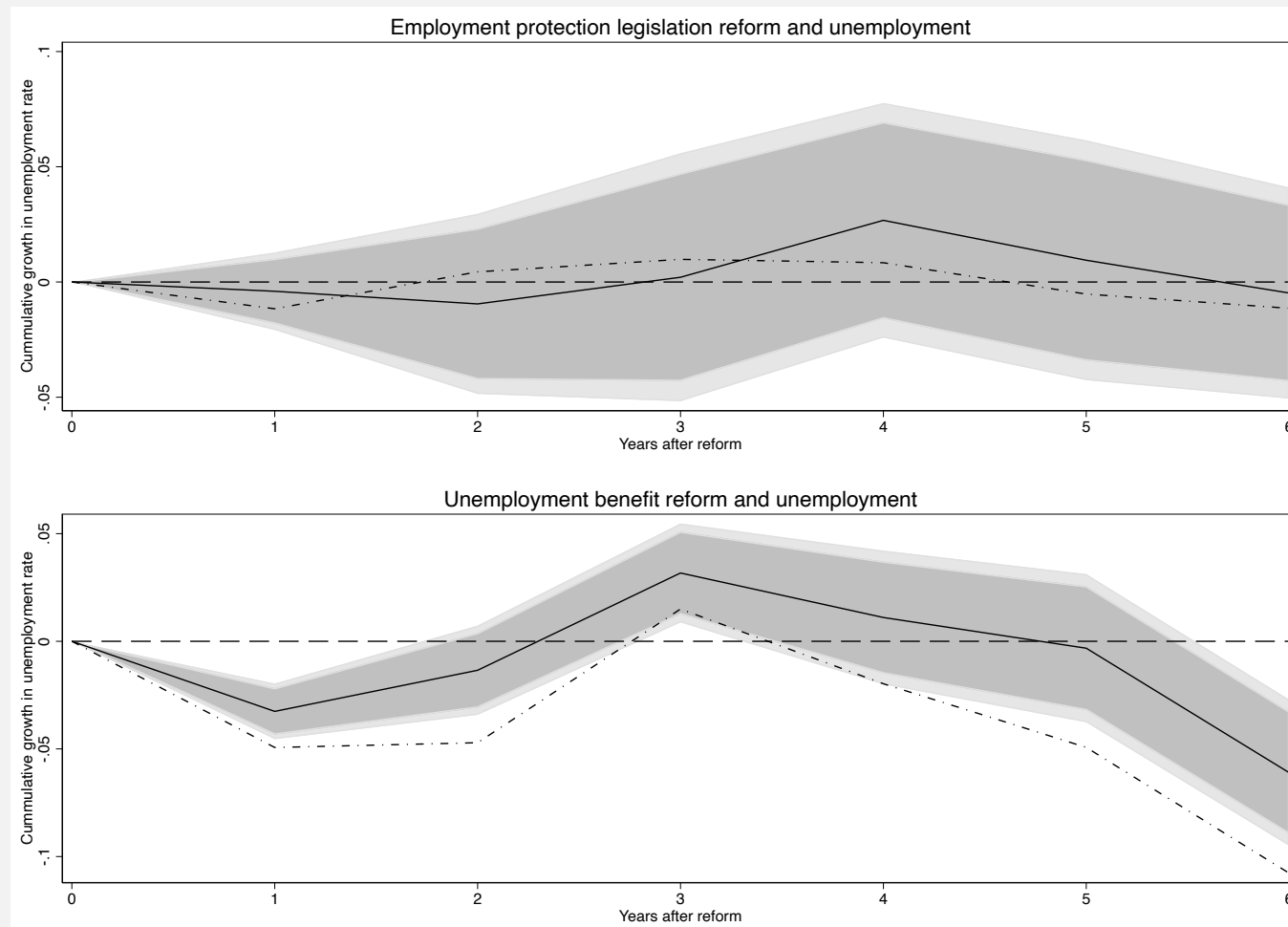
Variables	Output gap	Output gap _{t-1}	Inflation	Inflation _{t-1}	GDP growth	GDP growth _{t-1}	Unempl. rate	Unempl. rate, dif. _{t-1}	Unempl. rate, dif. _{t-2}
Reforms of network industries	-0.020 (0.039)	-0.014 (0.033)	-0.620 (0.469)	-0.083 (0.722)	0.000 (0.002)	-0.003 (0.004)	0.060 (0.055)	-0.010 (0.017)	-0.015 (0.016)
Labour market reforms	0.027 (0.038)	0.000 (0.031)	-0.887 (0.596)	-0.888 (0.694)	-0.003 (0.003)	0.001 (0.003)	0.120* (0.072)	-0.007 (0.025)	0.001 (0.026)
Joint reforms	0.140* (0.084)	0.082 (0.112)	-1.522* (0.798)	-1.449 (1.192)	0.007 (0.007)	0.008 (0.006)	-0.041 (0.187)	-0.049 (0.093)	-0.073 (0.055)
Obs.	896	896	896	896	896	896	896	896	896

Robust Standard errors: *** p<0.01, ** p<0.05, * p<0.1

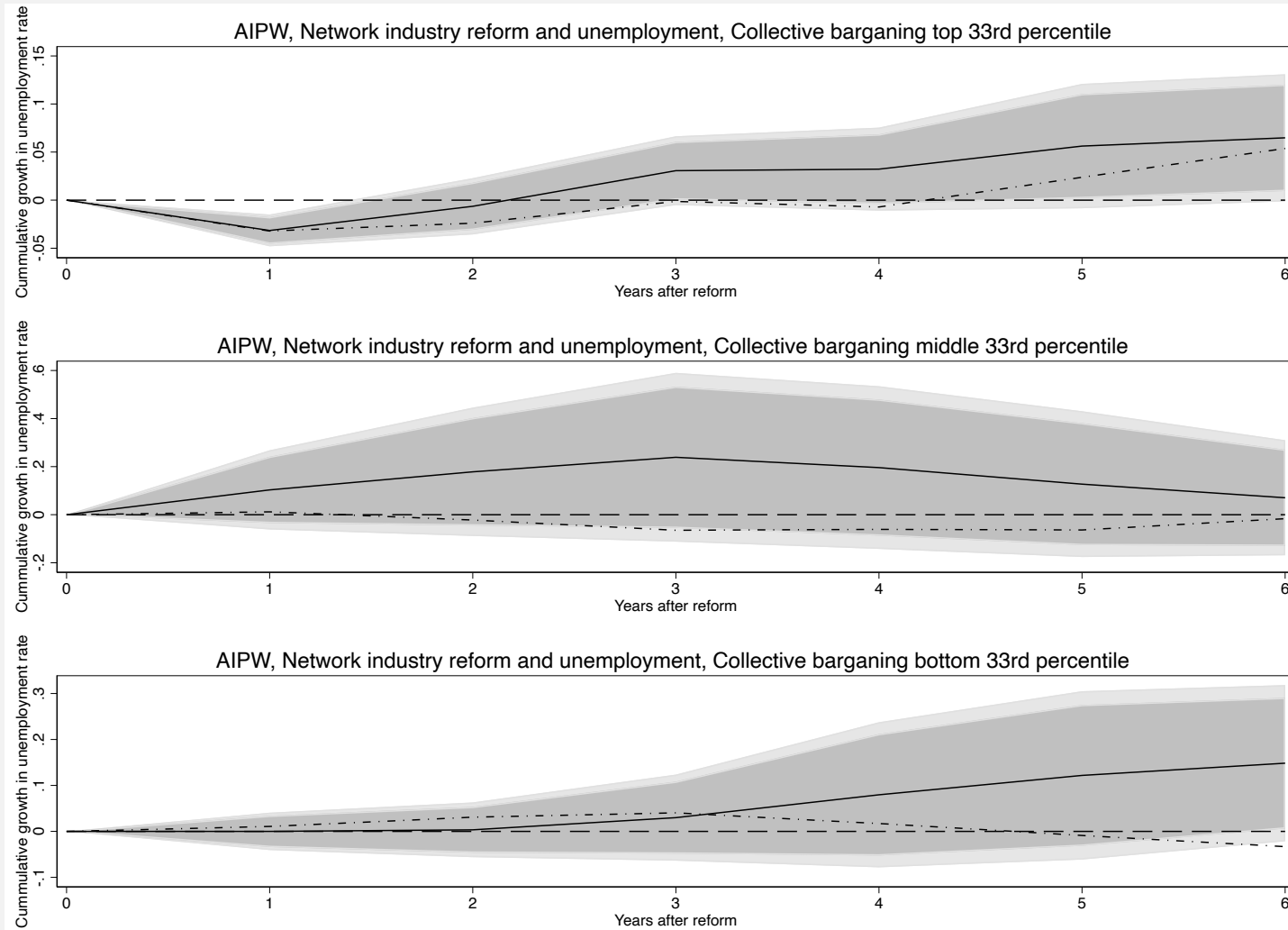
QUASI-EXPERIMENTAL IRF'S EFFECT OF REFORM IN NETWORK INDUSTRIES AND LABOUR MARKETS ON UNEMPLOYMENT



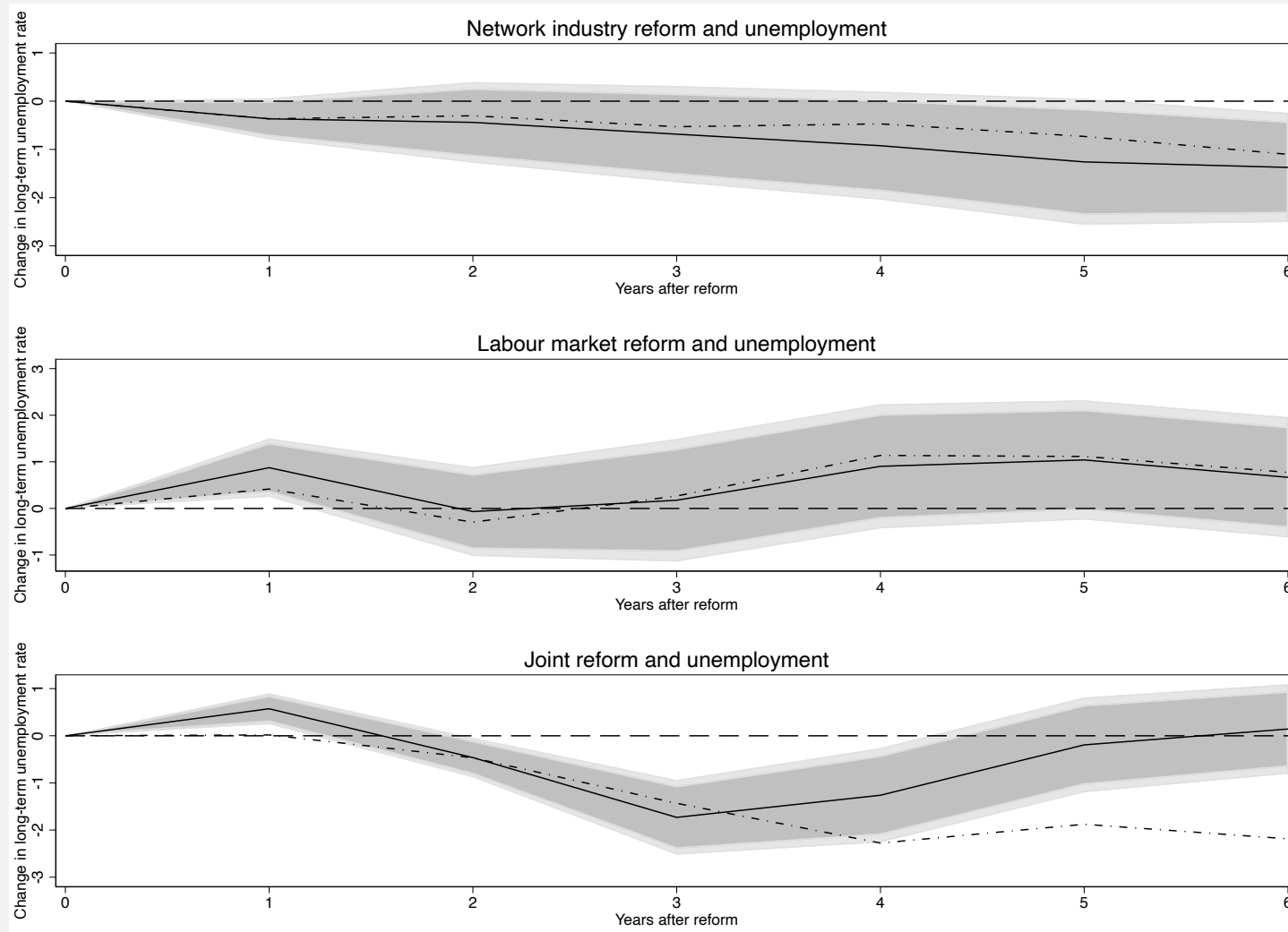
QUASI-EXPERIMENTAL IRF'S DIFFERENT TYPES OF LABOUR MARKET REFORMS



QUASI-EXPERIMENTAL IRF'S EFFECT OF REFORM IN NETWORK INDUSTRIES ON UNEMPLOYMENT, CONDITIONAL ON THE LEVEL OF COLLECTIVE BARGAINING



QUASI-EXPERIMENTAL IRF'S THE EFFECT ON LONG-TERM UNEMPLOYMENT RATE AS SHARE OF UNEMPLOYED



ROBUSTNESS

- Adding the participation rate as control and predictor ✓
- Jack-knife analysis by dropping individual countries one-by-one ✓
- Nickell-bias 2.0. Herbst and Johannesen (2024) bias correction ✓
- Cannova (2024) test suggest dynamic homogeneity ✓

CONCLUSION

- It is crucial to correct for reform selection bias
- Joint reforms in both areas decrease (long-term) unemployment in the short run
- Unemployment benefit reforms decrease unemployment