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Working Paper 245 – Appendix

How Far from Full Employment?

The European Unemployment Problem Revisited

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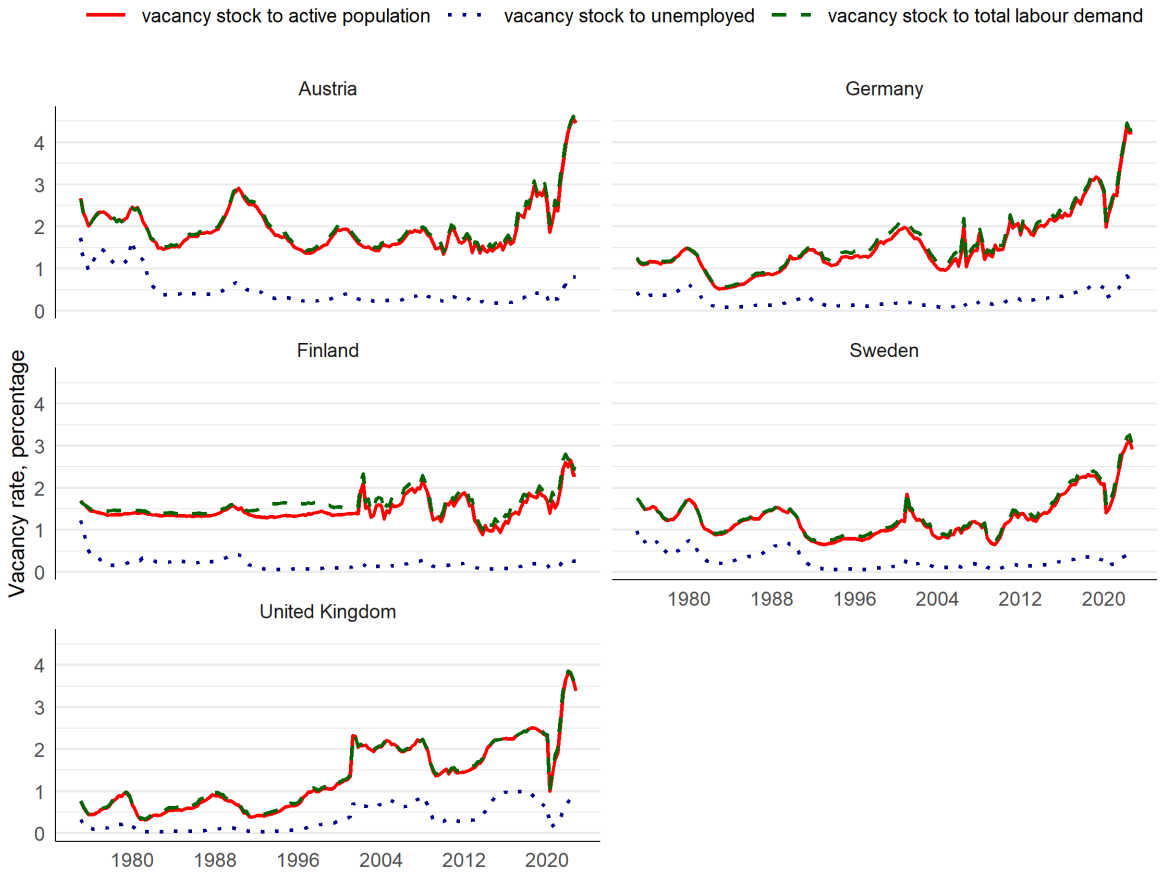
APPENDIX A: ADDITIONAL UNEMPLOYMENT AND VACANCY RATE CHARTS

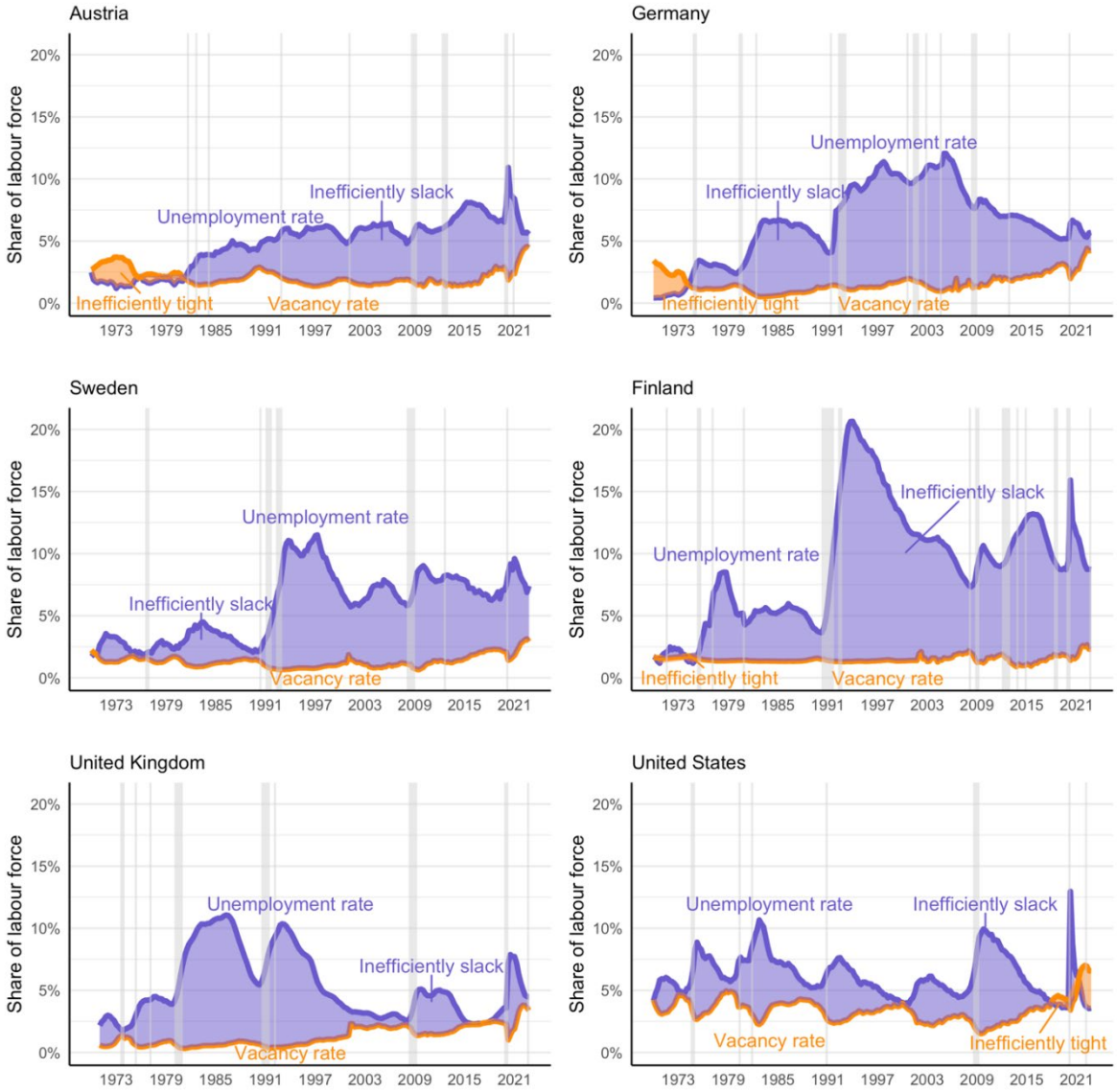
This appendix reports additional information on unemployment and vacancy rates, as well as BECRU and full employment gap estimates.

Figure A1 / Comparison of the vacancy rate definitions and vacancy-unemployment ratio, 1975-2022



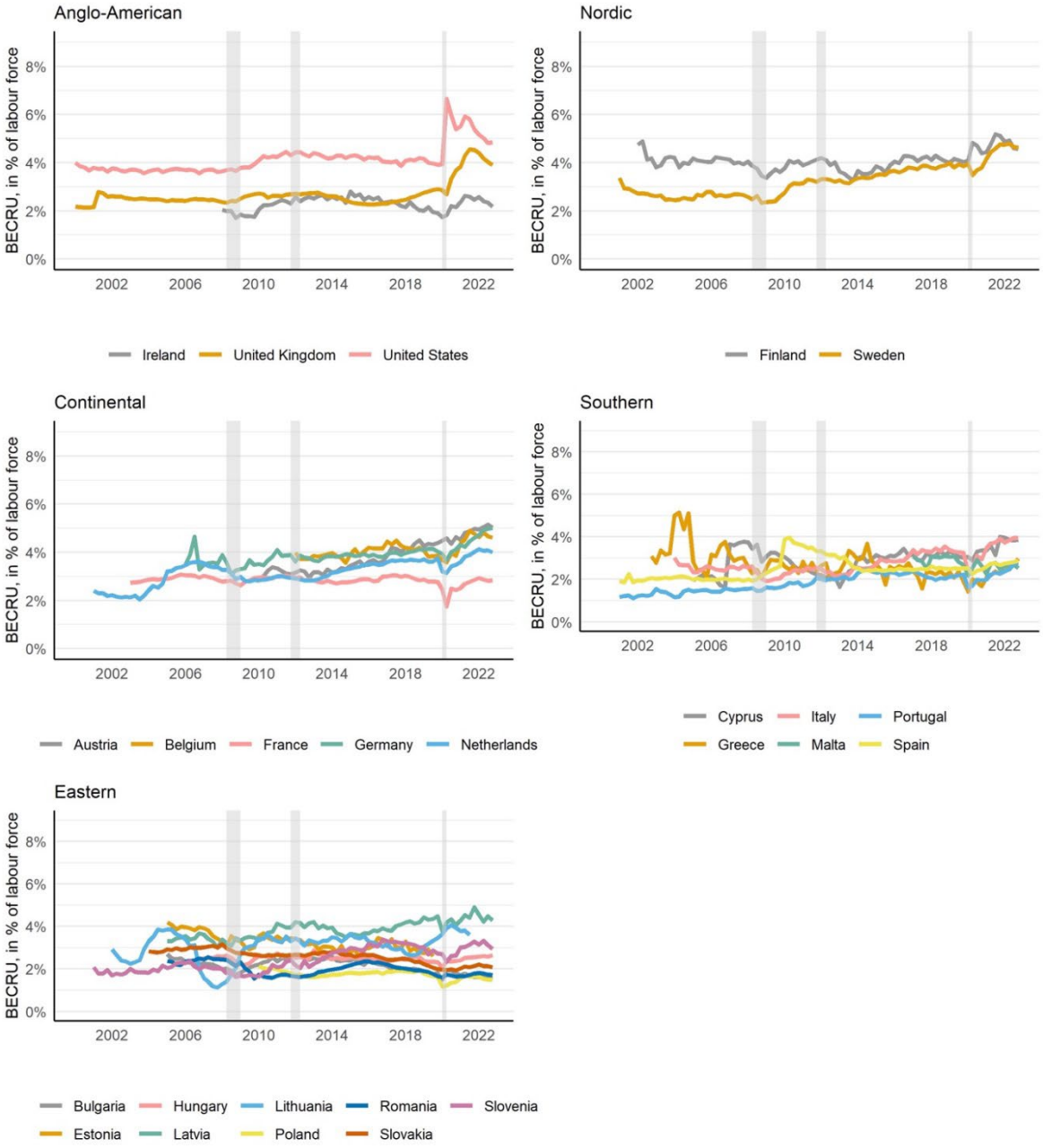
Source: OECD Registered Unemployed Dataset and Eurostat

Figure A2 / State of labour market, 1970-2022



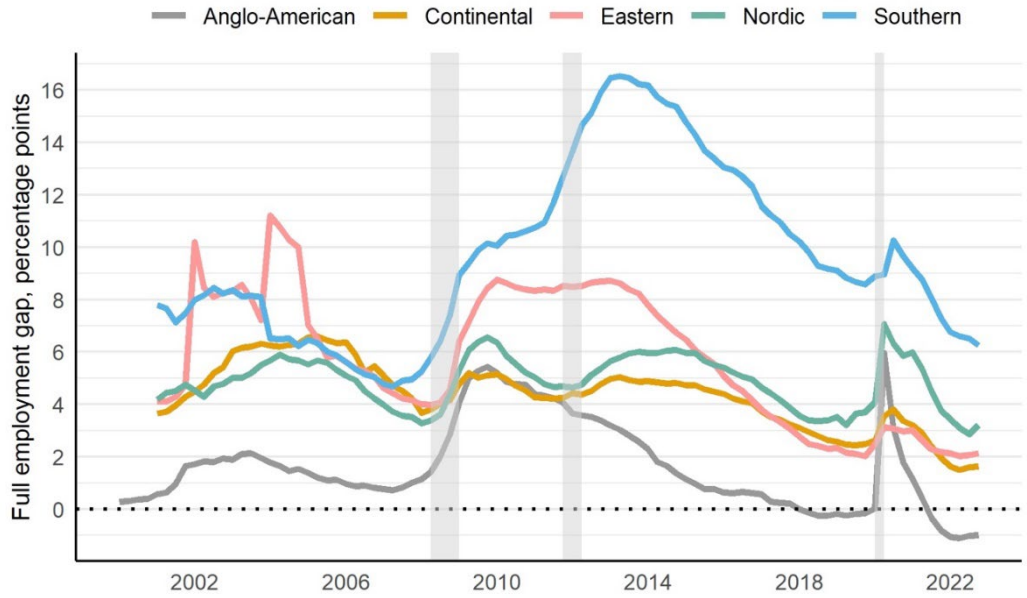
Notes: The grey areas in the figure indicate periods of recession in individual countries. A recession is defined as two consecutive quarters of negative real GDP growth. The data for Germany are for West Germany until 1991. The labour market is considered inefficiently slack when the unemployment rate is higher than the vacancy rate (indicated by the purple shade), and inefficiently tight when the unemployment rate is lower than the vacancy rate (indicated by the orange shade).
Source: OECD, Registered Unemployed and Job Vacancies Dataset, BLS JOLTS, and Michaillat and Saez (2022); own calculations.

Figure A3 / BECRU estimates for the extended country sample, 2000-2022



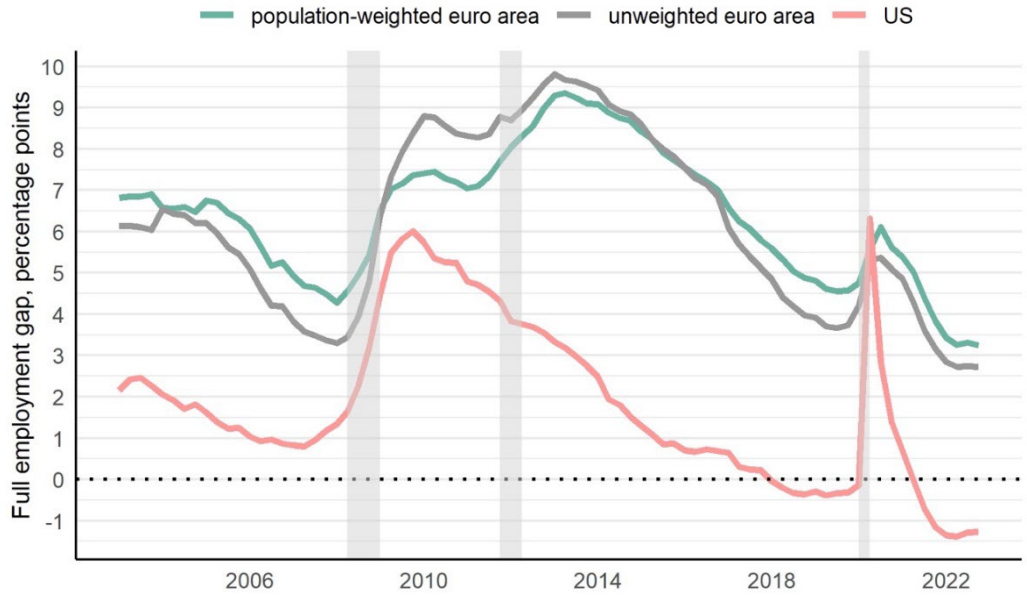
Notes: The grey areas in the figure indicate periods of in the aggregated OECD Europe sample. The data for Germany are for West Germany until 1991. A recession is defined as two consecutive quarters of negative real GDP growth.
Source: Eurostat, ISTAT, DARES, BLS JOLTS, and Michaillat and Saez (2022); own calculations.

Figure A4 / Population-weighted full employment gaps for different country groups, 2000-2022



Notes: The grey areas in the figure indicate periods of recession in the aggregated OECD Europe sample. A recession is defined as two consecutive quarters of negative real GDP growth. The data for Germany are for West Germany until 1991. Continental: Austria, Belgium, France, Germany, Netherlands, Luxembourg. Nordic: Finland, Sweden. Southern: Greece, Italy, Cyprus, Portugal, Spain, Malta. Eastern: Bulgaria, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia, Slovakia. Anglo-American: US, UK, Ireland. The Beveridge full employment gap (g) is calculated as $g = u - BECRU$.
Source: Eurostat, ISTAT, DARES, BLS JOLTS, and Michaillat and Saez [2022]).

Figure A5 / Full employment gaps for the Euro area and the US, 2000-2022



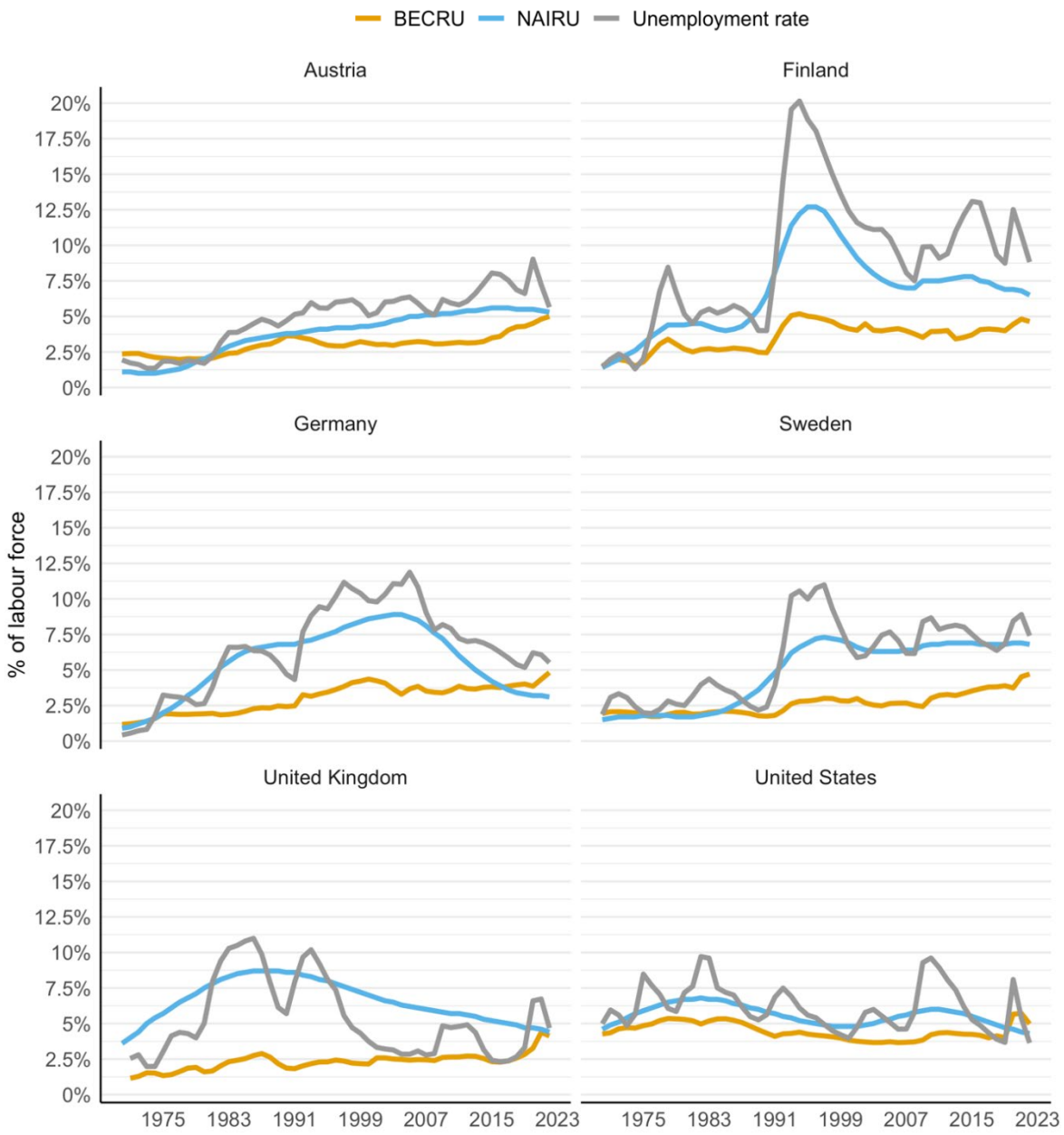
Notes: The grey areas in the figure indicate periods of recession in the aggregated OECD Europe sample. A recession is defined as two consecutive quarters of negative real GDP growth. The data for the euro area show an average (either unweighted or population-weighted) for its 20 member countries. The Beveridge full employment gap (g) is calculated as $g = u - BECRU$.
Source: Eurostat, ISTAT, DARES, BLS JOLTS, and Michaillat and Saez (2022).

Figure A6 / Graphical comparison of underemployment rate for the extended country sample, 2000-2022

Solid lines, in percentage points, left vertical axis and full employment gap estimates, dashed lines, in percentage points, right vertical axis.

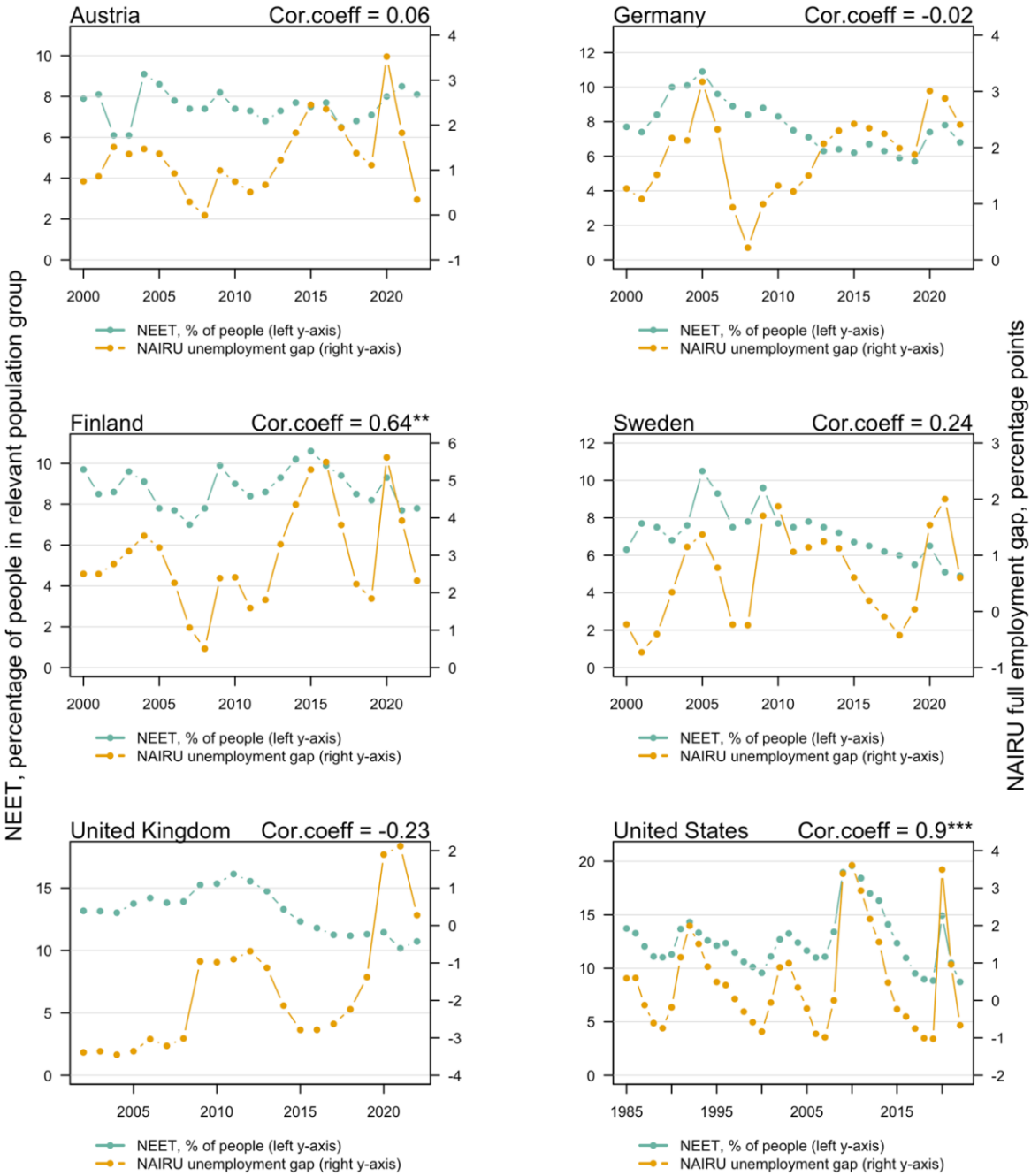
Notes: The underemployment measurement UERATE was constructed inversely to full time equivalents per active population (FTERATE) based on data from Eurostat and FRED; i.e., UERATE = 1 – FTERATE. Full employment gap measurements are based on the explained approach and computed for the extended country sample based on Eurostat data. The grey areas in the figure indicate periods of in the aggregated OECD Europe sample. The data for Germany are for West Germany until 1991. A recession is defined as two consecutive quarters of negative real GDP growth.
Source: Eurostat, FRED, ISTAT, DARES, BLS JOLTS, and Michaillat and Saez (2022).

Figure A7 / Actual unemployment rate, BECRU and NAIRU estimates, 1970-2022



Source: OECD, Eurostat, ISTAT, DARES, BLS JOLTS, Michaillat and Saez (2022), AMECO; own calculations.

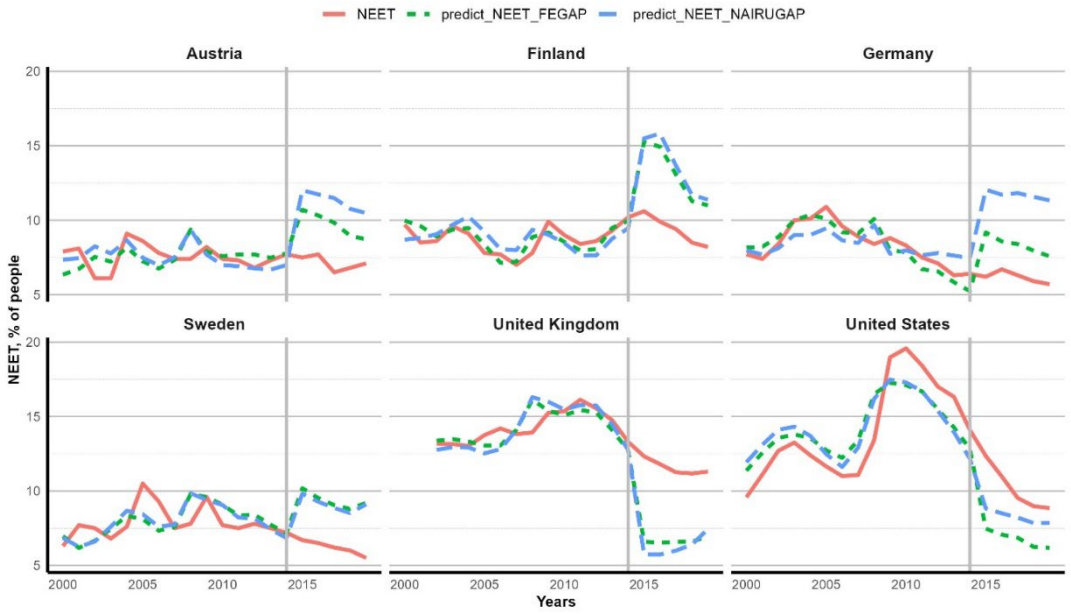
Figure A8 / NEET rate and NAIRU full employment gap estimates, 2000-2022



Source: AMECO, Eurostat, OECD, Michaillat and Saez (2022), ONS, and BLS; own calculations.

Figure A9 / Comparison of actual NEET data with in-sample based on FEGAP and NAIRUGAP estimations

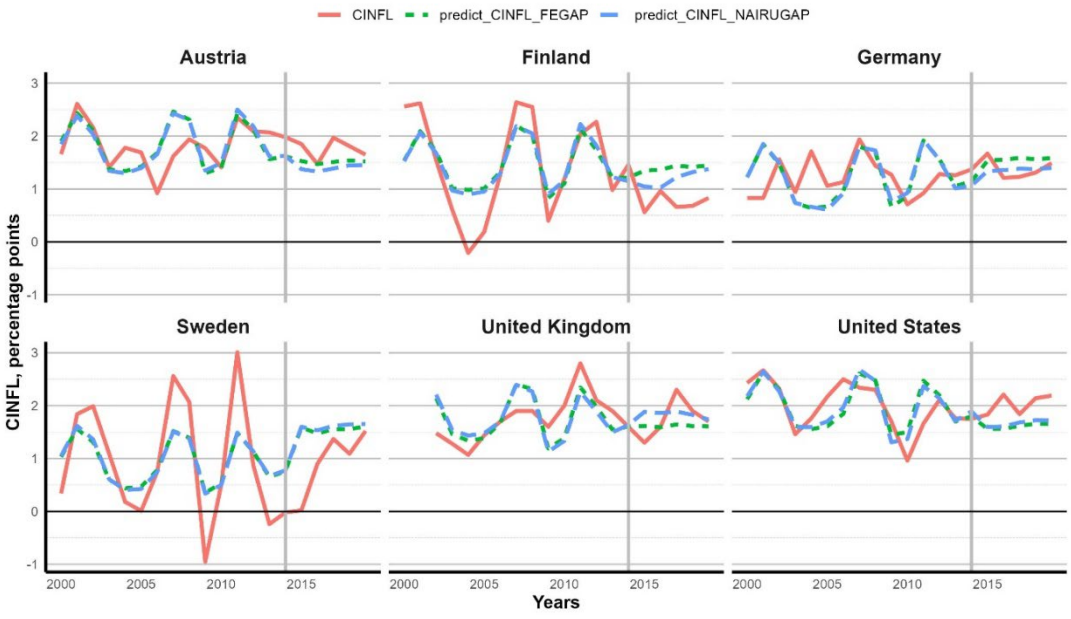
Values between 2000 and 2014, i.e. left of vertical grey line and out-of-sample predictions, right of vertical grey line.



Source: AMECO, Eurostat, OECD, Michaillat and Saez (2022), ONS, and BLS; own calculations.

Figure A10 / Comparison of actual CINFL (core inflation) data with in-sample based on FEGAP and NAIRUGAP estimations

Values between 2000 and 2014,i.e. left of vertical grey line and out-of-sample predictions, right of vertical grey line.



Source: World Bank, AMECO, Eurostat, OECD, Michaillat and Saez (2022), ONS, and BLS; own calculations.

Table A1 / Numerical comparison of underemployment rate (UERATE) and full employment gap (FEGAP) measurements for the six-countries sample and pre-crisis (2018), Covid-19 (2020, and recovery (2022) periods

Period	Pre-crisis 2018		Covid-19 2020		Recovery 2022	
Measurement/ country	UERATE	FEGAP	UERATE	FEGAP	UERATE	FEGAP
Austria	27.033	2.612	26.779	4.515	27.062	0.644
Germany	23.048	1.438	22.304	2.353	22.468	0.687
Finland	23.547	5.256	23.690	8.070	25.155	4.181
Sweden	21.633	2.562	23.259	4.696	22.415	2.685
United Kingdom	30.947	0.094		3.325		0.547
United States	15.129	-0.238	17.632	2.432	13.771	-1.339

Notes: The underemployment measurement UERATE was constructed inversely to full time equivalents per active population (FTERATE) based on data from Eurostat and FRED; i.e., UERATE = 1 – FTERATE. Full employment gap measurements are based on our previously explained approach and applied to the six-countries sample.
Source: Eurostat, FRED, ISTAT, DARES, BLS JOLTS, and Michaillat and Saez (2022).

APPENDIX B: PRE-TESTING

A) Checking for multi-collinearity

We perform a Spearman correlation analysis and compute the variance inflation factor (VIF) to check for potential multi-collinearity of key variables in our baseline estimation set-up. Spearman correlations among explanatory variables for our regressions are reported in Table A2 and do not point to any evidence of considerable correlations (beyond 0.9 or -0.9). Although high correlations are found between $ACCU_{t-1}$ and $PRCA_{t-1}$ (0.91), and between LTU_{t-1} and $PUCA_{t-1}$ (-0.78), this is of no concern as we are not including ACCU and its public and private sub-components ($PUCA_{t-1}$ and $PRCA_{t-1}$) in the same model. The correlation between $EPL_{t-1}$and DCLU_EU is at 0.72, but since in our regression we only include the cluster dummy as an interaction term with the lagged full employment gap (with which the correlation is only 0.40) this is also of no concern. The lagged FEGAP variable does not show any considerable correlation with other explanatory variables. Its high correlation with the dependent variable (0.92) could potentially be a problem if the VIF is greater than 10; however, this is not the case. The VIF of the lagged FEGAP is between one and two for all econometric baseline specifications. VIF values based on the regression specifications as in Section 5 (see Table 2) can be found in Table A3 and only indicate signs of low to moderate correlation as they range between one and three. The highest recorded VIF value for models (2)-(5) is 2.14 for $EGLOB_{t-1}$ and EPL_{t-1} for the benchmark model specification. Model (6) combines individual fixed effects with time period dummies and shows lightly higher, but still unproblematic VIF values (e.g. 2.21 for EPL_{t-1}). Models (7) and (8) utilise an interaction term of the lagged full employment gap with a country cluster dummy that shows a VIF value of 5.71. This is probably due to the fact the European country cluster only counts five country candidates, which cannot be changed due to the few country cases with long time series. Since this value is still much lower than 10 and we also do not any VIF in the benchmark model which is greater than 2.14 there is no evidence for multicollinearity.

Table A2 / Spearman correlation analysis in a tabular form with values (upper table), graphical representation in the form of a correlation plot (lower table)

	FEGAP	$FEGAP_{t-1}$	EPL_{t-1}	$UDENS_{t-1}$	TFP_{t-1}	$EGLOB_{t-1}$	$ACTPOP_{t-1}$	$ACCU_{t-1}$	$INFL_{t-1}$	LRG_pg_{t-1}	LRG_cp_{t-1}	$PUCA_{t-1}$	$PRCA_{t-1}$	OG_{t-1}	LTU_{t-1}	DCLU_EU
FEGAP	1	0.92	0.25	0.39	-0.05	0.31	-0.47	-0.29	-0.25	-0.15	0.01	-0.27	-0.23	-0.33	0.45	0.40
$FEGAP_{t-1}$	0.92	1	0.23	0.38	0.12	0.31	-0.46	-0.33	-0.36	-0.11	0.03	-0.32	-0.25	-0.40	0.55	0.40
EPL_{t-1}	0.25	0.23	1	0.58	-0.04	0.21	-0.34	-0.40	-0.09	0.19	0.48	-0.46	-0.25	-0.11	0.31	0.72
$UDENS_{t-1}$	0.39	0.38	0.58	1	0.10	0.22	-0.27	-0.32	0.05	0.13	0.28	-0.09	-0.34	-0.13	0	0.66
TFP_{t-1}	-0.05	0.12	-0.04	0.10	1	-0.11	0.01	0.05	-0.04	0.04	-0.02	-0.03	0.07	0.15	0.16	-0.02
$EGLOB_{t-1}$	0.31	0.31	0.21	0.22	-0.11	1	-0.20	-0.04	-0.59	0.16	0.28	-0.44	0.11	0.10	0.38	0.60
$ACTPOP_{t-1}$	-0.47	-0.46	-0.34	-0.27	0.01	-0.20	1	0.17	0.28	-0.04	-0.13	0.26	0.07	0.35	-0.39	-0.40
$ACCU_{t-1}$	-0.29	-0.33	-0.40	-0.32	0.05	-0.04	0.17	1	0.07	-0.02	-0.16	0.36	0.91	0.41	-0.22	-0.33
$INFL_{t-1}$	-0.25	-0.36	-0.09	0.05	-0.04	-0.59	0.28	0.07	1	-0.25	-0.29	0.31	-0.05	0.13	-0.42	-0.26
LRG_pg_{t-1}	-0.15	-0.11	0.19	0.13	0.04	0.16	-0.04	-0.02	-0.25	1	0.72	-0.01	-0.03	0.06	0.04	0.13
LRG_cp_{t-1}	0.01	0.03	0.48	0.28	-0.02	0.28	-0.13	-0.16	-0.29	0.72	1	-0.29	-0.07	0.12	0.15	0.38
$PUCA_{t-1}$	-0.27	-0.32	-0.46	-0.09	-0.03	-0.44	0.26	0.36	0.31	-0.01	-0.29	1	0	-0.11	-0.78	-0.67
$PRCA_{t-1}$	-0.23	-0.25	-0.25	-0.34	0.07	0.11	0.07	0.91	-0.05	-0.03	-0.07	0	1	0.47	0.05	-0.13
OG_{t-1}	-0.33	-0.40	-0.11	-0.13	0.15	0.10	0.35	0.41	0.13	0.06	0.12	-0.11	0.47	1	-0.06	-0.05
LTU_{t-1}	0.45	0.55	0.31	0	0.16	0.38	-0.39	-0.22	-0.42	0.04	0.15	-0.78	0.05	-0.06	1	0.57
DCLU_EU	0.30	0.40	0.72	0.66	-0.02	0.60	-0.40	-0.33	-0.26	0.13	0.38	-0.67	-0.13	-0.05	0.57	1.00

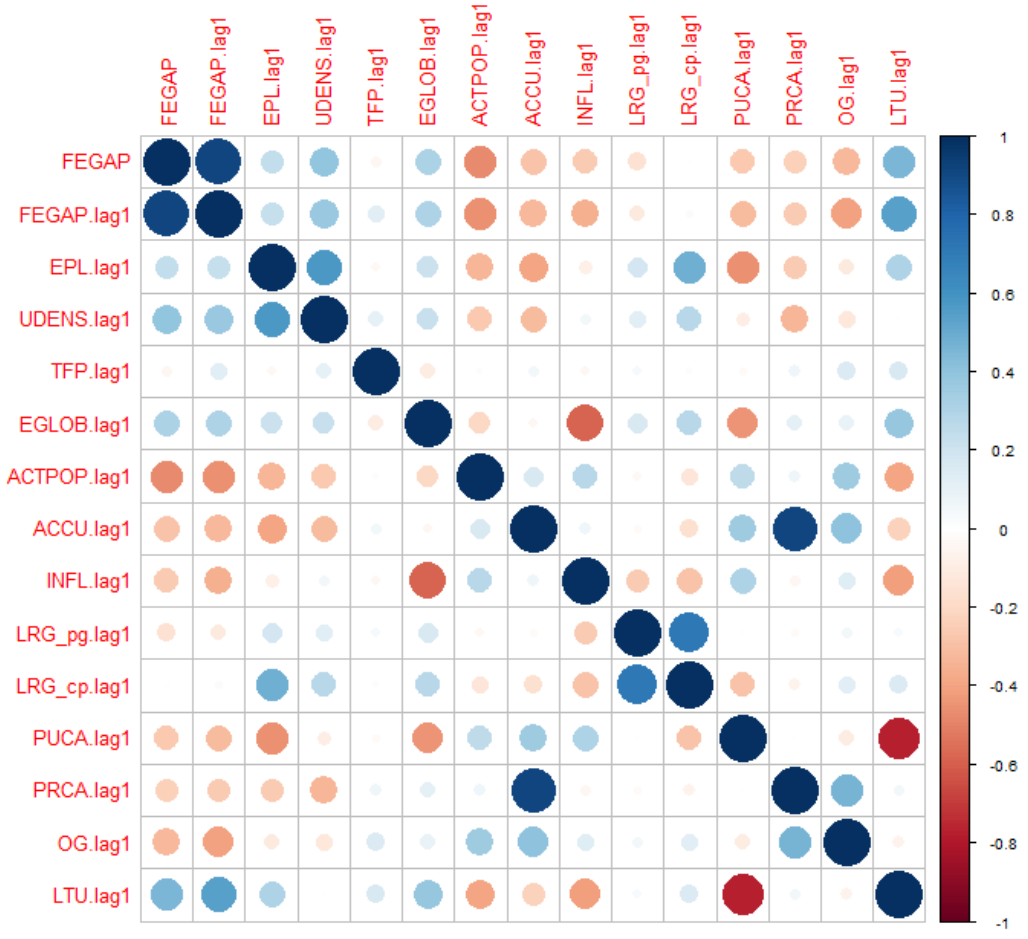


Table A3 / VIF results for explanatory variables of our econometric baseline regression specifications

Model	$FEGAP_{t-1}$	EPL_{t-1}	$UDENS_{t-1}$	TFP_{t-1}	$EGLOB_{t-1}$	$ACTPOP_{t-1}$	$ACCU_{t-1}$	$INFL_{t-1}$	LRG_pg_{t-1}	DCLU_EU
(2)	1.10	1.46	1.52							
(3)	1.39	1.80	1.65	1.04	1.49	1.14				
(4)	1.84	2.12	1.89	1.11	2.14	1.14	1.49	1.90		
(5)	2.01	2.14	1.96	1.12	2.14	1.15	1.49	1.92	1.19	
(6)	2.14	2.21	1.98	1.17	2.55	1.18	1.56	1.95	1.26	
						Eighties	**Nineties**	**FinCrisis**	**EuroCrisis**	
						1.43	1.33	1.11	1.12	
(7), (8)	2.03	4.76	2.00	1.15	2.88	1.19	1.66	2.28	1.19	5.71

Note: Results refer to baseline regressions of Table 2, where two-way fixed effects are included in models (2)-(5), country fixed effects and time-period dummies included in model (6), and time fixed effects are combined with country cluster dummies in model (7). SOD = social democratic countries cluster dummy (equivalent to 'DCLU_SOD' in baseline regression); CON = continental countries cluster dummy (equivalent to 'DCLU_CON' in baseline regression).

B) Testing for unit roots

Results of several unit root tests that we applied to our panel dataset variables are depicted in Table A4. In the first run (1) we applied the Levin Lin Chu (LLC) test which assumes in its H_0 that each time series contains a unit root, and in its H_a that each time series is stationary. In addition to its restricted null, the LLC further assumes cross-sectional independence (which would imply, for instance, that Austria's $EGLOB_{t-1}$ is independent of Germany's). As a second unit root test (2), we run the Im, Pesaran and Shin (IPS) test, which is more flexible than the LLC test, as its H_a allows some individuals to have a unit root (i.e. allowing for heterogeneous coefficients). Conducting a more advanced IPS test such as the cross-sectionally augmented IPS test is not possible due to the low number of individual countries. A third test (3) that we run is the Maddala Wu (MW) test, which is a Fisher-type test that combines p-values from tests based on Augmented Dickey-Fuller (ADF) regressions per individual available. In contrast to the IPS test, which assumes asymptotic validity regarding the amount of N individuals going to infinity, the Fisher test depends on T going to infinity (Maddala and Wu, 1999). Because our dataset has the format of a long time series with few cross-sectional units, it is worthwhile to add the MW test to our battery of unit root tests. Lastly, we also run the ADF test for each variable and country for completeness; it only tests for unit roots on a country level for the single time series variables and is not as reliable as the other tests for a panel dataset.

As Table A4 shows, the IPS, LLC and MW tests report stationarity (or at least weak stationarity) for most variables. While $UDENS_{t-1}$appears as non-stationary in several tests we do find evidence of panel stationarity for our complete baseline set of regressors in the MW test (including $UDENS_{t-1}$). Utilizing union density rate as an untransformed regressor is also in line with previous research in panel data analysis (Rumler and Scharler, 2011). Nevertheless, we also include $\Delta UDENS_{t-1}$ (the difference of $UDENS_{t-1}$ with its preceding value) into our battery of stationary tests which proves strongly stationary. In a further step of substituting $\Delta UDENS_{t-1}$ for $UDENS_{t-1}$ in our baseline regression does not impact our regression results.[1] Hence, we argue that the $UDENS_{t-1}$ can be used as a rate variable in our empirical approach.

1 Results are available upon request.

Table A4 / Unit root tests for key variables of our econometric baseline regression specifications

Variable	(1) LLC test results[2]	(2) IPS test results[3]	(3) MW testing[4]	(4) ADF test results[5]
$FEGAP_{t-1}$	p < 0.01, stat	p < 0.01, stat		p > 0.10, non-stat (except GBR, USA)
EPL_{t-1}	p < 0.01, stat[6]	p < 0.01, stat[6]		p < 0.05, stat (except DEUUSA)[6]
$UDENS_{t-1}$	p > 0.10, non-stat	p > 0.10, non-stat		p > 0.10, non-stat (except DEU, GBR)
TFP_{t-1}	p < 0.01, stat	p < 0.01, stat		p < 0.01, stat
$EGLOB_{t-1}$	p < 0.01, stat	p < 0.10, weakly stat	p < 0.01, stat	p > 0.10, non-stat (except GBR)
$ACTPOP_{t-1}$	p < 0.01, stat	p < 0.01, stat		p < 0.01, stat
$ACCU_{t-1}$	p < 0.01, stat	p < 0.01, stat		p < 0.05, stat (except USA)
$INFL_{t-1}$	p < 0.01, stat	p < 0.01, stat		p < 0.01, stat
LRG_pg_{t-1}	p < 0.01, stat	p < 0.01, stat		p < 0.05, stat (except DEU)
$dUDENS_{t-1}$	p < 0.01, stat	p < 0.01, stat		p < 0.01, stat

C) Testing for cointegration

If time series variables do not exhibit stationarity, they can still show a stable long-term relationship together (i.e. be cointegrated with each other), which can impact the model estimation. While the MW test indicates a stationary panel, panel-specific stationarity tests LLC and IPS report non-stationarity for $UDENS_{t-1}$ and weak stationarity for $EGLOB_{t-1}$. Therefore, we also include a battery of cointegration tests to test for cointegrating relationships in our panel. We will base our conclusions on the Pedroni test results, as it is the most comprehensive cointegration test, being able to detect homogenous as well as heterogenous cointegration relationships. However, we also add test results of the Kao and Fisher test in order to provide more information on our data structures.

Table A5 shows the results of the cointegration tests: the first row collects test results of bivariate cointegration tests regarding the $UDENS_{t-1}$ variable and each other key regressor variable (i.e., $UDENS_{t-1}$ and $FEGAP_{t-1}$ in (1a), etc.). Though stationary variables cannot include the same stochastic trend as an I(1) variable we include the outcomes of the bivariate check-ups as additional proof and for matters of transparency. The results show that the Pedroni as well as the Kao test do not detect any cointegrating relationships. The Fisher test reports two significant cases of cointegration with $UDENS_{t-1}$, namely TFP_{t-1} and $INFL_{t-1}$, and two cases with weak cointegrating relationships, namely $FEGAP_{t-1}$, and $ACTPOP_{t-1}$.

At next we group the $UDENS_{t-1}$ variable with other regressor variables that could potentially form a cointegrating set of variables. We start in row (2a) by adding the variables that were suspected by the Fisher test to show signs of cointegration. However, we do not find cointegrating relationships based on

2 H_0 is that all individuals follow a unit root process, and H_a is that all individuals are stationary.

3 H_0 is that all individuals follow a unit root process, and H_a is that some individuals can have a unit root, while some can be stationary.

4 H_0 is that all individuals follow a unit root process, and H_a is that some individuals can have a unit root, while some can be stationary.

5 The ADF test results report the p-value for the lag coefficient (γ) for a trend-based ADF regression specification, being $\Delta y_t = \gamma y_{t-1} + a_0 + a_2 t + \epsilon_t$. The null hypothesis represents a non-stationary outcome ($\gamma = 0$). The tests were run on each time series variable per country and, unless otherwise stated, test results hold for all country cases.

6 Owing to time series issues with the data variation of the EPL variable, the test was carried out on a sub-sample that excluded the US.

the Pedroni test. Repeating the same exercise by adding the other remaining variables of our benchmark model we also do not find any signs of cointegration according to the Pedroni test in row (2b). For our whole set of variables we were not able to run a Pedroni test – see row (3) in Table A5 – as the number of variables exceeded the maximum of the software limit.

As we do not find any sign of clear cointegration in our panel data there is also no need or possibility to specify a correct vector error correction model. In addition, our previous tests also validate the usage of union density level data in our regression approach.

Table A5 / Cointegration tests for variables used in the baseline econometric specification

	Variables	Pedroni test[7] [H0: no cointegration]	Kao test[8] [H0: no cointegration]	Fisher test[9] [H0: no cointegration]
(1a)	$UDENS_{t-1}$ ~ … $FEGAP_{t-1}$	p > 0.10 for all 11 test statistics	p > 0.10	**p < 0.10**
(1b)	EPL_{t-1}	p > 0.10 for all 11 test statistics	p > 0.10	p > 0.10
(1c)	TFP_{t-1}	p > 0.10 for all 11 test statistics	p > 0.10	**p < 0.01**
(1d)	$EGLOB_{t-1}$	p > 0.10 for all 11 test statistics	p > 0.10	p > 0.10
(1e)	$ACTPOP_{t-1}$	p > 0.10 for all 11 test statistics	p > 0.10	**p < 0.10**
(1f)	$ACCU_{t-1}$	p > 0.10 for all 11 test statistics	p > 0.10	p > 0.10
(1g)	$INFL_{t-1}$	p > 0.10 for 8 / 11 test statistics	p > 0.10	**p < 0.01**
(1h)	LRG_pg_{t-1}	p > 0.10 for all 11 test statistics	p > 0.10	p > 0.10
(2a)	$UDENS_{t-1}$, $FEGAP_{t-1}$, $EGLOB_{t-1}$, TFP_{t-1}, $INFL_{t-1}$, $ACTPOP_{t-1}$	p > 0.10 for 11 / 11 test statistics	p < 0.01	p < 0.01 (at most 2 cointegrating relationships
(2b)	$UDENS_{t-1}$, $FEGAP_{t-1}$, $EGLOB_{t-1}$, EPL_{t-1}, $ACCU_{t-1}$, LRG_pg_{t-1}	p > 0.10 for 8 / 11 test statistics	p < 0.01	p < 0.01 (at most 3 cointegrating relationships
(3)	All baseline variables	–	p < 0.01	–

Table A6 / Descriptive statistics (1970-2019)

Statistic	N	Mean	S.D.	Min	1st Qu	3rd Qu	Max
FEGAP	296	3.26	2.81	-0.88	1.20	4.74	14.97
FEGAP.lag1	296	3.18	2.82	-0.88	1.03	4.73	14.97
EPL.lag1	296	1.85	0.92	0.09	1.35	2.60	2.70
UDENS.lag1	296	44.45	23.10	9.90	25.78	67.88	86.60
TFP.lag1	296	0.97	1.68	-7.09	0.09	1.98	5.08
EGLOB.lag1	296	68.28	12.12	38.59	60.43	79.96	84.92
ACTPOP.lag1	296	0.76	1.01	-2.07	0.27	1.18	5.48
ACCU.lag1	296	7.32	0.98	4.73	6.64	7.80	10.32
INFL.lag1	296	4.03	3.74	-0.49	1.57	5.49	24.21
LRG_pg.lag1	296	4.79	1.39	2.14	3.58	6.00	6.69

7 Pedroni residual cointegration test based on Pedroni (1999), conducted in EViews10+ with the assumptions of a deterministic intercept and trend and an automatically selected lag length based on Schwarz information criterion.

8 Engle-Granger based Kao test, conducted in EViews10+, with the assumption of an individual intercept and an automatically selected lag length based on the Schwarz information criterion.

9 Johansen Fisher panel cointegration test, conducted in EViews10+ with the assumption of a linear trend in the level data as well as an intercept and a trend in the cointegration equations; the lag specification for differenced endogenous is assumed to be 1.

APPENDIX C: ROBUSTNESS CHECKS

A) Using country- and cluster-specific dummies:

In Table A7, we collect regression results with individual country-specific and cluster-specific dummies. In order to visualise individual country (D.COU) and cluster effects of welfare states (D.CLU), the regressions were run with time-fixed effects only, and hence columns (2), (3), and (5) differ from columns (1), (4), and (6). The benchmark model in the first column (BM) with no country dummies is equal to the benchmark model of Table 2. The regression outcome of column (2) with the country dummies suggests that – controlling for all the other confounding factors – in reference to the US most countries in our sample are associated with significantly lower full employment gaps on average. One might think that such a statement is not consistent with previous depictions of full employment gaps (e.g., Figure 6). Yet, it is to say that univariate graphical representations cannot directly be compared with multivariate regression results. In region analysis of column (3) we leave out other confounding variables and only regress FEGAP on the welfare state dummies. There we do find that compared to the reference country of the US each country dummy is associated with higher full employment gaps. Adding terms of lagged full employment gaps interacted with individual country dummies (BM+D.COU.X in column (4)) also reflects the hysteresis effect regarding the European unemployment problem that has become apparent in the main regression results section 5.2 for the cluster of European countries. Clustering countries into groups of welfare states as in column (5), we find that social democratic welfare states (FIN, SWE) are associated with lower full employment gaps compared to the reference cluster of liberal welfare states (GBR, USA). The switch to the reference category of the liberal welfare state cluster also implies slight changes to estimates: It is notable that the variable measuring the left-right dimension of government is now smaller in absolute size and loses significance. This suggests that the relationship of political partisanship with full employment gaps is moderated by the type of reference group welfare state regime, which is represented by the liberal cluster (i.e., the UK and the US). Furthermore, the variable EGLOB switches sign, as it now indicates that an increase in economic globalisation is related to decline in full employment gaps, which again can be explained by a specific relation of the liberal cluster as a reference group with the dependent variable. Model (*BM+D.CLU.X*) in column (6) extends our baseline model by interacting the cluster dummies with the lagged full employment gap. Results are similar to the ones of Table 2, reflecting the European unemployment problem by finding a stronger hysteresis effect regarding full employment for the social democratic welfare and the conservative welfare cluster.

Table A7 / Regression results for country and cluster dummies

	FEGAP					
	(1) *BM*	(2) *BM+D.COU*	(3) *D.COU*	(4) *BM+D.COU.X*	(5) *BM+D.CLU*	(6) *BM+D.CLU.X*
$FEGAP_{t-1}$	0.904***	0.904***		0.677***	0.975***	0.847***
	(0.024)	(0.024)		(0.041)	(0.025)	(0.045)
EPL_{t-1}	0.151	0.151		-0.035	0.209*	0.215
	(0.207)	(0.209)		(0.089)	(0.112)	(0.199)
$UDENS_{t-1}$	0.039***	0.039***		-0.007*	0.020**	0.031***
	(0.013)	(0.013)		(0.004)	(0.008)	(0.009)
TFP_{t-1}	-0.229***	-0.229***		-0.221***	-0.225***	-0.223***
	(0.053)	(0.053)		(0.064)	(0.063)	(0.058)
$EGLOB_{t-1}$	-0.024	-0.024		-0.018	-0.040**	-0.013
	(0.030)	(0.030)		(0.016)	(0.018)	(0.029)
$ACTPOP_{t-1}$	-0.121**	-0.121**		-0.150***	-0.135***	-0.128**
	(0.056)	(0.057)		(0.046)	(0.051)	(0.051)
$ACCU_{t-1}$	-0.069	-0.069		0.042	0.023	0.004
	(0.055)	(0.055)		(0.027)	(0.031)	(0.078)
$INFL_{t-1}$	0.069*	0.069*		0.064***	0.060*	0.063*
	(0.037)	(0.038)		(0.013)	(0.035)	(0.038)
LRG_pg_{t-1}	-0.056*	-0.056*		-0.019	-0.039	-0.059**
	(0.031)	(0.031)		(0.025)	(0.028)	(0.028)
DCOU_AUT		-0.866*	0.060***			
		(0.484)	(0.000)			
DCOU_DEU		-0.356	1.785***			
		(0.613)	(0.000)			
DCOU_FIN		-1.682***	3.873***			
		(0.559)	(0.039)			
DCOU_SWE		-2.345***	1.392***			
		(0.540)	(0.039)			
DCOU_GBR		-0.620*	1.164***			
		(0.317)	(0.051)			
$FEGAP_{t-1}$ x DCOU_AUT				0.344***		
				(0.064)		
$FEGAP_{t-1}$ x DCOU_DEU				0.285***		
				(0.047)		
$FEGAP_{t-1}$ x DCOU_FIN				0.351***		
				(0.038)		
$FEGAP_{t-1}$ x DCOU_SWE				0.392***		
				(0.041)		
$FEGAP_{t-1}$ x DCOU_GBR				0.255***		
				(0.064)		
DCLU_CON					-0.145	
					(0.194)	
DCLU_SOD					-0.932**	
					(0.361)	
$FEGAP_{t-1}$ x DCLU_CON						0.113***
						(0.039)
$FEGAP_{t-1}$ x DCLU_SOD						0.108*
						(0.059)
Observations	296	296	299	296	296	296
R^2	0.906	0.936	0.318	0.937	0.932	0.908
Adjusted R^2	0.881	0.919	0.164	0.920	0.915	0.883
F Statistic	249.468*** (df = 9; 232)	244.206*** (df = 14; 232)	22.709*** (df = 5; 243)	248.310*** (df = 14; 232)	294.978*** (df = 11; 235)	207.379*** (df = 11; 230)

Notes: Dependent variable: FEGAP. Details on the variables used are available in Table 1. Estimates for the constant and for country-fixed effects are not shown for brevity. ***, ** and * refer to statistical significance at the 1%, 5% and 10% level, respectively. Cluster-robust standard errors are shown in parentheses.

B) Using three- and five-year data averages:

As argued in Section 5, we followed an approach in the empirical literature (Felbermayr and Gröschl, 2014) of using lagged variables as an identification strategy of our explanatory variables. In addition, we now average our data over the course of three (see Table A8) and five years (see Table A 9), which is are time periods of roughly a business cycle, to account for business cycle effects and complement our analysis with an additional identification strategy. The estimation equation that we apply is shown in equation (A1) and only differs from equation (1) in terms of averaging data over three and five years.

$$\widetilde{FEGAP}_{i,t} = \alpha + \beta\, \tilde{H}_{i,t-1} + \gamma\, \tilde{L}_{i,t-1} + \delta\, \tilde{S}_{i,t-1} + \theta\, \tilde{M}_{i,t-1} + \eta\, \tilde{P}_{i,t-1} + \zeta_i + \xi_t + \varepsilon_{i,t} \quad \text{(A1)}$$

The regression results reported below in Table A8 and Table A9 generally confirm our regression results of Section 5, although some point estimates became attenuated and standard errors increased, leading to fewer significant coefficients. For example, in the averaged regression results we find regarding the benchmark model (column 5) point estimates for the $FEGAP3_{t-1}$ coefficient to be 0.662, for $FEGAP5_{t-1}$ being 0.387, while Table 2 reports a coefficient of $FEGAP_{t-1}$ for BM to be 0.904. Due to the reduction of observations we find more estimates in the 3 years averaged data to be significant than in the 5 year average sample, though the pattern of significant estimators did not change. Coefficients where the sign remained but standard errors changed include $UDENS3_{t-1}$/$UDENS5_{t-1}$ (still positive point estimates, but higher standard errors), $TFP3_{t-1}$/$TFP5_{t-1}$ (still negative sign, while standard errors increased), $INFL3_{t-1}$/$INFL5_{t-1}$ (still positive point estimates and fewer significant results), and $LRG3_{t-1}$/$LRG5_{t-1}$ (retaining its negative point estimate, although standard errors increase and estimator is not anymore significant). Most other insignificant coefficients also kept the sign of their point estimates and remained insignificant (in most specifications), such as $EPL3_{t-1}$/$EPL5_{t-1}$ (still positive, but [mostly] insignificant point estimates), $ACCU3_{t-1}$/$ACCU5_{t-1}$ (still negative, but insignificant point estimates). Insignificant results are reported for the EGLOB5 variable, while the standard errors even increase beyond the effect size of the respective point estimates. The $ACTPOP3_{t-1}$/$ACTPOP5_{t-1}$ variable keeps the sign of its point estimate, but with increasing standard errors no more significant results are obtained. In terms of the time period dummies (BM+D.T) we find slight differences between the three and five year averaged sample version, where coefficients for the financial crisis and Euro crisis are positive but not always significant. The 1990's period shows a positive and significant coefficient in both cases. Interactions of lagged full employment gap with dummies of a block of European countries (BM+X1) and the individual European countries (BM+X2) confirm observations of Table 2, and provide evidence to the European unemployment problem.

Table A8 / Regression table for three-year averaged data

	FEGAP							
	(1) *M1*	(2) *M2*	(3) *M3*	(4) *M4*	(5) *M5/BM*	(6) *BM+D.T*	(7) *BM+D.X1*	(8) *BM+D.X2*
$FEGAP3_{t-1}$	0.726***	0.660***	0.672***	0.678***	0.662***	0.553***	0.260**	0.279**
	(0.058)	(0.068)	(0.029)	(0.036)	(0.043)	(0.084)	(0.118)	(0.138)
$EPL3_{t-1}$		0.510	0.801	0.573	0.538	0.442	0.551*	0.155
		(0.337)	(0.481)	(0.348)	(0.343)	(0.722)	(0.288)	(0.359)
$UDENS3_{t-1}$		0.068*	0.054*	0.067**	0.070**	0.091***	0.068**	0.107***
		(0.037)	(0.031)	(0.032)	(0.034)	(0.027)	(0.032)	(0.017)
$TFP3_{t-1}$			-0.661***	-0.576***	-0.561***	-0.378***	-0.531***	-0.550***
			(0.128)	(0.140)	(0.137)	(0.114)	(0.128)	(0.157)
$EGLOB3_{t-1}$			0.062	0.041	0.037	0.073***	0.012	-0.001
			(0.111)	(0.090)	(0.095)	(0.025)	(0.102)	(0.108)
$ACTPOP3_{t-1}$			-0.271	-0.251	-0.245	0.049	-0.297	-0.306
			(0.225)	(0.307)	(0.311)	(0.301)	(0.291)	(0.312)
$ACCU3_{t-1}$				0.007	0.003	0.062	0.007	0.457**
				(0.181)	(0.175)	(0.258)	(0.164)	(0.203)
$INFL3_{t-1}$				0.186**	0.184**	0.235***	0.181**	0.090
				(0.086)	(0.081)	(0.031)	(0.084)	(0.069)
LRG_pg3_{t-1}					-0.054	-0.151	-0.006	0.051
					(0.079)	(0.104)	(0.053)	(0.035)
Eighties						-0.642		
						(0.648)		
Nineties						1.408**		
						(0.547)		
FinancialCrisis						0.289		
						(0.588)		
EuroCrisis						2.185***		
						(0.818)		
$FEGAP3_{t-1}$ x DUEP_EU							0.452***	
							(0.099)	
$FEGAP3_{t-1}$ x DCOU_AUT								1.401***
								(0.088)
$FEGAP3_{t-1}$ x DCOU_DEU								0.552***
								(0.150)
$FEGAP3_{t-1}$ x DCOU_FIN								0.410***
								(0.153)
$FEGAP3_{t-1}$ x DCOU_SWE								0.724***
								(0.157)
$FEGAP3_{t-1}$ x DCOU_GBR								0.362**
								(0.155)
Observations	102	102	102	102	102	102	102	102
R^2	0.542	0.572	0.654	0.675	0.676	0.721	0.687	0.721
Adjusted R^2	0.414	0.438	0.528	0.545	0.540	0.660	0.548	0.573
F Statistic	93.370***	34.276***	23.347***	18.730***	16.487***	16.477***	15.339***	12.188***
	(df = 1; 79)	(df = 3; 77)	(df = 6; 74)	(df = 8; 72)	(df = 9; 71)	(df = 13; 83)	(df = 10; 70)	(df = 14; 66)

Notes: Dependent variable: FEGAP. Details on the variables used are available in Table 1. Estimates for the constant and for country-fixed effects are not shown for brevity. ***, ** and * refer to statistical significance at the 1%, 5% and 10% level, respectively. Cluster-robust standard errors are shown in parentheses.

Table A9 / Regression table for five-year averaged data

	FEGAP							
	(1) *M1*	(2) *M2*	(3) *M3*	(4) *M4*	(5) *M5/BM*	(6) *BM+D.T*	(7) *BM+D.X1*	(8) *BM+D.X2*
$FEGAP5_{t-1}$	0.579***	0.502***	0.472***	0.415***	0.387***	0.342**	-0.016	-0.042
	(0.087)	(0.109)	(0.059)	(0.058)	(0.070)	(0.142)	(0.231)	(0.271)
$EPL5_{t-1}$		0.996**	1.269**	0.655	0.590	0.424	0.593	0.258
		(0.412)	(0.613)	(0.486)	(0.476)	(0.674)	(0.434)	(0.865)
$UDENS5_{t-1}$		0.088	0.050	0.077	0.085	0.086*	0.080	0.149***
		(0.054)	(0.052)	(0.054)	(0.060)	(0.043)	(0.057)	(0.043)
$TFP5_{t-1}$			-0.562***	-0.431**	-0.384	-0.277	-0.336	-0.030
			(0.165)	(0.208)	(0.258)	(0.268)	(0.265)	(0.466)
$EGLOB5_{t-1}$			0.120	0.081	0.067	0.070	0.045	0.099
			(0.150)	(0.117)	(0.132)	(0.075)	(0.145)	(0.160)
$ACTPOP5_{t-1}$			-0.336	-0.307	-0.302	-0.185	-0.373	-0.458
			(0.463)	(0.548)	(0.556)	(0.595)	(0.550)	(0.683)
$ACCU5_{t-1}$				-0.212	-0.219	-0.193	-0.214	0.433
				(0.285)	(0.283)	(0.365)	(0.279)	(0.515)
$INFL5_{t-1}$				0.273*	0.272*	0.255	0.272*	0.046
				(0.153)	(0.152)	(0.188)	(0.159)	(0.197)
LRG_pg5_{t-1}					-0.099	-0.076	-0.045	-0.024
					(0.130)	(0.117)	(0.086)	(0.129)
Eighties						-0.994**		
						(0.398)		
Nineties						1.412**		
						(0.666)		
FinancialCrisis						0.573		
						(1.337)		
EuroCrisis						1.382		
						(1.442)		
$FEGAP5_{t-1}$ x DUEP_EU							0.455**	
							(0.211)	
$FEGAP5_{t-1}$ x DCOU_AUT								2.022***
								(0.241)
$FEGAP5_{t-1}$ x DCOU_DEU								0.921**
								(0.365)
$FEGAP5_{t-1}$ x DCOU_FIN								0.369
								(0.257)
$FEGAP5_{t-1}$ x DCOU_SWE								0.538
								(0.397)
$FEGAP5_{t-1}$ x DCOU_GBR								0.192
								(0.297)
Observations	60	60	60	60	60	60	60	60
R^2	0.351	0.416	0.455	0.496	0.498	0.615	0.507	0.578
Adjusted R^2	0.130	0.179	0.176	0.196	0.178	0.446	0.168	0.197
F Statistic	23.794***	9.959***	5.435***	4.549***	3.973***	5.038***	3.593***	3.037***
	(df = 1; 44)	(df = 3; 42)	(df = 6; 39)	(df = 8; 37)	(df = 9; 36)	(df = 13; 41)	(df = 10; 35)	(df = 14; 31)

Notes: Dependent variable: FEGAP. Details on the variables used are available in Table 1. Estimates for the constant and for country-fixed effects are not shown for brevity. ***, ** and * refer to statistical significance at the 1%, 5% and 10% level, respectively. Cluster-robust standard errors are shown in parentheses.

C) Using the NAIRU gap instead of the FEGAP variable:

To check for the consistency of our regression results of Table 2 regarding the full employment gap (FEGAP), we now regress the NAIRU gap (NAIRUGAP) on the selection of our variables. The estimation equation that we apply is shown in equation (A2) and only differs from equation (1) in terms of the left-hand-side variable, which shows the NAIRU gap (NAIRUGAP) instead of the FEGAP:

$$NAIRUGAP_{i,t} = \alpha + \beta\, H_{i,t-1} + \gamma\, L_{i,t-1} + \delta\, S_{i,t-1} + \theta\, M_{i,t-1} + \eta\, P_{i,t-1} + \zeta_i + \xi_t + \varepsilon_{i,t} \qquad \text{(A2)}$$

Results in Table A10 do not indicate large differences between the two tables. The most notable observable deviation can be found in the behaviour of the EGLOB variable, which is negative and significant for all regression specifications in the NAIRUGAP case, but only reflects a negative and significant coefficient in the last model with interaction terms (BM+D.X2) of the FEGAP case. While the signs of the EGLOB coefficients are negative in both regression tables, it is the lower standard errors that yield significant results in the NAIRUGAP case. This could be explained in the sense that the relation of the FEGAP-EGLOB variable appears similar, although slightly noisier than in the NAIRUGAP-EGLOB case. Another set of deviations is reported for the time-specific regression models (BM+D.T), where the association of $EGLOB_{t-1}$ and the FEGAP is positive and significant, the association of $UDENS_{t-1}$ and NAIRUGAP maintains its significance, and the association of the FinancialCrisis dummy and the NAIRUGAP is not significant anymore.

Table A10 / Regression table for NAIRU gap estimates

	NAIRUGAP							
	(1) *M1*	(2) *M2*	(3) *M3*	(4) *M4*	(5) *M5/BM*	(6) *BM+D.T*	(7) *BM+D.X1*	(8) *BM+D.X2*
$NAIRUGAP_{t-1}$	0.841***	0.825***	0.859***	0.852***	0.833***	0.800***	0.533***	0.537***
	(0.027)	(0.029)	(0.030)	(0.043)	(0.042)	(0.045)	(0.043)	(0.040)
EPL_{t-1}		0.091	0.180	0.024	0.010	-0.115	0.030	0.006
		(0.127)	(0.127)	(0.132)	(0.167)	(0.137)	(0.132)	(0.170)
$UDENS_{t-1}$		0.017*	0.029***	0.034***	0.038***	0.005	0.038***	0.039***
		(0.010)	(0.006)	(0.009)	(0.009)	(0.006)	(0.008)	(0.008)
TFP_{t-1}			-0.231***	-0.203***	-0.193***	-0.213***	-0.186***	-0.188***
			(0.047)	(0.052)	(0.052)	(0.044)	(0.054)	(0.058)
$EGLOB_{t-1}$			-0.027**	-0.038***	-0.046***	0.022***	-0.057***	-0.058***
			(0.011)	(0.014)	(0.016)	(0.004)	(0.017)	(0.017)
$ACTPOP_{t-1}$			-0.091***	-0.094***	-0.094***	-0.150***	-0.093***	-0.092***
			(0.022)	(0.027)	(0.026)	(0.054)	(0.025)	(0.028)
$ACCU_{t-1}$				-0.052	-0.042	-0.044	-0.061	-0.064
				(0.059)	(0.052)	(0.114)	(0.043)	(0.049)
$INFL_{t-1}$				0.065**	0.063**	0.079***	0.055**	0.054**
				(0.029)	(0.027)	(0.021)	(0.022)	(0.024)
LRG_pg_{t-1}					-0.075***	-0.089**	-0.051***	-0.048***
					(0.016)	(0.035)	(0.009)	(0.009)
Eighties						-0.035		
						(0.177)		
Nineties						0.359***		
						(0.102)		
FinancialCrisis						0.401		
						(0.275)		
EuroCrisis						0.005		
						(0.162)		
$NAIRUGAP_{t-1}$ x DUEP_EU							0.349***	
							(0.036)	
$NAIRUGAP_{t-1}$ x DCOU_AUT								0.381**
								(0.189)
$NAIRUGAP_{t-1}$ x DCOU_DEU								0.341***
								(0.066)
$NAIRUGAP_{t-1}$ x DCOU_FIN								0.322***
								(0.046)
$NAIRUGAP_{t-1}$ x DCOU_SWE								0.388***
								(0.042)
$NAIRUGAP_{t-1}$ x DCOU_GBR								0.358***
								(0.040)
Observations	296	296	296	296	296	296	296	296
R^2	0.705	0.710	0.766	0.774	0.779	0.733	0.794	0.795
Adjusted R^2	0.638	0.641	0.706	0.714	0.719	0.716	0.737	0.733
F Statistic	574.893***	194.276***	128.283***	99.605***	90.877***	58.582***	89.112***	62.811***
	(df = 1; 240)	(df = 3; 238)	(df = 6; 235)	(df = 8; 233)	(df = 9; 232)	(df = 13; 277)	(df = 10; 231)	(df = 14; 227)

Notes: Dependent variable: FEGAP. Details on the variables used are available in Table 1. Estimates for the constant and for country-fixed effects are not shown for brevity. ***, ** and * refer to statistical significance at the 1%, 5% and 10% level, respectively. Cluster-robust standard errors are shown in parentheses.

D) Adding regressors:

We add further regressors to check the robustness of our baseline regression specification. Table A11 below compares the results of the benchmark regression (1) with additional regression specifications (2-5). Regressions with the following additional variables are used in our robustness checks:

› (2): We add the output gap (OG) as an additional control variable for the effects of business cycle shifts on the full employment gap. Similarly to the inflation measure, we would also expect a negative relationship between the OG and the full employment gap, as the latter will decrease in times of expansion and increase in times of recession. Although the standard error for the OG coefficient is high and we do not find a significant result for its point estimate, adding the variable does not change the sign or significance of other baseline regression variables.

› (3): As another indicator for unemployment hysteresis, we add long-term unemployment (LTU). Notably, the data for LTU are not equally available between 1970 and 2019 for the countries in our dataset, which significantly reduces the number of observations for the panel regression (a decline in the number of observations from 294 to 225). Therefore, we include LTU as an additional robustness check but do not use it in our baseline regression. If the lagged dependent variable is dropped, regression results suggest that LTU is positively associated with the full employment gap (2). Nevertheless, coefficient signs of $FEGAP_{t-1}$ and LTU in their separate regressions indicate that there is a hysteresis effect of higher unemployment rates: if workers remain unemployed for a longer time, it is more likely that current unemployment will go up further, rather than coming down. A policy-minded conclusion of this finding would be to specifically target the long-term unemployed to sustainably reduce overall unemployment rates.

› (4): Instead of using the aggregated value for capital accumulation, we include public capital accumulation (PUCA) as the ratio between real gross fixed capital formation of general government and the real net capital stock, and the private capital accumulation rate (PRCA) as the ratio between real gross fixed capital formation of the private sector and the real net capital stock. Results of our baseline regressors do not change. Both PRCA and PUCA are negatively, although insignificantly, associated with FEGAP and hence mirror the behaviour of their aggregated variable ACCU.

› (5): Besides the political variable that we use in our baseline regressions, which are based on the parlgov data (LRG = LRG_pg), we also have information on the left-right inclination of governments based on the cpds dataset (left-right dimension of the government based on cpds data, LRG2 = LRG_cp) that we use for sensitivity checks. To adjust it to the zero-to-ten scale, we constructed a weighted sum, weighting the cabinet seat share of left-wing parties by multiplying it with one, center parties with five, and right wing parties with nine. Although the original parlgov and cpds data use a left-to-right-wing scale (with higher numbers indicating a more right-leaning government), we use an inverted scale for our LRG_pg and LRG_cp, where one is the score for a very right-leaning party and nine the score for a very left-leaning government. Results for the political inclination appear only partly robust: more left-leaning governments (or their interactions with union strength) are associated with lower full employment gaps, but standard errors are high and hence results are not significant.

Table A11 / Regression results for testing additional regressors

	FEGAP				
	(1)	(2)	(3)	(4)	(5)
	BM	*BM+OG*	*BM.LTU*	*BM.PUPR*	*BM.LRG*
$FEGAP_{t-1}$	0.904***	0.909***		0.901***	0.907***
	(0.024)	(0.024)		(0.023)	(0.027)
EPL_{t-1}	0.151	0.172	-0.489	0.115	0.152
	(0.207)	(0.192)	(1.562)	(0.207)	(0.220)
$UDENS_{t-1}$	0.039***	0.037***	0.128	0.040***	0.036***
	(0.013)	(0.014)	(0.078)	(0.014)	(0.012)
TFP_{t-1}	-0.229***	-0.235***	-0.217*	-0.229***	-0.232***
	(0.053)	(0.049)	(0.126)	(0.053)	(0.054)
$EGLOB_{t-1}$	-0.024	-0.023	0.163	-0.023	-0.020
	(0.030)	(0.030)	(0.159)	(0.030)	(0.029)
$ACTPOP_{t-1}$	-0.121**	-0.126**	-0.101	-0.123**	-0.122**
	(0.056)	(0.050)	(0.101)	(0.055)	(0.057)
$ACCU_{t-1}$	-0.069	-0.074	-1.031**		-0.072
	(0.055)	(0.051)	(0.504)		(0.053)
$INFL_{t-1}$	0.069*	0.069*	0.163	0.071*	0.073*
	(0.037)	(0.037)	(0.192)	(0.038)	(0.040)
LRG_pg_{t-1}	-0.056*	-0.055*	-0.369***	-0.054	
	(0.031)	(0.032)	(0.121)	(0.033)	
OG_{t-1}		0.017			
		(0.025)			
LTU_{t-1}			0.114***		
			(0.030)		
$PRCA_{t-1}$				-0.068	
				(0.062)	
$PUCA_{t-1}$				-0.138	
				(0.149)	
LRG_cp_{t-1}					-0.026
					(0.021)
Observations	296	296	227	296	296
R^2	0.906	0.906	0.614	0.906	0.906
Adjusted R^2	0.881	0.881	0.465	0.881	0.881
F Statistic	249.468***	223.810***	28.867***	223.854***	248.557***
	(df = 9; 232)	(df = 10; 231)	(df = 9; 163)	(df = 10; 231)	(df = 9; 232)

Notes: Dependent variable: FEGAP. Details on the variables used are available in Table 1. Estimates for the constant and for country-fixed effects are not shown for brevity. ***, ** and * refer to statistical significance at the 1%, 5% and 10% level, respectively. Cluster-robust standard errors are shown in parentheses.

E) Adding Maastricht, Euro dummies and restricting sample to respective sub-periods:

We further compare the effect of the introduction of the Euro on Euro countries (AUT, DEU, FIN) with the benchmark (BM) regression (1) and the added interaction term of a Europe cluster dummy and the $FEGAP_{t-1}$ variable (2), by interacting country dummies with years for the enforcement of the Maastricht treaty in 1993 onwards (regression (3)), [10] and interacting country dummies with years for the introduction of the Euro currency from 1999 onwards (for AUT, DEU, and FIN; regression (4)).[11] Thereby, we want to test whether the Euro introduction had differential effects compared to Sweden, the UK, and the US.

We also split the sample into the time before the Maastricht criteria enforcement, pre 1993 (regression (5)), the years between the Maastricht treaty enforcement and the introduction of the Euro, i.e. 1993-1998 (regression (6)), the period between the introduction of the Euro and the Financial Crisis, 1999-2007 as in column (7), and the period after the financial crisis, after 2008 (regression (8)). Additionally, we also use a subset of our long panel dataset from 2000 onwards to compare it with the results of our short but extended-country panel dataset in regression (9).

The results in Table A 12 for columns (3)-(4) show negative and significant associations of the Maastricht dummy, as well as the Euro introduction with the full employment gap. For regressions (5)-(9) we find consistent effects with the benchmark of regression (1). Yet, $UDENS_{t-1}$ turns negative for (6)-(8), implying a time varying effect. $EGLOB_{t-1}$ turns into a negative and significant estimate for periods after 1999, while $ACTPOP_{t-1}$ becomes insignificant from 1999 onwards. For the political LRG_pg_{t-1} variable we find negative estimates for three periods, but only the one for the period of 2008-2020 is significant, while the one for model (6) in 1993-1998 is even positive and significant.

The interaction term of the European cluster with $FEGAP_{t-1}$ reflects the European unemployment problem as the hysteresis effect between 1970-1992 in column (5) for the US is 0.351 in column (5),[12] while the European value is higher by 0.573 units. For the period between 1993 and 1998 the US result seems negative though not significantly different from zero, and the European value being significantly higher, namely 1.436. For the years running up to the financial crisis, the labour market conditions for Europe improve, while the estimates for the lagged full employment gaps in Europe are still above the US values (0.676 vs 0.315, see column [7]). Post-financial crisis years appear like a turning point, as the association of $FEGAP_{t-1}$ and FEGAP for the US is now positive and highly significant again (0.894), while the European values are now below the US values (-0.098; see column [8]). The final column (9) reports a statistically significant value of 0.824 for the US and an insignificant one for the European cluster.

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[10] The Maastricht treaty was signed in February 1992 and entered into force in November 1993. Germany was a EU member at that time. Austria and Finland were considered EU candidate countries in 1993 and hence already faced conditions of fiscal regulations. The United Kingdom was a member of the EU in 1993, yet they decided for an opt-out regarding accessing the European Monetary Union (EMU), and hence were not under regulation of the Maastricht regulations I.e., the Maastricht dummy (DMAAS) is applied to Austria, Germany, and Finland for the years from 1993 onwards.

[11] The Euro dummy (DEURO) is applied to the Euro countries in our sample, i.e., to Austria, Germany, and Finland from 1999 onwards.

[12] The reader should mind, that the interaction of the full employment gaps and the European cluster, including Austria Germany, Finland, Sweden, and the UK ($FEGAP_{t-1}$ x DCLU_EU) means that the interpretation of $FEGAP_{t-1}$ is to be seen with regard to the base category of the US.

Table A12 / OLS estimation results for bilateral import prices of all ICT goods during 2012-2018

					FEGAP				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	BM	*BM+D.X*	*BM+D.X +D.MAAS*	*BM+D.X +D.EURO*	*1970-1992*	*1993-1998*	*1999-2007*	*2008-2019*	*2000-2019*
$FEGAP_{t-1}$	0.904***	0.643***	0.654***	0.650***	0.351***	-0.472	0.315**	0.894***	0.824***
	(0.024)	(0.026)	(0.026)	(0.033)	(0.071)	(0.380)	(0.123)	(0.268)	(0.112)
EPL_{t-1}	0.151	0.169	0.039	-0.086	-0.157	2.399	0.353	-0.260	-0.364
	(0.207)	(0.188)	(0.146)	(0.174)	(0.368)	(7.512)	(0.468)	(2.389)	(0.952)
$UDENS_{t-1}$	0.039***	0.036***	0.037***	0.032***	0.074***	-0.544**	-0.164***	-0.086*	-0.030
	(0.013)	(0.011)	(0.011)	(0.007)	(0.012)	(0.223)	(0.016)	(0.050)	(0.033)
TFP_{t-1}	-0.229***	-0.218***	-0.2228***	-0.226***	-0.245***	-0.176*	-0.122**	-0.140	-0.198**
	(0.053)	(0.056)	(0.060)	(0.063)	(0.070)	(0.092)	(0.060)	(0.136)	(0.077)
$EGLOB_{t-1}$	-0.024	-0.040	-0.040**	-0.035*	-0.078	0.131	-0.343***	-0.198	-0.109*
	(0.030)	(0.032)	(0.027)	(0.018)	(0.056)	(0.198)	(0.044)	(0.121)	(0.062)
$ACTPOP_{t-1}$	-0.121**	-0.137**	-0.127**	-0.136***	-0.148***	-0.224	-0.110*	0.026	-0.075
	(0.056)	(0.053)	(0.050)	(0.041)	(0.056)	(0.129)	(0.065)	(0.095)	(0.059)
$ACCU_{t-1}$	-0.069	-0.060	-0.099	-0.150*	0.100	0.193	0.028	-0.145	-0.193
	(0.055)	(0.045)	(0.065)	(0.079)	(0.160)	(0.539)	(0.155)	(1.301)	(0.435)
$INFL_{t-1}$	0.069*	0.063*	0.087***	0.095**	0.067**	-0.106	0.328***	0.515**	0.313***
	(0.037)	(0.033)	(0.025)	(0.027)	(0.029)	(0.181)	(0.090)	(0.217)	(0.112)
LRG_pg_{t-1}	-0.056*	-0.029	-0.046*	-0.052	-0.107	0.273*	0.105	-0.185**	-0.007
	(0.031)	(0.022)	(0.025)	(0.037)	(0.087)	(0.150)	(0.067)	(0.079)	(0.036)
$FEGAP_{t-1}$ x DCLU_EU		0.296***	0.302***	0.296***	0.573***	1.436***	0.676***	-0.098***	0.083
		(0.038)	(0.041)	(0.027)	(0.062)	(0.463)	(0.187)	(0.032)	(0.085)
DMAAS			-0.437*						
			(0.256)						
DEURO				-0.657***					
				(0.145)					
Observations	296	296	296	296	128	36	54	78	126
R^2	0.906	0.912	0.914	0.917	0.823	0.848	0.906	0.796	0.840
Adjusted R^2	0.881	0.888	0.889	0.893	0.752	0.646	0.834	0.685	0.778
F Statistic	249.468***	239.417***	221.648***	229.712***	42.176***	8.394***	28.902***	19.464***	47.378***
	(df = 9; 232)	(df = 10; 231)	(df = 11; 230)	(df = 11; 230)	(df = 10; 91)	(df = 10; 15)	(df = 10; 30)	(df = 10; 50)	(df = 10; 90)

Notes: Dependent variable: FEGAP. Details on the variables used are available in Table 1. Estimates for the constant and for country-fixed effects are not shown for brevity. ***, ** and * refer to statistical significance at the 1%, 5% and 10% level, respectively. Cluster-robust standard errors are shown in parentheses.

F) Analysing the temporal dimension of the European unemployment problem

To explore the development and changes of the European unemployment problem we explore the changes of the benchmark model with the interaction of the European cluster dummy and the labour market slack measures: results for using the Beveridgean full employment gap measure (FEGAP) are depicted in Table A13 and results for using the NAIRU gap measure are shown in Table A14. The results of both tables regarding outcomes of the non-interacted and interacted labour market slack measures and do not differ much and paint the same picture: Hysteresis effects of the European cluster are stronger than for the US in the periods of 1970s, 1980s, and most pronounced during the 1990s. While the US records a positive and significant association between the lagged labour slack measure and the dependent variable in the 1970s, there is no sign of a hysteresis effect for the US between 1980 and 2009. After the financial crisis, for the years 2010-2019 we find a positive and significant hysteresis effect for the US, and a significantly lower hysteresis effect for European countries.

Looking at results regarding estimates of the lagged labour slack measures (labor-slack-measure$_{t-1}$) and their interaction terms with the European cluster (labor-slack-measure$_{t-1}$ x DCLU_EU), one can hardly spot any difference between FEGAP and NAIRUGAP measures. Only in the period from 2000-2009 in Table A14 we find that according to the NAIRUGAP the hysteresis effect of Europe is significantly higher than for the US, while according to the FEGAP measure in Table A 13 we the estimates for the US as well as the European cluster are not significantly different from zero.

Finally, the two measures would make a different statement regarding the final decade of the European unemployment problem, the continuing unemployment problem that is Europe specific. According to the FEGAP measure the 1990s is the last decade where European countries record significantly higher hysteresis measures than the US. According to the NAIRUGAP measure, however, Europe also shows a significantly higher hysteresis effect in the 2000s.

Table A13 / Analysis of European unemployment problem by decades with FEGAP measure

	FEGAP						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	BM	*BM+D.X*	*1970-1979*	*1980-1989*	*1990-1999*	*2000-2009*	*2010-2019*
$FEGAP_{t-1}$	**0.904*****	**0.643*****	**0.362*****	**0.163**	**-0.069**	**0.611**	**0.948****
	(0.024)	**(0.026)**	**(0.106)**	**(0.162)**	**(0.210)**	**(0.399)**	**(0.350)**
EPL_{t-1}	0.151	0.169	-0.883**	-0.858	1.938	0.419	1.054
	(0.207)	(0.188)	(0.336)	(1.024)	(1.687)	(1.075)	(3.509)
$UDENS_{t-1}$	0.039***	0.036***	0.064**	0.114***	0.067	-0.020	0.011
	(0.013)	(0.011)	(0.030)	(0.038)	(0.075)	(0.070)	(0.069)
TFP_{t-1}	-0.229***	-0.218***	-0.196***	-0.144*	-0.396***	-0.285***	-0.106
	(0.053)	(0.056)	(0.070)	(0.074)	(0.048)	(0.098)	(0.149)
$EGLOB_{t-1}$	-0.024	-0.040	0.061	-0.091	0.053	-0.086	-0.150
	(0.030)	(0.032)	(0.052)	(0.056)	(0.084)	(0.063)	(0.110)
$ACTPOP_{t-1}$	-0.121**	-0.137**	-0.040	-0.023	-0.342***	-0.089	0.038
	(0.056)	(0.053)	(0.128)	(0.050)	(0.081)	(0.093)	(0.062)
$ACCU_{t-1}$	-0.069	-0.060	0.129	-0.408	-0.342*	-0.199	-0.120
	(0.055)	(0.045)	(0.255)	(0.333)	(0.187)	(0.746)	(1.665)
$INFL_{t-1}$	0.069*	0.063*	0.073*	0.026	-0.053	0.265**	0.411
	(0.037)	(0.033)	(0.036)	(0.051)	(0.088)	(0.127)	(0.329)
LRG_pg_{t-1}	-0.056*	-0.029	-0.181	-0.103	0.007	0.039	-0.070
	(0.031)	(0.022)	(0.133)	(0.081)	(0.098)	(0.165)	(0.048)
$FEGAP_{t-1}$ x DCLU_EU		**0.296*****	**0.417*****	**0.522*****	**0.818*****	**0.346**	**-0.147****
		(0.038)	**(0.080)**	**(0.054)**	**(0.230)**	**(0.356)**	**(0.071)**
Observations	296	296	50	60	60	60	60
R^2	0.906	0.912	0.793	0.806	0.916	0.757	0.801
Adjusted R^2	0.881	0.888	0.611	0.672	0.859	0.591	0.665
F Statistic	249.468***	239.417***	9.986***	14.513***	38.297***	10.928***	14.097***
	(df = 9; 232)	(df = 10; 231)	(df = 10; 26)	(df = 10; 35)	(df = 10; 35)	(df = 10; 35)	(df = 10; 35)

Notes: Dependent variable: FEGAP. Details on the variables used are available in Table 1. Estimates for the constant and for country-fixed effects are not shown for brevity. ***, ** and * refer to statistical significance at the 1%, 5% and 10% level, respectively. Cluster-robust standard errors are shown in parentheses.

Table A14 / Analysis of European unemployment problem by decades with NAIRUGAP measure

				NAIRU			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	BM	*BM+D.X*	*1970-1979*	*1980-1989*	*1990-1999*	*2000-2009*	*2010-2019*
$NAIRUGAP_{t-1}$	**0.833*****	**0.533*****	**0.379****	**0.098**	**-0.034**	**0.213***	**0.955*****
	(0.042)	**(0.043)**	**(0.155)**	**(0.187)**	**(0.149)**	**(0.122)**	**(0.223)**
EPL_{t-1}	0.010	0.030	-0.578	-0.861	1.160	0.367	2.809
	(0.167)	(0.132)	(0.497)	(1.028)	(1.881)	(0.488)	(2.576)
$UDENS_{t-1}$	0.038***	0.038***	0.078***	0.063	0.115*	-0.042	0.046
	(0.009)	(0.008)	(0.024)	(0.052)	(0.058)	(0.046)	(0.082)
TFP_{t-1}	-0.193***	-0.186***	-0.205**	-0.179**	-0.342***	-0.146*	-0.055
	(0.052)	(0.054)	(0.079)	(0.081)	(0.037)	(0.084)	(0.134)
$EGLOB_{t-1}$	-0.046***	-0.057***	0.072	-0.062	-0.037	-0.195***	-0.024
	(0.016)	(0.017)	(0.074)	(0.058)	(0.071)	(0.034)	(0.088)
$ACTPOP_{t-1}$	-0.094***	-0.093***	-0.032	0.002	-0.362***	-0.017	0.006
	(0.026)	(0.025)	(0.113)	(0.062)	(0.087)	(0.068)	(0.119)
$ACCU_{t-1}$	-0.042	-0.061	0.321	-0.468***	-0.274*	-0.437	-0.698
	(0.052)	(0.043)	(0.347)	(0.155)	(0.155)	(0.316)	(1.255)
$INFL_{t-1}$	0.063**	0.055**	0.092**	0.013	-0.075	0.275**	0.235
	(0.027)	(0.022)	(0.042)	(0.055)	(0.062)	(0.127)	(0.210)
LRG_pg_{t-1}	-0.075***	-0.051***	-0.207	-0.133	0.010	-0.002	-0.126
	(0.016)	(0.009)	(0.133)	(0.094)	(0.091)	(0.061)	(0.077)
$NAIRUGAP_{t-1}$ x		**0.349*****	**0.512*****	**0.663*****	**0.696*****	**0.939*****	**-0.406*****
DCLU_EU		**(0.036)**	**(0.113)**	**(0.118)**	**(0.194)**	**(0.266)**	**(0.140)**
Observations	296	296	50	60	60	60	60
R^2	0.779	0.794	0.754	0.761	0.867	0.730	0.811
Adjusted R^2	0.719	0.737	0.537	0.597	0.775	0.544	0.682
F Statistic	90.877***	89.112***	7.985***	11.126***	22.752***	9.451***	15.030***
	(df = 9; 232)	(df = 10; 231)	(df = 10; 26)	(df = 10; 35)	(df = 10; 35)	(df = 10; 35)	(df = 10; 35)

Notes: Dependent variable: FEGAP. Details on the variables used are available in Table 1. Estimates for the constant and for country-fixed effects are not shown for brevity. ***, ** and * refer to statistical significance at the 1%, 5% and 10% level, respectively. Cluster-robust standard errors are shown in parentheses.

G) Comparing US and five European countries regarding baseline regression:

We run the same approach from Section 5 for the reference group of a European block (AUT, DEU, FIN, SWE, GBR) and add interaction terms of all control variables interacted with a country dummy for the US; for matters of visibility, we repeat the same procedure and set the US as reference category, adding interaction terms with the European block and the control variables. Results in Table A15 support general observations of previous results and baseline output of Table 2, finding no significant effects for EPL_{t-1} and $EGLOB_{t-1}$, and a consistent negative coefficient for TFP_{t-1}.

With slight differences, common tendencies also remain for other variables: $UDENS_{t-1}$ with a weakly positive and significant association with FEGAP (but more error and less significance for US); $ACCU_{t-1}$ with an insignificant coefficient, though point estimates suggest a negative association with FEGAP for the European case, and a positive for the US case; $INFL_{t-1}$ being positively and significantly related with FEGAP for both cases, though for the US the estimate appears stronger; and for LRG_pg_{t-1} we find a negative association regarding FEGAP, yet signs of point estimates remain in the US and for Europe while the subsets do not show significant effects.

Different effects for Europe and the US can be observed for $ACTPOP_{t-1}$ which is negatively associated in case of the European block and without a significant effect for the US. Additionally, we also find a negative and significant estimate of public capital accumulation ($PUCA_{t-1}$) in case of European countries, while the coefficient for the US is positive and significant. This finding complements observations of previous regressions where the jointly estimated effect of (public and private) capital accumulation for all six countries on full employment gaps did not yield any significant effect. Hence, a mitigation of full employment gaps can be related to public investments in Europe, but less so in the US.

Table A15 / Analysis of FEGAP determinants for US vs Europe

	FEGAP				
	(1)	(2)	(3)	(4)	(5)
	BM	*BM+D.US.X1*	*BM+D.EU.X1*	*BM+D.US.X2*	*BM+D.EU.X2*
$FEGAP_{t-1}$	0.904***	0.927***	0.792***	0.923***	0.737***
	(0.024)	(0.013)	(0.044)	(0.018)	(0.057)
EPL_{t-1}	0.151	0.176	0.176	0.101	0.101
	(0.207)	(0.215)	(0.215)	(0.208)	(0.208)
$UDENS_{t-1}$	0.039***	0.035***	0.022	0.049***	-0.014
	(0.013)	(0.011)	(0.057)	(0.017)	(0.047)
TFP_{t-1}	-0.229***	-0.216***	-0.248***	-0.221***	-0.239***
	(0.053)	(0.066)	(0.057)	(0.065)	(0.059)
$EGLOB_{t-1}$	-0.024	-0.033	-0.025	-0.048	-0.085*
	(0.030)	(0.032)	(0.054)	(0.038)	(0.047)
$ACTPOP_{t-1}$	-0.121**	-0.123***	0.090	-0.120***	0.057
	(0.056)	(0.039)	(0.173)	(0.044)	(0.169)
$ACCU_{t-1}$	-0.069	-0.117	0.180		
	(0.055)	(0.082)	(0.327)		
$PUCA_{t-1}$				-0.401**	3.345***
				(0.189)	(0.391)
$PRCA_{t-1}$				-0.100	0.242
				(0.088)	(0.304)
$INFL_{t-1}$	0.069*	0.053*	0.132***	0.050	0.162***
	(0.037)	(0.032)	(0.031)	(0.030)	(0.029)
LRG_pg_{t-1}	-0.056*	-0.029	-0.060	-0.024	0.047
	(0.031)	(0.025)	(0.058)	(0.030)	(0.053)

Contd.

Table A15 / Continued

	FEGAP				
	(1)	(2)	(3)	(4)	(5)
	BM	*BM+D.US.X1*	*BM+D.EU.X1*	*BM+D.US.X2*	*BM+D.EU.X2*
$FEGAP_{t-1}$ x DCOU_US		-0.135***		-0.187***	
		(0.036)		(0.048)	
$UDENS_{t-1}$ x DCOU_US		-0.014		-0.063	
		(0.052)		(0.040)	
TFP_{t-1} x DCOU_US		-0.032		-0.018	
		(0.043)		(0.049)	
$EGLOB_{t-1}$ x DCOU_US		0.008		-0.037	
		(0.055)		(0.044)	
$ACTPOP_{t-1}$ x DCOU_US		0.213		0.177	
		(0.156)		(0.142)	
$ACCU_{t-1}$ x DCOU_US		0.297			
		(0.366)			
$PUCA_{t-1}$ x DCOU_US				3.745***	
				(0.529)	
$PRCA_{t-1}$ x DCOU_US				0.342	
				(0.341)	
$INFL_{t-1}$ x DCOU_US		0.078**		0.112***	
		(0.032)		(0.028)	
LRG_pg_{t-1} x DCOU_US		-0.032		0.072	
		(0.060)		(0.064)	
$FEGAP_{t-1}$ x DCLU_EU			0.135***		0.187***
			(0.036)		(0.048)
$UDENS_{t-1}$ x DCLU_EU			0.014		0.063
			(0.052)		(0.040)
TFP_{t-1} x DCLU_EU			0.032		0.018
			(0.043)		(0.049)
$EGLOB_{t-1}$ x DCLU_EU			-0.008		0.037
			(0.055)		(0.044)
$ACTPOP_{t-1}$ x DCLU_EU			-0.213		-0.177
			(0.156)		(0.142)
$ACCU_{t-1}$ x DCLU_EU			-0.297		
			(0.366)		
$PUCA_{t-1}$ x DCLU_EU					-3.745***
					(0.529)
$PRCA_{t-1}$ x DCLU_EU					-0.342
					(0.341)
$INFL_{t-1}$ x DCLU_EU			-0.078**		-0.112***
			(0.032)		(0.028)
LRG_pg_{t-1} x DCLU_EU			0.032		-0.072
			(0.060)		(0.064)
Observations	296	296	296	296	296
R^2	0.906	0.914	0.914	0.917	0.917
Adjusted R^2	0.881	0.887	0.887	0.890	0.890
F Statistic	249.468***	140.068***	140.068***	129.213***	129.213***
	(df = 9; 232)	(df = 17; 224)	(df = 17; 224)	(df = 19; 222)	(df = 19; 222)

Notes: Dependent variable: FEGAP. Details on the variables used are available in Table 1. Estimates for the constant and for country-fixed effects are not shown for brevity. ***, ** and * refer to statistical significance at the 1%, 5% and 10% level, respectively. Cluster-robust standard errors are shown in parentheses.

H) Running main regression specification on a larger sample of countries with a shorter timescale:

We run the same regression approach from Section 5 on a different dataset that includes 25 countries (23 EU member states, plus the UK and the US) for the period from 2000 to 2019. Results are shown in Table A16 below. We find that the FEGAP variable is continuously and significantly associated with an increase in the lagged FEGAP. Lagged EPL and lagged ACCU show a slightly positive tendency in their relation to FEGAP, but no significant results. Similar to results of the long run panel (see Table 2) we also find positive but mostly insignificant relations between the lagged UDENS variable and FEGAP. The lagged TFP coefficient is negative and significant and $INFL_{t-1}$ shows generally positive point estimates and significant results, both mirroring the results of the longer panel data.

Results that deviate from our observations of Section 5 are that $EGLOB_{t-1}$ which shows a significantly negative outcome and the political LRG_{t-1}, as well as the $ACTPOP_{t-1}$ variable, which both reflect a null outcome regarding their relation with FEGAP. These observations are in line with findings of Table A12 which supports the hypothesis of heterogenous effects for different time periods. In addition, the time-specific dummies show that all crises episodes – i.e., the dummies for the financial crisis of 2008-2009, the Euro crisis, and the COVID-19 crisis – are positively and significantly associated with an increase in FEGAP. Furthermore, the regression in column (8) with the interaction effects (BM+D.W.X) between the lagged full employment gap and welfare state clusters does not indicate positive and significant coefficients as in previous tables (e.g., Table 2, Table A8, Table A15). Yet, it is to say that the reference cluster in this case is the Anglo-American group which is composed of Irland, UK, and the US. If we take out Ireland and only keep the UK and the US as cluster reference as in column (9) – as it was also the case for the reference cluster in A 7 – we find significant and positive results for all European welfare state clusters, except for the Eastern Europe cluster.

Table A16 / Regression table based on short panel data

	FEGAP								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Reg 1	*Reg 2*	*Reg 3*	*Reg 4*	*BM*	*BM+D.T*	*BM+D.W*	*BM+D.W.X (incl. IRL)*	*BM+D.W.X (excl. IRL)*
$FEGAP_{t-1}$	0.823***	0.853***	0.893***	0.850***	0.855***	0.878***	0.968***	0.986***	0.703***
	(0.033)	(0.025)	(0.021)	(0.027)	(0.029)	(0.054)	(0.024)	(0.038)	(0.105)
EPL_{t-1}		1.894*	1.047	0.873	0.892	0.965	0.313**	0.235**	0.116
		(0.995)	(0.789)	(0.682)	(0.687)	(0.657)	(0.139)	(0.090)	(0.100)
$UDENS_{t-1}$		1.894*	1.047	0.873	0.892	0.965	0.313**	0.235**	0.116
		(0.995)	(0.789)	(0.682)	(0.687)	(0.657)	(0.139)	(0.090)	(0.100)
TFP_{t-1}			-0.168*	-0.164**	-0.164**	-0.182**	-0.168*	-0.158	-0.340***
			(0.096)	(0.079)	(0.079)	(0.073)	(0.101)	(0.097)	(0.100)
$EGLOB_{t-1}$			-0.288***	-0.371***	-0.371***	-0.267***	-0.020*	-0.021*	-0.033**
			(0.104)	(0.103)	(0.102)	(0.074)	(0.011)	(0.012)	(0.014)
$ACTPOP_{t-1}$			0.226	0.222	0.204	0.044	0.365	0.269	0.291
			(0.310)	(0.241)	(0.241)	(0.348)	(0.243)	(0.246)	(0.298)
$ACCU_{t-1}$				0.226	0.222	0.204	0.044	0.365	0.269
				(0.310)	(0.241)	(0.241)	(0.348)	(0.243)	(0.246)
$INFL_{t-1}$				0.157*	0.159*	0.167**	0.178*	0.204**	0.182**
				(0.084)	(0.085)	(0.079)	(0.094)	(0.093)	(0.079)
LRG_pg_{t-1}					0.032	0.083	0.028	0.035	0.070
					(0.065)	(0.056)	(0.059)	(0.058)	(0.051)
FinancialCrisis						1.668***			
						(0.434)			
EuroCrisis						1.668***			
						(0.434)			
CovidCrisis						2.338***			
						(0.392)			
DCLU_SOD							-0.301		
							(0.350)		
DCLU_CON							-0.529		
							(0.329)		
DCLU_MED							-0.317		
							(0.495)		
DCLU_EAS							-0.755**		
							(0.364)		
$FEGAP_{t-1}$ x DCLU_SOD								-0.014	0.279**
								(0.056)	(0.110)
$FEGAP_{t-1}$ x DCLU_CON								-0.063	0.234*
								(0.073)	(0.119)
$FEGAP_{t-1}$ x DCLU_MED								-0.008	0.271**
								(0.041)	(0.105)
$FEGAP_{t-1}$ x DCLU_EAS								-0.133**	0.125
								(0.060)	(0.107)
Observations	224	224	224	224	224	224	224	224	213
R^2	0.763	0.787	0.821	0.835	0.836	0.870	0.949	0.951	0.962
Adjusted R^2	0.713	0.740	0.777	0.792	0.792	0.848	0.941	0.943	0.955
F Statistic	592.634***	224.772***	136.561***	112.114***	99.324***	106.064***	274.390***	285.482***	347.957***
	(df = 1; 184)	(df = 3; 182)	(df = 6; 179)	(df = 8; 177)	(df = 9; 176)	(df = 12; 191)	(df = 13; 192)	(df = 13; 192)	(df = 13; 181)

Notes: Dependent variable: FEGAP. Details on the variables used are available in Table 1. Estimates for the constant and for country-fixed effects are not shown for brevity. ***, ** and * refer to statistical significance at the 1%, 5% and 10% level, respectively. Cluster-robust standard errors are shown in parentheses.

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