Public Employment Decline in Developing Countries in the 21st Century: The Role of Globalization*

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Abstract

Does globalization increases or decreases the size of government ("compensation" versus "efficiency" hypothesis)? The debate is re-visited with innovative bureaucracy and globalization indicators using panel data for the unexplored period 2000-2016. Robust evidence suggests that global competition reduces public employment.

Keywords: public employment; economic globalization; developing countries; efficiency hypothesis; compensation hypothesis; panel data estimation

JEL Codes: J45; F66; C33

Highlights:

- Robust evidence suggests that global competition reduces the size of government.
- The paper is the first to study new 2000-2016 data.
- Innovative bureaucracy and globalization indicators are used.

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1. Introduction

How does globalization affect public employment? In the tradition of Wagner's Law and the related literature[1] about the long-term trends of public expenditures and the size of government, one may conjecture that if globalization makes countries wealthier but life also riskier, this will induce a larger public sector including employment. In his seminal contribution, Rodrik (2000) studied in a theoretical model, the effects of international trade on public employment and indeed confirmed empirically that trade openness is positively associated with public employment in developing economies.

In Rodrik (2000)'s model, international trade is considered a source of risk, and citizens will have a higher demand for social insurance as long as the level of trade openness increases. This so-called "compensation hypothesis" suggests that the size of governments should be bigger under globalization to compensate for the negative consequences of international trade (economic globalization), which results in an extended welfare state (Rodrik, 1998). On the contrary, the "efficiency hypothesis" states that the size of governments should be smaller to compete with the rest of the world. Note that public employment has important productivity and redistributive effects. Typically, the private sector is more productive than the public sector, and the rise of public sector jobs can cause a "crowding out" of private sector jobs. Therefore, according to the "efficiency hypothesis", a higher level of trade (economic globalization) will increase the competition among countries (will increase the productivity) and this should decrease the size of government and governments' capacity to finance the welfare state (see the literature reviews in Potrafke, 2019; Schulze and Ursprung, 1999).

This paper revisits the debate by studying new measures of economic globalization and public employment in the under-researched 21st century data. Applying the empirical strategy of Rodrik (2000) like he did to developing countries, our innovation is to introduce two new

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[1] See Shelton (2007) for a guide to the broader perspectives of this literature.

datasets for measuring public employment and economic globalization into this debate, the Worldwide Bureaucracy Indicators (WWBI) dataset of World Bank (2018) and the revisited Swiss Federal Institute of Technology (KOF) globalization indices of Gygli et al. (2019). The Graphical Abstract reveals support for the efficiency hypothesis.

2. Methodology and Data

The analyzed baseline equation is:

$$Public\ Employment_{i,t} = \gamma_0 + \gamma_1\ Economic\ Globalization_{i,t} + \gamma_2\ X_{i,t} + \vartheta_t + \vartheta_i + \varepsilon_{i,t}\ (1)$$

We use various measures of $Public\ Employment_{i,t}$ and $Economic\ Globalization_{i,t}$ in the country i at time t. $X_{i,t}$ denotes the vector of controls and ϑ_t, ϑ_t, and $\varepsilon_{i,t}$ represent the "time fixed-effects", the "country fixed-effects", and the "error term", respectively. For equation (1); we applied fixed-effects estimation, which is the standard estimation technique used in the previous literature. We provide robust standard errors clustered at the country level and the cluster-robust Hausman test using the RHAUSMAN Stata module.

We study two public employment indicators as the dependent variable: PSE_STE: public sector employment as a share of total employment and PSE_SPE: Public sector employment as a share of paid employment drawing from the WWBI dataset of World Bank (2018) covering 2000-2016. We use the four-year average data to smooth business cycles. The unbalanced dataset includes 92 developing countries listed in Gözgör et al. (2019), Appendix I. As central regressors, we use the KOF indices of economic globalization (overall, de facto and de jure measures) provided in the database of the Swiss Federal Institute of Technology (KOF) (Gygli et al., 2019). The new version of the KOF globalization dataset provides the most comprehensive outlook for trade globalization and financial globalization. The "de jure" measures focus on trade and investment regulations, trade taxes, tariffs, capital account openness, and trade and investment agreements; while the "de facto" measures are based on

volumes of trade (trade openness), portfolio investments, FDI investments, international debt, international reserves, and the market diversification. "Overall" economic globalization measure combines "de jure" and "de facto" variables.[2] Thus, the dataset of Gygli et al. (2019) provides every aspect of economic globalization. To put it differently, the KOF indices are superior in terms of a variety of indicators in comparison to what Rodrik had available (just trade openness). We also depart from Rodrik's paper in terms of the sample; while his paper focuses on the data for the periods of 1960-1964 and 1985-1989, our paper considers the period between 2000 and 2016.

Furthermore, we control for country size (GDP and population), macroeconomic stability (inflation rate), labor market conditions (labor force participation rate and index of labor market regulations), which can affect public employment. A higher level of institutional quality (e.g., democracy) is an essential indicator of trust in government that there is merit in public procurement.[3] Therefore, we control for the level of institutional quality and examine political variables to see whether the baseline results vary with these indicators. We use indices of institutionalized democracy (index from 0 to 10)[4], executive constraints concept (EXCONST) (index from 1 to 7), and POLITY2 (index from –10 (strongly autocratic) to +10 (solidly democratic)) from the Polity IV Annual Time Series provided by Marshall et al. (2018). We also use the index of civil liberties to control for informal institutions. Finally, we use dummy variables for legal origin and government ideology, which can also affect public employment in developing economies.

Details of all variables, descriptive statistics, and robustness checks of the analysis are reported in Gözgör et al. (2019) and the Online Appendix.

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[2] For the details of the KOF indices of globalization, visit https://www.kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html
[3] Note that there is no multicollinearity problem between controls and economic globalization indicators.
[4] We prefer to use the index of democracy to capture the heterogeneities among the developing economies. There are also recent datasets to provide democracy as a dummy variable (e.g., Bjoernskov and Rode, 2019) and based on the machine learning algorithm (see, e.g., Gründler and Krieger, 2019).

3. Empirical Results

Table 1 provides the results of the baseline regressions of the equation (1) for the two public employment measures as the dependent variables. The results for PSE_STE are reported in columns (I), (II), and (III), while the results for PSE_SPE are provided in columns (IV), (V), and (VI). All results imply that economic globalization (ECI_KOF) decreases public employment, and the coefficients of ECI_KOF are statistically significant at the 1% or 5% level. We also use the de facto index of economic globalization (ECIdf_KOF) and the de jure index of economic globalization (ECIdj_KOF). Although all globalization measures are negatively related to public employment, the coefficient for ECIdj_KOF is not statistically significant for PSE_SPE. Overall, our findings are in line with the efficiency hypothesis.

Among the controls, the per capita GDP is negatively related to public employment in every estimation. Besides, the urban population is positively associated with PSE_STE, but it is negatively associated with PSE_SPE. Rodrik (2000) finds that both per capita GDP and the urban population positively affect public employment. Finally, according to the results of the cluster-robust Hausman test, the fixed-effects estimations are consistent (see notes in Table 1).

4. Robustness Checks

First, we use several additional controls (Online Appendix Table III). Country size is captured by including GDP and population, macroeconomic stability by incorporating the inflation rate, and labor market conditions by using labor market participation rates and an index of labor market regulations. Following Potrafke (2010), we control for government ideology by creating dummy variables for left and right governments as well as unclear orientations using the dataset of Cruz et al. (2018). Furthermore, the quality of institutions can matter for the relationship between economic globalization and public employment (Potrafke, 2015). We, therefore, use several measures of quality of formal and informal institutions: Legal origins, "EXCONST",

"POLITY2", and "democracy" indices. The baseline results are robust to including all of these controls.

The Online Appendix Table IV also provides the results of robustness checks, excluding outliers and specific countries from the dataset. At first, extreme observations for the measures of economic globalization and public employment were excluded. Following Gozgor and Ranjan (2017), extreme observations are those who are more than two standard deviations away from the average. At second, it is analyzed whether the effects of economic globalization on public employment can be region-specific. Following Rodrik (1998), the observations for the Sub-Saharan African, the Latin American, and the Caribbean as well as the developing East Asian countries were separately excluded from checking the robustness of the results. The results are shown to be robust (Gözgör et al., 2019).

We also included 19 developed (high-income) countries to the sample and re-estimated the benchmark regressions and reexamined the Graphical Abstract (Online Appendix, Table VI and Figures I-IV there). We also checked comparability with Rodrik (2000) by replacing our globalization measure KOF with Rodrik's trade measures for the sample of developing countries (see Online Appendix, Table V). In all cases, the relationship between economic globalization and public employment is somewhat weaker but remains negative.

5. Conclusion

In an unbalanced panel dataset of 92 developing economies over the period 2000-2016, we find a negative impact of economic globalization on public employment supporting the efficiency hypothesis over the compensation hypothesis.

Acknowledgments

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Table 1

Determinants of Public Sector Employment (Four-year Averaged, 2000–2016) (Developing Countries)

Regressors	PSE_STE (III)	PSE_STE (IV)	PSE_STE (V)	PSE_SPE (VIII)	PSE_SPE (IX)	PSE_SPE (X)
Per Capita GDP	–0.047* (0.025)	–0.050* (0.026)	–0.047* (0.025)	–0.140*** (0.047)	–0.141*** (0.048)	–0.141*** (0.052)
Urban Population	0.068 (0.164)	0.077 (0.165)	0.053 (0.165)	–0.042 (0.390)	–0.020 (0.381)	–0.081 (0.406)
ECI_KOF	–0.118*** (0.044)	–	–	–0.191** (0.073)	–	–
ECIdf_KOF	–	–0.077** (0.034)	–	–	–0.163*** (0.048)	–
ECIdj_KOF	–	–	–0.069** (0.031)	–	–	–0.056 (0.078)
Observations	212	212	203	212	212	203
Number of Countries	92	92	88	92	92	88
Cluster-robust Hausman	24.2 [0.000]	23.4 [0.000]	28.3 [0.000]	25.7 [0.000]	24.6 [0.000]	27.1 [0.000]
R-squared (Within)	0.091	0.074	0.088	0.185	0.192	0.157

Notes: Table provides the fixed-effects estimations. PSE_STE: public sector employment as the share of total employment, PSE_SPE: public sector employment as the share of paid employment, ECI_KOF: index of economic globalization, ECIdf_KOF: index of de facto economic globalization, ECIdj_KOF: index of de jure economic globalization. The dependent variables are PSE_STE & PSE_SPE. The Cluster–robust Hausman (RHAUSMAN) test shows whether the results of the fixed-effects or the random effects estimations are valid (null hypothesis: the difference in coefficients is not systematic). The robust standard errors clustered at the country level are reported. The standard errors are in parentheses, and the p–values are in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Graphical Abstract
Public Employment Shares Decline with Globalization
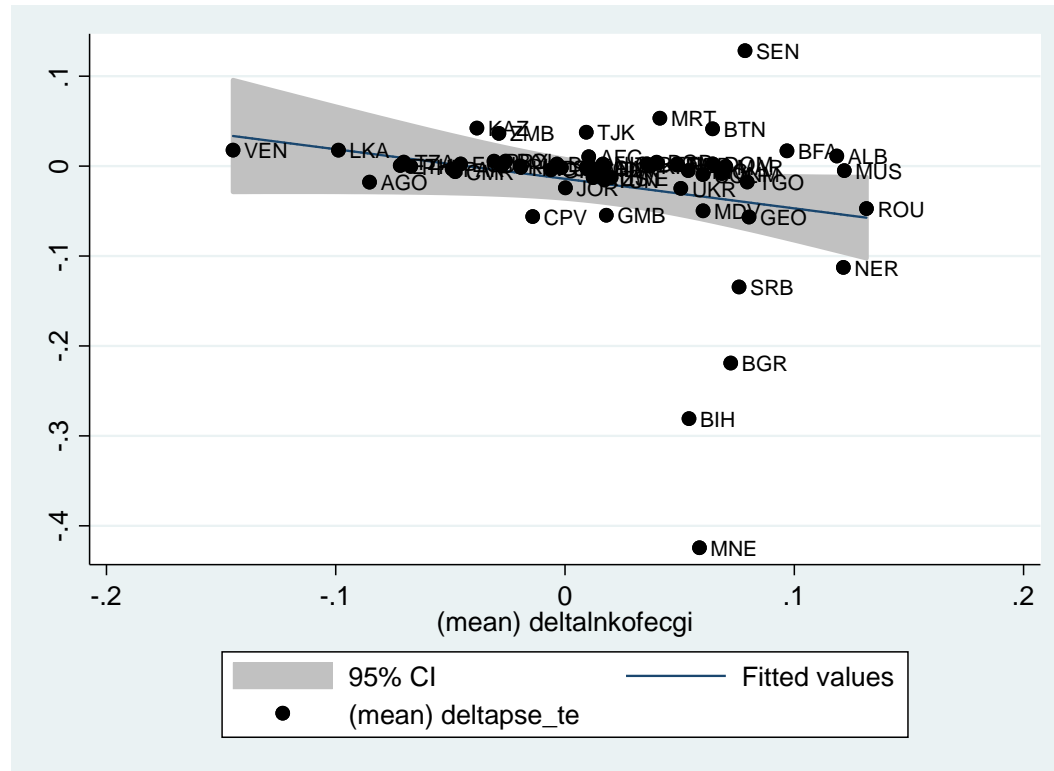
Notes: Country points report sample averages of the changes of public sector employment as the share of total employment (Y) against changes of the KOF index of economic globalization (X) in developing countries for 2000-2016. ISO country codes are reported.

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Online Appendix

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Appendix I
The List of Countries Included in the Dataset

Developing Countries (92 Countries)

Afghanistan, Albania, Angola, Bangladesh, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Cabo Verde, Cambodia, Cameroon, Central African Republic, Chad, China, Colombia, Comoros, Congo DR, Congo Republic, Costa Rica, Dominican Republic, Djibouti, Ecuador Egypt, El Salvador, Eswatini, Ethiopia, Gabon, the Gambia, Georgia, Ghana, Guatemala, Guinea, Guinea-Bissau, Haiti, Honduras, Jamaica, Jordan, Kazakhstan, Kenya, Lebanon, Lesotho, Liberia, Madagascar, Malawi, Maldives, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Papua New Guinea, Paraguay, Peru, the Philippines, Romania, Russia, Rwanda, São Tomé and Principe, Senegal, Serbia, Seychelles, Sierra Leone, Solomon Islands, South Africa, Sri Lanka, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Tunisia, Turkey, Uganda, Ukraine, Venezuela, Vietnam, Zambia, and Zimbabwe.

Developed Countries (19 Countries)

Argentina, Canada, Chile, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Palau, Panama, Poland, Slovenia, the United Kingdom, the United States, and Uruguay.

Appendix Table I
Descriptive Summary Statistics (Developing Countries)

Variables	Definition	Data Source	Mean	Standard Deviation	Minimum	Maximum	Observations
Public Sector Employment (PSE_STE)	The Share of Total Employment	WWBI: World Bank (2018)	0.133	0.113	0.018	0.583	212
Public Sector Employment (PSE_SPE)	The Share of Paid Employment	WWBI: World Bank (2018)	0.306	0.149	0.074	0.759	212
Economic Globalization (Overall) (ECI_KOF)	Logarithmic Form	KOF: Gygli et al. (2019)	3.864	0.273	3.047	4.398	368
Economic Globalization (De Facto) (ECIdf_KOF)	Logarithmic Form	KOF: Gygli et al. (2019)	3.947	0.293	3.027	4.499	368
Economic Globalization (De Jure) (ECIdj_KOF)	Logarithmic Form	KOF: Gygli et al. (2019)	3.708	0.426	2.416	4.417	352
GDP per Capita (Constant 2010 US$)	Logarithmic Form	WDI: World Bank (2019)	7.550	1.075	5.299	9.591	368
Urban Population	Percentage of Total Population	WDI: World Bank (2019)	0.465	0.198	0.130	0.986	368
Population, Total	Logarithmic Form	WDI: World Bank (2019)	16.09	1.681	11.31	21.03	368
Inflation, Consumer Prices (Annual %)	Percentage	WDI: World Bank (2019)	8.446	16.60	−0.660	229.5	354
Labour Force Participation Rate (Modelled ILO Estimate)	Percentage of Total Population Ages 15+	WDI: World Bank (2019)	64.02	11.25	39.42	88.68	364
Gross Domestic Product (Current US$)	Logarithmic Form	WDI: World Bank (2019)	23.43	1.967	18.22	29.95	368
Labour Market Regulations	Index from 0 to 10	Economic Freedom Dataset: Gwartney et al. (2018)	5.983	1.412	2.646	9.040	309
Institutional Quality (EXCONST)	Index from 1 to 7	Polity IV Annual Time Series: Marshall et al. (2018)	4.884	1.735	1.000	7.000	337
Level of Institutionalized Democracy	Index from 0 to 10	Polity IV Annual Time Series: Marshall et al. (2018)	5.176	3.284	0.000	10.00	337
Institutional Quality (POLITY2)	Index from −10 to 10	Polity IV Annual Time Series: Marshall et al. (2018)	3.547	5.210	−10.00	10.00	340
Civil Liberties Ratings (1 Representing the Most Free; 7 the Least Free)	Index from 1 to 7	Freedom House, Freedom in the World Database	3.770	1.236	1.000	6.500	335
British Legal Origin	Dummy Variable	Legal Origin Data: La Porta et al. (2008)	0.282	0.450	0.000	1.000	368
French Legal Origin	Dummy Variable	Legal Origin Data: La Porta et al. (2008)	0.663	0.473	0.000	1.000	368
Government Ideology (Chief Executive's Party's Value) (Left)	Dummy Variable	Database of Political Institutions: Cruz et al. (2018)	0.266	0.444	0.000	1.000	368
Government Ideology (Chief Executive's Party's Value) (Right)	Dummy Variable	Database of Political Institutions: Cruz et al. (2018)	0.127	0.334	0.000	1.000	368
Government Ideology (Chief Executive's Party's Value) (Not Clear)	Dummy Variable	Database of Political Institutions: Cruz et al. (2018)	0.467	0.499	0.000	1.000	368

Appendix Table II
Correlation Matrix (Four-year Averaged Data) (Developing Countries)

Regressors	PSE_STE	PSE_SPE	Per Capita GDP	Urban Population	ECI_KOF	ECIdf_KOF	ECIdj_KOF
PSE_STE	1.000	–	–	–	–	–	–
PSE_SPE	0.573	1.000	–	–	–	–	–
Per Capita GDP	0.455	–0.125	1.000	–	–	–	–
Urban Population	0.313	–0.182	0.722	1.000	–	–	–
ECI_KOF	0.366	–0.046	0.563	0.444	1.000	–	–
ECIdf_KOF	0.441	0.234	0.346	0.236	0.799	1.000	–
ECIdj_KOF	0.178	–0.273	0.530	0.452	0.782	0.269	1.000

Notes: PSE_STE: public sector employment as the share of total employment, PSE_SPE: public sector employment as the share of paid employment, ECI_KOF: index of economic globalization, ECIdf_KOF: index of de facto economic globalization, ECIdj_KOF: index of de jure economic globalization.

Appendix Table III
Robustness Checks: (Including Additional Controls) (Developing Countries)

Robustness Exercises	Coefficient	PSE_STE	PSE_SPE
Results of the Baseline Regressions	ECI_KOF	–0.118*** (0.044)	–0.191** (0.073)
Including Inflation Rate	ECI_KOF	–0.119*** (0.045)	–0.150** (0.073)
Including Labour Force Participation Rate	ECI_KOF	–0.122** (0.043)	–0.190*** (0.072)
Including Gross Domestic Product	ECI_KOF	–0.118*** (0.043)	–0.190** (0.073)
Including Population	ECI_KOF	–0.115** (0.045)	–0.188** (0.074)
Including Labour Market Regulations	ECI_KOF	–0.098*** (0.030)	–0.166** (0.076)
Including Institutional Quality (EXCONST)	ECI_KOF	–0.102** (0.043)	–0.159** (0.075)
Including Institutional Quality (POLITY2)	ECI_KOF	–0.106** (0.043)	–0.174** (0.075)
Including The Level of Democracy (Index)	ECI_KOF	–0.102** (0.042)	–0.164** (0.073)
Including Civil Liberties (Index)	ECI_KOF	–0.104** (0.041)	–0.175** (0.073)
Including Dummy Variables for Legal Origin	ECI_KOF	–0.118*** (0.044)	–0.191** (0.073)
Including Dummy Variables for Government Ideology	ECI_KOF	–0.118*** (0.045)	–0.190** (0.073)

Notes: PSE_STE: public sector employment as the share of total employment, PSE_SPE: public sector employment as the share of paid employment, ECI_KOF: index of economic globalization. The constant term, per capita GDP, urban population, country-fixed effects, and time trend are also estimated, but their coefficients are not reported. The robust standard errors those are clustered at the country levels are in parentheses. *** and ** indicate statistical significance at 1% and 5%, respectively.

Appendix Table IV
Robustness Checks: (Excluding the Outliers) (Developing Countries)

Robustness Exercises	Coefficients	PSE_STE	PSE_SPE
Results of the Baseline Regressions	ECI_KOF	–0.118*** (0.044)	–0.191** (0.073)
Excluding Extreme Units of Public Employment	ECI_KOF	–0.050** (0.025)	–0.125** (0.057)
Excluding Extreme Units of Economic Globalization	ECI_KOF	–0.117** (0.045)	–0.196** (0.075)
Excluding Sub-Saharan Africa Countries	ECI_KOF	–0.215*** (0.066)	–0.353*** (0.087)
Excluding Latin American and Caribbean Countries	ECI_KOF	–0.131** (0.052)	–0.214*** (0.080)
Excluding East Asian Countries	ECI_KOF	–0.121** (0.046)	–0.194*** (0.076)

Notes: PSE_STE: public sector employment as the share of total employment, PSE_SPE: public sector employment as the share of paid employment, ECI_KOF: index of economic globalization. The constant term, per capita GDP, urban population, country-fixed effects, and time trend are also estimated, but their coefficients are not reported. Robust standard errors clustered at the country level are in parentheses. *** and ** indicate statistical significance at 1% and 5%, respectively.

Appendix Table V
Determinants of Public Sector Employment (Four-year Averaged, 2000–2016) (Developing Countries)

| Regressors	PSE_STE (I)	PSE_STE (II)	PSE_SPE (III)	PSE_SPE (IV)
Per Capita GDP	–0.059** (0.029)	–0.063** (0.031)	–0.151*** (0.057)	–0.158*** (0.057)
Urban Population	0.081 (0.173)	0.160 (0.172)	–0.025 (0.384)	–0.021 (0.408)
Real Trade Openness	–0.006 (0.049)	–	–0.032 (0.085)	–
Nominal Trade Openness	–	–0.020 (0.041)	–	–0.025 (0.076)
Observations	207	209	207	209
Number of Countries	89	92	89	92
R-squared (Within)	0.042	0.040	0.139	0.130

Notes: The dependent variables are PSE_STE & PSE_SPE, PSE_STE: public sector employment as the share of total employment, PSE_SPE: public sector employment as the share of paid employment. Real Trade Openness is calculated from the Penn World Table (PWT) dataset, and it is based on the real PPP USD prices. Nominal trade openness is obtained from the World Development Indicators (WDI) dataset, and it is based on the nominal USD prices. Robust standard errors clustered at the country level are in parentheses. *** and ** indicate statistical significance at 1% and 5%, respectively.

Appendix Table VI
Determinants of Public Sector Employment (Four-year Averaged, 2000–2016) (All Countries)

| Regressors	PSE_STE (I)	PSE_STE (II)	PSE_STE (III)	PSE_SPE (IV)	PSE_SPE (V)	PSE_SPE (VI)
Per Capita GDP	–0.049** (0.023)	–0.050** (0.024)	–0.048** (0.024)	–0.139*** (0.044)	–0.138*** (0.044)	–0.139*** (0.048)
Urban Population	0.065 (0.156)	0.073 (0.157)	0.056 (0.160)	–0.056 (0.376)	–0.038 (0.368)	–0.086 (0.392)
ECI_KOF	–0.096** (0.038)	–	–	–0.159** (0.063)	–	–
ECIdf_KOF	–	–0.070** (0.029)	–	–	–0.148*** (0.043)	–
ECIdj_KOF	–	–	–0.055* (0.031)	–	–	–0.049 (0.062)
Observations	239	243	230	239	243	230
Number of Countries	109	112	105	109	112	105
R-squared (Within)	0.084	0.074	0.084	0.181	0.191	0.161

Notes: The dependent variables are PSE_STE & PSE_SPE, PSE_STE: public sector employment as the share of total employment, PSE_SPE: public sector employment as the share of paid employment, ECI_KOF: index of economic globalization, ECIdf_KOF: index of de facto economic globalization, ECIdj_KOF: index of de jure economic globalization. The Robust standard errors clustered at the country level are in parentheses. *** and **indicate statistical significance at the 1% and 5%, respectively.

Appendix Figure I
Public Sector Employment as the Share of Paid Employment-Economic Globalization (All Countries)

Notes: Country points report sample averages of the changes of public sector employment as the share of paid employment (Y) against changes of the KOF index of economic globalization (X) in all countries for 2000-2016. ISO country codes are reported.

Appendix Figure II
Public Sector Employment as the Share of Paid Employment-Economic Globalization (Developing)
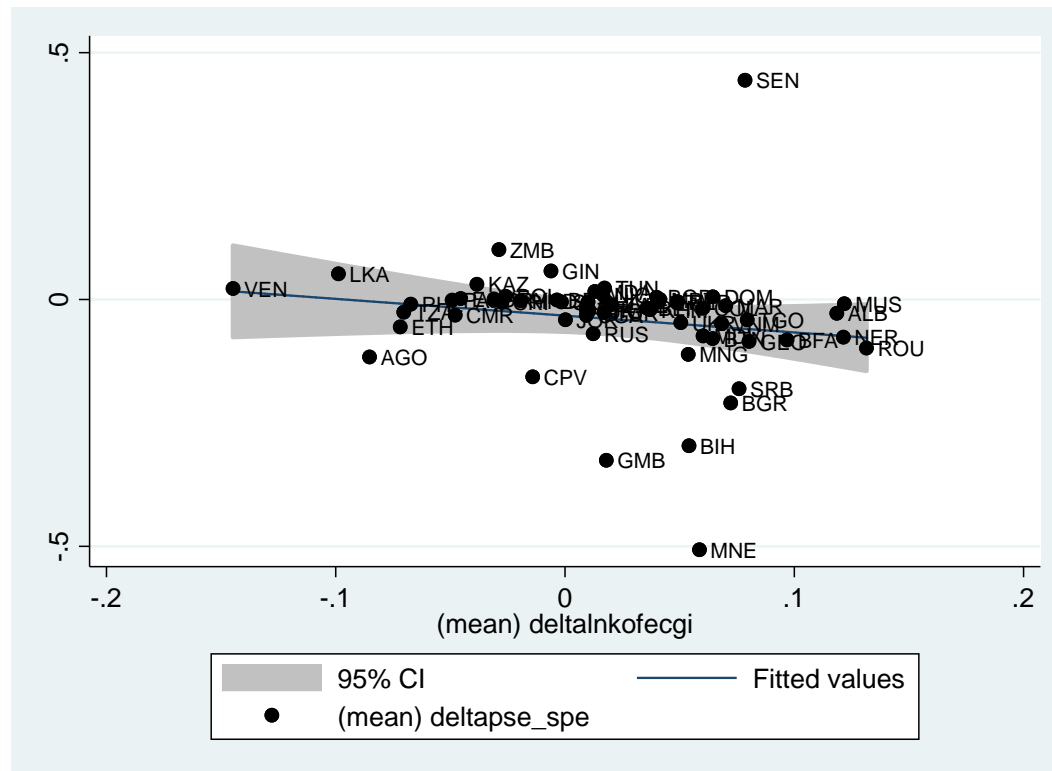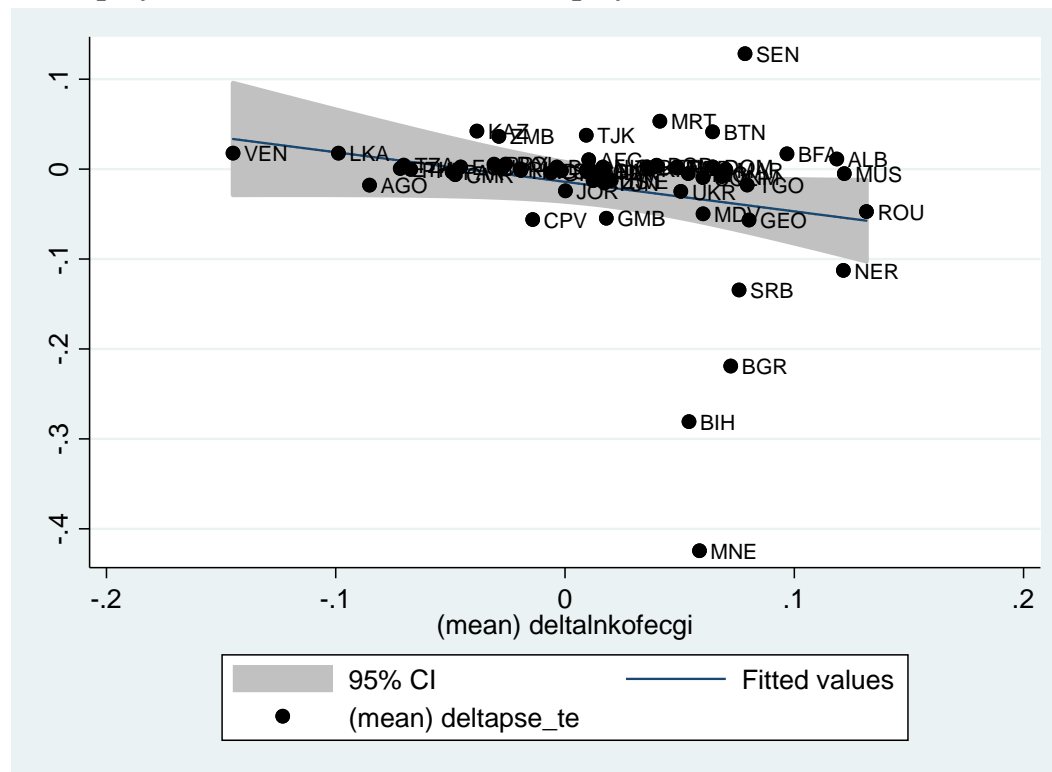

Notes: Country points report sample averages of the changes of public sector employment as the share of paid employment (Y) against changes of the KOF index of economic globalization (X) in developing countries for 2000-2016. ISO country codes are reported.

Appendix Figure III
Public Sector Employment as the Share of Total Employment-Economic Globalization (All Countries)
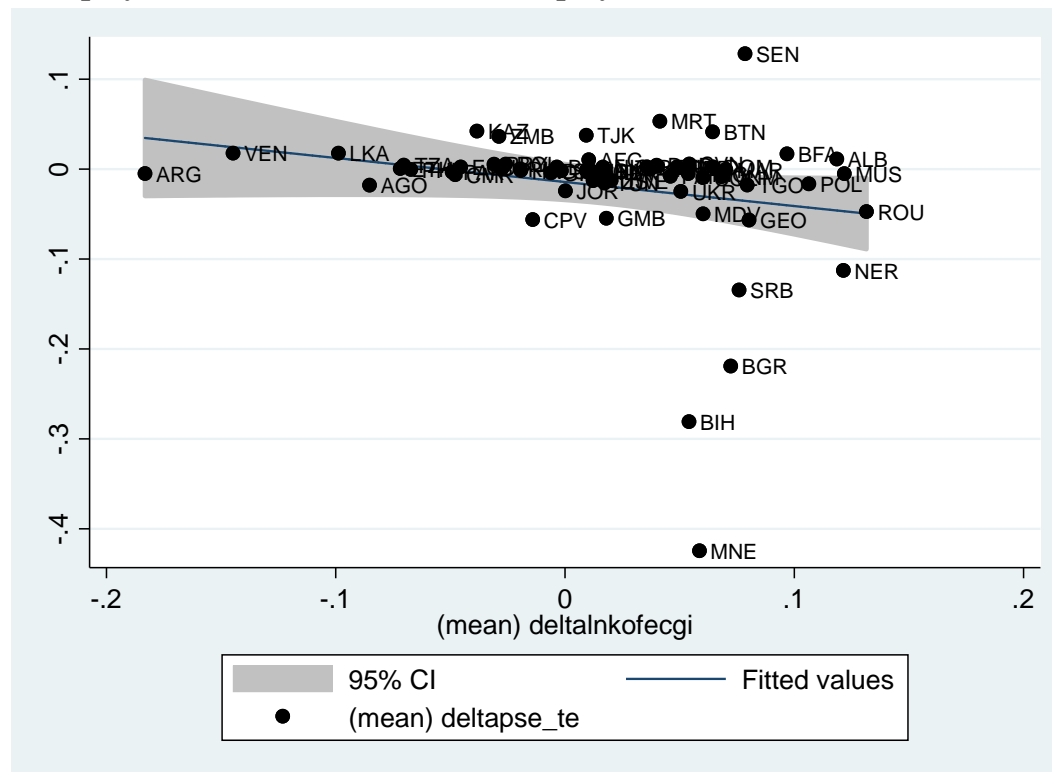
Notes: Country points report sample averages of the changes of public sector employment as the share of total employment (Y) against changes of the KOF index of economic globalization (X) in all countries for 2000-2016. ISO country codes are reported.

Appendix Figure IV
Public Sector Employment as the Share of Total Employment-Economic Globalization (Developing)

Notes: Country points report sample averages of the changes of public sector employment as the share of total employment (Y) against changes of the KOF index of economic globalization (X) in developing countries for 2000-2016. ISO country codes are reported.