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

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Abstract

The impact of globalization on developing countries has been debated: While the "compensation hypothesis" suggests that globalization increases the need for public employees, the "efficiency hypothesis" states that the size of government should be smaller while competing with the world. We are the first to re-visit the debate for 2000-2016 using panel data for 92 developing countries and new innovative bureaucracy and globalization indicators to find robust evidence for the "efficiency hypothesis".

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

JEL Codes: J45; F66; C33

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1. Introduction

How does globalization affect public employment? In the tradition of Wagner's Law and the related literature¹ 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; and therefore, a higher level of trade (economic globalization) will decrease the size of government and governments' capacity to finance the welfare state (see the literature review of 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), our innovation is to introduce two new datasets for measuring public employment and economic globalization into this debate, the Worldwide Bureaucracy Indicators (WWBI) dataset of World Bank (2018) and the revisited KOF globalization indices of Gygli et al. (2019).

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

Our study finds that the used measures of economic globalization are negatively associated with public employment in a panel dataset of 92 developing economies for the period from 2000 to 2016. We also implement various robustness checks, such as including several controls and excluding outliers, all supporting the efficiency hypothesis for the developing economies in the 21st century.

The structure of the paper is as follows. Section 2 explains the methodology, data, and empirical model. Section 3 reports the empirical findings, and Section 4 provides the robustness checks. Section 5 concludes the paper.

2. Methodology and Data

The analysed baseline equation is:

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

We use various measures of *Public Employment*_{*i,t*} and *Economic Globalization*_{*i,t*} in country *i* at time *t*. *X*_{*i,t*} denotes the vector of controls and ϑ_t , ϑ_i , 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 dataset includes 92 developing countries listed in 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). When it is compared to previous datasets, 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 each and 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), labour market conditions (labour force participation rate and index of labour market regulations), which can possibly affect the public employment. A higher level of institutional quality (e.g., democracy) is an important 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), executive constraints concept (EXCONST) (index from 1 to 7), and POLITY2 (index from -10 (strongly autocratic) to +10 (strongly 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.

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.

Details of all variables used in the paper and the descriptive statistics are reported in Appendix Table I. The correlation matrix for the main variables used in the regressions is provided in Appendix Table II.

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 each and every estimation. In addition, 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 and report the related results in Appendix Table III. Specifically, we control for country size by including GDP and population, macroeconomic stability by incorporating the inflation rate, and labour market conditions by using labour market participation rates and an index of labour 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). For this purpose, we use several measures of quality of formal and informal institutions: Legal origins, “EXCONST”, “POLITY2”, and “democracy” indices. The baseline results are statistically robust to including all of these controls.

Appendix Table IV also provides the results of robustness checks, excluding outliers and specific countries from the dataset using again equation (1) for the two public employment measures as the dependent variables. At first, we have excluded extreme observations for the measures of economic globalization and public employment. Following Gozgor and Ranjan (2017), we identify extreme observations as those which are more than two standard deviations away from the average. At the second, we analyse whether the effects of economic globalization on public employment can be region-specific. Following Rodrik (1998), we separately exclude the observations for the Sub-Saharan African, the Latin American and the Caribbean as well as the developing East Asian countries to check the robustness of the results. Specifically, we re-estimate the baseline regressions by excluding the observations from the countries in those regions and one region at each time. The results in Appendix Table IV are robust to the exclusion of each region, and this implies that the baseline results are not dominated by the presence of observations from the specific regions.

5. Conclusion

The paper studies the impact of economic globalization on public employment in a panel dataset of 92 developing economies over the period 2000-2016. After using several measures of public employment and economic globalization as well as implementing various robustness checks, we find a negative impact of economic globalization on public employment supporting the efficiency hypothesis over the compensation hypothesis. However, hyper-globalization

(probably due to automation and digitalization) in the 21st century may significantly decrease public employment in developing economies.

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Table 1
Determinants of Public Sector Employment (Four-year Averaged, 2000–2016)

Regressors	PSE_STE (I)	PSE_STE (II)	PSE_STE (III)	PSE_SPE (IV)	PSE_SPE (V)	PSE_SPE (VI)
Constant Term	0.923*** (0.272)	0.786*** (0.237)	0.727*** (0.184)	2.139*** (0.415)	2.039*** (0.349)	1.641*** (0.465)
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: 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.

Appendix I

The List of Developing Countries Included in the Dataset (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, Chile, China, Colombia, Comoros, Congo DR, Congo Republic, Costa Rica, Dominican Republic, 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 Príncipe, 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.

Appendix Table I
Descriptive Summary Statistics

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)

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)

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 the 1% and 5% levels, respectively.

Appendix Table IV
Robustness Checks: (Excluding the Outliers)

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. The robust standard errors those are clustered at the country levels are in parentheses. *** and ** indicate statistical significance at the 1% and 5% levels, respectively.