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RESEARCH ARTICLE

YOUTH UNEMPLOYMENT IN DEVELOPING AND EMERGING COUNTRIES: DOES INSTITUTIONAL QUALITY MATTER?

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Abstract: This paper examines the relationship between real gross domestic product (GDP) growth and youth unemployment rates, commonly known as Okun's Law. it estimates an augmented version of Okun's Law to analyze the non-linear relationship between fluctuations in GDP and youth unemployment across 88 developing and emerging countries from 1985 to 2019. By incorporating the influence of institutional quality, we explored the non-linear nature of youth unemployment responsiveness to GDP fluctuations. Our analysis employed the 3SLS regressor technique to estimate the model parameters. Our findings suggest that the responsiveness of youth unemployment to changes in GDP is notably heightened in countries with robust institutional environment. We, also, find that the variable representing GDP fluctuations is significantly influenced by the explanatory factors included in our model. Overall, our study contributes to a deeper understanding of Okun's Law by emphasizing the role of institutional quality in modulating the relationship between GDP fluctuations and youth unemployment.

Keywords: Emerging and developing countries, Institutional quality, Panel-data regressions, Youth unemployment.

Jel Classifications*: C33, J08, O43*

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INTRODUCTION

Youth unemployment remains a complex and multifaceted challenge with far-reaching implications for individuals, communities, and societies at large. It is a topic that has been extensively studied in scientific literature across various disciplines, including economics, sociology, psychology, and public policy.

According to the International Labor Organization (ILO), the global youth unemployment rate stood at around 13.1% in 2021. This rate is significantly higher than the overall unemployment rate for adults. Youth unemployment rates vary significantly by region. For example: In the Middle East and North Africa (MENA) region, youth unemployment rates have been particularly high, exceeding 25% in some countries.

In Sub-Saharan Africa, youth unemployment rates are also notably high, with rates above 20% in many countries. In contrast, youth unemployment rates tend to be lower in regions such as North America and Europe, but they still face challenges, especially among certain demographic groups.

One of the primary objectives outlined in the Europe 2020 strategy by the European Commission is to achieve a 75% employment rate among individuals aged 20 to 64 by the year 2020. Despite declines in both youth and adult unemployment rates since 2014, the European Union continues to grapple with unemployment issues, including variations in unemployment rates among Member States and persistently high levels of youth

unemployment in certain European countries (Lecerf and Dobreva, 2019).

To effectively combat unemployment, it's crucial to pinpoint the overarching cause behind the rise in the unemployment rate. In 1962, Arthur Okun observed a consistent pattern in empirical data, in U.S. during the period 1948-1960. He identified a short-term inverse correlation between unemployment and real GDP. This relationship has been investigated by numerous empirical studies over the years and is known as "Okun's law".

This law statistically holds for most countries, the magnitude of Okun's coefficients varies across nations and across age cohort. Consequently, recent studies in this field have sparked a fresh debate concerning the applicability of Okun's Law in both developing and developed nations. These studies underscore the instability and non-linear nature of Okun's coefficient while delving into the various factors that could impact this correlation.

In this context, this article offers a multidimensional contribution to the literature. First, we examine the hypothesis that the sensitivity of employment to changes in output is contingent upon the institutional quality of countries gauged through global governance indicators. Second, we encompass a substantial sample of developing and emerging countries across Africa, Latin America and Asia, where youth unemployment is, on average, more pronounced, bridging a gap in research often focused on advanced countries. third, the study spans the period from 1985 to 2019, ensuring a sufficiently extensive timeframe for robust and meaningful estimates.

The subsequent sections of the article are organized as follows: Section 2 displays a brief review of literature on youth unemployment. In Section 3, the empirical analysis is presented, covering the econometric model, regression methodology, and descriptions of the data and variables used in the model. Section 4 discusses the results of our estimations, Finally, in Section 5, we present our concluding remarks, summarizing the key implications and contributions of our study to the literature.

LITERATURE REVIEW

Most of the literature examining the validity of Okun's Law focuses on advanced economies (see Huang, H.C. and Lin, S.C (2008), Wang, X. and Huang, HC. (2017), Tumanoska, D (2020) and Obst, T. (2021)). Benos, N. & Athanassios, S (2020) tested the Okun's Law for the G7 countries and Gil-Alana *et. al.* (2020) for the OECD countries.

Certain economists, such as Zanin (2014) and Brincikova & Darmo (2015), have specifically examined Okun's Law in relation to gender groups, finding that male unemployment displays greater sensitivity to business cycles compared to female unemployment. Other studies in the literature compared Okun's coefficients across different age cohorts. A prevalent finding from empirical research is that young individuals exhibit greater sensitivity to output fluctuations fluctuations compared to older individuals.

O'Higgins (1997) suggests that this heightened sensitivity among the young workforce stems from their lower redundancy protection and fewer company-specific competencies relative to older workers. As a result, companies might perceive reduced opportunity costs linked to laying off young employees.

Furthermore, Bell and Blanchflower (2011) argue that companies tend to favor hiring experienced workers leading to a situation where labor market entrants, typically young individuals, struggle to secure employment and improve their experience-a phenomenon referred to as the "experience trap." This situation exacerbates during economic downturns, potentially driving youth unemployment rates higher, as young job seekers must compete against more experienced and skilled adults for a limited number of available positions (Unt, 2012).

Hutengs and tadtmann (2013) studies Okun's coefficients across five different age cohorts in some Eastern and Central European (CEE) countries, highlighting that young individuals tend to have higher Okun's coefficients than adults.

This implies that young individuals tend to be more reactive to shifts in the business cycle when contrasted with their older counterparts. Similarly, Dunsch (2017) showed that young people in CEE countries exhibit greater sensitivity to trade output fluctuations than adults. In line with these findings, Dixon et al. (2016), using a sample of 20 OECD countries over the period 1985-2013, found that Okun's Law decreases with age. Specifically, they found that a positive change in real GDP growth leads to a more substantial reduction in the youth unemployment rate.

However, the notion of greater sensitivity among young individuals has been challenged by some economists. Marconi et al. (2016) found that youth unemployment is not significantly more sensitive to output fluctuation than adult unemployment. They addressed this by using the unemployment ratio as the dependent variable instead of the unemployment rate, citing issues with interpreting the status of young individuals transitioning between schooling and work.

By using the unemployment ratio, which adjusts for the overlap between student status and employment status, they argued that youth unemployment is not significantly more sensitive to output fluctuations than adult unemployment.

Similarly, Dunsch (2016) conducted a study on Okun's Law in Germany and Poland spanning from 1992 to 2014. The aim was to investigate the hypothesis suggesting that young individuals are more vulnerable to economic fluctuations compared to adults. The findings indicated that in Poland, the Okun's coefficient for young individuals is higher in absolute terms than for older age groups.

However, in Germany, the variance in Okun's coefficients between age groups is relatively minor and lacks statistical significance. This implies that in Germany, the notion that young individuals are more responsive to economic cycles than adults is not substantiated.

EMPIRICAL ANALYSIS

Specification of the Augmented Okun's Law

According to Okun's original formulation in 1962, shifts in aggregate demand lead to fluctuations in output around its potential level. These output fluctuations, in turn, influence employment levels as firms adjust by hiring or laying off workers, subsequently impacting the unemployment rate. Consequently, there is a short-run negative relation between output fluctuations and unemployment around their respective long-term levels. In this study, we aim to test Okun's Law while incorporating the institutional quality effect.

Our primary objective is to explore how changes in production influence fluctuations in youth unemployment and how this relationship interacts with the quality of the institutional environment. We hypothesize that countries with stronger institutions will exhibit a more pronounced responsiveness of unemployment to the output gap.

Importantly, we address the often-neglected aspect of endogeneity in the output gap, a feature overlooked in many previous studies examining the original Okun's Law. To achieve this, we simultaneously estimate a system of two equations, capturing the dynamic interplay between output fluctuations and youth unemployment, enriched by the institutional quality effect.

$$\begin{cases} U_{it}^{c} = \alpha_0 + \alpha_1 y_{it}^{c} + \alpha_2 Inst_{it} + \alpha_3 (Inst_{it} * y_{it}^{c}) + \alpha_4 n_{it} + \mu_i + \vartheta_t + \varepsilon_{it} & (1) \\ y_{it}^{c} = \beta_0 + \beta_1 Inst_{it} + \sum \beta_s X_{sit} + \theta_i + \varphi_t + e_{it} & (2) \end{cases}$$

where the subscripts t and i refer to time and country, respectively.

Equation 1 extends Okun's relation by incorporating institutional quality and the population growth rate alongside the output gap as explanatory variables for the youth unemployment gap. Equation 2 outlines the fluctuations in production, influenced by specific explanatory factors. The variables in the system are defined as follows:

U^c is the cyclical component of the youth unemployment rate which refers to the

difference between the actual youth unemployment rate and its trend[1]. The unemployment rate of the youth population is the fraction of the labor force aged 15 to 24. Unemployment data are ILO's estimates.

y^c refers to the cyclical component of the output, i.e., where y is the log of the output .

α_1 is Okun's coefficient

$Inst$ represents the indicator of the institutional quality. Six sub-indicators are considered from (WGI) database, including *Voice and Accountability* (VA), *Control of Corruption* (CC), *Rule of Law* (RL), *Governance effectiveness* (GE) and *Political Stability and Absence of Violence* (PS), *Regulatory Quality* (RQ).

The indicators are evaluated on a scale spanning from -2.5 to 2.5, where higher values signify more effective institutions. Furthermore, we employ an index derived from the average of these six sub-indicators (referred to as "Gov") as a proxy for the comprehensive level of institutional quality[2].

Notice that $Inst$ enters the U^c equation in order to interact with the output gap, y^c, to measure the institutional quality effects on youth unemployment.

$Inst$ enters also the y^c equation as explanatory variable.

n is a proxy of the labor-force growth rate. It is the log of the population growth rate.

$\sum X$ represents a set of variables describing output fluctuations, as identified in the literature.
We examine the following variables, expressed in logarithmic form:

- ***CPI***: the Consumer Price Index (2010=100),
- ***Inv/GDP***: the investment rate denotes the GFCF as a percentage of GDP,
- ***Open/GDP***: the openness rate refers to the sum of imports and exports as a percentage of GDP,
- ***DebtServ/Exp***: the ratio of debt service to exports,
- ***FDI/GDP***: the inward flow of Foreign Direct Investment as a percentage of GDP,
- (ϑ_t and φ_t), (u_i and θ_i), and (ε_{it} and e_{it}) refer respectively to the unobserved time-specific effects, country-specific effects, and residual terms.

In equation (1) of this model, we anticipate (according to the original Okun's Law) that the coefficient α_1 exhibit a negative sign. The direct influence of the institutional variables (denoted as α_2) on the youth unemployment gap is contingent upon whether the sampled countries exhibit, on average, a high or low level of institutional quality.

Simultaneously, the coefficient α_3 on the interaction variable should display a negative sign, indicating that the sensitivity of youth unemployment to economic fluctuations is greater in nations with more robust institutions. Concerning the impact of population growth (denoted as α_4), we anticipate it to be positive. This expectation stems from the understanding that a higher population growth rate would result in a correspondingly higher growth rate in labor supply, consequently contributing to an increase in the youth unemployment rate. We anticipate, in equation (2), that the output gap will expand with the presence of stronger institutions ($\beta_1 > 0$).

Moreover, the output gap is expected to increase with the *Open/GDP, Inv/GDP*, and *FDI/GDP ratios and* decrease with the price index (*CPI*) and the ratio of debt service to exports (*DebtServ/Exp*).

Data Description

We base our econometric analysis on an unbalanced annual dataset comprising a sample of 88 emerging. This dataset spans the period 1985-2019.

1 : Cyclical components of unemployment and output are obtained using the *Hodrick–Prescott high-pass filter* such that $U^c = U - U^*$ and $y^c = y - y^*$, where U^* and y^* refer to the trend components.

2 : More details about what these indicators capture, are provided in the appendix.

Table A in the appendix displays the data sources of the variables. The statistics of these variables are summarized in the Table 1 below.

Table1: Summary statistics (data from 88 DCs over the 1985-2019 period)

Variable	Obs	Mean	Std. Dev.	Min	Max
U^c	2,765	14.48107	11.64941	0.27	60.83
y	3,037	24.02164	1.791336	18.69897	30.31422
n	3,163	2.2532311	1.437547	-6.766132	17.51221
RL	1,825	-0.4170487	0.7412437	-2.346105	1.880382
Gov	1,825	-0.404762	0.6689733	-2.100317	1.639372
VA	1,825	-0.4713938	0.718458	-2.000246	1.314993
RQ	1,825	-0.2994436	0.7659269	-2.363184	2.260543
CC	1,825	-0.4076674	0.7430188	-1.815811	2.32558
GE	1,825	-0.3481789	0.7672633	-2.078399	2.436975
PS	1,825	-0.4848393	0.880126	-2.844653	1.61567
CPI	2,889	81.8842	99.23047	0.1	3364.82
Inv/GDP	2,716	22.20876	8.49991	0.1	93.54746
Open/GDP	2,866	74.43833	54.47162	0.1746816	161.8237
Debtserv/Exp	2,381	17.8012	14.42645	0.1834247	156.8582
FDI/GDP	3,030	3.233422	6.61351	0	442.62

Note: '*y*' is the log of constant GDP (in 2015 US$).

The study sample exhibits high standard deviations in youth unemployment (11.6%), indicating significant variation in countries' youth unemployment situations and their approaches to address it. Additionally, the average values of institutional quality indicators are negative, indicating generally low institutional quality across the sampled countries and the timeframe examined.

The standard deviations of these indicators are substantial, leading to a division among countries with negative institutional quality values and those with positive values. Certain countries, such as Singapore, Hong Kong, and South Korea in recent years, have even achieved results close to the maximum values.

Econometric Analysis and Regression Results

Our system is estimated via *three-stage least squares* (*3sls*) *with fixed effects*. This regressor is appropriate for systems in which the endogenous explanatory variables are determined by dependent variables from other equations within the system, as is the case in our model We perform these regressions while we control for both time and country specific-effects.

However, before proceeding, it is imperative to verify the stationarity of the variables employed in the model. Given the panel structure of the data, we employ panel unit-root tests to examine the order of integration of the series included in the model. We present the estimation results of our model in Tables 3 and 4, in the appendix.

In Table 3, we show the regression results of equation (1) where the dependent variable is U^c. The regression results displayed in Table 4 correspond to equation (2). In both tables, various specifications of Okun's Law are examined. While time and country effects are estimated, they are not included in the reported regressions for the sake of clarity in presentation.

In Specification (1), the responsiveness of unemployment is solely determined by fluctuations in real output. Notably, Okun's coefficient displays the anticipated sign but is non-significant. Moving to Specification (2), we introduce the population growth rate (n) as an additional explanatory variable in Okun's Law to account for the growth rate of the labor supply. The results indicate a strengthening of the relationship between unemployment and output fluctuations.

Furthermore, the coefficient for the population growth rate proves highly significant (at the 1% level) and positive, aligning with expectations. Consequently, countries experiencing faster population growth rates tend to exhibit larger unemployment gaps. This outcome underscores the notion that higher demographic rates are indicative of heightened pressures on the labor market's supply side, consequently impacting the unemployment rate.

In Specifications (3) through (9) in Table 3, we progressively augment the original formulation of Okun's Law with institutional quality indicators (*GE*, *CC*, *PS*, *RQ*, *RL*, *VA*, and *Gov*). These indicators are incorporated both directly to capture their individual impacts on unemployment gaps and indirectly through their interactions with the output fluctuations variable, y^c. Key findings emerge from these analyses.

The primary observation pertains to the direct influence of institutional factors on youth unemployment gaps. Across all specifications presented in Table 3, these factors appear statistically insignificant, although with the anticipated negative sign observed in some of these specifications. This result leads to the conclusion that the prevailing institutional quality, on average, within the sampled countries lacks the potency to directly influence youth unemployment. It's noteworthy that the average levels of institutional quality indicators among the countries considered fall below the threshold of moderate institutional quality, i.e., zero. Consequently, these poor performances on average yield an insignificant direct impact on youth unemployment.

The second pivotal finding pertains to the interaction term representing the indirect influence of institutional factors. The interaction between output fluctuations and institutional variables yields a statistically significant negative effect on youth unemployment gaps.

With the exception of the Political Stability indicator (PS), all institutional indicators exhibit significance when interacting with the output gap. Particularly, when the Government (Gov) indicator is utilized as the composite index of the six indicators, the results demonstrate significance at the 5% level. Consequently, a higher governance index enhances the efficacy of output fluctuations in mitigating youth unemployment gaps.

This outcome provides backing for our hypothesis, indicating that the sensitivity of unemployment to fluctuations in output is contingent upon the quality of existing institution. Specifically, this responsiveness is more pronounced in environments characterized by robust institutions. Control of Corruption, Government Effectiveness, Regulatory Quality, Rule of Law and Voice and Accountability emerge as significant determinants of this responsiveness. Given that these factors exhibit variation across countries and evolve over time, the magnitude of this responsiveness is expected to fluctuate within the sampled countries.

In Table 4 in the appendix, Specifications (1) and (2) reveal notable impacts of the explanatory variables on the output fluctuations variable, y^c. As expected, countries with higher *Inv/GDP* and *FDI/GDP* ratios exhibit significantly elevated output growth. Conversely, there exists a negative and significant correlation with the *Debt-service/exports* ratio and the *CPI* level. These findings align with expectations and are congruent with established empirical literature on economic growth determinants, tracing back to seminal works such as Solow and Swan (1956) and Mankiw, Romer, and Weil (1992), among others.

The impacts of these factors exhibit high significance levels (at the 1% level) in Specifications (1) and (2). The specifications, from (3) to (9) incorporating institutional quality indicators, reveal two key observations. Firstly, all these indicators demonstrate statistical significance (at the 1% level) with a positive correlation, indicating that countries with stronger institutional quality tend to experience higher output growth. Secondly, the economic determinants of output fluctuations remain robust across various specifications.

Indicators such *as Debt-service/exports* ratio , *Inv/GDP, Open/GDP, FDI/GDP* , and the *CPI*

maintain statistical significance (at the 1% level) with the expected direction of impact, underscoring their reliability amidst specification changes.

We posit that due to the generally weaker institutional frameworks in developing countries compared to developed ones, the correlation between youth unemployment and GDP growth should be more pronounced in the latter group. Moreover, our findings regarding the influence of institutions on the magnitude of Okun's coefficient shed light on previous observations, such as those made by Viren (2001), suggesting that countries with lower youth unemployment tend to exhibit higher Okun's coefficients, and vice versa. We theorize that countries with low youth unemployment rates typically possess stronger institutional frameworks, leading to higher Okun's coefficients, and conversely for those with high youth unemployment rate.

CONCLUSION

This study examined an extended version of Okun's Law, employing a system of two simultaneous equations that incorporate the institutional quality effects on the responsiveness of youth unemployment to economic growth fluctuations. Utilizing annual data spanning from 1985 to 2019 for a sample of developing and emerging countries, we employed the *3SLS regressor* technique, incorporating fixed time and country-specific effects. Additionally, we controlled for the endogeneity of output fluctuations by including institutional variables.

Our findings yield several notable results. Firstly, we provide empirical evidence supporting the notion that the responsiveness of youth unemployment to output changes is more pronounced in countries characterized by stronger institutional frameworks. Secondly, we observe that the variability in output fluctuations is significantly influenced by the institutional factors.

Our results contribute to the ongoing discourse in the literature, offering significant policy implications for developing and emerging countries. Specifically, our findings underscore the importance of enhancing the institutional environment, encompassing measures to improve *Control of Corruption (CC), Voice and* Accountability (VA), *Regulatory Quality (RQ), Government Effectiveness (GE) and the Rule of Law (RL).*

Such improvements are deemed equally crucial alongside efforts to foster economic growth in the endeavor to mitigate youth unemployment within these nations.

REFERENCES

1. Benos, Nikos and Athanassios, Stavrakoudis (2020), “Okun’s Law: Copula-Based Evidence from G7 Countries”, Quarterly Review of Economics and Finance, Vol.84 No.4, pp. 478-491.

2. Bell, D. N. F. and Blanchflower, D. G. (2011), “Young people and the Great Recession”, Oxford Re view of Economic Policy, Vol. 27 No.2, pp. 241-267.

3. Brincikova, Z. and Darmo, L. (2015), “The impact of economic growth on gender specific unemployment in the EU”, Economic Sciences, Vol.62 No. 3, pp.383-390. doi:10.1515/aicue-2015-0026.

4. Dunsch, S. (2016), “Okun’s law and youth unemployment in Germany and Poland”, International Journal of Management and Economcis, Vol. 49 No.1, pp. 34-57. doi:10.1515/ijme-2016-0003

5. Dunsch, S. (2017), “Age and gender-specific unemployment and Okun’s law in CEE countries", Eastern European Economics, Vol. 55 No. 4, pp. 377-393. doi:10.1080/00128775.2017.1338962

6. Gil-Alana, Luis A., Marinko Skare and Sanja Blazevic Buric (2020), “Testing Okun’s Law. theoretical and empirical considerations using fractional integration”, Applied Economics, Vol. 52 No.5, pp. 459-474.

7. Hutengs, O. and Stadtmann, G. (2013), “Don’t trust anybody over 30: youth unemployment and Okun’s law in CEE countries”, Bank & Credit, Vol.45 No.1, pp. 1-16.

8. Marconi, G., Beblavy, M. and Maselli, I. (2016), "Age effects in Okun's law with different indica tors of unemployment", Applied Economics Letters, Vol. 23 No.8, pp. 580-583. doi:10.1080/13504851.2015.1090540

9. Obst, Thomas. (2021), "Dynamic version of Okun's Law in the EU15 countries: The role of delays in the unemployment-output nexus", Scottish Journal of Political Economy, Vol. 69 No. 2, pp.225-241.

10. O'Higgins, N. (1997), "The challenge of youth unemployment", International Social Security Review, Vol. 50 No.4, pp. 63-93.

11. Okun, A.M. (1962), "Potential GNP: Its measurement and significance", American Statistical Association, Proceedings of the Business and Economic Statistics Section, pp. 98-104.

12. Tumanoska, Despina. (2020), "The relationship between economic growth and unemployment rates: Validation of Okun's Law in panel context", Research in Applied Economics, Vol.12 No.1, pp. 33-55.

13. Wang, X. and Huang, HC. (2017), "Okun's law revisited: A threshold in regression quantiles approach", Applied Economics Letters, Vol.24 No. 21, pp. 1533-1541.

14. Dixon, R., Lim, G. C. and Van Ours, J. C. (2016), "Revisiting Okun's relationship", (Discus sion Paper No.9815). Germany: The Institute for the Study of Labor (IZA). Retrieved from http://ftp.iza.org/dp9815.pdf

15. Lecerf, M. and Dobreva, A. (2019), "The fight against unemployment: Summary", Brussels: Euro pean Parliamentary Research Service (EPRS). Retrieved from http://www.europarl.europa.eu/RegData/etudes/BRIE/2018/630274/EPRS_BRI(2018)630274_EN.pdf

16. Unt, M. (2012), "Boom and bust effects on youth unemployment in Estonia", Germany: The Friedrich-Ebert-Stiftung's International Dialogue Department. Retrieved from http://library.fes .de/pdf-files/id/09473.pdf

17. Zanin, L. (2014), "On Okun's law in OECD countries: An analysis by age cohorts", Economics Letters, Vol. 125, pp. 243-248. Retrieved from https://doi.org/10.1016/j.econlet.2014.08.030

APPENDIX

Table A: Description and sources of the used variables

Variable	Variable description	Source
U	Youth unemployment rate as % of the labor force ages 15-24.	International Labor Organization
y	Log of: GDP measured in constant 2015 US$.	World Bank Development Indicators Database
n	Log of: Population growth (annual %)	
GE, CC, PS, RQ, RL, VA, Gov	We utilize the indicators available in the Worldwide Governance Indicators (WGI) database as proxies for institutional quality: - Control of Corruption (CC) within the Worldwide Governance Indicators (WGI) database reflects perceptions regarding the extent to which public power is utilized for personal gain, encompassing both minor and major instances of corruption, as well as the potential influence of elites and private interests on the state. - Government Effectiveness (GE) in the Worldwide Governance Indicators (WGI) database encompasses perceptions of various factors, including the quality of public services, the effectiveness and independence of the civil service, the quality of policy development and execution, and the government's credibility regarding policy commitments - Regulatory Quality (RQ) within the Worldwide Governance Indicators (WGI) database captures perceptions regarding the government's capability to devise and enforce effective policies and regulations conducive to fostering private sector growth and development - Political Stability and Absence of Violence/Terrorism (PS) in the Worldwide Governance Indicators (WGI) database assesses perceptions of the probability of political unrest and the presence of politically-driven violence, including acts of terrorism.. - Voice and Accountability (VA) within the Worldwide Governance Indicators (WGI) database evaluates perceptions regarding the degree to which citizens in a country can engage in the selection of their government, as well as the levels of freedom of expression, association, and the presence of independent media - Rule of Law (RL) in the Worldwide Governance Indicators (WGI) database gauges perceptions regarding the degree to which individuals and entities trust and adhere to societal rules. This includes evaluating the quality of contract enforcement, property rights, the effectiveness of law enforcement agencies and judicial systems, and the prevalence of crime and violence within a given society. The Governance Index (Gov) serves as a representation of global institutional quality and is derived by computing the arithmetic mean of the six mentioned indicators spanning from 1996 to 2019. They are assessed on a scale ranging from -2.5 to +2.5, with higher values denoting stronger and more efficient institutions.	World Bank Database, the WGI by Kaufmann and Kraay (2020).
Ln(Inv/GDP)	Log of: Ratio of Gross fixed capital formation to GDP (%)	World Bank Development Indicators Database
Ln(FDI/GDP)	Log of: Ratio of Foreign Direct Investment inflows to GDP (%)	
Ln(Open/GDP)	Log of: Openness ratio: Ratio of "Sum of imports and exports of goods and services to GDP (%)	
Ln(DEBT_SERV/EXP)	Log of: Ratio of total debt service (% of exports of goods, services and primary income) (%)	
Ln(CPI)	Log of: Consumer Prices Index (base 100 = 2010)	

Table 2: Panel Unit-Root Tests

		Level				Notes:
	P.U.R.T	**Statistic**	**p-value**	**trend**	**I(.)**	
U^c	I-P-S	-7.605	0.000	--	I(0)	1-I-P-S indicates the Im, Pesaran, and Shin (2003)
	Fisher-	17.68	0.000	--	I(0)	

	type					test. The null hypothesis posits that all panels exhibit a root process, whereas the alternative hypothesis suggests that there is a nonzero fraction of stationary panels. The reported statistic is denoted as "Z-bar-tilde". 2- Fisher-type stands for the Fisher-type test with the Augmented Dickey-Fuller approach. The null hypothesis assumes all panels contain unit roots based on unit root tests conducted individually. The reported statistic is the "Modified inv. chi-squared". The Phillips-Perron unit-root test with lag(1) is used in the Fisher-type test.
y^c	I-P-S	-7.879	0.000	--	I(0)	
	Fisher-type	15.00	0.000	--	I(0)	
GE (Government_Effectiv) =	I-P-S	-1.774	0.038	--	I(0)	
	Fisher-type	5.469	0.000	--	I(0)	
CC = (Control_Corruption)	I-P-S	-3.455	0.000	--	I(0)	
	Fisher-type	7.280	0.000	--	I(0)	
PS = (Political_Stability)	I-P-S	-3.073	0.001	--	I(0)	
	Fisher-type	8.201	0.000	--	I(0)	
RQ = (Regulatory_Quality)	I-P-S	-7.049	0.000	yes	I(0)	
	Fisher-type	3.695	0.000	--	I(0)	
RL = (Rule_Law)	I-P-S	-7.202	0.000	yes	I(0)	
	Fisher-type	2.315	0.010	--	I(0)	
VA (Voice_Accountability) =	I-P-S	-6.066	0.000	yes	I(0)	
	Fisher-type	6.467	0.000	--	I(0)	
Gov = (Governance)	I-P-S	-7.775	0.000	yes	I(0)	
	Fisher-type	2.846	0.002	--	I(0)	
n	I-P-S	-8.711	0.000	--	I(0)	
	Fisher-type	4.153	0.000	--	I(0)	
Ln(Inv/GDP)	I-P-S	-8.146	0.000	yes	I(0)	
	Fisher-type	4.926	0.000	--	I(0)	
Ln(Open/GDP)	I-P-S	-6.731	0.000	yes	I(0)	
	Fisher-type	6.712	0.000	--	I(0)	
Ln(FDI/GDP)	I-P-S	-12.40	0.000	--	I(0)	
	Fisher-type	29.45	0.000	--	I(0)	
Ln(DebtServ/EXP)	I-P-S	-4.143	0.000	--	I(0)	
	Fisher-type	5.596	0.000	--	I(0)	
Ln(CPI)	I-P-S	-9.466	0.000	yes	I(0)	
	Fisher-type	38.04	0.000	--	I(0)	

Table 3: Estimation of the Extented Okun's Law (3sls regressions with country and time fixed-effects): Equation (1) of the system

		Dependent variable : U^c								
Variables		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
n		--- ---	0.531*** (0.173)	0.644*** (0.216)	0.695*** (0.220)	0.613*** (0.216)	0.625*** (0.218)	0.687*** (0.216)	0.556*** (0.211)	0.626*** (0.213)
y^c		-7.064**	-8.407**	-27.03***	-33.57***	-17.81**	-24.62***	-27.16***	-21.05***	-25.29***
		(3.526)	(3.620)	(8.615)	(10.18)	(8.815)	(7.209)	(9.341)	(7.703)	(9.319)
GE				0.501						
				(0.411)						
y^c * *GE*				-16.48**						
				(7.041)						
CC					0.638					
					(0.390)					
y^c * *CC*					-19.68**					
					(8.938)					
PS						0.097				
						(0.192)				
y^c * *PS*						-4.307				

						(5.201)				
RQ							0.172			
							(0.466)			
*y^c * RQ*							-12.68**			
							(4.956)			
RL								-0.292		
								(0.357)		
*y^c * RL*								-14.04**		
								(7.182)		
VA									0.286	
									(0.270)	
*y^c * VA*									-11.22**	
									(5.715)	
Gov										0.175
										(0.484)
*y^c * Gov*										-14.97**
										(7.506)
Constant		-3.863*** (0.6019)	-4.410*** (0.6280)	-3.149*** (0.636)	-3.108*** (0.650)	-3.415*** (0.631)	-3.241*** (0.768)	-3.629*** (0.675)	-3.118*** (0.661)	-3.290*** (0.721)
Count eff		yes	Yes	yes	yes	Yes	yes	yes	yes	yes
Time eff		yes	yes	yes	yes	Yes	yes	yes	yes	yes
Obs.		1,596	1,586	1,143	1,143	1,143	1,143	1,143	1,143	1,143
Countries		88	88	88	88	88	88	88	88	88

***Notes**: standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Fixed country and time-specific effects are not reported here to save space.*

Table 4: Estimation of the Augmented Okun's Law (3sls regressions with country and time fixed-effects): Equation (2) of the system

	Dependent variable : y^c								
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GE			0.0688***						
			(0.0066)						
CC				0.0448***					
				(0.0069)					
PS					0.0267***				
					(0.0031)				
RQ						0.0735***			
						(0.0066)			
RL							0.0576***		
							(0.0067)		
VA								0.0200***	
								(0.0056)	
Gov									0.0934***
									(0.0078)
Ln(Inv/GDP)	0.0394*** (0.0050)	0.0387*** (0.0049)	0.0292*** (0.0064)	0.0310*** (0.0065)	0.0219*** (0.0066)	0.0341*** (0.0063)	0.0270*** (0.0065)	0.0308*** (0.0066)	0.0210*** (0.0063)
Ln(Open/GDP)	0.0012 (0.0042)	0.0017 (0.0041)	0.0100** (0.0051)	0.0101** (0.0052)	0.0141*** (0.0051)	0.0083* (0.0050)	0.0131** (0.0051)	0.0101* (0.0053)	0.0119** (0.0050)
Ln(FDI/GDP)	0.0051*** (0.0012)	0.0049*** (0.0011)	0.0077*** (0.0014)	0.0071*** (0.0014)	0.0080*** (0.0014)	0.0047*** (0.0014)	0.0065*** (0.0014)	0.0081*** (0.0014)	0.0069*** (0.0014)
Ln(DebtServ/E	-	-	-	-	-	-	-	-	-

XP)	0.0070***	0.0067***	0.0084***	0.0069***	0.0066***	0.0080***	0.0061***	0.0060**	0.0085***
	(0.0020)	(0.0020)	(0.0023)	(0.0023)	(0.0023)	(0.0022)	(0.0023)	(0.0024)	(0.0022)
Ln(CPI)	-0.0094***	-0.0090***	-0.0198***	-0.0198***	-0.0241***	-0.0205***	-0.0236***	-0.0211***	-0.0226***
	(0.0026)	(0.0026)	(0.0049)	(0.0050)	(0.0049)	(0.0048)	(0.0025)	(0.0051)	(0.0048)
Constant	-0.0838**	-0.0849***	-0.0074	-0.0278	-0.0015	0.0225	0.0027	-0.0296	0.0580
	(0.0295)	(0.0288)	(0.0407)	(0.0417)	(0.0415)	(0.0408)	(0.0416)	(0.0427)	(0.0409)
Country effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Time effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Obs.	1,597	1,587	1,143	1,143	1,143	1,143	1,143	1,406	1,143
Countries	88	88	88	88	88	88	88	78	88

***Notes**: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Country and time fixed specific effects are not reported here to save space.*