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COVID-19: Deconstructing Regional and Global Effects on Africa's Economy

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Outline

- (Facts and Motivation) Presenting the problem ,
- (Purpose) Clearly lay down the specific research question,
- (Methodology) Explain the methodology we adopted and why,
- (Results) Share our findings
- (Take-aways) Conclusion

The Facts and Motivation

- 2020 marked a loss of decades of development progress in Africa,
- Worst recession in the last five decades, African output contracted by 1.8-percent,
- Extensive lockdowns were enforced, international supply chains halted, international trade slowed, demand muted globally,
- Governments took on additional debt required for pandemic contagion efforts,
- Average public debt rose by about 10-percentage-points,
- Per capita GDP declined dramatically (almost 5%) ,
- About 85 million to 130 million people fell behind poverty lines globally,
- The effect of Delta and Omicron variants not fully realized yet.

Purpose and Research Question

- Can we decouple the global effect of the pandemic on Africa from the regional, Africa-specific effects?
- Can we create a case where African countries were, in fact, not African?
- We are aiming to analyze the additional economic cost of the pandemic born by Africa, compared to the rest of the world.
- Then, we analyze suitable policymaking avenues to bridge the gap.

Methodology

- By using the Synthetic Estimation method, we can re-create each African country, with non-African countries that resemble them.

- Since 2019-SARS-nCov2 pandemic was indeed global, the 2020 economic performance of the proxy African country created with a non-African country mix, captures the 'global' effect of the pandemic.

- Then the economic performance differential between this 'synthetic' country and the actual country could be described as the 'regional' or 'Africa-specific' impact.

Methodology: Synthetic Estimation

- The seminal paper by Abadie and Gardeazabal (AER, 2003).
- The method further nuanced later by Abadie, Diamond, Hainmuller (JASA, 2012).
- Used for estimating the effect of conflicts, terrorism, natural disasters, strict changes in regulatory discourse, and in our case a global pandemic.

Methodology: Synthetic Estimation

- Let α be one African country and any non-African country be denoted as i,

$$\omega_i: \quad f\left\{\sum_{y=1}^{n} g_{i,t-y}^{act} + T_{i,t} + \sum_{y=1}^{n} \frac{(\lambda_{i,t-y})}{n} + GDP_{i,t}\right\}; \; where \; n = 4. \qquad (1)$$

ω_i = weight country i

g_i^{act} = Real GDP growth rate of country i

T_i = Trade openness of country i

λ_i = $Weighted\ average$ real growth rate of export partners of country i

GDP_i = $Log\ of\ expenditure - side\ per\ capita\ GDP\ in\ PPP\ terms$ of country i

n = number of lags, length of the resemblance horizon

Methodology: Synthetic Estimation

$$Fitness\ Index = \frac{RMSPE}{RMSPE_{\alpha}} = \sqrt{\frac{\left(\theta_{\alpha} - \sum_{i}^{m} \omega_i \theta_i\right)^2}{{\theta_{\alpha}}^2}} \quad (2)$$

where m is the total number of non-African countries.

Finally, the growth rate of the synthetic African country α, *the treatment effect*:

$$g_{\alpha}^{syn} = \sum_{i}^{m} (\omega_i)(g_i^{act}) \quad (3)$$

g_{α}^{syn} = Real GDP growth rate of synthetic country α

Methodology: Governance and Institutions

$$\Delta g_\alpha = \beta_0 + X'\beta + \varepsilon_\alpha \quad (4)$$

$$\Delta g_\alpha = \beta_0 + X'\beta + \vartheta_\alpha + \mu_\alpha \quad (5)$$

$$\Delta g_\alpha = \varphi_0 + \Delta X'\tilde{\beta} + \mu_\alpha \quad (6)$$

Where with N observations and j variables:

$$\Delta X = \begin{bmatrix} X_{1,\alpha} - \overline{X_1} \\ X_{2,\alpha} - \overline{X_2} \\ X_{3,\alpha} - \overline{X_3} \\ \cdots \\ X_{j,\alpha} - \overline{X_j} \end{bmatrix}$$

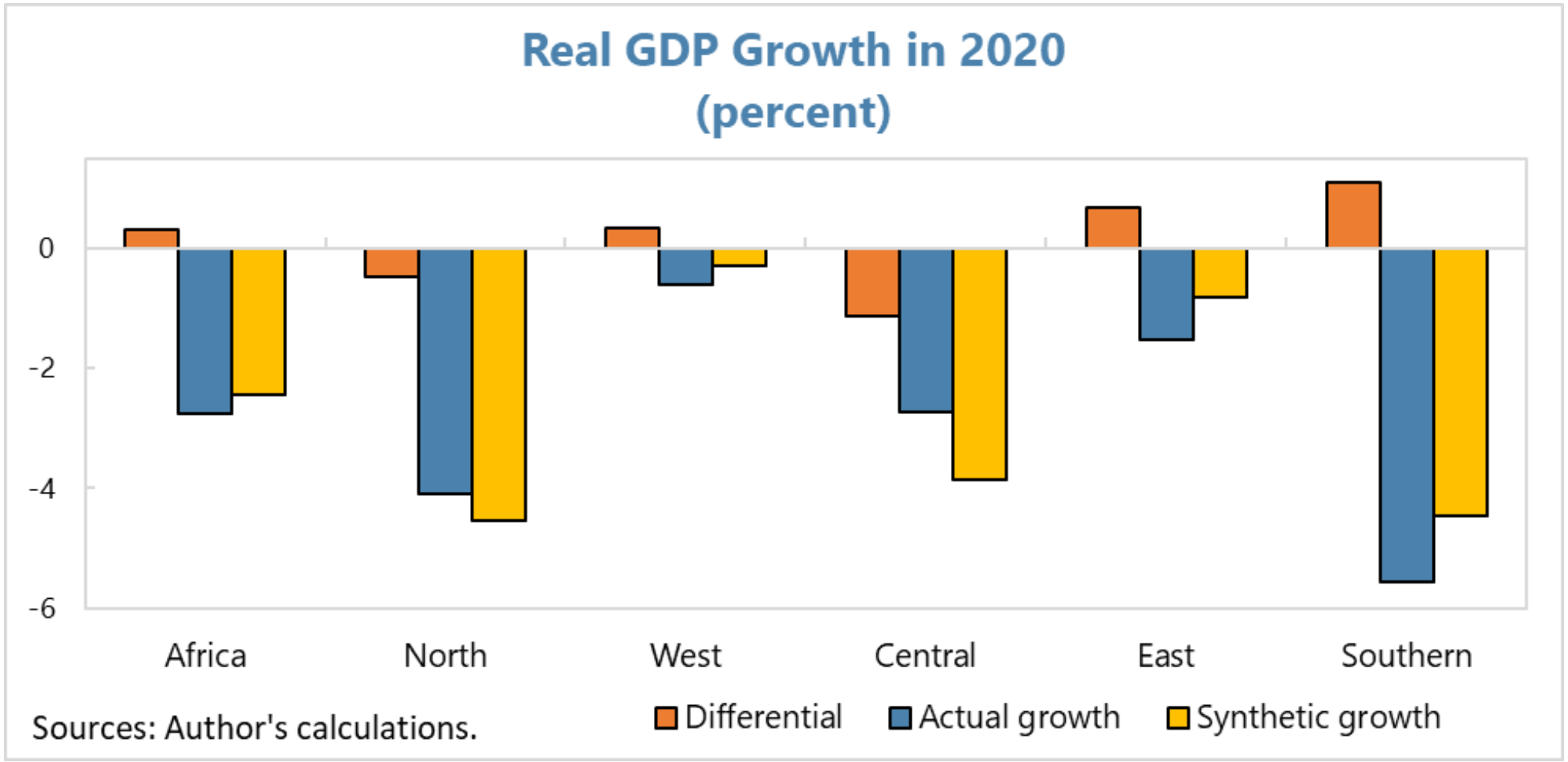
$$\tilde{\beta} = \begin{bmatrix} \widetilde{\beta_1} & \widetilde{\beta_2} & \widetilde{\beta_3} & \cdots & \widetilde{\beta_j} \end{bmatrix}$$

$$\overline{X_j} = \frac{1}{N}\sum_{i=1}^{N}\left(X_{\alpha,j}\right)$$

Data

- Our dataset comprises real GDP, real GDP per capita, expenditure-side PPP GDP, trade openness, export partnerships (bilateral relationships).
- Sources for macro variables: AfDB, IMF, and PWT.
- In the second part on policy analysis and reasoning, we are using Global Competitiveness Indicators and Country Policy and Institutional Assessment (CPIA) and World Governance Indicators (WGI) series from World Bank.
- A total of 49 African countries:
- Eritrea, Liberia, Libya, Somalia and South Sudan are excluded due to data availability.

Results: Synthetic Estimation of Real GDP



Sources: Author's calculations.

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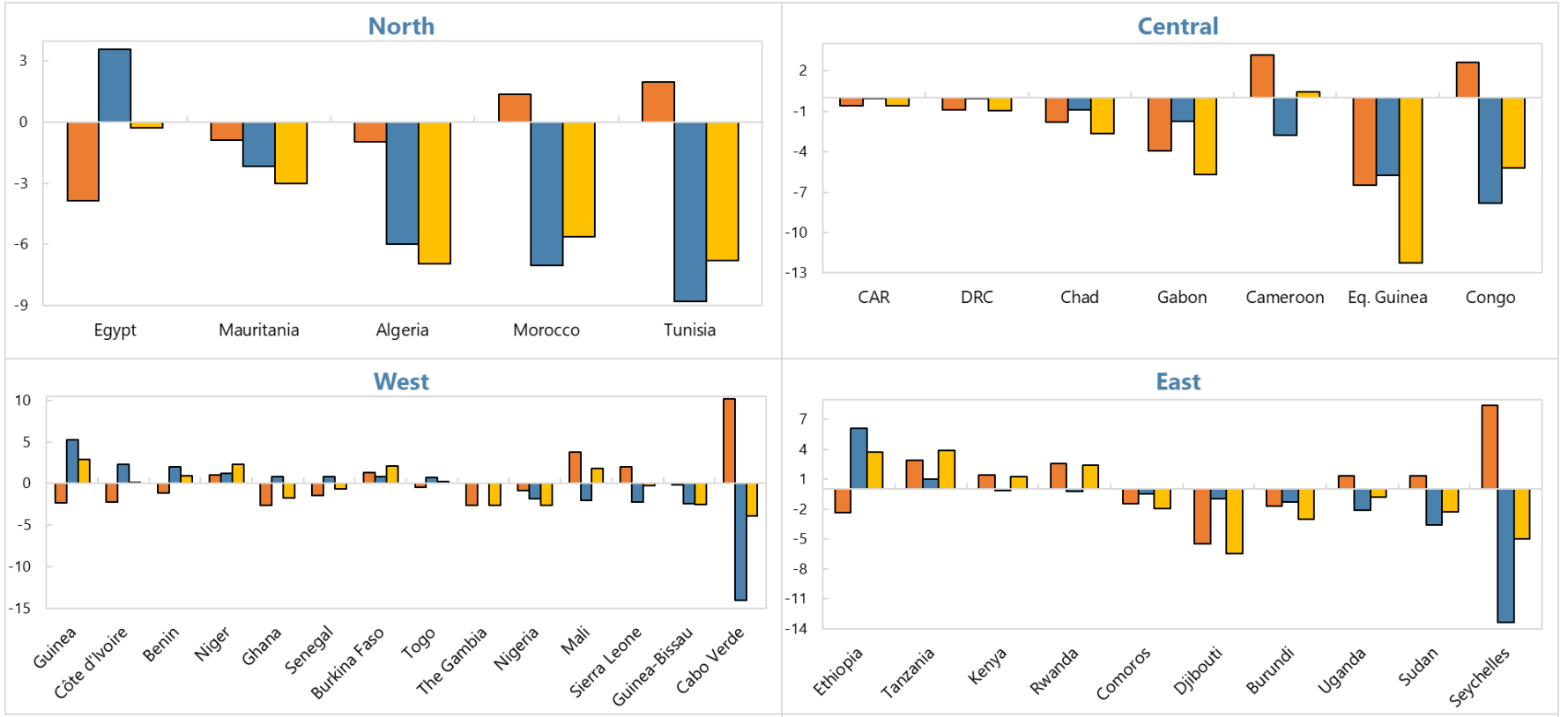
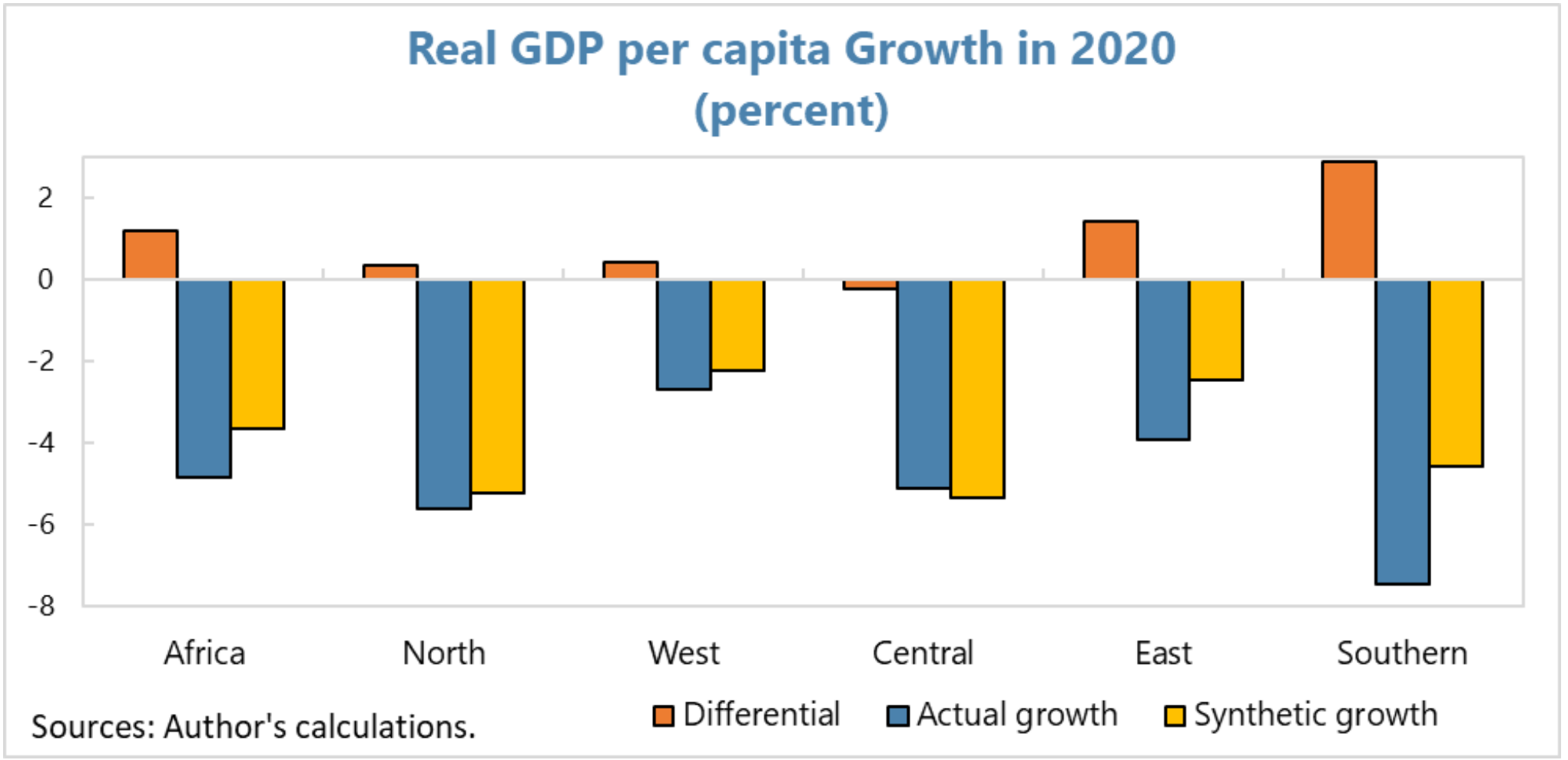
Results: Synthetic Estimation of Real GDP



Sources: Author's calculations.

Results: Synthetic Estimation of Real GDP per capita



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Results: Synthetic Estimation of Real GDP per capita

Sources: Author's calculations.

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Results: Regional Disparities

- Largest regional component in West Africa
- Large passthrough in West, East, and Southern Africa
- North Africa with mixed results

Table 1a. Real GDP growth (percent)

	Actual growth	Synthetic growth	Differential	Differential % of Actual
Africa	-2.8	-2.44	0.32	11.7
North	-4.1	-4.55	-0.46	-11.4
West	-0.6	-0.3	0.3	54.7
Central	-2.7	-3.8	-1.1	-41.2
East	-1.5	-0.8	0.7	45.9
Southern	-5.6	-4.5	1.1	19.9

Table 1b. Real GDP per capita growth (percent)

	Actual growth	Synthetic growth	Differential	Differential % of Actual
Africa	-4.9	-3.65	1.20	24.8
North	-5.6	-5.2	0.4	6.7
West	-2.7	-2.2	0.5	16.8
Central	-5.1	-5.3	-0.2	-4.3
East	-3.9	-2.5	1.4	36.7
Southern	-7.5	-4.6	2.9	39.0

Sources: Authors' calculations.

Results: Governance, Institutional and Policy Strength

Differential in Real GDP growth	*Coefficients*	*t-stat*	*P-value*
Building human capital	-1.95	-2.7	0.011
Debt policy rating	0.65	1.15	0.246
Fiscal policy rating	1.05	1.17	0.249
Beta-zero	-0.2	-0.61	0.539
		R^2=	0.25

f-test

(1) Building human capital = 0
(2) Debt policy rating = 0
(3) Fiscal policy rating = 0

F(3, 31) = 3.47
Prob > F = 0.0279

Differential in Real GDP growth	*Coefficients*	*t-stat*	*P-value*
Control of Corruption	3.02	1.92	0.061
Government Effectiveness	-2.93	-1.17	0.25
Regulatory Quality	2.68	1.21	0.233
constant	0.32	0.65	0.513
		R^2=	0.22

f-test

(1) Control of Corruption = 0
(2) Government Effectiveness = 0
(3) Regulatory Quality = 0

F(3, 45) = 4.17
Prob > F = 0.0108

Results: Governance, Institutional and Policy Strength

Differential in Real GDP per capita growth	*Coefficients*	*t-stat*	*P-value*
Building human capital	-2.33	-2.06	0.048
Debt policy rating	2.12	0.25	0.806
Fiscal policy rating	-0.538	-0.38	0.706
Beta-zero	0.438	0.82	0.42
		R^2=	0.15

f-test

(1) Building human capital = 0

(2) Debt policy rating = 0

(3) Fiscal policy rating = 0

F(3, 31) = 1.84

Prob > F = 0.161

Take-aways: Essential policymaking avenues in Africa

- This paper shows evidence that Africa was affected by the pandemic asymmetrically than the rest of the world
- Non-African countries significantly overperformed their African counterparts in 2020
- There is not only ample space available for, but also a massive need for reforms that enhance economic governance, capacity development, and institution building
- Strong institutions not only make strong economies, but also make up resilient economies
- Countries with better fiscal policy management were associated with better performances in 2020
- Government effectiveness and control of corruption restrains region-specific costs
- Results are concerning.

Thank you!