

Eurobonds, Debt Sustainability and Macroeconomic Performance: *Synthetic controlled experiments*

Chuku Chuku, Mustafa Yasin-Yenice

ECMR, AfDB

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Plan of Talk

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- 2 Eurobond issuances in Africa
A diagnosis and stylized facts
- 3 Modelling Strategy: Synthetic control experiments
- 4 Results and discussion
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The Context

The context

- ▶ As trailblazer, South Africa issued the first African Eurobond in 1995; by 2001, Egypt and Tunisia had followed suit
- ▶ Fast-forward to 2020: 21 African Sovereigns have issued over 125 Eurobonds instruments valued at \$155b. in international capital markets.
- ▶ Including middle-income heavyweight (Egypt, South Africa, Nigeria); resource-intensive middleweights (Zambia, Angola, Ghana) and non-resource intensive economies (Kenya, Ethiopia, Tanzania).
- ▶ Has access to international capital markets altered the economic fortunes of these countries?

The promise of Eurobond covenants

A close examination of Africa's Eurobond covenants and prospectuses indicate that proceeds would be used to

1. Support capital accumulation for faster growth and development,
2. Improve debt management and restructuring
3. Provide a benchmark for domestic corporate bonds

Eurobonds as a commitment device

International finance helps provide an external form of discipline for economic management through the threat of capital flight.

Consumption and investment smoothing, building reserves, diversifying financing sources, and benchmarking

Key questions

Have the indicated objectives on Africa's sovereign Eurobond issuances been achieved? In other words:

1. Do countries that issue Eurobonds eventually grow faster?
2. How is the debt sustainability situation impacted after Eurobond issuances?
3. Are there any positive feedback effects on domestic capital markets?
4. (bonus) What factors propelled the surge in Eurobond issuances by African countries?

Our approach and the value proposition

Short of the gold standard

- ▶ We carry out synthetic controlled experiments using the methods of Abadie et al (2010)
- ▶ Involves comparative case study analyses for frontier market economies that issued Eurobonds in the past two decades

Value proposition

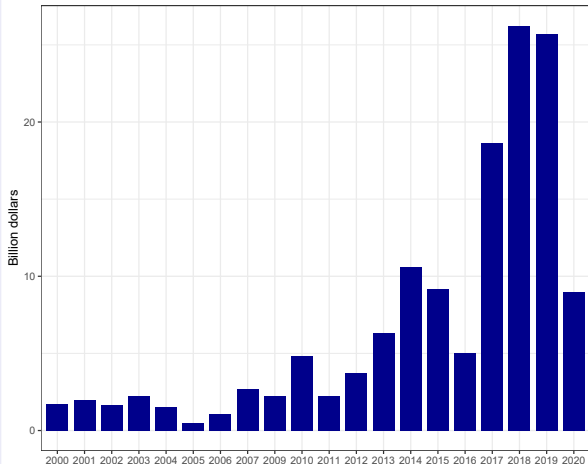
- ▶ First, choice of experimental control units are based on transparent, data-driven methods, and also makes explicit the relative contributions of each control unit.
- ▶ Second, overcomes the shortcomings of deterministic DSA approaches by using actual debt trajectories between treated and control countries.

Eurobond issuances in Africa

A diagnosis and stylized facts

Steady uptrend in Eurobond issuances

Sovereign bond issuances in Africa's frontier markets, 2000-2020



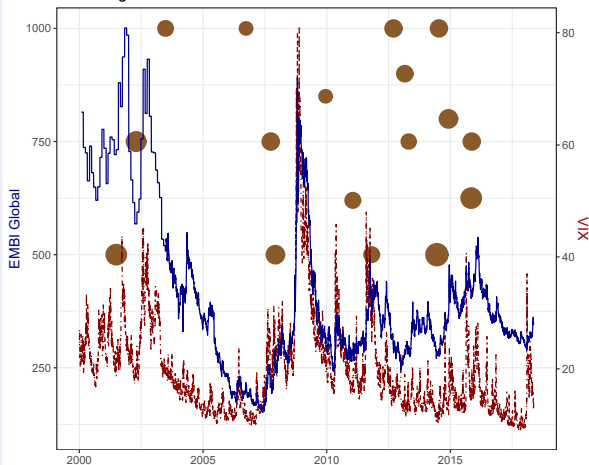
Cumulative size of annual issuances persistently rising

COVID-19 impacts might upend this trend

Issuances mostly below 3% of GDP: from \$200 million up to \$3 billion

Bunching on market conditions

Bunching on market conditions: EMBI vs. VIX



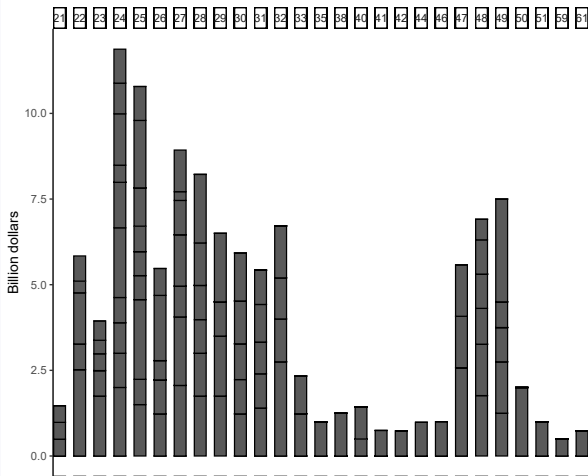
Evidence of clustering around market conditions in issuances

Significant new entrants between 2013 and 2017

Most of the issuances where 10-year tenures

A wall of maturities coming due soon

Wall of African sovereign bond maturities

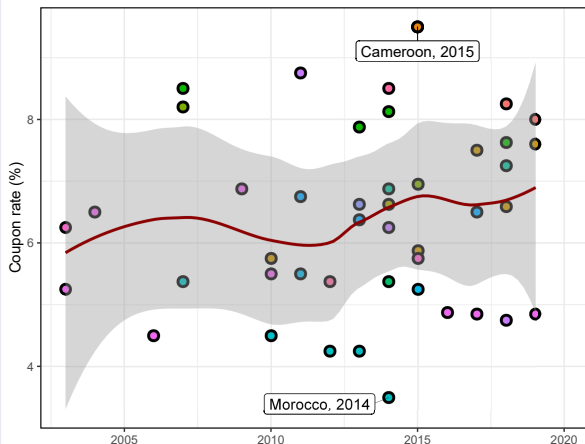


Schedule of repayments spikes in 2024, 2025

Early restructuring via rolling over, reprofiling or rescheduling can help to flatten the wall

Heterogeneous coupon rates trending

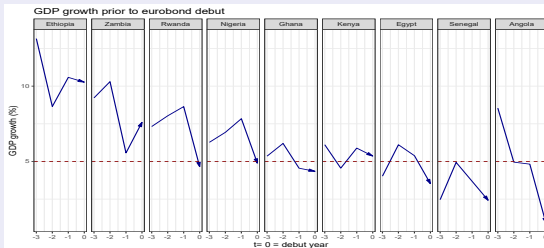
Trend of coupon rates on 10-year bond issuances



Most African Eurobond issuances tend to have fixed coupon rates

Rates vary significantly by countries, ranging from competitive 3.5% by Morocco to exceptionally high 9% in Cameroon

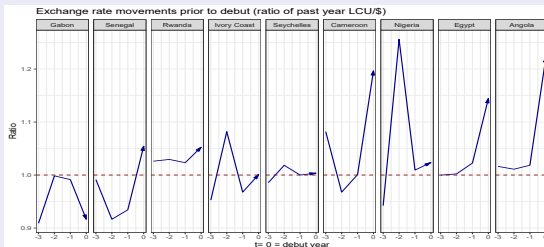
Robust growth prior to issuance



- ▶ Most countries had robust GDP growth—close to or above 5%

- ▶ This favourable domestic condition helped to attract investors

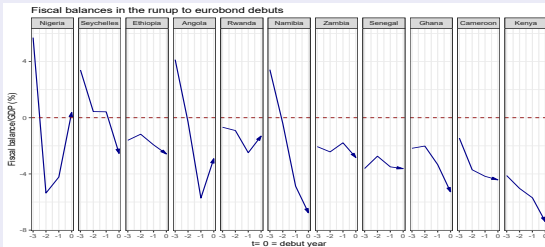
Exchange rate gyrations prior to issuance



- ▶ Wide fluctuations in exchange rates signals macro-instability

- ▶ This did not deter investors and countries from making Eurobond debuts

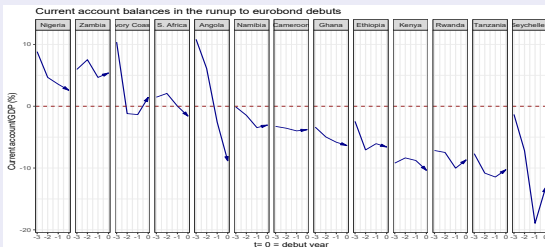
Tight fiscal space prior to issuance



- ▶ Many countries already running wide deficits above 5% of GDP

- ▶ Kenya, Cameroon, Namibia, Ghana, typical examples

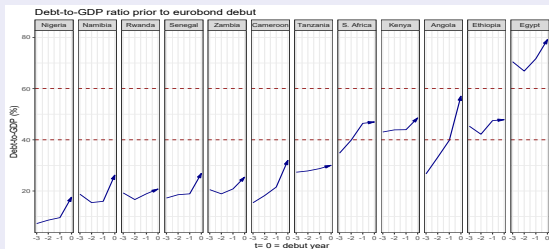
Dwindling external positions



- ▶ External positions were deteriorating in the run up to issuances

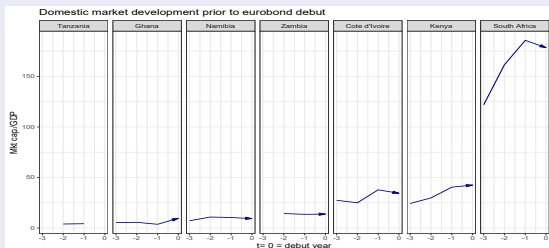
- ▶ This suggests that issuances had multiple objectives

Debt trajectories bending upwards



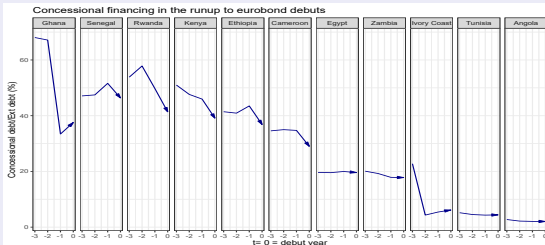
- ▶ Most countries approaching or exceeding debt sustainability thresholds at issuance

Flat domestic capital markets



- ▶ Domestic debt markets were mostly lacklustre at issuance
- ▶ Pointing to the inability of sovereigns to mobilize domestic savings for projects

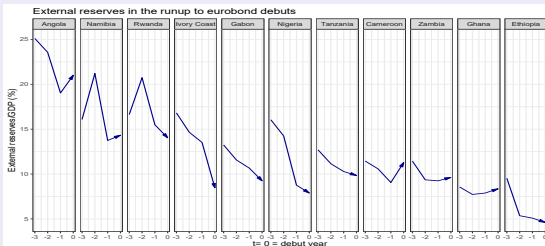
Concessional financing drying up



- Graduation from low- to middle-income status meant gradual phasing out of concessional financing.

- Ghana, Senegal, Rwanda, Kenya, experienced significant drops.

External buffers depleting



- Dwindling buffers weaken shock-absorbing capacity in the event of sudden reversals.

- This suggests that issuances had multiple objectives

Modelling Strategy: Synthetic control experiments

The setting

- ▶ Our aim to estimate the impact of Eurobond issuances on a country's debt sustainability and macroeconomic performance.
- ▶ We apply the synthetic control method (SCM) by Abadie and Gardeazabal (2003); Abadie et al. (2010, 2015).
- ▶ Formally, the intervention effect for country i at time T_0 and beyond can be defined as

$$\tau_{it} = Y_{it}(I) - Y_{it}(N) = Y_{it} - Y_{it}(0) \quad (1)$$

- ▶ The estimand of interest is the vector $\tau_{i,T_0+1}, \dots, \tau_{i,T}$. But it is complicated by the missing counterfactual $Y_{it}(0)$.

Identification and weighting strategy

- ▶ The dynamic intervention effect, τ_{it} , can be robustly identified by the SCM estimators if Y_{1t}^N is generated from a linear factor model (see Abadie et al., 2010).

$$Y_{jt}^N = \boldsymbol{\theta}_t \mathbf{Z}_j + \boldsymbol{\lambda}_t \boldsymbol{\mu}_j + \epsilon_{jt} \quad (2)$$

- ▶ $\boldsymbol{\theta}$ and $\boldsymbol{\lambda}$ are the common factors and \mathbf{Z}_j and $\boldsymbol{\mu}_j$ are the factor loadings
- ▶ A non-parametric technique is used to choose controls from the donor pool and their relative weights for best resemblance.

$$\| \mathbf{X}_1 - \mathbf{X}_0 \mathbf{W} \|_V = \sqrt{(\mathbf{X}_1 - \mathbf{X}_0 \mathbf{W})' \mathbf{V} (\mathbf{X}_1 - \mathbf{X}_0 \mathbf{W})} \quad (3)$$

Why use the synthetic control method

- ▶ Because it is the closest we get to the gold standard of randomized control experiments.
- ▶ Because of the transparency in the contribution of each control unit and the sparsity too
- ▶ It guards against apriori and ad hoc specification searches in the design of the study
- ▶ It has a comparable strategy for inference in classical econometrics through *placebo effects* from permutation sampling.
- ▶ It can potentially deal with endogeneity issues arising from anticipation effects of the intervention

Selecting case studies

The criteria for selection into the case study group from the 21 countries that issued Eurobonds are as follows:

1. Country should have issued Eurobond prior to 2015 to allow for a sensible post-intervention period.
2. Country should not have defaulted on its Eurobonds (Coted'Ivoire is an exception)
3. Countries should not have issued Eurobond for the sole purpose of debt restructuring and management e.g Congo and Seychelles.

► Use annual country-level panel data for the period 1980 to 2019

► Four outcome variables: per capita GDP, debt-to-GDP evolution, capital accumulation, and domestic debt market development.

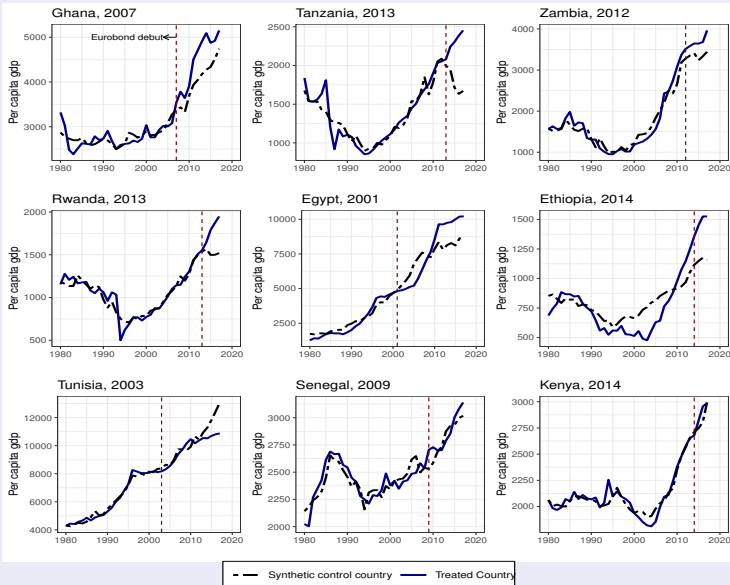
Results and discussion

Synthetic control weights and country combinations for capita GDP

Donor Pool	Treatment Countries										
	Angola	Cameroon	Egypt	Ethiopia	Gabon	Ghana	Kenya	Rwanda	Senegal	Tunisia	South Africa
Algeria	-	0.05	-	-	0.86	0.02	0.01	-	-	0.19	0.61
Bhutan	0.13	-	-	-	-	-	-	-	-	-	-
Botswana	-	-	0.23	-	-	-	-	-	-	0.03	-
Burkina Faso	-	-	-	-	-	-	-	0.24	-	-	-
Burundi	-	-	-	0.20	-	-	-	0.14	-	-	-
Comoros	-	-	-	-	-	-	0.25	-	0.12	-	-
Congo, Dem. Rep.	-	0.28	-	0.12	-	0.67	-	0.25	-	-	-
Equatorial Guinea	0.16	-	0.09	-	0.04	-	-	0.01	-	-	-
Eswatini	-	0.07	-	-	-	-	-	-	-	0.45	-
Gambia, The	-	-	-	-	-	-	-	-	0.18	-	-
Guinea	0.41	0.41	-	-	-	-	-	-	-	-	-
India	-	-	-	-	-	0.12	0.00	-	-	-	-
Iran	-	-	0.15	-	-	0.03	-	-	-	0.32	-
Lao PDR	-	0.20	-	-	-	-	-	0.08	-	-	-
Madagascar	-	-	-	-	-	-	-	-	0.30	-	-
Mali	-	-	0.54	-	-	-	-	-	-	-	-
Mauritius	-	-	-	-	0.10	0.11	-	-	0.07	0.01	0.25
Mozambique	-	-	-	0.69	-	-	-	0.29	-	-	-
Nepal	-	-	-	-	-	-	0.60	-	-	-	-
Nicaragua	-	-	-	-	-	0.04	0.13	-	0.03	-	0.14
Niger	0.31	-	-	-	-	-	-	-	0.29	-	-
Sierra Leone	-	-	-	-	-	-	-	0.00	-	-	-

► No synthetic control unit is constructed from more than six countries from a donor pool

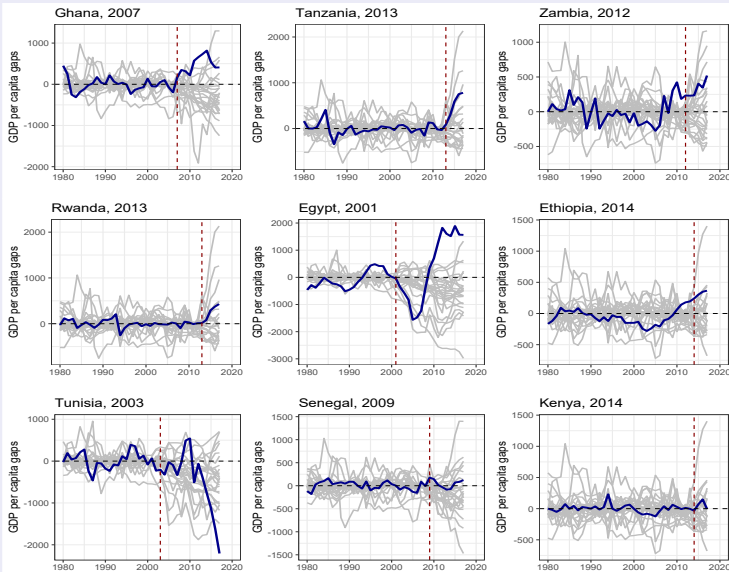
Income evolution in treated vs. synthetic country



For the majority of countries income per capita diverged noticeably from the counterfactual after treatment

Eurobond issuances have had moderate positive effects on income, about 10 percent on average within 10 years of issuance

Placebo experiments validate results



Placebo experiments validate robustness of results

All permutation distributions are more than 19.

$1/19 \approx 0.05$, the conventional level of significance

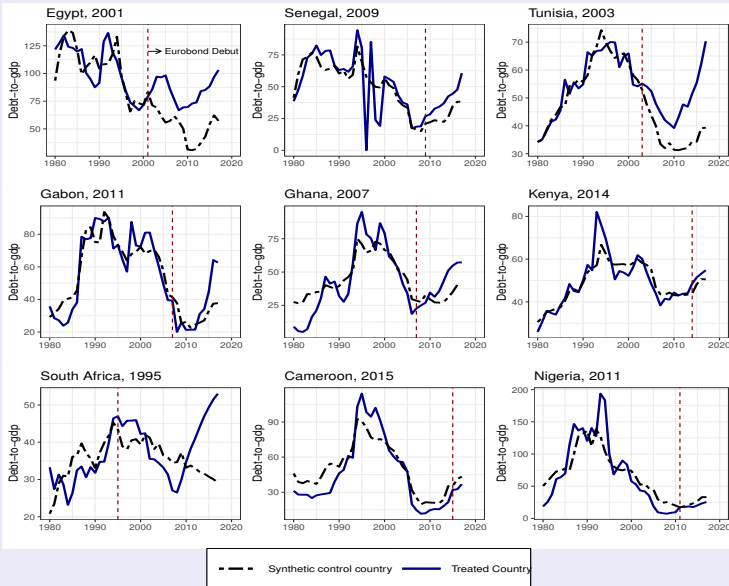
Interrogating the synthetic control choices

Synthetic control weights and country combinations for debt-to-GDP

Donor Pool	Treatment Countries													
	Ivory Coast	Cameroon	Egypt	Ethiopia	Gabon	Ghana	Kenya	Nigeria	Rwanda	Senegal	Tunisia	Tanzania	Zambia	South Africa
Algeria	-	0.39	0.50	0.14	0.04	0.18	-	0.41	-	-	0.17	-	-	-
Bangladesh	-	-	-	-	-	-	-	-	-	-	0.05	-	-	0.57
Benin	-	-	-	-	-	-	-	-	-	0.77	-	0.69	-	-
Botswana	-	-	-	-	-	-	-	0.04	-	0.02	-	-	-	0.32
Burkina Faso	-	0.21	-	-	-	0.79	0.29	-	0.84	0.06	0.20	-	-	-
Burundi	-	-	-	-	0.10	-	-	-	-	-	-	-	-	-
Central African Republic	-	0.30	-	-	-	-	0.04	-	-	-	-	-	-	-
Chad	-	0.07	-	-	-	-	-	-	-	0.00	0.19	-	-	-
Congo, Dem. Rep.	-	-	-	-	-	0.02	-	-	0.00	-	-	-	-	0.04
Equatorial Guinea	-	-	0.28	-	-	-	-	0.09	-	-	0.02	0.04	-	-
Gambia, The	-	-	-	0.28	-	-	-	-	-	-	-	-	-	-
Haiti	-	-	-	-	0.19	-	-	0.20	-	-	0.06	-	-	-
India	0.40	-	-	0.27	-	-	0.44	-	-	-	-	-	-	0.08
Iran, Islamic Rep.	-	0.03	-	-	0.14	-	0.20	-	-	0.02	-	0.01	-	-
Lesotho	0.07	-	-	-	-	-	-	-	-	-	-	-	-	-
Madagascar	0.32	-	-	-	-	-	-	-	-	-	-	-	-	-
Malawi	-	-	-	0.29	0.08	-	-	-	-	-	-	-	-	-
Mali	-	-	-	-	-	-	-	0.21	-	-	0.01	0.06	-	-
Mauritania	0.05	-	0.13	-	-	-	-	-	0.15	-	0.02	-	0.77	-
Mauritius	-	-	-	-	-	-	-	-	-	0.09	-	-	-	-
Nepal	-	-	-	-	0.45	-	-	-	-	-	0.27	-	-	-
Nicaragua	0.01	-	0.00	0.01	-	-	-	0.04	-	-	-	0.03	0.04	-
Niger	-	-	-	-	-	-	-	-	-	0.04	-	-	-	-
Sierra Leone	0.15	-	-	-	-	-	-	-	-	-	-	0.17	0.19	-
Togo	-	-	0.09	-	-	-	0.04	-	-	-	-	-	-	-

- The countries selected as potential control countries share similar historic debt characteristics in the pre-Eurobond issuance period

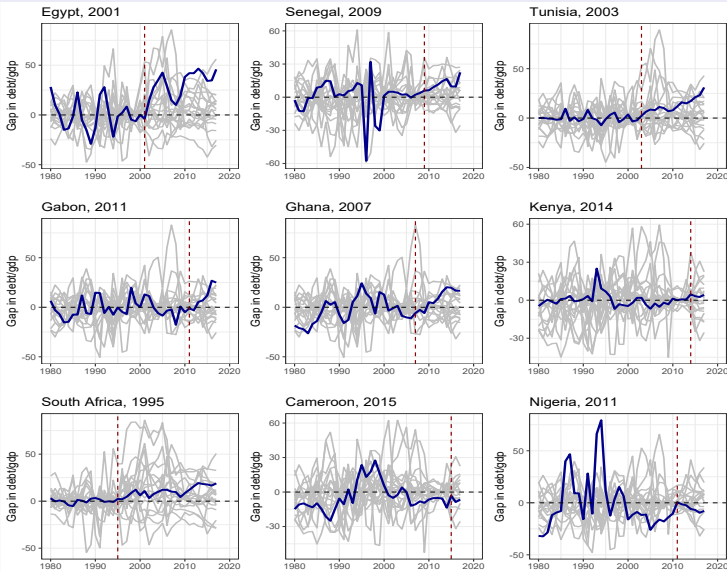
Evolution of debt-to-GDP: treated vs. synthetic country



Sharp positive effect of Eurobond intervention on subsequent debt trajectories observed

Eurobond issuances caused an increase in debt levels by an average of 13 percentage points over the counterfactual synthetic control countries

Placebo experiments for debt-to-GDP ratio



Placebo experiment confirms robustness of results

Egypt, Senegal, Tunisia, Gabon, and Ghana are robust and not by chance

Conclusion and takeaways

Takeaways

- ▶ Eurobond issuances have had a noticeable positive effect on per capita GDP—about 10 percent annual improvement
- ▶ Debt-to-GDP ratio in the post-intervention period caused an average increase of about 13 percentage points
- ▶ There has been a positive growth effect on physical capital accumulation, above 4 percentage points for some countries
- ▶ We did not find any systematic impact of Eurobond issuances on domestic capital markets

Policy considerations

- ▶ Access to international capital markets remain an important channel for raising external financing and accelerating growth and development.
- ▶ Because Eurobond issuances tend to elevate debt vulnerabilities, countries need to have active debt management frameworks that make for impactful use of the proceeds to pay for itself.
- ▶ Focus on rebalancing debt portfolio towards domestic debt markets

Merci beaucoup
Comments welcome