Does environmental pollution matter for bilateral trade? Empirical investigation in Africa

International Days of Macroeconomics and Finance 2024 - Dakhla, Morocco

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Outline

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A few facts about intra-African trade

- Between the end of the 2008 financial crisis and the outbreak of the Covid-19 pandemic, Africa was the only region (alongside Asia) to experience a trend increase in intra-regional trade.
- In 2021, with a trade volume of USD 71 billion, intra-continental trade represented around 14% of world trade (TRALAC, 2021).
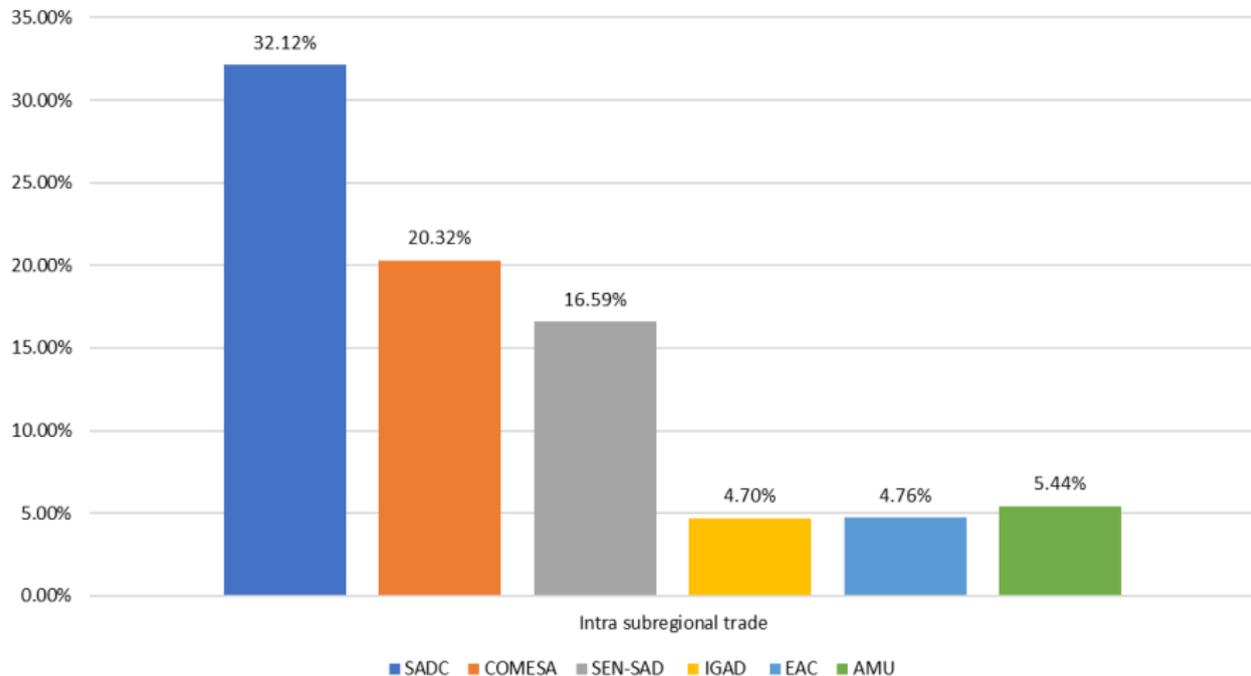- Average growth rate of intra-African trade over the period 2010-2020, is 7%.

A few facts about intra-African trade

- Despite this, regional trade remains weak.
- Only 6% of developing countries' merchandise exports are located in Africa.

A recent overview of intra-regional trade by major region
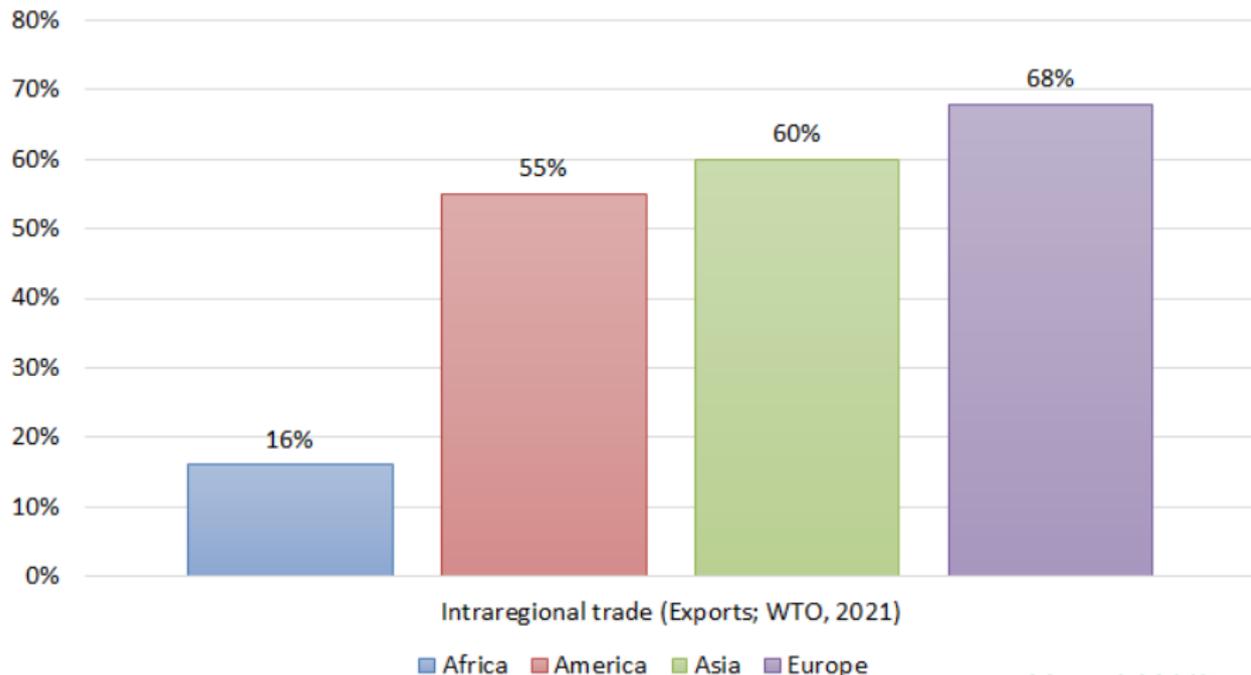
Significant sub-regional disparities

The need to identify barriers to intra-African trade

## Several factors have been proposed in the empirical literature

- quality of infrastructure, multiplicity of the trade agreements, low diversification of economies, institutional quality and precariousness of ICTs among others (see Olney, 2022; Yushi and Borojo, 2019; Ngepah and Udeagha, 2018; Olu et al., 2015; Montinari and Prodi, 2011; Longo and Sekkat, 2004; Foroutan and Pritchett, 1993)

Current priority for most African governments

Structural transformation

- The focus is on industrialization.
- The aim is to boost intra-regional trade through diversification.

The consequence of such a strategy:
increased environmental pollution

CO2 emissions (K)
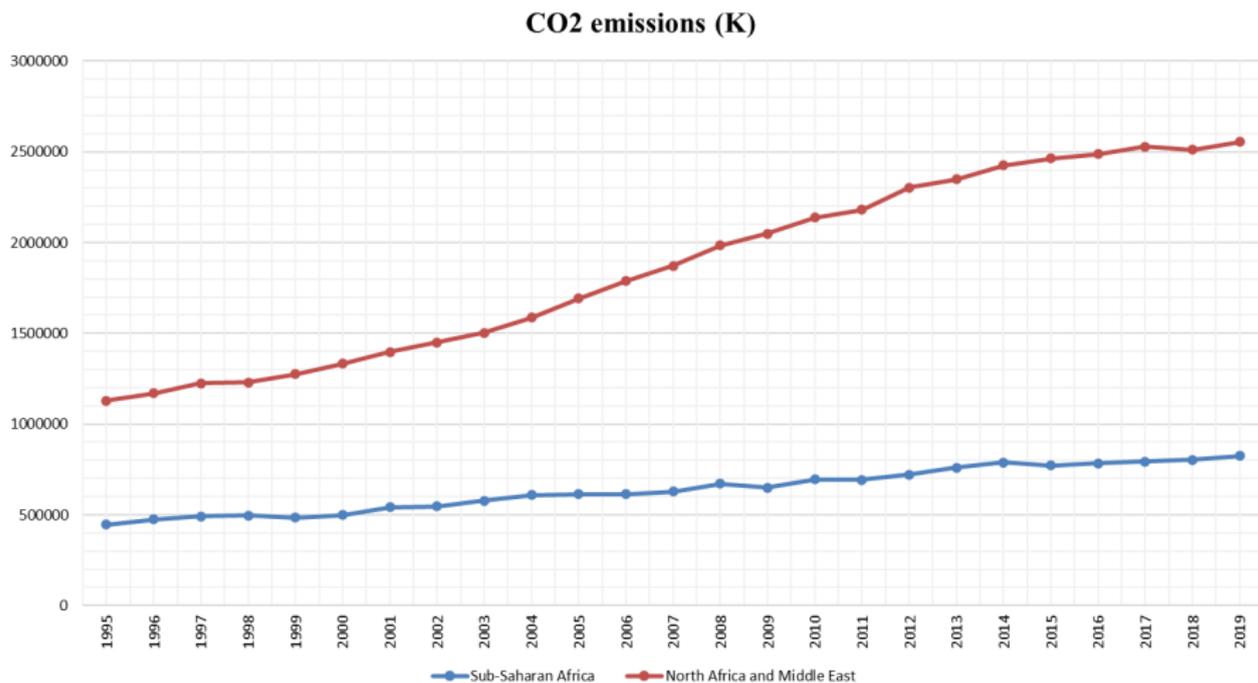
The consequence of such a strategy:
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Lesson
Possible improvement in intra-African trade at the cost of environmental pollution.

Theoretical considerations

Existence of a debate

Can environmental priorities be reconciled with international trade?

Theoretical considerations

The conventional view

- Trade-off between environment and industry performance.
- Environmental regulations increase costs for local companies, reducing specialization and thus international trade (Tobey, 1990; 2001, McGuire, 1982; Pethig, 1976; Siebert, 1977).

Theoretical considerations

Porter's point of view (1991) and Porter and Linde (1995)

- Pollution wastes resources.
- Environmental regulation stimulates business innovation and offsets induced costs, which can be a source of comparative advantage.
- Environmental concerns can stimulate international trade.

Aim of the paper

- Assess the effect of environmental pollution on bilateral trade in Africa.

Contribution

- To the best of our knowledge, this is the first study to propose environmental pollution as an explanation for bilateral trade in Africa.
- The effects of pollution are considered for both exporting and importing countries.
- Emphasis on emissions of the main greenhouse gases, namely CO2 and methane (CH4).

Sample and study period

- 32 African countries with annual data from 1995 to 2019.

Econometric framework

- Gravity model.

Dependent variable

- Bilateral exports

Variables of interest

- CO2 emissions
- Methane emissions

Control variables

- GDP, internet users, oil exports, landlocked, distance, common language, common colonial origin, common border, population

Estimation techniques

- Poisson Pseudo Maximum Likelihood (PPML)
- Zero Inflated Poisson (ZIP)

Data

- Mostly from CEPII and World Bank's WDI.

Results from PPML

Main result: Environmental pollution significantly reduces bilateral trade in
Africa

	Dependent variable: Bilateral Exportation	
VARIABLES	(a) PPML (CO2)	(b) PPML (Methane)
CO2 emissions (kt)_it	-0.597***	
	(0.00567)	
CO2 emissions (kt)_jt	-1.369***	
	(0.00453)	
Methane emissions (kt of CO2 equivalent) _it		-1.18e-0.5***
		(9.18e-08)
Methane emissions (kt of CO2 equivalent)_jt		-2.08e-08***
		(1.07e07)
Controls	Yes	Yes
Constant	Yes	Yes
Observations	101	281
Countries	32	32
Log likelihood	-223327.72	1.39e+07
Wald chi2(14)	2.41e+06	-2365518.7
Prob > chi2	0.0000	0.0000

Notes: *, **, *** significance at the 10%, 5% and 1% thresholds respectively. () The
robust standard errors.

Results from ZIP

Negatitve effect confirmed

	Dependent variable: Bilateral Exportation	
VARIABLES	(1) ZIP (CO2)	(2) ZIP (Methane)
CO2 emissions (kt)_it	-0.845*** (0.00591)	
CO2 emissions (kt)_jt	-1.359*** (0.00461)	
Methane emissions (kt of CO2 equivalent) _it		-9.95e-06*** (9.18e-08)
Methane emissions (kt of CO2 equivalent)_jt		-1.25e-05*** (9.93e-08)
Controls	YES	YES
Constant	YES	YES
Observations	101	281
Countries	32	32
Log likelihood	-198749.5	-2058907
LR chi2(32)	3111792.19	1.63e+07
Prob > chi2	0.0000	0.0000

Notes: *; **; *** significance at the 10%, 5% and 1% thresholds respectively. () The robust standard errors.

Overall, our results suggest that policymakers in Africa should strengthen regulations to induce agents to adopt more environmentally friendly behaviors that can reduce environmental pollution and can thus promote bilateral trade.

Thank you for your kind attention

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