

Evidence from Gravity Model Estimations

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Presentation Outline

- ① Introduction & Motivation
- ② Institutional Background
- ③ Data & Descriptive Statistics
- ④ Empirical Strategy
- ⑤ Main Results
- ⑥ Mechanisms & Heterogeneity
- ⑦ Robustness Checks
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Introduction

Research Question

- How does intra-regional trade integration among ACP countries affect their bilateral trade with the EU?

Key Findings

- Higher intra-regional trade shares are associated with significantly lower EU-ACP bilateral trade
- “Stumbling block” effect: At mean IT share (10%), bilateral trade is $\approx 16\%$ lower
- At 90th percentile (26%), the effect reaches 36% lower
- EPAs partially offset this negative relationship

Contribution

- First paper to empirically test the stumbling block hypothesis in EU-ACP context
- Policy relevance for trade agreement design in developing countries

Institutional Background

Cotonou Agreement & EPA Negotiations

- Signed in 2000, replaced Lomé Convention
- Key change: From non-reciprocal to reciprocal trade agreements
- Economic Partnership Agreements (EPAs) as new framework

ACP Regional Groupings

- ECOWAS (West Africa), SADC (Southern Africa)
- EAC (East Africa), CARICOM (Caribbean)
- CEMAC, COMESA, Pacific Islands Forum

Timeline

- 2000: Cotonou Agreement signed
- 2002-2007: EPA negotiations begin
- 2008 onwards: EPA implementation phases

Data Sources

- **BACI**: CEPII bilateral trade data
- **CEPII**: Gravity variables (distance, contiguity, etc.)
- **WDI**: World Development Indicators

Key Variables

- *Dependent Variable*: Bilateral trade (EU-ACP), estimated via PPML
- *Independent Variable*: Intra-regional trade share
- *Controls*: Distance, common language, colonial ties, GDP

Sample Construction

- 78 ACP countries
- 7 Regional Economic Communities
- Time period: 1995–2020

Descriptive Evidence

Figure 1a: Regional Trends

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it_share_time_series.png

Figure 1b: IT Share vs Trade

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stumbling_block_scatter.png

Regional Integration and EU-ACP Trade: Descriptive Evidence

Gravity Model Specification

Model Equation

$$\ln(TRADE_{ijt}) = \beta_0 + \beta_1 IT_SHARE_{jt} + \beta_2 EPA_{jt} \quad (1)$$

$$+ \beta_3 (IT_SHARE_{jt} \times EPA_{jt}) \quad (2)$$

$$+ \gamma X_{ijt} + \mu_{ij} + \theta_t + \epsilon_{ijt} \quad (3)$$

Key Variables

- IT_SHARE_{jt} : Intra-regional trade share for country j at time t
- EPA_{jt} : Time-varying EPA treatment indicator
- X_{ijt} : Standard gravity controls
- μ_{ij} : Country-pair fixed effects
- θ_t : Time fixed effects

Identification Strategy

Fixed Effects Structure

- **Exporter \times Year FE:** Control for time-varying exporter characteristics
- **ACP Importer FE:** Control for time-invariant importer characteristics
- **Year FE:** Control for common time shocks

Identification

- Within-country variation in IT share over time
- Standard gravity controls: distance, language, colonial ties

Main Results: Gravity Model Estimates

	Baseline PPML	IT Share PPML	IT \times EPA PPML	IT Intensity	IT Share OLS
ln(Distance)	-1.717*** (0.607)	-1.769*** (0.639)	-1.769*** (0.639)	-1.764*** (0.639)	-1.195*** (0.240)
Common Language	1.113*** (0.218)	1.119*** (0.222)	1.119*** (0.222)	1.120*** (0.222)	0.687*** (0.125)
Colonial Tie	0.205 (0.228)	0.186 (0.232)	0.186 (0.232)	0.184 (0.232)	1.251*** (0.202)
EPA (=1 in force)	-0.031 (0.047)	-0.058 (0.044)	-0.158** (0.066)	-0.055 (0.044)	-0.136*** (0.044)
Intra-REC Trade Share		-1.755*** (0.384)	-1.758*** (0.378)		-1.526*** (0.245)
EPA \times IT Share			0.901** (0.422)		
Intra-REC Trade Intensity				-0.006*** (0.002)	
Obs.	44,054	43,238	43,238	43,238	40,334
R ²					0.755

Notes: Clustered (pair_id) SE in parentheses. *** $p < 0.01$, ** $p < 0.05$. Columns (1)-(4): PPML. Column (5): OLS.

Interpretation of Magnitudes

Economic Interpretation

- At mean intra-regional trade share (10%): $\approx 16\%$ lower EU-ACP bilateral trade
- At 90th percentile (26%): $\approx 36\%$ lower bilateral trade

EPA Offset Effect

- EPAs partially mitigate the negative relationship
- Interaction term: $+0.90^{**}$ ($p < 0.05$)

Trade Direction

- Effect stronger for EU exports to ACP (-1.86)
- vs. ACP exports to EU (-1.60)

Heterogeneity: REC Effects

Figure 2a: REC Heterogeneity

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rec_coef_plot.png

Figure 2b: Marginal Effects

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marginal_effects_it_share.png

Effect of Intra-REC Trade Share on EU-ACP Bilateral Trade

Heterogeneity Analysis

REC-by-REC Subsamples

- ECOWAS, SADC, EAC, CARICOM, CEMAC, COMESA, Pacific
- All show negative effects, but substantial variation
- PIF (Pacific Islands): largest negative coefficient (-29.6)
- Central Africa: smallest effect (-0.81 , not significant)

Regional Subsamples

- Africa: largest sample, significant effects
- Caribbean: moderate effects
- Pacific: limited data, imprecise estimates

Robustness Checks

Sample Sensitivity

- Excluding outlier countries
- Different time windows
- Alternative sample definitions

Specification Alternatives

- Alternative fixed effects
- Different control variables
- Nonlinear specifications

OLS vs. PPML

- Poisson Pseudo-Maximum Likelihood addresses zero trade flows
- Results remain robust across specifications

Conclusion

Summary of Findings

- ① Strong evidence of “stumbling block” effect
- ② Higher intra-regional trade shares reduce EU-ACP bilateral trade
- ③ Magnitude: 16% to 36% reduction depending on IT share level
- ④ EPAs partially offset negative effects

Policy Implications

- Trade agreements must account for regional integration effects
- EPAs can mitigate trade-diverting effects of RECs

Limitations

- Data constraints for smaller ACP countries
- Could extend to other developing regions

Thank You!

Questions?

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