

The Erosion of Trade Linkages After Independence

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Overview

- ① Introduction
- ② Data and Methodology
 - Specification
 - Monadic Effects and Tetrads
 - Dyadic Effects
- ③ Regression Result
- ④ Trade with Different Partners
- ⑤ Falsification Exercise
- ⑥ Impact on Extensive Margin
- ⑦ Conclusion
- ⑧ Strengths and Weaknesses
- ⑨ Reference
- ⑩ Appendix

Introduction

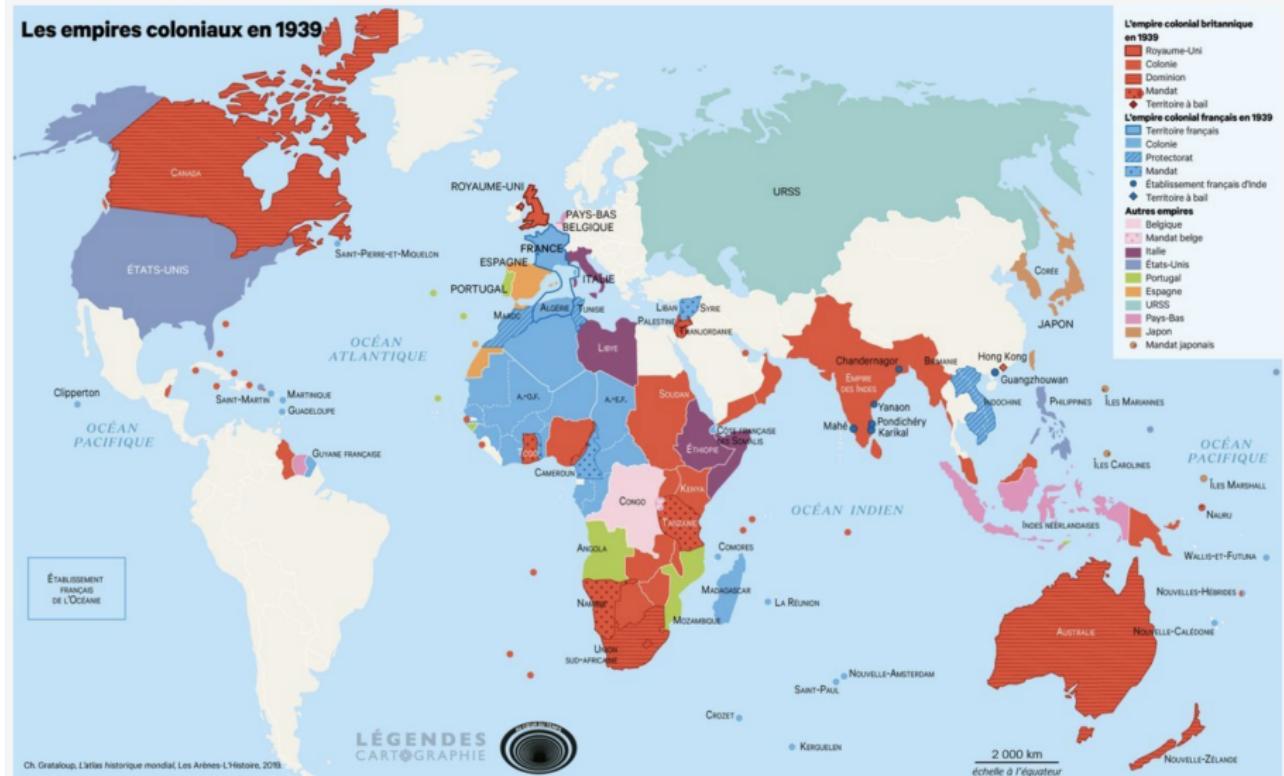
- The world today in comparison to 1945 looks very different with many independent nations across the globe.
- Prompting research in economics on the long-run consequences of the 'institutions' governing the regions prior to World War 2, being *Colonial Rule*.

Core of the paper:

'Investigates the bias in post-colonial bilateral trade pattern'

The authors use *Gravity Equation* based relationships for analysis.

The Colonial Map of the World, 1939



Source: @LegendesCarto

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November 21, 2024

4 / 27

Data

Sources:

- ① *CIA World Factbook* - for independence dates (principal variable of interest)
 - They use 255 country pairs with colonial histories, of which 34 were still in a colonial relationship in 2006.
- ② *Direction of Trade Statistics (DOTS) by IMF* - to estimate the influence of independent events on bilateral trade for the period of 1948 - 2006.

Definition of Independence:

Arises at the end of a colonial period involving long-term, civilian administration that usually includes significant settlement. The end of a military occupation is not a sufficient condition for an independence event.

The Model

The benchmark gravity model to model expected bilateral trade among countries.

$$x_{ijt} = G_t M_{it}^{ex} M_{jt}^{im} \phi_{ijt} \quad (1)$$

- x_{ijt} : exports from exporting country i to importing country j in year t
- G_t : common year factor determining trade
- M_{it}^{ex} : monadic index of attributes of *exporter i*
- M_{jt}^{im} : monadic index of attributes of *importer j*
- ϕ_{ijt} : captures the variation in bilateral trade intensity, a dyadic effect

The Model

Further, based on Eaton and Kortum (2002), approximation of the log of the dyadic term to represent observed and unobserved bilateral trade cost determinants.

$$\ln \phi_{ijt} = \delta D_{ijt} + u_{ijt} \quad (2)$$

Transforming Eq 1. by taking log,

$$\ln x_{ijt} = \ln G_t + \ln M_{it}^{ex} + \ln M_{jt}^{im} + \delta D_{ijt} + u_{ijt} \quad (3)$$

Then re-expressing as [*mostly for Poisson Pseudo-Maximum Likelihood Estimation*]:

$$x_{ijt} = \exp(\ln G_t + \ln M_{it}^{ex} + \ln M_{jt}^{im} + \delta D_{ijt}) \eta_{ijt} \quad (4)$$

The Model

Monadic Effects

Look at the composition of monadic terms: M_{it}^{ex} and M_{jt}^{im} .

- where, $M_{it}^{ex} = N_{it}^{\alpha_1} y_{it}^{\alpha_2}$,
- and, $M_{jt}^{im} = N_{jt}^{\alpha_3} y_{jt}^{\alpha_4}$
 - $N \rightarrow$ Population
 - $y \rightarrow$ GDP per capita

Putting in Eq 3

$$\ln x_{ijt} = \ln G_t + \alpha_1 \ln N_{it} + \alpha_2 \ln y_{it} + \alpha_3 \ln N_{jt} + \alpha_4 \ln y_{jt} + \delta D_{ijt} + u_{ijt} \quad (5)$$

The Model: Tetrads

- Takes the ratio of ratios approach to eliminate the monadic effects.
- Requires set of 4 trading partners, for instance countries indexed as i , j , k and l .
- Based on eq 1, ratio of i 's exports to j over its imports to country k :

$$R_{i\{jk\}t} = \frac{x_{ijt}}{x_{ikt}} = \frac{M_{jt}^{im} \phi_{ijt}}{M_{kt}^{im} \phi_{ikt}} \quad (6)$$

- Then for a reference exporter l , we get,

$$R_{l\{jk\}t} = \frac{x_{ljt}}{x_{lkt}} = \frac{M_{jt}^{im} \phi_{ljt}}{M_{kt}^{im} \phi_{lkt}} \quad (7)$$

- The ratio-of-ratios:

$$r_{\{il\}\{jk\}t} \equiv \frac{R_{i\{jk\}t}}{R_{l\{jk\}t}} = \frac{\frac{\phi_{ijt}}{\phi_{ikt}}}{\frac{\phi_{ljt}}{\phi_{lkt}}} \quad (8)$$

- Which after plugging in Eq 2 gives,

$$\ln r_{\{il\}\{jk\}t} = \delta \tilde{D}_{ijt} + \tilde{u}_{ijt} \quad (9)$$

- $\tilde{D}_{ijt} \equiv D_{ijt} - D_{ikt} - D_{ljt} + D_{lkt}$
- $\tilde{u}_{ijt} \equiv u_{ijt} - u_{ikt} - u_{ljt} + u_{lkt}$

Dyadic effects

D_{ijt} is divided into two sets:

- ① Control variables typically used in gravity equation analyses.
 - Time-invariant controls
 - Time-variant controls
- ② Indicators that represent current and past colonial ties.
 - identifies effects of being in a current or former colonial relationship

Specifications Overview

Table 1

Regression specifications used in Table 2 and Fig. 4.

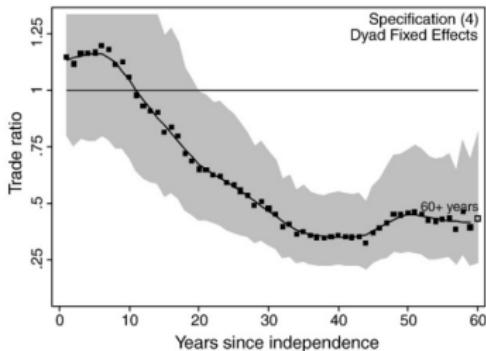
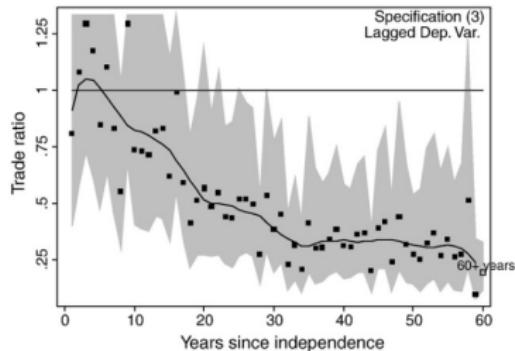
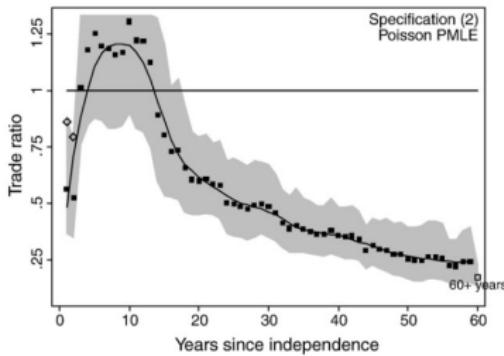
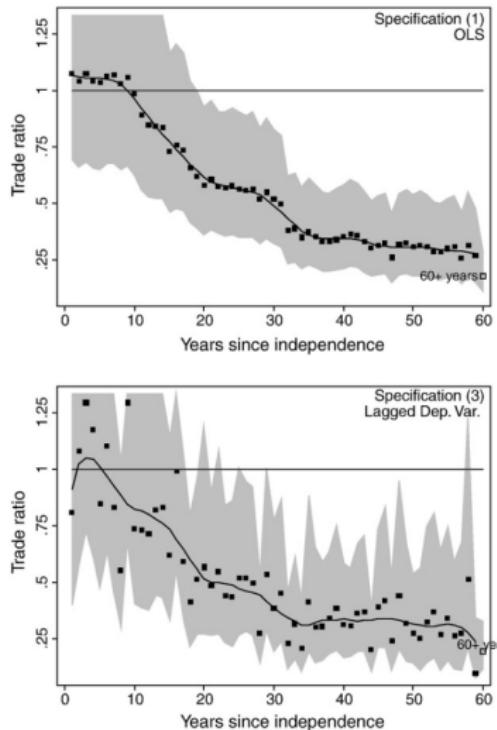
Abbreviation	Dep. Var.	Monadic Vars.	Dyadic-observed	Dyadic-unobserved
(1) OLS	$\ln x_{ijt}$	$\ln N_i, \ln N_j,$ $\ln y_i, \ln y_j$	All \mathbf{D}_{ijt}	None
(2) Poisson PMLE	x_{ijt}	$\ln N_i, \ln N_j,$ $\ln y_i, \ln y_j$	All \mathbf{D}_{ijt}	None
(3) LagDV	$\ln x_{ijt}$	$\ln N_i, \ln N_j,$ $\ln y_i, \ln y_j$	All \mathbf{D}_{ijt}	$\ln x_{ij,t-1}$
(4) DyadFE	$\ln x_{ijt}$	$\ln N_i, \ln N_j,$ $\ln y_i, \ln y_j$	Time-varying \mathbf{D}_{ijt}	Fixed effects
(5) Tetrads	$\ln r_{\{i\}\{jk\}t}$	N/A	Time-varying $\tilde{\mathbf{D}}_{ijt}$	Fixed effects

Note: \mathbf{D}_{ijt} comprises log distance; ij indicators for sharing a border, a language, legal origins, colonial history, ongoing colonial relationship; ijt indicators for regional trade agreements, common currency, both i and j in GATT, i in ACP and j in EU, and Indep1 to Indep60. All specifications include year dummies.

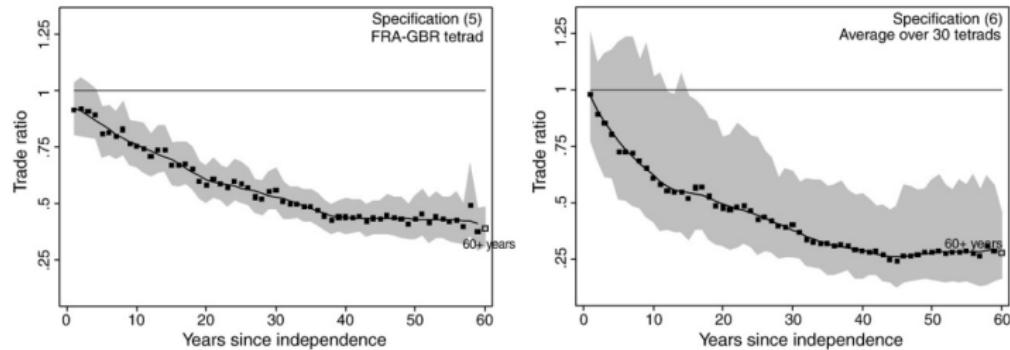
Results

Specification	(1) OLS	(2) Poisson PMLE	(3) LagDV	(4) DyadFE	(5) Tetrad FRA, GBR	(6) Tetrad 30 Avg.
<i>Monadic variables</i>						
In Pop, origin	0.882 ^a (0.006)	0.805 ^a (0.025)	0.142 ^a (0.002)	0.223 ^a (0.045)		
In Pop, dest	0.767 ^a (0.006)	0.811 ^a (0.025)	0.124 ^a (0.002)	0.886 ^a (0.039)		
In GDP/Pop, origin	1.030 ^a (0.007)	0.784 ^a (0.029)	0.162 ^a (0.002)	0.659 ^a (0.015)		
In GDP/Pop, dest	0.868 ^a (0.007)	0.825 ^a (0.027)	0.138 ^a (0.002)	0.634 ^a (0.014)		
<i>Time-fixed dyadic variables</i>						
In Dist (avg)	-0.906 ^a (0.014)	-0.641 ^a (0.040)	-0.144 ^a (0.003)			
Shared border	0.598 ^a (0.062)	0.548 ^a (0.110)	0.086 ^a (0.011)			
Shared language	0.434 ^a (0.032)	0.524 ^a (0.111)	0.055 ^a (0.006)			
Shared legal	0.306 ^a (0.024)	0.134 (0.087)	0.054 ^a (0.004)			
ColHist	1.995 ^a (0.233)	1.317 ^a (0.141)	0.300 ^a (0.041)			
ColAlways	-0.960 (0.643)	-0.610 (0.418)	-0.173 (0.111)			
<i>Time-varying dyadic variables</i>						
RTA	0.868 ^a (0.038)	-0.054 (0.102)	0.136 ^a (0.007)	0.435 ^a (0.025)	0.420 ^a (0.028)	0.383 ^a (0.062)
Both GATT	0.120 ^a (0.018)	0.060 (0.059)	0.003 (0.003)	0.181 ^a (0.015)	0.102 ^a (0.037)	0.118 ^c (0.082)
Shared currency	0.638 ^a (0.078)	-0.008 (0.086)	0.091 ^a (0.014)	0.416 ^a (0.065)	0.125 ^a (0.038)	0.290 ^c (0.156)
ACP	0.156 ^a (0.057)	-0.199 ^a (0.115)	-0.032 ^a (0.010)	-0.402 ^a (0.051)	0.256 ^a (0.067)	0.097 (0.186)
Lagged exports			0.840 ^a (0.001)			
Observations	592,923	945,873	533,359	592,923	630,317	624,855.9
R ²	.627	.743	.891	.843	n/a	n/a
RMSE	1.888	1.903	0.974	1.225	1.465	1.481

Non-Parametric Indep Effects I



Non-Parametric Indep Effects II



Graphical Independence Effects

Evidence from Ghana and the Ivory Coast

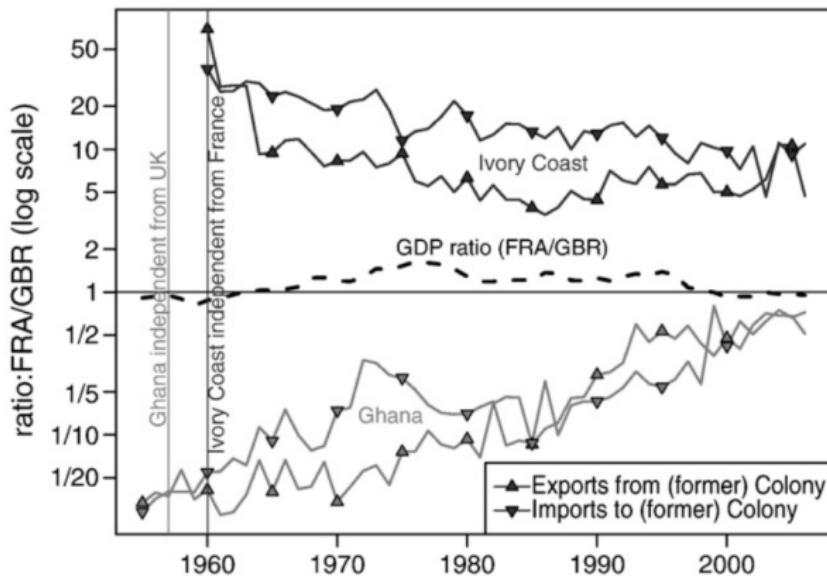


Fig. 2. Trade of Ivory Coast and Ghana with their respective metropoles.

Impact of Independence Event Type

Analysis of trade deterioration based on the dissolution of colonial ties - Amicable or Hostile.

Example:

- Algeria - War of Independence (1954 - 1962)
- Senegal - Peaceful separation 1960

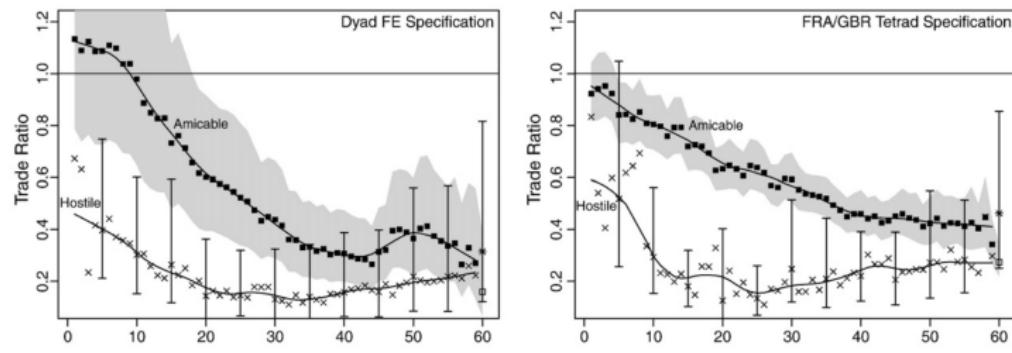


Fig. 6. Independence effects depend on type of separation.

Trade with Different Countries

The impact of independence on trade with other countries in the empire, siblings, and ROW, along with the metropole.

- Reduction in trade with siblings, and effect augments when both siblings become independent
- Increase in trade with ROW

For analysis:

- Authors use DyadFE specification
- Dummies for siblings since year of independence
- Dummies for ROW trade

Trade with Different Countries: Result

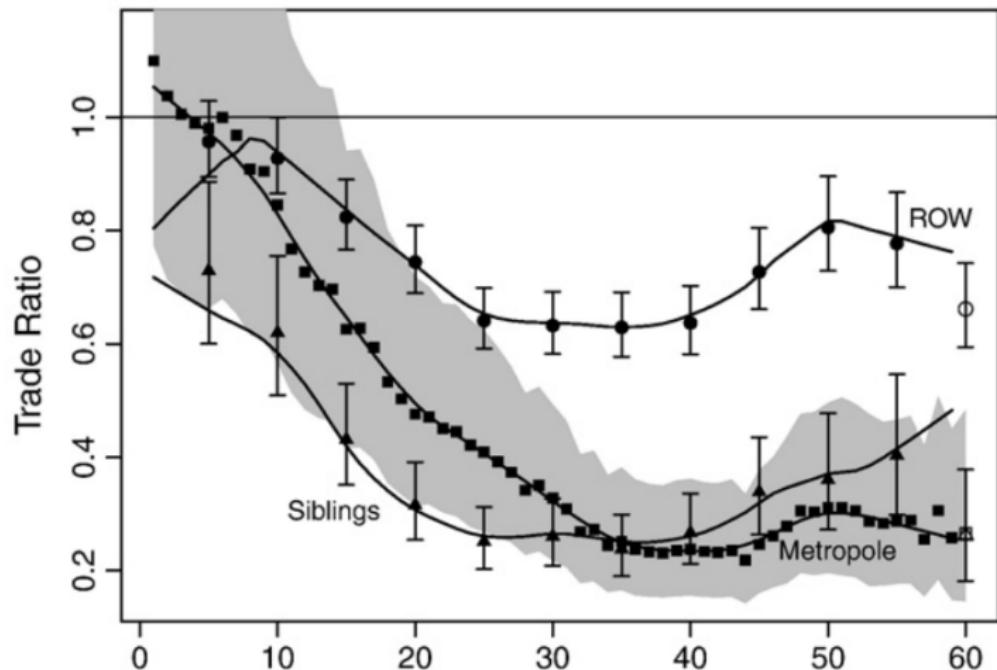


Fig. 7. Trade with metropole, "siblings", and rest-of-world after independence.

Falsification Exercise

- Assign never-colonised countries to potential colonisers from Europe and generate random independence dates between 1950 and 1975.
Example: Colony- Bhutan, Metropole- Belgium & Independence date- 1967
- Add a set of years-since independence dummies for false independence events.

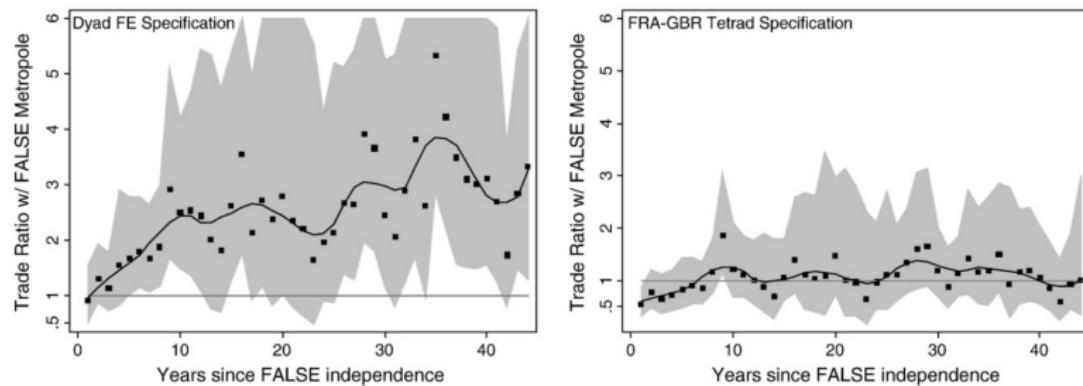


Fig. 5. Estimated independence effects for false colonial relationships.

Impact on Extensive Margin

- To see the how a former colony realises positive trade with its metropole, siblings, and ROW after independence.
- The authors use a linear probability model (LPM),
 - Dependent variable = 1 if exports are positive.
- Estimate with full sample as well as with a restricted sample, i.e. with and without zeros respectively.

Impact on Extensive Margin

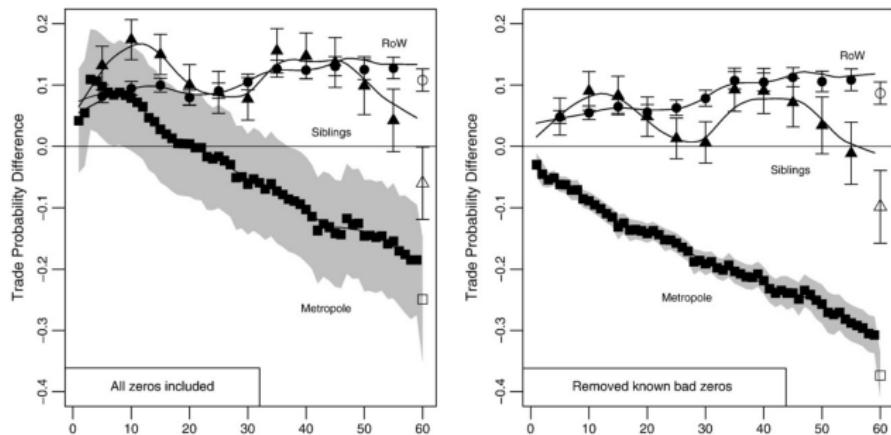


Fig. 8. Linear probability model estimates of independence effects on the extensive margin.

- Also, the authors mention that based on the regression in Table 4, the intensive margin of trade declines (unrelated to the above graphs).

Conclusion

- The paper shows that after independence, post-colonial trade contracts by about 65% after 40 years, this is seen also for siblings. This is also supported by non-parametric estimates.
- Further, trade erosion is also seen for 3rd countries by 20% after independence.
- We see similar results for the analysis for the extensive margin.
- Reductions in trade could be due:
 - Reverse causation
 - Termination of trade arrangements imposed by the metropole.
 - *Deterioration of trade-promoting capital - institutions and networks.*
- It could be interesting to see possibly how trade creation and diversification could evolves after independence among other things.

Strengths and Weaknesses

① Strengths

- Possibility of general application to newer and present forms of colonisation in the 21st century.
- Treatment of zeros and small observations.
- Contributes to the greater literature in trade especially for bilateral trade and as a general model can be used for similar exercises..

② Weakness

- Treatment of Colonial Relationship for variables like *ColHist* and *ColAlways*.
- Limited use of factors that have a considerable effect on trade relationships today.
- The characterisation of independence events - amicable and hostile.
For example: UK and India (and Pakistan).
- Inaccuracy with the treatment of historical data in some cases.
Example: Bangladesh

Reference



Keith Head, Thierry Mayer, John Ries (2010)

The erosion of colonial trade linkages after independence

Journal of International Economics, Volume 81, Issue 1, 2010, Pages 1-14.

Appendix

Table A.4

Metropoles, colonies, and independence events since 1900.

UK		Ghana	1957	Cambodia	1953	S Africa	1902†
Bermuda	-	Malaysia	1957	Syria	1946†	Austria	
Falklands	-	Sudan	1956	Lebanon	1943	Bosnia	1918†
Gibraltar	-	Eritrea	1952	Russia		Croatia	1918†
St Helena	-	Israel	1948	Armenia	1991	Czechia	1918†
Hong Kong	1997	Burma	1948	Azerbaijan	1991	Slovenia	1918†
Brunei	1984	Sri Lanka	1948	Belarus	1991	Slovakia	1918†
St Kitts	1983	Bangladesh	1947	Estonia	1991	Japan	
Antigua	1981	India	1947	Georgia	1991	Korea, N	1945†
Belize	1981	Pakistan	1947	Kazakhstan	1991	Korea, S	1945†
Vanuatu	1980	Jordan	1946	Kyrgyzstan	1991	Palau	1945†
Zimbabwe	1980	Iraq	1932	Latvia	1991	Taiwan	1945†
Kiribati	1979	Egypt	1922	Moldova	1991	Belgium	
St Vincent	1979	Ireland	1921†	Tajikistan	1991	Burundi	1962
St. Lucia	1979	Afghanistan	1919†	Turkmenistan	1991	Rwanda	1962
Dominica	1978	S Africa	1910	Ukraine	1991	Zaire	1960
Solomon Is.	1978	N Zealand	1907	Uzbekistan	1991	Denmark	
Tuvalu	1978	Australia	1901	Lithuania	1990	Faroe Is	-
Seychelles	1976	Papua	1901	Finland	1917	Greenland	-
Grenada	1974	France		Turkey		Iceland	1944
Bahamas	1973	F Guiana	-	Cyprus	-	Italy	
Bahrain	1971	F Polynesia	-	Armenia	1920†	Somalia	1960
Qatar	1971	Guadeloupe	-	Lebanon	1920†	Libya	1951
UAE	1971	Martinique	-	Yemen	1918	Eritrea	1941†
Fiji	1970	N Caledonia	-	Syria	1917†	Australia	
Tonga	1970	Reunion	-	Iraq	1916†	Papua	1975
Mauritius	1968	St Pierre	-	Albania	1912	Nauru	1968
Nauru	1968	Vanuatu	1980	Macedonia	1912†	USA	
Swaziland	1968	Djibouti	1977	Libya	1911†	Palau	1994
Yemen	1967	Comoros	1975	Germany		Philippines	1946
Barbados	1966	Algeria	1962†	Burundi	1918†	Marshall Is.	1986
Barbados	1966	Peru	1969	Namibia	1919†	Yugoslavia	



Appendix

Lesotho	1966	Cameroon	1960	Rwanda	1918†	Slovenia	1991†
Gambia	1965	C African Rep	1960	Papua	1915†	China	
Maldives	1965	Chad	1960	Nauru	1914†	Mongolia	1921†
Malawi	1964	Congo	1960	Palau	1914†	Ethiopia	
Malta	1964	Cote D'Ivoire	1960	Samoa	1914	Eritrea	1993†
Tanzania	1964	Gabon	1960	Portugal		Greece	
Zambia	1964	Madagascar	1960	Macao	1999	Cyprus	-
Kenya	1963	Mali	1960	Angola	1975†	N Zealand	
Singapore	1963	Mauritania	1960	Cape Verde	1975	Samoa	1962
Jamaica	1962	Niger	1960	Mozambique	1975	Pakistan	
Trinidad	1962	Senegal	1960	Sao Tome	1975	Bangladesh	1971†
Uganda	1962	Togo	1960	Guinea-Bissau	1974	S Africa	
Kuwait	1961	Guinea	1958	Netherlands		Namibia	1990†
Sierra Leone	1961	Morocco	1956	Aruba	-	Spain	
Cyprus	1960	Tunisia	1956	N Antilles	-	Eq Guinea	1968
Nigeria	1960	Laos	1954†	Suriname	1975		
Somalia	1960	Viet Nam	1954†	Indonesia	1949†		

Note: **Metropole** = colonizer, - = current colony, † = hostile separation.