

## **Corruption and Agricultural Trade**

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*Selected Paper prepared for presentation at the International Agricultural Trade Research Consortium's (IATRC's) 2015 Annual Meeting: Trade and Societal Well-Being, December 13-15, 2015, Clearwater Beach, FL.*

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# Corruption & Agricultural Trade

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# Corruption:



- Corruption – “The abuse of entrusted power for private gain” (Transparency International)
- “Every year, over US \$1 trillion is paid in bribes around the world, enriching the corrupt and robbing generations of a future.” – United Nations Office on Drugs and Crime (UNODC, 2006)
- Not a single country in the world is completely free from corruption.

## Corruption in the World (2010):

Rank	Country	CCI
1	Denmark	2.41
5	Finland	2.18
30	United States	1.26
66	South Korea	0.40
88	Brazil	0.00
121	Colombia	-0.41
135	India	-0.51
143	China	-0.60
147	Nepal	-0.65
165	Dominican Republic	-0.81
170	Hondurus	-0.87
171	Uganda	-0.90
172	Kenya	-0.94
180	Bangladesh	-1.02
210	Myanmar	-1.68
211	Somalia	-1.74

# Why do we care about corruption?

- Negative Impacts:
  - ▶ Lowers: Economic growth, government expenditure, per capita GDP (Mauro, 1995, 1998).
  - ▶ Raises: Transaction cost, uncertainty (Wei, 2000); Inequality and poverty (Gupta et al., 2002); Infant mortality rate (Mosley et al., 2004).
  - ▶ Hinders: Long run foreign and domestic investment (Wei, 2000); Female labor force participation (Swami et al., 2001).
- Positive Impacts:
  - ▶ Removes government imposed rigidities, enhances efficiency (Leff, 1964; Meon and Weill, 2008).

# How does Corruption affect International trade?

- Corruption prevails mostly in the form of extortion or evasion.
  - ▶ Acts as a hidden tax.
  - ▶ Influences the time it takes to trade.
  - ▶ Results in unreported trade.
  - ▶ Deprives the government of revenue.
- Protectionist trade policies: leads to higher level of corruption (Dutt, 2009).
- Bribe referred to as "speed money": helps improving efficiency (Bardhan, 1997).
- Corruption has an overall negative impact but bribery enhances imports (Jong and Bogmans, 2011).

# Research Question:

- *What is the effect of corruption on bilateral agricultural trade?*
  - ▶ Positive or negative?
  - ▶ Period of study: 2006 to 2010.

## Econometric Specification:

- Gravity Model: The volume of trade between two countries is positively related to the size of the economies and negatively related to the trade costs between them.

$$Y_{ei} = G \frac{(M_e M_i)}{D_{ei}} \quad (1)$$

- Gravity Equation:

$$Y_{eit} = \beta_0 + \sum \beta_k z_{k,ei} + \epsilon_{eit} \quad (2)$$

- Gravity Variables:
  - ▶ Size of the economy : measured by the GDP of the country.
  - ▶ Proxy for trade cost : distance between the countries.
  - ▶ Other variables : dummy for landlocked country, island economy, common language, common border, colonial heritage, etc.



## Gravity Equation:

$$\begin{aligned}\log(\text{Export})_{eit} = & \alpha + \beta_1 \text{Corruption}_{et} + \beta_2 \text{Corruption}_{it} + \gamma_1 \log(\text{GDP})_{et} \\ & + \gamma_2 \log(\text{GDP})_{it} + \gamma_3 \log(\text{Population})_{et} + \gamma_4 \log(\text{Population})_{it} \\ & + \gamma_5 \log(\text{Distance})_{ei} + \gamma_6 \text{Landlocked}_e + \gamma_7 \text{Language}_{ei} \\ & + \gamma_8 \text{Colony}_{ei} + \gamma_9 \text{Border}_{ei} + \gamma_{10} \text{Island}_e + \gamma_{11} \text{Income}_e \\ & + \gamma_{12} \text{Region}_e + \gamma_{13} \log(\text{ExchangeRate})_{et} + \gamma_{14} \log(\text{Tariff})_{iet} \\ & + \gamma_{15} \log(\text{Tariff})_{iet} \times \text{Corruption}_{et} \\ & + \gamma_{16} \log(\text{Tariff})_{iet} \times \text{Corruption}_{it} + \delta_{ei} + \epsilon_{eit}\end{aligned}\quad (3)$$

## Variables of Interest:

- Bilateral trade flow data: UN's COMTRADE database.
  - ▶ Standard International Trade Classification (SITC) Revision 1.
  - ▶ Agricultural commodities: Category 0 at one digit level.
- Control of Corruption Index (CCI).
  - ▶ Source: Worldwide Governance Indicators (WGI).
  - ▶ Range: -2.5 (most corrupt) to 2.5 (least corrupt).
- Corruption Perception index (CPI).
  - ▶ Source: Transparency International (TI).
  - ▶ Range: 0 (most corrupt) to 10 (least corrupt).

## Some of the questions asked are:

- “Is corruption in government widespread?”
- “How many elected leaders (parliamentarians) do you think are involved in corruption?”
- “How many border/tax officials do you think are involved in corruption?”
- “How common is for firms to have to pay irregular additional payments to get things done?”
- “How often do firms make extra payments in connection with taxes, customs, and judiciary?”
- “How problematic is corruption for the growth of your business?”
- “To what extent does corruption exist in a way that detracts from the business environment for foreign companies?”

# Limitations of the Model & Solutions:

- Heteroscedasticity:
  - ▶ Solution: Robust standard error.
- Auto-correlation:
  - ▶ Solution: Clustered standard error.
- Omitted variable bias:
  - ▶ Solution: Control variable; Panel regression.
- Sample Selection bias:
  - ▶ Reason: Missing trade values.
  - ▶ Solution: Heckman Correction (Two-step method, Selection method).
- Endogeneity:
  - ▶ Reason: Reverse causality; Omitted variable; Measurement error.
  - ▶ Solution: Instrumental variable regression (2SLS, GMM).

## Instrument:

- Ethnolinguistic fractionalization:
  - “The probability that two randomly selected persons from a given country will not belong to the same ethnolinguistic group” (Mauro, 1995).
- Ethnically diverse societies:
  - ▶ More likely to engage in non-collusive bribery (Shleifer and Vishny, 1993).
- ▶ Ethnic conflict:
  - ▶ Leads to political instability and higher incidence of corruption (Mauro, 1995).
  - ▶ Lowers a country’s economic growth, level of the public goods provision (Alesina et al., 1997).
  - ▶ Leads to poor economic performance (Feraon, 2002).

## Instrument:

- Ethnolinguistic Fractionalization (ELF) Index based on Taylor and Hudson (1972) formula:

$$ELF = 1 - \sum_{i=1}^n \Pi_i^2 \quad (4)$$

Where,  $\Pi_i$  is the proportion of people belonging to the ethnic group  $i$ .

- Data Source: Roeder (2001).

## ELF(1961):

Country	ELF
South Korea	0.003
Denmark	0.049
Greece	0.099
China	0.118
France	0.252
Uruguay	0.341
Spain	0.436
United States	0.501
Cuba	0.639
Burkina Faso	0.712
India	0.887
Uganda	0.909

## Results:

Dep Var: $\log(\text{Export})_{ei}$	(2-step)	(Selection)	(2SLS)	(GMM)
$\text{CCI}_e$	1.46***	0.26***	4.49***	4.49***
$\text{CCI}_i$	0.10	0.39***	2.52**	2.52**
$\log(\text{GDP})_e$	0.09	-0.10	-1.54**	-1.54**
$\log(\text{GDP})_i$	0.72***	-0.32***	0.16	0.16
$\log(\text{Dist})_{ei}$	-2.97***	0.79***	-3.72***	-3.72***
$\log(\text{Tariff})_{ie}$	0.14	-0.73	0.64**	0.64**
$\log(\text{Ex Rate})_e$	1.32	0.00	1.59***	1.59***
$\log(\text{Tariff})_{ie} \times \text{CCI}_e$	-0.123*	0.056*	-0.59***	-0.59***
$\log(\text{Tariff})_{ie} \times \text{CCI}_i$	-0.05	-0.03	-0.57**	-0.57**
Observations	1944	15049	11962	11962
F-statistic			15.42	16.49

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Region dummy, income dummy, and year fixed effect included.



## Results continued:

Dep Var: $\log(\text{Export})_{ei}$	(2-step)	(Selection)	(2SLS)	(GMM)
$\log(\text{Popl})_e$	0.46	-0.28***	2.57***	2.57***
$\log(\text{Popl})_i$	-0.02	-0.04	0.65**	0.65**
$\text{Island}_e$		0.08	-0.11	-0.11
$\text{Landlocked}_e$		-0.10	-1.06***	-1.06***
$\text{Colony}_{ei}$		-0.27	0.79	0.78*
$\text{Language}_{ei}$		-0.50***	0.74***	0.74***
$\text{Border}_{ei}$		-0.45*	0.02	0.02
Constant	-5.54	14.32***	0.01	0.01
Observations	1944	15049	11962	11962
F-statistic			15.42	16.49

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Region dummy, income dummy, and year fixed effect included.

## Sensitivity Analysis:

Dep Var: $\log(\text{Export})_{ei}$	(2-step)	(Selection)	(2SLS)	(GMM)
$\text{CPI}_e$	0.502***	0.126***	2.309***	2.309***
$\text{CPI}_i$	0.066	0.252***	1.199**	1.199**
$\log(\text{GDP})_e$	0.119	-0.170**	-1.797***	-1.797***
$\log(\text{GDP})_i$	0.708***	-0.289***	0.134	0.134
$\log(\text{Dist})_{ei}$	-2.830***	0.821***	-3.751***	-3.751***
$\log(\text{Ex Rate})_e$	1.637*	-0.787	0.632	0.632
$\log(\text{Tariff})_{ie}$	0.422	-0.005	3.283***	3.283***
$\log(\text{Tariff})_{ie} \times \text{CPI}_i$	-0.049	0.022*	-0.342***	-0.342***
$\log(\text{Tariff})_{ie} \times \text{CPI}_i$	-0.017	-0.021	-0.260**	-0.260**
Observations	1787	14116	11390	11390
F-Statistic			18.75	18.64

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Region dummy, income dummy, and year fixed effect included.

## Sensitivity Analysis continued:

Dep Var: $\log(\text{Export})_{ei}$	(2-step)	(Selection)	(2SLS)	(GMM)
Colony <sub>ei</sub>		-0.196	0.619	0.619
Island <sub>e</sub>		0.096	0.061	0.061
Landlocked <sub>e</sub>		-0.133	-1.051***	-1.051***
Language <sub>ei</sub>		-0.481***	0.703***	0.703***
Border <sub>ei</sub>		-0.450*	0.038	0.038
$\log(\text{Popl})_e$	0.406	-0.204***	2.778***	2.778***
$\log(\text{Popl})_i$	-0.034	-0.063	0.677**	0.677**
Constant	-8.730*	12.80***	-7.229**	-7.229**
Observations	1787	14116	11390	11390
F Statistics			18.75	18.64

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Region dummy, income dummy, and year fixed effect included.

# Conclusion & Policy Implications:

- Conclusion:
  - ▶ Corruption can be trade-taxing when the protection level is low.
  - ▶ Corruption can be trade-enhancing for highly protected countries.
  - ▶ The results were robust for different measures of corruption.
- Policy implications:
  - ▶ Liberalize international trade.
  - ▶ Adopt modern techniques and technologies to reduce direct interaction between the traders & customs officials.
  - ▶ Improve governance structure, quality of human capital, freedom of press, etc.

The End

Thank You!