Pain and Gain: The Short- and Long-run Effects of Economic Sanctions on Growth

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Introduction

- Economic sanctions are instruments for coercive foreign diplomacy
  - senders and targets
  - commonly used by US, EU, UN and others
  - imposed on the basis of well-defined standards
  - becoming more popular (instead of war)
- Sanctions and GDP per capita
  - EU/UN/US on Iraq (1990, -65.0%)
  - UN/US on Libya (2011, -62.4%)
  - EU/UN on Rwanda (1994, -47.5%)
- Endogeneity between sanctions and GDP

Research Questions and Findings

- What is the impact of economic sanctions on growth?
  - we propose an IV strategy to identify the impact of sanctions on growth
  - we find that OLS estimates are biased downward
  - negative in the SR and insignificant over LR (10 years)

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  - trade sanctions: lingering negative effects both in SR and LR
  - smart sanctions: insignificant in the SR, positive over 10 years

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- Impact Mechanism
  - TFP, human capital, democracy and general social unrest

Literature Review

- impact of economic sanctions
  - Neuenkirch and Neumeier (15', 16'), Shin et al. (16'), Rosenberg et al. (16'), Felbermayer et al. (19')

- trade, aid and growth
  - Frankel and Romer (99'), Feyrer (19'), Rajan and Subramanian (08')

- trade vs. smart sanctions
  - Ahn and Ludema (17', 19'), Drezner (11'), Rosenberg et al. (16'), Hufbauer et al. (08')

Outline

- Introduction
- Discuss our IV
- Main specification
- Regression results
- Conclusions

Threat to Identification

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- OLS is biased if χ_{jt} and Y_{jt} (GDP per capita) are correlated.

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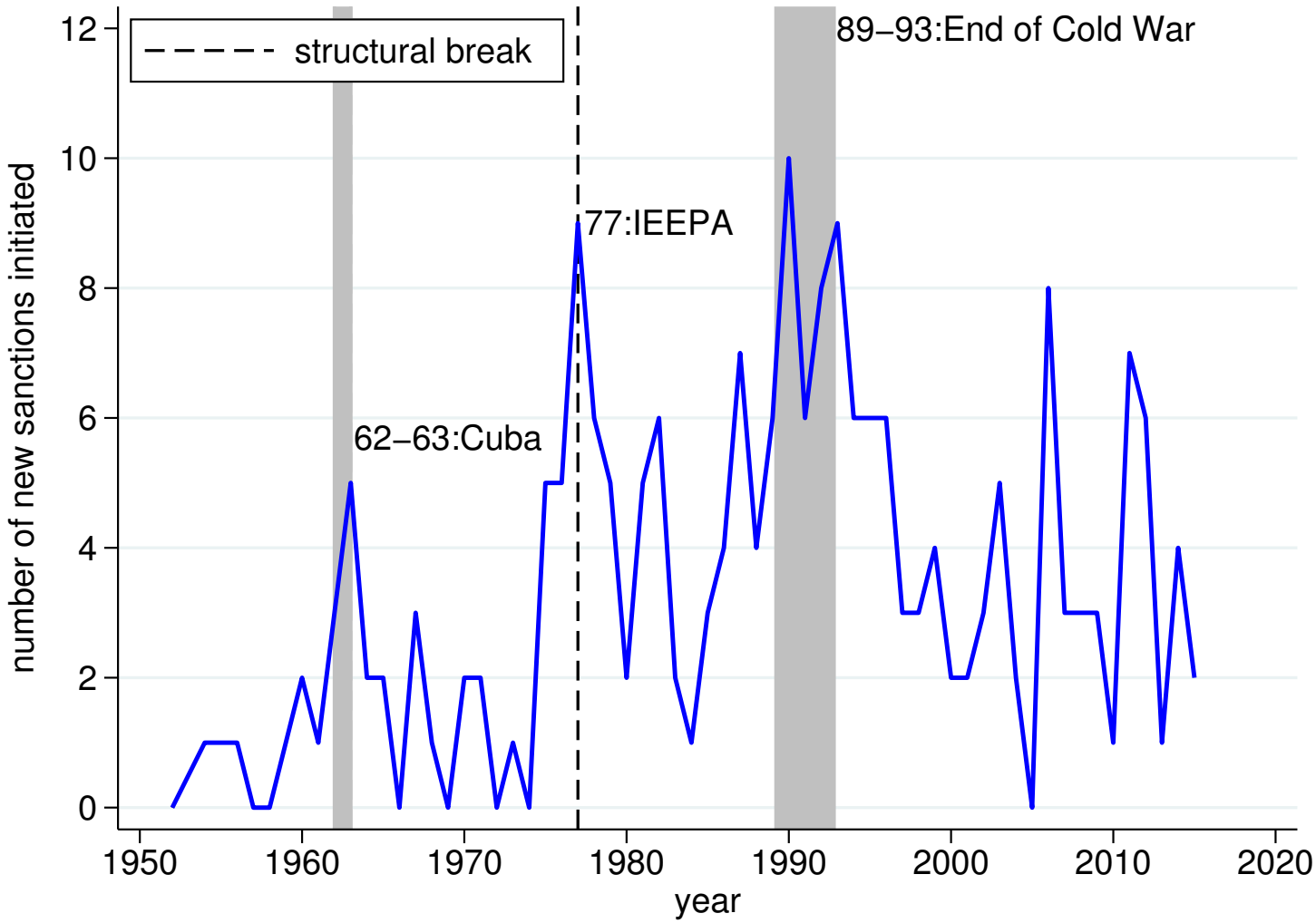
- assume that $\mathcal{S}_{it}$ is exogenous to Y_{jt},

US Sanctions



US Sanctions

EXECUTIVE ORDER

PROHIBITING CERTAIN TRANSACTIONS WITH AND SUSPENDING ENTRY INTO THE UNITED STATES OF FOREIGN SANCTIONS EVADERS WITH RESPECT TO IRAN AND SYRIA

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the International Emergency Economic Powers Act (50 U.S.C. 1701 *et seq.*) (IEEPA), the National Emergencies Act (50 U.S.C. 1601 *et seq.*), section 212(f) of the Immigration and Nationality Act of 1952, as amended (8 U.S.C. 1182(f)), and section 301 of title 3, United States Code,

I, BARACK OBAMA, President of the United States of America, hereby find that

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$$S_{ijt} = \beta_0 + \beta_1 \hat{\mathcal{S}}_{it} + \beta_2 \hat{\mathcal{C}}_{ij} + \beta_3 \hat{\mathcal{S}}_{it} \cdot \hat{\mathcal{C}}_{ij} + \epsilon_{ijt}$$

where $(\mathcal{C}_{ij})$ is the pre-determined country-pair characteristics

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- We use

$$\hat{S}_{jt} \equiv \sum_i \hat{S}_{ijt}$$

  to instrument the endogenous variable

$$S_{jt} \equiv \sum_i S_{ijt}$$

IV Regression

- IV regression specification:

$$\log(Y_{jt}) = \beta_0 + \beta_S S_{jt} + \underbrace{\Phi_j + D_t + \Phi_j \cdot D_t^{10y} + R_j \cdot D_t}_{\text{fixed effects}} + \epsilon_{jt},$$

where

- Y_{jt} is the GDP per capita of country j in year t
- S_{jt} is the number of sanctions that country j received
- FEs include
  - country FEs interacted with decade FEs
  - region FEs interacted with year FEs
- ϵ_{jt} is the error term
- We also substitute S_{jt} with S_{jt}^z, where z indicates a particular type of sanctions.
  - $z \in \{\text{trade}, \text{fin./trav.}, \text{other}\}$

IV Regression

- For lingering effects of sanctions, we regress

$$\log(\bar{Y}_{jt}^{10y}) = \beta_0 + \beta_S \sum_{t'=0,1,\ldots 9} S_{jt+t'} + \underbrace{\Phi_j + D_t + \Phi_j \cdot D_t^{10y} + R_j \cdot D_t}_{\text{fixed effects}} + \epsilon_{jt},$$

  where

- $\bar{Y}_{jt}^{10y}$ is the average GDP per capita over 10 years
- $\sum_{t'=0,1,\ldots 9} S_{jt+t'}$ is the sum of sanctions over 10 years

Data Source

- Sanctions
  - Global Sanctions Data Base (Felbermayr et al. 20')
- Economic indicators
  - GDP per capita (WDI)
  - trade, TFP, human/physical capital (PWT)
- History / Geography Characteristics
  - Population, distance, language, colonial ties (CEPII)
- Others
  - Democracy (Acemoglu et al. 19')
  - Strikes, Revolutions etc. (CNTS)
  - Wars (UCDP)
- Sample restrictions
  - 56 (-3) target countries (95% of observed sanctions), 50 largest sender countries
  - year: 1960-2015

Stage Zero

- Recall that the "stage zero" is a probit regression as follows

$$S_{ijt} = \beta_0 + \beta_1 \hat{\mathcal{S}}_{it} + \beta_2 \hat{\mathcal{C}}_{ij} + \beta_3 \hat{\mathcal{S}}_{it} \cdot \hat{\mathcal{C}}_{ij} + \epsilon_{ijt}$$

Stage Zero

Dep. Var.	(1) Any S_{ijt}	(2) Any S_{ijt}	(3) z=Trade S^z_{ijt}	(4) z=Fin./Trav. S^z_{ijt}	(5) z=Other S^z_{ijt}
$\hat{\mathcal{S}}_{it}$	0.0631***	0.0511***			
	(0.000465)	(0.000890)			
$\hat{\mathcal{S}}^z_{it}$			0.0653***	0.0943***	0.102***
			(0.00167)	(0.00123)	(0.00391)
POP_i/POP_j	-0.0562***	-0.110***	-0.0885***	0.0305***	-0.0858***
	(0.00192)	(0.00327)	(0.00407)	(0.00310)	(0.00345)
log(*distance*)	-0.0949***	-0.150***	-0.239***	-0.0239***	0.216***
	(0.00507)	(0.00748)	(0.00779)	(0.00806)	(0.0106)
LANG	0.0843***	0.113***	-0.181***	0.146***	0.314***
	(0.0117)	(0.0185)	(0.0234)	(0.0183)	(0.0192)
Observations	190,400	190,400	190,400	190,400	190,264
colonial ties	✓	✓	✓	✓	✓
$\hat{\mathcal{S}}_{it} \cdot \hat{\mathcal{C}}_{ij}$		✓			
$\hat{\mathcal{S}}^z_{it} \cdot \hat{\mathcal{C}}_{ij}$			✓	✓	✓

First Stage

- We run a naive regression

$$S_{jt} = \beta_0 + \beta_1 \hat{S}_{jt} + \epsilon_{jt}$$

- Recall that
  - S_{jt} is the number of sanctions that country j received in year t
  - $\hat{S}_{jt}$ is the *predicted* number of sanctions with exogenous variables

First Stage

	(1)	(2)	(3)	(4)
		z=Trade	z=Fin./Trav.	z=Other
Dep. Var.	S_{jt}	S^z_{jt}	S^z_{jt}	S^z_{jt}
$\hat{S}_{jt}$	1.059***			
	(0.0570)			
$\hat{S}^z_{jt}$ (z=Trade)		1.044***		
		(0.118)		
$\hat{S}^z_{jt}$ (z=Fin./Trav.)			1.062***	
			(0.0643)	
$\hat{S}^z_{jt}$ (z=Other)				1.836***
				(0.201)
Constant	-0.425	-0.168	-0.177	-1.988***
	(0.380)	(0.438)	(0.142)	(0.428)
Observations	3,808	3,808	3,808	3,808
Adjusted R^2	0.096	0.040	0.130	0.038
F-statistic	345.27	78.25	272.65	83.17

Main Results

- Recall that our main regression specification is

$$\log(Y_{jt}) = \beta_0 + \beta_S S_{jt} + \underbrace{\Phi_j + D_t + \Phi_j \cdot D_t^{10y} + R_j \cdot D_t}_{\text{fixed effects}} + \eta_{jt},$$

- instrument S_{jt} with $\hat{S}_{jt}$

SR and LR Effects of Sanctions

Dep. Var.	(1)	(2)	(3)	(4)
	$\log Y_{jt} \times 100$		$\log \bar{Y}_{jt}^{10y} \times 100$	
	OLS	IV	OLS	IV
panel A				
S_{jt}	-0.230***	-0.188***		
	(0.0397)	(0.0525)		
panel B				
$\sum_{t'=t}^{t+9} S_{jt'}$			-0.0292***	-0.000279
			(0.00499)	(0.0157)
Observations	2,103	2,103	1,626	1,626
Countries	53	53	53	53
Region × Year FE	✓	✓	✓	✓
Country × 10-Year FE	✓	✓	✓	✓
First Stage F-statistic		249.83		79.74

Trade vs. Smart Sanctions

Dep. Var.	(1) $\log Y_{jt} \times 100$	(2) $\log Y_{jt} \times 100$	(3) $\log \bar{Y}_{jt}^{10y} \times 100$	(4) $\log \bar{Y}_{jt}^{10y} \times 100$
panel A				
S_{jt}^{z} (z=Trade)	-0.183*	-0.204**		
	(0.0973)	(0.0984)		
S_{jt}^{z} (z=Fin./Trav.)	-0.109	-0.122		
	(0.0721)	(0.0755)		
S_{jt}^{z} (z=Other)		-0.281		
		(0.285)		
panel B				
$\sum_{t'=t}^{t+9} S_{jt'}^{z}$ (z=Trade)			-0.0828***	-0.0671**
			(0.0201)	(0.0288)
$\sum_{t'=t}^{t+9} S_{jt'}^{z}$ (z=Fin./Trav.)			0.0549***	0.0682***
			(0.0179)	(0.0233)
$\sum_{t'=t}^{t+9} S_{jt'}^{z}$ (z=Other)				0.220*
				(0.128)
Observations	2,103	2,103	1,626	1,626
Countries	53	53	53	53
Region × Year FE	✓	✓	✓	✓
Country × 10-Year FE	✓	✓	✓	✓
First Stage F-statistic	69.32	10.65	54.72	4.35

Mechanisms

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- We use the following regression specification

$$\bar{X}_{jt}^{t'y} = \beta_0 + \sum_{z=\text{trade, smart}} \beta_S^z S_{jt}^z + \Phi_j + D_t + \Phi_j \cdot D_t^{10y} + R_j \cdot D_t + \epsilon_{jt},$$

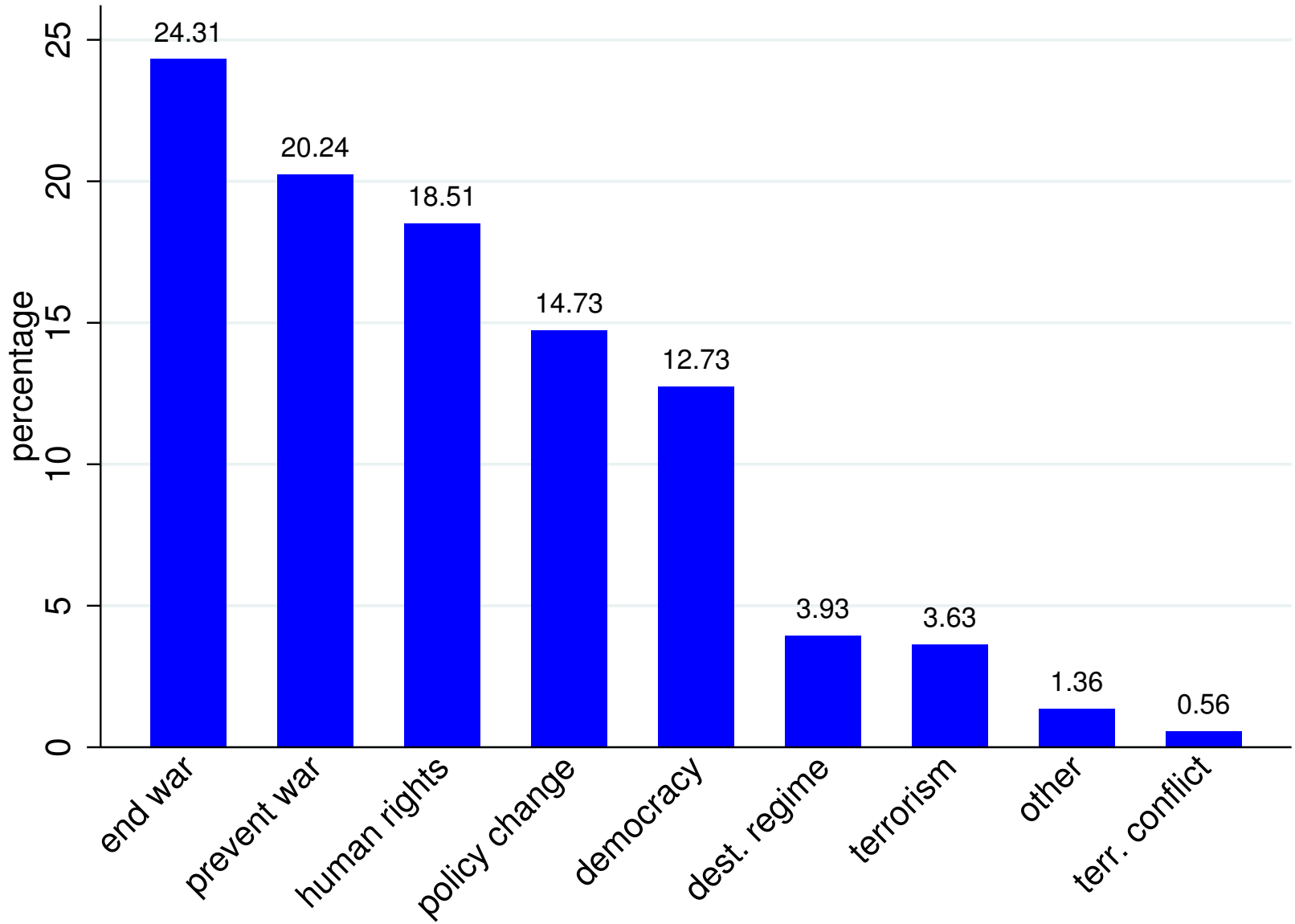
where $\bar{X}_{jt}^{t'y}$ are the t'-year average of the mechanism variable X since year t.

Mechanism Variables

- Two broad categories of $\bar{X}_{jt}^{t'y}$:
  1. trade, TFP and factors of production
     - export / GDP
     - import / GDP
     - TFP
     - human capital
     - physical capital
  2. objectives of sanctions
     - democracy
     - strikes, demonstrations, revolutions
     - terrorist activities
     - wars

- We plot the time series of β_S^z with their 95% confidence intervals.

Figure: Sanctions By Objectives



Source: Global Sanctions Data Base (GSDB)

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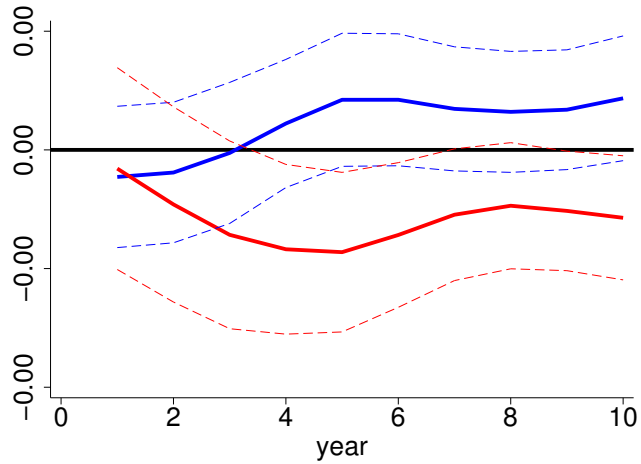
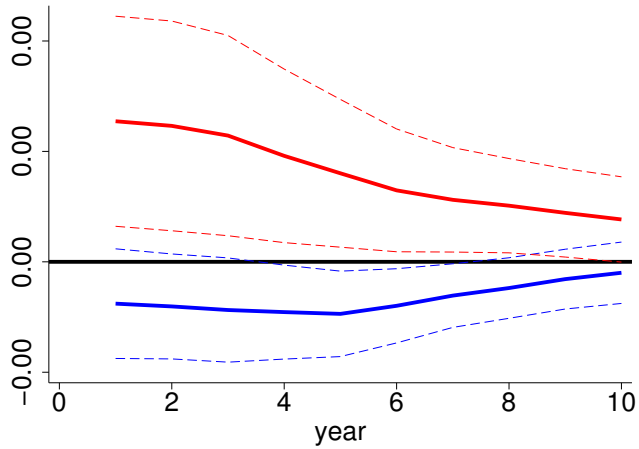
Figure: Potential Mechanisms, Part I (Trade vs. Smart Sanctions)

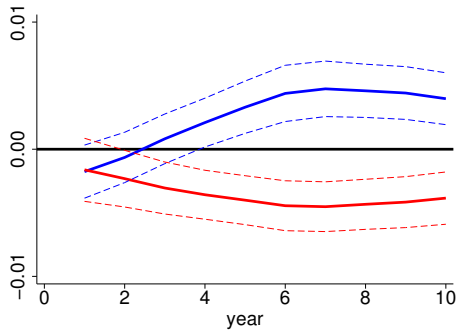
(a) Export/GDP



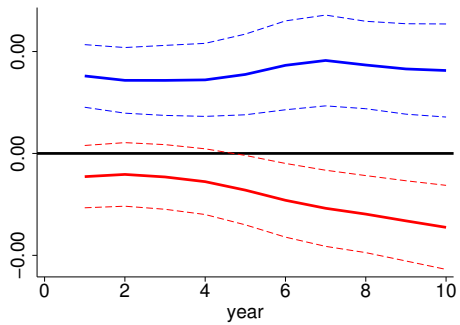
(b) Import/GDP



(c) TFP



(d) Human Capital



(e) Physical Capital

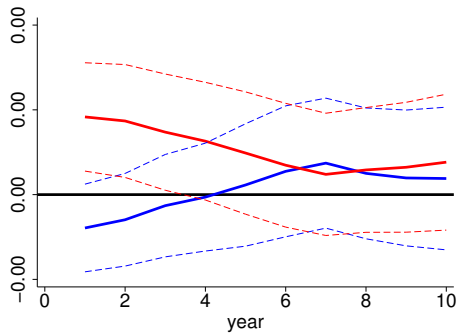
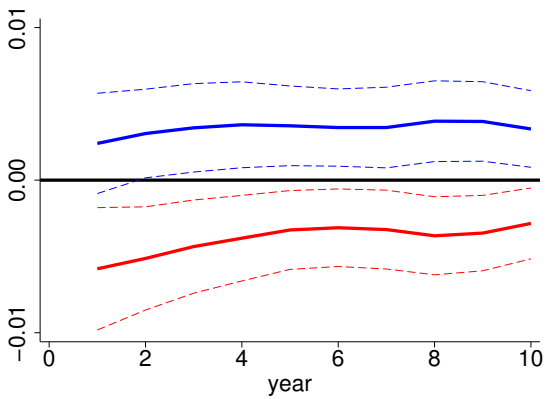
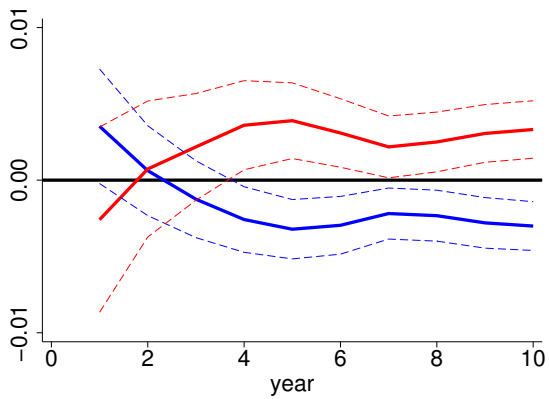


Figure: Potential Mechanisms, Part II (Trade vs. Smart Sanctions)

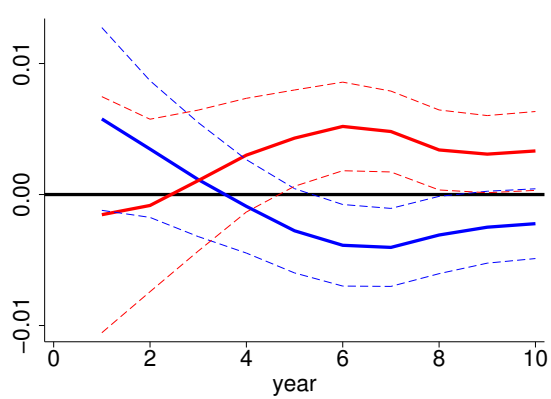
(a) Democracy



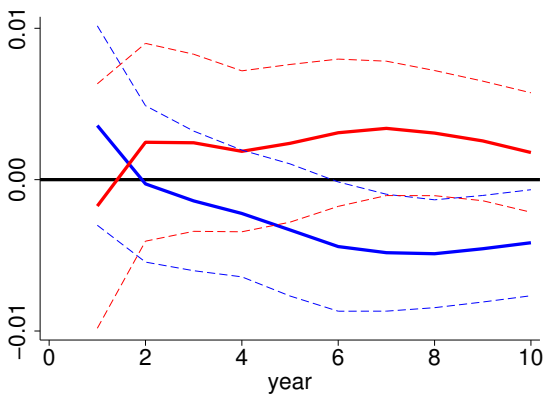
(b) Strikes



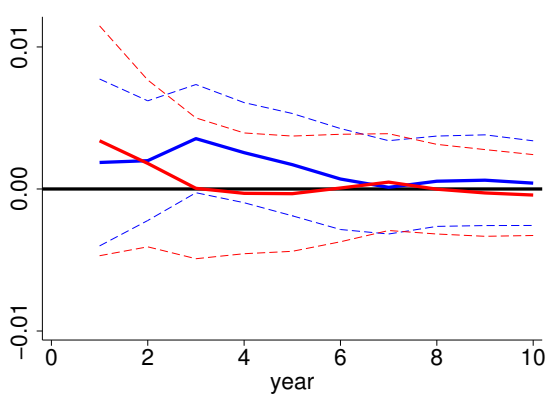
(c) Anti-Government Demonstrations



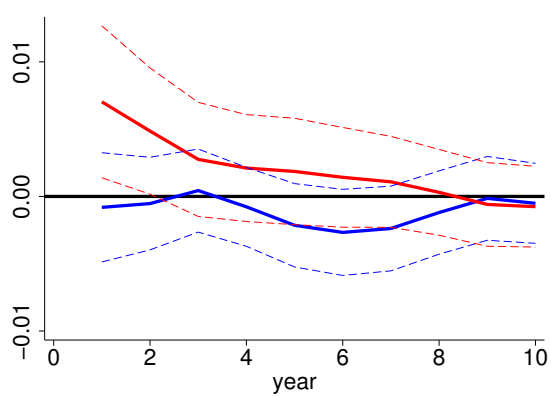
(d) Revolutions



(e) Terrorist Activities



(f) Wars



Conclusions

- We propose a novel IV strategy to address the endogeneity issue of sanctions.
- We show that
  - sanctions have a negative SR and insignificant LR effects on growth
  - trade sanctions are always detrimental
  - smart sanctions can be beneficial in the long run
- For mechanisms, we show that smart sanctions improve TFP, human capital and democracy, and they reduce the extent of social unrests.

Appendix