

# On the Dynamics of Corruption

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## Corruption: Definition

- Wikipedia: A form of dishonesty or criminal activity undertaken by a person or organization entrusted with a position of **authority**, often to acquire illicit benefit. ... May include bribery and embezzlement, ... it may also involve practices that are **legal** in many countries. Political corruption: office-holder or other governmental employee acts in an official capacity for personal gain. Petty corruption, small favors. Grand corruption: affecting government on a large scale ... and corruption so prevalent, part of the everyday structure of society, including ... organized crime. Corruption and crime: endemic social occurrences ... with regular frequency in virtually all countries, varying degree and scale.

What do we do?

Paper **motivates** corruption regarding **enforcement of property rights** over legitimate income: **rent-seekers** prey on incomes, are pursued by cops. Some of the cops may choose to **go rogue**, appropriate what belongs to the treasury.

## Corruption: Definition, continued

Corruption and Rent-seeking lead to misallocation.

Misallocation stunts growth, because:

- Corruption: defined differently by data sets. Measures widely available.
- Rent-seeking: elusive concept defies consistent measurement.
- bribery, embezzlement, nepotism, extortion and racketeering, illegal licensing, tax evasion, information misreporting
- rent-seeking, predation, appropriation, extraction, involuntary redistribution, property crime
- all distort incentives.

This paper defines corruption as **dereliction** of duty by enforcers pursuing rent seekers and **appropriation** of ill-gotten gains of rent seekers caught.

# Outline of presentation

1. Highlights of Azariadis and Ioannides “On the Dynamics of Corruption”
2. Measurement of corruption, culture and institutions
3. Estimation of three dynamic equations:
  - 3.1 GDP per capita against culture, and lagged human capital, institutions and corruption
  - 3.2 Corruption against culture and lagged corruption, institutions and human capital
  - 3.3 Institutions against culture and lagged corruption, institutions and human capital

# Overview of Azariadis and Ioannides

- Joint evolution of corruption and per capita GDP, enriched with accounting for personal morality, and culture moderating social interactions.
- Institutions enforce property rights to legitimate income, majority voting over “strong” vs. “weak” enforcement.
- Culture moderates social conventions, “norms,” similar to consumption externalities.
- Households choose: {honest work, rent-seeking, corruption}.
- Key predictions: societies with collectivist cultures and corruption-tolerant norms behave very differently from the individualistic ones of neoclassical growth theory:
  - highly nonlinear GDP and corruption dynamics;
  - dominant roles for culture and social norms as engines of institutional quality, corruption and growth;
  - majorities can favor weak property rights,
  - world economy: individualistic and collectivist convergence clubs with two distinct stable long-run states.

## Key features of Azariadis and Ioannides, cont'd

- standard two-period OLG model of world growth [Diamond (1965)]
- many similar countries, common economic fundamentals (population, technology, tastes and endowment)
- different social structure (culture, history, politics)
- perfect capital mobility, zero labor mobility: common wage & interest rate, independent of social structure, antisocial behavior.
- world capital/labor ratio independent of any nation's institutional choice
- Rent seekers prey on legitimate income. Government hires cops to enforce property rights.
  - $\mu$  % less productive: at equilibrium between rent-seeking and production
  - $1 - \mu$  % more productive: equilibrium between production and enforcement.  
enforcers: at equilibrium, honest or corrupt?
  - (corrupt enforcers =  $(1 - \mu)x_t$ ; rent-seekers =  $\mu\rho_t$ ).

## Key features of Azariadis and Ioannides, cont'd

- common neoclassical production function:

$$Y_{j,t} = K_{j,t}^{\alpha} N_{j,t}^{1-\alpha}, \quad j = 1, \dots, J.$$

- rent-seekers preying on workers, enforcers policing rent-seekers: DMP-style CRS technologies describe matching
- individuals affected by social norms, via taste for conformism over  $x_t^n = x_{t-1}$ ,  $\rho_t^n = \rho_{t-1}$ :
- productive workers “dislike” anti-social behavior  $1 - \sigma x_{t-1}$
- rent seekers “like” anti-social behavior  $1 - (1 - \sigma)x_{t-1}$ ; and individual shock augments anti-social income.
- institutions proxied by enforcement intensity, policy  $\theta_t := \frac{\text{enforcers}}{\text{rent seekers}} = \frac{D_t}{X_t}$ .

## Key features of Azariadis and Ioannides, cont'd

- Individualism  $\sigma$  culture  $\beta$  collectivism [Hofstede]

Greif (1994): "Cultural beliefs are the ideas and thoughts common to several people that govern **interaction** — between these people and among them, ... which capture people's expectations with respect to actions that others ..."

- Social interaction effects: linked to antisocial behavior

- Utility function:  $v_{i,j,t} = (1 - \delta_{i,j,t})y_{i,j,t}R_{j,t+1}^\beta =: \hat{y}_{i,j,t}R_{t+1}^\beta$

- Lagged endogenous social effect: honest dislike, corrupt/rent-seekers like anti-social behavior:

- Honest:  $\delta_{i,j,t} = \sigma x_{j,t-1}$

- Corrupt & rent-seekers:  $\delta_{i,j,t} = \sigma(1 - x_{j,t-1})$ .

- Additional individual social effect augments antisocial income.

- Institutions North (1990): "the humanly devised **constraints** that structure human interactions ... rules, laws, constitutions,... and their **enforcement** characteristics."



# Key Highlights of Azariadis and Ioannides: World without Corruption

Utopia benchmark: no corruptible humans or externalities

- No wastage on enforcement.  $\mathcal{J}$  nations, 1 unit labor each, saves fraction  $\beta$  of total gross wage.
- Equilibrium: world saving = world capital

$$k_t : \text{capital p.c. } k_{t+1} = \beta(1 - \alpha)k_t^\alpha, \quad k_t \equiv K_t/\mathcal{J}$$

- World capital accumulation unaffected by social interactions!

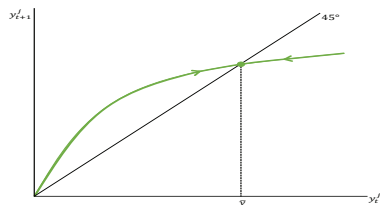


Figure 1: Growth without corruption

Capital mobility:  $\Rightarrow$  GDP per capita differences **disappear** at  $t = 0$

# Choice over Honest Work, Rent Seeking and Corrupt Enforcement

Given institutions:  $\theta_t$ , rent seekers caught w.p.  $q(\theta_t)$ .

Intensity of rent seeking:  $z_t = \frac{\text{rent seekers}_t}{\text{productive workers}_t}$ .

- Choice: produce or seek rents; enforce laws or corrupt them.
- More productive: earn 1, pay tax, may be looted w.p.  $p(z_t)$ ;

$$y_t^{HE} = \underbrace{(1 - \phi_t)[1 - p(z_t)]}_{\text{own wage income}}(1 - \sigma x_{t-1}).$$

$$\text{Honest enforcers } y_t^{HE} = (1 - \phi_t)[1 - p(z_t)](1 - \sigma x_{t-1});$$

$$\text{Corrupt enforcers } y_t^{RE}(\varepsilon) = \underbrace{(1 - \phi_t)(1 - \pi)(1 - p(z_t))}_{\text{own wage income}}(1 - \sigma x_{t-1})$$

$$+ \underbrace{(1 - \phi_t) \frac{p(z_t)}{z_t} \frac{q(\theta_t)}{\theta_t} [1 - \sigma(1 - x_{t-1})]}_{\text{loot after social interactions "tax"}} \underbrace{\varepsilon}_{\text{ind. soc. effect}};$$

- Less productive: earn  $\gamma y_t^{HE}$ .

# Occupational Choice Determines Incidence of Corruption and Rent Seeking

Individual social effect augments antisocial income:  $\varepsilon \sim 1 - \left(\frac{\bar{\varepsilon}}{\varepsilon}\right)^\zeta$ .

Together with social norms define thresholds:  $(\hat{\varepsilon}_t^1(x_{t-1}), \hat{\varepsilon}_t^2(\rho_{t-1}))$

- $x_t := \text{Prob}\{y_t^{RE}(\varepsilon) > y_t^{HE}\} \implies \text{Law of motion: } x_t = \left(\frac{\bar{\varepsilon}}{\hat{\varepsilon}_t^1(x_{t-1})}\right)^\zeta$ .
- $\rho_t := \text{Prob}\{y_t^{RS}(\varepsilon) > \gamma y_t^{HE}\} \implies \text{Law of motion: } \rho_t = \left(\frac{\bar{\varepsilon}}{\hat{\varepsilon}_t^2(\rho_{t-1})}\right)^\zeta$ ;

Endogenous social effect: value aggregate incidence of corruption/rent-seeking, positively or negatively.

- Social interactions: equivalent to “taxes, subsidies” proportioned to the mass of retired producers and rent-seekers

## Corruption, exogenous institutions: Summary

- Incidence of corruption and rent-seeking as equilibrium outcomes
- Long-run impact on net output and growth
- Corruption under exogenous institutions:
  - decreasing in lagged GDP per capita;
  - increasing in past corruption (“norm”);
  - decreasing in institutional quality and human capital;
  - increasing (decreasing) in collectivism, if “poor” (“good”) norms”;

$$x_{j,t} \left( \underbrace{y_{j,t-1}}_{(-)}, \underbrace{x_{j,t-1}}_{(+)}, \underbrace{\theta_{i,j,t-1}}_{(-)}, \underbrace{\gamma_{j,t-1}}_{(-)}; \text{culture} \right)$$

# Dynamics of corruption, given institutions: individualistic societies

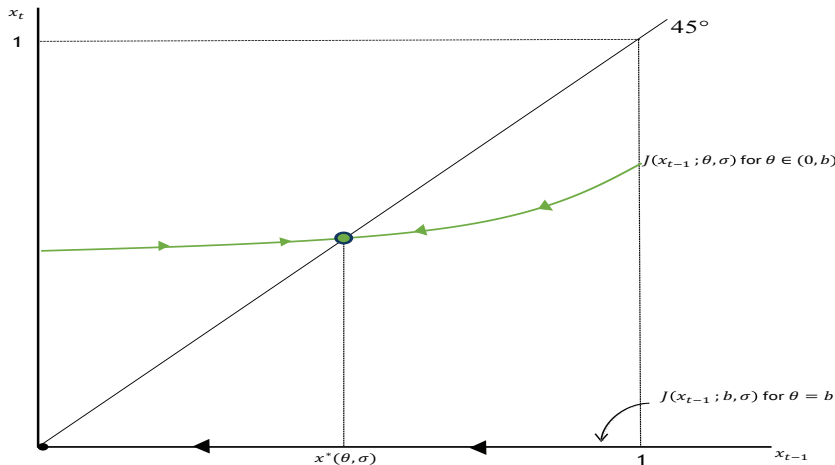


Figure 2: Corruption vs. Norms at Low  $\sigma$

## Recall: World without Corruption

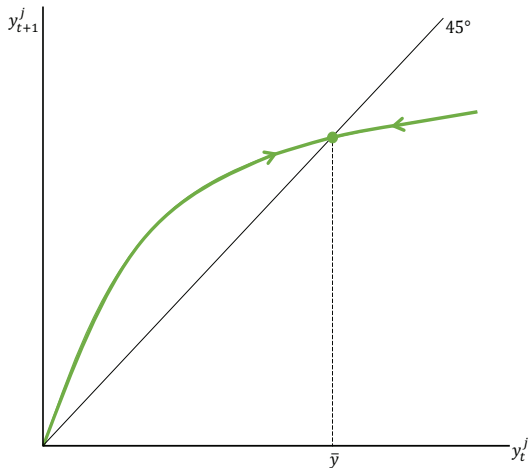


Figure 3: Growth without corruption

Capital mobility:  $\Rightarrow$  GDP per capita differences **disappear** at  $t = 0$   
Corruption: **a deadweight loss!**

# Dynamics of corruption, given institutions: collectivist societies

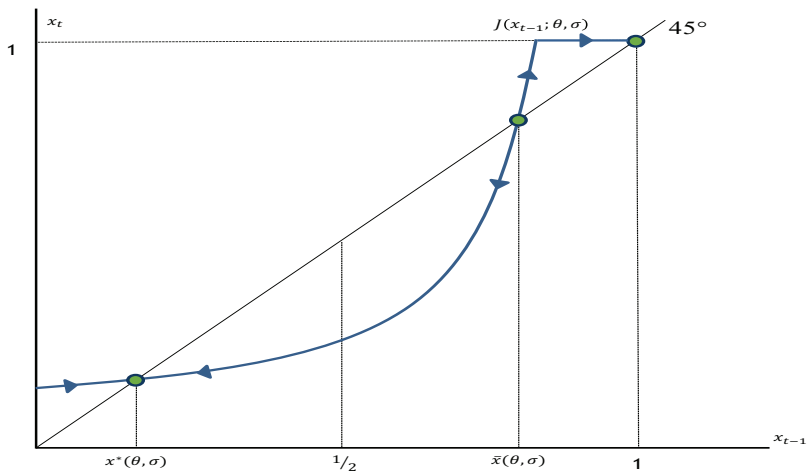


Figure 4: Corruption vs. Norms at High  $\sigma$  and Low  $\theta$

# Corruption vs. Institutions: CPI vs. ICRG<sub>ins</sub>, WMO<sub>ex</sub>

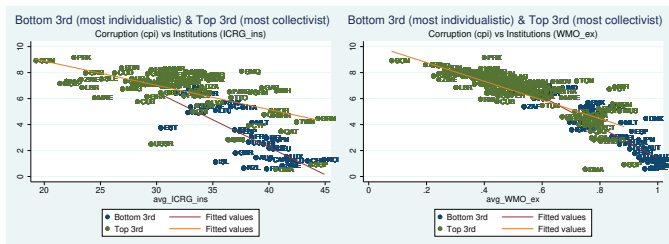


Figure 5: Culture (Hofstede) and Corruption vs. Institutions

## Negative correlation of corruption and institutional quality

- Evidence consistent with theory: negative correlation stronger in more individualistic societies:
- Scatter of points for most individualistic societies (bottom 1/3 Hofstede index) *steeper* than for most collectivist (top 1/3).
- Institutions **more** effective in combatting corruption in **individualistic** societies.



# Choosing Institutions by Majority

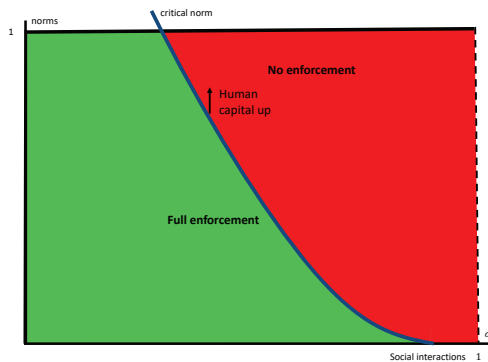


Figure 6: Role of Human capital, culture, history, and efficiency of predator-victim matching

- Individualist societies vote for strong institutions if:
  - skills of corruptible members are not too low;
  - predators are not easily matched with prey;
  - social interactions are weak;

# Choosing Institutions by Majority

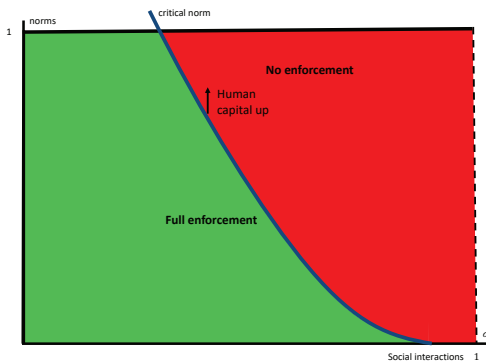


Figure 7: Role of Human capital, culture, history, and efficiency of predator-victim matching

- Conformist societies, on the other hand, become prisoners of their past which shapes current institutions through prevailing norms.
  - no enforcement if norms tolerate corruption, full enforcement otherwise.

# AGENDA and OVERVIEW, cont'd

- Stage 2: Politics endogenizes institutions: {Full, No} enforcement
  - heterogeneous agents vote: median voter not too productive
  - Voting only by the young matter, who make occupational choices potentially leaving them in different outcomes.
  - explain persistence of status quo (good and bad governance)
  - explain incidence of reform and populism (improvements and declines in governance)

Strengthens tendencies in results with exogenous institutions

- Succinct view of endogenous institutions: threshold trades off preference for conformity against “norm” (lagged corruption), given human capital and technology of enforcement.

Partition space in terms of preference for conformity and norm lagged corruption.

## AGENDA and OVERVIEW, cont'd

- Stage 2: Politics endogenizes institutions: {Full, No} enforcement
  - heterogeneous agents vote: median voter not too productive
  - Voting only by the young matter, who make occupational choices potentially leaving them in different outcomes.
  - explain persistence of status quo (good and bad governance)
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Strengthens tendencies in results with exogenous institutions

## Formal Result 1: Laws of motion, corruption and rent-seeking, $(x_t, \rho_t)$

For a specific CES matching technology for predators and victims, critical values are defined for sufficiently high moral scruples,

a.

$$\hat{\varepsilon}_t^1 = \max \left\{ \bar{\varepsilon}, \frac{\pi A \theta_t}{q(\theta_t)} m(x_{t-1}) \right\}; \hat{\varepsilon}_t^2 = \max \left\{ \bar{\varepsilon}, \frac{\gamma A}{1 - q(\theta_t)} m(x_{t-1}) \right\}. \quad (1)$$

with  $m(x) := \frac{1-\sigma x}{1-\sigma(1-x)} \in [1-\sigma, 1/(1-\sigma)]$ , decreasing and convex in  $x$ ; increasing in  $\sigma$  if  $x \leq 1/2$ , decreasing in  $\sigma$  if  $x \geq 1/2$ .

b. Given enforcement level  $\theta \in [0, b]$ , and  $\lambda := \bar{\varepsilon}/\gamma A \leq 1$ , the equilibrium paths of corruption and rent-seeking intensities are:

$$x_t = \mathcal{J}(x_{t-1}; \theta, \sigma) := \min \left\{ 1, \left[ \frac{B_1(\theta)}{m(x_{t-1})} \right]^\zeta \right\}; \rho_t = \min \left\{ 1, \left[ \frac{B_2(\theta)}{m(x_{t-1})} \right]^\zeta \right\}, \quad (2)$$

where

$$B_1(\theta) := \lambda \frac{q(\theta)}{\theta} \frac{\gamma}{\pi}; B_2(\theta) := \lambda [1 - q(\theta)] \leq 1, \quad \forall \theta \in [0, b].$$

Aggregate corruption readily follows.

## Formal Result 2: Properties of laws of motion

- a.  $\nu := \frac{\bar{\varepsilon}}{\pi A} q'(0) < 1$  : if  $\sigma \in [0, 1 - \nu]$ , society sufficiently individualistic, time map of eq. (2a) increasing convex in  $x$   
 $\forall (\theta, \sigma) \in [0, b] \times [0, 1 - \nu]$  with unique, stable fixed point  $x^*(\theta, \sigma)$ ;  
 Figure 2.

- b.  $x^* = x^*(\overbrace{\theta}^{(-)}, \overbrace{\sigma}^{(-/+)}); \forall \sigma \in [0, 1 - \nu]$ . Decreasing (increasing) in  $\sigma$ ,  
 if  $\sigma < (>) \frac{1}{2}$ .

- c.  $\rho^*(\overbrace{\theta}^{(-)}, \overbrace{\gamma}^{(-)})$

- d. If  $\sigma \in [1 - \nu, 1]$  society sufficiently conformist,  $\exists \theta = \hat{\theta} \in [0, b)$ , eq. (2a) implies Fig. 2,  $\forall \theta \in [\hat{\theta}, b]$ .
- e. If conformist  $\sigma \in [1 - \nu, 1] \forall \theta \in [0, \hat{\theta}]$ , then (2a) sigmoid time map with three fixed points: a low stable steady state  $x^*(\theta, \sigma) < \frac{1}{2}$ ; a high  $x = 1$ , and an unstable intermediate  $\tilde{x}(\theta, \sigma) > \frac{1}{2}$ . See Figure 4.

Multiplicities common with strong social interactions [Ioannides (2013), p.32].

### Formal Result 3: Choice of institutions by majority

$$\theta \in \{0, b\}$$

Define critical values for matching parameter  $A : (\hat{A}, \tilde{A}, A \geq \max\{\hat{A}, \tilde{A}\}; \hat{x}(\sigma, \lambda)$  based on  $(\tilde{\sigma}, \hat{\sigma}, \lambda^*)$  :

$$\hat{x}(\sigma, \lambda) := \frac{\lambda^* - \lambda(1 - \sigma)}{\sigma(\lambda^* + \lambda)}; \hat{\sigma} := \frac{\lambda^*}{\lambda} - 1 > \tilde{\sigma} := 1 - \frac{\lambda}{\lambda^*} \quad (3)$$

- A majority votes for  $\theta = b$ , if  $x_{t-1} \leq \hat{x}(\sigma, \lambda)$ ;  $\theta = 0$ , otherwise.
- If the human skills parameter  $\gamma$  is sufficiently small, the median voter opts for no enforcement for any social norm  $x_{t-1} \in [0, 1]$ .
- If  $\gamma$  is not small, then  $\theta = b$  if  $\sigma \in (0, \tilde{\sigma})$ ; regimes switch for  $x_{t-1} = \hat{x}(\sigma, \lambda)$  if  $\sigma \in (\tilde{\sigma}, \hat{\sigma})$ , Figure 4. ??.

critical norm  $\hat{x}(\overset{(-)}{\underbrace{\sigma}}, \overset{(-)}{\underbrace{\lambda}})$  :

$\lambda := \frac{\bar{\varepsilon}}{\gamma A}$ , great human capital and stronger scruples (lower  $\bar{\varepsilon}$ ) shrink region  $(\sigma, x_{t-1})$  favoring no enforcement, encouraging factor misallocation and perpetuating underdevelopment.

# Three Estimation Equations

Three equations predicted by Azariadis and Ioannides:

Notation:  $D_t$  : year dummy;  $\gamma_{j,t}$  : human capital;  $\epsilon_{j,t}^y, \epsilon_{j,t}^x, \epsilon_{j,t}^\theta$  : random effect plus I.I.D. shock.

- GDP pc Regressions: Eq. (1)

$$y_{j,t} = b + b_{y,x} \cdot \overbrace{x_{j,t-1}}^{(-)} + b_{y,\theta} \cdot \overbrace{\theta_{i,j,t-1}}^{(+)} + \beta_{y,\sigma} \cdot \overbrace{\sigma_j}^{(-/+)} + b_\gamma \cdot \overbrace{\gamma_{j,t-1}}^{(+)} + D_t + \epsilon_{j,t}^y,$$

- Corruption Regressions: Eq. (2)

$$x_{j,t} = b + b_{x,x} \cdot \overbrace{\tanh(x_{j,t-1})}^{(+)} + b_{x,\theta} \cdot \overbrace{\theta_{j,t-1}}^{(-)} + \beta_{x,\sigma} \cdot \overbrace{\sigma_j}^{(+)} + b_\gamma \cdot \overbrace{\gamma_{j,t-1}}^{(?)} + D_t + \epsilon_{j,t}^x,$$

$\tanh(\cdot) := \frac{e^{bx} - e^{-bx}}{e^{bx} + e^{-bx}}$ , particularly flexible one-parameter function.

- Institutions<sub>i</sub> Regressions : Eq.(3)  $\theta_{i,j,t}$  [alternatively, vector form:  $\Theta_{i,j,t}$ ]

$$\theta_{i,j,t} = b + b_{i,x} \cdot \overbrace{x_{j,t-1}}^{(-)} + b_{i,y} \cdot \overbrace{y_{j,t-1}}^{(?)} + \beta_{i,\sigma} \cdot \overbrace{\sigma_j}^{(-)} + b_{i,\gamma} \cdot \overbrace{\gamma_{j,t-1}}^{(+)} + D_t + \epsilon_{j,t}^\theta,$$



# Measurement Issues: Corruption, Rent Seeking

**Corruption Outcomes:** indices abound, aggregate and sectoral;

**Rent seeking:** much talked about, only micro stories abound

- Transparency International: Corruption Perception Index (CPI)
- World Bank: Control of Corruption Index (CCI)
- PRS Group, International Country Risk Guide: ICRG<sub>c</sub> Corruption Index

All positively autocorrelated and quite persistent

## Measurement: Culture

- *Hofstede* individualism vs. collectivism  
Acting predominantly as members of a cohesive, lifelong group or organization: conformism
- *Tabellini* trust
- *Michele Gelfand, Irem Uz*: Tightness vs. Looseness index.
- *General Preference Survey, Falk et al.* (2018): patience, risk-taking, trust, positive reciprocity, negative reciprocity, altruism  
Negative reciprocity: sanctioning antisocial unfair behavior behavior, engaging in prosocial punishment
- *Inglehart and Welzel*: traditional versus secular-rational values, survival versus self-expression values. Component of World Values Survey.
- *Schwartz*: intellectual autonomy, affective autonomy, egalitarianism vs. hierarchy, and harmony vs. mastery.
- *Fisman and Miguel*: parking violations by UN diplomats in NY City.

## Measurement: Institutions

- Quality of institutions, explored sources
- Fish out components of World Governance Indicators (IBRD), Quality of Governance (Univ. of Gothenburg), World Justice Project (WJP), Bertelsmann Transformation Index (BTI), International Country Risk Guide (ICRG), World Economic Forum (WEF)
- Experimented with numerous institutions, emphasized the following:
  - $ICRG_{ins}$ : Economic risk taking, higher values, safer
  - $WMO_{ex}$ : risk of expropriation, higher values, better
  - $ICRG_{lo}$ : law and order, higher values safer
  - $WEF_{pr}$ : enforcement of property rights
  - $WMO_{ex}$  Global Insight Business Conditions and Risk Indicators, World Governance Indicators
  - What do empirics suggest about: Institutions and culture, substitutes or complements?
  - How design of institutions reacts to culture?

# Identification Strategy

Fend off the *identification police*, who are known to take no prisoners:  
Instrumental variable estimation strategy

- Three dynamic equations  $(y_{jt}, x_{jt}, \theta_{i,j,t})$  estimated separately with IV.
- 1. human capital: instrument with 5-year lag of population share of 15-64 years
  2. corruption: % share of women in parliament
  3. institutions equation used for IV in GDP and corruption equations.
- System of dynamic equations  $(y_{jt}, x_{jt}, \theta_{i,j,t})$  cries out for estimation as system! Later!

# Table 3: GDP pc against Culture, Corruption, Institutions, Human Capital

Table 3: GDP per capita 1. Culture: Hofstede Collectivism

	(1) y	(2) y	(3) y	(4) y	(5) y	(6) y	(7) WMO_ex	(8) WMO_ex
L.cpi	-0.0254** (0.0124)	-0.0180 (0.0128)					-0.00547*** (0.00206)	0.0157 (0.0423)
L.hc	0.240** (0.0948)	0.0866 (0.0963)	0.363*** (0.0880)	0.200** (0.0862)	0.374*** (0.0767)	0.199** (0.0834)	0.0248** (0.0122)	-1.143 (5.619)
L.ICRG_ins	0.00501*** (0.00139)	0.00466*** (0.00122)						
col	-0.958*** (0.237)	-0.235 (0.183)	-0.451* (0.243)	0.242 (0.249)				
avg.cpi		0.00956 (0.0290)						-0.0281 (0.0301)
avg.hc		0.374*** (0.125)		0.259** (0.108)		0.240** (0.118)		0.852 (4.135)
avg.ICRG_ins		0.0472*** (0.0129)						
L.CCI			-0.0650* (0.0382)	-0.0245 (0.0401)	-0.109*** (0.0343)	-0.0697** (0.0321)		
L.WMO_ex			0.300** (0.129)	0.212* (0.115)	0.372* (0.192)	0.326 (0.201)	0.916*** (0.0188)	0.833*** (0.223)
avg.CCI				-0.0174 (0.102)		-0.253*** (0.0933)		
avg.WMO_ex				1.007* (0.576)		-0.785 (0.512)		
patience					0.0694 (0.116)	-0.0924 (0.130)	-0.00654 (0.00579)	-0.0203 (0.111)
risktaking					-0.250* (0.151)	-0.247* (0.147)	-0.00879 (0.00804)	0.156 (0.786)
posrecip					0.0340 (0.207)	0.00755 (0.213)	-0.00179 (0.00863)	-0.0243 (0.207)
negrecip					0.256*** (0.0970)	0.352*** (0.110)	0.0141** (0.00578)	-0.0831 (0.552)
altruism					-0.0440 (0.143)	0.0617 (0.148)	-0.00338 (0.00621)	0.119 (0.660)
trust					0.147 (0.128)		0.00552 (0.00599)	-0.155 (0.773)
L.y							-0.0159 (0.0135)	0.611 (2.841)
avg.y								-0.287 (1.243)

Table 3: GDP pc against Culture, Corruption, Institutions, Human Capital, cont'd

								(1.470)
_cons	3.838*** (0.338)	1.238** (0.554)	3.047*** (0.309)	1.889*** (0.432)	2.669*** (0.240)	3.092*** (0.289)	0.0811** (0.0367)	-0.0706 (1.344)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	219	219	179	179	133	133	595	595
Number of id	51	51	56	56	40	40	61	61
Wald Chi2	304.2662	405.3577	227.5384	271.0874	354.5237	437.9214	41893.92	338.0297
Wald test		34.521		22.014		15.946		1.334
R2 within	0.654	0.671	0.496	0.551	0.508	0.562	0.288	0.206
R2 between	0.649	0.796	0.696	0.747	0.850	0.861	0.998	0.615
R2 overall	0.664	0.779	0.731	0.765	0.861	0.864	0.971	0.594
Country random effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard error in parentheses.

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p <$

0.01 Institution

instrumented by eq 79

Human capital IV: 5-year-lagged age composition

Corruption IV: share of women in parliament

# Table 4: Corruption Autoregressions: Culture, Institutions, Human Capital, linear

Table 4: Corruption Autoregressions: linear

	(1) ICRG <sub>c</sub>	(2) ICRG <sub>c</sub>	(3) CCI	(4) CCI	(5) CCI	(6) CCI
main						
L.hc	0.568*** (0.210)	0.870** (0.408)	-0.161** (0.0762)	0.0368 (0.148)		
L.ICRG <sub>lo</sub>	0.174*** (0.0485)	0.147*** (0.0518)				
col	-1.930*** (0.458)	-1.288*** (0.436)	0.863*** (0.250)	0.268 (0.215)		
L.tanh_ICRG <sub>c</sub>	6.365*** (0.856)	6.364*** (0.865)				
avg_hc		-0.758* (0.416)		0.0131 (0.150)		
avg_ICRG <sub>lo</sub>		0.352*** (0.0955)				
L.WMO <sub>ex</sub>			-0.559** (0.223)	0.699** (0.287)		
L.tanh_CCI			1.865*** (0.164)	1.689*** (0.150)		
avg_WMO <sub>ex</sub>				-2.970*** (0.361)		
L.CCI					2.071*** (0.228)	2.111*** (0.236)
_cons	-3.264*** (1.004)	-3.947*** (1.047)	-0.877** (0.353)	0.166 (0.364)	1.445*** (0.209)	1.472*** (0.215)

# Table 4: Corruption Autoregressions: Culture, Institutions, Human Capital, nonlinear

	L.p.CCI.col_ICRG Jo		L.p.CCI.col_ICRG Jo.mre		L.p.CCI.col_ICRG Jo.mre	
					-0.237*** (0.0140)	-0.229*** (0.0137)
.cons					0.400*** (0.152)	0.312** (0.151)
<hr/>						
sigma						
.cons					0.397*** (0.0101)	0.399*** (0.0101)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1945	1945	720	720	779	779
Number of id	75	75	80	80		
Wald Chi2	756.1127	888.9588	740.1337	1580.758	82.57317	79.90359
Wald test		13.856		68.921		
R2 within	0.434	0.434	0.227	0.227		
R2 between	0.729	0.802	0.915	0.941		
R2 overall	0.656	0.704	0.907	0.932		
Country RE	Yes	Yes	Yes	Yes		

Robust standard error in parentheses.

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

0.01 Institution

instrumented by eq 79

Human capital IV: 5-year-lagged age composition

Corruption IV: share of women in parliament



# Going forward

Anti-social behavior in the form of rent-seeking and corruption have profound effects on welfare.

- Nonlinearities cry out for more direct econometric treatment, acknowledges multiplicity of equilibria. Working on that.
- Nagging question: why is successful reform so rare?  
Menu of Policies, influence preferences and norm-setting, deeper analysis of politics.
- From small open economies to the global economy  
Reform in many countries:
  - Spillover effects via interdependent preferences?
  - Policy spillovers
  - Effects on capital accumulation and growth?