# Political Economics III, Spring 2019

## Part III, Culture, Institutions, and Policy

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Lecture 5, April 24

# Extend November 2018 Munich Lectures

Joint research with Tim Besley

- four related papers – and forthcoming book
- superficially, very different topics – democratic institutions, organizational design, nationalist/populist politics, evironmentalism

Common features

- new angle on strategic design of institutions or policy, as economists have studied them
- combine with ideas in other social sciences: political science, business economics, sociology, social psychology, and evolutionary anthropology
- study two-way interactions with slow-moving culture or values associated with social identities

# Lecture 5 – today

"Democratic Values and institutions"

- forthcoming, *American Economic Review: Insights*
- how does strategic design of democratic/autocratic institutions, by incumbent elite, interact with slow-moving democratic values?

"Organizational Dynamics: Culture, Design and Performance"

- Mimeo, 2018
- how does design of decentralized/centralized organizations interact with slowly moving organizational cultures?

# Lecture 6 – on May 8

"The Rise of Identity Politics"

- Mimeo, 2019
- how does strategic design of policy, by political parties, interact with slow-moving political identities, and endogenously forming social movements and new parties?

"Environmental Politics and the Dynamics of Values"

- forthcoming, *Journal of the European Economic Association*
- how does strategic design of anti-pollution intervention, by political parties, interact with slow-moving environmentalist/materialist values, and how does this modify standard welfare analysis?

# Democratic Values and Institutions

Tim Besley and Torsten Persson

*American Economic Review: Insights* (forthcoming)

# A **BIG** question in social science

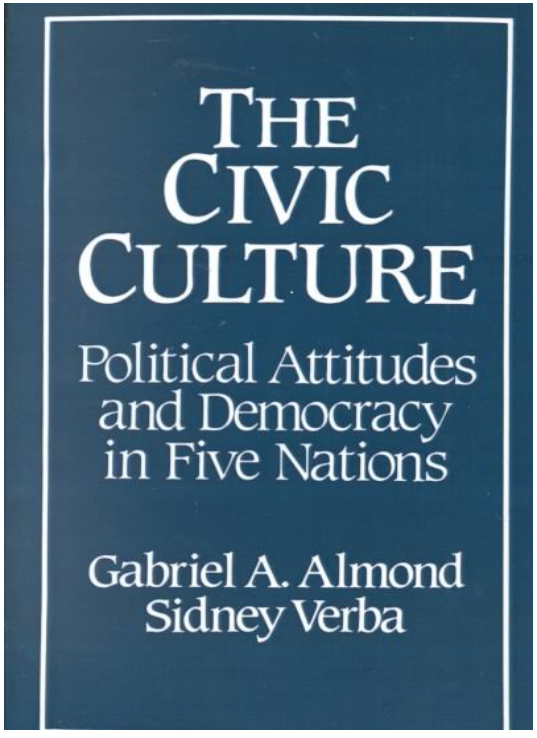
Diverse political histories across countries and time?

- why are some countries stable democracies, others stable autocracies, yet others plagued by institutional instability?

Big question for two reasons

- *intrinsic* – care about democracy, as such
- *instrumental* – may help us answer another big question: why are some countries rich and others poor?
- no stable democracy is poor, but tricky causality issues

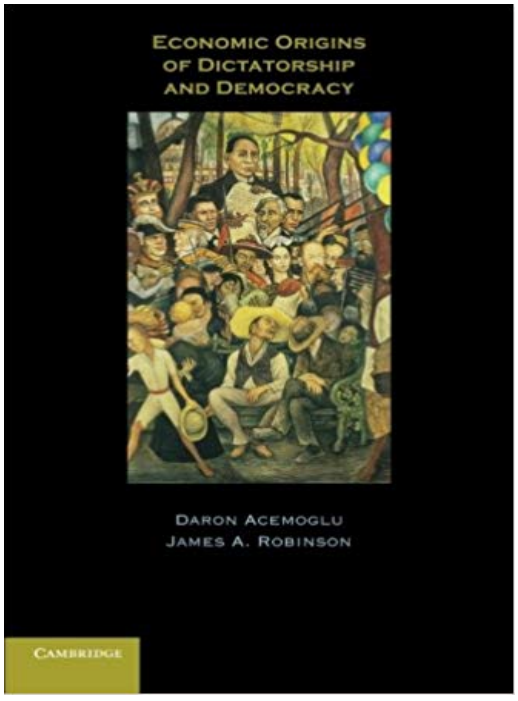
# Old political sociology tradition




"*(I)f a political system is not characterized by a value system allowing the peaceful 'play' of power ... there can be no stable democracy*." Lipset (1959, p. 71)

- focus on democratic values, or culture

# More recent political economics tradition




*"During the nineteenth century most Western societies extended voting rights, ... these political reforms can be viewed as strategic decisions by the political elite to prevent widespread social unrest and revolution."* Acemoglu and Robinson (2000, p. 1167)

- focus on strategic design of democratic institutions

So far, no integration of the two traditions

# This paper

Study two-way feedbacks between democratic values and institutions

- build model to join cultural and strategic traditions – neither institution design nor values have upper hand

In that model

- incumbent group chooses institutions and may repress citizens, who may fight to demand (defend) democracy
- as Acemoglu and Robinson (2000, 2006), *except* commitment: institutions must comply with current incentives
- but institution choices depend on democratic values (our single state variable), which depend on expected institution choices

# What insights from the analysis?

Model constructed to fit basic facts in data

- for democratic reform history and democratic values

Accommodates many earlier ideas, including

- a mechanism for history dependence and institutional inertia
- a precise notion of critical junctures

Has auxiliary predictions for democratic values

- these too in line with data

# Roadmap

1. Introduction
2. **Background**
3. Model
4. Insights
5. Conclusion

# Social science on culture and values

Old and modern classics

- Montesquieu (1748), Lipset (1959), Almond and Verba (1963): link democratic values to institutions
- Moore (1966): should consider changing values

Measurement of values

- Ingelhardt (1997), Ingelhardt and Welzel (2005): World Value Survey (WVS)

Cultural evolution more generally

- Cavalli-Sforza and Feldman (1981), Boyd and Richerson (1985): evolving choices

Culture and values in economics

- Güth and Yaari (1982): evolving preferences
- Bisin and Verdier (2000), Tabellini (2008), Besley (2015): so far, emphasize economic and social, not political, choices

# Political economics on democratic change

Strategic approach to political reforms

- Acemoglu and Robinson (2000, 2006), Lizzeri and Persico (2004): reform the franchise, as can't credibly commit to future policy – institutional commitment *assumed*
- Aidt and Frank (2015): empirical support
- Weingast (1997): democratic rights as an equilibrium
- Lagunoff (2001): choice of civil liberties

# Closest antecedents

Political culture and political institutions

- Ticchi, Verdier and Vindigni (2013), Bisin and Verdier (2017): similar big-picture question, but assume commitment to political institutions (two state variables)

Political reforms

- Persson and Tabellini (2009): democratic capital shapes willingness to defend democracy
- Gorodnichenko and Roland (2015): different values may shape democratic reforms

Values, protests and public policy

- Passarelli and Tabellini (2017): disappointments, given a reference point, make people stand up against unfairness

# Facts on democratic reforms

*Political reform histories have three forms*: *always remain non-democratic, permanent transition to democracy, or churning between the two, churning being the most prevalent*

- from Polity IV data (positive Polity2 score)
- all 50 countries with data from 1875
- well-known patterns of inertia

# Classified Polity IV histories of 50 countries – Table 1

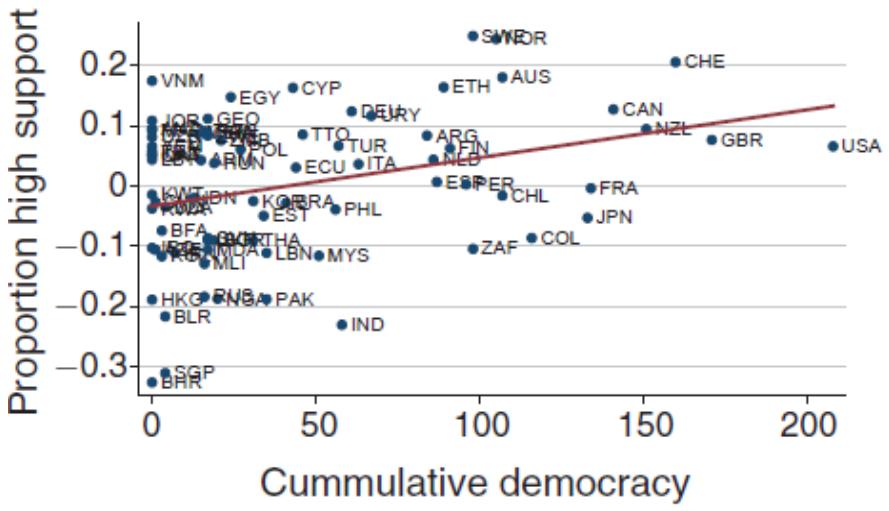
| Weak | Mixed | | Strong |
|---|---|---|---|
| Always nondemocratic | Multiple changes (number upward, number downward) | | Always democratic |
| Afghanistan | Argentina*† (7, 6) | Haiti (4, 4) | Canada*† |
| Morocco*† | Austria (3, 2) | Honduras (3, 2) | New Zealand† |
| Oman | Belgium (3, 2) | Iran*† (1, 1) | Switzerland* |
| | Bolivia (2, 1) | Japan*† (2, 1) | United States*† |
| Permanent switch to non-democracy (year of switch) | Brazil*† (2, 1) | Liberia (1, 1) | Permanent switch to democracy (year of switch) |
| | Chile*† (3, 2) | Nepal (3, 2) | |
| | China*† (1, 1) | Netherlands*† (2, 1) | |
| | Colombia*† (3, 2) | Norway* (2, 1) | |
| | Denmark (3, 2) | Peru*† (8, 7) | Costa Rica (1841) |
| | Dominican Republic (2, 1) | Portugal (3, 2) | El Salvador (1982) |
| | Ecuador† (3, 2) | Paraguay (2, 1) | Hungary* (1989) |
| | Ethiopia*† (1, 1) | Serbia* (4, 3) | Italy* (1945) |
| | France* (3, 2) | Spain*† (4, 3) | Mexico*† (1994) |
| | Germany*† (2, 1) | Thailand*† (5, 4) | Nicaragua (1990) |
| | Greece (5, 4) | Turkey*† (3, 2) | Romania (1990) |
| | Guatemala (6, 5) | Venezuela (1, 1) | Russia*† (1992) |
| | | | Sweden*† (1910) |
| | | | United Kingdom*† (1837) |
| | | | Uruguay* (1910) |

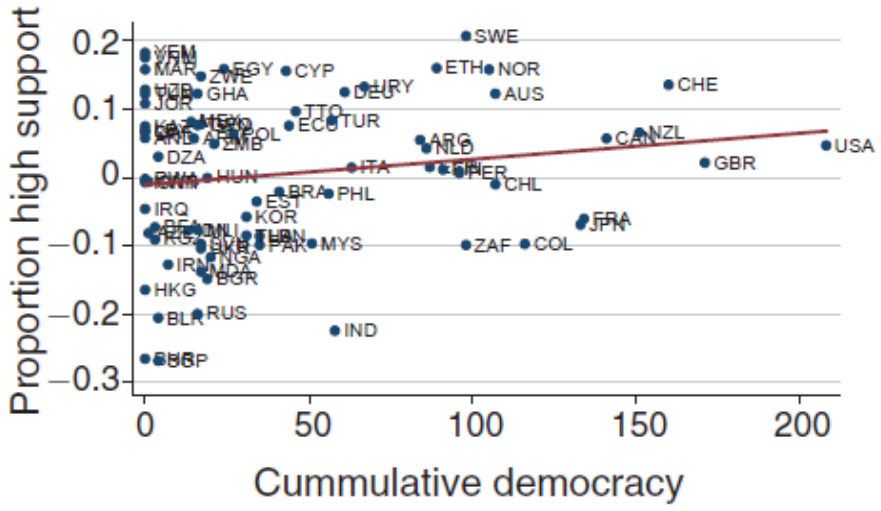
# Facts on democratic values

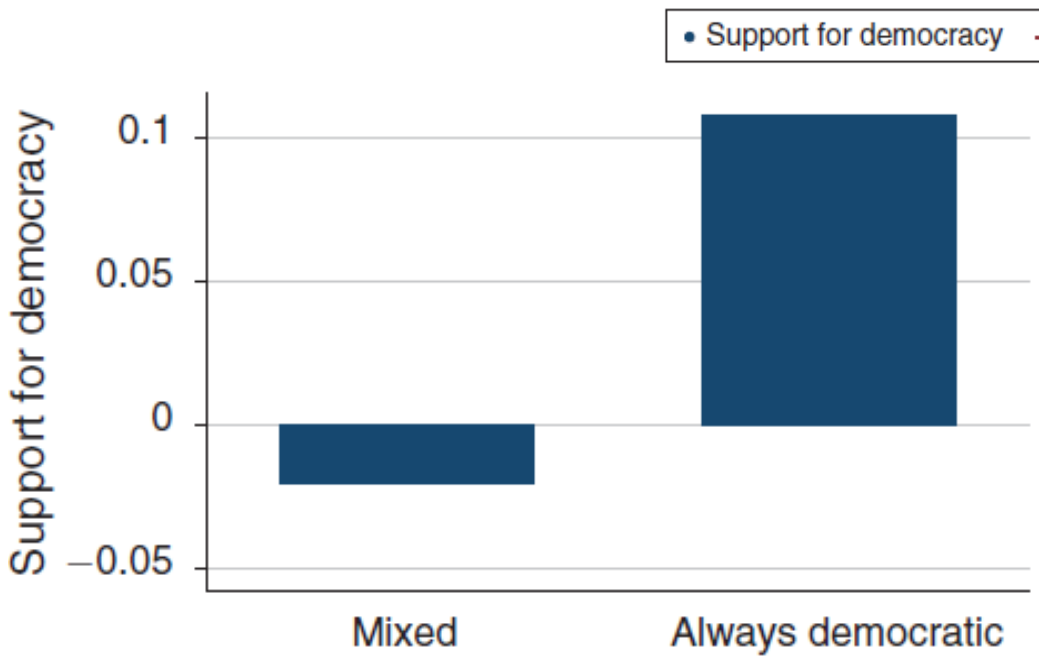
*Democratic values vary across individuals and countries, and are strongest (weakest) in countries with long (short) histories of democracy*

- from 2007, 2012 individual WVS data (V140)
- "How important is it for you to live in a country that is governed democratically? On this scale, where 1 means it is 'not at all important' and 10 means 'absolutely important' what position would you choose?"
- classify as strong values if score $> 8$
- global share with strong democratic values is 0.6
- measure country share vs. global share, also holding constant income, education, age, and gender

# WVS values and democratic histories – Figure 1



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# Groups and conflicts of interest

Sequential-generation model with two groups

- groups may alternate as incumbent and opposition

Incumbent picks one of two institutions

- democracy $D_t = 1$, or autocracy $D_t = 0$
- random variable $x_t$ captures "stakes" in institutional choice – resource rents, or incumbent leader unpopularity, depending on how interpret democracy

Material payoffs generate conflicting interests

- incumbent prefers autocracy, more so for higher $x_t$
- opposition prefers democracy, more so for higher $x_t$

# Types, values, and social justice

Two types of citizens

- share $(1-\mu_t)$ passive, $\tau = p$, just care about material payoff
- share $\mu_t$ *concerned* $\tau = c$ – socially identify with this group
- their payoff also includes democratic values – $\mu_t$ the share of people with high democratic values (as in WVS data)

Democratic values

- positive for democracy $s(x_t)$ – the concerned "rejoice"
- negative for autocracy $-\gamma s(x_t)$ – the concerned "despair"
- see as concern for social justice: gains or losses by whole opposition group given two reference points (Kahneman-Tversky 1979, Thaler 1999)
- can drive protest, and shape relative fitness (below)

# Protests by concerned and fighting by incumbent

Simple model of citizen protests against autocracy

- shocks to common cost of protest
- passive never protest
- concerned may protest, when cost low

Protest technology

- higher share of opposition $\mu_t$ protesting raises probability of success, which installs democracy
- more (costly) repression $f_t$ by incumbent cuts success probability
- if whole opposition protests, $\mu_t = 1$, success probability is 1: like complementary collective action

# Evolution of democratic values

Use simple class of "Darwinian" dynamics

$$\mu_{t+1} - \mu_t = (1 - \mu_t)\,\varsigma_{p,c} - \mu_t \varsigma_{c,p}$$

- where $\Delta\left(\mu_{t+1}\right)$ is *expected fitness* of being concerned vs. passive and $\varsigma_{p,c} > 0 \Longleftrightarrow \Delta\left(\mu_{t+1}\right) > 0$ and $\varsigma_{c,p} > 0 \Longleftrightarrow \Delta\left(\mu_{t+1}\right) < 0$
- this is a 'revision protocol' (Sandholm 2010)
- give example of specific microfoundation with strategic (forward-looking) socialization by parents
- can also reflect (backward-looking) imitation with $\Delta\left(\mu_t\right)$, but this does not affect (qualitative) results

Three possible long-run rest points: $\hat{\mu} = 1; \hat{\mu} = 0; \Delta\left(\hat{\mu}\right) = 0$

- which one(s) will reflect how $\Delta\left(\mu\right)$ varies with $\mu_t$

# A specific microfoundation

Sequential-generations model

- every family has two parents and two children
- fraction $\beta$ of families: parents of same type – where kids inherit type $\tau = c$ or $p$
- fraction $(1-\beta)$ of mixed families – where kids' type depend on $\Delta\left(\mu_{t+1}\right)$ and family-specific shock $\eta$ – become $\tau = c$ if $\Delta\left(\mu_{t+1}\right) \geq \eta$
- c.d.f. $G(\eta)$ symmetric around zero mean: $G(0) = \frac{1}{2}$

Change in share of concerned citizens

$$\mu_{t+1} - \mu_t = 2\mu_t\left(1-\mu_t\right)(1-\beta)\left[G\left(\Delta\left(\mu_{t+1}\right)\right) - \frac{1}{2}\right]$$

- $[\cdot]$ term positive (negative) as $\Delta\left(\mu_{t+1}\right) > 0$ $(< 0)$
- special case of dynamics on previous slide

# Timing in period (generation) $t$

1. Leader selected from incumbent group, and $x_t$ realized
2. Leader chooses $D_t$ and $f_t$
3. If $D_t = 1$, democracy payoffs.
   If $D_t = 0$, cost realized and concerned opposition citizens decide on protest. Unsuccessful (or no) protest gives autocracy payoffs, successful protest gives democracy payoffs
4. Payoffs realized. New generation born and socialized, changing $\mu_t$ to $\mu_{t+1}$. Non-beaten incumbent stays on to $t+1$. Else, opposition becomes next period's incumbent.

# Protest and fighting by citizens and incumbents

Optimal protests and incumbent repression at 2 and 3 pin down:

- incumbent's *total* autocracy payoff less total democracy payoff
- probability that autocracy successfully enforced
- under weak conditions, both go up with stakes $x_t$ and down with proportion of concerned citizens $\mu_t$

# Equilibrium institutions at $t$

Incumbent's choice of $D_t$ involves a trade-off

- compare total payoff under autocracy and democracy
- for some critical stakes $\hat{x}(\mu)$, these payoffs are equal

**Proposition 1** *There are two thresholds $\mu^L < \mu^H$ such that*

1. $\mu \leq \mu^L$, $D = 0$ *for all* $x$ and $\mu$
2. $\mu \geq \mu^H$, $D = 1$ *for all* $x$ and $\mu$
3. $\mu \in \left[\mu^L, \mu^H\right]$, $D = 0$ *iff* $x \geq \widehat{x}(\mu)$

- democratic values $\mu$ low: protest success unlikely – incumbent picks autocracy and fights little, no matter the stakes
- $\mu$ high: incumbent likely to lose – fighting too costly, citizens get democracy, no matter the stakes
- $\mu$ in between: democracy (autocracy) for low (high) stakes

# Equilibrium dynamics of democratic values

Concerned-citizen share and expected fitness

- recall Darwinian dynamics: $\mu_{t+1} \gtreqless \mu_t$ as $\Delta(\mu_{t+1}) \gtreqless 0$

$$\Delta(\mu) \text{ is } \begin{cases} > 0 & \text{if } \mu \geq \mu^H \\ \gtreqless 0 & \text{if } x \lesseqgtr \widehat{x}(\mu) \\ < 0 & \text{if } \mu \leq \mu^L \end{cases} \quad \text{and} \quad \mu \in \left[\mu^L, \mu^H\right]$$

- being concerned better (worse) if incumbent always (never) chooses democracy, because always expect rejoice (despair)
- for intermediate $\mu$, expect democratic rejoice only for realizations $x \leq \widehat{x}(\mu)$
- $\Delta(\mu_{t+1})$ increases with $\mu_{t+1}$, as probability of successful protest goes up – a dynamic complementarity

# Dynamics and steady states

**Proposition 2** *There is a unique value* $\hat{\mu} \in [\mu^L, \mu^H]$ *where* $\Delta(\hat{\mu}) = 0$. *When* $\mu_0 \geq \hat{\mu}$, *the polity converges to* $\mu = 1$. *But when* $\mu_0 < \hat{\mu}$, *it converges to* $\mu = 0$

- 1st-order approximation of dynamic microfoundation expression around $\mu_t$ and some rewriting gives

$$\mu_{t+1} - \mu_t = \frac{2\mu_t(1-\mu_t)(1-\beta)}{1 - 2\mu_t(1-\mu_t)(1-\beta)\, g(\Delta(\mu_t))\,\Delta_\mu}\left[G(\Delta(\mu_t)) - \frac{1}{2}\right]$$

- denominator on RHS positive (under mild assumption)
- as $G(\cdot)$ increasing, with $G(0) = 1/2$, term in $[\cdot]$ implies $\mu_{t+1} - \mu_t > 0$ iff $\Delta(\mu_t) > 0$, i.e., $\mu_t > \hat{\mu}$
- apply expression for $\mu_{t+1} - \mu_t$ to $t = 0, 1, 2, ..$ – as $\Delta(\mu)$ monotonically increasing, result follows

# Implications

How do dynamics work?

- as interior steady state unstable: values adjusts over time to fully democratic or non-democratic
- democratic values feed back to institutional choice – as per Proposition 1 – until transition to democracy or autocracy irreversible; cross threshold $\mu^H$ or $\mu^L$

Endogenous persistence of institutions

- institutions sticky, not by assumption, but as incumbent pays close attention to slow-moving democratic values

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# Motivating facts redux

Analysis predicts country-specific histories

- Propositions 1 and 2 imply country-specific paths for institutions $D_t$ and values $\mu_t$

Institutional histories of three types, as in Table 1

- permanent autocracy – values $\mu$ start below threshold $\mu^L$
- one reform into permanent democracy – $\mu$ crosses threshold $\mu^H$ from below into region of irreversible democracy
- multiple shifts in $D$ – different stakes $x$, above and below, $\widehat{x}(\mu)$ in $[\mu^L, \mu^H]$ region

Democratic values history-dependent, as in Figure 1

- longer history in $D = 1$ with rejoice of democracy gives higher share $\mu$ with strong values today

# Insights from bridging cultural and strategic approaches

New light on strategic approach

- inertia of political institutions may not reflect commitments, but reformers' attention to democratic values, which have more inertia than institutions

New light on cultural approach

- mechanism whereby democratic values give stability: enter cost-benefit calculus of potential protesters and strategic institutional reformers

# Other insights

Framework encompasses several existing ideas

- varieties of reform: defensive and offensive democratizations
- critical junctures: permanent shocks close to $\hat{\mu}$ may reshape political history
- initial conditions: could be reset by historical events – e.g., the Enlightenment – or by influential leaders
- autocracy traps: long repression history gives low democratic values that make autocracy stick – e.g., 1990s or present-day Russia, initial post-colonial African democracies
- microfoundation for democratic capital: omitted variable, rather than state dependence

# Consider predictions beyond motivating facts

Introduce foreign occupation in model

- outside power imposes autocracy $D_t = 0$, and enforces it by strong repression $f_t$
- may depress democratic values for two reasons
- more years of autocracy make current democratic values lower
- *holding constant* years of autocracy, enforcement by foreign occupation reduces democratic values (more despair from autocracy cut relative fitness of being concerned)

**Prediction** *Ceteris paribus, democratic values should be lower for generations that formed democratic values during, rather than after, foreign occupations*

# How test this auxiliary prediction?

Go back to WVS data

- consider foreign occupations due to colonialism and USSR post-war occupation
- interpret generations in model, as cohorts in WVS data

Consider *within-country* variation in values

- do people in cohorts with "formative years" during, rather than after, foreign occupation have lower democratic values?
- consider formative years as up to 16 (or 18, or 20)
- hold constant *individual* age, gender, education, income, and *country-wide* average values

# Foreign occupations and democratic values – Table 2

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Colonial rule at 16 | −0.062 | −0.058 | | |
| | (0.015) | (0.016) | | |
| USSR occupation at 16 | | | −0.069 | −0.067 |
| | | | (0.018) | (0.088) |
| Individual controls | Yes | Yes | Yes | Yes |
| Birth-year dummies | Yes | Yes | Yes | Yes |
| Country dummies | Yes | Yes | Yes | Yes |
| Countries in sample | All | Past colonies | All | Post-USSR block |
| Number of countries | | | | |
| Observations | 140,311 | 103,776 | 140,311 | 25,952 |
| $R^2$ | 0.075 | 0.074 | 0.075 | 0.056 |

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# Contribution

Aims of paper

- use approach inspired by evolutionary anthropology to bridge cultural and strategic approaches to democracy
- see democratization as two-way process: evolving democratic values and institutional experience reinforce each other
- get institutional persistence without commitment

Propose model of coevolving democratic values and institutions

- single state variable: share of citizens with strong enough democratic values to stand up for democracy
- cultural evolution driven by relative fitness of concerned vs. passive types
- model reproduces main patterns in data for democratic values and histories, and has additional predictions that seem to hold

# Ways ahead from this basic framework

Explore role of political leaders

- to what extent can they influence democratic values?

Delve deeper into separate aspects of democracy

- one is free elections, another is checks and balances
- positively, but not perfectly, related across countries and time
- need some common drivers – democratic values? – to understand the positive relation and distinct drivers to understand mixed regimes (in theory and data)

Apply similar framework to related questions

- two-way interactions of culture and institutions

# Organizational Dynamics: Culture, Design, and Performance

Tim Besley and Torsten Persson

Mimeo, 2018

# Starting points

Organizational design and performance

- microeconomic research: *strategic* design of authority and boundaries to pursue fixed, material objectives
- much less attention to organizational dynamics

Widely heterogenous performance of similar organizations

- applies to bureaucracies, firms, and governments
- many, outside of economics, ascribe differential performance to organizational *cultures*
- little agreement on how formally study such cultures

But, so far, strategic and cultural approaches disjoint

# This paper

Attempts to bridge strategic and cultural approaches

- develop generic model with two-way feedbacks between organizational culture and design
- culture *not* seen as sets of beliefs about equilibrium play, but as endogenously evolving types – tied to social identities
- draw some general lessons about organizational performance, dysfunctionality, and inertia
- use in four specific examples: bureaucracy, innovation, productivity, and political parties

# Two-way feedbacks

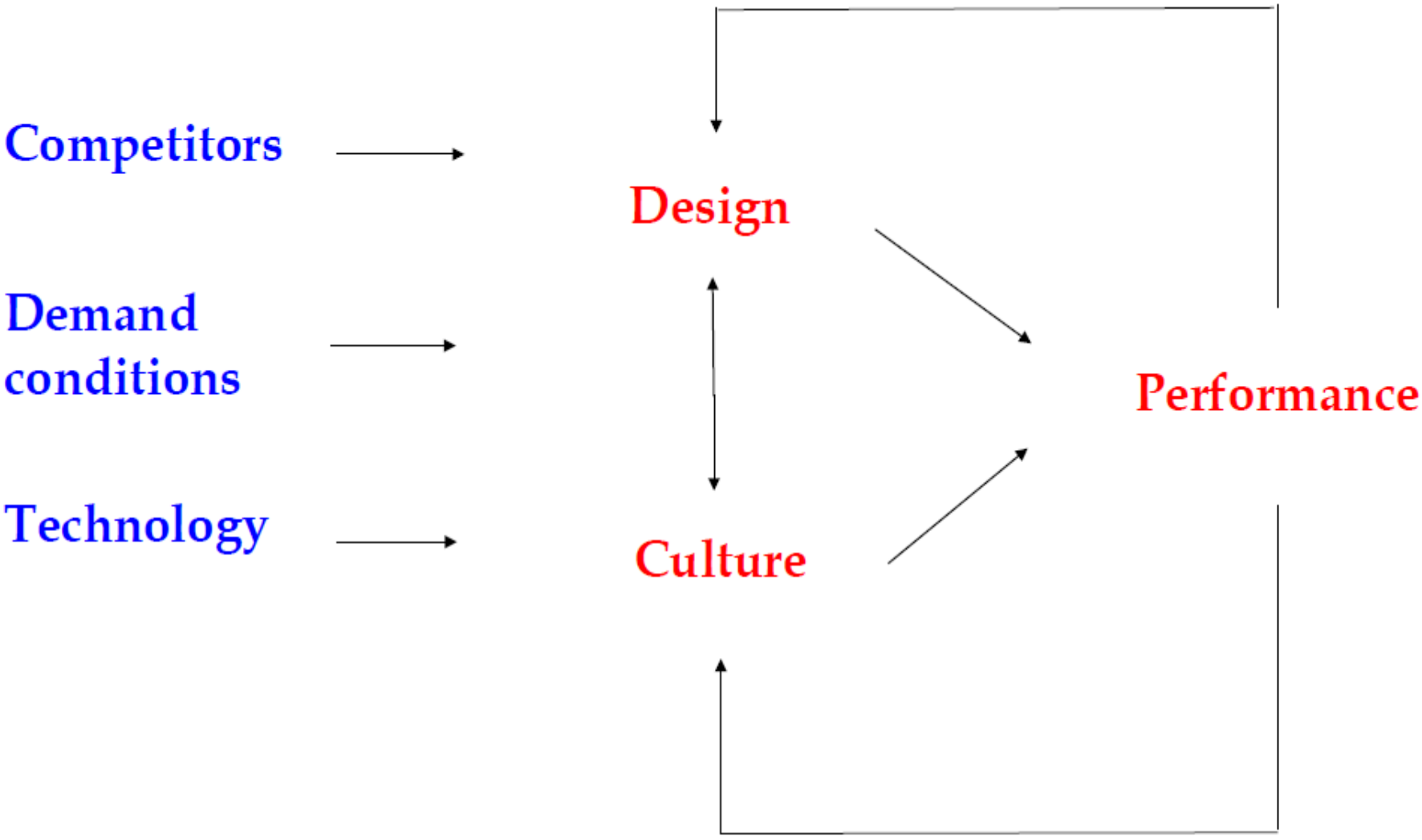
What drives organizational design and culture?

- leaders trade off benefits and cost of decentralization
- employees adopt social identity that shapes values and choices
- this culture affects organization design – and (expected) design feeds back to culture

Cousin to Besley and Persson (2019), Bisin and Verdier (2017)

- study interplay of democratic values and democratic institutions, and of culture and institutions more generally

# Our approach in a picture



# Roadmap

1. **Related Research**
2. IBM Case Studies
3. Generic Model
4. Analysis, Extensions, and Insights
5. Applications and Final Remarks

# Related research

Outside economics

- dynamics of culture: as in work on cultural evolution (Cavalli-Sforza and Feldman 1981, Boyd and Richerson 1985) and organizational cultures (Hofstede 1984, Schein 1990)
- conflicting interests in organization: related to field of organizational behavior (Cyert and March 1963)

Inside economics

- culture as prevalence of types: as in one approach to corporate cultures (Hodgson 1996, Lazear 1995)
- types with socially internalized values: as in research on identity (Akerlof 1976, Akerlof and Kranton 2000)
- socialization and cultural dynamics: like in work on cultural transmission (Bisin and Verdier 2000, Tabellini 2008)
- authority design: as in classical incentive theory (Aghion and Tirole 1997, Alonso et al 2008, Rantakari 2012), and work on management styles (Bloom, van Reenen, et al)

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# Initial leaders, culture, and products

Early culture and products

- reflected ethos of director Thomas J. Watson Sr.
- specialization in punch-card systems

Becoming a giant organization

- worldwide leader in mainframes from 1950s
- legendary Thomas J. Watson Jr. led push for new mainframe-oriented culture
- strong sales growth coupled with decentralization to new divisions, across geography and functions

Increasing competition

- by 1980 still $>60\%$ of world mainframes, but $<25\%$ of all computers
- large difficulties in early 1980s

> *"IBM bringing out a personal computer would be like teaching an elephant to tap dance."*

# Mainframe-PC transition

A lot of organizational inertia

Mills (1996) on IBM's management and authority structures

> *"IBM's top executives attempted to manage the corporation from the top, ... in so doing exceeded their capabilities. But IBM ... requires a high degree of central coordination and direction ... a judicious blend of decentralized operating management and centralized strategic direction. In the 1980s, IBM's executives failed to get the mixture right."*

and blames culture for lackluster response

> *"Is IBM the victim of a corporate culture that pushed the wrong type of executive to the top? Yes. IBM chief executives were too inbred, too steeped in the arrogance of success, and too certain of their own judgment in a time of challenge. IBM's culture contributed greatly to each shortcoming."*

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# Key building blocks

Organization has a leader

- represents ultimate principals
- picks centralized or decentralized design, $o \in \{c, d\}$
  $d$ may have benefits (better information) and costs (conflicting interests)

Organization has a continuum of divisions, $\omega \in [0, 1]$

- upper-tier (senior) managers: choose projects if $o = d$
- two different types $\tau(\omega) \in \{0, 1\}$, share $\mu$ has type 0
  e.g., type 0 (1) likes to work with mainframes (PCs)
- lower-tier (junior) managers: put in effort $e$ – adopt one type
- this period's junior managers next period's senior managers

# States of the world and projects

Aggregate state of the world

- $\theta \in \{0, 1\}$ shapes organization's priority
  e.g., $\theta = 0$ (1) mainframes (PCs) most important
- $\beta$ probability of $\theta = 0$, world predictable if $\beta$ close to 0 or 1

Local projects

- $\rho(\omega, \theta) \in \{0, 1\}$ for each $\omega$
- if $o(\theta) = c$, leader picks $\rho(\omega, \theta)$ for all $\omega$ according to $\theta$
- if $o(\theta) = d$, upper-tier managers pick $\rho(\omega, \theta) = \tau(\omega)$

Divisional payoffs $\pi(\rho(\omega, \theta), \theta, o(\theta))$

- reflect how projects $\rho(\omega, \theta)$ aligned with $\theta$

# Leader – organizational payoff

Information

- sees $\theta$ and $\mu$, not $\tau(\omega)$ and choice $\rho(\omega, \theta)$ if $o(\theta) = d$ (to rule out contracting)

Objective

- design organization $o(\theta)$ to maximize

$$\Pi(\int \pi(\rho(\omega, \theta), \theta, o) d\omega, e)$$

- divisional payoffs depend on project-state match

$$\begin{aligned} \pi(0,0,d) &= \pi(1,1,d) = 1 > \pi(0,0,c) = \pi(1,1,c) = \pi \\ \pi(0,1,d) &= \pi(0,1,d) = 0 > \pi(0,1,c) = \pi(1,0,c) = -\pi \end{aligned}$$

- centralization costs: $\frac{1}{2} < \pi < 1$, (implicit) information loss
- initially, effort $\overline{e}$ exogenous and common across $\omega$ later, endogenous (common) $e(\theta) = \int e^*(\theta, \omega) d\omega$

# Upper-tier managers – types and choices

Information, types, and choices

- observe $\theta$ and, *iff* $o(\theta) = d$, choose $\rho(\omega, \theta)$
- share $\mu_t$ $(1 - \mu_t)$ identify with type $\tau = 0$ $(1)$ and prefer $\rho(\omega, \theta) = \tau(\omega)$
- payoff is $\overline{e}u(\rho(\omega, \theta), \tau(\omega))$, where $\overline{e}$ effort by lower-tier manager and

$$u(0,0) = u(1,1) = u > u(0,1) = u(1,0) = 0$$

- no direct benefit to $\tau = 0$ or $\tau = 1$, if favorite project
- $\mu_t$ gauges organizational culture at $t$ – *single* state variable

State and time-dependent conflicts of interest

- *type* $\tau = 0$ $(1)$ does what leader wants in *state* $\theta = 0$ $(1)$, latent conflict of interest changes with $\mu_t$ and $\theta$

# Upper-tier managers – values

Hold "tribal" values

- if socially identify with a type, value payoffs of same-type coworkers – value for manager of type $\tau(\omega)$ is

$$v(\tau(\omega),\omega,\theta) = \overline{e}u(\rho(\omega,\theta),\tau(\omega)) +$$

$$\int \xi\left(\tau(\varpi)\right)\overline{e}u(\rho(\varpi,\theta),\tau(\varpi))d\varpi$$

- $\tau\left(\varpi\right) \in \{0,1\}$ type in division $\varpi \neq \omega$

$$\xi\left(\tau\left(\varpi\right)\right) = \begin{cases} \xi > 0 \text{ if } \tau\left(\varpi\right) = \tau(\omega) \\ 0 \text{ if } \tau\left(\varpi\right) \neq \tau(\omega) \end{cases}$$

- internalize payoffs of everyone in tribe
  parameter $\xi$ measures strength of social identity
- values reflect organizational design; evolve over time

# Lower-tier managers – effort and matching

Invest in effort, once and for all

- exogenous $\overline{e}$ specific to organization (endogenize later)

Randomly matched to divisions

- socialized by upper-tier managers in $t$ to become upper-tier managers in $t+1$

# Lower type managers – type transmission

Dynamics follow revision protocol (Sandholm 2010)

$$\mu_{t+1} - \mu_t = (1 - \mu_t)\,\varsigma^{1,0} - \mu_t \varsigma^{0,1}$$

where $\varsigma^{1,0} > 0 \iff \Delta > 0$ and $\varsigma^{1,0} > 0 \iff \Delta < 0$

- $\Delta$ is *relative fitness* of type 0:

$$\Delta = E[v(0, \omega, \theta)] - E[v(1, \omega, \theta)]$$

  where expectations taken over $\omega$ and $\theta$.
- can reflect (forward-looking) micro-founded socialization or (backward-looking) replicator dynamics
- either way, transmission is "Darwinian": type increases its share when expected to do better

# Timing

1. Organization enters $t$. Share $\mu_t$ upper-tier managers has type $\tau = 0$, and $1 - \mu_t$ has $\tau = 1$. Nature determines $\theta_t \in \{0, 1\}$
2. New lower-tier managers enter. Invest $\overline{e}$ and assigned randomly to divisions
3. Leader chooses organizational form $o(\theta_t) \in \{c, d\}$
4. Lower-tier managers socialized, which shapes $\mu_{t+1}$
5. If $o(\theta_t) = c$, leader chooses $\rho(\omega, \theta_t) \in \{0, 1\}$, for all $\omega$
   If $o(\theta_t) = d$, upper-tier managers in each division choose $\rho_t(\omega, \theta_t) \in \{0, 1\}$
6. Payoffs. Lower-tier managers replace upper-tier managers

# Roadmap

1. Related Research
2. IBM Case Studies
3. Generic Model
4. **Analysis, Extensions, and Insights**
5. Applications and Final Remarks

# Culture maps into organizational design

Analyzing steps 5 and 3 gives

**Proposition 1** *Decentralization choices satisfy:*

1. $o(0) = d$ *iff*
$$\mu \geq \pi$$
2. $o(1) = d$ *iff*
$$\mu \leq 1 - \pi$$

- decentralize when enough managers share leader's preferences – e.g., those with $\tau = 0$ if $\theta = 0$

# Cultural dynamics

Preliminaries

- the revision-protocol transmission rule

$$\mu_{t+1} - \mu_t = (1 - \mu_t)\,\varsigma^{1,0} - \mu_t \varsigma^{0,1}$$

with $\varsigma^{1,0} > 0 \Longleftrightarrow \Delta(\mu) > 0$ and $\varsigma^{0,1} > 0 \Longleftrightarrow \Delta(\mu) < 0$
has three possible steady states: $\hat{\mu} = 1; \hat{\mu} = 0; \Delta(\hat{\mu}) = 0$

- long-run outcome will reflect how relative fitness $\Delta(\mu_t)$ varies with culture $\mu_t$

**Lemma 2** *If there exists* $\hat{\mu} \in [0, 1]$, *where* $\Delta(\hat{\mu}) = 0$ and $\Delta(\mu)$ *is globally increasing, steady states at* $\mu = 0$ *and* $\mu = 1$ *are stable, and one at* $\hat{\mu}$ *unstable*

# Is relative fitness globally increasing?

Computing relative fitness (using Proposition 1) yields

$$\Delta(\mu) = \begin{cases} \beta\hat{\delta}(\mu) + (1-\beta)\,\delta_L(\mu) & \text{if } \mu > \pi \\ \beta\delta_H(\mu) + (1-\beta)\,\delta_L(\mu) & \text{if } \mu \in [1-\pi, \pi] \\ \beta\delta_H(\mu) + (1-\beta)\,\hat{\delta}(\mu) & \text{if } \mu < 1-\pi \end{cases}$$

- given by functions $\hat{\delta}(\mu)$ when $o = d$, $\delta_H(\mu)$ when $o = c$ and $\theta = 0$, and $\delta_L(\mu)$ when $o = c$ and $\theta = 1$
- as culture $\mu$ varies from 0 to 1, $\Delta(\mu)$ changes discretely at cutoffs $\pi$ and $1-\pi$, and smoothly off these cutoffs

Functions $\hat{\delta}(\mu)$, $\delta_H(\mu)$, and $\delta_L(\mu)$ are such that

**Lemma 3** *For all* $\{\mu, \beta\} \in [0,1] \times [0,1]$, $\Delta(\mu)$ *is globally increasing in* $\mu$

# Organizational design maps into culture

Steady state and dynamics

- define critical value, for which $\Delta(\mu) = 0$

$$\tilde{\mu}(\beta) = (1-\beta) + \frac{(1-2\beta)}{\xi}$$

**Proposition 2** *There are three cases*

1. *If $\beta$ is close enough to* 1, *a type-*0 *culture emerges in long run* (*i.e.*, $\lim_{t\to\infty} \mu_t = 1$) *from any starting value* $\mu_0 > 0$.
2. *If $\beta$ is close enough to* 0, *a type-*1 *culture emerges in long run* (*i.e.*, $\lim_{t\to\infty} \mu_t = 0$) *from any starting value* $\mu_0 < 1$.
3. *If* $\tilde{\mu}(\beta) \in [1-\pi, \pi]$ *a type-*0 (type-1) *culture emerges in long run if* $\mu_0 > \tilde{\mu}(\beta)$ $(\mu_0 < \tilde{\mu}(\beta))$

# Extension 1 – variable effort

Investment in effort at stage 2 endogenous

- $e(\omega, \theta) \in [\underline{e}, \overline{e}]$ has increasing and convex cost $\psi(e)$

Payoff – share of upper-tier manager's rent

- $e(\theta) I(\rho(\omega, \theta), \tau(\omega))$, where

$$I(0,0) = I(1,1) = I > I(0,1) = I(1,0) = 0$$

- $\gamma(\theta)$ probability of $I$ – i.e., of happy upper-tier manager

Optimal effort: $e^*(\gamma(\theta)) = \arg\max \{\gamma(\theta) I e - \psi(e)\}$

- increasing in $\gamma(\theta)$, common to all lower-tier managers

Propositions 1 and 2 still hold

- but we have new critical value

$$\tilde{\mu}(\beta) = \frac{e^*(1-\mu)(1-\beta)[1+\xi] - \beta e^*(\mu)}{\xi[(1-\beta)e^*(1-\mu) + \beta e^*(\mu)]}$$

# Extension 2 – asymmetric payoffs

Payoff in one state $\theta$ more sensitive to right type

- assume payoffs satisfy

$$\begin{aligned}\pi(0,0,d) &= \chi \geq \pi(1,1,d) = 1 > \pi(0,0,c) = \pi(1,1,c) = \pi \\ \pi(0,1,d) &= \pi(0,1,d) = 0 > \pi(0,1,c) = \pi(1,0,c) = -\pi\end{aligned}$$

- decentralization for a larger range of $\mu$ in state 0

Propositions 1 and 2 still apply

- except wider decentralization range

$$o(0) = d \quad \textit{iff} \quad \mu \geq \pi/\chi$$

in first condition of Proposition 1

# Extension 3 – different types of leaders

Leaders may have enough charisma to overcome social identity

- assume senior managers (partly) internalize leader payoffs

$$u\left(\rho\left(\omega,\theta\right),\tau\left(\omega\right)\right)+\kappa\pi\left(\rho\left(\omega,\theta\right),\theta,o\right)$$

- leader with $\kappa \geq u$ ($\kappa < u$) can (not) make manager act against his values, pick $\rho\left(\omega,\theta\right)=\theta$ to benefit organization

Proposition 1 becomes trivial if $\kappa \geq u$

- leader always set $o = d$, as faces no conflict of interest

Proposition 2 – cultural dynamics?

- if $\kappa \geq u$, $\Delta\left(\mu\right)$ still globally increasing in $\mu$, so organization still driven to monoculture
- but as all managers happy, sign of $\Delta\left(\mu\right)$ only reflects relative tribe size: converge towards $\mu = 0$ ($\mu = 1$) when initial $\mu$ above (below) $\frac{1}{2}$

# Insights from Propositions 1 and 2

1. Organizational cultures and designs correlated
2. Different cultures can coexist with common parameters
3. Dysfunctional organizational cultures are possible
4. Organizational inertia may slow or prevent adaptation to changing conditions

# 1. Culture and design

No deterministic relation

Predictability: $\beta$ close to 0 (1) (Case 1 (2) in Proposition 2)

- steady drift towards managerial monoculture
- see decentralization (and high effort)
- organization looks free of internal conflicts

Unpredictability: mid-range $\beta$ (Case 3 in Proposition 2)

- organization flips between $c$ and $d$, depending on $\theta$
- often centralized design (and lower effort)
- organization looks conflict-ridden half the time

# 2. Coexistence

In Case 3, starting point determines final outcome

- consider two organizations with same fundamentals: parameters $\{\beta, u, l, \xi, \bar{e}\}$, and functional form $\Pi$
- if initial $\mu$ on opposite sides of "critical juncture" $\tilde{\mu}(\beta)$, adjust towards different long-run cultures
- designs respond in opposite ways to shifts in $\theta$
- performance differs across dynamics and steady states

# 3. Dysfunctional cultures

**Proposition 3** *The leader's payoff is greater or smaller for* $\mu = 1$ *than* $\mu = 0$, *depending on* $\beta \gtreqless 1/2$

Best culture may lose out in long run and in transition

- in Case 3, can converge to either $\tau = 0$ or $\tau = 1$ culture
- $\tau = 1$ ($\tau = 0$) culture dysfunctional if $\beta > 1/2$ ($< 1/2$)

In asymmetry extension, scope for dysfunctionality greater

**Proposition 3'** *The leader's payoff is greater or smaller for* $\mu = 1$ *than* $\mu = 0$, *depending on* $\beta \gtreqless \frac{1-\pi}{1-\pi+\chi-\pi} < \frac{1}{2}$

- similar result in endogenous-effort extension

# Why no organizational Coase theorem?

Friction is lack of commitment – not short horizons

- at each $t$, design must be incentive-compatible for leader, who thus takes future design choices as given
- design shapes cultural dynamics, which feed back to design
- like failure of Coase theorem in political economics
- gradual dynamics of values create persistence

# 4. Inertia of organization

Culture may *not* respond to changing fundamentals

- consider two $\beta$-values: $\beta_H > \beta_L$
- suppose organization with $\beta_H$ has converged to $\mu = 1$
- will culture respond if $\beta$ shifts to $\beta_L$ (via an MIT-shock)?
- no, if $\Delta(1) > 0$, a sufficient condition for which is

$$\beta_L \geq \hat{\beta}_L = \frac{1}{2+\xi}$$

Cultural hysteresis

- we see inertia, unless $\beta_L < \hat{\beta}_L$
- culture only starts adjusting if shock to environment large enough for $\Delta(1) = \beta(1+\xi) - (1-\beta)\xi < 0$
- identity-based cultures may prevent organizational adaptability

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# IBM redux

Two types of projects and managers

- $\rho(\omega, \theta_t) \in \{M, P\}$, projects oriented to *M*ainframes, or (first) *P*unch Cards, (then) *P*Cs
- managers $\tau(\omega) \in \{M, P\}$, with different social identities
- divisional payoffs – replacing $\theta = 0, 1$ by $M, P$

$$\pi(M, M, d) = \pi(P, P, d) = 1 > \pi(M, M, c) = \pi(P, P, c) = \pi$$
$$\pi(M, P, d) = \pi(P, M, d) = 0 > \pi(M, P, c) = \pi(P, M, c) = -\pi$$

Early mainframe era – 1950s to 1970s

- Watson Jr. inherits organization with both $M$ and $P$ types, but $\beta = \beta_H$ close to 1 so $\theta = M$ almost all $t$
- with influence $\kappa > u$, he convinces $P$ types to work on $M$ projects and moves to decentralized organization
- with $\mu > \frac{1}{2}$, $\Delta(\mu) > 0$, so IBM approaches monoculture with only mainframe types, $\mu \to 1$, and payoff $\to \Pi(1, \overline{e})$

# IBM redux – new market conditions

Performance problems with changing conditions in late 1970s

- modest fall in $\beta$ – PCs perhaps important – and Watson's successors (Learson and Cary) less charismatic with $\kappa < u$
- optimal response to $\theta = P$: centrally impose $P$-projects on all $\omega$, as $\Pi(\pi(P, P, c), \overline{e}) = \Pi(\pi, \overline{e}) > \Pi(1-\mu, \overline{e}) = \Pi(\mu\pi(M, P, d) + (1-\mu)\pi(P, P, d), \overline{e})$ when $\mu$ close to 1
- with endogenous effort, payoff is $\Pi(\pi, e^*(1-\mu))$

Compare to new firm with PC-culture

- IBM performance lower than for new decentralized firm with $\mu$ close to 0 and payoff $\Pi(1-\mu, e^*(1))$
- IBM resembles "elephant trying to tap dance" for two reasons: $\pi < 1-\mu$, and $e^*(1-\mu) < e^*(1)$

# IBM redux – adaptation or not?

Will IBM adapt?

- not if "death of mainframe" is still in doubt so $\beta > \hat{\beta}_L$
- transition begins only if $\beta$ falls further (or new manager with $\kappa > u$ brought in), but turnover of managerial culture is a time-consuming process

Lessons?

- analytical narrative of IBM and its slow adaptability due to strong culture
- suggested trade-off: strong organizational cultures – via strong leaders – powerful in stable environments, but may create inertia and dysfunctionality when adaptation needed
- interesting insight to combine with analysis of market selection

# Three additional applications of generic model

Public bureaucracies and service delivery

- dilemma of top control, with unpredictable environment; performance can differ for same fundamentals

Heterogeneous productivity in firms

- culture, design and performance endogenously correlated; markets may (partly) weed out dysfunctional cultures

Political party cultures

- coexistence of different cultures in two competing parties; culture can cause problem or give competitive edge

# What do we learn and what next?

Insights on how organizational design and culture coevolve

- may see different performance for similar fundamentals
- no guarantee cultural dynamics yield optimal outcomes
- organizations can have "critical cultural junctures"
- no commitment and slow-moving culture can hold back adaptation to shifts in environment

Future theory and applications

- apply similar modeling to other organizations
- consider hiring and firing – when can outside recruitment resolve organizational inertia?
- study further role of "transformational" leaders – top-down rather than bottom-up view of culture