On the joint evolution of culture and institutions

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On the economics of culture

Main questions:

- Cultural heterogeneity
- Cultural persistence

Cultural heterogeneity

[show figure on language fractionalization in Asia]

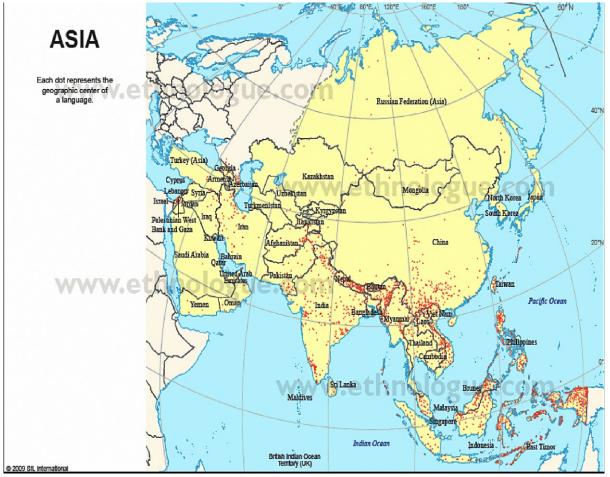


Figure 5 Languages spoken in Asia. Source: www.Ethnologue.com

Cultural (or is it institutional?) persistence

- Acemoglu, Johnson, and Robinson (2001) protection of property rights
- La Porta, Lopez de Silanez, Shleifer and Vishny (1999) legal origin on income.
- Guiso, Sapienza, and Zingales (2008) free city-states in medieval Italy on trust.
- Nunn and Wantchekon (2008) slave trade on trust
- Grosjean (2009) ottoman domination on corruption.
- Grosjean (2011) pastoral culture on violence.

Cultural (or is it institutional?) persistence

- Miguel, Saiegh, and Satyanath (2008) history of civil conflict on violently play in soccer
- Mo (2007) Chinese writing system on the adoption of collective values.
- Rodríguez-Pose, and Sandall, 2007 medieval family systems on various indicator of demographic and economic development
- Voigtländer and Voth (2010): pogroms in 1349 in Germany (following the Black Death) on various measures of anti-Semitism in the 20's and 30's
- Alesina, Giuliano, and Nunn (2010) early historical use of animal plough agriculture on female labor force participation.

On the economics of culture and institutions

- The fundamental questions:
 - What accounts for economic prosperity?
 - What stands at its origin?
- Their translation in in economic/statistical speak:
 - What is the single univariate cause of GDP growth? E.g., D. Acemoglu and J. Robinson, Why nations fail, E.g., D. Acemoglu and J. Robinson, Why nations fail, Ch. 2, Theories that don't work, 2012.

The myth of the origin

- The origin of the Mafia in Sicily
 - a price shock on sulfur an lemon in the 1850's (Buonanno, Durante, Prarolo, and Vanin, 2012),
 - lack of city states (because of Norman domination) in the XIV'th century (Guiso, Sapienza, and Zingales, 2007),
 - the Paleolithic split into nomadic pastoralism in 7th millenium BC (Alinei, 2007).
- The origin of all languages:
 - Babel tower incident on May 5th, 1491 B.C., Ussher (1650).

Motivation

• The method:

- historical natural experiments where institutions are varied in geographical units with common geographical characteristics, culture, and other possible socio-economic determinants of future prosperity
- Some successsful examples:
 - the institutional design of colonial empires, the more extractive the higher settlers' mortality rates (Acemoglu and Robinson, 2001);
 - the spanish colonial policy regarding the forced mining labor system in Peru' (Dell, 2010);
 - the U.S.-Mexico border separating the city of Nogales (Acemoglu and Robinson, 2010);
 - the border separating the island of Hispaniola into two distinct political and institutional systems, Haiti and the Dominican Republic (Diamond, 2010).

Some critical issues

- The assumption that the distinct institutions arise in otherwise common environments is disputable: settlers' mortality rates correlated with natives' (see e.g., Alsan, 2012, on tse-tse fly).
- The identification of the natural experiment as a change in institution is often debatable, as cultural attitudes affect institutional set-up: Puritans, Cavaliers, Quakers, Scots-Irish in early waves of immigration into America, Fischer (1989); Genoese and Maghrebi traders, Greif (1994); bourgeois values behind Magna Charta etc. in Medieval England, McCloskey (2006, 2010).
- Historical natural experiment does not imply a single cause;
- Similar arguments for culture as the cause of prosperity: individual values about the scope of application of norms of good conduct in Europe, Tabellini (2008); social capital in Italy, Putnam (1993); university reform in Italy, Durante, Labartino, and Perotti (2011); voting reform again in Italy, Nannicini, Stella, Tabellini, and Troiano (2010).

Basic (if obvious) claims

- Institutions and cultural traits evolve jointly.
 - political institutions like city states in Italy in the Middle Age and civic capital (Guiso, Sapienza, and Zingales, 2007 and 2010),
 - industrialization and social capital in Indonesia (Miguel, 2003),
 - the technology of plough, patriarchal institutions and gender attitudes (Alesina and Giuliano, 2011).
- Cultural traits can also change rapidly, jointly with institutional changes:
 - attitudes towards corruption in Hong Kong in the last decades after various successful institutional efforts (Clark, 1987 and 1989; see also Hauk and Saez-Marti', 2002),
 - attitudes towards redistribution after the institition of welfare states in Europe (Alesina and Angeletos, 2005; Alesina and Giuliano, 2010) and in East Germany after unification (Alesina and Fuchs Schuendeln, 2005);
 - social/civic/human capital after colonization (Glaeser, La Porta, Lopez-de-Silanez, Shleifer, 2004; Easterly and Levine, 2012; and Bisin and Kulkarni, 2012).

On the joint dynamics of culture and institutions

- On to modeling:
 - Adapt model of cultural dynamics
 - Develop model of institutional dynamics

 Bisin and Verdier (1998, 2000a, 2001a) building on Cavalli Sforza and Feldman (1973, 1981) in evolutionary biology and of Boyd and Richerson (1985) in anthropology; Bisin and Verdier (2010) for a recent survey.

- Dichotomous cultural trait in the population, $\{a, b\}$.
- Fraction of individuals with trait $i \in \{a, b\}$, q^i .
- Reproduction is a-sexual and each parent has one child.
- Direct vertical (parental) socialization and horizontal/oblique socialization in society at large:
 - i) direct vertical socialization with probability d^{i} ;
 - ii) a child from a family i, if not directly socialized (probability $1-d^i$), is horizontally/obliquely socialized by picking the trait of a role model chosen randomly in the population (i.e., he/she picks trait i with probability q^i and trait $j \neq i$ with probability $q^j = 1 q^i$).

Probability that a child from a family with trait i is socialized to trait
 j:

$$P^{ii} = d^i + (1 - d^i)q^i$$

 $P^{ij} = (1 - d^i)(1 - q^i)$

• Dynamics of the fraction of the population with trait i:

$$\dot{q}^{i} = q^{i}(1 - q^{i}) \left(d^{i} - d^{j}\right).$$
 (1)

- Utility to a cultural trait i parent of a type j child, $i,j \in \{a,b\}$, $V^{ij}(q^i)$
- Cultural intolerance of trait i, $\Delta V^{i}(q^{i}) = V^{ii}(q^{i}) V^{ij}(q^{i})$,
- Socialization costs, $C(d^i)$.
- Direct socialization is then the solution to

$$d^{i} = d(q^{i}, \Delta V^{i}(q^{i})), \tag{2}$$

of the parental socialization problem:

$$\max_{d^i \in [0,1]} -C(d^i) + P^{ii}V^{ii}(q^i) + P^{ij}V^{ij}(q^i), \text{ s. t. } 1) \; .$$



- The dynamics of the fraction of the population with cultural trait i is then determined by equation (1), evaluated at d^i satisfying (2).
- Under relatively natural assumptions about preferences, cultural transmission satisfies cultural substitution: $\Delta V^i(q^i) \geq 0$, $d^i(q^i, \Delta V^i(q^i))$ is a continuous, strictly decreasing function in q^i , and, moreover, $d^i(1, \Delta V^i(q^i)) = 0$.
- In this case, the stationary states of the population dynamics are $(0,1,q^{i*})$, where q^{i*} is culturally heterogeneous. Moreover, the culturally heterogeneous stationary state is globally stable, that is, $q^i(t,q^i_0) \to q^{i*}$, for any $q^i_0 \in (0,1)$.

- Acemoglu (2003) and Acemoglu and Robinson (2006) study political institutions, notably the shift between dictatorship and democracy and viceversa;
- Guimaraes and Sheedy (2010) extend these analyses while grounding them in the theory of coalition formation;
- Levine and Modica (2012) have evolutionary approach.

- Agents separated into homogeneous groups in terms of relevant characteristics, e.g., preferences (including cultural traits), resources, and technologies.
- Action of agents of group i, a^i ($\mathbf{a} = \{a^i\}_i$ is the vector).
- The (vector of) economic policies in society, t.
- ullet Parametrization of economic institutions (the distinction between economic policies and economic institutions will be clearer later), heta.
- Agents of group i have preferences represented by an indirect utility function:

$$u^{i}\left(a^{i},t;\theta,\mathbf{q}\right)$$



- Identify political institutions with the weights in the social choice problem which determines economic policies: weight associated to each agent of group i, $\alpha^i \geq 0$ normalized so that $\sum_i \alpha^i q^i = 1$ $(\alpha = \{\alpha^i\}_i)$.
- The social choice problem for the determination of t, given political institutions α , economic institutions θ , and the distribution of the population by groups \mathbf{q} is as follows:

$$\max_{t \in T} \sum_{i} \alpha^{i} q^{i} u^{i} \left(a^{i}, t; \theta, \mathbf{q} \right)$$
 (3)

- Political institutions lack commitment, so that the solution of the social choice problem results in a map T: A → T which is anticipated by agents when choosing their actions aⁱ, for any i.
- Each agent of type *i* then solves the following choice problem:

$$\max_{\mathbf{a}^{i}} \ u^{i} \left(\mathbf{a}^{i}, \ T \left(\mathbf{a} \right); \theta, \mathbf{q} \right) \tag{4}$$

• An equilibrium is a (a, t) such that i) each element a^i of a solves (its corresponding) choice problem (4) given the policy map T; ii) the policy map T solves the social choice problem (3); and the policy choice t satisfies t = T(a).

Let

$$\left[\begin{array}{c} \mathbf{a}\left(\alpha,\theta,\mathbf{q}\right) \\ t\left(\alpha,\theta,\mathbf{q}\right) \end{array}\right]$$

denote the equilibrium map as a function of the state variables $(\alpha, \theta, \mathbf{q})$.

 Future political and economic institutions are chosen each generation by the present institutional mechanism. Denoting the future with a prime, institutional change is determined by the solution of the following problem:

$$\max_{\alpha',\theta'} \sum_{i} \alpha^{i} q^{i} u^{i} \left(\mathbf{a} \left(\alpha', \theta', \mathbf{q}' \right), t \left(\alpha', \theta', \mathbf{q}' \right); \theta', \mathbf{q}' \right)$$
 (5)

What can I do now

- Can study now joint dynamics of α and \mathbf{q} in different context.
- Can identify *cultural and institutional multipliers*, by means of comparative dynamics (change initial α while keeping **q** constant).
- Can study qualitative conditions for large multipliers, complementarity and substitability between culture and institutions - see next rough examples.

Example: Property rights and bourgeois values

Optimal extraction problem in this economy - $\alpha^a = 1$.

$$\max_{\{c_i\}_i} u_a(c_a)$$

subject to:

$$c_a + c_b = q^b \gamma I_b,$$

where

$$I_b \in \operatorname{arg\,max} u_b(c_b(I_b), I_b)$$

Example: Property rights and bourgeois values

- As γ increases an institutional setting with $\alpha^b > 0$ could be optimally chosen.
- In this case, ΔV^b increases, other things equal; and so does q_t^b over time; which in turn strengthens incentives to increase α^b
 - \longrightarrow complementarity between culture and institutions
 - → *large* cultural multiplier

• Preferences over consumption, c, and hours worked, I:

$$u_i(c, I) = \ln c + \theta_i \ln (1 - I)$$
 with $\theta_i > 0$

- ullet Agents differ in terms of their preferences for leisure, $heta_i$, with $heta_a < heta_b$.
- q denote the fraction of individuals of type a (with a "work ethic") in the population.

Optimal redistributive fiscal policy in this economy (Mirlees problem) - $\alpha^b = 1$.

$$\max_{t,\{l_i,c_i\}_{i=a,b}} \ln \, c_b + heta_b \, \ln \left(1-l_b
ight)$$

subject to:

$$\begin{aligned} c_a &= (1-t) \textit{wl}_a \\ c_b &= \textit{wl}_b + \frac{q}{1-q} \textit{twl}_a \\ \textit{In } c_a + \theta_a \textit{ In } (1-\textit{I}_a) &\geq \textit{In } c_b + \theta_a \textit{ In } (1-\textit{I}_b) \\ \textit{In } c_b + \theta_b \textit{ In } (1-\textit{I}_b) &\geq \textit{In } c_a + \theta_b \textit{ In } (1-\textit{I}_a) \\ &\frac{1-\textit{I}_i}{\textit{I}_i} \geq \theta_i, \quad i = a, b \end{aligned}$$

• Agents of type *a*: unrestricted labor supply:

$$I_{a}=\frac{1}{1+\theta_{a}}.$$

• Agents of type b: work less than unrestricted labor supply:

$$I_b < \frac{1}{1+\theta_b}.$$

• The consumption (after tax income) of agents of type a is higher:

$$c_a > c_b$$
.

• The labor supply of agents of type b, l_b , and the per-capita transfers they receive, $\frac{q}{1-q} twl_a$, are decreasing with the fraction of agents of type a in the population, q; $ql_a + (1-q)l_b$ decreases when q decreases.

When equilibrium allocations result from the optimal redistributive fiscal policy,

$$\Delta V^b > 0$$
 and $\Delta V^a = 0$

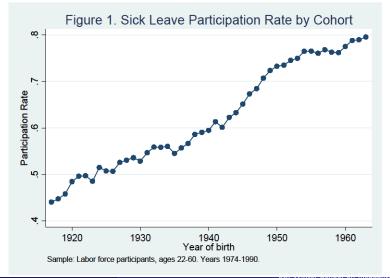
that is, only agents of type b, with 'no work ethic', socialize their children. Hence:

- The marginal tax rate decreases over time and tends to 0 with q.
- The extent of the redistribution, $\frac{q}{1-q}twl_a$, also decreases over time and tends to 0 as $q_t \to 0$.
- The difference in the equilibrium labor supplies across types, $I_a^* I_b^*$ decreases over time; and, as $q_t \to 0$, both agents' labor supplies tend to be undistorted with respect to the first best, $I_i = \frac{1}{1+\theta_i}$, for $i = \{a, b\}$.
- The average labor supply, $q_t l_a + (1 q_t) l_b$ decreases over time as $q_t \to 0$.

- As q decreases an institutional setting with $\alpha^b < 0$ could be optimally chosen.
- In this case, $\Delta V^a=0$, other things equal; and so $q_t^a\to 0$ over time; which in turn may strengthen incentives to decrease α^b

 \longrightarrow substitability between culture and institutions \longrightarrow negative(?) cultural multiplier

From M. Ljunge, 2011:



Conclusions

- Joint evolution of culture and institutions is west: go west, young man, go west!
- Modeling objective: abstraction without formal generality

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