

Chapter 3

Formal (and informal) institutions and economic growth

3.1 Regression Discontinuity Design (RD)

3.1.1 RD in theory

- treatment assignment ($T = 1$) depends discontinuously on some observable W
 - for example, the assignment to $T = 1$ if W exceeds a critical value w_0 (the discontinuity)
 - Ex. Age, income, deadline, ... , but also geographical location
- so the assignment method to treatment and control is the opposite of randomization, being a deterministic function of some observable variable
- however, the assignment to groups $T = 1$ and $T = 0$ is "*as good as random*" in a neighborhood of the discontinuity
 - under the condition that both W and w_0 are exogenous (are not under the individual control)
 - always check for other characteristics

3.1.2 RD in practice

For a sufficiently small c :

$$\mathbb{E}[y_{i0}|w_0 - c < W_i < w_0] = \mathbb{E}[y_{i1}|w_0 < W_i < w_0 + c]$$

(namely look at the difference in the outcome y for the units immediately below and above the discontinuity)

c is chosen on the base of the problem and the data

In linear regressions:

$$y_i = \alpha + \beta_i W_i + \gamma_i D_{W>w_0} + \delta X_i + \epsilon_i$$

3.2 "National Institutions and Subnational Development in Africa" - Michalopoulos & Papaioannou (2014)

We investigate the role of national institutions on subnational African development in a novel framework that accounts for both local geography and cultural-genetic traits. We exploit the fact that the political boundaries on the eve of African independence partitioned more than 200 ethnic groups across adjacent countries subjecting similar cultures, residing in homogeneous geographic areas, to different formal institutions. Using both a matching type and a spatial regression discontinuity approach we show that differences in countrywide institutional structures across the national border do not explain within-ethnicity differences in economic performance, as captured by satellite images of light density. The average noneffect of national institutions on ethnic development masks considerable heterogeneity partially driven by the diminishing role of national institutions in areas further from the capital cities.

They use the Regression Discontinuity Strategy to identify the causal link between formal institutions and growth.

Idea:

- different institutional contexts can have different unobservable characteristics → endogeneity of institutions
- if we were to observe some discontinuity w_0 (exogenous) such that similar contexts are characterized by different institutions, we could resort to RD
→ study the effect of different institutions in otherwise "identical" subcontexts

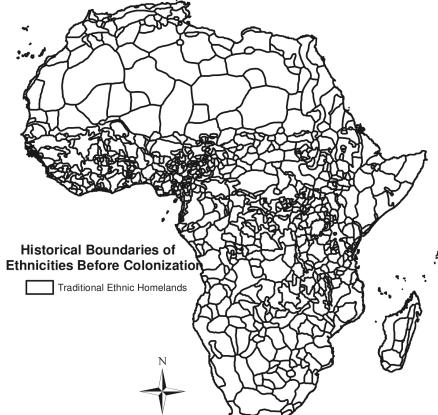


FIGURE IA
Ethnic Boundaries

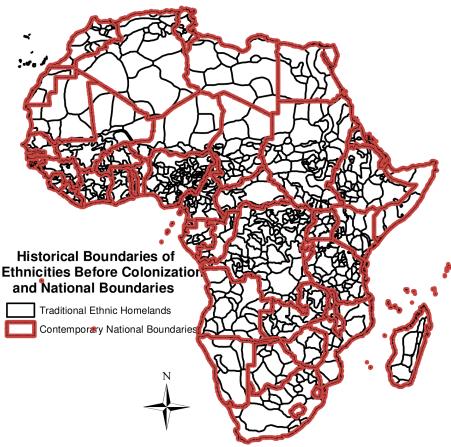


FIGURE IB
Ethnic and Country Boundaries

An exogenous border is imposed that splits the same ethnic group in different countries that have different institutional settings.

"Quasi-Experimental" context

- political boundaries have divided more than 200 ethnic groups in different states
- ethnic groups remained in their historical settlement regions

identification strategy: exploit economic development of ethnic groups partitioned into different states → similar cultures (but not only culture) & different institutions

Several difficulties: parsity of economic performance indicators at the local (country-ethnicity) level
→ solution: satellite images of **light density**

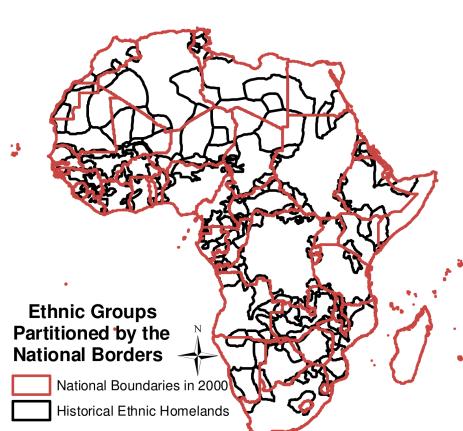


FIGURE IIIA
Partitioned Ethnic Homelands

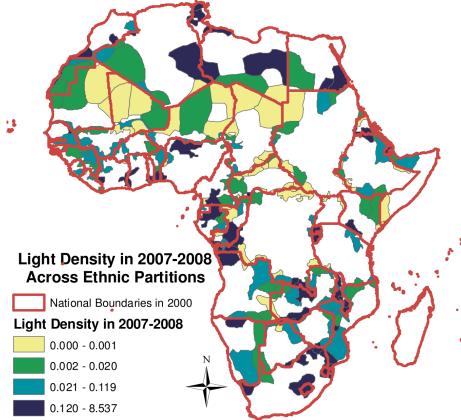


FIGURE IIIB
Luminosity across Partitioned Ethnic Homelands

Graphical representation of the sample

Example: Ambo, an ethnic group partitioned between Angola (a country scoring quite low in most proxies of national institutions) in the north and Namibia (an institutionally advanced African country) in the south.

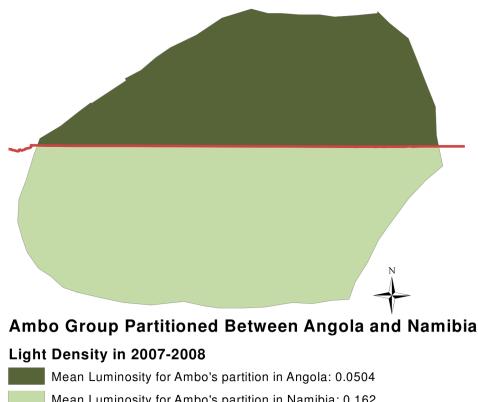


FIGURE IIA
Example: Unit of Analysis I

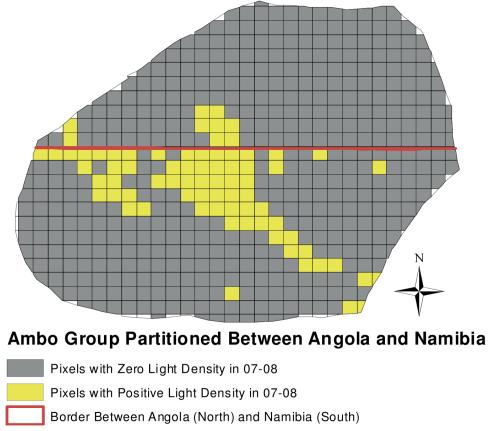


FIGURE IIB
Example: Unit of Analysis II

3.2.1 Identification

Estimation Method (1)

Specification at the Country-Ethnic Homeland Level:

$$y_{i,c} = \alpha_0 + \gamma IQL_c + \lambda_1 PD_{ic} + \lambda_2 AREA_{ic} + X'_{ic}\Phi + \alpha_i + \epsilon_{ic}$$

where i : ethnic group and c : country and

- y_{ic} (dependent variable) = $\ln(0.01) + \text{light density}$

- light density of group i in country c
- reflects the level of economic activity in the historical homeland of ethnic group i in country c
- IQL_c : institutional quality in country c
- PD_{ic} : log population density of group i in country c
- $AREA_{ic}$: log land area of the homeland of group i in country c
- X_{ic} : other control variables
- α_i : fixed effects per ethnic group

Estimation Method (2) - Linear Probability Model

Specification at the Pixel Level

$$y_{p,i,c} = \alpha_0 + \gamma IQL_c + \lambda_1 PD_{p,i,c} + \lambda_2 AREA_{pic} + X'_{p,i,c}\Phi + \alpha_i + \zeta_{p,i,c}$$

where $y_{p,i,c}$

- dummy that takes on the value 1 if pixel p is lit and 0 otherwise.
- Each pixel, p , falls in the historical homeland of partitioned ethnicity i located in country c

other control variables are measures at the pixel level

Estimation Method (3) - Regression Discontinuity

$$y_{p,i,c} = a_0 + \gamma IQL_c^{\text{HIGH}} + f(BD_{p,i,c}) + \lambda_1 PD_{p,i,c} + \lambda_2 AREA_{p,i,c} + X'_{p,i,c}\Phi + \alpha_i + \zeta_{p,i,c} \quad (3.1)$$

it is similar to specification (2), but:

- we add RD-polynomials of the distance from the centroid of each pixel to the national border $f(BD_{p,i,c})$.
- IQL_c^{HIGH} : dummy variable that takes the value 1 for pixels falling in the country with the relatively better institutions

Independent Variables

- IQL : institutional quality of country c , as reflected in the rule of law and the control of corruption measures.
 - For split groups, each partition is assigned to the corresponding country c
 - For example, regional light density in the part of the Egba in Benin is matched to the institutional quality of Benin, whereas the adjacent area of the Egba in Nigeria is assigned the value of Nigeria

Based on World Bank Governance Indicators:

- Governance “*the manner in which public officials and institutions acquire and exercise the authority to shape public policy and provide public goods and services*” (World Bank 2007, p. 1)
- The WGI cover over 200 countries and territories
 - * measures six dimensions of governance starting in 1996: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption.

- * The aggregate indicators are based on several hundred individual underlying variables, taken from a wide variety of existing data sources.
- * The data reflect the views on governance of survey respondents and public, private, and NGO sector experts worldwide.
- other control variables: Distance to the capital city, Distance to the sea coast, Surface area, Area under water (rivers, lakes, other streams), Elevation, Land suitability for agriculture, Population density in 2000, Malaria Stability Index, Diamond mine indicator and Petroleum/oil indicator

Validity of the Strategy

For our identification strategy that compares economic development at the homelands of the same ethnicity in adjacent countries to be valid, one needs border drawing to not have been influenced by local circumstances and factors that shape or reflect economic well-being (see Angrist and Pischke 2008). Moreover, the ethnic areas across the border need to be similar across all relevant for development dimensions.

- anecdotal evidence suggests that colonizers drew African borders in an arbitrary manner
- the delineation of African borders took place in a period when Europeans had not yet settled (most of) Africa and had limited knowledge of its political and economic geography
- 80% of African borders follow latitudinal or longitudinal lines, the highest percentage across all continents.

investigate whether differences in institutional quality across the border correlate with differences in various characteristics

TABLE II
VALIDITY OF IDENTIFICATION DESIGN AT THE COUNTRY-ETHNICITY HOMELAND LEVEL

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Dependent variable is:									
	Ln (land area)	Ln (area under water)	Mean elevation	Land suitability	Malaria stability	Oil indicator	Diamond indicator	Distance to the capital	Distance to the sea coast	Distance to the border
Panel A: Rule of law										
Rule of law	-0.0474 (0.2058)	0.0480 (0.0453)	0.0041 (0.0217)	0.0091 (0.0184)	-0.015 (0.0230)	0.0365* (0.0199)	-0.0161 (0.0433)	-0.1887 (0.1233)	0.0001 (0.0178)	-0.0037 (0.0049)
Double-clustered std. err.										
Adjusted R-squared	0.682	0.796	0.964	0.935	0.941	0.753	0.547	0.582	0.986	0.639
Observations	507	507	507	507	507	507	507	507	507	507
Panel B: Control of corruption										
Control of corruption	-0.0686 (0.2229)	0.037 (0.0610)	0.0119 (0.0222)	-0.0052 (0.0243)	-0.0324 (0.0233)	0.0431 (0.0294)	-0.0199 (0.0612)	-0.1753 (0.1490)	0.0037 (0.0176)	-0.007 (0.0077)
Double-clustered std. err.										
Adjusted R-squared	0.683	0.795	0.964	0.935	0.941	0.753	0.547	0.565	0.986	0.551
Observations	507	507	507	507	507	507	507	507	507	507

- The results are supportive of our identification strategy, as they point out that the two (or more) partitions of split groups are appropriate counterfactuals
- Differences in geography-ecology, location, and natural resources across the border within partitioned ethnic homelands are small and not systematically linked to differences in national institutions

3.2.2 Results

Baseline Results

TABLE IV
NATIONAL INSTITUTIONS AND REGIONAL DEVELOPMENT ACROSS AND WITHIN PARTITIONED ETHNIC GROUPS

	(1) Rule of law	(2)	(3)	(4)	(5) Control of corruption	(6)	(7)	(8)
Panel A: Country-ethnic homeland level								
Institutional quality	0.6510*** (0.1951)	0.1943 (0.1898)	0.5150** (0.2024)	0.2159 (0.2135)	0.7904*** (0.2268)	0.2566 (0.2197)	0.6019*** (0.2329)	0.2675 (0.2439)
Double-clustered std. err.								
Adjusted R-squared	0.292	0.792	0.392	0.798	0.298	0.792	0.393	0.798
Within R-squared		0.061		0.067		0.062		0.067
Observations	507	507	507	507	507	507	507	507
Panel B: Pixel level								
Institutional quality	0.1072*** (0.0400)	0.0246 (0.0165)	0.0834** (0.0324)	0.0278 (0.0181)	0.1371*** (0.0464)	0.0370 (0.0273)	0.1097*** (0.0415)	0.0403 (0.0290)
Double-clustered std. err.								
Adjusted R-squared	0.149	0.331	0.202	0.340	0.160	0.331	0.209	0.340
Within R-squared		0.059		0.066		0.059		0.066
Observations	42,710	42,710	41,025	41,025	42,710	42,710	41,025	41,025
Ethnicity fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Pop. dens. and area	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Location controls	No	No	Yes	Yes	No	No	Yes	Yes
Geographic controls	No	No	Yes	Yes	No	No	Yes	Yes

Panel A gives the results at the country-ethnic homeland level (equation (1)), and Panel B reports the results at the pixel level (equation (2)). For comparability, in odd-numbered columns we report cross-sectional estimates, and in even-numbered specifications we add ethnicity fixed effects.

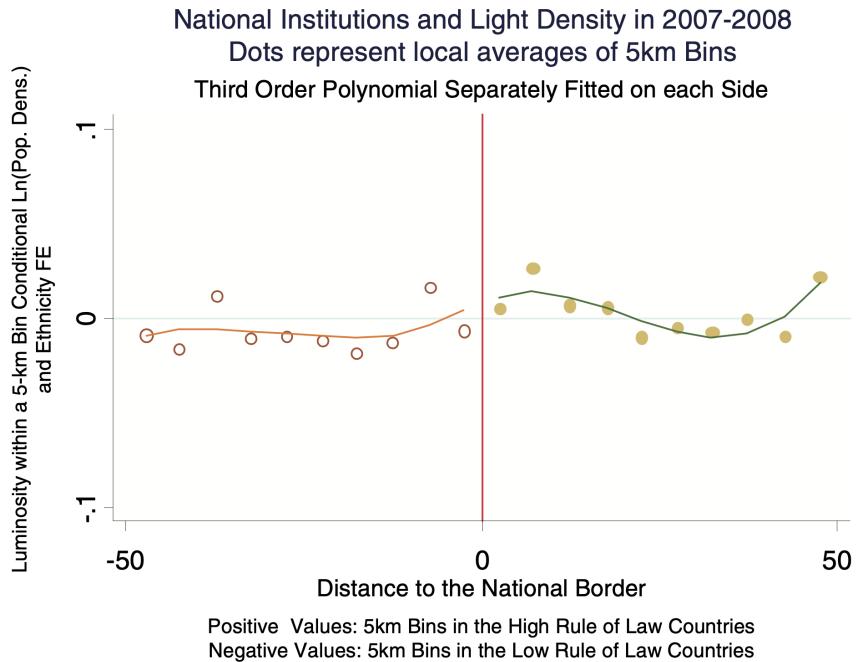
Results:

- When we solely exploit within-ethnicity variation, the coefficients on rule of law and control of corruption drop sizably and become statistically insignificant
- This is a uniform pattern across all permutations.

Regression Discontinuity (RD) Estimates

NATIONAL INSTITUTIONS AND REGIONAL DEVELOPMENT AT THE BORDER REGRESSION DISCONTINUITY (RD) ESTIMATES

	(1)	(2)	(3) Rule of law	(4)	(5)	(6)	(7)	(8)	(9) Control of corruption	(10)	(11)	(12)
Bandwidth	All pixels		100 km		50 km		All observations		100 km		50 km	
RD polynomial	3rd-order	4th-order	3rd-order	4th-order	3rd-order	4th-order	3rd-order	4th-order	3rd-order	4th-order	3rd-order	4th-order
Panel A: Global RD polynomial												
Institutional quality	0.0166 (0.0138)	0.0058 (0.0135)	0.0123 (0.0165)	0.0050 (0.0185)	-0.0010 (0.0240)	0.0122 (0.0272)	0.0038 (0.0154)	-0.0086 (0.0137)	0.0116 (0.0166)	0.0123 (0.0176)	-0.0030 (0.0223)	0.0079 (0.0276)
Double-clustered std. err.												
Adjusted R-squared	0.342	0.342	0.320	0.320	0.347	0.347	0.342	0.343	0.320	0.320	0.347	0.347
Within R-squared	0.059	0.059	0.037	0.037	0.064	0.064	0.059	0.060	0.037	0.037	0.064	0.064
Panel B: Ethnic-specific RD polynomial												
Institutional quality	0.0175 (0.0125)	0.0203 (0.0154)	0.0037 (0.0124)	0.0135 (0.0183)	0.0068 (0.0176)	0.0185 (0.0318)	0.0020 (0.0119)	0.0114 (0.0138)	0.0011 (0.0136)	0.0094 (0.0181)	0.0124 (0.0189)	0.0128 (0.0283)
Double-clustered std. err.												
Adjusted R-squared	0.416	0.427	0.412	0.423	0.441	0.459	0.416	0.427	0.412	0.423	0.441	0.459
Within R-squared	0.133	0.144	0.129	0.140	0.158	0.176	0.133	0.144	0.129	0.140	0.158	0.176
Observations	40,209	40,209	21,289	21,289	13,408	13,408	40,209	40,209	21,289	21,289	13,408	13,408
Ethnicity fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pixel area & pop. dens.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes



3.2.3 Conclusion

Lack of a systematic association between national institutions and regional development within partitioned African homelands

- differences in national institutions across the border do not systematically translate into differences in economic performance within partitioned ethnicities
- results go against the conventional wisdom in economics on the causal effect of national institutions on development, in Africa at least
- yet they are consistent with the African historiography that de-emphasizes the importance of colonial and contemporary countrywide institutions in the hinterland

Further Results:

- **heterogeneity:** the analysis reveals considerable heterogeneity

” We find that the average effect of institutions is economically negligible and statistically insignificant for approximately 60% of partitioned ethnicities. Yet for some groups, consisting of approximately 20%–25% of the sample, a significant positive association emerges, whereas for the remaining ones the within-ethnicity association turns negative.

Overall, the uncovered heterogeneity provides a useful reminder that generalizing from the findings of case studies focusing on a single border discontinuity can be quite misleading.”

- **distance from the capital** → the explanatory power of national institutions monotonically declines with distance to the capital city.
 - diminishing role of national institutions in areas distant from capital cities
 - law enforcement might explain the result → law enforcement decays with distance from the capital

These correlations vividly illustrate the limited penetration of the state in remote areas, suggesting that at least within Africa, treating countries as homogeneous entities where nationwide characteristics (in our case the quality of national

institutions) exert a uniform influence across regions may be quite misleading. In fact, the uncovered patterns are supportive to an old idea among development scholars (e.g., Lewis 1954) on the coexistence in Africa (and other parts of the developing world) of a “dual” economic-institutional framework with customary rules being dominant in the countryside and colonial-national institutions becoming relevant for regions closer to the capitals

Michalopoulos & Papaioannou (2014)’s result suggests that culture is important in explaining growth.

Two main channels:

1. Individual utility function (via social norms)
2. Cooperation and trust
 - Trust and cooperation are essential elements of the market
 - Without trust, “*no market could function*” (Arrow, 1973, p. 24)

Overlapping between culture, informal institutions, and social capital

3.3 Informal institutions: theoretical framework and Measurement issues

3.3.1 Remarks on Social Capital

As numerous reviews have noted, the social capital about which Bourdieu wrote has little to do with what the concept later became. For the French author, social capital is a resource of individuals and families inherent in their network of relationships and capable of being transformed into other forms of capital-economic and cultural. It is, in essence, the ability of persons and families to command resources through their membership in networks and other social structures (Bourdieu 1979, 1980; Wacquant 2000). For Putnam, in contrast, social capital is a public good—the amount of participatory potential, civic orientation, and trust in others available to cities, states, or nations (Putnam 1993, 2000). Coleman’s definition fell somewhere in the middle, related to the density of social ties and their capacity to enforce the observance of the norms. “Closure” was the term that he used to refer to mutual knowledge and social ties between community members who support each other and sanction deviance. Coleman lamented the disappearance of community closure, which gave way, in the modern world, to ever-growing atomization and anomie (Coleman 1988, 1993)

Definitions of social capital:

- Bourdieu, 1985: ”The aggregate of the actual or potential *resources* which are linked to possession of a durable *network* of more or less institutionalized relationships of mutual acquaintance or recognition”

- Coleman, 1988: A variety of entities with two characteristics in common: "they all consist of some aspect of social structure, and they **facilitate** actions within that structure"
- Putnam, 2001: "The central idea of social capital, in my view, is that networks and the associated norms of reciprocity have **value**. (...)"
 - available at the level of cities, states...
 - idea of a "public good"

Like physical capital, social capital is far from homogeneous

Attribute of Individuals vs Populations/Areas

When Putnam telescoped the concept into much larger social units, the empirical focus changed from the immediate circle of relationships surrounding individuals and families to aggregate characteristics of the population. (Portes&Vickstrom, 2011)

- literature on social networks
- structure of the network, linked resources, etc

Positive Connotation:

"the collection of good behavior that tends to be simultaneously present in certain communities/countries whose inhabitants vote, obey the law, and cooperate with each other and whose leaders are honest and committed to the public good" (Putnam, 1995)

Methodological concerns: social capital should be defined and measured independently from its consequences

In a critical review of social capital as a characteristic of cities and nations, Portes (1998) noted that, for Putnam's argument to be taken seriously, three methodological conditions had to be observed:

- (1) social capital must be defined, conceptually and empirically, as distinct from its alleged consequences.
- (2) measures of social capital must be taken prior to its hypothesized effects to ensure that the causal relationship does not run in the opposite direction.
- (3) there must be a control for other variables that could plausibly explain the observed relationship in order to guard against spuriousness.

- risk of tautology
- (im)possibility of falsification

3.3.2 Measures

Examples of measures

(as in Tabellini G. (2010). *Culture and Institutions: economic development in the regions of Europe*)

TRUST

Interactions between trusting individuals are more likely to lead to efficient outcomes, whereas lack of trust makes it more difficult to overcome the inefficient equilibrium

- trust facilitates the extension of anonymous market exchange and reduces the need for external enforcement of contractual agreement
- lack of trust is associated with suspicion and fear of fraud
 - this raises the cost of transactions outside of the local community
 - and thus reduces the benefit of division of labor and the gains from trade

To measure trust we consider the following question in the survey:

“Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?”

The level of trust in each region is measured by the percentage of respondents who answer “Most people can be trusted” (the other possible answers are “*Can't be too careful*” and “*Don't know*”)

RESPECT AND OBEDIENCE

To obtain a more direct measure of generalized vs. limited morality, we also consider the values transmitted from parents to children

“Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five.”

- The variable *respect* is defined as the percentage of respondents in each region that has mentioned the quality “*tolerance and respect for other people*”
- The variable *obedience* is defined as the percentage of respondents in each region that has mentioned the quality “*obedience*”

The other choices are: Good manners; Independence; Hard work; Feeling of responsibility; Imagination; Thrift, saving money and things; determination, perseverance; Religious faith, Not being selfish (unselfishness).

Lack of respect for others and obedience are typical of hierarchical societies

- in hierarchical societies, individualism is mistrusted and to be suppressed
- good behavior is deemed to result from coercion, not from internalization of the values of society
- the role of the state is to force citizens to behave well
- the role of paternal education is to control the negative instincts of children, often through recourse to violence

Such coercive cultural environments stifle individual initiative and cooperation within a group and can hurt growth and development.

CONTROL

A cultural feature often mentioned as a driver of economic development is the conviction that individual effort is likely to pay off.

- If individuals are highly motivated to succeed and view economic success as related to their deliberate choices, they are more likely to work hard, to invest for the future, and to innovate and undertake new economic initiatives.
- If individuals regard success as due to luck or to uncontrollable external events, they are more likely to have a passive, resigned, and lazy attitude towards economic activity.

To measure this cultural trait we use the following question in the survey:

: “Some people feel they have completely free choice and control over their lives, while other people feel that what we do has no real effect on what happens to them. Please use this scale (from 1 to 10) where 1 means ‘none at all’ and 10 means ‘a great deal’ to indicate how much freedom of choice and control in life you have over the way your life turns out.”

Issues with Measures

Measuring values and beliefs is problematic: limits in terms of comparability (individual and country "fixed effects")

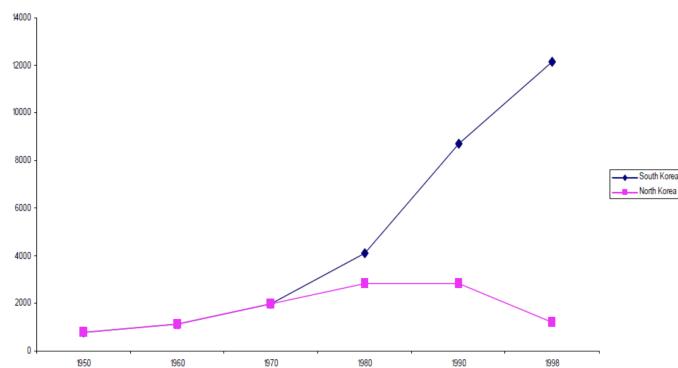
Portes & Vickstrom (2011)

- The determination and rhetorical skill with which Putnam succeeded in wresting the concept of social capital away from its sociological creators (...) have been remarkable
- In the end, this was the version of the concept that prevailed in the public mind and that has been adopted, in some form or another, by major institutions such as the World Bank



Growth: *culture or institutions?*

- Acemoglu: supremacy of formal institutions → historical examples (e.g. Korea)



- however there are several counter-examples → regional differences in Italy
 - same institutions since unification (1861)
 - but persistent cultural differences and economic differences

