Networks and economic growth
Part 2: recent studies

Lecture notes for the course of Economics and Policy of Networks

Prof. Fabio Sabatini
Sapienza University of Rome, Department of Economics and Law

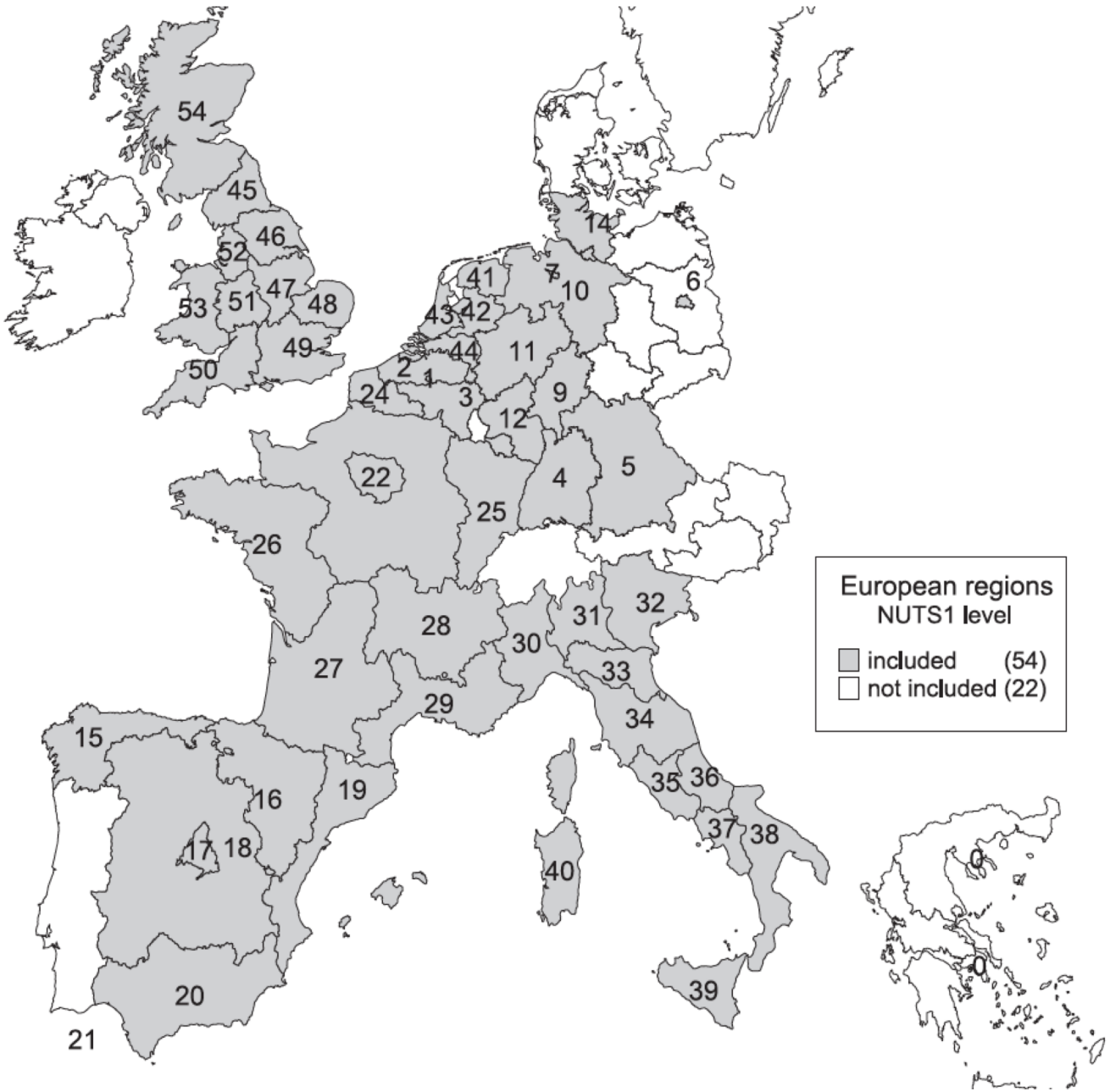
1. Civic networks and growth in European regions

Civic networks and growth in Europe

- Beugelsdijk and van Schaik (2005, EJPE) test **the role of civic networks and trust in growth** across 54 European regions by using data from the *European Values Study* (EVS).
- EVS is a large-scale, cross-national and longitudinal survey research program on basic human values, initiated by the European Value Systems Study Group (EVSSG) in the late 1970s: http://www.europeanvaluesstudy.eu/.
- The survey was conducted until 2008.

Civic networks and growth in Europe

- B&VS used just the 1990 wave of the survey.
- The set comprises seven countries, i.e. France, Italy, Germany, Spain, The Netherlands, Belgium and the United Kingdom.
- The Eurostat definition of regions was used. The regional level in the analyses was the NUTS1 level.
- The total number of regions was 54.


European regions
NUTS1 level
included (54)
not included (22)
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Civic networks and growth in Europe

- The authors measure trust à la Knack and Keefer (1997), using the "Rosenberg question": "Generally speaking, would you say that most people can be trusted, or that you cannot be too careful in dealing with people?"
- **Indicator of trust**: After deleting the number of respondents that answered don't know, they took **the fraction of people that answered "most people can be trusted"**.
- **Indicator of civic networks**: **the average number of civic groups cited per respondent in each region**.
- **B&VS also distinguish between active and passive** membership in groups, where respondents were considered as "active" when they not only were a member but also did voluntary work for an association.

Civic networks and growth in Europe

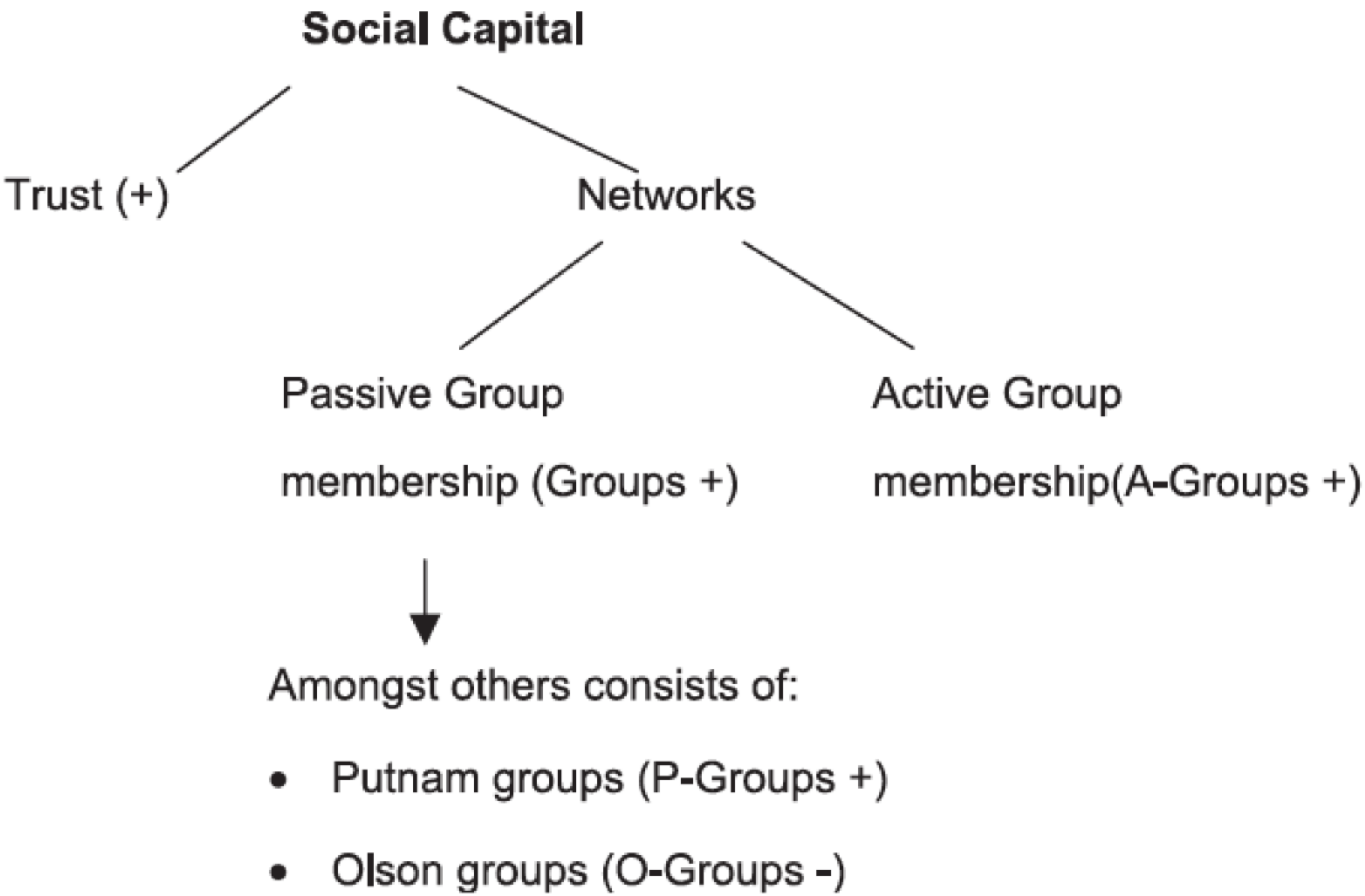
- In addition, B&VS distinguish between Putnam and Olson networks.

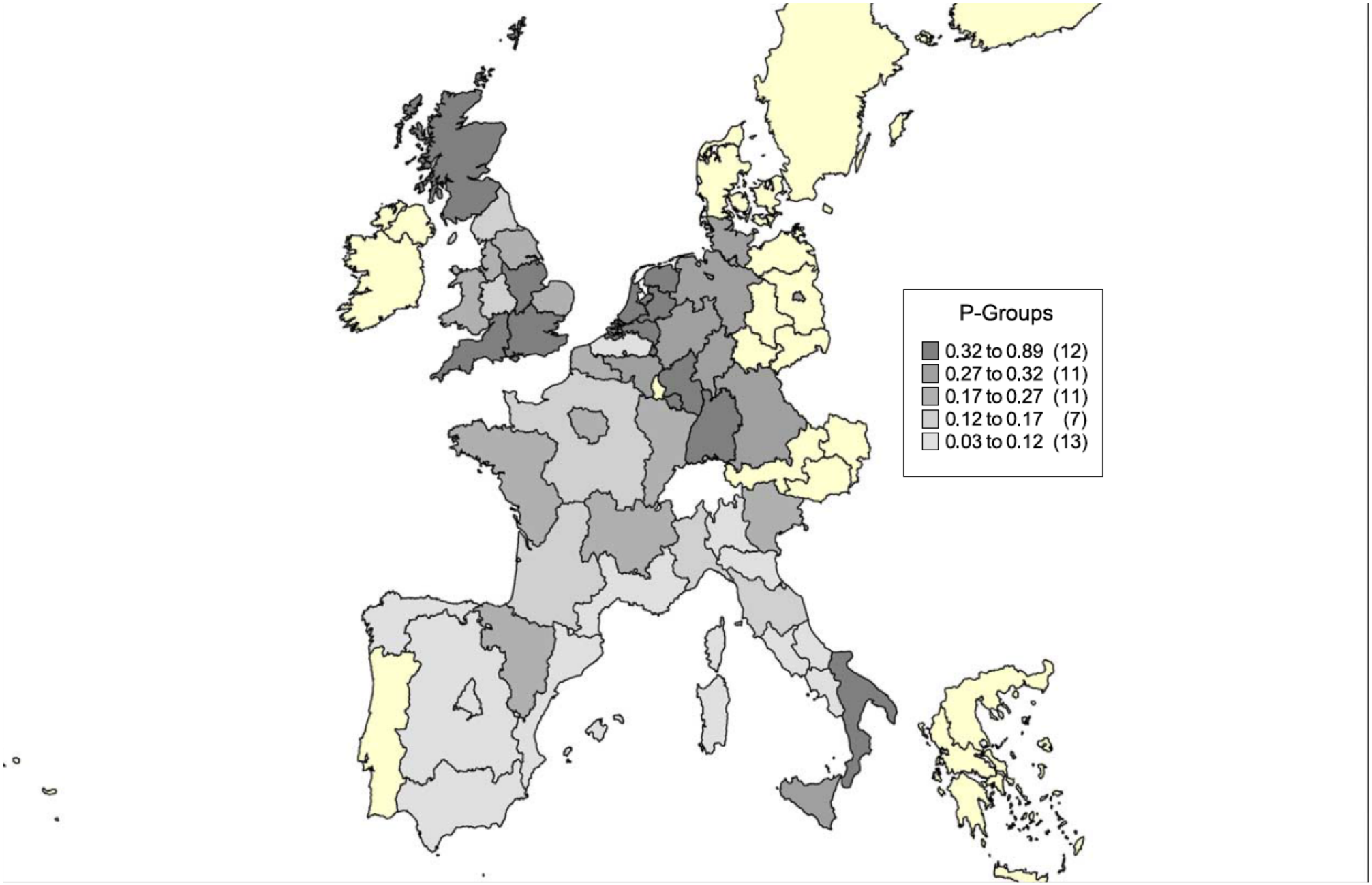
- Putnam:
  - Religious or church organizations
  - Education, arts, music or cultural activities
  - Youth work
- Olson:
  - Trade unions
  - Political parties or groups
  - Professional associations

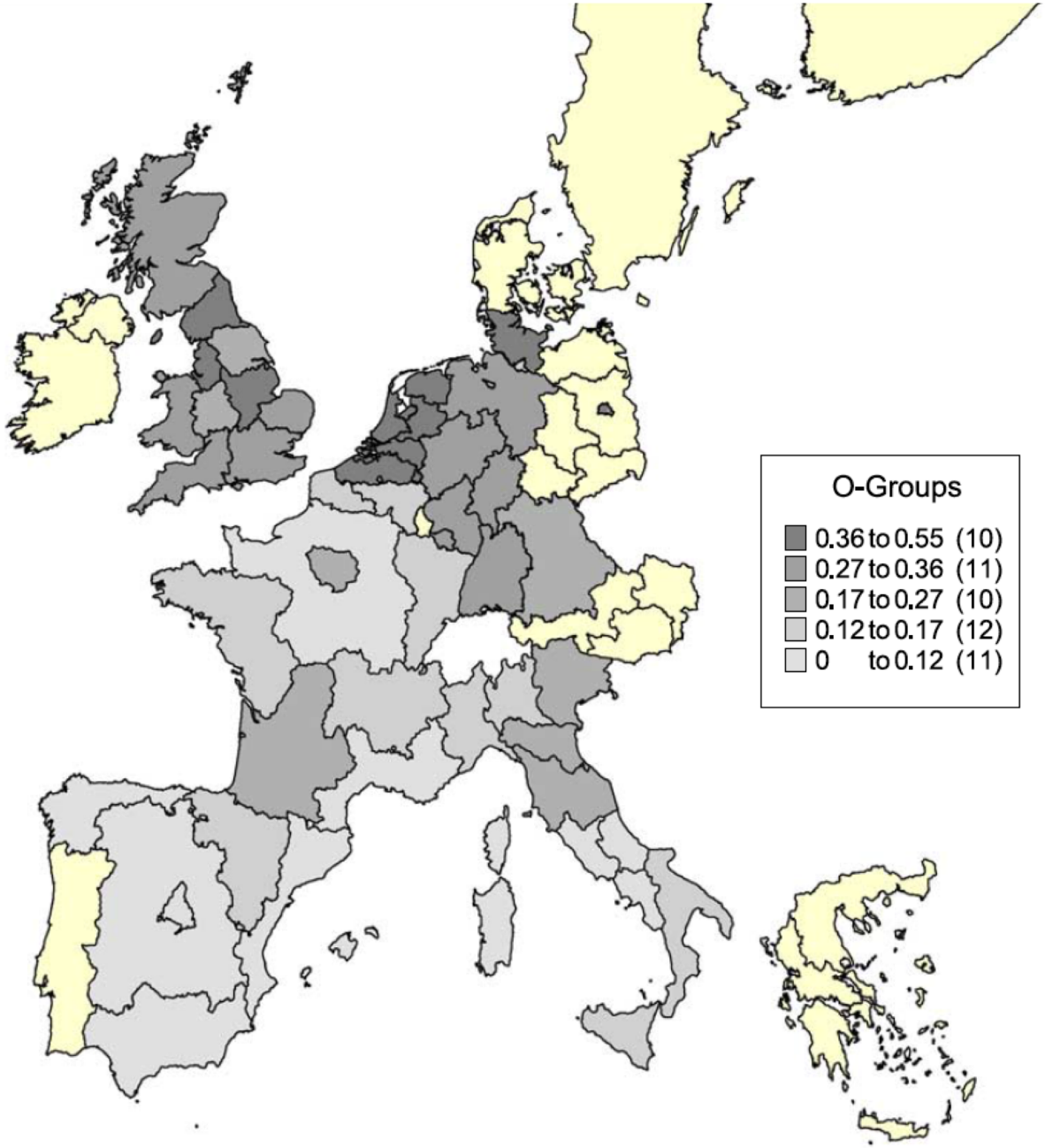
Civic networks and growth in Europe

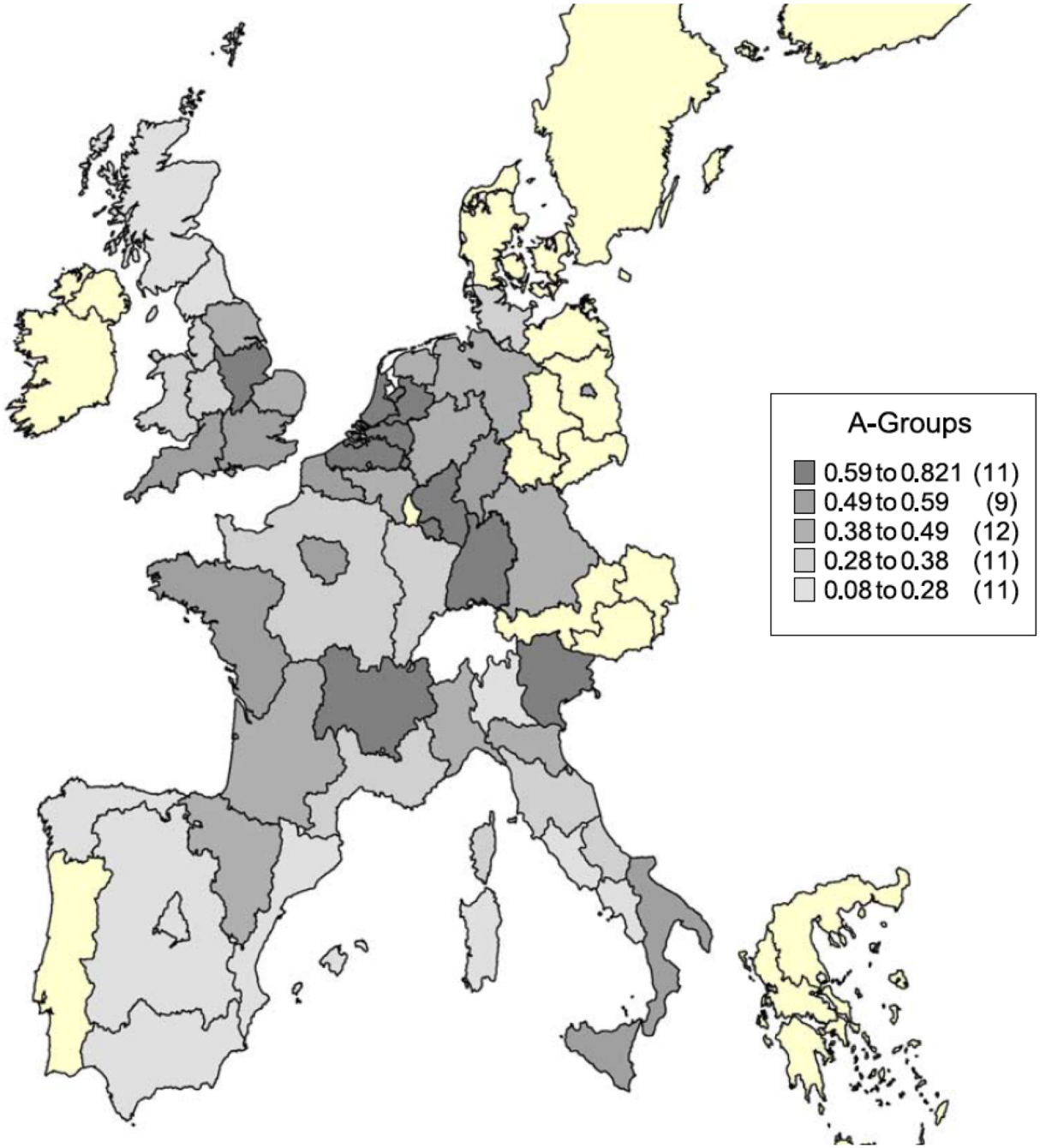
- In addition, EVS also provided information about membership in the following groups, that were accounted for in a more general measure of civic networks:
  - Social welfare services for elderly handicapped or deprived people
  - Local community action
  - Third world development or human rights
  - Conservation, the environment, ecology
  - Sports or recreation
  - Women's groups
  - Peace movement
  - Animal rights
  - Voluntary organizations concerned with health

- **So B&VS have 4 indicators of**:
  - **Membership in Putnam groups**
  - **Membership in Olson groups**
  - **Active membership in all groups**
  - **Passive membership in all groups**


Social Capital
Trust (+)
Networks
Passive Group
membership (Groups +)
Active Group
membership(A-Groups +)
Amongst others consists of:
• Putnam groups (P-Groups +)
• Olson groups (O-Groups -)


P-Groups
0.32 to 0.89 (12)
0.27 to 0.32 (11)
0.17 to 0.27 (11)
0.12 to 0.17 (7)
0.03 to 0.12 (13)


O-Groups
0.36 to 0.55 (10)
0.27 to 0.36 (11)
0.17 to 0.27 (10)
0.12 to 0.17 (12)
0 to 0.12 (11)


A-Groups
0.59 to 0.821 (11)
0.49 to 0.59 (9)
0.38 to 0.49 (12)
0.28 to 0.38 (11)
0.08 to 0.28 (11)

Civic networks and growth in Europe

- B&VS **compute regional growth differentials by relating the regional GDP per capita information to the country mean**.
- There were 3 reasons to **use the country mean as a correction factor**.

1. The authors did not have information about regional price levels
2. The figures on regional GDP are provided in an index form that was not comparable across countries.
3. It allowed to direct control for national growth rates that might bias regional growth rates.

- Controls were initial level of GRP per capita, school enrolment rate, investment ratio, and control variables for spatial correlation and the concentration of human capital in agglomerations.

Civic networks and growth in Europe

- **Regional growth rates are significantly and positively related to passive group membership**.
- **Active membership is highly significant and its inclusion in regressions leads to the highest variance explained**.
- It can be calculated that a one standard deviation change in active membership raises growth by .03.
- **Trust is not significant**.

Table 3
Regression results

Social capital and regional economic growth, 1950–1998										
Model	1		2		3		4		5	
Dependent variable	Growth 1950–1998									
Constant	−1.44	(0.749)	−1.45**	(0.757)	−1.49**	(0.506)	−1.37*	(0.582)	−1.01	(0.631)
Initial level of GRP per capita	−0.971**	(0.059)	−0.968**	(0.059)	−0.938**	(0.079)	−0.942**	(0.063)	−0.969**	(0.049)
Investment	0.476	(0.264)	0.481	(0.268)	0.553**	(0.176)	0.484*	(0.205)	0.422*	(0.214)
Schooling	0.527*	(0.267)	0.518	(0.277)	0.397	(0.208)	0.449*	(0.207)	0.569**	(0.208)
Agglomeration	0.528**	(0.164)	0.522**	(0.161)	0.423*	(0.205)	0.404**	(0.191)	0.472**	(0.154)
Spatial spillover	0.308**	(0.091)	0.301**	(0.086)	0.213*	(0.095)	0.233**	(0.085)	0.245**	(0.074)
Trust			0.011	(0.041)						
Putnam groups					−0.007	(0.086)				
Olson groups					0.119	(0.065)				
Passive group membership							0.109**	(0.048)		
Active group membership									0.175**	(0.046)
R^2	0.4089		0.4090		0.4673		0.4641		0.4813	

Country-based cluster adjusted standard errors between parentheses. N=54.
* $p<0.1$.
** $p<0.05$.

Open issues

- Why B&VS' results concerning European regions are different from K&K's cross-country results?
- Were classification issues properly addressed?
- Which time spans do B&VS and K&K cover? Are they actually the same?
- Which countries? Were the two samples comparable?
- Were endogeneity issues addressed and solved in both the studies?
- Does the design of the researches influence their results?

2. Civic networks, innovation and growth in European regions

Networks, innovation and growth

- Akçomak and ter Weel (2009, EER) study the **relationship between social capital, innovation, and growth** in 104 European regions in the period 1990-2002.
- The authors emphasize the role of social capital in **innovation** as conducive to growth.

Networks, innovation and growth

- **Risk affects any innovation decision in different ways**:

1. The investor may be **risk averse**.
2. **Internal capital constraints** may be too high in a competitive market.
3. **Monitoring costs** may be high.
4. **Information asymmetries** and **moral hazard** problems may hinder the financing of R&D.

- **Social capital can lower all these barriers**.

Networks, innovation and growth

Social capital can lower those barriers in 3 ways, according to A&TW:

1) Normally, firms with "bad projects" can mimic firms with "good projects", and this leads to underinvestment in innovation.
However, **if the economy is dense of networks, the probability that a "bad" firm will meet a specific investor (funder, bank) again is higher.**
The importance of reputation is then higher and norms of reciprocity and cooperative attitudes will be stronger.

2) When, thank to mechanism 1), the reputation of firms in the area is higher, **investors/banks may positively change their expectations regarding firms in the area**, which can increase the probability of financing ideas in the region.

3) In general, **if networks in the area are trust-intensive, and if the area is characterized by a high level of generalized trust, then monitoring costs are lower** and **innovation becomes a more efficient investment**.

Networks, innovation and growth

- A&TW measure **social capital** through an indicator of social trust drawn from the 2000 wave of the European Social Survey, as given by responses to the Rosenberg question ("Generally speaking…").
- After stressing, in the first part of the paper, the network dimension of social capital, they just pick one measure of trust.
- As for **innovation**, the authors use:
  - Total number of patent applications to the European Patent Office per million inhabitants by year of filing excluding patent applications to the National Patent Offices in Europe as a proxy for innovation output. To avoid yearly fluctuations, A&TW use 3-year average around each point in time, so pat91 is the average between 1990 and 1992.
  - R&D intensity - defined as the percentage of R&D personnel employment in total employment in the business enterprise sector in 1995 – as a proxy for innovation inputs.
- The **economic performance** is measured by the growth rate of GDP per capita between 1990 and 2002.
- **Human capital** is measured as the share of tertiary level students in all students in 1993.

The empirical strategy

- Since social capital is positively correlated with education – which generally fosters the formation of trust-intensive networks – A&TW include in the growth equation the **interaction term between social capital and education**.
- Since the economic performance is positively correlated with innovative activities, the authors incorporate this relation in the framework by employing a patent regression, in which they explain patent applications with R&D intensity, education and trust.

$$Patents = \alpha_0 + \alpha_1 R\&D\ intensity + \alpha_2 education + \alpha_3 trust + \upsilon$$

The empirical strategy

- Since trust is clearly endogenous, A&TW instrument trust.
- They pick **historical information** collected on literacy rates, universities and political institutions as instruments provided by the POLITY IV project on Political Regimes Characteristics and Transitions 1800-2002.

http://www.europeanvaluesstudy.eu/

www.systemicpeace.org/polityproject.html

Center for Systemic Peace

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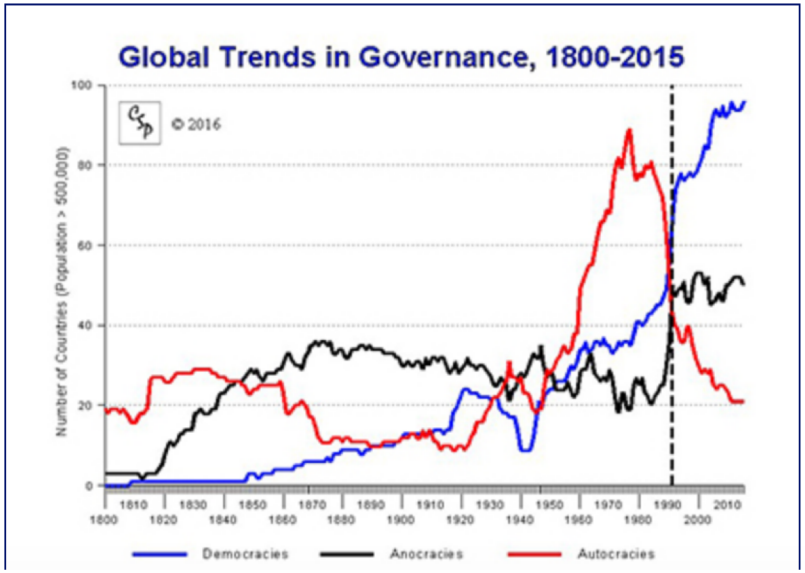
About Polity

The Polity IV Project continues the Polity research tradition of coding authority characteristics of states in the world system for purposes of comparative, quantitative analysis. An improved and enhanced Polity 5 version in the series is currently in development.

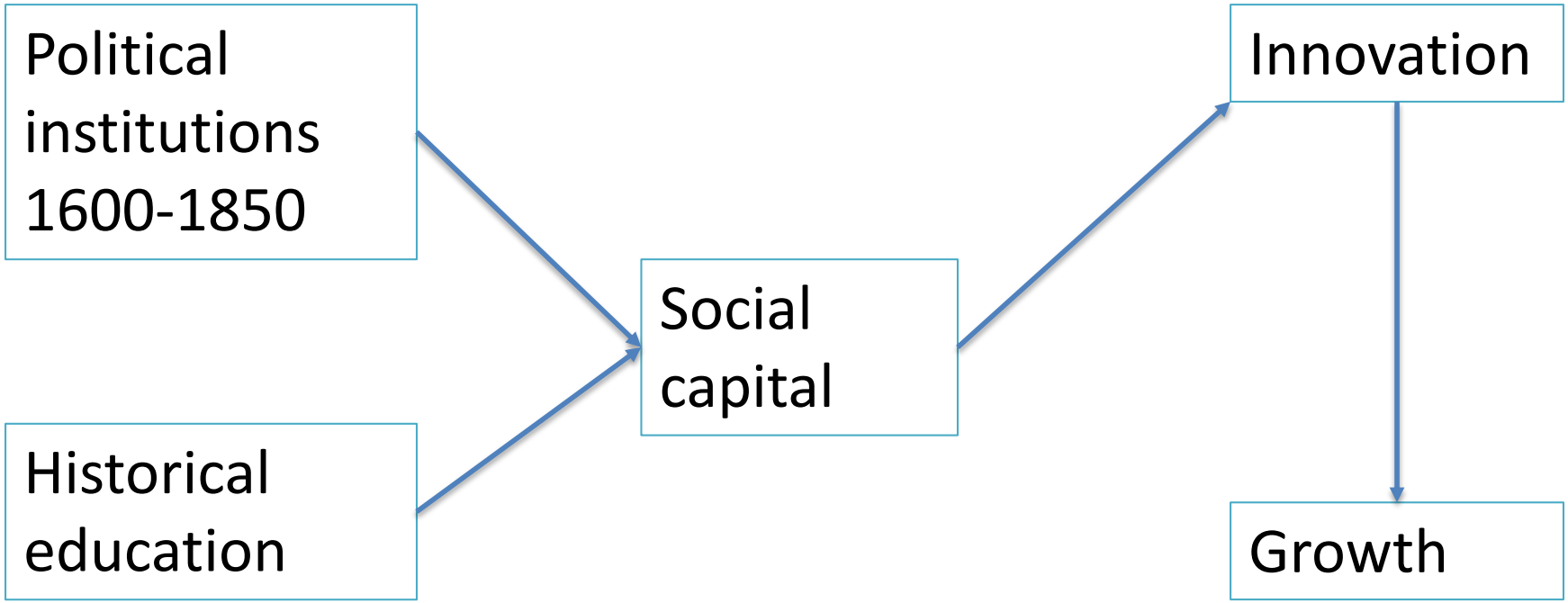
The Polity IV dataset covers all major, independent states in the global system over the period 1800-2015 (i.e., states with a total population of 500,000 or more in the most recent year; currently 167 countries). With the support of the Political Instability Task Force, the Polity IV Project has been transformed into a living data collection effort, meaning that it constantly monitors regime changes in all major countries and provides annual assessments of regime authority characteristics, changes and data updates.

The Polity conceptual scheme is unique in that it examines concomitant qualities of democratic and autocratic authority in governing institutions, rather than discreet and mutually exclusive



The empirical strategy: instruments

- More specifically, the instruments are:
  - A proxy for political institutions: "constraints on the executive on a scale 1 (unlimited power) to 7 (accountable executive constrained by checks and balances).
    Assumption: More democratic institutions are associated with higher social capital.
    Basically, A&TW build the indicator as the average of 5 variables measuring institutions from 1600 to 1850.
  - Two proxies for historical education:
    - [2000 – (date of foundation of the 1st university founded in the region)]
    - Number of universities per 100,000 inhabitants around 1850
  - A proxy for historical education: measured through literacy rates in the 1870s and 1880s.


Political institutions 1600-1850
Historical education
Social capital
Innovation
Growth

The empirical strategy

- In the lectures concerning methodological issues, we pointed out that what is key for identification is that the historical instruments don't have a direct effect on today's output but affect the latter **only because they affected the instrumented variables** centuries ago, which are then reflected – though intergenerational transmission – in today culture.
- Can this be considered the case for A&TW empirical strategy?
- Can literacy and institutions affect other (than trust) aspects of markets and society that can in turn affect the outcomes of interest in the structural equations?
- In other words, are they correlated with the error term in the structural equations?

The empirical strategy

- Anyway, A&TW basically estimate the following **system of simultaneous equations**:

$$\text{growth} = \beta_0 + \beta_1 \text{gdppc90} + \beta_2 \text{pat91} + \beta_3 \text{trust} + \beta_4 \text{educ} + \beta_5 \text{urban} + \varepsilon,$$
$$\text{pat91} = \alpha_0 + \alpha_1 \text{R\&Dintns} + \alpha_2 \text{trust} + \alpha_3 \text{educ} + \upsilon,$$
$$\text{trust} = \delta_0 + \delta_1 \text{literacy} + \delta_2 \text{instPC} + \delta_3 \text{univPC} + \delta_4 X + \eta,$$

Networks, innovation and growth: results

- **Social capital is found being significantly and positively correlated with growth** in the TSLS.
- **The same positive role of trust holds for innovation, however measured**.
- **Democratic institutions and literacy in the past predict well (significant and positive) social capital** in the first stage regression.

Networks, innovation and growth: results

- When A&TW include both social capital and innovation in the growth equation, they are not statistically significant.
- They thus estimate a 3 Stages Least Square (3SLS), which, according to them, suggests that **social capital causes innovation and that innovation causes growth**.

Open issues

- Is there the possibility to conduct more consistent and reliable estimations of the roles of networks and trust on the economic performance, in the world, in Europe, in Italy, in your country?
- Would it be possible to estimate the effect of various types of networks on a range of social, political and economic outcomes, in addition to economic growth, investments, and innovation?
- For example: can criminal networks, civic networks, family networks, networks of friends, networks of industries, vertical networks, political networks, etc. be measured?
- Are we able to build meso and macro indicators of those concepts?

3. The long-term persistence of civic networks in Italian communes and their effect on economic development

The long-term persistence of civic networks and economic development

- In spite of remarkable success stories like the Asian Tigers and, more recently, China, there is a very large persistence in economic development.
- Among European countries, there is a correlation of **0.56** between per capita income at the beginning and the end of the century.
- Even between the 1700s and 2000s (over a 300 year-span and with an industrial revolution in the middle) the correlation is 0.23.

The long-term persistence of civic networks and economic development

- In an influential paper **Acemoglu, Johnson and Robinson (hereafter AJR) (2001, AER) attribute this persistence to the long-lasting effect of formal institutions**.
- **Protection of property rights** and **limitations on the power of the executive**, which – they claim – are essential to the development process, are built into the formal institution of a country and tend to persist over the centuries.
- For instance, in countries where settlers' mortality was very high, colonizers designed institutions **aimed at extracting value, rather than creating it**.
- In the view of AJR, these extractive institutions did not foster (*and still do not foster*) the rule of law, thus having a negative effect on development.

The long-term persistence of civic networks and economic development

- An alternative view is provided by Tabellini (2010), who attributes this persistence to **culture,** measured by indicators of individual values and beliefs, such as **trust** and **respect for others**.
- Tabellini showed that regions of Europe that had **more decentralized decision-making** responsibilities in the XVII and XVIII centuries, today have both more “progressive values” and higher income per capita.

The long-term persistence of civic networks and economic development

- Both these important papers, however, could not completely reject the alternative that the source of persistence is **geographical**.
- Acemoglu et al. (2001) are aware of this problem and argue that the diseases that were a problem then (yellow fever and malaria) no longer represent a major source of comparative disadvantage. Still other geographical factors impeding economic development could be at the origin of this persistence.

The long-term persistence of civic networks and economic development

- In “Making Democracy Work”, Putnam et al. (1993) conjectured that regional differences in trust and social capital within Italy can be traced back to the **history of independence that certain cities experienced in the first centuries of the second millennium**.
- Putnam’s conjecture has two advantages.
  - First, it traces back the origin of these differences to institutions, the **free city-states**, that are long gone.
  - These institutions concentrated in the Centre-North of Italy, but did NOT involve all the major cities of the region → There is room for a natural experiment.

Long-term persistence of civic networks

- To test Putnam's conjecture, Guiso et al. (hereby GSZ) (2016) first compared current levels of social capital *within* the North-central part of Italy.
- Following Putnam's (1993), they used the following measures of social capital:
  1. **<u>Number of non-profit organizations per capita</u>. Basically, this is a measure of civic networks.**
  2. **<u>Turnout at major referenda</u>.**
  3. **The presence of an <u>organ donation organization</u> in the municipality.**

Long-term persistence of civic networks

- The total number of non-profit associations present in a town in 2000 is drawn from 2001 census carried out by the Istat.
- GSZ do not distinguish between associations: sport and cultural clubs (basically leisure time associations) are grouped together with civil and human rights associations.
- Voter turnout in referenda only refers to *3 major referenda* (chosen how?).
- Organ donation is measured by an indicator of the existence in the town of an organ donation association – which does not mean there are actual health facilities for organ "removal".

Faenza vs. Senigallia…

Long-term persistence of civic networks

Senigallia, a town of 44,000 inhabitants 60 miles South of Faenza.
In the middle ages, Senigallia used to hold one of the largest fairs in Italy, visited by merchants from all over Europe and especially the Levant.
It belonged to the March of Ancona and as such had a strong presence of imperial power.
Senigallia never became a free city.

Faenza, 54,000 inhabitants, 30 miles South-East of Bologna. **In the XII century, Faenza became a free city** (*commune*).

Long-term persistence of civic networks

Following all three measures of social capital, "Faenza dominates Senigallia":

1) The number of non-profit organizations per capita is 42% higher
2) Voter turnout at referenda is 89% versus 86% (not exactly a "dominating position").
3) Faenza has an organ donation organization, while Senigallia does not.

To conduct this analysis in a more systematic way, GSZ identify the **largest (by population) 400 Italian towns** in the Center-North in 1871 (the first Census after Italian unification) in the area that was under the Holy Roman Empire at the beginning of the second Millennium.

Long-term persistence of civic networks

- For these towns, the authors reconstruct their medieval history and collect several measures of social capital.
- GSZ, then, **test whether there is a significant relation between the fact the town was a free city-state in the 1000-1300 period and today's levels of social capital**.
- Consistent with Putnam's conjecture, **GSZ found that Center-Northern cities that experienced a period of independence as a free city have significantly higher levels of social capital today**.
- For example, **the number of voluntary associations is 25% higher in cities that were free city-states**.

Table 3. Effect of communal history on the number of non-profit organizations

The table shows OLS estimates of the effect of having been an independent city on the number of non-profit organizations per inhabitant in the city. Regressions are weighted using city population. Panel A is run on the sample of the 400 largest towns located in the Center-North of Italy (as of 1871). Panel B includes the whole sample of cities in the same area. Robust standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Panel A: Sample of 400 largest towns in the Center-North

	Only History	History and geography	History, geography and endowment	No large towns	No provincial capitals	History, geog., endow. and income	History, geo, endow and area dummies
Commune	0.42	1.12***	1.05***	0.93**	1.72***	1.02***	1.26***
	(0.36)	(0.33)	(0.33)	(0.37)	(0.39)	(0.27)	(0.28)
Elevation		1.09	0.93	0.66	0.15	1.61**	2.71***
		(0.81)	(0.79)	(0.84)	(0.65)	(0.75)	(0.79)
Max difference in elevation		0.58*	0.52*	0.93***	0.81***	0.70***	0.47*
		(0.33)	(0.30)	(0.27)	(0.28)	(0.25)	(0.25)
Intersection of Roman roads		0.97***	0.89***	1.03***	0.25	0.59**	0.72**
		(0.33)	(0.32)	(0.38)	(0.64)	(0.26)	(0.30)
On the coast		-0.15	-0.16	-0.35	0.01	0.34	0.22
		(0.43)	(0.37)	(0.33)	(0.34)	(0.29)	(0.30)
More than 5km from coast		-0.77**	-0.67**	-0.31	-0.01	-0.03	-1.04***
		(0.34)	(0.29)	(0.27)	(0.22)	(0.26)	(0.39)
Population (million people)		-4.11**	-5.35***	-33.26*	-49.26***	-8.04***	-5.44***
		(1.89)	(1.80)	(18.42)	(12.46)	(1.36)	(1.53)
Population squared		1.98	2.05	351.79**	242.18***	3.78***	2.46**
		(1.43)	(1.39)	(163.69)	(86.97)	(1.07)	(1.15)
Gini inequality index of Land ownership			2.12**	0.38	0.11	2.75***	1.19
			(1.03)	(0.85)	(0.80)	(0.82)	(0.98)
Gini income inequality index			14.63***	12.98**	13.83***	-4.27	12.69***
			(4.91)	(5.19)	(5.11)	(5.01)	(4.31)
Income per capita						0.51***	
						(0.06)	
Observations	400	400	400	381	337	400	400
R-squared	0.02	0.25	0.30	0.30	0.26	0.48	0.39

What does this suggest?

A note on income inequality

- At one point, GSZ introduce two Gini measures of inequality: in land ownership and in pre-taxed income.
- Surprisingly, higher income inequality leads to more social capital, as measured by the number of non-profit associations per capita.
- This effect, however, is due to the lack of a control for income per capita.
- When GSZ introduce this control (see column 6) this effect disappears.
- Question: could this effect be due to the fact that the indicator of nonprofit organizations does not distinguish between different types? For example, **sport and cultural clubs are more likely to include the rich**.

Long-term persistence of civic networks

- This finding per se does not prove there is a causal linkage between a town's status in the Middle Ages and its current levels of social capital.
- Other time invariant factors, such as geography, could well have biased both these variables (think for example of the closeness to the sea).
- To sort out causality, the authors look into Italian history to find **exogenous determinants of the rise of independent municipalities** (natural experiment).

A history-based natural experiment

- GSZ's reading of Medieval history books suggested that a **key factor in the formation of free cities was the coordination role played by a local religious authority**.
- Therefore, as a predictor of becoming a free city-states (i.e. as an instrumental variable), GSZ used whether a town was the seat of a bishop before the year 1000.

A second potential predictor of achieving independence is the strategic military position. Cities like Orvieto (Tr) and Civita Bagnoregio (Vt), which are located on top of a cliff, were much easier to defend militarily (especially before the introduction of gunpowder), than a city in the middle of a valley.

A history-based natural experiment

- Since the advantage of strategic military position is not easy to identify directly, GSZ used earlier history to determine it.
- **The earliest civilization that was organized as free city-states is Etruscan** (IX century B.C), which populated an area from Mantua in the North to Salerno in the South
- Since the Etruscans had the first mover advantage, they chose to locate their cities in positions that were easy to defend.
- Hence, GSZ used the Etruscan origin of a city as a predictor of becoming a free city-state in the Middle Ages.


Adria
Po
Spina
Felsina
Arno
Arezzo
Volterra
Perugia
Populonia
Chiusi
Tevere
Roselle
Vetulonia
Vulci
Volsinii
Isola d'Elba
Tarquinia
Veio
Cere
Roma
Cuma
Napoli
MAR TIRRENO
MARE ADRIATICO
MARE IONIO
Siracusa
Città della dodecàpoli
Zone di influenza etrusca
Colonie greche
Colonie fenicie
Risorse minerarie dell'Etruria
ferro
rame
argento

A history-based natural experiment

- GSZ thus have 2 instruments:
  - Whether a town was the seat of a bishop before the year 1000.
  - The Etruscan origin of the town.
- Both these instruments have a strong predictive power on the likelihood of being a free city-state (the F-test is ok).
- Even when instrumenting the existence of a free city-state with its historical determinants, GSZ found that free city-state towns have more social capital today (estimates hold in TSLS).

A history-based natural experiment

- These results are supportive of Putnam's conjecture, but they do not allow a definitive rejection of the geographical alternative.
- It is possible that something in the morphology of the territory (not captured by controls) drove GSZ's results.
- If there is a location advantage that…
  - Has led the Etruscans to settle there,
  - Has lead the Catholic Church to elect it as a seat of its bishops
  - Has made it easier for that city to conquer independence from the Emperor,
  - and also fosters social capital today…

  then GSZ's instruments do not solve the problem.

A history-based natural experiment

- To address this issue, GSZ used a difference in difference approach, exploiting a "**historical counterfactual**".
- If cities in Southern Italy did not become free city-states, it is not because they were poorer or had less opportunities to trade (in fact at the beginning of the second millennium the South of Italy was more developed and prosperous than the North) but **because of the strong central power exerted by the Normans**.
- Under the maintained hypothesis that the determinants of location advantages are the same in the Center North and in the South (i.e.: the presence of a bishop and the Etruscan origins), it is possible to predict which towns would have become free city-states in the South *had the Normans not been there*.

A history-based natural experiment

- GSZ then compared the difference in social capital between:

1) The towns predicted to become free city-states in the Centre North (where they *did* become).
2) The towns predicted to become free city-states in the South (where they *did not*).

- The difference in difference **estimates suggest that at least half of the gap in social capital between the North and the South of Italy can be attributed to the free city-state experience**.

A history-based natural experiment

- The following table shows the explanatory power of the "historical instruments".
- **Regressing a free city dummy variable on bishop location and Etruscan origin, GSZ found that both instruments have the expected sign and are highly statistically significant**.
- **A town that was the seat of a bishop is 73% more likely to become a free city-state than a town that was not**. It's a lot! Maybe too much?
- **Similarly, a town that was founded by the Etruscans is 17% more likely to become a free city-state**.

Probability model for whether the city was a Commune

	Only instruments	Instruments and geography	First stage estimates
Bishop city	0.74***	0.75***	0.54***
	(0.07)	(0.07)	(0.06)
Etruscan city	0.17***	0.14**	0.21***
	(0.06)	(0.06)	(0.05)
Elevation		-0.47**	-0.37**
		(0.22)	(0.18)
Max difference in elevation		-0.01	0.08
		(0.07)	(0.05)
Intersection of Roman roads		-0.06	-0.15**
		(0.08)	(0.06)
On the coast		-0.25**	-0.26***
		(0.11)	(0.08)
More than 5km from the coast		-0.14***	0.03
		(0.05)	(0.05)
Population (million people)			1.59***
			(0.31)
Population squared			-1.16***
			(0.23)
Gini inequality index of land ownership			-0.54**
			(0.21)
Gini income inequality index			2.76***
			(0.78)
Observations	400	400	400
R-squared	0.6	0.64	0.75
F-test of excluded instruments			65.77
Partial R-squared of excluded instruments			0.4746

Instrumental variables regressions. Dependent variables: social capital measures

	Non-profit organizations	Referenda turnout	Organs donation organizations	Non-profit organizations	Referenda turnout	Organs donation organizations
Commune: basic definition	1.03**	1.98***	0.42***			
	(0.47)	(0.75)	(0.13)			
Commune: 1300C.E. definition				1.34**	2.43**	0.57***
				(0.60)	(1.11)	(0.18)
Elevation	0.92	-7.27***	-0.32	1.21	-6.76***	-0.17
	(0.79)	(1.54)	(0.21)	(0.93)	(1.98)	(0.27)
Max difference in elevation	0.52*	-2.87***	-0.21**	0.57**	-2.78***	-0.19**
	(0.30)	(0.44)	(0.09)	(0.25)	(0.44)	(0.08)
Intersection of Roman roads	0.89***	0.03	-0.13	0.81***	-0.09	-0.16*
	(0.32)	(0.50)	(0.09)	(0.31)	(0.51)	(0.10)
On the coast	-0.17	-2.89***	-0.06	-0.21	-2.99***	-0.07
	(0.35)	(0.71)	(0.11)	(0.32)	(0.70)	(0.11)
More than 5km from the coast	-0.68**	0.03	-0.27*	-0.60**	0.14	-0.24
	(0.29)	(0.75)	(0.16)	(0.29)	(0.76)	(0.16)
Population (million people)	-5.31**	-11.85***	-0.15	-6.22***	-13.21***	-0.59
	(2.14)	(3.59)	(0.79)	(2.05)	(4.10)	(0.80)
Population squared	2.02	3.75	-0.17	2.61*	4.65	0.12
	(1.61)	(2.64)	(0.52)	(1.50)	(2.89)	(0.52)
Gini inequality index of land ownership	2.11**	3.39**	0.66	2.21**	3.50**	0.70*
	(1.02)	(1.48)	(0.42)	(0.96)	(1.58)	(0.42)
Gini income inequality index	14.68***	-12.45*	4.18***	14.28***	-12.96*	3.92***
	(4.99)	(6.56)	(1.21)	(4.90)	(6.68)	(1.22)
Observations	400	400	400	400	400	400
F-test of excluded instruments	65.77	65.77	65.77	18.99	18.99	18.99
Sargan test: *p*-value	0.1507	0.0083	0.9928	0.11198	0.0072	0.7621

Social capital and economic development

- Having established the validity of the instruments **(…)** for social capital, GSZ used them to estimate the impact of social capital on economic development.
- GSZ measure economic performance at the city level by using disposable income per capita in the city in 1999 as constructed from income tax statements.

Social capital and economic development

- When GSZ instrument today's social capital with the free city indicator, the estimated coefficient of social capital increases from 0.40 to around 0.57 and is highly statistically significant (columns 3 and 4).
- **Raising social capital by one standard deviation increases per capita income by 1,120 euros, about 7.5% of the sample mean**.
- The high value of the F test of the excluded instrument (29.7 and 15.8 respectively, depending on whether controls for province capital are also included) implies that historical independence is a powerful instrument.

Effect of social capital (nonprofit organizations) on income per capita

	(1) OLS	(2) OLS	(3) I.V.: Commune	(4) I.V.: Commune	(5) I.V.: Commune	(6) I.V.: length of indip	(7) I.V.: Bishop + Etruscan city
Social capital	0.40***	0.38***	0.57***	0.56***	0.56***	0.57***	0.81***
	(0.04)	(0.04)	(0.13)	(0.19)	(0.21)	(0.22)	(0.30)
Elevation	-0.72	-0.69	-1.02*	-1.00	-1.01	-1.08*	-1.32*
	(0.62)	(0.62)	(0.61)	(0.65)	(0.64)	(0.65)	(0.74)
Max difference in elevation	-0.48**	-0.48**	-0.45**	-0.45**	-0.46**	-0.49**	-0.41*
	(0.22)	(0.22)	(0.20)	(0.20)	(0.21)	(0.21)	(0.23)
On the coast	-0.11	-0.16	-0.01	-0.02	-0.03	-0.03	0.26
	(0.32)	(0.32)	(0.31)	(0.33)	(0.40)	(0.41)	(0.50)
More than 5km from the coast	-0.03	-0.05	0.06	0.06	0.06	0.11	0.19
	(0.47)	(0.47)	(0.44)	(0.45)	(0.45)	(0.47)	(0.51)
Intersection of Roman roads	0.04	-0.01	-0.15	-0.15	-0.15	-0.11	-0.34
	(0.24)	(0.24)	(0.27)	(0.27)	(0.27)	(0.27)	(0.33)
Population (million people)	13.61***	11.05***	13.15***	12.77***	12.73***	12.44***	15.13***
	(1.85)	(2.35)	(1.75)	(2.77)	(2.91)	(2.95)	(3.69)
Population squared	-9.03***	-7.20***	-8.61***	-8.34***	-8.31***	-8.03***	-9.90***
	(1.79)	(2.06)	(1.68)	(2.22)	(2.29)	(2.31)	(2.81)
Gini inequality index of land ownership	-0.26	-0.18	-0.13	-0.12	-0.12	-0.30	-0.06
	(0.70)	(0.70)	(0.66)	(0.65)	(0.65)	(0.65)	(0.73)
# of visitors per million people					0.00	0.00	-0.01
					(0.01)	(0.01)	(0.01)
Province dummies	YES	YES	YES	YES	YES	YES	YES
Province capital dummies	NO	YES	NO	YES	YES	YES	YES
Observations	400	400	400	400	400	383	400
Sargan test (p-value)							0.9763
F-test for excluded instrument			29.68	15.77	13.54	11.18	3.95
R-squared	0.74	0.74					

Social capital and economic development

- GSZ obtain similar results if instead of the indicator for a free city they use as instrument for social capital:

1) The (log) of the length of time a free city retained its independence (column 6)
2) Or the indicators of whether the city was the seat of a bishop in Medieval times and whether it had been founded by the Etruscan (column 7)

Open issues

- Did GSZ measure social capital properly?
- Are all networks alike?
- Why the estimates work only under certain specifications?
- Is the story behind the instruments valid?
- Did the presence of a bishop – i.e. the fact the town was governed by a religious authority – actually favour the transition to the status of free city (so-called city-states)?
- Do you find the bishop-hypothesis consistent with Putnam's arguments about the hierarchical organization of religious institutions?
- According to Putnam, which is the role of religious institutions in the creation of social capital?
- And what about the Etruscan origins?

I warmly suggest the reading of:

Belloc, M., Drago, F., Galbiati, R. (2016). Earthquakes, Religion, and Transitions to Self-government in Italian Cities. *Quarterly Journal of Economics*, 131 (4): 1875-1926

Which shows that the presence of a bishop actually hampered the transition to free city-states.

4. Inherited trust and growth in a sample of countries

Inherited trust and growth

- Algan and Cahuc (2010) (hereafter A&C) developed a new method to uncover the causal effect of trust on economic growth by focusing on the inherited component of trust and its time variation.
- According to A&C, the economic literature cannot explain easily the causal effect of trust on growth.
- The main reason is that previous studies identify the effect of trust on income per capita from **cross-country** or **cross-regional** differences, **without any time variation**.
- This makes it impossible to control for specific **invariant** national or regional features which could *codetermine* both trust and economic development.

Inherited trust and growth

- A&C view on Tabellini (2010): For example, Tabellini analyzes the role of culture on income per capita of European regions by using historical variables (the history of institutions and literacy rates) as an instrument for contemporaneous trust.
- Though this analysis exploits variations in the historical variables across regions, which makes it possible to control for **country fixed effects**, it makes it impossible to control for ***regional*** fixed effects.
- It is thus difficult to exclude the possibility that some **time invariant factors**, such as **the geography of the region**, could cause both the low literacy rate in the region and the present low level of trust.
- This difficulty is common to all studies using time invariant instruments for trust.

A&C's method to assess the effect of trust

- In the previous lectures we saw that it is well established that the parents' social capital is a good predictor of the social capital of children (e.g. Putnam, 2000; Uslaner, 2002; Guiso et al., 2016).
- We also saw that Putnam et al. (1993) assessed the effect of the historical level of civic capital in Italy on the current performance of Italian regional institutions and, in a follow-up study, on the current differentials in economic growth across Italian regions.

A&C's method to assess the effect of trust

- This suggested the idea, in some way implemented in Guiso et al. (2016), to use **the past levels of social (or civic) capital to instrument the current levels of social capital**, in order to econometrically identify the effect of social capital on the institutional performance and growth.
- While this was in some way possible when dealing with concepts such as civic capital – which Guiso et al. (2016) instrumented through indicators of specific characteristics of Italian municipalities in medieval history…
- … it is virtually impossible to know the historical, or even the recent past, levels of trust.

- A&C, however, had a smart idea to determine them…

A&C's method to assess the effect of trust

- A&C used the trust that US descendants have inherited from their forebears who immigrated from different countries at different dates to detect **changes in inherited trust in the countries of origin**.
- For example, by comparing Americans with Italian origins whose forebears migrated between 1950 and 1980, it is possible to detect differences in trust inherited from Italy between 1950 and 1980.
- In the same way, it is possible to get **time varying measures of trust inherited from** Italy by running the same exercise for forebears who immigrated from Italy to the U.S. in other periods, for instance between 1920 and 1950.
- Once we have time varying measures of inherited trust, it is possible to estimate **the impact of changes in inherited trust on changes in income per capita in the country of origin**, in this case in Italy.

A&C's method to assess the effect of trust

- Using a **time varying measure of inherited trust over long** periods to assess changes in per capita income allows:
  1. **To avoid reverse causality problems**.
  2. **To control for both**:
     - **Omitted time invariant factors**, such as geography.
     - **Other observed time varying factors** such as changes in the economic, political, cultural, and social environments.

A&C's method to assess the effect of trust

- How to retrieve data about inherited trust?
- The General Social Survey (GSS) provides information about
  - the contemporaneous trust of US descendants of immigrants
  - the wave of immigration in the US of their ancestors.
- The GSS contains a standard core of demographic, behavioral, and attitudinal questions, plus topics of special interest.
- Among the topics covered are civil liberties, crime and violence, intergroup tolerance, morality, national spending priorities, psychological well-being, social mobility, and stress and traumatic events.
- Since the GSS adopted questions from earlier surveys, trends can be followed for up to 70 years.
- Unfortunately, the GSS is not a panel.

Data can be downloaded online free of charge at this url:
http://gss.norc.org/Get-The-Data

Inherited trust

- **“Inherited trust” – i.e. the past level of trust in any given country – is measured using the current level of trust declared by immigrants from that country in the United States**.
- More specifically, inherited trust is measured by the **country of origin fixed effect** in individual regressions of the contemporaneous trust of US descendants of immigrants – but we will come back to this aspect later.

Inherited trust

$$Y_{ct} = \alpha_0 + \alpha_1 S_{ct} + \alpha_2 X_{ct} + F_c + F_t + \varepsilon_{ct},$$

Current level of trust

Time varying characteristics of the country

Country fixed-effects (time invariant specific features of the country)

Period fixed-effects

$$S_{ct} = \gamma_0 + \gamma_1 S_{ct-1} + \gamma_2 X_{ct} + \Phi_c + \Phi_t + \nu_{ct}$$

Inherited component of trust

"environmental component of trust"

$$Y_{ct} = \alpha_0 + \alpha_1 S_{ct} + \alpha_2 X_{ct} + F_c + F_t + \varepsilon_{ct},$$

???

$$S_{ct} = \gamma_0 + \gamma_1 S_{ct-1} + \gamma_2 X_{ct} + \Phi_c + \Phi_t + \nu_{ct}$$

$$trust_{it} = \mu_0 + \mu_1 \boldsymbol{H}_{it} + Country_i + z_{it}$$

inherited trust is measured by the **country of origin fixed effect** in individual regressions of the contemporaneous trust of US descendants of immigrants

This strategy leads to estimate one single equation in the form of Y_{ct}, where the level of trust in a country is replaced by its value as determined through the second equation

$$Y_{ct} = \alpha_0 + \alpha_1 S_{ct} + \alpha_2 X_{ct} + F_c + F_t + \varepsilon_{ct},$$

$$S_{ct} = \gamma_0 + \gamma_1 S_{ct-1} + \gamma_2 X_{ct} + \Phi_c + \Phi_t + \nu_{ct}$$

$$trust_{it} = \mu_0 + \mu_1 \boldsymbol{H}_{it} + Country_i + z_{it}$$

Inherited trust

- The GSS variable for the country of origin reads as follows: “From what countries or part of the world did your ancestors come?”.
- The individual can report up to three countries of origin **by order of preference**. Two respondents out of three report only one country of origin.
- A&C selected the GSS ethnic variable that captures the country of origin to which the respondent feels the closest to make the comparison between countries of origin interpretable.
- A&C state they have **“A large number of observations for at least 24 countries or continents”**.
- They then “present **only the countries of origin displaying 15 or more observations** (!) in our estimations”.

	General Social Survey			
	N	"Trust most other people"	"Can't be too careful"	"Depends"
Africa	3,095	0.17	0.79	0.04
Austria	230	0.44	0.50	0.06
Belgium	58	0.51	0.49	0.0
Canada	488	0.41	0.55	0.04
Czech Republic	458	0.44	0.49	0.07
Denmark	277	0.53	0.43	0.04
Finland	180	0.52	0.41	0.07
France	761	0.44	0.50	0.06
Germany	6,276	0.44	0.52	0.04
Hungary	228	0.43	0.52	0.02
India	120	0.29	0.60	0.11
Ireland	4,144	0.45	0.50	0.05
Italy	1,949	0.38	0.57	0.05
Mexico	990	0.25	0.70	0.05
Netherlands	595	0.42	0.54	0.06
Norway	690	0.57	0.40	0.03
Poland	1,098	0.43	0.52	0.05
Portugal	90	0.35	0.59	0.06
Russia	554	0.47	0.47	0.06
Spain	320	0.33	0.63	0.04
Sweden	598	0.51	0.44	0.05
Switzerland	154	0.54	0.41	0.05
United Kingdom	5,941	0.50	0.45	0.05
Yugoslavia	146	0.48	0.47	0.05

Inherited trust

- “There is a fairly high number of migrants for each of the considered countries”. (is it?)
- Even admitting that trust actually is inherited, **the problem is we do not know whether the ancestors of these migrants were representative of the country of origin’s population!**
- **Can you imagine any specific bias affecting the trust of those who chose to migrate to the US in the past century?**

Estimation strategy

- To assess the role of trust in the economic performance, one has to deal with the endogeneity issues at stake in the estimation of the following equation:

$$Y_{ct} = \alpha_0 + \alpha_1 T_{ct} + \alpha_2 X_{ct} + F_c + F_t + \varepsilon_{ct}$$

- Where Y_{ct} is per capita income in country *c* at time *t;*
  T_{ct} is the country average of trust of country *c* at time *t*, conditional on the individual characteristics of its citizens;
  X_{ct} is a vector of time varying characteristics of the country, which might include the past economic development with the lagged values of per capita income or other socio-economic factors like education;
  F_c are country fixed effects capturing all other time invariant specific features of the country;
  F_t are period fixed effects common to all countries.
- The inclusion of country fixed effects serves to ensure that the correlation between attitudes and the economic performance is not driven by unobservable country time invariant factors.

Estimation strategy

- The problem with the previous equation is that contemporaneous trust is likely to be correlated with the unobserved error term. People who live in richer countries may tend to be more open-minded and trusting as a result of their better education and higher opportunities to achieve higher levels of cultural consumption.
- This is the point where A&C bring **inherited** trust into the strategy.

Estimation strategy

- We know from the social capital literature that moral values are substantially inherited from parents and farther ancestors.
- Putnam et al. (1993) found proofs of the persistence of civicness across centuries in Italy.
- Based on different U.S. surveys, Uslaner (2002) found evidence that trust is for the most part inherited from parents, instead of being learned from the people we meet, and that moral values are unconditional, i.e. they do not depend upon reciprocity.
- Guiso et al. (2004) used Italian survey data to show that migrants from Southern, low-trust, regions in Italy tend to carry with them their mistrust to their new locations.
- Based on WVS data, Guiso et al. (2003) similarly found that people who are raised religiously exhibit some common beliefs and preferences, even if they reject religion as adults.

Estimation strategy

- The findings summarized in the previous slide suggest the convenience to estimate the current level of trust as:

$$T_{ct} = \gamma_0 + \gamma_1 T_{ct-1} + \gamma_2 X_{ct} + \Phi_c + \Phi_t + v_{ct}$$

- Where Where T_{ct-1} is the country average of trust of the previous generation in period $t - 1$, Φ_c and Φ_t are country and time fixed effects, respectively, and v_{ct} is the error term.
- In this equation it is assumed that the current trust of individuals is also influenced by all the factors that may affect the economic performance and by the level of trust of the previous generation.

Estimation strategy

- The assumptions that allow identifying the system of equations:

$$Y_{ct} = \alpha_0 + \alpha_1 T_{ct} + \alpha_2 X_{ct} + F_c + F_t + \varepsilon_{ct}$$

$$T_{ct} = \gamma_0 + \gamma_1 T_{ct-1} + \gamma_2 X_{ct} + \Phi_c + \Phi_t + \nu_{ct}$$

- Are:
  - The trust of previous generations is excluded from the economic performance equation.
  - The error of the economic performance equation is uncorrelated with the level of trust of the previous generations.

Estimation strategy

- As previously said, A&C proxy the **inherited trust** of people living in country *c* by the trust that the descendants of US immigrants have inherited from their ancestors migrated from that country *c* (e.g. Italy).
- More precisely, inherited trust is measured by the country of origin fixed effect in individual regressions of the contemporaneous trust of US descendants of immigrants. This trust is measured in the United States.
- This substantially leads to the estimate of a single equation

T_{ct-1}

$$Y_{ct} = \alpha_0 + \alpha_1 T_{ct} + \alpha_2 X_{ct} + F_c + F_t + \varepsilon_{ct}$$

- Where the term T_{ct} is replaced by the estimate of the term gamma T_{ct-1} of the second equation.

Estimation strategy

As for the **validity of the identifying assumptions**…

$$Y_{ct} = \alpha_0 + \alpha_1 T_{ct} + \alpha_2 X_{ct} + F_c + F_t + \varepsilon_{ct}$$

$$T_{ct} = \gamma_0 + \gamma_1 T_{ct-1} + \gamma_2 X_{ct} + \Phi_c + \Phi_t + \nu_{ct}$$

This error refers to the estimation of the current level of per capita income in a certain county, let's say Italy.

Even if the "past" level of trust was inherited by the previous generations living in the country of origin of respondents, it actually refers to the place where respondents actually live, i.e. the United States.

Y_{ct} in Italy
T_{ct-1} of Italian migrants in the United States:
It seems reasonable to assume they are unrelated

In depth: the estimation of inherited trust

- A&C assume a **gap of 25 years** between two generations.
- They then impose a benchmark lag of 25 years between the inherited trust and the contemporaneous economic outcome at date T.
- A&C then focus on:
  - Second generation Americans born before T−25, since the parents of the second generation immigrated before T−25.
  - Third-generation Americans born before T−25+25 (i.e. before time T), since the grandparents of the third generation born before T immigrated before T−25.
  - Fourth-generation Americans born before T−25+50 (i.e. born 25 years after time T).

In depth: the estimation of inherited trust

- A&C start by focusing on inherited trust in the two periods 1935–1938 and 2000–2003 (1935 and 2000 henceforth).
- Inherited trust in 1935 is that of:
  - Second-generation Americans born before 1910 (i.e., whose parents arrived for sure one generation before 1935, i.e. 1935-25=1910).
    This is the trust that people who were more than 25 years old in 1935 inherited from parents who lived in Italy 25 years before 1935.
  - Third-generation Americans born before 1935 (i.e. 1935-25+25=1935). This is the trust that people less than 25 years old in 1935 inherited from grandparents who lived in Italy 25 years before 1935.
  - Fourth-generation Americans born before 1960 (i.e. 1935-25+50=1960).
    This is the trust that people who will be born 25 years after 1935 will inherit from ancestors who lived in Italy 25 years before 1935.

1) Ancestors (grand-grand-parents) arriving from Italy will transmit their trust to descendants (grand-grand-sons) born before 1960 (between 1935 and 1960).

2) Grand-parents arriving from Italy will transmit their trust to grand-sons born before 1935 (between 1910 and 1935)

3) Parents arriving from Italy will transmit their trust to children born in 1910 or before.

1) Ancestors (grand-grand-parents) arriving from Italy will transmit their trust to descendants (grand-grand-sons) born after 1985.

2) Grand-parents arriving from Italy will transmit their trust to grand-sons born before 1960 (between 1935 and 1960)

3) Parents arriving from Italy will transmit their trust to children born in 1935 or before.

. . .

1) Ancestors (grand-grand-parents) arriving from Italy will transmit their trust to descendants (grand-grand-sons) born after 2025.

2) Grand-parents arriving from Italy will transmit their trust to grand-sons born before 2025 (between 2000 and 2025)

3) Parents arriving from Italy will transmit their trust to children born in 2000 or before (between 1910 and 2000).

1910

1935

2000

Trust in Italy in 1935 and 2000 therefore is…

1) Trust of 2nd generation Americans born in or before 1910 (whose parents arrived from Italy in or before 1910), who would still live in Italy if that migration hadn't take place.

2) Trust of 3rd generation Americans born in or before 1935 (whose grand-parents arrived from Italy in or before 1910).

3) Trust of 4th generation Americans born in or before 1960 (whose grand parents arrived from Italy in or before 1910).

. . .

1) Trust of the 2nd generation Americans born in or before 1975 (whose parents arrived from Italy in or before 1975), who would still live in Italy if that migration hadn't take place.

2) Trust of the 3rd generation Americans born after 1925 (whose parents arrived from Italy after 1925)

3) Trust of the 4th generation Americans born after 1950 (whose parents arrived from Italy after 1950), who would still live in Italy if that migration hadn't take place.

1910 1935 2000

In depth: the estimation of inherited trust

This is the number of observations used by A&C to compute **inherited trust in 1935 and 2000**:

TABLE A2—OBSERVATIONS FOR INHERITED TRUST IN 1935 AND 2000: GSS 1977–2004

Country of origin	Inherited trust in 1935	Inherited trust in 2000
Africa	1,720	673
Austria	36	97
Belgium	12	23
Canada	138	173
Czech Republic	94	221
Denmark	99	78
Finland	38	75
France	329	189
Germany	2,852	1,602
Hungary	20	104
India	7	11
Ireland	2,017	1,036
Italy	216	1,103
Mexico	93	394
Netherlands	249	147
Norway	255	223
Poland	156	556
Portugal	11	40
Russia	51	272
Spain	82	80
Sweden	207	222
Switzerland	64	34
United Kingdom	3,282	1,071
Yugoslavia	14	86

India has 1,324,171,354 inhabitants!

In depth: the estimation of inherited trust

- Column 1 reports the estimates for inherited trust in 1935, relative to trust inherited by Swedish Americans in 1935.
  Having forebears coming from a different country of origin than Sweden has a statistically significant effect on inherited trust.
- Column 2 reports trust inherited in 2000 relative to trust inherited by Swedish Americans in 1935. Inherited trust displays substantial changes between the two periods

TABLE I—INHERITED TRUST IN 1935 AND 2000

	Dependent variables			
	(1) Inherited trust in 1935		(2) Inherited trust in 2000	
	Coeff	Standard error	Coeff	Standard error
Country of origin	Swedish ancestors - 1935 : Reference			
Sweden			0.052***	(0.004)
Africa	−0.231***	(0.004)	−0.243***	(0.007)
Austria	−0.031***	(0.004)	0.102***	(0.011)
Belgium	0.073***	(0.013)	0.134***	(0.021)
Canada	−0.024**	(0.010)	0.078**	(0.015)
Czech Republic	0.006	(0.008)	−0.052***	(0.009)
Denmark	0.045***	(0.002)	0.157***	(0.004)
Finland	−0.032***	(0.003)	0.172***	(0.003)
France	0.040***	(0.004)	−0.047***	(0.010)
Germany	0.024***	(0.001)	−0.004	(0.008)
Hungary	0.023***	(0.004)	0.020*	(0.011)
India	−0.041***	(0.009)	−0.376***	(0.012)
Ireland	0.030***	(0.003)	−0.025*	(0.012)
Italy	−0.022*	(0.012)	−0.086***	(0.016)
Mexico	0.101***	(0.014)	−0.125***	(0.015)
Netherlands	−0.039***	(0.003)	0.051***	(0.005)
Norway	0.156***	(0.001)	0.113***	(0.003)
Poland	0.047***	(0.014)	−0.052***	(0.015)
Portugal	0.004	(0.009)	0.002	(0.017)
Russia	0.171***	(0.012)	−0.068***	(0.007)
Spain	−0.052***	(0.009)	0.042**	(0.015)
Switzerland	0.058***	(0.002)	0.102***	(0.007)
United Kingdom	0.043***	(0.001)	0.003	(0.007)
Yugoslavia	0.303***	(0.010)	−0.018	(0.016)
R^2	0.105			
Observations	11026			

Notes: The dependent variable is the level of trust inherited by US immigrants from the periods 1935 and 2000. Trust is measured from the answer to the question: "Generally speaking, would

In depth: the estimation of inherited trust

- Explaining changes in inherited trust within countries is beyond the scope of A&C's paper.
- The authors state that "The set of potential candidates is quite wide. One might first think about the role of national shocks such as **wars**. The ancestors of the current US respondents are likely to have undergone very different national crises. The ancestors who have transmitted their trust for the period 1935 have mainly migrated before World Wars I and II."
- **All true. But what about the non-representativeness of the samples? For example, there are 7 observations from India relative to 1935 and 11 relative from 2000.**
  India approximately has 1,335,250,000 inhabitants.

Inherited trust and growth: results

- The dependent variable is the income gap relative to Sweden in 1935 and in 2000. The main explanatory variable is the level of inherited trust measured by the coefficient associated with the country of origin fixed effect in the GSS.

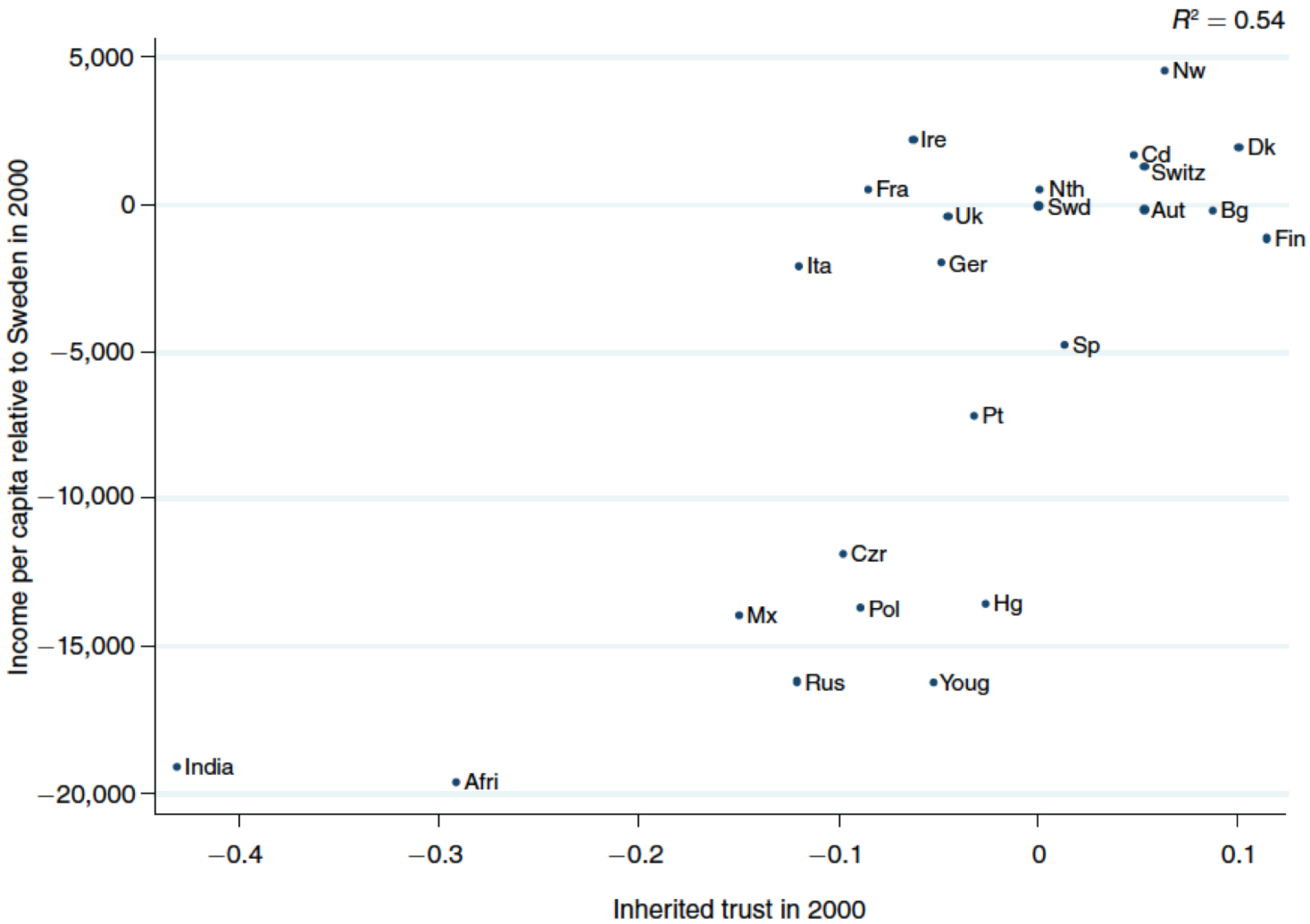


Table 5—Inherited Trust and Income Per Capita in 1935 and 2000: Cross-Country Regression

	Dependent variable: Income per capita in 1935 and 2000			
	(1)	(2)	(3)	(4)
Inherited trust in 1935 and 2000	35,952.13***	18,389.59***	18,601.70***	20,030.74***
	(6,811.83)	(4,811.88)	(5,708.99)	(6,966.35)
Initial income per capita 1870 and 1930		3.83***	3.84***	3.64***
		(0.45)	(0.53)	(0.54)
Political institutions in 1930 and 2000			1.45	32.50
			(74.73)	(82.03)
Outliers				Africa, India excluded
R^2	0.37	0.75	0.69	0.63
Observations	48	48	46	44

Notes: OLS regressions. The dependent variable is the GDP per capita in the source countries in 1935 and 2000, relative to Sweden. Data come from Maddison. Inherited trust of US immigrants from the source countries for the periods 1935 and 2000 is estimated relative to the trust inherited by US immigrants with Swedish ancestors for those periods. The coefficients of inherited trust come from the regressions on the GSS. Political institutions are measured by the index Polity2 from the Polity IV database. A higher level indicates more democratic institutions. Institutions in the source countries are measured relative to Sweden.

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

This means there are 22 countries!

Inherited trust and growth: results

- A&C then assess how changes in inherited trust relate to changes in income per capita over time.
- The change in inherited trust is measured by the change in the value of the country of origin fixed effects in separate regressions on the trust question for the periods 1935 and 2000.
- **Change in inherited trust is strongly correlated with change in income per capita**.

The impact of inherited trust on income per capita is **economically sizeable**. This figure displays the **change in income per capita in period 2000–2003 that countries would have experienced <u>if the level of inherited trust in a given country had been the same as trust inherited from Sweden</u>**.

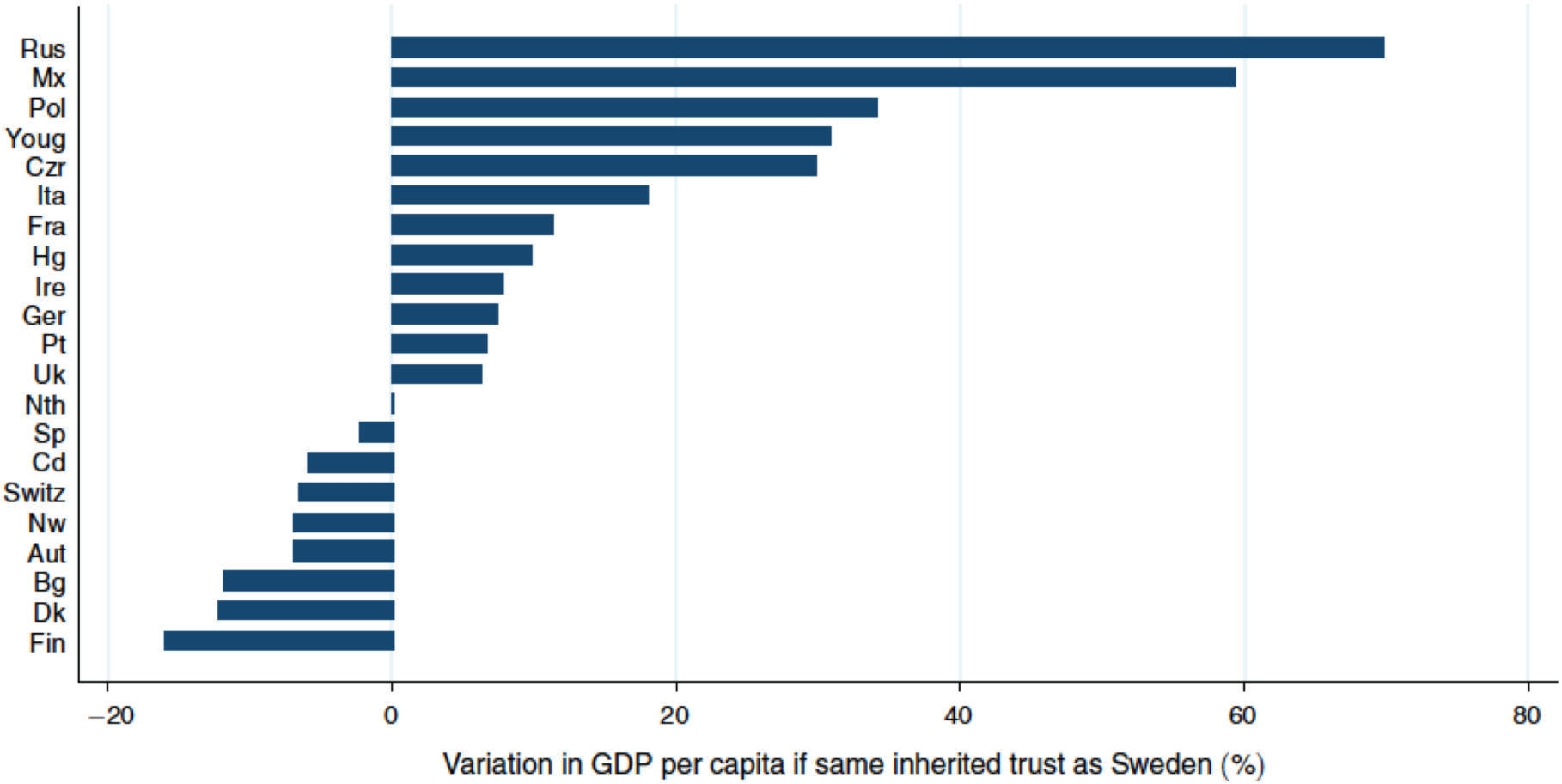


FIGURE 5. PREDICTED VARIATIONS IN GDP PER CAPITA IN 2000 IF INHERITED TRUST HAD BEEN THE SAME AS INHERITED TRUST FROM SWEDEN, CONTROLLING FOR LAGGED GDP PER CAPITA, CONTEMPORANEOUS POLITICAL ENVIRONMENT, AND COUNTRY FIXED EFFECTS

To assess the contribution of time invariant factors, A&C also calculate the predicted increase in income per **capita if the countries had the same country fixed effect as Sweden**. This task serves to give an idea of how remarkable is the size of the effect of inherited trust.

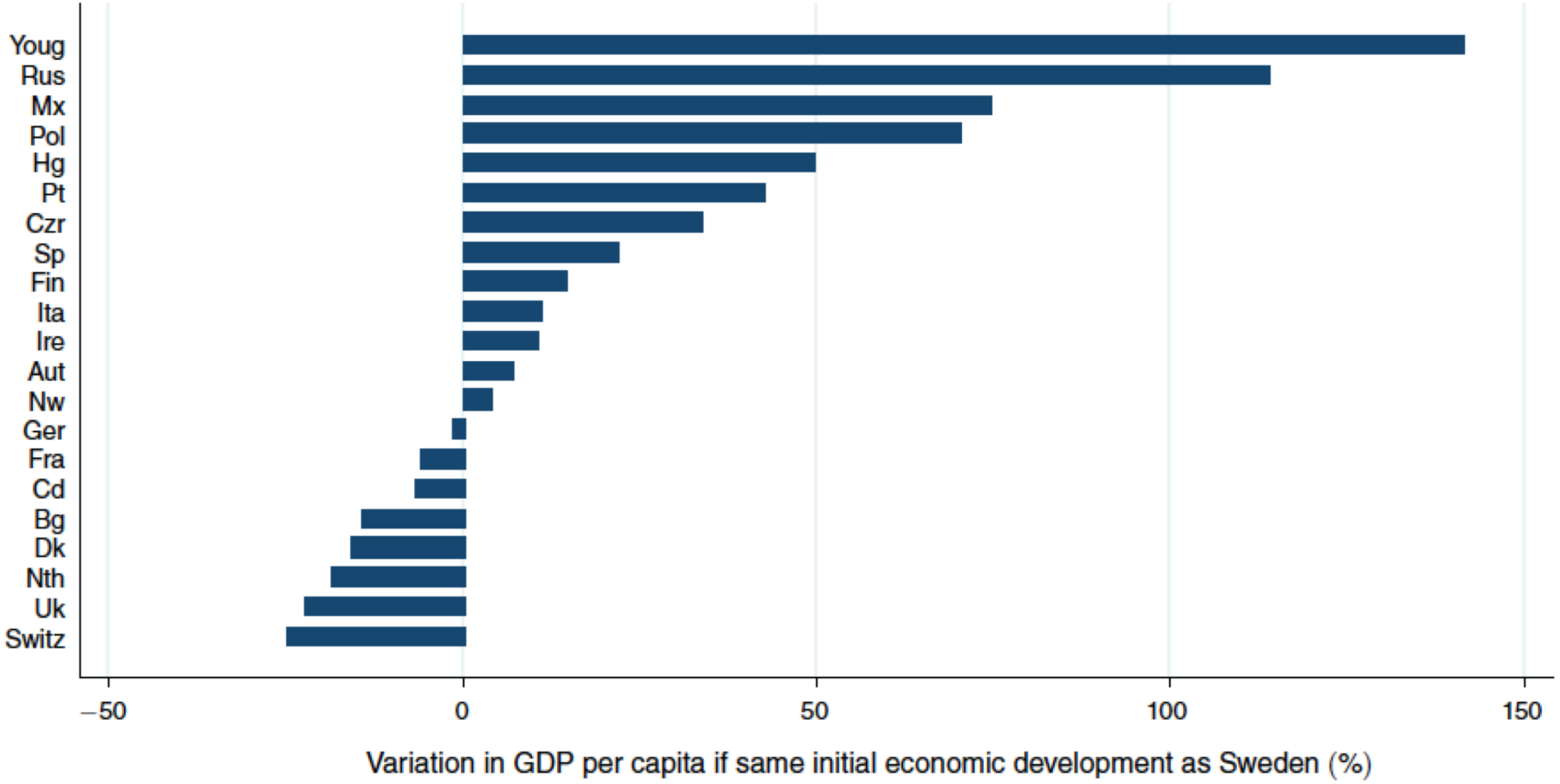


FIGURE 6. PREDICTED VARIATIONS IN GDP PER CAPITA IN PERIOD 2000 IF GDP PER CAPITA IN THE 1930S HAD BEEN THE SAME AS IN SWEDEN, CONTROLLING FOR INHERITED TRUST, CONTEMPORANEOUS POLITICAL ENVIRONMENT, AND COUNTRY FIXED EFFECTS

Ideas for future research

- The same method A&C apply to the measurement of inherited trust can be used to measure inherited tolerance based on WVS data.
- For example, **tolerance** towards immigrants or towards people belonging to ethnic minorities (a proxy for racism?), towards people with diverse sexual orientations (homophobia), etc.
- It could be interesting to assess whether there is a relationship between tolerance and growth.

Why tolerance and growth?

- Florida (2003: 10) in defining tolerance as "openness, inclusiveness, and diversity to all ethnicities, races, and walks of life."
- Florida and colleagues have presented descriptive evidence of a **substantial correlation between indicators of diversity and the economic performance of American cities** (Florida and Gates, 2001; 2003; Florida and Mellander, 2010).
- To explain this result, the authors argued that **talented and creative people are attracted to places that welcome differences in ethnicity, tastes, opinions, and sexual orientation**.
- On the other hand, **living in an open and diverse environment helps to make talented people even more creative and productive**. "Places with talented people both grow faster and are better able to attract other talented people" (Florida and Gates, 2001: 2).
- This virtuous circle has been claimed to be the source of the economic success of U.S. clusters that have the highest concentration in creative workers, such as Washington, DC, Boston, Austin, The Research Triangle, and San Francisco.
- **Does this sound credible to you?**

Tolerance and growth

- This body of research is under investigated in the literature, in part due to some issues that undermine the credibility of results found in American clusters:

1) The use of within-country data focusing on specific cities seriously prevents from the generalization of results.
2) Tolerance is measured as the share of a population that is gay, bohemian or foreign-born.
3) In addition, endogeneity concerns are not addressed in a systematic way.

Tolerance and growth

- Berggren and Elinder (2012, *Public Choice*) extended the analysis beyond the American borders to find a **significantly negative cross-country correlation between tolerance and growth** in World Values Survey (WVS) data.
- The authors interpret this result as an outcome of the **decline in productivity possibly associated to the negative reaction that conservative people may have to alternative habits and lifestyles**.
- According to B&E, racists and homophobes may, in fact, feel uncomfortable in workplaces where minorities they dislike are welcomed. As a consequence, they may want to migrate elsewhere, or reduce effort and productivity, or, more simply, they may become involuntarily unable to do their best at work.
- More in general, it may be argued that people living in areas where minorities they dislike are welcomed may feel less happy, thereby lowering productivity.
- **Does this sound credible to you?**

Weaknesses of B&E's interpretation

1. The macro, cross-country, level of the analysis does not allow to control for the skills, talent, and effort of conservative people. Racists and homophobes may well be less educated and skilled, and therefore less productive, than those types of workers who, according to Florida's claims, might be attracted by more tolerant places.
2. It is also unclear whether, and why, **intolerant people** should be higher in number, and possibly more productive, than the open-minded ones, which is a required assumption for explaining the negative role of tolerance.
3. What about the happiness, the productivity and the creativity of LGTB people?
4. Problems of reverse causality may arise. People in societies with a high GDP and economic growth, in fact, may tend to display more open-mindedness and tolerance. Tolerance may also be affected by expectations about future growth.
5. The validity of the authors' measure of tolerance is limited. B&E measured tolerance by using replies to a question in the WVS, in which respondents in different countries are asked if they would like to have homosexuals or people of a different race as their neighbours. These responses should be strongly contextualized and do not necessarily reflect moral values (think for example of how having a very noisy immigrants or homosexuals family as neighbours could bias interviewees' replies).

Moral values and growth

- We also may want to use the same estimation strategy to analyse the effect exerted on development and well-being by other inheritable values detected in the GSS and the ESS, such as social trust, religiosity, sexism, democratic preferences, and Rawlsian (strongly egalitarian) preferences concerning income distribution.
- In the following slides we will see some probably "inherited values"

How tolerance could be measured in the GSS

- “There are always some people whose ideas are considered bad or dangerous by other people. For instance, somebody who is against all churches and religion ... If such a person wanted to make a speech in your (city/town/ community) against churches and religion, should he be allowed to speak, or not?”
- “Should such a person be allowed to teach in a college or university, or not?”
- “If some people in your community suggested that a book he wrote against churches and religion should be taken out of your public library, would you favour removing this book, or not?”

How tolerance could be measured in the GSS

- “Or, consider a person who believes that Blacks are genetically inferior. If such a person wanted to make a speech in your community claiming that Blacks are inferior, should he be allowed to speak, or not?”
- “Should such a person be allowed to teach in a college or university, or not?”
- “If some people in your community suggested that a book he wrote which said Blacks are inferior should be taken out of your public library, would you favour removing this book, or not?”
- “Now, I would like to ask you some questions about a man who admits he is a Communist. Suppose this admitted Communist wanted to make a speech in your community. Should he be allowed to speak, or not?”
- “Suppose he is teaching in a college. Should he be fired, or not?”
- “Suppose he wrote a book which is in your public library. Somebody in your community suggests that the book should be removed from the library. Would you favour removing it, or not?”

How tolerance could be measured in the GSS

- “And what about a man who admits that he is homosexual ... Suppose this admitted homosexual wanted to make a speech in your community. Should he be allowed to speak, or not?”
- “Should such a person be allowed to teach in a college or university, or not?”
- “If somebody in your community suggests that a book he wrote in favour of homosexuality should be taken out of your public library, would you favour removing it, or not?”
- “There's been a lot of discussion about the way morals and attitudes about sex are changing in this country. If a man and a woman have sex relations before marriage, do you think it is always wrong, almost always wrong, wrong only sometimes, or not wrong at all?”
- “Do you think sex relations before marriage are always wrong, almost always wrong, wrong only sometimes, or not wrong at all?”
- “What about sexual relations between two adults of the same sex-- do you think it is always wrong, almost always wrong, wrong only sometimes, or not wrong at all?”
- “Do you agree or disagree with the following statement: Homosexual couples have the right to marry one another.”

How to measure religiosity in the GSS

- “The United States Supreme Court has ruled that no state or local government may require the reading of the Lord's Prayer or Bible verses in public schools. What are your views on this--do you approve or disapprove of the court ruling?”
- “What is your religious preference? Is it Protestant, Catholic, Jewish, some other religion, or no religion?”
- “Do you believe there is a life after death?”
- “About how often do you pray?”
- “To what extent do you consider yourself a religious person? Are you very religious, moderately religious, slightly religious, or not religious at all?”
- There are several items for an in-depth specification of religious preferences in the survey that we do not report here for the sake of brevity.

How to measure sexism in the GSS

- "Agree or disagree with this statement: Most men are better suited emotionally for politics than are most women."
- "If your party nominated a woman for President, would you vote for her if she were qualified for the job?"
- "Agree or disagree: A working mother can establish just as warm and secure a relationship with her children as a mother who does not work."
- "Agree or disagree: A preschool child is likely to suffer if his or her mother works."
- "Agree or disagree: It is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family."

How to measure democratic values in the GSS

- “Consider a person who advocates doing away with elections and letting the military run the country. If such a person wanted to make a speech in your community, should he be allowed to speak, or not?”
- “Should such a person be allowed to teach in a college or university, or not?”
- “Suppose he wrote a book advocating doing away with elections and letting the military run the country. Somebody in your community suggests that the book be removed from the public library. Would you favor removing it, or not?”

Next lecture

- In these lectures, we saw how the main studies on the current frontier of research about networks, culture, and development, suffer from several severe weaknesses.
- In the next lecture, we will see a much stronger study concerning how history and culture affect institutions and, therefore, economic development.
- The study, authored by Marianna Belloc, Francesco Drago and Roberto Galbiati will be directly presented by leading author Marianna Belloc.

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Highlights

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Examples of possible exam questions

- Briefly summarize the main results obtained by Akcomak and ter Weel (2009) concerning the relationship between social capital, innovation, and growth in European regions and explain how, according to the authors, the transmission mechanism of social capital's influence on economic growth may work.
- Briefly explain which is the main factor determining the community's endowments of social capital in the work of Guiso, Sapienza and Zingales (2016).
- Explain how Guiso, Sapienza and Zingales measure civic networks and which is, in their claims, their relationship with economic development.
- Briefly summarize Algan and Cahuc's (2010) main results.

Thank you!