Does Culture matter? The Impact of Tolerance on Economic Modernization in Comparative Perspective

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Theoretical framework

- Debate on culture and economic development
- Tolerance and modernization
- Modernization = economic and technological modernization. Building of knowledge-based, or post-industrial economy
    - Innovation and investment
- Innovations and culture?
- *R.Inglehart*: transition to post-industrial growth requires cultural change
- *R.Florida*: The Rise of Creative Class.
- Creative class is required for economic growth. Three “T”: Talent, Technology, Tolerance
- Tolerance = low barriers for creative class
- Universalism of this trend: modernization requires tolerance
    - Debate on cultural cosmopolitanism (e.g., Beck and Grande 2010) and universalism (e.g., Welzel 2011)

Theoretical framework

- How to measure tolerance? R.Florida, R.Inglehart
- Tolerance: gender equality, attitude to homosexuals and attitude to xenophobia
- The larger share of tolerant attitudes to these issues, the more tolerant the society is.
- Causal mechanism? The role of institutions: institutions create innovation-friendly environment for the creative class.
- Tolerance – Institutions – Modernization

Main argument

- increase in tolerance, which can be expressed via tolerant attitude towards gender equality, homosexuality and attitude towards xenophobia, has significant positive impact on modernization

Data and methods

- In my research I took data for 55 countries
- The main databases I used are World Values Survey (data for tolerance), World Development Indicators by the World Bank (data on social, economic development and demography) and Worldwide Governance Indicators (data on institutional quality).
- I took data for 1998-2008 years.

Data and methods

- The key variable is the **Index of Modernization** (IM). IM consists of two parts: *innovation index* (weight **0,65** of total IM) and *investment index* (weight **0,35** of total IM).
- **Innovation index** is the sum of 4 indicators:
- - *R&D expenditures as share of GDP* (0,4 of Innovation Index)
- - *high-tech exports as share of total merchandise exports* (0,4 of InnIndex)
- - *sci and technical journal articles*, adjusted per 1 mln population (0,1 of Inn Index)
- - *patent applications by residents*, adjusted per 1 mln population (weight 0,1 of Innovation Index)
- **Investment Index** is the sum of 2 indicators:
- - *gross capital formation as share of GDP* (weight 0,5 of Investment Index)
- - *foreign direct investment as share of GDP* (weight 0,5 of Investment Index)
- I transform absolute figures for every indicator in points on a 100-point scale, where 0 points is minimum value, 100 points – maximum value; all values for each indicator are adjusted to the median value.

Data and Methods

- ***Attitude to homosexuals*** -- indicator for tolerant attitude to homosexuality in the country. It is the share of positive responses ("**never**") on statement **"Homosexuality is never justifiable"** from WVS. The less share of positive responses, the more this society is tolerant to homosexuality. I take these data from World Values Surveys for 1995, 2000 and 2005 waves.
- ***Gender Equality*** -- indicator for gender equality in the country. It is the share of **positive** responses on question **"When jobs are scarce men should have more rights to a job than women"** from World Values Survey. The less share of positive responses, the more this society is tolerant to gender equality. I take these data from World Values Surveys for 1995, 2000 and 2005 waves.
- ***Attitude to xenophobia*** -- indicator for tolerant attitude to immigrants and/or ethnic minorities. It is the share of **positive** responses on question **"Could you please sort out any that you would not like to have as neighbors? – Immigrants/ foreign workers".** I take these data from World Values Surveys for 1995, 2000 and 2005 waves.
- ***Index of Tolerance*** - the total average assessment ratio for gender equality, attitudes toward homosexuality and attitude towards xenophobia – with equal weights (0,33).

Data and Methods

- ***Voice and accountability*** – indictor for openness of political regime from Worldwide Government Indicators (WWGI) dataset by the World Bank. The higher in the country the score is, the more democratic is the country. Estimates for *Voice and accountability* vary from -2,5 to 2,5. For convenience, the variable has been reformulated - for each value was added 2,5 points to each score had a positive sign.
- ***Control of Corruption*** – indicator for level of corruption, from WWGI. Estimates for *Control of corruption* vary from -2,5 to 2,5; the higher score is , the less corrupted is the country. For convenience, the variable has been reformulated - for each value was added 2,5 points to each score had a positive sign.
- ***Rule of law*** – indicator for level of rule of law from WWGI. It captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimates for *Rule of law* vary from -2,5 to 2,5. For convenience, the variable has been reformulated - for each value was added 2,5 points to each score had a positive sign.
- ***Regulatory Quality*** – indicator for quality of business environment and investment climate in the country, from WWGI. Estimates for *Regulatory quality* vary from -2,5 to 2,5; the higher score means more friendly environment for private business. For convenience, the variable has been reformulated - for each value was added 2,5 points to each score had a positive sign.
- ***Control variables***– regional dummies. They are designed to capture country-specific effects. Europe, Asia, N.America, S.America, former Soviet Union.

Two paths of modernization?

	innovation index	**investment index**	**modernization index**
innovation index	1,000	-,054	,932**
investment index	-,054	1,000	,265**
modernization index	,932**	,265**	1,000

Two paths of modernization

- Two paths/models of modernization?
- Is it possible to build post-industrial economy without post-industrial society?
- **“Catch-up modernization”**: *low* innovation, *high* investment and *low* tolerance
- **“Tolerant modernization”**: *high* innovation, *low* investment and *high* tolerance

Hypotheses

- The higher level of average tolerance has positive impact on modernization
- The higher level of tolerance to homosexuality has positive impact on modernization
- The higher level of tolerance to immigrants/ ethnic minorities has positive impact on modernization
- The higher level of tolerance to gender equality has positive impact on modernization
- The higher score for tolerance has positive impact on openness of political regime
- The higher score for tolerance has positive impact on rule of law
- The higher score for tolerance has positive impact on control of corruption
- The higher score for tolerance has positive impact on regulatory quality
- The higher level of average tolerance has positive impact on innovation
- The higher level of tolerance to homosexuality has positive impact on innovation
- The higher level of tolerance to immigrants/ ethnic minorities has positive impact on innovation
- The higher level of tolerance to gender equality has positive impact on innovation
- The higher level of average tolerance does not have positive impact on investment
- The higher level of tolerance to homosexuality does not have positive impact on investment
- The higher level of tolerance to immigrants/ ethnic minorities does not have positive impact on investment
- The higher level of tolerance to gender equality does not have positive impact on investment

Models

- Dependent Variable: ***Index of Modernization***. Independent variables: *Tolerance Index (tolerance average), lagged DV* and sets of regional dummies *Europe, Asia, N.America,* or *S.America, former SU,*
- Dependent Variable: ***Index of Modernization***. Independent variables: *Gender equality, Attitude to homosexuality, Attitude to xenophobia, lagged DV* and sets of regional dummies *Europe, Asia, N.America,* or *S.America, former SU*
- Dependent Variable: ***Index of Modernization***. Independent variables: *Tolerance Index (tolerance average)*, *lagged DV, Institutions* (sequentially adding *Control of corruption, Rule of law, Regulatory quality, Voice and accountability*) and sets of regional dummies *Europe, Asia, N.America,* or *S.America, former SU*
- Dependent Variable: ***Index of Modernization***. Independent variables: *Gender equality, Attitude to homosexuality, Attitude to xenophobia, lagged DV, Institutions* (sequentially adding *Control of corruption, Rule of law, Regulatory quality, Voice and accountability*), *Immigration* and sets of regional dummies *Europe, Asia, N.America,* or *S.America, former SU*
- Dependent Variable: ***Index of Innovation***. Independent variables: *Tolerance Index (tolerance average), lagged DV* and sets of regional dummies *Europe, Asia, N.America,* or *S.America, former SU*
- Dependent Variable: ***Index of Innovation***. Independent variables: *Gender equality, Attitude to homosexuality, Attitude to xenophobia, lagged DV* and sets of regional dummies *Europe, Asia, N.America,* or *S.America, former SU*
- Dependent Variable: ***Index of Innovation***. Independent variables: *Tolerance Index (tolerance average)*, *lagged DV, Institutions* (sequentially adding *Control of corruption, Rule of law, Regulatory quality, Voice and accountability*) and sets of regional dummies *Europe, Asia, N.America,* or *S.America, former SU*
- Dependent Variable: ***Index of Innovation***. Independent variables: *Gender equality, Attitude to homosexuality, Attitude to xenophobia, lagged DV, Institutions* (sequentially adding *Control of corruption, Rule of law, Regulatory quality, Voice and accountability*), *Immigration* and sets of regional dummies *Europe, Asia, N.America,* or *S.America, former SU*

Models

- Dependent Variable: ***Index of Investment***. Independent variables: *Tolerance Index (tolerance average), lagged DV* and sets of regional dummies *Europe, Asia, N.America,* or *S.America, former SU*
- Dependent Variable: ***Index of Investment***. Independent variables: *Gender equality, Attitude to homosexuality, Attitude to xenophobia, lagged DV* and sets of regional dummies *Europe, Asia, N.America,* or *S.America, former SU*
- Dependent Variable: ***Index of Investment***. Independent variables: *Tolerance Index (tolerance average)*, *lagged DV, Institutions* (sequentially adding *Control of corruption, Rule of law, Regulatory quality, Voice and accountability*) and sets of regional dummies *Europe, Asia, N.America,* or *S.America, former SU*
- Dependent Variable: ***Index of Investment***. Independent variables: *Gender equality, Attitude to homosexuality, Attitude to xenophobia, lagged DV, Institutions* (sequentially adding *Control of corruption, Rule of law, Regulatory quality, Voice and accountability*), *Immigration* and sets of regional dummies *Europe, Asia, N.America,* or *S.America, former SU*

Tolerance and Modernization (Dependent variable – Modernization Index)

	Model 1	***Model2***	***Model 3***	***Model 4***	***Model 5***	***Model 6***
	Beta Coefficients Standardized					
Tolerance Index $_{(t-2)}$	**-0.451**** **(0.025)**	**-0.829**** **(0.029)**	**-0.541**** **(0.022)**	-	-	-
Gender Equality $_{(t-2)}$	-	-	-	**-0.389**** **(0.038)**	**-0.729**** **(0.038)**	**-0.433**** **(0.032)**
Attitude towards Homosexuals $_{(t-2)}$	-	-	-	**-0.315**** **(0.024)**	**-0.234**** **(0.020)**	**-0.217**** **(0.022)**
Xenophobia $_{(t-2)}$	-	-	-	**0.208**** **(0.042)**	**-0.092**** **(0.040)**	0.033 (0.039)
Europe	**-**	**0.626**** **(1.197)**		**-**	**0.523**** **(1.039)**	-
Asia	**-**	**0.882**** **(1.671)**		**-**	**0.936**** **(1.620)**	-
N.America	**-**	**0.245**** **(2.355)**		**-**	**0.205**** **(2.036)**	-
S.America	-	**-**	**-0.536**** **(1.260)**	-	**-**	**-0.480**** **(1.176)**
Former SU	-	**-**	**-0.124**** **(1.116)**	-	**-**	**-0.083**** **(1.097)**
R-squared	*0.203*	*0.471*	*0.473*	*0.330*	*0.550*	*0.521*
Adjusted R-squared	*0.202*	*0.467*	*0.470*	*0.327*	*546*	*0.517*
Observations	*571*	*571*	*571*	*675*	*675*	*675*

Institutions, Europe, Asia, N.America (Dependent variable – Modernization Index)

	Model 7	*Model 8*	*Model 9*	*Model 10*	*Model 11*	*Model 12*	*Model 13*	*Model 14*
	Standardized Beta Coefficients							
Tolerance Index $_{(t-2)}$	**-0.611**** **(0.036)**	**-0.273**** **(0.036)**	**-0.344**** **(0.035)**	**-0.498**** **(0.033)**	-	-	-	-
Gender Equality $_{(t-2)}$	-	-	-	-	**-0.664**** **(0.039)**	**-0.461**** **(0.037)**	**-0.503**** **(0.037)**	**-0.529*** **(0.040)**
Attitude towards Homosexuals $_{(t-2)}$	-	-	-	-	**-0.146*** **(0.022)**	-0.015 (0.019)	-0.010 (0.020)	**-0.126*** **(0.020)**
Xenophobia $_{(t-2)}$	-	-	-	-	**-0.098**** **(0.040)**	-0.048 (0.036)	**-0.090**** **(0.036)**	**-0.130**** **(0.039)**
Voice and Accountability $_{(t-2)}$	**0.297**** **(0.736)**	-	-	-	**0.195**** **(0.675)**	-	-	-
Control of Corruption $_{(t-2)}$	-	**0.591**** **(0.520)**	-	-	-	**0.510**** **(0.456)**	-	-
Rule of Law $_{(t-2)}$	-	-	**0.535**** **(0.568)**	-	-	-	**0.471**** **(0.521)**	-
Regulatory Quality $_{(t-2)}$	-	-	-	**0.430**** **(0.596)**	-	-	-	**0.328**** **(0.599)**
Europe	**0.528**** **(1.232)**	**0.433**** **(1.095)**	**0.393**** **(1.150)**	**0.513**** **(1.116)**	**0.486**** **(1.049)**	**0.422**** **(0.939)**	**0.393**** **(0.973)**	**0.496**** **(0.989)**
Asia	**0.833**** **(1.634)**	**0.586**** **(1.570)**	**0.561**** **(1.632)**	**0.752**** **(1.551)**	**0.935**** **(1.598**	**0.729**** **(1.500)**	**0.726**** **(1.536)**	**0.879**** **(1.550)**
North America	**0.207**** **(2.319)**	**0.156**** **(2.076)**	**0.141**** **(2.133)**	**0.195**** **(2.154)**	**0.181**** **(2.042)**	**0.134**** **(1.836)**	**0.123**** **(1.884)**	**0.328**** **(1.942)**
R-squared	*0.505*	*0.608*	*0.596*	*0.567*	*0.564*	*0.650*	*0.638*	*0.596*
Adjusted R-squared	*0.501*	*0.605*	*0.592*	*0.563*	*0.559*	*0.646*	*0.635*	*0.592*
Observations	*571*	*571*	*571*	*571*	*675*	*675*	*675*	*675*

Results

- Tolerance has positive effect on technological modernization.
- Gender equality has the strongest impact on modernization. Other kinds of tolerance - attitude to homosexuality and attitude to xenophobia - have less impressive impact.
- Institutions do matter – strong political institutions are likely to be causal link between tolerance and modernization.
- Now I run my models with separate parts of my IM: Innovation Index and Investment Index

Tolerance and Innovations (Dependent variable – Innovation Index)

	Model 15	*Model 16*	*Model 17*	*Model 18*	*Model 19*	*Model 20*
	Standardized Beta Coefficients					
Tolerance Index $_{(t-2)}$	**-0.504**** **(0.036)**	**-0.915**** **(0.040)**	**-0.561**** **(0.031)**	-	-	-
Gender Equality $_{(t-2)}$	-	-	-	**-0.315**** **(0.054)**	**-0.653**** **(0.054)**	**-0.361**** **(0.046)**
Attitude to Homosexuals $_{(t-2)}$	-	-	-	**-0.409**** **(0.034)**	**-0.329**** **(0.028)**	**-0.263**** **(0.032)**
Xenophobia $_{(t-2)}$	-	-	-	**0.162**** **(0.061)**	**-0.127**** **(0.058)**	-0.031 (0.056)
Europe	-	**0.580**** **(1.664)**	-	-	**0.479**** **(1.477)**	-
Asia	-	**0.920**** **(2.323)**	-	-	**0.913**** **(2.303)**	-
N.America	-	**0.265**** **(3.275)**	-	-	**0.235**** **(2.894)**	-
S.America	-	-	**-0.520**** **(1.775)**	-	-	**-0.474**** **(1.681)**
Former SU	-	-	**-0.217**** **(1.573)**	-	-	**-0.177**** **(1.567)**
R-squared	*0.254*	*0.535*	*0.524*	*0.368*	*0.585*	*0.553*
Adjusted R-squared	*0.252*	*0.531*	*0.522*	*0.365*	*0.581*	*0.549*
Observations	*571*	*571*	*571*	*675*	*675*	*675*

Institutions, Tolerance and Innovations. Europe, Asia and N.America. (Dependent variable – Innovation Index)

	Model 21	*Model 22*	*Model 23*	*Model 24*	*Model 25*	*Model 26*	*Model 27*	*Model 28*
	Standardized Beta Coefficients							
Tolerance Index $_{(t-2)}$	**-0.697**** **(0.050)**	**-0.273**** **(0.049)**	**-0.441**** **(0.048)**	**-0.626**** **(0.046)**	-	-	-	-
Gender Equality $_{(t-2)}$	-	-	-	-	**-0.578**** **(0.055)**	**-0.376**** **(0.051)**	**-0.420**** **(0.051)**	**-0.479**** **(0.058)**
Attitude to Homosexuals $_{(t-2)}$	-	-	-	-	**-0.230**** **(0.031)**	**-0.104**** **(0.027)**	**-0.099**** **(0.028)**	**-0.236**** **(0.028)**
Xenophobia $_{(t-2)}$	-	-	-	-	**-0.134**** **(0.056)**	**-0.082**** **(0.050)**	**-0.125**** **(0.051)**	**-0.160**** **(0.056)**
Voice and Accountability $_{(t-2)}$	**0.296**** **(1.018)**	-	-	-	**0.222**** **(0.954)**	-	-	-
Control of Corruption $_{(t-2)}$	-	**0.591**** **(0.707)**	-	-	-	**0.527**** **(0.633)**	-	-
Rule of Law $_{(t-2)}$	-	-	**0.523**** **(0.779)**	-	-	-	**0.485**** **(0.727)**	-
Regulatory Quality $_{(t-2)}$	-	-	-	**0.376**** **(0.841)**	-	-	-	**0.285**** **(0.860)**
Europe	**0.483**** **(1.705)**	**0.433**** **(1.489)**	**0.353**** **(1.577)**	**0.482**** **(1.575)**	**0.436**** **(1.482)**	**0.374**** **(1.305)**	**0.345**** **(1.358)**	**0.455**** **(1.421)**
Asia	**0.872**** **(2.261)**	**0.586**** **(2.135)**	**0.607**** **(2.238)**	**0.807**** **(2.188)**	**0.912**** **(2.256)**	**0.700**** **(2.085)**	**0.697**** **(2.144)**	**0.864**** **(2.226)**
North America	**0.227**** **(3.209)**	**0.156**** **(2.824)**	**0.163**** **(2.925)**	**0.221**** **(3.039)**	**0.209**** **(2.884)**	**0.163**** **(2.551)**	**0.152**** **(2.631)**	**0.215**** **(2.789)**
R-squared	*0.569*	*0.608*	*0.596*	*0.608*	*0.602*	*0.691*	*0.678*	*0.619*
Adjusted R-squared	*0.565*	*0.605*	*0.592*	*0.605*	*0.598*	*0.688*	*0.675*	*0.615*
Observations	*571*	*571*	*571*	*571*	*675*	*675*	*675*	*675*

Tolerance and Investment
(Dependent variable – Investment Index)

	Model 29	***Model 30***	***Model 31***	***Model 32***	***Model 33***	***Model 34***
	Standardized Beta Coefficients					
Tolerance Index $_{(t-2)}$	**0.105*** **(0.026)**	**0.161**** **(0.036)**	-0.003 (0.027)	-	-	-
Gender Equality $_{(t-2)}$	-	-	-	**-0.259**** **(0.042)**	**-0.308**** **(0.051)**	**-0.260**** **(0.041)**
Attitude towards Homosexuals $_{(t-2)}$	-	-	-	**0.236**** **(0.027)**	**0.252**** **(0.026)**	0.102 (0.029)
Xenophobia $_{(t-2)}$	-	-	-	**0.159**** **(0.047)**	0.092 (0.055)	**0.190**** **(0.050)**
Europe	-	**0.203**** **(1.496)**	-	-	**0.190**** **(1.402)**	-
Asia	-	-0.017 (2.089)	-	-	**0.175*** **(2.186)**	-
N.America	-	-0.031 (2.944)	-	-	-0.065 (2.747)	-
S.America	-	-	**-0.108*** **(1.552)**	-	-	-0.073 (1.505)
Former SU	-	-	**-0.258**** **(1.375)**	-	-	**0.262**** **(1.403)**
R-squared	*0.011*	*0.057*	*0.088*	*0.051*	*0.079*	*0.116*
Adjusted R-squared	*0.009*	*0.050*	*0.084*	*0.046*	*0.070*	*0.110*
Observations	*571*	*571*	*571*	*675*	*675*	*675*

Institutions, Tolerance and Investment. Europe, Asia and N.America.

(*Dependent variable – Investment Index)*

	Model 35	*Model 36*	*Model 37*	*Model 38*	*Model 39*	*Model 40*	*Model 41*	*Model 42*
	Standardized Beta Coefficients							
Tolerance Index $_{(t-2)}$	**0.186*** **(0.047)**	**0.234**** **(0.053)**	**0.247**** **(0.050)**	**0.321**** **(0.045)**	-	-	-	-
Gender Equality $_{(t-2)}$	-	-	-	-	**-0.327**** **(0.053)**	**-0.302**** **(0.056)**	**-0.300**** **(0.055)**	**-0.207**** **(0.057)**
Attitude towards Homosexuals $_{(t-2)}$	-	-	-	-	**0.227**** **(0.030)**	**0.257**** **(0.030)**	**0.260**** **(0.030)**	**0.306**** **(0.028)**
Xenophobia $_{(t-2)}$	-	-	-	-	0.094 (0.055)	0.093 (0.055)	0.092 (0.055)	0.073 (0.055))
Voice and Accountability $_{(t-2)}$	0.034 (0.951)	-		-	-0.056 (0.934)	-	-	-
Control of Corruption $_{(t-2)}$	-	0.077 (0.754)	-	-	-	0.011 (0.697)	-	-
Rule of Law $_{(t-2)}$	-	-	0.095 (0.811)	-	-	-	0.017 (0.783)	-
Regulatory Quality $_{(t-2)}$	-	-	-	**0.207**** **(0.814)**	-	-		**0.166**** **(0.847)**
Europe	**0.192**** **(1.592)**	**0.178**** **(1.589)**	**0.162**** **(1.642)**	**0.149*** **(1.525)**	**0.200**** **(1.436)**	**0.187**** **(1.436)**	**0.185**** **(1.463)**	**0.176**** **(1.399)**
Asia	-0.022 (2.112)	-0.055 (2.279)	-0.073 (2.330)	-0.079 (2.119)	**0.175*** **(2.186)**	**0.170*** **(2.294)**	**0.168*** **(2.310)**	0.146 (2.192)
North America	-0.036 (2.998)	-0.043 (3.014)	-0.050 (3.045)	-0.056 (2.943)	-0.059 (2.795)	-0.067 (2.806)	-0.068 (2.835)	-0.077 (2.746)
R-squared	*0.057*	*0.059*	*0.061*	*0.079*	*0.080*	*0.079*	*0.079*	*0.090*
Adjusted R-squared	*0.049*	*0.051*	*0.053*	*0.071*	*0.070*	*0.069*	*0.069*	*0.081*
Observations	*571*	*571*	*571*	*571*	*675*	*675*	*675*	*675*

Causality

- Direction of causality “Tolerance – Modernization”?
- it is tolerance that affects modernization
- Two tests
- I plan to test directly the suggestion that Modernization changes in response to its’ misfit to Tolerance, whereas Tolerance does not change in response to it’s misfit to Modernization. I measure the misfit by regressing Tolerance Index in *t0* on the estimated Modernization Index of this year and save the residuals

Causality

- 1) I create new dataset: for every country I have values for MI at *t0* and *t1*. I do the same for TI. I also create 2 variables: "delta MI" and "delta TI" as MI (*t0-t1*) and TI (*t0-t1*). *Change in modernization and tolerance over the time.*
- 2) I run regressions: (1) TI (t0) → MI (t0), and save residuals as "resMI t0"

  (2) TI (t1) → MI (t1) , and save residuals as "resMI t1"
- Then I calculate new variable – "delta of residuals" (del resMI = resMI t0 – resMI t1). This variable shows the change in modernization.
- 3) What factor has more explanatory power in "modernization – tolerance" link? I run new regression:
- (3) Del resMI = delMI+delTI

Causality

	Standardized Beta Coefficients
Delta Tolerance Index	**0,231****
Delta Modernization Index	**0,926****
R-square	*0,860*
Adjusted R-square	*0,855*
Observations	*55*

The strongest coefficient means that this factor is caused, and the weaker coefficient is driving the things

The casual arrow goes from tolerance to modernization

Causality

- Test 2: “seemingly unrelated regressions” approach
- The idea is to run two models: from the DV measured prior to the modernization IV measured later and the DV measured prior to the tolerance IV measured later.
- SUR – to control correlated error terms in reciprocal systems. Then one compares the coefficients in the two models to decide if Xt1 has a stronger effect on Yt2 or Yt1 on Xt2.
- MI = MI (t-2) + delTol + delInst
- Tol = Tol (t-2) +delMI +delInst
- in both equations the coefficients (delMI and delTol) are insignificant. In second equation delInst is positive and significant . impact of institutions on tolerance

Conclusion

- Tolerance has significant impact on modernization, and the most predictive factor is gender equality. Why ***Gender equality*** has proved to be more important than other factors?
- Female labor force participation during industrialization affects fertility rates, literacy rates and school enrollment, political participation.
- Gender equality and Shift to postindustrial societies. I would suggest two explanatory mechanisms:
- - Female higher literacy and school enrollment rates – and later – higher university enrollment rates lead to increase of creative class. If process of industrialization is associated with low-wage jobs for women and high-wage positions for men, process of post-industrialization provides much more opportunities for women, due to the extended access to the education system.
- - Women gain much more political influence in societies, what has strong impact on political institutions. In general, women's empowerment is associated with democratization.

Conclusion

- As for attitude to homosexuals and attitude to xenophobia, their impact differs depending on modernization pattern
- In the *Tolerant modernization* model tolerance has unclear effects on Innovation. Institutions have more impact on innovation than culture
- In the *Catch-up modernization* model tolerance is negatively associated with investment
- Institutions do matter; they seem to be causal mechanism in relations between Tolerance and Modernization.
- My findings support universalist approach to social change: modernization requires tolerance. All kinds of anti-tolerant legislation will hinder innovative development

- **THANK YOU!**