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Is Tolerance Good or Bad for Growth?

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Abstract We investigate to what extent tolerance, as measured by attitudes toward different types of neighbors, affects economic growth. Data from the World Values Survey enable us to investigate tolerance–growth relationships for 54 countries. We provide estimates based on cross-sectional as well as panel-data regressions. In addition we test for robustness with respect to model specification and sample composition. Unlike previous studies, by Richard Florida and others, we find that tolerance toward homosexuals is *negatively* related to growth. For tolerance toward people of a different race, we do not find robust results, but the sign of the estimated coefficients is positive, suggesting that inclusion of people irrespective of race makes good use of productive capacity. We propose mechanisms to explain these divergent findings, which clarify why different kinds of tolerance may be of different economic importance.

Keywords Tolerance · Growth · Diversity · Human Capital · Creativity · Innovation

JEL codes O40 · Z13

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1 Introduction

> But those values upon which our success depends – hard work and honesty, courage and fair play, tolerance and curiosity, loyalty and patriotism – these things are old. These things are true. They have been the quiet force of progress throughout our history. … The success of our economy has always depended not just on the size of our gross domestic product, but on the reach of our prosperity; on our ability to extend opportunity to every willing heart – not out of charity, but because it is the surest route to our common good.
> – President Barack Obama, inauguration speech, January 20, 2009

What has made certain countries flourish economically? Episodes in history suggest that an open attitude toward minorities of different kinds has played a role. For example, the admittance of Jews and other religious minorities into the Netherlands, the United Kingdom and Sweden attracted productive immigrants and allowed them to participate in the economy, with positive overall effects.[1] Based on his historical study of technological progress, Mokyr (1990: 12) claims that "innovation requires diversity and tolerance". In line with such historical indications, it has indeed been suggested in recent years, most notably by Richard Florida and his co-authors, that tolerance is positively related to economic development.

We follow Florida (2003: 10) in defining tolerance as "openness, inclusiveness, and diversity to all ethnicities, races, and walks of life." On this definition, a tolerant person is characterized by an attitude of openness, irrespective of his underlying opinion of those to whom this attitude is extended. They may be liked or disliked, approved or disapproved of, loved or hated, it does not matter – a tolerant person accepts the presence and participation of all kinds of people in society.[2] While it is easy to see how someone would be tolerant toward a group which is liked, why would someone be tolerant toward a group he dislikes? Different reasons could be envisaged. Some people regard openness as a virtue, period, as part of established norms of behavior. Others embrace openness even of those disliked because they consider it beneficial for society or themselves to let everyone be part of social life. In any case, it should be noted that tolerance is a multifaceted concept, in that a person can be tolerant to different degrees toward different groups of people, and intolerant toward some.

[1] See, e.g., Mokyr (1990), Israel (1995) and Grell and Porter (2000).

[2] This is, e.g., in line with the definition of Corneo and Jeanne (2009: 691): "respect for diversity." We know that a common definition of tolerance restricts it to cases where someone has an attitude of openness while disliking, disapproving of or hating those to whom this attitude is extended. This implies that people with an attitude of openness based on genuine like, approval or love do not count as tolerant. As hopefully made clear, we include this group as well in our wider definition, as we are primarily interested in whether certain groups are "allowed into" society or not, not what those who do the letting in think privately about those let in.

We operationalize this concept of tolerance by making use of replies to a question in the World Values Survey (Inglehart et al. 2004), in which respondents in different countries are asked if they would like to have homosexuals or people of a different race as their neighbors.[3] The fraction in each country that does not answer no is our basic measure of tolerance. We argue that this operationalization captures the essence of tolerance as entailing an attitude of openness, of letting people in and being included in social – and economic – life. The question is if tolerance, thus understood, is related to economic growth – and, not least, if different types of tolerance have different effects.

The modern economic tolerance literature – the approach of which is well summarized in Florida (2002a) – tries to answer that question. In so doing, it has almost exclusively made use of data from American cities; the dependent variable under study has most often been population or employment growth, technological development or income (rather than income growth); and tolerance has generally been defined as the share of a population that is gay, bohemian or foreign-born. The thesis is that a city with widespread tolerance among its inhabitants will attract people in general and creative, productive individuals in particular, with beneficial effects for the economy. While we recognize the plausibility of this thesis, we consider the empirical approach – its predominant focus on the U.S. and the resulting usage of within-country data, as well as the measure of tolerance and the absence of methodic sensitivity analysis – as seriously incomplete.

Our contribution consists in offering, for the first time, a cross-country analysis of how tolerance affects growth, both in a cross-section and a panel. In so doing, we use growth in GDP per capita as the dependent variable, which enables us to relate to the empirical growth literature, and attitude measures of tolerance. We look at two types of tolerance and thereby recognize that tolerance toward one group may yield different economic consequences than tolerance toward another. In addition, we apply a sensitivity analysis (by changing the model specification and by performing an outlier analysis in the form of least trimmed squares) to see whether the tolerance–growth relationships are robust.

We find a relatively robust *negative* effect of tolerance toward homosexuals on growth. This result is almost without exception statistically significant, both in the cross-sectional regressions and in the panel-data analysis, and it withstands our sensitivity tests. The estimated coefficient is quite stable and of practical relevance, indicating that an increase in tolerance toward homosexuals of 10 percentage points entails a decrease in the growth rate by 0.3–0.4 percentage points. These results stand in contrast to previous results using American data, which point to a positive effect of tolerance

[3] Inglehart and Abramson (1999) and Mellander and Florida (2007) claim that openness toward the gay and lesbian population is the best available indicator of tolerant attitudes.

toward homosexuals on different types of economic performance. We propose three mechanisms to explain the negative relationship: that this type of tolerance scares off or reduces the productivity of intolerant but productive and innovative people; that it reduces the average productivity of homosexuals by affecting choices of education and occupation and by reducing the felt need to work hard to prove one's worth; and that homosexuals on average have more "postmaterialist", less strict, and less future-oriented values, which will disseminate easier with increased tolerance.

As for tolerance toward people of a different race, we do not find as robust results. The sign of the estimated coefficient is positive throughout, suggesting that inclusion of people into social and economic life irrespective of race, releases innovativeness and productive activities. However, this result cannot be firmly established with our data, as statistical significance is shaky.

2 Tolerance and growth: previous literature and theoretical preliminaries

2.1 Previous literature

The issue of what causes economic growth stands at the center of much modern economic research. Since the early 1990s, the growth literature has taken an empirical turn.[4] As Temple (1999) notes, cross-country studies have shown that not only physical capital and labor, as stressed in earlier growth theory, matter for how economies develop. Human capital also seems important, as do institutional and social factors. For instance, research indicates that the quality of legal institutions is positively related to growth.[5] Political institutions, most notably those that define and guarantee civil liberties and democracy, also seem to have bearing on how well the economy functions,[6] as does government size.[7] Among social factors, social capital in the form of trust, as well as income inequality, have been shown to matter.[8] We suggest that tolerance may be another important social factor.[9]

[4] Pioneering work has been made by, e.g., Barro (1991), Levine and Renelt (1992), Mankiw et al. (1992) and Sala-í-Martin (1997). For reviews see, e.g., Temple (1999) and Bosworth and Collins (2003).

[5] See, e.g., Knack and Keefer (1995), Aron (2000), Glaeser et al. (2004), Rodrik et al. (2004), Acemoglu et al. (2005), Berggren and Jordahl (2005) and Doucouliagos and Ulubasoglu (2006).

[6] See, e.g., Barro (1996), Aron (2000), Butklewicz and Yanikkaya (2006) and Doucouliagos and Ulubasoglu (2009).

[7] See Bergh and Karlsson (2010) for a presentation of and contribution to this literature.

[8] On trust, see, e.g., Zak and Knack (2001), Beugelsdijk et al. (2004), Berggren et al. (2008) and Dincer and Uslaner (2010). On income inequality, see, e.g., Aghion et al. (1999), Barro (2000) and Knowles (2005). For a broad analysis of how values, especially those relating to self-expression, relate to economic performance, see Inglehart and Welzel (2005).

The idea that tolerance is beneficial for technological and economic performance, as well as for population growth, has been put forth consistently in the works of Richard Florida and his co-authors. Florida (2003: 11) argues that "[p]laces that are open and possess *low entry barriers* for people gain creativity advantage from their ability to attract people from a wide range of backgrounds. All else equal, more open and diverse places are likely to attract greater numbers of talented and creative people – the sort of people who power innovation and growth." Florida and Gates (2001: 1) find that

> [t]he leading indicator of a metropolitan area's high-technology success is a large gay population. … Gays not only predict the concentration of high-tech industry, they are also a predictor of its growth. … Metropolitan areas with high concentrations of foreign-born residents also rank high as technology centers. Overall diversity is a strong indicator of a metropolitan area's high-technology success.

Florida (2002b) finds a positive relationship between the share of bohemians in U.S. metropolitan areas, on the one hand, and human capital and the concentration of high-technology industries, on the other hand. In a study of U.S. regional development, Florida et al. (2008b) find a positive effect of tolerance (the share of coupled gays and lesbian of all households plus the share of people in bohemian occupations) on human capital and occupational skills, as well as on regional wages (a proxy for labor productivity) and income. Florida and Mellander (2010) show that their Bohemian-Gay Index not only relates positively to housing values, but that it also influences income positively. In essence, a line of studies document that tolerance and technological and economic performance seem to go together in the U.S.

There is a closely related literature that extends this perspective to other settings. Florida et al. (2008a) look at China and find a positive relationship between tolerance, as measured by the share of the population in a region who are from other parts of the country (indicating openness), and GDP per capita. Mellander and Florida (2007) report that tolerance, as measured by attitudes toward and rights of gays and lesbians, affects the distribution of human capital among Swedish regions, which in turn affects regional wages per capita (their dependent variable). Boschma and Fritsch (2007) look at employment growth and new-business formation at the regional level in eight European countries, and find that human capital as measured by creative occupation is related to these outcome variables and that tolerance, as measured by the share of bohemians and the share of foreign-born individuals, in turn attracts creative individuals to a region. Marlet and van Woerkens (2005, 2007) find that creative

[9] Our analysis of tolerance can be related to Buchanan and Tullock (1962), who stress the importance of taking the interests of minorities into consideration when designing political institutions. It can also be related to Buchanan and Congleton (1997), in focusing on the effects of generality – of having social attitudes of a kind that entail treating people equally. Generality, or non-discrimination, can be encompassed in the formal institutions, as suggested by Buchanan and Congleton, but could also characterize informal institutions, as in this study.

individuals, who are important for urban employment growth across Dutch cities, are *not* primarily attracted by tolerance (measured by the average of the shares of people who subscribed to two gay magazines and belonged to the national gay political organization, the share of bohemians and ethnic diversity) but by job opportunities and amenities. Ottaviano and Peri (2006) show that there is a positive relationship between the share of foreign-born residents in U.S. cities and subsequent wage and rent increases for U.S.-born citizens. Again, these studies, with two exceptions, lend some support to the idea of a beneficial link between tolerance and certain economic variables. Hence, the effect does not seem to be U.S.-specific. However, these studies are all limited to specific countries or regions, and the measures of tolerance used are not, in our view, particularly apt (see section 3).

There are other studies that rather find that education, and the higher productivity that it gives rise is to, are central for population and productivity growth in U.S. cities, hence implying that tolerance and an ability to attract creative individuals are not that central – see Glaeser et al. (1995), Glaeser and Saiz (2004), Glaeser (2005) and Shapiro (2006). As tolerance may be a byproduct of education, failing to control for human capital may result in severely misleading conclusions about the role of tolerance. However, McGranahan and Wojan (2007) confirm the Florida thesis that creative occupations exert an independent and larger effect on employment growth, compared to human capital.

On the basis of the current state of the literature, we believe that our study offers valuable complementary knowledge about the tolerance–growth relationship.

2.2 Theoretical preliminaries

Oftentimes, tolerance is portrayed as a social attitude with solely beneficial effects. As described in section 2.1, Richard Florida and others stress that tolerance spurs creativity and innovation. Of central importance for this process to work is an openness to change – to the introduction of new combinations and creative destruction (to use Schumpeter's phrases). North (1990: 80–81) locates the determinants of openness to change and adaptation in both formal and informal institutions. That is: new ideas must be legally permitted to emerge and be put to use, and norms, traditions, and attitudes must likewise accept that old ways of doing things are replaced with new ones. Tolerance, the previous literature suggests, constitutes an openness of this kind. While we acknowledge that tolerance can stimulate economic growth in this way, in line with endogenous growth theory (Romer 1986, 1990), we think that tolerance sometimes could have negative effects, which is overlooked in the literature.

We suggest that tolerance can affect economic growth in three basic ways. *First*, by affecting others than those toward which tolerance is directed. *Second*, by affecting the productivity and innovative capacity of the minority groups that become tolerated. *Third*, by affecting the generation and spread of new ideas and values. In the following, we discuss mechanisms through which these effects can be positive or negative, with an emphasis on differences between tolerance toward homosexuals and tolerance toward people of a different race in this regard.

2.2.1 Effects on others

Suppose that productive people are attracted to tolerant environments. Then tolerance can increase the efficient allocation of labor and talent both between and within countries, as it entails what Florida and Gates (2001: 2) call low barriers to entry for human capital. This, then, is a mechanism through which tolerance affects growth positively. Suppose, in contrast, that the talented, productive and innovate people overall dislike the acceptance of all people and lifestyles. Conservative or intolerant groups may be important even in societies that are overall characterized as tolerant. Then a negative growth effect could ensue, if tolerance scares off or reduces the productivity and innovativeness of these people. If, say, a country or area is very tolerant toward homosexuals, then conservative people may decide to not move there, and to the extent that they would have contributed to higher growth by working hard and applying their skills and talents, their not coming represents foregone growth opportunities. Furthermore, the productivity of the intolerant in a given area or country could be affected by the general tolerance extended to certain minority groups. Racists or those with sexual prejudice can feel uncomfortable in workplaces where minorities they dislike, and their lifestyles, are welcomed. Consequently, they can self-select away from the most productive jobs available to them if those jobs are part of a setting which welcomes such minorities. Whether the growth effect of tolerance is positive or negative therefore at least partly depends on whether the productive and innovative welcome or dislike the acceptance of all people and lifestyles.

We argue that a negative growth effect is more probable with regard to tolerance toward homosexuals. If productive and innovative people are sexually prejudiced, tolerance could deter them from moving into an area or country, it could encourage them to move elsewhere and it could reduce their productivity if they stay put.[10] If they value traditional family life, it could be unpleasant to live

[10] Following Herek (2000), we use the term "sexual prejudice" to denote negative attitudes toward an individual because of his or her sexual orientation, in this case homosexuality.

in a society in which a gay lifestyle is openly acknowledged and respected.[11] Even though one's sexual orientation can be hidden (unlike race), in tolerant societies there is little incentive to do so, which exacerbates this effect. In contrast, tolerance toward people of another race can be expected to *attract* new and productive people to an area or a country, especially foreigners, as they are often of another race and since, in any case, the correlation between tolerance toward people of a different race and tolerance toward immigrants is high (0.85, based on data from Inglehart et al. 2004).

Furthermore, for the sexually prejudiced people who remain in a given, generally tolerant place, they can be expected to be affected by the presence of homosexuals in the workplace, which makes them spend time and energy on matters unrelated to productive activities.[12] They can also self-select away from professions or workplaces where homosexuals are visible, which means that they impose a constraint on themselves which in some cases entails not taking a job at which their productivity could be put to the best use.

2.2.2 Effects on the tolerated groups

Consider first two mechanisms through which tolerance can increase growth: by attracting innovative and productive minority-group members from other countries and by affecting the allocation of labor and talent within a country. As for the latter mechanism, if employers solely care about the productivity of potential employees and do not much care about characteristics unrelated to productivity, then it is more probable that people are allocated to positions to which their talent is put to best use. This implies a link between tolerance and discrimination (in the sense of Becker 1971), such that where the former is in place, the latter is less prevalent. But consider also that there are two mechanisms through which tolerance can decrease growth: it can attract low-productive minority-group members from other countries and areas, and it can make a group toward which tolerance is extended less productive to the extent that non-innovative or unproductive choices are encouraged (or at least not discouraged) through tolerant attitudes. Whether the growth effect of tolerance is positive or negative therefore at least partly depends on how productive those toward whom tolerance is extended are and how their productivity changes with tolerance.

[11] Corneo and Jeanne (2009) find that being married is a predictor of finding homosexuality not justifiable. Furthermore, Stratton (2007) finds that married men are more productive than unmarried men. Together, these two finding provide some support for sexually prejudiced persons being high-productive.

[12] See, e.g., Embrick et al. (2007) on working class masculinity and its relations to attitudes toward homosexuals in the workplace.

We suggest that a negative growth effect is more probable in the case of tolerance toward homosexuals, which can make homosexuals less productive on average, in two ways. *On the one hand*, homosexuality can be hidden, and it could be that in an intolerant society, homosexuals to a large extent lead "heterosexual" lives, marrying someone of the opposite sex and having children – and therefore, they are similar to others in the labor market.[13] When tolerance rises, the need to adapt socially is reduced, which leads them not to marry and have children, which may make them take a less long-term view (involving less care for long-term investments of a physical, monetary and human-capital kind), and to satisfy a preference for certain kinds of low-productive jobs.[14] There is, as far as we can see, no corresponding mechanism based on race.

On the other hand, tolerance can make homosexuals feel a reduced psychological need to prove their worth in society, which can cause a reduced propensity to acquire an education and to work hard. In contrast, this mechanism does not apply very well to people of a different race. Whereas homosexuals can hide their orientation in an intolerant society, race cannot easily be hidden. This implies that even if people of a different race work hard, they will still probably be discriminated against in an intolerant society, which means that they will not be able to prove their worth in practice although they feel a need to do so. In the case of homosexuals then, there is a clear difference between an intolerant and tolerant society: in the former, they can work hard and hide their orientation; in the latter, they feel a reduced need to prove to others that they are productive. In the case of people of a different race, they can wish to work hard in an intolerant society but will be stopped anyway because of racist attitudes. In the tolerant society, the need to prove one's worth is small also for them, but the difference between the two settings, in terms of productive contributions, is much smaller than for homosexuals.

[13] See, e.g., Ross (1989).

[14] Ahmed and Hammarstedt (forthcoming) find that homosexual males have a lower average income than heterosexual males. According to Plug and Berkhout (2008), such a difference primarily results from a selection effect where a certain segment of homosexual workers concentrate in lower-paid (and plausibly less productive) occupations. Antecol et al. (2008) find that it has to do with differences in human-capital accumulation, which is also relevant for growth. Black et al. (2007) suggest the following: "Applying the theory of household specialization to gay men, we might expect that gays who realize early in life that they are unlikely to form traditional households with children may plan on specializing less intensely in market production than heterosexual men. These realizations would create differences by sexual orientation in educational choices, occupational choices, and other labor market decisions."

2.2.3 New ideas

Perhaps the most important effect of tolerance is its dynamic effects on the generation and spread of new ideas. On the positive side, tolerance can be seen as an indication of a broader outlook on life and on openness toward that which is unknown or untried at present, which implies an openness to new ideas and entrepreneurship.[15] The idea is that a society which allows everyone to contribute to the generation of new knowledge, be it as employees, employers or entrepreneurs, can grow at a faster pace than a society in which the new knowledge of certain groups of people is not listened to.[16] However, there is a negative side as well. The ideas that are generated and spread in a tolerant climate need not be growth-enhancing. For growth to ensue from openness to ideas, there is a need for a well-functioning selection mechanism, which filters out ideas that are not relevant or good for growth. Oftentimes, we suggest, such a mechanism is not in place. In particular, tolerance toward a group with values that are not conducive to productive and innovative activity may lead to the dissemination of those values into the wider population as the tolerated group takes a more prominent place in society, with negative growth effects. Whether the growth effect of tolerance is positive or negative therefore at least partly depends on the content and character of the most influential ideas that are generated and spread in an open climate.

Also here we think that a negative growth effect is more probable with regard to tolerance toward homosexuals. Homosexuals to a larger degree advocate a more postmaterialst, a more leisure-oriented, less strict and less long-term way of life (with less weight to long-term investment), plausibly both because they personally benefit from a socially liberal society and because they generally do not have children.[17] This should have economic consequences, in terms of work ethic, rule-following and willingness to save and invest for the long term. In contrast, there is no reason to expect people of a different race to embrace such a perspective, both because stricter values are prevalent among many

[15] A negative link between the personality trait "openness to experience" and prejudice is shown to exist by, e.g., Ekehammar and Akrami (2003) and Barron et al. (2008). On tolerance, diversity and creativity, see, e.g., Sternberg (1999) and Page (2007). The link between entrepreneurship and economic growth is well documented: see, e.g., Nyström (2009).

[16] This relates to what Granovetter (1983) calls "the strength of weak ties", i.e., the idea that it is beneficial for the generation, spread and use of knowledge in society if people are open to ties not only with people of their own kind but also with people that are different and with whom they are only loosely related.

[17] Inglehart and Abramson (1999) and Inglehart and Welzel (2005) describe the broad value shifts in many countries in recent years, toward a more individualistic and self-realizing ideal, away from a more self-denialist and duty-bound position. This "social liberal" shift seems to have been adapted to a higher degree by homosexuals – see Egan et al. (2009).

minority race groups and because they typically have children, which induce them to take a cautionary-conservative and long-term perspective.

2.2.5 Summary

Tolerance can have both positive and negative effects on economic growth – by affecting productive and innovate people outside of the tolerated groups, by affecting members of the tolerated groups and by affecting the generation and spread of ideas and values. The theoretical mechanisms outlined in this section should be seen as elaborative and as *potentially* able to explain the tolerance–growth relationships. It may be that not all of the proposed mechanisms are at work or, to the extent that they are, that the effects are small. However, we would argue that they are all potentially valid and that they, taken together, offer an explanation of a substantial effect of tolerance on growth. As for the signs, we suggest that there are stronger reasons to expect negative growth effects for tolerance toward homosexuals than for tolerance toward people of a different race.[18] However, if these negative effects dominate the positive ones is an empirical question, which we will now address.

3 Empirical approach and data

3.1 Empirical approach

Unlike the previous literature, we investigate the relationship between tolerance and growth in a *cross-country* setting. This approach can be motivated as a valuable complement to see if previously documented relationships hold for a larger selection of countries.

First, we follow the standard approach in the empirical growth literature and estimate a model of the following kind:

$$\Delta Y_i = \alpha + \mathbf{X_i}\boldsymbol{\Gamma} + \mathbf{F}_i\boldsymbol{\beta} + u_i, \qquad (1)$$

where ΔY_i denotes the average annual growth rate of real GDP per capita, where $\mathbf{X_i}$ is a row vector of tolerance measures and where $\mathbf{F}_i$ is a row vector of control variables.

[18] By focusing here on negative effects, we do not want to give the impression that the reasoning applies to all or most homosexuals (we are concerned with aggregates and averages), nor do we want to give the impression that tolerance toward homosexuals is a bad thing. The purpose of our reasoning is not intended to be normative."

The model is estimated in a baseline specification with $\mathbf{X_i}$ consisting of two tolerance measures: tolerance toward people of a different race and tolerance toward homosexuals; and with $\mathbf{F_i}$ consisting of real GDP per capita, the average years of total schooling and the investment share of GDP. We then extend $\mathbf{F_i}$ in three steps, in each step keeping the preceding additions. In step one, we add trust and the quality of the legal system; in step two, we add the Gini coefficient, government consumption as a share of GDP and two measures of political institutions (civil liberties and political rights); in step three we add country-group dummies for Asia, Latin America, transition countries, the EU and North America. Lastly, we perform a sensitivity test for our measure of human capital, by exchanging average years of total schooling with the gross enrollment rate and cognitive skills, respectively. This is warranted, since Glaeser (2005) finds that when human capital is controlled for, the effect of tolerance vanishes. One possible explanation is that as people obtain more education they also get more tolerant as a byproduct. Failing to correctly account for human capital in any study of the role of tolerance for economic growth could be severely misleading. Cogntive skills, obtained from Hanushek and Woessmann (2009), is a valuable complement to the other two measures, which can be criticized on at least two grounds: first, by pointing out that schooling is of varying quality between countries and second, by pointing out that learning outside of schools are not taken into account. Cognitive skills refer to average test scores in math and science in primary and secondary school. In defense of average years of schooling and similar measures we would like to point out that it captures the social aspects of schooling better than cognitive skills, a feature which may be especially relevant when tolerance, which is a social attitude, is studied. Results are reported in section 4.1.

Second, we apply a robustness test focusing on outliers, i.e., observations that deviate from the linear pattern formed by the majority of the data (Rousseeuw and Leroy 1987). Outliers can occur for different reasons, e.g., measurement error, extraordinary but irrelevant events (such as disasters) or observations being drawn from a different population with a different relationship between the variables of interest. The latter is especially relevant in the cross-country context, when uncertainty about the specification of the empirical model is substantial.

More specifically, we use the estimation technique least trimmed squares, which is "robust against the possibility that one or several unannounced outliers may occur anywhere in the data" (Hubert et al. 2004: 1515).[19] Following Rousseeuw and Leroy (1987), outliers are identified in the following way. A regression line is calculated by making use of the 75 percent of the observations that give the best fit (i.e., that minimize the sum of the squared residuals). The remaining 25 percent of the observations are then added, and residuals for all observations are computed. Countries with a

[19] This technique was introduced by Rousseeuw (1984); see also Temple (1999), Zaman et al. (2001) and Sturm and de Haan (2005).

standardized residual above approximately 2.5 are identified as outliers.[20] Thereafter, reweighted least squares is used for inference, in which countries identified as outliers are given the weight zero and the rest the weight one. The main advantage of least trimmed squares is that it, unlike simpler diagnostic methods, can handle cases with several jointly influential outliers. As we use the method with a breakdown point of 25 percent, it can handle cases where up to one fourth of the observations are jointly influential.[21] Results are reported in section 4.2.

Third, we look at the issue of endogeneity by regressing our tolerance measures on average, annual economic growth during the *preceding* ten-year period. The idea is that if there is an effect of growth on tolerance, this should yield significant estimates for growth in these regressions. Results are reported in section 4.3.

Fourth, we perform a fixed-effects panel-data analysis, using data from two ten-year growth periods, 1988–1997 and 1998–2007 with control variables measured in the beginning of each period (i.e. around 1988 and 1998 respectively). We estimate the following model:

$$\Delta Y_{i,t} = \alpha_i + \gamma_t + \mathbf{X_{i,t}}\mathbf{\Gamma} + \mathbf{F}_{i,t}\boldsymbol{\beta} + u_{i,t}, \qquad (2)$$

where ΔY_i denotes the average annual growth rate of real GDP per capita in country i in the period t to t+9, where α_i is an intercept for country i, where γ_t captures average growth differences between the two time periods, where $\mathbf{X_{i,y}}$ is a row vector of tolerance measures for country i in year t and where $\mathbf{F}_{i,t}$ is a row vector of control variables for country i in year t. Here, we apply the full model used in the cross-sectional analysis. There are several advantages of a panel-data analysis (see, e.g., Hsiao, 2007), such as a reduced risk of omitted-variable bias, multicollinearity and endogeneity. Results are reported in section 4.4.

[20] It should be noted that if the errors are normally distributed, then less than 1 percent of the observations should have a standardized residual above 2.5. Hence, if such cases are common, this suggests that the model is not suitable for all the countries in the sample.

[21] For more on the LTS estimator and its application, see Verboven and Hubert (2005) and Rousseeuw and Van Driessen (2006).

3.2 Data[22]

Our variables can be divided into four groups:

- The dependent variable: *Growth:* average annual growth in real GDP per capita.
- Variables of interest: *Tolerance homosexuals:* share of the population that does *not* pick "homosexuals" in answer to the question: "On this list are various groups of people. Could you please mention any that you would not like to have as neighbors?"; *Tolerance race:* share of the population that does *not* pick "people of a different race" in answer to the same question.
- Control variables: *Gdp:* real GDP per capita; *Schooling:* average years of total schooling; *Investment share:* Total investment as percent of GDP in 1998; *Trust:* share of the population that answers in the affirmative to the question: "In general, do you think most people can be trusted or can't you be too careful?"; *Legal*: quality of the legal system (area 2 of the Economic Freedom Index); *Gini:* the Gini coefficient, measuring income inequality*; Government:* government consumption as percent of GDP, measuring the size of government; *Civil liberties:* a composite measure of freedom of expression and belief, associational and organizational rights, rule of law and personal autonomy and individual rights; *Political rights:* a composite measure of electoral process, political pluralism and participation and functioning of government; *Asia:* a dummy taking the value 1 for Asian countries and 0 for other countries; *Latin America:* a dummy taking the value 1 for Latin American countries and 0 for other countries; *Transition:* a dummy taking the value 1 for transition (i.e., former socialist) countries and 0 for other countries; *EU:* a dummy taking the value 1 for countries that are members of the European Union and 0 for other countries; *North America:* a dummy taking the value 1 for North American countries and 0 for other countries.
- Alternative education measures: *Enroll:* gross enrollment rate in secondary education; *Cognitive skills:* average test scores in math and science in primary and secondary school.

Let us comment a little more on this choice of variables. *First*, we believe that our tolerance measures are suitable in that they are based on actual social attitudes. The previous literature has used shares of inhabitants belonging to various minority groups as measures of tolerance, which seems to us far-fetched. For instance, one could have a large fraction of a certain group and still have intolerant attitudes toward it in the general population. Extreme but clarifying examples involve Jews in Nazi Germany and blacks under apartheid in South Africa; and Charles and Guryan (2008) show that the

[22] The complete dataset is available on request.

share of blacks in U.S. states is negatively related to black relative wages (if anything, indicating a link between population share and *in*tolerance).

Second, the control variables were chosen for two reasons: they have all been advanced as potential determinants of growth on theoretical grounds, and they have been linked to economic growth in several empirical studies (see section 2.1). With regard to theory, *Gdp* is included to capture a possible convergence effect; *Investment* is a measure of the change in physical capital; and *Schooling* is a measure of human capital. These are classic factors, all theoretically relevant for growth. As for the other control variables, *Trust* reduces transaction costs and enables smooth economic interaction without the need for costly contracting and monitoring, which could be expected to stimulate growth; *Legal* measures the extent to which transactions and investments are safe, which reasonably stimulates productive economic activity and growth; *Gini* measures income inequality, which is included since growth could be affected by socioeconomic cleavages; *Government* is a measure of government size, which is relevant to include since government expenditures affect both the abilities and incentives of people, but there is no consensus in the empirical literature about the sign of the effect; *Civil liberties* and *Political rights* are two further institutional variables, which could be relevant for growth: the first captures the degree to which citizens – including minorities – are treated equally in the legal-political sense, and the latter measures the quality of democracy, which can be expected to affect economic-political decision-making; the country-group dummies, lastly, are included as there may be systematic differences between regions that relate to region-specific characteristics not easily captured by the included control variables. This can be viewed as an attempt to approach a fixed-effects model in which country-specific effects are accounted for.

Two time periods are used in this study: the cross-sectional regressions use 1998–2007 and the panel-data regression furthermore uses 1988–1997. We consider a ten-year period apt to capture growth effects. The explanatory variables are all measured in the beginning of each time period.

Descriptive statistics, including definitions, sources and observation years, are found in Table A1 in the Appendix, and the sample can be found in Table A2 in the Appendix. Fig. 1 and Fig. 2 illustrate tolerance levels around 1998, in the countries which we include in our cross-sectional regressions.

Fig. 1 Shares of populations that are tolerant toward homosexuals (circa 1998)

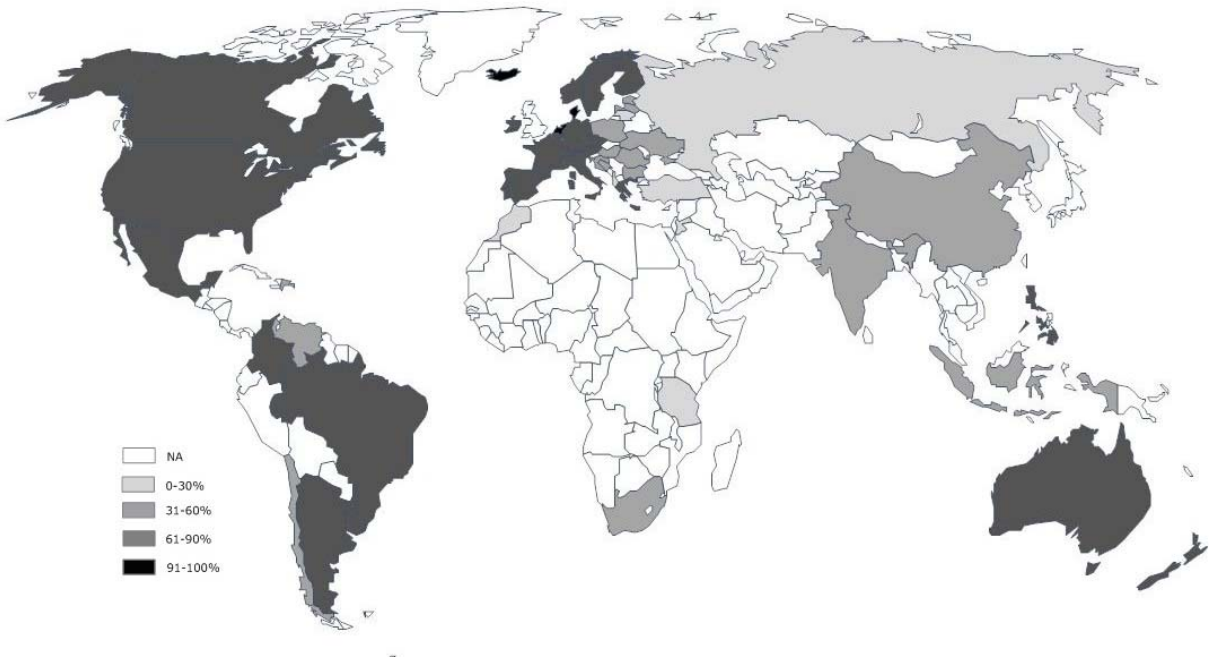
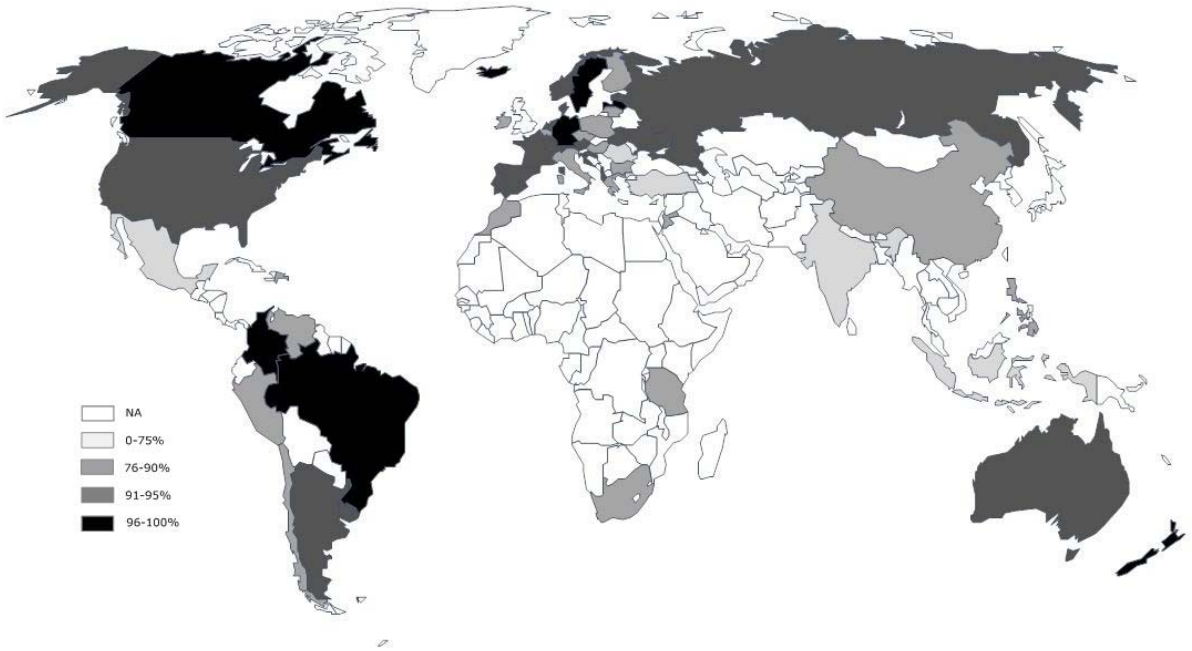


Fig. 2 Shares of populations that are tolerant toward people of another race (circa 1998)



4 Results

4.1 Cross-sectional results

In Table 1, we report the estimates of regression model (1): it shows to what extent our two measures of tolerance are related to economic growth. We estimate four variations of this model, at each stage adding more control variables.

Table 1 Cross-sectional regression results

Dependent variable: Average annual growth in real GDP per capita 1998–2007				
	(1)	(2)	(3)	(4)
Tolerance homosexuals	-3.652**	-4.551***	-3.955**	-3.037*
	(1.696)	(1.683)	(1.624)	(1.615)
Tolerance race	1.443	4.230	6.163	12.45***
	(3.465)	(3.740)	(4.102)	(4.091)
Gdp	-0.0661	-0.0466	-0.0497	-0.00464
	(0.0505)	(0.0708)	(0.0670)	(0.0514)
Schooling	0.411***	0.388***	0.287*	0.0121
	(0.129)	(0.129)	(0.149)	(0.179)
Investment share	0.0622	0.0829*	0.0641	0.0895*
	(0.0517)	(0.0480)	(0.0551)	(0.0520)
Trust		4.675*	4.195*	5.325**
		(2.427)	(2.356)	(2.164)
Legal		-0.387	-0.478	-0.418
		(0.307)	(0.357)	(0.366)
Gini			-0.0585**	0.0502
			(0.0284)	(0.0433)
Government			-0.00434	-0.0907**
			(0.0406)	(0.0432)
Political rights			-0.351	-0.239
			(0.363)	(0.356)
Civil liberties			0.326	0.347
			(0.491)	(0.493)
Asia				2.043
				(1.372)
Latin America				-1.809*
				(0.943)
Transition				2.146***
				(0.785)
EU				0.947
				(0.614)
North America				0.0432
				(0.810)
Constant	0.112	-1.144	1.107	-8.187
	(3.322)	(3.653)	(4.971)	(5.565)
Adj. R^2	0.264	0.333	0.350	0.478
Observations	54	54	54	54

Notes: Robust standard errors in parentheses. *significant at 10%; ** significant at 5%; *** significant at 1%.

Notably, in all regressions, we find evidence of a statistically significant, *negative* relationship between *Tolerance homosexuals* and *Growth*. This stands in stark contrast to the within-country literature cited above, which finds a positive effect of this kind of tolerance. Our point estimate indicates that an increase in the fraction of people who do not object to having homosexuals as neighbors by ten percentage points is associated with a 0.3–0.4 percentage-point growth reduction. The estimates of *Tolerance race* are positive throughout, but statistical significance is only achieved in the most extensive model with country-group dummies. The point estimate suggests a large effect: a ten percentage increase in this type of tolerance is related to a growth increase of 1.2 percentage points. However, one should interpret this with caution, both because of the lack of statistical significance and because the size of the estimate varies a great deal between the different specifications of the model.[23]

As for the control variables, *Gdp* is of the expected sign but does not attain statistical significance. *Schooling* also has the expected positive sign, as does *Investment*, but neither variable attains statistical significance in a consistent manner. As a sensitivity test, we have replaced *Schooling* in column (4) with *Enroll* and *Cognitive*, respectively, and the results are qualitatively unaltered.[24] The statistical significance, sizes and signs of our tolerance measures are not sensitive to which measure of human capital that is used. *Trust* is statistically significant and positively related to *Growth* throughout. Interestingly, the tolerance measures are not affected by its inclusion, suggesting an independent effect of tolerance not captured by trust. *Legal* has a negative sign, unlike what we expected, but it is not statistically significant. *Gini* and *Government* are statistically significant in one specification, respectively, each then with a negative sign. None of the two measures of political institutions are statistically significant; however, *Latin America* and *Transition* are, with a negative and positive sign, respectively.

While adding more variables to the model reduces the risk of omitted-variable bias, it typically comes with the cost of reducing the power of the hypothesis tests, potentially causing problems with multicollinearity. Note, however, that we obtain statistical significance for both tolerance measures in the most extensive model, indicating that the addressing of omitted-variable bias has not critically reduced the power of our tests – quite the opposite.[25] Furthermore, we have calculated variance inflation factors for each variable in all specifications, and none of them exceeds 9, which indicates that there is no clear problem of multicollinearity.

[23] The correlation between tolerance toward homosexuals and tolerance toward people of a different race is 0.51.

[24] In the case of *Cognitive skills*, the sample is 48 countries.

[25] If adding variables to the model effectively isolates exogenous variation in the variables of interest, the power of the test may increase, which seems to be the case here.

We have also carried out a "missingness analysis" along the lines of Ríos-Figueroa and Staton (2008), to see whether there are significant differences in average *Growth* (our dependent variable) in 1998–2007 between our sample (54 countries) and all other countries for which data are available (132 additional countries). We find a difference of 0.9 percentage points: average *Growth* in our big sample was 3.4 percent and growth in the countries we do not include was 2.5 percent. The difference is statistically significant at the 10 percent level. This difference should be taken to indicate that countries not included in our analysis are systematically different from those that are included. As a consequence, one should be careful to generalize our results to the countries not included in the study.

To summarize, our cross-sectional analysis indicates at this point that there is a relatively robust negative relationship between *Tolerance homosexuals* and *Growth*, while the positive relationship between *Tolerance race* and *Growth* is more uncertain in terms of statistical significance.

4.2 Outlier analysis: least trimmed squares

So far the analysis has proceeded on the implicit assumption that there are no outliers. To make sure this is the case, we use least trimmed squares to identify outliers and reweighted least squares to see what happens when such observations are removed. We eliminate countries in the descending order of their standardized residuals computed from the fitted values of the first-stage regression. Countries with a standardized residual greater than 2.5 are eliminated in this procedure (see section 3.1 for further details). Table 2 shows what happens when the three identified outliers are removed. The basis of the exercise is the model of column (4) in Table 1.

Table 2 Point estimates for tolerance when outliers are removed

Dependent variable: Average annual growth in real GDP per capita 1998 to 2007				
Tolerance homosexuals	-3.037*	-2.792**	-2.144*	-2.528**
	(1.615)	(1.291)	(1.165)	(1.062)
Tolerance race	12.45***	9.998**	8.940**	10.46***
	(4.091)	(3.676)	(3.474)	(3.327)
Number of observations	54	53	52	51
Sample	Full	Excl China	Excl China India	Excl China India Luxembourg

Notes: Robust standard errors in parentheses. *significant at 10%; ** significant at 5%; *** significant at 1%. All estimated equations include a constant term, both tolerance measures and the same six control variables as before as well as the country-group dummies (not reported here), i.e., the basis is column (4) of Table 1. Sources and variable definitions: see Table A1. Sample list: see Table A2.

The removal of outliers changes little: the size of the estimates is reduced a little, but statistical significance is retained for both tolerance variables throughout. We conclude that the initial results are not sensitive to outliers: previous results remain when the outliers are removed and are broadly representative for the full sample.

4.3 Endogeneity

Our results should be interpreted with some caution and should only be seen as suggesting the possibility of a causal relationship. Partial correlations do not decisively settle the issue of whether tolerance causes growth or vice versa. As suggested by Friedman (2005) and Andersen and Fetner (2008), people in societies with a high GDP and economic growth tend to display more tolerance and generosity. In our view, there are two theoretical reasons why there may be a problem of reverse causality: it could be that attitudes like tolerance are affected by expectations of future growth, in turn determined by the previous growth record; and it could be that there is actual persistence in growth rates within countries. If this is the case, it seems plausible that a causal effect from growth to tolerance would be picked up by the estimated coefficient of growth in the preceding period.

We have regressed our measures of tolerance on the growth rate 1988–1997, i.e. the preceding ten-year period. The results are presented in Table A3 in the Appendix. It turns out that we do not attain statistical significance for the growth variable, neither for *Tolerance homosexuals* nor for *Tolerance race*. Furthermore, the point estimates of growth are close to zero for both tolerance measures. When we remove outliers on the basis of a least trimmed squares analysis and re-estimate, nothing changes. This provides an indication that there is a tolerance–growth relationship, in that causal order.

4.4 Panel-data analysis

We also perform a fixed-effects panel-data analysis using data from two ten-year periods of growth. As noted in section 3.1, there are obvious advantages to using the panel-data approach, such as reduced problems with omitted-variable bias, multicollinearity and endogeneity. Data restrictions only enable us to carry out this analysis for 24 countries. Admittedly, this is a more limited sample, but we still consider the exercise useful, since panel data allows us to see whether a tolerance-growth relationship can be established when controlling for constant, country-specific influences on growth, such as institutional and historical factors of various kinds, that cannot easily be captured in the cross-sectional regressions. In other words, we think there is a risk for omitted-variable bias which the

panel-data analysis more convincingly takes care of.[26] In motivating the panel-data analysis, our reasoning goes along the lines of Gustavsson and Jordahl (2008: 353–354). They stress that if the point estimates of a fixed-effects panel-data analysis, using a smaller sample, have the same signs and sizes as in the cross sectional analysis, then this indicates that omitting fixed effects do not bias the point estimates of the cross-sectional analysis.

We first report the cross-sectional results for the same 24 countries used in the panel-data analysis, and then the panel-data results themselves, in Table 3.

We include the cross-sectional results in order to get an indication of whether the change to the smaller sample *as such* has an effect on the results. Here, we find that the signs and sizes of the tolerance variables are similar to the results for the larger sample, although in the small sample we do not get statistical significance. This is not surprising, since the sample is much smaller. When turning to the panel-data results, using two ten-year periods (1988–1997 and 1998–2007), we find that the signs and sizes of the tolerance variables remain the same, with statistical significance for the tolerance toward homosexuals variable.[27]

As in section 4.1, we have undertaken a "missingness analysis", to see whether there are significant differences in average *Growth* (our dependent variable) in 1998–2007 between our small panel-data sample (24 countries) and the 30 additional countries in our big cross-sectional sample. We find a difference of 0.5 percentage points (with the higher rate of 3.6 percent for the 30 additional countries), but this difference is not statistically significant at conventional levels.

This implies, in our view, a confirmation of the relative robust effect of tolerance toward homosexuals and the more shaky effect of tolerance toward people of a different race. It can be added that *Trust* is not statistically significant in the panel-data regression and that the size of the estimate is reduced considerably.[28]

[26] One should bear in mind that time-varying growth determinants that are omitted from the analysis could still bias the estimates of the effect of tolerance on growth.

[27] Note that the panel approach and the cross-sectional analysis differ in the type of variation used to estimate the parameters and also in that data from a longer time period are used in the panel case.

[28] When we remove China and India, identified as outliers in section 4.2, the results for our two tolerance measures do not change qualitatively.

Table 3 Panel-data regression results

Dependent variable: Average annual growth in real GDP per capita		
	(1)	(2)
Model	Cross-section	Panel fixed effects
Tolerance homosexuals	-6.366	-3.629*
	(4.220)	(2.063)
Tolerance race	4.916	3.481
	(7.951)	(4.647)
Gdp	-0.000155	-0.000516***
	(0.000162)	(0.000174)
Schooling	0.200	0.657**
	(0.373)	(0.275)
Investment share	-0.0148	-0.108
	(0.0569)	(0.0703)
Trust	4.099	0.191
	(3.293)	(1.989)
Legal	0.0716	0.205
	(0.561)	(0.273)
Gini	-0.0481	0.124**
	(0.0357)	(0.0470)
Government	-0.0161	-0.0908
	(0.0999)	(0.137)
Political rights	0.425	-0.682*
	(0.760)	(0.388)
Civil liberties	0.390	0.496
	(0.914)	(0.480)
Time dummy		1.982**
		(0.889)
Asia	-3.038	
	(5.834)	
Latin America	-3.391	
	(3.855)	
Transition	-1.920	
	(4.118)	
EU	-0.514	
	(1.714)	
North America	-0.979	
	(1.635)	
Constant	5.129	1.287
	(5.054)	(5.865)
Adj. R^2	0.521	0.864
Time period	1998–2007	1988–2007
Observations	24	48

Notes: Robust standard errors in parentheses. *significant at 10%; ** significant at 5%; *** significant at 1%.

5 Concluding remarks

Florida (2004: 17) claims the following:

> The same dynamics that fueled the movement of creative people between U.S. regions now operates on a global scale, and other nations are stepping up their ability to compete.

Florida suggests that creative people are attracted to open, dynamic and tolerant environments and that such environments therefore are conducive to economic dynamism and growth. While there is some support for this suggestion on a local or regional basis, there is to our knowledge no empirical study to date which looks at the tolerance–growth relationship in a cross-country setting. This study is an attempt to fill that void. We propose several mechanisms that may cause tolerance to increase or decrease growth. We stress that different types of tolerance may have different effects on growth. In particular, we argue that there are stronger theoretical reasons for expecting tolerance toward homosexuals, compared to tolerance toward people of a different race, to have a negative effect on growth.

We investigate, for the time period 1998–2007, whether tolerance toward homosexuals and toward people of another race, as measured by the share of people in different countries that indicate that they do not mind having neighbors that are homosexuals or of a different race, is related to growth in real GDP per capita. We analyze this issue by looking at a sample of maximally 54 countries, following the methodology of the empirical growth literature.

Our main result is that tolerance toward homosexuals is *negatively* related to growth. Statistical significance is obtained throughout in a cross-sectional regression model which is varied in four different ways. When three identified outliers are removed, the result stands. And we verify the result in a panel-data analysis, which although conducted with a smaller sample indicates that fixed effects do not bias the cross-sectional estimates. As for tolerance toward people of a different race, for which we find a positive sign, the result is less robust. In the initial cross-sectional regressions, it only attains statistical significance in the most extensive model. That significance is retained when outliers are removed, but it does not appear in the panel-data analysis. In all, this makes us less certain about the relationship between tolerance toward people of a different race and economic growth.

To get a feeling for the economic significance of our results, the point estimates suggest that an increase in tolerance toward homosexuals (people of a different race) by 10 percentage points is associated with a decrease in growth by 0.3–0.4 (an increase in growth by 1.0–1.2) percentage points. This is a non-negligible effect in both cases, although the effect for tolerance toward people of another race should be interpreted with caution due to absence of statistical significance in several regressions. If one moves from the average tolerance value to the maximum value, for tolerance toward

homosexuals (toward people of another race) the growth rate decreases by 1.1 (increases by 1.4) percentage points. Again, this indicates substantial effects.

Two caveats should be added. It is hard to establish causality, but we offer two preliminary indications of a direction from tolerance to growth and not the other way around. We regress tolerance on earlier growth, and do not find any statistically significant effect; and the panel-data analysis is more easily interpreted as causal (Finkel 1995). We should also stress that the results are applicable to the countries of our samples, and since they encompass at most 54 countries, one should be careful in generalizing the results to other parts of the world. We still think that the results are of value for clarifying the nature of the tolerance–growth relationships for the included countries.

What to make of these results? Our overall interpretation is that just as growth is affected by other social factors, such as trust, it is also affected, in the typical country in our sample, by tolerance toward homosexuals. Hence, quite unlike the results of Richard Florida and his co-authors, the cross-country evidence does not suggest that there is a general positive relationship between tolerance of homosexuals and growth: quite the opposite holds. This result should not be seen as normative: one may very well advocate tolerance toward homosexuals in spite of this finding, as there are other, and to many people more important, goals than growth. In any case, we also find some, although weaker, signs of a positive influence by tolerance toward people of a different race.

We do not consider this study to be definitive in providing an answer to the role of tolerance for economic growth. Rather we view it as a first attempt to look into the economic effects of tolerance across countries. Extending the panel-data analysis as more data becomes available and trying to test empirically the various mechanisms that can explain the results, separately and jointly, are features on a future research agenda.

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Appendix

Table A1 Descriptive statistics

Variable	Description	Year(s)	Source	Obs	Mean	Std dev	Min	Max
Tolerance homosexuals	Share of the population that does *not* pick "homosexuals" in answer to the question "On this list are various groups of people. Could you please mention any that you would not like to have as neighbors?"	1998	World Values Survey (Inglehart et al. 2004)	54	0.59	0.23	0.02	0.94
Tolerance race	Share of the population that does *not* pick "people of a different race" in answer to the question "On this list are various groups of people. Could you please mention any that you would not like to have as neighbors?"	1998		54	0.87	0.083	0.64	0.98
Growth	(((Gdp 2007/Gdp 1997)^0.1)-1)*100	1997–2007	Penn World Tables 6.3 (Heston et al. 2009)	54	3.38	1.97	0.58	9.75
Gdp	Real GDP per capita (chain series), 2000 constant prices (thousands of USD)	1998		54	16.2	11.8	0.65	55.2
Investment share	Total investment as percent of GDP, constant prices	1998		54	25.2	7.01	10.2	37.7
Schooling	Average years of total schooling	1998	Barro and Lee (2010), www.barrolee.com	54	8.93	2.06	3.88	13.0
Trust	Share of the population agreeing with the statement "most people can be trusted" rather than with the alternative "you need to be very careful in dealing with people".	1998	World Values Survey (Inglehart et al. 2004)	54	0.29	0.15	0.03	0.67
Legal	Area 2 of the Economic Freedom Index: Legal structure and security of property rights (measured from 1 to 10, where 1 is the lowest and 10 is the highest degree)	2000	Gwartney and Lawson (2008), www.freetheworld.com	54	6.78	1.86	3.40	9.62

Gini	Gini coefficient measuring income inequality	1998 (circa)	World Income Inequality Database V2.0c May 2008, World Institute for Development Economics Research, United Nations University, www.wider.unu.edu	54	36.1	10.1	22.3	60.4
Government	General government final consumption as percent of Gdp	1998	World Development Indicators database, the World Bank, www.worldbank.org	54	17.1	5.58	4.40	27.3
Political rights	Political rights (measured from 1 to 7, where 7 is the lowest and 1 is the highest degree)	1998–1999	Freedom House database, www.freedomhouse.org	54	2.06	1.53	1	7
Civil liberties	Civil liberties (measured from 1 to 7, where 7 is the lowest and 1 is the highest degree)	1998–1999		54	2.44	1.34	1	6
Enroll	Average enrollment rate in secondary education for the years with available data between 1996 and 2000, percent of population in theoretical age for secondary education	1996–2000	Education database, the World Bank, www.worldbank.org	54	90.3	27.0	5.92	155.3
Cognitive skills	Average of all test scores in math and science, primary through end of secondary school, for three age groups: ages 9–10, ages 13–15 and those in the final year of secondary education, from three periods of time (1964–1972, 1982–1991 and 1995-2003, scaled to PISA scale divided by 100)	1964–2003	Hanushek and Woessmann (2009)	48	4.59	0.58	3.09	5.19
Asia	Dummy for Asian countries (China, India, Indonesia, Philippines)	1998	-	54	0.09	-	0	1
Latin America	Dummy for Latin American countries	1998	Bjørnskov (2008)	54	0.17	-	0	1
Transition	Dummy for transition countries	1998	*Freedom in the World Historical Rankings* database, www.freedomhouse.org	54	0.26	-	0	1
EU	Dummy for EU countries	2007	www.europa.eu	54	0.46	-	0	1
North America	Dummy for North American countries (Canada, Mexico, United States)	1998	-	54	0.06	-	0	1

Notes: In certain cases, values are from adjacent years, when data were missing for our particular year of interest.

Table A2 The sample

Country	Country
Albania	Latvia
Argentina[P]	Lithuania
Australia	Luxembourg
Austria[P]	Malta
Belgium[P]	Mexico[P]
Brazil[P]	Morocco
Bulgaria[P]	Netherlands[P]
Canada[P]	New Zealand
Chile[P]	Norway[P]
China[P]	Peru
Colombia	Philippines
Croatia	Poland[P]
Czech Republic	Portugal[P]
Denmark[P]	Romania[P]
Dominican Rep.	Russian Fed.
Estonia	Slovakia
Finland[P]	Slovenia
France[P]	South Africa
Germany[P]	Spain[P]
Greece	Sweden[P]
Hungary[P]	Switzerland
Iceland	Turkey
India[P]	Tanzania
Indonesia	Ukraine
Ireland	United States[P]
Italy[P]	Uruguay
Jordan	Venezuela

Notes: Countries with superscript P are included in the panel-data analysis.

Table A3 Cross-sectional regression results: testing for endogeneity

Dependent variable: Tolerance homosexuals and Tolerance race respectively				
	Homosexuals	Race	Homosexuals	Race
Growth 1988–1997	0.00424	0.000659	0.000772	0.00262
	(0.0132)	(0.00407)	(0.00894)	(0.00279)
Gdp	0.00394	0.00101	0.00599**	0.00218**
	(0.00293)	(0.000881)	(0.00247)	(0.000902)
Schooling	0.0400**	0.0149***	0.0590***	0.0103**
	(0.0155)	(0.00456)	(0.0113)	(0.00414)
Investment share	-0.000731	-0.000968	-0.0121***	-0.00108
	(0.00499)	(0.00165)	(0.00382)	(0.00121)
Trust	0.273*	-0.0760	0.247*	0.0576
	(0.161)	(0.0639)	(0.129)	(0.0541)
Legal	-0.0656	0.00663	-0.0228	0.00415
	(0.0447)	(0.0104)	(0.0235)	(0.00775)
Gini	-0.00146	-0.000103	-0.00430	-0.001000
	(0.00378)	(0.00110)	(0.00265)	(0.000948)
Government	0.00673	0.00736***	0.00922**	0.00678***
	(0.00563)	(0.00194)	(0.00353)	(0.00121)
Political rights	-0.0249	0.0160	-0.0611***	-0.00320
	(0.0227)	(0.0118)	(0.0199)	(0.00721)
Civil liberties	-0.0553	-0.00907	0.0445	0.0312***
	(0.0448)	(0.0231)	(0.0311)	(0.0112)
Asia	-0.0609	-0.126***	0.196**	-0.214***
	(0.153)	(0.0449)	(0.0811)	(0.0275)
Latin America	0.0602	0.0326	0.307***	0.0406
	(0.117)	(0.0410)	(0.0689)	(0.0252)
Transition	-0.299***	-0.0251	-0.271***	-0.0191
	(0.0972)	(0.0336)	(0.0688)	(0.0252)
EU	0.0708	-0.0440*	0.157***	-0.0715***
	(0.0578)	(0.0259)	(0.0460)	(0.0163)
North America	-0.0105	-0.0590*	0.0165	-0.0267
	(0.0639)	(0.0341)	(0.0595)	(0.0278)
Constant	0.722	0.631***	0.299	0.637***
	(0.459)	(0.104)	(0.250)	(0.0815)
Adj. R^2	0.628	0.653	0.849	0.857
Observations	49	49	43	43

Notes: Robust standard errors in parentheses. For four countries (Czech Republic, Estonia, Russia and Slovenia) growth rates refer to 1990–1997. In column 3 and 4, six outliers identified with LTS have been removed.