Is Tolerance Good or Bad for Growth (or Both)?*

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Abstract. Societies that generate new ideas and that are open to change and adaptation can be expected to experience economic growth. As new ideas emanate from people, the degree to which minorities are accepted can affect how well the full set of new ideas are disseminated and put to productive use. We investigate to what extent tolerance, as measured by attitudes toward different types of neighbors (with data from the World Values Survey), is related to growth. Our empirical findings are, to our knowledge, the first cross-country results on the tolerance–growth relationship, and also the first to be based on an attitude measure of tolerance (as opposed to population shares). The basic specification suggests that there is indeed a positive relationship between tolerance toward people of another race and growth. A thorough sensitivity analysis, taking outliers into account and varying the model specification in an extreme bounds analysis, confirms that this result is relatively robust for most countries: it turns out statistically significant in 88 percent of the 12,341 regressions. However, we also find that tolerance toward homosexuals becomes statistically significant – with a negative sign! Hence, although different kinds of tolerance may be valued for many reasons, not all kinds need be positively related to growth.

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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.

Dictionary.com (2009) defines tolerance as

> a fair, objective, and permissive attitude toward those whose opinions, practices, race, religion, nationality, etc., differ from one's own; freedom from bigotry.

The question is if such an attitude of respect for diversity is related to economic growth.[2]

The modern economic tolerance literature – perhaps first and foremost represented by the work of Richard Florida, as outlined in *The Rise of the Creative Class* (2002) and related papers – 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 GDP 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 an empirical investigation which uses GDP growth as the dependent variable and a cross-country approach, which enables us to relate the issue to the larger empirical growth literature. Furthermore, we use a more direct and, we think, more adequate attitude measure of tolerance. Our tolerance variable is based on 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 another race as their neighbors. The fraction in each country that does not answer no is our basic measure of tolerance. In addition, we apply a thorough sensitivity analysis (in the form of changing the measure of human capital, extreme bounds analysis

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

[2] We do not address the question of what causes tolerance to emerge – for an analysis, see Corneo and Oliver (2008).

and an outlier analysis in the form of least trimmed squares) to see whether the tolerance–growth relationship is robust.

We find that there is a positive and statistically significant relationship between tolerance toward people of another race and economic growth in the basic model specification. This indicates that tolerance in a country *may* be conducive to a better economic performance. In a sensitivity analysis that takes outliers into account, as well as variations in the model specification, this result is confirmed as quite robust. However, this robustness analysis also reveals that tolerance toward homosexuals stands in an equally robust but *negative* relationship with growth, quite unlike previous results in the within-country literature. Of course, such tolerance may nevertheless be valued for other reasons. In addition to this factual result, we believe that our study contributes to the conceptual understanding of how tolerance is multifaceted and that different kinds of tolerance may yield different economic consequences.

The paper is organized as follows. After a brief literature review and presentation of our theoretical starting point, we present the empirical approach used and the data. Then we report the basic regression results, as well as the findings of a detailed robustness analysis. We close with some concluding remarks.

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.[3] 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. Among institutions, especially protection of private property and the quality of the legal system are positively related to growth.[4] Among social factors, social capital in the form of trust, as well as religious variables, have been shown to matter.[5] Tolerance may be another important social factor.

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. Tolerance is defined by Florida (2003: 10) as "openness, inclusiveness, and diversity to all ethnicities, races, and walks of life", and he 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

[3] 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 of the literature, see, e.g., Temple (1999) and Bosworth and Collins (2003).

[4] See, e.g., Knack and Keefer (1995), Aron (2000), Berggren (2003), Glaeser et al. (2004), Rodrik et al. (2004), Acemoglu et al. (2005) and Doucouliagos and Ulubasoglu (2006).

[5] On trust, see, e.g., Zak and Knack (2001) and Berggren, Elinder and Jordahl (2008). On religion, see, e.g., Barro and McCleary (2006). For a broad analysis of how values, especially those relating to self-expression, relate to economic performance, see Inglehart and Welzel (2005).

talented and creative people the sort of people who power innovation and growth." (p. 11) 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 (2002) 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. Florida, Mellander and Stolarick (2008), in a study of U.S. regional development, 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 (2007) show that their Bohemian-Gay Index not only relates positively to housing values, but that it also influences income positively.[6] 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, Mellander and Qian (2008) 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 (2004, 2005) find that creative individuals, who are important for urban employment growth across Dutch cities, are *not* primarily attracted by tolerance (measured by size of the local gay scene [the average of the shares of people who subscribed to two gay magazines and belonged to the national gay political organzation], 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 one exception, 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, none of these studies are of a cross-country kind 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.[7] 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

[6] For a popular summary of this line of research, see Florida (2002).

[7] See, e.g., Glaeser, Scheinkman and Shleifer (1995), Glaeser and Saiz (2004), Glaeser (2005) and Shapiro (2006).

growth, compared to human capital. In our empirical investigation, we control for human capital (using two alternative measures).

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

2.2. Theoretical Preliminaries

Growth theory has developed beyond the basic Solow model. Romer (1986, 1990) has been instrumental in introducing endogenous growth theory, which stresses that growth is a function of the increasing returns of new knowledge. As new ideas spread and are applied, virtually boundless growth ensues. 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). As North (1990: 80–81) puts it:

> Adaptive efficiency … is also concerned with the willingness of a society to acquire knowledge and learning, to induce innovation, to undertake risk and creative activity of all sorts, as well as to resolve problems and bottlenecks of the society through time. We are far from knowing all the aspects of what makes for adaptive efficiency, but clearly the overall institutional structure plays a key role to the degree that the society and the economy will encourage the trials, experiments and innovations that we can characterize as adaptively efficient. The incentives embedded in the institutional framework direct the process of learning by doing and the development of tacit knowledge that will lead individuals in decision-making processes to evolve systems that are different from the ones that they had to begin with.

It is interesting to note North's location of 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. Here, we take special interest in attitudes toward categories of people different from oneself.

Against this background we ask what reason there is for expecting tolerance to affect economic growth rates positively. We suggest three possible links. *First*, tolerance may affect the allocation of labor and talent between countries, as it entails what Florida and Gates (2001: 2) call *low barriers to entry for human capital*. That is, a country where the inhabitants are tolerant may retain and attract people of various backgrounds who are conducive to economic growth. Tolerance toward particular minorities need not only be perceived as an attractive feature of a country by the minorities directly concerned – as Florida and Gates (2001: 6) point out, broader categories of people with high levels of creative potential could very well be attracted to a location where openness (in general) is a defining characteristic. *Second*, tolerance may affect the allocation of labor and talent within a country. That is, if economic decision-makers do not much care about the backgrounds of potential employees, then it is more probable that people are allocated to positions on the basis of productivity. This implies a link between tolerance and discrimination (in the sense of Becker, 1971), such that where the former is in place, a taste for the latter is weak. Of course, this link between tolerance and discrimination may also be present at the international level: minorities are probably more inclined to stay in or move to a country where there is little discrimination. *Third*, and perhaps most important, tolerance may be an indication of a broader outlook on life and on openness toward that which is unknown or untried at present, hence indicating an openness to new ideas and

entrepreneurship.[8] To be concrete: A society which allows everyone to contribute to the generation of new knowledge, be it as employees, employers or entrepreneurs, will probably grow at a faster pace than a society in which the new knowledge of certain groups of people is not listened to. These three factors concern the allocation and productive use of talent and creativity and a mental climate which may induce innovation (i.e., adaptive efficiency, in North's sense).

More precisely, we include two minority categories in our empirical investigation: homosexuals and people of another race.[9] We believe that both are relevant from the theoretical perspective just described, and they have indeed been used widely, in various forms, in the above-cited literature. Mellander and Florida (2007), e.g., claim that openness toward the gay and lesbian population is the best available indicator of tolerant attitudes available.

Something might also be said for there *not* being a cross-country relationship between tolerance and growth. One reason may be that the people toward whom tolerance is extended do not really matter much for economic growth, either because they are few[10] or because they are not very productive. Another reason may be that the transaction costs of moving between countries are prohibitive for the relevant categories of people even without intolerance, causing there to be barriers of entry for human capital (even though the barriers would be even higher with intolerance).

Lastly, may there be a rationale for a negative relationship? Could tolerance *reduce* growth? Plausibly it could, if tolerance either scares off productive, intolerant people who would otherwise locate in a country or if it lowers productivity among the existing population. This latter option could occur if the group toward which tolerance is extended is less productive than others (e.g., criminals or drug abusers) or if the productivity of others is somehow affected by the tolerance extended to certain minority groups. Perhaps racists work less well in a country where people of another race are generally accepted, to take one possible scenario.[11] Another possibility is that people in a group toward which people are intolerant become more productive in a hostile environment, perhaps out of necessity or to prove to others that they are indeed good for society. Thus, on theoretical grounds, there is certainly no necessary positive effect of tolerance on growth.

It also seems important to stress that different kinds of tolerance can have different effects on productivity and growth – tolerating one group or one type of behavior need not entail the same consequences for growth as tolerating another group or another type of behavior. The concept should, we argue, be seen as multifaceted.

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[8] 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 (2008).

[9] Two other possible categories to look at are immigrants and religious groups. However, due to data restrictions, we do not look at the latter; and since the overlap between immigrants and people of a different race is quite large, we choose only to look at the race. (Results for immigrants are available upon request.)

[10] To be more precise, there may still be an effect of tolerance on growth even if those towards whom tolerance is extended are few in number, but the effect is *moderated* by that number.

[11] Tolerance could also be correlated with other variables that *in turn* affect growth (e.g., a poor work ethic), which should then ideally be controlled for when conducting empirical tests.

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 by noting that the relationship may differ between countries, that the variation in the variables is plausibly bigger between than within countries and that it enables producing a global picture of a relationship.

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

$$\Delta Y_i = \alpha + \mathbf{X_i}\boldsymbol{\Gamma} + \mathbf{F_i}\boldsymbol{\beta} + u_i, \quad (1)$$

where ΔY_i denotes the average 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. The analysis is carried out in five parts: a basic model is estimated, the measure of human capital is varied, robustness with respect to model specification is assessed by the use of extreme bounds analysis, outlier analysis is applied, and extreme bounds analysis combined with outlier analysis is performed. Special emphasis is put on the latter part as that synthesizes the approaches of the former parts.

First, 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 gross enrollment rate in secondary education, the investment share of GDP, and dummies for Latin America, Asia and transition countries. Results are reported in section 4.1.

Second, we put focus on the measure of human capital, as it has been suggested in the literature that it, rather than tolerance, induces growth. For example, Glaeser (2005) finds that when human capital is controlled for, the effect of tolerance seems to vanish. One possible explanation is that as people obtain more education they also get more tolerant as a byproduct.[12] If education in itself increases productivity growth, then failing to correctly account for human capital in any study of the role of tolerance for economic growth could be severely misleading. In the baseline model we control for human capital in the form of the gross enrollment rate in secondary education. This measure is likely to be a suitable proxy for the role of human capital for economic growth, as it can be seen as proportional to the rate of human-capital accumulation. If a relatively large fraction of a cohort is enrolled in secondary education, it is likely that the level of human capital is increasing in the near future with positive effects on productivity. But it is also a reasonable proxy for the current level of human capital, since enrollment rates are changing slowly within countries. A further advantage is that data are available for many countries. However, measures such as this may 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. As a sensitivity analysis we therefore complement the analysis by substituting the enrollment measure with a measure of cognitive skills from Hanushek and Woessman (2009). Cognitive skills refer to

[12] In fact, Florida et al. (2006) find a positive correlation between the number of university students in a U.S. region and a Tolerance Index which includes the shares of coupled gays and lesbians, the shares of foreign-born people, a measure of integration, and the share of people working in bohemian occupations.

average test scores in math and science in primary and secondary school. In defense of the enrollment rate 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 for the basic regression and for the other regressions in the Appendix.

Third, we apply a robustness test focusing on the model specification, in the form of extreme bounds analysis. Following Leamer (1985), Levine and Renelt (1992), Sala-i-Martin (1997) and Sturm and de Haan (2001), we see what happens with the statistical significance and sign of the estimated tolerance coefficients when a wide set of further control variables, which have been compiled because they have been shown to stand in some relation to growth in other studies, are varied in all possible combinations of three. The rationale behind this type of test is that limited sample sizes make it impossible to estimate very general "kitchen sink" type of models, forcing the researcher to choose some preferred specifications. The extreme bounds test circumvents this problem and provides maximal transparency for the reader. As there is no evident "true" model specification, this exercise constitutes a test of whether a certain variable (tolerance) is *systematically and consistently* related to the dependent variable or not. More precisely, we estimate the following model:

$$\Delta Y_i = \alpha + \mathbf{X_i\Gamma} + \mathbf{F_i\beta} + \mathbf{C_i\delta} + u_i, \qquad (2)$$

which is identical to (1) except for the addition of $\mathbf{C_i\delta}$, where $\mathbf{C_i}$ is a new vector of control variables. By combining the variables of this vector in all possible combinations of three (which has become the standard way of conducting this kind of test), while keeping the rest as before, we get 12,341 regressions. Based on these, we see how robust the estimated coefficients are by looking at the shares for which statistical significance at the 5 and 10 percent levels is attained and at the shares for which there the sign of the estimated coefficients is unchanged.[13] Results are reported in section 4.2.

Fourth, 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 model is substantial as well as whether the same model can be applied to all countries.

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, Rousseeuw and Van Aelst, 2004: 1515).[14] 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

[13] Sometimes, four more formal criteria of robustness are applied: (i) the strong extreme bounds test (indicating whether all of the estimated coefficients are statistically significant at the 5 percent level and of the same sign), (ii) the weak extreme bounds test (indicating whether at least 95 percent of the estimated coefficients are statistically significant at the 5 percent level and of the same sign), (iii) the strong sign test (indicating whether all of the estimated coefficients have the same sign) and (iv) the weak sign test (indicating whether at least 95 percent of the estimated coefficients have the same sign). We choose to make a more informal assessment of robustness, viewing it as a continuous rather than a dichotomous variable where more and less robustness can obtain even if the formal criteria are not met.

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

remaining 25 percent of the observations are then added, and residuals for all observations are computed. Countries with a standardized residual above approximately 2.5 are identified as outliers.[15] 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.[16] Results are reported in section 4.3.

Fifth, we combine extreme bounds analysis and least trimmed squares/reweighted least squares in order to synthesize the insights from parts three and four. This is done by identifying and removing outliers for each specification in the extreme bounds analysis, in line with the procedure described in the preceding paragraph. While this makes it possible to see whether the tolerance–growth relationship is robust both in terms of sample composition and model specification simultaneously, a possible drawback is that the sample varies between the regressions. However, as we do not have data for all variables, the sample changes anyway when we perform the extreme bounds analysis. Results are reported in section 4.4.

Lastly, let us briefly comment on the problem of endogeneity. Our results should be interpreted with 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 (2006), people in societies with economic growth tend to display more tolerance and generosity. However, we have designed our study such that the dependent variable is measured for the 1998–2003 period, whereas the explanatory variables date from around 1998, i.e., in the beginning of the period. This may help somewhat in certifying that there is a tolerance–growth relationship, in that causal order.

3.2. Data[17]

Our variables can be divided into four groups:

- The dependent variable: *Growth:* Average annual growth in real GDP per capita 1998–2003.
- Variables of interest: *Tolerance homosexuals:* Share of the population that in or around 1998 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 in or around 1998 does *not* pick "people of a different race" in answer to the same question.
- Fixed control variables: *Gdp:* Real GDP per capita in 1998; *Enroll:* Gross enrollment rate in secondary education in 1998;[18] *Investment share:* Total investment as a share of GDP in 1998; *Latin America:* a dummy taking the value 1 for Latin American countries and 0 for

[15] 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.

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

[17] The complete dataset can be downloaded from both our websites.

[18] In one column in Table 1, we replace this variable by *Cognitive skills:* Average test scores in math and science in primary and secondary school for the period 1964–2003.

other countries; *Asia:* a dummy taking the value 1 for Asian 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.

- Switch variables: 43 control variables that are included in all possible combinations of three in the robustness analysis.

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. Second, the fixed control variables and the switch variables were chosen as they have all been advanced as potential determinants of growth on theoretical grounds, as measures of a possible convergence effect and of human and physical capital. They have also been linked to economic growth in several empirical studies. We add to the fixed variables three regional dummies to capture, albeit in a crude way, non-modelled heterogeneity between countries.[19]

The time period for this study is 1998–2003. We consider a five-year period apt to capture growth effects; and data availability issues made it difficult to extend the period very much without losing many observations.

Descriptive statistics are found in Table A1 in the Appendix, and the sample, as well as data on tolerance and growth, can be found in Table A2 in the Appendix.

4. Results

4.1. Basic Results

In Table1, we report the estimates of the basic 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: one with tolerance toward homosexuals, one with tolerance toward people of another race, one with both tolerance measures included and the gross enrollment rate as the measure of human capital, and one with both tolerance measures included and cognitive skills as the measure of human capital.

In column (1) the relationship between tolerance toward homosexuals and growth is evaluated – and we find evidence of a *negative* relationship. 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 0.29 percentage-point growth reduction. However, this estimate is not statistically significant.

[19] When other region dummies are included, no dramatic effects arise, and since adding more variables use up degrees of freedom, we choose this parsimonious specification.

In column (2), we instead look at the relationship between tolerance toward people of a different race and growth. The point estimate shows a positive relationship with growth, but this estimate is also statistically insignificant at conventional levels. In column (3) we include both tolerance measures in the model and estimate both parameters simultaneously, using the gross enrollment rate as the measure of human capital. This causes minor changes in the coefficients, but the coefficient for tolerance toward people of another race becomes statistically significant at the ten percent level, indicating that a ten-percentage-point increase in tolerance is associated with an increase in the growth rate of about 0.82 percentage points.[20]

Table 1: Basic results

Dependent variable: Average annual growth in real GDP per capita 1998–2003				
	(1)	(2)	(3)	(4)
Tolerance homosexuals	-2.927		-3.412	-2.716
	(2.132)		(2.198)	(1.960)
Tolerance race		7.294	8.167*	6.653
		(4.397)	(4.376)	(4.571)
Enroll	0.004	-0.016	-0.003	
	(0.018)	(0.017)	(0.018)	
Cognitive skills				-0.258
				(0.784)
Investment share	0.087*	0.085*	0.088*	0.090*
	(0.049)	(0.050)	(0.049)	(0.048)
Gdp	-0.020	-0.073	-0.037	-0.066
	(0.059)	(0.056)	(0.060)	(0.061)
Asia	1.696	1.746	2.132	1.449
	(1.439)	(1.448)	(1.450)	(1.313)
Latin America	-2.266**	-3.171***	-2.646**	-3.600***
	(1.006)	(0.999)	(1.043)	(1.079)
Transition	2.022**	2.164**	1.814**	1.512
	(0.891)	(0.885)	(0.902)	(0.975)
Constant	2.324	-3.094	-3.605	-1.257
	(1.579)	(3.567)	(3.536)	(4.562)
Observations	63	61	61	51
Adjusted R-squared	0.43	0.43	0.45	0.46

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Lastly, in column (4), we change the measure of human capital to cognitive skills.[21] This causes few changes. The main difference is that tolerance toward people of another race loses its statistical significance.[22] The sizes and signs of our tolerance measures do not seem sensitive to which measure of human capital that is used – and are, in fact, not even sensitive to excluding such measures.

[20] The correlation between tolerance toward homosexuals and tolerance toward people of another race is 0.50. We have also performed the regressions with tolerance toward immigrants as a third tolerance measure. As it is highly correlated with tolerance toward people of another race (0.82), as well as conceptually overlapping with this other measure, we do not include it here for reasons of brevity. The estimated coefficient is not statistically significant; other results are available upon request.

[21] The correlation between the enrollment rate and cognitive skills is 0.54.

[22] We have done two more things. First, if no human-capital measure is included, this does not change the results much. Second, although the sample differs somewhat between the regressions, that is not very important. If we restrict the analysis to the 50 countries for which we observe both the enrollment rate and cognitive skills, the results are virtually

It is also worth noting that among the control variables only the investment share of GDP, as well as the dummies for Latin American and transition countries, obtain estimates that have the expected sign and are statistically significant. The estimates of our measures of human capital and initial GDP per capita are furthermore small; the enrollment rate also changes signs in the different specifications. This tentative analysis indicates a possible small but uncertain negative relationship between tolerance toward homosexuals and growth and a possible larger positive relationship between tolerance toward people of another race and growth. However, also this latter result is uncertain due to weak statistical significance. As many cross-country regression results have been shown to be sensitive to model specification and to small changes in the sample of countries, we need to carry out a sensitivity analysis along those dimensions before we make claims about the nature of the relationships.

4.2. Model Specification: Extreme Bounds Analysis

We now turn to the extreme bounds analysis (see section 3.1 for details). In this test of the model specification, we wish to see to what extent statistical significance is attained for the two tolerance measures when the set of control variables, $\mathbf{C}_i$ in equation (2), is varied in a systematic way, more precisely, in each possible combination of three. Note that the fixed control variables $\mathbf{F}_i$ are included in each regression. This yields 12,341 regressions.

Table 3: Robustness results with respect to model specification for the two tolerance parameters

	X=Homosexuals	X=Race
Average estimate for *Tolerance X*	-2.14	6.94
Share of regressions where *Tolerance X* is statistically significant at the 5 percent level	0.01 %	7.7 %
Share of regressions where *Tolerance X* is statistically significant at the 10 percent level	1.1 %	31.6 %
Share of regressions where *Tolerance X* takes a negative sign	97.3 %	0.7 %
Number of observations	38–61	

Three switch variables out of 43 are included in each regression. Number of regressions in each column: 12,341. Sources and variable definitions: see Table A1. Sample list: see Table A3.

Table 3 reveals that the results are not at all robust with regard to model specification, especially not those that concern tolerance toward homosexuals. There, only 0.01 percent (1.1 percent) of all regressions entails statistical significance at the 5 percent (10 percent) level. The corresponding figures for tolerance toward people of another race are higher: 7.7 percent and 31.6 percent respectively – but it is still the case that the degree of robustness is low. In terms of the sign of the estimated coefficients, both measures are reasonably stable. When replacing *Enroll* with *Cognitive skills*, these conclusions continue to hold – see Table A4 in the Appendix for details. In all, we conclude that this exercise does not indicate any robust tolerance–growth relationship.

unchanged (see Table A2 in the Appendix). The main difference is that the parameters of both tolerance measures attain statistical significance at the 10 percent level in all three specifications.

4.3. Outliers: Least Trimmed Squares

So far the analysis has proceeded on the implicit assumption that there are no outliers. Here, we use least trimmed squares 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 4 shows what happens when the four identified outliers are removed.

Table 4: Results without outliers (least trimmed squares and reweighted least squares)

Dependent variable: Average annual growth in real GDP per capita 1998					
Tolerance homosexuals	-3.412	-3.521*	-4.640**	-4.839**	-5.036***
	(2.198)	(2.100)	(2.020)	(1.989)	(1.868)
Tolerance race	8.167*	8.530**	7.345*	5.570	6.312
	(4.376)	(4.182)	(3.962)	(4.041)	(3.800)
Number of observations	61	60	59	58	57
Sample	Full	Excl Uruguay	Excl Uruguay Venezuela	Excl Uruguay Venezuela Albania	Excl Uruguay Venezuela Albania Armenia

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 fixed control variables as before (not reported here). Sources and variable definitions: see Table A1. Sample list: see Table A3.

The removal of outliers renders the estimated coefficients of tolerance toward homosexuals statistically significant at the 1 percent level, with a retained negative sign. This procedure also renders the estimated coefficient of tolerance toward people of another race statistically insignificant (p-value 0.103). The initial results are clearly sensitive to outliers, especially in terms of statistical significance. When replacing *Enroll* with *Cognitive skills* (see Table A5 in the Appendix), neither of the two *Tolerance* coefficients attain statistical significance when outliers are excluded, and the size of the estimated coefficients is reduced (dramatically for *Tolerance race*). In all, this provides indications of a low degree of robustness with regard to the sample, especially for *Tolerance race.*

4.4. Least Trimmed Squares in Combination with Extreme Bounds Analysis

Although the results of the preceding section give some indication that the relationships are important for growth, it is still the case that this finding is based on the basic regression model (1). As the results of the extreme bounds analysis indicated substantial sensitivity to the choice of control variables, a synthesis of those analyses is called for. Here, we investigate the effects of combining the outlier analysis with extreme bounds analysis, in line with model (2), varying the model specification in a systematic manner. For each regression of the extreme bounds analysis, the least trimmed squares/reweighted least squares exercise is performed.

The results are presented in Table 5. Remarkably, it turns out that in around 90 percent of all regressions, the estimated coefficients of both tolerance measures is statistically significant at the 5 percent level. It is clearly the case that both variables must be considered quite robustly related to economic growth for the vast majority of countries in our sample. This is reinforced by the high stability of the signs of the estimated coefficients.

Table 5: Robustness results with respect to model specification combined with LTS and RLS

	X=Homosexuals	X=Race
Average estimate of *Tolerance X*	-3.7	6.0
Share of regressions where *Tolerance X* is statistically significant at the 5 percent level	91.1 %	88.9 %
Share of regressions where *Tolerance X* is statistically significant at the 10 percent level	93.9 %	91.7 %
Share of regressions where *Tolerance X* takes a negative sign	99.4 %	4.5 %
Average number of outliers	6.8	
Minimum number of outliers	1	
Maximum number of outliers	12	
Number of observations	32–58	
Most frequent outliers (percent of regressions where the country is outlier)	Uruguay (83.8 %) Venezuela (83.0 %) Ireland (71.6 %) Argentina (62.7 %) Albania (62.7 %)	
Number of countries that are never outliers	14	

Three switch variables out of 43are included in each regression. Number of regressions in each column: 12,341. For no other country than the ones mentioned is the percent of regressions where the country is an outlier higher than 39 percent. Sources and variable definitions: see Table A1. Sample list: see Table A3.

We have also replaced *Enroll* with *Cognitive skills*, and the results are reported in Table A6 in the Appendix. They reveal somewhat weaker shares of statistical significance for the *Tolerance* measures, and somewhat smaller estimated coefficients (especially for tolerance toward people of a different race), but the overall picture is the same. Based on Tables 5 and A6, it seems safe to say that both our tolerance measures, for most countries, are quite strongly related to growth and that their effects are of opposite signs.

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 investigate, for the time period 1998–2003, 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 another race, is related to growth in real GDP per capita. We analyze this issue by looking at a sample of maximally 63 countries. We follow the methodology of the empirical growth literature, including a careful look at how robust the relationships are.

Our results are derived in several steps. What unites all of them is that tolerance toward homosexuals is negatively related to growth, whereas tolerance toward persons of another race is positively related to growth. What varies is the statistical significance of these results. First, we look at a basic regression with standard control variables: there, only the race variable is statistically significant. Our next step is to perform an extreme bounds analysis to see how the estimated coefficients of the tolerance variables are affected by a systematic variation in the set of control variables. It turns out that both measures are very clearly non-robustly related to growth. However, when we begin to identify outliers by means of least trimmed squares and to remove them from the sample, we find, when estimating the basic regression model, that only tolerance toward homosexuals attains statistical significance. We finish the analysis by combining the identification and removal of outliers with extreme bounds analysis, to find that both measures are quite robustly related to growth. This holds irrespective of whether the gross enrollment ratio or cognitive skills are used to control for human capital, implying that the effect of tolerance is not very sensitive to how human capital is measured.

To get a feeling for the economic significance of our results, an increase in tolerance toward people of another race (toward homosexuals) by 10 percentage points is associated with an increase in growth by 0.6 (decrease in growth by 0.4) percentage points, a non-negligible effect. If one moves from the average tolerance value to the maximum value (see Table A1), for tolerance toward people of another race (toward homosexuals) the growth rate increases by 0.7 (decreases by 1.4) percentage points. Again, indicating a substantial effect.

What to make of these results? Our preferred overall interpretation, based on the combined robustness test where outliers are removed and extreme bounds analysis is applied, is that just as growth is affected by other social factors, such as trust and religion, it is also affected, *in the typical country*, by tolerance. Notably, the relationship is positive for tolerance toward people of another race and negative for 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 clear-cut positive relationship between tolerance of homosexuals and growth.[23] Our results point to the necessity of improving our understanding of the mechanisms through which different kinds of tolerance may affect economic activity and that different kinds of tolerance may yield different economic consequences. A negative growth effect of tolerance could emerge if tolerance is perceived as negative by productive, intolerant people who choose to locate elsewhere and if it reduces productivity within a country. Or it could be that tolerance is related to some variable which

[23] Admittedly, the measures used are different: whereas they generally look at the share of gays and lesbians or immigrants of a city's or a region's population, we look at actual attitudes – a more straightforward and apt measure, we would argue.

we have not accounted for and which drives the result, e.g., work norms. No matter what, tolerance overall may of course still be valued for other, non-material reasons.

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. Our analysis is to a large extent limited by data availability. As more data become available, more detailed analyses can be conducted. This will enable panel-data analysis, which may be helpful in providing additional information about causality. What we are able to show is a that there are partial correlations between our measures of tolerance and growth, a good starting point for further inquiry.

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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 (circa)	The World Values Survey – see Inglehart et al. (2004)	64	0.55	0.24	0.09	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 (circa)		62	0.87	0.08	0.64	0.98
Growth	(((Gdp 2003/Gdp 1998)^0.2)-1)*100	1998–2003	Heston, Summers and Aten (2006)	64	2.81	2.68	-4.88	9.52
Gdp	Real GDP per capita (chain series), USD in 2000 constant prices	1998–2003		64	13091.2	9487.40	1040.7	42077.74
Investment share	Total investment as share of GDP, constant prices	1998		64	18.34	6.88	3.10	36.2

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)	52	4.63	0.53	3.09	5.45
Enroll	Average enrollment rate of the years with available data between 1996 and 2000	1996 – 2000	Education database, the World Bank, www.worldbank.org	63	89.5	24.94	25.7	155.2
Latin America	Dummy for Latin American countries	1998	Bjørnskov (2008)	64	0.17	0.38	0.00	1.00
Asia	Dummy for Asian countries	1998		64	0.08	0.27	0.00	1.00
Transition	Dummy for transition countries	1998	*Freedom in the World Historical Rankings* database, www.freedomhouse.org	64	0.34	0.48	0.00	1.00
Openc98	Exports plus imports (i.e., total trade) divided by Gdp	1998	Heston, Summers and Aten (2006)	64	77.96	41.28	17.02	239.78
Trust	Share of the population agreeing with the statement "most people can be trusted" rather than with the alternative "you can't be too careful in dealing with people" (earlier versions) or "you need to be very careful in dealing with people" (the latest version.	1998 (circa)	World Values Survey – see Inglehart et al. (2004)	64	26.3	14.02	3.00	64.77
Ethnicfrac	Ethnic fractionalization	2001	Alesina et al. (2003)	62	0.33	0.21	0.05	0.85
Languagefrac	Linguistic fractionalization	2001		61	0.29	0.25	0.02	0.91
Religionfrac	Religious fractionalization	2001		62	0.43	0.22	0.00	0.86
Gini98	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	64	36.86	10.51	22.30	60.40
Corruption	Transparency International's Corruption Perception Index	2000	*Corruption Perceptions Index* database, www.transparency.org	57	5.21	2.54	1.20	10.00

Urban95	Percent urban population	1995	United Nations (2003)	62	64.52	20.93	11.60	100.00
Engfrac	Fraction of a country's population that speaks English as a native language	1992 (circa)	Hall and Jones (1998); www.ethnologue.com; and CIA's *The World Factbook*, www.cia.gov/library/publications/the-world-factbook/	63	0.09	0.26	0.00	0.97
Eurfrac	Fraction of a country's population that speaks one of the major languages of western Europe: English, French, German, Portuguese or Spanish	1992 (circa)		64	0.35	0.44	0.00	1.00
Latabs	Absolute latitude	2008	CIA's *The World Factbook*, www.cia.gov/library/publications/the-world-factbook/	64	40.13	15.45	4.00	65.00
Area	The sum of all land and water areas delimited by international boundaries and/or coastlines, in square kilometers	2008		64	1321807	3156400	316	17075200
SubSahara	Dummy for Subsaharan countries	2008	Stanford University Library, www-sul.stanford.edu/depts/ssrg/africa/guide3.html	63	0.03	0.18	0.00	1.00
UK_colony	Dummy for former British colonies	2008	NationMaster, www.nationmaster.com/encyclopedia/British-Empire	64	0.13	0.33	0.00	1.00
Span_colony	Dummy for former Spanish colonies	2008	NationMaster, www.nationmaster.com/encyclopedia/Spanish-Empire	64	0.17	0.38	0.00	1.00
Yrsopen	Fraction of years during 1950–1994 that the economy in the country has been open	1950–1994	Hall and Jones (1999)	47	0.45	0.35	0.00	1.00
Frankrom	Natural log of the Frankel-Romer forecasted trade share	1996		47	2.66	0.96	0.83	5.64
Polright98	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	61	2.16	1.57	1.00	7.00
Civillib98	Civil liberties (measured from 1 to 7, where 7 is the lowest and 1 is the highest degree)	1998–1999		61	2.59	1.38	1.00	6.00
Popgrowth95-00	Annual population growth	1995–2000	United Nations (2004)	63	0.62	0.94	-1.32	3.02

Lifeexp1998	Life expectancy at birth	1998	Millennium Development Goals database, the World Bank, www.worldbank.org	61	72.42	6.08	41.00	79.00
VoiceAccount	Point estimate of “Voice and accountability”, the first cluster of governance indicators	1997–1998	Kaufmann, Kraay and Zoido-Lobatón (1999)	63	0.62	0.85	-1.29	1.68
PolStab	Point estimate of “Political stability”, the second cluster of governance indicators	1997–1998		64	0.40	0.84	-1.42	1.69
GovEff	Point estimate of “Government effectiveness”, the third cluster of governance indicators	1997–1998		64	0.42	0.95	-1.32	2.03
RegQual	Point estimate of “Regulatory quality”, the fourth cluster of governance indicators	1997–1998		64	0.39	0.68	-1.54	1.23
RuleLaw	Point estimate of "Rule of Law", the fifth cluster governance indicators	1997–1998		64	0.43	0.91	-1.11	2.00
ControlCorruption	Point estimate of “Control of corruption”, the sixth cluster of governance indicators	1997–1998		64	0.42	1.01	-1.00	2.13
Landlocked	Dummy variable indicating that a country has no coastline	2008	CIA’s *The World Factbook*, www.cia.gov/library/publications/the-world-factbook/	64	0.19	0.39	0.00	1.00
Christians	Percent of population that are Christian	1998	The World Values Survey – see Inglehart et al. (2004)	63	0.67	0.26	0.00	0.99
Muslims	Percent of population that are Muslims	1998		63	0.07	0.20	0.00	0.91
Buddhists	Percent of population that are Buddhists	1998		63	0.01	0.04	0.00	0.31
Hindus	Percent of population that are Hindus	1998		63	0.02	0.10	0.00	0.77
Jews	Percent of population that are Jews	1998		63	0.00	0.01	0.00	0.09
EFI1	Area 1 of the Economic Freedom Index: Size of government	2000	Economic Freedom of the World Index database, www.freetheworld.com	55	5.44	1.57	2.29	8.55

EFI2	Area 2 of the Economic Freedom Index: Legal structure and security of property rights	2000		55	6.73	1.94	3.47	9.62
EFI3	Area 3 of the Economic Freedom Index: Access to sound money	2000		55	8.04	1.93	2.71	9.83
EFI4	Area 4 of the Economic Freedom Index: Freedom to trade internationally	2000		55	7.50	1.00	5.10	9.06
EFI5	Area 5 of the Economic Freedom Index: Regulation of credit, labor and business	2000		55	6.32	0.87	4.43	8.19
Military98	Military expenditures as a share of Gdp	1998	World Development Indicators database, the World Bank, www.worldbank.org	61	1.87	1.08	0.00	6.60
Govcons98	General government final consumption as a share of Gdp	1998		60	16.87	5.37	4.40	27.32
Growth LFPR 93–98	Annual percentage growth in Labor force participation rate	1993–1998		62	-0.03	4.88	-13.79	16.29
Inflation 98	Inflation (Gdp deflator, percent)	1998		62	8.32	14.59	-5.55	76.58
Stddev infl	Standard deviation of inflation (Gdp deflator, percent)	1989–1998		62	268.00	733.80	0.60	4981.42

Note: The figures are based on the full sample of 64 countries.

Table A2: Basic results with different measures of human capital. identical samples

Dependent variable: Average annual growth in real GDP per capita 1998			
	(1)	(2)	(3)
Tolerance homosexuals	-3.995*	-3.966*	-4.005*
	(2.121)	(2.336)	(2.186)
Tolerance race	7.933*	7.957*	7.932*
	(4.586)	(4.705)	(4.643)
Enroll		-0.001	
		(0.018)	
Cognitive skills			0.019
			(0.807)
Investment share	0.087*	0.087*	0.087*
	(0.047)	(0.048)	(0.048)
Gdp	-0.045	-0.044	-0.045
	(0.058)	(0.059)	(0.063)
Asia	2.462	2.453	2.459
	(1.496)	(1.541)	(1.520)
Latin America	-3.180***	-3.189***	-3.171***
	(1.034)	(1.087)	(1.121)
Transition	1.436	1.440	1.426
	(0.862)	(0.881)	(0.970)
Constant	-3.112	-3.101	-3.179
	(3.703)	(3.763)	(4.765)
Observations	50	50	50
Adjusted R-squared	0.49	0.48	0.48

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table A3: The sample and values for the tolerance measures and growth

Country	Year for tolerance observations	Tolerance homosexuals	Tolerance race	Growth
Albania	1998	30.0	92.2	9.3
Argentina	1998	71.3	95.5	-3.1
Armenia	1997	16.7	80.8	9.5
Australia	1995	75.3	95.4	2.2
Austria	1999	73.3	92.1	1.7
Azerbadjan	1997	9.3	87.8	7.4
Bangladesh	1996	16.3	82.7	4.0
Belarus	1996	36.6	95.0	8.0
Belgium	1999	82.5	86.1	1.8
Bosnia and Herzegovina	1998	43.6	75.5	3.4
Brazil	1998	73.7	97.2	0.7
Bulgaria	1997	59.2	82.7	4.2

Canada	2000	70.3	95.0	2.6
Chile	1998	57.6	88.0	1.5
China	1995	39.3	77.1	7.4
Colombia	1998	85.1	98.0	-0.2
Croatia	1996	54.5	91.6	2.8
Czech Republic	1998	76.0	89.5	2.5
Denmark	1999	92.0	92.6	1.2
Dominican Republic	1996	51.3	81.5	3.1
El Salvador	1998	21.7	n.a.	0.5
Estonia	1996	36.1	92.5	5.0
Finland	1996	70.1	87.8	2.4
France	1999	84.2	90.9	1.9
Georgia	1996	23.0	90.5	2.9
Germany	1997	86.7	97.2	1.1
Great Britain	1998-99	77.7	n.a.	2.4
Greece	1999	73.2	85.6	3.8
Hungary	1998	46.6	81.4	4.6
Iceland	1999	92.1	96.9	1.9
India	1995	38.6	64.0	4.8
Ireland	1999	72.5	87.7	6.1
Italy	1999	71.3	84.5	1.3
Latvia	1996	40.8	95.5	5.9
Lithuania	1997	23.5	86.0	4.8
Luxembourg	1999	80.8	92.8	3.2
Macedonia	1998	34.1	73.6	1.5
Malta	1999	60.0	81.0	1.7
Mexico	1998	63.0	73.9	1.1
Netherlands	1999	93.8	95.0	1.2
New Zealand	1995	77.7	97.0	2.7
Nigeria	1995	10.7	79.5	3.3

Norway	1990	85.7	91.8	1.3
Peru	1998	46.2	88.4	0.9
Philippines	1996	67.5	75.8	1.5
Poland	1997	34.0	80.1	3.0
Portugal	1999	74.4	93.3	1.3
Puerto Rico	1995	67.7	93.4	3.7
Republic of Moldova	1996	22.6	92.3	2.8
Romania	1998	44.2	70.3	3.3
Russian Federation	1995	29.1	91.7	7.7
Serbia	1996	24.5	84.7	3.0
Slovakia	1998	53.9	86.5	3.3
Slovenia	1995	39.3	82.9	3.4
South Africa	1996	50.8	88.4	2.8
Spain	1995	79.7	91.7	2.8
Sweden	1996	88.8	97.0	2.5
Switzerland	1996	80.9	91.4	0.7
Taiwan	1994	27.3	82.9	2.7
Turkey	1996	13.3	69.2	-0.3
Ukraine	1996	34.8	91.4	7.1
United States	1995	70.2	92.9	1.5
Uruguay	1998	69.4	92.8	-4.9
Venezuela	1998	32.5	80.0	-4.1

Table A4: Robustness results with respect to model specification for the two tolerance parameters

	X=Homosexuals	X=Race
Average estimate for *Tolerance X*	-2.27	6.64
Share of regressions where *Tolerance X* is statistically significant at the 5 percent level	0.04 %	3.8 %
Share of regressions where *Tolerance X* is statistically significant at the 10 percent level	4.7 %	19.6 %
Share of regressions where *Tolerance X* takes a negative sign	96.9 %	1.6 %
Number of observations	35-51	

Human capital is measured by *Cognitive skills.* Three switch variables out of 43 are included in each regression. Number of regressions in each column: 12,341. Sources and variable definitions: see Table A1. Sample list: see Table A3.

Table A5: Results without outliers (least trimmed squares and reweighted least squares)

Dependent variable: Average annual growth in real GDP per capita 1998								
Tolerance homosexuals	-2.716	-2.453	-2.519	-1.759	-3.057*	-2.503	-2.233	-2.180
	(1.960)	(1.953)	(1.817)	(1.642)	(1.646)	(1.529)	(1.457)	(1.296)
Tolerance race	6.653	4.496	3.987	3.855	1.440	-0.077	-0.997	-0.028
	(4.571)	(4.821)	(4.489)	(4.015)	(3.930)	(3.663)	(3.502)	(3.129)
Number of observations	51	50	49	48	47	46	45	44
Sample	Full	Excl Albania	Excl Albania Uruguay	Excl Albania Uruguay Argentina	Excl Albania Uruguay Argentina Turkey	Excl Albania Uruguay Argentina Turkey Russia	Excl Albania Uruguay Argentina Turkey Russia China	Excl Albania Uruguay Argentina Turkey Russia China Ireland

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 fixed control variables as before except *Enroll,* which is exchanged for *Cognitive skills* (not reported here). Sources and variable definitions: see Table A1. Sample list: see Table A3.

Table A6: Robustness results with respect to model specification combined with LTS and RLS

	X=Homosexuals	X=Race
Average estimate of *Tolerance X*	-3.3	4.3
Share of regressions where *Tolerance X* is statistically significant at the 5 percent level	76.1 %	75.1 %
Share of regressions where *Tolerance X* is statistically significant at the 10 percent level	83.9 %	79.1 %
Share of regressions where *Tolerance X* takes a negative sign	98.1 %	14.5 %
Average number of outliers	6.4	
Minimum number of outliers	2	
Maximum number of outliers	10	
Number of observations	31-47	
Most frequent outliers (percent of regressions where the country is outlier)	Uruguay (92.2 %) Ireland (86.7 %) Argentina (79.7 %) Albania (72.3 %) Turkey (56.2 %) Armenia (48.3 %)	
Number of countries that are never outliers	5	

Human capital is measured with *cognitive skills.* Three switch variables out of 20 are included in each regression. Number of regressions in each column: 12,341. For no other country than the ones mentioned is the percent of regressions where the country is an outlier higher than 39 percent. Sources and variable definitions: see Table A1. Sample list: see Table A3.