Tolerance and economic growth revisited: A note

Bomhoff, Eduard and Lee, Grace HY

Monash University, Malaysia, Monash University, Malaysia

25 August 2012

Tolerance and economic growth revisited

Eduard J. Bomhoff

Grace Lee Hooi Yean[1]

[1] Professor and Senior Lecturer, Monash University Sunway Campus. Department of Economics, School of Business, Jalan Lagoon Selatan, Bandar Sunway, 46150 Selangor, Malaysia.

Corresponding author: grace.lee@ monash.edu; phone: +60 3 5514 4907; fax: +60 3 5514 6192/6194

Abstract

Berggren and Elinder (BE) in this journal write on the relationship between the degree of tolerance in a nation and its rate of economic growth. They are disturbed to find in their cross sections that faster economic growth statistically goes together with intolerance of homosexuals. In this comment, we revisit the issue and demonstrate that the concern expressed by BE is unwarranted if we properly account for "conditional convergence" in the regressions for economic growth. Other things being equal, a country grows faster if it starts from a poorer initial position. In the BE dataset, China since the Deng reforms is a prime example. At about the same time, another group of countries managed to accelerate their economic growth after a long period of stagnation: the ex-communist countries in central and Eastern Europe. Many of these nations also grew exceptionally fast for a number of years, once freedom had been regained and the initial chaos overcome. With simple modeling of these historical initial conditions, we find no statistical pattern that associates bias against homosexuals with weaker economic growth. Our results are robust under alternative specifications.

Keywords Tolerance; Growth

JEL codes O40; Z13

1. Introduction

A recent article in this journal by Berggren and Elinder (2011) (hereafter BE) focuses on the association between the degree of tolerance of sexual preferences in different countries and economic growth. BE focus on analyzing responses to one of two questions in the World Values Survey (WVS) about tolerance for homosexuality and find that countries with less tolerant attitudes on average exhibit stronger economic growth. As they note, such a result would contradict the popular writings of Richard Florida (2005), who has argued that successful cities need a culture that is welcoming of gays and especially of their contributions to the creative areas of the urban economy (also see Marlet and Woerkens 2007).

BE are distressed by their conclusion and write that "one may very well advocate tolerance toward homosexuals in spite of this finding [of a negative relationship between the degree of tolerance and growth], as there are other, and to many people more important, goals than growth." [2] BE argue that productive and innovative people who are sexually prejudiced would refrain from moving into tolerant places. Staying in places with more tolerance towards homosexuality would reduce their productivity.

BE have very kindly provided their rich data set, which combines the Survey responses with national economic, demographic and government indicators. We use it for the same sample of 56 countries (reduced to 54 countries in some specifications, both in their paper and in this comment) to show that their concern is unwarranted. More recent data allow yet another test for a sample that includes more East Asian countries – fast growing but with different, more conservative values as compared to the rich west, but again there is no evidence of growth being promoted by intolerance of homosexuals.

[2] They also test for the responses to the question in the WVS about attitudes toward neighbors of different races and find the positive coefficient they are looking for. That also is true in our analysis, but the coefficient is insignificant, so we focus here on the contentious issue of economic growth and tolerance of homosexuals.

One of the principal causes of the contrast between the findings of BE and our results lies in the modeling of "conditional convergence". In neoclassical growth models, such as Solow (1956), Cass (1965), and Koopmans (1965), a country's GDP per capita growth rate is negatively related to its starting level. The convergence issue in growth theory has generated much discussion in the literature. Integral to these discussions are the concept of β and σ–convergence (Barro and Sala-i-Martin 1991). Regions tend to converge over different time periods at a strikingly similar speed of around 2% per year.[3] All of BE's regression equations have growth over some period as the dependent variable and the level of GDP per capita as one of the explanatory variables. We replace that level by the logarithm of initial GDP per person, in line with the literature, since the distance between, for example, the poorest country in their sample, Tanzania with a GDP per capita of $652 (PPP corrected) in the starting year (1998) and Turkey's $6418 is very likely to be more relevant for potential future growth than the gap between two upper-middle income countries such as Turkey and Argentina ($13,132). All of our results below, however, hold also for BE's level of GDP.

2. Tolerance and economic growth revisited

BE measure tolerance for homosexuals by answers to a question (A132) in the third wave of the WVS, which was conducted in 1995-1998:

"On this list are various groups of people. Could you please sort out any that you would not like to have as neighbors?"

They take the percentage of respondents who do not mention homosexuals as undesirable neighbors. In addition to using BE's variable, we also use answers to another question (F118)[4] on homosexuality:

[3] Refer to Quah (1996) and Sala-i-Martin (1996) for a review of empirical findings on convergence.

[4] This question has been more commonly used in research because it has served as one of the components of the Inglehart-Welzel index of "self-expression values" (see Bomhoff and Gu 2012; Inglehart and Welzel 2005;

"Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between".

Answers to this question are on a scale of 1 to 10 with 1 meaning 'never justifiable' and 10 meaning 'always justifiable'. Therefore, in both cases, higher numbers mean greater tolerance, but answers to question F118 should have more information since it asks for a response on a ten-point scale. Here, we employ both measures of tolerance for homosexuals and find no significant differences in our regression models.

BE are correct in pointing out that very tolerant countries grow more slowly on average than less tolerant countries. The first column of Table 1 shows the simplest possible regression using their dataset and their measure of tolerance. Results for the full WVS wave 5 dataset and with the alternative variable for tolerance (not shown here) are broadly similar. There is a simple explanation: tolerance for homosexuals increases as people urbanize and work in service industries (Štulhofer and Rimac 2009). Thus, the rich countries tend to be more tolerant. But because Switzerland is already so rich, it can no longer get the boost to economic growth from "catching up" that is available to poorer countries.

There need not be a causal link between tolerance and growth when the low growth as well as the broad social tolerance in Switzerland and other rich countries are both functions of high income, urbanization and a preponderance of service industries.

One could, for example, also correlate growth with the well-known indicator developed by Barro and Lee (2010) for the average number of years of schooling of females.[5] Perhaps no other single variable is so strongly predictive of economic development than is female education. The same type of regression as before – not shown here – just correlating growth with the number of years of schooling for all females, does deliver an even stronger negative

---

Inglehart 2007). Two fewer countries are covered by this alternative question in wave 3 than by the question used by BE, thus reducing the sample size slightly.

[5] See http://www.barrolee.com/data/yrsch2.htm .

coefficient. There is no need, however, to rush to a wrong deduction and claim– copying the language in BE when they comment on the correlation between tolerance for homosexuals and growth - that education of girls is desirable "in spite of this finding". The correlation simply summarizes in one number the fact that poor countries have fewer girls with a full education and that these countries also have the potential for catching up and thus grow faster on average. It is therefore important to account better for conditional convergence, since otherwise the researcher will conclude wrongly from the negative association between growth (higher on average in poor countries) and the indicator variable – tolerance (lower on average in these poor countries).

In BE's Table 1, models 2 and 3 are the most satisfactory.[6] We start from BE's richer model 3 and make the following changes in order to better account for initial historical conditions. First, for clarity of presentation and also to limit the number of regressors in a modestly sized sample of 54 countries, we omit a number of insignificant variables from BE's models 2 and 3 (keeping these variables does not change our findings). Second, we add a dummy variable for the 15 ex-communist countries, as in BE's 15-variable model 4 (see section 3 for more discussion). Third, we add a second shift variable for the three Baltic republics – again see section 3 for a justification based on the common histories of Estonia, Latvia and Lithuania. Finally, adopting BE's cut-off point for outliers (defined as standardized residuals greater than 2.5), we add dummies for fast growing China and Ireland. The second column of Table 1 reports the regression results after the above changes are made to model (3) in BE. Although not reported here, preliminary analyses also include education (average years of schooling), tolerance towards other racial groups and regional dummies for Africa, Asia, European Union and North America. These variables are found to be statistically

[6] We are able to duplicate both exactly. BE's model 4 has 16 explanatory variables for a set of 54 countries, which appears excessive. Also, the crucial coefficient on homosexuality is much less significant in model 4 than in models 2 and 3.

insignificant and their inclusion produces little change in the coefficients of the other variables in our model.

3. Tolerance in Central and Eastern Europe

We want our models to reflect that all 15 ex-communist countries in the sample exited from communism and Russian domination and then suffered a very large drop in GDP over the period 1991-1994, just a few years before BE started measuring growth. That traumatic transition also created the potential for very rapid catching-up in this group of countries in which the values of many adults were still shaped under communist rule. In order to account for this, we use data from Angus Maddison's (2003) unique historical dataset for national GDP. Maddison's research puts numbers on the terrible waste under communism as he offers estimates of GDP per capita for all countries in the BE sample; annual numbers for the larger countries and a single number for 1973 for the Baltic republics, Moldavia and Ukraine, which at the time were part of the USSR and no longer independent nations. For consistency, we work with the 1973 numbers for all ex-communist countries and compare these to Maddison's estimates for 1990, the first full year after the fall of communism, as well as 1994, the end of the depression following the breakdown of Comecon, and 1998, the starting year of the analysis in BE.

In Western Europe, GDP per capita increased by an average of 40% between 1973 and 1990, in spite of two oil price hikes and concomitant recessions in 1973-1975 and 1980-1982. In all 15 ex-communist countries in our sample, by contrast, GDP increased by some 10% on average. Between 1990 and 1998, the initial year in BE, Western Europeans gained another

13%, but in Central and Eastern Europe, GDP per capita fell in 12 out of our 15 countries, stagnated in Hungary and went up only in Poland and Slovenia.[7]

The data also illustrate that the three Baltic republics are somewhat special. Here is some potted history. When Hitler invaded Poland in the fall of 1939, Stalin had begun the implementation of a secret protocol in the Molotov-Ribbentrop pact. After escalating threats, the Red Army occupied Lithuania on June 15, 1940, Estonia on June 16 and Latvia on June 17. All three countries dissolved into the Soviet Union. In August 1989, 50 years after the Molotov-Ribbentrop pact, the citizens of Estonia, Latvia and Lithuania joined hands for a 600 km protest against the Soviets and the three Baltic countries soon after became independent nations again. In the course of the 1990s they lifted legal bans on homosexuality and later passed legislation against homophobic discrimination – a pre-requisite for joining the European Union, which the Baltics managed to do in 2004.

In 1973, the three Baltic republics were some 30% poorer on average than neighboring Finland; in 1998, Estonia was 45% poorer, Latvia and Lithuania were at one-third of the Finnish level. These countries have forests and can produce their own cement, but otherwise natural resources are limited, so that trends in GDP must be related primarily to human capital and politics. After almost 50 years of forced economic integration in the USSR, their small economies at first suffered terribly from the legacy of central planning when they became independent nations again and had to pay in hard currency for all their imports. Ukraine and Moldava suffered even more than the Baltics between 1990 and 1998, and were less able to recover in more recent years, perhaps because they have much less openness and an even

[7] For consistency, we use Maddison's GDP estimates for 1998 for this comparison with 1973. We need approximations for Slovenia, Slovakia and the Czech Republic, since these countries did not exist in 1973. Maddison's initial year of GDP per capita for these territories is 1990, immediately after the transition, but before the full impact of the break-up of Comecon hit, with the low point in GDP per capita reached around 1994. We take the ratio of GDP in the territory of the future Czech Republic to GDP in all of Czechoslovakia in 1990 and apply that to Maddison's estimate of GDP for all of Czechoslovakia in 1973; likewise for Slovakia. Similarly for Slovenia, we use the fact that GDP per capita in the territory of future Slovenia in 1990 was twice as high as the average in that year for all of Yugoslavia and apply that ratio to Maddison's estimate for Yugoslavia in 1973 to get an estimate for Slovenia in 1973; likewise for Croatia.

more tragic history, and because they were not given a chance to embark on the road towards membership in the European Union.

As mentioned above, 1973 is the first year after the Iron Curtain descended over Europe for which we have a consistent set of estimates of GDP per capita. We insert Maddison's numbers in the BE equations to proxy for historical conditions, hoping to capture something of Baltic strength of human capital and institutions from the past. A test for equality of the coefficient for the Baltics and the other 12 countries in the sample is strongly rejected, so we allow for a separate coefficient on the same variable for Estonia, Latvia and Lithuania. The three Baltics exhibit even stronger catching-up after 1994, and that must reflect institutional strengths from longer historical connections to Sweden or Finland and a Hanseatic history of trading with cities in the West.

4. Empirical Results

Table 1 reports our empirical results. Note that the dollar value of initial GDP in the second column of Table 1 is quite insignificant here (also in the original BE models: the level of GDP has *t*-values ranging from 0.09 to 1.3 in their four models and thus never reaches significance). To account better for conditional convergence, we re-estimate, replacing the dollar level of GDP per capita by its natural logarithm. The results are reported in the third column of Table 3. The Jacque-Bera test indicates that both models 2 and 3 satisfy the requirement of normally distributed errors.

Model 3 in Table 1 explains 72% of the variation in the dependent variable with seven explanatory variables – much better than the 16-variable model (4) in BE with an *R*-squared of 48% and double the explanatory power of their models (1)-(3). These results are confirmed by further tests (not shown here), where we measure tolerance of homosexuals in the alternative manner, using responses to question F118 about attitudes toward homosexuality.

We also re-run the model changing the starting year to 1996 – just before the East Asian crisis and the crash of the Russian Ruble. Again, no important changes are found. A robustness check that replaces the Baltics and transitional country dummies with the log of GDP per capita 1973 (Baltics and ex-communist countries) produces similar results.[8] In addition, results from specification tests together with Akaike's and the Schwartz Criterion provide evidence that both of our models (2) and (3) are preferable to BE's model (refer to the Appendix).

It is worth noting that the coefficient on initial GDP in 1998 in our model is much more significant than in BE. The imprecision with which they estimate this coefficient explains why another variable – tolerance for homosexuals – obtained a significance that was inappropriate.[9]

BE's concern is gone: there is no statistical link between bias against homosexuality and rapid economic growth.

There remains a puzzle, though, namely why tolerance for homosexuals is on average so low in the ex-communist countries. Various researchers have analyzed trends in values in these countries. Easterlin (2009) notes exceptionally large declines in life satisfaction during the initial years after the fall of communism. A sharp rise in income inequality in this period, coupled with the greater vulnerability of older people to all these changes, made senior respondents especially bitter.

Looking in some more detail at the distribution of the responses, we find that in the three Baltics, a minuscule 1.6% of the 4200 respondents wholly accept others having alternative sexual preferences; 12% of the 5700 respondents in the other four ex-communist countries close to the West hold that fully tolerant view. At the other side of the spectrum, 49.8% of the Baltic respondents below age 30 feel that homosexuality is completely unacceptable; 27.9%

[8] Results not produced here.
[9] Omitted variable bias can cause significant predictors to appear to be insignificant.

of the young people in the Czech Republic, Slovakia, Slovenia and Poland agree with them. In Spain, for example, only 11% of the young take such a severe view of homosexuality. Selezneva (2011) summarizes a large number of papers on values in the ex-communist nations and also concludes that greater economic uncertainty in the ex-communist countries could well reinforce traditional attitudes and social norms.

5. Conclusion

In this comment, we revisit BE's study, which finds a negative relationship between the degree of tolerance of alternative sexual lifestyles and economic growth over the 1998-2007 period. Our results, however, explain growth better with more attention to initial conditions. We conclude that the concern in BE is unwarranted. Tolerance on average increases as countries get richer. Overall, our results do not provide any evidence that tolerance towards homosexuals would have any effect on economic growth. This implies that the role of tolerance is so minor that we cannot find an effect. Our findings clearly cast some doubt on the results of BE. City leaders and economic developers who implement policies aiming at improving tolerance of homosexuals, for reasons other than growth, should have little to worry about its growth-retarding effects.

Acknowledgement

We thank Sue Tee Gan and Kay Ann Cheong for excellent research assistance. Mary Gu from Monash Malaysia provided very helpful comments on earlier drafts. We also thank two anonymous referees from this Journal for their extensive comments and suggestions.

Appendix: Specification Test

Table A1 Specification Test

	BE's Model (3)	Model (2)	Model (3)
Ramsey's RESET test			
Likelihood ratio			
No of fitted terms: 2	16.08***	0.72 (0.70)	1.05 (0.59)
No of fitted terms: 3	19.97***	0.97 (0.81)	1.05 (0.79)
No of fitted terms: 4	22.75***	6.14 (0.19)	1.48 (0.83)
Akaike information criterion (AIC)	3.96	3.11	3.04
Schwarz criterion (SC)	4.40	3.40	3.33

Notes: * denotes significance at 1%. Figures in parentheses represent the probability. Model (2) and (3) in the last two columns correspond with the model (2) and (3) in Table 1.

We employ Ramsey's Regression Specification Error test (RESET) to compare our model specification with that of BE's. Ramsey's RESET jointly tests whether the coefficients on the predicted squared, cubed and fourth powers are equal to zero. Results from Table A1 show that Ramsey rejects BE's model, indicating that BE's model is misspecified. In addition, both Akaike's and the Schwartz Criterion provide evidence that both our models (2) and (3) are preferable to BE's model.

References

Barro, R. J. and Lee, J.-W. (2010). *A new data set of educational attainment in the world, 1950–2010* (NBER Working Paper No. 15902). National Bureau of Economic Research.

Barro, R.J., Sala-i-Martin, X. (1991). Convergence across states and regions. *Brookings Papers on Economic Activity*, *22* (1), 107–182.

Berg, A., Ostry, J.D. and Zettelmeyer, J. (2008). *What makes growth sustained?* (International Monetary Fund Working Paper 08/59).

Berggren, N., Elinder, M. (2011). Is tolerance good or bad for growth? *Public Choice*, *150* (1–2), 283–308.

Bomhoff, E.J. and Gu, M.L. (2012). East Asia remains different - a comment on the index of "self-expression values" by Inglehart and Welzel. *Journal of Cross-Cultural Psychology*, *43* (3), 373–383.

Cass, D. (1965). Optimum growth in an aggregative model of capital accumulation. *Review of Economic Studies*, *32* (3), 233–40.

Easterlin, R.A. (2009). Lost in transition: life satisfaction on the road to capitalism. *Journal of Economic Behavior and Organization*, *7*(2), 130–145.

Florida, R. (2005). *Cities and the creative class*. London: Routledge.

Inglehart R. and Welzel, C. (2005). *Modernization, cultural change and democracy: the human development sequence*. Cambridge: Cambridge University Press.

Inglehart, R. (2007). Mapping global values. In Y. Esmer and T. Pettersson (Eds.), *Measuring and mapping cultures: 25 years of comparative value surveys* (pp. 11–32). Boston: Brill.

Inglehart, R. and Baker, W.E. (2000). Modernization, cultural change, and the persistence of traditional values. *American Sociological Review*, *65*, 19–51.

Koopmans, T.C. (1965). On the concept of optimal economic growth. In *The Econometric Approach to Development Planning* (pp. 225–300). Amsterdam: North-Holland.

Maddison, A. (2003). *The world economy: historical statistics*. Paris: OECD.

Marlet, G. and Woerkens, C. (2007). The Dutch creative class and how it fosters urban employment growth. *Urban Studies*, *44* (13), 2605–2626.

Quah, D.T. (1996). Empirics for economic growth and convergence. *European Economic Review*, *40*, 1353–1375.

Sala-i-Martin, X. (1996). Regional cohesion: evidence and theories of regional growth and convergence. *European Economic Review*, *40*, 1325–1352.

Selezneva, E. (2011). Surveying transitional experience and subjective well-being: income, work, family. *Economic Systems*, *35* (2), 139–157.

Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, *70* (1), 65–94.

Štulhofer, A. and Rimac, I. (2009). Determinants of homonegativity in Europe. *Journal of Sex Research*, *46* (1), 24–32.

Table 1 Cross-sectional regression results

Dependent variable: Average annual growth in real GDP per capita 1998-2007	(1)	(2)	(3)
Constant	4.833***	3.428***	7.592***
	(0.870)	(0.984)	(2.455)
Tolerance homosexuals	-2.614**	0.145	1.048
	(1.190)	(0.916)	(0.943)
Gini		-0.024	-0.030*
		(0.018)	(0.016)
Transition countries dummy		2.139***	2.108***
		(0.50)	(0.409)
China dummy		7.112***	6.825***
		(1.135)	(1.096)
Ireland dummy		2.845**	2.980***
		(1.094)	(1.060)
Baltics dummy		2.652***	2.823***
		(0.702)	(0.684)
Initial GDP/capita 1998 (thousands of dollars)		-0.0121	
		(0.000)	
Initial GDP/capita 1998 (natural logarithm)			-0.500*
			(0.261)
Jarque-Bera statistic	6.27**	3.26	1.73
Adjusted R^2	0.09	0.70	0.72
Observations	56	56	56

Notes: *, ** and *** denote significance at 10%, 5% and 1%, respectively. The Breusch-Pagan-Godfey heteroscedasticity test indicates that the null hypothesis of homoscedasticity cannot be rejected in model (2) and model (3). However, heteroscedasticity is found to be present in Model (1). Figures in parentheses represent the standard errors. For model (1), White heteroscedasticity-consistent standard errors are reported. The Jarque-Bera (JB) statistic has a χ^2 distribution with two degrees of freedom under the null hypothesis of normally distributed errors.