Economics of Governance (2007) 8:1–16
DOI 10.1007/s10101-006-0014-z

ORIGINAL PAPER

Money, religion and revolution

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Received: 3 April 2004 / Accepted: 10 August 2005 /
Published online: 25 September 2006

Abstract How do money and religion affect the support for revolt in nations? We take a different approach from previous studies to provide an answer by using micro-data based on surveys of revolutionary tastes of over 100,000 people living in 61 countries from 1981–1997. Controlling for personal characteristics and country fixed effects, a 4 percentage point decrease in the GDP growth rate increases the probability of a person wanting to revolt by 2.3 percentage points. This rise can be offset by belonging to a religion which lowers the probability of being revolutionary by between 1.8 and 2.7 percentage points (compared to non-religious people). The effect is concentrated amongst people who identify themselves as being Christian. By comparison, Muslims have similar chances of wanting to revolt as non-religious people.

Keywords Revolution · Development · Growth · Religion

1 Introduction

A fundamental requirement of market economies is the security of ownership claims to property. Yet historically the existing order has been regularly challenged by revolt. The publication of Karl Marx's (1887) *Das Kapital* began interest in the question of whether capitalist societies could be sustained, or

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would meet their end in violent confrontation. At the heart of the debate about the cause of revolts lies the question of what makes an individual want a radical change of government that may only be possible by use of force. Hirshleifer (1995) draws the distinction between preferences and opportunities as two of the basic ingredients for conflict. Preferences for revolt may stem from a sense of grievance associated with a feeling of social injustice, unfairness or exploitation of a group of people. Even in the absence of such factors, a desire for revolt could arise simply because of expected monetary gains for the victors. Rebel organizations often need a charismatic leader to make them cohesive although revolutionaries may still fail due to repression by the authorities or lack of finance that limits their opportunities for action. These kinds of factors have made it difficult to identify empirical regularities associated with the occurrence of civil conflict.

The present paper adopts a different strategy to previous studies that have focused on explaining revolutionary outcomes at a high level of aggregation. Instead our aim is to explain the structure of revolutionary *preferences* at the individual level. We use evidence obtained from survey data that asks people directly whether they want existing structures to be overturned by revolution. This approach allows us to understand the relative roles of money and religion in shaping the support for revolt in society and, more broadly, to profile revolutionaries.[1] The paper is consequently in the spirit of a literature that uses surveys to test for the determinants of individual preference parameters.[2] The previous empirical literature on conflict comes mainly from cross-country comparative studies that have used aggregate level regression evidence to try to explain civil conflict by their economic and political conditions.[3] Several of these studies have used indices of "economic discrimination" to explain rebellion to capture the idea that relative deprivation, not absolute income, drives discontent [see Gurr and Moore (1997)]. Sambanis (2001) highlights many of the controversies in this literature. First, there is "disagreement [about] the very definition of a civil war". An absolute number of battle deaths has typically been used (usually 1,000) that is not scaled by population size. A dummy variable is set equal to one when the threshold is passed, meaning that there is limited time variation

[1] Characteristics like age that may be correlated with the value of time and human capital can affect tastes purely for rational economic reasons without needing to assume changes in preference parameters [see Becker and Stigler (1977)].

[2] On the support for different political parties see, inter alia, Alt (1979) and Hibbs (1982). The present paper's focus is instead on whether people believe that the entire organization of society should be overthrown.

[3] These studies show *"no consistent relation of level of economic development to political violence"* [Coleman (1990), pg 487]. For example, Sigelman and Simpson (1977) and Weede (1981) find higher per capita income is negatively associated with political violence whereas Muller (1985) obtains positive effects in a cross-section of 58 nations. Fearon and Laitin (2003) argue that civil war is correlated with low income, rough terrain and large populations. See also MacCulloch (2001) and Miguel, Satyanath, Sergenti (2003) who use rainfall to instrument for income in civil conflict regressions.

in the dependent variable that can be exploited.[4] Second, revolutionary tastes may not translate into actions due to the free-rider problem that undermines collective action. Whether people join a revolt may depend crucially on what others are observed to be doing, which can lead to 'revolutionary bandwagons' and 'information cascades'.[5] Third, only those rebel organizations that can sustain themselves financially may be able to survive. When the funding constraint is binding, a taste for revolt may again not translate into actions.[6]

Arguments linking religion to revolt in capitalist societies were most influentially introduced by Marx (1887) who made the famous statement that "religion is the opiate of the masses".[7] Preceding the rhetoric of the 'opiate' he also writes that "religious suffering is at one and the same time the expression of real suffering and a protest against real suffering. Religion is the sigh of the oppressed creature, the heart of a heartless world and the soul of soulless conditions". Raines (1992) emphasizes that for Marx religion is, in the hands and voices of the poor and the exploited, a crying out against 'real suffering', not 'illusory sufferings' such as fear of punishment from the gods. Marx's rejection of religion appears to stem from the view that its abolition "as the illusory happiness of the people" would lead to "the demand for their real happiness". In other words, religion may be a substitute for actual protest and demands for revolutionary change in society to improve people's lot since it provides an outlet for suffering. Non-religious people who do not have this outlet may be more prone to support radical change to achieve tangible improvements in their well-being.

Another strand of research has recently begun to address the link between religion and economic variables such as growth. Barro and McCleary (2002) study how economic performance and political institutions are related to religious participation and beliefs. Guiso, Sapienza and Zingales (2002) use survey data to identify the relation between religion and attitudes judged favorable to growth.[8] Iannaccone (1998) shows how religious membership can be explained as a club good whereby rational individuals may wish to join even when self-sacrifice is demanded in the form of standards concerning dress, diet, grooming,

[4] Francisco (1993) notes that since there are many different objective measures of revolt that could be used (such as sabotage, rallies or terrorism) it is difficult to choose between them. Events such as political strikes are hard to classify. He notes that most studies *"of protest and revolt use other measures, especially political deaths"*.

[5] See Mancur Olson (1965), *The Logic of Collective Action*. Some theorists have consequently turned to the role of charisma of revolutionary leaders and ideology to help explain observed collective action [see Roemer (1998)]. Kuran (1991) and Lohmann (1994) show how it may be possible for large numbers of people to privately support revolt but be unwilling to act unless they see others doing so.

[6] Collier and Hoeffler (2001) present evidence that a nation's level of primary commodity exports positively affects civil conflict possibly due to the ability of natural resources to help finance rebel movements.

[7] See the *Deutsch-Franzosische Jahrbucher* (1844).

[8] See also Sacerdote and Glaeser (2002), Glaeser and Glendon (1997) and Montalvo and Reynal-Querol (2002).

sexual conduct, entertainment and social activities. He also reviews Adam Smith's (1776) arguments in favor of 'religious competition' and claim that civil strife may arise from regulation and suppression of religious freedoms.[9]

The paper is organized as follows. Section II introduces the data set and reports several validation exercises. Section III describes the empirical strategy. Section IV presents the main results on how revolutionary preferences depend on whether each respondent is religious and their income. Section V concludes.

2 Data description and validity

2.1 Data description

2.1.1 Revolutionary preferences

The source of the data on the taste for revolt is three waves of the World Values Survey Series (1981–1984, 1990–1992, 1995–1997) in which a random sample of 168,482 individuals in 64 independent countries were interviewed.[10] Of these, we use data on 107,985 people in 61 nations who answered the following question: *"On this card are three basic kinds of attitudes vis-à-vis the society in which we live in. Please choose the one which best describes your own opinion (one answer only)"*. The three relevant response categories are: *"The entire way our society is organised must be radically changed by revolutionary action"*, *"Our society must be gradually improved by reforms"*, and *"Our present society must be valiantly defended against all subversive forces"* (The *"Don't know"* and *"Not asked in this survey"* categories are not included in our data set). The appendix provides a summary of the World Values survey.

Table 1 shows the proportions of individuals who desire revolutionary action, versus those who do not (i.e., the ones who desire either gradual reforms or present society valiantly defended) for the entire sample, the unemployed, religious people and by income quintile. Of the full sample, 9.8% of respondents declare a taste for revolution in their country and for the unemployed, 14.1% want one. Of those people who belong to a religious denomination, 9.2% show a taste for revolt whereas for those who are atheist, 10.3% desire one. The breakdown between religions shows large differences. Whereas 7.8% of Christians want to revolt, 18.3% of Muslims do. There also exists a monotonically declining proportion of people wanting a revolution as we go up the income quintiles. In the first, second and middle quintile, there are 10.8, 10.4 and 10.2%, respectively, of respondents who want revolt. These numbers decline more sharply as we rise into the top group of incomes. In the 4th quintile, 9.3% want a revolution and in the top quintile this proportion falls to 6.9%.

[9] Berman (2000) shows how social interactions within a religious community can act as a signaling device of commitment in order to participate in a mutual insurance arrangement.

[10] The countries surveyed include almost 80 percent of the world's population. The World Values survey was also used to obtain indicators of trust and civic norms in Knack and Keefer's (1997) study of the determinants of "social capital".

Table 1 Support for revolution across sub-groups: 61 nations, 1981–1997

TASTE for REVOLT?					If religious		
	All	Unemployed	Atheist	Religious	Christian	Muslim	Other
Yes	9.8	14.1	10.3	9.2	7.8	18.3	12.9
No	90.2	85.9	89.7	90.8	92.2	81.7	87.1
TASTE for REVOLT?	Income quintiles						
	First (Lowest)	Second	Third	Fourth	Fifth		
Yes	10.8	10.4	10.2	9.3	6.9		
No	89.2	89.6	89.8	90.7	93.1		

All figures are based on the full sample of 107,985 people and are expressed as percentages. In the religion category, *"Other"* includes what was originally coded in the World Values Survey as *"Jew", "Hindu", "Buddhist"* or *"Other"*

2.1.2 Religion

The World Values survey asks each respondent " *Do you belong to a religious denomination? If yes, which one?"*. We first defined a dummy variable, *Religious*, equal to one if the respondent identifies herself as belonging to a religious denomination and zero otherwise. If the respondent does belong to a religion, we next code her into three broad religious groupings using the dummy variables, *Christian*, *Muslim*, and *Other Religion*. Of the full sample of 107,985 people who answered this question, 65 per cent declare themselves as belonging to one of the Christian faiths ("Roman Catholic", "Protestant" or "Orthodox") and 7 percent declare themselves as being "Muslim". The *Other Religion* category includes what was originally coded in the survey as being "Jewish", "Hindu", "Buddhist", or "Other". These four categories combined account for 10 percent of the full sample. The base category used for all these dummy variables is the group of people who say that they are *"Not a member*" or belong to *"No religious denomination"*.

2.2 Data validation

It is possible to provide evidence that tastes for revolt are correlated with observable measures of conflict in society. Our dataset allows us to match the surveyed taste for revolt with forms of political action that the same person has undertaken at the time of, or prior to, the survey. These are "signing a petition", "joining in boycotts", "attending lawful demonstrations", "joining unofficial strikes" and "occupying buildings or factories". The first may be taken more as an indicator of reformist action, whereas the other four as indicators of active involvement in changing society. We represent each political action by a dummy variable that takes the value 1 if the respondent has answered "Have done" and 0 if the answer was "Might Do" or "Would Never Do". Since all these variables are measured at the individual level, there are a total of 107,985 independent observations measured across all the countries and years in our sample.

Table 2 Correlation coefficients between tastes for revolt and revolutionary actions: 61 nations, 1981–1997

	TASTE For REVOLT?	Signed a Petition	Joined in boycotts	Lawfully demonstrated	Unofficial strikes
Signed a petition	−0.01	1			
Joined in boycotts	0.06	0.29	1		
Lawfully demonstrated	0.05	0.31	0.37	1	
Unofficial strikes	0.06	0.17	0.29	0.33	1
Occupied buildings/*factories*	0.06	0.11	0.21	0.21	0.31

All figures are based on the full sample of 107,985 people

Table 2 reports the Pearson correlation coefficients between each person's taste for revolt and the above indicators of actual protest. The taste for revolt is positively correlated with all of them, except for signing a petition. The correlation coefficients between taste for revolt and (a) joined in boycotts is 0.06, (b) lawfully demonstrated is 0.05, (c) unofficial strikes is 0.06 and (d) occupied buildings is 0.06. These coefficients are all significant at the 1 percent level. In contrast, signing a petition shows a small negative correlation (equal to −0.01) with declaring that society must be radically changed by revolutionary action (at the 5 percent level). This makes sense if signing a petition is regarded as being more of a reformist act than a revolutionary one. The indicators of actual protest are more highly correlated with each other than with the declared taste for revolt. For example, the correlation coefficient between "lawfully demonstrated" and "joined in boycotts" is 0.37. We also test for the relation between actual civil wars and revolutionary tastes using a data set of all civil wars in the world between 1944 and 1999 [see Doyle and Sambanis (2000)]. There are 10 countries in the sample that were engaged in a civil war. The average support for revolt in these places is 16 percentage points (compared to 9 percentage points in the remaining sample). The Pearson correlation coefficient between average national levels of revolutionary support and whether or not the country was actually experiencing a civil conflict equals 0.68.

Consequently there appears to be a statistically significant link between an individual declaring that the established order should be changed by revolt and the same person taking some form of rebellious action. The size of the effect indicates that the majority are unwilling to undertake action, possibly for fear of reprisal, the presence of collective action problems or due to binding financial constraints.

3 Empirical strategy

We explain an individual's taste for revolt across a sample that includes 20 nations in 1981–1984, 36 nations in 1990–1992 and 45 nations in 1995–1997 by the level and change of average income in their country, the relative income category (in quintiles) of each respondent, religious membership and also a large number of other control variables. The results take advantage of both

cross-country and time series variation in the data. The probit regressions are of the form:

$$\begin{aligned} TASTE\ for\ REVOLT?_{ict} = {} & \alpha\ GDP\ per\ capita_{ct} + \beta\ \Delta GDP\ percapita_{ct} \\ & + \delta Personal\ Income\ Quintile_{ict} \\ & + \gamma Religious_{ict} + \lambda MICRO_{ict} + \eta_c + \varepsilon_{ict} \end{aligned} \quad (1)$$

where $TASTE\ for\ REVOLT?_{ict}$ is a dummy variable that takes the value 1 when individual, i, who lives in country c, and year t, agrees with the statement that *"The entire way our society is organised must be radically changed by revolutionary action"*. The variable $GDP\ per\ capita_{ct}$ is measured as per capita income, in 1992 US$, adjusted for purchasing power parity (in logarithms). $\Delta GDP\ per\ capita_{ct}$ is the first difference of $GDP\ per\ capita_{ct}$ (where $\Delta GDP\ per\ capita = log(1+growth\ rate) \approx growth\ rate$). These data come from the World Development Indicators of the World Bank. A person's income position within each a country is proxied by the variable, $Personal\ Income\ Quintile_{ict}$, which assigns an income quintile to each respondent. $Religious_{ict}$ enters both as a dummy indicating whether each person is religious, and also as a vector of the different religions to which he or she may belong. The main categories that we divide the sample into are "Christian", "Muslim" and "Other Religion".

The vector $MICRO_{ict}$ refers to a control set of personal characteristics that includes the respondents political orientation on a 1 (right-wing) to 10 (left-wing) point cardinal scale. We also control for their employment and marital status, age, gender and education level. See the appendix for a full description of the definitions. There are other variables that may have been omitted from our regressions and affect the taste for revolt. Consequently we include a set of country fixed effects, η_c, to control for unobserved heterogeneity. The (i.i.d) error term is ε_{ict}. Robust standard errors are computed to correct for potential heteroskedasticity and for potential correlation of the error term across observations that are contained within a cross-sectional unit in any given year [see Moulton (1986)]. Table 3 provides summary statistics.

4 The effect of money and religion on the taste for revolt

Table 4 reports the marginal probabilities from the probit regressions in equation (1). Column (1) investigates the role of income in explaining one's taste for revolt, proxied by the level of *GDP per capita* in the country, its change over the previous year and the income ranking of each individual. The coefficient on *GDP per capita* is not significantly different from zero, whereas the coefficient on the change in GDP is negative and significant at the 1 percent level. Its size indicates that a person living in a country that experiences a real growth rate of 10 percentage points per year is expected to have a 7.2 percentage points lower probability of desiring a revolution than if the growth rate was zero. The results also show a monotonically decreasing effect on having a revolutionary taste as one goes up the income ladder. Going from the bottom to the top income

Table 3 Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
TASTE for REVOLT?	107,985	0.10	0.30	0	1
Religious	100,519	0.83	0.38	0	1
Christian	99,837	0.65	0.48	0	1
Muslim	99,837	0.07	0.25	0	1
Other religion	99,837	0.10	0.30	0	1
Left	99,837	5.60	2.25	1	10
Unemployed	99,837	0.06	0.24	0	1
Age	80,770	40.6	15.9	18	95
Married	80,770	0.66	0.47	0	1
Male	80,770	0.50	0.50	0	1
Age finished school					
12–14 years old	80,770	0.18	0.38	0	1
15–18 years old	80,770	0.34	0.47	0	1
> 19 years old	80,770	0.46	0.50	0	1
GDP per capita (raw level)	97	11,043	6,803	748	25,644
GDP per capita (in logs)	97	8.96	0.86	6.62	10.15
Δ GDP per capita (in logs)	97	−4.7e-3	0.04	−0.11	0.10

These figures are based on World Values Survey data between 1981 and 1997 from the following 61 nations: Argentina, Armenia, Australia, Austria, Azerbaijan, Belgium, Bangladesh, Bulgaria, Bosnia-Herzegovina, Belarus, Brazil, Canada, Switzerland, Chile, China, Colombia, Czech Republic, Germany, Denmark, Dominican Republic, Spain, Estonia, Finland, France, United Kingdom, Georgia, Ghana, Croatia, Hungary, India, Ireland, Iceland, Italy, Japan, South Korea, Lithuania, Latvia, Moldova, Mexico, Macedonia, Nigeria, The Netherlands, Norway, Pakistan, Peru, Philippines, Poland, Puerto Rico, Portugal, Russia, Slovak Republic, Slovenia, Sweden, Turkey, Taiwan, Ukraine, Uruguay, United States, Venezuela, Serbia, South Africa

quintile lowers the probability of desiring revolt by 2.5 percentage points (at the 1 percent level). These results suggest that both economic growth and each person's income ranking within their country play important roles in shaping the taste for revolt in nations.

Columns (2–6) investigate the role of ideology. We also test whether there are differences depending on whether the respondent identifies herself as being Christian or Muslim. Column (2) includes the dummy variable, *Religious*, which takes the value 1 when an individual says that she belongs to a religion (and 0 otherwise). It also includes the previous set of variables measuring income. The coefficients on the income variables, $\Delta GDP\ per\ capita$ and *Personal Income Quintile*, remain similar in size and significance levels to their corresponding values in column (1). Rising up from the bottom to the top income quintile lowers the probability of desiring a revolt by 2.3 percentage points (at the 1 percent level). A 4 percentage point decrease in the GDP growth rate is predicted to increase the probability of an individual supporting a revolt by the same amount. Being religious has a negative effect on having a revolutionary taste (at the 1 percent level) lowering the probability by 2.7 percentage points. In other words, religious ideology appears to matter and the size of its effect is large in monetary terms.

Column (3) controls for whether the respondent is left-wing and their employment status. Leftists are on average less religious than rightists (correlation

Table 4 How tastes for revolt vary with money and religion: 61 Nations, 1981–1997, probit regressions

Dep. Variable: TASTE for REVOLT?	(1)	(2)	(3)	(4)	(5)	(6)
GDP per capita	0.052	0.031	0.030	0.028	0.028	0.039
	(0.039)	(0.032)	(0.032)	(0.030)	(0.031)	(0.039)
Δ GDP per capita	**−0.717****	**−0.572****	**−0.511****	**−0.538****	**−0.482****	**−0.369***
	(0.162)	**(0.148)**	**(0.130)**	**(0.136)**	**(0.119)**	**(0.181)**
Personal Income Quintile						
Second	−0.006	−0.004	−0.006	−0.004	−0.005	−0.005
	(0.004)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
Third	**−0.010**	**−0.010***	**−0.012****	**−0.010***	**−0.012****	**−0.011****
	(0.005)	**(0.004)**	**(0.004)**	**(0.004)**	**(0.004)**	**(0.004)**
Fourth	**−0.015***	**−0.014***	**−0.015****	**−0.013***	**−0.015****	**−0.015****
	(0.006)	**(0.005)**	**(0.004)**	**(0.005)**	**(0.004)**	**(0.005)**
Fifth (top)	**−0.025****	**−0.023****	**−0.024****	**−0.022****	**−0.023****	**−0.023****
	(0.006)	**(0.005)**	**(0.005)**	**(0.005)**	**(0.005)**	**(0.005)**
Religious		**−0.027****	**−0.018****			
		(0.006)	**(0.005)**			
Christian				**−0.033****	**−0.023****	**−0.019****
				(0.006)	**(0.005)**	**(0.004)**
Muslim				−0.006	−5.2e-4	0.008
				(0.019)	(0.019)	(0.021)
Other				3.0e-4	0.004	**0.021***
				(0.009)	(0.009)	**(0.011)**
Left			**0.010****		**0.010****	**0.009****
			(0.001)		**(0.001)**	**(0.001)**
Employment status						
Unemployed			**0.018****		**0.017****	**0.012***
			(0.005)		**(0.005)**	**(0.005)**
Self-employed			2.0e-4		−7.7e-4	0.004
			(0.004)		(0.004)	(0.005)
Retired			**−0.024****		**−0.024****	−0.002
			(0.004)		**(0.004)**	(0.006)
Student			**0.016****		**0.016****	0.004
			(0.004)		**(0.005)**	**(0.005)**
Housewife			**−0.018****		**−0.018****	**−0.008***
			(0.004)		**(0.004)**	**(0.004)**
Marital status						
Married						**−0.008****
						(0.003)
Divorced						0.003
						(0.005)
Separated						0.005
						(0.007)
Widowed						−0.006
						(0.006)
Age						**−7.7e-4****
						(1.3e-4)
Male						**0.019****
						(0.003)
Age Finished School						
12–14 years old						**−0.015***
						(0.007)
15–18 years old						−0.013
						(0.008)
> 19 years old						**−0.013**
						(0.008)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.09	0.08	0.09	0.08	0.10	0.11
Observations	107,985	100,519	99,837	99,837	99,837	80,770

All regressions are Probits. Marginal Probabilities reported. Standard errors in parentheses
Bold-face denotes significance at the 10% level; Single-starred bold at the 5% level; Double-starred bold at the 1% level. Standard errors are adjusted to take account of clustering

coefficient = −0.10) and are more supportive of revolt (correlation coefficient = 0.09). Consequently it is important to include this kind of measure of political orientation to control for potential omitted variable bias. An extreme Left-winger (i.e., *Left* = 10) is 9.0 percentage points more likely to support a revolt than an extreme right-winger (i.e., *Left* = 1). The effect of being religious remains negative and significant at the 1 per cent level although it now reduces revolutionary support by 1.8 percentage points [compared to 2.7 percentage points in column (2)]. Of the other controls, being unemployed or a student increase the probability of supporting revolt by 1.8 and 1.6 percentage points, respectively. Being retired or a housewife decreases the probability of supporting revolt by 2.4 and 1.6 percentage points, respectively. These four coefficients are all significant at the 1 percent level. The effects of our basic set of income variables remain similar to before.

Column (4) divides individuals into three separate religious categories, *Christian*, *Muslim* and *Other Religions*. Being Christian lowers the chance of supporting revolt by 3.3 percentage points, significant at the 1 percent level. For Muslims and people of other religious beliefs there is no difference compared to the non-religious group. We also estimate this specification separately for each country to see whether, for example, the effect of being Christian is fairly consistently negative across countries. Figure 1a shows a histogram of the 25 countries for which the coefficient on *Christian* was significant at least at the 10 per cent level. The effect is negative in all except four of these countries (large positive effects of being Christian on revolutionary support exist in Bangladesh and Macedonia). Figure 1b shows a similar figure for the (significant) coefficients on *Muslim*.

Column (5) also controls for how left-wing are respondents. The effect of being Christian is again negative at the 1 percent level of significance although its (absolute) size is now lower (i.e., 2.3 percentage points). There is a possibility that the different religions react differently depending on whether they are in the majority or the minority within their country. (For example, minority religious groups may believe that they are discriminated against). Table 5 reports the countries with more than 1 percent Muslims in our (random) survey sample. It lists the proportion of people who are Muslim and their corresponding level of revolutionary support. The majority Muslim countries are Bangladesh, Pakistan, Azerbaijan and Turkey. In the minority countries the average level of revolutionary support amongst Muslims is 10.7 percent, whereas in the majority countries the average is 20.3 percent. This could be due to unobserved heterogeneity. Consequently we also repeated our regression specifications (including fixed effects) with additional dummies for whether religious respondents (of any denomination) are in the minority. Using the column (3) specification gives a coefficient (standard error) on *Religious* of −0.03 (0.01) and on *Religious minority* (equal to one for minorities) of 0.02 (0.01). Consequently the regression evidence suggests that religious minorities may be more prone to support revolt (compared to majorities). When we split individuals into *Christian, Muslim* and *Other Religions* using the column (5) specification, the coefficients on all three of the minority dummies are positive, although not significant.

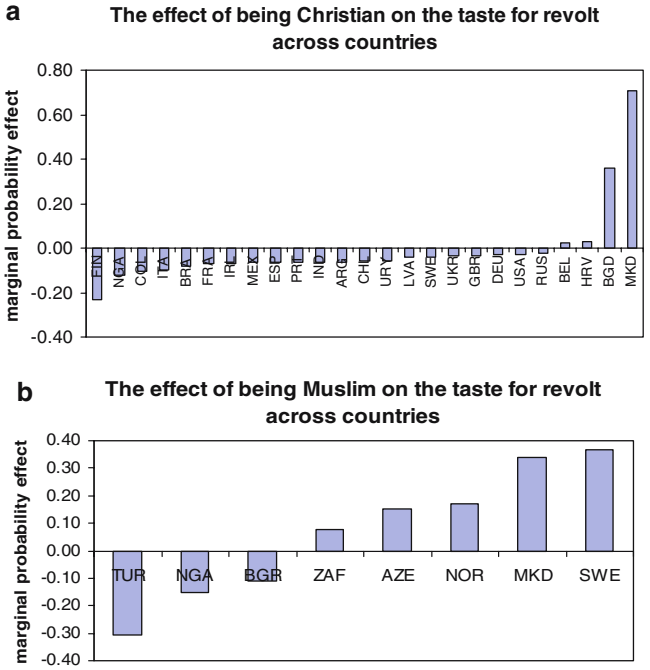

Fig. 1 **(a)** *FIN* Finland, *NGA* Nigeria, *COL* Colombia, *ITA* Italy, *BRA* Brazil, *FRA* France, *IRL* Ireland, *MEX* Mexico, *ESP* Spain, *PRT* Puerto Rico, *IND* India, *ARG* Argentina, *CHL* Chile, *URY* Uruguay, *LVA* Latvia, *SWE* Sweden, *UKR* Ukraine, *GBR* United Kingdom, *DEU* Germany, *USA* United States of America, *RUS* Russia, *BEL* Belgium, *HRV* Croatia, *BGD* Bangladesh, *MKD* Macedonia **(b)** *TUR* Turkey, *NGA* Nigeria, *BGR* Bulgaria, *ZAF* South Africa, *AZE* Azerbaijan, *NOR* Norway, *MKD* Macedonia, *SWE* Sweden

Column (6) expands the set of possible controls by including an individual's marital status, age, gender and level of education, although adding these extra variables leads to a substantial drop in the number of observations (down from 107,985 in column (1) to 80,770 for the present regression). Being married and older reduces one's taste for revolt. On the other hand, being male increases the chances by 1.9 percentage points (i.e., Fearon and Laitin's (2001) observation that young men are more likely to join rebellions appears to be a stylised fact of these survey data). Compared to having no or primary level education, there is not a monotonic effect of higher levels of education in reducing the support for revolt. Being educated up to 12–14 years of age has a negative effect (at the 1 percent level) and being in higher education ($\geq$19 years old) has a similar sized effect (at the 10 percent level). Intermediate levels of education do not appear to play an important role.[11] The results from this last regression are obtained after controlling for 78 variables (including fixed effects).

[11] Krueger and Malečkovà (2003) conduct a statistical analysis of the determinants of participation in Hezbollah militant activities in Lebanon. Their evidence suggests that having a living standard above the poverty line or a secondary school or higher education is positively associated with participation in Hezbollah.

Table 5 Revolutionary tastes in countries with more than 1 percent Muslims in the sample

Country	Percentage of all people with a Revolutionary Taste	Percentage of Muslims in the Sample	Percentage of Muslims with a Revolutionary Taste
Australia	5.2	1.3	0
Bulgaria 1997	6.6	11.8	1.5
Finland	2.2	2.5	0
Slovenia	10.4	1.3	5.0
South Africa 1996	12.1	2.1	1.8
Bulgaria 1990	22.1	6.6	3.9
Bosnia-Herzegovina	15.4	27.3	10.1
Croatia	4.8	1.2	0
Georgia	9.4	4.0	13.2
Ghana	13.3	5.3	0
India	14.5	8.5	12.9
Macedonia	12.4	24.3	31.9
Nigeria	28.1	24.8	25.7
Russia	13.9	2.6	9.6
South Africa 1990	15.9	10.3	18.3
Taiwan	2.9	2.8	2.5
Bangladesh	10.8	85.9	10.5
Pakistan	29.1	81.9	28.7
Turkey	18.7	95.6	17.0
China	5.2	1.3	7.7
Serbia	12.8	5.8	12.7
South Africa 1982	16.0	5.7	46.0
Azerbaijan	23.5	91.6	24.9

These figures are based on World Values Survey data between 1981 and 1997 for 61 nations

As a further check on the robustness of the results we also tried controlling for the effects of income inequality using the Deininger and Squire (1996) data set. Due to limited availability of the "high quality" series of Gini coefficients for the countries and years in our sample, we could only exploit 19 percent of the size of the original sample, providing us with too few degrees of freedom. If we linearly interpolate the available inequality data, the coefficient on the Gini coefficient is positive and significant at the 10 percent level (using 40,011 observations of individuals). In other words, there is evidence that lower inequality also reduces revolutionary tastes. The coefficient on $\Delta GDP\ per\ capita$ remains of similar size and significance to its previous levels and there is still a monotonically declining effect on wanting a revolt as one goes up the income quintiles. Being religious also retains it negative and significant effect.

5 Conclusion

Revolts are hard to explain. One view is that preferences for revolt stem from a sense of grievance associated with feelings of social injustice, unfairness or exploitation of a group of people. However another view is that revolutionary tastes arise simply because of expected monetary gains for the victors. Until

recently it has been hard to find data that could shed some light on these issues. The present paper is an attempt to do so by using surveys that ask people directly whether they want existing structures to be overturned by revolutionary action.

The specific question that we address is the relative importance of money versus religion in determining the tastes for revolt in society. We use data on over 100,000 individuals living in 61 nations between 1981 and 1997 and first check that their preferences are correlated with several different observable measures of conflict in their respective countries. After controlling for personal characteristics and country fixed effects, being higher in the income distribution within a country and experiencing higher economic growth both reduce revolutionary support. Religion plays an important role and its effect is large when quantified in monetary terms. Religious people have between 1.8 and 2.7 percentage points lower chance of wanting to revolt (similar in size to a jump from the bottom to top income quintile). It corresponds to adding 4 percentage points onto the growth rate. This effect is concentrated amongst people who identify themselves as being Christian. By comparison, Muslims have similar chances of desiring a revolt to non-religious people.

A Appendix

A.1 Survey descriptions

World values survey and European values survey (1981–1984, 1990–1992, 1995–1997)

The Combined World Values Survey is produced by the Institute for Social Research, Ann Arbor, MI, USA. The series is designed to enable a cross-national comparison of values and norms on a wide variety of norms and to monitor changes in values and attitudes across the globe. Both national random and quota sampling were used. All of the surveys were carried out through face-to-face interviews, with a sampling universe consisting of all adult citizens, aged 18 and older, across over 60 nations around the world.

These surveys are being expanded to provide a more complete cross-sectional, as well as time series, dimension. The 1981–1983 survey covered 22 independent countries plus surveys in Northern Ireland and Tambov oblast of the Russian republic; the 1990–1993 survey covered 42 independent countries plus surveys in Northern Ireland, and Greater Moscow; the 1995–1997 survey covered 53 independent countries, plus surveys in Puerto Rico, Tambov oblast, Montenegro, the Andalusian, Basque, Galician and Valencian regions of Spain and a pilot survey in Ghana. In all, 64 independent countries have been surveyed in at least one wave of this investigation. These countries include almost 80 percent of the world's population.

The full set of countries covered by the survey is as follows: Argentina, Armenia, Australia, Austria, Azerbaijan, Belgium, Bangladesh, Bulgaria, Bosnia-Herzegovina, Belarus, Brazil, Canada, Switzerland, Chile, China,

Colombia, Czech Republic, Germany, Denmark, Dominican Republic, Spain, Estonia, Finland, France, United Kingdom, Georgia, Ghana, Croatia, Hungary, India, Ireland, Iceland, Italy, Japan, South Korea, Lithuania, Latvia, Madagascar, Mexico, Macedonia, Mongolia, The Netherlands, Norway, Pakistan, Peru, Philippines, Poland, Puerto Rico, Portugal, Russia, Slovak Republic, Slovenia, Sweden, Turkey, Taiwan, Ukraine, Uruguay, United States of America, Venezuela, South Africa, Nigeria, Romania, Moldova and Serbia (ex-Yugoslavia).

A.2 Data Definitions

TASTE for REVOLT?: A dummy variable that equals 1 when the survey respondent answers that "The entire way our society is organised must be radically changed by revolutionary action", and equals 0 when the respondent answers that either "Our society must be gradually improved by reforms" or "Our present society must be valiantly defended against all subversive forces" [from the World Values Survey (1980–97)].

GDP per capita: GDP per capita, with Purchasing Power Parity adjustment, in constant 1992 US$, and measured in logs. The source is the World Development Indicators of the World Bank.

Δ*GDP per capita*: The first difference of GDP per capita (with PPP adjustment, in constant 1992 US$). The source is the World Development Indicators of the World Bank.

Personal Income Quintile: This heading refers to a set of 4 dummy variables which take the value 1 depending on which income quintile the respondent's family income belongs to. The base category is the lowest income quintile.

Religious: A dummy variable that equals 1 when the survey respondent answers yes to the question "Do you belong to a religious denomination? If yes, which one?". The specific categories of religion listed in the remainder of the question were "1. Roman Catholic 2. Protestant 3. Orthodox 4. Jews 5. Muslim 6. Hindu 7. Buddhist 8. Other". The base category is people who answer "0. Not a member" or "No religious denomination".

Christian: A dummy variable that equals 1 when the survey respondent declares herself as belonging to one the following three religious groups: "1. Roman Catholic 2. Protestant 3. Orthodox".

Muslim: A dummy variable that equals 1 when the survey respondent declares herself as belonging to "5. Muslim".

Other religion: A dummy variable that equals 1 when the survey respondent declares herself as belonging one of the following religious groups "4. Jews 5. Muslim 6. Hindu 7. Buddhist 8. Other".

Left: A variable measured on a 1 to 10 point cardinal scale that is generated from the answer to the World Values survey question that asks: "In political matters, people talk of 'the left' and 'the right'. How would you place your views on this scale, generally speaking? 1 (left) 2 3 4 5 6 7 8 9 .. 10 (Right). *Left* rescales these answers so that 1 equals "right" and 10 equals "left".

Employment status: A set of dummy variables taking the value 1 depending on the respondent's employment status: "Unemployed", "Self-employed", "Retired", "Student", "Housewife" or "Other". The base category is "Employed".

Marital status: A set of dummy variables taking the value 1 depending on the respondent's marital status: "Married", "Divorced", "Separated" or "Widowed". The base category is "Never Married".

Age: The respondent's age in years.

Male: A dummy variable taking the value 1 if the respondent is male and 0 otherwise.

Age finished school: This heading refers to a set of dummy variables which take the value 1 depending on the age at which the respondent finished full-time education: up to "12–14 years old", "15–18 years old" or up to "at least 19-years-old". The base category is education up to, but not including, 12-years-old.

References

Alt J (1979) The politics of economic decline. Cambridge University Press, New York

Barro RJ, McCleary RM (2002) Religion and political economy in an international panel, NBER Working Paper No. 8931

Becker G, Stigler J (1977) De Gustibus Non Est Disputandum. Am Econ Rev 67(2):76–90

Berman E (2000) Sect, subsidy, and sacrifice: an economist's view of ultra-orthodox Jews. Q J Econ 115(3):905–953

Coleman J (1990) Foundations of Social theory. Harvard University Press, MA

Collier P, Hoeffler A (2001) Greed and grievance in civil war. World Bank Policy Research Paper#2355

Doyle MW, Sambanis N (2000) International peacebuilding: a theoretical and quantitative analysis. Am Polit Sci Rev 94(4):779–802

Fearon, James and David Laitin (2001) quoted in "What Terrorists Want: Is there a Better Way to Defeat Al Qaeda?" by Nicholas Lemann, The New Yorker
Fearon, James, David Laitin (2003) Ethnicity, insurgency and civil war. Am Polit Sci Rev 97(1):75–90
Francisco R (1993) Theories of protest and the revolutions of 1989. Am J Polit Sci 37(3):663–680
Glaeser E, Glendon S (1997) The demand for religion. Harvard University mimeo
Guiso L, Sapienza P, Zingales L (2003) People's opium? religion and economic attitudes. J Monet Econ 50:225–82
Gurr T, Moore W (1997) Ethnopolitical rebellion: a cross-sectional analysis of the 1980s with risk assessments for the 1990s. Am J Polit Sci 41(4):1079–1103
Hibbs D (1982) On the demand for economic outcomes: macroeconomic performance and mass political support in the United States, Great Britain and Germany. J Polit 43:426–461
Hirshleifer J (1995) Theorizing about conflict. In: Hartley K, Sandler T (eds) Handbook of defense economics, vol 1, Elsevier, Amsterdam, pp 165–192
Iannaccone LR (1992) Sacrifice and stigma: reducing free-riding in cults, communes, and other collectives. J Polit Econ 100(2):271–291
Iannaccone LR (1998) Introduction to the economics of religion. J Econ Lit vol 36(3):1465–1495
ICPSR (2000), World values surveys and European values surveys, 1981–1984, 1990–1993, and 1995–1997 [computer file]. Colchester, Essex: UK Data Archive [distributor], 21 February 2000. SN: 4366
Knack S, Keefer P (1997) Does social capital have an economic payoff? a cross-country investigation. Q J Econ 112(4):1251–1288
Krueger A, Maleckova J (2003) Education, poverty, political violence and terrorism: is there a causal connection?. J Econ Perspect 17(4):119–44
Kuran T (1991) The East European revolution of 1989: is it surprising that we were surprised? Am Econ Rev 81(2):121–125
Lohmann S (1994) The dynamics of informational cascades: the monday demonstrations in Leipzig, East Germany, 1989–91. World Polit 47:42–101
MacCulloch R (2003) The taste for revolt. Econ Lett 79:7–13
Marx K (1844) Contribution to the critique of Hegel's Philosophy of right. in Deutsch-Franzosische Jahrbucher, Paris
Marx K (1887) Das Kapital. Progress Publishers, Moscow
Miguel T, Shanker S, Ernest S (2004) Economic shocks and civil conflict: an instrumental variables approach. J Polit Econ 112(4):725–753
Montalvo J, Reynal-Querol M (2002) The effect of ethnic and religious conflict on growth. PRPES Working Paper No. 15, Wheatherhead Center for International Affairs
Moulton B (1986) Random group effects and the precision of regression estimates. J Econo 32:385–397
Muller E (1985) Income inequality, regime repressiveness and political violence. Am Sociol Rev 50(1):47–61
Olson M (1965) The logic of collective action. Harvard University Press, Cambridge
Raines J (ed) (2002) Marx on religion. Temple University Press, Philadelphia
Roemer J (1998) Why the poor do not expropriate the rich: an old argument in new garb. J Public Econ 70:399–424
Sacerdote B, Glaeser E (2002) Education and religion. NBER Working Paper No. 8080
Sambanis N (2001) A review of recent advances and future directions in the quantitative literature on civil war. Def Peace Econ 13(2):215–243
Sigelman L, Simpson M (1977) A cross-national test of the linkage between economic inequality and political violence. J Conflict Resolut 21:105–128
Smith A (1776) An inquiry into the nature and causes of the wealth of nations. Modern Library New York (1965)
Weede E (1981) Income inequality, average income and domestic violence. J Conflict Resolut 25(4):639–654