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Work Ethic, Social Ethic, No Ethic: Measuring the Economic Values of Modern Christians*

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Abstract

Benito Arruñada finds evidence of a distinct Protestant social ethic in the ISSP's 1998 Religion II Survey (*Economic Journal* 2010; 120: 890-918). We replicate Arruñada's results using his broad definition of Protestantism and our new narrow definition, which includes only those ascetic denominations that Max Weber singled out for possessing a strong capitalist work ethic. We then extend this analysis to the ISSP's 2008 Religion III Survey, the most recent comparable international questionnaire on religious attitudes and religious change. We find no evidence of a Calvinist work ethic, and suggest that Arruñada's Protestant social ethic continues into the twenty-first century.

JEL Codes: J24, Z12.

Keywords: work ethic, social ethic, international social survey programme, replication.

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1. Introduction

How do religious beliefs, cultural norms and personal values influence decision-making in society? Max Weber (2011) argues that Protestantism held a distinctive role in the rise of modern capitalism. Central to Weber's century-old thesis is the difference between Protestants and Catholics in terms of attitudes towards work, thrift and self-improvement.¹ Recent studies have tested Weber's "work ethic" hypothesis in historical settings (e.g. Becker and Woessmann, 2010; Cantoni, 2015; Blum and Strebel, 2016), but results remain conflicted and controversial. Starting with Barro and McCleary (2003) and Guiso et al. (2003), the use of cross-country surveys to help disentangle institutional from religion-related effects has become a popular social research methodology, one which helps to address whether the economic values of Protestants and Catholics still differ today.² Arruñada (2010) is one such study, and is particularly interesting as it tests an alternative hypothesis involving a Protestant "social ethic".³

Arruñada's article, the subject of the present note, explores the idea that Protestants exert a greater effort of trust towards their Church, education system and government.⁴ He pits this against a simplified interpretation of Weber's work ethic: Protestants are more willing to work, and to work longer hours, than their Catholic peers. He tests these hypotheses using the results of the International Social Survey Programme's (ISSP) Religion II Survey, conducted in 1998, which asked respondents located in 32 countries a series of questions useful for the social scientific study of religion. Arruñada's results indicate that Protestants indeed worked more hours than Catholics; however, after controlling for fixed country effects, this difference disappears. He argues instead that his findings are consistent with the idea that Protestants monitor one another's conduct more carefully, and support the political and legal institutions that facilitate this; Protestants promote a social rather than a work ethic.

We revisit Arruñada's findings in two ways: (1) we replicate a subset of his results in a narrow sense, to the best of our ability; and (2) we extend his analysis to 2008, the most recent year for which the ISSP has conducted its survey of religious attitudes and religious change.⁵ We repeat our analysis for both a strict Calvinist⁶ and an all-encompassing definition of

¹ Weber's Protestant ethic hypothesis concerns the direct content of Protestant teachings as much as the overall Protestant lifestyle, including – in his work on Protestant sects – followers' economic interaction within exclusive social organisations (Kalberg, in: Weber, 2011).

² Social survey data have not solved the controversies: Durlauf et al. (2012) find that Barro and McCleary's (2003) results cannot be replicated with Bayesian methods, and so conclude 'there is no evidence that religious beliefs [...] have a direct robust relationship with economic growth' (p. 1074).

³ Arruñada (2010) has been cited 39 times in Crossref and 143 times in Google Scholar (July 2016).

⁴ Like La Porta et al. (1997), Arruñada's focus is on Putnam's (1993) idea that hierarchical religions such as Catholicism discourage interpersonal trust, and therefore hinder social and market interaction.

⁵ We only replicate results which can be extended to 2008. Where multiple replicable proxies for a hypothesis are available, we choose to replicate and extend only a subset in order to maintain brevity.

⁶ Weber (2011) identifies Calvinists in particular as possessing a distinctive work ethic. He argues this stems from their dogma of predestination, which encourages worldly activity as a means of gaining the self-confidence to be counted among the elect rather than the reprobate.

Protestantism.⁷ Our results, alongside Arruñada's predictions and findings, are summarised in Table 1.⁸ While we conclude that the precise definition of Protestantism does not greatly influence the results for 1998, we argue that Arruñada's findings are strengthened by our analysis of the 2008 survey wave. Catholics now exert notably less confidence in their political and legal institutions than Protestants – a result Arruñada predicted, but which was not borne out in the 1998 data.

2. Data and empirical strategy

The ISSP 1998 survey contains 39,034 observations. Alongside the demographic characteristics of all respondents, the dataset includes questions on feelings, values, religious beliefs and practices, social habits and opinions. Like Arruñada, we drop observations on individuals with missing values and non-Christian affiliations. We adopt two definitions of Protestantism: a strict Calvinist definition that constitutes just 1,212 individuals;⁹ and a broader definition that includes 6,604.¹⁰ Table 2 provides summary statistics for variables defined exactly as in Arruñada (2010: 910-914) for our two Protestant definitions,¹¹ alongside statistics taken directly from Arruñada (2010: 903-904) for comparison.¹²

We matched the ISSP's 2008 questions onto the 1998 set and have sufficient data to extend at least five of Arruñada's models. A full list of variable definitions across both survey waves is reported in the online supplementary materials (Table S1). Again, we adopt Calvinist (1,262 individuals) and broad (9,573) definitions of Protestantism. Summary statistics are reported in Table 2, with the difference in means between 1998 and 2008 reported in the supplementary materials (Table S2). The proportion of respondents in work has increased by 11 percentage points, while the average number of working hours worked per week has decreased by 1.5 hours. Interestingly, while working Protestants worked a 39-hour week in 2008, their Catholic counterparts worked 40-hour weeks. The difference is starker for Calvinists. This may, of

⁷ This broader definition is probably closest to that used in Arruñada (2010).

⁸ We also report those results from Arruñada (2010) that we did not replicate and extend (see n. 5).

⁹ The strict Calvinist or ascetic definition constitutes only those denominations that can trace their roots to John Calvin's teachings: Presbyterian (ISSP 1998 code 43); Congregational, excluding Slovakia (45); Free Church, excluding Norway and Denmark (48); Other Protestant State Churches, including only the Netherlands, Slovakia, Hungary and Switzerland (49); United Church, excluding Latvia (55); and Free Presbyterians (60).

¹⁰ The broad all-encompassing definition constitutes: Baptists (ISSP 1998 code 40); Methodists (41); Lutherans (42); Presbyterians (43); Anglicans (44); United Reformed Church (45); Unitarians (47); Free Church (48); Other Protestant State Churches (49); United Church (55); Free Presbyterians (60); Brethren (61); Pentecostal (62); Salvation Army (64); Seventh-day Adventists (65); Hussites (67); Non-Denominational (91); and Other Christians (92).

¹¹ As in Arruñada (2010), we define Catholics as the sum of Roman Catholics (ISSP 1998 code 10) and Greek Catholics (11). While the definition of Catholicism remains identical across samples, variable standardisation means summary statistics sometimes differ.

¹² Arruñada (2010) counts an additional 139 Protestants and 58 Catholics. We attribute this disparity to our decision to exclude respondents hailing from Bulgaria or Canada, a choice we make because these countries were not surveyed in both 1998 and 2008.

course, be due to common changes in working practices that happen to correlate with the denomination of countries' majority religions. Regression analysis is therefore necessary to control for such fixed effects.

Indeed, our empirical strategy, which is identical to Arruñada (2010), is to estimate the following equations:

$$\begin{aligned}
 Y_i = & \alpha_0 + \alpha_{0c}Catholic + \beta_1Faith + \beta_2Religious\ upbringing + \beta_3Education \\
 & + \beta_{1c}(Catholic \times Faith) \\
 & + \beta_{2c}(Catholic \times Religious\ upbringing) \\
 & + \beta_{3c}(Catholic \times Education) + \sum_t(\beta_t Control_m\ variables) \\
 & + \sum_r(\beta_r Control_m\ dummies)
 \end{aligned} \tag{1}$$

where each dependent variable, Y_i , represents a value from five variables constructed from survey questions present in both datasets: two relating to the Protestant work ethic hypothesis (*Positive working hours* and *Working hours of workers*), and three to the social ethic hypothesis (*Religious practice*, *Trust institutions* and *Family importance*). The coefficient α_{0c} represents the difference attributed to being Catholic rather than Protestant. *Faith*, *Upbringing* and *Education* have been standardised and measure attitudes relative to the average person in the sample. With Protestantism as the omitted category, the interaction terms measure the differential impact of Catholic *Faith*, *Upbringing* and *Education*.

Our replication of Arruñada's results, using both the strict Calvinist and broader definitions of Protestantism, is reported in Table 3, Panel (a), alongside those taken from Arruñada (2010: 905) for comparison. Our extension, using the ISSP's 2008 survey wave, is reported in Panels (a) of Tables 4 and 5. As in Arruñada (2010), the overall effect of "being Catholic" is estimated in a simplified version of equation (1), in which *Faith*, *Upbringing* and *Education* and their interactions are excluded, but the demographic and country controls left in. The results of these exercises are reported in Panels (b) of Tables 3, 4 and 5. A comparison of residual heterogeneity between Catholics and Protestants is reported the supplementary materials (Table S3).

3. Results and robustness

Following Weber's work ethic hypothesis, Arruñada predicts that fewer Catholics should be in work, and should work fewer hours. His results suggest this is not the case. Our results confirm his findings for 1998 (models 1 and 2) and show they also hold for 2008 (models 6, 7, 11 and 12). A comparison of residual heterogeneity in these regressions (Table S3) suggests Calvinists have become more homogenous with respect to their working practices between 1998 and 2008.

Predictions relating to Arruñada's alternative social ethic hypothesis are in three parts: (1) Catholics exert less effort in mutual social control than Protestants; (2) they support political and legal institutions less; and (3) they hold less homogenous values. In the first (models 3, 8 and 13), measured by Arruñada as the relationship between *Education* and *Religious practice*,

predictions match results in all cases: the difference between Catholics and Protestants in 1998 is -0.091 standard deviations for Arruñada, -0.114 for our Calvinist definition and -0.078 for all Protestants; and in 2008 it is -0.099 for Calvinists and -0.071 for all Protestants. This result suggests Catholics consistently exerted less social control than their Protestant peers. The difference in the simplified regressions in Panels (b) switches sign for all Protestants in 2008 (model 13); Catholics now practice less than Protestants. Comparing residual heterogeneity (Table S3) suggests Protestants have become less homogenous with respect to their religious practices in the decade between the two survey years.

In the second social ethic hypothesis (models 4, 9 and 14), measured here in the coefficient of *Catholic* in a regression of *Trust institutions*, our findings confirm those of Arruñada for 1998: a result that is not statistically significant. However, our results are quite different for 2008: Arruñada's original unrealised prediction of a statistically significant negative coefficient is here realised for the broader definition of Protestantism, both in Panel (a) and the simplified Panel (b); Catholics now have less confidence than Protestants in the institution of parliament and in their courts and legal system.

The third social ethic hypothesis (models 5, 10 and 15) is again read in the coefficient of *Catholic*, this time in a regression of *Family importance*. Our results are almost identical to those of Arruñada for 1998, and persist into 2008: statistically significant and positive; Catholic support for the family, defined here as their intolerance of premarital sex, remains greater than that of Protestants.

4. Discussion and conclusion

We have successfully replicated Arruñada (2010) in a narrow sense, extended his results to a much stricter definition of Protestantism, and shown that an analysis of the ISSP's newest religion dataset yields compatible findings. We suggest our analysis of Calvinists, the ascetic denomination to which Weber ascribed unique capitalist economic values, has strengthened Arruñada's findings. Like Protestants more generally, modern Calvinists display little evidence of having a different work ethic than their Catholic peers. But our analysis of values towards the rule of law suggests one significant change between 1998 and 2008: Protestants placed more confidence in civic institutions in 2008, a result predicted but not found by Arruñada for 1998. Understanding the reason for this temporal change should be the subject of further enquiry.

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Data sources

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- International Social Survey Programme 2008: Religion III (ISSP 2008). Includes codebook. Available at: <http://www.issp.org/>.

Table 1: Summary of predictions and results, including those not replicated and extended in this study

Hypotheses	Variables and tests	Proxies used	Available for 1998 and 2008?	Included in analysis?	Catholics show more (+) or less (-) of the corresponding indicator					
					Predictions	Results				
						Arruñada	ISSP 1998		ISSP 2008	
				Calvinist	Broad	Calvinist	Broad			
Work ethic:										
<i>Catholics work less and less effectively than Protestants</i>	Willingness to work and work effort	<i>Working hours</i>	Yes	No	-	n. s.				
		<i>Positive working hours</i>	Yes	Yes	-	n. s.	n. s.	n. s.	n. s.	n. s.
		<i>Working hours of those working</i>	Yes	Yes	-	n. s.	n. s.	n. s.	n. s.	n. s.
	Earthly achievements	<i>Success index</i>	No	No	-	n. s.				
Social control:										
<i>Catholics exert less effort in mutual social control than Protestants</i>	Willingness to exert effort in social enforcement Different impact of education for Catholics and Protestants	<i>Volunteer index</i>	No	No	-	-				
		Relationship between <i>Education</i> and: <i>Religious practice</i>	Yes	Yes	-	-	-	-	-	-
		<i>Trust Church</i>	Yes	No	-	-				
Rule of law:										
<i>Catholics support political and legal institutions less than Protestants</i>	Willingness to support political institutions Willingness to cooperate with the law Confidence in political and legal institutions	<i>Tolerance of tax fraud</i>	No	No	+	+				
		<i>Cover up for friends</i>	No	No	+	+				
		<i>Trust institutions</i>	Yes	Yes	-	n. s.	n. s.	n. s.	n. s.	-
Homogenous values:										
<i>Catholics hold less homogenous values than Protestants</i>	Importance of the family between Catholics and Protestants	<i>Family importance</i>	Yes	Yes	+	+	+	+	+	+
		<i>Trust strangers</i>	Yes	No	-	-				

Notes: n. s. = not significance at standard levels.

Sources: Arruñada (2010: 898); and own calculations.

Table 2: Summary statistics, Arruñada/ISSP 1998 vs. ISSP 2008 (using Calvinist and Broad definitions of Protestantism)

Variable	Arruñada			Calvinist						Broad					
	ISSP 1998			ISSP 1998			ISSP 2008			ISSP 1998			ISSP 2008		
	Obs.	Mean	St. Dev.	Obs.	Mean	St. Dev.	Obs.	Mean	St. Dev.	Obs.	Mean	St. Dev.	Obs.	Mean	St. Dev.
Catholics and Protestants:															
<i>Positive working hours</i>	19,246	0.583	0.493	13,715	0.480	0.500	20,384	0.598	0.490	19,107	0.497	0.500	28,718	0.611	0.488
<i>Working hours of workers</i>	9,614	40.981	13.721	6,587	41.817	13.934	12,184	40.064	14.107	9,497	41.171	13.576	17,533	39.706	13.698
<i>Religious practice</i>	18,553	0.000	1.000	13,272	0.000	1.000	19,706	0.000	1.000	18,393	0.000	1.000	27,694	0.000	1.000
<i>Trust institutions</i>	18,064	0.000	1.000	12,747	0.001	1.000	19,315	0.000	1.000	18,246	0.000	1.000	27,320	0.000	1.000
<i>Importance of family</i>	18,158	1.503	1.209	12,828	1.423	1.218	19,137	1.435	1.284	17,964	1.490	1.214	27,129	1.477	1.274
<i>Catholic</i>	19,246	0.653	0.476	13,715	0.912	0.284	20,384	0.938	0.241	19,107	0.654	0.476	28,718	0.666	0.472
<i>Faith</i>	19,246	0.000	1.000	13,715	0.000	1.000	20,384	0.000	1.000	19,107	0.000	1.000	28,718	0.000	1.000
<i>Religious upbringing</i>	19,246	0.000	1.000	13,715	0.000	1.000	20,384	0.000	1.000	19,107	0.000	1.000	28,718	0.000	1.000
<i>Education</i>	19,246	0.000	1.000	13,715	0.000	1.000	20,384	0.000	1.000	19,107	0.000	1.000	28,718	0.000	1.000
<i>Women</i>	19,246	0.557	0.497	13,715	0.558	0.497	20,384	1.568	0.495	19,107	0.557	0.497	28,718	1.568	0.495
<i>Age</i>	19,246	0.000	1.000	13,715	-0.001	1.000	20,384	0.000	1.000	19,107	-0.001	1.000	28,695	0.000	1.000
<i>Age squared</i>	19,246	0.000	1.000	13,715	-0.001	1.000	20,384	0.000	1.000	19,107	-0.001	1.000	28,695	0.000	1.000
<i>Widowed</i>	19,246	0.093	0.291	13,715	0.095	0.293	20,384	0.093	0.291	19,107	0.096	0.294	28,718	0.086	0.281
<i>Divorced & seperated</i>	19,246	0.065	0.247	13,715	0.058	0.234	20,384	0.090	0.286	19,107	0.066	0.248	28,718	0.092	0.289
<i>Single</i>	19,246	0.215	0.411	13,715	0.215	0.411	20,384	0.280	0.449	19,107	0.218	0.413	28,718	0.285	0.451
Protestants:															
<i>Positive working hours</i>	6,685	0.658	0.474	1,212	0.448	0.497	1,262	0.616	0.486	6,604	0.523	0.500	9,581	0.638	0.480
<i>Working hours of workers</i>	3,520	39.057	13.510	543	37.484	15.789	778	36.814	13.611	3,453	39.360	13.182	6,117	38.614	12.826
<i>Religious practice</i>	6,348	-0.243	1.084	1,135	-0.116	1.150	1,202	-0.337	1.204	6,256	-0.214	1.096	9,175	-0.132	1.119
<i>Trust institutions</i>	6,360	0.109	0.954	1,137	0.181	0.866	1,209	0.199	0.874	6,395	0.030	0.956	9,199	0.213	0.969
<i>Importance of family</i>	6,392	1.643	1.169	1,143	1.435	1.140	1,188	1.604	1.157	6,279	1.615	1.182	9,166	1.580	1.232
<i>Catholic</i>	6,685	0.000	0.000	1,212	0.000	0.000	1,262	0.000	0.000	6,604	0.000	0.000	9,581	0.000	0.000
<i>Faith</i>	6,685	-0.181	1.033	1,212	-0.063	1.025	1,262	-0.138	0.994	6,604	-0.171	1.038	9,581	-0.090	1.054
<i>Religious upbringing</i>	6,685	-0.498	1.070	1,212	-0.366	1.101	1,262	-0.455	1.195	6,604	-0.508	1.051	9,581	-0.433	1.083
<i>Education</i>	6,685	0.171	0.946	1,212	0.175	0.937	1,262	0.058	1.025	6,604	0.169	0.950	9,581	0.166	1.033
<i>Women</i>	6,685	0.552	0.497	1,212	0.546	0.498	1,262	1.548	0.498	6,604	0.552	0.497	9,581	1.565	0.496
<i>Age</i>	6,685	0.055	1.000	1,212	0.111	0.975	1,262	0.215	1.005	6,604	0.023	0.998	9,573	0.042	0.979
<i>Age squared</i>	6,685	0.053	1.016	1,212	0.097	0.998	1,262	0.212	1.053	6,604	0.021	1.010	9,573	0.033	0.982
<i>Widowed</i>	6,685	0.091	0.288	1,212	0.092	0.290	1,262	0.111	0.314	6,604	0.096	0.295	9,581	0.076	0.264
<i>Divorced & seperated</i>	6,685	0.082	0.275	1,212	0.069	0.254	1,262	0.103	0.304	6,604	0.082	0.275	9,581	0.098	0.298
<i>Single</i>	6,685	0.211	0.408	1,212	0.210	0.407	1,262	0.220	0.415	6,604	0.221	0.415	9,581	0.286	0.452
Catholics:															
<i>Positive working hours</i>	12,561	0.543	0.498	12,503	0.483	0.500	19,122	0.596	0.491	12,503	0.483	0.500	19,137	0.597	0.491
<i>Working hours of workers</i>	6,094	42.093	13.720	6,044	42.206	13.690	11,406	40.286	14.113	6,044	42.206	13.690	11,416	40.290	14.109
<i>Religious practice</i>	12,205	0.126	0.937	12,137	0.010	0.984	18,504	0.022	0.981	12,137	0.110	0.928	18,519	0.065	0.929
<i>Trust institutions</i>	11,686	-0.060	1.019	11,610	-0.017	1.011	18,106	-0.013	1.006	11,851	-0.016	1.023	18,121	-0.108	0.998
<i>Importance of family</i>	11,766	1.426	1.224	11,685	1.422	1.226	17,949	1.424	1.291	11,685	1.422	1.226	17,963	1.424	1.291
<i>Catholic</i>	12,561	1.000	0.000	12,503	1.000	0.000	19,122	1.000	0.000	12,503	1.000	0.000	19,137	1.000	0.000
<i>Faith</i>	12,561	0.096	0.969	12,503	0.006	0.997	19,122	0.009	1.000	12,503	0.090	0.967	19,137	0.045	0.968
<i>Religious upbringing</i>	12,561	0.265	0.849	12,503	0.035	0.983	19,122	0.030	0.978	12,503	0.268	0.858	19,137	0.217	0.879
<i>Education</i>	12,561	-0.091	1.016	12,503	-0.017	1.004	19,122	-0.004	0.998	12,503	-0.090	1.014	19,137	-0.083	0.972
<i>Women</i>	12,561	0.559	0.496	12,503	0.559	0.497	19,122	1.569	0.495	12,503	0.559	0.497	19,137	1.569	0.495
<i>Age</i>	12,561	-0.029	0.999	12,503	-0.012	1.001	19,122	-0.014	0.998	12,503	-0.014	1.000	19,122	-0.021	1.009
<i>Age squared</i>	12,561	-0.028	0.990	12,503	-0.010	0.999	19,122	-0.014	0.995	12,503	-0.013	0.994	19,122	-0.017	1.009
<i>Widowed</i>	12,561	0.094	0.292	12,503	0.095	0.294	19,122	0.092	0.289	12,503	0.095	0.294	19,137	0.092	0.289
<i>Divorced & seperated</i>	12,561	0.056	0.230	12,503	0.057	0.232	19,122	0.089	0.285	12,503	0.057	0.232	19,137	0.089	0.285
<i>Single</i>	12,561	0.217	0.412	12,503	0.216	0.411	19,122	0.284	0.451	12,503	0.216	0.411	19,137	0.284	0.451

Sources: Arruñada (2010: 903-904); and own calculations in Stata using ISSP Research Group (1998), Religion II Survey and ISSP Research Group (2008), Religion III Survey.

Table 3: Religious determinants of economic values, ISSP 1998 (omitted category: Protestants)

Variable	Work ethic hypothesis						Social ethic hypothesis								
	(1)			(2)			(3)			(4)			(5)		
	Positive working hours			Working hours of workers			Social control: Religious practice			Rule of law: Trust institutions			Homogeneous values: Family importance		
	Arruñada	Calvinist	Broad	Arruñada	Calvinist	Broad	Arruñada	Calvinist	Broad	Arruñada	Calvinist	Broad	Arruñada	Calvinist	Broad
(a) Difference between Catholics and Protestants (regressions with variable effects):															
<i>Catholic</i>	-0.014	-0.051	-0.008	0.033	0.430	-0.038	-0.034*	-0.054*	-0.084***	-0.012	-0.017	0.003	0.111***	0.179***	0.141***
	(0.035)	(0.067)	(0.036)	(0.445)	(0.999)	(0.462)	(0.018)	(0.032)	(0.019)	(0.022)	(0.037)	(0.022)	(0.026)	(0.043)	(0.026)
<i>Faith</i>	0.067***	0.003	0.019	-0.445*	-0.413	-0.492*	0.580***	0.597***	0.571***	0.057***	0.081***	0.049***	-0.230***	-0.282***	-0.248***
	(0.023)	(0.053)	(0.024)	(0.256)	(0.776)	(0.267)	(0.012)	(0.027)	(0.012)	(0.013)	(0.031)	(0.014)	(0.016)	(0.036)	(0.017)
<i>Religious upbringing</i>	-0.004	-0.055	0.010	0.035	0.004	0.027	0.248***	0.246***	0.268***	0.045***	0.042	0.046***	-0.069***	-0.071**	-0.101***
	(0.022)	(0.051)	(0.026)	(0.248)	(0.712)	(0.296)	(0.011)	(0.025)	(0.013)	(0.013)	(0.030)	(0.015)	(0.016)	(0.034)	(0.018)
<i>Education</i>	0.219***	0.164***	0.206***	0.746***	0.559	1.014***	0.108***	0.133***	0.094***	0.134***	0.097***	0.114***	-0.075***	-0.035	-0.081***
	(0.023)	(0.054)	(0.023)	(0.245)	(0.709)	(0.249)	(0.010)	(0.026)	(0.011)	(0.013)	(0.030)	(0.013)	(0.015)	(0.034)	(0.015)
<i>Catholic x Faith</i>	-0.131***	-0.055	-0.081***	0.649**	0.734	0.701**	-0.167***	-0.199***	-0.169***	0.048***	0.021	0.039**	0.121***	0.186***	0.143***
	(0.027)	(0.055)	(0.027)	(0.316)	(0.801)	(0.324)	(0.014)	(0.028)	(0.014)	(0.017)	(0.032)	(0.017)	(0.02)	(0.037)	(0.021)
<i>CatholicR x Religious upbringing</i>	-0.040	0.028	-0.005*	-0.374	-0.465	-0.038	0.048***	0.013	0.001	0.011	0.013	-0.001	0.060***	0.072**	0.010***
	(0.028)	(0.053)	(0.003)	(0.32)	(0.740)	(0.036)	(0.014)	(0.026)	(0.002)	(0.018)	(0.032)	(0.002)	(0.021)	(0.036)	(0.002)
<i>Catholic x Education</i>	-0.035	0.029	-0.014	-0.821***	-0.611	-1.092***	-0.091***	-0.114***	-0.078***	-0.082***	-0.054*	-0.060***	0.104***	0.058*	0.118***
	(0.028)	(0.056)	(0.027)	(0.312)	(0.734)	(0.312)	(0.012)	(0.027)	(0.013)	(0.016)	(0.032)	(0.016)	(0.018)	(0.035)	(0.018)
Observations	18,233	11,684	17,139	9,614	5,776	9,026	18,553	11,860	17,544	18,046	11,415	17,371	18,158	11,432	17,103
(b) Difference between Catholics and Protestants (regressions without variable effects):															
<i>Catholic</i>	-0.03	-0.052	-0.013	-0.192	-0.05	-0.223	0.078***	0.092**	0.017	0.007	-0.002	0.024	0.110***	0.153***	0.156***
	(0.035)	(0.060)	(0.034)	(0.428)	(0.767)	(0.413)	(0.022)	(0.038)	(0.022)	(0.002)	(0.033)	(0.021)	(0.025)	(0.039)	(0.024)
Observations	18,233	13,080	17,988	9,614	6,587	9,497	18,553	13,272	18,393	18,046	12,747	18,246	18,158	12,828	17,964

Sources: Arruñada (2010: 905); and own calculations in Stata using ISSP Research Group (1998), Religion II Survey.

Notes: All models (in columns) estimated with constants and demographic and country controls, whose coefficients are not reported in the table. Equation (1), probit; equations (2) and (4), OLS; equations (3) and (5), ordered probit. *, **, *** Significance at 10, 5, and 1% levels. Robust standard errors in parentheses.

Table 4: Religious determinants of economic values, ISSP 1998 vs. ISSP 2008 (using Calvinist definition of Protestantism)

Variable	Work ethic hypothesis				Social ethic hypothesis					
	(6)		(7)		(8)		(9)		(10)	
	Positive working hours		Working hours of workers		Religious practice		Trust institutions		Family importance	
	ISSP 1998	ISSP 2008	ISSP 1998	ISSP 2008	ISSP 1998	ISSP 2008	ISSP 1998	ISSP 2008	ISSP 1998	ISSP 2008
(a) Difference between Catholics and Protestants (regressions with variable effects):										
<i>Catholic</i>	-0.051 (0.067)	0.088 (0.080)	0.430 (0.999)	1.184 (0.825)	-0.054* (0.032)	0.146*** (0.046)	-0.017 (0.037)	-0.032 (0.048)	0.179*** (0.043)	0.130** (0.055)
<i>Faith</i>	0.003 (0.053)	0.041 (0.066)	-0.413 (0.776)	-1.560** (0.754)	0.597*** (0.027)	0.548*** (0.040)	0.081*** (0.031)	0.021 (0.043)	-0.282*** (0.036)	-0.244*** (0.049)
<i>Religious upbringing</i>	-0.055 (0.051)	-0.154** (0.065)	0.004 (0.712)	0.122 (0.659)	0.246*** (0.025)	0.267*** (0.035)	0.042 (0.030)	0.081* (0.042)	-0.071** (0.034)	0.013 (0.049)
<i>Education</i>	0.164*** (0.054)	0.053 (0.063)	0.559 (0.709)	0.887 (0.628)	0.133*** (0.026)	0.075** (0.036)	0.097*** (0.030)	0.053 (0.034)	-0.035 (0.034)	0.069* (0.040)
<i>Catholic x Faith</i>	-0.055 (0.055)	-0.051 (0.067)	0.734 (0.801)	1.342* (0.761)	-0.199*** (0.028)	-0.159*** (0.040)	0.021 (0.032)	0.046 (0.044)	0.186*** (0.037)	0.124** (0.050)
<i>CatholicR x Religious upbringing</i>	0.028 (0.053)	0.107 (0.066)	-0.465 (0.740)	-0.038 (0.671)	0.013 (0.026)	0.036 (0.036)	0.013 (0.032)	-0.090** (0.042)	0.072** (0.036)	-0.006 (0.050)
<i>Catholic x Education</i>	0.029 (0.056)	0.128** (0.063)	-0.611 (0.734)	-0.855 (0.639)	-0.114*** (0.027)	-0.099*** (0.036)	-0.054* (0.032)	-0.022 (0.035)	0.058* (0.035)	0.011 (0.041)
Observations	11,684	18,865	5,776	11,325	11,860	18,258	11,415	17,876	11,432	17,690
(b) Difference between Catholics and Protestants (regressions without variable effects):										
<i>Catholic</i>	-0.052 (0.060)	0.083* (0.051)	-0.05 (0.767)	0.393 (0.537)	0.092** (0.038)	0.118*** (0.038)	-0.002 (0.033)	0.032 (0.030)	0.153*** (0.039)	0.135*** (0.037)
Observations	13,080	20,384	6,587	12,184	13,272	19,706	12,747	19,315	12,828	19,137

Sources: Own calculations in Stata using ISSP Research Group (1998), Religion II Survey; and ISSP Research Group (2008), Religion III Survey.

Notes: All models (in columns) estimated with constants and demographic and country controls, whose coefficients are not reported in the table. Equation (6), probit; equations (7) and (9), OLS; equations (8) and (10), ordered probit. *, **, *** Significance at 10, 5, and 1% levels. Robust standard errors in parentheses.

Table 5: Religious determinants of economic values, ISSP 1998 vs. ISSP 2008 (using broad definition of Protestantism)

Variable	Work ethic hypothesis				Social ethic hypothesis					
	(11)		(12)		(13)		(14)		(15)	
	Positive working hours		Working hours of workers		Religious practice		Trust institutions		Family importance	
	ISSP 1998	ISSP 2008	ISSP 1998	ISSP 2008	ISSP 1998	ISSP 2008	ISSP 1998	ISSP 2008	ISSP 1998	ISSP 2008
(a) Difference between Catholics and Protestants (regressions with variable effects):										
<i>Catholic</i>	-0.008 (0.036)	0.036 (0.023)	-0.038 (0.462)	-0.372 (0.311)	-0.084*** (0.019)	-0.127*** (0.013)	0.003 (0.022)	-0.159*** (0.017)	0.155*** (0.027)	0.118*** (0.019)
<i>Faith</i>	0.019 (0.024)	0.000 (0.018)	-0.492* (0.267)	-0.380** (0.193)	0.571*** (0.012)	0.529*** (0.010)	0.049*** (0.014)	0.021* (0.011)	-0.247*** (0.017)	-0.216*** (0.013)
<i>Religious upbringing</i>	0.010 (0.026)	-0.071*** (0.018)	0.027 (0.296)	0.134 (0.197)	0.268*** (0.013)	0.290*** (0.010)	0.046*** (0.015)	-0.024** (0.012)	-0.100*** (0.018)	-0.149*** (0.014)
<i>Education</i>	0.206*** (0.023)	0.206*** (0.016)	1.014*** (0.249)	0.858*** (0.189)	0.094*** (0.011)	0.057*** (0.009)	0.114*** (0.013)	0.095*** (0.010)	-0.078*** (0.016)	0.010 (0.011)
<i>Catholic x Faith</i>	-0.081*** (0.027)	-0.014 (0.021)	0.701** (0.324)	0.265 (0.234)	-0.169*** (0.014)	-0.141*** (0.011)	0.039** (0.017)	0.052*** (0.014)	0.141*** (0.021)	0.085*** (0.016)
<i>CatholicR x Religious upbringing</i>	-0.005* (0.003)	0.035 (0.021)	-0.038 (0.036)	-0.005 (0.230)	0.001 (0.002)	-0.006 (0.012)	-0.001 (0.002)	0.021 (0.014)	0.101*** (0.022)	0.149*** (0.016)
<i>Catholic x Education</i>	-0.014 (0.027)	-0.024 (0.019)	-1.092*** (0.312)	-0.851*** (0.234)	-0.078*** (0.013)	-0.071*** (0.010)	-0.060*** (0.016)	-0.056*** (0.013)	0.112*** (0.019)	0.077*** (0.014)
Observations	17,139	27,932	9,026	17,176	17,544	26,936	17,371	26,587	16,897	26,383
(b) Difference between Catholics and Protestants (regressions without variable effects):										
<i>Catholic</i>	-0.013 (0.034)	0.014 (0.022)	-0.223 (0.413)	-0.517* (0.293)	0.017 (0.022)	-0.101*** (0.016)	0.024 (0.021)	-0.170*** (0.016)	0.156*** (0.024)	0.139*** (0.018)
Observations	17,988	28,695	9,497	17,522	18,393	27,672	18,246	27,297	17,964	27,108

Sources: Own calculations in Stata using ISSP Research Group (1998), Religion II Survey; and ISSP Research Group (2008), Religion III Survey.

Notes: All models (in columns) estimated with constants and demographic and country controls, whose coefficients are not reported in the table. Equation (11), probit; equations (12) and (14), OLS; equations (13) and (15), ordered probit. *, **, *** Significance at 10, 5, and 1% levels. Robust standard errors in parentheses.

Table S1: Variable definitions, Arruñada/ISSP 1998 vs. ISSP 2008

Variable	Arruñada/ISSP 1998		ISSP 2008		Value of variable
	Code	Survey question	Code	Survey question	
Work ethic:					
<i>Positive working hours</i>	v213	Hours worked weekly	WRKHRS	R: Hours worked weekly	Binary variable (equals 1 if hours > 0)
<i>Working hours of workers</i>	v213	Hours worked weekly	WRKHRS	R: Hours worked weekly	Hours worked (observation omitted if hours = 0)
Social control:					
<i>Religious practice</i>	Index	Built with scores of first principal components from v58,v59,v60 and v218	Index	Built with scores of first principal components from V59,V60,V63 and ATTEND	Standardised
	v58	How often do you pray?	V59	How often do you pray?	Frequency
	v59	How often take part in church activities?	V60	R: Attendance of religious services	Frequency
	v60	Would you describe yourself as extremely religious?	V63	R describes self as religious	Recoded for the variable to increase with religiosity
	v218	How often do you attend religious services?	ATTEND	Attendance of religious services	Frequency
Rule of law:					
<i>Trust institutions</i>	Index	Built with scores of first principal components from v20 and v23	Index	Built with scores of first principal components from V14 and V17	Standardised
	v20	How much confidence respondent has in parliament?	V14	How much confidence respondent has in parliament?	Variable to increase with confidence
	v21	How much confidence respondent has in courts and the legal system?	V17	How much confidence respondent has in courts and the legal system?	Variable to increase with confidence
Homogenous values:					
<i>Importance of family</i>	Index	Built as difference between v7 and v8	Index	Built as difference between V7 and V8	Difference
	v7	Do you think it is wrong to have sexual relations before marriage?	V7	Do you think it is wrong to have sexual relations before marriage?	Tolerance
	v8	Do you think it is wrong to have sexual relations with others than spouse?	V8	Do you think it is wrong to have sexual relations with others than spouse?	Tolerance
Independent variables:					
<i>Catholic</i>	v217	R: Religious denomination	RELIG	R: Religious denomination	Binary variable
<i>CatholicR</i>	v53	Religion R was raised in	V52	What religion, if any, were you raised in?	Binary variable
<i>Faith</i>	Index	Built with scores of first principal components from v39 to v41	Index	Built with scores of first principal components from V35 to V37	Standardised
	v39	R believe in life after death?	V35	Belief in life after death	Variable to increase with strength of belief
	v40	R believe in Heaven?	V36	Belief in heaven	Binary variable
	v41	R believe in Hell?	V37	Belief in hell	Binary variable
<i>Religious upbringing</i>	v57	R age 11-12 yrs, how often attend church	V58	R age 11-12, R attend church	Frequency
<i>Education</i>	v205	R: Education II: Highest education level	DEGREE	R: Education II-highest education level	Standardised
Control variables:					
<i>Sex</i>	v200	Sex of respondent	SEX	Sex of respondent	Binary variable
<i>Marital status</i>	v202	R: Marital status	MARITAL	R: Marital status	Binary variable
<i>Age</i>	v201	Age of respondent	AGE	Age of respondent	Standardised
<i>Country</i>	v3	Country	V4	Country	Standardised

Sources: Arruñada (2010: Appendix); ISSP 1998 Codebook; and ISSP 2008 Codebook.

Table S2: Comparison of means, ISSP 1998 vs. ISSP 2008

Variable	Difference (ISSP 2008 – ISSP 1998)					
	Catholics and Protestants		Protestants		Catholics	
	Calvinist	Broad	Calvinist	Broad	Calvinist	Broad
<i>Positive working hours</i>	0.117***	0.113***	0.168***	0.116***	0.113***	0.113***
<i>Working hours of workers</i>	-1.753***	-1.466***	-0.671***	-0.746***	-1.920	-1.916***
<i>Importance of family</i>	0.012	-0.013***	0.170	-0.035	0.002***	0.002
<i>Catholic</i>	0.026***	0.012***				
<i>Women</i>	1.010	1.011***	1.002	1.013	1.010	1.010
<i>Widowed</i>	-0.002	-0.009***	0.019	-0.020	-0.004	-0.004***
<i>Divorced & seperated</i>	0.032***	0.026***	0.034***	0.016***	0.032***	0.032***
<i>Single</i>	0.065***	0.067***	-0.011***	0.066***	0.068	0.068***

Sources: Own calculations in Stata using ISSP Research Group (1998), Religion II Survey; and ISSP Research Group (2008), Religion III Survey.

Notes: Difference in means is calculated by subtracting the 1998 from the 2008 means. *, **, *** Significance at 10, 5, and 1% levels in a two-tailed t-test following Levene's (1960) test for equality of variances.

Table S3: Comparison of residual heterogeneity, Catholics vs. Protestants

Variable	Difference (Protestants – Catholics)				
	Arruñada	ISSP 1998		ISSP 2008	
		Calvinist	Broad	Calvinist	Broad
<i>Positive working hours</i>	-0.039***	0.015**	-0.015***	0.017***	0.012***
<i>Working hours of workers</i>	-1.701***	1.035***	-1.021***	-0.888***	-1.245***
<i>Religious practice</i>	0.022	0.136***	0.027	0.215***	0.105***
<i>Trust institutions</i>	-0.050***	-0.097***	-0.055***	-0.050***	-0.060***
<i>Family importance</i>	-0.076***	-0.002***	0.000***	-0.001***	0.000***

Sources: Arruñada (2010: 906), and own calculations in Stata using OLS regressions with the same independent variables as in Panels (a) of Tables 4, 5 and 6.

Notes: *** Significance at 1%, using Levene's (1960) test for equality of variances.