

## Culture and Tax Structures

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# Culture and Tax Structures

## Abstract

We argue that societies with a stronger tendency towards postmaterialist life goals tilt the tax structure towards personal income taxes and away from corporate taxation. We provide empirical evidence for this correlation in OECD countries. To address endogeneity issues we then use an epidemiological approach and employ the cultural values of second-generation immigrants to the US as an instrument for the degree of postmaterialism in their ancestral countries. Estimations with this approach re-confirm that personal taxes are higher, both in absolute and relative terms, in more postmaterialist countries.

JEL-Code: H110, H200, Z100.

Keywords: tax structure, taxation, social values, culture.

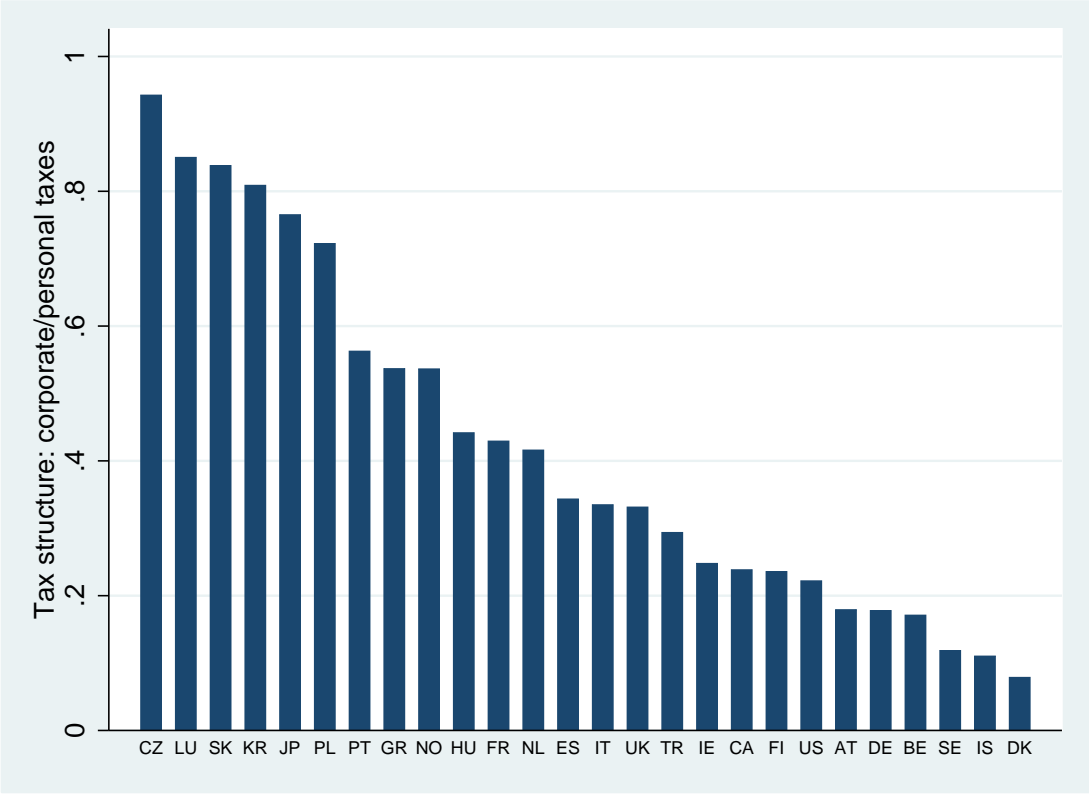
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# 1 Introduction

Taxation varies widely internationally, not only in the details of tax codes and tariffs but also in its overall structure. Particularly pervasive differences prevail in the taxation of personal versus corporate incomes. For illustration, Figure 1 reports the ratios between revenues from corporate and personal income taxes in OECD countries.

FIGURE 1: CROSS-COUNTRY DIFFERENCES IN TAX RATIOS

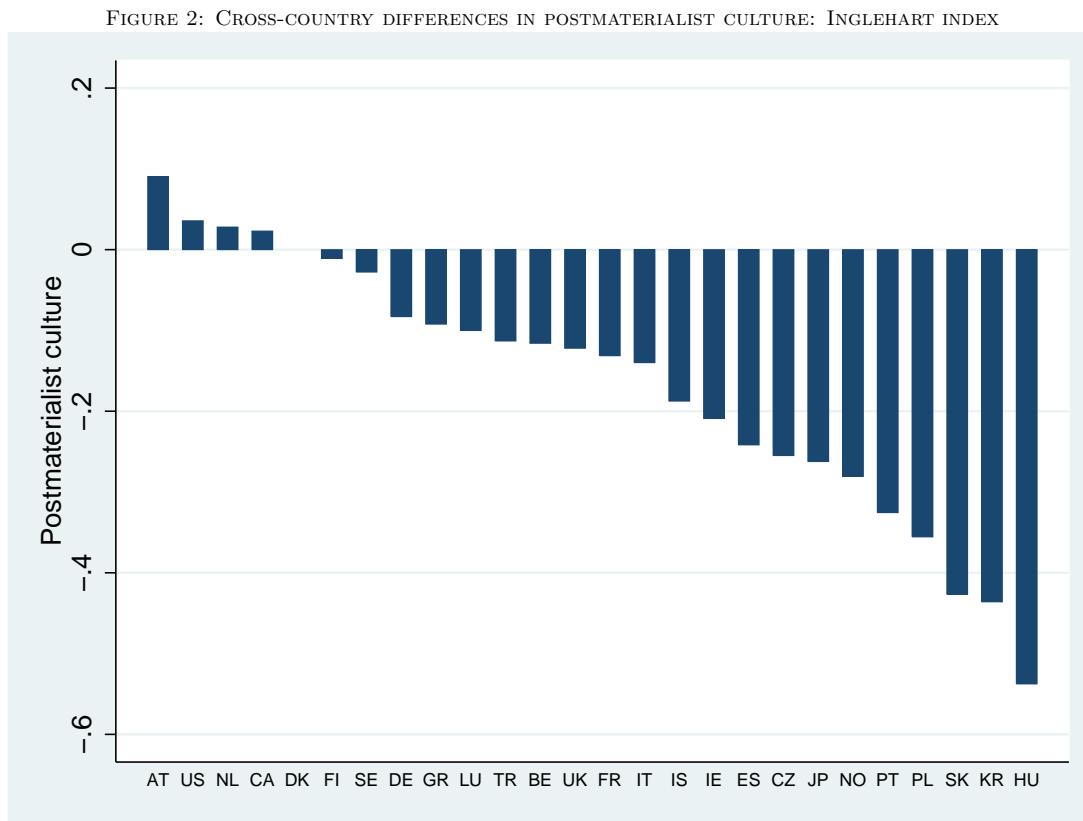


Source: OECD, Revenue Statistics, 2009. Averages for 1980, 1990, and 2000 (for details see Section 2).

The ratio between corporate and personal income taxes differs by a factor of five across OECD countries. As a tendency, the ratio is highest in Eastern European and Asian countries, in the middle range in Southern European and Anglosaxon countries, and lowest in Northern Europe and North America. This observation calls for an explanation, in particular as the relative burden of taxation on individuals (“labour”) and corporations (“capital”) is a highly sensitive and politically contested feature of the tax systems.

In this paper we argue that cross-country differences in tax structures could be caused by differences in values and norms. Specifically, we argue that different strengths of postmaterialist attitudes play a key role in explaining Figure 1. Postmaterialism roughly describes an attitude that places relatively low emphasis on material possessions and monetary incentives (we will be more specific below). Its most prominent quantitative measure is the so-called Inglehart postmaterialism index. Figure 2 reports the value of

this index (precisely: its difference with respect to the Danish value, which we use for normalization), with higher values indicating stronger degrees of postmaterialism in the population:



*Note:* Country’s score on the Inglehart’s postmaterialism scale. Mean deviations from Denmark.  
For details see Section 2.  
*Source:* WVS 1980, 1990, 2000.

Postmaterialist attitudes appear weakest in Eastern European and Asian countries, moderate in Southern Europe, and highest in North America and Northern Europe. A quick comparison of Figures 1 and 2 already suggests an intriguing, yet not perfect correlation (Spearman’s rho is at  $-0.63$ ): tax policies in more postmaterialist countries seem to impose a relatively higher tax burden on individuals than on corporations. This paper argues that this finding is not coincidental but that a strong association and even a causal link from postmaterialist attitudes to tax structures prevails. We test this hypothesis empirically, controlling for reverse causality by applying an epidemiological IV approach.

Standard theories of tax structures have difficulties in explaining Figure 1. E.g., theories of globalization and tax competition would argue that countries more deeply integrated in international capital markets should tax mobile capital less heavily than rather immobile labour (Wildasin and Wilson, 2004). Viewing corporate taxes roughly as taxes on capital (income) and personal income taxes largely as taxes on labour,<sup>1</sup> this would imply

<sup>1</sup>Arlen and Weiss (1995) call this the “rational populist”-view of the corporate tax.

a lower corporate/personal tax ratio in more open economies. However, many of the economies of Figure 1 have similar degrees of openness; it appears implausible that, e.g., Scandinavian countries are subjected to globalization so much more intensely than, say, the Netherlands as to warrant such a distinctly lower relative tax burden on capital. Also political explanations appear problematic. If anything, one would expect that traditionally social-democrat Scandinavian countries burden corporations relatively more heavily than individuals than liberal or conservative countries such as the UK, the US, or Switzerland. Generally, countries with a low ratio between corporate and personal taxes might be viewed as more business-friendly and less socially equitable; in that sense, the ranking in Figure 1 does not match with the common reputation of the ranked countries. Different tax structures might also be linked to different structures of factor markets. E.g., Hungerbühler and van Ypersele (2009) argue that countries with less distorted labour markets would have a higher ratio of profit to personal income taxes than countries with severe market imperfections. However, Figure 1 does not provide any support for this theory. To the contrary: countries with flexible labour markets (the U.S. or Denmark, say) have a lower corporate to individual tax ratio than countries with highly regulated labour markets (say, France, Japan, or Greece).

This paper argues that differences in value orientations and, in particular, varying degrees of postmaterialism may help to explain Figure 1 (though we do not endeavour to test the correctness of this or any other theoretical approach). Postmaterialism deemphasises material goods (such as consumption, wealth, and income) but gives higher priority to immaterial goods: belongingness, sense of community, social equity, esteem, self-expression, freedom of choice, and intangible concerns of the quality of life (Davis and Davenport, 1999; Hellevik, 1993; Inglehart, 1971, 1997, 1999; Inglehart and Welzel, 2005; Moors and Vermunt, 2007; Duch and Taylor, 1993). Beginning in the 1970s, there has been a strong tendency towards higher degrees of postmaterialism across the globe, covering all socioeconomic classes and democratic as well as non-democratic states (Inglehart, 1997).<sup>2</sup> However, as Figure 2 evidences, large cross-country differences prevail, even between the developed democracies in the OECD.

Economically, a higher degree of postmaterialism is associated with a reduced sensitivity

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<sup>2</sup>In the *World Values Surveys*, the largest investigation on attitudes, values, and beliefs around the world, a rising share of respondents say that less emphasis on material possessions is a desirable change in our way of life; a growing number of people consider “hard work” or “saving money” as less valuable qualities to be taught to a child than tolerance and respect; people to a greater extent stress the importance of leisure and the “higher” goods in the standard Maslow order; respondents increasingly think that, when seeking a job, good pay is less important than a feeling of accomplishment and working with people one likes; people are increasingly interested in arts, music, entertainment and culture; and respondents are more inclined to view economic growth as a less important policy objective than, say, the protection of the environment (Inglehart, 1997; Inglehart and Welzel, 2005).

of individuals to monetary incentives (such as changes in prices, wages, and taxes). This is in line with Inglehart's (1990, pp. 176f; 1997) observations that, compared to materialists, postmaterialists are generally less driven by achievement motivation, are lesser responsive to economic rewards than materialists, and are willing to accept lower pay for the same amount of labour and at comparable levels of education.<sup>3</sup> In short, the price (wage, rate-of-return, tax) sensitivity of income-generating household activities (labour supply, saving etc.) decreases with the strength of postmaterialism. The theory of optimal taxation demands that such goods or activities ought to be taxed more heavily that respond relatively less sensitively (inverse elasticity rule). Presupposing that OECD countries are all comparably open and that integrated capital markets equalize the tax sensitivity of investment and capital internationally, stronger postmaterialist attitudes would then call for a higher relative tax burden on personal incomes – as suggested by the correlation between Figures 1 and 2. Under this proviso, stronger postmaterialism would *ceteris paribus* also imply larger government budgets since the lower excess burden of personal income taxes reduces the marginal costs of public funds. While not our prime target, Section 3 will provide some tentative evidence for this hypothesis too.

In positing a link between postmaterialism and the relative tax burden on individual incomes, our research adds to a growing literature on the complementarity between values and cultures and the design of economic policy (Guiso et al., 2006; Fernandez, 2010; Fernandez and Fogli, 2009). Trust as an indicator for social capital (La Porta et al., 1997, Aghion et al., 2011), civic attitudes (Algan and Cahuc, 2009), and social identities (Shayo, 2009) are the most widely used cultural indicators; labour market institutions, mechanisms conducive to growth and development, and the design of the welfare state, education and of intergenerational transfers are important explananda. For our study, two strands in this literature are particularly relevant: approaches that relate policy changes to postmaterialism and approaches that try to explain features of the tax system in terms of culture.

Shifting priorities from materialist issues to postmaterialist, quality-of-life goals arguably impacts on political institutions, processes, and policy choices. Political scientists argue that postmaterialism helps to promote good governance and democratic participation (see, e.g., Inglehart and Welzel, 2005), fosters the emergence of social movements with concerns about civil rights, inequality, the environment, or the perils of globalization (Inglehart, 1997; della Porta and Diani, 1999). Postmaterialism has so far not been related to (changes in) tax policies. Rather, taxation has been linked to other cultural

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<sup>3</sup>Uhlaner and Thurik (2007) empirically show that stronger postmaterialism goes along with lower rates of entrepreneurial activities. Arguing that entrepreneurship is motivated by the hope of making lots of money, they corroborate that postmaterialists respond less elastically to monetary incentives.

predispositions. Alesina and Angeletos (2005), e.g., trace differences in redistributive taxation between Western Europe and the United States back to different perceptions about how fair market outcomes are. Hodler (2008) points out that different attitudes towards leisure (which one might loosely associate with postmaterialism) shape the size of welfare states and, by and large, the *overall* tax burden (without any implications for the tax structure). Franzen (2003) and others report evidence that the appreciation for eco-taxes is greater in postmaterialist than in materialist countries, leaving it open, however, whether this merely reflects increased concerns for the environment or a generally reduced price sensitivity. Qari et al. (2011) build on the assumption that individual values impact on tax sensitivities. Specifically, they posit that patriotic identification keeps mobile tax payers more attached to their home country; governments in turn can exploit this when financing a redistributive tax-transfer system. However, none of the studies we are aware of relates values and norms to the composition of the tax burden or to the tax mix. This is our focus.

We report cross-country evidence for a strong and statistically significant association between postmaterialist attitudes and tax structure: countries displaying high degrees of postmaterialist attitudes indeed tend to tax labour disproportionately more heavily than capital. However, the impact of culture on policy outcomes is potentially conflated with reverse effects: tax policy affects (post-)materialist attitudes (in an *a priori* unclear direction).<sup>4</sup> For instance, by heavily taxing personal incomes the government might convey a perception that an individual’s material wealth, work effort or the income generated through it are in low esteem socially. Also a negative impact cannot be excluded: high taxation of personal incomes might leave less to consume for individuals whose increased marginal utility from consumption then is expressed in terms of more materialist values. To capture reverse causality, we adopt an epidemiological approach à la Fernández (2008, 2010) or Algan and Cahuc (2009): we measure postmaterialist attitudes in a country by those of American-born citizens whose ancestors emigrated from that country to the US two generations ago (see Section 4). These inherited values are not shaped by the instantaneous economic and institutional environment in the country where people are currently living. As the degree of postmaterialism of people born and living in the U.S. is strongly positively associated with the attitudes of today’s populations in their ancestors’ country of origin we can use it as an instrument for today’s postmaterialism in the home country. Doing so, we are still able to identify that more postmaterialist countries tend to tax personal incomes relatively more heavily than corporate incomes.

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<sup>4</sup>On a macro-level, Inglehart and Baker (2000) are among the first to study such a “reverse” impact of economic and institutional factors on changes in values and culture. They show that economic changes indeed have systematic and predictable cultural consequences.

The rest of this paper is organized as follows: Based on data from the World Values Surveys, Section 2 constructs estimates for the degree of postmaterialism in OECD countries. Section 3 regresses national tax structures on postmaterialist values, confirming the correlation apparent from Figures 1 and 2. Section 4 statistically identifies the validity of these correlations by use of an epidemiological IV approach. Section 5 concludes.

## 2 Measuring postmaterialist culture in OECD countries

To operationalize the concept of postmaterialism, we built on the so-called four-item Inglehart index (due originally to Inglehart, 1971), one of the most widely used and replicated measure of postmaterialism in political and social science literature. This index is included in most large-scale survey data sets, thus enabling us to use the epidemiological approach in Section 4, which is demanding in terms of data availability.<sup>5</sup>

The Inglehart index as employed in the World Values Surveys (WVS) is constructed from the following question:

“If you had to choose, which one of the things on this card would you say is most important? And which would be the next most important?”

1. Maintaining order in the nation;
2. Give people more to say;
3. Fighting rising prices;
4. Protecting the freedom of speech.”

Items (1) and (3) are considered to reflect materialist values (economic and physical security) while items (2) and (4) express postmaterialist life goals (autonomy and self-expression). If a respondent chooses the two materialist items, he/she is scored with “1” as a degree of postmaterialism; if both postmaterialist items are given selected he/she is assigned a value of “3”; individuals with mixed choices get a score of “2”. The position on this scale reflects to which extent an individual gives priority to immaterial over economic values.

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<sup>5</sup>There is a large literature on the validity and appropriateness of the Inglehart index as a measure of postmaterialism. See, e.g., the exchange between Davis and Davenport (1999) and Inglehart and Abramson (1999). Despite some criticism, the Inglehart index continues to be widely accepted.



TABLE 1: OLS ESTIMATES OF POSTMATERIALISM: INDIVIDUAL LEVEL, WVS.

dependent variable	Inglehart index of postmaterialism	
	Coeff.	Std. error
male	0.052***	(0.007)
age	-0.002	(0.001)
age <sup>2</sup>	0.000	(0.000)
education	0.034***	(0.003)
unemployed	0.027	(0.018)
medium income class	0.017*	(0.009)
high income class	0.061***	(0.016)
left	0.143***	(0.019)
right	-0.031*	(0.016)
no religious affiliation	0.074***	(0.021)
country fixed effects		Yes***
constant	1.789***	(0.044)
N		57444
R <sup>2</sup>		0.123

*Note:* Daten is taken from the 1980, 1990 and 2000 waves of the WVS. Reference category is an individual from Denmark with low-class income and centered political orientation. Wave dummies are included. Standard errors are clustered at the country level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Our analysis includes OECD countries for which the WVS question was asked in at least one of the three main waves 1980-1984, 1990-1994, 1999-2003. These are: Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Turkey, United Kingdom, United States.<sup>6</sup> We refer to the periods as the 1980, 1990 and 2000 wave.

Figure 2 in the introduction reports the countries' mean responses on the Inglehart index over the three main waves, diminished by the mean score for Denmark (which is 2.07). Denmark is chosen as a reference country as it is included in all waves. To look closer at cross-country differences in postmaterialist culture, we take into account respondents' demographic and socio-economic characteristics. We do so by running individual level regressions on the whole three main waves. The statistical model is

$$I_{it} = \beta X_{it} + \eta_j + \epsilon_{it}, \quad (1)$$

where  $I_{it}$  represents the score on the Inglehart postmaterialism index of respondent  $i$  at wave date  $t$  ( $t = 1980, 1990, 2000$ ). The control vector  $X_{it}$  contains individual characteristics such as gender, age, education, income, employment status, religiosity and political orientation. The error term is denoted by  $\epsilon_{it}$ . The main variables of interest are the dummies for country  $j$ ; they are represented by the country fixed effects  $\eta_j$  (Denmark is chosen as the reference country).

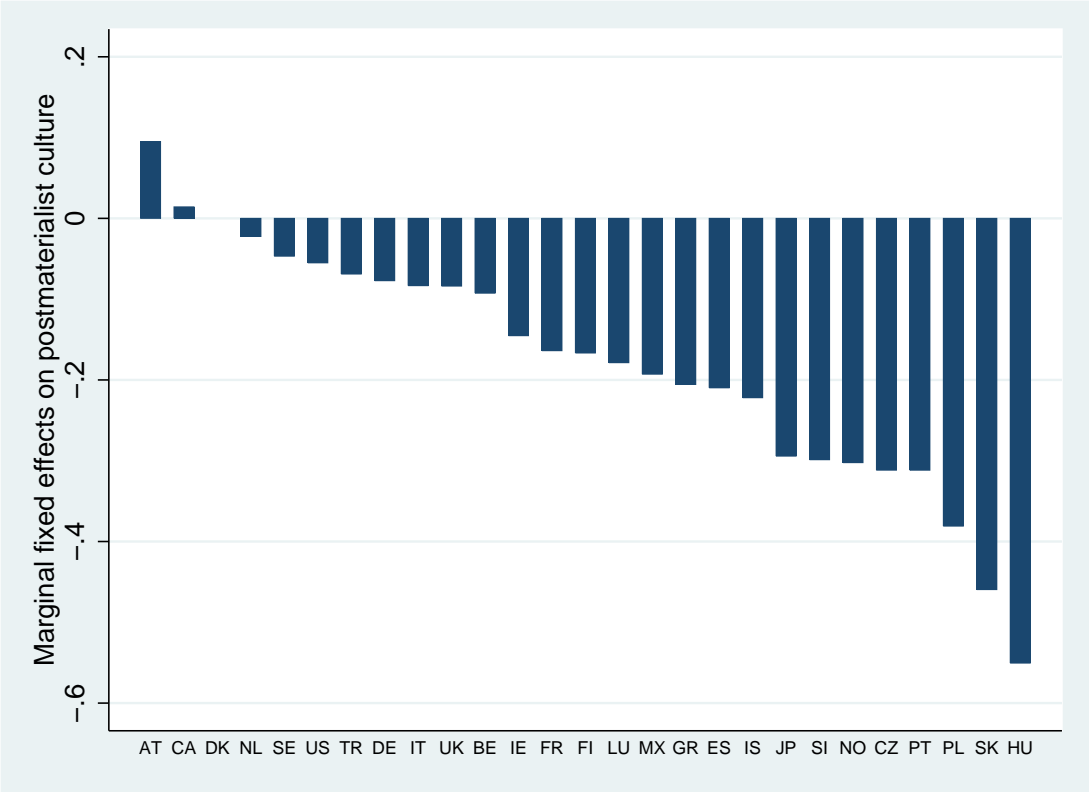
We estimate equation (1) by OLS.<sup>7</sup> Table 1 presents the regression results with clustered

<sup>6</sup>The third wave is excluded since it only provides a smaller set of countries and questions.

<sup>7</sup>Transforming the dependent variable into a dummy variable taking on the value 1 if the postmaterialist

standard errors at the country level. The signs of the controls are largely in line with arguments found in political science (see Inglehart and Welzel, 2005): the highest income category is associated with higher postmaterialist scores (it is argued that postmaterialist attitudes primarily arise after basic material needs have been satisfied), as is the case with being left, having no religious affiliation, and being highly educated. Generally, the individual controls are strongly associated with postmaterialist life goals: most are significant at least at a five-percent level. The country-specific effects, which can be interpreted as a country’s mean deviation from Denmark’s position on the Inglehart scale after conditioning on individual heterogeneity, are highly significant as well. We report them separately in Figure 3.

FIGURE 3: CROSS-COUNTRY DIFFERENCES IN POSTMATERIALIST CULTURE: MARGINAL COUNTRY-FIXED EFFECTS



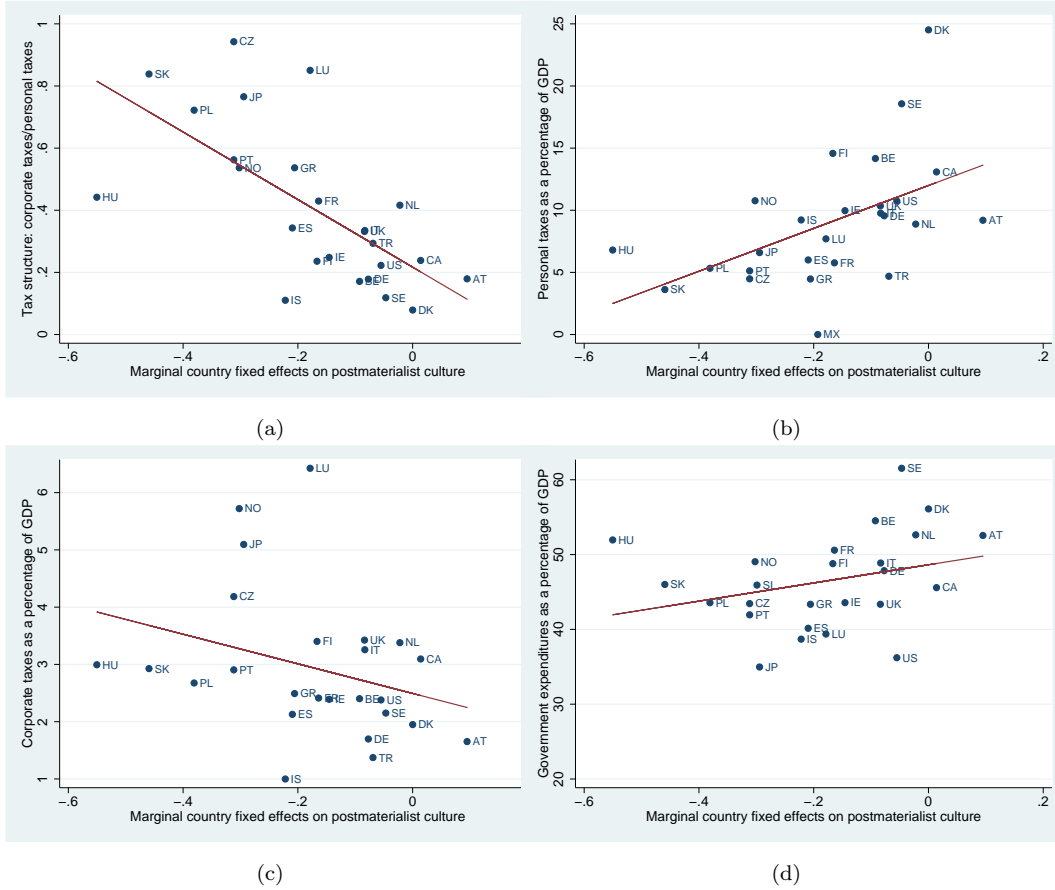
Note: Country’s conditional score on the Inglehart’s postmaterialism scale. Mean deviations from Denmark.  
Source: WVS 1980, 1990, 2000.

Though the ranking of the countries is not identical in every case (e.g., Finland’s score is somewhat lower), the correlation between the raw data on postmaterialism and the conditional deviations on the Inglehart scale is almost perfect ( $r = 0.934$ ).

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score is 3 and zero otherwise and running probit estimations yield qualitatively the same results.

FIGURE 4: Postmaterialist culture and policy outcomes



### 3 Tax structure and postmaterialist culture

In this subsection, we correlate postmaterialist culture with policy outcomes. To measure a country’s of tax burden on corporations, we use corporate tax revenues as a percentage of GDP. The individual tax burden is measured as the share in GDP of tax revenues from personal income.<sup>8</sup> Government total expenditures relative to GDP are used to capture public spending levels. The tax structure is measured by the ratio of corporate to individual taxes. All data are taken from OECD, Revenue Statistics, 2009.

We visualize the data and correlations by scatterplots in Figure 4. There, we map the corporate and the personal tax burden, the tax ratio and government expenditure (all averaged over the time span 1980-2003) against the marginal country-specific effects of postmaterialism, as derived in Section 2.

Panel (a) in Figure 4 shows that the connection between the tax ratio and and post-

<sup>8</sup>There is an extensive literature on what sort of tax rates are appropriate to measure tax burdens (see Sorensen, 2004). Ideally, we would like to use effective (forward-looking) marginal effective tax rates; as a second choice, we would opt for (ex post) macro average effective tax rates. Unfortunately, neither of these options is feasible since data is not available for a sufficiently large number of countries and/or periods.

materialist attitudes is clearly negative and, thus, well in line with our hypothesis. In fact, the predictive power of the postmaterialist trait is surprisingly strong: the bivariate linear regression exhibits  $R^2 = 0.4130$ , such that the proxy for postmaterialism explains more than 40 percent of the cross-country variation in relative tax burdens. The more materialist Eastern European countries rely, to a great deal, on taxes on corporate income. In contrast, the more postmaterialist Nordic countries tend more towards personal income taxation. Panel (b) relates cross-country heterogeneity in personal income taxes (as a percentage of GDP) to postmaterialist attitudes. The connection is strongly positive ( $R^2 = 0.2360$ ). The association between corporate taxation and postmaterialism appears to be negative; see panel (c). One conjecture (which we have not verified) might be that the corporate sector itself is smaller in postmaterialist economies. Generally, however, the picture is less clear cut when compared to the other panels; it also is more vulnerable to outlier problems.<sup>9</sup> Panel (d) reveals a positive, but quite weak correlation between postmaterialist attitudes and government spending ( $R^2 = 0.0561$ ). This might reflect the postmaterialist predilection for social equality, education or cultural activities or simply a generally lower marginal cost of public funds in less tax-sensitive economies; however, we do not pursue this direction any further.

To check whether the connections presented so far survive in a more rigorous regression framework, we estimate the following model:

$$T_{jt} = b_0 + \beta_1 \eta_{j,t} + \beta_2 X_{jt} + \epsilon_{jt}. \quad (2)$$

where  $T_{jt}$  denotes the respective tax variable in country  $j$  at wave date  $t$ . Postmaterialist culture is represented by the country-fixed effects  $\eta_{j,t}$ . We extract them by estimating a model similar to equation (1). In contrast to Section 2, we run individual regressions separately for each wave. Thus, we get a cultural variable for each country at different dates, endowing us with a maximum number of observations. Model (2) includes controls at the national level,  $X_{jt}$ . To measure a country's degree of openness, we use the share of exports plus imports in GDP. We also control for per capita GDP. To get consistency with our cultural data, the dependent variable and the controls are averaged over the corresponding wave periods.

Table 2 reports the results where we cluster standard errors at the country level and include time dummies. These results are in line with the correlations presented in the scatterplots earlier: in particular, postmaterialism is negatively linked to the tax ratio. The coefficient in the first column indicates that the effects are economically sizeable. An increase in the degree of postmaterialism of 0.4 (which is, e.g., the difference between

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<sup>9</sup>Excluding the countries with the highest corporate taxes, the line of fitness would be almost horizontal.

TABLE 2: POSTMATERIALIST CULTURE AND TAX POLICY (OLS)

	tax structure (1)	personal taxes (2)	corporate taxes (3)
postmaterialist culture	-0.639** (0.267)	12.545** (5.148)	-2.630 (1.831)
GDP per capita	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)
openness	0.000 (0.000)	-0.003 (0.003)	-0.000 (0.001)
constant	0.092 (0.139)	12.522*** (2.970)	1.046 (0.707)
N	49	49	49
R <sup>2</sup>	0.238	0.250	0.174

*Note:* Standard errors are clustered at the country level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Poland and Denmark) goes along with a decline in the corporate-to-personal tax ratio of 25 percentage points.

Regression results for the raw data can be found in the appendix (see Table 5); they exhibit significance at even higher confidence levels.

## 4 Epidemiological approach

So far we presented a stable link between postmaterialist culture and tax policy, suggesting that societies with a lower emphasis on material values shift tax burden from corporate to personal income. However, serious endogeneity issues arise in this context. A first concern is that our estimates are biased by reverse causation. E.g., higher taxes on personal incomes decreases private consumption which may go in hand with a value shift towards material goods and possessions. Economically, this reflects decreasing marginal utilities, in political science, this goes under the name of Inglehart’s Scarcity Hypothesis (see Inglehart, 1997). Second, the regression analyses so far may suffer from an omitted variable bias since the vector of controls in equation (2) might not include all factors that are both correlated with policy outcomes and a country’s position on the Inglehart scale (e.g., current economic and institutional conditions).

In this section, we tackle these problems by an epidemiological approach which has been proved a powerful tool to obtain exogenous variation in cultural variables in the recent literature on the role of culture in economics (for survey and critique, see Fernández, 2010).

Our empirical strategy is as follows. To separate culture from its specific national settings, we study individuals who share an identical political and economic environment but whose

system of values and beliefs potentially differ, and this in a way that systematically reflects the cross-national differences in culture we are interested in. Specifically, we use information on the postmaterialist inclinations of second-generation immigrants in the US. These immigrants were born in the US and are living there; they were neither exposed to the current policy of their country of ancestry nor to potentially omitted variables in equation (2), such as the prevailing ideology, current macroeconomic situations or institutions.<sup>10</sup> At the same time, these individuals are likely to have inherited a significant part of their ancestor’s country’s degree of postmaterialism through their parents’ cultural habits and practices. We exploit this source of variation to instrument for the country-specific effects gained from the WVS.

We use data from the US General Social Surveys (GSS) which include a question similar to that of the WVS quoted above. In the 1993, 1994 and 2000 waves, respondents were asked:

“Looking at the list below, please check a box next to the one thing you think should be America’s highest priority, the most important thing it should do. America should . . .

1. Maintain order;
2. Give people more say;
3. Control prices;
4. Protect free speech.”

Respondents could then name which two of these items they considered to be America’s first and second priorities. We classify an individual as a postmaterialist if items (2) and (4) were both selected (score “3”). We assign scores for the mixed and materialist categories (scores “2” and “1”, respectively). We restrict the GSS dataset to a sample comprising second (or higher) generation immigrants only.<sup>11</sup> On this subsample, we run OLS regressions of the form:

$$I_{ij} = \beta X_i + G_j + \epsilon_i. \tag{3}$$

Here,  $I_{ij}$  stands for the individual score on the Inglehart scale of an American-born respondent  $i$  whose ancestors come from country  $j$ .  $G_j$  represents the dummies associated with

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<sup>10</sup>It cannot be ruled out that immigrants born in the US are still in touch with their home countries’ conditions, e.g., via contacts with family members and friends who have not emigrated. We mitigate this problem by focusing on second- and higher-generation immigrants, excluding first-generation immigrants.

<sup>11</sup>A respondent is classified as an (at least) second-generation immigrant based on the GSS question “*From what countries or part of the world did your ancestors come from?*”

the country of origin  $j$ . The fixed effects capture the inherited part of postmaterialism transmitted from the country of origin through the customs of respondents'  $i$  ancestors (we again use Denmark as reference category). We combine data from 1993 and 1994 to one wave, representing the early 1990's. Thus, we can estimate the country of origin fixed effect,  $G_j$ , for two dates that are comparable with the 1990 and the 2000 wave periods from the WVS. In both regressions we control for the same individual characteristics,  $X_i$ , as in Section 2. The coefficients of the controls have in almost all cases the same signs as above and are statistically highly significant. In the Appendix, we show the regression results for the 1990 wave (see Table 6).

We then estimate the following two-stage model

$$\eta_{j,t} = c_0 + c_1 G_{j,t} + c_2 X_{jt} + v_{jt}, \quad (4)$$

$$T_{jt} = b_0 + \beta_1 \eta_{j,t} + \beta_2 X_{jt} + \epsilon_{jt}. \quad (5)$$

Equation (4) represents the first-stage regression of postmaterialist culture of home country  $j$  on average postmaterialism of second-generation Americans with ancestors from country  $j$ . Equation (5) represents the second stage, where the tax variable,  $T_{jt}$ , is regressed on the inherited part of culture,  $\eta_{j,t}$ , i.e., on those parts of culture which are separated from the current political and economic conditions of country  $j$  at wave date  $t \in (1990, 2000)$ . The control variables and the policy measures are the same as in Section 3 and averaged over the corresponding time period.

The first-stage estimates are reported in Table 3.<sup>12</sup> The coefficient of the marginal country of origin fixed effects is 0.43 and significant at the five percent level, indicating that strong cultural transmissions between generations take place.

TABLE 3: FIRST-STAGE ESTIMATES OF POSTMATERIALISM IN THE HOME COUNTRY

Dependent variable: Postmaterialism in the home country		
	Coeff.	Std. error
Inherited Postmaterialism of Americans from their country of origin	0.430**	(0.206)
GDP per capita	0.000	(0.000)
openness	0.000	(0.000)
constant	0.073	(0.136)
N		20
R <sup>2</sup>		0.288

*Note:* WVS, 1990, 2000. GSS, 1990, 2000. Standard errors are clustered at the country level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

<sup>12</sup>Our analysis includes those OECD countries for which policy variables and cultural data from the GSS are available from at least one of the two waves 1990 and 2000. These countries are: Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Sweden, United Kingdom.

The second-stage estimates for the different policy regressions are shown in Table 4. The IV results are qualitatively similar to the OLS estimates of section 3. In spite of a decrease in the number of observations<sup>13</sup> we gain significant parameter estimates for the instrumented marginal effects of postmaterialist culture in the regressions for the tax structure (column 1) and personal taxes (column 2).

TABLE 4: SECOND-STAGE REGRESSION OF TAX POLICY

	tax structure (1)	personal taxes (2)	corporate taxes (3)
postmaterialist culture	-1.458** (0.564)	42.843** (20.518)	-3.427 (2.584)
GDP per capita	0.000 (0.000)	0.001* (0.000)	0.000* (0.000)
openness	0.000 (0.000)	-0.011 (0.008)	-0.001 (0.001)
constant	0.388* (0.217)	5.445 (6.076)	1.742** (0.746)
N	20	20	20

*Note:* WVS, 1990, 2000. GSS, 1990, 2000. Standard errors are clustered at the country level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

These findings make us confident that the cross-country differences in tax structures observed in Figure 1 are indeed causally related to difference in materialist/postmaterialist attitudes, depicted in Figure 2.

## 5 Conclusion

Inglehart (1971) defines postmaterialism as the relative importance people ascribe to immaterial values relative to material goods. Put simpler, it is the degree of how little people are impressed by money. As taxation is foremost associated with a smaller purse, people's attitude towards money may have an effect on how strongly governments can tax them or how elastically they try to escape from the government's grabbing hands. Differences in value-induced perceptions of the burden imposed by taxes and in the responsiveness to taxation will then translate into different tax mixes in a society.

If people place lower relative emphasis on the material aspects of their work, they might also be less sensitive to their incomes being taxed away, implying that governments can increase the relative tax burden on individuals without generating too much political discomfort or too high an excess burden. In line with this idea, we demonstrate that in the OECD countries with higher priority on postmaterialist life goals tend to have low ratios of corporate to personal taxes.

<sup>13</sup>Due to limited data availability, such drops are not uncommon in studies using the epidemiological approach; cf., e.g., Cahuc and Algan (2009) or Halla (2010).



Our paper adds another piece of evidence to the hypothesis that culture indeed impacts on economic policy. Yet, the interaction between culture and the economic and institutional environment could also go the other way round. Studies of how tax structures affect cultural values and their changes would, thus, be an important addition to the literature.

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# Appendix

TABLE 5: POSTMATERIALIST CULTURE AND TAX POLICY (OLS)

	tax structure (1)	personal taxes (2)	corporate taxes rate (3)
Inglehart index	-0.708*** (0.255)	14.312*** (4.999)	-2.463 (1.603)
GDP per capita	0.000 (0.000)	0.000 (0.000)	0.000** (0.000)
openness	0.000 (0.000)	-0.003 (0.003)	0.000 (0.001)
constant	1.553*** (0.445)	-17.058** (7.939)	6.206** (2.985)
N	53	53	53
R <sup>2</sup>	0.3	0.316	0.187

*Note:* Standard errors are clustered at the country level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

TABLE 6: OLS ESTIMATION OF POSTMATERIALISM: INDIVIDUAL LEVEL, GSS DATA.

dependent variable	Inglehart index of postmaterialism	
	Coeff.	Std. error
male	0.168***	(0.042)
age	-0.001	(0.008)
age <sup>2</sup>	0.000	(0.000)
education	0.019***	(0.004)
income	0.002	(0.006)
unemployed	0.032	(0.136)
left	0.13***	(0.023)
right	-0.026	(0.048)
no denomination	0.138**	(0.064)
country dummies		Yes***
constant	1.877***	(0.168)
N		925
R <sup>2</sup>		0.068

*Note:* Daten is taken from the 1993 and 1994 waves of the GSS. Reference category is an immigrant from Denmark with centered political orientation. Standard errors are clustered at the country of origin level.