

The Impact of Individualism and Uncertainty Avoidance on Interdependence of Tax Culture and Tax Evasion

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Abstract The paper presents, how factors of tax culture, such as individualism and uncertainty avoidance, affect the dependence of tax evasion on tax culture on a revised sample of 34 countries. The research reveals that in the analysed countries the higher the degree of individualism, the lower the rate (affected by the degree of individual's influence) of tax evasion.

Keywords: • tax culture • tax evasion • individualism • uncertainty avoidance • Slovenia

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1 Introduction

Nerré (2008) showed that a country-specific tax culture is the entirety of all relevant formal and informal institutions connected with the national tax system and its practical execution, which are historically embedded within the country's culture, including the dependencies and ties caused by their ongoing interaction.

Tax culture can thus be interpreted from different perspectives, such as an individual, society and company, and has been the subject of numerous discussions of both classic and transformation economists (Nerré, 2008: 154). In the context of classical understanding of tax culture, Schumpeter (1929; in Nerré, 2008: 154) wrote that understanding of it was focused primarily on creators of the tax system, tax policy and tax economists who create the national taxation system, while the tax culture as such has many dimensions and is consequently present in many fields, such as economics, sociology and history (Nerré, 2004, 2008). The development of the tax culture in the tax system is often measured by the frequency indicator of tax evasion (Alm, 2012a: 56–59).

Hofstede (1980: 25; Richardson, 2008: 69; Richardson, 2006) discussed the interconnectedness of national culture, the related tax culture and tax evasion. He observed and defined the national culture with the aid of four cultural dimensions (Richardson, 2008: 69; Tsakumis et al., 2007; Richardson, 2006): individualism, patriarchy/sex, avoidance of uncertainty and influence/power. Tsakumis et al. (2007) further upgraded Hofstede's (1980) theoretical model by measuring the impact of legal, political, fiscal and religious variables in individual countries, while Richardson (2008) conducted an empirical analysis on a sample of 47 countries, and with the help of OLS regression model and descriptive methods identified the interdependence of tax culture, as part of the national culture, and tax evasion. For measuring of interdependence, he used variables of the theoretical model according to Hofstede, and variables that measure attitudes towards tax evasion.

The added value of the paper is in the study, by which we measure the interdependence of tax culture and tax evasion in Slovenia and in other selected countries using factors such as the index of shadow economy, confidence in government, religion, government effectiveness, influence/power, individualism, patriarchy, uncertainty avoidance and GDP per capita. Although the factors are identical to those used by Richardson in his 2008 study, our survey covers a different period, namely from 2010 to 2014. We were interested in whether the level of individualism and the level of uncertainty avoidance effect the level of tax evasion.

The introductory part of this paper is followed by the second chapter, where an overview of the factors in the field of tax culture and tax evasion measuring is given. The third chapter presents the results of the empirical research and is

followed by an analysis and discussion of the results in the fourth chapter. The fifth chapter provides conclusions.

2 Overview of factors of tax evasion and tax culture measurements

The overview of the factors is provided based on the study of the most important works in the field of research about the impact on tax evasion and tax culture, such as Tsakumis et al. (2007), Richardson (2006, 2008), Bame-Aldred et al. (2013), Kamau et al. (2012) and Pinto et al. (2013). The factors presented in this paper are divided into two groups: (a) factors of tax evasion measurement, and (b) demographic factors, economic factors, behavioural and other factors, and factors of tax culture measurement.

2.1 Demographic factors

Richardson (2006) identified demographic factors as a set of factors that include age, sex, education and occupational status.

Age of taxpayers is one of the major determinants of tax evasion (Jackson & Milliron, 1986: 130; in Richardson, 2006: 52). The studies found that older taxpayers meet their tax obligations better than younger taxpayers (Tittle, 1980; Witte & Woodbury, 1985; Dubin & Wilde, 1988; Feinstein, 1991; in Richardson, 2006: 152). Tittle (1980) clarified the relationship between age and tax deviancy, change of lifecycle and generational differences. Younger taxpayers dare take more risks and are less susceptible to punishment, which is reflected as a social and psychological generational difference (Richardson 2006: 152).

Gender as a factor has, in previous studies, also proved to be a statistically significant factor. Studies showed that women taxpayers meet their tax obligations at a higher rate than men taxpayers (Richardson, 2006: 152), but Jackson & Milliron (1986: 131; in Richardson 2006: 152) argued that the difference between male and female taxpayers is decreasing due to the increasing equality of women. The *level of education* is also one of the important factors that affect the quantity of tax evasion, referring to the ability of the taxpayer to understand and consider tax legislation (Jackson & Milliron, 1986: 132; Richardson, 2006: 152). Jackson & Milliron (1986: 132; Richardson, 2006: 152) claimed that education has two elements: the overall level and the specific level of tax knowledge (Richardson, 2006: 152). However, good knowledge of tax evasion also has a negative impact on the fulfilment of tax obligations, as it increases the disparity in performance (Richardson, 2006: 152). The problem arises because the more educated taxpayers are aware of the unnecessary use of taxpayers' money by the authorities and therefore feel cheated, which in turn lowers their tax morale (Torgler, 2003: 53–54).

2.2 Economic factors

According to Richardson (2006: 152–153), the economic factors include income level, marginal tax rates and penalties.

The *level of income* is the main factor among economic factors. It usually refers to the gross income or total income of the taxpayer (Jackson & Milliron, 1986: 133; adapted from Richardson, 2006: 152). Doerrenberg and Peichl (2010: 8), who examined the impact of *income* of taxpayers on tax morale, concluded that tax evasion brings higher benefits for high income taxpayers, especially in countries with a progressive tax system. However, for people who have a high income, tax evasion represents a major social risk and they are largely affected by possible sanctions in the form of loss of a well-paid job. Jackson & Milliron (1986) concluded that in a system where a progressive tax rate is established, the effect of income on tax morale is higher than in countries with a single tax rate, at which point the higher income of progressive taxation has a negative impact on tax morale.

Marginal tax rates are another one of the important factors that affect the frequency and the amount of tax evasion; however, the results of empirical researches are mixed. Mason & Calvin (1984) found that there is a positive correlation between marginal tax rates and tax evasion, while Feinstein (1991) found a negative correlation between them (Richardson, 2006: 153). Richardson & Sawyer (2001: 200–201; in Richardson, 2006: 152) argued that the failure to control the correlation between marginal tax rates and the income level can lead to inconsistency and thus tax evasion.

Penalties and related fines in the tax system may affect the willingness of taxpayers for tax cooperation and are part of the compulsory state policy in the fight against tax evasion. Kirchler et al. (2008: 215) described the fines in relation to taxpayers' confidence in the state and the strength of the state. Doran (2009: 111–112) highlighted two models that explain the importance of the fines in relation to tax cooperation. The first of these is a model of deterrence, which was carried out on the basis of studies by Allingham & Sandmo (1972, in Doran, 2009: 112) and defends the idea that taxpayers meet their tax obligations to avoid possible sanctions when it is expected that the opportunity cost of tax evasion would be higher than the payment of taxes.

2.3 Behavioural factors

Among the behavioural factors we shall point out the complexity of the tax system, perceptions of fairness, contact of taxpayers with authorities, ethics and tax morale.

The *perception of justice* is a factor for which it is generally accepted that the notion of justice is related to tax evasion (Jackson & Milliron, 1986: 127–129; adapted from Richardson, 2006: 153). The taxpayers' perceptions of fairness should not be underestimated (Richardson & Sawyer, 2001: 91–295; adapted from Richardson, 2006: 153). However, Spicer & Thomas (1982; in Richardson, 2006: 153) found a negative link between fairness and tax evasion in general.

The growing importance of the *complexity of the tax system* on tax evasion was researched by Jackson & Milliron (1986: 138), Richardson & Sawyer (2001: 184) and Richardson (2006: 153).

For *participation and contact of tax authorities and taxpayers* Spicer & Thomas (1982) found in the USA that experience of taxpayers in relation to tax authorities (Richardson, 2006: 153) is of major importance. In contrast, the reduction and deterioration of contact of tax authorities with taxpayers and negative experience affect the increase of tax evasion possibilities (Torgler & Murphy, 2004; Richardson, 2006: 153).

Tax morale, which is often perceived as a vague concept (Jackson & Milliron, 1986: 136; in Richardson, 2006: 153), describes the moral principles and values of individuals in relation to the settlement of tax liabilities (Torgler & Murphy, 2004: 301; in Richardson, 2006: 153).

Ethics is another behavioural factor that affects the level of tax evasion. Čokelc (2007, 2008: 15) stated that ethical norms can help the tax authority decide on tax uncertainties, which have not yet been defined in case law. In such cases, it happens that a tax agent is in doubt on whether or not to decide in favour of the taxpayer.

2.4 Other factors

Other factors noted in extant literature are orientation of the individual, orientation of the state, knowledge of creative accounting, geographic location, company size, industry, individual's ambition and competitiveness on the market (Kamau et al., 2012; Bame-Aldred et al., 2013; Čokelc, 2007, 2008; Pinto et al., 2012).

Knowledge of creative accounting can assist an individual in carrying out tax evasion. The concept of creative accounting is often used to describe developed accounting techniques that allow companies to report their financial results in an adapted way and thus give the public unreliable and false information about their business, which they may be forced to do by the large degree of competition on the market (Kamau et al., 2012: 78). Bame-Aldred et al. (2013) argued that the *orientation of an individual* and the state, and the self-esteem of the individual, impact the relationship and the level of tax evasion. Orientation of the individual

can be linked to the individual's moral and ethical principles, while the confidence of an individual is encouraged to the extent that it still has a positive impact on the environment (Bame-Aldred et al., 2013). When talking about tax evasion and motives, both may be associated with *ambition*. Unhealthy ambition, such as a great desire for personal benefits (Čokelc, 2007: 6–7) affects the level of tax evasion. At the same time, the propensity for tax evasion is also influenced by factors such as company size, industry and geographic location of the company. The issue here is geographical diversity, regulation of tax systems in countries, relations of the tax authorities with taxpayers, development of tax culture, ethics and morale in these areas. Thus, tax evasion is, in some industries, more frequent than elsewhere due to economic and political conditions. It is also necessary to highlight the size of the company, since according to Pinto et al. (2012: 83), larger and more competitive companies have a greater desire to evade taxes and avoid tax obligations due to the amount they would have to pay in taxes, and inadequate tax legislation.

Index of shadow economy: The fight against the shadow economy and tax evasion, both in OECD countries and other countries around the world, has been going on for decades and is one of the goals of the policy of each country. However, to implement this requires in-depth knowledge and experts who participate in activities to combat the shadow economy and motivate others. Information on how and in what way to actively combat the shadow economy and tax evasion would enable governments to formulate appropriate political measures that discourage specific economic activity from the shadow economy and encourage a transformation in official matters, which can, of course, be understood as an explicit goal of economic policy (Schneider & Buehn, 2012: 2).

Gross domestic product - GDP per capita - Gross domestic product (GDP) is a measure for the economic activity. It is defined as the value of all goods and services produced less the value of any goods or services used in their creation. The volume index of GDP per capita is based on Purchasing Power Standards (PPS) which is the ratio between the level of domestic GDP (Magnien, 2002).

Slemrod et al. (2003) included the control macroeconomic indicator in his regression, as well as the share of government expenditure in GDP. He found that the tax morale is falling if the relative government expenditure is increasing.

2.5 Tax culture factors

In the literature it was observed that the authors specified as factors of tax culture confidence in the government, religion, government effectiveness, influence/power, individualism, patriarchy and uncertainty avoidance.

Confidence in government is often measured in the context of a country's economic and political situation in the world (Richardson, 2008). The index of the shadow economy, it can be concluded because there is lack of confidence in the government that affects the level of the shadow economy and therefore tax evasion (Deb & Chakraborty, 2017).

Religion, as part of an individual's personality, according to Richardson (2008), affects his or her attitude toward society, himself, human personality in general, belief and behaviour. Alm and Torgler (2006: 237) found that the higher the level of religiosity of the individual, the higher the level of tax morale, as studies show that countries in which there is a higher level of religion present among individual taxpayers face a smaller risk of tax evasion. In the case of religion or religious beliefs of the individual, as a factor of tax morale wherein the degree of religious belief is measured by frequency of attendance at religious services, studies (Kanniainen and Pääkkönen: 2010) have shown that individuals who frequently attend religious services have a higher tax morality than those who attend religious services less frequently or not at all (Hauptman & Matajić, 2012).

The *effectiveness of the government* is one of those variables that upgraded the initial research by Tsakumis et al. (2007). The variable is significant from the point of view that the effectiveness of the government contributes enormously to the economic policy of each country and also on the level of individuals, who, according to the degree of government efficiency, adjust their attitude, thinking and actions, thus helping shape the field of taxation the tax culture (Richardson, 2008: 70).

Influence/power encompasses the extent to which there are less powerful members of organizations and institutions, which accept and expect that the influence of the individual is/will be unequally distributed. This is illustrated in inequality (more in comparison to less); however, the latter is defined from the lower level upward and not from the upper level downwards, indicating that the level of social inequality is confirmed both by the members and by the leaders (Hofstede, 2010a).

Individualism is, on one hand, compared to collectivism, a degree to which individuals are involved in particular groups. On the individualism side, we find societies in which relations and links between individuals are free, i.e., everyone expects that they and their immediate families will be looked after. On the opposite, collectivist side, there is a society where people have been included in strong, cohesive groups, often extended families who are still protected, in return for absolute loyalty (Hofstede, 2010) since birth.

Patriarchism, in comparison to feminism, refers to the distribution of emotional roles between the sexes, which represents one of the key issues of each society for which a range of answers and solutions is available. Studies have shown that (a)

the value of women in different societies varies less than the value of men; and (b) the value of patriarchy contains different dimensions depending on the country, ranging from very confident, competitive and maximally different men to the feminist pole on one hand, and men resembling the feminist pole, modest and attentive on the other. The confident 'pole' is thus called patriarchy, and the modest pole feminism (Hofstede, 2010).

Avoiding uncertainty and dealing with social tolerance of uncertainty and ambiguity shows what it is that the cultural programmes of members cover, so that they feel either uncomfortable or comfortable in unstructured situations. Unstructured situations are like a novel—unknown, surprising, different from usual. Avoiding uncertainty when it comes to culture is trying to reduce the possibility of such situations with strict rules, laws and measures for safety and security (Hofstede, 2010).

3 Empirical research

From among the selected factors of the tax culture, this study is limited to examining the impact of the degree of individualism and uncertainty avoidance on the level of tax evasion in selected countries. The latter was measured by using the index of shadow economy, the level of confidence in the government, GDP per capita, religion, government efficiency, influence/power, individualism, uncertainty avoidance and patriarchy. Based on previous studies and the range of influential factors, we examined the following hypotheses:

H1: The higher the degree of individualism, the lower the level of tax evasion in a country.

Individualism focuses on the level to which the state reinforces individual or collective performance and correlation. In countries with high individualism, it is vital that the same standards apply to all people (Hofstede, 1980; Richardson, 2008: 70). This means that the rules and procedures are used in general to ensure fairness and consistency (Trompenaars & Hampden-Turner, 1998; Richardson, 2008: 70). The tax systems in such countries are likely to be fair and act in accordance with the principle of ability to pay, as the tax burden is distributed among the taxpayers in a similar manner. In such an environment, people act in accordance with the tax system, as they regard it as fair (Spicer & Thomas, 1982; Milliron & Toy, 1988; Richardson, 2008: 70).

H2: The higher the level of uncertainty avoidance, the higher the rate of tax evasion in a country.

Avoiding uncertainty focuses on the degree of tolerance of uncertainty and ambiguity within a certain country. In countries with a high degree of uncertainty avoidance, the tolerance of doubt and ambiguity is lower. This creates a normative-oriented society with a lot of written laws and regulations that help

reduce uncertainty and ambiguity (Hofstede, 1980; Richardson, 2008: 70). The tax systems in these countries are likely to be complicated due to the need for a number of tax laws and regulations to reduce uncertainty and doubtfulness. In such situations, people perceive the tax system as being complicated, and thus a larger quantity of tax evasion occurs (Richardson, 2008: 70).

We would like to stress that for both hypotheses we imply the *ceteris paribus* assumption and claim that both relationships are valid on average.

3.1 Data and Methodology

The study included 34¹ countries from which it was possible to obtain public information from various databases to carry out the research. The sample included 26 countries that can be found in the study by Richardson (2008), however, for a different time period, and 8 new countries² that have not yet been studied.

The edited data was analysed using the statistical program SPSS (IBM SPSS Statistics 20) and EViews (EViews 4 SV). The data on the shadow economy used for the needs of the research date back to 2007 from the last official survey measuring the index of the shadow economy, which covered 162 countries around the world (Schneider, 2010: 160–164). The data are thus of cross-sectional nature. The data for the variables *trust in government* and *religion* were acquired from the online database World Values Survey. They are given by means of a four-point Likert scale (4 - "A great deal", 3 - "Quite a lot", 2 - "Not very much", 1 - "None at all") for the period 2010-2014, namely the data on the proportion of respondents who chose an individual response. For the purpose of our research, we calculated the cross-sectional data on the average assessment of the respondents in the country about trust in the government.

The data on the *effectiveness of the government* for the year 2010 was acquired through the web database Worldwide Governance Indicators of the World Bank. GDP per capita for 2010 was also collected from the World Bank website. Data for *influence/power*, *individualism*, *patriarchism* and *uncertainty avoidance* were available through Hofstede's online research information databases.

The study uses data from disparate periods of time, as we encountered several restrictions regarding the availability of data. We therefore decided to use the data from approximately the same time period. Regression analysis was used, namely the ordinary least squares method. For the dependent variable we used the index of shadow economy (ISE) as a standard proxy for tax evasion. After examining theoretical and empirical research by other authors, we included eight independent variables in our study, namely confidence in government (ZAUP), religion (RELIG), government effectiveness (UCIN), influence-power (VPL), individualism (INDV), patriarchism (PATR), uncertainty avoidance (IZOG) and

GDP per capita (BDP). Variable names as they appear in tables are given in brackets. The standard specification and diagnostic tests were carried out, such as Jarque-Bera test of normal distribution, correlation matrix and VIF test for multicollinearity, White heteroscedasticity test and Breusch-Godfrey serial correlation LM test.

4 Results and discussion

This section presents the results of the descriptive statistics (Table 1 and Table 2) and regression model estimated with ordinary least squares (Table 3).

4.1 Regression model

From Table 3 with regression results one can see that the statistically significant variables are individualism (INDV, $p = 0.0030$), avoidance of uncertainty (IZOG, $p = 0.0223$), patriarchy (PATR, $p = 0.0208$), GDP per capita (BDP, $p = 0.0388$), influence (VPL, $p = 0.0000$) and confidence in the government (ZAUP, $p = 0.0000$), as their p -values are less than 0.05. The statistically insignificant variables are religion (RELIG, $p = 0.1320$) and the efficiency of the government (UCIN, $p = 0.5570$), for which the p -value is higher than 0.05. A very high determination coefficient ($R^2 = 0.983699$) might indicate a problem with non-stationary variables.

The estimated regression model passed the standard diagnostic tests, namely the Jarque-Bera test for the normal distribution of residuals, White heteroscedasticity test, Breusch-Godfrey serial correlation LM Test and VIF test to check for multicollinearity. These tests were performed for the verification of the estimated model to make certain that the assumptions that apply to linear regression models hold.

The Jarque-Bera test of normality ($p = 0.56$, see Figure 1) showed that the residuals are normally distributed, as required. White heteroscedasticity test results in Table 4 demonstrate that the p -value is greater than 0.05 ($p = 0.49$), which means that the null hypothesis of homoscedasticity cannot be rejected. From the correlation matrix (Table 5) it can be established that the correlation coefficient for any pair of explanatory variables is not higher than 0.8. With the help of variance inflation factors (VIF), we examined whether the independent variables are multicollinear. The literature applies the rule that the VIF value above 10 reflects strong multicollinearity of an individual variable with other explanatory variables (Pfafjar, 2014). In our case, we can conclude that all the values of VIF are below 10 (Table 6). The results of Breusch-Godfrey serial correlation LM test show that there is no autocorrelation in residuals, as the p -value is greater than 0.05 ($p = 0.16$, Table 7).

Using the regression model, we checked the two hypotheses, which were set at the beginning. For the first hypothesis (*H1: The higher the degree of individualism, the lower the level of tax evasion in a country*), we found that the coefficient of variable individualism (INDV) is negative (-0.070919) and statistically significant, which means that H1 is confirmed. Our results are in line with those from the studies of Richardson (2008) and Tsakumis et al. (2007). Namely, in countries with high individualism, it is vital that the same standards apply to all people (Hofstede, 1980; Richardson, 2008: 70). The tax systems in such countries are likely to be fair and act in accordance with the principle of ability to pay, as the tax burden is distributed among the taxpayers in a similar manner. In such an environment, people act in accordance with the tax system, as they regard it as fair (Spicer & Thomas, 1982; Milliron & Toy, 1988; Richardson, 2008: 70).

The second hypothesis (*H2: The higher the level of uncertainty avoidance, the higher the rate of tax evasion in a country*) was rejected, since the coefficient of the variable uncertainty avoidance (IZOG) is negative (-0.042017) and statistically significant, which means that the higher the level of uncertainty avoidance, the lower (on average) the rate of tax evasion. Our results are not in line with those from studies of Richardson (2008) and Tsakumis et al. (2007). Tsakumis et al. (2007: 136) pointed out that uncertainty avoidance does not equate risk avoidance and claimed that high uncertainty avoidance cultures are often prepared to engage in risky behaviour to reduce ambiguity. In this case, one could expect that high uncertainty avoidance would often go hand in hand with low risk aversion. Contrary to this expectation, Baker et al. (2011) argued that cultures high in uncertainty avoidance are risk averse, valuing predictability and stability. Additionally, Frijns et al. (2013) explained that managerial risk tolerance is a combination of risk aversion and risk perception and used uncertainty avoidance as a proxy in their study. Our results also take into account the fact that several countries well-known for their high uncertainty avoidance, for example Germany and Japan, are also low on tax evasion.

5 Conclusion

This paper presents a set of factors for measuring tax culture and tax evasion obtained from extensive literature review. Thus, we have, according to individual studies, identified the perceived factors, namely: individualism, achievement of orientation, self-esteem, human orientation, knowledge of creative accounting, geographic location, company size, industry, uncertainty avoidance, individualism, patriarchy, influence, government effectiveness, confidence in the government, religion, GDP, ambition, competitiveness, economic factors (income level, source of income, marginal tax rates, sanctions, the possibility of disclosure or discovery), behavioural factors (complexity of the tax system, perceptions of fairness, contact of authorities with taxpayers, compliance with

peers, ethics, tax morale) and demographic factors (age, sex, education, occupational status).

Based on the results of our empirical study, we confirmed the first hypothesis (*H1: The higher the degree of individualism, the lower the level of tax evasion in a country*) and rejected the second hypothesis (*H2: The higher the level of uncertainty avoidance, the higher the rate of tax evasion in a country*). The findings of our study are somewhat different from the findings of the research by Richardson (2008) and Tsakumis et al. (2007). Namely, all three studies confirmed H1, whereas only our study rejected H2. H1 holds because tax systems in high individualism countries are likely to be fair and therefore motivate the taxpayers to comply with the tax paying duty. Regarding the rejection of H2, we base our reasoning on the observation that cultures high in uncertainty avoidance are risk averse (Baker et al., 2011) and are therefore less likely display tax evasion. Our findings that both higher individualism and higher uncertainty avoidance are associated with (on average) lower tax evasion are important for policy makers and tax authorities, since both suggest possible means to control the level of tax evasion.

This research has several limitations. We had some difficulties in obtaining credible statistical data, as certain statistical publications, used in previous studies, no longer exist. Additionally, it was not possible to prepare cross-sectional data for the same time period, since, for example, the survey for the index of the shadow economy was last carried out in 2007. Further research into determinants of tax evasion could focus on extending the sample of countries under observation, on studying the differences regarding the influence of factors on tax evasion among heterogeneous groups of countries, and, most importantly, on including the time dimension by studying panel data. Thus, one could examine how the impact of factors/dimensions on tax evasion changes over time.

Notes:

¹ Namely Argentina, Australia, Brazil, Chile, China, Colombia, Germany, Ecuador, Spain, Estonia, Hong Kong, India, Japan, Korea, Morocco, Mexico, Malaysia, Netherlands, New Zealand, Pakistan, Peru, Philippines, Poland, Romania, Russia, Singapore, Slovenia, Sweden, Thailand, Trinidad and Tobago, Turkey, Uruguay, United States and South Africa.

² Slovenia, Ecuador, Morocco, Pakistan, Romania, Trinidad and Tobago and Uruguay

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Appendix:

Table 1: Descriptive Statistics

	N	Range	Minimum	Maximum	Sum	Mean	Std. Error	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
VPL	34	82	22	104	2115	62.21	3.321	19.364	374.956
IND V	34	83	8	91	1388	40.82	4.010	23.384	546.816
PAT R	34	90	5	95	1686	49.59	3.051	17.792	316.553
IZO G	34	92	8	100	2224	65.41	4.047	23.599	556.916
UCI N	34	3	-1	2	24	.71	.161	.938	.881
ISE	34	49.4	8.6	58.0	945.7	27.815	2.1286	12.4118	154.053
RELI G	34	62	8	70	823	24.21	2.383	13.897	193.138
ZAU P	34	37.628	6.794	44.422	757.608	22.2825	1.582495	9.227450	85.146
BDP	34	51053.0	1023.0	52076.0	651597.3	19164.6	2903.90	16932.52	28671015
Valid N (list wise)	34				8	3			5.46

Source: own research

Table 2: Skewness and Kurtosis

	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
VPL	.001	.403	-.327	.788
INDV	.684	.403	-.528	.788
PATR	-.350	.403	.959	.788
IZOG	-.516	.403	-.623	.788
UCIN	.176	.403	-1.139	.788
ISE	.479	.403	-.211	.788
RELIG	1.614	.403	2.850	.788
ZAU P	.481	.403	.172	.788
BDP	.889	.403	-.703	.788

Source: own research

Table 3: Estimated Regression Model

Dependent Variable: ISE				
Method: Least Squares				
Sample: 1 34				
Included observations: 34				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
1	-5.430186	3.333511	-1.628969	0.1159
BDP	-4.64E-05	2.13E-05	-2.181104	0.0388
INDV	-0.070919	0.021610	-3.281791	0.0030
IZOG	-0.042017	0.017246	-2.436368	0.0223
PATR	-0.060726	0.024620	-2.466515	0.0208
RELIG	0.087663	0.056303	1.556978	0.1320
UCIN	0.400655	0.673103	0.595236	0.5570
VPL	0.176178	0.023811	7.399071	0.0000
ZAUP	1.321368	0.072969	18.10861	0.0000
R-squared	0.983699	Mean dependent var		27.81471
Adjusted R-squared	0.978483	S.D. dependent var		12.41180
S.E. of regression	1.820649	Akaike info criterion		4.258190
Sum squared resid	82.86906	Schwarz criterion		4.662227
Log likelihood	-63.38923	Durbin-Watson stat		2.540382

Source: own calculations

Table 4: Heteroskedasticity Test

White Heteroskedasticity Test:

F-statistic	1.014183	Probability	0.486765
Obs*R-squared	16.60447	Probability	0.411627

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 08/28/15 Time: 16:19

Sample: 1 34

Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-100.4039	49.84384	-2.014370	0.0601
BDP	-0.000234	0.000288	-0.814829	0.4264
BDP^2	4.53E-09	5.21E-09	0.868067	0.3974
INDV	-0.593176	0.272951	-2.173197	0.0442
INDV^2	0.001830	0.002347	0.779702	0.4463
IZOG	-0.230573	0.332045	-0.694403	0.4968
IZOG^2	-0.000242	0.002556	-0.094546	0.9258
PATR	-0.522032	0.226949	-2.300220	0.0344
PATR^2	0.001791	0.001902	0.941363	0.3597
RELIG	3.502623	1.345432	2.603343	0.0186
RELIG^2	-0.024843	0.009767	-2.543478	0.0210
UCIN	4.907756	2.499326	1.963632	0.0661
UCIN^2	-2.625355	1.771276	-1.482183	0.1566
VPL	0.243255	0.415895	0.584894	0.5663
VPL^2	-0.001166	0.002812	-0.414781	0.6835
ZAUP	5.479380	2.310375	2.371641	0.0298
ZAUP^2	-0.062794	0.029439	-2.133011	0.0478
R-squared	0.488367	Mean dependent var		2.437325
Adjusted R-squared	0.006830	S.D. dependent var		4.045609
S.E. of regression	4.031770	Akaike info criterion		5.933141
Sum squared resid	276.3378	Schwarz criterion		6.696321
Log likelihood	-83.86339	F-statistic		1.014183
Durbin-Watson stat	2.595228	Prob(F-statistic)		0.486765

Source: own calculations

Table 5: Correlation Matrix

	ISE	1	BDP	INDV	IZOG	PATR	RELIG	UCIN	VPL	ZAUP
ISE	1.000000	NA	-0.131693	-0.512484	0.456707	-0.182849	-0.823922	-0.690571	0.415889	0.928800
1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BDP	-0.131693	NA	1.000000	0.075253	0.148993	-0.021250	0.041990	0.285455	-0.243732	0.006957
INDV	-0.512484	NA	0.075253	1.000000	-0.174870	-0.029970	0.562125	0.523108	-0.644854	-0.287670
IZOG	0.456707	NA	0.148993	-0.174870	1.000000	-0.025638	-0.336894	-0.416678	0.097555	0.547559
PATR	-0.182849	NA	-0.021250	-0.029970	-0.025638	1.000000	0.398021	-0.173196	0.114686	-0.171809
RELIG	-0.823922	NA	0.041990	0.562125	-0.336894	0.398021	1.000000	0.580816	-0.337900	-0.772608
UCIN	-0.690571	NA	0.285455	0.523108	-0.416678	-0.173196	0.580816	1.000000	-0.512183	-0.604910
VPL	0.415889	NA	-0.243732	-0.644854	0.097555	0.114686	-0.337900	-0.512183	1.000000	0.106072
ZAUP	0.928800	NA	0.006957	-0.287670	0.547559	-0.171809	-0.772608	-0.604910	0.106072	1.000000

Source: own research

Table 6: VIF

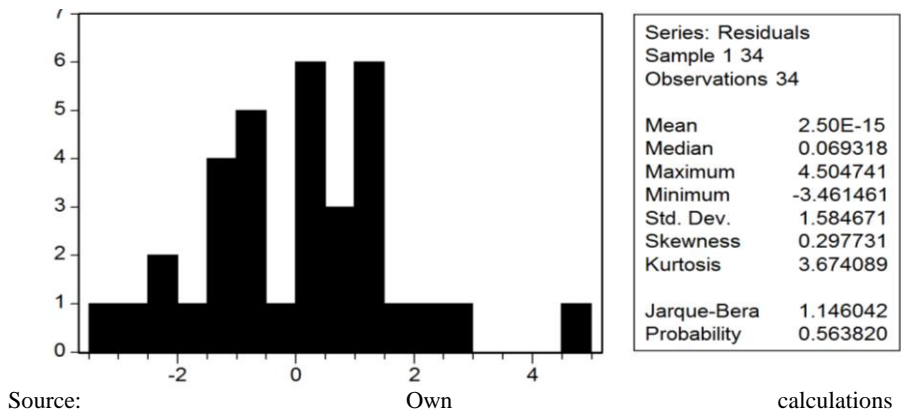
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	VPL	.503	1.990
	IZOG	.628	1.591
	INDV	.382	2.619
	BDP	.730	1.369
	ZAUP	.231	4.322
	RELIG	.149	6.724
	UCIN	.298	3.352
	PATR	.519	1.927

Source: own calculations

Table 7: Autocorrelation test

Breusch-Godfrey Serial Correlation LM Test:					
F-statistic	1.961756	Probability	0.163439		
Obs*R-squared	4.954755	Probability	0.083963		
Test Equation:					
Dependent Variable: RESID					
Method: Least Squares					
Date: 08/28/15 Time: 16:18					
Presample missing value lagged residuals set to zero.					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
I	3.019545	3.566147	0.846725	0.4059	
BDP	-1.28E-05	2.23E-05	-0.575390	0.5706	
INDV	-0.006437	0.021141	-0.304497	0.7635	
IZOG	-0.008715	0.017191	-0.506929	0.6170	
PATR	0.003806	0.023902	0.159226	0.8749	
RELIG	-0.034668	0.057724	-0.600574	0.5540	
UCIN	0.220323	0.658361	0.334653	0.7409	
VPL	-0.016664	0.024447	-0.681631	0.5023	
ZAUP	-0.017815	0.071123	-0.250486	0.8044	
RESID(-1)	-0.499428	0.252149	-1.980689	0.0597	
RESID(-2)	-0.198176	0.241530	-0.820502	0.4204	
R-squared	0.145728	Mean dependent var	2.50E-15		
Adjusted R-squared	-0.225694	S.D. dependent var	1.584671		
S.E. of regression	1.754407	Akaike info criterion	4.218331		
Sum squared resid	70.79271	Schwarz criterion	4.712154		
Log likelihood	-60.71163	Durbin-Watson stat	2.213003		

Source: own calculations

Figure 1: Histogram and Jarque-Bera test

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