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Institutional environment and individual income: a multilevel application

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Abstract

This paper is aimed at assessing how institutions, whether at the individual level or at the more aggregated level (institutional environment of the countries), relate to a categorical measure of individual income. To meet this need, as variables at different levels are included, the hierarchical logistic regression model is used, and the individual income category is the dependent variable. The results show that institutional dimensions such as family, trust, gender equality, interest in politics and democracy, competition and government size are positively related to higher income. Otherwise, institutional dimensions such as religion, obedience, authority and income equality are inversely related to the highest income category. Furthermore, regarding formal institutions at the aggregate level (countries), a positive association between individual income and being in an institutional environment with better guarantees of property rights and smaller government size is suggested. These results strengthen arguments that institutional environments that value trust, democracy and property rights can positively influence the determination of the individuals' income levels.

Keywords: Institutions. Values. Income.

Ambiente institucional e renda individual: uma aplicação multinível

Resumo

O objetivo deste artigo é avaliar como as instituições, seja no nível do indivíduo ou no nível mais agregado (ambiente institucional dos países), se relacionam com uma medida categórica de renda individual. Para atendê-lo, dado que se incluem variáveis em diferentes níveis, lança-se mão do modelo de regressão logística hierárquico, tendo a categoria de renda individual como variável dependente. Os resultados indicam que dimensões institucionais como família, confiança, igualdade de gênero, interesse por política e democracia, competição e tamanho de governo, apresentam-se positivamente relacionados à renda mais alta. De outra forma, dimensões institucionais como religião,

obediência, autoridade e igualdade de renda apresentam-se inversamente relacionados à categoria de renda mais alta. Além disso, sobre as instituições formais no nível agregado (países), sugere-se a associação positiva entre renda individual e estar em um ambiente institucional com melhores garantia de direito de propriedade e menor tamanho do governo. Esses resultados fortalecem argumentos de que ambientes institucionais que valorizam a confiança, a democracia e os direitos de propriedade podem influenciar positivamente na determinação do nível de renda dos indivíduos.

Palavras-chave: Instituições. Valores. Renda.

Entorno institucional y el ingreso individual: una aplicación multinivel

Resumen

El propósito de este artículo es evaluar cómo las instituciones, ya sea a nivel individual o al nivel más agregado (entorno institucional de los países), se relacionan con una medida categórica del ingreso individual. Para servirle, dado que se incluyen variables en diferentes niveles, se utiliza el modelo jerárquico de regresión logística, con la categoría de ingreso individual como variable dependiente. Los resultados indican que las dimensiones institucionales, como la familia, la confianza, la igualdad de género, el interés en la política y la democracia, la competencia y el tamaño del gobierno, están positivamente relacionados con mayores ingresos. De lo contrario, las dimensiones institucionales como la religión, la obediencia, la autoridad y la igualdad de ingresos están inversamente relacionadas con la categoría de ingresos más altos. Además, con respecto a las instituciones formales a nivel agregado (países), se corroboró la asociación positiva entre una mejor garantía de los derechos de propiedad, un tamaño de gobierno más pequeño y una categoría alta para medir el ingreso individual. Estos resultados revelan que los entornos institucionales que valoran la confianza, la democracia y los derechos de propiedad pueden influir positivamente en la determinación del nivel de ingreso de las personas.

Palabras clave: Instituciones. Valores. Ingresos.

1 Introduction

According to institutionalists, markets are not neutral points of intersection between individuals endowed with goods and services intended for exchange, but rather reflect the institutional environment in which they are formed. It is not the market that organizes and guides society, what really determines the allocation of resources in any social structure are the institutions (NORTH, 1977). According to North (1990), as institutions structure incentives for human exchanges (whether political, social or economic ones), these become the key to understanding the evolution of people.

Institutions define the rules of the game in society and organizations, making economic and social relations more predictable, facilitating the choices of decision-makers, even in environments of great uncertainty and complexity. The authors of the so-called Institutional Economics have highlighted the importance of greater social integration and cooperation as factors to promote socioeconomic development. Thus, the understanding of institutions such as values, habits, laws or informal and formal rules that condition the action, with normative content, indicates that they may be responsible for the installation of more cooperative or more opportunistic social dynamics.

According to Acemoglu (2009), institutions shape both social and economic relations. One should expect that an institutional change may entail, for example, the guarantee of property rights efficiently, bringing incentives to the expansion of investments in research and development (R&D). Incentives are an important part of a society, as they directly influence individual decisions and, consequently, where resources are allocated.

According to Olson (1982) and North (2005), the formal and informal institutions that make up the institutional environment are determinants or even conditions of the action of economic agents. Thus, whether at the micro or informal level (individual values, for example) or at the macro and formal level (the country's index of property right guarantee, for example), an association of these different institutional frameworks on individual economic results is expected.

There is evidence suggesting that strengthening institutions has a positive impact on labor productivity and economic growth of the countries (ACEMOGLU et al., 2004; KNACK and KEEFER, 1997). More specifically, efficient institutions help in the growth and performance of the economy and, consequently, in the increase in per capita income. However, there are no studies that analyze the impact of institutions on the economic performance of individuals.

Within this context, the aim of this article is to assess how informal institutions (individuals' values) and formal institutions (index of economic freedom) affect the level of individual income. That is, in addition to the relationships between informal institutions and income individually, formal institutions in the countries can also affect the level of income on the microscale. To meet this need, given that variables at different levels are included (individuals and countries), the hierarchical logistic regression model is used, and the individual income category is the dependent variable.

Regarding the values of individuals (first level), according to WVSA (2014), there is a spatial distribution of values worldwide, represented in two directions: the movement from south to north reflects the change from traditional values to values of the secular-rational type (the contrast between societies in which religion is very important and those in which it is not) and, moving from west to east, from survival values to self-expression values (the priority shifts in economic security for priority in welfare)¹. Thus, values of the "traditional" and "survival" types can be associated with typical values of "traditional" societies and, conversely, values of the "secular / rational" and "self-expression" types denote values of "non-traditional" societies.

As for formal institutions, which represent here the most aggregated institutional dimension (second level), the role of the State as regulator and promoter of development is highlighted, covering its capacity to promote

¹ Societies with "traditional" and "survival" values: Zimbabwe, Morocco, Jordan, Bangladesh; societies with "traditional" and "self-expression" values: the US, most of Latin America, Ireland; societies with values of the "secular-rational" and "survival" type: Russia, Bulgaria, Ukraine, Estonia; and societies with values of the "secular-rational" and "self-expression" type: Sweden, Norway, Japan, Benelux, Germany, France, Switzerland, Czech Republic, Slovenia and some English-speaking countries (WVSA, 2014).

institutional arrangements appropriate for the operation of the economy and favorable to the articulation between the different agents.

The database consisting of microdata on informal institutions is the World Values Survey (WVS), extracted from the World Values Survey Association (WVSA) and involves the values, beliefs and motivations of individuals. The database for formal institutions in the countries is the Heritage Foundation's Index of Economic Freedom. The analysis period covers the period from 1994 to 2014.

In addition to this introduction, this article has a literature review on topic 2, includes a description of the database and the econometric method in topic 3, and shows the results and discussions in topic 4 and final remarks in topic 5.

2 Informal and Formal Institutions

Institutions are regularities in social behavior (SCHOTTER, 1981) or rules of the game in the process of human interaction (NORTH, 1990, 1991 and 1992). According to Hodgson (2004), institutions are long-lasting systems of established and incorporated social rules that structure social interactions and involve some shared conceptions.

The institutions present at a given historical moment are the result of society's cultural heritage. Because this heritage slowly changes throughout generations, as a result of the learning process in the face of transformations in society and in the external environment, institutions also change gradually over time. It is not possible to understand a society without investigating the historical roots of its cultural evolution. Furthermore, this institutional inertia, inserted in historical time, is a path dependent process (MARTONE, 2007, p. 315).

Although formal institutions are North's (2005) main concern, the author recognizes the importance of cognitive elements in the formation and consolidation of the rules of the game. The limitations of individual rationality make human beings create benchmarks to define their behavior. These standards are based on individual beliefs that consolidate the institutional matrix of society (formal or informal restrictions) when they are shared.

Regarding informal institutions, Bourdieu (2005) analyzes social laws from a relational and systemic conception of the social structure. The social structure is seen as a hierarchical system of power and privilege, determined both by material and/or economic relations (salary, income) and by symbolic (status) and/or cultural (school education) relations between individuals. According to this point of view, the different location of groups in this social structure derives from the unequal distribution of resources and powers of each one of us. By resources or powers, Bourdieu means more specifically economic capital (income, wages, real estate), cultural capital (knowledge and knowledge recognized by diplomas and titles), social capital (social relations that can be reversed into capital, relations that can be capitalized) and finally, but not less important, the symbolic capital (what we commonly call prestige and/or honor). Thus, the privileged or non-privileged position occupied by a group or individual is defined according to the volume and combination of one or more capitals acquired and/or incorporated along their social trajectories. The set of these capitals would be understood from a system of

cultural dispositions (in their material, symbolic and cultural dimensions, among others), which Bourdieu calls habitus.

The habitus is related to a field and lies between the imperceptible system of structural relations, which shape actions and institutions, and the visible actions of actors, which structure relations. Habitus are the “social laws” that govern a field, such as the reproduction of the habitus through formal education. Such laws derive from usage, custom, have spatial-temporal validity, are established and supported by those who benefit from them: the dominant agents and institutions (Bourdieu, 1984). According to Bourdieu (2002), gender habitus are the result of education, a pedagogical work of naming and incorporation that begins in the process of child socialization and continues through varied and constant educational strategies of differentiation, most of the times implicit in the practices of various agents such as the family, the church, the school and the media. According to Silva (1995), the effects on social mobility seem stronger among men, when there is investment in education and culture. More than men, women need cultural capital to guarantee their class position. Likewise, they have to invest relatively more in education to obtain the same gains.

The concept of habitus considers the relationships of cooperation, friendship, responsibility, which can be represented by trust, which goes beyond the scope of the family and encompasses the willingness to cooperate within the social community. Trust presupposes the existence of common views on social relations and a sense of the common good. According to Bourdieu, trust and reciprocity can emerge from group amalgamation, which is nothing more than the intensification of the relational behavior of an individual or group, resulting from the inter-knowledge and inter-recognition of permanent and useful connections. Thus, willingness to comply with standards depends on how other people behave. In environments characterized by disrespect for norms, collective action is inefficient.

Analyzing formal institutions, authors such as Davis and North (1971) define the institutional environment as the set of fundamental rules of a political, social and legal nature that establish the basis for production, exchange and distribution. They include, for example, political regime, civil law, national constitution, property rights, among others.

According to North (1991), institutions provide the structure of incentives in an economy, and the development of a given region is directly linked to the efficiency of its institutions or the rules of the game. For North and Thomas (1973), development results from the evolution of property rights in each nation, which are associated with transaction costs, which would result from the difficulty of guaranteeing exclusivity and respect for property rights. Given the existence of significant transaction costs, these will define the gains obtained from the exchange (North, 1992). As goods have multiple attributes and services have multiple characteristics, there are costs in identifying and measuring all these attributes, or at least the attributes that have value, when specifying the terms of the contract, or verifying and ensuring its execution. To the extent that these costs are high or uncertain, property rights end up being imperfectly or incompletely specified: high transaction costs are directly related to poorly specified property rights. And high transaction costs reduce economic growth rates.

According to Martone (2007, p.313), institutions can produce low transaction costs in the economy, demanding clearer rules of the game. “This has to do with the quality of regulation of economic activities and markets, the reduction of information asymmetries and the provision of public goods in adequate quantity and quality. Transactions can be made unfeasible by transaction costs that exceed the potential benefits to the parties involved. Specifically, the dynamics of development (or backwardness) are related to the way in which property rights have been shaped by the State. Torstensson (1994), Knack and Keefer (1995), Goldsmith (1997), Carlsson and Lundstrom (2002) emphasize that securing and protecting property rights encourages growth. According to North (1981), the construction of a legal and defense system are the fundamental underlying sources of civilization. Economic growth in the modern Western world was linked not only to the emergence of safer property rights, but of political, religious and civil liberties (NORTH, 1988).

3 Database and econometric model

The micro (individual) level database is the World Values Survey (WVS), which is a worldwide survey of sociocultural and political change². The 2010-2014 wave is based on the values and beliefs of individuals from 97 countries spread across six continents. The choice of years (waves) was given by the higher frequency observed from wave 3 onwards, which is the time period used (1994-1998 to 2010-2014), in a total of 292,210 individuals interviewed (observations), as shown in Table 1.

Table 1 – Wave frequency

wave	frequency	%	% accumulated
1994-1998	74,148	25.37	25.37
1999-2004	60,045	20.55	45.92
2005-2009	83,975	28.74	74.66
2010-2014	74,042	25.34	100
Total	292,210	100.00	

Source: Prepared by the authors based on data from WVSA (2014).

It is noteworthy that most of the variables are categorical (binary). In Table 2, which considers variables from the first level (individuals), different percentage distributions can be seen between the variables. The variable of interest, individual income, is divided into two categories, low and high, and was built based on income deciles. Approximately 60% of the sample is in the “low” category and 31% is in the “high” category³. Considering other variables, of the total number of respondents in the world, 48% are men and 51% are women; 70% think “religion” is an important value against 27% who do not; 38% agree that men have more rights than women, against 57% who do not. Regarding trust and democracy, 24% say they trust the

² Find more details in Bell (1973) and Inglehart (1998), Welzel and Inglehart (2008).

³ The research interest is not focused on income comparisons between individuals from different countries, and the WVS is one of the most used sets of public opinion polls across time and nations.

majority of people, against 70% who do not; 80% think democracy is a good political system, against 9% who do not agree. Table 3 presents the simple correlation data between the variables.

Table 2 - Descriptive analysis of individual variables (first level)

Is family important?				Respect authority?			
	Freq	%	% ac		Freq	%	% ac
no	3242	1.11	1.11	bad	102889	35.21	35.21
yes	282694	96.74	97.85	good	170636	58.39	93.61
NA	6274	2.15	100.00	NA	18685	6.39	100.00
Is religion important?				Interested in politics?			
	Freq	%	% ac		Freq	%	% ac
no	78278	26.79	26.79	little	152693	52.25	52.25
yes	203687	69.71	96.49	much	128181	43.87	96.12
NA	10245	3.51	100.00	NA	11336	3.88	100.00
Child's obedience as good quality?				Income should be more equal?			
	Freq	%	% ac		Freq	%	% ac
no	173518	59.38	59.38	no	147817	50.59	50.59
yes	118674	40.61	99.99	yes	129073	44.17	94.76
NA	18	0.01	100.00	NA	15320	5.24	100.00
Are most people trustworthy?				Should people have more responsibility (or government)?			
	Freq	%	% ac		Freq	%	% ac
no	206188	70.56	70.56	no	177801	60.85	60.85
yes	72605	24.85	95.41	yes	101329	34.68	95.52
NA	13417	4.59	100.00	NA	13080	4.48	100.00
Should men have more rights than women?				Is competition good?			
	Freq	%	% ac		Freq	%	% ac
yes	168140	57.54	57.54	no	49757	17.03	17.03
no	111109	38.02	95.56	yes	199706	68.34	85.37
NA	12961	4.44	100.00	NA	42747	14.63	100.00
Have a more democratic political system?				Marital status			
	Freq	%	% ac		Freq	%	% ac
bad	26208	8.97	8.97	no partner	104099	35.62	35.62
good	233632	79.95	88.92	with partner	184339	63.08	98.71
NA	32370	11.08	100.00	NA	3772	1.29	100.00
Attendance at religious services?				Education			
	Freq	%	% ac		Freq	%	% ac
little	153408	52.50	52.50	low	135641	46.42	46.42
much	122480	41.92	94.41	high	136980	46.88	93.30
NA	16322	5.59	100.00	NA	19589	6.70	100.00
Against bribery?				Income			
	Freq	%	% ac		Freq	%	% ac
no	14853	5.08	5.08	low	175822	60.17	60.17
yes	262979	90.00	95.08	high	90989	31.14	91.31
NA	14378	4.92	100.00	NA	25399	8.69	100.00
Pride of the nation?				Gender			
	Freq	%	% ac		Freq	%	% ac
little	27764	9.50	9.50	woman	151476	51.84	51.84
much	251666	86.13	95.63	man	140475	48.07	99.91
NA	12780	4.37	100.00	NA	259	0.09	100.00

Note: NA = no answer based on the observations "missing", "unknown", "no answer" and "don't know".

Source: Prepared by the authors based on data from WWSA (2014).

Table 3 – Correlation explanatory variables - hierarchical logit model

	Fa	Re	Ob	Co	Ig	Ra	Ip	Ir	Tg	Com	De	Ar	Ho	On	Se	Id	Ec	Es	Dp	Lf
Family	1.000																			
Religion	0.059	1.000																		
Obedience	0.013	0.146	1.000																	
Confidence	-0.003	-0.147	-0.100	1.000																
Gender equality	-0.008	-0.150	-0.067	0.088	1.000															
Respect authority	0.029	0.169	0.111	-0.099	-0.078	1.000														
Interest in politics	0.006	-0.008	-0.063	0.088	-0.011	-0.001	1.000													
income equality	-0.013	-0.064	-0.012	0.025	0.035	-0.034	-0.030	1.000												
Size government	0.003	-0.011	-0.012	0.050	0.060	0.019	0.043	-0.208	1.000											
Competition	0.014	-0.010	-0.021	0.013	0.008	0.030	0.029	0.004	-0.084	1.000										
Democracy	0.024	0.019	-0.020	0.028	0.021	0.039	0.056	-0.012	0.006	0.081	1.000									
Religious activity	0.031	0.457	0.142	-0.089	-0.083	0.126	0.014	-0.071	0.019	-0.011	0.010	1.000								
Honesty	0.018	-0.012	-0.014	0.026	0.036	0.027	0.005	0.016	-0.017	0.059	0.054	-0.023	1.000							
Nationalism	0.057	0.146	0.076	-0.009	-0.034	0.135	0.027	-0.040	0.046	0.023	0.047	0.111	0.033	1.000						
Gender (1=man)	-0.023	-0.076	0.004	0.005	-0.111	-0.006	0.109	-0.029	0.023	0.033	0.013	-0.028	-0.020	-0.005	1.000					
Age	-0.019	-0.044	-0.053	0.075	0.000	0.015	0.088	0.062	0.021	-0.004	0.013	-0.035	0.066	0.009	0.012	1.000				
Marital status	0.073	-0.002	-0.012	0.032	-0.059	0.013	0.052	-0.008	0.013	0.015	0.003	0.003	0.028	0.024	0.026	0.257	1.000			
Education	0.008	-0.065	-0.124	0.084	0.085	-0.085	0.081	-0.044	0.033	0.048	0.022	-0.052	0.005	-0.048	0.016	-0.140	-0.072	1.000		
Property Law	-0.021	-0.244	-0.099	0.170	0.239	-0.118	0.022	0.061	0.099	0.007	0.007	-0.147	0.037	-0.047	-0.012	0.185	-0.002	0.064	1.000	
Fiscal freedom	0.023	0.245	0.086	-0.168	-0.183	0.076	-0.072	-0.057	-0.089	-0.029	-0.022	0.144	-0.022	0.041	-0.009	-0.128	-0.022	-0.015	-0.384	1

Source: Results from WVSA and Heritage data.

At the second level (formal dimension) the following variables extracted from the Heritage Foundation, specifically from the Index of Economic Freedom, were used: “Property Rights” and “Fiscal Health”. Each variable refers to a topic that is relevant to formal institutions, which refer to the rule of law and the government size, respectively. According to Miller and Kim (2016), both variables play a key role in the development and maintenance of personal and national prosperity. The descriptive analysis of these variables can be seen in Table 4.

Table 4 – Descriptive analysis of country variables (second level)

Variables	Obs	Average	Sta. deviation	Min	Max
Direito de propriedade	184	53.6957	24.4767	10	95
Tamanho do governo	184	71.7603	13.7317	33	100

Source: Prepared by the authors based on Heritage Foundation data.

According to Alston & Mueller (2005), property rights determine the incentives to use resources and consist of a set of formal and informal rights to use and transfer resources. For North and Thomas (1973), the lack of a clear definition of property rights increases transaction costs, which negatively impacts the economic growth. Additionally, property rights are able to guide the incentives of economic agents. When there is no definition of these rights, incentives tend to result in misallocation of resources (DEMSETZ, 1967). Thus, efficient property rights give citizens the confidence to develop an entrepreneurial activity, save their income, and make long-term plans.

The government size variable is a measure of government spending, tax burden, and fiscal health. The government spending component captures State consumption and all transfer payments related to various benefit programs. Studies show that excessive government spending causes chronic budget deficits and the accumulation of public debt, which is one of the most serious obstacles to economic dynamism. However, if there is government intervention for infrastructure investments, the impact on economic performance can be positive (YILDIRIM and GÖKALP, 2016). The tax burden is a composite measure that reflects marginal rates on personal and corporate income and the general level of taxation (including direct and indirect taxes imposed by all levels of government) as a percentage of gross domestic product (GDP) (HERITAGE FOUNDATION, 2019). Assuming that governments impose fiscal burdens on economic activity through taxes, the greater the government’s share of income or wealth, the lower the individual’s reward for economic activity and the lesser the incentive to make the investment.

*Econometric model: the multilevel approach*⁴

The logistic regression for the two-level hierarchical model is a series of Z groups (cluster-level variables), with a random sample of m_j unit-level variables

⁴ See Snijders and Bosker (1999), Raudenbush and Bryk (2002), Gelman and Hill (2007). Find more about multi-level models with binary responses in Rabe-Hesketh, Skrondal and Pickles (2005).

(individuals) in each j cluster ($j=1\dots Z$). The binary answer admits only two outcomes: success (1) and failure (0). Let Y_{ij} be the value of the response variable of the j th observation of the i th group and $u_i \sim N(0; D(\theta))$ with $D(\theta) = \sigma^2$. The two-level model for a binary answer is defined by the probability distribution (1) and by the linear predictor (2):

$$P(Y_{ij} = 0) = 1 - \mu_{ij} \text{ and } P(Y_{ij} = 1) = \mu_{ij} \quad (1)$$

$$g(u_{ij}) = x_{ij}^t \beta + z_{ij}^t u_i \quad (2)$$

where Y_{ij} represents the income category (0 for low and 1 for high) for individual i in country j , and $g(\cdot)$ is the logit function. This type of function also has the convenience of transforming the predicted value into the log-odds as shown in (3):

$$\eta_{ij} = \log\left(\frac{\pi_{ij}}{1-\pi_{ij}}\right) \quad (3)$$

where η_{ij} is the logarithm of the odds for individual i , and π_{ij} is the odds probability for individual i .

The intercept value is considered the expected average value of the dependent variable and varies between level 2 units. The null model has the configuration described in (4):

$$\eta_{ij} = \beta_{0j} + \varepsilon_{ij} \quad (4)$$

where $i = 1\dots N$ are the level 1 units, in this case individuals; $j = 1 \dots J$ are the level 2 units, countries; β_{0j} is the average result for the j th unit; ε_{ij} is the random effect associated with level 1.

From the ANOVA model, the intraclass correlation coefficient (ρ), represented by (5), can be calculated to justify the use of the hierarchical approach:

$$ICC = \frac{\sigma_{00}^2}{\sigma_{00}^2 + \frac{\pi^2}{3}} \quad (5)$$

Since in logistic regression models it is not possible to estimate the coefficients and error variance at the individual level in the random component of the model, it is suggested that this error variance be fixed at $\pi^2/3=3.29^5$.

To calculate the variability associated with level 1, the independent variables corresponding to that level are added, as shown in (6):

$$\eta_{ij} = \beta_{0j} + \beta_{kij} X_{kij} + \varepsilon_{ij} \quad (6)$$

⁵ Snijders and Bosker (1999); Raudenbush and Bryk (2002); Morenoff (2003).

where the subscripts i and j represent, respectively, individuals and countries. Furthermore, β_{0j} = intercept; β_{kj} = parameters to be estimated in the model; ε_{ij} = random error term; X_{kij} = explanatory variables, which include the values of individuals (informal institutions).

After the estimation of level 1, the explanatory variables of the second level are included, since it is a random intercept model. From that moment on, the variance is conditional. The inclusion and statistical significance of the explanatory variables mean that an individual's propensity to be of the high-income type varies across countries due to formal institutions in those countries. This institutional environment can be represented as in the model defined in (7):

$$\beta_{0j} = \gamma_{00} + \sum_{s=1}^S \gamma_{0s} Z_{sj} + u_{0j} \quad (7)$$

where Z_{sj} represents the level 2 variables for each country j , covering the formal institutions of the countries, such as property rights and government size.

To guide the inclusion of level 2 variables and know their importance in terms of explaining the variability of the intercept, the percentage of explained variance is used, according to expression (8):

$$\text{Percentage of the explained variance} = \frac{\tau_{00}(\text{non-conditional}) - \tau_{00}(\text{conditional})}{\tau_{00}(\text{non-conditional})} \quad (8)$$

The value of (8) provides the percentage of the intercept variance of the null model that is being explained by the inclusion of variables at level 2. Even though individual characteristics cover a good part of the individual's odds of having high income, there may be a proportion of the variance that remains unexplained, given by the intercept, that is, by the general mean. Thus, it is important to gradually include variables from level 2 to assess the contribution of each additional element to the reduction of the unconditional variability of the intercept. That is, in addition to the relationships between informal institutions and income at the individual level, formal institutions in countries can also affect the probability of the individual having high income.

4 Resultados e Discussão

The binary dependent variable for all estimated models, measured at the individual level (level 1), is the income category (assuming a value of 0 for low and 1 for high). Table 5 presents 5 (five) models with the estimates of the coefficients of the multilevel analyses in terms of the individual's odds of having "high income". Model 1 (null), in the first column is the ANOVA model with random effects. Through the calculation of the Intraclass Correlation Coefficient (ICC)⁶, we see the variation in the chances of the individual having "high income" linked to the characteristics of the countries. Thus, the ICC=0.1353 suggests that 13.53% of the variation in the

⁶ In logit, the fixed error variance is $\pi^2/3=3.29$ (Snijders, Bosker, 1999; Raudenbush, Bryk, 2002; Morenoff, 2003).

individual's odds of having high income stems from differences in these chances between countries. Given that the contextual variance coefficients are statistically different from zero for the 5 (five) models, it is assumed that the probabilities of having high income differ, for all models, according to the country in which the individual lives.

Table 5 – Multilevel regression results - 1994 to 2014.

	Model 1 (null)	Model 2	Model 3	Model 4	Model 5
Fixed Component					
Intercept	-0.6798*** (0.0735)	0.2214*** (0.0235)	0.1193*** (0.0155)	0.1563*** (0.0204)	0.0762*** (0.0115)
Family		1.4810*** (0.0893)	1.4759*** (0.0905)	1.4755*** (0.0904)	1.4748*** (0.0904)
Religion		0.8855*** (0.0132)	0.8955*** (0.013)	0.8923*** (0.0139)	0.8949*** (0.0139)
Obedience		0.8746*** (0.0107)	0.8706*** (0.0110)	0.8721*** (0.0110)	0.8710*** (0.0110)
Confidence		1.2367*** (0.0165)	1.2372*** (0.0170)	1.2385*** (0.0171)	1.2371*** (0.0170)
Gender equality		1.1860*** (0.0153)	1.1852*** (0.0159)	1.1853*** (0.0159)	1.1867*** (0.0159)
Respect authority		0.9542*** (0.0119)	0.9551*** (0.0124)	0.9576*** (0.0124)	0.9548*** (0.0124)
Political interest		1.2293*** (0.0142)	1.2348*** (0.0148)	1.2358*** (0.0148)	1.2363*** (0.0148)
Income equality		0.7177*** (0.0085)	0.7172*** (0.0088)	0.7168*** (0.0148)	0.7175*** (0.0088)
Size government		1.3467*** (0.0162)	1.3528*** (0.0167)	1.3507*** (0.0167)	1.3523*** (0.0088)
Competition		1.0307** (0.0162)	1.0279** (0.0151)	1.0291** (0.0151)	1.0286** (0.0151)
Democracy		1.0991*** (0.0208)	1.0884*** (0.0212)	1.0865*** (0.0212)	1.0890*** (0.0213)
Religious activities		1.0043 (0.0137)	1.0115 (0.0142)	1.0075 (0.0142)	1.0108 (0.0142)
Honesty		0.9250*** (0.0231)	0.8956*** (0.0229)	0.8958*** (0.0229)	0.8939*** (0.0229)
Nationalism		1.0602*** (0.0203)	1.0617*** (0.0215)	1.0562*** (0.0214)	1.0613*** (0.0215)
Gender (1=man)		1.0765*** (0.0121)	1.0788*** (0.0126)	1.0780*** (0.0125)	1.0789*** (0.0126)
Age		0.9890*** (0.0004)	0.9891*** (0.0004)	0.9892*** (0.0004)	0.9891*** (0.0004)
Marital status		1.4995*** (0.0184)	1.5050*** (0.0191)	1.5055*** (0.0191)	1.5056*** (0.0191)
Education		2.1771*** (0.0267)	2.1692*** (0.0275)	2.1734*** (0.0276)	2.1687*** (0.0275)
Property right			1.0113*** (0.0012)		1.0121 (0.0013)
Size of government				1.0048*** (0.0010)	1.0060*** (0.0010)

to be continued

<i>dummy_wave2</i>		1.0850*** (0.0232)	1.1550*** (0.0261)	1.1663*** (0.0263)	1.1473*** (0.0260)
<i>dummy_wave 3</i>		1.1973*** (0.0242)	1.3118*** (0.0277)	1.2160*** (0.0277)	1.2454*** (0.0285)
<i>dummy_wave 4</i>		1.2144*** (0.0235)	1.3422*** (0.0279)	1.2005*** (0.0273)	1.2618*** (0.0294)
Random Component	σ^2	σ^2	σ^2	σ^2	σ^2
Coefficient	0.5150*** (0.0760)	0.5532*** (0.0843)	0.6045*** (0.0969)	0.5711*** (0.0914)	0.6049*** (0.0970)
ICC	0.1353	0.1439	0.1551	0.1479	0.1553
% explained variance ¹	-	-	9.27%	3.14%	9.34%
Number obs.Level 1	266.811	162169	151.906	151.910	151.906
Number obs.Level 2	96	91	83	83	83

Note: Percentage of explained variance for each model estimated for the country, but not at the individual level. This occurs because the component of the variance at the individual level is heteroscedastic in nonlinear models (RAUDENBUSH, BRYK, 2002). Dummy variables for the “waves” were inserted in order to control the time effects.

*** 1% significance, ** 5% significance.

Source: Prepared based on estimates of the models

Model 2 (non-conditional) includes only the explanatory variables linked to the characteristics of individuals (level 1). Although individual characteristics explain a good part of the individual’s odds of having high income, there is still a proportion of the variance that remains unexplained, given by the intercept.

In Models 3, 4 and 5, the level 2 variables are gradually included. Gradual inclusion is important to analyze the degree of contribution of each additional variable to the reduction of the non-conditional variability of the intercept (estimated by Model 2). This measurement can be made through the percentage of explained variance. These models incorporate into Model 2 explanatory variables of the second hierarchical level, capturing the differentiated effect of formal institutions on the income category of individuals located in different countries.

Regarding models 3 and 4, for example, it is possible to see that in model 3 the variable “property right” explains the variability of the intercept (different averages between countries) at 9.27%, while “government size” explains less this variability, with 3.14% (Model 4).

Considering Model 5, all level 1 variables (with the exception of “religious activities”) are statistically significant. Thus, there is a division into two groups of values according to the relationship of the variables with individual income. Informal institutions such as family, trust, gender equality, democracy, nationalism, interest in politics, preference for competition and less government interference form a group of variables that can increase the individual’s odds of having “high income”. That is, most of these elements refer to values of “non-traditional” societies and these can be positively related to individual income. Conversely, more “traditional” values such as religion, obedience and respect for authority have an inverse relationship with individual income, that is, they can reduce the individual’s odds of having “high income”. Regarding the coefficients of the time dummies (waves), it is worth noting that they showed a tendency to grow and, considering model 5 (complete), an upward tendency can be seen according to the waves.

It is worth recalling the ideas of Bourdieu (2005), based on the analysis of social laws, relational and systemic conception of the social structure. The social

structure is a system of material and/or economic relations, symbolic and cultural relationships. It can be argued that the different location of individuals in this system derives from the unequal distribution of values (*habitus*), which are the “social laws” that regulate the relationships, customs and interaction of individuals.

Considering the two variables that represent formal institutions (Model 5), increases in the indices of “property rights” and “government size” may increase the odds of the individual having high income by 1.2% and 0.6%, respectively. In other words, the greatest effect of these formal institutions on individual income comes from guaranteeing the property rights of the countries. The positive value for “property right” (odds ratio greater than 1) is in accordance with North and Thomas (1973), and North (1981) and Martone (2007), who emphasize the direct relationship between better guarantees of property rights and economic prosperity (in this case, high individual income).

According to North (1981), the construction of a legal and defense system are the fundamental underlying sources of civilization. For the author, development is related to the maintenance of property rights, guaranteeing political, religious and civil liberties. That is, the more secure these freedoms are, the lower the transaction costs and, consequently, the greater the income. Thus, the income in a society in which the State guarantees property rights is greater than it would be if those who are governed guaranteed their rights, given the State’s economies of scale in offering protection and justice.

The positive odds ratio of the “government size” variable indicates a direct relationship between being in a country with less government interference (in terms of tax collection) and a greater chance of individuals having “high income”. However, its value was relatively low, and this result does not capture the demand of individuals for a smaller or greater presence of the State. Miller and Kim (2016) argue that the greater the government’s share of income or wealth, the lower the individual’s reward for economic activity. According to North (1981), there would be the ideal size in which the growth in tax revenue generated by the protection is equaled to the costs of offering this service, that is, more protection guarantees more individual income, but at the same time requires more taxes, which in turn, reduces income. This duality in the analysis of formal institutions is portrayed in North (1988), who considers the modern democratic state, with its political pluralism.

5 Final Remarks

Understanding the concept and forms of institutions is a complex task and there is a lack of consensus. The definitions move through more objective structures of identification, such as the laws and norms defined by the State, and less tangible structures in the cognitive sphere, such as norms, trust or values of the society. Thus, analyzing the association of formal and informal institutions with economic variables, more specifically with the income level of individuals, is a challenge.

The results reveal that institutions are directly or indirectly associated with the level of income of individuals. In the case of informal institutions, individual values such as family, trust, gender equality, interest in politics and democracy,

competition, government size (less intervention) are positively related to higher income. On the other hand, values such as religion, obedience, authority and income equality are inversely related to higher income.

Societies with high levels of control (where religion and authority are predominant values, for example), are those in which individuals have less relative autonomy over their choices, which can negatively affect their ability to innovate and endeavor. More traditional (pre-industrial) societies emphasize religion, male dominance in political and economic life, and prefer a more authoritarian political system.

With regard to the formal institutions of the countries, the positive association between guaranteed property rights and high individual income was corroborated, as well as a positive association for smaller government size and individual income. The existence of property rights provides an incentive structure in an economy, expands the environment of trust in formal rules and the legal system, and defines new directions for income generation. It is less risky to invest and innovate in an environment characterized by well-defined property rights. Regarding the government size, despite the controversies in the literature about the effects of government intervention on economic results, it is understood that the variable “government size” may be linked to a certain degree of individual autonomy, which may favor increases in the level of per capita income.

The State’s capacity to elaborate formal institutions is a requirement of an effective economic policy, especially when it comes to less developed countries. In addition, the understanding of informal institutions, rooted over time in society, allows for the construction of a political agenda oriented to the shapes of more socially and economically developed societies.

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