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HUMAN FREEDOM AND ECONOMIC DEVELOPMENT: A GRANGER CAUSALITY ANALYSIS OF PANEL DATA

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Abstract

Vigorous empirical research has been done recently about the immense impact of institutions on economic prosperity. Numerous studies have provided valuable evidence that market-supportive institutions, which limit the power of the state and promote individual choice, self-ownership, rule of law and voluntary exchange, have a positive impact on economic development. Here, we would like to introduce and examine one relatively new measurement of the institutional environment – the human freedom index and its link to economic prosperity. Human freedom is an indexed co-published between the Cato Institute and the Fraser Institute. It presents the state of human freedom in the world by uniting the aspects of personal and economic freedoms. In the paper, we examine the relationship between human freedom and economic development using the Granger causality test of panel data. The general idea is to analyze if there is a causal relationship between human freedom and economic growth and to determine the direction of the relationship. Additionally, we examine the causality between these two variables among the different regions around the world. The results of the study can serve as an indication of whether supporting human freedom can accelerate economic growth.

Key words: Institutions, Human freedom, Personal freedom, Economic freedom, Economic growth, Economic development

INTRODUCTION

The human freedom is a significant determinant of the economic growth in the modern economic theories. This aspect became popular with the rise of the new institutional economics (Brkić et al. 2020; Justesen 2008; Kacprzyk 2016). Human freedom is a social concept that recognizes the dignity of individuals or in other words human well-being. This concept is interconnected to other social and economic aspects, and it is very hard to be measured. In this research we use the human freedom index co-published between the Cato Institute and the Fraser Institute to determine the influence of the human freedom on the economic growth.

The topics become very popular during the pandemics due to COVID-19 virus. Imposing disproportionate restrictions that limited the information, free expression in the name of stopping Covid-19 caused negative effects in basic freedoms, and people lost confidence in the institutions. Contrary to this argument, some authors claimed that human rights do not present a barrier to crucial action to contain the virus and that human rights can act as a guide in the fight against the pandemic (Scheinin and Molbaek-Steensig 2021). In a pandemic, one person's actions affect the well-being of others. And whenever there are such externalities, the well-being of society requires collective action (Stiglitz 2021). In both cases, ensuring basic form of certainty is required, so that people can make rational decisions and can engage into investments that can contribute to higher economic growth.

The main objective of this paper is to determine the impact of human freedom (and its components: personal and economic freedoms) on the economic growth (expressed as GDP growth, GDP per capita and GDP per capita growth). The sample is comprised of 160 countries all around the world in the period from 2008 to 2018. However, since different regions have its own specifics, in the second part of the research we tried to establish the connection between human freedom and GDP growth in seven different regions.

This paper addresses the following questions:

- is there empirical evidence about causality between human freedom and economic growth? Is this positive relationship existing in different regions?
- is there empirical evidence about causality between segments of human freedoms (economic and personal freedoms) and economic growth? Is this positive relationship existing in different regions?
- can improvement in the human rights contribute to higher economic growth (worldwide and in different regions).

LITERATURE REVIEW

There are different views in the academic literature concerning the economic effect of human rights. One of the views is that improvement in the human right can make the legal system more efficient, increase income and consequently increase growth over time. Therefore, various groups of human rights (civil rights, property rights, social rights) are a precondition for productive and efficient decisions of individuals, and thus efficiency-enhancing. Other view is that there is no evidence that human freedoms in different regions of the world are harmful to growth. The majority of the studies (Jørgensen and Sano 2017; Blume and Voigt 2007) find no evidence to support this relationship. In other words, human rights either promote growth or have no effect on growth.

This paper ensures continuity of the previous research of Disoska and Kocevaska (2021). By using the Granger causality test, we have proven that improvements in human development led to higher economic growth, which further promotes human development. In this paper, we go further, by decomposing the index into its main components, we try to find specific relationship between economic and personal freedom to the economic growth.

The literature suggest that there is a positive relationship between economic growth and aspects of economic freedoms in general, especially in the European countries (Kacprzyk 2016; Brkić, Gradojević and Ignjatijević 2020; Akin et al. 2004; Cebula 2011, 2013; Cebula and Clark 2014, Ali and Crain 2001, 2002; Tortensson, 1994.) Very few papers have questioned the relationship between economic freedom and growth (De Haan et al. 2006; Carlsson and Lundström 2002).

Personal liberty encompasses the freedom of the press and the rights of individuals to assemble, hold alternative religious views, receive a fair trial and express their views without fear of physical retaliation. Gwartney et al. (1996) argue that a country may be liberal in a political sense — that is, be highly democratic while at the same time major civil liberties are protected, by adopting policies that conflict with economic freedom. The problem of authoritarian culture and/or restriction of individual freedoms can limit the economic growth (Abrams & Lewis 1995).

Political liberties, as part of personal liberties can be understand as the freedom of the citizens to participate in the political process vote, lobby, and choose among candidates, elections are fair and competitive, and alternative parties are allowed to participate freely. Therefore, good governance and political freedom are also significant to the process of economic growth (Lui

1996; Zhao, Kim and Du 2003; Akcay 2006; Brito-Bigott et al. 2008; Sano and Marslev 2016). This argument was supported in our previous papers of Disoska and Kocevskaja (2017; 2019). Better and freer institutional quality has a positive influence on economic growth, they reduce transactional costs and decrease market inefficiencies. The lessons from the East Asian financial crisis, confirms that without a strong institutional framework, economic growth can not be sustained (Clarke 1999).

DATA

In this paper, we analyze an unbalanced panel data covering 160 economies in the period from 2008 to 2018. Two groups of variables are used in the analysis: variables representing the economic development and variables explaining the institutional environment (human freedom and its components: personal and economic freedoms).

We use three separate variables to capture the economic development in the countries worldwide: Gross domestic product (hereinafter: GDP) growth, GDP per capita and GDP per capita growth. All of the variables are collected from the World Bank national accounts data, and OECD National Accounts data files through the World Bank Database portal. *GDP growth* represents the percentage growth rate of GDP at market prices based on constant local currency, calculated on an annual basis. *GDP per capita* is GDP given in constant 2010 U.S. dollars, divided by midyear population. *GDP per capita growth* is the annual percentage growth rate of GDP per capita based on constant local currency.

Table 1. Descriptive statistics of economic development variables

	<i>GDP growth</i>	<i>GDP per capita growth</i>	<i>GDP per capita</i>
Mean	3.329722	1.846013	14104.70
Median	3.405300	1.982400	5330.540
Maximum	123.1400	121.7800	110702.0
Minimum	-62.07590	-62.37810	210.8040
Std. Dev.	5.234801	5.128263	19236.49
Observations	1745	1745	1745

Source: World Bank national accounts data, and OECD National Accounts data. Authors' own calculations.

Human freedom is presented by the human freedom index, co-published by Cato Institute and the Fraser Institute (Vasquez and McMahon, 2020). The index is considered a broad measure of human freedom around the world. It measures to which extent the negative rights of individuals are respected by the countries worldwide. Human freedom index integrates 76

different indicators of personal and economic freedom of the individuals, organized in two broad categories: personal freedom and economic freedom. Personal freedom is constructed from 7 distinct areas or variables, including Rule of Law, Security and Safety, Movement, Religion, Association, Assembly, and Civil Society, Expression and Information, and Identity and Relationship. Economic freedom, on the other hand, incorporates Size of Government, Legal System and Property Rights, Access to Sound Money, Freedom to Trade Internationally, and Regulation of Credit, Labor and Business. Each of these variables is given on a 0 to 10 scale, where 0 stands for least free and 10 for most freedom. The latest edition of the index was published in 2020 and it covers total 162 countries in the period from 2008 to 2018. In the following table (Table 2), we present the descriptive statistics of the human freedom, economic freedom and personal freedom variables.

Table 2. Descriptive statistics of institutional variables

	<i>Human freedom</i>	<i>Economic freedom</i>	<i>Personal freedom</i>
Mean	6.998571	6.840339	7.151923
Median	6.970000	6.950000	7.165000
Maximum	8.990000	8.970000	9.590000
Minimum	3.600000	2.720000	2.310000
Std. Dev.	1.077697	0.932157	1.398671
Observations	1680	1680	1680

Source: Human freedom index 2020 (Vasquez and McMahon, 2020). Authors' own calculations.

The descriptive statistics of the individual components of economic freedom and political freedom are presented in Annex 1 and Annex 2.

STATIONARITY AND TRANSFORMATION

Before we continue with examination of the relationship between the economic variables and institutional variables, we have checked the stationarity of the time series. In the test equation, we used both individual intercept and trend. We performed two tests ADF – Fisher and PP – Fisher Chi – square tests, both assuming individual unit root processes as a null hypothesis. These two tests are considered to be most appropriate unit root tests for unbalanced panel data (Baltagi 2005). The results from the unit root tests are given in Table 3. According PP- Fisher Chi - Square test, all of the variables are stationary at a level or I(0) processes. When using ADF Fisher test, Human freedom and Personal freedom are stationary at first level, while all the other variables are I(0) processes. Having in mind the results from the

PP – Fisher Chi –square test, in the following sections of the paper, we assume all of the employed variables to be stationary processes at level.

Table 3. Results from unit root tests

Variable	ADF - Fisher Chi-square		PP - Fisher Chi-square	
	F stat	Stationarity	F stat	Stationarity
<i>GDP growth</i>	760.153***	I(0)	1083.37***	I(0)
<i>GDP per capita</i>	590.766***	I(0)	745.553***	I(0)
<i>GDP per capita growth</i>	749.268***	I(0)	1081.58***	I(0)
<i>Human freedom</i>	456.778***	I(1)	483.303***	I(0)
<i>Economic freedom</i>	355.043*	I(0)	580.211***	I(0)
<i>Personal freedom</i>	734.141***	I(1)	443.508***	I(0)

Note: p-value: *** significant at 99% level; ** significant at 95% level, * significant at 90% level.

In the next section, we describe the methodology that is used in order to examine the causality between the economic and institutional variables.

METHODOLOGY

Our empirical strategy is to examine the causality between the human freedom and economic development, by performing a panel data specific causality testing. We perform Granger causality test (Granger 1969) on the following bivariate model:

$$y_{i,t} = \alpha_{0,i} + \alpha_{1,i}y_{i,t-1} + \dots + \alpha_{k,i}y_{i,t-k} + \beta_{1,i}x_{i,t-1} + \dots + \beta_{k,i}x_{i,t-k} + \epsilon_{i,t}$$

$$x_{i,t} = \alpha_{0,i} + \alpha_{1,i}x_{i,t-1} + \dots + \alpha_{k,i}x_{i,t-k} + \beta_{1,i}y_{i,t-1} + \dots + \beta_{k,i}y_{i,t-k} + \epsilon_{i,t}$$

Where x and y denote the variables, t denotes the time period dimension of the panel, and i denotes the cross-sectional dimension.

In addition, we assume the panel data to be one large stacked set of data and the coefficients are same across all cross-sections:

$$\alpha_{0,i} = \alpha_{0,j}, \alpha_{1,i} = \alpha_{1,j}, \dots, \alpha_{l,i} = \alpha_{l,j}, \forall i, j$$

$$\beta_{0,i} = \beta_{0,j}, \beta_{1,i} = \beta_{1,j}, \dots, \beta_{l,i} = \beta_{l,j}, \forall i, j$$

RESULTS AND DISCUSSION

In this section, we present the results from the analysis of the relationship and causality between human freedom and economic development. We focus on the variable *Human freedom* as it was previously

defined in Section 3, but we also examine two additional aspects of human freedom – *Economic freedom* and *Personal freedom* and their connection with economic progress. Economic development is presented through three alternative variables, including GDP growth, GDP per capita growth and logarithmic transformation of GDP per capita.

First, we analyze if there is causation from the institutional variables (human freedom, economic freedom and personal freedom) to economic development by using Granger causality test for panel data. The null hypothesis is that human / economic / personal freedom do not cause economic development. The alternative hypothesis is that the different aspects of freedom have impact on economic development and can be used as predictors of economic growth. Granger causality testing do not provide information about the strength of the relationship between the variables.

The results from the Granger test of causality from human freedom to economic growth are given in Table 4.

Table 4. Causality from human freedom to economic development

Lags	Obs	Null Hypothesis: Human freedom does not Granger cause GDP growth.		Null Hypothesis: Human freedom does not Granger cause GDP per capita growth.		Null Hypothesis: Human freedom does not Granger cause log (GDP per capita).	
		F-stat	p-value	F-stat	p-value	F-stat	p-value
1	1506	18.675***	2.00E-05	0.01584	0.8998	37.281***	1.00E-09
2	1347	5.02797***	0.0067	5.1475***	0.0059	19.5946***	4.00E-09
3	1188	2.23883*	0.0821	2.07679	0.1015	8.37381***	2.00E-05
4	1032	1.86728	0.114	2.35694*	0.052	5.60983***	0.0002
5	876	4.46254***	0.0005	7.31459***	1.00E-06	9.36562***	1.00E-08
6	722	2.25499**	0.0366	5.05855***	4.00E-05	7.70823***	5.00E-08
7	572	1.46613	0.1767	3.52201***	0.001	4.41231***	9.00E-05
8	423	0.78042	0.6202	1.91874*	0.0558	4.16709***	8.00E-05
9	274	1.09134	0.3695	1.94642**	0.0461	3.48848***	0.0004
10	137	1.47749	0.1565	1.75518*	0.0767	2.39204**	0.0128

Note: p-value: *** significant at 99% level; ** significant at 95% level, * significant at 90% level.

The Granger test has been performed on 10 lags, because we expect to have prolonged effect of the human freedom on growth. We analyzed three scenarios examining the causality between the human freedom index, on one hand, and the GDP growth, GDP per capita growth and logarithmic transformation of GDP per capita, respectively, on the other hand. The null hypothesis in each of these scenarios is that the human freedom do not Granger

cause economic growth. In the first case, when we examine the relationship between human freedom and GDP growth, we can reject the null hypothesis in the first six lags¹¹⁵. Causal relationship is also confirmed from human freedom to GDP per capita growth, but with different lag length(2-10 lags)¹¹⁶. In the third case, when we examined the relationship between the human freedom and logarithm of GDP per capita, the null hypotheses is rejected regardless the lags lengths, meaning that the human freedom does Granger cause GDP per capita growth with lags from 1 to 10 years.

We further study the direction of causality from economic growth to human freedom by using Granger causality test. The results from the analysis are presented in Table 5.

Table 5. Causality from economic development to human freedom

Lags	Obs	Null Hypothesis: GDP growth does not Granger cause human freedom.		Null Hypothesis: GDP per capita growth does not Granger cause human freedom.		Null Hypothesis: Log(GDP per capita) does not Granger cause human freedom.	
		F-stat	p-value	F-stat	p-value	F-stat	p-value
1	1506	0.34151	0.559	1.64214	0.2002	0.45424	0.5004
2	1347	0.55351	0.5751	0.29098	0.7476	1.0774	0.3408
3	1188	1.35628	0.2547	1.5005	0.2127	1.55447	0.1988
4	1032	1.41375	0.2273	1.32767	0.2577	1.25733	0.2851
5	876	0.89117	0.4863	0.77779	0.5658	0.77666	0.5666
6	722	0.99741	0.4259	0.92447	0.4765	0.96257	0.4496
7	572	0.46888	0.8572	0.40755	0.8978	0.53667	0.8069
8	423	0.35801	0.942	0.35235	0.9446	0.35043	0.9455
9	274	0.63987	0.7625	0.59737	0.7988	0.59191	0.8033
10	137	1.53576	0.1354	1.42107	0.1795	1.19193	0.3035

Note: p-value: *** significant at 99% level; ** significant at 95% level, * significant at 90% level.

The results from the Granger causality analysis presented in Table 5, we can notice that long-term causal relationship from economic growth to human freedom does not exist. In all of the analyzed scenarios, presented in

¹¹⁵At significance level of 15%. When the significance level is 10%, the null hypothesis that human freedom does not Granger cause GDP growth should not be rejected when lag length is 4.

¹¹⁶At significance level of 15%. When the significance level is 10%, the null hypothesis that human freedom does not Granger cause GDP growth should not be rejected when lag length is 3.

the above-mentioned table, the null hypothesis should not be rejected at level of significance of 10%. This is a strong indication that promoting human freedom is beneficial for economic development. On the other hand, it seems that there is not an automatic consequence of economic development to human freedom, based on the results of the analysis from the economic development to human freedom.

CAUSALITY BETWEEN ECONOMIC/PERSONAL FREEDOM AND ECONOMIC DEVELOPMENT

Further, as economic freedom and personal freedom are two major components of human freedom, we were interested if they can be treated separately as an explanatory variable of economic growth. Thus, we expanded the analysis to explore the interconnectedness between the economic freedom and personal freedom, on one hand and economic growth, on the other hand. Again, the economic growth is presented by three alternative variables, including GDP growth, GDP per capita growth and logarithm of GDP per capita.

The results from the Granger causality testing from economic freedom to economic growth are summarized in Table 6, while the reverse causality testing from economic growth to economic freedom are presented in Table 7.

Table 6. Causality from economic freedom to economic development

Lags	Obs	Null Hypothesis: Economic freedom does not Granger cause GDP growth.		Null Hypothesis: Economic freedom does not Granger cause GDP per capita growth.		Null Hypothesis: Economic freedom does not Granger cause log (GDP per capita).	
		F-stat	p-value	F-stat	p-value	F-stat	p-value
1	1506	13.2561***	0.0003	0.1306	0.7179	20.5308***	6.00E-06
2	1347	1.80274	0.1652	1.26505	0.2826	9.69523***	7.00E-05
3	1188	0.51252	0.6737	0.86217	0.4602	5.41576***	0.0011
4	1032	0.26382	0.9012	0.65367	0.6244	2.98568**	0.0182
5	876	2.01645*	0.0741	4.31821***	0.0007	5.67019***	4.00E-05
6	722	2.2342**	0.0383	4.68042***	0.0001	6.79659***	5.00E-07
7	572	1.71518	0.1028	3.82323***	0.0005	4.55012***	6.00E-05
8	423	1.2862	0.2488	2.42755**	0.0143	4.09856***	0.0001
9	274	1.08925	0.371	1.62052	0.1096	1.97016**	0.0432
10	137	1.86037*	0.0578	2.17385**	0.0241	2.84325***	0.0034

Note: p-value: *** significant at 99% level; ** significant at 95% level, * significant at 90% level.

Table 7. Causality from economic development to economic freedom

Lags	Obs	Null Hypothesis: GDP growth does not Granger cause economic freedom.		Null Hypothesis: GDP per capita growth does not Granger cause economic freedom.		Null Hypothesis: Log (GDP per capita) does not Granger cause economic freedom.	
		F-stat	p-value	F-stat	p-value	F-stat	p-value
1	1506	9.15223***	0.0025	14.7462***	0.0001	0.02621	0.8714
2	1347	3.49911**	0.0305	5.16948***	0.0058	6.54758***	0.0015
3	1188	5.20896***	0.0014	7.19847***	9.00E-05	7.53474***	5.00E-05
4	1032	3.4547***	0.0082	4.65842***	0.001	5.5417***	0.0002
5	876	2.98011**	0.0113	3.31372***	0.0057	3.64333***	0.0029
6	722	1.38058	0.2198	1.73855	0.1094	2.53387**	0.0196
7	572	1.42343	0.1931	1.85529*	0.0747	2.10143**	0.0417
8	423	0.6412	0.7431	0.86152	0.5491	0.8247	0.5811
9	274	1.0129	0.43	1.25253	0.2635	1.31359	0.2299
10	137	1.66954*	0.0961	1.5596	0.1275	1.71039*	0.0863

Note: p-value: *** significant at 99% level; ** significant at 95% level, * significant at 90% level.

The results from the Granger causality testing of the relationship between the economic freedom and economic development are not straightforward as the results from the test between the human freedom and economic development. When we examine the relationship between the economic freedom and GDP growth, we notice that economic freedom (Granger) cause GDP growth where lags are 1,5,6 and 10, at a significance level of 10%. However, GDP growth also causes economic freedom on a long term (lags 1 to 5, and 10) at the same level of significance. Similar conclusion can be drawn when we examine the relationship between the economic freedom and GDP per capita growth. Our causality analysis shows that the causality between these two variables is bidirectional, economic freedom cause GDP per capita growth when lags are from 5 to 10, but also GDP per capita cause economic freedom when lags are 1 to 7 (level of significance is 15%). In the third case, when logarithmic transformation of GDP per capita is used as a proxy of economic development, we notice stable, long term causality from economic freedom to economic development (lags 1 to 10, level of significance 10%). However, we also observe a reverse causality from economic development to economic freedom (lags 2 to 7, and lag 10, level of significance 10%).

Finally, the causality between personal freedom and economic development are presented in Table 8 and Table 9. As it was already explained,

personal freedom constitutes second important aspect of human freedoms and because of that we were interested in examining its relationship with economic development. From the results given in Table 8 we observe existence of long term and stable causality from personal freedom to economic development, at a significance level of 10%. Thus, personal freedom (Granger) cause GDP growth from 1 to 6 lags, GDP per capita growth from 2 to 9 lags and logarithm of GDP per capita from 1 to 9 lags. On the other hand, at the same significance level, the causal relationship from economic development to personal growth is random. In this case, economic development cause personal freedom with lags 1,2,3 and 6. Only in one case, with lag of 6 years, the F-stat from Granger causality testing from GDP per capita growth to personal freedom is statistically significant. Logarithm of GDP per capita (Granger) causes personal freedom with 1,2 and 6 lags, at a significance level of 10%.

Table 8. Causality from personal freedom to economic development

Lags	Obs	Null Hypothesis: Personal freedom does not Granger cause GDP growth.		Null Hypothesis: Personal freedom does not Granger cause GDP per capita growth.		Null Hypothesis: Personal freedom does not Granger cause log (GDP per capita).	
		F-stat	p-value	F-stat	p-value	F-stat	p-value
1	1506	17.7041***	3.00E-05	0.1838	0.6682	33.4161***	9.00E-09
2	1347	6.24162***	0.002	6.44827***	0.0016	18.2428***	2.00E-08
3	1188	3.20703**	0.0224	2.33983*	0.0718	6.84955***	0.0001
4	1032	2.74454**	0.0274	3.22168**	0.0122	5.45272***	0.0002
5	876	3.26945***	0.0062	5.95243***	2.00E-05	6.77081***	3.00E-06
6	722	2.12206**	0.0489	4.56591***	0.0001	5.77651***	7.00E-06
7	572	1.52213	0.157	3.25014***	0.0022	3.31444***	0.0018
8	423	1.46997	0.1662	2.04707**	0.04	3.33322***	0.001
9	274	1.49437	0.1501	2.02935**	0.0366	3.61804***	0.0003
10	137	0.78456	0.6435	0.99148	0.4549	1.53683	0.135

Note: p-value: *** significant at 99% level; ** significant at 95% level, * significant at 90% level.

Table 9. Causality from economic development to personal freedom

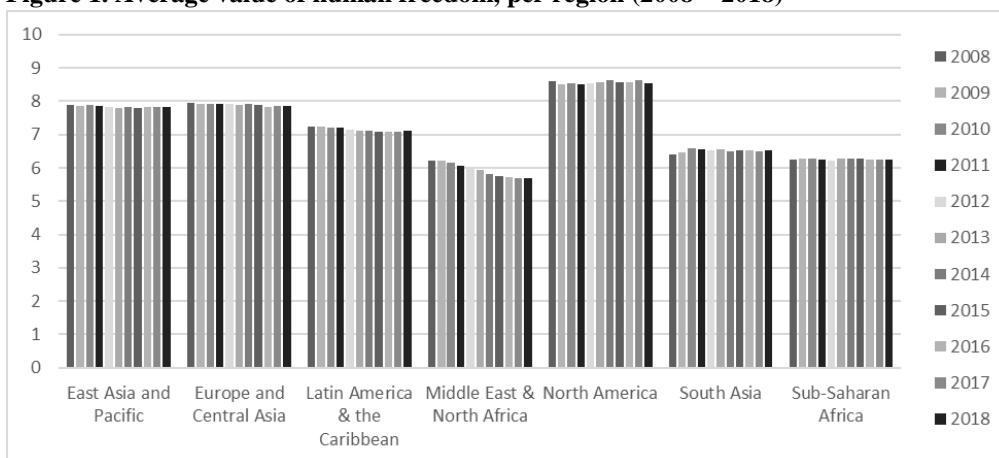
		Null Hypothesis: GDP growth does not Granger cause personal freedom.		Null Hypothesis: GDP per capita growth does not Granger cause personal freedom.		Null Hypothesis: Log (GDP per capita) does not Granger cause personal freedom.	
Lags	Obs	F-stat	p-value	F-stat	p-value	F-stat	p-value
1	1506	4.07397**	0.0437	2.21619	0.1368	5.18959**	0.0229
2	1347	3.16859**	0.0424	1.87643	0.1535	3.27042**	0.0383
3	1188	2.09176*	0.0996	1.06057	0.3649	1.52273	0.2069
4	1032	1.20142	0.3085	1.29323	0.2708	1.18231	0.3169
5	876	0.99391	0.4203	1.13443	0.3404	0.81469	0.5392
6	722	2.30678**	0.0326	2.30939**	0.0324	2.06613*	0.0551
7	572	1.26334	0.2663	1.29918	0.2483	1.47995	0.1717
8	423	1.38772	0.1998	1.37157	0.207	1.4188	0.1865
9	274	1.4086	0.1845	1.0968	0.3655	0.9376	0.4929
10	137	1.18254	0.3097	1.2116	0.2908	1.17917	0.3119

Note: p-value: *** significant at 99% level; ** significant at 95% level, * significant at 90% level.

REGIONAL ANALYSIS

The final question we aim to answer in this paper is if there is a difference between the regions of the world with regard to the causality between human freedom and economic development. We have organized the countries in 7 groups with regard to their geographical location: East Asia and Pacific; Europe and Central Asia; Latin America and the Caribbean; Middle East and North Africa; North America; South Asia; and Sub-Saharan Africa. The country list for each of the abovementioned regions is provided as appendix to the text (See: Annex 3). The average value of human freedom per region is given at Figure 1.

Figure 1. Average value of human freedom, per region (2008 – 2018)



Source: Human freedom index 2020 (Vasquez and McMahon, 2020). Authors' own calculations.

We notice difference between the human freedoms among the selected regions. North America is the region with highest average value of human freedom. On the other hand, the region of the Middle East and the North Africa region manifests the lowest and constantly deteriorating average value of human freedom. However, the regions differ not only by human freedom, but also by their size and number of countries within them. Europe and Central Asia is largest region with total 46 countries, while North America region is consisted from only two countries: Canada and United States of America. The size and the level of development of the countries also differs among the regions.

Having in mind these specifics of the regions, we proceed with the results of the Granger causality testing between the human freedom and economic development between the regions. In the next three tables (Table 10, Table 11 and Table 12), we present the F statistics and the number of observations for 10 lags for the causality between human freedom and GDP growth, GDP per capita growth and log (GDP per capita), in this order.

When we analyze the causality from human freedom to GDP growth, on a regional level, we noticed that the null hypothesis is rejected only in East Asia and Pacific region and Latin America and the Caribbean region, at a level of significance of 10% for lag 1 and lag 2. In the opposite case, when we analyze the impact of GDP growth to human freedom, we can reject the null hypothesis in the region of Europe and Central Asia, that GDP growth does not Granger cause human freedom, at lags 1,2 and 3 and a level of significance of 10%.

Table 10. Causality between Human freedom and GDP growth, by region

Null hypothesis: Human freedom does not Granger Cause GDP growth														
Lags	East Asia and Pacific		Europe and Central Asia		Latin America and the Carribean		Middle East and North Africa		North America		South Asia		Sub-Saharan Africa	
	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F stat	Obs	F-stat
1	90	9.85***	450	1.7	244	4.02**	159	1.47	20	0.25	153	0.94	390	0.04
2	81	3.52**	404	1.57	219	2.47*	141	1.21	18	0.63	136	1.12	348	0.51
3	72	1.74	358	0.4	194	0.76	123	1.05	16	0.11	119	1.97	306	0.27
4	63	1.4	313	1.07	169	0.73	106	0.87	14	3.81	102	0.95	265	0.37
5	54	2.01*	268	1.34	144	1.59	89	1.12	12	3.29	85	1	224	1.44
6	45	1.27	223	2.00*	119	1.12	72	1.03	/	/	69	0.55	184	1.17
7	36	1.53	178	1.52	94	0.61	56	1.76	/	/	54	0.68	146	1.17
8	27	3.02*	133	0.47	70	1.02	40	0.71	/	/	39	2.57**	108	1.55
Null Hypothesis: GDP growth does not Granger Cause Human freedom														
Lags	East Asia and Pacific		Europe and Central Asia		Latin America and the Carribean		Middle East and North Africa		North America		South Asia		Sub-Saharan Africa	
	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F stat	Obs	F-stat
1	90	0.25	450	3.72*	244	0.91	159	0	20	0.11	153	1.67	390	2.94*
2	81	0.16	404	5.10***	219	1.05	141	0.15	18	0.93	136	0.79	348	0.82
3	72	0.25	358	2.94**	194	1.24	123	0.27	16	1.2	119	3.06**	306	0.82
4	63	0.14	313	1.15	169	1.5	106	0.4	14	0.22	102	2.08*	265	0.8
5	54	0.49	268	1.14	144	1.01	89	0.28	12	0.48	85	0.68	224	1.17
6	45	0.8	223	1.58	119	1.11	72	1.09	/	/	69	0.7	184	1.75
7	36	1.06	178	1.39	94	2.16**	56	0.98	/	/	54	0.48	146	1.04
8	27	0.6	133	1.1	70	1.04	40	1.45	/	/	39	0.97	108	1.03

Note: p-value: *** significant at 99% level; ** significant at 95% level, * significant at 90% level.

Similar results are obtained from the analysis of the causality between the human freedom and the GDP per capita growth. Again, the null hypothesis is rejected in the East Asia and the Pacific region (lags 1-8) and Latin America and the Carribean region (lags 1,2), at a level of significance of 10%. GDP per capita growth cause human freedom in the European region with lags of 1,2 and 3 years, when level of significance is set to 10%.

Table 11. Causality between Human freedom and GDP per capita growth, by region

Null hypothesis: Human freedom does not Granger Cause GDP per capita growth														
Lags	East Asia and Pacific		Europe and Central Asia		Latin America and the Carribbean		Middle East and North Africa		North America		South Asia		Sub-Saharan Africa	
	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F stat	Obs	F-stat
1	90	12.48***	450	1.72	244	5.72**	159	0.21	20	0.72	153	0.69	390	0.76
2	81	4.97***	404	2.11	219	3.36**	141	0.25	18	1.29	136	1.14	348	1.51
3	72	2.57*	358	0.55	194	1.1	123	0.39	16	0.56	119	1.51	306	1.07
4	63	2.69**	313	1.56	169	0.97	106	0.84	14	4.73*	102	0.64	265	1.07
5	54	3.14**	268	1.82	144	1.82	89	1.13	12	5.23	85	0.73	224	2.13*
6	45	2.34*	223	2.21**	119	1.29	72	0.88	/	/	69	0.43	184	1.39
7	36	2.69**	178	1.58	94	0.66	56	1.13	/	/	54	0.7	146	1.54
8	27	4.14**	133	0.99	70	1.19	40	0.56	/	/	39	2.09*	108	1.7
Null Hypothesis: GDP per capita growth does not Granger Cause Human freedom														
Lags	East Asia and Pacific		Europe and Central Asia		Latin America and the Carribbean		Middle East and North Africa		North America		South Asia		Sub-Saharan Africa	
	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F stat	Obs	F-stat
1	90	0.77	450	3.04*	244	0.49	159	0	20	0.13	153	1.19	390	3.58*
2	81	0.11	404	4.75**	219	0.79	141	0.09	18	0.99	136	0.6	348	1.32
3	72	0.37	358	2.41*	194	1.21	123	0.22	16	1.75	119	2.53*	306	1.3
4	63	0.24	313	0.75	169	1.69	106	0.48	14	0.33	102	1.69	265	0.95
5	54	0.48	268	0.84	144	1.21	89	0.29	12	0.47	85	0.46	224	1.21
6	45	0.45	223	1.49	119	1.2	72	1.12	/	/	69	0.71	184	1.74
7	36	0.68	178	1.47	94	2.21**	56	1.04	/	/	54	0.42	146	1.03
8	27	0.45	133	1.21	70	1.09	40	1.9	/	/	39	0.99	108	1.03

Note: p-value: *** significant at 99% level; ** significant at 95% level, * significant at 90% level.

Finally, when we examine the relationship between human freedom and GDP per capita, transformed in logarithmic form, we noticed that human freedom causes GDP per capita, on the long run, in the following regions: East Asia and the Pacific, Europe and Central Asia, Latin America and the Caribbean and Sub-Saharan Africa. The causality in the opposite direction, from Economic prosperity to human freedom is evidenced in the Sub – Saharan region. In the both cases, level of significance is 10%.

Table 12. Causality between Human freedom and log(GDP per capita), by region

Null Hypothesis: Human freedom does not Granger Cause log(GDP per capita)														
Lags	East Asia and Pacific		Europe and Central Asia		Latin America and the Carribbean		Middle East and North Africa		North America		South Asia		Sub-Saharan Africa	
	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F stat	Obs	F-stat
1	90	8.74***	450	8.43***	244	13.15***	159	0.92	20	0.6	153	0.01	390	4.9**
2	81	0.88	404	11.02***	219	6.46***	141	0.22	18	1.39	136	1.78	348	3.15**
3	72	1.66	358	4.83***	194	2.62*	123	0.2	16	0.54	119	1.07	306	2.29*
4	63	1.28	313	3.67***	169	1.91	106	0.84	14	1.63	102	0.6	265	1.92
5	54	2.33*	268	4.34***	144	3.07**	89	1.3	12	66.55*	85	0.63	224	3.2***
6	45	1.97*	223	5.24***	119	2.1*	72	1.18	/	/	69	0.51	184	2.29**
7	36	2.71**	178	3.88***	94	0.85	56	1.19	/	/	54	1.54	146	2.23**
8	27	5.6***	133	2.83***	70	1.46	40	0.54	/	/	39	1.9	108	2.83***
Null Hypothesis: Log(GDP per capita) does not Granger Cause Human freedom														
Lags	East Asia and Pacific		Europe and Central Asia		Latin America and the Carribbean		Middle East and North Africa		North America		South Asia		Sub-Saharan Africa	
	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F-stat	Obs	F stat	Obs	F-stat
1	90	2.6	450	0.61	244	0.53	159	0.81	20	0.79	153	0.5	390	3.07*
2	81	2.08	404	1.95	219	0.76	141	0.5	18	0.32	136	0.82	348	3.17**
3	72	2.04	358	2.42*	194	1.3	123	0.51	16	2.97*	119	1.28	306	2.28*
4	63	1.68	313	0.66	169	1.72	106	0.85	14	0.81	102	2.63**	265	1.17
5	54	0.98	268	0.9	144	1.2	89	0.48	12	0.7	85	0.61	224	1.38
6	45	0.91	223	1.45	119	1.03	72	1.21	/	/	69	0.58	184	0.96
7	36	0.69	178	0.97	94	3.86***	56	1.22	/	/	54	0.44	146	1.22
8	27	0.45	133	1.34	70	1.5	40	1.85	/	/	39	0.94	108	1.15

Note: p-value: *** significant at 99% level; ** significant at 95% level, * significant at 90% level.

CONCLUSIONS

The economic literature still does not have common position on the relationship between human freedom and economic development. The challenge of our paper was to determine the relationship of influence among these variables, using Granger causality test. The results have shown that human freedom has influence on enhancing the economic growth, but in turn it does not create more human freedoms (there is no statistically significant prove).

Regarding the components of the human freedom, the model has proven that economic freedom has bidirectional relationship. Therefore, economic freedom is a significant factor in the country's economic development and prosperity and *vice versa*. This relationship manifest in long run, since economic freedom is a comprehensive indicator of many freedoms that often need more time to be implemented and make fully effective. Some of them are: protection of property rights, the presence of corruption, the size of public spending, the tax burden, ease of doing business in the country, flexibility in the labor market, price stability, international trade, the presence of foreign investment, development of financial markets and many other parameters of economic liberalism.

We did not find two-way relationship between the personal freedom and economic development. However, Granger causality has proven stable and long-term influence of the personal freedom to the economic growth.

Regarding the regional analysis, we find positive one way relationship of the two observed variables in East Asia and Pacific region and partly in Europe and Central Asia and Latin America and the Caribbean. However, these conclusions need to be carefully elaborated since we worked with regions with different number of countries and observations. That can lead us to bias conclusions.

In all of the equations, we use three indicators of economic development (GDP growth, GDP per capita and GDP per capita growth) in order to prove the robustness of the relationship between human freedom and economic growth. However, GDP per capita seems to be the best indicator that proves the long-term causality on the global and on regional level. Further analysis should be made in quantifying the causality between economic growth and human freedom in the world as well by different regions.

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