AN EMPIRICAL EVALUATION OF THE IMPACT OF INSTITUTIONS ON HARD POWER[1]

UMA AVALIAÇÃO EMPÍRICA DO IMPACTO DAS INSTITUIÇÕES NO HARD POWER

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Abstract

Would countries with stronger institutions and governance lead to less or more hard power? This article empirically analyzes this issue and corroborates the idea that countries with stronger institutions and good governance have a lower level of hard power, with it being understood here that hard power is basically symbolized by military spending. For this purpose, we used the World Bank's database of World Governance Indicators and the Stockholm International Peace Research Institute's (SIPRI) database for military spending, for a group of 153 countries. Estimates point to this relationship with some robustness through instrumental variable techniques, identifying, for example, that increased voice and accountability in countries would lead to lower military spending. Robustness tests using the cointegration technique corroborate the idea that more democracy leads to less hard power.

Keywords: institutions; voice and accountability; ordinary least squares; cointegration.

Resumo

Os países com instituições e governança mais fortes levariam a menos ou mais hard power? Este artigo analisa empiricamente essa questão e corrobora a ideia de que países com instituições mais fortes e boa governança levam a um menor hard power, entendendo-se aqui que hard power é basicamente simbolizado pelo gasto militar. Para isso, utilizamos a base de dados do World Governance Indicators, do Banco Mundial, e do Stockholm International Peace Research Institute (SIPRI), para gastos militares, para um conjunto de 153 países. As estimativas apontam para essa relação com alguma robustez por meio de técnicas de variáveis instrumentais, identificando, por exemplo, que mais voice and accountability nos países levariam a menos gasto militar. Nos testes de robustez usando a técnica de cointegração, é corroborada a ideia de que mais democracia leva a menos hard power.

Palavras-Chave: hard power; instituições; voice and accountability; mínimos quadrados ordinários; cointegração

1. INTRODUCTION

Would countries with stronger institutions have more or less hard power? The idea behind this article is to investigate this relationship. In theory, those nations that have a more robust institutional structure would have social demands other than military spending (with the terms hard

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power and military spending being viewed as interchangeable here). For their own preservation and/or defense against invasions, those countries that are dictatorships would tend to have higher military expenditures. As democracy gains ground in the countries, fears of invasions would decrease, under the presumption that democracies do not usually attack and, in theory, they could be under the protection of other democracies if they were attacked (such as, for example, under NATO's protection). At the same time, generally speaking, society's demands are for more public spending on goods and services that generate returns for the population itself.

Although military defense is an asset that intangibly has this character, clearly the demands include higher spending on education and health. Furthermore, the structure of public spending in the world over the last few decades has come under enormous pressure on account of demographic factors (an increase in the age of the population, leading to an increase in social security spending) and the crises that resulted in a sharp increase in public debt. This increase in debt played the role of a natural element that forced the population to choose the allocations necessary for public spending. Societies "irritated" with their leaders will not ask for more military spending, but more social spending. It is no wonder, for example, that for Saudi Arabia the price of oil has become not just an economic problem, but also a social problem in which we talk about a "social price of oil" (DALE AND FATTOUH, 2017), which it would keep the public deficit lower by collecting tax revenues for the purpose of keeping society under control, thus avoiding a new Arab spring.

Thus, it seems valid to investigate the theory that in those countries whose institutions are more robust there would be greater competition over public spending, with the military being given less room than so-called social spending. This belief is confirmed in this article with a negative and robust econometric relationship being observed between countries with more solid institutions and their military expenditures. It should be borne in mind that in addition to the expected impact of stronger democracies exhibiting lower levels of military spending, there is a perception that countries with greater voice and accountability, in other words, where there is greater participation by society in social organizations and the free press, also have less military spending. The possibility for the population to express their demands freely may make it possible to increase spending on matters that are of greater interest to the population at the expense of items where the benefit is less obvious, such as military expenditure.

In the analysis of robustness by time series cointegration techniques, we also see a confirmation of the idea that countries with a higher level of democracy would tend to exhibit lower levels of military spending over time.

In addition to this introduction, the article will continue with a brief theoretical assessment of the relationship between institutions and hard power. In the next section, there will be a discussion of the database used in the study. After this, there will be two sections in which there will be a discussion of the empirical results of the least squares regression and the cointegration test. Lastly, we will have the conclusion.

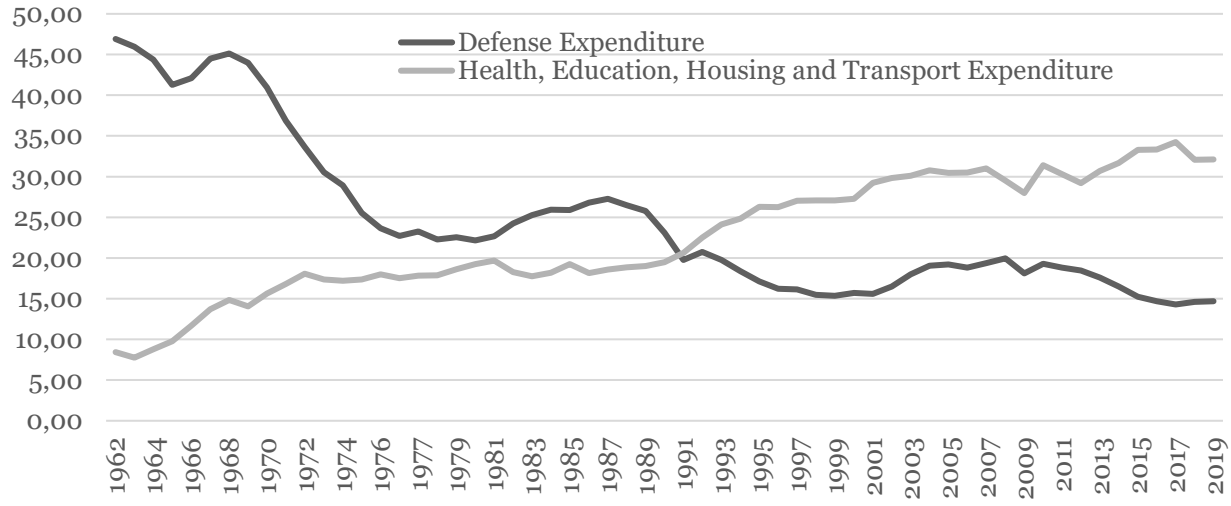
2. BRIEF THEORETICAL EVALUATION

As previously stated, this article will attempt to corroborate the hypothesis of a negative relationship between institutions and hard power, understood here as military capacity rather than economic capacity. The idea is that countries that have well-established institutions are less dependent on the use of force, and instead rely more on their ability to persuade via soft power instruments (GALLAROTTI, 2011). The relationship between institutions and soft power occurs through the indirect relationship via economic power. Better institutions translate into higher GDP per capita, which in turn can generate more soft power (VALE, 2019). At this point, we do not want to allude to any explicit causal relationship between hard and soft power, but rather to substantiate both. However, this relationship between the two types of power will be further explored in the next item.

Theoretically speaking, in general countries with better democratic institutions exhibit a greater demand for public sector goods and services in the form of education and health, for example (AVELINO *ET AL.*, 2005). Democratically stronger countries will have their populations opting for demands aimed at increasing their well-being, which would not include demands for greater military spending. For example, in recent decades the USA has reversed the demands for more military spending in relation to more public social spending (Graph 1).

There is the idea that military interventions are a public good that justifies the increase in the State's fiscal capacity (BESLEY AND PERSSON, 2011). However, these same authors identify this relationship theoretically, but their empirical results do not support this relationship (BESLEY AND PERSSON, 2011, pp. 98). For example, income inequality is a much more relevant element that justifies increasing the State's fiscal capacity than the prevalence of wars in which countries may have some interference.

GRAPH 1. MILITARY AND SOCIAL EXPENDITURE PROPORTION OF TOTAL PUBLIC EXPENDITURE – USA



Source: White House - Budget FY 2021 - Table 4.1 - Outlays by Agency: 1962–2025. Prepared by the author.

In fact, there is the idea that some public goods would be more relevant to society. Even in countries such as the USA where foreign policy is more present for society, military spending seems to receive less attention and desire for expansion by the population than more relevant social spending, especially for the elderly, whose demands have expanded naturally due to its own demographic growth (DEATON, 2013). The increase in income inequality in developed countries over the last few decades has given rise to the gut feeling that society has seen a decline in its influence over public policies (PIKETTY, 2017; MILANOVIC, 2016). For example, a decrease in income inequality may occur via investment in education. Indeed,

> the only remaining sensible way to equalize educational endowments is to make access to the best schools more or less equal regardless of parental income and, more importantly, to equalize the quality of education across schools. The latter can only be done by the state investment and financial support (MILANOVIC, 2016, pp. 222).

Failure to provide public goods that are of interest to society also has the long-term effect of causing a deterioration in the country's own political conditions. Or, in other words,

> the development of modern states has not kept pace with the development of democratic institutions, leading to unbalanced situations in which new (and sometimes even well-established) democracies have not been able to keep up with their citizen´s demand for high-quality government services. This has led, in turn, to the delegitimation of democracy as such (FUKUYAMA, 2015, pp. 14).

Another way to understand this is the incentives that each country's leaders have to remain in power. Providing more public goods would be the natural response of a leader who faces internal competition from other politicians and needs to improve his population's well-being if he wishes wants to remain in power. Bueno de Mesquita *et al.* (2001) outlines this idea and gives an interesting example from the 19th century. King Leopold of Belgium was also King of the Congo, but the behavior of the same king in the two places was totally different. In Belgium, Leopold implemented universal voting for adult males and his country experienced significant economic growth and industrialization, along with several other reforms that increased the well-being of the Belgians. In the view of Bueno de Mesquita *et al.* (2001), this was due to the victorious coalition, but which established limits and forced the king to remain popular in order not to lose his throne. But in the Congo, where Leopoldo did not need a coalition and ruled in an autocratic way, he governed exclusively for the benefit of those around him and there was increased kleptocracy. But coalitions like those in Belgium and other countries play an important role in the establishment and stability of institutions. As another author tells us,

> stable and effective states are the product of de facto coalitions which have negotiated the principal elements of political settlements and designed indigenously appropriate and legitimate political institutions which they are committed to support (LEFTWICH, 2010, pp.106).

3. DATABASE

In order to search for the empirical relationship between institutions and military expenditures, we initially opted for simple regression analysis, via OLS (Ordinary Least Square) and TSLS (Two Stages Least Square) (WOOLDRIDGE, 2010) and, then afterwards, by time series analysis via cointegration techniques as a test of robustness. All the data will be logarithmicized to identify elasticities.

For these initial estimates, we used the concept of military expenditure as an average percentage of GDP from 1996 to 2014 that was collected at the Stockholm International Peace Research Institute (SIPRI, 2018) for 153 countries. The reason for taking the average for this period is on account of the fact that the World Bank's Governance data starts on this date. The governance data measures corruption, government efficiency, regulatory quality, rule of law, political stability, and the absence of violence together with the level of voice and accountability in each country.

The World Bank's figures are ranked from 0 to 100 and taking the average between 1996 and 2014. According to the World Bank's (2018) website governance,

> consists of the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them (WORLD BANK, 2018).

Also according to the World Bank (2018),

> these aggregate indicators combine the views of a large number of enterprises, citizen and expert survey respondents in industrial and developing countries. They are based on over 30 individual data sources produced by a variety of survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms (WORLD BANK, 2018).

According to the organization, each of the variables is defined as follows (WORLD BANK (2018)):

- Voice and accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
- Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism.
- Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
- Regulatory quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

- Rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
- Control of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests (WORLD BANK, 2018).

As can be seen, there are various categories, some of which are more related to the institutional quality of a country, while others are less so. Rule of Law and Voice and Accountability would be the variables that would best capture a country's institutional quality, while the other four would capture the state's capacity to provide the population with public goods and keep the state functioning. In other words, they are not variables that capture the democratic state of a country. As Fukuyama (2013) points out in his criticism of the various governance measures that exist, North Korea may have good state capacity in some areas, but that would not imply that it has good governance.

However, by incorporating the other two institutional variables, one avoids the conclusion that this country has good governance. Fukuyama's criticism is more general about whether or not these indicators are interpreting their numbers correctly. As he says (FUKUYAMA, 2013, pp. 351), “an authoritarian regime can be well governed, just as a democracy can be maladministered.” In any case, Fukuyama (2014) considers that the rule of law, the state’s capacity and accountability characterize a country’s political and institutional development. Thus, it is still true that the World Bank's set of variables captures each country’s state of institutional development.

To be clearer regarding each variable’s impact on military spending, regressions will be made for each of the six variables.

Alternatively, the political regime data calculated by the Center of Systemic Peace (POLITY IV, 2018) was used, in which the country's political regime is calculated on a scale between -10 (perfect autocracy) and 10 (perfect democracy).

Cheibub *et al*’s (2010), democracy data, called DD here, was also used. In the classification of these authors, there is no room for the subjective nuances that appear in the Polity IV data. As they say (2010: 71),

> the Democracy and Dictatorship (DD) measure of political regime is minimalist. The coding is clear and stark, so that precise information is conveyed by the coding of each observation, and the codes involve no subjectivity, so it is easily reproducible (CHEIBUB ET AL, 2010, pp. 71).

As stated, the conceptualization is direct because

> underlying DD is the notion that democracy is a regime in which those who govern are selected through contested elections and, once identified, the occurrence of

> contested elections is necessary and sufficient to characterize a regime as democratic (CHEIBUB ET AL, 2010, PP. 72).

The authors go as far as making a comparison between their data and that of Freedom House and Polity IV and recognize that their data shows different results in empirical studies. For example, in the well-known study by Rodrik and Wacziarg (2005), the authors identify that new democracies have high growth rates vis-à-vis democratic regimes that are already established. Therefore, it is relevant here to know when the democratic transition took place in order to capture the effect on growth. Using the data from Polity IV, Rodrik and Wacziarg (2005) find positive results in the new democracies, but when these are redefined by Cheibub *et al* 's data (2010) it is discovered that this impact no longer exists.

Appendix D of the book by Dahl (1998) draws a comparison between the indicators used here and does not observe any significant differences when considering the central countries, but a great deal of divergence when considering the countries that are hardest to classify. In fact, according to this author,

> it is the uncontroversial cases that drive the high correlation among different measures of democracy: no measure is likely to produce very different readings for, say, England, the United States, Sweden, North Korea or Iraq. The problem arises with "difficult" cases, such as Mexico, Botswana, Malaysia, Peru, Guatemala, and scores of other countries that do not easily fit into the categories that make up existing measures (DAHL, 1998 pp. 228).

In order to avoid divergences in preference for one database or another, here, in addition to the Polity IV data, we will use the Cheibub *et al* (2010) database from 1962 to 2008, which is the last year available. The idea of using three different bases is to guarantee maximum robustness to the econometric exercise that will be performed.

It may be that other variables trigger military spending and to avoid this we need another set of variables. Therefore, as control variables, we chose the following data from the IMF statistical base: public expenditure in terms of % of GDP, population in millions of people, savings in terms of % of GDP and gross government debt also in terms of % of GDP, and specific dummies for very clear outliers in the regression residual plots. The population's participation data is also used in temperate zones. Countries in tropical zones are considered to have found it more difficult to develop (SACHS, 2001; EASTERLY AND LEVINE, 2003; and SOKOLOFF AND ENGERMAN, 2001). The idea is that "environments where crops are most effectively produced using large plantations will quickly develop political and legal institutions that protect the few landlords from the many peasants and may even have future slavery" (EASTERLY AND LEVINE, 2003 pp. 6).

No GDP data was explicitly included, as it is already indirectly contained in the denominators of the control variables and in the dependent variable itself. In addition, there could be a discussion about a possible endogeneity between military spending and institutions in which it could be

assumed that countries with strong military power could somehow bring about institutional changes, even if temporarily. The idea would be that the long-term order and stability produced by a dictatorship could lead to economic development and democracy itself, using the classic cases of Japan and South Korea as examples. This is Huntington's (1968) theory that for a country to become a democracy, there must first be order, and in developing countries, the military and/or a dictatorship were often able to put order in place. That is, Huntington separated political development from economic and social development. But Fukuyama (2013, 2014) goes further by considering that the tripod of rule of law, accountability, and state capacity is essential for the political development of any country.

Since it is true that the causal relationship is between institutions and military expenditure, regression by OLS would be enough for the estimate. In order to avoid any possibility in the opposite direction, it is essential to identify instruments (variables) that can be used to try to reduce the correlation between the independent variable and the error and this is done by identifying instrumental variables that are correlated with the explanatory variables, but not with the independent variable, along the lines of the previous chapter. This econometric correction decreases the risk of an endogeneity problem in the estimate.

We used four variables that are normally identified as instruments for institutions, used in the work of Acemoglu *et al* (2001). First, the legal system of origin in each country. The idea is that the French legal system protects investors less than the Anglo-Saxon system does (LA PORTA *ET AL*, 1998). This by itself does not detect whether a country will have more or less growth, but it does identify whether its governance is relatively better than another's. In this article, the French legal system will be identified as a dummy in the classification given in Glaeser *et al* (2004), with 1 being the French system and 0 being the English system. Another figure data explored by Acemoglu *et al.* (2005) is that of population density in 1500, the time of the great discoveries. The idea here is that places that were densely populated at that time encouraged exploitation by cheap labor (Spanish America), while places with little population demanded greater occupation on the part of the discoverers (USA and Canada). Another instrument is the mortality indicator of the discoverers, which would indicate that places with high mortality would be carriers of diseases that were incurable at the time (such as malaria), removing the colonizer from the place.

These variables would affect the institutional trajectory of the different countries when identifying where the colonizers would act more intensely as a colony of exploitation or one of settlement, but there would be no reason to believe that either one of them explains today's GDP per capita. In this article, OLS and TSLS (Two Stage Least Squares) will be used to estimate regressions by instrumental variables (WOOLDRIDGE, 2010).

4. EMPIRICAL RESULTS OF REGRESSION BY INSTRUMENTAL VARIABLES

In Table 1 we calculate the correlation between the independent variables used (World Bank governance, Polity IV, and DD), which shows a strong correlation between them. Therefore, they will be used individually in the regressions.

TABLE 1. CORRELATION, T-STATISTICS, AND PROBABILITY OF INDEPENDENT INSTITUTIONAL VARIABLES

	Corruption	Democracy	Government Efficiency	Politics	Polity (government regime)	Regulatory Quality	Rule of Law	Voice and Accountability
Corruption	1							
t-statistic	-----							
Probability	-----							
Democracy	0,458796	1						
t-statistic	6,131285	-----						
Probability	0	-----						
Government Efficiency	0,953343	0,514974	1					
t-statistic	37,49822	7,133609	-----					
Probability	0	0	-----					
Politcs	0,824413	0,372355	0,781143	1				
t-statistic	17,29601	4,764047	14,85627	-----				
Probability	0	0	0	-----				
Polity (government regime)	0,517549	0,833794	0,567642	0,3948	1			
t-statistic	7,182285	17,93372	8,187264	5,1019	-----			
Probability	0	0	0	0	-----			
Regulatory Quality	0,926157	0,575287	0,958249	0,7767	0,628792	1		
t-statistic	29,16048	8,351531	39,79424	14,641	9,602305	-----		
Probability	0	0	0	0	0	-----		
Rule of Law	0,968542	0,490765	0,962177	0,8322	0,527481	0,939545	1	
t-statistic	46,21582	6,688349	41,93878	17,821	7,372575	32,58062	-----	
Probability	0	0	0	0	0	0	-----	
Voice and Accountability	0,836109	0,750871	0,857954	0,7374	0,845655	0,881738	0,85127	1
t-statistic	18,09866	13,50006	19,83084	12,962	18,81402	22,19457	19,2641	-----
Probability	0	0	0	0	0	0	0	-----

Source: Prepared by the author.

The first OLS results in Table 2 show the expected negative and significant effects of institutional variables on military spending. For example, a 1% increase in the DD indicator leads to a 0.81% drop in military spending. This regression had the best adherence with R2 of 0.44%, which is relevant given that the democracy variable is apparently more robust than the data from Polity IV

as previously discussed. The Polity IV data show a negative effect of 0.98% and the World Bank's data show numbers of between -0.14 and -0.30, with the average indicator, calculated by the average of the governance indicators, showing a -0.29 impact.

TABLE 2. RESULTS OF REGRESSION OF INSTITUTIONAL VARIABLES WITH MILITARY SPENDING BY MINIMUM ORDINARY SQUARES (OLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Democracy (CGV)	-0.81***								
	(0.15)								
Polity (government regime)		-0.98***							
		(0.20)							
Governance Indicators (WB)			-0.29***						
			(0.08)						
Corruption				-0.15**					
				(0.06)					
Government Efficiency					-0.20***				
					(0.07)				
Politics						-0.30***			
						(0.07)			
Regulatory Quality							-0.20***		
							(0.07)		
Rule of Law								-0.14**	
								(0.06)	
Voice and accountability									-0.29***
									(0.08)
constant	-0.02	2.51***	0.42	0.19	0.16	0.34	0.40	0.13	0.50
	(0.45)	(0.79)	(0.56)	(0.55)	(0.55)	(0.54)	(0.55)	(0.56)	(0.52)
Public Expenditure (% of GDP)	0.23*	0.39*	0.24	0.19	0.22	0.27*	0.21	0.19	0.29*
	(0.14)	(0.14)	(0.16)	(0.15)	(0.16)	(0.16)	(0.16)	(0.15)	(0.16)
Population (million)	0.05*	0.05	0.02	0.03	0.04	-0.01	0.03	0.03	0.03
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Savings (% of GDP)	-0.01	-0.09	0.09	0.04	0.09	0.11	0.03	0.06	0.01
	(0.11)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.11)
% of people living in Temperate Zone	0.13	0.04	0.15	0.06	0.09	0.13	0.09	0.06	0.13
	(0.13)	(0.15)	(0.16)	(0.16)	(0.16)	(0.15)	(0.16)	(0.16)	(0.15)
Dummy Iceland	-2.17***		-2.22***	-2.26***	-2.21***	-2.32***	-2.28***	-2.26***	-2.23***
	(0.1)		(0.13)	(0.13)	(0.14)	(0.12)	(0.13)	(0.13)	(0.12)
Dummy Israel	1.54***	1.52***	1.43***	1.44***	1.47***	0.93***	1.46***	1.44***	1.44***
	(0.05)	(0.06)	(0.05)	(0.06)	(0.06)	(0.12)	(0.06)	(0.06)	(0.05)
Dummy Mexico	-1.23***	-1.09***	-1.10***	-1.18***	-1.13***	-1.14***	-1.11***	-1.22***	-1.06***
	(0.08)	(0.09)	(0.08)	(0.09)	(0.09)	(0.08)	(0.10)	(0.09)	(0.09)
Dummy Moldova	-1.08***	-1.2***	-1.36***	-1.35***	-1.37***	-1.36***	-1.31***	-1.30***	-1.33***
	(0.07)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)
Dummy Oman	1.67***	1.3***	1.67***	2.02***	2.03***	2.08***	2.03***	2.01***	1.82***
	(0.10)	(0.15)	(0.13)	(0.14)	(0.13)	(0.13)	(0.13)	(0.13)	(0.12)
Dummy Saudy Arabia	1.39***		1.70***	1.71***	1.69***	1.70***	1.73***	1.72***	1.15***
	(0.09)		(0.11)	(0.12)	(0.11)	(0.10)	(0.11)	(0.11)	(0.17)
Dummy United Arab Emirates	0.96***	0.68***	1.37***	1.31***	1.34***	1.41***	1.33***	1.27***	1.15***
	(0.09)	(0.14)	(0.14)	(0.15)	(0.14)	(0.13)	(0.14)	(0.14)	(0.11)
n	141	136	141	141	141	141	141	141	141
R2	0,44	0,33	0,35	0,31	0,33	0,38	0,33	0,31	0,4

Source: GDP per capita at 2014 prices from IMF; public debt and current account from IMF. All the regressions are in OLS. Robust standard errors (White) in parenthesis. * 10% significant** 5% significant *** 1% significant. All variables are in logarithm. Prepared by the author.

The results with instrumental variables by TSLS show equally negative results for the Polity IV and DD data and for the governance average (Table 3). In the separate data, it is negative and significant for policy, regulatory quality, and voice.

It should be pointed out that tests were carried out in order to identify whether the instrumental variable transforms what is endogenous to exogenous and whether the chosen instruments are valid or not. In the first case, we used the Durbin-Wu-Hausman endogeneity test (WOOLDRIDGE, 2010) and in the second case we used the Eichenbaum-Hansen-Singleton test (EHS (C-test)) (EINCHENBAUM *ET AL.*, 1988). Both tests confirm with a 5% significance that the variables are exogenous and that the chosen instruments are valid.

TABLE 3. RESULTS OF REGRESSION OF INSTITUTIONAL VARIABLES WITH MILITARY SPENDING BY MINIMUM SQUARES OF TWO STAGES (TSLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	TSLS	TSLS	TSLS	TSLS	TSLS	TSLS	TSLS	TSLS	TSLS
Democracy (CGV)	-1.63***								
	(0.61)								
Polity (Government Regime)		-1.18**							
		(0.54)							
Governance Indicators (WB)			-1.21**						
			(0.59)						
Corruption				-0.54					
				(0.88)					
Government Efficiency					-0.19				
					(0.33)				
Politics						-1.27**			
						(0.54)			
Regulatory Quality							-1.54**		
							(0.73)		
Rule of Law								-0.21	
								(0.36)	
Voice and accountability									-0.86***
									(0.2
constant	-0.56	2.97	0.66	0.42	-0.00	0.61	1.66	0.03	0.72
	(0.62)	(1.55)	(1.23)	(1.03)	(0.72)	(1.37)	(1.62)	(0.72)	(0.76)
Public Expenditure (% of GDP)	0.50*	0.47*	1.21	0.64	0.31	1.52**	1.27*	0.34	0.87***
	(0.25)	(0.26)	(0.66)	(0.83	(0.42)	(0.69)	(0.72)	(0.44)	(0.29)
Population (million)	0.09*	0.09*	0.05	0.08*	0.09**	-0.12	0.05	0.09*	0.05
	(0.05)	(0.04)	(0.05)	(0.05	(0.04)	(0.13)	(0.07)	(0.04)	(0.05)
Savings (% of GDP)	-0.07	-0.14	-0.03	-0.16	-0.05	-0.20	-0.01	-0.09	-0.07
	(0.16)	(0.15)	(0.29)	(0.22	(0.16)	(0.40)	(0.38)	(0.15)	(0.14)
% of people living in Temp. Zone	0.37	0.31	1.14**	0.77	0.37	1.24**	1.32*	0.41	0.78***
	(0.23)	(0.20)	(0.56)	(0.97)	(0.33)	(0.57)	(0.67)	(0.41)	(0.25)
n	67	67	67	67	67	67	67	67	67
J-stat (prob)	3.14 (0.20)	6.16 (0.05)	3.44 (0.18)	0.07 (0.01)	10.87 (0.004)	0.01 (0.99)	0.83 (0.65)	10.3 (0.005)	1.54 (0.46)
Durbin-Wu-Hausman test (prob)	2.46 (0.12)	0.02 (0.87)	2.64 (0.10)	0.11 (0.73)	0.13 (0.71)	6.71 (0.009)	5.66 (0.01)	0.001 (0.97)	3.01 (0.08)
C-test (prob)	1.02 (0.31)	1.58 (0.20)	0.43 (0.50)	1.30 (0.25)	1.67 (0.19)	0.001 (0.97)	0.22 (0.63)	8.44 (0.003)	0.24 (0.62)

Source: GDP per capita at 2014 prices from IMF; public debt and current account from IMF. All the regressions are in TSLS. Robust standard errors (White) in parenthesis. * 10% significant** 5% significant *** 1% significant. All variables are in logarithm. Prepared by the author.

Greater political stability may indicate a lower need for military spending over time, since this stability given at home could signal a country with terrorism and/or civil war, in addition to a greater sign of not getting involved in external conflicts. More voice and accountability leading to less military spending may indicate that the possibility of free expression by the population can lead to greater social demands than for military spending.

The tests using three distinct variables in the institutionalist literature, in addition to the specific identification of the policy and voice and accountability variables, strongly corroborate the article's hypothesis. This being the case, countries with low institutionality would have fewer conflicts between public spending choices, paving the way for more pronounced growth in military spending. It is no wonder that this is the path that has been taken recently by China and Russia, which have started to expand military spending more intensely in recent years. To a certain extent, this becomes an element of pressure on the United States. The competitive pressure to keep American military spending above at a higher level than China's is colliding with the issue of society's choice. The only way out for the Americans would be if there were an economic justification for a more widespread increase in public spending. And maybe this is what is happening.

Ever since the last decade, with the exceptionally low interest rates in developed countries, a debate has begun as to whether there is room for a more aggressive expansion of public spending as a way of getting around monetary policy's lack of capacity that is found in the so-called liquidity trap. Furman and Summers (2020) provided the theoretical and empirical basis for the Democratic Party, which assumed control of the American Executive and Legislative in 2021, to raise public spending more than expected. The theory is that as long as interest rates remain low, the government will have room to increase public debt, particularly in segments that exhibit potential for future productivity growth, such as education, basic science, and infrastructure. This always carries an inflationary risk behind it and the markets in 2021 began to signal this concern through the 10-year interest rate that started to rise precisely on account of the expectation that the American central bank, the Federal Reserve, will be forced to raise interest rates to contain a possible increase in inflation. This would eliminate the risk of using fiscal policy more aggressively.

This argument is important because the pressure to increase military spending in the United States will rise in the coming years because of the possibility that the Chinese will almost catch up with them by the end of this decade. Without any real room to increase this expenditure, the dispute over scarce resources will intensify at the very time that the United States is coming under increasing pressure to focus on the well-being of its people. Remarkably, the USA has been the only developed country that has seen a drop in its population's life expectancy (DEATON AND CASE, 2020), which will certainly demand spending efforts, especially on health over the coming years.

The result presented here poses an explicit challenge for Americans, as it is clear from the empirical results that society's attitude has played an important role in demobilizing the size of military spending in favor of more social spending. Accommodating these pressures within the same budget will be an important point of tension in the coming years.

4.1. COINTEGRATION TEST BETWEEN INSTITUTIONS AND HARD POWER

Another interesting exercise, as a test of robustness, which can be performed in order to confirm the idea of an inverse relationship between democracy and spending on hard power can be undertaken through the analysis of time series cointegration (MADDALA AND KIM, 1998). The idea here is to find a long-term relationship between these two variables and to confirm or disprove the results obtained via the regression analysis.

The need for cointegration is because the variables used here are non-stationary, that is, they are characterized as a random walk, in which the value of the variable in t is equal to the value of the variable in t-1 plus an error component. When variables exhibit this characteristic and are regressed in each other, we can get what is called spurious regression, in other words, they are variables that may have similar tendencies, but because they are non-stationary they present distorted R2 and t statistics. In Kennedy's succinct description,

> a nonstationary variable tends to wander extensively (that is what makes it nonstationary), but some pairs of nonstationary variables can be expected to wander in such a way that they do not drift too far apart, thanks to disequilibrium forces that tend to keep them together. Some examples are short- and long-term interest rates, prices and wages, household income and expenditures, imports and exports, spot and future prices of a commodity, and exchange rates determined in different markets. Such variables are said to be cointegrated: although individually they are I(1), a particular linear combination of them is I(0) (KENNEDY, 2008, pp. 302).

So, the idea is to find a regression in which the error e_t is white noise, that is, which has no autocorrelation. If the two variables Y and X are non-stationary, or integrated in order 1 as it is called (I(1)), it is possible to find a cointegration vector [1,-β] such that the error e_t of the regression is I(0) (GREENE (1993)):

$$e_t = y_t - \beta x_t$$

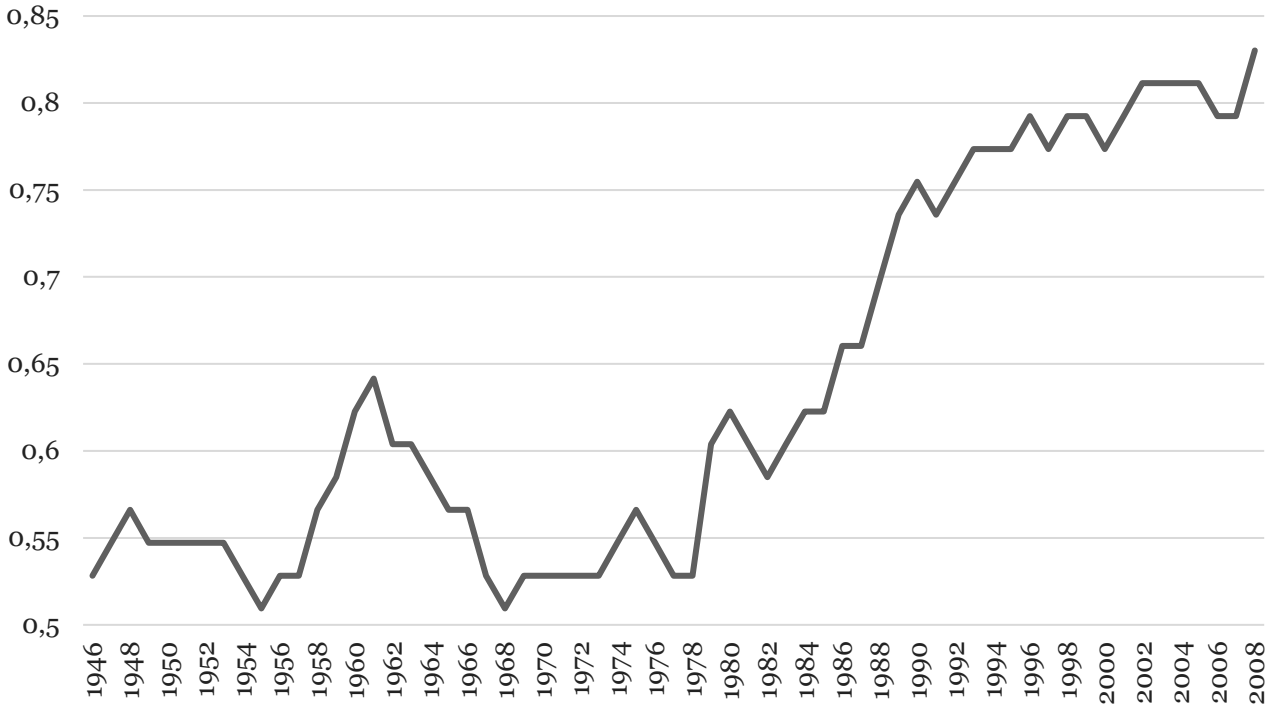
In the case studied here, as there are more than two related variables, we chose the method of Johansen (1988) and Johansen and Juselius (1990). In this method, all variables are considered endogenous for the estimate in which each is expressed as a linear function of itself and other variables. The equations are written in the form of a VAR (Autoregressive Vector). According to Kennedy (2008, pp. 311), "manipulation of this vector equation produces a vector error correction equation in which differentiated vector terms are explained as lagged differentiated vector terms plus a lagged levels term that represents the error correction phenomenon."

As there are more than two variables, it is possible to have more than one cointegration relationship. In other words, a relationship can be identified between variable X and variable Y, but variable Y can also be related to X in another equation. To identify how many cointegration relationships exist, there are two tests, the trace test and the maximum likelihood test, which will both be performed here. In addition to these tests, unit root tests will also be carried out in order to

identify whether or not the series exhibits stationarity along with specific tests to identify the best cointegration model. The models behind the method will not be described here because they are mathematically complicated, with it being recommended to look at Kennedy (2008) and Bueno (2012) for more details.

The data used will be three specific variables. First, the democracy measure variable will be given by the data compiled in Cheibub *et al.* (2010). A simple average of the data was made each year for the sample used from 53 countries (Graph 2). 53 countries were chosen in this case due to the availability of data for the second variable, military spending at 2016 prices compiled by SIPRI (2018) with the series starting in 1962 and ending in 2008, the last year of the Cheibub *et al.* (2010) compilation. The third variable is the annual average GDP per capita of the different countries compiled in Maddison (2018). All of the series are in logarithm.

CHART 2. CHEIBUB ET AL DEMOCRACY INDICATOR (2010) - AVERAGE FOR 53 COUNTRIES



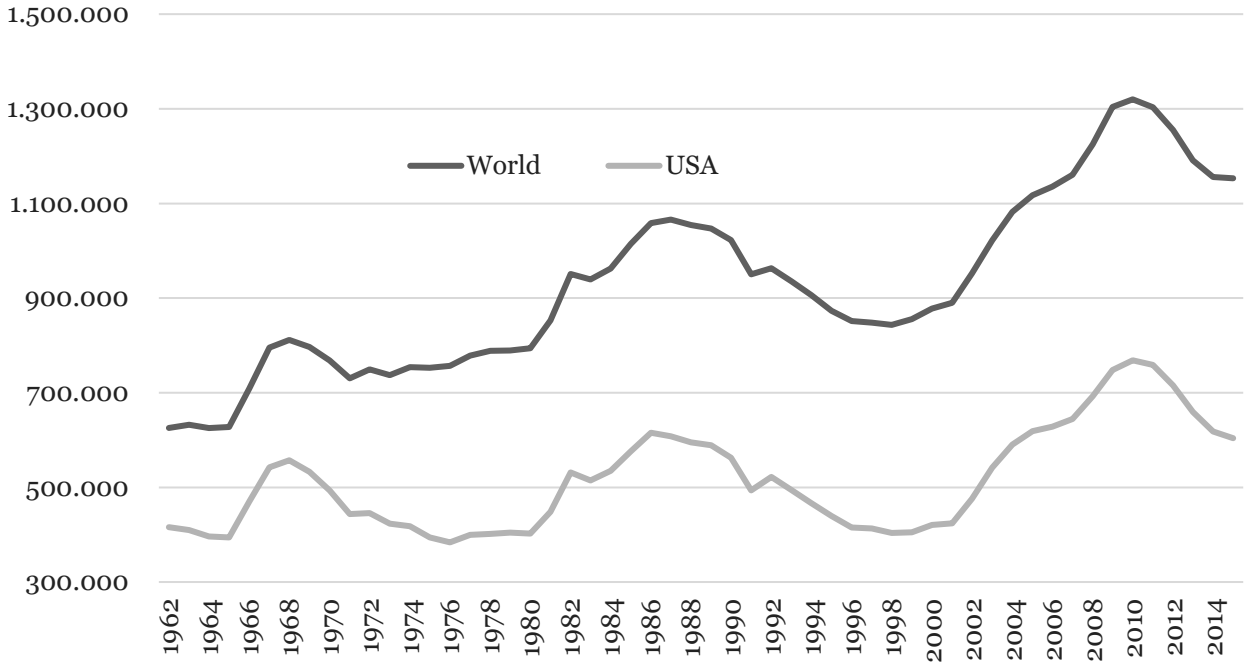
Source: CHEIBUB ET AL (2010). Prepared by the author.

In the given case of democracy, the statistic, as stated earlier, indicates 0 if the country is not a democracy and 1 if it is. The average over the years shows an increase in democracy in the world, with a marked acceleration in the 1980s. The average is relatively high in recent years due to there being a certain selection bias on account of the data. Countries with older information tend to be more consolidated countries with the chance of them being more established democracies. In either case, it is not that different a pattern to the one seen in the previous chapter for the world average.

Military spending, on the other hand, shows a pattern of three cycles over the decades, with the first one beginning in the late 1960s with the Vietnam War, the second one at the start of the

1980s with the intensification of the dispute between the US and the Soviet Union and the wars that got underway in the Middle East and the third one beginning after the attacks on the twin towers in 2001. As can be seen in Graph 3, American military spending has been responsible for practically all the military spending cycles in the world in recent decades, indicating the weight that the US represents in that indicator.

CHART 3. MILITARY SPENDING IN CONSTANT US $ 2016 - SUM FOR 53 COUNTRIES



Source: SIPRI (2018). Prepared by the author.

Firstly, the unit root tests identified non-stationarity in all the series (Table 4) using three standard tests: Augmented Dickey-Fuller (ADF) (DICKEY *ET AL.*, 1979) and Elliot-Rothemberg-Stock Point-Optimal (ERS) and Dickey-Fuller GLS, with the latter being based on Elliot *et al.* (1996). The latter tests are more recommended as they are tests with greater power than the traditional ADF test and are therefore preferred. The tests indicate non-stationarity of the three series.

TABLE 4. UNIT ROOT TESTS - DEMOCRACY, MILITARY SPENDING, AND WORLD GDP

	ERS (DF-GLS)	ERS	ADF
Democracy	0.07***	46.37***	-0.04***
Military Expenditur	-0.75***	22.63***	-1.84***
World GDP	0.66***	2239***	-2.7**

*Source: *** significant at 1%; ** significant at 5%. Lags were chosen by Hannan-Quinn criterium.*

The trace and maximum eigenvalue tests indicate that there is cointegration between the indicated variables (Table 5).

TABLE 5. TRACE AND MAXIMUM EIGENVALUE TEST

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.448337	45.59270	42.91525	0.0263
At most 1	0.242579	19.42068	25.87211	0.2566
At most 2	0.150870	7.195913	12.51798	0.3245

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.448337	26.17202	25.82321	0.0450
At most 1	0.242579	12.22477	19.38704	0.3945
At most 2	0.150870	7.195913	12.51798	0.3245

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Prepared by the author.

The result corroborates previous estimates, with the 1% increase in the measure of democracy index translating into a 2.7% drop in military spending in the long run (Table 6). One interesting result is that the increase in GDP in these countries led to a 3.06% drop in military spending over time, which may be related to the issue discussed earlier that the more developed the country, the greater the pressure for distribution of spending, particularly social, that would tend to squeeze military spending. At the same time, with the increase in democracy leading to greater development in countries, the expectation is that there will be less pressure for military spending, merely confirming the old theory that democracies never went to war with each other.

Another interesting result is the α coefficient that indicates the short-term impact of each variable on the model. For a variable to be considered exogenous, it is expected to be significant and the sign indicates the degree of convergence, whether it is fast or slow. In this case, the only significant α coefficient is precisely that of military expenditure and in the correct, negative sense, indicating that the variable is indeed endogenous, that is, it responds to variations in the model's other variables. Deviations from the trend of military spending would be forced to return to its natural trend by the movement of world GDP and democracy. The α of world GDP and democracy are not significant, indicating the exogeneity of the variables (Table 7). To confirm this, we also

estimated LR tests for each of the α in Table 10 and the results confirm that military spending is in fact endogenous while the other variables are exogenous.

TABLE 6. COINTEGRATION RESULT

Vector Error Correction Estimates			
Date: 11/17/18 Time: 14:44			
Sample (adjusted): 1966 2008			
Included observations: 43 after adjustments			
Standard errors in ( ) & t-statistics in [ ]			
Cointegrating Eq:	CointEq1		
LOG(Military Spending (-1))	1		
LOG(Democracy (-1))	2,707374		
	-0,87461		
	[3.09551]		
LOG(World GDP (-1))	3,062785		
	-1,44524		
	[2.11923]		
@TREND(62)	-0,108745		
	-0,04031		
	[-2.69757]		
C	-39,36292		
Error Correction:	D(LOG(Military Spending))	D(LOG(Democracy))	D(LOG(World GDP))
α	-0,241805	0,02375	-0,003553
	-0,04796	-0,04567	-0,01788
	[-5.04232]	[0.52004]	[-0.19870]

Source: Prepared by the author. Lag exclusion tests identified 3 lags by the Hanan-Quinn and Schwartz criteria. Lutkepohl and Urzua normality tests indicate the normality of the residues. Autocorrelation tests LM and Portmentau indicated non-autocorrection of residues.

TABLE 7. LR EXOGENEITY TEST

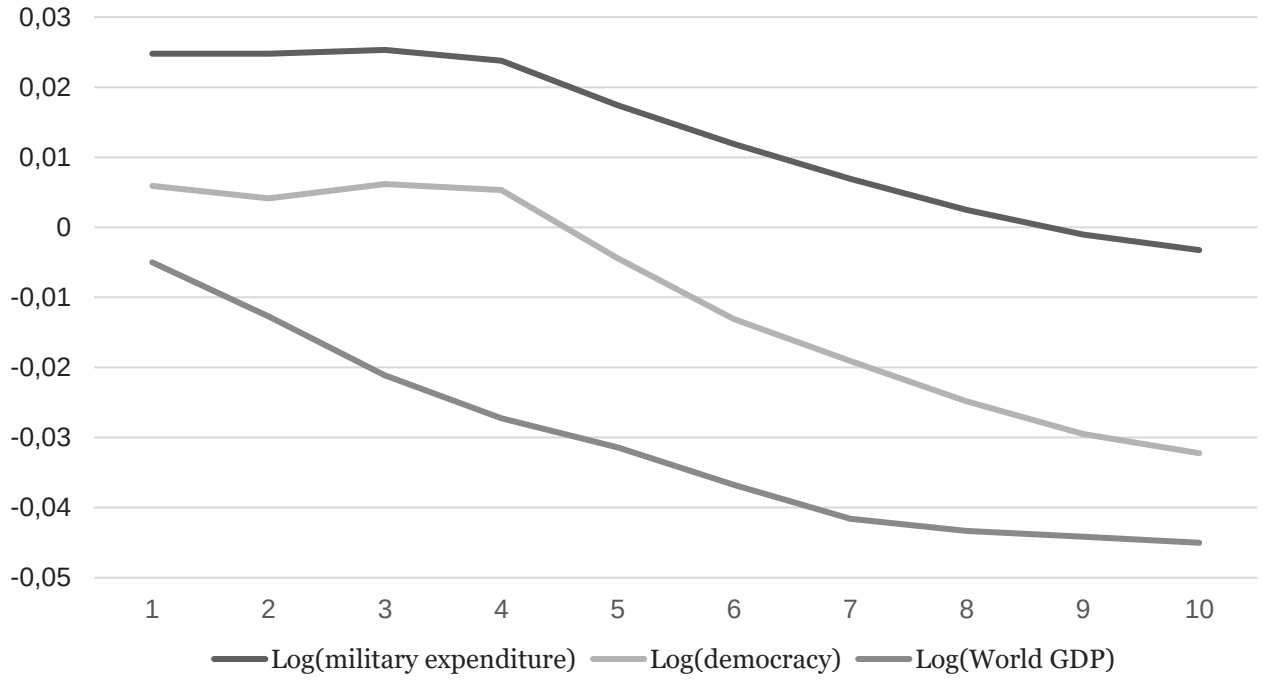
Military Expenditure	
Chi-square(1)	10,17
Probability	0
Democracy	
Chi-square(1)	0,37
Probability	0,55
World GDP	
Chi-square(1)	0,03
Probability	0,85

Source: Prepared by the author.

Another interesting analysis is to assess the temporal impact of shocks, especially on military spending, identified as exogenous. This can be done through impulse-response analysis within the cointegration model (Graph 4). In this case, it is possible to assess the impact of a one standard deviation increase in one variable on the others. In this case, as expected, a negative impact is observed over the long-term on military expenditure of the increase in democracy and world GDP. In the case of GDP, this impact is immediate, and, in the case of democracy, it takes about four years to occur. In other words, an increase in democracy today would take about four years to start having a negative impact on military spending.

The fact that changes in GDP have a faster impact than those in democracy makes sense because of the economic decisions that need to be made regarding the allocation of resources at times of change in GDP. But it is interesting to note a certain coincidence between the periods of increased military spending seen in Graph 3 and the GDP movements. The three cycles of military expansion were also cycles of economic pressure in the United States, caused by non-military factors. Thus, the Vietnam War coincided with the American crisis of the early 1970s. The arms race in the early 1980s coincided with the American double recession of 1981 and 1983 while and the collapse of the Twin Towers in 2001 coincided with the American recession, which had already got underway prior to the attacks.

CHART 4. IMPACT OF IMPULSE-RESPONSE ON DEMOCRACY AND WORLD GDP OF SHOCK IN MILITARY SPENDING



Source: Prepared by the author. Response of log(military expenditure) to Innovations.

As can be seen, the results are relatively robust in showing that increasing democracy and general governance measures in countries in different measures has the effect of reducing military

spending over the years. A similar result can be seen in world growth, with a negative impact on military spending, an interpretation that fits in with another result in which we saw that more developed economies have greater soft power (VALE, 2019). The combined interpretation of both results seems to suggest that, in fact, economies that are more developed and that have more solid institutions tend to see their soft power increase and their hard power decrease.

5. CONCLUSION

The Trump administration decided to increase military spending as soon as it took office, to a certain extent to reward the support received during the presidential campaign, but partly because it believes that this is necessary as a demonstration of American power. Whatever the reason, the fact is that US military spending has started to rise in recent years. Furthermore, this increase in spending has once again triggered an arms race in other countries, especially Russia (GIELOW, 2019). But is this sustainable? Will countries with public spending under pressure from an increasing public deficit and social demands of different orders have room for this type of expenditure to return to the prominent position that it enjoyed in the past? What the result of this article shows is that there are likely to be limited to this.

Countries with well-established democracies tend to show a lower growth in military spending over time, which does not mean that there will not be times when such spending may grow significantly, for example, due to some war, as shown in Graph 3. Perhaps, for the first time, there may be an inflection in US military spending in times of peace without a relevant war to justify such an increase. But the point is that limits tend to be placed on a very exaggerated expansion of military spending when there are opposing voices in society, whether due to the presence of a free press (voice) or because the choice may have to be between more military spending on the one hand or more spending on social security on the other.

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