The Basics of Power: An analysis of United States' Economic Power

Ștefan Cătălin Toplicean[1]

Abstract: Academic, public and political debates on terminology and the exercise of power associate this phenomenon with the effects felt by the countries involved. The topic creates interest, controversy and diverse approaches of specialists, as it involves an analysis of the distribution of power in different structures of society, but also among the main actors of the international system. Interesting is also the evolution of power within this system in the direction of multipolarity, bipolarity, unipolarity and multipolarity, in which states have maintained or changed positions among themselves. The purpose of this paper is to study the influence of the economic dimension of power on its other components. The study is a quantitative one, in which the economic influence of American power is pursued on the social, political, cultural, technological and military components of power. Knowing this influence is essential in order to achieve a hierarchy of power typology according to the importance and implications for states, especially for international actors such as the United States, where all categories of power meet.

Keywords: economic power; soft power; power centres; military power

1. Introduction

The globalization of the world economy, analyzed by enhancing international interdependencies between the structures of economic, social, political and cultural life, led to changing parameters of existing issues in these fields. Thus, the issues have come to bear a more global facet, rather than a national one, leading to the need to search for global solutions instead of national ones.

In the dynamics of international relations, history proves the decisive role power has by highlighting the rises and falls of the numerous regional or international

[1] PhD in progress, Alexandru Ioan Cuza University of Iasi, Faculty of Economic and Business Administration, Specialization Economics, Romania, Address: 20 Carol I Blvd. Iasi, Romania, Tel. +40 747 828 236, Corresponding author: tstefan.catalin@yahoo.com.

powers. The phenomenon led to an increasing interest by researchers, particularly with regard to differentiating between forms of power within society. This increased interest led to the development of different approaches and typologies, sometimes contradictory, of the various researchers and specialists in political science, philosophy, economy, psychology, geostrategic or military fields.

However, the broad extent the phenomenon of power may cover makes it difficult to define this concept, especially since dictionaries and encyclopedias only partially define its complexity. For example, the concept of power is defined as a condition, possibility and physical, moral and intellectual capacity to accomplish or act (DEX, 2009, p. 901).

The phenomenon of power is associated with numerous terms, of which: physical strength, will, influence, authority, domination, economic, social, political, military power. These associations highlight the vast range of defining power, as the terminology allows for many explanations and definitions.

Sociologist and economist Max Weber considers power to be the possibility to impose your own will within a social system, although there is an opposition regarding this imposition (Hastings, 2000, p. 23). On the other hand, political scientist Raymond Aron believes power results in the capacity of a state to influence the will of individuals or other states (Torcan, 2003). Some specialists agree with Max Weber and highlight two ways of imposing own will (Bal et al., 1999, p. 37): positive (free acceptance) and negative (constraint).

However, political scientist Joseph Nye Jr. considers there is a physical and intangible component of power, seen as the possibility to make changes and react to them (Nye, 2011, p. 5). For economist Gerard Kebabdjian, power is the ability of political or economic actors, international bodies and multinational companies to influence in a particular manner the world economic relations (Kebabdjian, 1994, p. 297). He believes power can be divided into five components: physical, economic, political, military and the nation value system (moral, cultural, religious), and the most important is the economic component.

Among all these attempts to surprise the essence of the power concept, the most widely spread and used definition is that of historian Robert Dahl (Stuparu, 2012, p. 93). In his vision, power is an asymmetric relationship between actor A, owner

of power, and actor B, subject of power, where A has an influence over B to obtain an action which the latter would not have performed without A's intervention.

Thus, power is seen as the capacity to perform changes and a capability to resist to such, however the manifestations of power are influenced and influence individuals and states based on the fields in which they occur.

From a **social** point of view, power is substantiated by the contact between the members of a community and is manifested by means of the authority of an individual or group of people, either chosen or imposed, to meet the scopes and represent the interests of the entire community. Whenever social power involves decisions influenced by modeling the political regime and having an impact on the whole society, power undergoes political implication. **Political** power is owned by a group of people which take decisions and implement them for the purpose of organizing and leading society. Its role is to create connections between the interests of power owners and the common interests of society and to establish strategies which ensure the order in social relationships, social progress and welfare of the people. Another responsibility political power holds is in the manner of performing and the manifestation of military power, which is decided on political grounds. **Military** power shows the capacity of military action which a state owns to ensure its own and its allies' security, as well as to meet political and geostrategic interests, based on the military potential it holds. Its usage is based on protecting national interests, thus serving political power but also helping it, at times, to exhibit and to preserve its democratic features. Using it in international politics however is being increasingly disproved, so military force is only used for configuring world security, fighting terrorism, unlocking strategic points and conflicted relations, whenever other measures, such as diplomatic or economic ones, lose their efficiency. Thus, an ever increasing importance in international practices is that of **economic** power, but military power still preserves its value as a means of comparison in relations between countries, gaining new meanings and significance deriving from economic and technological development. States wish to maintain a balance of power between its components, particularly between the military and economic sides, given by internal and external developments. Some states (The United States, Germany, Japan, China) watch over the existence and stability of the economy, as it constituted the base of development for the military power. Others (Russia, North Corea) use military power to enhance their economy, although this practice draws risks, economic sanctions and exclusion from international organizations.

Using the military, economic and technology fields in regards to international relations give a sense of determination to power, especially when used in a coercive manner. Besides these measureable displays of power, the current international environment is witnessing a "soft" usage of power, given by immaterial capacities such as diplomacy, education and culture. This occurs at an international level by means of communication and information, having effect on the how people perceive and think about reality. Soft power is a concept first described by Joseph Nye, by which is described how one actor influences the others to impose its will, not coercively, but by means of cultural, diplomatic anf religious values (Nye, 2004, p. 32). Using peaceful elements of negociation and persuasion in international affairs brings more benefits and lower cost to states than military intervention or coercive elements. At an international level, the United States represent the most successful soft power model, but American power can take various forms, from socio-political and economic to military and technological. All these features led to the United Stated becoming an **intelligent power**, as Joseph Nye believes, and he refers to the capacity to combine soft power resources with traditional ones, in order to develop efficient strategies and influence the actions of other states (Nye, 2010).

Despite these tendencies, the economic component of power remains the main focus and this is expressed by various means throughout history. At a world level, economic strength is essential, as it is the basis for developing all other types of power. Existance and ownership of resources are the key elements in providing the status of economic power, and measuring this component is done by means of various indicators: GDP size and dynamics, economic structure and potential, population, structure of the outside trade, specialized production, the structure of government consumption, expences and income. The most important and most frequently used one in economic studies remains the GDP.

2. Literature Review

Empirical studies regarding the means to quantify power developed apart from theoretical ones and determined a gap between the number of theoretical studies and the volume of empirical research. Empirical models are based on statistical research and a methodology based on analyzing a number of states within a given

time frame. Results led to a hierarchy or division of states by degrees of power, determined by calculating certain series of macroeconomic indicators.

There are significant differences in the process of selecting indicators, choosing the means of calculation and the degree of influence each has on the analyzed states, so the studies and research of specialists, international bodies and institutions vary significantly.

The first research regarding economic power analyzed the degree of external debt rescheduling under the impact of indicators such as: import, external debt rate, depreciation and reserves (Charles & Cline, 1971). Subsequently, the econometric method compared 69 states in regard to their external debt rescheduling risk, using imports, exports, capital introduction and external debt (Dhonte, 1975). At the same time, based on statistical data, 64 states were evaluated regarding dependency on external debt, over the period 1961-1974, using: GDP, import, export, external debt, reimbursement and state reserves (Grinols & Bhagwati, 1976).

National power was measured by comparing the influence of macroeconomic indicators such as: population, economic capacity, strategic objectives, military capabilities and national will (Cline, 1977), however the study was not fully based on quantity measurement, but also on state arguments and decisions.

Another study (Kharas, 1984) looked for the possibility of a state to lose the trust and support of the international community. It was applied to 43 states and comprised the period between 1965 and 1976, using external debt indicators, nominal GDP and GDP per inhabitant, net capital and investment.

Robert Barro's research (1991) analyzed the means of increasing economic power and was applied on 98 states, over 1960-1985; it showed human resources have a positive impact, while violence and political instability have a negative impact on economic strength, from the perspective of investing (Barro, 1999). At the same time, a state's economic growth rate is negatively affected by uncertainty regarding taxes, inflation and interest rate; his is shown by an empirical study which analyzed 67 states over year 1996 (Lensink & Hermes, 2000).

Empirical research on the phenomenon and measurement of power during the last decades was led by specialized institutions and international bodies. The most representative are WIPO (World Intellectual Property Organization), The World Bank, World Economic Forum, INSEAD (The Business School for the World), UNDP (United Nations Development Program), Cornell University, Heritage

Foundation, Wall Street Journal, Eurostat, Central Intelligence Agency, Transparency International etc. These institutions and foreign bodies trace the evolution of states by means of composite indicators, such as HDI (Human Development Index), GCI (Global Competitiveness Index), Corruption Perceptions Index, GII (Global Innovation Index), Index of Economic Freedom and WGBI (World Government Bond Index).

3. Methodology

This research tracks which of the components of strength are mostly influenced by the economic dimension. This dimension is measured by means of GDP, as this is mostly used when analyzing a state's economic power. Therefore, GDP will be considered the independent variable of the regression pattern, while dependent variables were grouped into 5 categories of indicators representing the components of power.

Variables used in this research were extracted from the World Bank statistical data and compared in the SPSS Program, and the details are comprised in the below table.

Table 1. Grouping Variables according to Power Components

Power components	Indicator
The economic dimension of power	GDP (current trillion US$) - PPP
Physical dimension of economy	Population growth (annual %)
	Labor force, total (million people)
	Unemployment, total (% of total labor force)
Socio-political aspects	Life expectancy at birth, total (years)
	Current health expenditure (% of GDP)
	Domestic general government health expenditure (% of general government expenditure) - DGGHE
The cultural dimension	Education expenditure (current billion US$)
	School enrollment, secondary (% gross)
	Secondary education, general pupils
The technological component	Scientific and technical journal articles
	High-technology exports (current billion US$)
	Patent applications, total
The military dimension	Armed forces personnel, total
	Arms exports (billion US$)
	Arms trade balance (billion US$)

The study was performed for the United States and included data over a 10-year period: 2006-2015. American economy was chosen as the U.S. represent the most reliable model of strength and comprise all its elements, whereas in the BRICS or European Union states power features occur only in part.

4. Empirical Findings

For starters, the univariate distribution of variables used is described in numbers. As such, there is a brief description of the measures of central tendency (Mean and Mode), as well as of the standard deviation and distribution of pattern coefficients for the five components of power.

Table 2. Numeric Description of the Statistical Distribution for Power Components

	Mean	**Mode**	**Std. Deviation**
GDP (current trillion US$)	15.635	13.856	1.417
Population growth (annual %)	0.828	0.711	0.099
Labor force, total (million people)	157.577	153.990	2.035
Unemployment, total (% of total labor force)	6.975	4.620	1.930
Life expectancy at birth, total (years)	78.430	78.741	0.393
Current health expenditure (% of GDP)	15.998	14.661	0.753
DGGHE (% of general government expenditure)	19.642	18.360	1.508
Education expenditure (current billion US$)	749.136	662.980	77.590
School enrollment, secondary (% gross)	94.548	93.034	1.186
Secondary education, general pupils	24377274.511	24095459.344	236969.884
Scientific and technical journal articles	413505.470	383114.900	21367.571
High-technology exports (current billion US$)	168.885	132.407	35.376
Patent applications, total	507099.400	425966.000	59635.649
Armed forces personnel, total	1490041.300	1347300.000	78105.396
Arms exports (billion US$)	8.275	6.828	1.133
Arms trade balance (billion US$)	7.419	5.877	1.220

Source: own editing of the results obtained by statistical research

After editing the statistical data, GDP average values can be observed, as well as the representative indicators of the other components of strength, as shown in Table 2.

Firstly, analyzing the economic side of power, over 2006-2015, The United Stated recorded a GDSP average of US$ 15.635 trillion, while the most frequent value of GDP was USD 13.856 trillion.

Then, looking at the three indicators which are representative for the physical dimension of economy, there is an average annual growth of American population by 0.828% over the period 2006-2015, while the average labor force occupation level reached 157.577 million inhabitants, and the average unemployment rate was 6.975%. At the same time, values show the most dominant population increase level was 0.711%, and the labor force occupation level often reached 153.99 million inhabitants. The most frequent unemployment rate was at 4.62%.

Thirdly, from a socio-political perspective, average life expectancy in the U.S. for the mentioned period was at an average of 78.43 years, while the most frequent level of life expectancy reached was 78.74 years. Health expenditure represented an avg. of 16% of GDP, and the average of government health expenditure was 19.642% of the general government expenditure.

From a cultural and educational perspective, American education expenditure averaged at US$749.136 billion over 2006-2015, while secondary school enrollment reached 94.548%. School enrollment average was 24.37 million people. The most frequent value shows an education expenditure average of US$ 662.98 billion, a rate of 93% and 24.1 million people as average secondary school enrollment rate.

From a technology point of view, the average of scientific and technical journal articles was 413,505 articles, and there were 507,099 patent applications over the reference period. Still, American high-technology exports averaged US$ 168.88 billion. Technological indicators show a number of 383,114 articles, 425,966 patent applications and USD$ 132.4 billion in hi-tech exports.

From a military perspective, American armed forces personnel averaged 1.49 million people. Arms trade made an avg. of US$ 8.275 billion in exports, while the U.S. balance of trade had a surplus of US$7.419 billion in arms trade. The most frequent arms export values were US$6.828 billion, a trade surplus of US$ 5.877 and armed forces personnel of 1.35 million people.

Standard deviation values are below those recorded by the average value of each indicator, which show certain homogeneity.

The study will also show the links between the independent variable *GDP current trillion US$* and the other dependent variables, in order to determine the components which are mostly influenced by the economic dimension of power.

Table 3 shows the results of editing statistical data. The correlation coefficient (R) indicates strong and positive links between GDP and the annual population growth (81.3%), as well as between GDP and labor force (94%). However, even though there is a positive connection between GDP and unemployment rate, is it a weak one at 5.8%. There are also differences in the value of the coefficient of determination (R^2). Variation in American population growth and labor force are explained over 66.1% and 88.3% by GDP variation. The situation changes with unemployment rate, whose variation only explains 0.3% of GDP change.

Table 3. Synthesis of regression patterns between GDP and indicators of the physical facet of the economy

Results of regression	GDP (current trillion US					
	R	**R^2**	**B_0**	**B_1**	**Sig(F)**	**Sig(B_1)**
Population growth (annual %)	0.813	0.661	1.7147	-0.0567	0.0042	0.0042
Labor force, total (million people)	0.940	0.883	136.4747	1.3497	0.0001	0.0001
Unemployment, total (% of total labor force)	0.058	0.003	8.2099	-0.0790	0.8736	0.8736

Source: own editing of the results obtained by statistical research

Regression parameter testing shows the Sig. probability associated to the Fischer test is lower than 0.05 in regard to American population growth (0.0042) and labor force (0.0001), meaning the models are significant to explain dependency between variables. On the other hand, Sig. associated to the Fischer test value is higher than 0.05 for unemployment rate (0.8736). Basically, there is a 95% probability that GDP will explain population growth changes and labor force levels, but not unemployment rate.

Regression parameter analysis shows the levels and changes in dependent variable average. If the influence of GDP changes is null, the average estimated level of American population growth is 1.7147%, labor force 136.4747 million people and unemployment rate is at an average of 8.21%. At the same time, a GDP increase of US$ 1 trillion determines a positive reaction of labor force (increase by 1.3497 million people) and an average decrease of the population by 0.0567% and of unemployment by 0.079%.

Sig. values obtained by testing the B_1 coefficient are lower than $\alpha = 0.05$ for the annual population growth level and employment rate, showing that the two indicators are influenced by the GDP over a 95% level of trust. It is not the same

for the unemployment rate, having a Sig. value of 0.8736, higher than the level of calculated risk.

Table 4 shows the results obtained by processing the statistical data. The correlation coefficient (R) indicates strong, positive links between GDP and all three social and political indicators of strength, respectively life expectancy in the U.S. (80.1%), American health expenditure (74.1% of GDP) and government health expenditure, as percentage of total government expenditure (95.3%). The coefficient of determination (R^2) indicates that over 50% of variation is explained by GDP changes, government education expenditure varying significantly, around 90%.

Regression parameter analysis shows that the Sig. probability associated to the Fischer test value is lower than 0.05, meaning the models are significant, from a statistical perspective, for explaining dependency between variables. This means that, for a calculated risk of 5%, the size of GDP explains the changes in life expectancy, American health expenditures and government education expenditure, as percentage from total government expenditure.

Table 4. Synthesis of regression patterns between GDP and socio-political indicators of power

Results of regression	GDP (current trillion US$)					
	R	**R^2**	**B_0**	**B_1**	**Sig(F)**	**Sig(B_1)**
Life expectancy at birth, total (years)	0.801	0.642	74.9557	0.2222	0.0053	0.0053
Current health expenditure (% of GDP)	0.741	0.549	9.8421	0.3937	0.0141	0.0141
DGGHE (% of general government expenditure)	0.953	0.909	3.7753	1.0148	0.00002	0.00002

Source: own editing of the results obtained by statistical research

Regression pattern analysis show possible scenarios when GDP change influence is null and when GDP changes by US$ 1 trillion. In the first case, the average life expectancy level is approximately 75 years, American health expenditure reach around 9.8% of GDP and government health expenditure over total government expenditure reaches 3.77%. in the second case, GDP growth determines an increase by 0.2 years in life expectancy, by around 0.4% in health expenditures over GDP and around 1% of government health expenditures over total government expenses.

Sig. values resulting from testing B_1 coefficient are lower to $\alpha = 0.05$ for the three indicators, which leads to believe they are influenced by the size of GDP, over a 95% level of confidence.

With regard to the cultural and educational dimension of power, Table 5 values show a strong and positive link between GDP and the three indicators chosen. There is a tight connection with the education expenditures (R=93.1%), and changes are explained over 86.6% by the GDP variation. It is a similar situation regarding secondary school enrollment, (R) having a value of 79.4%, and variation depending 63% on GDP change. On the other hand, although the link between GDP and the number of pupils in secondary enrollment is moderate (a little over 50%), changes in this indicator are explained by a GDP variation only by 30%.

There is also a difference when testing the regression parameters. Sig. probability associated to the Fischer test is over 0.05 in the case of pupils enrolled in secondary education (0.1045), while for the other two indicators it is lower and very close to 0. So, we can say that over a calculated risk of 5%, GDP explains changes only in regard to education expenditures and secondary education enrollment, but not to the number of pupils enrolled at this level of education.

Table 5. Synthesis of regression patterns between GDP and the cultural & educational component of power

Results of regression	GDP (current trillion US$)					
	R	**R^2**	**B_0**	**B_1**	**Sig(F)**	**Sig(B_1)**
Education expenditure (current billion US$)	0.931	0.866	-47.6317	50.9611	0.0001	0.0001
School enrollment, secondary (% gross)	0.794	0.630	84.1570	0.6646	0.0061	0.0061
Secondary education, general pupils	0.543	0.295	25798217	-90883	0.1045	0.1045

Source: own editing of the results obtained by statistical research.

Although the link between GDP and education is strong, regression parameter values are opposite. So, if GDP influence is null, the average education expenditure level is negative, of approximately USD 47.63 billion, but when GDP grows by US$ 1 trillion, expenditures also grow by 50.96 billion. It is opposite in the case of secondary education pupils, as when GDP is null, the average level is around 25.8 million. This indicator drops by 90,883 pupils when GDP increases by US$ 1 trillion. Secondary school enrollment is at an average of 84% if GDP influence is null, but with a US$ 1 trillion increase, it also rises by 0.66%.

Sig. values resulting from testing B_1 coefficient are lower to 0.05 for school enrollment and education expenditures, meaning the two indicators are influenced by the GDP size. For a 95% level of trust, the secondary education pupil level is not influenced by GDP, as Sig. value (0.1045) is higher than the calculated risk.

The technological dimension of strength is set by three indicators presented in Table 6, out of which only two have a correlation coefficient of over 50%. Thus, there is a strong, positive connection between GDP and the number of scientific and technical journal articles (88.1%), respectively patent applications (97.8%), but this link is rather moderate (a little below 50%). There features are evident when analyzing the determination report. Variation in the number of scientific and technical journal articles and patent applications in the United states is explained in a higher degree by GDP changes (77.6%, respectively 95.6%), while high-technology export fluctuations are determined only 24.5% by the size of GDP. The indicator varies also regarding Sig. probability associated to the Fischer test, as it is higher than a 0.05 risk degree. Therefore, GDP changes do not explain changes in hi-tech exports.

Changes in the number of scientific and technical journal articles and patent applications can be explained by changes in the GDP, as Sig. values are lower than the calculated risk, even close to 0. Sig. values for testing B_1 are similar to the Fischer test, so for a 95% level of trust, we can assert that only hi-tech exports are not influenced by the GDP, while the other two indicators are. If GDP change influence is null, the technological component records a number of 205,747 scientific and technical journal articles, an average of US$ 362.25 billion hi-tech exports and negative values in patent applications. GDP growth by US$ 1 trillion lead to an increase of 13,288 articles, 41,152 patent applications, while hi-tech exports decrease by US$12.36 billion.

Table 6. Synthesis of regression patterns between GDP and the technological component of power

Results of regression	GDP (current trillion US$)					
	R	**R^2**	**B_0**	**B_1**	**Sig(F)**	**Sig(B_1)**
Scientific and technical journal articles	0.881	0.776	205747	13288	0.0008	0.0008
High-technology exports (current billion US$)	0.495	0.245	362.2499	-12.3676	0.1455	0.1455
Patent applications, total	0.978	0.956	-136302	41152	0.000001	0.000001

Source: own editing of the results obtained by statistical research

The last three research indicators represent the military component of power, and between them and GDP there are also strong and positive links, as the correlation coefficient corresponding to each relation is between 80% and 90%, as described in Table 7. R^2 shows that over 63% of the three indicators' variation is explained by GDP changes, while armed forces personnel variation is 80% explained. Sig. probability for the Fischer test value and B_1 testing coefficient are identical and lower to 0.05 risk degree, proving that GDP fluctuation explain and influence changes in armed forces personnel, arms exports and arms trade balance.

Table 7. Synthesis of regression patterns between GDP and the military component of power

Results of regression	GDP (current trillion US$)					
	R	**R^2**	**B_0**	**B_1**	**Sig(F)**	**Sig(B_1)**
Armed forces personnel, total	0.894	0.800	2260808	-49298	0.0005	0.0005
Arms exports (billion US$)	0.799	0.638	-1.7074	0.6385	0.0056	0.0056
Arms trade balance (billion US$)	0.819	0.671	-3.6068	0.7052	0.0038	0.0038

Source: own editing of the results obtained by statistical research

Although the three indicators have similar features, regression parameter analysis shows significant differences. First, when GDP change influence is null, the average armed forces personnel is around 2.26 million people. Under the same conditions, the average arms exports and arms trade balance both have negative vales. When GDP is increased by US$ 1 trillion, the exports increase by around US$ 638.5 million, trade balance by US$ 705.2 million but the effect on economic growth is negative with regards to armed forces personnel, as it decreases by 49,298 people.

5. Conclusions

In the dynamics of international affairs, history proves the importance and primordial role of power by the rises and falls of the numerous regional and international powers. The phenomenon arouses the interest of researchers, particularly when differentiating between forms of power within society. Various opinions on the phenomenon of power result from the diversity of theoretical trends and the complexity of appearances.

Regarded as a capacity to induce change and a capability to resist to change, power determines influences between individuals and states, based on the fields in which

it occurs. The economic component of strength remains the nucleus of power and the base for development of all other types of power.

This research aimed at showing the influence of the economic dimension of American power over social & political, cultural, military and technological components of power. Analyzing the economic component of American strength over the period 2006-2015, we have seen that the United Stated recorded an average GDP increase of US$15.635 trillion.

The influence of the economic component over all others varies significantly. Thus, out of the three indicators which were representative for the physical dimension of economy, only the annual population growth and labor force has strong and positive links to the GDP, explaining 66% of the changes in the two indicators. Although GDP increase determines a population decrease, it also determines improved labor force and a decrease of the unemployment rate. However, unemployment rate fluctuations are not influenced by the GDP changes.

From a social and political perspective, over 50% of the variations in the three analyzed indicators (average life expectancy in the United States, American government health expenditure as proportion from the total government expenditure and total health costs) are explained by the changes in GDP, the education expenditure varying significantly, around 90%. In this way, an economic growth in the United Stated determines an evolution in the social and political environment, as each of the three indicators are prone to improvement.

From a cultural and educational perspective, the GDP only explains changes in education expenditure and secondary enrollment rate, but not in the number of pupils enrolled. Thus, between the GDP and the secondary enrollment rate, respectively education costs there are strong, positive links, and economic growth in the United States determines an improvement in the enrollment rate and an increase in education expenditure.

From the point of view of technology, the three indicators (scientific and technical journal articles, high-technology exports and patent applications) are influenced in part by the economic dimension of power. Therefore, for American economy, from 2006 until 2015, GDP fluctuations influence significantly only the number of scientific and technical journal articles and the number of patent applications. This means that an economic growth in the United States determine the publishing of a

higher number of scientific and technical articles and recording a higher number of patents.

The military field is influenced by the economic dimension of power. Changes in the three indicators: armed forces personnel, arms exports and arms trade balance, are 63% explained by GDP fluctuations. However, a growth in the U.S. economy would only bring advantage to arms exports and, therefore, would lead to a trade surplus, even though armed forces personnel number would decrease.

It is important to remember that the economic dimension of strength influences all spheres of power. The analysis made over the United Stated of America between the years 2006 and 2015 reveal that the economic side, represented by means of the GDP, has the biggest influence on the social, political and military fields, since changes in the three indicators from each category are explained by the changes in American economy. The physical side, technology and the cultural environment have a lower influence, as only two out of the three indicators analyzed for each component undergo changes following American economy fluctuations. In other words, in a higher or lower degree, the components of power are influenced by its economic dimension, and in this respect the analysis of the United Stated is relevant since this is considered the most accurate model of power, including all its dimensions.

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Appendices

Appendix 1

Year	GDP (current trillion US$)	Population growth (annual %)	Labor force, total (million people)	Unemployment, total (% of total labor force)	Life expectancy at birth, total (years)	Current health expenditure (% of GDP)	Domestic general government health expenditure (% of general government expenditure)
2006	13.8559	0.9643	153.99	4.62	77.69	14.6606	18.7561
2007	14.4776	0.9511	155.29	4.62	77.99	14.9006	18.7015
2008	14.7186	0.9459	157.09	5.78	78.04	15.2940	18.3631
2009	14.4187	0.8767	157.20	9.25	78.39	16.3378	18.3595
2010	14.9644	0.8333	157.01	9.63	78.54	16.3967	18.5313
2011	15.5179	0.7427	157.13	8.95	78.64	16.3581	18.9997
2012	16.1553	0.7509	158.43	8.07	78.74	16.3551	19.8154
2013	16.6915	0.7112	159.00	7.38	78.74	16.3229	20.5930
2014	17.4276	0.7523	159.80	6.17	78.84	16.5162	21.7295
2015	18.1207	0.7558	160.83	5.28	78.69	16.8361	22.5711

Sources: The World Bank, World Development Indicators, last update 28th August 2018

Appendix 2

Year	Education expenditure (current billion US$)	School enrollment, secondary (% gross)	Secondary education, general pupils	Scientific and technical journal articles	High-technology exports (current billion US$)	Patent applications, total	Armed forces personnel, total	Arms exports (billion US$)	Arms trade balance (billion US$)
2006	662.98	94.0011	24552317	383115	219.0260	425966	1498000	7.5120	6.8680
2007	672.04	94.5017	24731027	389452	218.1155	456154	1555000	7.8660	7.0460
2008	697.30	94.3738	24692888	391933	220.8845	456321	1540000	6.8280	5.8770
2009	683.00	93.9112	24524564	398871	132.4067	456106	1563996	6.9120	5.9440
2010	730.20	93.0339	24192786	409853	145.9327	490226	1569417	8.0630	6.9620
2011	798.04	93.7255	24214304	424938	145.6386	503582	1520100	9.0870	8.0920
2012	750.62	94.1275	24122437	432312	148.3310	542815	1492200	9.1220	7.9260
2013	752.13	94.7402	24095459	435212	148.5306	571612	1433150	7.6600	6.8730
2014	856.04	95.8849	24229777	440230	155.6406	578802	1381250	9.6560	9.0840
2015	889.01	97.1848	24417186	429139	154.3456	589410	1347300	10.0480	9.5200

***Sources**: The World Bank, World Development Indicators, last update 28th August 2018*