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THE GLOBAL BALANCE OF POWER AFTER THE COLD WAR. A POWERMETRIC APPROACH

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Abstract. The states (countries) are playing game of power and interest in the international system (IS) to survive and develop. In this game, the states compete to take the best position in the ranking of power. This allows to pursue their national interests more effectively. States with the greatest power (top states) decide on the polar structure and geostrategic nature of IS at every level (global, regional, local). Investigating the structure (static research) and nature (dynamic research) of global balance of power (GBP) after the Cold War three types of power: economic power, military power and geopolitical power were taken into consideration. The results of theoretical and empirical research are relevant to the decision-making process of the political system of states directly or indirectly involved in the international security.

Keywords: international system; powermetrics; economic power; military power; geopolitical power; militarization

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1. Introduction

There are a lot of attempts in scientific literature to search for links between economic development dimentions and various facets of security of a country (e.g. Rogalev et al., 2018; Mikhaylov et al., 2018; Korauš et al., 2019; Faridi, Sulphey, 2019; Moumen et al., 2019; Vigliarolo, 2020; Chehabeddine, Tvaronavičienė, 2020).

The purpose of this article differs from those studies. We raise the following fundamental questions in different kind of social studies like the international relations or security studies: (1) what is the structure (nature) of the international system after the Cold War in respect of global balance of an economic, military and geopolitical power? (2) what is the dynamic characteristics of this transformation? (3) what are the main determinants of this transformation process?

Many proposed approaches to this issue assume a bipolar structure of the international system now, but without specifying the field, solid criteria and in the absence of formal research. In this situation, the use of rather little-known powermetric methods seems valuable. Powermetrics is a new term, combining two concepts – 'power' and 'metric'. Powermetrics is the applied science dealing with measurements, assessments and evaluation of public life participant's (actors) power, particularly of states, and the modelling, simulation and forecast of relationship between them in global, regional and local dimensions. The synthetic concept of power (economic power and military power) evaluated according to a formal powermetric model meets the different concepts of power as soft power, hard power, smart power or sharp power and efficiently integrates all these concepts.

Many powermetric formal models have been already developed (Höhn, 2011). Among them, the formal model developed by Mirosław Sułek, a professor at the Institute of International Relations at the Warsaw University (further: Sułek formal model) deserves special attention, as a the modern and most effective synthetic approach. Other approaches have generally outdated indicators, such as steel production in the Wilhelm Fucks model or are based on the expert methods. Sułek formal model is focused on two main areas: (1) economic – resulting from the desire to rationalize the costs (expenditures) of the development and defence in the certain circumstances and conscious of their formation and (2) political-military – resulting from the desire to occupy the best position and to play the best role in the international system.

The states are striving for survival and development, in order to get maximum power, competing for limited global resources. This causes dynamic changes (in time and space) in GBP. To maximize the power in GBP, states must have the correct strategy and the will to achieve their national interests (goals). GBP is a game of power and interests, which takes the form of a permanent rivalry for the best position in the hierarchy. The rivalry between States is a so-called zero-sum game, where winning of one side is a loss the other side with the same size. In the GBP, a global power is always equal to 100%, while the ratio of states power is constantly changing. The rivalry between states for the limited global resources ('source of life energy') takes two forms: (1) cooperation (trade resources) or (2) struggle (taking other people's resources). The cooperation is a so-called positive-sum game, where all players profit, though in different degree. Struggle (in a different spheres: political, economic, military etc.) is a so-called negative-sum game, in which all players lose, though in different degree. Thus, in constant competition for maximum share of power, states alternate between cooperation and struggle, depending on the specific conditions. Studying changes in the GBP in the economic, military and geopolitical dimensions, the current international system can be reliably determined, especially in geostrategic studies. The period of a research has been established between 1992 (dissolution of the USRR) and 2018 (currently available source data).

2. Theoretical background

Powermetrics is a new term, introduced by the Polish scientist Mirosław Sułek (Sułek, 2013, p. 23–27), combining two concepts – 'power' and 'metric'. It has been adopted on the ground of Polish science. Powermetrics is an applied science, dealing with the measurement and evaluation of the power of political units, especially states (nations) and forecast the relation between them on a global, regional and local scale using of models and simulations scientific methods. The powermetric research focused on two main areas: (1) economic – resulting from the desire of rationalizing the development costs and defence in the certain circumstances and understanding of their formation; (2) political-military – resulting from the desire of occuping the best position and to playing the best role in the international distribution system.

The states strive for survival and development, in order to get maximum power, competing for limited global resources. This causes dynamic changes (in time and space) in the GBP. However, from the historical perspective, these changes are slow (there are periods of acceleration), which means that it is not possible to change GBP in a short time. A key sources of change of GBP is the uneven development of superpowers, causing a permanent shift of 'power centres' on the world map (in global, regional and local dimensions). The present GBP has a large inertia. It is a subject of constant fluctuations – causing increases or decreases in the number of main players, the stability of the international system, the mutual hostility etc. These changes are usually slow, reminding the tectonic motions, sometimes ending in unexpected changes ('earthquakes'). But even in this case (e.g. after the end of the cold war) these changes are not so rapid, because their potential is increasing in time. It was very often unnoticed or under-valued. The synthetic research usually requires the formal models or expert estimates. The sector research requires more specialized knowledge. GBP can also be studied statically (at the moment; at the short period of time) or dynamically (the significant changes, trends, directions at the long period of time). GBP can also be studied geographically – due to the location of states with the specific power on the world map. This allows determining the distribution between the major powers and the continents and the direction of changes. There are also other criteria of the GBP analysis, such as: balance, stability, polarity, level of political and military tension (escalation), which are closely associated not only with a particular GBP, but also with the interests of the individual states (Sułek, 2013, pp. 19–23).

To maximize the power in GBP, states must have the correct geostrategy and the will to achieve their national interests (goals). GBP is a game of forces and interests, which takes the form of a permanent rivalry for the best position in the hierarchy. The rivalry between states is a so-called zero-sum game, where winning of one side is a loss the other side with the same size. In the GBP, a global power is always equal to a one hundred percent, while the ratio of states power is constantly changing. The rivalry between states for the limited global resources ("source of life energy") takes two forms: (1) cooperation (trade resources) or (2) struggle (taking other people's resources). The cooperation is a so-called positive-sum game, where all players profit, though in different degree. Struggle (in a different spheres: political, economic, military etc.) is a so-called negative-sum game, in which all players lose, though in different degree. Thus, in the permanent rivaling for a maximum share of power, states cooperate and struggle, depending on the specific conditions (Sułek, 2013, pp. 23–27). The rivalry between states to maximize their power depends on the interaction of their national interests determined by the political system (authority) and the conditions for their implementation. Thus, states have to calculate the possibility of pursuing their national interests according to their power and will of society (in democratic system) or hard decision of leader(s) (in an autocratic regime). The powermetric study based on the quantitative and qualitative methods of the research of the international distribution of power seems to be very useful in the geostrategic studies (Białoskórski, 2018). This research was limited to the application of a formal model of measurement of power of states, as as the main players of the international system. The studies therefore omitted the use of other indicators and non-state actors. Among different approaches (Höhn, 2011) I have adopted the modern powermeric model developed by Mirosław Sułek (Sułek, 2013)]. This model recognises three types of power: (1) economic power (EP), (2) military power (MP) and (3) geopolitical power (GP). There are also derived indicators of power, such a militarization. Three types of militarization are distinguished: economic militarization (m_e), GDP militarization (m_{GDP}) and demographic militarization (m_d).

3. Research objective and methodology

The rivaling in the international system, states are still approaching to maximize their power in form of sociological power. This concept refers to cybernetic theory of known Polish scientist Marian Mazur and considers a power in the category of sociological power. There are two principle forms of sociological power of state: (1) Internal power – within political system of state and (2) External power – in the international system. (Mazur, 1996, p. 183). It relies on establishing proportions between cooperation and struggle (and therefore changing management standards) in order to achieve the best ratio of power. The international relations are synthesis of cooperation and struggle, in different spheres and proportions, determined during rivalry. In the GBP, the states pursue their goals defining a potential (capability) and employing social support (will) and appropriate strategy. In general approach, the national power is the product of tangible, intellectual and spiritual potential (Sułek, 2010, p. 98) & (Moczulski, 1999, p. 402–403):

$$NP = TP \times IP \times SP$$

Where:
NP – national power,
TP – tangible potential,
IP – intellectual potential,
SP – spiritual potential.

It can be also expressed as the product of national resources (potential), strategy and will to pursue national strategy by the political unit:

$$NP = R \times NS \times W$$

Where:
NP – national power,
R – resources,
NS – national strategy,
W – will to pursue of national strategy.

In both formulas, the tangible potential (resources) relates to presented synthetic concept of economic power (EP), military power (MP) and geopolitical power (GP). On the basis of these three sort of powers, it has been also estimated the level of power status (PS). Assuming, that the expression of the organizational and production ability or the collective action ability is the stream (flow) of the gross domestic product (GDP) in time. The economic power can be understood narrowly or broadly. In the narrow meaning of the main component of economic power is the value of GDP expressed in time, while in a broad sense, the expression of economic power are also demographic and spatial (territory) factors, which are an expression of the general power. In reflection, I took the view of a broad economic power, which part is the military power. Having regard to the above, the economic power can be expressed by the formula (where the exponent values were determined by the deductive method):

$$EP = (GDP)^{0.652} \times L^{0.217} \times a^{0.109}$$

Where:
EP – economic power (Sułek, 2001, pp. 87–97),
GDP – gross domestic product,
L – population,
a – area (territory).

Concept of military power (MP) formal (synthetic) model is based on economic power approach (EP) stressing the total character of state power, including military power. Assuming that the expression of organizational and production skills (ability to collective activity) is the stream of military expenditures (expressed in time unit), the military power can be expressed by the following formula (please note that the synthetic model takes into account the military power as conventional military power without nuclear factor, so the nuclear power factor has to be research separately):

$$MP = (MEX)^{0.625} \times S^{0.217} \times a^{0.109}$$

Where:
MP – military power,
MEX – military expenditures,
S – soldiers (active),
a – area (territory).

The concept of geopolitical power (GP) formal (synthetic) model is based on economic power (EP) and military power approach stressing the total character of state power, including economic power and military power. Geopolitical power is expressed by the following formula:

$$GP = \frac{EP + (2 \times MP)}{3}$$

Where:
GP – geopolitical power,
EP – economic power,
MP – military power.

This model has assumed that the power of the world is a whole and equals 1. The power of each state is therefore a fraction (share) of this size. To clarity of the presented results, the fractions can be multiplied by any number, e.g. if we multiply them by 100, we will get results in percent of the world's power (i.e. world=100%). It can be also multiplied by 1000 (then the power of the world=1000), and express it in the millimir (mM), where the basic unit of 1 mir as an expression of the world power ("mir" stands for "world" in the Russian language) means, the thousandths of the total world power. There are three types of militarization indicator: (1) economic militarization (m_e), (2) GDP militarization (m_{GDP}) and (3) demographic militarization (m_d). The militarization indicators are dimensionless quantities. The economic militarization indicator is the ratio of military power to economic power. The economic indicator can be also interpreted as an indicator of mobilization, because it

demonstrates how many part of the resources was allocated (mobilized) for military (defence) purposes. It can be also treated as an indicator of a defensive readiness:

$$m_e = \frac{MP}{EP} = \frac{MEX^{0.652} \times S^{0.217} \times a^{0.109}}{GDP^{0.652} \times L^{0.217} \times a^{0.109}}$$

After a mathematical simplification, the formula will take the form:

$$m_e = \left(\frac{MEX^{0.652}}{GDP^{0.652}}\right) \times \left(\frac{S^{0.217}}{L^{0.217}}\right)$$

It can be seen that the economic militarization indicator is the product of two partial indicators - GDP militarization and demographic militarization:

$$m_{GDP} = \frac{MEX^{0.652}}{GDP^{0.652}} \qquad m_d = \frac{S^{0.217}}{L^{0.217}}$$

The above indicators are important means of describing the security and defence policy of states. These indicators inform us about the type of military strategy of the states and about readiness to implement it. We can distinguish two extreme cases: first, when the indicator of the militarization of GDP is high, and the demographic militarization is - low and the second - the opposite. There are also a large number of intermediate situations.

As a polarity criterion to recognize every (global, regional and local) international system as a unipolar, bipolar or multipolar, I have adopted an algorithm of comparing the ratios of the largest powers of states in the ranking: the first with the second (P1/P2), the first with the third (P1/P3) etc. If P1>2×P2 - the system is unipolar with one pole - P1. If P1≤2×P2 – the system is bipolar with two poles - P1 and P2. If P1>2×P3 – the bipolar system is established. If P1≤2×P3 – the system is multipolar with three poles - P1, P2 and P3. The next poles of the system can be recognized in the same way. This concept of at least a two-fold advantage of the leader's power state over another ranking country comes from the theory of social cybernetics (Kossecki, 1981, p. 450).

The measurement of the economic, military and geopolitical power status (PS) is based on a concept of the synthetic measure of the economic power relative to a percentage of the global value calculated in Sułek formal model. It has been adopted the following economic, military and geopolitical PS categories designated on the measuring scale from 1 to 5 from the smallest to largest, where: 1 – local power (1.0-3.0%); 2 – regional power (3.0-7.0%); 3 – great power (7.0-12.0%); 4 – world power (12.0-18.0%) and 5 – superpower (>18.0%).

4. Results and discussion

4.1. The global balance of economic power

Taking under consideration the ranking of the economic power in 2018 it can be easy concluded that the global balance of economic power is the bipolar system with two global poles: China and the United States (U.S.) (Figure 1 & Table 1). The adopted polarity criterion is in bipolar system completed:

$$P1_{CHINA}=15.68\%/P2_{U.S.}=14.91\%=1.05\ (\leq 2.0);\ P1_{CHINA}=15.68\%/P3_{INDIA}=4.82\%=3.25\ (>2.0).$$

Similarly, in the case of the unipolar balance of economic power with the one pole of the United States in 1992, we obtain: $P1_{U.S.}=15.92\%/P2_{JAPAN}=6.86\%=2.32\ (>2.0)$.

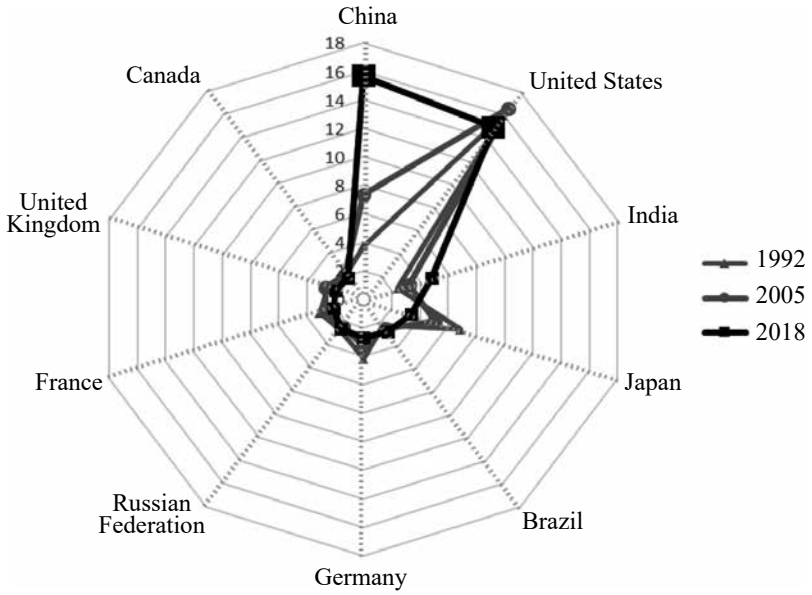

Figure 1. Bipolar balance of the economic power in 2018 relating to the unipolar systems in 1992 and 2005 (world=100%)

Source: Own elaboration.

China is the most winner of the transformation of the global economic system after the Cold War. China's massive growth of the economic power (+11.93%) has changed dominated by the United States unipolar system in 1992 into the bipolar economic system in 2018. At that period of time, the U.S. economic power dropped slightly (-1.01%). Such a dynamic growth of the economic power of China means further opportunities for the growth of its military power and geopolitical power (Figure 2 & Table 1).

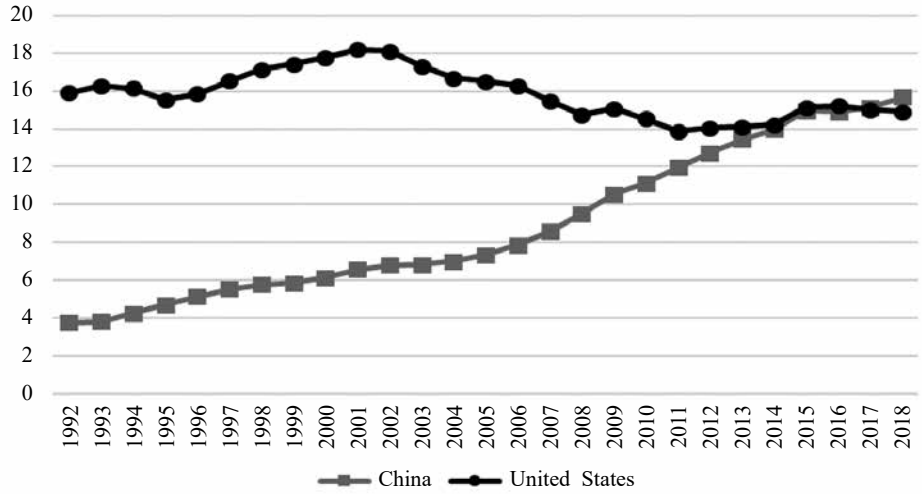

Figure 2. The economic power of China and the United States in 1992-2018 (world=100%)

Source: Own elaboration.

India has taken 3 rank with the high increase in 1992-2018 (+2.45%), but it does not appear as the future potential pole of the global economic system. For many researchers, it may be surprising that Japan is the biggest loser in the post-cold global economic system. Losses of Japan in the economic power value in 1992-2018 reach almost 50% (-3.47%). Russian Federation has maintained its status quo in this system on the 7th position with a slightly decrease (-0.09%). This means that Russia is in a deep economic recession from 1992. The old Western European states belong also to the main losers of the global economic system (Table 1).

Table 1. The economic power of the top 30 states in 2018 and its changes relating to 1992 (world=100%)

State	2018		1992		1992-2018	
	Rank	EP [%]	Rank	EP [%]	Change of Rank	Change of EP [%]
China	**1**	**15.679**	**4**	**3.748**	**+3**	**+11.930**
United States	**2**	**14.911**	**1**	**15.922**	**-1**	**-1.010**
India	3	4.818	9	2.426	+6	+2.393
Japan	4	3.391	2	6.857	-2	-3.466
Brazil	5	2.812	10	2.290	+5	+0.523
Germany	6	2.671	3	4.174	-3	-1.503
Russian Federation	7	2.582	7	2.676	0	-0.094
France	8	2.113	5	3.123	-3	-1.010
United Kingdom	9	1.951	8	2.541	-1	-0.590
Canada	10	1.841	11	2.065	+1	-0.224
Indonesia	11	1.716	17	0.961	+6	+0.754
Mexico	12	1.631	13	1.618	+1	+0.013
Italy	13	1.596	6	2.779	-7	-1.183
Australia	14	1.477	14	1.234	0	+0.243
Spain	15	1.253	12	1.679	-3	-0.426
Korea, Rep.	16	1.164	16	0.981	0	+0.183
Turkey	17	0.990	18	0.773	+1	+0.217
Saudi Arabia	18	0.925	22	0.610	+4	+0.315
Nigeria	19	0.793	30	0.409	+11	+0.384
Argentina	20	0.771	15	1.010	-5	-0.239
Thailand	21	0.695	23	0.593	+2	+0.103
Pakistan	22	0.678	29	0.418	+7	+0.260
Poland	23	0.636	26	0.460	+3	+0.176
South Africa	24	0.598	21	0.675	-3	-0.077
Netherlands	25	0.562	19	0.712	-6	-0.150
Philippines	26	0.546	34	0.353	+8	+0.193
Colombia	27	0.533	31	0.378	+4	+0.155
Egypt, Arab Rep.	28	0.511	36	0.338	+8	+0.174
Bangladesh	29	0.483	42	0.258	+13	+0.225
Sweden	30	0.473	20	0.700	-10	-0.226

Legend: China and The United States – the pole-states

Source: Own elaboration on the basis of Sułek formal model and data from: The World Bank. Retrived September 05, 2019, from https://data.worldbank.org

In order to answer the question about the main factors of changes in the global economic system, the dynamics of the economic power factors in period of 1992-2018 has been researched. The land area (territory) it can be assumed as a constant (China – 7.37%; U.S.– 7.18%), so let's take into account the other economic power's factors, i.e. GDP and population (L). The GDP factor is the most important (with the greatest weight) in the Sułek formal model. The China's GDP grew in the researched period +14.18% with the U.S. decline of -1.76% (world=100%). This is the main factor of the China's pole success in economic power, while the population index of both China and the U.S. is declining (China -3.02% and U.S. -0.39%). Analogical, the main reason for the fall of the economic power of Japan is a drastic decrease of GDP factor (-9.58%) with a decline in the population factor (-0.61%). Taking under consideration the dynamic of economic power status, it can be concluded, that there is no a superpower state in the bipolar economic system. The two pole-states – China and the United States has taken the level of world power (WP). Three states – India and Japan have positioned regional power

(RP), and the others – Brazil, Germany, Russian Federation, France, United Kingdom and Canada only – local power (LP). This means the increasing position of power status of China (two positions) and India (one position). Germany has lost one position from regional economic power to local power. The other states basically maintained their positions from 1992. Noteworthy is the only local economic power status of the 'old' European countries (Germany, France and the United Kingdom) and the Russian Federation.

4.2. The global balance of military power

In 2018, the global balance of military power is still unipolar system with the United States on the top, but the China has been growing up military ca. 83% since 1992 (Figure 3 &Table 3). The adopted polarity criterion is in unipolar system completed: $P1_{U.S.}$=22.62%/$P2_{CHINA}$=10.33%=2.19 (>2.0). Similarly, in the case of the military unipolar system with the one pole of the United States in 1992, we obtain: $P1_{U.S.}$=19.62%/$P2_{RUS}$ =6.93%=2.83 (>2.0).

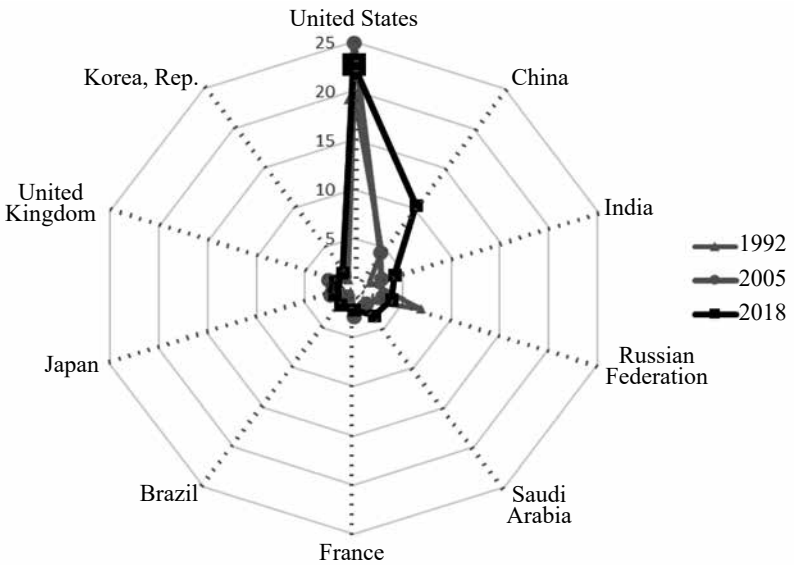

Figure 3. Unipolar balance of the military power in 2018 relating to the unipolar systems in 1992 and 2005 (world=100%)

Source: Own elaboration

Among the top 30 states in ranking of the military power in 2018, China has done the biggest progress of the dynamic (+5.73%) related to the United States (+2.99) in 1992-2018 (Figure 4 & Table 3).

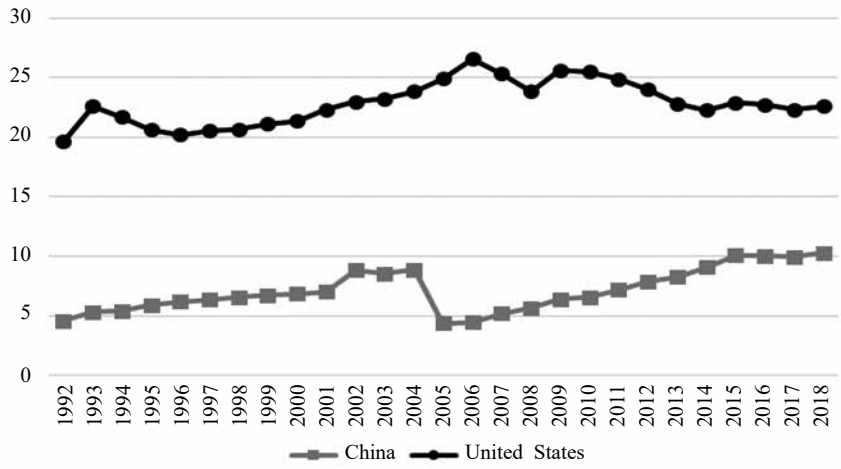

Figure 4. The military power of China and the United States in 1992-2018 (world=100%)

Source: Own elaboration

With a high growth rate of the Chinese military expenditures (MEX) (+7.37%), significant growth dynamics of the economic power (+11.93%), increasing of the MEX of the United States (9.07%) and India (2.56%) and decreasing of the MEX of the Russian Federation (-2.11%) in 1992-2018, China is undoubtedly the potentially second pole of the military international system in the coming decade. The above changes on a military 'chess-board' have positively influenced the position of India by four places from 7 to 3. However, it is difficult to treat India as the potential third pole of the military system. In addition to India, the Saudi Arabia and Brazil have also advanced in the system. Outside of Russia, the biggest losers in the military system are the states of Western Europe (Germany, France, United Kingdom and Italy). This is not a good forecast for the military role of the European Union in the global security system (Table 3).

Table 3. The military power of the top 30 states in 2018 and its changes relating to 1992 (world=100%)

State	2018		1992		1992-2018	
	Rank	MP [%]	Rank	MP [%]	Change of Rank	Change of MP [%]
United States	**1**	**22.618**	**1**	**19.622**	**0**	**+2.996**
China	2	10.326	3	4.592	+1	+5.733
India	3	4.218	7	1.651	+4	+2.567
Russian Federation	4	3.910	2	6.928	-2	-3.018
Saudi Arabia	5	3.445	9	1.553	+4	+1.892
France	6	2.175	4	2.177	-2	-0.002
Brazil	7	2.139	20	0.499	+13	+1.640
Japan	8	2.004	8	1.557	0	+0.447
United Kingdom	9	1.918	6	1.767	-3	+0.151
Korea, Rep.	10	1.880	12	0.947	+2	+0.933
Germany	11	1.822	5	1.921	-6	-0.099
Iran, Islamic Rep.	12	1.564	19	0.534	+7	+1.030
Australia	13	1.401	16	0.676	+3	+0.725
Italy	14	1.189	10	1.196	-4	-0.007
Canada	15	1.152	11	1.057	-4	+0.095
Pakistan	16	1.051	14	0.695	-2	+0.356
Colombia	17	0.888	38	0.271	+21	+0.617
Spain	18	0.843	18	0.586	0	+0.257
Iraq	19	0.790	N/A	N/A	N/A	N/A

Indonesia	20	0.784	21	0.476	1	+0.308
Algeria	21	0.774	50	0.185	+29	+0.589
Israel	22	0.738	26	0.414	4	+0.324
Turkey	23	0.733	13	0.713	-10	+0.020
United Arab Emirates	24	0.679	28	0.382	4	+0.297
Poland	25	0.640	25	0.431	0	+0.209
Thailand	26	0.620	27	0.406	1	+0.214
Mexico	27	0.587	39	0.266	+12	+0.321
Taiwan	28	0.545	N/A	N/A	N/A	N/A
Vietnam	29	0.514	22	0.460	-7	+0.055
Sudan	30	0.506	57	0.158	+27	+0.348

Legend: N/A – no data available for formula calculation; The United States – the pole-state

Source: Own elaboration on the basis of Sułek formal model and data from:
The World Bank (2019) and The Military Balance (2019).

There is the only one superpower (SP) in the unipolar military global system - the United States, holding this position since 1992. The second pole – China, has been promoted from regional power (RP) to great power (GP). India and Saudi Arabia have been promoted from local power (LP) to regional power (RP). The Russian Federation has maintained its position of regional power (RP). Brazil, Japan, France, the United Kingdom and Korea Republic have maintained the only position of local military power (LP), as well as Germany, but first time outside the top 10 states since 1992 (rank 11).

4.3. The global balance of geopolitical power

A geopolitical power expresses a kind of balance between economic power and military power in the formal model. In the period of 1992-2018 this system has been changed from a unipolar (one geopolitical pole - the United States) to a bipolar (two geopolitical poles - the United States and China) (Figure 5).

The adopted polarity criterion in bipolar geopolitical system is completed: $P1_{U.S.}$=20.049%/$P2_{CHINA}$=12.110%=1.66 (≤2.0); $P1_{U.S.}$=20.049%/$P3_{INDIA}$=4.418%=4.54 (>2.0).

Similarly, in the case of the geopolitical unipolar system with the one pole of the United States in 1992, we obtain: $P1_{U.S.}$=18.389%/$P2_{RUS}$ =4.311%=4.27 (>2.0).

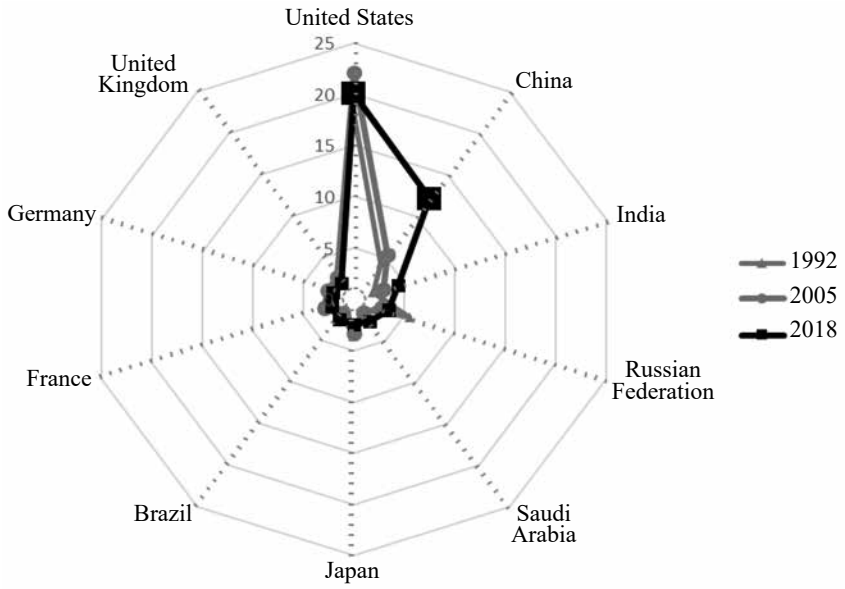

Figure 5. Bipolar balance of the geopolitical power in 2018 relating to the unipolar systems in 1992 and 2005 (world=100%)

Source: Own elaboration

China is the most winner of the transformation of the international geopolitical system after the Cold War. China's massive growth of the economic power (+11.93%) and increase of the military power (+5.73%) has changed dominated by the United States unipolar geopolitical system in 1992 into the bipolar geopolitical system in 2018. At that period of time, the China's geopolitical power has increased +7.799%, while the U.S. geopolitical power has increased slightly (+1.661%) (Figure 6 & Table 5).

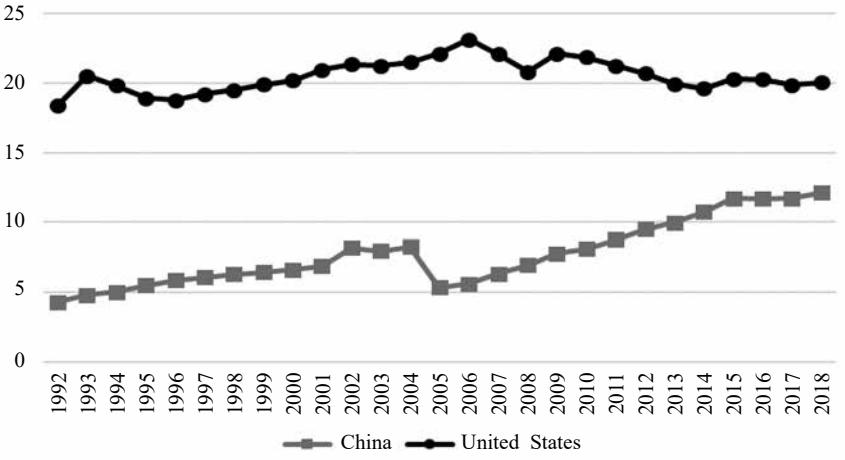

Figure 6. The geopolitical power of China and the United States in 1992-2018 (world=100%)

Source: Own elaboration

Table 5. The geopolitical power of the top 30 states in 2018 and its changes relating to 1992 (world=100%)

State	2018		1992		1992-2018	
	Rank	GP [%]	Rank	GP [%]	Change of Rank	Change of GP [%]
United States	**1**	**20.049**	**1**	**18.389**	**0**	**+1.661**
China	**2**	**12.110**	**3**	**4.311**	**+1**	**+7.799**
India	3	4.418	8	1.909	5	+2.509
Russian Federation	4	3.468	2	5.511	-2	-2.043
Saudi Arabia	5	2.605	11	1.239	+6	+1.366
Japan	6	2.466	4	3.324	-2	-0.858
Brazil	7	2.363	12	1.096	+5	+1.267
France	8	2.155	6	2.493	-2	-0.338
Germany	9	2.105	5	2.672	-4	-0.567
United Kingdom	10	1.929	7	2.025	-3	-0.096
Korea, Rep.	11	1.641	14	0.958	+3	+0.683
Australia	12	1.427	16	0.862	+4	+0.564
Canada	13	1.382	10	1.393	-3	-0.011
Italy	14	1.325	9	1.724	-5	-0.399
Iran, Islamic Rep.	15	1.297	29	0.356	+14	+0.941
Indonesia	16	1.094	19	0.638	+3	+0.457
Spain	17	0.980	15	0.950	-2	+0.029
Mexico	18	0.935	18	0.717	0	+0.218
Pakistan	19	0.927	20	0.603	+1	+0.324
Turkey	20	0.819	17	0.733	-3	+0.085
Colombia	21	0.770	35	0.307	+14	+0.463
Iraq	22	0.645	N/A	N/A	N/A	N/A
Thailand	23	0.645	26	0.468	+3	+0.177
Algeria	24	0.642	44	0.238	+20	+0.404
Poland	25	0.639	27	0.441	+2	+0.198
Israel	26	0.578	32	0.340	+6	+0.237
United Arab Emirates	27	0.559	36	0.303	+9	+0.257
Argentina	28	0.523	23	0.530	-5	-0.007
Vietnam	29	0.490	30	0.347	+1	+0.143
Netherlands	30	0.453	24	0.481	-6	-0.028

Legend: N/A – no data available for formula calculation; The United States and China – the pole-states

Source: Own elaboration on the basis of Sułek formal model and data from: The World Bank (2019) and The Military Balance (2019)

There is the only one superpower (SP) in the bipolar geopolitical global system in 2018 - the United States, holding this position since 1992. The second pole – China, has been promoted from regional power (RP) to world power (WP). India has been also promoted from local power (LP) to regional power (RP). The Russian Federation has lost its position of regional power (RP) in 1992 and great power (GP) in 1993-1995 to regional power (RP) in 2018. Japan has also lost its position of regional power (RP) to local power (LP). Germany, France, the United Kingdom, Brazil and Saudi Arabia maintained the only position of local geopolitical power (LP).

4.4. The militarization and global balance of power

The nature of pole structure of the international system is also reflected by the militarization indicators, i.e. economic militarization, GDP militarization and demographic militarization (Table 7).

The research clearly shows that the biggest winner of changes in the international system after the Cold War relating to economic power, military power and geopolitical power is China. It was possible primarily due to the highest increase of China's economic, military and geopolitical power, with the rather stable dynamic of U.S. power (Figure 7).

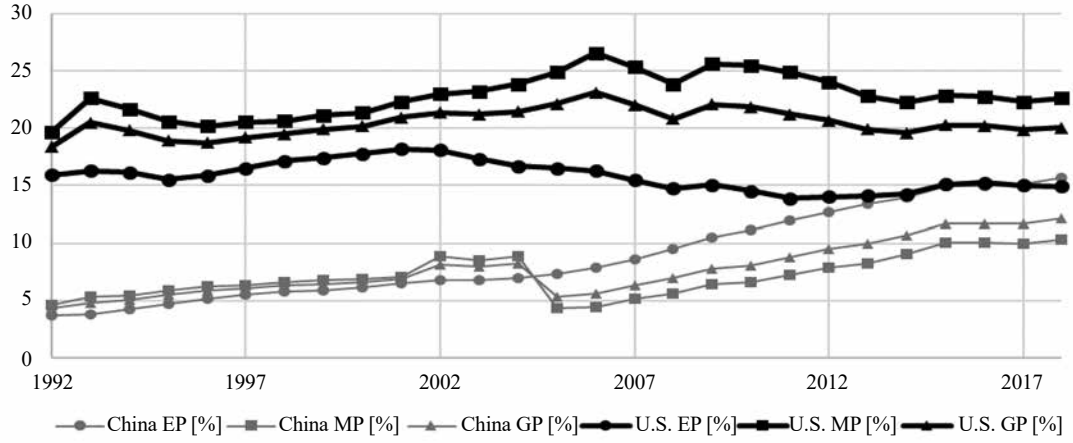

Figure 7. The The dynamic of economic power, military power and geopolitical power of the United States and China in 1992-2018

Source: Own elaboration on the basis of Sułek formal model and data from: The World Bank (2019 and The Military Balance (2019)

This conservative attitude of the United States in the dynamic of power in 1992-2018 may indicate the saturation of the American economy and the lack of significant reserves of its development in relation to China's capabilities. America is a much more economic militarized state than China. The U.S. economic militarization rate (m_e=MP/EP) is almost double highest of China, with a value of China below the level of the world (1.0) (Table 7). China, as a state with the highest level of the economic power in 2018 and the highest dynamic of power after the Cold War, it can be also seen as the future second pole-state in the military international system. It is enough for China to significantly increase military expenditures (probably higher than official data), which is possible by the huge economic power. The China's level of military spending is currently not high in relation to economic capabilities. The development of China's military power is currently focused on increasing the power of naval forces in the South China Sea region (estimated by American high diplomats as "increasingly provocative"). The China's global military aspirations are currently based on the nuclear deterrence (China is developing a strategic bomber to be launched in 2025). Meeting this rivalry with China requires considerable economic and military involvement of the United States, which is not easy due to the considerable economic and military saturation.

Table 7. The ranking of militarization of top 30 states in 2018

Rank	Economic Militarization		Rank	GDP Militarization		Rank	Demographic Militarization	
	State	m_e		State	m_{GDP}		State	m_d
1	Oman	4.122	1	Mongolia	4.217	1	Korea, Dem. People's Rep.	1.904
2	Saudi Arabia	3.725	2	Angola	4.181	2	Israel	1.545
3	Sudan	3.541	3	Vietnam	3.964	3	South Sudan	1.503
4	Afghanistan	3.455	4	Turkmenistan	3.322	4	Brunei Darussalam	1.492
5	Uzbekistan	3.449	5	Bulgaria	3.181	5	Armenia	1.471
6	Israel	2.868	6	Oman	3.077	6	Greece	1.426
7	Iraq	2.222	7	Mozambique	3.014	7	Singapore	1.419
8	United Arab Emirates	2.114	8	Armenia	2.997	8	Cyprus	1.411

Rank	Economic Militarization		Rank	GDP Militarization		Rank	Demographic Militarization	
	State	m_e		State	m_{GDP}		State	m_d
9	Jordan	2.109	9	Jordan	2.909	9	Korea, Rep.	1.399
10	Iran, Islamic Rep.	2.050	10	Tajikistan	2.839	10	Sri Lanka	1.390
11	Algeria	2.048	11	Saudi Arabia	2.834	11	Djibouti	1.354
12	Lebanon	2.002	12	Yemen, Rep.	2.825	12	Jordan	1.346
13	Cambodia	1.984	13	Kuwait	2.812	13	Oman	1.309
14	Singapore	1.893	14	Belarus	2.669	14	Lebanon	1.304
15	Brunei Darussalam	1.853	15	Nicaragua	2.584	15	Syrian Arab Republic	1.286
16	Bahrain	1.833	16	Georgia	2.551	16	Cambodia	1.266
17	Azerbaijan	1.786	17	Russian Federation	2.476	17	Myanmar	1.263
18	Colombia	1.665	18	Egypt, Arab Rep.	2.395	18	Lithuania	1.249
19	Trinidad and Tobago	1.622	19	Tanzania	2.346	19	Azerbaijan	1.232
20	Korea, Rep.	1.615	20	United Arab Emirates	2.327	20	Saudi Arabia	1.232
21	Morocco	1.584	21	Ethiopia	2.306	21	United Arab Emirates	1.224
22	Myanmar	1.581	22	Sudan	2.274	22	Iran, Islamic Rep.	1.218
23	Greece	1.568	23	Pakistan	2.098	23	Turkmenistan	1.215
24	Pakistan	1.550	24	Brunei Darussalam	1.996	24	Russian Federation	1.211
25	**United States**	**1.517**	25	Kazakhstan	1.943	25	Qatar	1.206
26	Russian Federation	1.514	26	Ukraine	1.922	26	Uruguay	1.205
27	Namibia	1.514	27	Cuba	1.904	27	Colombia	1.197
28	Botswana	1.483	28	Albania	1.818	28	Georgia	1.185
29	Mauritania	1.413	29	Uganda	1.800	29	Morocco	1.176
30	Sri Lanka	1.397	30	Israel	1.798	30	Dominican Republic	1.168
(…)	(…)	(…)	(…)	(…)	(…)	(…)	(…)	(…)
31	Ukraine	1.343	31	**China**	**1.790**	45	**United States**	**1.109**
56	India	0.875	37	**United States**	**1.432**	122	**China**	**0.884**
97	**China**	**0.659**	47	India	1.139	134	India	0.826
	World	1.000		World	1.000		World	1.000

Source: Own elaboration on the basis of Sułek formal model and data from:
The World Bank (2019) and The Military Balance (2019).

5. Conclusions

The research on the first scientific problem of the structure (nature) of the international system after the Cold War leads to the following conclusions: (1) There is no one "universal" concept of the international system, so it requires a vector approach in studying of its nature; (2) A powermetric approach based on measurement of three categories of power of state leads to three types of the international system: (a) bipolar economic international system with China and the United States as the two pole-states; (b) unipolar military international system with the United States as the only one pole-state; (c) bipolar geopolitical international system with the United States and China as the two pole-states; (3) The other states of these systems are in the orbit of influence of the pole-states. This study is based on the sources data from 2018, but this trend should continue in the coming years. China should maintain its position of an economic leader and strengthen its position as a military power (competing with the U.S. for a second pole-state position) and geopolitical power (reducing the distance to the U.S.).

The dynamic research diagnoses the main determinants of the balance of power in the international system (the second and third scientific problem). There was a dynamic increase in the economic, military and geopolitical power of China with the relative stagnation of US development in period of 1992-2018. The main determinants of these changes is the dynamic growth of China's GDP and increasing military expenditures. The Russian Federation is the only a local economic power with a downward trend and a regional military power. In total, this places Russia at the level of a regional geopolitical power with the unreal ambitions of a superpower. India's third power in the rankings is significant but without real chances for the position of a polar-state. Japan and Western European countries are the main losers of the international system.

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