THE INTERNATIONAL BALANCE OF POWER IN THE YEAR 2050 (SECURITY IMPLICATIONS)

Piotr KŁOS
Robert KOBRYŃSKI
National Defence University, Poland

Abstract
The project aims at applying qualitative and quantitative methods to create a model of the international balance of power in 2050. This allows to create more accurate forecasts of future security environment development and its implications. For the purpose, the authors use a computational model developed by Professor Mirosław Sulek, the Polish pioneer of powermetrics research. Fundamentals of the interdisciplinary model can be found in international relations theories, security studies methods, cybernetics and physics. The authors are directly involved in developing this field of research and their intention is to share initial results of their work.

Key words: Powermetrics, International Balance of Power, Power, Sulek’s Model

“Ultimately, only with power can the objectives internal and foreign policy be achieve
Nicholas Spykman

“When a country is growing in strength, the temptation to increase control over the environment rises. It will try to make the expansion in political, economic and territorial domains, and change the international system in accordance with its particular interests “
Robert Gilipin
Introduction

Recently, the end or collapse of western civilization became a popular slogan in the analyses of international relations. Also many statements putting a question mark on the position of the United States nowadays and in the future can be heard. China is widely claimed to be the one to replace the weakening US as a leader. In 2008 Fareed Zakaria published *The end of US hegemony*. In the same year Kegan’s *The Return of History and the End of Dreams* and Andrew Bacewich’s *The Limits of Power: The End of American Exceptionalism* were also published to stress those claims. A year earlier R. Meredith wrote *The Elephant and the Dragon: The Rise of India and China and What it Means for All of Us*. Also, our distinguished scientist B. Góralczyk published the widely discussed in Polish Academic circles *The Awakened Dragon: China’s Position on the World Stage*. Of course, there are more books dedicated to this phenomenon, with thousands of scientific articles and journalists using the above rhetoric every day.

Indeed, we do deal with profound changes in current international system. These changes didn’t appear suddenly, symptoms had been apparent before. In a book published in the nineties, *The Rise and Fall of the Great Powers* by P. Keneddy, we can also find a chapter called “The United States: The Problem of Number One in Relative Decline”. The conclusion is simple: changes which we are currently observing and which are crucial to the future of the international order, have only recently intensified and accelerated. And this is due not only to the financial crisis started in 2008, but also the weakening demographics of the countries of the Old Continent, as well as the absence of effective policies of the West towards the rising powers. And as correctly observed by Zakaria “global changes taking place are not caused by the decline of America, but are the result of the growth of “the rest of the world”1. The changes in the international system contribute mainly to the balance of power. As R. Aron rightly put it, “the balance of power is the most important feature of any international system”2.

Having all the above in consideration, the authors undertook the effort to explore the international balance of power in 2050 via not only qualitative, but also

---

quantitative methods. In this way, by using a specific, innovative methodology and tools, it was possible to answer the question about how the future world order will look like, what will the distribution of power in that international system be, and what are the security implications of such alignment.

What is the International Balance Of Power?

The balance of power is differently called arrangement of powers, or the relationship of powers. It is an important part of the international system and at the same time a very important object in international relations. “The main reason is that after taking into account the nature of the interest manifested in the international arena in terms of compliance/ conflict, the balance of power determines the strategy (policy) of countries aimed at security and development”\(^3\). The balance of power is constantly changing, is associated with increasing or decreasing the power of the individual entities, which then results in the policy of this entity and influence the international order.

The category of power is essential in the study of international relations. The term ‘power’ has many equivalents in other languages. In English, ‘power’ means the power in many ways or ability. Similar here is the term “might”. Latin “potestas” means strength, power, ability. In German we say about the power of the “Macht” or in French “puissance”\(^4\).

International policy – like any policy – is a battle for power\(^5\). “Each political entity, each participant of international relations strives for the survival and development. This applies in the same degree, not only to each state, regardless of its size, but also to all sorts of alliances, regional organizations, international and even terrorist organizations like Al-Qaeda. Therefore, despite the fact that the various aims that the international participants want to achieve, this direct (not


to say the most important) is power\textsuperscript{6}. More specifically growth of power, which always takes place at the expense of other actors of the international system.

What exactly does the word power mean? In the Polish language dictionary we found, among others, the following definitions: “The strength and effectiveness of the operation or impact on something”, “advantage in some area, usually political, economic or military”\textsuperscript{7}. The first example is in line with the thinking of the eminent social thinker of the second half of the twentieth century - R. Aron, who defines power as follows: “power is the ability to deal with, the creation or destruction. (...). Power in the international arena gives a political entity the ability to impose its will on another political entities. In short, political power is nothing absolute, but the relationship between human beings”\textsuperscript{8}. G. Stoessinger cites the following definition of power as “the ability of the state to use its tangible and intangible resources in a way that will affect the behavior of other states”\textsuperscript{9}. B. Russell states that “power can be defined as achieving the desired effects. It is therefore a quantitative approach: if the two people pursuing similar purpose, only one of them achieves this goal means that it has greater power than the second”\textsuperscript{10}. In one of the recent work published on the National Defense University on the understanding of power and how it is calculated, the authors propose the following definition: “power is the ability to conduct a deliberate action in the international system, with the potential to obtain funding, the result of which is the realization of the objectives”\textsuperscript{11}.

The power of the state indicates the place of the political entity in the hierarchy of participants in the international relations\textsuperscript{12}. For this reason, countries are trying to increase their potential geopolitical, because “international policy is necessarily

\textsuperscript{6} Ibidem, p. 47.
\textsuperscript{10} B. Russel, The Forms of Power, (w:) Power (ed.by S. Lukes), New York 1992, s. 19, cyt. w: M. Sulek, Podstawy potęgonomii i potęgometrii, op.cit., p. 34.
\textsuperscript{11} Z. Lach, J. Skrzyp, A. Łaszczuk, Potęga państw współczesnego świata w ujęciu geopolitycznym II.1.5.1.0, Akademia Obrony Narodowej, Warsaw 2011, p. 35.
\textsuperscript{12} Ibidem, p. 37.
international power policy”13. History has shown that the struggle for power was an integral part of the development of humanity and its organizational entities, such as states, and despite the fact that countries often stated the end of this policy14, the approach of ‘realpolitik’ will continue.

“Political units are competing for political power - synthetically in the world, it is always 100% true - rivalry boils down to seek an appropriate share of that total”15. The concept of power, generally associated with international relations, is relative. This means that the size of the power can be measured by comparing it with other powers16. There are for instance cases, that the political entity has so much power in comparison with others, that we can then talk about their absolute power. Similar observations can be found in R. Gilipin’s works, which state that “if the essence of international relations is power, power is the essence of relativity”17. Therefore, a power entity in the international arena is growing only by reducing the power of the other. This means that the scope of the available global power is constant, and the state in order to survive, will be always acting towards increasing or maintaining their own power. So repeating the thought of H. Morgenthau - the states are always struggling for power18.

The power balance is the result of many factors, to begin with historical processes that shaped the status quo through long periods of time and in a short time cannot be changed. It is not a constant condition however, but one under slow changes. This is related to the change in the number of participants in international relations, the change of the relationship between the units and the shifts of power of political units19. The biggest impact on changing the balance of power are the shifts of “centers of power”20. As rightly pointed by R. Kagan “engender it throughout

---

15 M. Sulek, Metodyka analizy geopolitycznej (na przykładzie potęgometrii), www.geopolityka.net (04.03.2013 r.).
16 M. Sulek, O potęgonomii i potęgometrii, www.geopolityka.net (05.03.2013).
20 Autor is considering big players disposing of important power.
history so much tension, and even caused a great war”21. This view is confirmed by a political scientist R. Gilipin, who states that a significant increase in power means that there is a temptation to increase control over the environment. “The state will try to make the expansion in political, economic and territorial domains, and change the international system in accordance with its particular interests”22. Variability is a fundamental feature of the international order. “No stillness, no stability, no status quo, but change is a fundamental feature of social life. Each order, protecting the status quo is based on it, contains a dynamic, tendency to variation, and this tendency wins”23.

The balance of power can be considered at three levels: globally, regionally and locally. The international balance of power (IBP) allows to determine the state of international relations. The system may have structural or behavioral characteristics. The first is that the centers of power have a specific distribution in time and space, the second means that the participants in the system behave according to their interests and their place in the balance of power.

**Methods of Measuring and Estimating IBP**

“[…] If we understand what the real balance of forces in the world, it will be a great achievement, because we avoid in this way the necessity of making pointless activities”

E. Todd,

The decline of the empire. Considerations about the disintegration of the U.S. system.

**General characteristic**

Estimating the international balance of power, understood as a “relationship of forces” is performed by measuring the power of the entities forming the specific

22 R. Gilipin, op.cit., pp. 94-95.
alignment of forces. Science dealing with the study of the power of political units is powernomics. It explores, among others, the essence of power, its manifestations, profiles, classify political units regarding power. This is an auxiliary science of international relations and geopolitics. Modeling and measuring power is called powermetrics. In this paper, the authors present the international balance of power in a synthetic way. Such an approach allows mainly to extract the most important features of power as:

- polarization (the number of polar powers),
- concentration (the share of the division of powers, the power of the state),
- stability,
- escalation.

It should also be noted that the forecast is not intended to accurately reflect future events. Forecast is merely auxiliary, which only determines the future changes that may be made in the international balance of power.

**Used methods**

In forecasting the international balance of power in 2050 authors use a computational model developed by M. Sulek, Polish professor at the University of Warsaw. His original model to calculate the power of political units was presented by him in several publications. Fundamentals of the model can be found in cybernetics and physics, but it also integrates newest IR and security studies theories. According to the author, the assessments of the political power should affect only “that which is inextricably linked to the existence and functioning, i.e. people working in a given area during a specified period, representing the specific skills of organizational and production.”

---

24 M. Sulek, *O potęgonomii i potęgometrii*, www.geopolityka.net, (02.03.2013 r.).
26 There are: *Podstawy potęgonomii i potęgometrii*, Kielce 2001; *Prognozowanie i symulacje międzynarodowe*, Warsaw 2011.
Political unit as any energy in a processing system, has several types of power: total, idle, availability, operating, assurance (as the sum of idle capacity and operating power) and coordination power that are explained beneath\(^\text{28}\).

<table>
<thead>
<tr>
<th>TOTAL POWER</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IDLE POWER</td>
<td>TOTAL</td>
<td>POWER</td>
</tr>
<tr>
<td>OPERATING POWER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASSURANCE POWER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COORDINATION POWER</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


**Graphic 1. Kinds of power**

The maximum permissible power, which each system is able to process is called total power. Idle power, which is part of the total power is used to cover any loss of energy. We are saying about the operating power when are dealing with the collection of energy from the environment and the associated difficulties. The cumulative idle power and operating power give the assurance power - it is a power that the system must collect in order to exist. The difference between the total power and the idle power is the operating power. „With the total power, after deduction of assurance power to cover the idle power and operating power remains some excess of power, which is the coordination power”\(^\text{29}\).

In the model of Sulek, availability power is called the total power, and the coordinating power is the military power. Availability power for a political entity is as follows:

\[
P_d = D^{0.652} \cdot L^{0.217} \cdot p^{0.109}
\]

The formula for the coordination power is presented as follows:

\[
P_m = W^{0.652} \cdot S^{0.217} \cdot p^{0.109}
\]

where:

Pd - total power;
Pm - military power using the number of soldiers on active duty;
D - gross domestic product;

\(^{28}\) Ibidem, p. 143.

\(^{29}\) M. Sulek, *Metody i techniki badań stosunków międzynarodowych*, op.cit., p. 106.
L - population;
p – surface (the area of the territory);
S - number of soldiers;
W - military spending.

Each of the components of power represents an important power-creative factor:
• gross domestic product represents the economic factor;
• population represents a demographic factor;
• the surface represents the geographical factor;
• the number of soldiers and military spending represent the military factor.

Presentation of Results

The international balance of power is created by all states. However, as shown by the realities of international politics in the contemporary geopolitical situation affects only narrow group of entities. This is due to the fact that most countries in the world have insufficient power to be able to have an active influence on the global balance of power, they are objects rather than actors in the scene. For the purpose of the article, the authors took into account the 10 greatest powers in 2012 (2013 data was not yet available). Group of countries studied was formed by: the United States, China, Japan, India, Brazil, Russia, Germany, France, Canada and the United Kingdom.

In the mentioned analysis results are available from the power of all the countries in the world for the years 2000 to 2012. The program also uses the Sulek’s model. The international balance of power for each year are presented in Table no. 1.

---

30 M. Sulek, Prognozowanie i symulacje międzynarodowe, op. cit., p. 144.
31 Ibidem, p. 144.
33 Downloading from „Powers of States” programme which is available: http://www.geopolityka.org/potegi-panstw.
The most important column in the table is the last (mM). It presents the distribution of power in the system between the main players. The power of the world is equal to 1000 miliMir units. As you can see the United States has the largest share in the power of the world - 14.1%. The second power proved to be China with 12.7% share in the power of the world. Could be stated that we are dealing with a bipolar system, but not quite. Well, the power structure of the U.S. and China is different. In the United States we can talk about the demographic, economic and spatial dimension of power. In the case of China’s large population contributes to the creation of a large GDP. This does not change the fact that in the case of GDP per capita, the state is still far in the rankings. Also in the case of the U.S., in the military dimension they remain the undisputed leader. Military expenditure levels translate into high spending per soldier. This is reflected in the quality of equipment and weaponry that create the US the major military power in the world nowadays, with grave security implications.

M. Sulek adopted the following criteria for the classification of powers:

- Superpower - more than 18% of world power
- A world power - 12-18%
- Great power - 7-12%
- Regional power - 3-7%
- Local power - 1-3%.


**Table 1. The international balance of power in 2012**

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP at constant prices of 2000</th>
<th>Population in millions</th>
<th>Surface in thousand s km²</th>
<th>partial results</th>
<th>Country’s Pd</th>
<th>World’s Pd</th>
<th>Total Pd</th>
<th>mM</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORLD</td>
<td>71630</td>
<td>709618</td>
<td>50932.15</td>
<td>335364.172</td>
<td>1</td>
<td>1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>15680</td>
<td>316698</td>
<td>9826.27</td>
<td>516130288</td>
<td>0.1419</td>
<td>141.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>82287</td>
<td>1349586</td>
<td>9596.09</td>
<td>4623251296</td>
<td>0.1277</td>
<td>127.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>59644</td>
<td>127253</td>
<td>3779.11</td>
<td>15814227</td>
<td>0.0435</td>
<td>43.486</td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>1625</td>
<td>1202</td>
<td>3267.26</td>
<td>1515205512</td>
<td>0.0417</td>
<td>41.669</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>2396</td>
<td>20191</td>
<td>8514.88</td>
<td>1352206112</td>
<td>0.0372</td>
<td>37.198</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>2022</td>
<td>142.15</td>
<td>17098.24</td>
<td>1210965777</td>
<td>0.0333</td>
<td>33.259</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>3401</td>
<td>81147</td>
<td>367.02</td>
<td>99160062</td>
<td>0.0273</td>
<td>27.266</td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>2698</td>
<td>65952</td>
<td>643.8</td>
<td>845971152</td>
<td>0.0233</td>
<td>23.262</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>1819</td>
<td>34568</td>
<td>9984.67</td>
<td>787104864</td>
<td>0.0216</td>
<td>21.643</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2444</td>
<td>63396</td>
<td>243.61</td>
<td>723918484</td>
<td>0.0199</td>
<td>19.906</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When the classification of powers according to the above adopted criteria can be seen that we can finds that in 2012 there was no superpower. U.S. and China can be classified as world powers. Japan, India, Brazil and Russia can be classified as regional powers, while Germany, France, Canada and the UK to local powers.

Output data

To create reliable models, the data quality must be assured. Therefore, GDP data were taken from the HSBC report. The experts of the institution presented the 100 largest economies in the world for the year 2050. According to the report, China’s economy will be larger than the U.S. by more than $3 trillion dollars. The sum of the two economies will constitute about 36% of global GDP. The third-largest economy will be India, three times smaller than China’s. The Japanese economy will be accounted for only 25% of the Chinese economy. The most pessimistic forecasts is for Russia, whose economy is reaching the minimum size of more than 1.8 trillion dollars. It is worth noting a large gap between China and the United States and other countries. Well, the size of the economies of the positions 3-10 will be only 66% of the size of China’s economy and the U.S. 60% of global GDP will be produced by the 10 analyzed countries.

<table>
<thead>
<tr>
<th>No.</th>
<th>Country</th>
<th>GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>World</td>
<td>132163</td>
</tr>
<tr>
<td>1.</td>
<td>USA</td>
<td>22700</td>
</tr>
<tr>
<td>2.</td>
<td>China</td>
<td>25334</td>
</tr>
<tr>
<td>3.</td>
<td>Japan</td>
<td>6429</td>
</tr>
<tr>
<td>4.</td>
<td>India</td>
<td>8165</td>
</tr>
<tr>
<td>5.</td>
<td>Brazil</td>
<td>2960</td>
</tr>
<tr>
<td>6.</td>
<td>Russia</td>
<td>1878</td>
</tr>
<tr>
<td>7.</td>
<td>Germany</td>
<td>3714</td>
</tr>
<tr>
<td>8.</td>
<td>France</td>
<td>2750</td>
</tr>
<tr>
<td>9.</td>
<td>Canada</td>
<td>2287</td>
</tr>
<tr>
<td>10.</td>
<td>United Kingdom</td>
<td>3576</td>
</tr>
</tbody>
</table>


*Table 2. Forecasted GDP for the year 2050 at constant prices of year 2000*
Data on the population of the studied countries have been drawn from the development of the Department of Economic and Social Affairs of the United Nations. The data presented are based on the medium variant.

<table>
<thead>
<tr>
<th>No.</th>
<th>Country</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>World</td>
<td>9550,945</td>
</tr>
<tr>
<td>1.</td>
<td>USA</td>
<td>400,853</td>
</tr>
<tr>
<td>2.</td>
<td>China</td>
<td>1384,977</td>
</tr>
<tr>
<td>3.</td>
<td>Japan</td>
<td>108,329</td>
</tr>
<tr>
<td>4.</td>
<td>India</td>
<td>1620,051</td>
</tr>
<tr>
<td>5.</td>
<td>Brazil</td>
<td>231,120</td>
</tr>
<tr>
<td>6.</td>
<td>Russia</td>
<td>120,896</td>
</tr>
<tr>
<td>7.</td>
<td>Germany</td>
<td>72,566</td>
</tr>
<tr>
<td>8.</td>
<td>France</td>
<td>73,212</td>
</tr>
<tr>
<td>9.</td>
<td>Canada</td>
<td>45,228</td>
</tr>
<tr>
<td>10.</td>
<td>United Kingdom</td>
<td>73,131</td>
</tr>
</tbody>
</table>


**Table 3. Population in 2050**

In most countries, an increase in population will be recorded. Only in the case of Japan, Russia and Germany, a decrease is assumed. The largest population growth will be recorded in India, where, according to forecasts, the country will have almost 420 million new citizens. This is an increase of almost 33%. Therefore, this country will become the most populous country in the world. Disputes population growth will be recorded in the United States, where it will arrive about 84 million new citizens. This is an increase of almost 27%. The biggest population losses will be noted in Japan and Russia. In the first case will leave about 19 million people, the second about 21 million.

Data concerning the area were obtained from the study the CIA World Factbook. It was assumed that the surface studied political entities will not change.

<table>
<thead>
<tr>
<th>No.</th>
<th>Country</th>
<th>Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>World</td>
<td>135266,15</td>
</tr>
<tr>
<td>1.</td>
<td>USA</td>
<td>9826,67</td>
</tr>
<tr>
<td>2.</td>
<td>China</td>
<td>9598,09</td>
</tr>
<tr>
<td>3.</td>
<td>Japan</td>
<td>377,91</td>
</tr>
<tr>
<td>4.</td>
<td>India</td>
<td>3287,26</td>
</tr>
<tr>
<td>No.</td>
<td>Country</td>
<td>Surface</td>
</tr>
<tr>
<td>-----</td>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td>5.</td>
<td>Brazil</td>
<td>8514.88</td>
</tr>
<tr>
<td>6.</td>
<td>Russia</td>
<td>17098.24</td>
</tr>
<tr>
<td>7.</td>
<td>Germany</td>
<td>357.02</td>
</tr>
<tr>
<td>8.</td>
<td>France</td>
<td>643.8</td>
</tr>
<tr>
<td>9.</td>
<td>Canada</td>
<td>9984.67</td>
</tr>
<tr>
<td>10.</td>
<td>United Kingdom</td>
<td>243.61</td>
</tr>
</tbody>
</table>


**Table 4: Area of the analyzed countries**

Only land area was taken into consideration, and it was assumed that the land size of the analyzed countries will not change.

**Result**

Table 5 presents the forecast of the potential for the year 2050. As can be seen the United States will lose its leading position. The difference between China and the U.S. will be substantial - about 5% of world power, and thus the aggregate power of the UK. Britain, Canada and France shall balance it. The third world power - India - will constitute less than 62% of U.S. power and only 44% of the one of China. The difference between most powerful and powerless state (France) will be around 15% of world power. 10 analyzed countries will focus on more than 50% of the world power system. Of the 10 countries analyzed, in only two cases a significant rise of power will be recorded: China and India. In the case of other countries, a decrease in power can be noticed.
Table 5. Forecast of the states’ potential for the year 2050

Figure 2 shows the percentage increases and decreases of states’ power in the power of a world. The largest percentage increase will be recorded in China - about 4%. Another Asian colossus - India – will also face a significant increase. Much worse are the forecasts for the other two BRIC countries, Brazil and Russia. The first of the country will lose about 1%, and the second about 1.4% of its power. European countries also will lose significant power. Germany will lose about 1%, France 0.8% and the United Kingdom about 0.3%. World leader - the United States - will lose more than 2% of world power, and the Canada about 0.4%.
Presented forecast certainly does not reflect future international balance of power in an exact, sure to be manner. It is intended primarily to indicate the direction of change in the future balance of power and thus realize that the creation of the international system today will be largely vulnerable to players from Asia. Will it be the centenary of the continent? The center of gravity moves to Asia, and is the responsibility of the Western states will lay to develop an effective strategy against the future powers. Asian centers of power certainly in the near future will play a key role in the international arena. Consequently, it seems worth considering British rule: “The state has no eternal enemies and eternal friends. Eternal are only their own interests.”

**Conclusion**

Power as a central category of international relations deserves special attention. In considering the relationship between the countries in terms of the criterion of strength we are talking about the balance of power or powers relations. And as rightly pointed out previously mentioned R. Aron, balance of power is the most important feature of any international system. Currently ongoing transformation in the international balance of power entail consequences for the entire globe. “The rest of the world is taking the floor” - in the words of F. Zakaria - not only causes weakening of American hard power, but also soft power. The result is that the analysis aimed at forecasting the international balance of power should gain popularity and be the part of an aid to political decision-making and security studies. It is also worth take a closer look at issue of the possibility of creation and use of resources of soft power by political entities and international organizations. Despite the ultimate argument behind hard power represented by military domains as a main tool of providing security, soft power plays an increasingly clearer role in international relations.
References


LACH Z. SKRZYP J., ŁASZCZUK A.: Potęga państw współczesnego świata w ujęciu geopolitycznym II.1.5.1.0, Akademia Obrony Narodowej, Warsaw 2011.


Other

Stosunki międzynarodowe – International relations 2009, nr 1-2 (t.39).

The World in 2050. From the Top 30 to the Top 100. HSBC Global Research.

www.geopolityka.net. dziennik internetowy nr ISSN: 2353-2335.

www.geopolityka.org. dziennik internetowy nr ISSN: 2083-7798


www.cia.gov.

www.esa.un.org

Consultant: Kamila TROCHOWSKA, PhD

The authors of this publication, Piotr Kłos and Robert Kobryński are M.A. students in the field of national security at the National Security Faculty of National Defence University of Warsaw. In academic year 2013/2014, both have been awarded
the scholarship of the Ministry of Science and Higher Education for outstanding achievements. The authors’ main field of research is powermetrics, they take part in several scientific research projects in the field, including one under the auspices of the Ministry of Economy. They both work on their M.A. theses in this area. The results of their work have been presented at many conferences, both in Poland and abroad.