Andrii SKRYPNYK

Doctor of Sciences (Economics),
Professor,
Department of Economics Cybernetics,
Faculty of Information Technologies,
National University of Life and Environmental Science of Ukraine,
E-mail: avskripnik@ukr.net

Eduard BUKIN

MSc in Rural Development, Food and Agricultural Organization of the United Nations.
Viale delle Terme di Caracalla, 00153 Roma, Italy,
E-mail: eduard.bukin@fao.org

MEGA-EVENTS AS A SOURCE OF RISKS FOR DEVELOPING COUNTRIES: COMPARATIVE STUDY FROM THE BRICS COUNTRIES AND UKRAINE

Abstract
This study is dedicated to consequences of preparing and conducting mega-event in the developing countries. Analysing the results of hosting mega-events in developing countries and focusing on the cases of Ukraine and BRICS countries, we have come to a conclusion that mega-events significantly misbalances equilibrium on the market of sports facilities. Developing countries often adopt the mobilizations way of development that allows overcoming the civilization barrier in time, improving supply of infrastructure to the sufficient level for hosting a mega-event. We have shown that mobilization way of development often increases the risks of hosting a mega-event at the national level and creates the risks for the international organisations that are responsible for hosting a mega-event. In addition, economic consequences of such a way of development are often negative for all developing countries. In order to cope with such risks, we suggest implementing a set of quantifiable criteria, which can increase the degree of objectivity during selection the host country for a mega-event.

Keywords: sport mega-event; civilization barrier; risk; financial destabilization; mobilization development; applicants for hosting; cost benefit analysis.

JEL classification: Z20, E60, L83

1. Introduction

Among the numer of principles which are used by the International Olympic Comity (IOC) to select a Host City for conducting a mega-event – i.e. the Winter Olympic Games (WOG), the key one is a long-term positive economic and social effect on the host city and surrounding areas. The long-term effect is a quantifiable indicator on both local and the national levels. To estimate the potential effect of a mega-event on economy, two main approaches are applied: Economic Impact Analysis (EIA) and Cost Benefit Analysis (CBA). Application of both approaches is case specific.

Many researchers show that the EIA often leads to the overvaluation of the economic impact (Barget y Gouguet 2010; Matheson y Baade 2004b; Porter y Fletcher 2008; Taks et al. 2011). In particular, Preuss (2006) argues that, due to insufficiently rigorous methodology, the EIA overvalues the impact on employment and overestimates of the expected economic growth. In addition, the EIA it does not properly distinguished the cash flows between cost and benefit (Kesenne 2005; Barget y Gouguet 2010). In contrast, the CBA has a greater scope, estimating the consumer surplus as a component of the benefits and accounting the opportunity costs of investments (Campabell y Brown 2003, p. 1-18). In addition, the CBA is more applicable to developed economies (Kesenne 2005). Nevertheless, generally, one or another approach is used to estimate the impact of a mega-event

prior preparation.

Besides CBA and EIA, which are purely academic approaches, the IOC suggests the guidelines for assessing the mega-event's impact. Following the internal reasoning, the IOC distinguishes between the positive impacts (increasing employment, growing wages or infrastructural development etc.) and negative impacts of hosting a mega-event (International Olympic Committee 2010). Among the negative impacts there are environmental externalities such as degradation of soils and water quality in the areas of the mega-event.

In general, hosting countries significantly underestimate the costs and externalities of a mega-even and overestimate the benefits (Matheson y Baade 2004a; McHugh 2006). Thus at the moment of preparation for (or application) for a mega-event, the potential consequences of the mega-event are seems to be positive for all beneficiaries: countries, international organizations, participants, and spectators. However, expectation of high benefits and low costs of the developing countries is controversial, since costs of preparation closely related to the need in infrastructure and the level of development (Andreff 2001). Therefore, estimating the preparation costs with any of the approaches (CBA, EIA or IOC guidelines) is becoming a complex task with regards to a developing country (Matheson y Baade 2004a).

Since the moment of preparation to a mega-event, the costs of a mega-event are underestimated, those are becoming high at the end. Higher costs are closely related with the risks of hosting a mega-event. The risks of hosting a mega-event are usually divided into two main categories: social risks and institutional risks (Jennings 2012). Social risks appear due to possible cut of public spending for healthcare, education and/or increasing taxes and decreasing real wages. Institutional risks include the probability of having a negative impact of the mega-event on the state economic and financial systems, slowing of reforms, increase in the level of the state intervention into the economy and, therefore, potential corruption. According to the IOC instructions, discussion about potential increase of taxes, caused by the state needs in finance, during preparation to a mega-event, is a part of the institutional risks assessment (International Olympic Committee 2010). Such approach for assessing the preparation costs is valid for a developed country; however, it is too simplistic for a developing country. Since there are many mechanisms for redistributing the preparation costs between the population (i.e. reduction of the real wages, increase of the public debt, reducing of the growth of social benefits etc.), the approach for assessing the institutional risks, suggested by the IOC, must account for more complex mechanisms.

In the present research, we analyse the process of preparing for a sport mega-event from the macroeconomic point of view of a hosting country. Using the example of the UEFA EURO-2012 in Ukraine, we investigate the peculiarities of preparation for and conducting a mega-event in the developing country with the high levels of corruption, lack of infrastructural development and sport facilities. The purpose of the present research is in making a comprehensive analysis of processes of preparation to a mega-event in a developing country, identifying the risks related to the preparation to a mega-event, and suggesting the quantifiable indicators aimed to reduce the risks related to the preparation and conducting a mega-event.

The research is structured in the following way. In the first section we introduce the concept of a civilizational barrier, that helps to described what is the difference in the levels of development between the potential mega-event hosts. The second section shows the case study of preparation to a mega event in a developing country. The third section is dedicated to the mobilization way of development, as a strategy of preparation to a mega-event in developing countries. The fourth section discusses the risks related to the preparation to a mega-event and suggests quantitative criteria for selecting the candidates for hosting a mega-event. The final section is a conclusive one.

2. Civilization barrier

Recently, the BRICS[1] countries have become leaders in the field of hosting mega-events. These countries host six out of nine mega-events durinf 2008 and 2018 (such mega-events are Winter Olympic Games (WOG), Summer Olympic Games (SOG) and FIFA World Cup (WC)). The Russian Federation and Brazil host two different mega-events. The key feature of conducting mega-events in the BRICS countries is in the high costs of preparation, caused by the lack of sports facilities and infrastructure at the moment of application for a mega-event (Tomlinson y Bass 2012). In order to conduct a mega-event (WOG or WC), each of the BRICS countries has to overcome a civilization barrier within the limited time.

A civilization barrier is a set of sports and infrastructural facilities sufficient for hosting a mega-event, fulfilling all the requirements of the responsible international organizations (IOC, FIFA, etc.). At the same time, the civilization barrier is a leap in the level of quality and supply of services and infrastructure from the low pre-preparation level to the higher international standards. In addition, the civilization barrier also consists of the peoples' readiness to host a big number of guests from abroad. Due to multidimensionality of the civilization barrier, it is rather difficult to quantify its' value. Thus, we use the costs of overcoming the civilization barrier and preparing for a mega-event.

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[1] BRICS – Brasilia, the Russian Federation, India, China and South Africa

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69

Every country has its own capabilities of overcoming the civilization barrier. For example, with the help of strong economy, China was capable to build necessary infrastructure for the SOG 2008 in a least harmful way. When these factors are not working properly (for example in Russian Federation with the WOG in Sochi 2014), preparation costs increases, outnumbering those planned at the beginning of preparation (Sokolov 2012). Other countries with weak economy (developing countries) need to accept the risks related to overcoming the civilization barrier. Since hosting the mega-event is a priority task for such countries, they focus substantial parts of the economic, financial and labour resources on overcoming the civilization barrier. Thus, developing countries overcome the civilization barrier in an artificial – not evolutionary way.

In developed countries, problems related to hosting a mega-event are resolved at the host city's/area's level. Financing the preparation for a mega-event is done at the expense of local budgets, charity funds and private sector. Therefore, financial risks of conducting a mega-event exist at the local budget level. In developing countries[1] or developed countries with lacking financial potential[2], mega-events are hosted by the entire country rather than a city. Therefore, main part of preparation expenditures guaranteed by the state budget and the risks of hosting a mega-event are national. In general, preparation for and conducting a mega-event is based on the available resources, financial system stability, and current institutional arrangements. Preparation for a mega-event involves adoption of foreign experience. Political capital and politics are also tightly related to the mega-events conducting in developing countries. Therefore, the issue of hosting a mega-event in developing countries is normally considered without proper thoroughness and the costs raises significantly, table 1.

Table 1. The estimation of costs of preparation for mega events

| Year | Event | Country | Expenses, billion US$ | | Ratio between fact and plan |
			Plan	Fact	
1998	XVIII WOG	Japan	1.57	2.45	1.56
2000	XXVII SOG	Australia	2.36	4.48	1.90
2002	XIX WOG	USA	1.9	2.45	1.29
2004	XXVIII SOG	Greece	4.65	13.5	2.90
2006	XX WOG	Italy	2.4	4.37	1.82
2008	XXIX SOG	China	16.3	43.19	2.65
2008	UEFA EURO-2008	Switzerland – Austria			1.1
2010	XXI WOG	Canada	2.88	6.08	2.11
2010	FIFA World Cup 2010	Republic of South Africa	0.49	12	14.88
2012	XXX SOG	England	3.93	20	3.92
2012	UEFA EURO-2012	Ukraine	14.24	11.71	0.82
		Poland	-	23.5	-
2014	FIFA World Cup	Brazil	13.3-	16.5	-
2014	XXII WOG	Russia	13.2	52	4
2016	XXXI SOG	Brazil	18		
2018	FIFA World Cup	Russia	23		

Source: grouped by authors from different sources: (Sokolov, 2012; Tomlinson y Bass, 2012; Andreff, 2012; Verkhovna Rada Of Ukraine, 2007).

The reasons why the costs are so high are in lack of sport facilities, infrastructure and experience of conducting mega-events in developing countries. For instance, before the WOG 2014, Sochi never held any World or European championships in such sports as ski jump, bobsleigh or biathlon. No infrastructure for conducting such events existed in the place prior the WOG 2014. Therefore, overcoming the civilization barrier and a leap in the level and quality of services and infrastructural objects was a difficult task. Since there was no demand for the winter sports infrastructure in Sochi before the WOG 2014, businesses did not see attractive to invest money in artificial overcoming the civilization barrier. Thus, major part of preparation costs were covered by the public sector.

From the example of Russia with the WOG 2014 in Sochi we can conclude that creating the infrastructure and sports facilities always falls behind the schedule and the facilities' price increases manifold. The infrastructural objects such as motorways and sports are very attractive for corruption. For instance, the motorway connection between Sochi and Krasnaya Poliana costs US$ 9 billion, which is approximately US$ 12.6 million per kilometre of a road. It is almost two times more than the average price of similar projects in the USA or EU. The main reason of

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[1] For example: WOG 2014 in Russian Federation, WFC 2014 in Brazil
[2] For example: SOG 2004 in Greece, EURO-2004 in Portugal

the high price is in absence of high-quality management (experience of conducting mega events), an unsuccessful choice of the city (Sochi is a subtropical$ summer resort) and the high level of corruption rent (Sokolov, 2012).

Besides WOG 2014 in Sochi, Russia is planning to conduct the FIFA World Cup 2018. The process of preparation to both mega-events is managed by Moscow, with the cash flows centrally distributed by the Russian Federation Government (RFG) for the entire preparation term. Private companies and state divides public money with the ratio 25% to 75% (Sandford 2013). However, the state companies as "Olympstroy" shared preparation costs delegated to the private companies. As of February 1, 2013, 1.526 trillion (Russian Rubles in value 2012) or roughly US$52 billion was spent on the preparation for WOG 2014 in Sochi. Russia's costs of the preparation for WOG 2014 in Sochi grew by five times during the six years of preparation. The detailed structure of WOG 2014 in Sochi preparation cost is investigated in the study of Sokolov (2012).

Considering the other examples form BRICS countries and the World, preparation for a mega-event in developing countries is covered by the budget of the entire country. Thus every citizen is bearing personal expenses for preparing and conducting the mega-event. The mechanisms of imposing costs on the tax-payers are not in the direct increase of taxes (such step is extremely risky form the governmental point of view). It is in using the external credits which will be liquidated by decreasing the nominal rates of wage-growth and by hiding the actual inflation rate. It is obvious that use of these mechanisms can lead to destabilization of the financial system in entire country.

3. Case study of Ukraine and the EURO-2012

Ukraine and Poland hosted the football championship between the European national teams – so called EURO-2012 of the Union des Associations Européennes de Football (UEFA). Before the EURO-2012 Ukraine has never held any mega-events of type 'A'[1] and 'B'[2] (according to classification of Taylog and Gratton (2002). Moreover, sporting events of type 'C'[3] were rare for Ukraine. The decision of the UEFA to choose Ukraine and Poland as hosts of EURO-2012 was quite natural for Ukrainians. The UEFA requirements to the quality of sports facilities were acceptable as well; although, those required considerable efforts. Higher costs were required for improving the overall infrastructure in Ukraine. Due to the failure to maintain infrastructure in the workable condition, conducting the sporting events of types 'B' and 'C', Ukraine was unable to prepare cities for EURO-2012 without financial difficulties.

In Ukraine, all costs of preparation for the EURO-2012 were reasonably distributed by the Ukrainian government for all directions according to the Law of Ukraine 'About preparation and conducting of the finals stage of European Football Championship EURO-2012' (Verkhovna Rada Of Ukraine 2007). Expenses for reconstruction of stadiums and training bases amounted only 11% of total costs. However, almost 90% of costs were created by the low quality of infrastructure. Taking into account that companies, responsible for infrastructure development are founded from the state, the ratio between budget and private expenditures is roughly 70% budget and only 30% private (Verkhovna Rada Of Ukraine 2007). It is obvious, that Ukraine could have avoided 70% of costs if infrastructure was good enough to host the mega-event. Thus, applying for hosting EURO-2012 should not have been a necessary condition for building infrastructural objects (Skrypnyk y Bukin 2013). Airports, railways, motorways, etc. have forecasted positive NPV, and could have been built earlier or later.

The utility of public expenditures for any infrastructural development is high. However, analysing the social utility of preparation from the standpoint of an average citizen of Ukraine, the situation is opposite. Form the 14 billion US$[4] spent on preparation for the EURO-2012, 70 % (US$ 10.2 billion) were covered by the taxpayers. Taken per capita (for 45 million Ukrainian citizens) these costs amounted to US$ 217 per person. For the comparison, the average monthly wage in 2012 was only US$ 360 (SSSU 2015). Therefore, personal utility of EURO-2012 compared with one monthly salary is unlikely to be high.

In developing countries it is observed an effect of increasing tourists inflow after a mega-event (Matheson, Peeters y Szymanski 2012). However, in the case of Ukraine the tourist flow after the EURO-2012 remains ordinary for the following seasons and the whole year. Moreover, the year 2012 had not been detected as an outlier from the general tendency (Figure 1) (SSSU 2015). Relatively higher increase of tourist flow to Ukraine were detected during the years 2000-2008, where the annual increase of tourist was 2.33 million tourists (regression equation is $TF(t) = 6.16 \cdot 10^6 + 2.33 \cdot 10^6 \cdot (t - 2000)$, where $TF(t)$ −the tourist flow dependence in time, t −the year of observation; $R^2 = 98.9, \ p - value = 0.001$). However after the world financial crises 2008-2009 the picture of tourists flow changed. The slope of regression (the increase of tourist) become only 955.6 thousand of tourists annually (the tendency could be described by the regression $TF(t) = 20.4 \cdot 10^6 + 0.9556 \cdot 10^6 \cdot (t - 2009)$, $R^2 = 0.88, \ p - value = 0.049$). The second regression is not reliable because of the

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[1] Type A – irregular, one-off, major international spectators events i.e. FIFA World Cup, Olympic Games.
[2] Type B – major spectator events – i.e. Open Golf, Wimbledon
[3] Type C – irregular, one-off, major international spectator/competition events
[4] Here and everywhere in the manuscript US$ is in value of 2012.

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71

small sample size (5 observation only), however it gives a general image of the tendency. As follows from the figure 1, the tendency of tourist flow to Ukraine is mainly depends on the global world economic situation. Thus, expectations that more tourists will visit Ukraine after the mega-event are doubtful. In addition, the invasion of Russia into Ukraine, started in 2014, will likely cause the decrease the tourists flow.
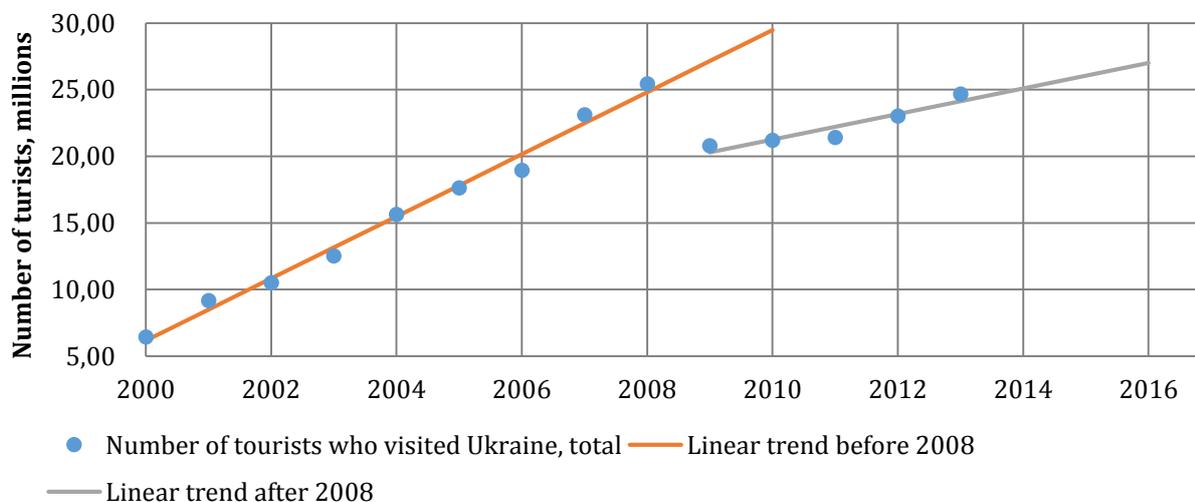

Figure 1. The tourist flow into Ukraine

As for the result of preparation to the EURO-2012 on the infrastructural development in Ukraine, there were no cardinal improvements. It is justified, that the mega-event caused just a slight redecoration of the infrastructure. Due to serious financial constraints one kilometre of motorways built for EURO-2012 in Ukraine cost approximately US$ 1.2 million (Verkhovna Rada Of Ukraine 2007). This had an impact on the motorways quality and lead to destruction of the motorways in the first winter after the mega event. As for the corruption, it increases with increasing cash flow distribution by the authorities. As for the corruption, it remains high during preparation to the mega-event. Due to the absence of the long-term development goals, there is no univocal positive impact of preparation to the mega-event. However, negative impact of the EURO-2012 is observed. Certainly, doubts could be voiced about the connection of all negative consequences with EURO-2012; thus, there might be other causes – i.e. a deficit of Ukrainian pension fund, "shackling" conditions of energy supply from Russia, public debts, etc. However, when all the above factors are traditionally inherent in the Ukrainian economy, the government took up the burden of EURO-2012 voluntarily, and it increased the pressure on the state finance (Skrypnyk y Bukin 2013).

Despite all economic complication of hosting a mega-event in Ukraine, government decided to apply for hosting another mega-event – WOG 2022 in Lviv (The President of Ukraine 2010). Although, Ukraine's chances to host the WOG were low – at the level of 3% (accordingly to the model of Sterken (2010)) and the chances to get into at least the second stage of selection process were not higher than 13%, inefficient public spending were partially done. After the revolution in Ukraine in 2014, and election of a new democratic President and Parliament, the new democratic government has replaced the former one. Since then, Ukraine has given up the plans to host the WOG 2022; however, some public spending has been done already.

4. Pathways for overcoming the civilization barrier: demand and supply

Let us consider overcoming the civilization barrier as a dynamic process. It is characterized by changes in supply and demand equilibrium on sport facilities in time (Pawlowski y Breuer 2012). It is assumed that a developing country has a higher rate of economic growth than a developed country. The income is growing, and so does the demand on sports facilities. The curve of overcoming the civilization barrier describes the equilibrium level of supply and demand in time. The equilibrium supply and demand grow depends on the income growth and the level of investment into the sport facilities (curve S_0S_1 on Figure 2.A). The evolutionary overcoming of the civilization barrier could be achieved in dot S_5 at the time t_5.

At the moment t_1 the decision is made about applying for hosting a mega-event, at the moment t_2 an application is made for hosting a mega-event. The mega-event is planned at the time t_3. At the moment of the decision making (t_1) a significant civilization barrier $\Delta S(t_1)$ remains. To overcome this civilization barrier on time (before the beginning of the mega-event t_3) it is necessary to increase the rates of sport facilities creation –

segment S_1S_3. In the first case (figure 2.A) we consider that the international organization refuses a country in hosting a mega-event.

At the moment t_2 (the time between submitting the application and receiving the status of a mega-event host is considered to be negligibly short) the government stops funding, and the system becomes equilibrium during the time $\left(t_2^* - t_2\right)$. During this time, maintaining the sport facilities in workable conditions requires additional state costs. They are proportional to the triangle $D_2D_2^*S_2$ area (the amount of losses from built and unused sports facilities is proportional the product of their value at the time of their not being used). In this case overcoming the civilization barrier happens in the same segment of time as without submitting an application – $\left(t_5 - t_1\right)$ and accompanied by additional budget costs proportional to the triangle $S_1S_2D_2^*$.

The symbols used in Figure 2 are: $\Delta S(t_1)$ – civilization barrier value when a country decides to apply for hosting a mega-event; S^* – level of supply, required for hosting the mega-event; t_0 – time when intensive development begins; t_1 – time of actual application for hosting a mega-event (the beginning of preparation); t_2 – time of the host country election ; t_2^* – time of reaching the equilibrium, when the candidate is rejected; t_3 – time of the mega-event or hypothetical time of overcoming the civilization barrier; t_4 – time of reaching equilibrium (in case of the positive impact of the mega-event); t_5 – time of evolutional overcoming of the civilization barrier and reaching the equilibrium (in case of the neutral impact of the mega-event); t_6 – time of reaching equilibrium (in case of the negative impact of the mega-event).
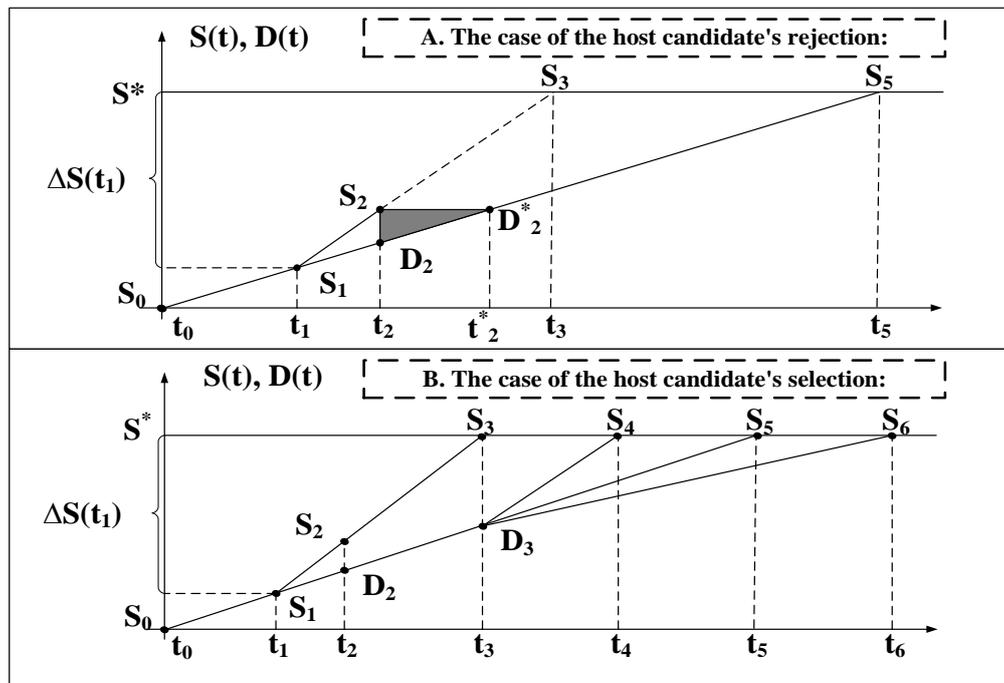

Figure 2. Overcoming the civilization barrier in cases of the host candidate's selection and rejection

Let us consider the case when the applicant country has been accepted for hosting a mega-event (Figure. 2.B). In this case, a gap between the supply and demand of sports facilities appears at the moment, when the mega-event takes place – $\left(S_3 - D_3\right)$. Bridging this gap mainly depends on the rate of economic growth after the mega-event. Hence, we consider three basis scenarios of development:

the mega-event has neutral impact on the rates of economic development (track – D_3S_5);

positive impact – the rate of economic development is accelerating – the demand of sport facilities is growing faster (track – D_3S_4);

negative impact – the rates of economic development are decreasing compare to the neutral and so are the rates of welfare growth, the demand of sport facilities is decreasing (track – D_3S_6).

In fact, hosting a mega-event could lead to the three possible consequences:

– reduction of time of overcoming the civilization barrier – the path $S_0D_3S_4$ (winning of time – $(t_5 - t_4)$);

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73

- no change in time of overcoming the civilization barrier – rates of demand growth remains stable;
- increase in time of overcoming the civilization barrier – the path $S_0 D_3 S_6$ (time losses – $(t_6 - t_5)$).

In the first case (winning of time) there are additional public costs for contributing the sports facilities' in working conditions, which are proportional to the area of the triangle $D_3 S_4 S_3$. In the second case, these costs are significantly greater and they are proportional to the area of the triangle $D_3 S_5 S_3$. In the third case of time losses, the costs are much greater and proportional to the area of the triangle $D_3 S_6 S_3$. All these costs should be added to the value of overcoming the civilization barrier which is equal to the area of triangle $S_1 D_3 S_3$.

Experience of hosting mega-events in developing countries shows that achieving the supply and demand equilibrium is rather unrealistic. For instance, after conducting EURO-2012 in Ukraine the new stadium built for the mega-event in Lviv ("Arena Lviv") was used only occasionally. In the spring of 2013, the city's authorities considered to demolish the "Arena Lviv". The motivation of such discussion was in groundlessness of costs for maintaining the stadium in working conditions (Tereschyuk 2013). However, after the invasion of the Russian troops to the eastern Ukraine, one of the leading football clubs of Ukraine "Shakhtar Donetsk" has moved to Lviv, where it holds own home matches of the football season 2014-2015. Most likely, that a temporary usage of the stadium will become permanent in future. After WOG 2014 in Sochi, the skiing resort Krasnaya Polyana may be expecting increase of demand. However, that is unlikely to happen with the numerous sport facilities (curling, figure skating, hockey) located directly on the Black Sea shore. Maintenance of these shore-located sports facilities is assigned to the federal budget, which is experiencing difficulties due to the sanctions, preparation for the World Cup 2018 and many other expenses that were not planned at the time of the deciding to host the Winter Games of 2014.

5. Criteria for reducing risks of hosting a mega-event

In order to host a mega-event, the countries, where development of infrastructure and sports facilities lag far behind the international requirements, need to adopt a mobilization model of development. By the term "mobilization model of development", we mean development of a country's economy by preparing it for hosting a mega-event, and focusing on preparation all available economic, financial and human resources. After a country adopts mobilization model of development considerable number of national and international risks appear. Such risks as whether or not the mega-event will take place are under responsibility of the international organization that chooses the host country. For instance, during WOG 2014 in Sochi such risk could have taken place due to the underestimation of weather volatility (Sochi is located in subtropical climate zone). Among the host country's risks that may realize immediately there are risks of financial system destabilization, deceleration of the economic growth rates, increasing level of corruption, increasing of the income distribution inequality and, consequently, increasing the social tension.

Despite there are strict requirements for the applicant for hosting a mega-event, the process of selecting the host country remains a black box. Therefore, modelling the process of the host country selection is extremely difficult. Sterken (2010) showed in his study possible factors influencing international organizations' decision about the place of hosting a mega-event. One of the criteria for selecting the host country is the rates of economic development during ten years before applying for a mega-event. The weak point of such approach is in assumption that the rates of economic development will stay as there is all along the preparation for the mega-event. At the same time, the risks related to the economic development and growth remain beyond the scope of the study. We propose a number of indicators aiming to decrease the risks of a mega prevent the international organization responsible for the mega-events from making hasty decisions.

As an indicator of the civilization barrier (R_n) we propose to use the ratio of the average GDP per capita in 5-10 countries sufficiently developed for hosting a mega-event $\left(\overline{GDP_5 \, per \, cap.} \right)$ with the respective indicator in the applicant country $\left(GDP_n \, per \, cap \right)$:

$$R_n = \frac{\overline{GDP_5 \, per \, cap.}}{GDP_n \, per \, cap.}$$

In addition, R_n should not exceed a critical value R_{crit} ($R_n \leq R_{crit}$). The value R_{crit} characterizes the gap between developed and developing countries. It is identified as ratio of the average GDP per capita in both groups:

$$\left(R_{crit} = \frac{\overline{GDP}_{developed} \; per \; cap.}{\overline{GDP}_{developing} \; per \; cap.} \right)$$

Another one is the test whether the real GDP grows rate of the applicant country significant exceeds the average rate of economic development in the world in the long term (not less than 10 years).

$$\overline{r_n} > \overline{r_c} + 1.65 \cdot \sigma_c / \sqrt{10}$$

$\overline{r_n}$ is the average rate of the applicant country's GDP growth on the 10-years interval, $\overline{r_c}$ is the average rate of the world economic development on the same interval, σ_c is the standard deviation of the world economic development rate, 1.65 is normal distribution quantile at 5 % level of significance.

Success of overcoming the civilization barrier depends on the government's financial capabilities (the size of state budget, possibility to attract financial resources, etc.) and on the mega-event project's investment attractiveness for the business. Moreover, the level of corruption and total effectiveness of state governance significantly influence the management effectiveness when overcoming the civilization barrier. Therefore, the following criterion indicates the applicant country's position in the upper part of the Corruption Perceptions Index (CPI) list:

$$I_n > I_{0.5}$$

where I_n is the average CPI on 5 year time interval prior the international organization is taking a decision about the host country, $I_{0.5}$ is the corruption precipitation index of the median country.

The value of civilization barrier should be estimated before selecting the mega-event host country. In order to avoid underestimation of the additional pressure on public finance, a group of independent experts from different countries should do evaluation of the civilization barrier. The possibility of overcoming the civilization barrier depends on the public finance availability. Total budget loading should be equally distributed along the time of preparation for the mega-event. The annually amount of public finance directed to preparation for a sport event should not exceed 2% of the annual budget. This level corresponds to the annual maximum allowable budget deficit established by the European Union. In fact, value of civilization barrier should be less than 20% of the cumulative state budget of the applicant country over 10 years of preparation:

$$S_n < B_n / 5$$

where S_n is the value of the civilization barrier of the applicant country, B_n is the state budget of the applicant country. The last condition defines the threshold of preparation expenditures from the public funds. This condition may be represented as a budget restriction. Since there are many differences in the budget systems of different countries, for some of them the value of the civilization barrier may be disparate.

As the last indicator for evaluating the civilization barrier, we suggest to use its ration with the GDP demonstrated over last 8 years, prior the decision-making on hosting the mega-event with the threshold of this ratio d_m.

$$\frac{S_n}{GDP_n(t_3 - 8)} < d_m$$

For the threshold value d_m we can use the values of such ratio in the countries, with had negative effect from hosting mega-events (i.e. SOG 2004 in Greece, UEFA EURO-2004 in Portugal). For Greece this indicator values 9.8%.

In 2012, Ukraine and Poland jointly hosted UEFA EURO-2012. The decision on applying for hosting the mega-event had been taken by countries in 2004. By applying the methodology shown above, we can estimate if the such countries like Ukraine should have hosted the mega-event. (All indicators were calculated for Ukraine at the moment of taking the decision to apply for hosting a mega-event in 2004).

$R_{crit} = 8$. It characterizes the gap between such developed countries as US, Austria, Germany, etc. and developing countries such as BRICS. For Ukraine, $R_n = 17$. Therefore, the first condition is not satisfied.

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75

The world's economy growth rate over 10 years prior 2004 was at the level = 2.9% , with the standard deviation of 0.6%. Therefore, the threshold rate of economy's development should be greater than 3.9%. Ukraine's average rate of economy development in 2004 was only $r = 0.5\%$.

Ukraine was occupying the 122 position (put of 145 positions) in the CPI rank of 2002-2004. It is significantly below the median of the list.

Ukraine's budget in 2004 was 65 billion UAH (US\$ 13 billions), value of civilization barrier, as it was observed after the mega-event in 2012 was US\$ 14.2 billion. It is substantially more than the budget possibilities.

Ukraine's GDP in 2004 was US\$ 65 billion. The value of civilization barrier compare to the GDP amounted about 21.8%. It is substantially more than threshold value of 10%.

As for Poland, who also hosted Euro-2012, the situation is a little different. At the moment of taking the decision to apply for EURO-2012 Poland had high rates of economy growth (5%), and the GDP 4 times larger tjat in Ukraine. In the CPI rank, Poland occupied 67 position, which is above the median. Despite significantly larger cost of preparation to a mega event in Poland (\$25 billion, compare to Ukraine) proposed indicator dos not exceed the critical values.

Consequently, taking into consideration calculations stated above, we may conclude that Ukraine did not qualify for hosting any mage-events in 2012. Moreover, Ukraine still does not qualify for hosting the WOG 2022 (table 2). In the table 2 we demonstrate the results of application of the proposed criteria on the example of some BRICS countries, Greece and South Korea, which have recently (or plan) hosting a mega-event. As follows from the table 2, testing the indicators for Greece confirms expecting of negative effect of the SOG-2004, since Grease does not qualify in most of the proposed indicators. South Korea, which hosts WOG-2018 and BRICS countries, who actively use mega-events for strengthening their international positions, indicates different results compare to Greece an Ukraine. The figures for Ukraine are shown for the planned WOG 2022. The sign in front of the numerical values indicate is the country comply (+) or does not comply (-) with the criteria.

Table 2. Testing of the suggested criteria on the BRICS countries

	1. Civilization barrier	2. ARED	3.CPI	4. BR	5. GDP ratio
Brazil (WC 2014; SOG 2018)**	+(7)	-(2,4%)	+(68/167)	-(92%)	+3,5
Russia(WOG 2014; WC 2018)**	+(6)	-(3,2%)	-(121/163)	-(26%0	+6,7
China (SOG 2008)*	-(25)	+(9,8%)	-(63/90)	+(12%)	+4,2
South Africa (WC 2010)*	+(7,5)	-(2,3%)	+(45/121)	-(85%)	+9,1
Greece (SOG 2004)*	+(2,5)	-(1,6%)	-(28/54)	-46,6%	-9,8
Ukraine (WOG 2022)***	-(17)	-(0,5)	-(142/175)	-105%	-35
South Korea (WOG 2018)***	+(2,5)	+(7,1)	+(39/178)	+(2,6%)	+(0,9)

*Based on the actual costs; ** Based on the actual and planed costs; *** Based on the planed costs*

As follows from the table 2, out of all analyzed countries, only South Korea qualifies for hosting the WOG 2018 – all indicators have the risk-free values. The risks for hosting any mega-events in one of the BRICS countries are approximately equal: 3 out of 5 criteria were satisfied for China, Brazil and South Africa. The worst situation is in Russia, where the costs are high because of the highest level of corruption. The weakest is Greek's economy, which does not meet four out of five criteria. Apparently, that is because the economic burden of the Greek's economy was already excessive, at the moment of application for the SOG-2004, what yielded into a deep economic stagnation of the country. Ultimately, worst indicators are observed for Ukraine with regard to (possible) hosting the WOG-2022. This is due to highest corruption level, lowest level of economic development and low budget expenses compare to all other countries. If we compare the values of the indicators for Ukraine in 2004 and 2014, we see significant deterioration in their dynamics: civilization barrier grown from 17 to 30; economy's growth rate decreased to zero; in the CPI rank Ukraine dropped from 137 to the 143 position. Since the WOG has a significantly higher value of the civilization barrier (compere to the UEFA EURO) and only a small increase of the Ukraine budget and GDP, the share of expenditure for preparation to a mega-event in the budget and GDP of Ukraine increased.

6. Conclusions

Many countries consider mega-events as an opportunity for development and promotion at the international level. By default, any applicant for a mega-event (or a host country) argues that conducting a mega-event yield

into short and long-term benefits worth of the costs made. In fact, as multiple researchers justified, it almost never happens.

Instead, at the beginning of the preparation for a mega-event, any country meets 'civilization barrier'. Civilization barrier is a difference between the quality and supply of the sport infrastructure and services in the country that applies for a mega event compare to the international standards sufficient for hosting the mega-event. Civilization barrier is a multidimensional indicator that could be measured as the costs of preparation and hosting the mega event. Value of the civilization barrier differs between different countries, depending on the level of their development. Therefore, developed countries, which already have sufficient sport facilities and constant economic growth, need either invest less, or less time to overcome the civilization barrier, comparinf with the developing countries.

After a country is selected for hosting a mega-event, it must prepare to it in a limited time. Since developing countries often lack capacities to overcome the civilization barrier in time, without prioritizing it, they need to adopt a mobilization way of development. Mobilization way of development speed ups the evolutional growth of supply of the sports facilities and infrastructure and allows preparing to the mega-event in time. It is characterized by focusing all available economic, financial and human resources on preparation to a mega-event, delaying necessary reforms and institutional transformations in the host country. In addition, it brings distortion to the market of the sport facilities, where supply is becoming greater than demand and additional public spending are necessary for maintaining the infrastructure.

Many developing countries that recently hosted a mega event are very representative with regard to the market equilibrium. Ukraine (hosted the UEFA EURO-2012), or Russia (WOG-2104) or China (WOG-2008), shows that mega-events significantly misbalances equilibrium on the market of sports facilities and lead either to additional expenses on maintain the infrastructure in workable condition, or on the total demolition of the sports infrastructure.

Comparing the sources of financing mega-events, it is evident, that in developing countries state budget provides the main share of costs. Thus, the risks of preparation for a mega-event are at the country level. In addition, budget pressure is amplifies by growing import of materials and services, necessary for hosting a mega-event. The combined effect of these mechanisms leads to increasing of the budget deficit, devaluation of national currency and other negative externalities. However, similar situation can be observed also in the developed such as Greece (host of the SOG-2004), or Portugal (host of EURO-2008). For them, the burden of preparation to the mega-events remained even after the mega-event were over.

In order to avoid such negative consequences of hosting a mega-event, we suggested several quantitative criteria which can increase the degree of objectivity during selection the host country for future mega-events. We tested these indicators on the sample of the countries, which have recently hosted a mega-event, and we showed, that these indicators are able to identify the countries that could potentially yield with the negative impact of a mega-event. In addition, applying the results from the indicators may lead to reducing risks of hosting a mega-event for a country as well as for the organizing institution.

The countries, where the proposed indicators have had negative values, showed slowing the rates of economic development and singes of instability in the growth. Greece and Portugal have endless debt problems, and even such strong economies like Brazil and Russia are in the state of recession after their mega-events. One of the world largest economies as China is entering the period of the instable economic development which is associated with the capital outflow. Undoubtedly, any of these countries has own reasons of economic deterioration, rather than hosting a mega-event. However, there is a common fact for all these countries. During long time they were allocating substantial resources for preparing to mega-events, instead of focusing them on tackling with the priorit problems of economic development.

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77

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