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## Social benefits valuation of hosting non-mega sporting events

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## **Abstract**

### **Purpose**

In the study, an attempt was made to estimate the social benefits resulting from three non-mega sporting events organized in Ergo Arena located on the border of two cities in Poland. By attributing a value to intangible social benefits, the intangible effect was determined and compared to the expenditure incurred in the construction of Ergo Arena Hall.

### **Design/methodology/approach (mandatory)**

In order to value social intangible effects of three non-mega sporting events the CVM method was applied. Each time, the CVM study covered the area of the two cities: Gdansk and Sopot and was conducted on a sample of 500 people - 250 per city. The mean values of Willingness-to-Pay were used in order to obtain aggregate values of intangible benefits. Finally the aggregate results were compared to expenditure incurred in connection with the construction of Ergo Arena Hall.

### **Findings (mandatory)**

It appeared that intangible effects were eagerly valued by the residents of Gdansk and Sopot. The aggregated value of all three sporting events was estimated at PLN 8.8 million. The obtained results question the equal share of both cities in financing but confirm that hosting non-mega sporting events may justify the use of public funds.

### **Originality/value (mandatory)**

A research gap arises regarding WTP in estimating the intangible social effects of NMSEs and considering these effects in the net effect valuation. The findings have implications for policy makers since they show to what extent may it be justified to use public means in order to host non-mega sporting events.

**Keywords:** Social benefits, Intangible effects, Contingent Valuation Method, non-mega sporting event, Willingness-to-Pay

## Introduction

Many recent studies in the world literature have focused on the impact mega sporting events (MSEs) have on host economies. Areas most frequently researched investigate the tangible effects, i.e. tourist flow (Ahlert & Preuss, 2010; Fourie & Santana-Gallego, 2011), the labour market (Baade & Matheson, 2002; Hotchkiss, Moore & Zobay, 2003; Tien, Lo & Lin, 2011), infrastructural changes (Essex & Chalkley, 1998; Chalkley & Essex, 1999; Hiller, 2000; Burbank, Adranovich & Heying, 2002) and the construction of sports arenas (Searle, 2002; Preuss, 2004).

In contrast, limited consideration has been given to smaller sporting events, so-called non-mega sporting events (NMSEs). Although in the world literature the possible substantial impact of non-mega sporting events on the host area has been mentioned, there is little confirmation to prove whether this is the case (Smith, 2009). This concerns, not least, the intangible social benefits, such as: community cohesion, civic pride, uniting people or improving self-esteem. Undoubtedly, this is largely because such effects are not simple to quantify (Walton, Longo & Dawson, 2008). Despite this, it is frequently assumed that these intangible effects could be at least comparable in scale to the tangible ones (Noll & Zimbalist, 1997). This means that considering them in the general calculation of benefits and costs allows for a more precise evaluation of the impact of an event on the host area, and for a justification for the use of public funds for its implementation. Nevertheless, accurate social impact assessments of NMSEs, and valuations of these impacts, are lacking. Even though there are significant number of studies on monetary valuation in sports (Owen, 2006; Santo, 2008; Hakes et al., 2011; Kiefer, 2015; Interis & Taylor, 2017; Wicker & Orłowski, 2019), the research conducted so far in terms of “events” referred exclusively to MSEs and for the most part was based on the use of the Contingent Valuation Method (CVM) (Heyne, Maennig & Suessmuth, 2007; Atkinson et al., 2008; Walton, Longo & Dawson, 2008; Preuss &



Werkmann, 2011; Zawadzki, 2016) and to a lesser extent, the hedonic pricing method (Kavetsos, 2012) and Opportunity Cost Approach (Solberg, 2003).

Therefore, the main objective of this paper is to estimate, using CVM, the intangible social benefits of three non-mega sporting events held in Ergo Arena Hall, on the border of Gdansk and Sopot, in northern Poland. Poland, after the organizational success of Euro 2012, was readily chosen to host large, but not mega, sporting events. After 2012, Polish cities were venues for, among others, the Men's European Volleyball Championship (2013 - in cooperation with Denmark), the World Indoor Championships in Athletics (2014), the Men's World Volleyball Championship (2014), the Men's European Handball Championship (2016), and again the Men's European Volleyball Championship (2017). This study has been prepared based on the World Indoor Athletics Championship in 2014 and the latter two of the above-mentioned events, which were held in Gdansk and/or Sopot. The idea of using these three events is not only to compare them but to provide more robust results on the NMSEs social effects valuation in general.

By attributing a value to intangible social benefits, the intangible effect may be determined and compared to the expenditure incurred in the construction of Ergo Arena Hall, which amounted to 330 million PLN and was derived exclusively from public sources. It is difficult to justify the use of financing solely from public sources for funding of such a scale. Thus, CVM was applied to attempt to determine the intangible effects.

An indirect aim of the study is to identify the determinants which affect the Willingness-to-pay (WTP) of the residents of Gdansk and Sopot, and on the basis of those determinants, an econometric analysis may be carried out to confirm the reliability of the study.

The structure of the paper is as follows: The first section describes the current state of knowledge on social effects with a particular emphasis on the size of sporting events. The

second presents the potential use of CVM for the analysis of NMSEs. The third section deals with the concept and basic features of the CVM survey and statistical methodology, as well as the results of the empirical analysis. In the last section, the aggregated values are compared to the real expenditure, and the main conclusions are discussed.

### **Importance of the size of a sporting event in its contribution to the social impact**

Despite the variety of events nowadays, the most important criterion among researchers is their size (Roche, 1994; Roche, 2000; Rojek, 2014). The interests of researchers almost exclusively relate to the largest ones, referred to in the world literature as mega events, which include the Olympic Games or the most important football tournaments (Mueller, 2015). The reason seems to be obvious. The scale of the potential impact of the event increases with the size of the event (Getz, 1989; Witt, 1998).

Perhaps because of the increased interest and numerous studies, voices have begun to question the indisputability of the benefits, particularly those tangible and economic ones, which result from the organization of MSEs (Crompton, 1995; Kesenne, 1999; Zimbalist, 2015). The difficulties in clearly defining the effects of events have been emphasized – it seems troublesome to attempt to identify from among numerous determinants shaping the state of the economy, those which are associated exclusively with the organization of such events. Doubts have also been raised about the variety of applied methods, based on numerous assumptions, which lead to the fact that the obtained results - even for the same event - can be characterized by significant discrepancies. It raises concern about the reliability of some studies, which may be distorted arbitrarily in the light of accepted standards (Tyrrell & Johnston, 2001; Dwyer et al., 2005).



This, among other reasons, is why recently, more attention has been paid to NMSEs, which are considered to be smaller in reach, scale, scope and size compared to MSEs (Taks, 2013). Nevertheless, while smaller events are considered to generate limited economic activity, their outcomes and net benefits for residents may actually be perceived to be more positive (Matheson, 2006; Agha & Taks, 2015). Smaller events are based, not least, on smaller, local resources and are therefore more likely to operate with less of a resource shortage or even at an optimum level where the demanded and supplied resources are well matched (Agha & Taks, 2015). Non-mega events with not so much demand have a higher potential for optimal economic impact compared to mega events with higher resource demands. Moreover, a larger amount of smaller events that do not absorb all the host's resources may eventually be more beneficial than one mega event that exceeds the host's resources and requires substantial expenditures to meet the resource demand (Ziakas & Costa, 2011; Agha & Taks, 2015).

Although the various research on the effects of sporting events has concentrated on tangible effects, currently, a shift in interest towards intangible effects such as social impact, both positive and negative, has been observed (Guo et al., 2012; Wicker et al., 2012). Social effects, which supposedly become apparent at the time of a given sporting event, are considered to be connected with "collective and individual value systems, behaviour patterns, community structures, lifestyle and quality of life" (Balduck et al., 2011). Indeed, there is some evidence of a relation between sporting events and positive social outcomes: enhancing social unity and social interactions, feel-good factor, national pride, sport participation, knowledge exchange, better quality of residents' life due to urban remodelling, raising awareness of disability, inspiring children and promoting a healthy style of life (Burbank et al., 2001; Preuss & Solberg, 2006; Misener & Mason, 2006; Kellett et al., 2008; Kavetsos &



Szymanski, 2010; Weed et al., 2009; Zhuang & Girginov, 2012; Dowling et al., 2013).

Nevertheless, these, again, refer almost exclusively to mega sporting events.

One of the few examples of cases of NMSEs providing social impacts and outcomes has been proposed by Taks (2013), who distinguishes four social components: power relations (e.g. the involvement of the local residents in the event's decision-making process), urban regeneration (e.g. the upgrading or construction of sports facilities in order to face the needs of local residents), socialisation (e.g. feelings of pride and identity) and human capital (e.g. opportunities for the personal growth and skills development of local residents through volunteering). The author confirms that under certain conditions, social benefits for host community residents are more likely to happen regarding smaller compared to larger sporting events. A slightly extended approach to the definition of social impacts is provided by Djaballah et al. (2015). The proposed components related to social impacts and outcomes include: social capital, well-being, collective identities, sport participation, urban regeneration, and human capital. The authors describe each of the above components in detail, indicating the concise examples of positive and negative social effects contained in these groups. Although they emphasize that the occurrence of these effects has its source in hosting MSEs, they undertake analyses of the key local government stakeholders' perceptions of possible social impacts of NMSEs hosted in 25 medium-sized cities in France. The respondents definitely more often perceived positive than negative social impacts of NMSEs (73 per cent of respondents). In the group of positive effects, "social capital" was indicated, notably referring to benefits for the youth, who are able to come and see the event due to accessible ticket prices. Interestingly, a connection between local corporations and social impacts was discovered. This confirms that the growing business interest in the social aspects of sporting events might stem from the close relation between social and economic outcomes (Dowling et al., 2013).





The organisation of NMSEs does not prevent the possibility of obtaining social benefits from the feel-good factor (Smith, 2009). This leads to experiencing social opportunities, including spending time with family and friends or the opportunity to meet new acquaintances (Kaplanidou, 2012). Even smaller events may provide fun, which has a social value and allows the social lives of communities to be enriched (Chalip, 2006).

In assessing the importance of NMSEs in generating social effects, it is inevitable to compare these events to their mega counterparts (Taks, 2013; Taks, Green, Misener & Chalip, 2014; Taks et al., 2015). These comparisons, in general, unveil the higher potential of smaller events for social benefits, which results from “the creation of tighter social networks and connectedness of the local population with the event” (Taks et al., 2015).

One important factor is that smaller events do not need the construction of sports facilities, which is common for MSEs. If this is the case, then the sports venues used for the organisation of NMSEs to a greater extent meet the expectations of local residents. This means that in the long term the facility is likely to be utilised by the community, instead of becoming a “white elephant”. A prime example may be found in Gdansk, where there are two main sports venues: a football stadium completed for 850 million PLN on the occasion of Euro 2012 in Poland (MSE), and the not so expensive Ergo Arena Hall used to organise many different smaller events. The former has hardly ever been filled with spectators, and carries extravagant maintenance expenditures, not to mention huge debts (Zawadzki, 2013). The latter is far more often used, which means that it meets the locals’ needs in a better way, while not being such a heavy financial burden.

NMSEs are more accessible for local residents than MSEs due to lower ticket prices and the simpler distribution of tickets (Bladen, Kennel, Abson & Wilde, 2012). In Gdansk, the prices of tickets for a match within Euro 2012 were in the range of PLN 120-2400, depending on the type of match and the place in the stadium. In turn, tickets for smaller sporting events



held at Ergo Arena Hall were always several times less expensive, ranging between 45 and 450 PLN (IAAF), and between 40 and 170 PLN (Volleyball). In the case of the European Men's Handball Championship in 2016, tickets were even cheaper and started from 39 PLN.

Several studies proved that a higher proportion of local residents versus non-local visitors have attended NMSEs compared to MSEs (Taks et al., 2009; Taks, 2013). This means that in the case of smaller events, one can expect to reveal a higher level of “consumer surplus” – firstly, because of the lower ticket price and secondly, due to the fact that NMSEs may be hosted in smaller cities or hosted more often (Taks et al., 2011). Again, Gdansk may be used as an example, which already after Euro 2012 was, or will be, the host of at least a few important major but not mega sporting events. At the same time, the likelihood that the city will organize another mega event in the coming years should be considered to be zero. Conversely, Sopot - a small city, has no chance to independently organize an MSE. However, this does not rule out the organization of NMSEs, as exemplified by the organization of the World Indoor Championships in Athletics in 2014, which provided a unique entertainment opportunity for the local community.

On the other hand, it is recognized that the possibility of negative social effects, although possible, is perceived as less likely in the case of NMSEs (Taks, 2013; Djaballah et al., 2015). This is due to the fact that smaller events are less intrusive in terms of stress, noise, traffic congestion, parking problems, acts of hooliganism, and many others (Fredline et al., 2003; Smith, 2009). Hence the general conclusion that NMSEs have the potential to create more positive and less negative social impacts on the quality of life of the residents in the host community compared to their larger counterparts.

Despite the advantage in creating a positive social impact, it is not known how NMSEs actually affect the host cities' residents from the intangible, non-monetary perspective.

Although there are methods that allow for the monetary valuation of potential social effects,



including those which attempt to value them using the contingent valuation method (CVM), they refer only to MSEs (Atkinson et al., 2008; Walton, Longo & Dawson, 2008; Preuss & Werkmann, 2011; Zawadzki, 2016). Thus far, no submission was received on this topic regarding the particular issue of NMSEs, although, as mentioned above, non-mega sporting events may reveal a contribution to these effects.

### **The application of CVM to estimate the benefits of NMSEs**

To distinguish a public good from a private good, two fundamental characteristics should be pointed out: non-rivalry and non-excludability of consumption (Drahos, 2004). The public good category cannot fully include the effects of a sporting event. Instead, they are a quasi-public good, as they have the characteristics of both a private and a public good. On the one hand, residents can buy tickets for sports matches, thus becoming active participants in the event. On the other hand, they may decide not to incur expenses in connection with the organization of the sporting event, for example through lack of interest. Nevertheless, they may be affected by the event in a different way, e.g. due to infrastructure changes improving their quality of life. The first group represents the use value (UV) of the sporting event and the second group the non-use value (NUV) (Johnson, Grootuis & Whitehead, 2001). The consumption of private goods reflects the use value while the consumption of public goods reflects the non-use value (Castellanos & Sanchez, 2007).

On the one hand, as indicated above, the effects of a sporting event are never fully related with the public good, yet on the other hand, the preparation and organization of the event may use funding solely from public sources. In such a case, public expectations concerning the justification of the use of such funds are fully legitimized. The NUV is used for this very purpose, synonymous with the consumption of a public good. As this is more

difficult to value, it is therefore less likely to be considered in a traditional economic calculation. For some economists, this is identified directly with the ephemeral, difficult-to-measure, intangible effects on society of a given good (Crompton, 2004).

The Contingent Valuation Method (CVM) makes it possible to estimate the value of goods beyond the use value (Walker & Mondello, 2007). According to Carson (2000, p. 1413), "Contingent valuation (CV) is a survey-based method frequently used for placing monetary values on goods and services not bought and sold in the marketplace". CVM research entails a hypothetical scenario in which respondents are asked to play the role of market participants to elicit people's preferences for certain goods by discovering how much they would be willing to pay (how much is their WTP) for particular improvements in them (Mitchell & Carson, 1989). Therefore, the members of this social group (i.e. the users) determine the UV as they use their own financial means for the possibility to directly use the given good. In the context of NMSEs, this social group will include all those who purchase tickets to the sporting events. The individuals who gain benefits and/or bear costs not associated with the direct use of the resources make it possible to determine the NUV (so-called non-users).

Similarly to all other methods, CVM is not without flaws (Wicker & Orłowski, 2019). As Whitehead (2005) pointed out, it is difficult to establish whether responses to hypothetical questions are credible and can therefore be considered valuable and measurable, which leads to the issue of hypothetical bias. Hypothetical bias exists if, for example, survey respondents pay little attention to their budget constraints and overstate willingness to pay (Walker & Mondello, 2007). If hypothetical bias is present in stated preference data then benefit estimates are biased upwards and the net benefits are upwardly biased. Although hypothetical bias is a serious problem, there are CVM studies in sport's economics that attempt to mitigate it (Wicker, Whitehead, Mason, & Johnson, 2017). Furthermore, a viable alternative to CVM



that would allow NUV to be better estimated has not been proposed. Moreover CVM, according to Wicker (2011), is less expensive and time-consuming than other methods such as the travel-cost method and hedonic pricing, which have a similar purpose.

### **CVM studies on NMSEs hosted in Ergo Arena Hall in Gdansk and Sopot**

Ergo Arena Hall, on the border of Gdansk and Sopot, in northern Poland, has functioned as a venue for sports and entertainment since 2010. Being one of the biggest and most modern facilities of this kind in Poland, it hosts a plethora of sports events, music concerts and cultural performances. Ergo Arena, since its opening, has hosted a variety of events, on average every three days, yet sporting events of various kinds are the most common.

Due to the location of the hall, on the border of two cities, its construction caused much controversy, including problems of a financial nature. Moreover, the construction phase of the hall, which was meant to last a year and a half in fact lasted three years. Due to this, the investment expenditures were vastly underestimated, which turned out to be a serious problem. Initially, the cost of the hall's construction was estimated at 100 million PLN, with the cities of Gdansk and Sopot allocating 25 million PLN of municipal funds for this purpose. In fact, the expenditures for Ergo Arena's preparation increased over threefold, to almost 330 million PLN, causing a burden on the budgets of both cities of 115 million PLN each. The use of an equal contribution of public funds from both cities was also controversial due to the substantial difference in the sizes of the two cities. The construction of the hall caused a disproportionately greater burden on the budget of Sopot since Gdansk, both in terms of area and number of residents, is over ten times larger than Sopot.

Three non-mega sporting events were the subject of this study: the World Indoor Championships in Athletics 2014, the European Men's Handball Championship 2016 and the



European Men's Volleyball Championship 2017. The 2014 IAAF World Indoor Championships in Athletics was held in Ergo Arena between 7<sup>th</sup> and 9<sup>th</sup> March 2014. As part of the 2016 tournament, six group stage matches took place at the hall on 16<sup>th</sup>, 18<sup>th</sup> and 20<sup>th</sup> January (each day two matches were played). In the case of the 2017 tournament, the venue in Gdansk and Sopot hosted four national teams that played five main phase games between 24<sup>th</sup> and 28<sup>th</sup> August. Each time, the CVM study covered the area of the two cities: Gdansk and Sopot. Research was conducted on a sample of 500 people - 250 per city. It was decided to do so despite the fact that Sopot is considerably smaller than Gdansk, yet its financial contribution is equal compared to Gdansk. Research was conducted about six months in advance of the event itself: for the 2014 IAAF World Indoor Championships in Athletics it was done in September 2013, for the European Men's Handball Championship 2016 - in June 2015, and for the European Men's Volleyball Championship 2017 - in February 2017. This allowed the question to be raised of hosting the events in the future and the willingness-to-pay statement to have a direct bearing on the outcome. Hence, it provides a plausible CVM scenario (Carson, 2000) and guarantees policy consequentiality, which is considered important to CVM research (Carson & Groves, 2007; Groothuis et al., 2015). Respondents were selected from among adult residents (18+ years old) of both cities whose postal code indicated their place of residence to be within the borders of either city - Gdansk or Sopot. In order to ensure the representativeness of the research sample, each time, the basic socio-economic parameters were agreed, with their features, including age, education and gender, distributed among the population of both cities (Table 1). The sampling method was a non-probabilistic quota sampling.

Each respondent in the study was read a description intended to increase their awareness of the issues treated in the study, and serving as an introduction. The description read as follows and was identical for all the respondents from both cities:



“Non-mega events such as the 2014 IAAF World Indoor Championships in Athletics (or the European Men's Handball Championship 2016; or the European Men's Volleyball Championship 2017), beyond revenues and costs of a financial nature, also generate a number of benefits of non-traditional valuation, so-called intangible benefits.

Typical intangible benefits include:

- social capital (local citizenship, neighbourhood connections),
- well-being (feel-good effect, national pride),
- collective identities (creating a sense of community, “communitas”),
- sport participation (health benefits, youth and senior participation in sport),
- urban regeneration (sport facilities, other infrastructural impacts), and
- human capital (volunteering, knowledge exchange).

These mentioned benefits affect all citizens to varying degrees. The extent to which the benefits are perceived may differ as well. For one, the benefits may have small, for others, large meaning.”

Afterwards, respondents were presented with a payment card including twenty different tax amounts (from 1 to 250 polish zloty). Then the hypothetical scenario was read: “Suppose that the hosting of non-mega sporting event (the 2014 IAAF World Indoor Championships in Athletics, etc.) due to financial reasons may not take place in Ergo Arena hall and there is a real risk of moving the event to other place somewhere beyond Tricity. The proposal to maintain the status quo has been put to a referendum vote for all residents of Gdansk and Sopot. How would you vote for the proposal of maintaining the organisation of sporting event in Gdansk and Sopot at the following tax amounts? Giving specific amounts will oblige you to make a payment in the form of a one-time additional tax burden increasing your household property tax. The specified amount will support the organization of the event in Ergo Arena Hall”.



The format of a payment card (Mitchell & Carson, 1984) with a single question regarding the exact value of WTP was chosen during the preparation phase of the research questionnaire. Despite the fact that no pilot study was carried out with the aim of calibrating the rates, it was assumed that the highest values of WTP would not exceed those obtained during Euro 2012, hosted in Gdansk (Zawadzki, 2016). It should be noted that the respondent, in answering the question in the payment card format (yes/no), agrees to the lower amount (for example 1 PLN) while rejecting next highest amount (2 PLN). This means that the actual willingness to pay is determined by an amount not less than 1 PLN and less than 2 PLN. It was assumed that WTP in conducted research was conservatively coded at the lower of these two amounts (in this case 1 PLN).

In accordance with the recommendations in the National Oceanic and Atmospheric Administration (NOAA) report, all respondents, when requested to provide their valuations, were informed that the expression of willingness to pay a certain amount in this study would translate into a burden on the budget of their household of exactly the same value, which could cause limitations on their purchase of other, either private or public goods (Arrow et al., 1993). Furthermore some *ex ante* approaches were attempted to mitigate hypothetical bias (Loomis, 2011). The first was a “cheap talk” informing the respondents that “past surveys have shown the WTP’s overstate”. In order not to do so, they were reminded to “report what they would pay if they use their own money”. The second consisted in explicitly informing the respondents that “the NMSE will be provided based on the results of the survey and that the probability of payment is exactly the same as the probability of the NMSE’s provision”.

The theoretical model is verified by the empirical part of the paper, which identifies the determinants that affect WTP (Table 2). Regression analysis is used to test for the validity of the willingness to pay statements. The determinants for WTP were selected in line with previously executed research in the wide context of sport. In relation to this, it was assumed





that the following factors had positively affected WTP: the level of education (Suessmuth, Heyne and Maennig, 2010), income (Wicker, 2011), and general interest in sport or sport's discipline, including watching matches on TV and at sports arenas (Carson, Flores & Meade, 2001; Atkinson et al., 2008). An important factor, positively affecting WTP is perception of intangible benefits (Preuss & Werkmann, 2011). The occurrence of a certain type of intangible positive effects (social capital, etc.) affecting the entity at the time of the NMSE organization in general should translate into the amount of proposed WTP for the analysed events (2014 IAAF World Indoor Championships in Athletics, etc.) in principle. On the other hand factors which had a negative impact on WTP were: the gender expression (for women) (Walton, Longo & Dawson, 2008) and the number of people living in the household (Castellanos & Sánchez, 2007). Younger and senior respondents were much more likely to express higher levels of WTP toward sporting events than senior in the middle age (Johnson, Mondello, Whitehead, 2007; Zawadzki, 2016).

The applied format of questions means that the feature of the dependent variable in the form of willingness to pay is that it is non-negative, while with high probability, for a large number of responses it equals zero. Indeed, the obtained results reveal that the total number of respondents who indicated a zero value was considerably large (over 1/3 of all responses). The dependent variable is therefore a left-censored value of zero.

Moreover, it is important to distinguish between genuine zeros and those which are protest zeros. A zero response does not always express a genuine zero. This is due to a respondent not understanding adequately the hypothetical scenario, their reluctance to unveil their own preferences or is a kind of protest against some aspect of the research questionnaire (Meyerhoff & Liebe, 2006). This protest is expressed in such statements as: "I should not be responsible for financing this good" or "I already pay enough taxes" (del Saz-Salazar & Guaita-Pradas, 2013). Protest responses are a problem for researchers as they distort the



results obtained. Although there is no universal solution in this area, this problem is usually solved by applying an additional question to the questionnaire to provide a reason for a zero valuation, and on this basis, the zeros are assigned to one of the two groups: genuine or protest (Castellanos et al., 2011).

One specification that allows for both types of zero (genuine and protest) is a selection model (Heckman, 1979). It assumes that respondents make two decisions with regard to valuing a good. The use of the first decision allows the determination of whether the respondent is willing to pay any amount of money for a good (the distinction between protest zeros and genuine zeros), while the second estimates the determinants which influence the WTP valuation. A different latent variable is utilised to model each decision process: to determine participation (selection equation) and to determine the expenditure level. Hence, the specification of Heckman's selection model is as follows (Castellanos et al., 2011):

$$DnoP_i = \begin{cases} 1 & \text{if } S_i^* > 0 \\ 0 & \text{if } S_i^* \leq 0 \end{cases}$$

$$S_i^* = Z'_i \delta + \varepsilon_i$$

$$WTP_i = X'_i \beta + u_i \text{ if } DnoP_i = 1$$

where:

DnoP is a dummy variable equal to 1 if the observation does not correspond to a protest zero, and 0 otherwise;  $S^*$  is the corresponding latent variable for the Probit model, and Z is a vector of determinants having a non-protest observation; X is a vector of explanatory variables; WTP is the WTP variable (PLN);  $\varepsilon_i$ ,  $u_i$  are error terms.

The specification of the selection model means that there are two sources for generating zeros, DnoP = 0 (protest zero) and DnoP = 1 (genuine zero). The assumption has been made that the



genuine zeros (396 out of 529 zero value answers) are zeros proposed due to one of the following reasons:

- “I am not interested in sport/the sporting event”;
- “Financial constraints do not allow me to propose a higher amount”.

All others responses, namely:

- “I am not responsible for decisions relating to the hosting or non-hosting of the event and do not consider myself obliged to incur any costs in this respect”;
- “I pay enough taxes and do not intend to bear any additional tax burden”;
- “My decision would have been different if the form of payment were not taxes”,

assign the indicated zero to the group of protest zeros (133 out of 529 zero value answers).

In the final stage of the study, the mean values of WTP have been used in order to obtain aggregate values of intangible benefits. Thanks to the appropriate selection of respondents in terms of gender, age and education, a representative sample has been obtained for the populations of Gdansk and Sopot, which enabled the transfer of WTP mean values to an aggregated level. Finally, the results were applied to the actual expenditure incurred in connection with the construction of Ergo Arena Hall. This provided a comprehensive way to determine the scale and direction of the impact of NMSEs on the host cities.

## **Results**

The analysis of the basic statistical information contained in Table 3 indicates generally higher average levels of  $WTP_{\text{benefit}}$  in Sopot compared to Gdansk. Higher WTP offers in the case of residents of Sopot may be explained by the higher level of age (AGE), and thus a greater sense of professional and financial stability. Considering the entire state, the

inhabitants of Sopot also have the smallest problem with finding a job. The unemployment rate in Sopot is one of the lowest in Poland. Moreover, it is highly significant that the area of the city of Sopot is much smaller compared to the area of the city of Gdansk, and therefore the availability of Ergo Arena Hall is much greater for the inhabitants of Sopot. In terms of communication, they are able to reach the sports facility faster and with less trouble due to its location on the border of the two cities.

Respondents also showed a generally greater interest in sport (INT\_S) in comparison to sports disciplines: athletics, basketball and volleyball (INT\_D). At the same time, volleyball raised the greatest interest among respondents in both Gdansk and Sopot. Such results are in line with the prevailing trend in Poland. Volleyball is the most popular discipline second only to football, and Poles are very successful both in terms of the national teams (World Champions two times in a row, in 2014 and 2018) and club games (Polish club teams have in recent years almost always been in the top four of the CEV Volleyball Champions League - Men). The highest average level of  $WTP_{benefit}$  for this sports discipline, indicated by both residents of Gdansk and Sopot: PLN 7.33 and PLN 11.29, respectively, is also a reflection of this state of affairs.

Respondents purchasing tickets for a sporting event were included in the users group. In none of the analyzed cases was their share among all respondents higher than 10%. Every tenth respondent - relating to residents of Sopot, admitted on-site participating in European Handball Championships.

A significant proportion of the respondents indicated the occurrence of positive social effects resulting from the organization of NMSEs. To the greatest extent, these intangible goods were perceived by residents of Sopot in conjunction with the 2016 European Handball Championships. Almost 42% of respondents pointed to the occurrence of the effect in the form of well-being, which includes the feel-good effect and national pride. What is worth



emphasizing, in both host cities, during each of the three analyzed sporting events, respondents pointed to the occurrence of positive social effects in all six components related to social impacts and outcomes proposed in the hypothetical scenario.

The analysis of  $WTP_{\text{benefit}}$  determinants was carried out in two ways (Table 4). At the first stage, it was examined whether respondents were willing to value social effects (selection equation). In this respect, it was important to distinguish between genuine and protest responses. The latter indicated the reluctance of the respondents to make a valuation. Due to the fact that in the additional questions, which aimed at assigning a zero valuation to one of two groups: genuine and protest, an important role should be attributed to the determinants referring to income and interest in sport, in the case of the selection equation, it was decided to use the following variables: INC, INT\_S, and INT\_D. The obtained results show that the decision to participate in the valuation was influenced by interest in the sports discipline (Gdansk 2014, Sopot 2017), and income (Gdansk 2016, Sopot 2016). General interest in sport (INT\_S), however, does not give unambiguous results. It appears that the variable INT\_S has a negative impact on the decision to participate in the valuation (Gdansk 2014).

Subsequently, the influence of the variables on the  $WTP_{\text{benefit}}$  offers was analyzed. Among the socio-economic variables, income (INC) has the greatest impact. In both cities, for each of the three events the level of coefficients was positive, with a high level of statistical significance (p-value <0.1). Moreover, a distinctive determinant affecting the amount of the offer turned out to be gender. According to expectations, males were more eager to propose higher values of  $WTP_{\text{benefit}}$ .

In the group of determinants indicating the respondents' attitudes to the events, statistically significant results were obtained in only a few cases. Both general interest in sport (INT\_S) in the case of Sopot in 2016, and attending the performance (MATCH) in the case of Sopot 2014, had a positive impact on the amount of the offer.



Predictably, perceptions of the intangible benefits were of great importance for the respondents' levels of WTP. On the whole, the coefficient relating to these variables obtained a positive value and was at the same time characterized by statistical significance. It does not matter where the respondents live, nor the type of sporting event, although the most transparent, positive relationships can be seen in the case of the European Volleyball Championship in 2017.

Table 5 shows that the number of users was relatively small compared to non-users. Nevertheless, the average level of  $WTP_{\text{benefit}}$  in all cases was higher for users than non-users. On the other hand the mean values of intangibles vary considerably within users and non-users groups. This may mean, that hosting NMSEs concerning popular disciplines in Poland may affect respondents regardless of whether they are active or only passive participants of events.

### **Aggregated use and non-use values of NMSEs organised in Ergo Arena Hall**

On the basis of the average value of willingness to pay and the number of adult residents of the two host cities, the results obtained in the research were aggregated (Table 6). According to these results, the valuation of the intangible benefits for all three NMSEs altogether amounts to over PLN 8.8 million. The amount was affected to the greatest extent by the valuation of the effects of the European Men's Volleyball Championship in 2017. The intangible positive social effects in this case were valued at over PLN 3.5 million. This may indicate a special attachment of Poles to volleyball and a readiness to propose a higher valuation.

Gdansk plays a greater role in the total valuation due to its vastly larger population. This is despite the fact that the mean WTP values were higher in Sopot during each of the analyzed



NMSEs. The valuation of intangible social effects in Sopot varied, depending on the event, from 8.9% to 12% of the aggregate total value for both host cities.

In the conducted research, the distinction between users and non-users was based on questions in the questionnaire referring to the purchase of tickets to Ergo Arena Hall during NMSEs. Typically, non-use value is the willingness to pay from those who are priced out of the market for the event. Hence, all those respondents who made tickets' purchases from their own means were considered users. Due to the much smaller number of users, aggregated use values should be considered much lower compared to non-use values. The total use and non-use value, amount to approx. 8.6 million PLN and 0.25 million PLN respectively.

As could be expected, the aggregated non-use values turned out to be many times higher in the case of Gdansk compared to Sopot. This conflicts with the equal share of both cities in financing the construction of the sports hall from public sources. Each city contributed PLN 115 million of public funds for the construction of Ergo Arena. Analyzing only the non-use value, this means that the valuation of intangible social benefits in the case of the three analyzed NMSEs covers this amount by approx. 7% for the city of Gdansk, while in Sopot only by ca. 0.73%. However, it should be emphasized that the organization of these NMSEs did not constitute an additional burden for the budgets of either city. In addition, Ergo Arena was not prepared specially for the analyzed events - in recent years, this sports arena has been, and in the near future will be, the venue for the organization of many other sporting events that can be considered as NMSEs. Although the obtained valuation of social effects is not particularly spectacular, it should be stated that it is high enough to justify the involvement of public funds, especially in the larger Gdansk.

## **Discussion**

Due to a lack of similar research, it is difficult to say whether the obtained valuation of the social intangible benefits is high, compared with other events of similar rank and size in Poland and other countries. It is known, however, that the valuation of these intangible effects is lower when comparing them with the results obtained in Poland at the time of Euro 2012. For example, the value of social benefits obtained in Gdansk during the MSE in 2012 was approx. 4-5 times higher compared to each of the analyzed NMSEs (Zawadzki, 2016). This should not come as a surprise - the size of the event determines the level of obtained benefits, including those which are intangible.

It is worth bearing in mind, however, that Euro 2012, on the other hand, generated enormous costs, including the construction of a football stadium in Gdansk for an amount exceeding PLN 900 million (Zawadzki, 2013). In this respect, the organization of each of the three NMSEs should be considered significantly cheaper. They took place in the existing hall, and their organization did not involve additional expenditures which would burden the budgets of the host cities.

The obtained aggregated values using the CVM method are not high, comparing them with the tangible expenditures for the construction of Ergo Arena. However, if we assume what is confirmed in the conducted research, that each NMSE determines the occurrence of beneficial social effects, then the interested cities should strive to maximize the number of events hosted at the existing facility. The example of Gdansk and Sopot shows that this is possible. In addition to the three analyzed in Ergo Arena Hall, at least two other NMSEs have been held in recent years and a further two are planned in the near future: the Women's European Volleyball Championship and the European Athletics Team Championships. It is difficult to imagine such a frequency of organizing MSEs in one venue, not least because there are very few events which can be considered “mega”.



The justification for spending public funds is much easier in the case of larger cities like Gdansk. The equal share in the financing of the hall on the border of Gdansk and Sopot, in view of the significant differentiation in the size of both cities, should be considered problematic. From the perspective of Sopot, although the average WTP values were higher, the aggregated values were significantly lower. In the case of a smaller city, even a very large number of events will not allow a valuation of social effects that would justify the expenditure incurred. In turn, in the case of Gdansk, it can be assumed that already several dozen of NMSEs, similar to those analysed, would allow a valuation of the aggregated intangible benefits to be obtained at the level of the outlays incurred from the city budget aimed at the construction of the sports facility.

## **Conclusions**

The hall on the border of Gdansk and Sopot is a perfect example of using the existing infrastructure to host many not mega, but still large and important, sporting events. The regression analysis indicates that readiness to support NMSEs organized in Poland depended primarily on income. The resources of the respondents' portfolio affected not only their willingness to make a valuation, but also the amount of proposed payments (offers). Interest in a particular sports discipline affected their readiness to participate in the valuation, while general interest in sport was significant in the context of the proposed amounts of WTP. In addition, higher levels of offers were proposed by males, and most importantly from the perspective of the conducted research, by those who perceived the positive social effects. Interestingly, it has occurred that the event's valuation depends on the discipline. In this respect, the importance should be attached to volleyball, which is a particularly popular sports

discipline in Poland, in which Poles have for many years achieved measurable successes both on the national and the club level. Furthermore it's worth mentioning that in the years 2014-2017 deflation occurred in Poland, which means that actual valuation from 2017 would be even higher.

The presented research concept is not free of shortcomings. Firstly, it concerns only two host cities where the most visible impact of NMSEs should have been expected. This does not mean that there are no other cities in close proximity to Gdansk and Sopot whose residents may benefit from intangible social effects due to the organization of these events. Taking into account the valuation of these positive effects in cities such as Gdynia, or smaller towns well connected with the Tri-City (including Pruszcz Gdanski, Wejherowo and Kartuzy), would very likely improve the obtained results.

Finally, the presented valuation of social effects applies only to benefits. The intangible costs are missing, yet it may also be assumed that they appear (e.g. social divisions or decreased sense of security) and may be valued. Only their inclusion would allow the intangible net social benefits to be estimated, the amount of which should be compared to the expenses incurred for the construction of the hall. The organization of subsequent NMSEs in Poland in the near future introduces such a possibility, although it is worth carrying out similar research in other host countries for comparative purposes.

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Table 1.

*Population characteristics of Gdansk and Sopot at the time of organization of non-mega sporting events*

Specification	City population	Research sample
Gdansk 2014		
Age mean [years]	42.2	40.2
Gender expression [%]	Males	46.4
	Females	53.6
Education [%]	Tertiary	28.0
	Secondary	40.0
	Basic vocational	20.0
	Others	12.0
Sopot 2014		
Age mean [years]	46.5	44.0
Gender expression [%]	Males	46.4
	Females	53.6
Education [%]	Tertiary	40.0
	Secondary	40.0
	Basic vocational	10.0
	Others	10.0
Gdansk 2016		
Age mean [years]	42.5	43.1
Gender expression [%]	Males	46.4
	Females	53.6
Education [%]	Tertiary	30.0
	Secondary	38.0
	Basic vocational	12.0
	Others	20.0
Sopot 2016		
Age mean [years]	47.0	48.2
Gender expression [%]	Males	45.6
	Females	54.4
Education [%]	Tertiary	37.0
	Secondary	42.0

	Basic vocational	10.5	13.0
	Others	12.2	8.0
Gdansk 2017			
Age mean [years]		42.6	40.5
Gender expression [%]	Males	47.4	46.4
	Females	52.6	53.6
Education [%]	Tertiary	27.0	28.5
	Secondary	36.0	36.5
	Basic vocational	15.0	16.0
	Others	22.0	19.0
Sopot 2017			
Age mean [years]		47.2	46.7
Gender expression [%]	Males	46.5	46.0
	Females	53.5	54.0
Education [%]	Tertiary	36.7	41.0
	Secondary	40.6	42.0
	Basic vocational	10.5	9.5
	Others	12.2	7.5

*Table 2.*

*Details of WTP determinants*

Variable	Symbol	Description
<b>Socio-economic</b>		
Age	AGE	Number of years
Gender	GEND	1 = male; 0 = female
Education	EDU	From 1 = University degree To 5 = Primary education
Income	INC	Gross monthly income: from 1 = to 1500 zloties; to 9 = above 8500 zloties
Household size	HHSIZE	The number of members of the household
<b>Defining the attitude to the event</b>		
General interest in sport	INT_S	From 0 = none to 4 = very strong (every day)
Interest in sports discipline (athletics, handball, volleyball)	INT_D	From 0 = none to 4 = very strong (every day)
Attending the event's performances	MATCH	0 = no; 1 = yes
<b>Intangible benefits</b>		
Social capital	SOCIAL	0 = no; 1 = yes
Well-being	WELL	0 = no; 1 = yes
Collective identities	IDENTITY	0 = no; 1 = yes
Sport participation	SPORT	0 = no; 1 = yes
Urban regeneration	URBAN	0 = no; 1 = yes
Human capital	HUMAN	0 = no; 1 = yes

Table 3 Basic statistics of WTP and its determinants

Variables	2014 World Indoor Championships in Athletics				2016 European Handball Championship				2017 European Volleyball Championship			
	Gdansk 2014		Sopot 2014		Gdansk 2016		Sopot 2016		Gdansk 2017		Sopot 2017	
Metric/Ordinal	mean	SD	mean	SD	mean	SD	mean	SD	mean	SD	mean	SD
WTP <sub>benefit</sub>	6.01	18.82	7.05	17.52	6.08	22.27	9.99	20.22	8.04	19.86	11.29	26.83
AGE	40.2	11.1	44.0	9.8	43.1	11.4	48.2	13.2	40.5	12.8	46.7	14.6
EDU	2.34	1.15	2.6	1.23	3.51	1.05	2.23	1.23	3.39	1.14	2.63	1.14
INC	3.72	2.31	3.62	1.82	3.69	1.89	3.62	2.15	4.12	2.07	4.62	2.00
HHSIZE	3.63	1.3	3.11	1.14	2.9	1.51	3.29	1.3	3.06	1.45	3.6	1.28
INT_S	1.66	1.18	1.75	1.29	2.28	1.14	1.9	1.23	2.29	1.15	2.31	1.13
INT_D	1.55	1.29	1.53	1.27	1.86	1.04	1.2	1.09	1.92	0.88	2.14	1.05
Dummy	% of respondents		% of respondents		% of respondents		% of respondents		% of respondents		% of respondents	
GEND	46.4		46.4		46.4		45.6		46.4		46.0	
MATCH	4.0		5.2		5.6		4.4		6.8		3.2	
SOCIAL	19.6		8.8		9.2		37.6		15.6		3.6	
WELL	21.2		16.8		17.6		41.6		4.8		18.0	
IDENTITY	24.4		16.8		11.2		35.2		13.6		25.2	
SPORT	17.2		8.8		7.2		17.6		14.4		12.0	
URBAN	11.6		6.4		5.2		7.2		12.8		13.2	
HUMAN	8.0		5.2		6.0		8.8		11.6		12.0	



Table 4. Analysis of  $WTP_{benefit}$  determinants

	Gdansk 2014 $WTP_{benefit}$		Sopot 2014 $WTP_{benefit}$		Gdansk 2016 $WTP_{benefit}$		Sopot 2016 $WTP_{benefit}$		Gdansk 2017 $WTP_{benefit}$		Sopot 2017 $WTP_{benefit}$	
	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value
<b><math>WTP_{benefit}</math> equation</b>												
AGE	-.3562032	0.670	-.9656884	0.182	.1539341	0.810	.7150614	0.265	-.6512021	0.382	.8581251	0.383
GEND	5.641948	0.014	4.27368	0.023	.8361123	0.757	7.492725	0.001	-1.484205	0.564	-.9623788	0.767
EDU	-1.142357	0.319	.0948958	0.905	.9737989	0.452	-.7094738	0.464	1.580728	0.161	-.2847452	0.842
INC	2.697424	0.010	4.288089	0.001	6.077045	0.004	3.969398	0.000	1.374699	0.053	3.779095	0.007
HHSIZE	-.3829352	0.696	.2431834	0.769	-.4366769	0.645	1.434772	0.112	.133144	0.888	2.198276	0.088
INT_S	-1.047574	0.820	2.524961	0.148	2.477722	0.438	6.451143	0.000	-1.278311	0.847	5.611877	0.195
INT_D	3.808718	0.446	.3027532	0.894	1.904819	0.591	-1.404866	0.358	2.018277	0.522	4.783955	0.483
MATCH	-7.164332	0.325	13.57365	0.009	3.004283	0.617	-9.177935	0.128	-.4583595	0.925	20.25344	0.114
SOCIAL	3.627667	0.215	.3560176	0.919	7.946796	0.107	1.716507	0.488	7.544731	0.237	15.25642	0.001
WELL	-.6297209	0.836	7.536771	0.005	3.943251	0.253	4.7728	0.088	23.25727	0.000	1.854873	0.676
IDENTITY	-2.563177	0.443	5.550431	0.028	13.04066	0.000	2.077615	0.449	18.95487	0.000	13.04152	0.002
SPORT	.2758773	0.933	.6043251	0.859	-5.849907	0.188	1.125919	0.716	4.711537	0.191	21.5294	0.000
URBAN	2.016741	0.475	7.966267	0.043	2.063723	0.718	-.8877876	0.843	10.42445	0.006	5.328489	0.299

HUMAN	1.492611	0.692	17.12775	0.000	.0614286	0.991	-4.518579	0.290	2.393174	0.557	3.396785	0.555
const	-14.0706	0.185	-24.00604	0.126	-40.07078	0.021	-31.71977	0.000	-4.005185	0.885	-60.83036	0.009
<b>Selection equation</b>												
INC	-.0472108	0.333	.0685899	0.253	.179747	0.019	.1445004	0.037	-.0138085	0.799	.0674324	0.309
INT_S	-.2769297	0.085	.0439552	0.709	.0495512	0.794	-.2979881	0.200	.2809738	0.026	-.0530855	0.797
INT_D	.5322226	0.040	-.1896276	0.229	-.0432534	0.845	-.0210304	0.877	-.1124602	0.494	.4289947	0.100
const	1.501216	0.000	.8877629	0.001	.6394694	0.143	.8815732	0.002	.995604	0.013	.3088389	0.444
$\lambda$	54.92	0.266	29.8	0.545	69.926	0.214	25.337	0.283	-15.508	0.852	67.239	0.131
$\rho$	1.693		1.3753		1.90636		1.24299		-0.77006		1.74910	
$\sigma$	32.438		21.67		36.680602		20.384336		20.138709		38.44259	

Table 5

Mean values of  $WTP_{benefit}$  and its determinants based on users and nonusers

	Gdansk 2014		Sopot 2014		Gdansk 2016		Sopot 2016		Gdansk 2017		Sopot 2017	
	users	n-users	users	n-users	users	n-users	users	n-users	users	n-users	users	n-users
	n=15	n=235	n=16	n=234	n=24	n=226	n=29	n=221	n=28	n=222	n=21	n=229
$WTP_{benefit}$	6.60	5.97	22.69	5.98	7.5	5.92	15.31	9.0	9.86	7.81	20.85	10.41
AGE	41.0	40.1	42.5	44.1	43.0	43.1	46.8	48.0	40.6	40.4	47.2	46.6
EDU	1.93	2.37	2.56	2.60	3.54	3.50	2.38	2.21	3.39	3.39	2.71	2.62
INC	4.33	3.68	4.56	3.56	3.79	3.68	3.76	3.61	4.21	4.11	5.0	4.58
HHSIZE	3.93	3.62	3.19	3.11	2.62	2.92	3.28	3.29	3.29	3.03	3.29	3.63
INT_S	3.00	1.57	2.75	1.68	2.04	2.31	2.76	1.79	2.32	2.29	2.71	2.27
INT_D	3.33	1.44	2.93	1.43	1.71	1.88	1.72	1.14	1.75	1.83	2.33	2.12
GEND	47 %	46 %	44 %	47 %	54 %	46 %	38 %	47 %	43 %	47 %	43 %	46 %
MATCH	100%	0 %	100 %	0 %	100 %	0 %	100 %	0 %	100 %	0 %	100 %	0 %
SOCIAL	33 %	19 %	0 %	9 %	17 %	8 %	69 %	33 %	4 %	4 %	29 %	14 %
WELL	27 %	21 %	37 %	15 %	37 %	15 %	31 %	43 %	0 %	5 %	29 %	17 %

IDENTITY	7 %	26 %	19 %	17 %	8 %	11 %	21 %	37 %	11 %	14 %	43 %	24 %
SPORT	7 %	18 %	25 %	8 %	8 %	7 %	34 %	15 %	11 %	15 %	5 %	13 %
URBAN	20 %	11 %	19 %	6 %	0 %	6 %	21 %	5 %	4 %	14 %	5 %	14 %
HUMAN	27 %	7 %	6 %	5 %	4 %	6 %	14 %	8 %	0 %	13 %	14 %	12 %

*Table 6.*

*Aggregated values divided into use and non-use components*

Event	City	Total	NUV	UV
2014 IAAF World Indoor Championships in Athletics	Gdansk	2,372,365.26	2,357,554.98	14,810.28
	Sopot	232,647.43	197,348.68	35,298.75
	Both cities	2,605,012.69	2,554,903.66	50,109.03
European Men's Handball Championship 2016	Gdansk	2,390,669.04	2,331,169.38	59,499.66
	Sopot	327,156.94	304,280.61	22,876.33
	Both cities	2,717,825.98	2,635,449.99	82,375.99
European Men's Volleyball Championship 2017	Gdansk	3,152,749.32	3,062,877.00	89,872.64
	Sopot	366,154.39	337,711.83	28,442.56
	Both cities	3,518,903.71	3,400,588.83	118,315.2

