Highlights

- We compared sporting events of different sizes held in the same city in terms of the valuation of intangible social benefits.
- We found that sporting events, regardless of their size, determine the occurrence of social impacts among host residents.
- We found that by valuing intangible effects, it is possible, at least partially, to justify the spending of public funds for the organisation of sporting events.
- We found that even though higher average values, and consequently higher aggregated values, have been observed for mega sporting events, smaller sporting events have greater potential for host cities.
- The findings have implications for policymakers since they indicate that the organisation of smaller sporting events determines the occurrence of social impacts not smaller than those observed for MSEs.

Abstract

The main aim of this study is to assign value to intangible effects, including social impacts, which appear when organising sporting events of various scales in the city of Gdansk located in northern Poland. A survey was conducted to determine the city residents' willingness-to-pay (WTP) using the contingent valuation method (CVM). The average WTP values, which ranged between PLN 6.04 and PLN 46.34, show that the scale of the sporting event may be important for the local community’s perception of such social impacts as well-being and urban regeneration. However, considering the costs of organising sporting events – including the preparation of sporting facilities – it turns out that it is easier to justify spending public funds for holding smaller events, among others, due to the possibility of organising such events in the same place more frequently.

Keywords: cost-benefit analysis, public finances, social impacts, CVM, MSE, NMSE

Public valuation of social impacts. The comparison between mega and non-mega sporting events

Introduction

In the global literature, the most commonly discussed effects of organising sporting events include those related to mega sporting events (MSEs), as well as the economic impact of such events on the host economy (Barclay, 2009; Matheson, 2009; Tien et al., 2011; Zimbalist, 2015). However, research on the potential effects of smaller sporting events, including non-mega sporting events (NMSEs), is less frequent. If the latter topic is addressed, it is done to discuss the NMSEs' potential social impacts specifically (Djaballah et al., 2015; Taks et al., 2015). In this respect, smaller events are considered more sustainable than their larger "big-bang" counterparts (Smith, 2010). Furthermore, it implies that NMSEs open up greater opportunities for creating a social legacy compared to MSEs (Gratton & Preuss, 2008; Cornelissen et al., 2011).

Yet, even if this is the case, MSEs and NMSEs held in the same place and at a similar time have never been compared before. Although, in general, intangible constructs such as "civic pride" or "well-being" have been measured frequently in social impact studies (Kim et al., 2015; Schlegel et al., 2017; Oja et al., 2018), monetary valuation of social impacts is difficult to gauge and therefore, missing. While there have been some attempts to evaluate them, primarily using the contingent valuation method (CVM), these endeavours concerned only MSEs (Atkinson et al., 2008; Walton et al., 2008; Zawadzki, 2016). To include such intangible, social impacts in the overall balance of costs and benefits of organising sporting events appears appropriate, especially since public funding is used frequently to finance them these days (Dwyer & Forsyth, 2009; Zawadzki, 2017). However, justifying the use of these funds solely based on the real cash flow is a difficult task, especially given the enormous

capital requirements that appear in the event organisation process – especially in the case of larger sporting events (Baade & Matheson, 2002; Zimbalist, 2015).

There is no full compliance regarding the attributes that should distinguish mega-events from other types of smaller events. In consequence, there is variability in defining large events (Mules & Faulkner, 1996; Jago, 1997; Horne, 2007; Gold & Gold, 2011; Mills & Rosentraub, 2013; Müller, 2015; Zawadzki, 2017; Getz & Page, 2019), though the most frequently cited attributes include: the frequency of the event, the uniqueness of the event, the number of observers, the recognition of the organiser, the size of the expenditures, the participation of the state and public funds, media attractiveness and the impact on the host. NMSEs are generally smaller and less expensive than their mega counterparts, yet still considered large (Gratton & Taylor, 2000). Müller (2015) distinguishes between mega and other large events based on four independent criteria: visitor attractiveness, media range, overall cost and urban transformation. According to these attributes, Müller considers the Summer and Winter Olympics, the largest football tournaments (FIFA, UEFA) and Asian Games as mega-events. The same approach was employed in this paper, where UEFA Euro 2012, organised in Poland and Ukraine, has been perceived as a mega sporting event.

The main objective of this paper is to estimate and compare the monetary value of intangible social benefits of one mega sporting and two non-mega sporting events held in two sporting arenas in Gdańsk, Poland, using CVM. While Poland was chosen to host other large events relatively often after the organisational success of UEFA Euro 2012, none of them was an MSE. Therefore, this paper presents research results concerning the 2016 European Men's Handball Championship and the 2017 Men's European Volleyball Championship. The UEFA Euro 2012 and the latter two events were held in Gdańsk.

An indirect aim of the study is to compare the valuation of the social impacts of the sporting events examined to the expenditure incurred for the construction of two sporting

arenas in Gdańsk, i.e. Ergo Arena Hall and Arena GdańskStadium, which amounted to PLN (Polish zloty) 330 million and PLN 850 million respectively.[1] The former was utilised at the time of NMSEs: the 2016 European Men's Handball Championship and the 2017 Men's European Volleyball Championship, while the latter, during the Euro 2012 tournament, out of which four matches were hosted in Gdańsk. The city of Gdańsk covered a significant portion of these construction expenses, namely 85 per cent in the case of Arena Gdańsk and 35 per cent in the case of Ergo Arena. It is difficult to justify solely based on tangible benefits. Thus, CVM was applied to determine intangible effects based on positive social impacts. Although in the literature, there were some endeavours to use CVM in order to value sports facilities perceived as public goods (Johnson et al., 2012), it was never applied to compare arenas located in the same city and hosting both an MSE and an NMSE.

The structure of the paper is as follows: the first section describes the theoretical background concerning sporting events' social impacts, as well as the use of CVM to valuate them. The second section presents the concept and basic features of the CVM surveys and methodology, as well as the results of the empirical analysis, including the comparison between the aggregated intangible values and the real expenditures connected with the construction of sporting arenas in Gdańsk. The main conclusions are included in the final section.

Theoretical background concerning social impacts of sporting events and their valuation using CVM

In the context of this paper, the impact of sporting events on social issues should be stressed. Social effects are supposed to appear at the time of a given sporting event and are considered to be linked with "collective and individual value systems, behavior patterns, community structures, lifestyle and quality of life" (Balduck et al., 2011, p. 194). Indeed, in the literature, there are examples of a close relationship between sporting events and positive

social outcomes: civic pride, social unity and cohesion, feel-good factor, improvement of self-esteem, improved quality of life, motivation to lead a healthy lifestyle, inspiration for the younger generation and many others (Zawadzki, 2022). Despite the wide variety of events held today, the most important criterion for researchers is their scale (Roche, 2000; Rojek, 2014). Researchers are typically interested in the economic impact of the largest ones, referred to in the global literature as mega-events (Soutar & McLeod, 1993; Walle, 1996). The reason seems apparent. The scale of the potential economic impact of an event is supposed to increase along with its size (Witt, 1988;). Nevertheless, there has been a growing interest in smaller and much cheaper sporting events (Taks, 2013; Djaballah et al., 2015). This is due to at least three vital reasons. Firstly, some authors argue that the event's size is insufficient to determine economic impact, and it should be considered in relation to the city's resources (Agha & Taks, 2015). Secondly, it is becoming increasingly difficult to justify spending enormous amounts of money on mega sporting events such as Olympic Games or the greatest football tournaments, which – as more and more research suggests – do not benefit the host economy unequivocally (Zimbalist, 2015). Last but not least, researchers also seek the effects of sporting events other than economic ones. Social impacts, which are of growing interest to researchers dealing with the impact of variously sized sports events, seem particularly vital in this regard (Smith, Ritchie & Chien, 2019; Wallstam, Ioannides & Pettersson, 2020; Biaett & Richards, 2020).

Both types of sporting events considered in the following paper potentially contribute to the numerous positive and negative social impacts, which may translate into specific, positive or negative social outcomes (Taks, 2013). It is assumed that social impacts revolve around different stakeholders in the host communities: entrepreneurship, public and non-public sector units and most of all – the residents (Small, 2007; Guo et al., 2012; Parra-Camacho et al., 2021). These specific impacts improve the quality of life, even though the

catalogue of possible social dimensions is exceptionally capacious and reaches beyond the one-sided perception of the relationship between the organisation of a sporting event and the occurrence of potential social outcomes involving the host residents. The numerous group of social impacts and social dimensions is provided in Table 1. However, the proposed social effects are not only positive. Although less frequently, research has demonstrated that hosting sporting events may also result in negative social impacts (Kim et al., 2015; Taks et al., 2020). For instance, the organisation of a sporting event, instead of improving, may deteriorate the quality of life due to overcrowding, increased traffic, noise, acts of vandalism and excessive interference with urban structures or the environment (Djaballah et al., 2015; Smith et al., 2021).

Attention is also drawn to the discrepancies in the scope of influence of the said social impacts on residents, which is related to the size of the sporting events. NMSEs are based particularly on smaller local resources. They are, therefore, more inclined to operate with a smaller resource deficiency or even at an optimum level, where demanded and supplied resources are well-matched (Agha & Taks, 2015). Non-mega events with a lower resource demand exhibit a higher potential for optimal economic impact than mega-events with higher demands. Therefore, according to some, even though the former can create limited economic activity, their net social benefits may be more favourable than those resulting from the latter (Matheson, 2006). According to Zawadzki (2020), the advantage of NMSE over MSE consists in the lack of requirement to own an often oversized sports facility, most frequently not adapted to the needs of the local community. The organisation of an NMSE is less expensive, while the event itself is more accessible for host residents due to, among other things, lower prices of tickets (Bladen et al., 2012). Additionally, social benefits may become more apparent in the case of NMSEs vs MSEs because the former may occur in a given location more than once (Taks et al., 2011). More importantly, it may carry stronger direct

community involvement and closer social connectedness (Taks, 2013; Kerwin et al., 2015). For many small towns and cities, the NMSE is the only chance to organise an important sporting event, which provides an opportunity to induce social impacts. Apart from the NMSE's potential for positive effects, voices claiming that adverse effects are more likely to result from the MSE have also been raised. They include increased social polarisation and inequalities between local communities (Whitson & Horne, 2006; Taks, 2013; Müller, 2015). The frequently addressed issue involves the excessive interference of mega sporting events in urban remodelling, which results in many negative social effects, such as price booms, forced evictions of less powerful groups within the local community or excessive sports infrastructure that does not serve the community after the event (Jennings, 2000; Cashman, 2006; Taks, 2013).

The CVM as a method for the valuation of sporting events' social impacts

Due to being "intangible", social impacts are generally not subject to market trade. Thus no price reflects their value. However, including such impacts in the final valuation is necessary to obtain a full view of the benefits and costs of the sporting events. The omission of effects that are difficult to measure results in an increased knowledge gap, as well as, among other things, raised social disorientation with regard to the validity of the use of public funds to finance such events. According to Nordwall & Brown (2020), justification for public-sector involvement ought to be supported by a good public argument. Therefore, it is necessary to search for solutions enabling the assignment of particular monetary values to these effects, thus allowing their economic valuation. The method that provides such opportunities is cost-benefit analysis (CBA). This is because it requires evaluating all effects in monetary terms, including those that do not have a market value (Hanley & Spash, 1993). The notion enables the shift from the traditional value assessment to alternative methods

based on the analysis of human preferences and behaviours (Smith & Krutilla, 1982). They are divided into revealed preference methods and stated preference methods (Wicker & Orlowski, 2019). The former consists of observing the actual behaviours and decisions of consumers who purchase or otherwise use the given goods (Willis, 2014). They include the travel cost and the hedonic price methods. The latter consists of an attempt to simulate the market to present hypothetical behaviours and reactions of consumers to the proposed scenario related to the use of given goods (Kroes & Sheldon, 1988). The contingent valuation method is most commonly used in broadly defined sports (Zawadzki, 2016; Johnson & Whitehead, 2000).

In neoclassical economics, the subjective theory of value, based on the usefulness of the represented goods or services for the consumer, constitutes the foundation for the use of the CVM. The willingness to pay (WTP) category is the link between subjective utility and the market price, which can be expressed in monetary units (Zawadzki, 2017). The subjective theory of value derives from the belief that the purpose of management is to satisfy human needs. Therefore, these very needs should constitute the starting point for value interpretation. In other words, each commodity has a value that is linked to its ability to satisfy human needs.

Initially, the CVM was limited to estimating the value of natural resources that were not subject to traditional valuation (Ciriacy-Wantrup, 1952). Currently, the catalogue of circumstances within which CVM is applied is much broader and goes beyond the environmental aspect. Typically, it involves determining a value for general-use goods to estimate the efficiency of using public funds to build and maintain them. Hence the growing popularity of the method in the functioning of public libraries, roads, hospitals and issues related to the broadly understood sport (Zawadzki, 2017). The WTP category provides a monetary measure of the subjective value that a given commodity, including public goods, expresses for the consumer. Two constitutive characteristics distinguish public goods from

private ones: non-rivalry and non-excludability of consumption. The effects of sporting events cannot be fully included in the public goods category. Instead, they are quasi-public goods, having the characteristics of both private and public goods . On the one hand, residents can become active participants in the event, for example, by buying match tickets or souvenirs with the event's logo. On the other hand, they may not be interested in the sports event or, for other reasons, may decide not to incur expenses in connection with it. Even so, the event may affect them positively (e.g. improve their quality of life due to infrastructure changes resulting from the event) or negatively (e.g. cause difficulties associated with increased tourist traffic). Hence the WTP category suggests the validity of using market prices to estimate the benefits or costs, including those difficult to measure, resulting from the undertakings such as the organisation of a sporting event.

The CVM is a study of a hypothetical market. This kind of research raises some objections to the possibility of relating the results to real economic values. However, "by asking a hypothetical question, you get a hypothetical answer" (Atkinson et al., 2008). Therefore, one should be aware that the answer could be both underestimated and overestimated. That is why the whole research process should be well-thought-out to minimise the risk of distortion that could undermine the credibility of the results and, consequently, the validity of the research. Almost all studies on the subject confirm it, regardless of the area of CVM use (Neill et al., 1994; List & Gallet, 2001).

In order to minimise the potential of hypothetical bias, it may be valuable to increase respondents' attention to their budget constraints. According to the National Oceanic and Atmospheric Administration (NOAA) report, all respondents should be instructed that the expression of a certain WTP offer would cause a burden on their household's budget of precisely the same value, which could limit the purchase of other goods (Arrow et al., 1993). In addition, "cheap talk" may be applied to reduce hypothetical bias (Loomis, 2011).

According to this approach, the respondents are informed that WTP tends to be overstated and reminded to "use exclusively their own money".

Thanks to the questionnaire investigation, it is possible to determine the average level of WTP. This allows estimating the parameters of the valuation function in relation to selected determinants affecting the values of readiness to pay declared by the respondents. A review of the existing literature on the subject provides a catalogue of the most common socio-economic and demographic factors of CVM studies that refer to sporting events or sports facilities (Owen, 2006; Atkinson et al., 2008; Walton et al., 2008; Wicker et al., 2012). The literature review allows defining the catalogue of the most common socio-economic and demographic factors in the case of CVM studies relating to sporting events or sporting facilities. The application of the"income" variable is a common practice, and income's positive influence on the WTP offer was confirmed in many cases (Walton et al., 2008; Wicker et al., 2012). This is because people with more disposable income can allocate more funds to purchase all goods, including those related to sporting events. The education level also has a positive effect on the WTP amount (Süssmuth et al., 2010). The greater awareness of better-educated people can explain this. In the context of gender, previous studies show greater interest in sports, particularly football, among men and, consequently, greater willingness to make payments (Walton et al., 2008). The situation is similar in the case of younger people (Johnson et al., 2007). Younger people predominate among active fans, who identify more with a given discipline and are more likely to participate in sporting events. Moreover, the number of people living in the household has a negative impact on the willingness to pay. Castellanos and Sanchez (2007) associate this with a lower income level per family member. Still, other reasons exist, such as a greater scope of responsibilities and lack of time for pleasure. As part of CVM research, previous studies show that people with a positive attitude towards sporting events or more frequently using sports facilities are ready to

pay higher fees (Atkinson et al., 2008; Carson et al., 2001). The selection of appropriate demographic and socio-economic determinants is of key importance for transferring the obtained WTP value to the aggregate level (Mitchell & Carson, 1989).

The use of CVM for the evaluation of intangible social impacts of mega sporting events has so far focused on MSEs. The most widely commented research in the world literature concerns three UK cities (London, Glasgow and Manchester) before the 2012 London Summer Olympics (Atkinson et al., 2008). It was also the first study in which estimates of intangible benefits of sporting events were made, including benefits affecting the inhabitants of the given city and the entire host country alike. The authors determined that for London residents, the aggregated level of WTP due to such social benefits as uniting people, feel-good factors and national pride, among others, amounted to USD 950 million. At the same time, the intangible benefits for the rest of the UK's population were valued at USD 2.93 billion. The share of the rest of the country in the aggregated valuation of intangible effects was more than three times greater, even though the average WTP values obtained in London were about twice as high as in other cities of the United Kingdom. It was due to the disparity between the population of London and the rest of the UK. Furthermore, it was indicative of the role played by non-host regions in the final valuation of the intangible benefits of sporting events at a national level. The high aggregated valuation of the intangible positive effects of the 2012 Summer Olympics, estimated to be nearly USD 4 billion across the UK, nearly balanced the costs associated with investments made in sports facilities, estimated at USD 4.7 billion.

Another example from Europe was the study by Preuss & Werkmann (2011), who used the CVM to estimate the positive, intangible effects for the German community in the context of a potential event (which never actually took place) – the 2018 Winter Olympics in Munich. In this case, the aggregated value of the intangible benefits, equated with a sense of

national pride, ranged between USD 744 million and USD 1.09 billion, depending on the scenario. Based on the regression analysis, the authors concluded that there is a significant correlation between the positive attitude towards organising the Winter Olympics and the amount of WTP contributions.

Humphreys et al. (2018) performed a CVM analysis of MSEs in a novel context, focusing on WTP for success, regarded as winning gold medals in the 2010 Winter Olympic Games in Vancouver, Canada. The authors analysed the impact of the "Own the Podium" government-sponsored subsidisation programme on intangible benefits in terms of national pride or identity. WTP estimates from a CVM study using data from nationally representative surveys before and after the Games suggest that the medal success generated intangible benefits of between three and five times its cost. Furthermore, the ex-post average WTP led to much larger aggregate WTP figures than pre-Olympics estimates. After the Olympics, the average WTP of about USD 91 per household led to an ex-post annual aggregate WTP of about USD 1.143 million and a three-year undiscounted WTP of USD 3.429 million.

Recently, CVM was used to assess Germany's WTP for hosting Olympic Summer Games in the indefinite future (Wicker et al., 2017). The results indicated that people in Germany were generally willing to support hosting the Games financially. Furthermore, the perception of positive intangible effects of the Olympics, including pride and happiness derived from sporting success and greater German prestige, had a positive effect on WTP. Seventy-two per cent of respondents stated a positive WTP with an average payment of EUR 47. Aggregate WTP over five years amounted to EUR 46 billion, exceeding the estimated costs of the proposed 2024 Summer Games for Hamburg.

Method

The three sports events, i.e. one MSE (UEFA Euro 2012) and two NMSEs (the 2016 Men's European Handball Championship and the 2017 Men's European Volleyball

Championship), took place in Gdańsk at different times over five years. To make the WTP results comparable with the aggregated values, all results were brought to the 2017 levels – the year in which the last analysed events took place. Table 2 shows detailed information on the number of respondents, sampling and the interview method used.

As part of the study, each respondent in the case of every sporting event was read a description serving as an introduction to the issues treated in the study and intended to increase their awareness. It reads as follows:

> Sporting events such as UEFA Euro 2012/the European Men's Handball Championship 2016 / the European Men's Volleyball Championship 2017, beyond revenues and costs of a financial nature, also generate a number of effects of non-traditional valuation, so-called intangible effects. These effects include a number of social benefits.

These social benefits were then clearly defined and explained. The catalogue of social impacts was slightly different for the MSE compared to NMSEs. In the case of the former, they included psychological benefits, promotion of the country internationally, improved quality of life, sports facility legacy, motivation to lead a healthy lifestyle and inspiration for the younger generation. For the latter, they included social capital, well-being, collective identities, sports participation, urban regeneration and human capital.

Afterwards, the hypothetical scenario was presented, which was similar for each analysed event:

> Suppose that continuing to use public means to fund sporting events (UEFA Euro 2012/the European Men's Handball Championship 2016 / European Men's Volleyball Championship 2017) were put to a vote. Providing certain amounts will oblige you to make a payment in the form of an additional tax burden, increasing your property tax. Do you think that you would vote for or against the proposal of organising the sporting event?

Afterwards, respondents were presented with a payment card, including tax amounts (dependent on the event itself) and asked how they would vote in one of the various amounts:

> The amount you indicate will be your contribution to the organisation of the UEFA Euro 2012/European Men's Handball Championship 2016 /European Men's Volleyball Championship 2017. Please point out on the presented payment card an amount which is adequate to the maximum value of your contribution.

In all three events, it was decided to use a single question about the exact value of WTP in the form of a payment card (Mitchell & Carson, 1984). It involves providing respondents with cards with multiple rates, ranging from 0 (an assumption accepted by all) to a large amount that all respondents are likely to reject. The respondents learn about the card and select a value. It should be noted that the respondent, answering the question in the payment card format, agrees to an amount of WTP_i^N while rejecting a higher amount represented in the form WTP_i^W. It means that the actual willingness to pay is determined by an amount not less than WTP_i^N and less than WTP_i^W. It can therefore be assumed that the probability of choosing WTP_i^N corresponds to the likely willingness to pay, ranging between the lower (N) and higher (W) WTP values:

$$P(WTP_i^N) = P(WTP_i^N \leq WTP_i < WTP_i^W)$$

The payment card approach brings certain benefits and threats. On the one hand, it allows the respondent to understand each examined issue better and reduces the number of blank or ill-considered answers (Ryan, Scott & Donaldson, 2004). On the other hand, it provokes to provide an imposed answer from the amounts indicated on the card and the so-called anchoring bias (Zawadzki, 2017). Although CVM studies frequently employ other WTP questionnaire formats, including double-bounded dichotomous choice, the choice of a single question about the exact value of WTP results from the fact that the decision to use this format took place before Euro 2012 (the pilot study was conducted in 2011). In the case of subsequent sporting events, this format was unchanged so that it would not cause disturbances in the results.

To ensure the research sample representativeness, basic socio-economic parameters were agreed upon each time, including age, gender and education and their distribution in the population of Gdańsk. Furthermore, respondents were selected only from among adults indicating the city of Gdańsk as their place of residence (Gdańsk postal codes). While the interview and sampling methods were different for the MSEs and the NMSEs, the hypothetical scenario and the payment vehicle were the same regardless of the sports event. The only difference concerned the time range of payments. While in the case of NMSEs, they were one-time sums paid in one year, in the case of Euro 2012, an additional tax burden was calculated annually for the next five years.

During the preparation of hypothetical scenarios, the emphasis was placed on limiting the risk of disturbances in the form of responses deviating from reality, particularly those that overestimate the valuation. Therefore, according to the recommendations of NOAA, the respondents were informed each time about the need to take into account the reduction of the household budget by the proposed WTP amount (Arrow et al., 1993). The empirical part of the study was based on testing the proposed theoretical model and defining the determinants affecting WTP. In addition to socio-economic variables and the variables referring to the attitude of the respondents towards the organisation of a specific event in Gdańsk, there was an important catalogue of WTP determinants related to the occurrence of intangible social impacts (Table 3). In this respect, the perception of social benefits (BENEFIT) in general and detailed social effects dependent on the sporting event were investigated. For the MSE, those were psychological benefits (PSYCH), promotion of the country internationally (PROM), improved quality of life (QUAL), sports facility legacy (LEGACY), motivation to lead a healthy lifestyle (MOTIV) and inspiration for the younger generation (INSPIR). In turn, for both NMSEs, the list of social impacts included social capital (SOCIAL), well-being (WELL), collective identities (IDENTITY), sports participation (SPORT), urban regeneration

(URBAN) and human capital (HUMAN). The respondents described each social benefit perception, giving 1 when they perceived it and 0 when they did not notice it.

One of the features of the WTP dependent variable was that it was non-negative. At the same time, it also had a high probability of being equal to zero in the case of many responses received. Therefore, the dependent variable was left-censored by 0. As such, it was decided to use the Tobit model, which enables such censorship. This model is as follows (Castellanos et al., 2011):

$$WTP_i = \begin{cases} WTP_i^* \text{ if } WTP_i^* > 0 \\ 0 \text{ if } WTP_i^* \leq 0 \end{cases}$$

for the regression equation: $WTP_i^* = X_i\beta + u_i \approx N(0,\sigma^2)$

where:

WTP indicates the WTP (PLN) variable, WTP^* is a hidden variable, X is a vector (horizontal) of explanatory variable values, β is a vector (vertical) of the regression equation parameters, and u_i determines random components of the equation.

A Tobit model assumes that the researcher takes a two-step approach in the analysis. First, it considers whether a respondent is willing to pay or not (logistic regression); second, it regards the proposed amount of money. Basic assumptions for logistic regression include the independence of the observations, no extreme outliers or influential observations in the dataset, a linear relationship between explanatory variables and the logit of the response variable and no correlation between independent variables (multicollinearity).

Results

The findings support the importance of sporting events for the citizens of Gdańsk. More than 91% of respondents indicated social benefits (BENEFIT) due to the UEFA Euro 2012 (Table 4). In the case of NMSEs, the share of respondents noting positive social impacts

was smaller and ranged between 48-57%. Nonetheless, it is worth noting that the differences may not relate solely to the scale of the event but also to the type of sport. Poland's favourite sport is football, followed by volleyball. In the case of UEFA Euro 2012, the greatest importance was attributed to promoting the country internationally (41%), while in the case of the 2016 European Handball Championship, it was well-being (17%), and in the case of the 2017 European Volleyball Championship, it was sports participation (14%). The scale of valuation of social impacts goes hand in hand with the size of the event. While the average WTP level in the case of UEFA Euro 2012 was over PLN 46, in the case of NMSEs in 2016 and 2017, it was smaller and amounted to about PLN 6 and PLN 8, respectively. There were slightly more men among the MSE respondents, whereas in the case of NMSEs, women had a minor numerical advantage.

Although the analysis of WTP determinants is highly diversified and relies on the type of the sports event, the socio-economic factor significantly affecting the level of the offer for each event analysed was the level of income (Table 5). More educated respondents were ready to contribute higher WTP amounts for the 2017 European Volleyball Championship. Contrary to expectations, the willingness to pay in the 2012 survey was related to the growing number of people living in the same household. Although previous studies pointed out the negative relationship in this respect, caused, among other things, by the lower level of income per family member (Castellanos & Sánchez, 2007), in this case, the results can be explained by the greater emotions delivered by the MSE in the family circle, especially since the WATCH variable influenced the WTP. The willingness to pay was also influenced by the interest in a given discipline (INT_D) and the purchase of tickets to participate in a sports event (MATCH) actively. In the case of the 2017 European Volleyball Championship, the significant positive effect of EDU can be observed. It may be explained by better-educated

volleyball players (Scheerder & Vos, 2011), which can go hand in hand with better education of fans.

The research focused on measuring the value of social impacts of sporting events through WTP. In this respect, depending on the event analysed, results indicate a statistically significant positive relationship between the perception of social effects and the amount proposed by the inhabitants of Gdańsk. For example, in the case of the Euro 2012 and 2017 European Volleyball Championship, the mere fact of indicating social benefits did not have a statistically significant impact on WTP. However, it can be explained by the high percentage of responses confirming the perception of such intangible benefits, also among respondents proposing a zero valuation. Nearly 23% of all responses concerning the event in 2012 and nearly 25% concerning the event in 2017 were zero valuations. Nevertheless, individual social benefit categories are indicated as important determinants of WTP. This applies to MSEs (PSYCH, PROM, QUAL) and NMSEs (SOCIAL, WELL, IDENTITY, SPORT, URBAN). In particular, the 2017 European Volleyball Championship case indicates a link between social impacts and the offered amount. Five of the six social benefit categories show statistical significance of the results within the given range.

The highest average value of WTP for Euro 2012 determines the highest value among all analysed sports events – nearly PLN 18.3 million (Table 6). However, if one compares the amount of intangible social benefits in this case to the expenses related to the construction of the stadium by the city of Gdańsk, it turns out to be approx. 2.55%. In other words, approx. 40 events of this type would have to be held to pay for the expenses related to the preparation of the sports facility. Interestingly, although NMSEs show significantly lower aggregated values related to social impacts, they would contribute to a faster return on investment, taking into account also lower amounts of expenditure incurred for the construction of Ergo Arena. The organisation of both NMSEs in Gdańsk determined the acquisition of intangible social

benefits at approx. PLN 5.5 million, which translates into a nearly 5% share in the expenditure on the construction of this sports facility.

Discussion and Conclusions

The research results indicate that sports events, regardless of their size, determine the occurrence of social impacts among host residents. It means that by valuing these intangible effects, it is possible, at least partially, to justify the spending of public funds on such events. In the case of this research, the evaluation of positive social impacts was compared with the cost of construction of two sporting arenas in the city of Gdańsk, Poland. Naturally, it should be borne in mind that hosting an event generates other expenditures than just the construction costs, even greater in the case of mega sporting events. Nevertheless proposed approach allows us to identify the main trends between intangible effects and tangible costs in both MSEs and NMSEs.

The mean WTP values for MSE obtained among Gdańsk residents should be considered low compared to those found during studies carried out in wealthier countries in North America or Western Europe (Wicker et al., 2017; Humphreys et al., 2018). Simultaneously, repeatedly higher mean WTP values can be observed in the case of UEFA Euro 2012 compared to both NMSEs organised in Gdańsk. This translates into relatively low aggregate values, to a small extent covering the construction costs of even the cheaper sports facilities. It should be emphasised, however, that only the inhabitants of Gdańsk were taken into account in the above studies, even though the Gdańsk agglomeration is much larger and includes other cities, such as Gdynia or Sopot. Their residents would probably express positive opinions on social impacts in relation to the organisation of each of the three events, which would be reflected by WTP> 0 and, consequently, higher aggregated values.

Although higher average values, and consequently higher aggregated values, were observed for MSEs, smaller sports events have greater potential for host cities for at least two

reasons. Firstly, the construction of the sports facility where NMSEs were held was a smaller burden on the Gdańsk's budget compared to the football stadium used during the Euro 2012. Therefore, even lower average WTP values can generate correspondingly high aggregate values, which in the case of a single NMSE, can represent an even higher share of intangible benefits regarding tangible expenditure on the construction of a sports facility. Secondly, the probability of organising another NMSE is much higher compared to an MSE. In the last few years alone, Ergo Arena in Gdańsk was the venue for other NMSEs, including the Men's European Volleyball Championship (in cooperation with Denmark) in 2013 and the World Athletics Indoor Championships and Men's Volleyball World Championships in 2014. As confirmed by this research, each of these events provided a real opportunity to generate social impacts that could be linked to a specific valuation by the local community. The organisation of MSEs by Gdańsk (or any other city in the world) with such a frequency is highly improbable.

The analysis of WTP determinants is broadly consistent with previous CVM research on sports. The amount of WTP was influenced by the income level and interest in sports and watching games on TV. However, in the case of UEFA Euro 2012, the increase in the number of people in the household quite unexpectedly determined the rise of the WTP level. It can be explained by the greater impact of social impacts such as social cohesion or spending time with family in larger social groups living together.

The findings have implications for policymakers since they indicate that the organisation of smaller sporting events determines social impacts not smaller than those observed for MSEs. However, some study limitations should be noted. Above all, only social benefits were considered. However, it is known that the organisation of sporting events of this type can have negative effects, such as overpopulation and loss of security. Therefore, only their inclusion in the proposed valuation would show the total value of intangible social net

effects, which would most likely be lower than the one indicated in this study. On the other hand, it would be beneficial for NMSEs, the organisation of which does not determine as many negative social impacts as may be observed for MSEs.

Notes

1. Given the average exchange rate of EUR 1 = PLN 4, the Ergo Arena cost was approx. EUR 82.5 million, while the cost of Arena Gdańsk was around EUR 212.5 million.

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