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Article

The Economic Impact of Participant Sports Events: A Case Study for the Winter World Masters Games 2020 in Tyrol, Austria

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Abstract: The Winter World Masters Games (WWMGs) are a large sports event for 30+-year-old athletes. As there are neither competitive qualification requirements for participants, nor entrance fees for spectators, the event can be considered as a participatory sports tourism event rather than a spectator event. In 2020, the WWMGs were staged in Innsbruck, Tyrol. In this study, we estimate the payoff of the event for the regional economy by assessing the impacts generated by participant spending and organizational expenditure. Furthermore, we discuss the peculiarities of the masters sports concept. Our empirical work is based on three distinct analyses: (1) economic impact analysis of participant spending, (2) cost-benefit analysis of organizational resource flows, and (3) discussion of impacts with experts in a focus group setting. Our results support the previous findings that masters sports events attract rather affluent and consumption-oriented participants. Indeed, the WWMGs were found to have a regional economic impact of €6.18 million and an estimated yield of €4.40 for each publicly subsidized euro. For an audience interested in the economic impact of events, this paper presents a novel method for handling non-normal expenditure distributions and adds to the understanding of how visitor segmentation can be utilized in an assessment of event impacts.

Keywords: economic impact study; sports events; tourism events

JEL Classification: L83; Z20; Z30

1. Introduction

Sports events have the potential to bring substantial short-term economic benefits to the hosting region by attracting visitor expenditure as well as long-term benefits by enhancing the region's image as a sport tourism destination. Moreover, sports events can create regional economic benefits by stimulating business activity and creating jobs in the region (Dwyer et al. 2016). Staging sports events induces upfront operational expenditure through, for example, investments, staff salaries, marketing, facilities, and equipment. Given that the benefits of the events are often indirect, and even the direct short-term benefits are, for the most part, widely spread across economic sectors, there is often no incentive for single business enterprises to invest in staging the events. Organizing such events, therefore, often requires considerable financial or in-kind support from public bodies (Mules 1998).

In order to justify the public subsidies for staging the events and to verify the positive societal outcomes for the hosting region, a range of economic impact evaluation techniques has been developed and applied. Very often, however, the evaluations are restricted to simple economic impact studies,

which analyze the impacts of event guest spending on regional economies, but do not account for flows of public and private financial means, especially during the preparatory phase of the event. Moreover, most of the extant economic impact evaluations fail to consider indirect and intangible societal costs and benefits which are difficult to quantify, such as impacts on regional image, public health, or environment (Preuss 2004b; Mules and Dwyer 2005).

The Winter World Masters Games (WWMGs) are an international multi-sport event for 30+-year-old athletes, staged in Tyrol, Austria in January 2020. With more than 3500 international participants, the WWMGs can be seen as a large-scale event that facilitates considerable economic activity. However, as there are neither competitive qualification requirements for participating athletes nor entrance fees for spectators, the event can be considered a participatory sport tourism event rather than a spectator sports event. The mechanism of economic activity, therefore, differs from large spectator sports events, such as World Championships in popular sports, the Olympic Games, or the Tour de France, as the impact mainly emanates from the participants rather than the fans. Moreover, the WWMGs and other masters sports events differ from large, single-sport participatory events (e.g., Berlin Marathon) in terms of their duration, prompting participants to stay in the area for a longer period of time. On the other hand, the WWMGs contrast with other large multi-sport participatory events (e.g., Youth Olympic Games) in that it attracts more affluent, consumption-oriented participants, who, instead of traveling alone, are often accompanied by family and friends.

This study provides a holistic overview of the economic impact of the WWMGs on the region of Tyrol by combining three distinct analyses. First, we study the regional economic impact of participant spending during the event. In order to calculate the true net economic impact of the event and to avoid the common pitfall of overestimating the gains by computing all event-related flows of money (gross impacts), we distinguish between non-local and local sources and destinations of spending (Tyrrell and Johnston 2001). Second, a cost-benefit analysis of the organizing committee's monetary flows is conducted. Finally, we provide a qualitative analysis by discussing with experts the findings gained in the first two research questions. Peculiarities, potentials, and challenges of participatory events like the WWMGs are discussed.

2. Literature Review and Conceptual Framework

As the organizing communities and sponsors are intrinsically interested in a sporting event's return on investment, economic impact analyses have long since been commonplace in conjunction with larger scale sports, cultural, and tourism events. However, the analyses conducted in advance of such events have often produced misleading and exaggerated estimates on gains (Baade and Matheson 2016). Consequently, both, (1) economic impacts of specific events and event types and (2) methodological issues of analyses have attracted considerable academic attention. Whereas the academic discussion surrounding the latter is portrayed in Sections 2.2 and 2.3, we provide a brief outline of the literature on masters sports events in general, and their economic impacts in particular, in the following subsection.

2.1. Masters Sports Events

A classification of sports events into Type A, B, C, and D events was provided by Gratton et al. (2000), and further extended to include Type E events by Wilson (2006). According to the authors, the events could be classified as follows:

- Type A: one-off, major international spectator events, creating significant economic impact and media interest, such as the Olympic Games or the FIFA World Cup,
- Type B: major spectator events that are part of the annual calendar, creating significant economic impacts and media interest, such as the Wimbledon Championship Tennis Tournament or Soccer FA Cup Final,

- Type C: one-off, major international spectator or competitor events, creating limited economic activity (e.g., European Junior Swimming Championships or World Badminton Championships),
- Type D: Major competitor events that create limited economic impact (e.g., national championships in most sports),
- Type E: Minor competitor/spectator events, generating very limited economic activity, no media interest, and part of an annual domestic cycle of sport events (e.g., local and regional sport events in most sports).

While acknowledging the unambiguousness of this typologization, [Gammon \(2011\)](#) stated that in an ever-broadening event landscape, it is becoming ever more difficult to classify events into predefined categories, and suggested a rudimentary framework for categorizing sports events by (1) the level of produced economic activity, (2) geographic scope (i.e., local, regional, national, international), (3) the scope of sports disciplines (i.e., multisport, single-sport), (4) the level of media interest, (5) the regularity of the event at a location, (6) the primary target audience (i.e., spectators or participants), and (7) the level of tourism potential. Whereas the majority of recent research on sports event impacts has still focused on large, type A events, such as the Olympic Games and the FIFA World Cup (e.g., [Preuss 2015](#); [Groothuis and Rotthoff 2016](#); [Alm et al. 2016](#); [Wan and Song 2019](#)), short and long-term impacts of small-scale sports events are increasingly receiving academic attention (e.g., [Malchrowicz-Mosko and Poczta 2018](#); [Bazzanella et al. 2019](#); [Plunkett and Brooks 2018](#)). However, beyond two studies focusing on the impacts of the Youth Olympic Games ([Schnitzer et al. 2016](#); [Zhang et al. 2020](#)), there is a relative paucity of recent studies investigating the impacts of large, international participatory sports events.

Some authors have highlighted that, in comparison to youth events, masters sports events may generate relatively high economic impacts for the hosting communities because they tend to attract more affluent participants who often travel together with their families or friends ([Mules and Faulkner 1996](#); [Gratton et al. 2000](#)). Although older participants traveling with children observably spend more at sport tourism events ([Salgado-Barandela et al. 2018](#)), very few published academic studies have specifically examined the economic impact of masters sports events. In one of the few pieces of research on the economic impact of masters sports events, [Ryan and Lockyer \(2001\)](#) analyzed the spending behavior of the participants at the South Pacific Masters Games 2000 in Hamilton, New Zealand. The authors made a distinction between local participants and out-of-region participants and concluded that the event made a positive regional economic contribution. In order to maximize the economic output, they recommended that the organizers select sports that draw the highest possible number of out-of-region participants.

Beyond economic impact studies, some published studies also aim to describe the participants at masters events. In one of the early studies, [Ryan and Lockyer \(2002\)](#) examined the participants' expectations of and their satisfaction with the South Pacific Masters Games 2000. Based on the participants' expectations and motivations, the authors found two distinct participant segments: whereas one group was strongly motivated by competitive aspects, the other segment considered social interaction and companionship as the main reason for participating, and as a framework for physical challenge and self-expression. Partly based on these findings, [Trauer et al. \(2003\)](#) developed a conceptualization, typologizing participants at masters sports events. The authors highlight three participating categories: the serious competitors, the games enthusiasts, and novices/dabblers. Whereas serious competitors are motivated predominantly by competition, the games enthusiasts, while also being highly involved in their sport, are additionally strongly motivated by the social aspects of the games. The novices/dabblers are, according to the framework, not quite as highly involved in their sports, and are perhaps beginners in an athletic sense, seeking more the fun and experience-related aspects of participation. Furthermore, [Gillett and Kelly \(2006\)](#) analyzed the motives for traveling among non-local participants in the Australian National Masters Games 2005. Through semi-structured interviews, the authors found that competitive aspects, social aspects, and identity-related aspects were all important motives for traveling to masters sports events. Moreover, they identified that

the competitive aspects, such as the competition itself, goal achievement, and athletic identity, were dominating motives among the traveling participants, while the category of local participants was more likely to include a larger number of primarily fun and experience-seeking participants.

Spectator and participant sports events have become a fundamental component of the tourism strategies of many cities and regions, which are, therefore, willing to invest significant amounts of public money to bid for and stage such events. While the sports events do indeed have the potential to create flows of “new money”, which further stimulate economic activity in the respective regions, the aggregate benefits are by no means straightforward (Gratton et al. 2000). For instance, the subsidies required for bidding for and staging the event often need to be financed through public spending cuts in other areas or through tax increases leading to possible reductions in economic activity elsewhere (Dwyer et al. 2005). To justify the considerable investment of public resources in sports events, hosting communities, and event organizing committees, therefore, conduct economic impact evaluations to measure the event’s economic return to the citizens (Crompton et al. 2001). However, the economic impact studies rely on assumptions that are often unjustified, leading to inaccurate or even doubtful results (Crompton 1995). In the following, we address some of the important methodological considerations, which are also relevant to our study.

2.2. Participant Expenditure

The regional economic benefits of an event derive essentially from (1) the consumption of participants and (2) increased post-event tourism (Preuss 2005). Regarding the latter, it has been demonstrated that event participation positively influences the participants’ intention to revisit and likelihood to spread positive word of mouth about the region (Newland and Yoo 2020), although the event’s positive impact on post-event tourism may be limited if the region is already highly developed in terms of tourism (Kurtzman 2005). As economic impact evaluations are conducted during the event or right after it, the post-event impacts obviously cannot be directly estimated or quantified leading to a focus on participant spending during the event. Even handling the indicated expenditures is an ambiguous undertaking and largely dependent on the researcher’s procedural decisions (Jeong et al. 2016). Some of the fundamental decisions affecting the outcome include the treatment and analysis of expenditure data. First, the data collected by surveys is often incomplete with a significant number of missing responses, which in turn raises the question of whether the missing indications should simply be ignored or rather treated as a “zero-spending indication” (Stynes and White 2006; Jeong et al. 2016). The latter approach obviously leads to lower central tendency values and, furthermore, to lower bottom-line scores. Second, the researcher needs to decide how to deal with outliers, and conscientiously report the proceedings. Along with a peak of zero-observations and a rather high number of missing responses, the expenditure distributions are often characterized by some exceptionally large spending indications (i.e., outliers), which might either be valid indications or contaminated by erroneously incorrect indications, for example, misplaced decimal points, (Stynes and White 2006) or even deliberately exaggerated indications (Jeong et al. 2016). Third, when estimating the primary regional economic impact of multiple participant expenditure items, it must be decided how the non-normally distributed expenditure data should be aggregated: whereas high outliers may distort the mean, the median values might be pulled to zero in some expenditure categories due to a large number of zero-spending indications (Stynes and White 2006). Each aggregation approach can, therefore, potentially lead to fallacious or misleading outcomes.

A great deal of research on the economic impacts of tourism and sports events has focused on the treatment of expenses for different participant groups. Crompton (1995) argued that only the spending of non-residents should be accounted for as “new money” in the region, whereas spending by local residents should be considered as expenditure, that, without participation, would have been expended on other commodities in the same area. While this is often considered as “a rule of thumb” in regional economic impact evaluations, there are further aspects that need to be considered. On the one hand, some of the non-resident guests might have traveled to the region in any case but switched the

timing to coincide with the event. In terms of the event impacts, the expenditure of “time-switchers” is, therefore, non-incremental, as it would have occurred in the region anyway, albeit perhaps at a different point in time. The expenditure of time-switchers should, thus, be excluded from the net impacts (Mules and Dwyer 2005). On the other hand, not all guests may perceive the event as the primary reason for travel but may have decided to take advantage of it and participate as they were already in the region anyway. Like “time-switching” participants, the spending of these “casual” participants should not be accounted for as event-impacted expenditure, as it would have occurred in the region (on other commodities) anyway (Jeong et al. 2016). However, even if the event was not a primary reason for travel, it may still have caused the participant to stay in the area for a longer or shorter time period. In such cases, the expenditure made during the “additional” period should indeed be regarded as incremental, and as negative for a “shortened” period (Mules and Dwyer 2005).

Furthermore, the question of whether the expenditure would or would not have been made in the region should not only be considered within the group of non-resident participants but also within the group of participating residents (Tyrrell and Johnston 2001). While it is often probable that the expenditure of participating residents would have occurred in the region anyway, there is, of course, a possibility that some of the local participating residents would have traveled elsewhere for the particular event (if not organized in the home region, but elsewhere) (Tyrrell and Johnston 2001) or that the event would have kept some of the residents from making other leisure trips elsewhere (Gelan 2003). In these cases, event participation keeps money from flowing out of the region and can be added to the gain obtained from non-resident event participants (Burgan and Mules 1992).

It can be presumed that, among non-resident event participants, there are segments that demonstrate divergences in spending behavior (Crompton 2010), and that may structurally differ in terms of, for instance, distribution of length of stay, main purpose of travel, household income distribution, gender distribution, etc. (Legoh  rel and Wong 2006). Jeong et al. (2016), therefore, recommended differentiating between visitor groups and sampling them individually, in order to avoid misleading estimates for the economic impact of visitor expenditures.

2.3. Organizational Expenditure

An economic impact analysis of participant spending provides a measure of induced economic activity but does not take the organizational costs into account. As a result, it does not reflect the true welfare effect of the event (de Nooij and van den Berg 2018). The purpose of a cost-benefit analysis is to estimate the community welfare effect of an event (Dwyer 2019) by comparing the cost of the production factors necessary to stage the event with the increase in economic activity (i.e., benefits) caused by the event (K  senne 2005). Besides participant spending, organizational expenditure and revenues form another important resource flow, impacting economic activity in the region. Depending on the type of event, the nature of the streams differs intrinsically. Typically, most of the mid-sized and large events create inflows from tickets or participant fees, partners and sponsors, governmental subsidies, and, in the case of spectator sports events, TV and media rights, whereas labor costs, operations, facility costs, administration, and promotion represent typical expenditures (Preuss 2004a). Specifically, in masters events, while there are no revenues from spectator entrance fees or TV broadcasting; public subsidies, sponsoring and participant fees form the principal sources of revenue. Masters events are, however, typically also characterized by rather low operational and facility expenditures, as there is no need to manage large spectator crowds. In order to include the organizational expenses and revenues in the economic impact evaluation, the origins and destinations of all resource flows need to be specified by applying the following cost-benefit analysis framework (Preuss 2004a): (1) exogenous/autonomous means, which stay in the region (i.e., benefits), (2) regional means, which are used for imports (costs), (3) regional means, which are spent in the region (reallocations), and (4) exogenous/autonomous means, which are used for imports (neutrals).

3. Methodology

In the following section, we briefly explain the methods employed in our three-way study. In Section 3.1, we describe the reasoning for the segmentation of the event participants based on their origin and primary participation motives, and the subsequent calculation of the total economic impacts of participant expenditures. In Section 3.2, the logic of the cost-benefit analysis and the economic impact calculation for organizational expenditures are described and in Section 3.3, we briefly explain the aims and methods of the qualitative part of the study.

3.1. Participant Expenditure

An online questionnaire was designed to collect the data for calculating the local economic impacts of participant expenditure. In our field study, we used the so-called “recall method”, which means that the respondents were asked afterward to estimate their expenditure during the event as closely as possible (Faulkner and Raybould 1995). To tackle the problem of recalling expenditure, participants were, on the one hand, informed about the study before the event started. On the other hand, the questionnaire was distributed by the organizing committee to all participants via the event newsletter and social media immediately after the event in the hope that the participants would fill in the survey straight after or even prior to returning home.

The questionnaire consisted of (1) demographic items, (2) items on motives for participation and perceived importance of the event, (3) behavioral items, and (4) expenditure items. In order to follow previously described conceptual considerations and to avoid the overestimation of economic impacts by including the money flows which would have occurred in the region even without the event (Tyrrell and Johnston 2001; Crompton 1995), we grouped the participants based on the location of their permanent residence (i.e., Tyrol or non-Tyrol) and their primary motivations for participation. Based on these background variables, we distinguished between participant segments producing incremental, displaced, and retained economic impacts (Ryan and Lockyer 2001). The Tyrolean participants were grouped into those who perceived the event as so important that they refrained from going on another trip (home stayers) and those who opted to participate just because the event was organized in Tyrol. Event guests were, similarly, grouped into those who traveled to Tyrol because of the event and those who would have traveled there anyway (casuals). Moreover, as we will later illustrate in more detail, we noticed differences in spending behavior between the non-Tyrolean guests (a) whose participation was entirely motivated by the event itself and (b) who decided to participate because the event was organized near home. We, therefore, additionally distinguished between “event-motivated guests” and “proximity-motivated guests” (see Table 1 for participant segmentation).

To estimate the economic impact of different participant groups, the part of the questionnaire covering spending information was divided in the following way:

- Non-Tyrolean participants, who indicated the event itself or its proximity to home as the main reason for participation, were asked to estimate their spending on different expenditure categories (accommodation, catering, entertainment, shopping, etc.) during the event.
- Non-Tyrolean participants, who indicated the region (Tyrol) as the main reason for travel (casuals) were asked to indicate (1) if they (a) shortened or (b) prolonged their stay due to the event. If yes, an indication of hypothetical additional/subtractive spending was requested.
- Tyrolean participants were asked whether the event was so important to them personally that they had (a) given up another holiday trip to participate in it or (b) whether they would have attended the WWMGs 2020 if it had been organized in another region, and if so, to estimate their travel budget for the hypothetical, non-realized trip.
- No spending information was requested from the Tyrolean participants who would have stayed at home regardless of the event (domestic casuals).

Table 1. Participant Segments.

Segment	Description	Impact Type	Impact
1a. Event-Motivated Guests	Non-Tyrolean guests, whose primary motivation for participation was the event itself	Incremental	Positive
1b. Proximity-Motivated Guests	Non-Tyrolean guests whose primary motivation for participation was proximity to home	Incremental	Positive
2a. Casual Guests	Non-Tyrolean guests who would have traveled to Tyrol anyway (region motivated). Planned an alternative trip as long as realized trip.	Non-incremental	Neutral
2b. Casual Guests (shortening)	Non-Tyrolean guests, who would have traveled to Tyrol anyway (region motivated). Planned an alternative trip longer.	Mainly non-incremental. Negative for the days shortened.	Neutral/negative
2c. Casual Guests (extending)	Non-Tyrolean guests, who would have traveled to Tyrol anyway (region motivated). Planned an alternative trip shorter.	Mainly non-incremental. Positive for the days prolonged.	Neutral/positive
3. Home Stayers	Tyrolean participants, for whom the event plays a very important role, and who (a) would either have participated in the event elsewhere (if not organized in Tyrol) or (b) decided to refrain from another holiday trip because of the event	Retained	Positive
4. Domestic Casuals	Tyrolean participants, for whom the event was of secondary importance and who did not have plans to travel elsewhere during the event. The spending by this group would have, therefore, occurred in the region (on other items) anyway	Displaced	Neutral

Potentially relevant economic impacts were additionally created by the event guests' travel companions, as well as those participants who had traveled to Tyrol early to make preparations (e.g., training camp or exploring the competition sites). The behavioral part of the questionnaire, therefore, also included items on (1) spending by travel companions where the participant did not travel alone and (2) spending during the possible run-up visit. Moreover, due to the event venues' proximity to neighboring regions (e.g., the German State of Bavaria and the Italian region of South Tyrol), we considered the possible spillover effects of accommodation expenditure by asking whether the accommodation was located in Tyrol. For the guests staying outside Tyrol, expenditure on accommodation outside Tyrol was excluded, while other expenditure was partly included, as we will illustrate later.

To calculate the size of each segment N_s in the population of event participants, we used its relative share in the sample (where n denotes the total sample size of respondents, and n_s is the sample size of a segment, and N the whole population of participants).

$$N_s = \frac{n_s}{n} N \quad (1)$$

In our analysis, we treated missing values as zero if a respondent provided a positive number on at least one of the other spending items, and excluded the respondents leaving all items blank. This can be considered as a rather conservative approach, as the respondents were asked to evaluate multiple expenditure items, and in some cases may have answered only one (e.g., accommodation) while leaving the others blank. In these cases, the respondent most probably understated the expenditure, as it is unrealistic to assume that no money was spent on, for example, beverages or meals, if the said respondent stayed in the region for several days. Moreover, in a move to tackle previously introduced problems for (1) the overstatement of impacts by using mean and (2) the understatement of impacts by using median, we decided to utilize a combination of the mean and median approach by taking the average of mean and median for the indicated participant expenditure segment s and category c ,

specifically. Thus, starting from e_{is}^c , which denotes expenditure in category c of a participant i who belongs to segment s , we were able to calculate the segment-specific expenditure in category c as

$$e_s^c = \frac{(\bar{e}_s^c + \tilde{e}_s^c)}{2} \quad (2)$$

where $\bar{e}_s^c = \frac{1}{n_s} \sum_{i=1}^{n_s} e_{is}^c$, which is the segment-specific mean of expenditures in category c , and \tilde{e}_s^c is the corresponding median of individual expenditures in segment s .

Next, we calculated the aggregate expenditure in category c , denoted as e^c , which is obtained by computing first the total segment expenditure by multiplying the participant-specific expenditure e_s^c by the segment size N_s , and then summing up all segment expenditures in that category over all segments m :

$$e^c = \sum_{s=1}^m e_s^c N_s \quad (3)$$

Finally, the net regional economic impact of participant expenditures E is calculated by summing up all aggregated category expenditures e^c over all categories k , that is,

$$E = \sum_{c=1}^k e^c \quad (4)$$

In this study, E represents all direct spending by guests and retained expenditure by Tyrolean participants comprising the direct regional economic gain for Tyrol (Ryan and Lockyer 2001). These net gains received by, for example, lodging businesses, restaurants, bars, retailers, public transportation companies, and sports service providers, in turn, further stimulate economic activity and create additional output through, for instance, additional business turnover, household income, and government revenue (Crompton 1995). To compute these secondary, indirect, and induced impacts, we followed previous impact studies and used a multiplier approach (cf. e.g., Burgan and Mules 1992). The output multipliers depend on the population and the volume of local industrial output, being higher in large and industrially well-developed regions (Wiersma et al. 2005). As the computation of an exact output multiplier is a rather complex process which goes beyond the scope of this study, the selection of an approximately appropriate multiplier is based on similar studies previously conducted in Tyrol (Siller et al. 2019; Schnitzer et al. 2016) and elsewhere (Ryan and Lockyer 2001; Tyrrell and Johnston 2001). Although Tyrol is an economically well-developed region, being in the top-30 of 281 EU regions (Wirtschaftskammer Tirol 2018), it is rather small in terms of population and geographic size. Given that it is also economically strongly networked with neighboring regions in Austria, Germany, and Italy, rather remarkable business turnover and consumption leakages to neighboring regions can be assumed. Therefore, to consider induced impacts while also avoiding overestimations, a rather conservative multiplier of 1.4 is used. Thus, the total economic impact TE is derived according to

$$TE_{participants} = 1.4E \quad (5)$$

3.2. Organizational Resource Flows

For the purpose of this study, the WWMGs organizing committee provided the official event budget numbers along with the relevant invoicing data to identify the geographical sources and destinations of the streams of means. In our analysis, we assessed the regional economic impact of organizing committee resource flows by utilizing the cost-benefit model of Preuss (2004b). According to the model, the first step was to distinguish between regional and non-regional (i.e., autonomous) sources on the one hand, and between regional and non-regional (i.e., use on imports) destinations on the other hand, and further, to allocate them into (see Figure 1):

- Benefits: all streams of means that flowed into the region from outside and were spent in the region,
- Costs: all streams of means that stem from the region but were used for imports (i.e., were leaving the region),
- Re-allocations: all streams of means that stem from the region and were spent in the region,
- Neutrals: all streams of means that flow into the region from outside and were used for imports.

		Use of Funds	
		Region R	Import I
Origin of Funds	Autonomous a	Benefits (positive)	Neutrals
	Regional r	Re-allocations (neutral)	Costs (negative)

Figure 1. Matrix to isolate regional impact from total impact (Preuss 2004b).

After allocating the resource flows, the net regional economic impact P was assessed using the following equation, where E is total expenditures, a is percentage autonomous means, R is percentage expenditures in the region, r is percentage regional means, and I percentage imports (Preuss 2004b)

$$P = E(aR - rI) \quad (6)$$

As with the participant expenditure, in order to account for the induced impacts that the expenditure of the organizing committee stimulates in the regional economy, the previously introduced multiplier (1.4) was used. Thus,

$$TE_{organization} = 1.4P \quad (7)$$

Finally, the total economic impact of the WWMGs 2020 was calculated by summing up the economic impact of participant expenditure and organizational expenditure

$$TE_{WWMG2020} = TE_{participants} + TE_{organization} \quad (8)$$

3.3. Qualitative Analysis of the WWMGs and Their Peculiarities

Staging events may inflict (a) hardly foreseeable positive or negative externalities and (b) indirect or intangible costs and benefits (Taks et al. 2011). As these may be difficult to value or may appear completely unexpectedly, we decided to complement the findings of our numeric analyses with a qualitative study. In order to (1) explore the peculiarities of participants as a target group, (2) to understand what makes events such as the WWMGs unique, and (3) what implications this may have for future organizers, we discussed the findings of the economic impact analysis with a panel of experts in a focus group setting. A focus group setting was chosen, as it is an adequate means of gathering a collection of various views on a specific defined topic (Myers 2013). Focus group processes are similar to in-depth interviews with additional interaction between participants and researchers, which provides further information (Peters and Schnitzer 2015).

The focus group discussion was held on 27 February 2020 with six experts (Table 2), all of whom were stakeholders involved in the WWMGs. Prior to the discussion, the participants were informed in detail about the preliminary findings of the participant survey. The focus group was led by two

researchers and lasted 90 min. The discussion was, with the consent of all participants, recorded digitally and transcribed. To analyze the data, similar themes and sub-categories were created, based on the categorization process by [Mayring and Fenzl \(2014\)](#), following deductive category development. Five major themes were used to present the data:

- Characteristics of participants at masters sports events
- The role of master sports in the host country of the WWMGs
- Opportunities for master sports and masters sports events
- Challenges of master sports and masters sports events
- The future of (masters) sports events

As the data and content analysis was based on data retrieved in German, the results of the analysis as well as related quotes and statements presented in this article were translated into English. Ensuring the quality and credibility of this transcription and translation process and the accuracy of the quotations, two researchers fluent in German and English were consulted during the translation process. Exemplary quotes for each category are given in the results section.

Table 2. Focus group composition.

Expert	Gender	Role/Position
E1	Male	CEO of the tourism board of one of the host sites (TOURISM)
E2	Male	Chairman of a sports club and operational director of competitions (SPORT)
E3	Male	Director of the sports department of a host site (PUBLIC)
E4	Male	Project leader of the event (ORGANIZATION)
E5	Female	Athlete and entrepreneur (PARTICIPANT)
E6	Male	Chairman of a regional sports federation (FEDERATION)

4. Results

In the following section, we briefly summarize the results of the participant expenditure analysis (Section 4.1.1), the cost-benefit analysis of organizational resource flows (Section 4.1.2), and the qualitative part of the study (Section 4.2).

4.1. Regional Economic Impacts

4.1.1. Participant Expenditure

The WWMGs 2020 recorded altogether 3661 registered participants, 3234 of whom were athletes and 427 were accompanying persons including, for example, coaches. The questionnaire was delivered to all 3661 registered participants and resulted in 1280 replies, which yielded a response rate of 35%.

The first step was to estimate the real sizes of each participant segment (Figure 2). A total of 1154 survey respondents answered the question regarding their primary residence as well as their primary motivation for participation. Analysis of the survey data revealed that 12.7% of the respondents were residents of Tyrol and 87.3% traveled to the event from elsewhere. Furthermore, of the non-Tyrolean respondents, 92.3% indicated they were primarily event-motivated, while 6.6% decided to participate because the event was organized nearby, and 1.2% made changes to their previously planned trip to Tyrol so that they could participate in the event. Of the Tyrolean respondents, 43.5% indicated that they would have participated in the event even if it was organized elsewhere or that they had canceled another holiday trip because of the event, whereas the remainder (56.5%) took the opportunity to participate solely because they did not have any other travel plans and the event happened to be taking place in their home region.

Following the recommendation of [Crompton \(2010\)](#) and [Jeong et al. \(2016\)](#), we took a closer look at the potential differences in spending behavior between visitor groups and noticed that non-local guests whose participation was mainly motivated by proximity to home, spent less on average (€590)

than the guests who were primarily motivated by the event as such (€1498) during their stay in the region. As the one-way ANOVA revealed the difference as statistically significant ($F = 5.034$, $p = 0.025$), we further divided the event guests producing wholly incremental impacts into two subsegments: (1) event-motivated guests (EMG), comprising 80.5% of all participants and (2) proximity-motivated guests (PMG), comprising 5.72% of all participants (see descriptions of the participant segments in Table 1 and the estimation of segment sizes in Figure 2).

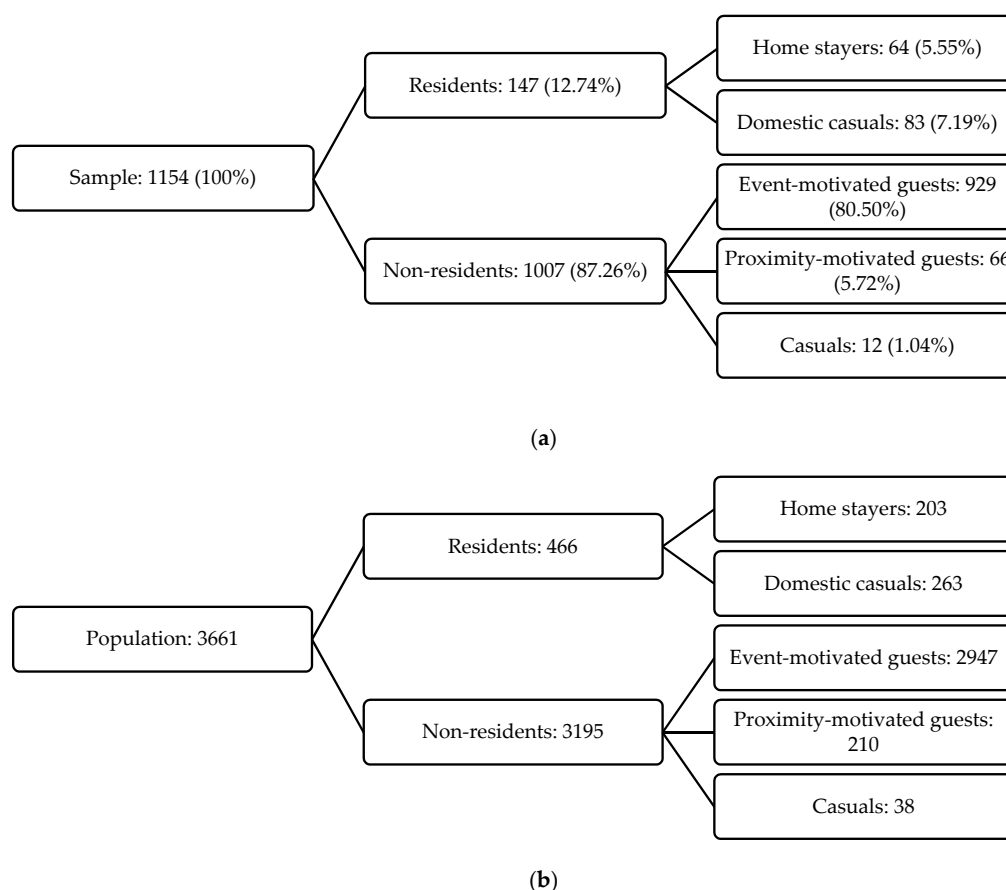


Figure 2. Sample segment sizes (a) and estimated population segment sizes (b) (cf. Jiménez-Naranjo et al. 2016).

Moreover, prior to the event, we observed two interesting event-related characteristics, which have an impact on total incremental spending. First, based on our prior knowledge of masters sports events generally, we were mindful that event guests often travel together with participating or non-participating family members or friends. Second, observations by the organizing committee and tourism officials revealed that a significant number of participants had traveled to Tyrol prior to the games to make individual preparations or take part in training camps. Thus, in addition to individual spending by the event guests, we accounted for the impacts generated by possible travel companions (i.e., spending by and spending on the travel companions), as well as spending during the run-up visit. Furthermore, due to the proximity of the competition centers, Innsbruck and Seefeld, to neighboring economic areas (especially the German state of Bavaria and the Italian region of South Tyrol), we were aware that a notable number of guests may stay outside Tyrol, causing direct expenditure leakages to those regions. We, therefore, distinguished between guests staying in Tyrol and guests who stayed outside Tyrol during the event. All expenditures by the guests accommodated in Tyrol were considered as incremental, whereas the accommodation expenditures leaking out of Tyrol were excluded from the analysis. However, as the guests staying outside Tyrol also spent time in the competition areas, we considered it justifiable to assume that some of their other expenditure (e.g., food, beverages, merchandise, shopping, and entertainment) was targeted at Tyrolean businesses. Thus, we rather

conservatively estimated that 25% of non-accommodation-related spending by the guests staying elsewhere will have occurred in Tyrol.

Based on the survey responses, 92.5% of EMG and 69.7% of PMG stayed in Tyrol. If these proportions are related to the estimated total segment sizes, that is, 2947×0.925 and 210×0.697 (see Figure 3), the total approximate number of overnight guests in Tyrol per segment can be assessed. Therefore, a total of 2726 event-motivated guests and 146 proximity-motivated guests opted for accommodation in Tyrol during the event. Furthermore, most of the guests (67.3% of EMG and 53% of PMG) traveled with companions. In our analysis of spending on and by travel companions we, further distinguished not only between the location of accommodation (as with individual spending by event participants) but also between non-registered and registered travel companions: as all registered guests were asked to complete the survey, we did not account for spending by registered travel companions in order to avoid duplicate calculations. Instead, spending on both registered and non-registered travel companions was accounted for (see Figure 3 for exact splits). Moreover, 18.3% of EMG (estimated $N = 539$) and 32.3% of PMG (estimated $N = 68$) visited Tyrol prior to the event to take part in training camps, to participate in other events in order to prepare for the WWMGs, or to get to know the competition sites.

As previously stated, the spending by “casual guests” is generally considered non-incremental, as the trip to Tyrol would have occurred at some point anyway, even without the event. However, on the one hand, if the alternative trip had been shorter in time than the realized trip, spending during these “additional” days could be considered incremental. In that instance, the total direct impact surplus is average daily spending \times average number of days extended \times total number of extending casuals. On the other hand, the contrary would be true where the alternative trip lasted longer than the realized trip. In that case, the total direct impact deficit is average daily spending \times average number of days shortened \times total number of shortening casuals. Based on the survey results, the total estimated size of the casual guest segment is, however, very small—only slightly over 1% of all participants or 38 participants altogether. From the survey respondents, only two are categorized in the “shortening casuals” segment and four in the “extending casuals” segment. Additionally, only two of the “extending casuals” and none of the “shortening casuals” provided usable data on the item related to the length of their alternative trip. Thus, the sample size in both cases is clearly too small for reasonable estimations to be made. Conclusively, the WWMGs 2020 had a very marginal time-switching effect on travel to Tyrol and we, therefore, decided to consider the expenditure by casual guests entirely as non-incremental (i.e., neutral).

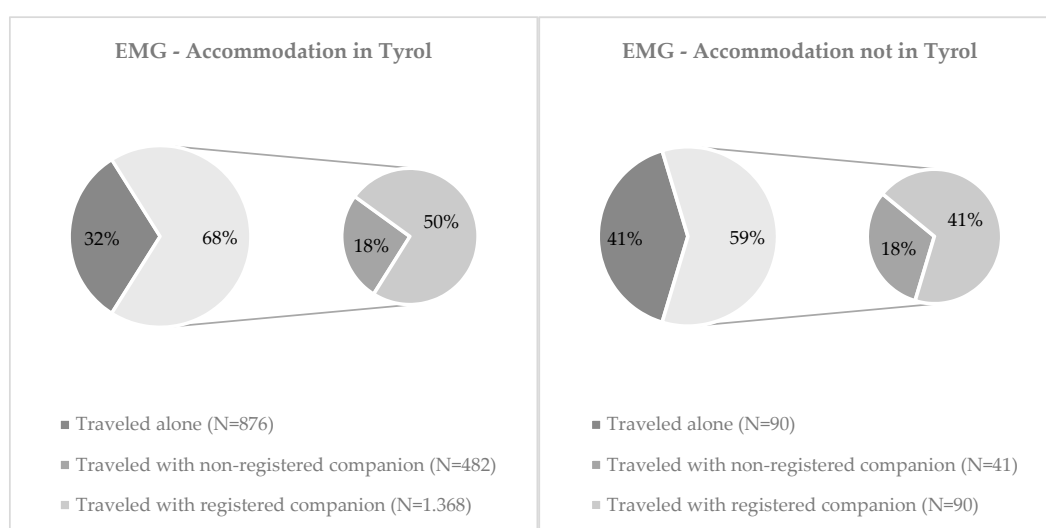


Figure 3. Cont.

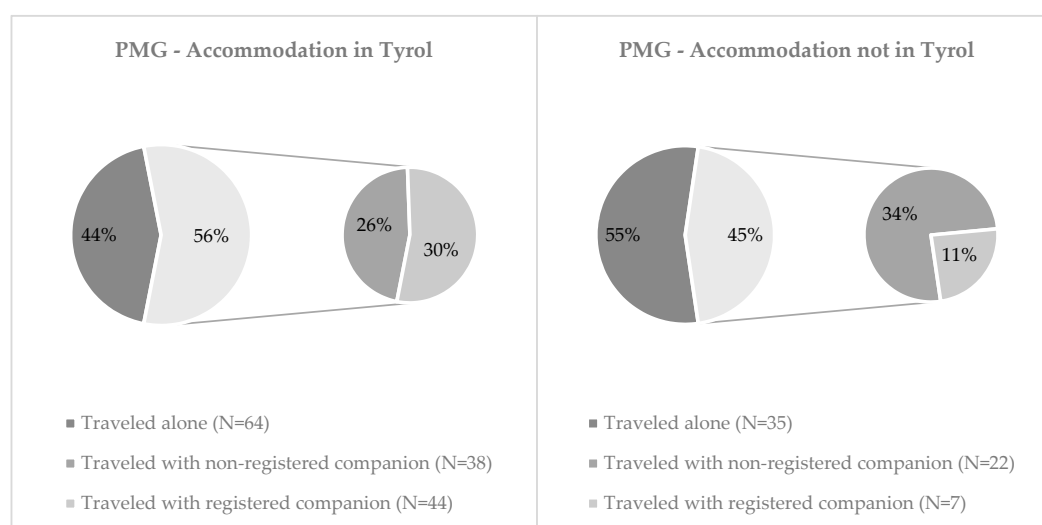


Figure 3. Event guest groups traveling with or without companions.

Of the Tyrolean survey respondents, 64 indicated either that they would have participated in the WWMGs 2020 even if it were not organized in Tyrol, or that they had sacrificed another holiday trip for the event. This is altogether 5.6% of all respondents and 43.5% of all Tyrolean respondents. Because their hypothetical spending during an alternative trip is “retained” in Tyrol, this segment of “home stayers”, which is rather significant in size, is also essential in terms of regional economic impacts on Tyrol. In the survey, the home stayers were asked to assess the spending they would have paid out during their alternative trip (i.e., WWMGs participation elsewhere or another holiday trip). In our analysis, the total retained expenditure is assessed, based on the event guests’ estimations, by computing the average of mean and median for the hypothetical spending and multiplying it by the estimated segment size ($N = 168$ for WWMGs participation elsewhere and $N = 35$ for another hypothetical trip).

Added together, all direct spending by guests and retained expenditure by Tyrolean event participants constitute the net regional economic gain in Tyrol (Ryan and Lockyer 2001). Unlike the majority of previous economic impact analyses, we also included spending associated with the participants’ travel companions, as well as spending during preparatory visits to Tyrol, which were observed to have a rather substantial effect. We also accounted for the direct leakages caused by the guests opting for accommodation outside the accounted economic area. As spending by event guests in Tyrol altogether amounted to €4,047,384 and retained expenditure of home-staying Tyrolean participants was €209,789, the net regional economic impact of the participant expenditure was €4,257,173 (see Appendix A for exact calculations). Altogether, when employing the previously introduced output multiplier of 1.4, the participants generated a total economic impact of €5,960,041 in the region of Tyrol (see Table 3).

Table 3. The total economic impact of WWMGs 2020 participants.

Segment	Expenditure Type	Economic Impact (€)
Event-Motivated Guests	Incremental	3,931,796
Proximity-Motivated Guests	Incremental	115,588
Home Stayers	Retained	209,789
Net Regional Economic Gain		4,257,173
Output Multiplier		1.4
Total Participant Economic Impact		5,960,042

4.1.2. Organizational Expenditure

During the project period from 2016 to 2020, the organizing committee's budget for the WWMGs amounted to €2.7 million. The city of Innsbruck and the state of Tyrol supported the event with a total of €1.4 million. Sponsoring and sales activities (€846,000, value-in-kind sponsoring excluded) and the registration fees paid by the participants (€432,000) were additional major sources of income as presented in Table 4. The means from local sources, including city and state subsidies and the majority of sponsoring income, contributed 81.1% to the overall budget, while 18.9% (i.e., non-local sponsoring and registration fees) were brought in from the rest of Austria or outside Austria and are thus considered as foreign revenue. In terms of the costs for organizing the WWMGs 2020, Table 5 below gives an overview of the composition of expenditure. It can be noted that a large part (87%) was spent in Tyrol and only 13% of the funds flowed into economic cycles outside Tyrol (Innsbruck-Tirol Sports GmbH 2020).

Table 4. WWMGs 2020 Revenue Overview (Innsbruck-Tirol Sports GmbH 2020).

Revenue Type	Sum (€)		
Public Subsidies	1,400,000		
Sponsoring and Sales	846,000		
Registration Fees	432,000		
Other Income (incl. commissions, licenses)	22,000		
Total	2,700,000		
Revenue Source	Sum (€)	aut./reg.	%
Local Revenue (Tyrol)	2,190,000	r	81.1
Foreign Revenue (Rest of Austria)	72,000	a	2.7
Foreign Revenue (Outside Austria)	438,000	a	16.2
Total	2,700,000		100.0

Table 5. WWMGs 2020 Expenditure Overview (Innsbruck-Tirol Sports GmbH 2020).

Expenditure Type	Sum (€)		
Human Resources and Administration	1,334,000		
Event Operations	316,000		
Sports and Venues	580,000		
Marketing and Communications	243,000		
Events and Ceremonies	152,000		
Client Services and International Relations	75,000		
Total	2,700,000		
Expenditure Destination	Sum (€)	Reg./Impt.	%
Local Expenditure (Tyrol)	2,348,000	R	87.0
Foreign Expenditure (Rest of Austria)	187,000	I	6.9
Foreign Expenditure (Outside Austria)	165,000	I	6.1
Total	2,700,000		100.0

As described previously, we applied the model of Preuss (2004b) for the cost-benefit analysis of the streams of means for the organization budget. The model analyzes the monetary flows of the organizing committee, distinguishing between benefits, costs, re-allocations, and neutrals, which are illustrated in Figure 4. Thus, using the equation introduced above (see Equation (6)), the net regional economic gain deriving from the activities of the organizing committee amounts to $€2,700,000 \times (18.9\% \times 87.0\% - 81.1\% \times 13.0\%) = €159,300$. The total economic impact of the organizing committee resource flows including their indirect and induced effects, therefore, amounts to $€159,300 \times 1.4 = €223,020$.

		Use of Funds	
		Region (R = 87.0%)	Import (I = 13.0%)
Origin of Funds	Autonomous (a = 18.9%)	Benefits 16.4%	Neutrals 2.5%
	Regional (r = 81.1%)	Re-allocations 70.6%	Costs 10.5%

Figure 4. Origins and destinations of the WWMGs organizing committee resource flows (cf. [Preuss 2004b](#)).

4.1.3. Total Economic Impacts of the WWMGs 2020

The total net regional economic gain (see Table 6) of the WWMGs 2020 amounts to €4.42 million, more than 96% (€4.26 million) of which derives from participant and event guest spending and the remaining 4% (€0.16 million) from the organizational resource flows. To compute the total economic impact of the WWMGs 2020 on Tyrol, the net regional economic gain is multiplied by the abovementioned output multiplier (1.4), leading to an economic impact estimation of €6.18 million. The operational event budget for the WWMGs 2020 was €2.7 million with a total of €1.4 million deriving from public funds (provincial and city government) and regional tourism institutions. Thus, given that the organization and execution of the WWMGs 2020 were publicly subsidized to the order of €1.4 million, the relationship between total economic impact and volume of subsidies is roughly 4.4:1. Each publicly provided euro, therefore, yielded €4.40 in the regional economy.

Table 6. Total Economic Impacts of the WWMGs 2020.

Resource Flow	Net Gain (€)	Total Impact (€)
Participant Expenditure	4,257,173	5,960,042
Organizing Committee Expenditure	159,300	223,020
Total	4,416,473	6,183,062

4.2. Findings of Qualitative Study

The final part of the findings chapter is devoted to the analysis of the focus group interviews. The focus group consisted of a panel of experts and event stakeholders who were able to provide deeper insights into the evolution of the WWMGs, the organization of this event, and the peculiarities of the event and its participants. Before the interview, the interviewees were provided with the preliminary results of the participant expenditure study.

4.2.1. Characteristics of the Masters Event Participants

The experts perceived the masters athletes as being very passionate. At the competitions themselves, the spirit of the games seems to have been more important than their actual performance. Furthermore, the participants were described as a solvent audience. Discussions with athletes showed that they cover most of the costs for equipment, training, travel, and accommodation themselves. Many seem willing to make large investments for their masters sports activities. This includes the purchase of new equipment, as well as attending training camps and traveling to more distant events:

“The WWMGs participant is a person who has to pay for everything himself, from all the equipment to the journey, to the overnight stay. He competes at this kind of event simply out of passion.” (E5)

4.2.2. The Role of Master Sports in the Host Country of the WWMGs

During the discussion, it became clear that masters sports in general and this kind of event are much more popular in the Anglo-Saxon countries. While in the host country Austria, and the region of Tyrol in particular, master sports are still in their infancy and the WWMGs are largely seen as a typical touristic event, many other countries have a more comprehensive knowledge of master sports and masters events (also among policymakers and sports federations), and their attitude toward them is accordingly more favorable.

The Anglo-Saxon region is mentioned as a model example, where, in contrast to Austria, master sports are highly regarded. A fundamental reason for this is the fact that, in these countries, masters athletes are an integral part of the regional sports clubs, co-financing youth and top-class sport through their higher membership fees. In North America, healthy and athletic aging is also seen as part of a good lifestyle. Accordingly, North America has over 10,000 registered masters athletes.

“If we stick to the potential, it doesn’t hurt to look at other countries and cultures, especially if you look at the English-speaking world, starting with England, but very much Canada, USA, Australia, and New Zealand. (. . .) There, the masters sport, in general, exists as a social trend, quite different from our region.” (E4)

4.2.3. Opportunities Presented by Master Sports and Masters Sports Events

According to the experts, the participants’ economic potential can also be used in Tyrol, both in terms of immediate event impacts, and of longer-lasting benefits (e.g., public health impacts). Practicing sports and physical activities on a masters level is naturally also associated with promoting individual health and reducing the burden of healthcare costs.

Furthermore, the concrete economic potential of masters sport and related business opportunities were brought up in the discussion. Experience has shown that the participants in masters events like to take advantage of, for example, local leisure, gastronomy, and hotel services. This potential can be exploited by staging further masters events, such as world or continental championships.

“But if you had a masters world championship every few years, that could be something. Or even groups of two or three in which the competition is of a manageable size.” (E6)

There was a general consensus that future masters events may also develop economic potential primarily through the participants rather than through the spectators. Masters events are said to have great economic potential through the investments made by athletes before, during, and after the events. Future events could, therefore, also be designed as participant rather than spectator events, and also include, for example, training camps. This would potentially encourage athletes to arrive earlier, train under professional supervision, and familiarize themselves with the venue in advance. The value-adding period of an event could, thus, be extended. The experts saw great economic potential in training programs for over 30-year-old athletes. It was mentioned that a rethink among coaches would be desirable and that economic potential should not only be seen in junior and top-class sport but also in grassroots and especially adult/senior sport.

“I think the whole mindset of all the coaches has to change. So that not only the new top athlete is valuable for the economy as a whole, but everyone who goes skiing.” (E1)

4.2.4. Challenges of Masters Sports and Masters Sports Events

It is noted, as a country-specific issue, that masters sports are currently only partially anchored in Austrian sports associations. The associations’ resulting lack of knowledge about masters sport can make it difficult for the masters segment to gain initial acceptance. However, it was noted that the representatives of the associations were impressed by the masters event held in Innsbruck. The experts present at the event considered the step-by-step incorporation of masters sports into the structures

of their associations, as well as a set of rules and regulations covering all countries and sports as a prerequisite for drawing up future offerings and for achieving the desired acceptance.

“The bottom line was really positive. Also for the Federations and the technical delegates, which were surprised by the level of professionalism of all involved parties. This is a good starting point for future endeavors in masters sport.” (E2)

The political representatives noted that sport-specific funding is mainly invested in young talent. However, the master sports should not be completely ignored here. The organizers of the WWMGs 2020 criticized that it was not possible to raise funding for adult grassroots sports via the relevant (sports) funding agencies at the state or federal level. A detour had to be made via tourism funding. With regard to the discussed potential of master sports, corresponding sports-specific financial support was demanded.

“And I think this is something where a boost must come from the side (federal and state level) somewhere if you look at all the positive aspects that come with the masters sport. (...) It should be possible to get a contribution for mass sports directly for such events.” (E4)

The experts stated that the organization of events like the WWMGs 2020 is heavily dependent on committed individual stakeholders. However, the resources of the volunteering office reach their limits when it comes to the continued provision of services on the scale of the WWMG 2020. The representatives of the sports federations greatly appreciated the collaboration with the publicly funded organizing committee and felt that the gained expertise could be carried forward in the future. Therefore, a need was recognized for a professionally organized contact point for sports representatives, providing services for organizing masters sports programs (e.g., coordination of the project partners, access to funding agencies, and knowledge of the regulations). According to the experts, this can only be ensured if the contact point is staffed by competent, full-time professionals. Corresponding decision-makers should be motivated to pave the way for this.

4.2.5. The Future of (Masters) Sports Events

The comparably early winter in Tyrol and the guarantee of snow are seen as a competitive advantage in bidding for events in snow sports. However, as the effects of global warming are clearly perceptible also in Tyrol, climate change was additionally mentioned as a threat and a challenge. Therefore, integrating climate protection and sustainability measures—which increasingly feature on city government agendas—into the framework of sports events, was perceived as important.

“On the subject of potentials, you have to look, what to pack, what events are possible at what time of the year, will it ever be too hot or anything else?” (E3)

Another challenge mentioned by the experts was the local population's saturation with sporting events. Also, on the political side, a certain reluctance toward staging major events has been noted. The interlocutors unanimously agreed, however, that sports tourism represents a substantial economic pillar for Tyrol and that sports events, thus, create significant added value. With regard to the future of masters events as part of the Tyrolean portfolio, the issue of event saturation is considered as a challenge.

5. Discussion and Conclusions

The three-way analysis of the WWMGs 2020 enabled us to gain an extensive picture of the peculiarities of masters sports events not only in terms of their immediate economic impacts but also in terms of their wider potential in bringing long-lasting benefits to the hosting region. First, the results of the economic impact analysis revealed that the total impact of the WWMGs 2020 on the region of Tyrol was approximately €6.2 million. Second, the impacts derived alone from event guest spending

(excluding the retained expenditure of Tyrolean participants, the expenditure of event guests' travel companions, and the expenditure during preparatory visits) yielded a return of €2.3 for every publicly subsidized euro. This is a comparably high return on public investment, as, for instance, the Youth Olympic Games 2012, which were staged in the same geographic region, with induced regional economic impacts of €10.5 million and public subsidies of €10 million, barely brought a positive return on taxpayers' money (Schnitzer et al. 2016). Both, the results of the quantitative participant expenditure study and the focus group interview study clearly indicate that the main reason for the remarkable regional economic impact of the WWMGs is the older, more affluent participant base. Additionally, the event guests often travel with their families and friends and are willing to invest significantly in, for example, accommodation, catering, and leisure activities. Interestingly, a notable number of event participants visited the region before the actual event (e.g., to attend training camps and explore the competition sites), which increased the event-induced economic benefits to the region.

In addition to affluent guests who are willing to consume services related to tourism and catering in the hosting region, the masters sports events seem to offer other major benefits for the event regions. As observed in our analysis of organizational resource flows, there is little to no need for major investments in housing, venues, and infrastructure. As participatory events, masters sports events can be staged in areas that are naturally suited for specific sports disciplines, and have sufficient infrastructure and accommodation capacity already in place. This is often not the case with many constantly growing, large-scale spectator sports events, which require major investments in additional accommodation capacity, infrastructure, and venue refurbishments or construction in order to make a successful bid. In the case of large spectator sports events, high initial investments not only result in high opportunity costs, but potentially lead to economically, environmentally, and socially unsustainable construction and, further, to a negative stance among the general public toward the bidding for such events (Schnitzer and Haizinger 2019).

An important practical implication drawn from the results of this research is that masters sports events provide a promising future alternative for those regions and cities strategically focusing on sports and tourism events. As stated in our focus-group discussion, while the masters events and masters sports movement are already more firmly established and much better known in Anglo-Saxon countries, they are still in their infancy in most of Europe and the rest of the world. However, due to the growth of older, affluent, active, and experience-seeking population groups, it is realistic to expect an increase in the popularity of masters sports events and other sports events directed at the adult and senior population. Conclusively, the masters sports events are not only in place to offer an attractive alternative in terms of immediate economic gains for a hosting region, but also, to contribute to reducing rising healthcare costs by promoting a healthy and active lifestyle for the aging population.

We would also like to comment on two currently intensely debated issues and challenges from the perspective of sports and tourism events in general, and masters events in particular. First, although the WWMGs 2020 were organized in January and, therefore, remained largely unaffected by COVID-19, the consequences of the global pandemic generally catalyzed the discussion about the risks of large tourism events and their financial resilience. Indeed, the mega event projects, with long and resource-intensive bidding processes (Emery 2002) and very high operational costs as well as venue and infrastructure-related capital costs (Flyvbjerg et al. 2016), are very vulnerable to risks associated with unexpected crises, such as global pandemics. As we have demonstrated in this study, the operational costs associated with a large participatory event such as the WWMGs are by no means comparable to the mega-events and there are practically no associated infrastructural investment needs. Although certainly not completely risk-free, we, therefore, consider the risks related to large masters events to be manageable. However, in order to mitigate the potential human and economic cost of canceling an event, we would agree with the suggestions of Parnell et al. (2020) and would encourage the organizers of participatory events and smaller-scale spectator events to perform a careful risk assessment prior to the event. Second, as discussed in our focus-group interviews, sports events are not only impacted by climate change, but they also contribute to global warming and environmental

pollution (Sotiriadou and Hill 2015). Attracting thousands of participants, the majority of whom travel from overseas, the WWMGs are no exception. We, therefore, support the authors' recommendation for all event organizers to raise environmental awareness among participants and other event stakeholders, while additionally, encouraging the organizers to explore new ways of mitigating and offsetting the environmental impact of the events.

From a methodological perspective, one of the key strengths of this study is the extensive examination of economic impacts. First of all, this study not only considered participant spending but also included the impacts generated by organizational resource flows. Second, we considered the retained expenditure of the "home stayers" segment, as well as the impacts of "extending" and "shortening casuals", although the "casual" segment turned out to have a negligible impact. Third, we took into account not only the spending of participants themselves but also that of their travel companions. Fourth, as we were aware of significant event-induced early travel to Tyrol prior to the event (e.g., training camps), we also included these impacts in the analysis. Additionally, this paper provides researchers exploring the economic impact of events with a novel method for analyzing non-normal expenditure distributions. The "mean-median approach" introduced in this paper could prove useful in dealing with (a) potentially overstated impacts through using expenditure averages and (b) potentially understated impacts through using expenditure medians.

With regard to generalizability, data collection, and data analysis, some limitations need to be acknowledged. First, as an event venue, Tyrol has two very notable advantages: (1) it is generally a highly popular winter tourism region and (2) it is located very centrally and is easily accessible especially from many large European metropolitan areas. Thus, as the number of non-local participants may have been positively impacted by the location and regional brand, we would recommend caution with regard to the generalizability of the results. Second, as described previously, we used the "recall method" for expenditure data collection, meaning that the participants were asked to fill in their expenditures afterward. This method has its strengths in its simplicity but may have led to some memory-related inaccuracies in the responses. Third, the online survey for expenditure data collection was offered only in German and English. Whereas the sample representation of most nationalities corresponded well with the population representation, we noticed a slight overrepresentation of native German and English speakers, whereas, for instance, Chinese and Russian guests were slightly underrepresented in the sample. Finally, with respect to data analysis, we did not employ any capture rates for computing the exact expenditure margins that were retained locally or leaked out of the region. However, as Tyrol is a geographically small area, located very centrally, and has traditionally close economic ties to neighboring regions (e.g., the German State of Bavaria and the Italian region of South Tyrol), we acknowledged potentially significant leakages and spill-overs by using a very conservative multiplier.

Author Contributions: Conceptualization, M.S. and P.L.; methodology, P.L., S.S., M.S., and H.W.; literature review, P.L. and A.M.; validation, H.W. and M.S.; formal analysis, P.L., S.S., M.S., and A.M.; data curation, P.L., S.S., and M.S.; writing—original draft preparation, P.L., M.S., and S.S.; writing—review and editing, M.S., H.W., S.S., and P.L.; project administration, P.L. and M.S. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. Participant Spending by Segment and Expenditure Category

Individual Expenditure (€) of event guests - Accommodation in Tyrol

Expenditure	Event-Motivated Guests					Proximity-Motivated Guests				
	\bar{X}	Md	$(\bar{X}+Md)/2$	N	Total $((\bar{X}+Md)/2)N$	\bar{X}	Md	$(\bar{X}+Md)/2$	N	Total $((\bar{X}+Md)/2)N$
Accommodation	760.59	500.00	630.30	2726	1,718,190	283.96	200.00	241.98	146	35,329
Food	262.41	200.00	231.21	2726	630,267	114.39	100.00	107.19	146	15,650
Beverages	86.15	50.00	68.07	2726	185,568	48.06	40.00	44.03	146	6,428
Medical	5.77	0.00	2.89	2726	7,866	7.04	0.00	3.52	146	514
Public Transport	13.57	0.00	6.78	2726	18,492	4.78	0.00	2.39	146	349
Rental Car	66.09	0.00	33.05	2726	90,086	25.12	0.00	12.56	146	1,834
Merchandise	74.15	20.00	47.08	2726	128,331	11.12	0.00	5.56	146	812
Sports Equipment (rental & service)	30.84	0.00	15.42	2726	42,037	22.45	0.00	11.22	146	1,639
Sports Activities	41.09	0.00	20.54	2726	56,000	20.41	0.00	10.20	146	1,490
Entertainment	28.06	0.00	14.03	2726	38,249	1.84	0.00	0.92	146	134
Shopping	95.88	25.00	60.44	2726	164,754	26.53	0.00	13.27	146	1,937
Other	33.65	0.00	16.83	2726	45,867	24.22	3.60	13.91	146	2,031
Total					3,125,706					68,146

Individual Expenditure (€) of event guests - Accommodation not in Tyrol

Expenditure	Event-Motivated Guests					Proximity-Motivated Guests				
	\bar{X}	Md	$(\bar{X}+Md)/2$	N	Total $0.25((\bar{X}+Md)/2)N$	\bar{X}	Md	$(\bar{X}+Md)/2$	N	Total $0.25((\bar{X}+Md)/2)N$
Food	226.93	150.00	188.46	221	10,413	66.54	70.00	68.27	64	1,092
Beverages	87.25	50.00	68.62	221	3,791	43.46	25.00	34.23	64	548
Medical	1.93	0.00	0.96	221	53	0.00	0.00	0.00	64	0
Public Transport	12.86	0.00	6.43	221	355	0.62	0.00	0.31	64	5
Rental Car	105.96	0.00	52.98	221	2,927	0.00	0.00	0.00	64	0
Merchandise	49.37	0.00	24.68	221	1,364	5.38	0.00	2.69	64	43
Sports Equipment (rental & service)	24.67	0.00	12.33	221	681	47.69	0.00	23.85	64	382
Sports Activities	59.40	0.00	29.70	221	1,641	25.38	0.00	12.69	64	203
Entertainment	39.09	0.00	19.54	221	1,080	0.00	0.00	0.00	64	0
Shopping	61.21	0.00	30.61	221	1,691	15.38	0.00	7.69	64	123
Other	52.25	32.00	42.12	221	2,327	34.77	10.00	22.38	64	358
Total					26,324					2,754

Expenditure (€) related to companions of event guests - Accommodation in Tyrol

Expenditure	Event-Motivated Guests					Proximity-Motivated Guests				
	\bar{X}	Md	$(\bar{X}+Md)/2$	N	Total $((\bar{X}+Md)/2)N$	\bar{X}	Md	$(\bar{X}+Md)/2$	N	Total $((\bar{X}+Md)/2)N$
Spending by non-registered companions	459.89	150.00	304.94	482	146,983	328.89	50.00	189.44	38	7,199
Spending on non-registered companions	343.83	30.00	186.91	482	90,092	165.00	95.00	130.00	38	4,940
Spending on registered companions	343.83	30.00	186.91	1368	255,697	165.00	95.00	130.00	44	5,720
Total					492,773					17,859

Expenditure (€) related to companions of event guests - Accommodation not in Tyrol

Expenditure	Event-Motivated Guests					Proximity-Motivated Guests				
	\bar{X}	Md	$(\bar{X}+Md)/2$	N	Total $0.25((\bar{X}+Md)/2)N$	\bar{X}	Md	$(\bar{X}+Md)/2$	N	Total $0.25((\bar{X}+Md)/2)N$
Spending by non-registered companions	373.57	200.00	286.79	41	2,940	65.00	50.00	57.50	22	317
Spending on non-registered companions	370.38	80.00	225.19	41	2,308	61.43	50.00	55.71	22	307
Spending on registered companions	370.38	80.00	225.19	90	5,067	61.43	50.00	55.71	7	98
Total					10,315					722

Expenditure (€) of event guests during the run-up visit in Tyrol

Expenditure	Event-Motivated Guests					Proximity-Motivated Guests				
	\bar{X}	Md	$(\bar{X}+Md)/2$	N	Total $((\bar{X}+Md)/2)N$	\bar{X}	Md	$(\bar{X}+Md)/2$	N	Total $((\bar{X}+Md)/2)N$
Spending during run-up visit	726.64	300.00	513.32	539	276,678	367.86	400.00	383.93	68	26,107
Total					276,678					26,107

Retained expenditure (€) of home-staying Tyrolean participants

Expenditure	Home Stayers				Total $((\bar{X}+Md)/2)N$
	\bar{X}	Md	$(\bar{X}+Md)/2$	N	
Budget for opted-out holiday trip	879.43	1000.00	939.71	35	32,793
Budget for WWMG participation elsewhere	1105.34	1000.00	1052.67	168	176,996
Total					209,789

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