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# The effect of hosting on performance of host countries in summer and winter Olympic Games

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## ABSTRACT

*The purpose of this study is to review the effect of hosting on performance of host countries in summer and winter Olympic Games. Statistical population is all multi sport competitions of IOC comprising winter and summer Olympic Games. Statistical sample is performance of all countries that be host in this games (48 countries) comprising of 27 hosts in summer games and 27 hosts in winter games. The data related to each competition is gathered from books, papers, dissertations and related websites. Relative share of total medals and count of obtained medals is used as a proxy for countries performance. For reviewing the performance in host and guest situation, the relative share of total medals/count of obtained gold medals that gained by host country is compared with relative share of total medals/count of obtained gold medals that gained by this country in periods other than host period. Descriptive and inferential statistics (Kolmogorov-Smirnov and Wilcoxon tests) is used for analyzing data. The results show no meaningful difference between relative share of total medals and count of gold medals in host guest situations in both of summer and winter Olympic Games. Finally, countries with hosting request and home advantage not only will develop political, economic, cultural, environmental, tourism and psychological aspects, but it will have higher performance in terms of medals.*

**Keywords:** *home advantage, hosting situation, summer and winter Olympic Games.*

## INTRODUCTION

Numerous sport events is done in throughout the world that attract lots of advocators. Nevertheless, Olympic games is the greatest sport event in the world that most of people pay special attention to it, so that through Atlanta Olympic games at 1996 that was the 100<sup>th</sup> jubilee of Olympic games, about 3.5 billion spectators watched the greatest sport event of world in 16 days [15]. Summer and winter Olympic Games is administrated by IOC. IOC was established by Pierre de Coubertin in international sport Congress of the Sorbonne was held in Paris. IOC organize and perform Olympics games every four years in one city in world. In ancient Olympics, the games were performed in honor of Zeus (King of all Gods and father of human race in Greek mythology) in Olympia every four years and the prize of winners was an olive branch. However, summer and winter Olympic Games were performed at 1896 and 1924 for the first time, respectively [18].

The host right of great events is determined after competing among competitors that demanded for hosting this events. At first, candidate cities for hosting games sent their requests for hosting to IOC and the Committee determine the host after several voting stage through a two years cycle [18]. Various studies review the advantages

of hosting these Games to host cities from different perspectives such as political, economic, cultural, environmental, tourism and mental [3, 6, 7, 8 & 20].

In addition to the effects of sport events on host cities, it is seemed that performing these events could improve performance of host country in viewpoint of number of medals, so that it is alluded to improved performance in single-sport events in hosting situation. As an example McEwan, Martin Ginis & Bray (2012) studied the effects of host and guest games on performance (win or lose) of NHL and report that an advantage of host games is shoot loss-imminent whenever a team require to point for escaping from losing. Oppositely, a disadvantage of it is the shoot win-imminent whenever a team is shooting for wining. Vergin and Susic (1999) state that football teams of NFL league win the %58 of host games. This games cause increased public attention in national level, too.

Nevill, Balmer and Williams (2002), by reviewing effects of population crowd and experience on referee decisions, conclude that referees set less foul (%15.5) in condition of population crowd, compared with population silence. So, spectators as an advantage of hosting could affect referees' performance and results of match toward the host team. Sanches, Garsia-Calvo, Leo, Pollard and Gomez (2009) by analyzing host advantage in two football leagues of the two best division of Spain, report the host advantage in first division and second division 66.3 and 65.6 respectively and couldn't show any meaningful difference between host advantage in these two leagues. As well as, results showed that host advantage has reduced after introducing three points system.

Goldman (2009) by reviewing host advantages in NHL, show that there is a meaningful difference between wins in host and guest games. As well as, Penas and Ballesteros (2011) by doing a study with subject of "Game location and team quality effects on performance profiles in professional soccer" report that number of goals, shoots, shoot on goals, attacks, completed passes, completed dribbles and so on was meaningfully more for host teams relative to guest teams.

Rahnama, Sadeghipour and Bambaiechi (2005) compare the performance of premier football league of Iran in host and guest games and conclude that number of wins, goals and gained points in host matches are meaningfully more than them in guest games. As well as, the number of losses in host games are meaningfully less than number of losses in guest games. Rahnama, Sadeghipour, Bambaiechi and Khayambashi (2006) report that host advantage phenomenon is effective in performance of teams of Asian teams, too; and state that most advantage of host games in east (and southeast) Asia and west (and southwest) Asia is respectively in Indonesia (%65.3) and Saudi Arabia (60.6). In addition, Tahmasebi, Vazini, salehpour and Hatami (2012) by reviewing host advantage in premier football league in Iran, show that host advantage in Iran league is %61 that is similar to England and Turkey leagues. As well as, factors such as climate conditions and distance is inv advantage for host teams. However, goals and spectators population have no effect on host advantage.

Nevertheless, Bray and Martin (2003) by inquiring 52 skier show that there is no meaningful difference between observed performance of sporadic athletics in host and guest games.

Pollard and Pollard (2005) hint to review causes of improved performance in host situations and draw a model related to host advantage phenomenon in home matches (figure 1).

In spite of numerous studies about improved performance of countries in single-sport events, there is no study which investigate the effect of hosting on summer and winter Olympic Games narrowly (even international multi sport events); however some studies pay attention to this subject moderately. Balmer, Nevill and Williams (2003) investigate host advantage for track and field and weightlifting (predominantly objectively judged), boxing and gymnastics (predominantly subjectively judged), and team sports (involving subjective decisions) in 1896 to 1996 Olympics. The results show that in host situation, there is a lot of host advantage for the upshots of boxing, gymnastics and team sports (involving subjective decisions of referees) and this advantage is not for guest situation. it shows that referees give rather more points to athletics of Olympic host countries in regard of population and crowd of spectators. However, these study imply to host advantage in a multi-sports and concentrate on indentifying causes of improved performance of host countries. Clarke (2005) compared the differences of performance of host countries in Olympic games in comparison with before and after periods and suggest that percent of obtained medals in host situation is more in comparison with guest situation (before and after host period). Nevertheless, in this study there is no inferential analyze about existence of meaningful difference in this field and it is concentrated only on descriptive results.

so said, there is no research that narrowly compared performance of host countries relative to non-host (guest) situation in multi sport events such as summer and winter Olympic games. As well as, rare researches in this field are of less details and only about multi-sport [1] or in descriptive mode (4). However, the method used by Clarke (2005) for comparing performance of countries in host period with pervious and next periods seem to be suit and rational; Because comparing performance with previous periods is less influenced by political, economic and so on variables. So, we used comparing host countries performance with pervious and next periods for purposes of our research. The other positive aspect of our research is that include winter Olympic games, in addition to summer Olympic games, and so we can attribute our research and our result to multi sport events in master level (other than college level or disables level). Totally, we investigate that is the performance of countries in international multi sport events of IOC better in host situation or not?

### MATERIALS AND METHODS

This research is descriptive and comparing. Statistical population is all multi sport competitions of IOC that include credible summer and winter Olympic Games. Performance of all countries that were host of these games (48 countries) is the statistical sample (27 summer Olympic Games and 21 winter Olympic games). Data related to each Olympic Games is gathered by books, papers, dissertations and related websites. For reviewing performance of countries, count of medals and number of gold medals is used normally; but, because count of distributed medals was varied from one period to other period, we used the relative share of total obtained medals and relative share of obtained gold medals. For example, relative share of total obtained medals by host is computed by following formula:

$$\text{Relative share of total obtained medals} = \frac{\text{total obtained medals}}{\text{total distributed medals}}$$

For determining relative share of obtained gold medals, the similar formula is used. As well as, for comparing of performance in host and guest situation, the relative share of total obtained medals/gold medals by host, is compared by this ratio for pervious and next periods witch the cited country was not host. However, it's not probable that the first and the last periods be compared with pervious and next period respectively and so we eliminate these events from our analysis. As well as, some countries were not present in pervious or next periods of host period (because of factors such as boycott) and we used the performance of nearest present periods to host periods as pervious or next period performance. For analyzing the data, we used descriptive and inferential statistics (Kolmogorov-Smirnov and Wilcoxon tests) in %5 level of meaningfully.

### RESULTS

As it could be seen in table 1, mean of relative share of total obtained medals and number of gold medals in host period are more than mean of relative share of total obtained medals and number of gold medals in pervious and next periods that the current host was present at those events, for both summer and winter Olympic games. However, this mean is more for summer Olympic Games. A notable point is that the mean of relative share of total obtained medals for next period after host period is less than previous period of hosting in both summer and winter games. As well as, observed standard deviations show that there is much dispersion in relative share of total obtained medals and number of gold medals in both summer and winter games.

The results of table 2 show that there is a meaningful difference between relative share of total obtained medals/number of gold medals in host situation and guest situation (relative share of total obtained medals and number of gold medals in pervious and next periods to host period).

### DISCUSSION

The result show that the mean of relative share of total medals and count of gold medals in host situation is more than them in previous and next periods that current host country were present in games, in both summer and winter Olympic games. These results are similar to Clarke (2005)'s results. In Clarke study relative share of medals was investigated for each country separately, but, we use mean of relative share in the present study. These ratios show that host countries obtained about %17 of total medals and gold medals in summer Olympic Games and %10 in winter Olympic Games. As observed, the mean of obtained total medals and gold medals for summer Olympic Games is more than it for winter Olympic Games. Because of using relative share of obtained medals, the difference

between number of distributed medals in summer and winter games is not matter. So, it must compare the effect of each factor affecting host advantage for both summer and winter games (using Polard and Polard's model, 2005). However, to catch a glimpse of influencing factors, it could be stated that most of factors are similar for both of summer and winter games, but only two factors, spectators and referees that are of less means for winter games. Number of spectators is less for winter games and winter Olympic Games events are more objective, comparing with summer games and therefore, referees are less affected by spectators for host interests. Of course other factors can affect these differences in means such as elite level. because of requirement equipments and special geographic conditions are solely are dominated by some countries and so athletics of these countries have such a higher performance comparing athletics of other countries that if other countries were host, athletics of host country had not better performance comparing them. This imply to unequal share of host advantage for different countries, as some countries obtained more share of medals in host situation and several countries obtained less share of medals in host situation, specially for Olympic games. Of course, this may be related to other factors such as the distance of other countries to host city, weather and climate conditions and so on.

An attractive point is that the mean of relative share of total obtained medals and obtained gold medals for next periods after host period is less than it for previous period in both summer and winter games. In other word, the host country has impaired performance comparing with both host period performance and pervious period to host period and has not improved performance in next period to host period. This is seemed to be opposite to this claim that implementing international sport events improve performance in next periods. However, this impaired performance may occur periodically and performance of countries would take sustain improving in the further next periods. As well as, attending to 8 years interval between pervious and next period to host period, conditions of other countries may improved, because if review the trend of obtaining medals by countries in different periods, in first periods only some countries obtained medals and placed in medal rank (less than 20 countries at the first sex periods) and number of them increased gradually and nowadays number of countries that obtained medals reaches to 80 [4]. However it is necessary to more study in this field for gain insight more and more about impaired performance in next period after host period.

The results show that there is a meaningful difference between relative share of total obtained medals/number of gold medals in host situation and guest situation (relative share of total obtained medals and number of gold medals in pervious and next periods to host period). This result shows that Countries with request the hosting an international multi-sport event like the Olympic Games Summer and Winter Can benefit from the higher performance in respective event. These findings are consistent with studies McEwan, Martin Ginis and Bray (2012), Tahmasebi, Vazini, salehpour and Hatami (2012), Penas and Ballesteros (2011), Sanches, Garsia-Calvo, Leo, Pollard and Gomez (2009), Goldman (2009), Rahnama, sadeghipour, Bambaiechi, Khayambashi (2006), Rahnama, Sadeghipour and Bambaiechi (2005), Balmer, Nevill and Williams (2003), Nevill, Balmer and Williams (2002) and Vergin and Susic (1999). All the studies mentioned and present study have done in team sports and multi-sport (that team sports and sports that are mostly subjective are included) and it shows that all the studies emphasize on important the home advantage in team sports and sports mostly subjective (that Creates the possibility of jury bias). However in individual events, still there is ambiguity about the importance of home advantage. Because the only study have done on individual sports (skiing sport) (2) has not been reported Significant difference between performance in host situation comparing with guest situation. Regardless of the outcome, boycotts, revolutions, wars and etc has great impact on the Countries performance in sport events. For example, the 1980 and 1984 Olympics were boycotted by many countries and it led to countries medals that did not participate in games is divided among other countries such as the host country and influence on results of home advantage. However, such things are happening in all the Olympic periods and now we're seeing some of these issues threatening and can't be deleted restrictions of such intervention variables. Finally, countries with hosting request and home advantage not only will develop political, economic, cultural, environmental, tourism and psychological aspects, but it will have higher performance in terms of medals. It seems that some countries that were hosted in the several of summer and Winter Olympic Games (USA, Great Britain and Russia), are as top powers these games. But, holding such events need to several infrastructure and updated that can be achieved with long-term planning.

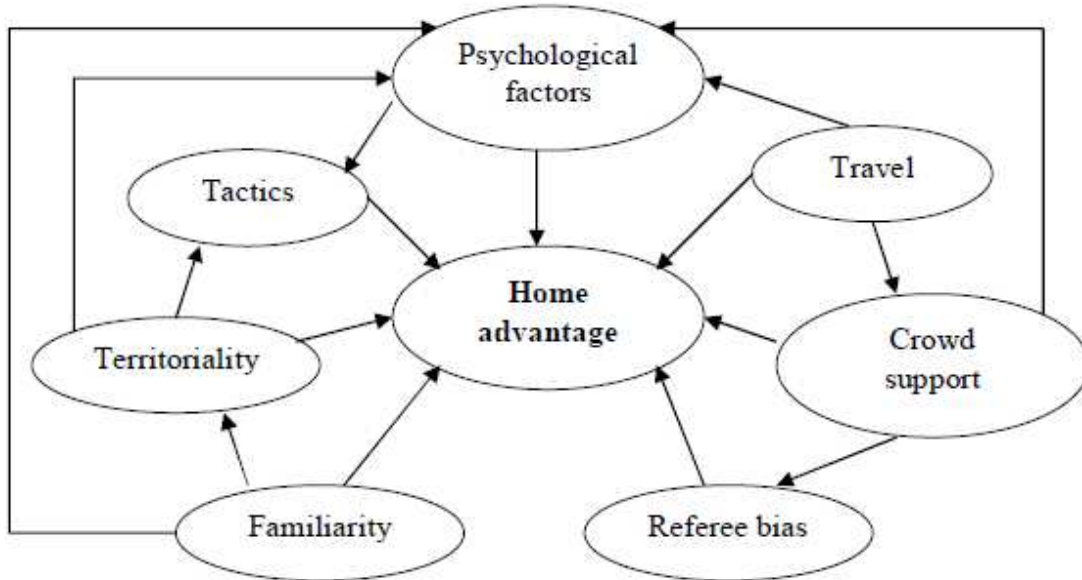


Figure 1: Factors affecting improved performance of countries in host situation

Table 1: descriptive statistics of relative share of total obtained medals and number of gold medals

	event	period	N	M	SD
relative share of total obtained medals	summer Olympic Games	previous period of hosting	26	6.46	5.602
		period of hosting	27	17.04	19.186
		after period of hosting	26	6.23	5.233
	winter Olympic Games	previous period of hosting	20	6.35	4.344
		period of hosting	21	9.43	6.997
		after period of hosting	20	4.35	3.216
relative share of number of obtained gold medals	summer Olympic Games	previous period of hosting	26	6.81	7.077
		period of hosting	27	16.89	18.444
		after period of hosting	26	6.73	6.75
	winter Olympic Games	previous period of hosting	20	6.5	5.247
		period of hosting	21	10.95	10.773
		after period of hosting	20	5	4.91

Table 2: difference between relative share of total obtained medals/number of gold medals in host situation comparing with guest situation.

	event	Z	Sig	
relative share of total obtained medals	compared with the previous period	summer Olympic Games	-4.293	0.001
		winter Olympic Games	-3.179	0.001
	compared with the after period	summer Olympic Games	-4.098	0.001
		winter Olympic Games	-3.601	0.001
relative share of number of obtained gold medals	compared with the previous period	summer Olympic Games	-4.194	0.001
		winter Olympic Games	-2.56	0.001
	compared with the after period	summer Olympic Games	-3.893	0.010
		winter Olympic Games	-2.815	0.005

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