IOSR Journal Of Humanities And Social Science (IOSR-JHSS)
Volume 20, Issue 11, Ver. II (Nov. 2015) PP 79-84
e-ISSN: 2279-0837, p-ISSN: 2279-0845.
www.iosrjournals.org

PESE Influences on Olympic Performance

Jayantha K[1].,Kennedy D Gunawardana[2], RAND Ramanayaka[3], Ashika B.A.D.W.[4]

[1,,3,4] *Department of Sport Science and Physical Education, University of Kelaniya, Sri Lanka*
[2]*Department of Accounting, University of Sri Jayewardenepura, Sri Lanka*

Abstract: *TheOlympic Game being considered as the most competitive and major sport event in the world. Consequently, studies based on Olympic performance yield an important place in the sport studies. The main purpose of this study is to examine thepredication capacity of predicators which have been reviled by several authors previously. Among those studies predicting Olympic performance takes a significant stand. This study reviled the significance of political, economic, socio-cultural, and ecological (PESE) factors in predicting the performances of Olympic Game. The basic political background, GDP per capita, population size, HDI and host city advantages were considered to represent those factors respectively. Year 2000, 2004, 2008 and 2012 Olympic Games, and countries at least taken one medal in each game were selected for the sample. As the nature of the study, secondary data were associated and used official published reports that relevant to those dimensions of variables to maintain the validity of the data. The step wise multiple regression analysis was employed to measure the predication capacity of the independent variables with the inferential statistics of the model. The degree of determinants of the overall model was 0.32 means that the reading capacity of the dependent variable by the independent variables is 32%. All estimation of the model were statistically significance at 95% level of confidence.. The above results shows that weak relationship of all factors with Olympic performance and therefore it can be concluded PESE related factors do not help considerably to predict the Olympic performance.*

Keywords:- *Olympic Games,Olympic Performance, PESTEL Analysis, Sport.*

I. Introduction

The ancient Olympic Games, as far as we know today, have a long history. It all began in Greece, in the Peloponnese about 3,000 years ago. According to existing historic manuscripts, the first ancient Olympic Games were celebrated in 776 BC in Olympia. They were dedicated to the Greek god Zeus and took place in the same place every four years. This four- year period became known as an "Olympiad"[1]. Pierre de Coubertinof France who founded the International Olympic Committee (IOC) in 1894in Paris and the first Games, 1896, marked the beginning of the new Olympic era that has now lasted for over a century[2]. In little over a century, the Olympic Games have become a global event. Two major technological revolutions have contributed to this: in transport and the media.[2]. Today the Olympic Games has become as a mega event that more than 200 nations participated in the game and highly competitive stage.The diversified gaining; such as socio-economic impact, socio-cultural impact, physical impact, political impact,[3] delivered by the Game has led to increase the competitive in the game. In addition to that participants, spectators, volunteers, and non-direct participant via media are also dramatically increasing game by game and this scenario led to keep higher attention of the world community towards the game. Within this context discussions of different point of views have been widespread. However, factors behind the Olympic performance are still a puzzle. Even though, some micro and macro level factors identifies by the previous studies they are not sufficient to predict Olympic performance accurately. This nature explains the uncertainty of the Olympic behavior, not the soundless of the findings. Hence it is important to further strengthen and expand the existing theories until match them with the ultimate goal that is the key objective of this study. This paper reviews the rhythm of the Olympic Talley distribution from a macro point of view which is not new but rather a vast sample and adding Human Development Index (HDI) that has been kept less attention by the researchers. In addition to HDI, this study was associated Gross Domestic Product (GDP) per capita, political application of the nations (weather it is/was basically communist or not), mid-year population, and host city advantage as independent variables that are macro level factors influence on Olympic Talley or Olympic performance.

II. Literature Review

Studies on Olympic performance are not new. The first study of Olympic performance determinants (Jolk et al., 1956 cited by Andreff (2010)[4] was combining economic variables, such as GDP per capita and population, with weather, nutrition, and mortality in the athlete's home nation. The first two econometric

analyses of Olympic Games (Grimes et al., 1974; Levine, 1974) exhibited that communist countries were outliers in regressing medal wins on GDP per capita and population: they were winning more medals than their level of economic development and population were likely to predict. Cited by Andreff (2010)[4]. Kuper, (2001)[5] argued that higher income per capita allows a country to specialize in sports, to train athletes better, to provide better medical care, to send a larger group of athletes to the games, etc. In the Olympic history the richer countries have participated at many more events than developing countries. As we will show later on, income per capita was a crucial determinant at the first editions of the Games. There is evidence that the costs of transport and medical care, etc. decreased over time, which enables even poor countries to send delegates. Besides that host advantages pay a major impact on Olympic performance. Korea doubled its medal share at the 1984 games and hosted the Olympics in 1988. Australia performed significantly better at the Atlanta Games in 1996. And Greece doubled its medal normal share at the Sydney 2000 Games. This is a time-to-build argument: it takes long run planning to create a group of optimal performing athletes.Kuper (2001)[5]. A reason studies Hawksworth (2012)[6] shows that economic and political factors were found to be statistically significant in explaining the number of medals won by each country at previous Olympic Games: Population; average income levels (measured by GDP per capita at PPP exchange rates); whether the country was previously part of the former Soviet/communist bloc and whether the country is the host nation. In general the literature shows that population size, income per capita, the home advantage, and a socialist/communist tradition have a major impact on the medal counts. Population size is the fundamental determinant of medal success. A larger population increases the group of potential athletes. There is a debate on the impact of a larger population on performance though. A country like India has a large population but relatively low success rate at the Games. Bangladesh is the country with the largest population that never won a medal. Another issue in this respect is that countries with large groups of talented athletes are not allowed to send them all. For most events there are participation limits. So the relation between population and Olympic success is a complicated one. Kuper (2001)[5]. A most recent study Jayantha (2015)[7] reveals that the effect of the GDP per capita, Country mid- year populations, HDI, Host city advantages and political form of the nation on Olympic medal Talley with related to a small sample that is of 2000 Olympic Game. Though some of research findings show the predication capacity of the socio economic variable as above mentioned. In reality it is not enough to use particular socio economic factors which previous studied have mentioned for predication the wining medal. It is because, the country like Kenya, Jameika, Uganda…etc which are in African region has proven the potential under the low condition of socio economics factors. In this study, it is focused to rethink the predication capacity of socio economic variables which had been used in previous studies. So this study based on the problem of "does socio economics variables (already used in several models of medals predication) sufficiently predict the medal wining of the country in Olympic." The method of evaluation the predication capacity extended by the hypothesis of the socio economics variables have no significance in terms of predication capacity.

III Materials and Method

3.1 Working Definitions:

With purpose of evaluation the socio economics variables predication capacity it is used regression analysis. The dependent variable of the model called Olympic Performance is defined in this study as; the total medal tally taken by a particular nation in a given Olympic Game. The PESE denoted by Political, Economic, Socio-cultural, and Ecological Factors respectively. As the purpose of this study the variable political is defined as; weather the political system in a particular nation is/was basically on socialism or not. The variable Economic is defined as; the GDP per-capita in a particular nation and year. Mid-year population and healthiness of particular nation in the considered year are defined by the variable Socio-cultural. Finally the variable Ecology is defined as; the backing of the surrounding nature for the Olympic Games.

Fig: 1 – Conceptual framework – Developed by Researchers

3.2 Operational Definitions:

As to operationalize the study, operational definitions were also set. Accordingly, the political system was defined as a dummy variable. Weather a nation is/was basically in communist background take 1 and otherwise 0. The variable Economic was operationalized as the mid-year GDP per-capita of the concerned nation. The variable Socio-cultural was considered as two dimensions such as population and healthiness of the people in the nations. Accordingly, population was considered as the mid-year population of the particular nation and year. Besides that HDI reflected the healthiness of the people in the individual nation.. Finally the variable Ecology was considered again as a dummy variable. Therefore the Host city for One Olympic Games take 1 and otherwise 0.

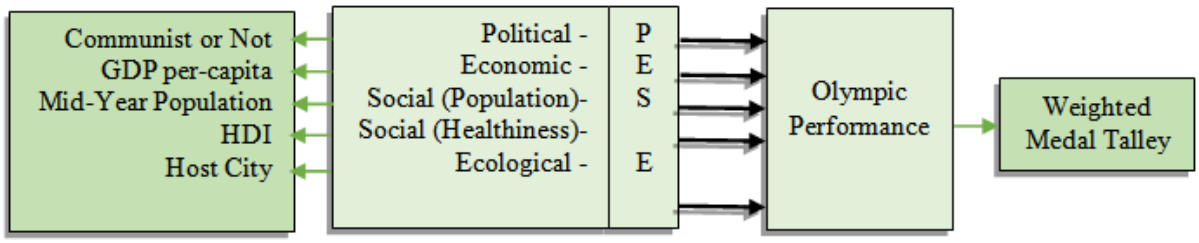

Fig: 2 – Operationalization of the study – Developed by Researchers

3.3 Operationalization of the variables

All variables mentioned above were operationalized with the aid of measurement criteria indicated in the table No. 03 below.

Dimensions	Dependent Variable	Indicator	Hypothesized Sign
Olympic performance	Medal Count (Mit)	The number of medal won by a country in a particular Olympics	N/A
	Independent Variables		
Political	Political System (pol)	1 if the country is or was to be a socialist country or 0 otherwise	+
Economic	GDP per capita (GDP)	The per capita GDP (measured in PPP current international dollars) of a country at a particular Olympic year	+
Socio-cultural	Population (MP)	The population size of a country at a particular Olympic year	+
	Human Development Index (HDI)	The Human Development Index of a country at a particular Olympic year	+
Ecological	Hosting Country (Host)	1 if the country is the hosting country of the year or 0 otherwise	+

3.4 Validity and reliability of Data.

As the study totally depend on secondary data could maintained validity and reliability of data by collecting them from reliable sources. Accordingly, data pertaining the Olympic performance and Host city were collected from IOC data sources and others were collected through official web sited relevant to the each variable such as [8] Org for understand the political scenario, [9] Org for GDP per-capita, [10]org for mid-year population, [11] For HDI and [12] for Host city advantages. All the data was considered as it is except the data pertaining to the Olympic performances[12]. Those data was re-evaluated as assigning values 5, 3, and 1 points for Gold, Silver and Browns respectively according to precious others.

3.5 Development of Hypotheses

While Olympic performance was considered as the dependent variable as the researchers are mainly interest on that, and the Political (Ball, 1972)[4][13][7] GDP per-capita (Jolk 1956)[4][13][7] Population (Jolk, 1956)[4][13][7]Human Development index, and Host,[13][7] status of particular countries were considered as independent variablesof the study.

3.6 Sample

Year 2000, 2004, 2008 and 2012 Olympic Games and those who gained at least one Olympic Medal in four particular Games were selected as the sample.

3.7 Data Analysis

There are many econometrics model have been employed to estimate medal forecasting. As mentioned in the background of the study, several authors have attempted to predict the wining medal of the each country by using socio economic data. Accordingly objective of this study as previously mentioned,this section of the study devotes to test the predication capacity of so-called independent variable which aiming to test the research hypothesis. To test the predication capacity of the independent variable it is used multiple regression model. The dependent variable of the model is "*Weighted medalvalue* (it is a product of number of medal won by the each country)" (Mit) in this model it has been examined the four Olympics for each country. The explanatory variables are GDP per capita in purchasing power parity dollars (PPP$) and midyear population (MP), And the political background of the country as a dummy variables. The gap between two Olympic is four year gap. When we consider the GDP per capita and Mid-year population it is considered the ***mean*** value of each variable for the last four years. It reflects the average Socio economics situation of the country. It has been used as a dummy variable to explain the Host city advantage. In this predication model, poetical approach of the country mentioned as dummy variable (POL). If it is socialist country, it is considered in to model as 1, and 0 otherwise.

The model for the medal forecasting is shown below:

$$Y = \beta_0 \pm \beta_1 GDP \pm \beta_2 MP \pm \beta_3 HDI \pm \beta_4 POL + \beta_5 HOST \pm \varepsilon$$

Where Y represents the dependent variable called *Weighted medal* of a country and GDP stands for the *GDP per capita* of each country, MP stands for *mid-year population*, HDI stands for the *human development index value of the country*, POL stands for *political approach* of the country (communist or not) and HOST stands for the *host city* (dummy variable) finally ε stands for random error which normally standard distributed.

3.7.1 Overview of the data set

The tables 01 bellow shows the mean value of the each variables and their standard deviation.

Table 01: Mean Value and Standard Deviation of Each Variables

Descriptive Statistics			
	Mean	Std. Deviation	N
Weighted medal	46.03	68.550	252
GDP per capita	18662.776984	16091.9190021	252
Population (Million)	78.3219	215.98921	252
HDI	.74661	.142542	252
Communist or not	.29	.455	252
Host	.01	.109	252

According to estimationsmentioned above, there is comparatively a higher standard deviation of Population and GDP per-capita. It means that the population and income distribution within countries have note clustered around its mean. The table 02 shows the model summary of regression analysis. The procedure was step wise regression analysis. Basically there were five models which reflects full model at model number 5.

Table 02: Model Summary

Model Summary[f]										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.160[a]	.026	.022	67.799	.026	6.591	1	250	.011	
2	.472[b]	.223	.217	60.673	.197	63.172	1	249	.000	
3	.505[c]	.255	.246	59.518	.032	10.758	1	248	.001	
4	.523[d]	.274	.262	58.887	.019	6.349	1	247	.012	
5	.573[e]	.328	.314	56.767	.054	19.790	1	246	.000	.359
a. Predictors: (Constant), GDP per capita										
b. Predictors: (Constant), GDP per capita, Population (Million)										
c. Predictors: (Constant), GDP per capita, Population (Million), HDI										
d. Predictors: (Constant), GDP per capita, Population (Million), HDI, Communist or not										
e. Predictors: (Constant), GDP per capita, Population (Million), HDI, Communist or not, Host										
f. Dependent Variable: Weighted medal										

The degree of determinants (R Square) of each model gets increasing value but the value of *R Square* for the 5th model which includes all independent variables is 0.328. The changes of Square of each step of model are at considerably lower level. This means that the predictors of the models which squinty added to the model have no much effect to increase the overall prediction capacity. The statistical significance of the model which is measured by the F test statistics are at worthy level to model, to be accepted except first model. The analysis of variance (ANOVA) is shown by the table 03.

Table 03:Analysis of Variance

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30295.572	1	30295.572	6.591	.011[b]
	Residual	1149188.174	250	4596.753		
	Total	1179483.746	251			
2	Regression	262847.559	2	131423.779	35.701	.000[c]
	Residual	916636.188	249	3681.270		
	Total	1179483.746	251			
3	Regression	300958.165	3	100319.388	28.319	.000[d]
	Residual	878525.581	248	3542.442		
	Total	1179483.746	251			
4	Regression	322974.510	4	80743.628	23.285	.000[e]
	Residual	856509.236	247	3467.649		
	Total	1179483.746	251			
5	Regression	386746.681	5	77349.336	24.003	.000[f]
	Residual	792737.065	246	3222.508		
	Total	1179483.746	251			
a. Dependent Variable: Weighted medal						
b. Predictors: (Constant), GDP per capita						
c. Predictors: (Constant), GDP per capita, Population (Million)						
d. Predictors: (Constant), GDP per capita, Population (Million), HDI						
e. Predictors: (Constant), GDP per capita, Population (Million), HDI, Communist or not						
f. Predictors: (Constant), GDP per capita, Population (Million), HDI, Communist or not, Host						

The table 03 shows the parameter estimation and their test statistics. The "Beta" value of the each variable at statistically significance level except "Beta" value for the variable called "GDP per capita". This means that all regression coefficients which are statistically significant deviate from zero. The null hypothesis called the regression coefficient value equal to zero in population is rejected.

Table 04

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
5	(Constant)	-56.659	22.928		-2.471	.014			
	GDP per capita	.001	.000	.139	1.913	.057	.160	.121	.100
	Population (Million)	.136	.018	.429	7.770	.000	.411	.444	.406
	HDI	97.834	33.979	.203	2.879	.004	.179	.181	.150
	Communist or not	21.173	8.416	.140	2.516	.013	.080	.158	.132
	Host	150.621	33.858	.239	4.449	.000	.342	.273	.233

IV Results

According to data analysis above mentioned.Though each variables in the module were statistically significance at 95% level of confidence. it shows that the predication capacity of the overall model at very low level comparatively.The degree of determents which called "R square" (.328) clearly shows that independent variables have only 24% reading capacity regarding dependent variable. Stepwise regression models have no significant impact in terms of "R Square" when it increases one over another.

V Discussion

As mentioned in the beginning of the paper, it was clearly noted that finding out the prediction capacity of PESE factors subject to meddle predication in Olympics was the objective of the study. In this model, it had been used data of four Olympics. Last 12-16 years experiences regarding Olympic medal winning imply that complexity of predication is needed to intellectual intervention.

VI Conclusion and Recommendations

The results of the study demonstrate that the macro level PESE factors do not support further to predict the Olympic performances. In average, PESE factors support 32% to predict the Olympic performance which is not sufficient. There is a huge difference between the predicted Olympic performance based on the proposed modal and the actuals. It reveals that the major factors influence for Olympic performancestill remaining hidden and different macro and micro level factors which are influenced on Olympic performance should be identified and tested. Furthermore, priorities of nations and their motivation towards sport should be consider when studying Olympic performance since they may be influenced on training facilitation and participation in

Olympic Games. Moreover, still there is a possibility to check whether there are any ventures to develop the proposed modal and use the variation of deference of predicted values based on the modal and actuals for predicting the Olympic performance.

Reference

[1]. T. H. E. O. Truce and T. H. E. Athlete, "the Olympic Games of Antiquity," no. July, pp. 1–3, 2009.
[2]. International Canoe Federation, "The Modern Olympic Games," pp. 1–18, 2007.
[3]. M. Malfas, B. Houlihan, and E. Theodoraki, "Impacts of the Olympic Games as mega-events," Proc. ICE - Munic. Eng., vol. 157, no. 3, pp. 209–220, 2004.
[4]. M, Andreff,. and Andreff W., "Economic Prediction of Sport Performances : From Beijing Olympics to 2010 FIFA World Cup in South Africa," 12th Conf. Int. Assoc. Sport Econ. 85th West. Econ. Assoc. Int. Conf. Portland, June 29th – July 3rd 2010., no. 10, 2010.
[5]. G. Kuper and Sterken, E., "Olympic participation and performance since 1896," Available SSRN 274295, 2001.
[6]. J. Hawksworth, "Modelling Olympic performance Economic briefing paper," Price water house Coopers Int. Ltd., 2012.
[7]. K.Jayantha,. and E. G. Ubayachandra, "Going for Gold Medals : Factors affecting Olympic," Int. J. Sci. Res. Publ. Vol. 5, Issue 6, June 2015 ISSN 2250-3153, vol. 5, no. 6, pp. 1–7, 2015.
[8]. Infoplease, Communist Countries, Past and Presenthttp://www.infoplease.com/ipa/A0933874.html, downloaded on 2015 July 15
[9]. United Nations Development Programme, Human Development Report http://hdr.undp.org/en/content/gdp-per-capita-2011-ppp , downloaded on 2015 July 15
[10]. World Population Prospects: The 2015 Revision, United Nations Population Division Department of Economic and Social Affairs, http://esa.un.org/unpd/wpp/DVD/ , downloaded on 2015 July 15 2000 2004 2008 2012
[11]. United Nations Development Programme, Human Development Reports, Human Development Index trends, 1980-2013, http://hdr.undp.org/en/content/table-2-human-development-index-trends-1980-2013, downloaded on 2015 July 15
[12]. Olympic, http://www.olympic.it/english/game, downloaded on 2015 July 15
[13]. A. B. Bernard and M. R. Busse, "Who Wins the Olympic Games : Economic Resources and Medal Totals," Unpubl. Work -National Bur. Econ. Res., pp. 1–23, 2001.