

Sport Economics

Title

Modeling international sporting success of nations. Do national sport policy factors significantly improve the fit?

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Abstract

Introduction

Policy makers aim to better understand factors that determine sporting success. On one hand, studies have found a number of socio-economic factors such as GDP per capita or population size reliable predictors of how well a country do in international sporting events (De Bosscher et al., 2006; Bredtmann et al., 2016). On the other hand, national sports policies factors such as public expenditure on sport have been shown to be correlated to the international sporting success (De Bosscher et al., 2015). This paper aims to clarify the role of sport policies factors to describe the international winter and summer sporting success, respectively. Additionally, it evaluates the impact of a climate factor as a proxy for possible winter or summer sports tradition. Do policy factors significantly improve the fit when added to socio-economic variables? Should a climate factor be included to better describe the success in winter and summer sports? The study applied a multivariate approach to collect new evidence about international sporting success factors.

Methods

The analysis applied multiple linear regression for summer and winter sporting success, respectively. The dependent success variables were the medal shares during the time period 2009-2012 (Olympic Games and World Championships). Two sets of dependent variables were defined. The set of macro-level variables was composed of GDP per capita, population size and an indicator based on global climate data. The set of meso-level variables was retrieved from the project SPLISS 2.0 (Sports Policy factors Leading to International Sporting Success; De Bosscher et al., 2015). The nine SPLISS composite indicators – such as finance or talent identification - were available for 16 countries/regions. In a preliminary step, the dimension of the meso-level indicators was reduced by using principal component analysis (PCA). The objective was to remain within the overall limit of five independent variables to model the 16 SPLISS countries/regions. Models were evaluated and compared by using adjusted R-squared, AIC and BIC, as well as ANOVA.

Results

The full model with all macro-level and meso-level independent variables fitted very well for summer sports (R-squared=0.91) and well for winter sports (R-squared=0.77). The meso-level factors did significantly improve the fit for summer sports ($p<0.01$) but not for winter sports ($p=0.51$) when compared to the model with only macro-level variables. The climate factor has been shown to be significant to describe the success for winter sports ($p<0.01$) but not for summer sports.

Discussion/Conclusion

The study provides some evidence of the impact of meso-level sport policy to describe the international sporting success in addition to macro-level factors; but only for summer sports. Yet, the study relies on a small data set of 16 countries/regions. A generalization would require further study with available sport policy factors for a larger data set of countries. Another finding is the impact of the climate factor only for winter sports. This result suggests that a possible tradition for winter sports does not lead to the reduction of the performance in summer sports.

References

- Bredtmann, J., Crede, C. J. & Otten, S. (2016) Olympic medals: Does the past predict the future? *Significance*, 13 (3), 22-25.
- De Bosscher, V., De Knop, P., Van Bottenburg, M. & Shibli, S. (2006). A Conceptual Framework for Analysing Sports Policy Factors Leading to International Sporting Success. *European Sport Management Quarterly*, 6(2), 185-215.

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De Bosscher, V., Shibli, S., Westerbeek, H. & Van Bottenburg, M. (2015). *Successful elite sport policies. An international comparison of the sports policy factors leading to international sporting success (SPLISS 2.0) in 15 nations*. Maidenhead: Meyer & Meyer.