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7-25-2019

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Analytics Brief 2019-03

Modeling the Determinants of Equestrian Sport Medal Shares in the Olympic Games

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July 25, 2019

Off the track Thoroughbred (OTTB) athletes occasionally have become part of the United States Equestrian Team. For example, Touch of Class was a Thoroughbred mare who won the gold medal in both individual and team show jumping in the 1984 summer Olympic Games. She actually began her athletic career in the racing industry under the Jockey Club registered name Stillaspill. Similarly, Blackfoot Mystery, having raced only three times, competed in the 2016 summer Olympic Games in individual eventing.[a]

Historically, equestrian sport debuted in the 1900 summer Olympic Games with individual show jumping. After a hiatus, equestrian sport resumed in 1912 with both individual and team show jumping and eventing, as well as individual dressage. Team dressage was added in 1928. With the exception of its omission from the 1960 Olympic Games, 18 medals have since been sought after by top athletes from countries around the world every four years. This study measures those factors that statistically determine the share of the 18 medals obtained by country during the last consecutive seventeen summer Olympic Games:

- Inflation-adjusted per capita GDP is directly related to a country's share of medals. Hence wealthier countries obtained a greater share of the medals.

- Population is directly related to a country's share of medals. Hence larger countries obtained a greater share of the medals.

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[a] The authors thank Stacie Clark and Erin Shea of the Thoroughbred Aftercare Alliance for these examples, as well as other examples of OTTB athletes who were in competitions such as the Rolex.

- Distance from the home country to the host country is inversely related to a country's share of medals. Hence travel-induced fatigue adversely impacts performance, and, in the limit, host countries obtained a greater share of the medals.

- The share of medals from a previous Olympic Games is directly related to the share of medals in the subsequent Olympic Games. This inertia is common in economic data and underscores the need to invest in long term equestrian team development.

- Taken collectively, former Soviet Union and nearby Eastern European countries from 1960 to 1988 obtained a greater share of the medals.

A Tobit regression methodology was used to model the medal shares in this study for each country that obtained at least one equestrian medal in the 1952-2016 time frame. All of the determinants of medal share, sans the sphere of Soviet influence in two model specifications, were statistically significant and were consistent in sign with previous studies. Due to a statistically significant difference in magnitudes of influence of the first two explanatory variables in each specification, both real per capita GDP and population must be kept separately in each model. The modeling effort also corrects for heteroskedasticity using two different methodologies and yielded nearly identical results. This is important given medal share varies geographically. Additionally, all continuous variables besides medal share were transformed with a natural logarithm. Each model has 16 (i.e., T-1) control variables for event years 2 to 17, implying the base event year is 1952. Finally, Poisson and negative binomial count data regression methodologies were also used to model medal totals by country with nearly identical results as the medal share approach. A Technical Appendix is also available which provides detailed analytics underlying the results summarized herein.

References

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Dr. Steven S. Vickner is an economist and associate professor in the Equine Industry Program, College of Business, University of Louisville. He earned both his MS and PhD in agricultural and resource economics from Colorado State University, an MBA in management from the University of Denver and a bachelor's degree in economics from Bowling Green State University. His research focuses on the role of information and technology on economic decision-making, and he has done years of extensive work studying yearling Thoroughbred prices. He teaches Equine Economics, Equine Marketing, and the senior capstone project course in the EIP, as well as Data Analytics II in the new MS in Business Analytics Program. For more information, contact Vickner at (502) 852-4888 or steven.vickner@louisville.edu.

David Hess is a graduate research assistant in the Equine Industry Program and will graduate in August 2019 in the first cohort of the MS in Business Analytics Program in the College of Business, University of Louisville. He earned his bachelor's degree in applied mathematics from Murray State University with an emphasis in actuarial science and a minor in economics. He has interests in working with diverse sources of data, programming in scripting languages like R, and finding insights in complex data sets with cutting edge analytical methods. His contribution for helping build the underlying database of this study is greatly appreciated!

The Equine Industry Program at UofL is the only AACSB-accredited undergraduate business degree in the world with an equine focus. Graduates can be found in all aspects of the industry, from training to broadcasting to financial analysis.