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A study of relationship of Olympic medal ranking with GDP and per capita income

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Abstract

The emerging markets now claim half of all Olympic medals. They are now claimants of around 50 percent of gold, silver, and bronze medals, which is quite surprising. When emerging markets began participating back in the 1920s and 1930s, the share of medals they won was quite small in the majority of sports, but a few decades later, especially following WWII, this began to change. Nowadays, maybe as a reflection of the improved health, education, and social attitudes toward sports, emerging markets are now leaders in many sports, including boxing, diving, weightlifting, and others.

The London games mark the 30th Olympics since their modern inception in 1896. Competition to host the games has become fierce in recent years, and economists have begun to study the economy of Olympics. What the games say about the economic achievement. The countries with strong emerging economies are now leading the medal count, and stresses the strong correlation between economic growth and athletic achievement.

The per capita income levels are strongly associated with medal attainment. The increasing GDP per capita by one standard deviation tends to be associated with two to five medals more per Olympics. A very strong host effect, by which the number of medals can increase by more than 50 percent for host countries. Overall, higher levels of income or higher levels of development and a better environment for growth tend to be associated with more Olympic success.

The aim of the study of "A study of relationship of Olympic medal ranking with GDP and per capita income" was to find out the relationship of development of economy and Olympic medals. To find the results GDP and Per Capita income of the countries was considered as development factors of economy and medal tally ranked was taken to find out the relationship.

An analysis of medal tally of Olympic 2012 was analysed and in rank order correlation of GDP and medal tally found that the correlation coefficient is 0.683., which show a moderate positive relationship between the two variables. Which means with the increase in GDP there is increase in medal in Olympics and in rank order correlation of Per Capita income and medal tally found that the correlation coefficient is 0.283., which show a low positive relationship between the two variables. Which may be the cause of methods of Rank order correlation. So it can be tested through other method. Because Jose Ursua study shows a strong relationship between per capita income and medals in Olympics.

So to win more medals in Olympics be a rich country with good infrastructure. Have lots of young peoples. Focus on your advantage, use the events that are individual in nature and for which a lot of medals are handed out per events.

Keywords: Olympic medal ranking, GDP, per capita income

Introduction

The Olympics are truly global now, in the sense that the modern Olympics went back and forth between Europe and the U.S. for almost fifty years, and the first exploration or venture into the "outback world" was the 1956 Olympics in Melbourne, and then Tokyo 1964. But even these games still took place within the confines of developed markets. In fact, the 1968 games in Mexico [City] was a first in an emerging market. Twenty years later, we had Seoul, and twenty [years after that] we had Beijing. So with Rio de Janeiro scheduled for 2016, it is not an [overstatement] to say that the Olympics have globalized for good. The Olympics now cover all income levels. That is, the number of participating countries has grown almost ten times over the past one hundred years, and the games now bring together a very diverse group of nations. The host countries have also become more diverse in terms of the differences between their GDP per capita and their levels of development.

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Another trend is that emerging markets now claim half of [all] Olympic medals. They are now claimants of around 50 percent of gold, silver, and bronze medals, which is quite surprising. When emerging markets began participating back in the 1920s and 1930s, the share of medals they won was quite small in the majority of sports, but a few decades later, especially following WWII, this began to change. Nowadays, maybe as a reflection of the improved health, education, and social attitudes toward sports, emerging markets are now leaders in many sports, including boxing, diving, weightlifting, and others.

The regional split of medals also is gradually balancing around the world, and slightly more than two hundred countries that are now expected to participate in the Olympics cover literally all continents. So as the world economy has become more globalized, so has the share of medals that accrue to the planet's different regions. This includes not only the BRICs and other emerging markets, but also the group of countries that we often highlight in our research as a group of up-and-coming countries in terms of their potential for growth. Mexico and South Korea, Bangladesh, and Turkey are countries, in addition to the BRICs (Brazil, Russia, India, and China), that have an increased presence in the global sphere and have also taken their place as [formidable] competitors in the Olympics. Most medals used to go to either North American or developed European countries; nowadays, there is a more even split that not only covers all continents, but also several geopolitical groups.

The London games mark the 30th Olympics since their modern inception in 1896. Competition to host the games has become fierce in recent years, and economists have begun to study the economy of Olympics. What the games say about the economic achievement. The countries with strong emerging economies are now leading the medal count, and stresses the strong correlation between economic growth and athletic achievement.

Jose Ursua found that per capita income levels are strongly associated with medal attainment. In particular, he found that increasing GDP per capita by one standard deviation tends to be associated with two to five medals more per Olympics. He also found a very strong host effect, by which the number of medals can increase by more than 50 percent for host countries. Overall, higher levels of income or higher levels of development and a better environment for growth tend to be associated with more Olympic success

Objectives and methods of the study

The aim of the study of “A study of relationship of Olympic medal ranking with GDP and per capita income” was to find out the relationship of development of economy and Olympic medals. To find the results GDP and Per Capita income of the countries was considered as development factors of economy and medal tally ranked was taken to find out the relationship. The rank order co-relation method was used and the secondary data was obtained from various sources. The study was delimited according to GDP ranking of only top nine countries and other variables were ranked only for these nine countries.

Variable analysis

This is still a world of American primacy; the United States is first among un-equals. As has been the case in every Summer Olympics since 1996 except Beijing in 2008, when the host country came away with more gold than anyone else American athletes won the largest number of medals overall,

as well as the most gold. 2012

Table 1: Summer Olympics medal table of 55

| Rank | NOC | Gold | Silver | Bronze | Total |
|------|---------------------------|------|--------|--------|-------|
| 1 | United States (USA) | 46 | 29 | 29 | 104 |
| 2 | China (CHN) | 38 | 27 | 23 | 88 |
| 3 | Great Britain (GBR)* | 29 | 17 | 19 | 65 |
| 4 | Russia (RUS) | 24 | 26 | 32 | 82 |
| 5 | South Korea (KOR) | 13 | 8 | 7 | 28 |
| 6 | Germany (GER) | 11 | 19 | 14 | 44 |
| 7 | France (FRA) | 11 | 11 | 12 | 34 |
| 8 | Italy (ITA) | 8 | 9 | 11 | 28 |
| 9 | Hungary (HUN) | 8 | 4 | 5 | 17 |
| 10 | Australia (AUS) | 7 | 16 | 12 | 35 |
| 11 | Japan (JPN) | 7 | 14 | 17 | 38 |
| 12 | Kazakhstan (KAZ) | 7 | 1 | 5 | 13 |
| 13 | Netherlands (NED) | 6 | 6 | 8 | 20 |
| 14 | Ukraine (UKR) | 6 | 5 | 9 | 20 |
| 15 | New Zealand (NZL) | 6 | 2 | 5 | 13 |
| 16 | Cuba (CUB) | 5 | 3 | 6 | 14 |
| 17 | Iran (IRI) | 4 | 5 | 3 | 12 |
| 18 | Jamaica (JAM) | 4 | 4 | 4 | 12 |
| 19 | Czech Republic (CZE) | 4 | 3 | 3 | 10 |
| 20 | North Korea (PRK) | 4 | 0 | 2 | 6 |
| 21 | Spain (ESP) | 3 | 10 | 4 | 17 |
| 22 | Brazil (BRA) | 3 | 5 | 9 | 17 |
| 23 | South Africa (RSA) | 3 | 2 | 1 | 6 |
| 24 | Ethiopia (ETH) | 3 | 1 | 3 | 7 |
| 25 | Croatia (CRO) | 3 | 1 | 2 | 6 |
| 26 | Belarus (BLR) | 2 | 5 | 5 | 12 |
| 27 | Romania (ROU) | 2 | 5 | 2 | 9 |
| 28 | Kenya (KEN) | 2 | 4 | 5 | 11 |
| 29 | Denmark (DEN) | 2 | 4 | 3 | 9 |
| 30 | Azerbaijan (AZE) | 2 | 2 | 6 | 10 |
| 30 | Poland (POL) | 2 | 2 | 6 | 10 |
| 32 | Turkey (TUR) | 2 | 2 | 1 | 5 |
| 33 | Switzerland (SUI) | 2 | 2 | 0 | 4 |
| 34 | Lithuania (LTU) | 2 | 1 | 2 | 5 |
| 35 | Norway (NOR) | 2 | 1 | 1 | 4 |
| 36 | Canada (CAN) | 1 | 5 | 12 | 18 |
| 37 | Sweden (SWE) | 1 | 4 | 3 | 8 |
| 38 | Colombia (COL) | 1 | 3 | 4 | 8 |
| 39 | Georgia (GEO) | 1 | 3 | 3 | 7 |
| 39 | Mexico (MEX) | 1 | 3 | 3 | 7 |
| 41 | Ireland (IRL) | 1 | 1 | 3 | 5 |
| 42 | Argentina (ARG) | 1 | 1 | 2 | 4 |
| 42 | Serbia (SRB) | 1 | 1 | 2 | 4 |
| 42 | Slovenia (SLO) | 1 | 1 | 2 | 4 |
| 45 | Tunisia (TUN) | 1 | 1 | 1 | 3 |
| 46 | Dominican Republic (DOM) | 1 | 1 | 0 | 2 |
| 47 | Trinidad and Tobago (TRI) | 1 | 0 | 3 | 4 |
| 47 | Uzbekistan (UZB) | 1 | 0 | 3 | 4 |
| 49 | Latvia (LAT) | 1 | 0 | 1 | 2 |
| 50 | Algeria (ALG) | 1 | 0 | 0 | 1 |
| 51 | Bahamas (BAH) | 1 | 0 | 0 | 1 |
| 52 | Grenada (GRN) | 1 | 0 | 0 | 1 |
| 53 | Uganda (UGA) | 1 | 0 | 0 | 1 |
| 54 | Venezuela (VEN) | 1 | 0 | 0 | 1 |
| 55 | India (IND) | 0 | 2 | 4 | 6 |

The United States earned 104 medals, 11 percent of the total; with 46 golds, Americans won 15 percent of all gold medals. Athletes representing 84 other countries won 89 percent of the total medals and 85 percent of the gold. In 1988, only 52 countries earned medals of any kind. Olympic power, like economic, military and diplomatic power, is increasingly diffused. Non polarity, not uni polarity, not even multi polarity, defines the 21st century. And yes, China is clearly on the rise. At the 1988 Seoul Olympics, China won 28 medals, just five of which were gold. Today, a quarter-century later, China came in second to the United States with 88 medals overall, 38 of them gold. This does, however, represent something of a falling-off from four years ago. The decline could be attributed to China's loss of home-country advantage, or it might be further evidence that a difficult political and economic transition is sapping the nation's energy and focus. Economic growth in China is slowing Olympic results seem to be a lagging indicator.

Russia did extremely well by coming in third overall and fourth in gold, especially when you consider that it is a country of 143 million people, less than half the population of the United States and only 11 percent of China's. For what it is worth, if you combine Russia's tally with that of Ukraine, Kazakhstan and the other former Soviet republics, the old U.S.S.R. would have won the most medals and nearly equalled the United States in gold. This is more evidence that we are fortunate the Cold War ended when it did.

If the Olympics are any measure, Germany has not weathered the end of the Cold War and the country's unification all that well. In 1988 in Seoul, the two Germanys won a combined 142 medals, including 48 gold. This time, a unified Germany won 44 medals, 11 of them gold. It would appear that the private sector has not stepped up to replace the role of the East German state in training athletes. The two Koreas, which won a combined 34 medals (17gold), are no doubt taking notice.

The 17 euro-zone countries, including Germany, had a strong showing: 168medals, 41gold. Here, at least, there is little link between financial disarray and athletic achievement. But this is unlikely to persuade the British to end their opposition to joining the euro zone; they are doing just fine on their own, thank you. Indeed, Great Britain's remarkable 65-medal haul (with 29 gold) equals more than one medal per every million inhabitants. At that rate, China or India would have taken every medal awarded. The British performance close to a 50 percent improvement compared with the Beijing Games four

years ago can in part be chalked up to the traditional home-team advantage.

The likelihood that the British will match this outcome in Rio in four years is about as great as that of its empire rising again. Of course, Britain's success this year bodes well for Brazil, the host of the 2016 Summer Games. Brazil won 17 medals (three gold) this year, and if form holds, it will earn considerably more next time.

Jamaica and Kenya are proof that even small countries can be world-class. By contrast, India was one of the least-successful competitors, winning only two silver medals and four bronze ones in London despite a population of more than 1.2 billion. This reinforces the view that India is not quite ready to join the ranks of the major powers.

Japan, meanwhile, garnered its highest-ever number of medals, 38, but fell down on the gold with seven medals, far short of the 16 golds it won in both 1964 and 2004. Like its economy, Japan's Olympic showing is more drift than direction.

The Middle East continues to do abysmally, much worse than any other region. The area pays a price, at the Olympics and everywhere else, for poor governance and a lack of opportunities available to women. That said, the Middle East can be accorded some slack, since people there have been busy lately ousting repressive governments. Those taking up residence in Tahrir Square can be forgiven for not making it to Trafalgar Square.

GDP values in billions of dollars

The gross domestic product (GDP) is one of the measures of national income and output for a given country's economy. GDP can be defined in three ways, all of which are conceptually identical. First, it is equal to the total expenditures for all final goods and services produced within the country in a stipulated period of time (usually a 365-day year). Second, it is equal to the sum of the value added at every stage of production (the intermediate stages) by all the industries within a country, plus taxes less subsidies on products, in the period. Third, it is equal to the sum of the income generated by production in the country in the period—that is, compensation of employees, taxes on production and imports less subsidies, and gross operating surplus (or profits)

Per capita income

Table 2: Per Capita income is denoted to average annual income of a person of that particular country during a year.

| Sr. No. | Name of Country | Per Capita Income Rank | World Rank | Per Capita Income in \$ year 2011 |
|---------|-----------------|------------------------|------------|-----------------------------------|
| 1 | U.S.A | 1 | 7 | 48,442 |
| 2 | China | 8 | 94 | 8,442 |
| 3 | Japan | 7 | 24 | 34,278 |
| 4 | Germany | 4 | 17 | 39,414 |
| 5 | France | 6 | 23 | 35,194 |
| 6 | U.K. | 5 | 22 | 36,511 |
| 7 | India | 9 | 125 | 3,650 |
| 8 | Canada | 2 | 15 | 40,541 |
| 9 | Australia | 3 | 16 | 39,466 |

Results and conclusion

Relationship of GDP rank and medal tally rank

To find out the relationship between GDP ranking and

Olympic medal tally ranking, the rank order correlation was calculated as per table.

Table 3: Correlation of GDP Rank and Olympic Medal Rank

| Sr. No. | Name of Country | GDP Rank | Medal Rank | D = R1-R2 | D Square |
|---------|-----------------|----------|------------|-----------|----------|
| 1 | U.S.A | 1 | 1 | 0 | 0 |
| 2 | China | 2 | 2 | 0 | 0 |
| 3 | Japan | 3 | 7 | -4 | 16 |
| 4 | Germany | 4 | 4 | 0 | 0 |
| 5 | France | 5 | 5 | 0 | 0 |
| 6 | U.K. | 6 | 3 | +3 | 9 |
| 7 | India | 7 | 9 | +2 | 4 |
| 8 | Canada | 8 | 8 | 0 | 0 |
| 9 | Australia | 9 | 6 | +3 | 9 |
| | | | | | 38 |

Rank Order Correlation = $1 - 0.316 = 0.683$

In the above calculation we found that the correlation coefficient is 0.683. Which show a moderate positive relationship between the two variables. Which means with the increase in GDP there is increase in medal in Olympics

Relationship of Per Capita Income Rank and Medal Tally Rank

To find out the relationship between Per Capita Income ranking and Olympic medal tally ranking, the rank order correlation was calculated as per table.

Table 4: Correlation of Per Capita Income Rank and Olympic Medal Rank

| Sr. No. | Name of Country | Per Capita Income Rank | Medal Rank | D = R1-R2 | D Square |
|---------|-----------------|------------------------|------------|-----------|----------|
| 1 | U.S.A | 1 | 1 | 0 | 0 |
| 2 | China | 8 | 2 | 6 | 36 |
| 3 | Japan | 7 | 7 | 0 | 0 |
| 4 | Germany | 4 | 4 | 0 | 0 |
| 5 | France | 6 | 5 | 1 | 1 |
| 6 | U.K. | 5 | 3 | 2 | 4 |
| 7 | India | 9 | 9 | 0 | 0 |
| 8 | Canada | 2 | 8 | -6 | 36 |
| 9 | Australia | 3 | 6 | -3 | 9 |
| | | | | | 86 |

Rank Order Correlation = $1 - 0.716 = 0.283$

In the above calculation we found that the correlation coefficient is 0.283. Which show a low positive relationship between the two variables. Which may be the cause of methods of Rank order correlation. So it can be tested through other method. Because Jose Ursua study shows a strong relationship between per capita income and medals in Olympics.

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Recommendation

To win more medals in Olympics be a rich country with good infrastructure. Have lots of young peoples.

Focus on your advantage, use the events that are individual in nature and for which a lot of medals are handed out per events.

At the 1912 Stockholm Olympics, Pierre de Coubertin, the French founder of the International Olympic Committee, won a gold medal for literature for what is perhaps the most famous of all sports poems, "Ode to Sport." One of the verses in that poem starts with the following lines: "O sport, you are progress. To serve you, a man must improve himself, both physically and spiritually." Our research shows that in fact the reverse can also be true. Progress and improvement in economic growth have historically often equaled progress in a sport

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