Medal Counts Vs. GDP Per Capita

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Our following report shows if changes in a country's economic performance relates to changes in a country's Olympic success over time. Specifically, the question is asking whether the difference in medal counts from 2016 to 2000 Olympics is associated with change in GDP per capita over the same period. Relating to economics, GDP per capita reflects national productivity, income, and ability to invest in athletics programs. GDP per capita can influence a country's ability to fund athletic programs and compete internationally. By comparing the change rather than levels of GDP, our analysis focuses on whether improvements in economic condition correlates to improvements in medal performance overall. The goal is not to identify a universal rule, but to test a measurable relationship between the available data and whether shifts of wealth can explain Olympic outcomes.

The analysis uses GDP per capita for the 2000 and 2016 Olympic medal totals for the same years, merged by country into a single set of 68 total complete observations. From these sources, we created two additional variables, **Differences_Medals** and **Differences_cap**. Basic cleaning involved removing the rows with missing values and converting GDP and medal into single numeric formats. Summary statistics showed a wide variation in GDP changes, ranging from $4,400 to $45,000. Medal changes clustered around 0. To visualize, the report shows histograms from each variable and a scatterplot comparing the two. The descriptive steps created a foundation to examine our question at large.
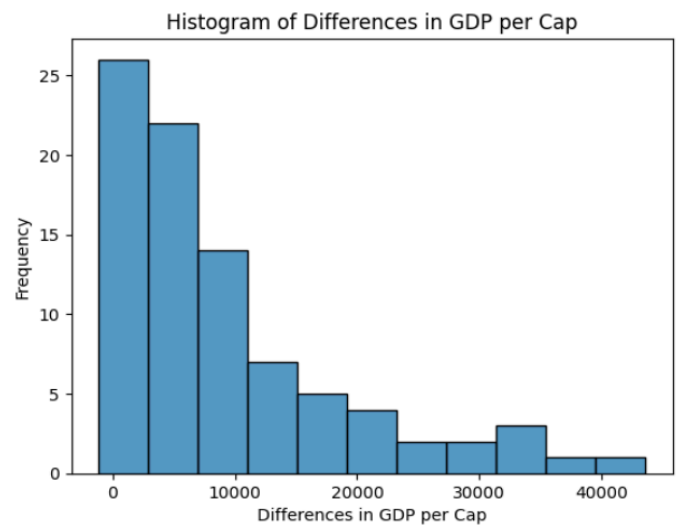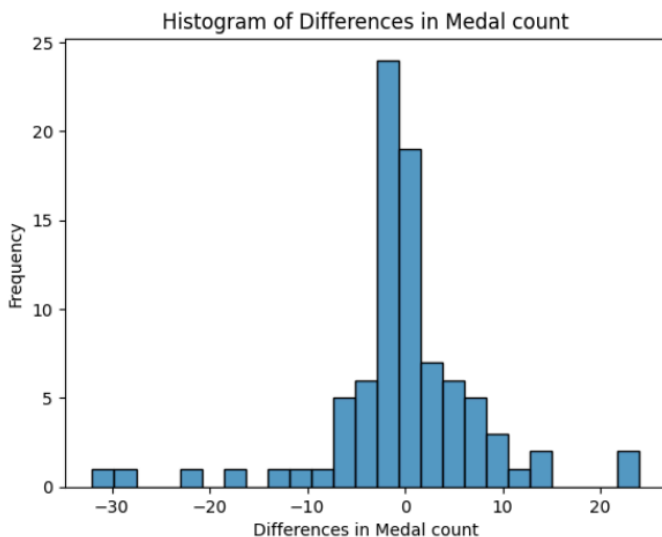
We evaluated our relationship using a simple General Linear Model estimated by ordinary least squares. The model is formed with:

$(Differences\_cap)_i = \beta_0 + \beta_1(Differences\_medal_i) + \epsilon_i$

Where **Differences_cap** represents the change in GDP per capita for country "i", and **Differences_medal** represents change in medal count. **β0** is the intercept, show the average GDP change when medal change is 0. **β1** measures how a one medal change is associated with GDP change and **ϵ** measures the error term. The model assumes a linear relationship, with no major outliers, with the condition that it is hard to satisfy all requirements given the spread of GDP change over time. Despite the given limitations, our model provides a clear way to estimate if the variables move together over time.

As expected, our regression results show no meaningful changes in medal counts and changes in GDP per capita. Our slope coefficient was near zero with a high p-value, indicating medal performance does not estimate economic growth. Overall, the model provides little evidence that changes in Olympic success are tied to Nation wide economic performance.
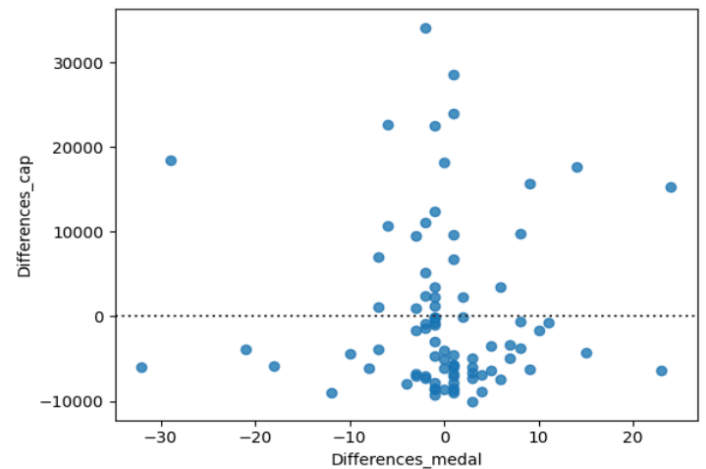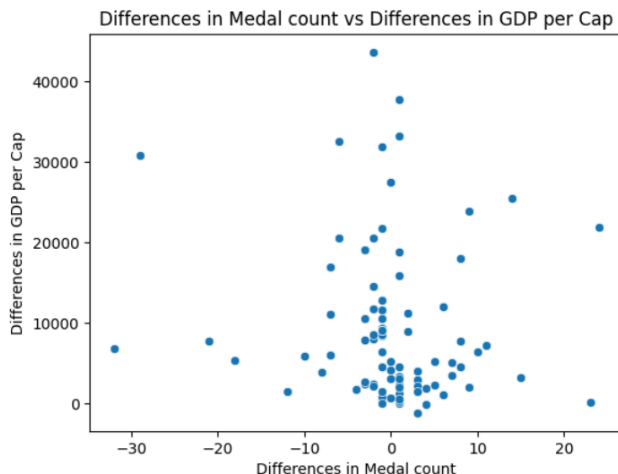
The analysis examined whether changes in Olympic medal counts from 2000 to 2016 were associated with changes in GDP per capita in the same time frame. We concluded that there is no meaningful evidence to support that claim between the two variables, with both the slop and intercept proving statistically insignificant. Visuals from both the scatterplot and residual plot further support our findings and highlight substantial variation of outliers in GDP change. Overall, the findings presented suggest a shift in Olympic performance does not reliably track with economic growth, within the scope of our dataset.

References

Olympic Medal Count 2000
Olympic Medal Count 2016

GDP per capita 2016
https://countryeconomy.com/gdp?year=2016
GDP per capita 2000
https://countryeconomy.com/gdp?year=2000