

After conducting a detailed data analysis of Marvel movies since the year 2000, some interesting trends and patterns have been observed. These results are instrumental in understanding factors that contribute to the success of Marvel movies, as indicated by their rating and box office earnings.

Our data set comprised of 26 movies from "Iron Man" released in 2008 to "Guardians of the Galaxy Vol. 3" in 2023. The data included attributes like release year, rating, director, main actors, budget, and box office earnings.

From the statistical regression analysis, it was observed that approximately 36.7% of the variability in movie ratings can be explained by the budget and box office earnings. This indicates that while budget and box office earnings play a role in determining the success of a movie, as represented by its rating, a significant portion (about 63.3%) of the variability is not accounted for by these factors. This unexplained variance suggests the influence of other unconsidered factors such as the director, cast, storyline, marketing, and others.

The p-value for 'Box Office Earnings' was found to be significant (0.014) indicating that it's a significant predictor for movie rating. However, 'Budget' was not a significant predictor in the model, suggesting that a larger budget does not necessarily result in a higher rating.

Movies like "The Avengers" (2012), "Avengers: Infinity War" (2018), and "Avengers: Endgame" (2019) had exceptionally high box office earnings, crossing the billion-dollar mark. It's important to note that these are ensemble movies featuring multiple major characters from the Marvel universe, which could be a significant factor contributing to their high earnings. Moreover, these movies have comparatively high ratings, indicating a positive correlation between box office earnings and ratings.

On the other hand, movies like "Thor: The Dark World" (2013) and "Ant-Man and the Wasp: Quantumania" (2023) had relatively lower ratings, despite substantial budgets and box office earnings. This further confirms the earlier observation that budget is not a significant predictor of movie ratings.

In conclusion, while box office earnings seem to have a positive influence on the movie ratings, factors beyond budget and earnings significantly contribute to the success of Marvel movies. Further analysis including additional factors such as cast, director, storyline, etc., could provide a more comprehensive understanding of what makes a Marvel movie successful.