

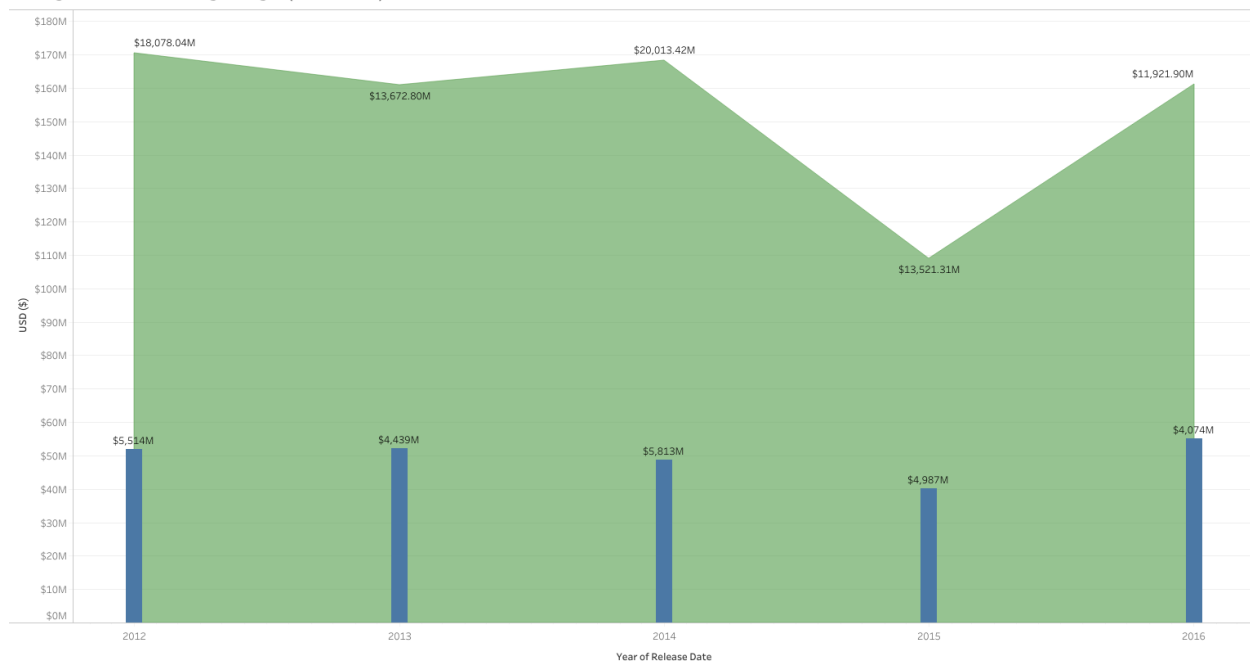
Research Question: What factors contribute to the financial success of movies?

Our Data Visualization Project analyzes a Box Office Performance Dataset to answer the question: What factors contribute to the financial success of movies? We performed exploratory data analysis to identify trends and factors correlated with higher profit. The original dataset, sourced from COOP resources, included 508 movies, released between 2012 and 2016, with release date, director(s), main cast members, budget, and box office revenue.

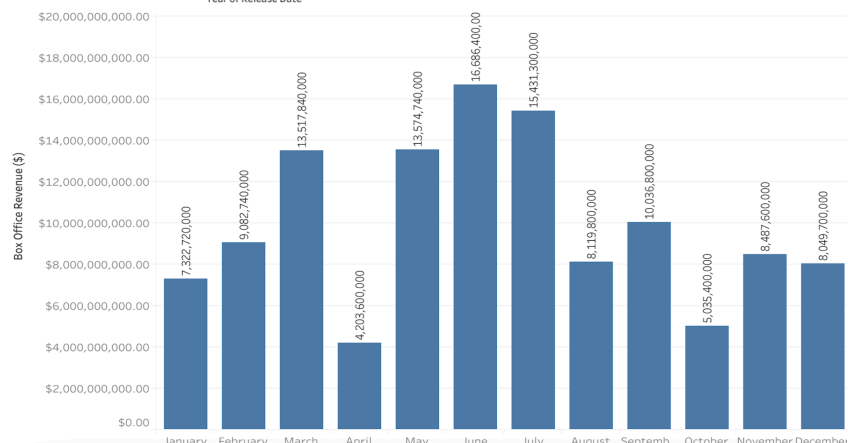
We cleaned the data using Python's pandas and numpy libraries. We removed unnecessary fields such as Wikipedia links and Director (2), focusing only on Director (1). We added a new field, Profit (\$), as the difference between revenue and budget. From the cleaned dataset, we generated two summary tables for further analysis using Python:

- Movie_Cast: cast member, movie count, total budget, total revenue, and total profit
- Movie_Directors: director, avg. budget, avg. revenue, avg. profit, movie count, combined genres, and profit margin (profit ÷ budget)

Average Revenue vs. Average Budget (2012 - 2016)



We began our visual exploration by comparing average revenue and budget annually. These trends appeared roughly proportional, suggesting revenue and budget to be proportional. Then we



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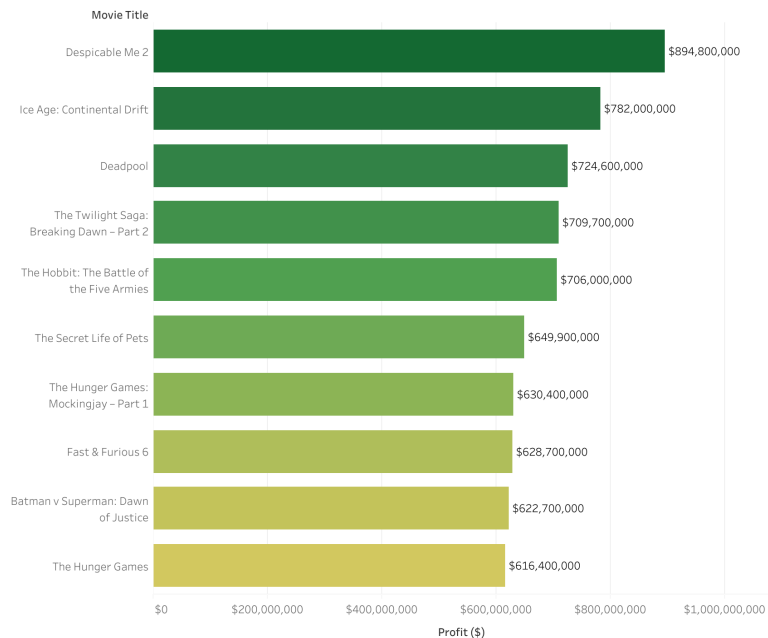
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investigated monthly revenue, which shows the summer months (June and July) to generate the highest revenue. Meanwhile, April and October generate the lowest revenue. We continued into the top 20 highest-grossing films, revealing 95% of the movies belonged to established franchises, and 35% being DC/Marvel superhero titles—often associated with large production budgets.

We then examined the 10 most profitable movies and their lead actors. Surprisingly, we found no strong correlation between actor popularity and movie profit. For instance, Jennifer Lawrence's high-grossing roles were likely driven by the success of The Hunger Games franchise, which had a built-in fanbase. This suggests that franchises, rather than star power, may play a more significant role in financial success. When looking at average profitability between the genders, male-led movies generated \$715,528,571.43 in profits while female-led movies generated \$652,166,666.67. This 9.72% difference between the protagonist's gender suggests that gender may not play a significant role in terms of movie profitability.

We also looked at genres in terms of profitability. We found that blockbuster genres (Adventure, Animation, Sci-Fi) dominate in terms of profitability, while family-friendly content (Animation, Family, Adventure) is consistently profitable. Some genres have seasonal spikes (e.g., Horror in October, Dramas in Fall/Winter, Action in Summer), offering insights into audience preferences and studios' release strategies.

Finally, we analyzed the 20 most profitable directors by average profit margin. All had directed multiple films during the dataset's time span, indicating a level of consistency in output. Interestingly, lesser-known directors outperformed well-known figures like Steven



Spielberg in terms of efficiency. This implies that niche or genre-specific filmmakers can often deliver higher returns on investment. Profit margins across this group ranged from 3x to over 14x their original budgets, underscoring the volatile nature of movie profitability and the importance of choosing directors who consistently generate strong financial results.

Our analysis highlights several trends that contribute to a movie's financial success. Franchises consistently performed well in both box office revenue and profit, likely due to strong fan bases and continued audience engagement. Big-budget films, especially DC/Marvel titles, also tended to generate higher returns. In contrast, cast popularity did not show a strong correlation with profit. Directors who released multiple films within the 2012 to 2016 time frame were among the most profitable, suggesting that consistent output and experience with franchise content may lead to better financial outcomes.