
# Microsoft Film Studio Proposal

By Jake Sherman

# Summary

- A statistical analysis of data in the film industry to provide insights into how to optimize a movie studio's return on investment.
- Statistics analyzed:
  1. Film Budget
  2. Movie Runtime
  3. Film Genre
- Findings:
  1. Low budget films ($1-$5M) offer the highest ROI.
  2. A runtime of 95-105 minutes has the most entries that doubled investment.
  3. The horror genre offers a significantly higher ROI than the next closest genre.

# Outline

- Business Problem
- Data
- Methods
- Results
- Conclusions

# Business Problem

- Unlike traditional investments, producing movies can often be hit or miss, with results varying widely from earning massive returns to a complete loss of investment.
- Statistical insights can improve studios' strategic decision making to boost returns on investment, potentially even making the difference between success and bankruptcy.

# Data

- The film data studied for their impact on ROI were production budget, movie runtime, and genre.
- ROI is defined as:

  ((worldwide gross / production budget -1) * 100)

  ROI of 0 means the film broke even.

  ROI of -100 is a complete loss of investment.

  ROI of 100 is making 100% (or doubling investment), and, for the purposes of this study, is the criteria for success.

# Methods: Data Preparation

- Data was aggregated amongst a SQL database and a csv file to combine film runtime, film genre, production budget, and worldwide theatrical gross.  A column for ROI was then added using the formula on the previous slide.
- ROI results were measured in relation to production budget, runtime, and genre but there was a second analysis conducted to monitor changes in representation of production budget, runtime, and genre for films that qualified as successful (ROI >=100).

# Methods: Production Budgets

- Although production budgets have a very strong correlation with worldwide gross (.79), production budgets have an extremely weak (negative) correlation with ROI (-.02). That is, as production budget for a film increases, the worldwide gross is likely to increase as well but with minimal effect on its actual ROI. Therefore, a linear study would not be optimal.
- As such, production budgets were broken down into four categories for analysis:
    1. Low budget: $0.5M-$5M budgets
    2. Mid-level budget: $5M-$50M
    3. Big Budget: $50M-100M
    4. Blockbuster Budget: $100M+

# Methods: Production Budgets

- Films with a budget of less than $500k were dropped from the analysis to reduce outlier budget/ROIs based on self made films or celebrity favors.
- Analysis includes:
    1. Average and Median ROI for each film tier.
    2. A film's odds of doubling its investment (achieve ROI 100) for each tier.

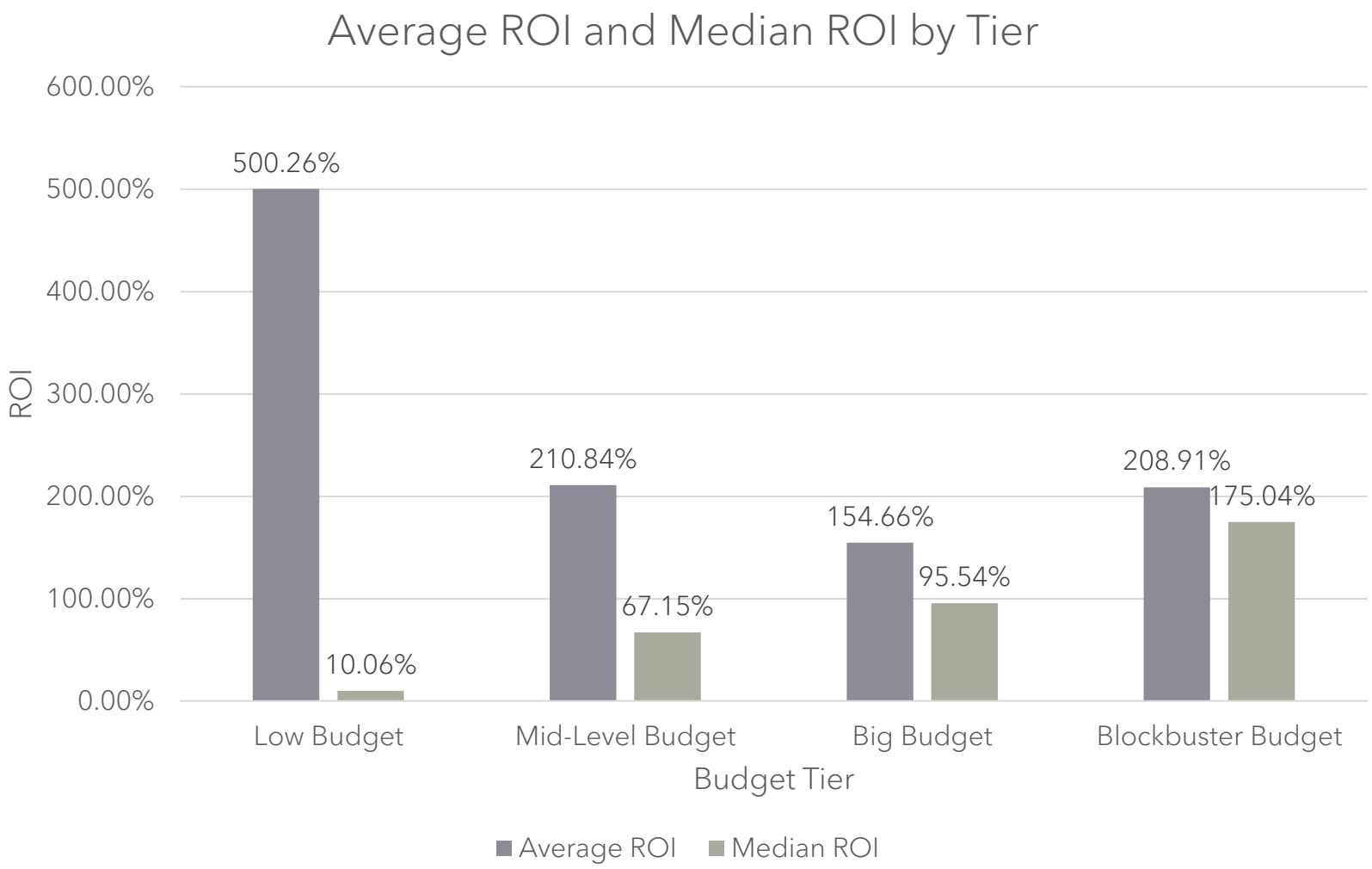
# Methods: Runtime

- Most film festivals have a minimum runtime of at least 75 minutes to be considered a feature film. As such, all films with a shorter runtime were dropped from the study.
- Runtime was broken down into 10 intervals from 75-175 minutes.  Each interval is 10 minutes.
- Analysis includes:
    1. Correlation with production budgets and ROIs
    2. Relationship with ROI
    3. Comparative stats to films that achieved ROI 100

# Methods: Genre

- Each film was associated with up to three genres.  To offer more definitive results, secondary and tertiary genres were dropped so the study could focus on the primary genre.
- Analysis includes:
    1. Comparative stats to films that achieved ROI 100
    2. Average ROI for each genre

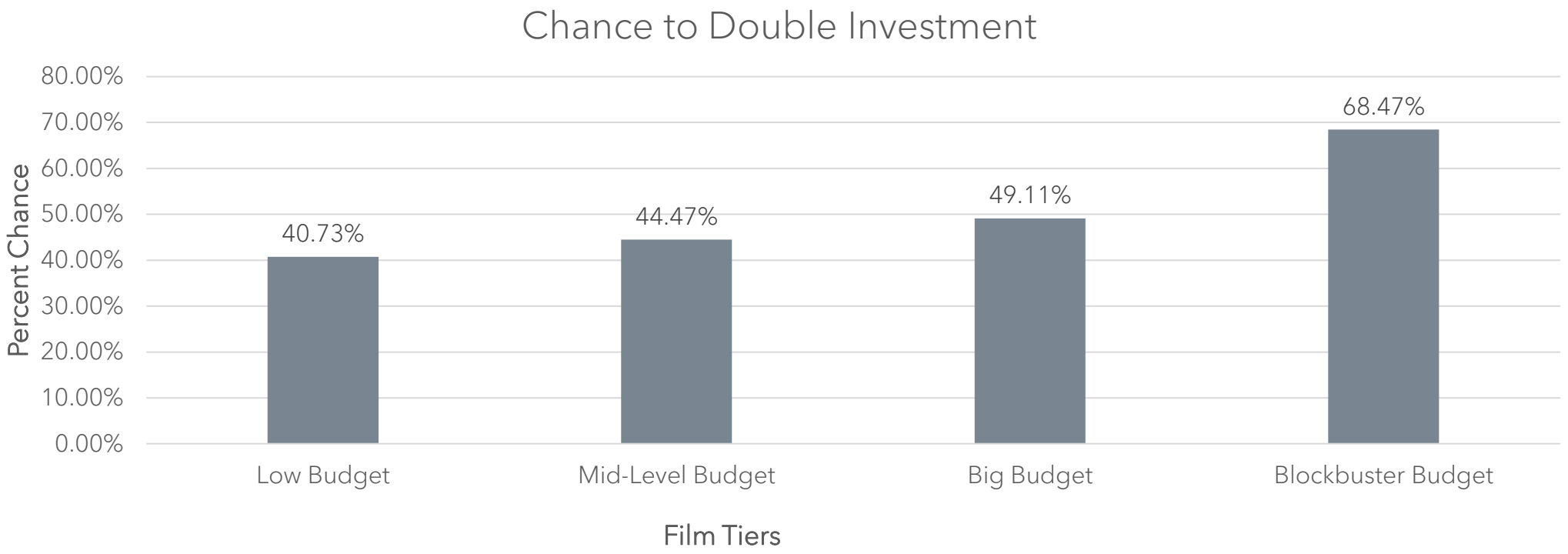
# Results: Production Budgets



# Results: Production Budget

- Low budget films have the highest average ROI but lowest median ROI while the inverse is true for blockbuster budget films.
- Low budget films have a far greater ROI standard deviation (volatility) than Blockbuster Budget films (2072% vs. 184%) but if a low budget film “hits”, the return more than justifies the risk.

# Results: Production Budget



# Results: Production Budget

Although blockbuster production budgets have the best chance to achieve success (100% ROI), have the lowest standard deviation, and have the highest median ROI, the average ROI of a low budget film is so much greater than any other category that it demands to be the focus of Microsoft's film studio.

Limitations: All films will have marketing budgets and theatre profit distributions that will eat into profits.  While the ROI's reflected here are far more optimistic than can be expected in reality, this would not change the recommendation to focus on low budget films to optimize ROI.

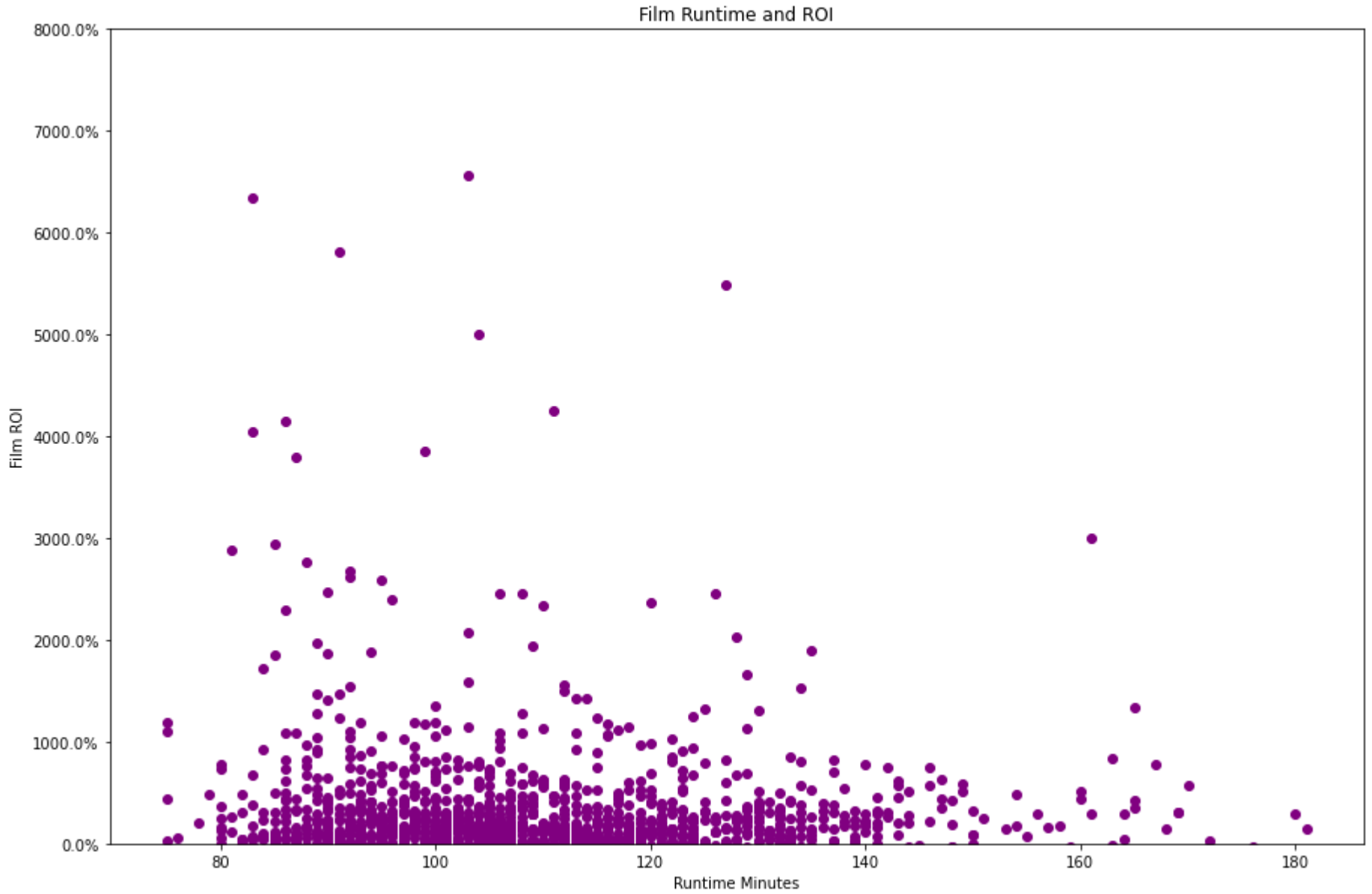
# Results: Runtime

- Correlations

  Positive correlation (.39) between runtime and production budget.

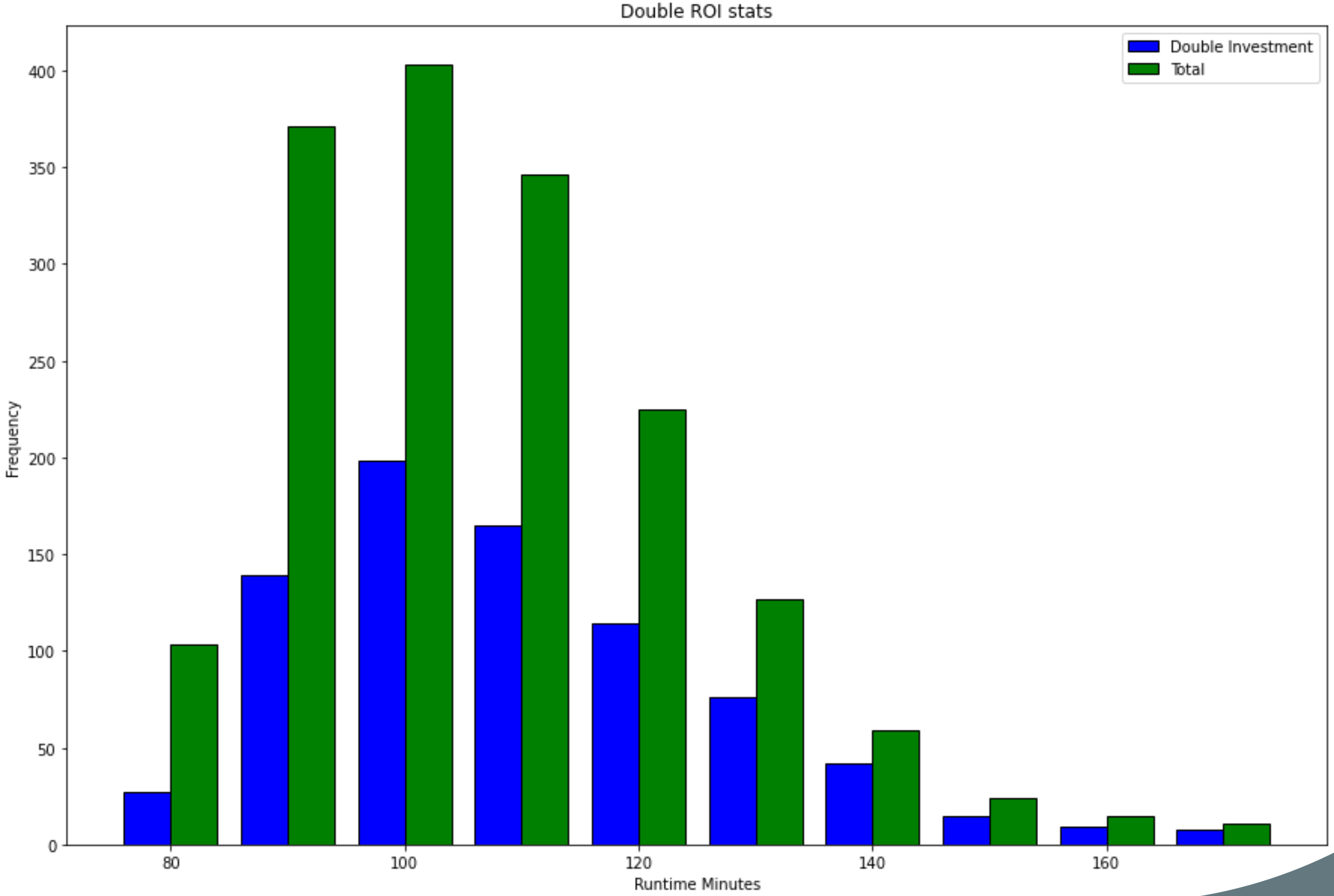
  Insignificant correlation (-.02) between runtime and ROI.

- Average runtime is 106.36 minutes. Majority of excessive returns (over 2000% ROI) occur in films shorter than 116 minutes (third quartile) .


Film Runtime and ROI
8000.0%
7000.0%
6000.0%
5000.0%
4000.0%
3000.0%
2000.0%
1000.0%
0.0%
Film ROI
80
100
120
140
160
180
Runtime Minutes

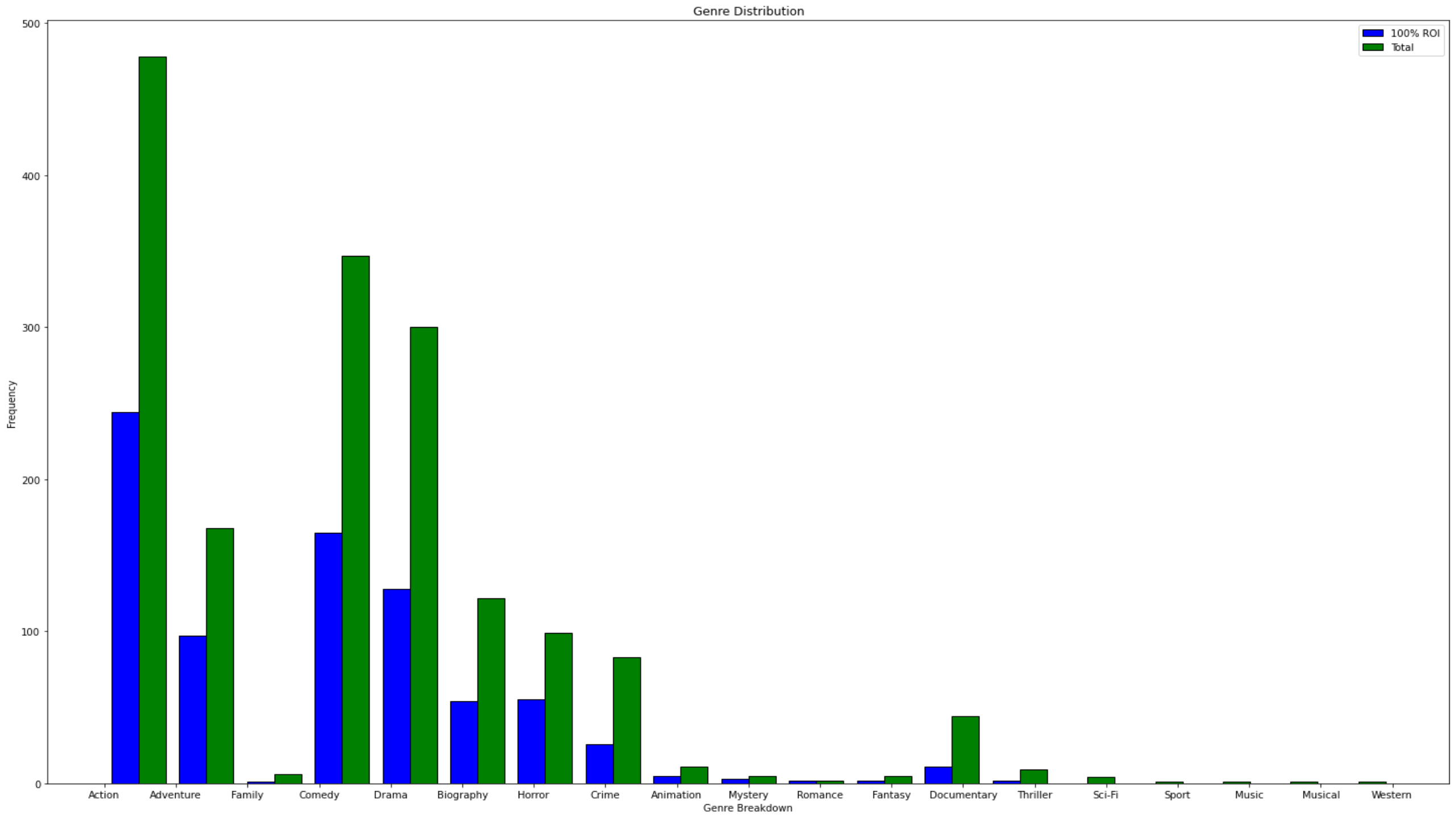
# Results: Runtime

- 95-105 minute runtimes proved to be the bin with the greatest sample size as well as the most films that achieved success (100% ROI).
- Films with longer runtimes tend to be more likely to achieve success and have a smaller sample size but this is likely because longer films tend to have higher production budgets and therefore higher median ROIs.
- Film runtime is unlikely to be a primary driver of ROI and is more likely a byproduct of genre and film budget.


Double ROI stats
Double Investment
Total
Frequency
Runtime Minutes
0
50
100
150
200
250
300
350
400
80
100
120
140
160

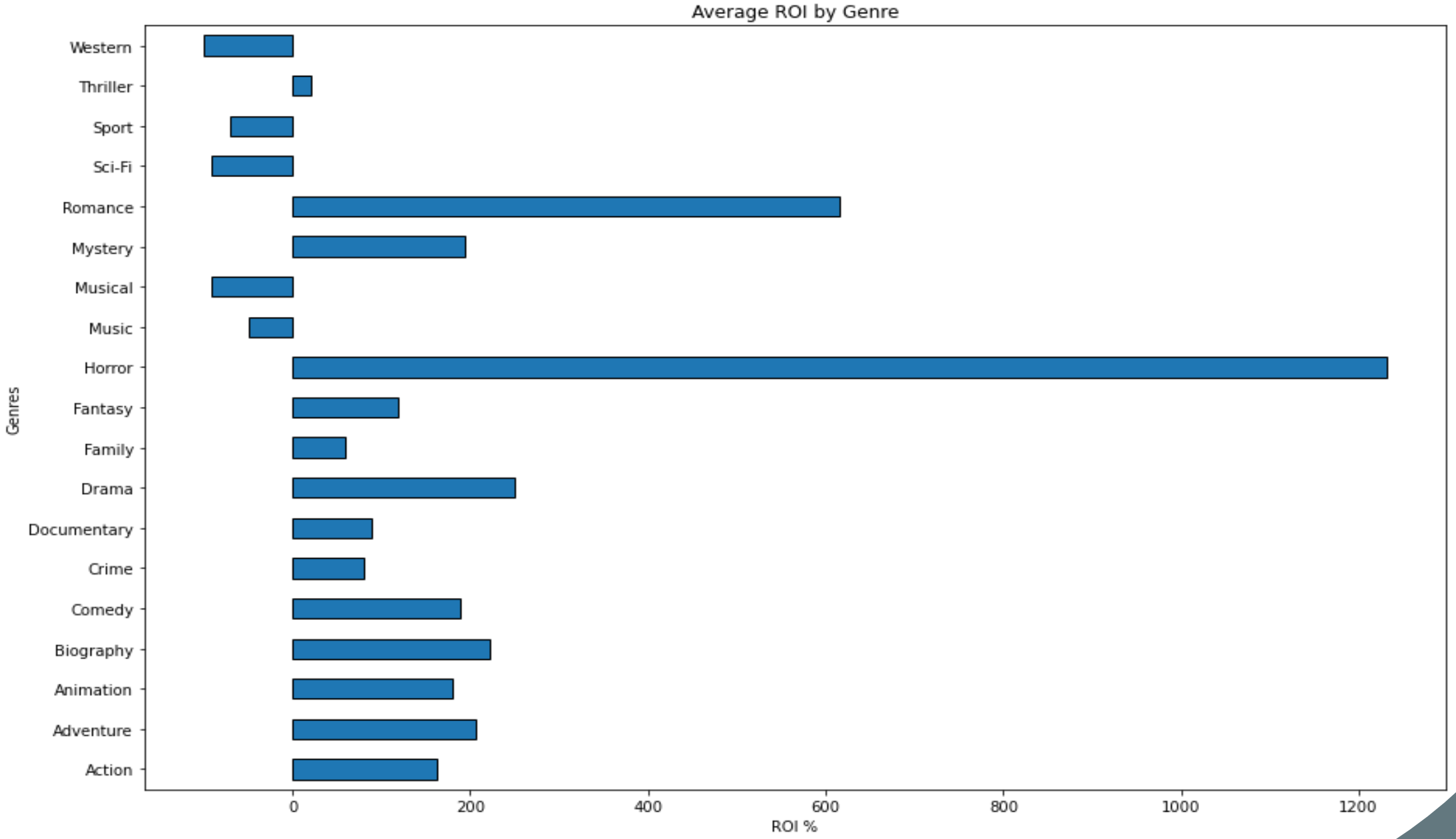
# Results: Genre

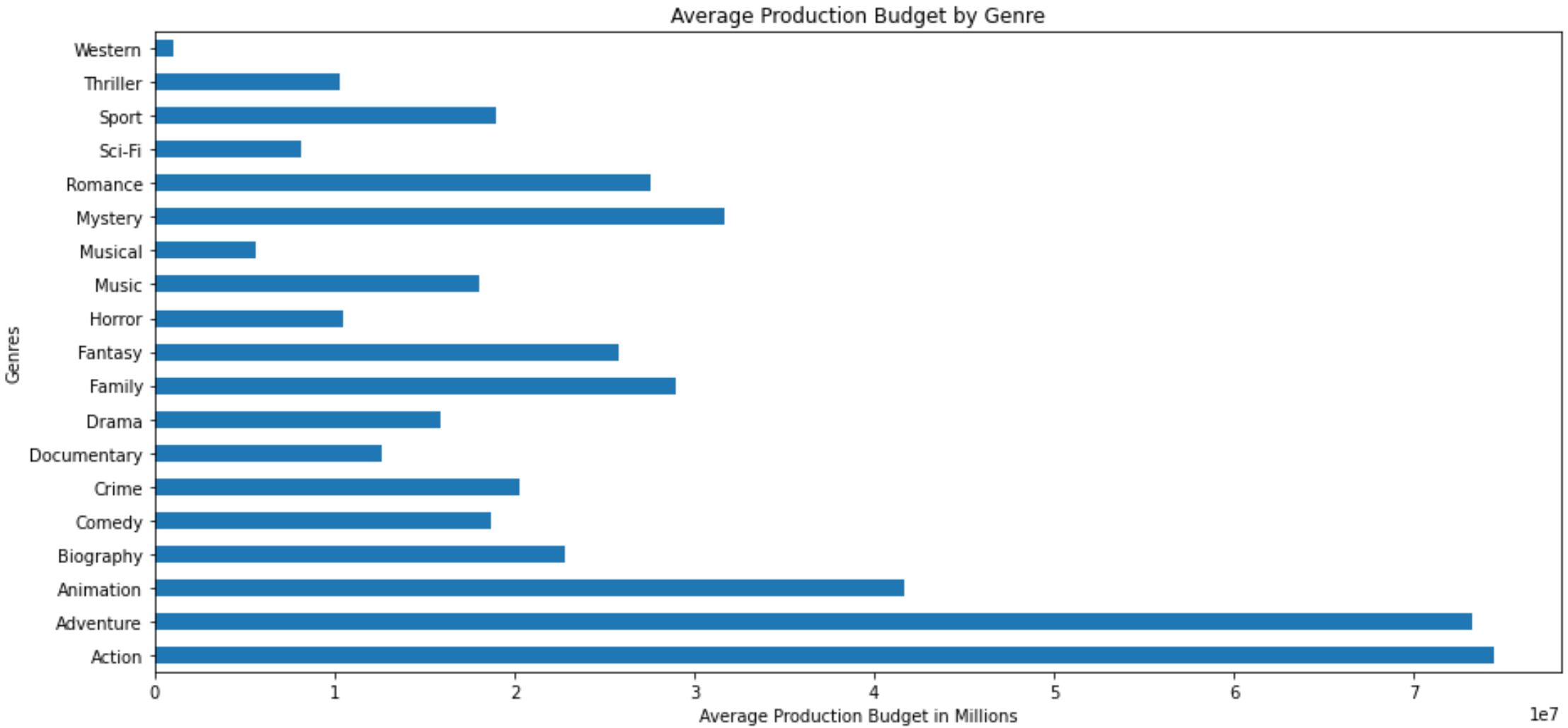
- Action, Adventure, and Horror films represented 28.3%, 10.0%, and 5.9% respectively of the total dataset yet represented 30.7%, 12.2%, and 6.9% of the 100% ROI dataset. They were the only categories to increase representation by at least 1%.


Genre Distribution
100% ROI
Total
Frequency
0
100
200
300
400
500
Action
Adventure
Family
Comedy
Drama
Biography
Horror
Crime
Animation
Mystery
Romance
Fantasy
Documentary
Thriller
Sci-Fi
Sport
Music
Musical
Western
Genre Breakdown

# Results: Genre

- The Horror genre had an average ROI of 1231.2%.  The next closest genre is romance with an average ROI of 616.2%.
- Horror had an average budget of $10.05M, while the average budget of the entire dataset was $39.4M.
- While the horror genre shows massive returns, it likely derives some of its alpha from having a relatively low budget.  Even so, this evidence shows audiences have the strongest demand for horror genre independent of production budget.


Average ROI by Genre
Western
Thriller
Sport
Sci-Fi
Romance
Mystery
Musical
Music
Horror
Fantasy
Family
Drama
Documentary
Crime
Comedy
Biography
Animation
Adventure
Action
Genres
0
200
400
600
800
1000
1200
ROI %


Average Production Budget by Genre
Western
Thriller
Sport
Sci-Fi
Romance
Mystery
Musical
Music
Horror
Fantasy
Family
Drama
Documentary
Crime
Comedy
Biography
Animation
Adventure
Action
Genres
0
1
2
3
4
5
6
7
Average Production Budget in Millions
1e7

# Conclusions

- Production budget has the largest correlation to worldwide theatrical gross.
- Low budget movies ($0.5M-$5M) offer the highest expected return on investment.
- The horror genre has shown the most resilience to requiring a large production budget in order to get a sizeable theatrical gross.
- A portfolio of low budget horror films are the best investment a studio can make.

# Conclusions

- Project limitations: no access to film marketing budget, theatrical profit distributions, or backend compensation to pinpoint exact ROI.
- Future improvement ideas: investigate the breakdown of film budgets to discover which components (stars, directors, set design etc.) are the most critical to invest resources in to maximize ROI.

# Thank You!

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