# Microsoft Movie Studio

Mengyu Jackson

# Summary

Explored relationships between runtime, budget, genre, TMDB average vote score, and ROI.

The best movies for optimizing ROI are short, low budget horror/thriller movies. These tend to have lower reviews however.

The best movies for optimizing vote score and total profit are long, high budget, Action/SciFi or Action/Adventure movies. These still have ROI much higher than average movie, but may require expensive IP.

Short, high budget, Animation/Adventure/Comedy movies also do very well according to all three metrics (ROI, total profit, and vote score)

# Outline

- Business Problem
- Data
- Methods
- Results
- Conclusions

# Business Problem

- Microsoft wants to create a new movie studio.
- What type of films are currently doing the best?
- Microsoft's brand is valuable.
- Generate actionable insights!

# Data

- Data Source:
  - Box Office Mojo
  - IMDB
  - TheMovieDB.org
- Dependent Variables to optimize:
  - ROI = profit / budget
  - Vote_average
  - We'll also talk about absolute profit
- Independent Variables which influence ROI and vote_average:
  - Runtime
  - Budget
  - Genre
  - Studio

# Methods

- Joined data from many sources
- Analyzed 1000+ movies
- Plotted and computed regression lines comparing 1 independent and dependent variable at a time
- Iteratively improved expected ROI by fixing best options for dependent variables
- Stopped when sample size became too small to remain meaningful

# Results: Percent of Movie Profitable

**Percent of Movie Which Are Profitable**
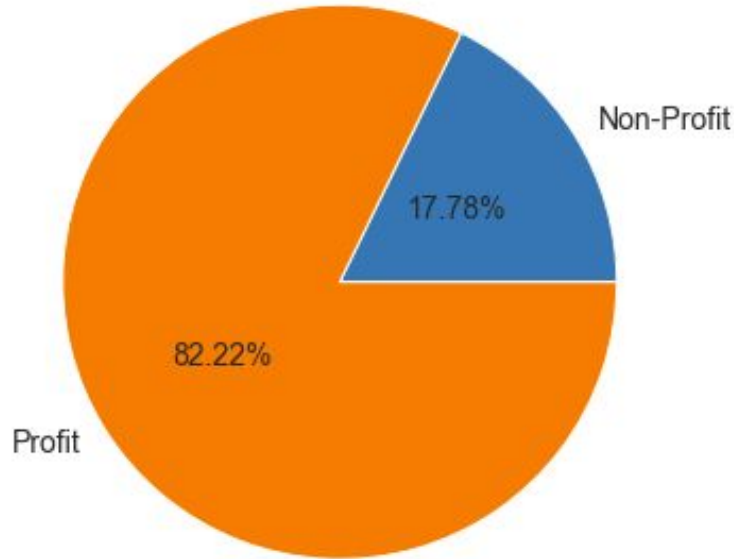


**Question:** Is movie making money?

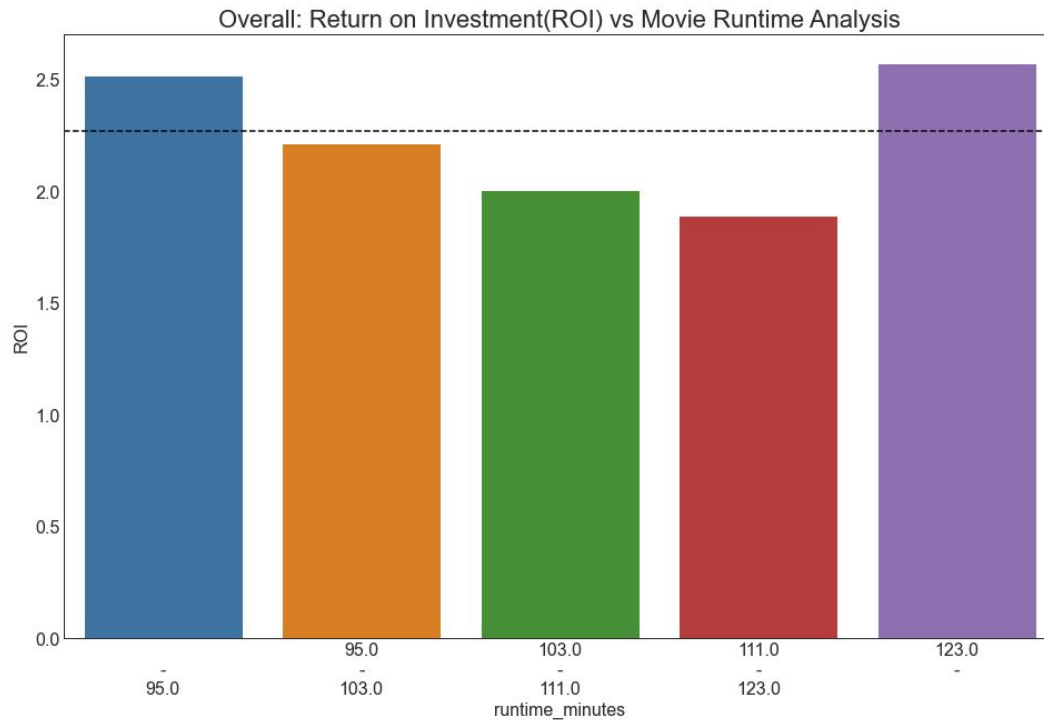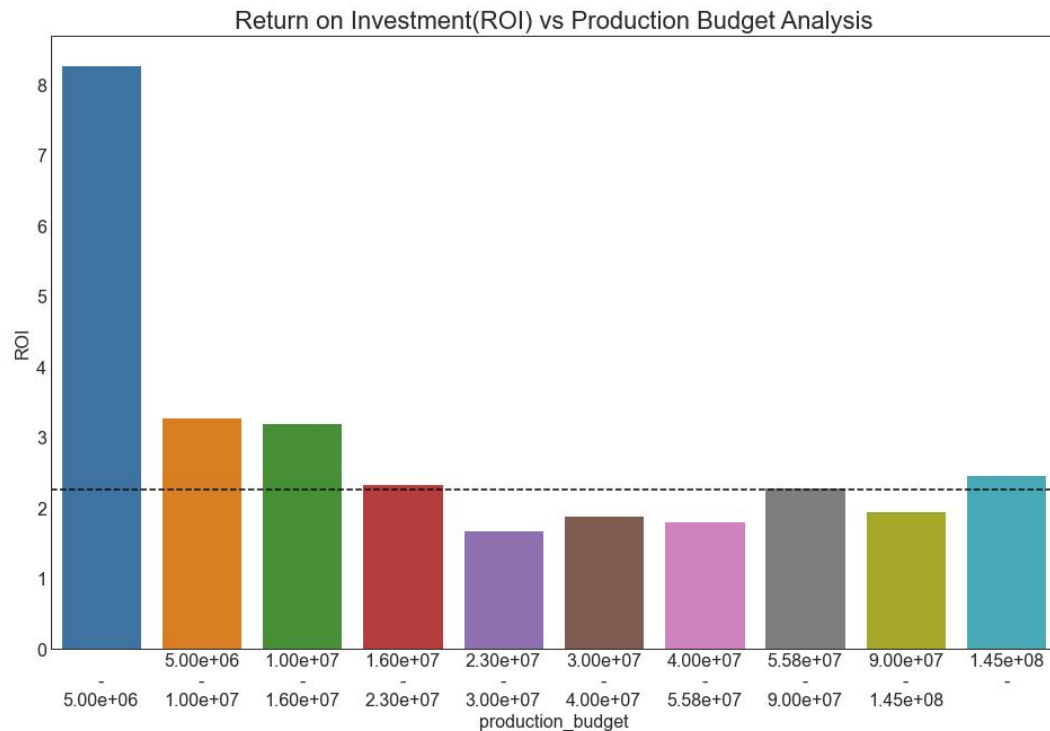**Answer:** Yes, 82.22% movie profit, only 17.78% movie not profit.

# Results: Runtime

Insights:

< 95 min = 🙂

> 123 min = 🙂

95-123 min = 😦

Overall: Return on Investment(ROI) vs Movie Runtime Analysis

# Results: Budget



Return on Investment(ROI) vs Production Budget Analysis
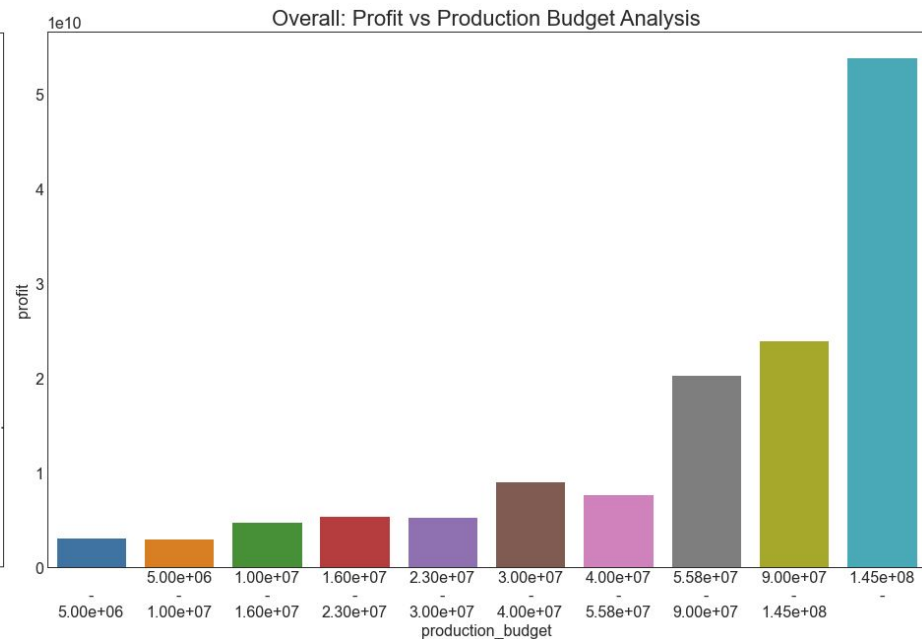
Insights:

< $5 million = 😁
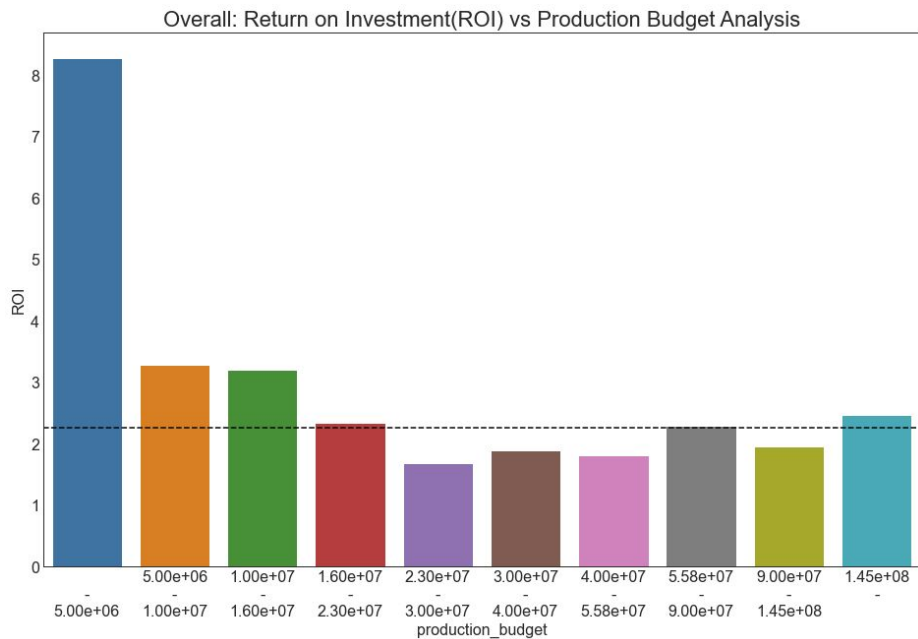
$5-$16 million = 🙂

$16-$56 million = 😟

$56+ million = 😐

# Results: Budget

- High budget = High profit
- Low budget = High ROI



Overall: Return on Investment(ROI) vs Production Budget Analysis



Overall: Profit vs Production Budget Analysis

# Results: Genre

Overall Movies: Number of Movies vs Genre
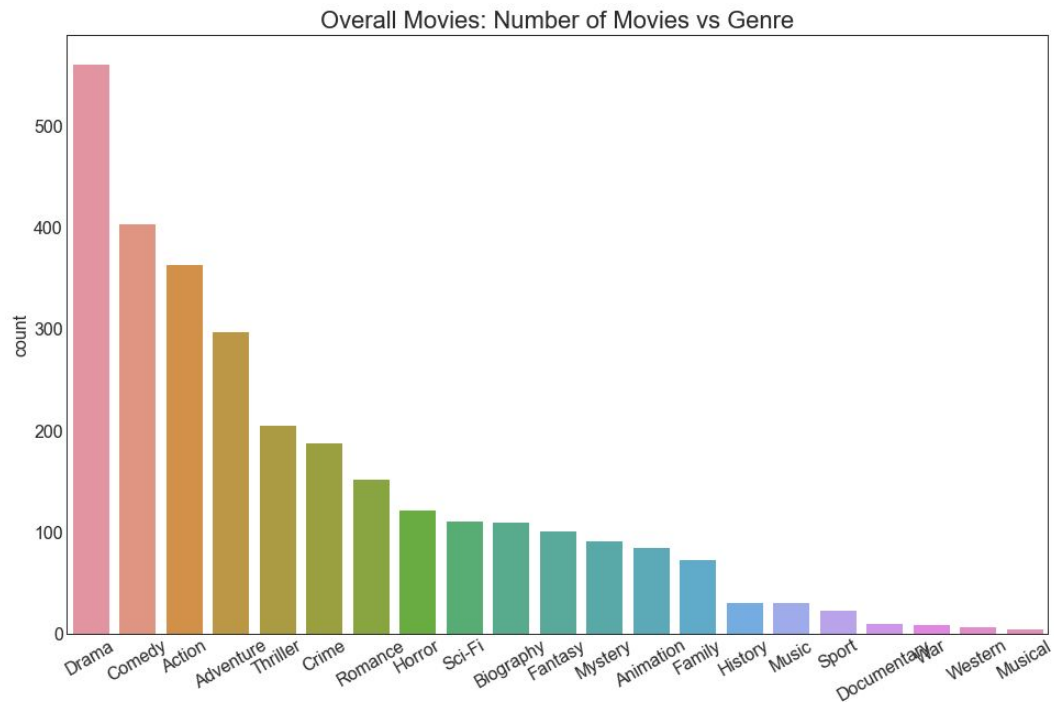


History - Musical are very infrequent.

We exclude them from further analysis

# Results: Genre


Overall Movies: ROI vs Genre
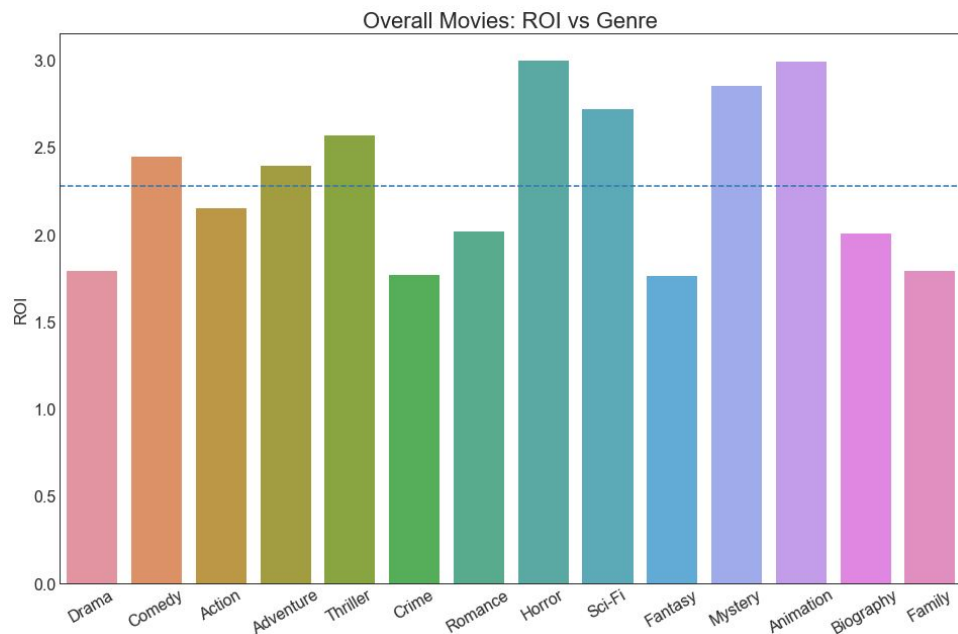
Insights:

Horror, Animation, Mystery = 😁

SciFi, Thriller = 🙂

Action, Adventure, Biography = 😐

Drama, Crime, Romance, Fantasy = 😧

# Results: Choices

Low or High Budget?

Short or Long?

| ROI and Vote Average by category | | | |
|---|---|---|---|
| | **All Budgets** | **Low Budget** | **High Budget** |
| **All Length** | 2.27 ROI 6.39 AV | 7.62 ROI 6.30 AV | 2.27 ROI 6.40 AV |
| **Short Movie** | 2.51 ROI 5.90 AV | 11.63 ROI 5.90 AV | 2.67 ROI 6.35 AV |
| **Long Movie** | 2.68 ROI 7.00 AV | 6.19 ROI 7.10 AV | 2.81 ROI 7.10 AV |

# Final Recommendation: Low Budget Short Movie



Low Budget Short Movie:  ROI vs Genre
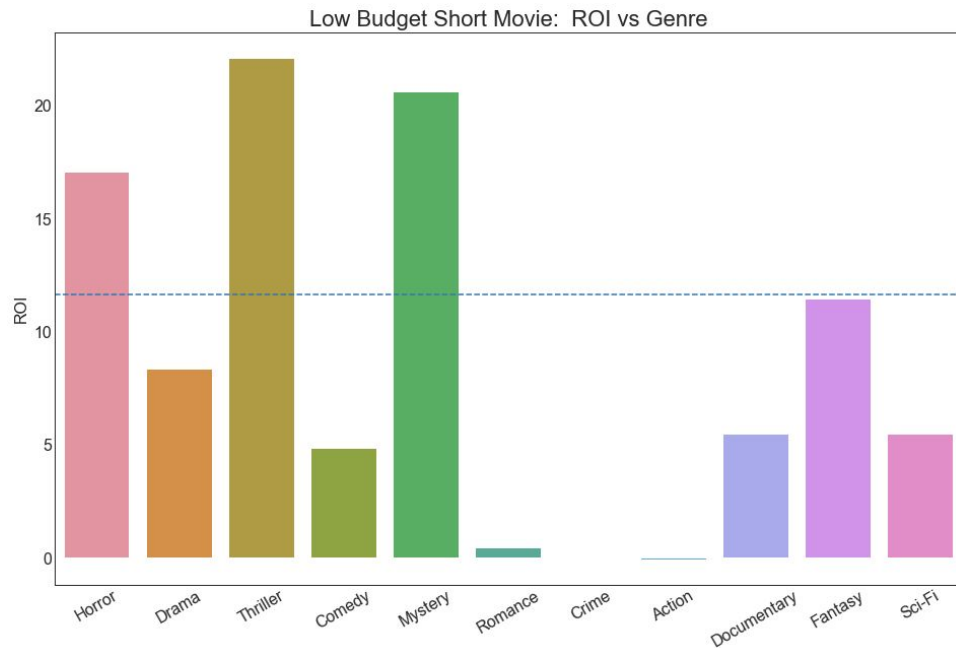
Insights:

Horror, Animation, Mystery = 😁
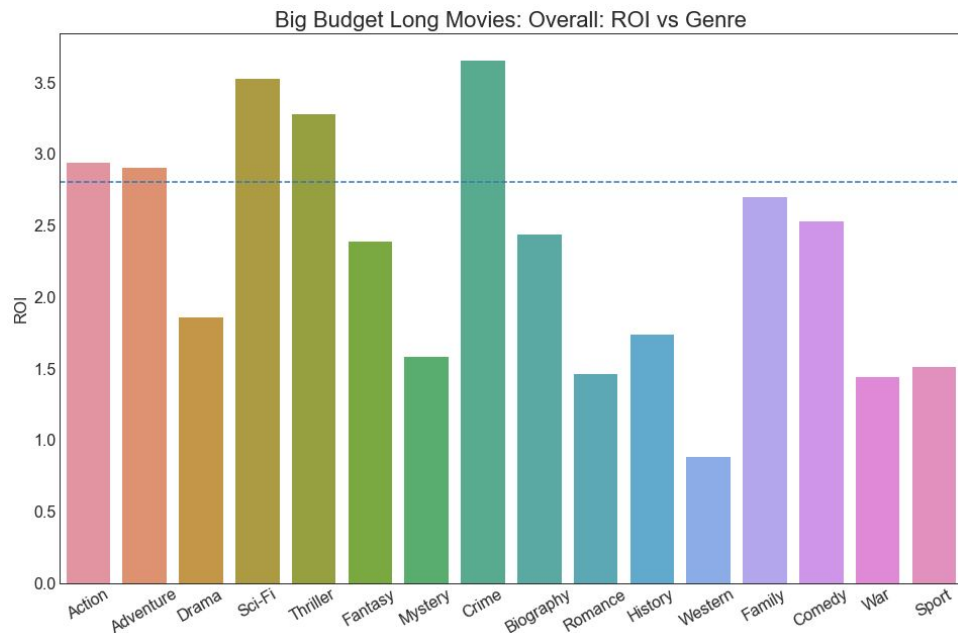
Final expected ROI (Thriller) > 20 !

ROI far exceeds baseline, as well as expected ROI of any subset chosen by a single variable.

# Final Recommendation: High Budget Long Movie



Big Budget Long Movies: Overall: ROI vs Genre
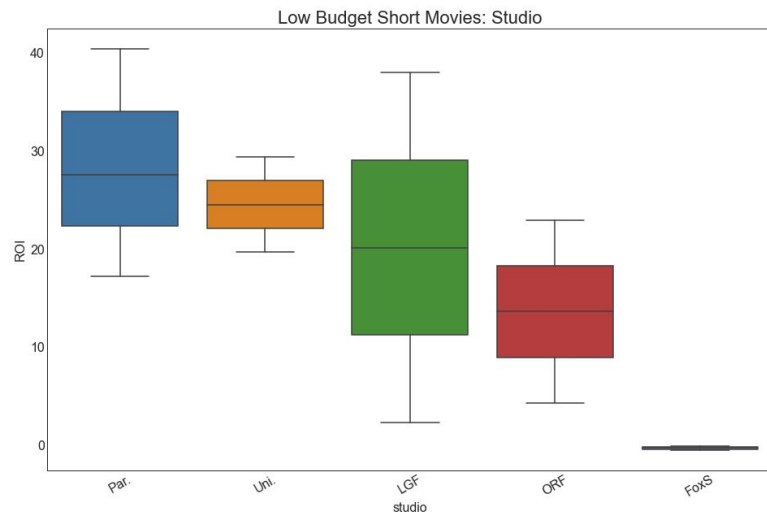
Insights:

Sci-Fi, Thriller = 🙂

Action, Adventure = 😐

Final expected ROI (Sci-Fi) = 3.5!

ROI is very good in a category that generates a lot of absolute profit.

# Studio To Study: Low Budget Short Movie



Low Budget Short Movies: Studio

Par and Uni Make best Horror Films (by ROI).

|  | original_title | studio | runtime_minutes | ROI | profit | averagerating | genres |
|---|---|---|---|---|---|---|---|
| 599 | Paranormal Activity 3 | Par. | 83.0 | 40.407969 | 202039844 | 5.8 | Horror,Mystery,Thriller |
| 928 | The Last Exorcism | LGF | 87.0 | 37.981056 | 68365900 | 5.6 | Drama,Horror,Thriller |
| 978 | The Purge | Uni. | 85.0 | 29.422194 | 88266581 | 5.7 | Horror,Thriller |
| 481 | Lights Out | WB (NL) | 81.0 | 28.761302 | 143806510 | 6.3 | Drama,Horror,Mystery |
| 600 | Paranormal Activity 4 | Par. | 88.0 | 27.563598 | 137817992 | 4.6 | Horror,Mystery,Thriller |
| 19 | A Haunted House | ORF | 86.0 | 22.969023 | 57422558 | 5.1 | Comedy,Fantasy |
| 587 | Ouija | Uni. | 89.0 | 19.660126 | 98300632 | 4.5 | Horror,Mystery,Thriller |
| 602 | Paranormal Activity: The Marked Ones | Par. | 84.0 | 17.180971 | 85904854 | 5.0 | Horror,Mystery,Thriller |
| 443 | Kevin Hart: Let Me Explain | LG/S | 75.0 | 11.930902 | 29827255 | 6.8 | Comedy,Documentary |
| 933 | The Lazarus Effect | Rela. | 83.0 | 6.671862 | 33359310 | 5.2 | Horror,Mystery,Sci-Fi |

# Studio To Study: High Budget Long Movie


High Budget Long Movies: Studio
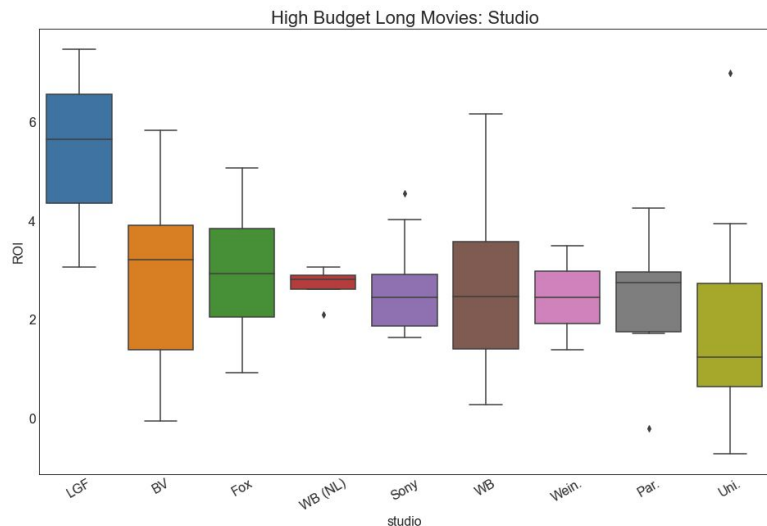
No standout studios (LGF has only 3 movies; all Hunger Games).
High Budget seems dominated by expensive IP. Further analysis required, but Superhero movies seem like safe bets.

| | original_title | studio | runtime_minutes | ROI | profit | averagerating | genres |
|---|---|---|---|---|---|---|---|
| 909 | The Hunger Games | LGF | 142.0 | 7.474042 | 597923379 | 7.2 | Action,Adventure,Sci-Fi |
| 308 | Furious Seven | Uni. | 137.0 | 6.993278 | 1328722794 | 7.2 | Action,Crime,Thriller |
| 81 | Aquaman | WB | 143.0 | 6.168092 | 986894640 | 7.1 | Action,Adventure,Fantasy |
| 91 | Avengers: Infinity War | BV | 149.0 | 5.827114 | 1748134200 | 8.5 | Action,Adventure,Sci-Fi |
| 121 | Black Panther | BV | 134.0 | 5.741291 | 1148258224 | 7.3 | Action,Adventure,Sci-Fi |
| 910 | The Hunger Games: Catching Fire | LGF | 146.0 | 5.652831 | 734868047 | 7.5 | Action,Adventure,Sci-Fi |
| 944 | The Martian | Fox | 144.0 | 5.067328 | 547271443 | 8.0 | Adventure,Drama,Sci-Fi |
| 327 | Gone Girl | Fox | 149.0 | 5.042085 | 307567189 | 8.1 | Drama,Mystery,Thriller |
| 1058 | Transformers: Dark of the Moon | P/DW | 154.0 | 4.763028 | 928790543 | 6.2 | Action,Adventure,Sci-Fi |
| 727 | Skyfall | Sony | 143.0 | 4.552635 | 910526981 | 7.8 | Action,Adventure,Thriller |

# Conclusions

- "Middle of the Road" movies are the worst across all metrics:
  - Make a low-budget (for best ROI) or high budget (for best profit, best ratings, good ROI) movie, not a middle budget movie
  - Make a movie that is either long or short, not medium length
- Pick Genre that suits budget and length:
  - Horror/Thriller for Low Budget/Short Movies
  - Sci-Fi/Thriller for High Budget/Long Movies
- Intellectual Property seems important for successful High Budget/Long Movies
  - Acquire movie rights for comic book superheroes or popular books.
- Further Research
  - We can help analyze directors/writers/actors within a certain genre/budget/runtime once you make a decision!

# Thank You!

**Email:** mengyujackson121@gmail.com
**GitHub:** github.com/mengyujackson121
**LinkedIn:** www.linkedin.com/in/mengyu-jackson-9b5597140/