

# FILM INDUSTRY ANALYSIS: REVENUE AND RATINGS TRENDS

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# INTRODUCTION

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How are movie revenues and cast according to Box Office Mojo in the 2001-2023 period related to their ratings in IMDb?

**Motivation:** Analyzing the cast and quality of a film project can help an investor know what parameters to take into account when investing both during and before production.

# BACKGROUND

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ON FILM INDUSTRY ANALYSIS

# CONTEXT FOR FILM INDUSTRY

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The support for film projects is becoming less stable and reform proposals to improve this have been made (Y Vorontsova, 2023).

The number of feature films produced has greatly increased, leading to a greater number of investors (China Quarterly).

Digital technologies and "big data" can enhance the cinema experience, adapting some of it to consumer preferences (C. Weinberg et al., 2020).

# RELATED LITERATURE

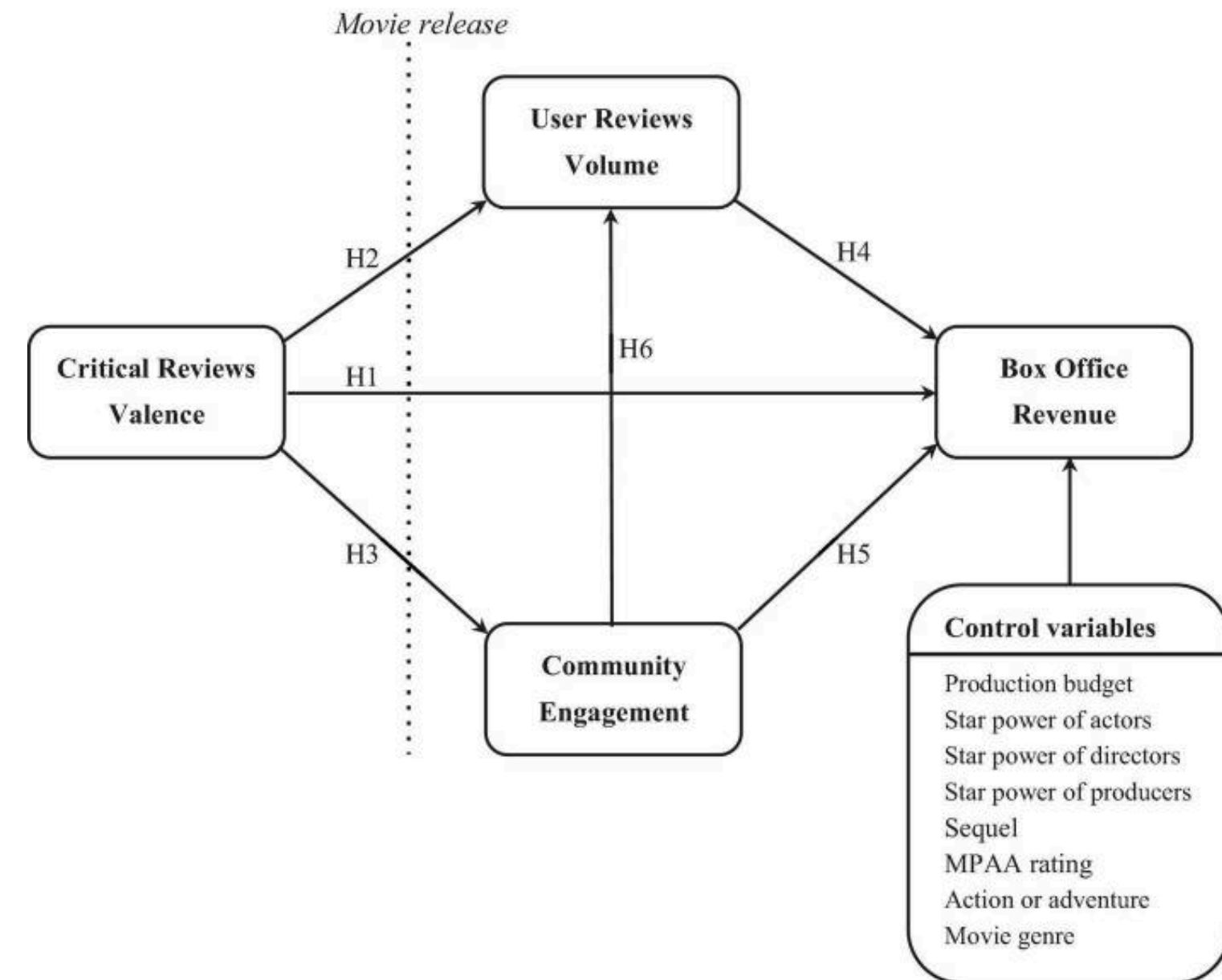
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## **CHIU, Y. ET AL. (2022). STUDY OF THE SALES IMPACT (ACCORDING TO BOX OFFICE) OF THE CRITICAL REVIEWS AND USER REVIEWS (FROM METACRITICS).**

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Graph 1. Dataflow for forecasting in another project

- Some features of compatibility allowed to use up to 200 important movies during recent years.
- The main objective was a forecasting system for the expected revenue.
- Finally they concluded that there is a subtle but clear relationship.



## **INTERNET MOVIE DATABASE (IMDB) AND BOX OFFICE MOJO OFFICE**

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- More than 200 millions of monthly visitors each one.
- Almost 700 thousands movie titles and features
- The most famous films database.

K. Dodds (2006), "Popular geopolitics and audience dispositions:  
James Bond and the Internet Movie Database (IMDb)"

A. Oghina et al. (2012), "Predicting IMDB Movie Ratings Using Social Media"

N. Quader et al. (2017), "A machine learning approach to predict movie box-office success"

# DATA COLLECTION STRATEGY

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METHODS

STRATEGY

DESCRIPTION






# DATA COLLECTION

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- **Our Approach:** Data was extracted using web scraping with Python. Selenium handled dynamic content effectively in the absence of an official API.
- **Defining the Data:** Focused on movies from 2001 to 2023, excluding documentaries and shorts, with at least 200 votes.
- **Dataset:** For a comprehensive analysis we extracted movie title, rating, unique ID (for Box Office Mojo), revenues, and cast/crew information.

# DATA COLLECTION STRATEGY

## IMDB - Filters

 TITLES    NAMES    COLLABORATIONS

Movie ✕   Release Date: January 1, 2001 to December 31, 2023 ✕   Rating Count: 200 or above ✕   Exclude Documentary ✕   Exclude Short ✕

### Search filters

Expand all ▾ 1-50 of 53 474

Sort by   Number of ratings ▾

↓   ≡   ≡   ≡   ≡

- Title name ▾
- Title type ▾
- Release date ▾
- IMDb ratings ▾
- Number of votes ▾
- Genre ▾
- Awards & recognition ▾
- Page topics ▾
- Companies ▾
- Instant watch options ▾
- US certificates ▾



#### 1. The Dark Knight

2008   2h 32m   PG-13  
★ 9.0 (3M)   ☆ Rate   84 Metascore



When a menace known as the Joker wreaks havoc and chaos on the people of Gotham, Batman, James Gordon and Harvey Dent must work together to put an end to the madness.



#### 2. Inception

2010   2h 28m   PG-13  
★ 8.8 (2.6M)   ☆ Rate   74 Metascore



A thief who steals corporate secrets through the use of dream-sharing technology is given the inverse task of planting an idea into the mind of a C.E.O., but his tragic past may doom the project and his team to disaster.



#### 3. Interstellar

2014   2h 49m   PG-13  
★ 8.7 (2.3M)   ☆ Rate   74 Metascore





DATA COLLECTION STRATEGY

BoxOfficeMojo - Selenium

Inception - Box Office Mojo

boxofficemojo.com/title/tt1375666/credits/?ref=bo\_tt\_tab#tabs

Un software de prueba automatizado está controlando Chrome.

Performance

Cast and Crew

All-Time Rankings

Related Stories

Similar Movies

View contact information for cast and crew

Filmmakers	Role
Christopher Nolan	Director
Christopher Nolan	Writer
Christopher Nolan	Producer
Emma Thomas	Producer
Hans Zimmer	Composer
Wally Pfister	Cinematographer
Lee Smith	Editor
Guy Hendrix Dyas	Production Designer

Cast	Role
Leonardo DiCaprio	Cobb
Joseph Gordon-Levitt	Arthur
Elliot Page	Ariadne
Ken Watanabe	Saito

Latest Updates: News | Daily | Weekend | All Time | International | Showdowns

Glossary | User Guide | License IMDb Data | Help

# OVERCOMING OBSTACLES

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- **Incomplete Data:** Some fields were inconsistently available, with certain entries containing the information while others were left blank
- **Dynamic Page Issues:** Frequent page refreshes caused values to shift or change locations. For example, in the initial IMDb dataset, the duration overlapped with the release year and other fields, making the data extraction process more complex.
- **Execution Time:** Extracting the datasets with selenium required significant runtime, the prolonged process ultimately led to kernel failures, preventing us from capturing all desired information.



# DATA DESCRIPTION

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7000 films collected

Table 1: Data set overview: Selected movies with ratings and worldwide gross revenue.

Title	Rating	Worldwide Gross (in M\$)	Director	Actors
The Dark Knight	9.0	1004	Christopher Nolan	Christian Bale (Batman), Heath Ledger (Joker)
Inception	8.8	836	Christopher Nolan	Leonardo DiCaprio, Joseph Gordon-Levitt
Avatar	7.9	2847	James Cameron	Sam Worthington, Zoe Saldana

**Sources:** IMDb for ratings, BoxOfficeMojo for the worldwide gross and cast.

# DATA DESCRIPTION

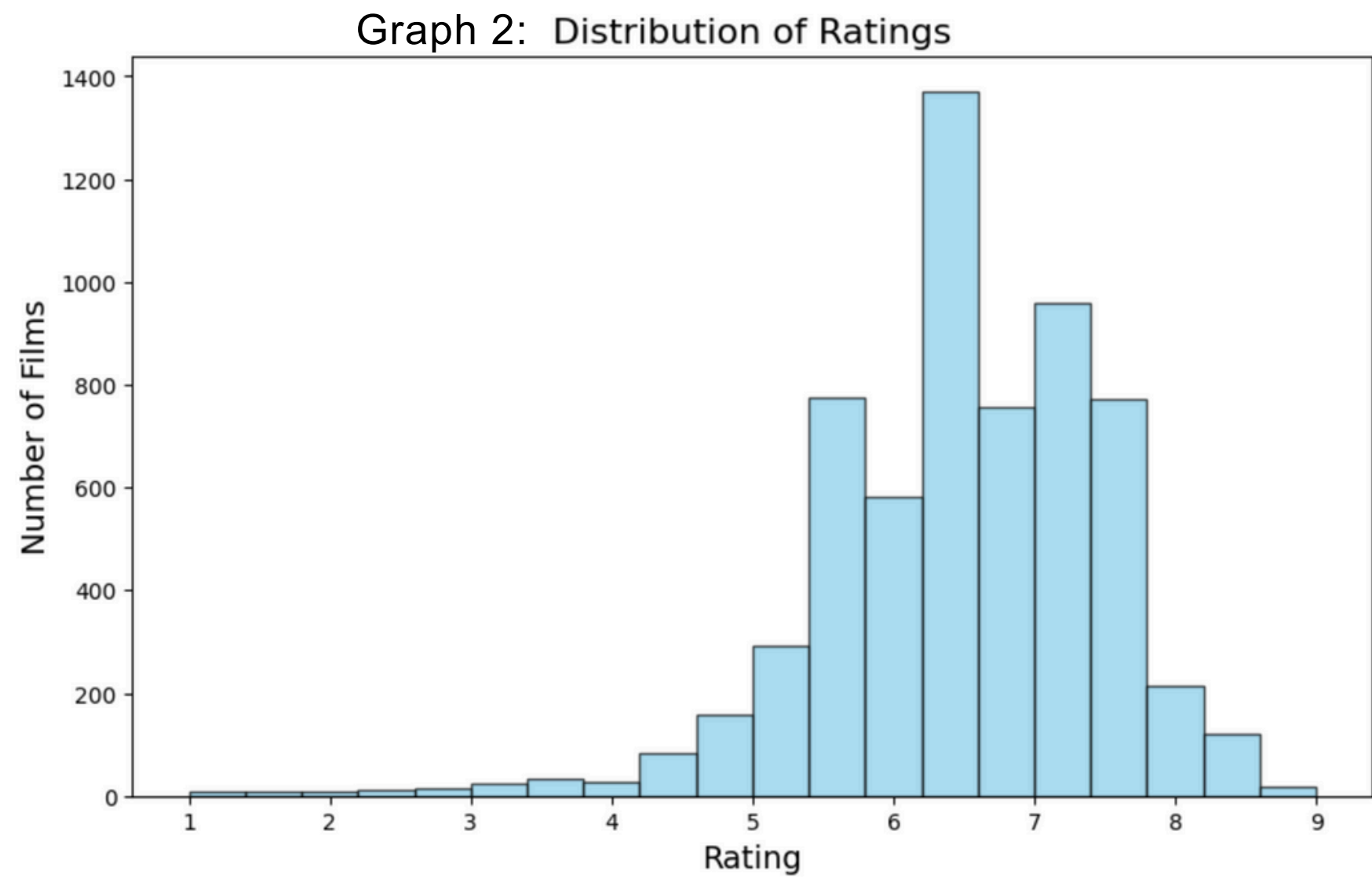


Table 2: Descriptive statistics for ratings and worldwide gross.

Variable	Average	Median	Standard Deviation	Q1 (25th Per-centile)	Q3 (75th Per-centile)
Rating	6.5	6.6	1.0	6.0	7.2
Worldwide Gross (in M\$)	89	21	189	3	87

Sources: IMDb for ratings, BoxOfficeMojo for the worldwide gross.

# DATA ANALYSIS

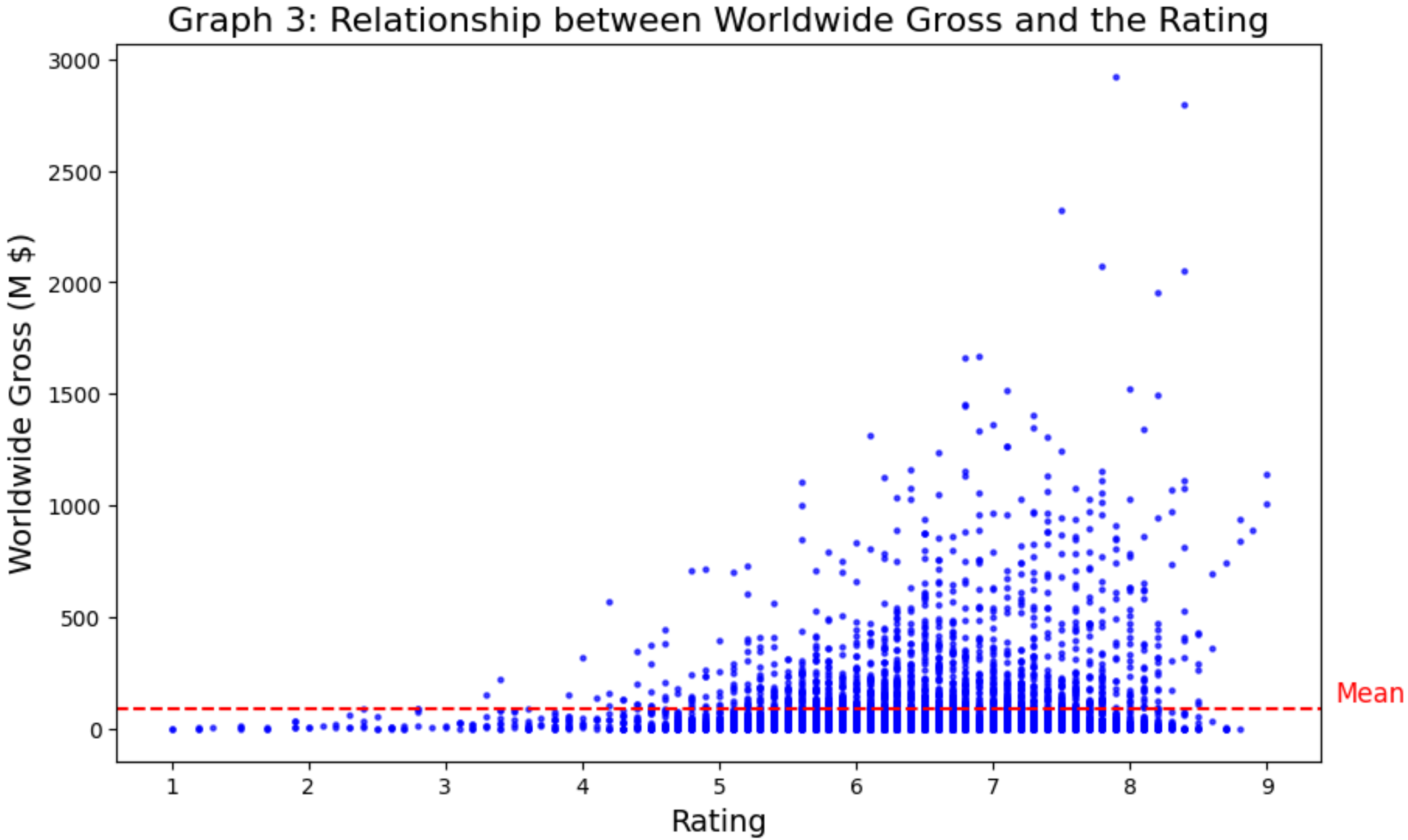
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RATINGS

ACTORS AND  
FILM DIRECTORS

REVENUES





DATA ANALYSIS

DIRECTORS

Table 3: Top directors by average worldwide gross revenue.

Director	Average Revenue (in M\$)	Number of Films
Anthony Russo	1140	6
Peter Jackson	820	8
David Yates	800	8
J.J. Abrams	780	6
Sam Raimi	670	6
Christopher Nolan	620	10
Michael Bay	540	10
Bryan Singer	530	6
Jon Favreau	490	9
Francis Lawrence	460	8

**Note:** With a minimum of 5 films. **Sources:** BoxOfficeMojo for the worldwide gross and cast.

- **Franchise dominance:** Marvel, Lord of the Rings, Transformers

Table 4: Top directors by average rating.

Director	Average Rating	Number of Films
Christopher Nolan	8.22	10
Quentin Tarantino	8.03	8
Peter Jackson	7.94	8
Denis Villeneuve	7.78	8
Martin Scorsese	7.76	7
Hirokazu Koreeda	7.66	7
Asghar Farhadi	7.66	7
S. Shankar	7.65	6
Bong Joon Ho	7.63	6
Nuri Bilge Ceylan	7.63	7

**Note:** With a minimum of 5 films. **Sources:** IMDb for ratings, BoxOfficeMojo for the cast.

- **High ratings, limited filmography:** Top ratings with relatively few films, indicating consistent quality.

DATA ANALYSIS

ACTORS

Table 5: Top actors by average worldwide gross revenue.

Actor	Average Worldwide Gross (in M\$)	Number of Films
Robert Downey Jr.	617	25
Vin Diesel	436	21
Chris Evans	421	28
Tom Cruise	412	21
Will Smith	362	20
Dwayne Johnson	329	37
Mark Ruffalo	317	29
Jack Black	292	24
Johnny Depp	284	33
Daniel Craig	276	21

**Note:** With a minimum of 15 films. **Sources:** BoxOfficeMojo for the worldwide gross and cast.

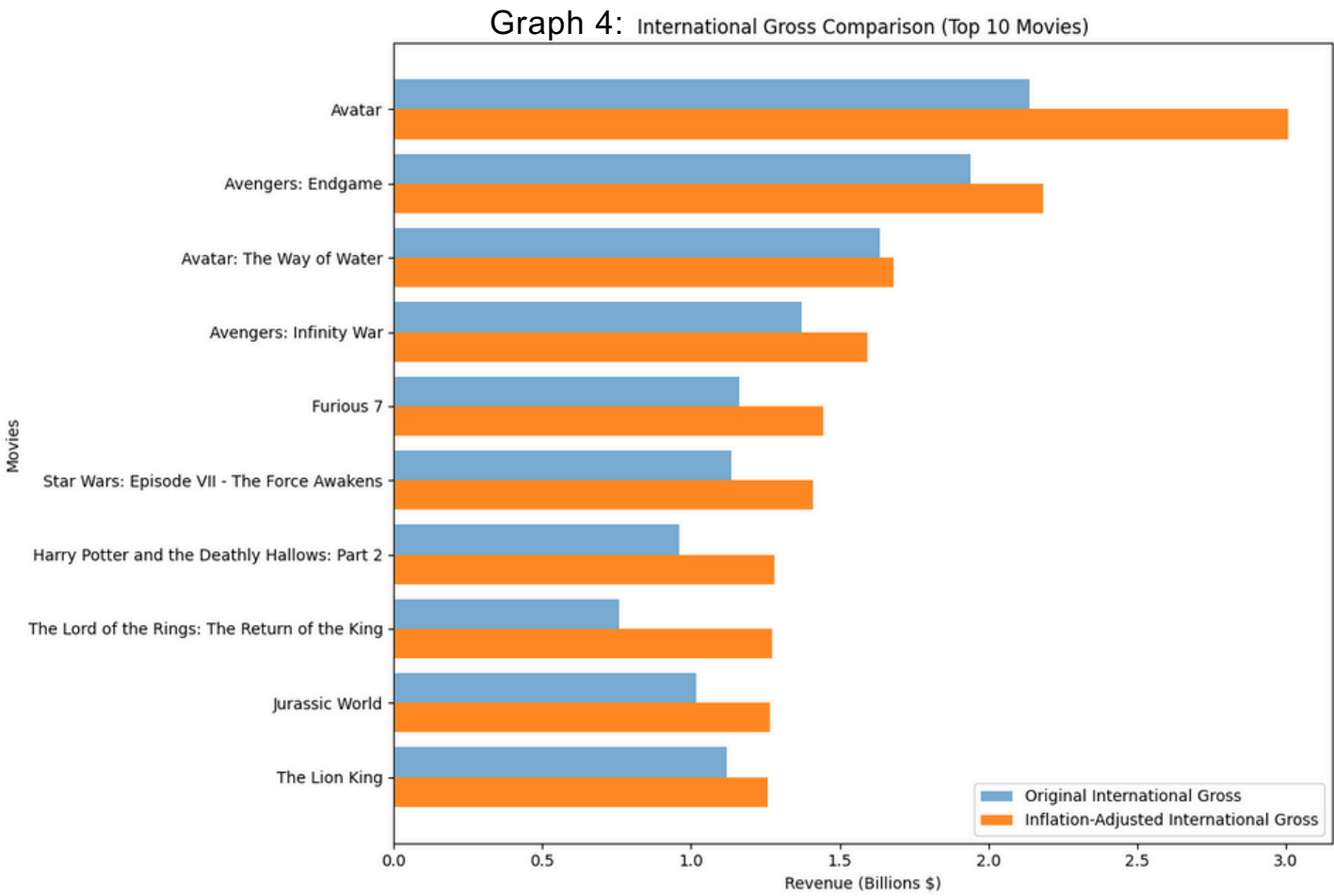
- **Franchise dominance:** Downey Jr. and Diesel lead, driven by Marvel and Fast & Furious.

Table 6: Top actors by average rating and notable performances.

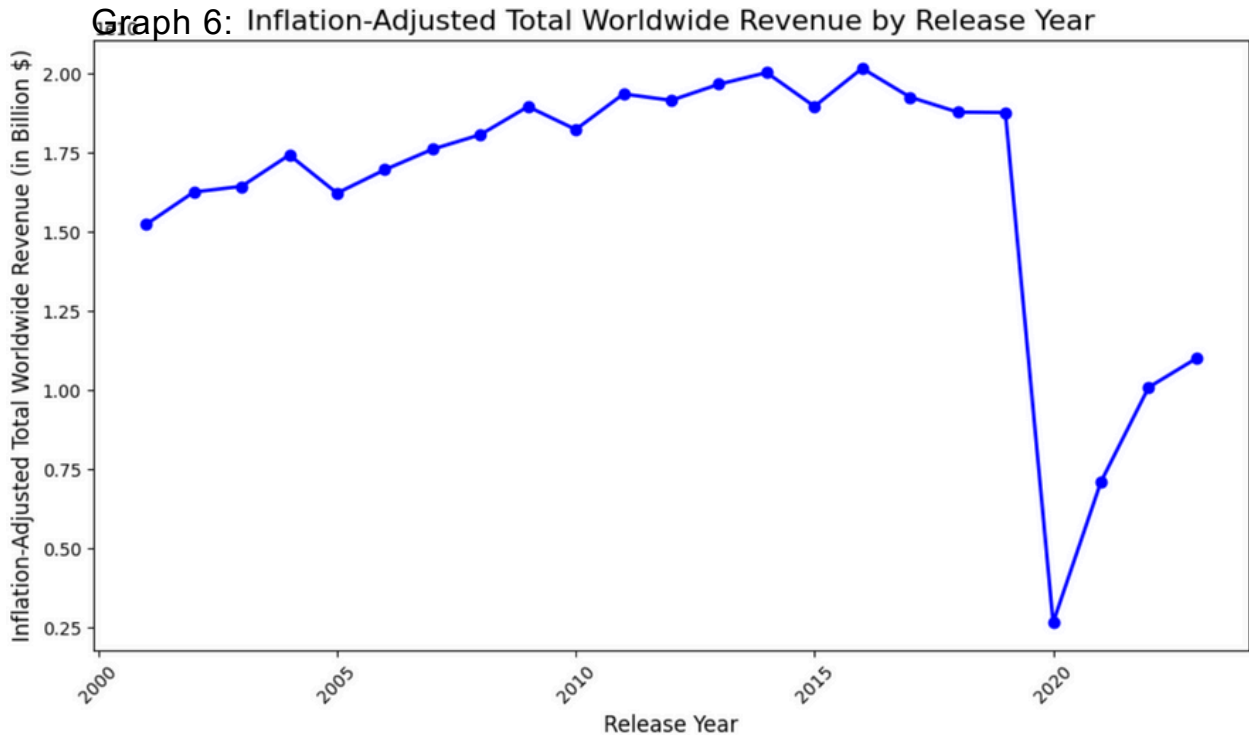
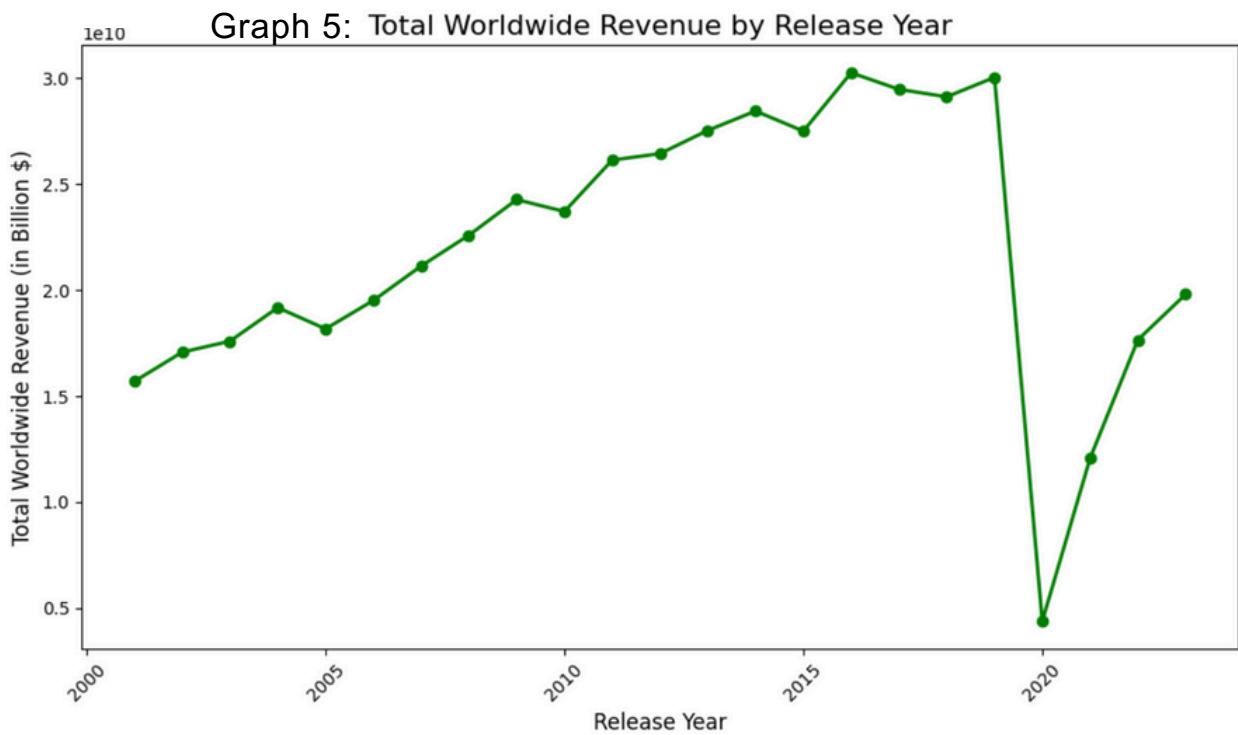
Actor	Average Rating	Number of Films
Leonardo DiCaprio	7.75	17
Robert Downey Jr.	7.25	25
Ajay Devgn	7.21	17
Philip Seymour Hoffman	7.21	19
Mads Mikkelsen	7.15	17
Brad Pitt	7.08	27
Ryan Gosling	7.05	23
Emma Watson	7.05	16
Christian Bale	7.05	29
Tom Cruise	7.03	20

**Note:** With a minimum of 15 films. **Sources:** IMDb for ratings, BoxOfficeMojo for the cast.

# DATA ANALYSIS      REVENUES



By aligning earnings to today's economic conditions, the comparison offers a more accurate perspective on the box office revenues of movies across different eras



**Note:** The adjustment is based on changes in the consumer price index (CPI) **Sources:** Inflation Data: Consumer Price Index (CPI) data used for inflation adjustments were sourced from the [U.S. Bureau of Labor Statistics](#).



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# CONCLUSION

THERE IS NOT A CLEAR RELATIONSHIP BETWEEN RATING AND REVENUES, BUT THE BIGGEST AMOUNTS OF REVENUES ARE LOCATED IN THE SECOND HALF OF THE RATING VALUES

THERE'S A CLEAR CORRELATION BETWEEN RENOWNED DIRECTORS AND HIGH REVENUE, INDICATING THAT DIRECTORS PLAY A CRITICAL ROLE IN COMMERCIAL SUCCESS.



# BIBLIOGRAPHY

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