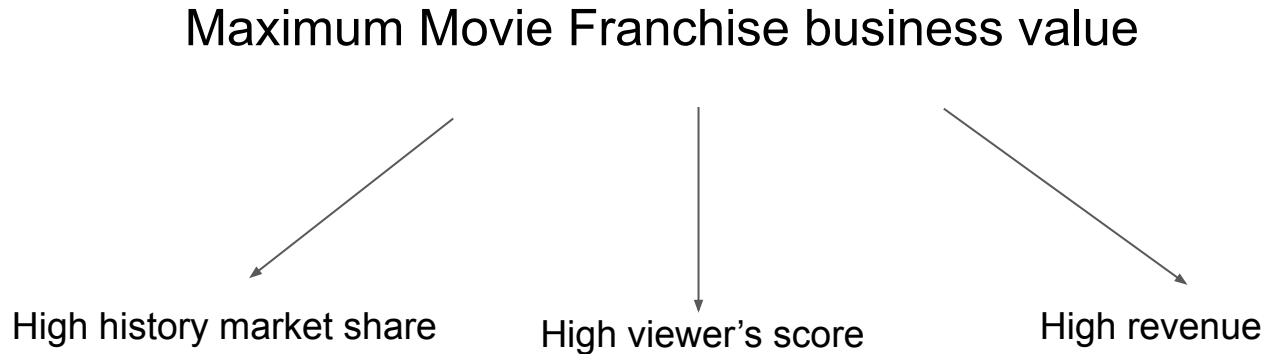# Most Valuable Movie Franchise

Donghuai Li

Problem Statement

What are the top 3 franchises in past 20 years that are recommend to brought back based on their business values?

Issue Tree

Maximum Movie Franchise business value

High history market share

High viewer's score

High revenue

Valuable Movie Franchise Ghose Deck

Synthesis

-The movie value consists of three parts.
-Our recommend movies are *Avatar, The Lord of Ring, Star war.*

Overview of Analysis

- History market share

- Average weighted score

- Average revenue

History market share

-Compare franchise based on average market share for each movie in franchise.

Average weighted score

-Use the IMDB weighted score to represent part of franchise business value.

Average revenue

-The revenue also reflect the popularity of a franchise. Higher revenue imply people are more willing to pay for its re-release.

Limitation 1

-This data set contain movies most before 2018, and some movies have missing data.

Limitation 2

-Even movies in same franchise have much difference. The cast and crew also changed among movies.
-Viewers' preference changed during long time span of franchise movies.

Review of next step

-Try to find more dimension of franchise business value.

Missing Value in Revenue Analysis

Over half of data are given 0 revenue, we need to figure out the explanation to the missing. Is it missing at totally random, or missing at random?

There are many columns in metadata but only few can test the relationship with missing value in revenue. In the following parts, we exam the number of votes, the average of votes, the popularity of movie, the year of production to the revenue's relationship, respectively.

Data Distribution

● Rvenue =0
● Rvenue >0

989 (37.7%)

1632 (62.3%)
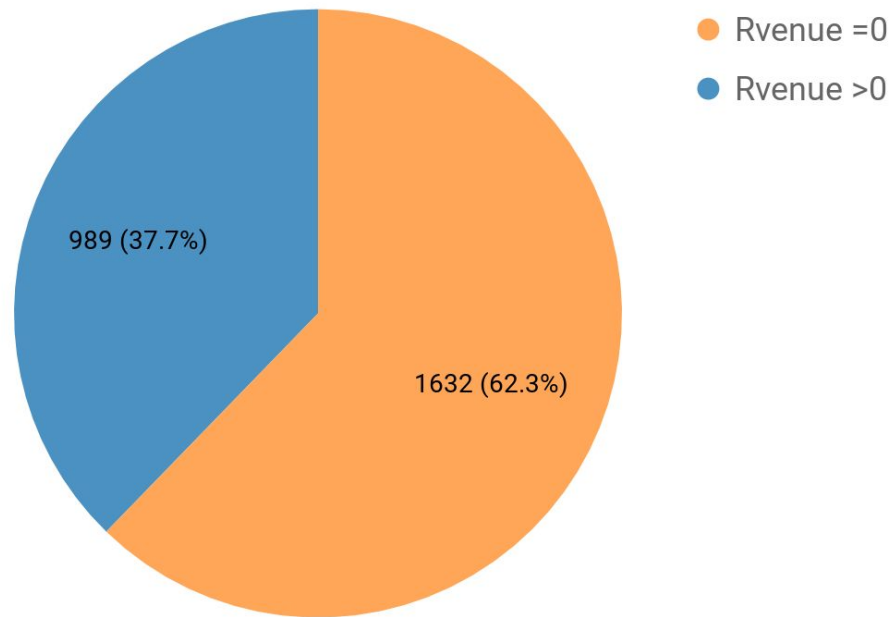
Vote & revenue

Stack plot for under different revenue group with count of votes
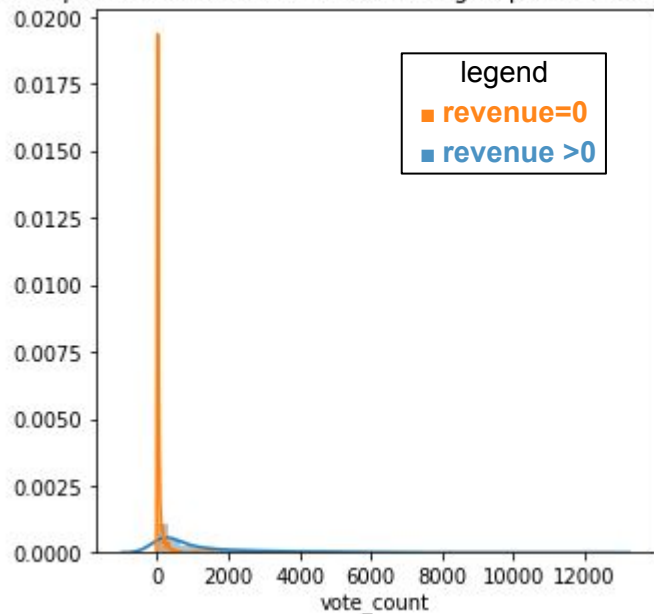
Stack plot for under different revenue group with mean vote rate

legend
- revenue=0
- revenue >0
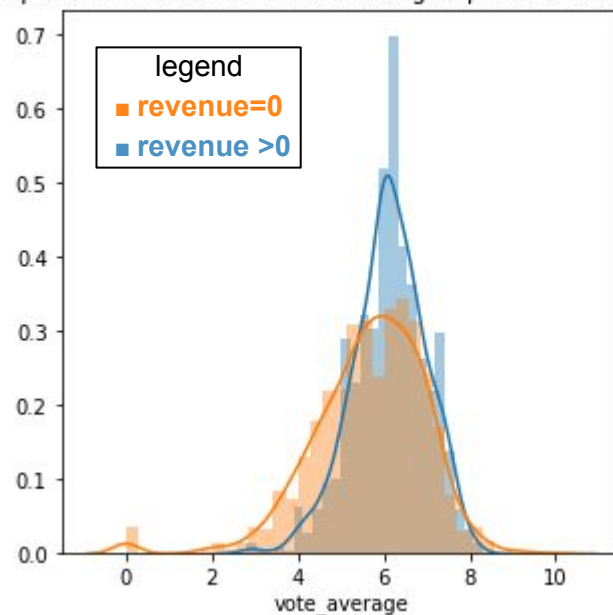
Movies with different revenues have significantly different distributions of number of votes. At the same time, the average vote score, movies with income greater than 0 are more concentrated near the average, which can be said to be a smaller standard deviation.
We can conclude that number of vote has a strong relationship with revenue.

Popularity/Year & revenue

Stack plot for under different revenue group with popularity

legend
■ revenue=0
■ revenue >0

revenue=0
revenue >0

Stack plot for under different revenue group with years

legend
■ revenue=0
■ revenue >0
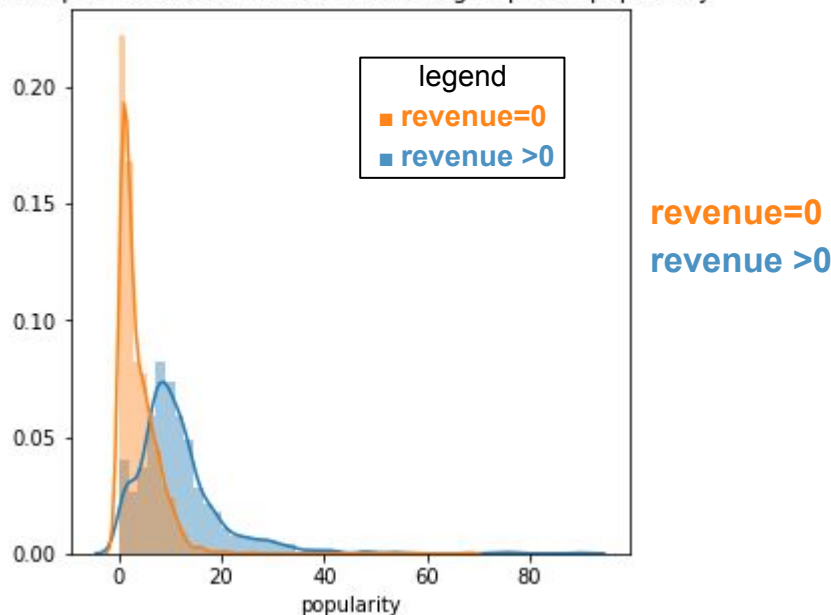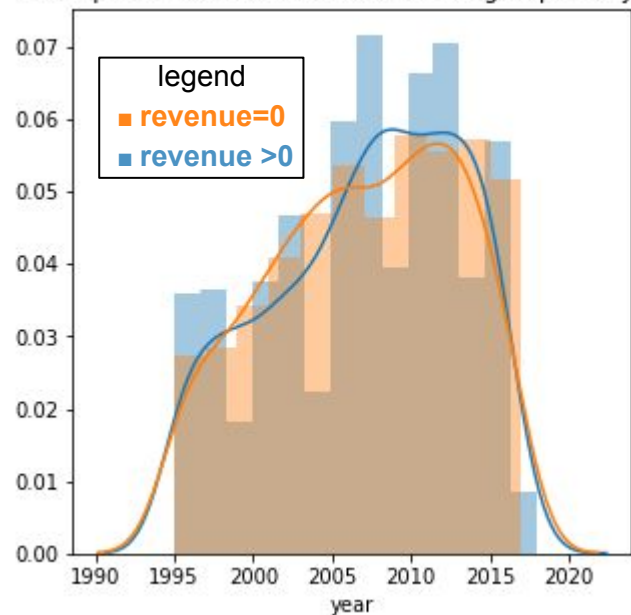
Knowing that the number of votes is related to revenue, we naturally think whether the popularity is also related to revenue. As you can see in the figure above, movies with zero profits are significantly less popular. At the same time, it can be seen in the graph of year and revenue that the year has little effect on whether the revenue is 0.

So we concluded that regardless of the production year of the movie, unpopular movies are more likely to missing the revenue data. The missingness of revenue is missing at random (MAR)

History market share

Average Market Share

		Avg. market share in percentage
1	Avatar Collection	23.15%
2	The Lord of the Rings Collection	11.56%
3	Harry Potter Collection	10.55%
4	Star Wars Collection	10.49%
5	Spider-Man Collection	9.91%
6	Pirates of the Caribbean Collection	9.52%
7	Wonder Woman Collection	9.42%
8	The Avengers Collection	9.30%
9	Finding Nemo Collection	9.19%
10	Toy Story Collection	9.08%
11	Indiana Jones Collection	8.62%
12	Frozen Collection	8.57%
13	Shrek Collection	8.37%
14	The Incredibles Collection	8.18%
15	The Dark Knight Collection	7.97%

Avg. market share in percentage

Considering the rapid growth of the film market every year, we compared the popularity of movie based on their market share on published year.
From the graph we find "Avatar" have much higher market share than other collection. People who missing Avatar before are very likely to see it.

Average Weighted Score

Average Weighted Score

	Collection	Avg. Weighted score
1	The Lord of the Rings Collection	7.828
2	The Dark Knight Collection	7.645
3	Guardians of the Galaxy Collection	7.546
4	Kill Bill Collection	7.419
5	Kingsman Collection	7.395
6	Toy Story Collection	7.346
7	Harry Potter Collection	7.338
8	How to Train Your Dragon Collect..	7.249
9	The Vengeance Collection	6.772
10	Infernal Affairs Collection	6.671
11	Elite Squad Collection	6.599
12	Rebuild of Evangelion	6.321
13	Samurai Trilogy	6.292
14	Cocaine Cowboys	6.248
15	Kvartet I Collection	6.241

Avg. Weighted score

We can observe that there are approximately three levels of score. The top 8 all higher than 7.2. The middle level has score between 6.8 to 6.5. The bottom level's score lower than 6.4.
So, collections in first level are all recommend.

Inflation adjusted Average Revenue
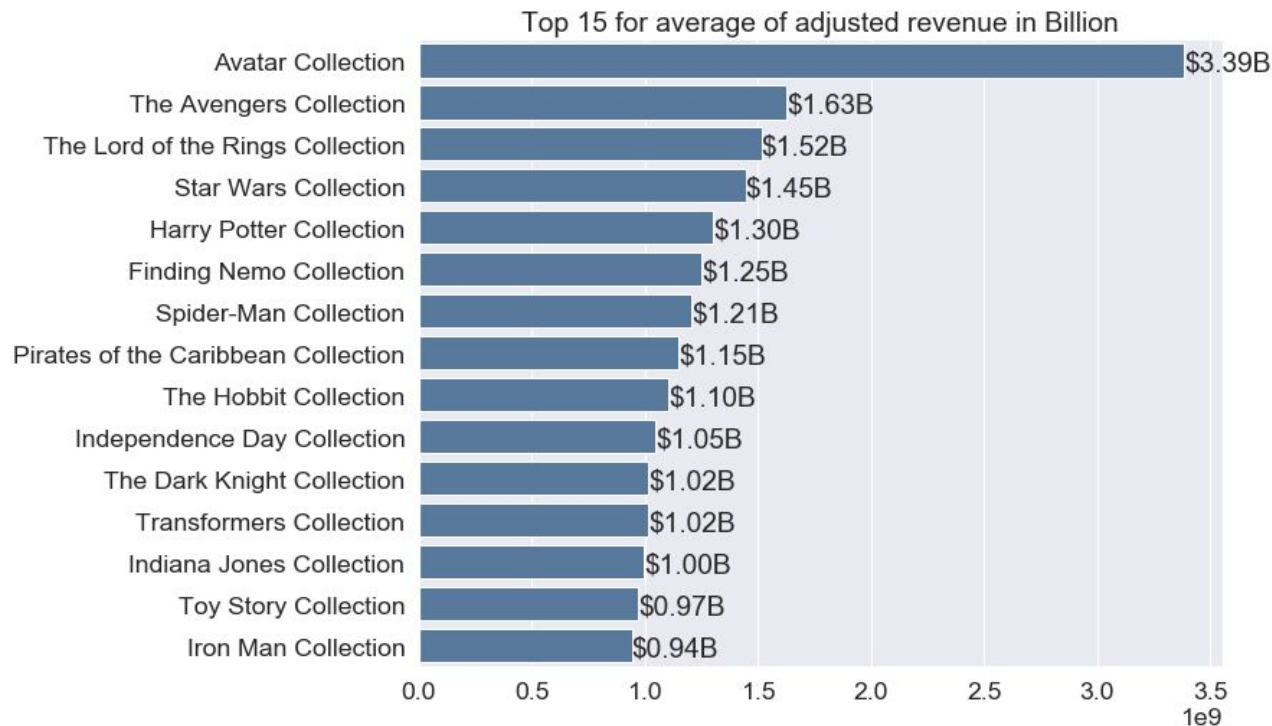

Top 15 for average of adjusted revenue in Billion

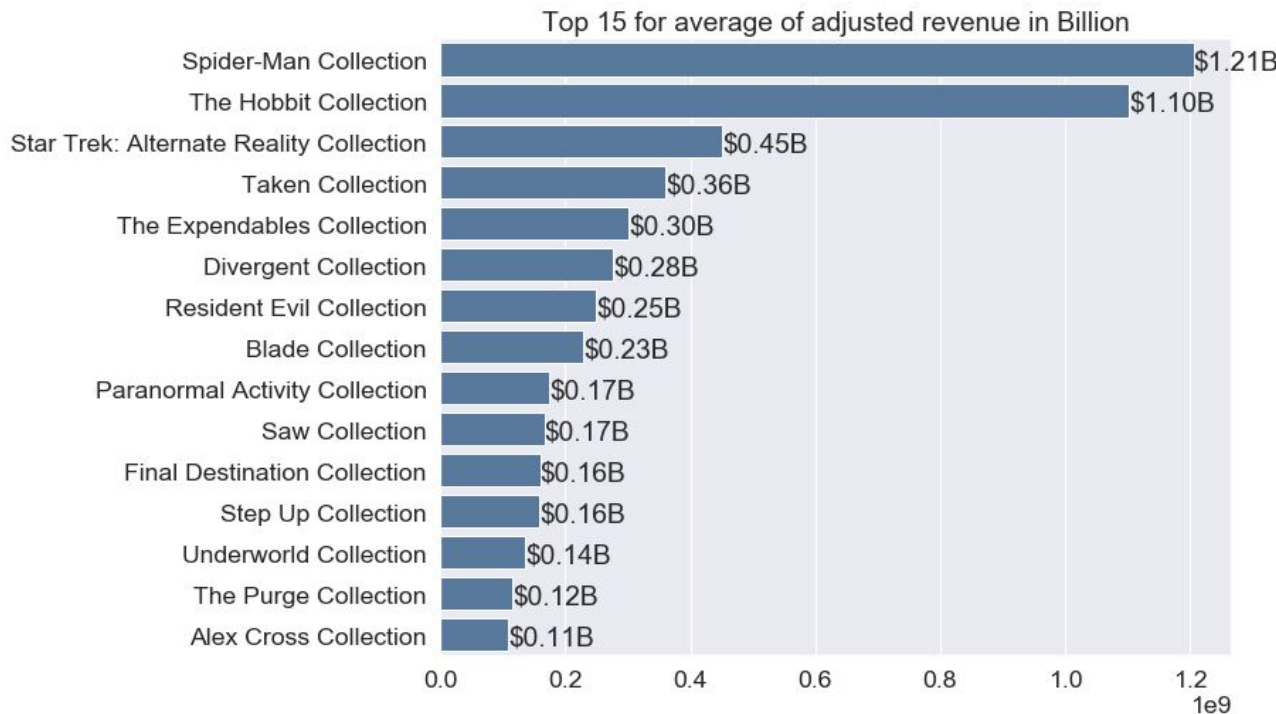| Collection	Value
Avatar Collection	$3.39B
The Avengers Collection	$1.63B
The Lord of the Rings Collection	$1.52B
Star Wars Collection	$1.45B
Harry Potter Collection	$1.30B
Finding Nemo Collection	$1.25B
Spider-Man Collection	$1.21B
Pirates of the Caribbean Collection	$1.15B
The Hobbit Collection	$1.10B
Independence Day Collection	$1.05B
The Dark Knight Collection	$1.02B
Transformers Collection	$1.02B
Indiana Jones Collection	$1.00B
Toy Story Collection	$0.97B
Iron Man Collection	$0.94B

"Avatar" is definitely a phenomenal movie, with extraordinary high market share and revenue after consider the inflation among years.
After **"Avatar"**, "**The Avengers**" and "**Lord of the Rings**" are the most popular franchise recently. The top 5 collections of average revenue are our recommendation.
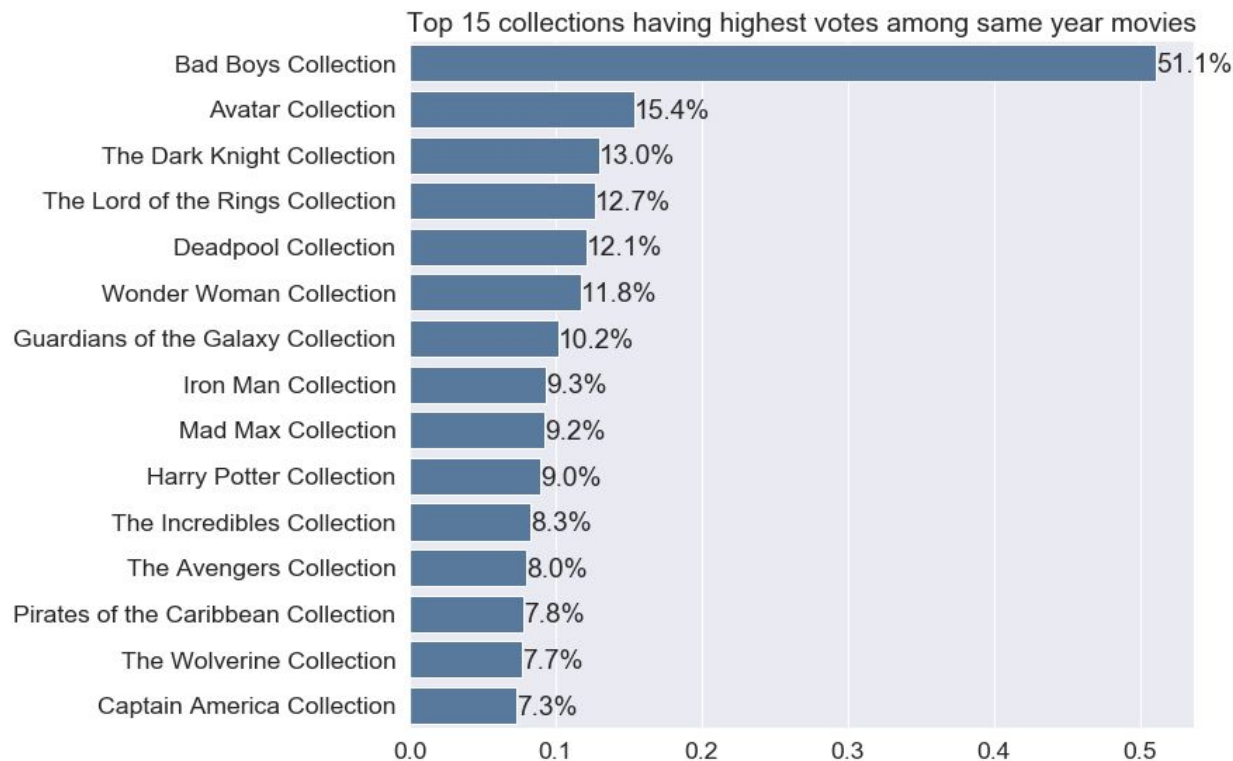
The inflation index is from:https://www.the-numbers.com/market/

Most stable revenue collections

Top 15 for average of adjusted revenue in Billion

Collection	Value
Spider-Man Collection	$1.21B
The Hobbit Collection	$1.10B
Star Trek: Alternate Reality Collection	$0.45B
Taken Collection	$0.36B
The Expendables Collection	$0.30B
Divergent Collection	$0.28B
Resident Evil Collection	$0.25B
Blade Collection	$0.23B
Paranormal Activity Collection	$0.17B
Saw Collection	$0.17B
Final Destination Collection	$0.16B
Step Up Collection	$0.16B
Underworld Collection	$0.14B
The Purge Collection	$0.12B
Alex Cross Collection	$0.11B

In order to minimize the changes in audience tastes over time and thus affect revenue, we first list the collections that include more than two movies with a total revenue of more than 100 million. Then selected 15 series according to the average income from high to low.

The Spider-Man and Hobbit shows a completely advance in stable revenue.

Collections with most votes

Top 15 collections having highest votes among same year movies

Collection	Percentage
Bad Boys Collection	51.1%
Avatar Collection	15.4%
The Dark Knight Collection	13.0%
The Lord of the Rings Collection	12.7%
Deadpool Collection	12.1%
Wonder Woman Collection	11.8%
Guardians of the Galaxy Collection	10.2%
Iron Man Collection	9.3%
Mad Max Collection	9.2%
Harry Potter Collection	9.0%
The Incredibles Collection	8.3%
The Avengers Collection	8.0%
Pirates of the Caribbean Collection	7.8%
The Wolverine Collection	7.7%
Captain America Collection	7.3%

We compare the number of votes for each movie in the collections with the total number of votes for movies produced that year. The higher the number, the more people discuss the movie. You can see two new collections appearing in the TOP 5 collections, they are: "**Bad Boys**" and "**Deadpoll**".