

Theaters and Movies during Covid

Alex Stake

A dark blue diagonal gradient bar that starts from the bottom left and extends towards the top right, covering the lower half of the slide.

Intro



Covid has hit theaters particularly hard

I aim to demonstrate that theaters are recovering as vaccinations increase

Methodology

- The Question: Can we predict total domestic box office gross based on the timing of release and covid vaccinations?
- Linear Regression as the core model

The Data

Box Office Mojo
by IMDbPro

Search for Titles

IMDbPro

Domestic International Worldwide Calendar All Time Showdowns Indices

Daily Weekend Weekly Monthly Quarterly Yearly Seasons Holidays

Daily Box Office For 2021

Year 2021

Data as of Sep 30, 15:19 PDT

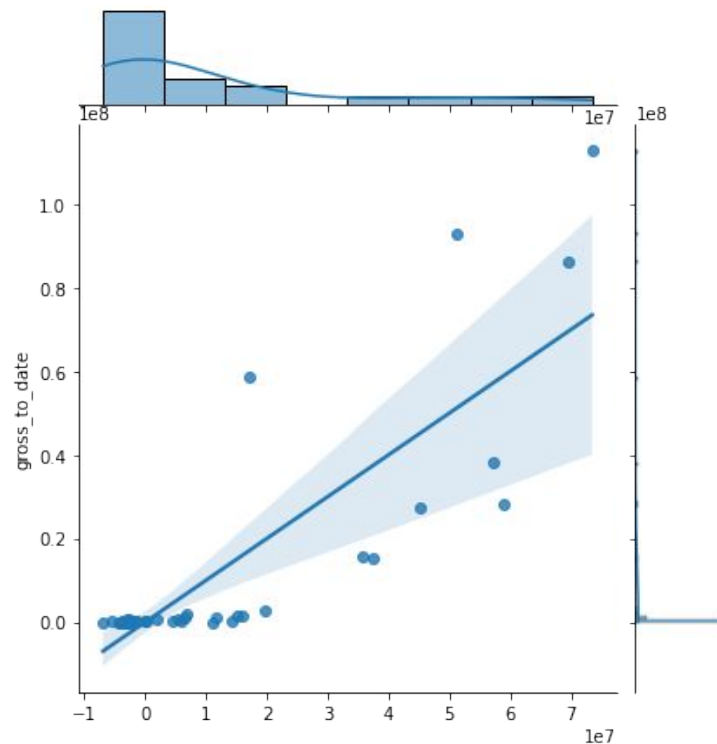
| Date | Day | Day # | Top 10 Gross | % YD | % LW | Releases | #1 Release | Gross |
|--------------|-----------|-------|--------------|---------|--------|----------|---|-------------|
| Sep 29, 2021 | Wednesday | 272 | \$2,405,897 | -21.5% | -14.6% | 24 | Shang-Chi and the Legend of the Ten Rings | \$961,808 |
| Sep 28, 2021 | Tuesday | 271 | \$3,065,418 | +27.7% | -16.2% | 24 | Shang-Chi and the Legend of the Ten Rings | \$1,175,926 |
| Sep 27, 2021 | Monday | 270 | \$2,401,254 | -71.3% | -16.5% | 24 | Shang-Chi and the Legend of the Ten Rings | \$946,189 |
| Sep 26, 2021 | Sunday | 269 | \$8,370,990 | -40.5% | -19.4% | 29 | Shang-Chi and the Legend of the Ten Rings | \$3,530,763 |
| Sep 25, 2021 | Saturday | 268 | \$14,065,861 | +57.1% | -19% | 29 | Shang-Chi and the Legend of the Ten Rings | \$5,933,872 |
| Sep 24, 2021 | Friday | 267 | \$10,263,071 | +295.1% | -4.8% | 29 | Shang-Chi and the Legend of the Ten Rings | \$3,566,776 |
| Sep 23, 2021 | Thursday | 266 | \$2,597,470 | -7.8% | -39.1% | 31 | Shang-Chi and the Legend of the Ten Rings | \$1,341,020 |
| Sep 22, 2021 | Wednesday | 265 | \$2,816,951 | -23% | -30.6% | 31 | Shang-Chi and the Legend of the Ten Rings | \$1,467,643 |
| Sep 21, 2021 | Tuesday | 264 | \$3,656,899 | +27.1% | -26.6% | 31 | Shang-Chi and the Legend of the Ten Rings | \$1,961,601 |
| Sep 20, 2021 | Monday | 263 | \$2,876,849 | -72.3% | -24.4% | 31 | Shang-Chi and the Legend of the Ten Rings | \$1,539,514 |
| Sep 19, 2021 | Sunday | 262 | \$10,380,757 | -40.2% | -29.3% | 32 | Shang-Chi and the Legend of the Ten Rings | \$6,050,069 |
| Sep 18, 2021 | Saturday | 261 | \$17,355,509 | +60.9% | -27.2% | 32 | Shang-Chi and the Legend of the Ten Rings | \$9,754,340 |
| Sep 17, 2021 | Friday | 260 | \$10,784,252 | +152.7% | -27.9% | 32 | Shang-Chi and the Legend of the Ten Rings | \$5,866,342 |
| Sep 16, 2021 | Thursday | 259 | \$4,267,587 | +5.1% | -27.2% | 33 | Shang-Chi and the Legend of the Ten Rings | \$2,581,531 |
| Sep 15, 2021 | Wednesday | 258 | \$4,061,081 | -18.5% | -39.2% | 33 | Shang-Chi and the Legend of the Ten Rings | \$2,466,295 |
| Sep 14, 2021 | Tuesday | 257 | \$4,985,014 | +31% | -45.6% | 32 | Shang-Chi and the Legend of the Ten Rings | \$3,180,985 |

- Scraped from Boxofficemojo.com
- 2 years: 2020 and 2021
 - Each Days' top 30 movies' performance, days in release, gross to date
- CDC Vaccine data from CDC.gov
 - Covers December 2020 to September 2021
 - Number of distributed, administered, and fully vaccinated people by location

Results

- $R^2 = 0.6918843924735739$
- $MAE = 9,606,285.61840231$

Performs well on much smaller scales, but even with LASSO it is still overfitting



Conclusion

- **Something more is going on here**
- No, you cannot predict the Total Domestic Gross from the numbers of releases and covid vaccinations using linear regression

Future work

- Add more data per each movie (budget, runtime, etc.)
- Create a time series using the date of vaccination
- Gather data to the end of 2021 to better predict 2022