DATASCI203 Final Project:

Screamingly Good Returns of Horror Movie Investments

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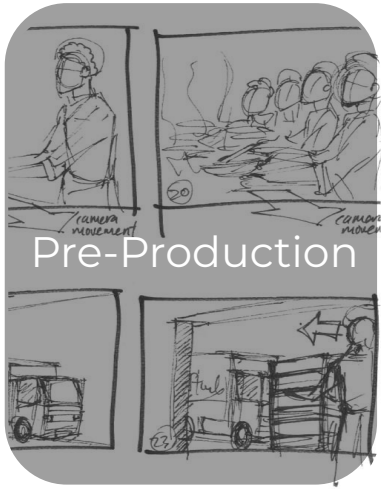

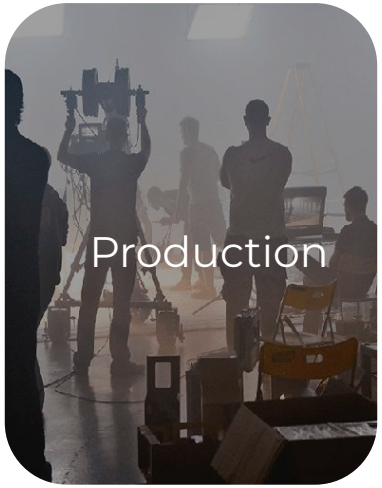

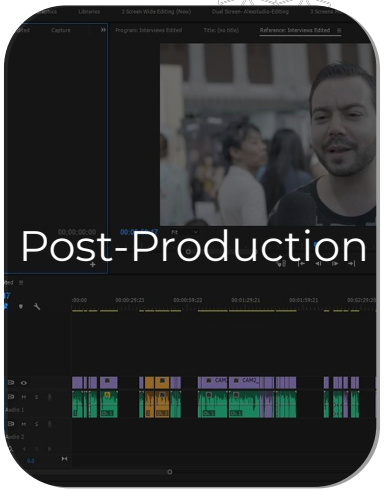

Considering Only Production Budget:

Does producing a horror film over other genres lead to a higher ROI?

Data

Original Dataset: 3401 Records

Variable	Example
release_date	11/18/2005
movie	Harry Potter and the Goblet of Fire
production_budget	150000000
domestic_gross	290013036
worldwide_gross	896911078
distributor	Warner Bros
mpaa_rating	PG-13
genre	Adventure

After Data Wrangling: 2403 Records

- Omitted films released prior to 2000
- Removed records with revenue in null
- Transformed and added 5 variables

Variable	Example
ROI	(worldwide_gross-production_budget)/ production_budget
genre_indicator	0 = Others; 1 = Horror
time_variable	1-20 mapped to year 2000-2019 respectively
seasonality	Winter = Jan-Mar ; Spring = Apr-June Summer = July-Sept ; Fall = Oct-Dec
major_studios	Walt Disney, Warner Bros, Sony Pictures, Universal, and Other

Model

log(ROI+1) = β0+β1 * genre_indicator + β2 * time_variable

log(ROI+1) = β0+β1 * genre_indicator + β2 * time_variable + β3 * seasonality

log(ROI+1) = β0+β1 * genre_indicator + β2 * time_variable + β3 * mpaa_rating

log(ROI+1) = β0+β1 * genre_indicator + β2 * time_variable + β3 * major_studios

Model Interpretation

	Output Variable: Return on Investment				
	log(ROI + 1)				
	(1)	(2)	(3)	(4)	(5)
Genre Indicator	0.71***	0.72***	0.86***	0.75***	0.87***
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
Time Variable	0.01	0.01	0.01*	0.01*	0.01*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Seasonality: Spring		0.01			−0.03
		(0.10)			(0.10)
Seasonality: Summer		0.30***			0.23**
		(0.08)			(0.08)
Seasonality: Winter		0.28**			0.23*
		(0.09)			(0.09)
MPAA Rating: PG			−0.54***		−0.41**
			(0.14)		(0.14)
MPAA Rating: PG-13			−0.69***		−0.57***
			(0.13)		(0.13)
MPAA Rating: R			−1.05***		−0.87***
			(0.14)		(0.15)
Major Studio: Sony Pictures				0.46***	0.43***
				(0.09)	(0.09)
Major Studio: Universal				0.74***	0.68***
				(0.11)	(0.10)
Major Studio: Walt Disney				0.70***	0.46***
				(0.11)	(0.10)
Major Studio: Warner Bros				0.51***	0.47***
				(0.10)	(0.10)
Constant	0.19**	0.04	0.97***	−0.05	0.52***
	(0.07)	(0.09)	(0.12)	(0.09)	(0.15)
Observations	2,436	2,436	2,430	2,436	2,430
R^2	0.02	0.02	0.04	0.05	0.07
Residual Std. Error	1.60 (df = 2433)	1.59 (df = 2430)	1.58 (df = 2424)	1.57 (df = 2429)	1.55 (df = 2417)

Note: *p<0.05; **p<0.01; ***p<0.001
Newey-West Adjusted Standard Errors
in parentheses

Limitations

01 I.I.D. Data

- Clustering among films
- Temporal clustering

02 Budget Data Constraints

- ROI calculations exclude pre-production and post-production
- Produces overestimates compared to the true model

03 Omitted Variable: Famous Actors/Actresses

- Affiliation with famous stars are positively correlated with ROI
- Affiliation with famous stars are negatively correlated with horror
- Omitted variable bias is negative, driving bias towards zero, producing underestimates

04 Omitted Variable: Marketing Budget

- Marketing budget is positively correlated with ROI
- Marketing budget is positively correlated with horror
- Omitted variable bias is positive, driving bias away from zero, producing overestimates

Key Findings

Statistical Significance

- **Horror genre** has a statistically significant positive association with higher ROI.
- **Seasonality** affects ROI, with summer and winter releases showing better returns.
- **MPAA ratings** influence ROI, especially for non-G rated movies.
- **Major studio backing** is advantageous for improved ROI.

Business use

Choosing to invest in horror films can yield higher returns compared to investing in any other movie genres.