Keeping It PG-13:

Assessing the benefits of modifying an R-rated film to earn a PG-13 rating from the MPAA.

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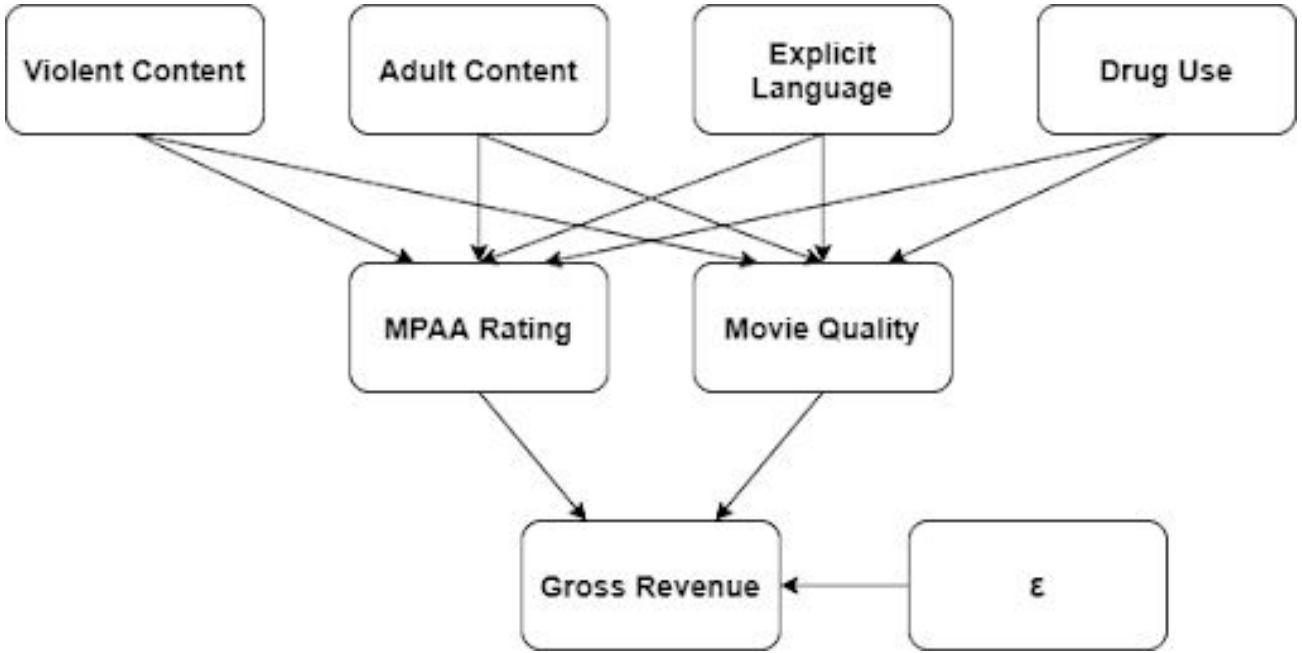
HOW'D YOU GUYS LIKE MY MOV...
THAT WAS EXCESSIVE WADE... EVEN FOR ME!!!
S-S-SO MUCH LANGUAGE...
RESTRICTED
R
SEXUAL CONTENT AND LANGUAGE THROUGHOUT, AND BRIEF GRAPHIC NUDITY
Under 17 Requires Accompanying Parent or Adult Guardian
PARENTS STRONGLY CAUTIONED
PG-13
Some Artistic Nudity And Adult Themes
Some material may be inappropriate for children under 13

Research Question

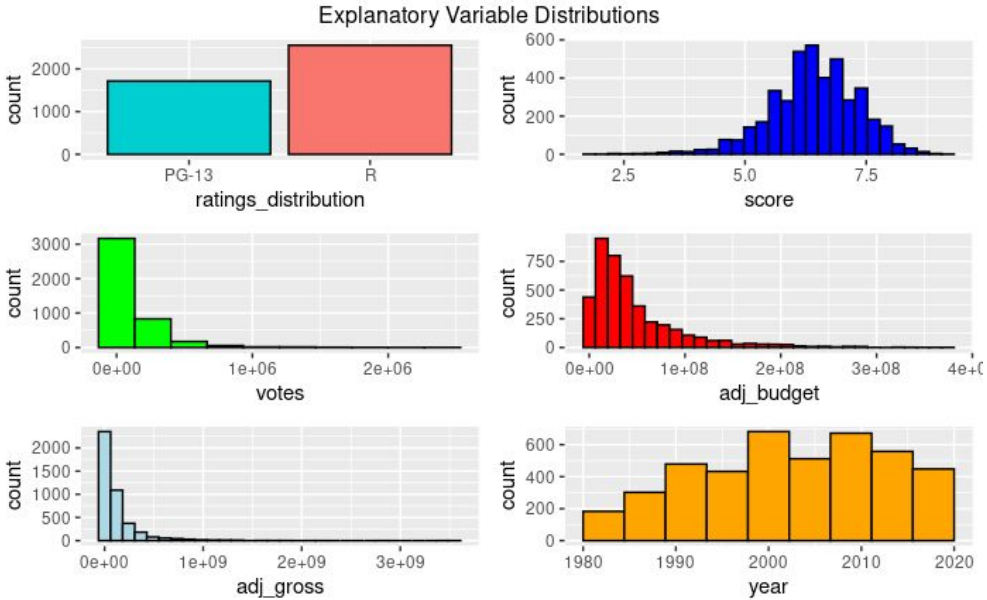
Holding other factors constant, how much more money should a movie studio expect to make on a film that gets a PG-13 rating instead of an R rating from the MPAA?

Causal Theory



Data

7512 unique movies scraped from IMDb.com



Data Point Considerations:

1. Non-zero budget and revenue
2. PG-13 and R rated movies
3. Duplicate titles prioritized by the most budget

kaggle

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Research Design

1. **Gather** and **clean** the data from previous films
2. **Operationalize perceived quality** using the IMDb **Score** and MPAA **rating** as is
3. Create an **indicator variable** for PG-13 (R is the base case)
4. Adjust the **revenue** and **budget** numbers from movies released in previous years to estimate their worth in **2020**
5. Generate models based on our **causal theory, prior knowledge** of the movie industry, and **EDA**
6. Choose the **"best-fitting" model** and use it to **predict** the possible outcomes

Models

(1)
$$ln(Gross) = \beta_0 + \beta_1 * PG13$$

(2)
$$ln(Gross) = \beta_0 + \beta_1 * PG13 + \beta_2 * Score$$

(3)
$$ln(Gross) = \beta_0 + \beta_1 * PG13 + \beta_2 * Score + \beta_3 * PG13 * Score$$

(4)
$$ln(Gross) = \beta_0 + \beta_1 * PG13 + \beta_2 * Score + \beta_3 * ln(Budget)$$

(5)
$$ln(Gross) = \beta_0 + \beta_1 * PG13 + \beta_2 * Score + \beta_3 * PG13 * Score + \beta_4 * ln(Budget) + \beta_5 * PG13 * ln(Budget)$$

Analysis

Table 1:

	Dependent variable: log(adj_gross)				
	(1)	(2)	(3)	(4)	(5)
PG13	1.051***	1.140***	1.199***	0.494***	−2.435***
	(0.054)	(0.052)	(0.361)	(0.045)	(0.719)
IMDb Score		0.436***	0.440***	0.401***	0.419***
		(0.028)	(0.037)	(0.023)	(0.030)
PG13 x Score			−0.009		−0.046
			(0.056)		(0.045)
PG13 x Log(Budget)					0.186***
					(0.039)
Log(Budget)				0.836***	0.778***
				(0.018)	(0.022)
(Intercept)	17.106***	14.271***	14.245***	0.435	1.309**
	(0.034)	(0.183)	(0.241)	(0.333)	(0.411)
Observations	4,269	4,269	4,269	4,269	4,269
R^2	0.083	0.133	0.133	0.425	0.428
Adjusted R^2	0.083	0.133	0.133	0.424	0.427
Note:					*p<0.05; **p<0.01; ***p<0.001

91.24% less revenue PG13 to R with 0 score/budget

41.9% increase in revenue for 1 point

37.3% increase in revenue for PG13 and 1 point

10% increase in budget results in 9.6% increase in revenue for PG13

10% increase in budget results in 7.7% increase in revenue

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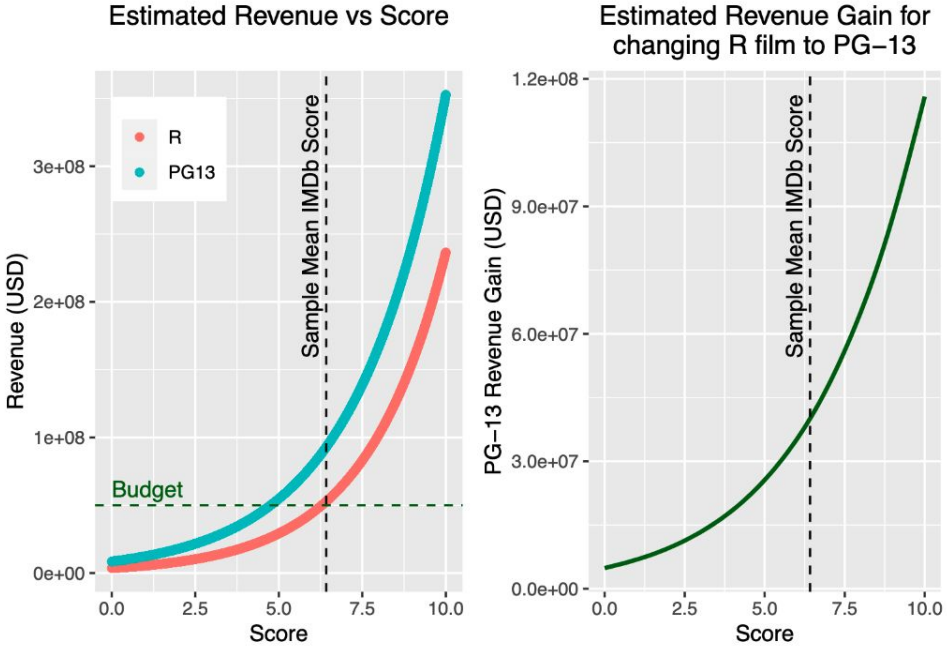
Conclusion



- **PG-13** movie expected to **generate more revenue** than **R**
- Gross revenue (**R**): $52,781,381
- Gross Revenue (**PG-13**): $92,884,941
- **Increase** in revenue**: $40,103,560**

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Thank you!

Collinearity Check