

The Twitch logo is a purple speech bubble with a white 'T' inside. It is positioned in the background, centered behind the text.

Advertising on Twitch.tv

# Background

- Twitch.tv is a video game streaming website
  - Streamer's channels are separated by game and ordered by number of viewers
    - More viewers means the channel is listed higher
- Many companies pay streamers to play their games
  - #sponsored
    - Pay upwards of \$3000 for an hour of gameplay from a specific streamer
  - Bounties board
    - Any partnered (brand safe) streamer can take these
    - Lower pay but more common
- How Twitch viewership translates to increased sales

Stream Call of Duty: WWII [PC] for 1 hour  
Available until 05/16/2018

**\$100**

**Call of Duty: WWII [PC]**  
sponsored by Twitch

Stream for 1 hour straight with an average of **X concurrent viewers**. If you don't hit an average of at least **X concurrents**, you will not receive a payout. If you achieve the minimum but do not reach the goal, you will get a **proportional percentage** of the payout.

- No needless bad-mouthing of the content.
- Put **#sponsored** in your stream title.
- Turn on the **"Store Past Broadcasts"** option in your [Channel Settings](#).
- Complete the bounty by **07/31/2018**.

Game key included with bounty activation. Keys are emailed 72 hours after bounty activation.

**Max Payout: \$100**

[Activate Bounty](#)

Discover Following Browse ... Search

VALORANT  
297K viewers  
Shooter FPS

Just Chatting  
129K viewers  
RL

Call of Duty: Modern Warfare  
88.5K viewers  
FPS Shooter

FORTNITE  
84.5K viewers  
Shooter

LEAGUE OF LEGENDS  
78.6K viewers  
MOBA

Grand Theft Auto V  
60.8K viewers  
Driving/Racing Game Action

Dota 2  
40.8K viewers  
MOBA

HEARTHSTONE  
39.5K viewers

TEAMFIGHT TACTICS  
27K viewers

Final Fantasy VII Remake  
24.2K viewers

World of Warcraft  
21.9K viewers

SHATTERED WEB  
21.8K viewers

SUPER MARIO MAKER 2  
20.9K viewers

Escape From Tarkov  
18.2K viewers

# variables:

- **Name:** string with game name
- **Release date:** string with day first released on Steam
- **Ratingtotal:** sum of all ratings on Steam prior to May 2019
- **Positive\_ratings\_ratio:** percent of positive ratings between 0 and 1
- **Peakviewers:** peak Twitch.tv viewers for a given game
- **Day:** the date that the peak viewership occurred
- **Totalviewers:** average total viewers per day on twitch.tv during a month
- **Charity\_stream:** binary where 1 means peak viewership occurred during AGDQ charity
- **Fps:** binary where 1 means the game is a first person shooter
- **Moba:** binary where 1 means the game is a massive online battle arena
- **Tournament:** binary where 1 means the peak viewership occurred due to an esports tournament
- **Sequel:** binary where 1 means the game is part of a series
- **Price:** price of the game in may 2019

# Study

- Goal: use IV regression to see how total sales (ratingstotal) increases due to higher peak viewership
  - Instrument variable is charity\_stream
  - Instrumented is peakviewers
- Potential covariates are:
  - Price
  - Sequel
  - Totalviewers
  - Positive\_ratings\_ratio
  - Fps
  - Moba

# Observations:

- 418 observations with more than 300 with release dates between 2019 and 2015
  - Remaining observations of games released before twitch.tv became popular
- Steam related values (release date, price, name, fps, moba) collected from online dataset
- Twitch related values (peakviewers, totalviewers, day) collected (by hand) from twitchtracker.com and sullygnome.com
- Tournament and charity stream values collected according to GDQ and esports schedules for known events (twitch rivals, keemstar, etc)

# Selecting Observations

- Original dataset of 20000 was parsed down to 1057 by eliminating games with less than 2500 ratings and less than 70% positive ratings
  - 200 games selected between 2018 and 2019
  - 120 games between 2015 and 2017
  - 80 games before 2015
- Duplicates like “Elder Scrolls v: Skyrim” and “Elder Scrolls v: skyrim Legendary edition” were dropped

# Model: 2SLS

- First regression:
  - $\text{Peakviewers} = B_0 + B_1 \cdot \text{charity\_stream} + B_2 \cdot \text{price} + B_3 \cdot \text{sequel} + B_4 \cdot \text{totalviewers}$
- Second regression:
  - $\text{Ratingstotal} = B_0 + B_1 \cdot \text{peak\_hat} + B_2 \cdot \text{price} + B_3 \cdot \text{sequel} + B_4 \cdot \text{totalviewers}$

# IV regression (2SLS) Over OLS or Diff in Diff:

- Simultaneity
  - High twitch viewership may induce sales but sales may induce high twitch viewership
  - 2SLS is better than OLS for determining coefficients under these conditions
  - Although, finding a good instrument is difficult
- Limited data
  - Almost all games are streamed on twitch these days
    - No natural control group without creating new conflicts (e.g. old vs new games)



# Ratings as Proxy for Sales

- Ratingstotal is used as a proxy for purchases or playerbase
- Since steam only allows rating a purchased game, this creates a minimum quantity sold
- Since not everyone leaves a rating, sales could be higher but total ratings acts as a benchmark
- No reliable data on actual sales for all observations, so the study is limited in applicability
  - I.e. can't determine correct multiplier for converting ratings to sales

# Charity Streams as Instrument Variable:

- Games Done Quick Charity streams tend to have high viewership that doesn't drop between games
- Games selected tend to be older, often before twitch got popular and high viewership is unlikely to incentivize new purchases
- Charity has multiple events each year at regular intervals, eliminating effects due to summer viewership spike or the increase in twitch's popularity
- Games pulled from multiple genres, correcting for twitch's bias towards FPS and MOBA games
- Little financial incentive to viewbot, viewership is more likely to be organic

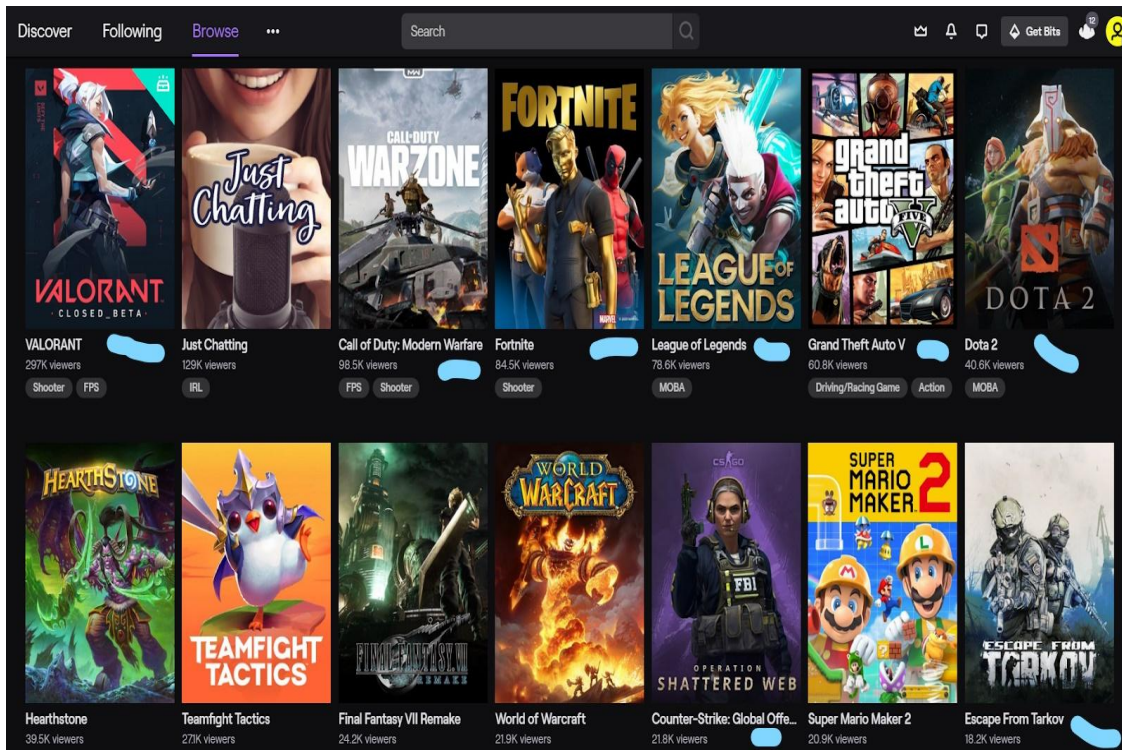
# Excluding Tournament results:

- Tournaments primarily attract viewers that already own the game
- Tend to be of games that have been out for multiple years and have established fanbases
- Companies have strong incentive to viewbot to pad stats for investors, skewing results
- Brings in “non-gamer” viewers unlikely to purchase or play games
  - E.g. not part of twitch’s main demographic



# Excluding fps and moba as regressors:

- Significant potential for multicollinearity between peak viewership and whether the game is an FPS or MOBA
- Most successful games on twitch fall into these two categories
  - 8/14 of top spots, sometimes more



# Summary Statistics for core variables

	(1)	(2)	(3)	(4)
	charity_stream 0		charity_stream 1	
VARIABLES	N	mean	N	mean
positive_ratings_ratio	371	0.866	47	0.922
price	371	14.13	47	10.97
peakviewers	371	45,479	47	142,360
totalviewers	371	931,111	47	942,000
ratingstotal	371	31,647	47	37,227
sequel	371	0.313	47	0.277

# Preliminary Results:

- High statistical significance on peak viewership and price
  - Each additional viewer is associated with 0.157 more Steam ratings
    - E.g. about 6 viewers per additional rating
- Average monthly site traffic (totalviewers) and whether the game was part of a franchise were statistically insignificant
  - Makes sense since average monthly twitch viewers generally shouldn't have an effect on the quantity sold
  - Being in a franchise would only increase sales if compared favorably to the original

VARIABLES	(1) ratingstotal
peakviewers	0.157** (0.0639)
price	-324.2* (189.7)
sequel	6,252 (4,921)
totalviewers	0.00335 (0.00808)
Constant	13,560* (8,005)
Observations	412
R-squared	0.203

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Preliminary Results:

- Low R-squared value could be explained by missing explanatory variables
  - Whether the game was on sale
  - Which streamers played the game
  - How many streamers played it over what period of time
  - Average viewership
  - Whether the streams were #sponsored streams

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