



Esports Earnings Analysis

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Questions we'll be looking to Answer

1. Which genre of video games has the most prevalence in the eSports community?
2. Does player base have a direct connection to earnings?
3. Do certain countries impact revenue more than others?
4. What is the highest earning game?
5. Does number of tournaments directly relate to revenue?

Variables We'll Be Leveraging and Their Impact

The key elements of the dataset we'll be using are as follows:

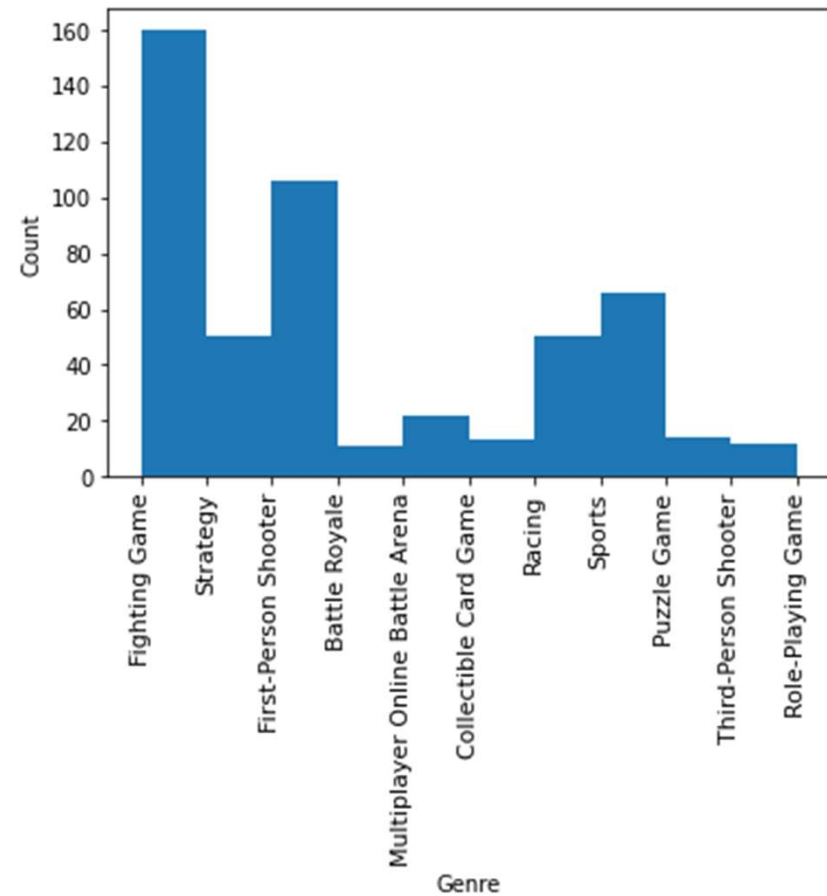
- Video Game Genre -> as Strings, break down gameplay functionality
- Esports Player Base -> Number of players active in eSports
- TotalMoney -> Revenue earned in total from eSports
- Top Country Earnings - For country holding most championship titles, total earnings for the country
- Tournament No - Number of eSports tournaments held for the game

All of these will be related back to earnings in some form to show how each can impact this critical number. Meaning our question can be summed up as which of these variables has the highest impact on overall revenue for eSports.

Video Game Genre

According to the graph on the right, we can see the most common genre to have an eSports association is fighting games, followed by first-person shooters, and then sports games.

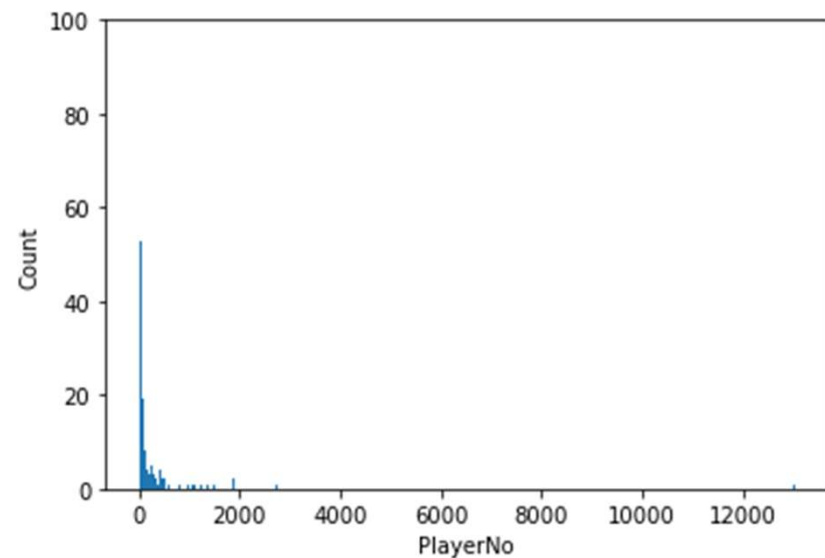
The only real outlier lying in the data might be considered is role-playing games, which do not have any esports organizations as a genre, however this should still be included in the data as it will serve as a control example for total earnings.



Esports Player Base

We can see from our histogram here that there is a wide dispersion in player base between those communities shown.

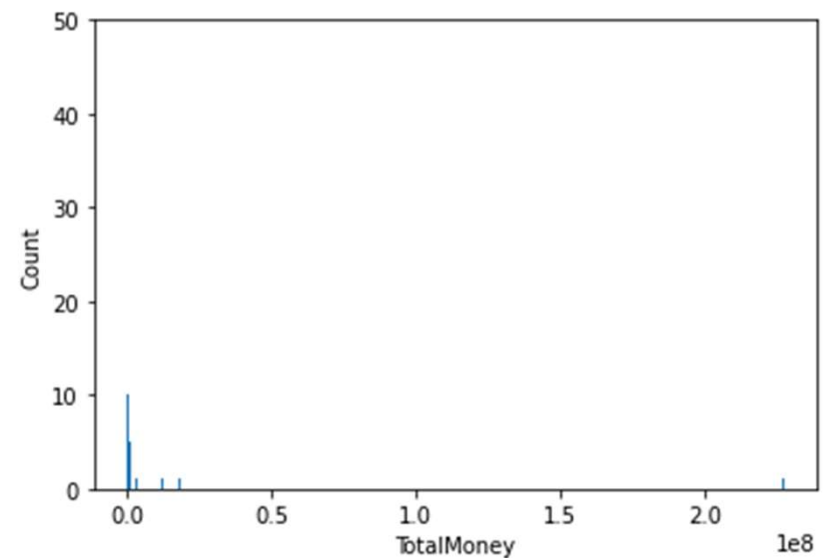
There seems to be a heavy weighting towards games that have zero active esports players. Considerations could be made to eliminate these similar to genre, or use them as a control case which we'll do here.



Total Money Earned

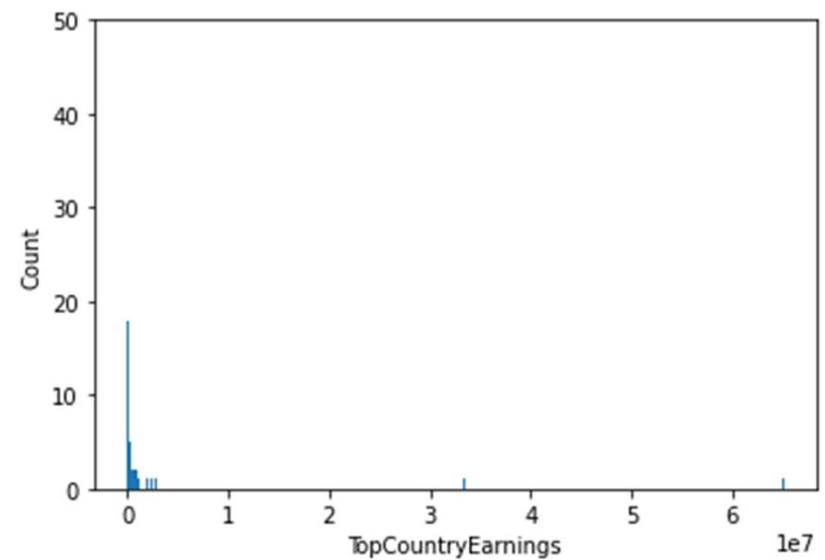
Similar to our player base graph, wide dispersion here in income levels for the games. Notice x axis is in millions.

In the same note as the last two variables, the only potential outliers would again be zero value games. We will continue to include these as control cases



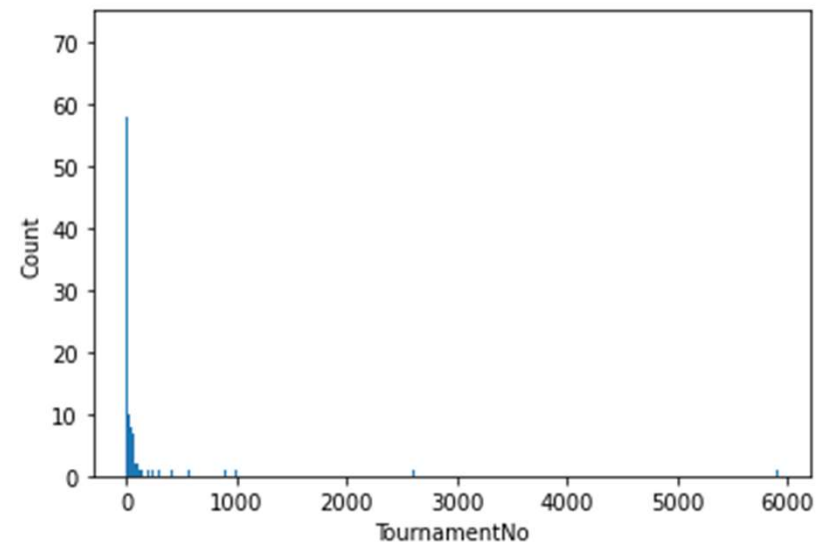
Top Country Earnings

This case is closely related to total overall earnings, similar wide dispersion in earnings, x values in millions, and outliers of zero values.



Tournament Numbers

As seen in previous variables, wide dispersion shown in number of tournaments held for each game, with a heavy concentration under 500, but few oddballs all the way up to 7,000 for Starcraft 2. Interesting to see, and will contain good data to see impact on earnings for those exceptionally high tournament holders.



Statistical Analysis of Quantitative Variables



Esports Player Base

Mean: 187 active eSports players

Mode: 3 active eSports players

Variance: 633,265.46

Standard Deviation: 795.78 eSports players

Smallest Player No. Values: 0:48, 1:8, 2:3, 3: 63, 4:12, 5:16, 6:17, 7:9, 8:14, 9: 4

Largest Player No. Values: 1879: 1, 2078: 1, 2423: 1, 2754: 1, 3494: 1, 3836: 1, 4137: 1, 4347: 1, 7130: 1, 13032: 1

Total Money Earned

Mean: \$1,744,743.24 USD earned

Mode: \$0 USD earned

Variance: 161,073,186,389,221.75

Standard Deviation: \$12,691,461.16 USD earned

Smallest TotalMoney Values: 0:43, 10:1, 16:1, 20: 3, 25:1, 30:1, 32:1, 35:1, 40:1, 50: 5

Largest TotalMoney Values: 15,228,710:1, 18,177,982.65: 1, 23,098,378:1, 2,371,0378: 1,
26,049,333:1, 33,914,063:1, 79,003,449:1, 97,508,425:1, 102,474,261:1, 227,419,904:1

Top Country Earnings

Mean: \$601,082.31 USD earned

Mode: \$0 USD earned

Variance: 14,076,003,256,209.92

Standard Deviation: \$3,751,800.00 USD earned

Smallest TotalCountryEarning Values: 0:60, 9.6:1, 10:1, 18:1, 20:2, 24:1, 25:1, 30:3, 32:1, 35:3

Largest TotalCountryEarning Values: 5,359,312:1, 5,808,630:1, 6,136,956:1, 7,577,721:1,
13,127,719:1, 15,379,018:1, 20,635,189:1, 26,739,426:1, 33,422,756:1, 65,060,611:1

Number of Tournaments

Mean: 80.75 tournaments held

Mode: 1 tournament held

Variance: 170,123.83

Standard Deviation: 412.46 tournaments held

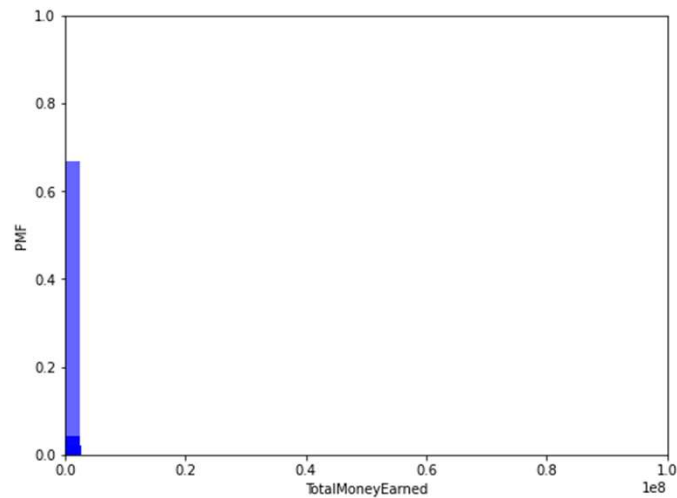
Smallest Tournament No Values: 0:32, 1:104, 2:50, 3:31, 4:27, 5:15, 6:11, 7:13, 8:15, 9:9

Largest Tournament No Values : 995:1, 1022:1, 1087:1, 1197:1, 1335:1 , 1434:1, 2477:1, 2608:1, 5252:1, 5909:1

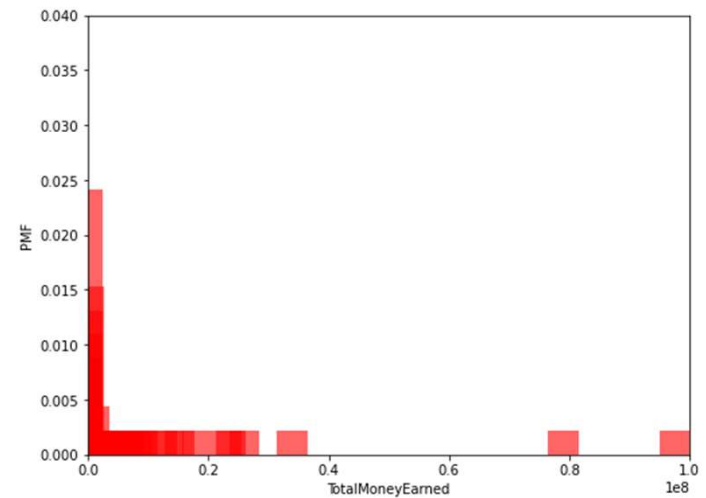
PMF Analysis

While both still heavily favor zero income, we have a much wider dispersion for those games with a real player base, which could be indicative that player base is a factor in revenue earnings.

NO PLAYERS



>0 PLAYERS

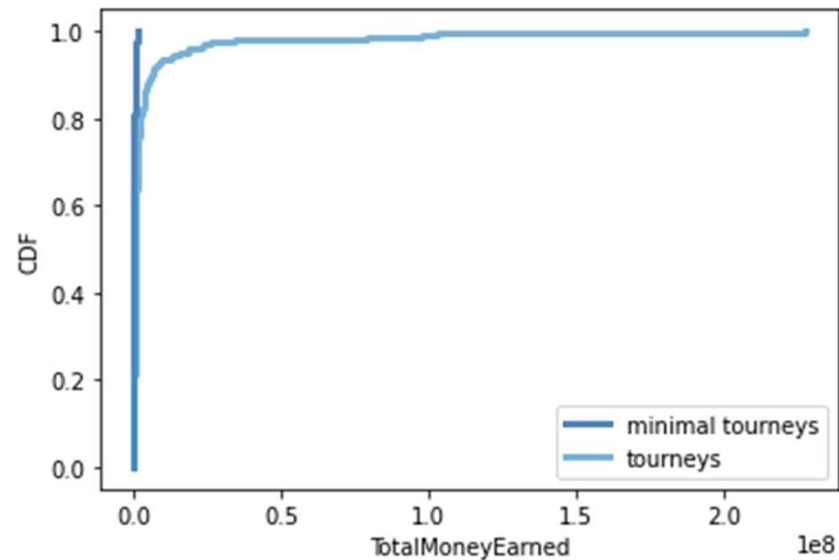




The background image is a blurred screenshot of a financial market data screen. It features a line chart with a blue line and a shaded area, likely representing a stock price and its volatility. Surrounding the chart are various stock indices and their values, including OMXRGI, OMX ICELAND 8, and OMX ICELAND 25 INDEX. The text 'CDF Analysis' is overlaid on the chart in a large, white, serif font, with a horizontal line underneath it.

CDF Analysis

For eSports holding less than 10 tournaments, as we'd expect, they have less overall earnings than that of those over 10 tourneys.

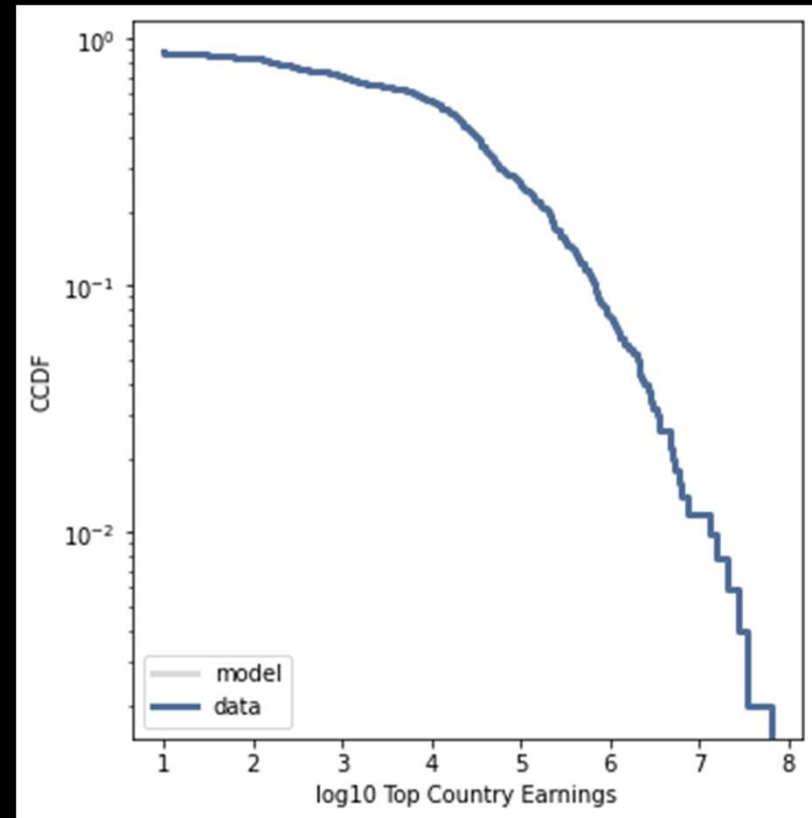


The background is a dark, black space filled with numerous colorful spheres and bokeh. The spheres vary in size and are primarily red, blue, and yellow, with some featuring marbled or multi-colored patterns. They are scattered throughout the frame, creating a sense of depth and movement. A thin white horizontal line is positioned below the text.

Analytical Distributions

Lognormal Distribution for Top Country Earnings

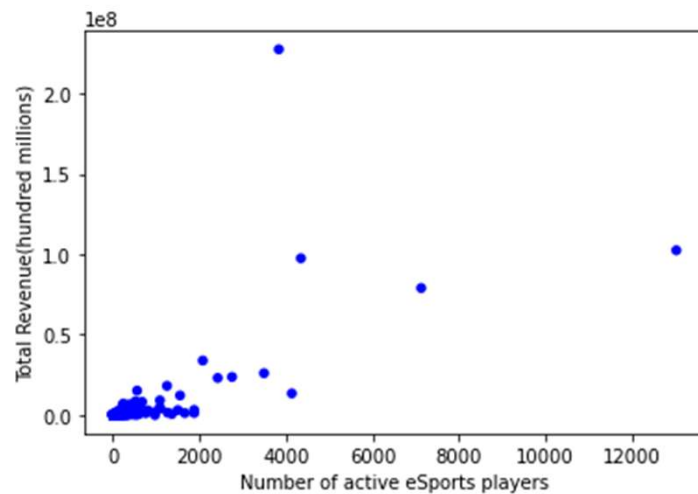
From our visualization on the right we can see that top country earnings follow a lognormal distribution, with those higher valued falling off dramatically in probability in comparison to smaller earnings.



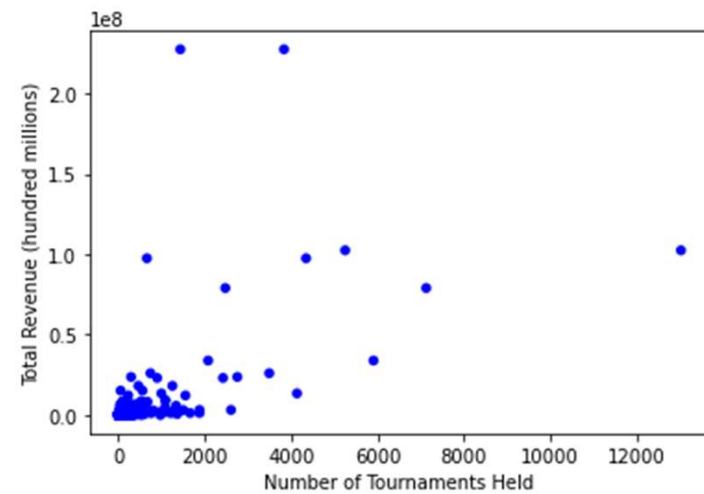
Examination of Correlation and Causation

Comparing Scatters, earnings as a result of players versus tournaments

PLAYERS VS EARNINGS



TOURNAMENTS VS EARNINGS



From these graphs, we can see that while both do seem to have a similar connection (more players/tournaments correlates to more revenue), more outliers seem to exist in the graph of tournaments vs revenue, meaning the correlation here may not be as strong.

Covariance and Correlation Numbers

Covariance for players vs revenue: 6,970,152,232.22

Covariance for tournaments vs revenue: 2,732,776,523.79

Correlation of players vs revenue: 0.69

Correlation of tournaments vs revenue: 0.52

Similar to what we predicted in our last slide, number of eSports players seems to have a better correlation to game revenue than number of tournaments does

Hypothesis Testing

Correlation Tests (analyzing last chapter's info)

Running correlation test on esports players vs revenue:

Pvalue=0.00, reject null hypothesis that player number does not correlate to overall revenue, accept that player numbers do have a correlation to overall revenue

Similarly, we run the test for tournament numbers vs revenue:

Pvalue=0.00 as well, reject null hypothesis that tournament numbers do not correlate to overall revenue, accept that tournament numbers do have a correlation to overall revenue



Regression Analysis

Multiple Regression of Player Num and Tournament Num on Total Revenue

OLS Regression Results						
Dep. Variable:	TotalMoney	R-squared:	0.478			
Model:	OLS	Adj. R-squared:	0.476			
Method:	Least Squares	F-statistic:	229.6			
Date:	Sat, 06 Mar 2021	Prob (F-statistic):	1.70e-71			
Time:	20:17:56	Log-Likelihood:	-8794.4			
No. Observations:	504	AIC:	1.759e+04			
Df Residuals:	501	BIC:	1.761e+04			
Df Model:	2					
Covariance Type:	nonrobust					
	coef	std err	t	P> t	[0.025	0.975]
Intercept	-3.128e+05	4.2e+05	-0.744	0.457	-1.14e+06	5.13e+05
PlayerNo	1.114e+04	794.661	14.016	0.000	9577.001	1.27e+04
TournamentNo	-277.8235	1533.177	-0.181	0.856	-3290.072	2734.425
Omnibus:	1088.065	Durbin-Watson:	1.932			
Prob(Omnibus):	0.000	Jarque-Bera (JB):	2353737.277			
Skew:	16.446	Prob(JB):	0.00			
Kurtosis:	336.168	Cond. No.	909.			

Based on coefficients shown, player number has a much more significant level of prediction for total earning levels than number of tournaments. However, the combination of variables still only accounts for ~48% of the variance in total revenues, so even this model is not perfect by any means.

Conclusion

What we can pull from the data is that while no particular element is a direct indicator of total revenues being pulled, in the best predictor would likely be the number of active eSports players worldwide.