

# PATH OF EXILE

In-Game Trade Economy  
Analysis

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# What is Path of Exile?



*Path of Exile (or POE) is a free-to-play action role-playing video game developed and published by Grinding Gear Games.*

Path of Exile is a dark fantasy action RPG where players take on the role of an exile banished to the ruined continent of Wraeclast.

In Wraeclast, they fight various monsters and people who have been causing chaos and destruction. The setting/story expands greatly from there.

# A Living, Breathing Virtual Economy

Rather than a traditional form of currency, trading conducted within POE is done by trading in-game items for other in-game items. There are over 180 in-game items classified as "Currency", but there are 2 that players agreed upon for use in trades due to their consistent value: Chaos Orbs & Divine Orbs.



Path of Exile is a continuous, on-going game. Within the game, there are specific "Leagues", with each League typically lasting around 4 months. At the end of a League the players' character, equipment, and items are all sent to a permanent realm. Basically, each player has to start over from the ground up at the start of each League.

As players progress through the game, they will find lots of useable gear and items. Each of these can vary in value depending on their scarcity and potency, among many other factors. This, in turn, affects their market value in terms of Chaos Orbs and Divine Orbs.



# Questions We Want Answers To:

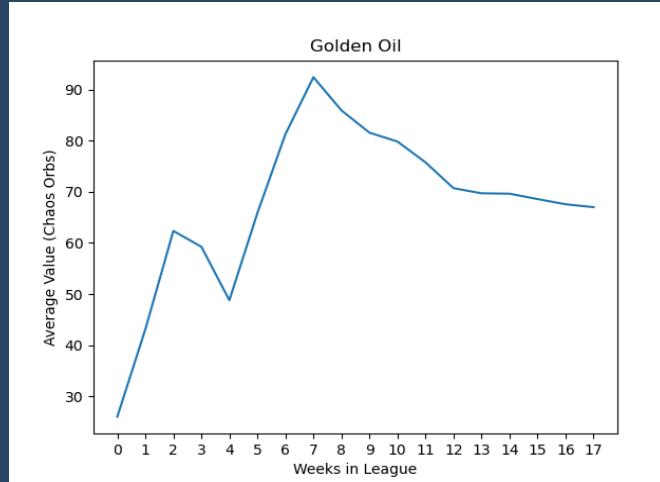
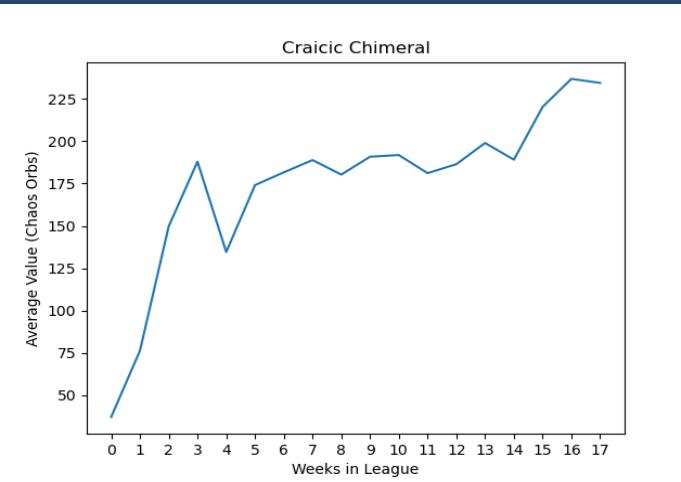
- Are there items (Weapons, armor, special artifacts) that are affordable early on that can be sold for a profit in a short time frame for an early season advantage?
- How do various in-game currencies compare at their minimum and maximum values?
- How do real world currency exchange rates compare to Chaos and Divine Orbs?



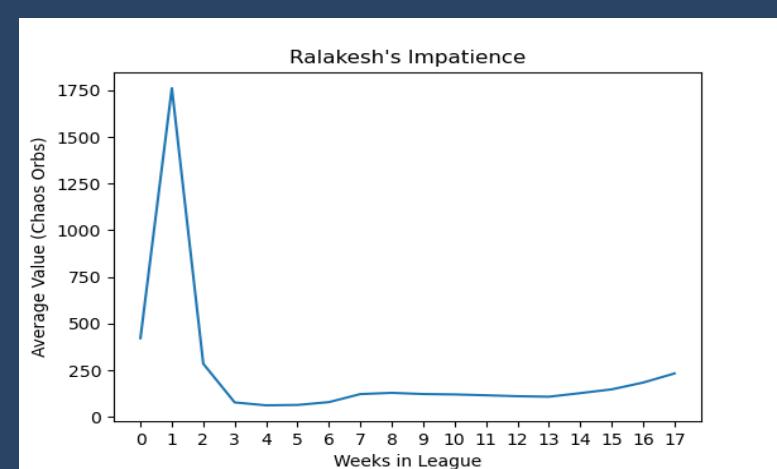
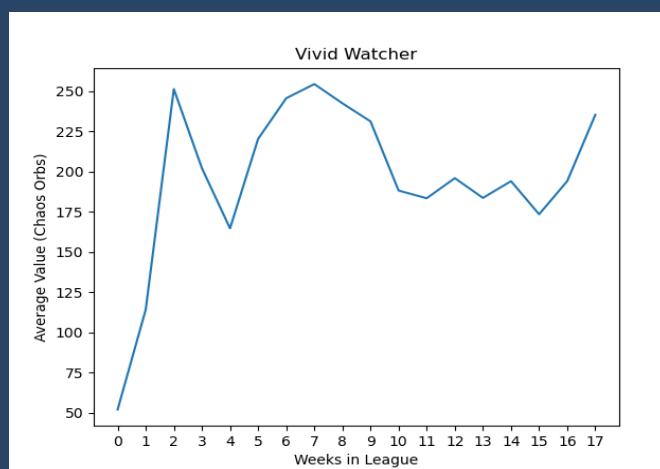
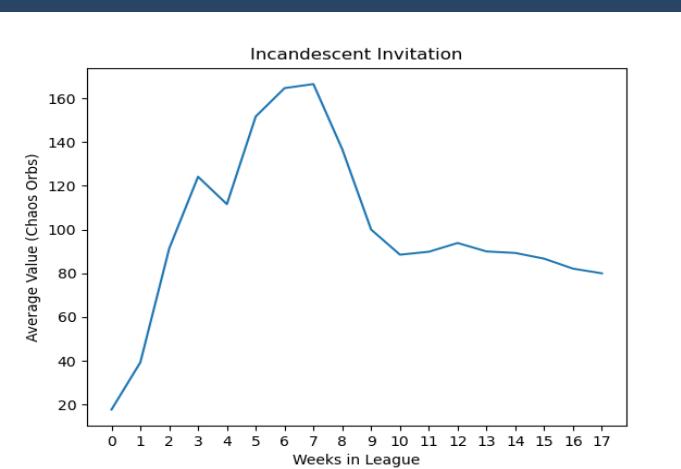


# Buy Low Sell High- PoE Items Analysis

Hypothesis: Are there items (Weapons, armor, special artifacts) that are affordable early on that can be sold for a profit in a short time frame?



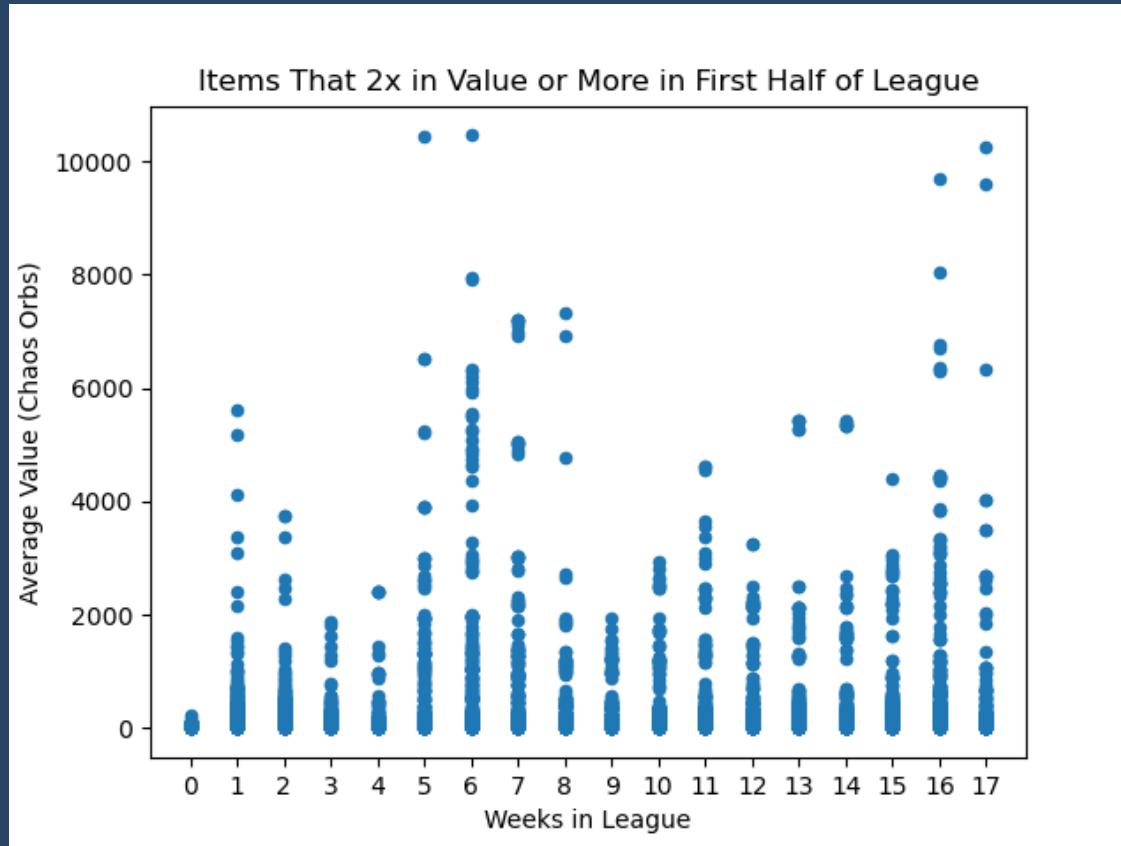
- The five examples on the left initially posited to have early game flip value- all confirmed a 2x or greater increase in value at some point in the first half of the season.
- Using features common to these items, how can we identify other items that might give us an advantage? Criteria included:
  - Under 100 Chaos Orbs in cost in first week
  - At least 2x or greater average value *at least one point* in weeks 2 through 8
  - Similar Item Type to these listed- Weapons, Armour, 'Oil', 'Beast', 'Invitation'. Not all items have relevant resale value.





## PoE Items Analysis (cont.)

Hypothesis: Are there items (Weapons, armor, special artifacts) that are affordable early on that can be sold for a profit in a short time frame?

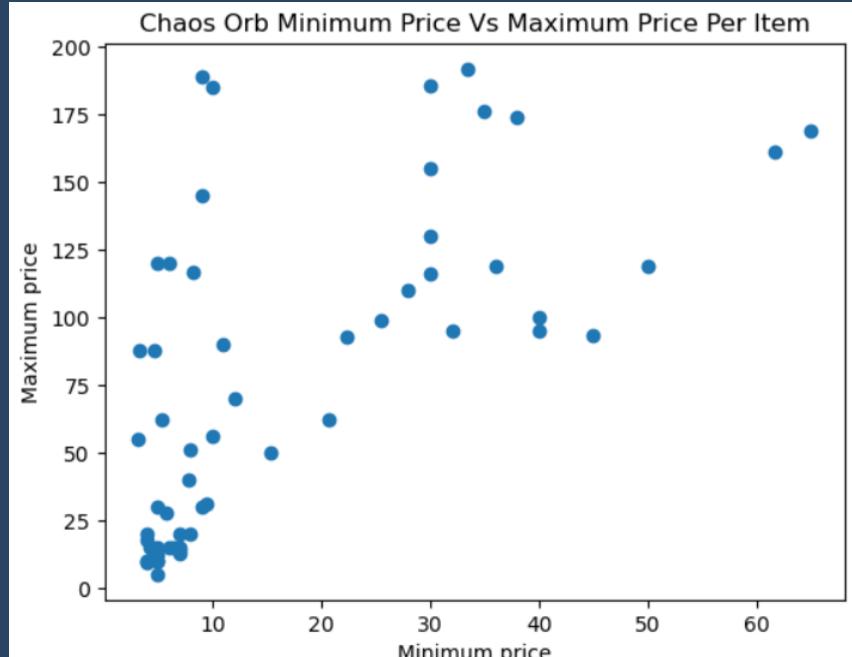


- Using the initial items as a benchmark for resale opportunity, we identified 132 items with a 2x resale value in the first half of the season (see scatter plot).
- Process steps:
  - Download CSV of daily transactions for each item (3.3m rows for 4300+ items).
  - Convert dates to datetime and aggregate by average price per week.
  - Filter to items that sold for 100 chaos orbs or less week 1. Join that to grouped data for weeks 2-8, and calculate the quotient. Filter to items that were 2x or higher from their week one price on at least one week.



# Analysis of Different Currencies at Their Lowest vs Highest Price

How do different types of currencies change from when at there lowest point to there highest point.



Get	Value			
	first	last	min	max
Al-Hezmin's Crest	7.0000	9.00000	7.00000	13.00000
Alva's Memory	5.0000	5.00000	5.00000	5.00000
Awakener's Orb	61.6000	120.00000	61.60000	161.25000
Awakening Fragment	34.0000	3.99960	3.21180	55.00000
Blazing Fragment	90.0000	39.99960	30.00000	115.90000
Blessing of Esh	75.0000	53.00000	28.00000	110.00000
Blessing of Tul	89.2800	40.00000	36.10000	118.80000

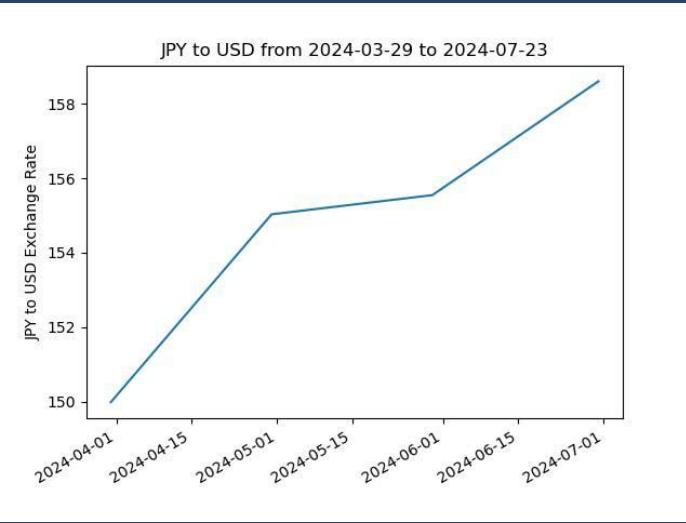
- After grouping all of the items together by name from different dates we got a cleaned dataframe that we used to find the individual values.
- The starting price of that item at the start of the league represented by the "first" column.
- The ending price of the individual item at the end of the league is represented by the "last" column.
- The lowest price of the league is represented by the "min" column.
- The highest price of the league is represented by the "max" column.

Taking the "min" column and our "max" column and plotting it we are able to see the relationship between different currencies.



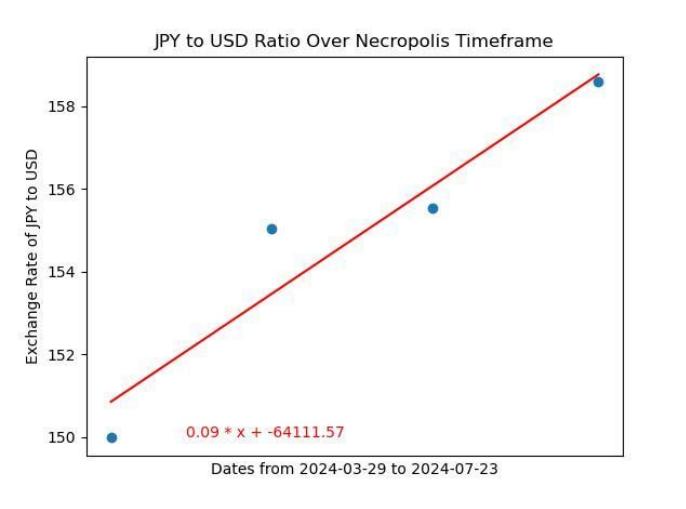
# Japanese Yen to US Dollar

Selected due to most similar average exchange rate



Japanese Yen to US Dollar over the same timeframe as Necropolis League taken from the Alpha Vantage API<sup>1</sup>.

- Only four dates available through Alpha Vantage API for analysis during this timeframe, as their data is archived once a month.
- Data was averaged from opening/closing/min/max of exchange rates for each day.
- Data shows increasing trend in the ratio of JPY to USD.
- Increasing USD value or decreasing JPY value?



## Scatter Plot of the Same Data with Linear Regression

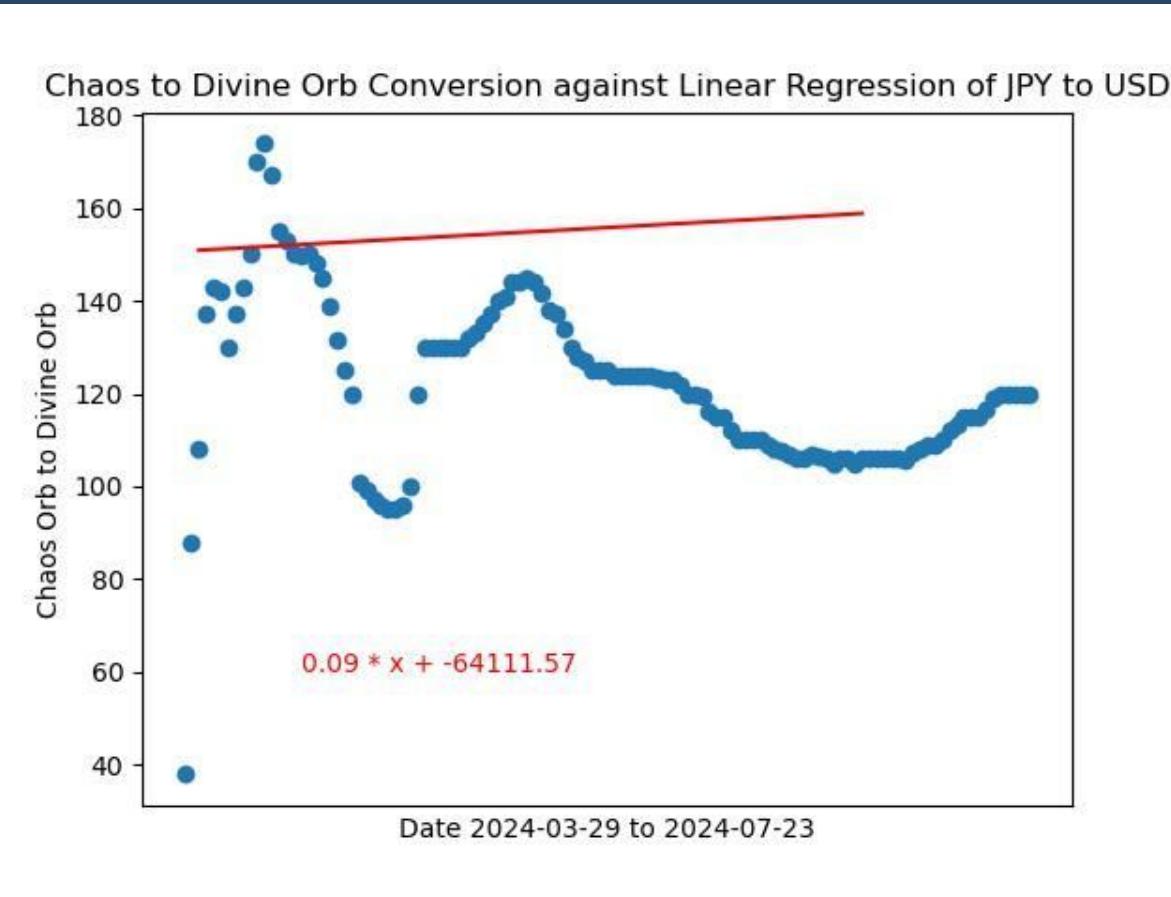
- Linear regression line shows a positive slope of 0.09, reinforcing statement of increasing JPY to USD exchange rates.
- Linear regression equation intercept number is very large due to formatting datetime objects to the ordinal data type. (ex. 2024-03-31 is 738976)

<sup>1</sup>. <https://www.alphavantage.co/documentation/>



# JPY/USD to Chaos/Divine comparison

JPY/USD Linear Regression line plotted over scatter plot of Chaos/Divine exchange Data



The Chaos to Divine exchange rate was the most similar to the JPY to USD exchange rates over other world currencies.

- Chaos/Divine trend only generally followed the JPY/USD trend at the end of the league.
- JPY/USD variance from Necropolis timeframe data was 12.7. Whereas Chaos/Divine variance over the same time period was 351.4, an increase in variance of ~27 times.
- This high of variance isn't seen in world currency data, even over time frames of developing countries experiencing Natural Disasters.<sup>1</sup>

<sup>1</sup> <<https://www.imf.org/en/Publications/WP/Issues/2024/08/30/Currencies-in-Turbulence-Exploring-the-Impact-of-Natural-Disasters-on-Exchange-Rates-553991>>

## | Conclusion

1. Are there items (Weapons, armor, special artifacts) that are affordable early on that can be sold for a profit in a short time frame for an early season advantage?
  - a. Yes, there are 132 items that can be purchased for under 100 Chaos Orbs in week 1 of the season that can be resold at key points weeks 2-8 for at least 2x the value.
2. How do various in-game currencies compare at their minimum and maximum values?
  - a. There is a significant difference between min and max values of currencies.
3. How do real world currency exchange rates compare to Chaos and Divine Orbs?
  - a. There was a significant difference in variance between in-game currencies and real world currencies.

