

Brief Backstory:

I was playing Warframe in May 2024 and had obtained multiple sets of Mesa Prime. I contemplated between selling the sets during that time or waiting it out for the market to give me a better deal.

Then, a question popped up in my mind: “Is a vaulted warframe worth more or is about the same price as an un-vaulted warframe around this time period?” With that question looming over my head, I decided to conduct a price analysis project to see if there was a difference in prices between vaulted and un-vaulted warframes during that time period.

Bringing the Data into “Life”:

Before I started my project, I decided to focus on using SQL and Tableau to analyze and interpret data. As soon as I began my project, I knew that I had to obtain data from a reliable, accurate source and transform that data into a format that would be useful and relevant to my project question.

1. Obtaining the Data

The clear-cut destination to obtain the necessary data is warframe.market since virtually all Warframe players use this website to list items they want to sell and/or buy. Also, its market data consistently updates with respect to changes in supply and demand and stores all sale data for all items. Thus, warframe.market is go-to data source.

Since warframe.market’s data is stored in an API, I had to find a way to obtain the data through an API link. After searching for ways to request data from an API, I discovered that I could use Postman to request data in JSON format, then convert JSON into CSV for usable data in MySQL Workbench.

2. Transforming the Data (Exploratory Data Analysis)

I was aware that the obtained data would have its limitations. In a nutshell, I only possessed market data that was updated on 6/3/2024, the day I obtained the data. For instance, I would not be able to analyze data from 2018 because most of the entries around that time would be gone (because the player sold/removed the item from their list) or an old listing may contain an item’s nominal price in 2024 and not its real price in 2019.

Given this limitation, I selected four warframes (two vaulted, two un-vaulted) with the same release year (2019) and their most recent vault/un-vault period being in 2024. By choosing warframes with the same release year, there is reduced bias from the game’s

“meta” and the potential for recency bias, both which often lead to sudden price changes that do not accurately reflect how much a warframe is actually worth. The vaulted warframes are Atlas Prime and Mesa Prime (both from 2/15 to 6/3), and the un-vaulted warframes are Equinox Prime and Wukong Prime (both from 5/9 to 6/3).

I narrowed down each warframe’s vault/un-vault period using the [Warframe Prime Resurgence Wiki](#)’s data on past and current vaulted/un-vaulted warframes. Before I created a database in MySQL Workbench and imported each warframe’s data table onto it, I deleted unnecessary columns using Excel (e.g., player name, player status, etc.). Finally, I converted the date columns into DATETIME format and used each warframe’s respective DATETIME range to query relevant data.

Analysis and Visualization:

The next step was to conduct data analysis focused on price changes during each warframe’s vault/un-vault period through summary statistics.

1. Data Analysis

To analyze price changes through summary statistics, I extracted each warframe’s price average, median, minimum, and maximum. There is more emphasis on median over average since there may be a few price outliers and very small sample sizes in certain months. On the other hand, I extracted minimum selling prices and maximum buying prices to see how closely buyers and consumers converge to a single price over time.

To conduct a more detailed analysis, I analyzed vaulted warframe prices separately from un-vaulted warframe prices. To elaborate, Atlas Prime and Mesa Prime’s recent vault period is months long while Equinox Prime and Wukong Prime’s recent un-vault period is only a month long. Thus, I analyzed immediate short- and short-run prices for the vaulted warframes and analyzed price changes before and after un-vaulting for the un-vaulted warframes.

a. Vaulted Warframes

- Mesa's immediate short- and short-run statistics stayed about the same
 - Sell prices slightly fell in the short run (possibility: slightly lower demand for Mesa because of new warframes in rotation)
- Atlas' immediate short- and short-run statistics stayed about the same
 - Sell prices moved towards buy prices
 - Buy prices did not change much (possibility: lack of popularity -> low demand/liquidity -> lower sell prices)

b. Un-vaulted Warframes

- Equinox and Wukong's summary statistics during the un-vault period had extremely similar numbers
 - Minimum and maximums were relatively close to each other (possibility: sellers and buyers value these warframes about the same)
- Right before the un-vaulting period, both Equinox and Wukong's prices dropped by over 10 platinum (possibility: demand goes down because buyers are willing to wait for a week to obtain these warframes for free)
- During the vault period, Wukong had a higher median value than Equinox (98 platinum vs 80 platinum)
 - Discovered that Equinox was outclassed by other warframes, hence its lower value relative to Wukong

After extracting these valuable insights, I concluded that line graphs would best represent price changes over the given periods of time and heat maps would best show times where buyers and consumers could have landed great deals.

2. Data Visualization

For the line graphs, one graph shows the median price trends in vaulted and un-vaulted warframes and the others graphs show the changing relationship between the minimum selling and maximum buying prices of a warframe. On the other hand, the heat maps show the median platinum price per week with the most saturated color being the highest value.

In all of these visualizations, I chose the timeframe to be from 1/28-6/3 because it was after the data analysis phase that I realized that Mesa Prime and Atlas Prime had a brief un-vault period before 2/15. With that in mind, this allowed me to compare both vault/un-vault periods for all of the warframes.

To create the median price graph, I simply added the dates (in week) to the columns and median prices to the rows and included reference markers to show when a warframe was vaulted/un-vaulted. This was the same process for the heat maps with the only difference being a different type of visualization applied on the parameters.

To create the max/min comparison graphs, I included two calculated fields. First, I filtered prices based on the order type: IF [Order Type (Equinox)] = 'buy' THEN [Platinum (Equinox)] END. Then, I calculated the min/max depending on which order type I filtered,

in this case it is “buy:” MIN([Filtered Platinum (Equinox Buy)]). I repeated this process for each warframe and its order types.

Findings from the Data:

1. Price Trend Comparison

In both visualizations, warframes during their vault periods had stagnated median selling prices while the median buying prices slowly crept up. For instance, Mesa’s median selling price stayed mostly at 90 platinum while its median buying price gradually went up from around 60 platinum to around 70 platinum.

2. Minimum Selling Price vs. Maximum Buying Price

The most notable change in both visualizations is that the minimum selling prices decrease over time. This price decrease is more pronounced in Equinox and Wukong’s visualization right before un-vaulting, which is also reflected in the queries. However, it is important to note that at the same time, maximum buying prices in vaulted warframes gradually rise while those prices in un-vaulted warframes slowly decrease.

3. Time Heat Maps

In Atlas and Mesa’s visualization, Mesa shows notable median selling price increases around early April and late May while Atlas experiences this from mid-February to mid-March (both around a 10% price drop). In Equinox and Wukong’s visualization, Equinox experiences considerable median selling price drops from mid-March to early April while Wukong has a somewhat dramatic downfall after mid-March (both exceed a 10% price drop, with Equinox reaching up to 20%).

Significance of Insights:

1. Price Trend Comparison

Actionable Insight for Sellers: Sellers should consider timing their sales around the vaulting date to capitalize on the higher demand and increased prices. Listing items a few days before the official vaulting can help maximize profits.

Actionable Insight for Buyers: Buyers might want to avoid purchasing warframes immediately after vaulting due to inflated prices. Instead, they should plan ahead and buy before the vaulting announcement when prices are lower.

2. Minimum Selling Price vs. Maximum Buying Price

Actionable Insight for Sellers: Sellers should set their prices closer to the maximum buying price once a warframe is vaulted to increase the likelihood of a quick sale while still obtaining a reasonable profit.

Actionable Insight for Buyers: Given that the buy/sell prices rarely converge (except Mesa), buyers should place buying orders slightly above the current minimum selling price to secure better deals without having to wait too long.

3. **Time Heat Maps**

The heat maps can help both buyers and sellers identify periods of high price volatility. For example, sudden color changes within consecutive weeks indicate price swings.

Equinox and Wukong: Both warframes showed high volatility during certain periods, marked by significant color changes in their heat maps. For instance, Equinox's price change from March 31 to April 7, 2024, and Wukong's from April 7 to April 14, 2024.

Actionable Insight for Traders: Sellers can exploit price peaks during volatile weeks, while buyers can look for price dips to purchase.

Conclusion:

Vaulted warframes are generally worth more than un-vaulted Warframes during the given time period. The rarity and limited availability of vaulted Warframes drive up their prices, while the increased supply of un-vaulted Warframes tends to lower their prices. This trend is evident in the visualizations, where vaulted warframes consistently show higher median prices and more significant price spikes upon being vaulted.

References:

1. warframe.market
2. [Warframe Prime Resurgence Wiki](https://wiki.warframe.com/en/Prime/Resurgence)