**Gotta Analyze 'Em All: Pokémon TCG Price Projections and Analysis**

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28 November 2023

**1 Introduction**

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**1.1 Link to Dashboard**

The dashboard for this Performance Assessment can be found at:

<https://public.tableau.com/app/profile/mel.milam/viz/D214_PerformanceAssessment_Task2_Dashboard_LoraMilam/GottaAnalyzeEmAll>

**1.2 Research Question**

The identified research question aims to determine the Pokémon card with the highest return on investment through comprehensive data analysis, specifically focusing on cards of Double Rare and above for sets between the most recent, Paradox Rift, and the Legendary Collection. For sets prior to the Legendary Collection, the analysis includes Pokémon cards of Rare and above. It is noteworthy that digital Pokémon sets and promotional sets are excluded from this analysis. The justification for this research question stems from the complexity of the Pokémon Trading Card Game (TCG) market, which is influenced by numerous factors. The context involves a collectible card game where the market dynamics are intricate, and informed investment decisions can significantly benefit from data-driven insights.

**1.3 Justification**

The Pokémon TCG market is multifaceted and subject to various influences, making it challenging for investors to pinpoint cards with the highest return on investment. The justification lies in the need for a systematic approach to navigate this complexity. Additionally, this analysis’s refined focus lies in the recognition that not all Pokémon cards contribute equally to the market dynamics. By narrowing the scope to Double Rare and above for recent sets and Rare and above for older sets, the analysis targets cards that typically hold greater value. This strategic inclusion aligns with the goal of identifying high-return cards within a specific tier of rarity, streamlining the research for more actionable insights. Data analysis was chosen as the methodology because it offers a comprehensive understanding of historical card prices and fluctuations, enabling the identification of cards with consistent value growth.

**1.4 Context**

In the context of Pokémon TCG, the market is influenced by factors such as card rarity, type, set, condition, and more. Understanding historical price trends and identifying patterns in card attributes can provide valuable insights for investors. The market is dynamic, and data analysis becomes essential to unravel hidden patterns, guide portfolio diversification, and inform buying and selling decisions. This tailored approach acknowledges the evolving nature of the Pokémon TCG market, considering recent sets separately and adjusting the scope based on rarity tiers. The exclusion of digital Pokémon sets and promotional sets further refines the context, focusing on tangible cards within the specified criteria.

**1.5 Hypothesis**

The hypothesis is that through meticulous data analysis of Pokémon cards of Double Rare and above for recent sets and Rare and above for older sets, it is possible to identify Pokémon cards that demonstrate consistent value appreciation over time. The hypothesis further suggests that by understanding patterns related to card attributes and market performance, investors can build diversified portfolios, reduce risk, and strategically time their buying and selling decisions. In essence, the hypothesis posits that a data-driven approach can empower investors to navigate the challenges of the Pokémon TCG market and uncover cards with the potential for the highest returns on investment within the specified rarity parameters.

**2 Data Collection**

**2.1 Relevant Data Collected**

The data collection process aimed to compile information on Pokémon TCG pull rates, hits, single product prices, and sealed product prices from various sources. The data was sourced from platforms such as Bulbagarden, Collectorcache, PriceCharting, YouTube, Reddit, TrollandToad, Eliteforum, Pokemon.com, Google Drive, Facebook, Digitaltq, Dropbox, Codedyellow, Infinite TCGPlayer, Flipsidegaming, and Instagram. The focus was on English sets, with an emphasis on pull rates for specific Pokémon TCG cards.

For pull rates, manual surveys were conducted when pre-prepared data for certain English sets was not readily available. Additionally, the plan included connecting to market price platforms like TCGPlayer or PriceCharting to streamline data integration for single and sealed product prices.

For a more thorough analysis of market dynamics, market prices for Pokémon booster packs and boxes were utilized. Unfortunately, the coding platform, Anaconda, encountered issues accessing this data. Additional manual data collection was required to acquire this information.

In cases where certain Pokémon sets did not officially have booster boxes, the analysis adapted by using market prices for 36-pack bundles, aligning with the standard number of packs found in a traditional booster box. This approach ensured a consistent methodology for assessing and comparing prices across different sets, irrespective of the packaging convention.

For sets that lacked both official booster boxes and 36-pack bundles, a pragmatic solution was employed. The booster pack price for such sets was multiplied by 36 to approximate the cost of a standard booster box. This method provided a practical means to incorporate these sets into the overall analysis, maintaining a standardized unit for price comparison.

**2.2 Advantage of the Data-Gathering Methodology**

The advantage of this approach lies in the diversity of data sources. By collecting information from a wide array of platforms, a comprehensive and nuanced dataset was created. This ensures a more accurate representation of pull rates, hits, and pricing information, capturing a broader range of market dynamics.

**2.3 Disadvantage of the Data-Gathering Methodology**

One disadvantage was the initial reliance on automated data retrieval from market price platforms. The coding platform, Anaconda, encountered issues accessing this data. This led to the need for additional manual data collection, which can be time-consuming and potentially introduces human error.

**2.4 Overcoming Challenges**

To address the challenges faced during data collection, a manual survey was conducted for pull rates where pre-prepared data was unavailable. For the issues with automated data retrieval from market price platforms, the fallback was a manual collection process. This involved extracting data directly from various online sources and manually calculating the pull rates, ensuring that the data remained accurate, overcoming the challenges posed by the limitations of the initial automated data retrieval plan.

While the data collection process faced challenges, the use of diverse sources and adaptability in the methodology allowed for a robust dataset to be compiled, providing valuable insights into Pokémon TCG pull rates and pricing dynamics.

**3 Data Extraction and Preparation**

**3.1 Preparation and Extraction Step**

The following steps were used to extract and prepare the data:

Step 1: Data Collection from Various Sources

* Data was gathered from diverse platforms such as Bulbagarden, Collectorcache, PriceCharting, YouTube, Reddit, TrollandToad, Eliteforum, Pokemon.com, Google Drive, Facebook, Digitaltq, Dropbox, Codedyellow, Infinite TCGPlayer, Flipsidegaming, and Instagram.

Step 2: Manual Surveys for Pull Rates

* When pre-prepared pull rate data for certain English sets was unavailable, manual surveys were conducted to collect pull rate statistics.

Step 3: Connection to Market Price Platforms (TCGPlayer, PriceCharting)

* Attempted to connect to market price platforms (TCGPlayer, PriceCharting) for streamlined data integration of single and sealed product prices.

A close-up of a computer screen

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Step 4: Utilization of Market Prices for Booster Packs and Boxes

* Market prices for Pokémon booster packs and boxes were utilized to enhance the analysis of market dynamics.

Step 5: Adaptation for Sets without Official Booster Boxes

* For Pokémon sets without official booster boxes, market prices for 36-pack bundles were used to align with the standard number of packs in a traditional booster box.

Step 6: Pragmatic Solution for Sets Lacking Booster Boxes and Bundles

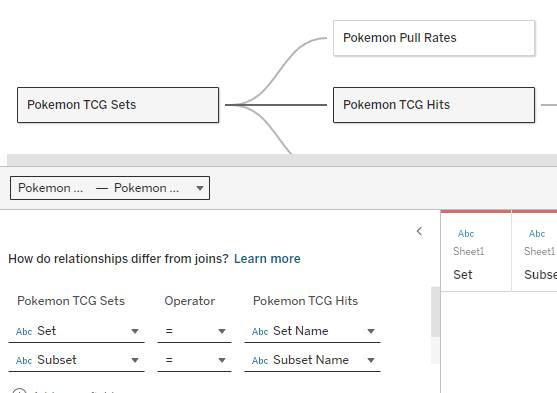
* In cases where sets lacked both official booster boxes and 36-pack bundles, the booster pack price was multiplied by 36 to approximate the cost of a standard booster box.

Step 7: Data Preparation in Tableau

* Data extracted from various sources was loaded into Tableau for preparation and analysis.
* Tableau's relationship capability was utilized to establish connections between tables, allowing for cross-table calculations and enabling a holistic view of the data.

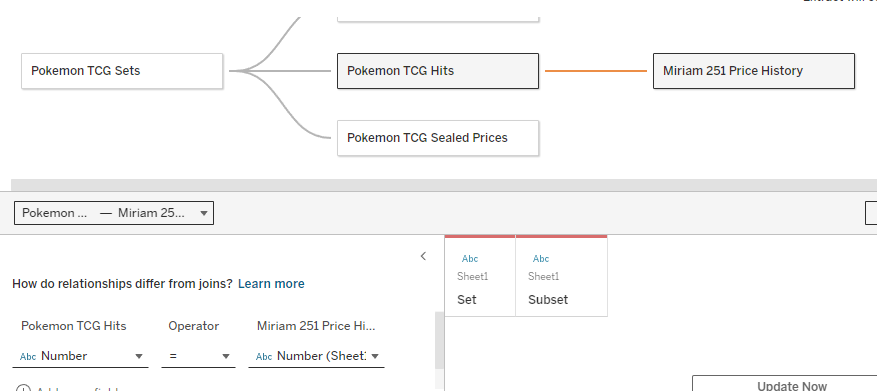
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**3.2 Tools and Techniques**

**3.2.1 Data Preparation**

Tableau for Data Preparation:

Advantage: Tableau's relationship capability simplifies the integration of disparate datasets. It enables efficient cross-table calculations, making it easier to perform comprehensive analyses and derive insights from interconnected data.

Disadvantage: One potential disadvantage is that Tableau might not be as attuned to more in-depth data preparation needs. While it excels in visualization and basic data manipulations, users may find more complex data transformations and cleansing tasks better addressed with specialized tools.

Manual Surveys and Adaptation:

Advantage: Manual surveys allowed for the collection of specific data when pre-prepared data was not available, ensuring a more comprehensive dataset. Adaptation in pricing methods provided a practical solution for sets without standard booster boxes.

Disadvantage: Manual surveys can be time-consuming and may introduce the possibility of human error. Adaptation methods may not precisely reflect market dynamics, but they offer a pragmatic approach when facing data limitations.

**3.2.2 Justification**

Tableau was chosen primarily for its visualization capabilities, but it may have limitations in handling more intricate data preparation tasks. This is balanced by its strength in simplifying relationships between datasets, making it valuable for the specific analysis and insights sought in this project. The disadvantage acknowledges that for deeper data preparation needs, alternative tools might be more suitable. The overall choice was made considering the specific requirements and strengths of Tableau in the context of the project goals.

**4 Analysis**

**4.1 Analysis Techniques**

1. Top 10 Cheapest Market Priced Booster Packs and Boxes:

* Identified and analyzed the market prices of the top 10 cheapest booster packs and boxes.

2. Highest Pull Rates Based on Card Type and Card Type Subset:

* Determined and analyzed the highest pull rates for Pokémon cards based on their card type and card type subset.

3. Top 10 Highest Market Priced Pokémon Cards:

* Identified and analyzed the market prices of the top 10 highest-priced Pokémon cards.

4. Lowest Individual Pull Rate Cost Calculation:

* Developed an equation to calculate the lowest individual pull rate cost for a specific Pokémon card.
* Utilized the equation: ((number of booster boxes needed) \* (booster box price)) + ((additional booster packs needed to equal the pull rate packs needed) \* (booster pack price)).

5. Gross Cost Margin Comparison

* Utilized the pull rate cost calculation and Pokémon card market prices to determine the gross cost margin of individual Pokémon cards.

6. Tableau’s Forecast Capability on Market Price History:

* Applied Tableau’s forecast capability to predict the market price trend of Scarlet and Violet Base Set Card Number 251, Miriam, based on historical data.
  1. **Outputs and Determinations**

1. Top 10 Cheapest Market Priced Booster Packs and Boxes:

* Provided insights into cost-effective options for booster pack and box purchases.

1. Highest Pull Rates Based on Card Type and Card Type Subset:

* Identified statistically significant card types and subsets with the highest pull rates.

1. Top 10 Highest Market Priced Pokémon Cards:

* Revealed the most valuable Pokémon cards based on market prices.

1. Lowest Individual Pull Rate Cost Calculation:

* Revealed the lowest cost associated with organically pulling a specific Pokémon card from a booster pack.

1. Gross Cost Margin Comparison

* Demonstrated that statistically, no individual Pokémon card is worth the cost of organically pulling it from a booster pack. The calculated cost exceeded potential profit margins.

1. Tableau’s Forecast on Market Price History:

* Offered a predicted trend for the market price of Scarlet and Violet Base Set Card Number 251, Miriam, aiding in future investment decisions.
  1. **Advantage and Disadvantage**

Advantage: The combination of analyzing market prices, pull rates, and forecast capabilities in Tableau provided a holistic understanding of the Pokémon TCG market. This allowed for informed decisions on cost-effective purchasing, identification of valuable card types, and predictions for potential investments.

Disadvantage: One potential disadvantage lies in the complexity of calculating the lowest individual pull rate cost, as it involves multiple variables and assumptions. The accuracy of the conclusion is contingent on the reliability of market prices and pull rate data. Additionally, forecasting in Tableau is subject to the assumption that historical trends will continue, which may not always hold true in a dynamic market.

1. **Data Summary and Implications**

**5.1 Research Question**

The research aimed to determine the Pokémon card with the highest return on investment, focusing on Double Rare and above for recent sets and Rare and above for older sets. The exclusion of digital Pokémon sets and promotional sets refined the scope. The hypothesis posited that data analysis could empower investors to navigate the complex Pokémon TCG market and uncover cards with the highest returns.

* 1. **Limitation**

One limitation lies in the complexity of calculating the lowest individual pull rate cost, relying on multiple variables and assumptions. The accuracy is contingent on the reliability of market prices and pull rate data. Additionally, forecasting in Tableau assumes historical trends will continue, which may not hold true in a dynamic market.

* 1. **Recommendation for Action**

Based on the results, it is recommended that investors reconsider the strategy of organically pulling specific Pokémon cards from booster packs due to the calculated costs outweighing potential profit margins. Instead, a more cost-effective approach may involve strategic purchasing of specific cards from the market.

* 1. **Proposed Directions for Future Study**

1. Enhance Forecasting Algorithm:

* Gather additional data to create a more robust forecasting algorithm, possibly incorporating trends from older Pokémon TCG sets to determine potential trends for newer sets. This would provide a more refined and accurate basis for predicting future market prices.

1. Streamline Data Collection Process:

* Continue efforts to streamline the data collection process, aiming for live pricing data from market price platforms. Automation could enhance efficiency, reduce manual efforts, and ensure real-time insights for investors.

These proposed directions aim to further strengthen the predictive capabilities of the analysis and improve the overall effectiveness of investment decisions in the dynamic Pokémon TCG market.

**6 Supporting Documentation**

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