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December 2024

A1 Data Extraction & Visualization

Part 1

View

View name: mateus_p_gomes_view (“invest” database)

```
CREATE VIEW mateus_p_gomes_view AS
SELECT
holdings_current.ticker,
holdings_current.date AS 'holdings_date',
holdings_current.variable AS 'holdings_variable',
holdings_current.value AS 'holdings_value',
holdings_current.price_type AS 'holdings_price_type',
holdings_current.quantity AS 'holdings_quantity',
(holdings_current.value * holdings_current.quantity) AS 'AUM',
security_masterlist.security_name,
security_masterlist.sp500_weight,
security_masterlist.sec_type,
security_masterlist.major_asset_class,
security_masterlist.minor_asset_class,
pricing_daily_new.date AS 'pricing_daily_date',
pricing_daily_new.variable AS 'pricing_daily_variable',
pricing_daily_new.value AS 'pricing_daily_value',
pricing_daily_new.price_type AS 'pricing_daily_price_type',
account_dim.account_id,
account_dim.acct_open_date,
account_dim.acct_open_status,
customer_details.customer_id,
customer_details.full_name,
customer_details.email,
customer_details.customer_location,
LAG(pricing_daily_new.value, 1) OVER (PARTITION BY pricing_daily_new.ticker ORDER BY pricing_daily_new.date) AS 'previous_value'
FROM invest.pricing_daily_new
INNER JOIN invest.security_masterlist USING (ticker)
INNER JOIN invest.holdings_current USING (ticker)
INNER JOIN invest.account_dim USING (account_id)
INNER JOIN invest.customer_details ON
account_dim.client_id = customer_details.customer_id
WHERE   pricing_daily_new.price_type = 'Adjusted' AND pricing_daily_new.date > '2020-08-09' AND customer_details.customer_id = '148'
```

Figure 1

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Question 1

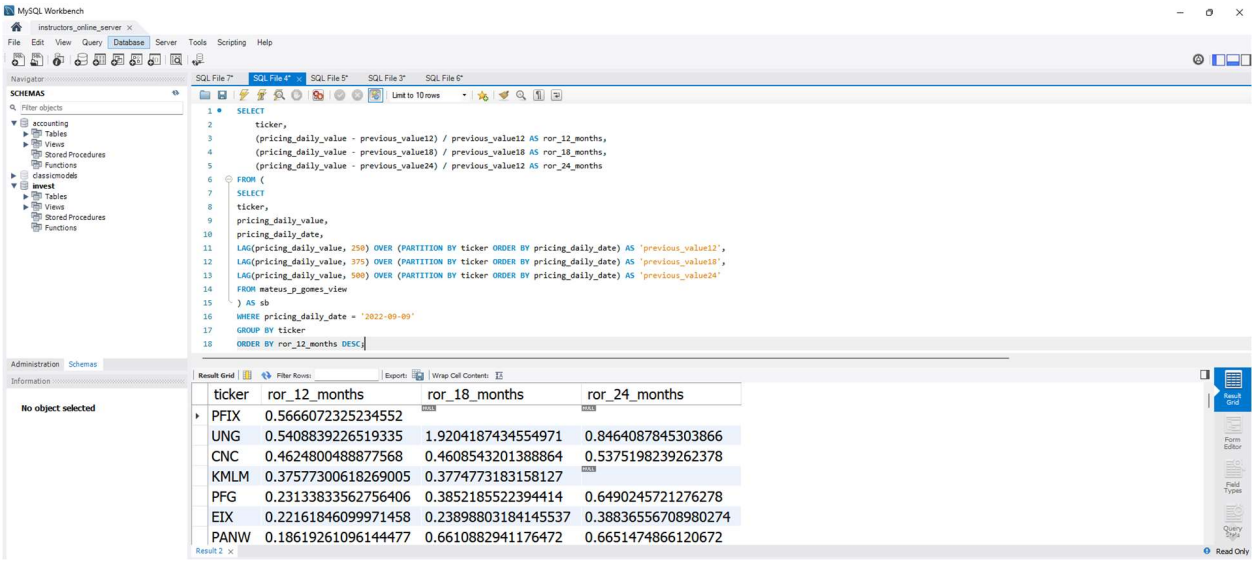

Figure 2

Key Findings

The analysis of returns over the most recent 12, 18, and 24 months as of September 9, 2022, reveals that the ticker PFIX achieved the highest 12-month return, while UNG dominated both the 18-month and 24-month return periods. PFIX is an ETF designed to hedge against rising interest rates, which likely explains its performance given the Federal Reserve's interest rate hikes starting in early 2022 to combat inflation. Similarly, UNG, the United States Natural Gas Fund, experienced significant growth due to soaring natural gas prices driven by the global energy crisis and heightened demand following geopolitical tensions, including the Russia-Ukraine war.

Recommendations

Energy Sector Opportunities

The strong performance of UNG underscores the importance of monitoring energy commodities, particularly during periods of geopolitical instability. Investors should consider diversifying portfolios to include exposure to such commodities when relevant market conditions arise.

Inflation and Rate Hedging

PFIX's success highlights the value of strategies designed to hedge against inflation and rising interest rates. As monetary policy evolves, investors may benefit from allocating a portion of their portfolio to such instruments in similar macroeconomic conditions.

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Question 2

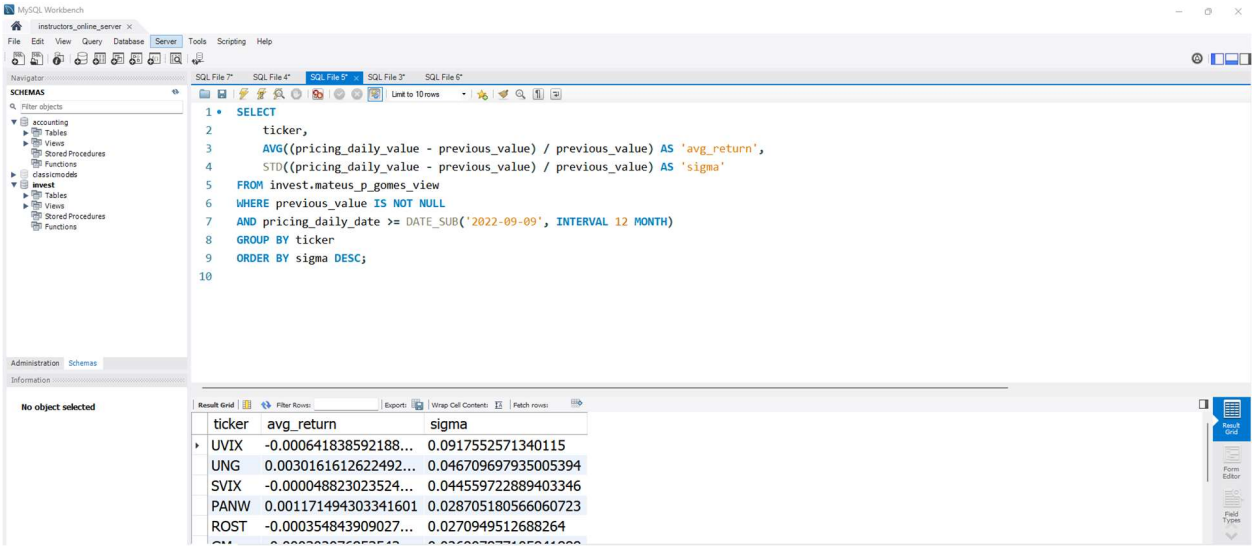

Figure 3

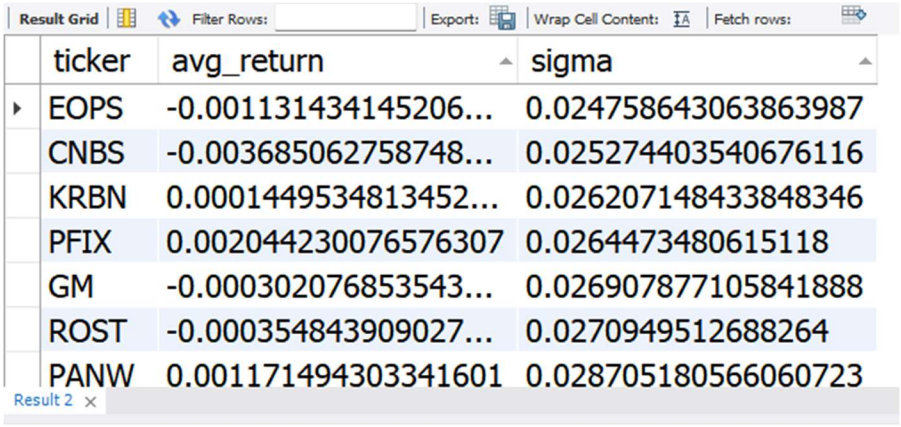

Figure 4

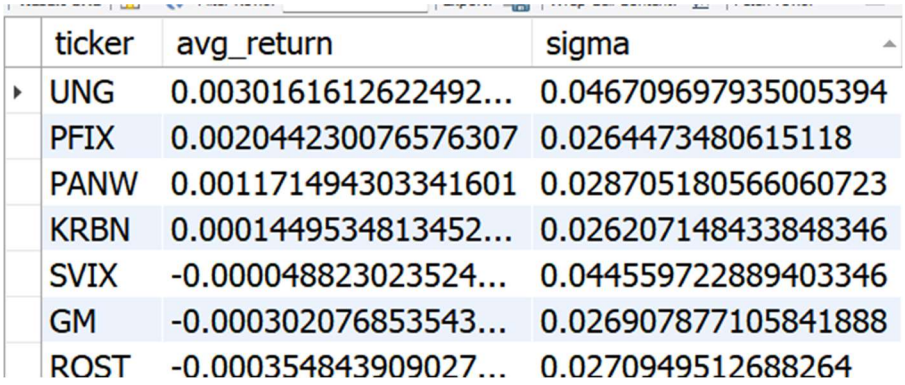

Figure 5

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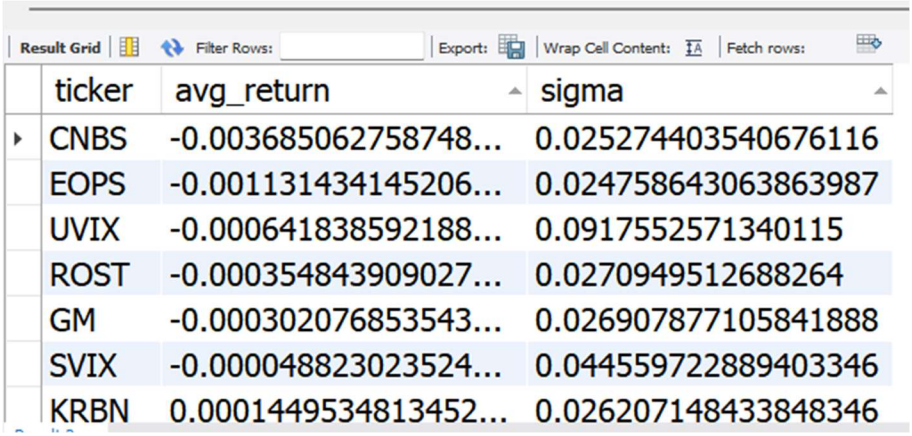

ticker	avg_return	sigma
CNBS	-0.003685062758748...	0.025274403540676116
EOPS	-0.001131434145206...	0.024758643063863987
UVIX	-0.000641838592188...	0.0917552571340115
ROST	-0.000354843909027...	0.0270949512688264
GM	-0.000302076853543...	0.026907877105841888
SVIX	-0.000048823023524...	0.044559722889403346
KRBN	0.0001449534813452...	0.026207148433848346

Figure 6

Key Findings

The analysis of the most recent 12 months' sigma (risk) and average daily return reveals some important insights. UNG, which had the highest average return, is likely benefiting from high volatility in the natural gas market, driven by geopolitical tensions and energy supply concerns. In contrast, CNBS, which had the lowest average return, represents a cannabis ETF, a sector that has faced regulatory challenges and inconsistent market growth over the past year. UVIX, the ticker with the highest sigma (risk), is an inverse volatility ETF, which naturally exhibits high volatility as it aims to capitalize on sudden market swings. On the other hand, EOPS, with the lowest sigma, indicates lower risk, suggesting it is likely a more stable investment.

Recommendations

Volatile Markets

Investors looking for high returns in volatile sectors should consider exposure to **UNG**, particularly during periods of heightened energy market uncertainty. However, they should also be prepared for the associated risks.

Low-Risk Options

For risk-averse investors, EOPS provides a safer alternative with lower volatility, suitable for conservative portfolios.

Volatility Hedging

Investors interested in volatility itself could explore opportunities in products like UVIX, though they should be cautious of the high risk inherent in such instruments.

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Question 3

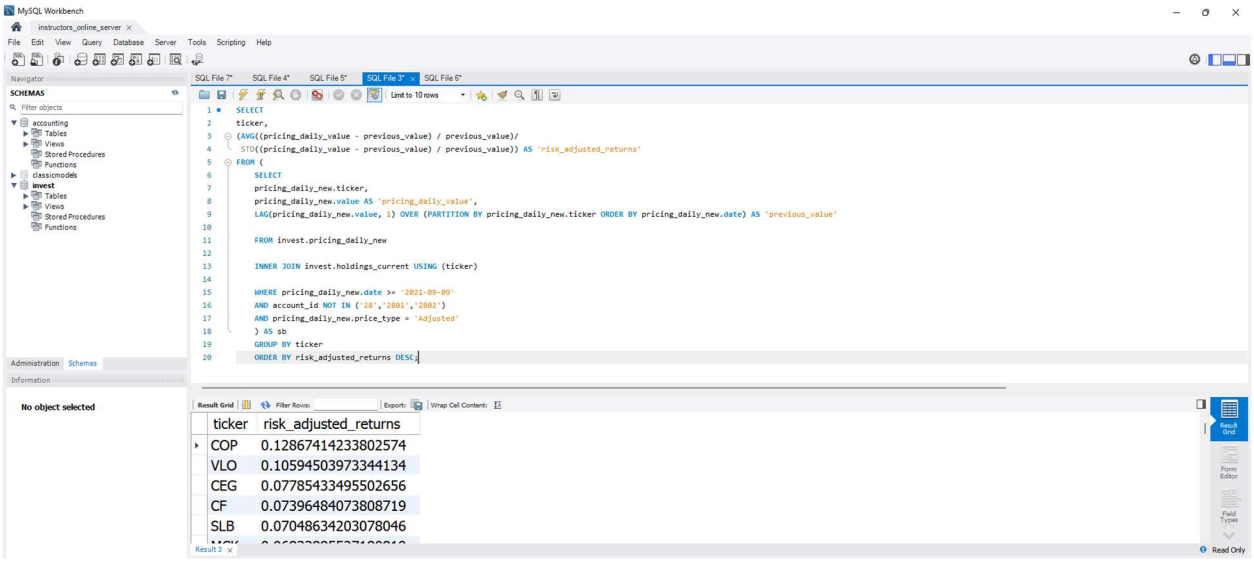

Figure 7

Key Findings

The analysis of risk-adjusted returns for the last 12 months reveals that COP, VLO, and CEG are the top three tickers with the highest risk-adjusted returns, suggesting that they offer strong returns relative to the level of risk taken. These tickers stand out due to their superior performance in volatile markets, likely driven by favorable macroeconomic factors. COP (ConocoPhillips) and VLO (Valero Energy) benefited from rising oil and gas prices in response to global supply constraints, particularly following geopolitical events like the Russia-Ukraine war. CEG (Consolidated Edison) might have experienced stable performance due to its role as a utility company, benefiting from steady demand for energy and its relatively low volatility compared to more cyclical sectors. These stocks offer the opportunity for adding value to the portfolio without significantly increasing risk, especially in a market characterized by uncertainty.

Recommendations

Given their strong performance and favorable risk-return characteristics, COP, VLO, and CEG should be considered for portfolio expansion. These investments can enhance returns without substantially increasing risk, making them suitable for diversification strategies, but monitor macro conditions: While these tickers have performed well, continued global uncertainty (such as energy price volatility or regulatory changes) could impact their future performance. Regular monitoring is essential.

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Question 4

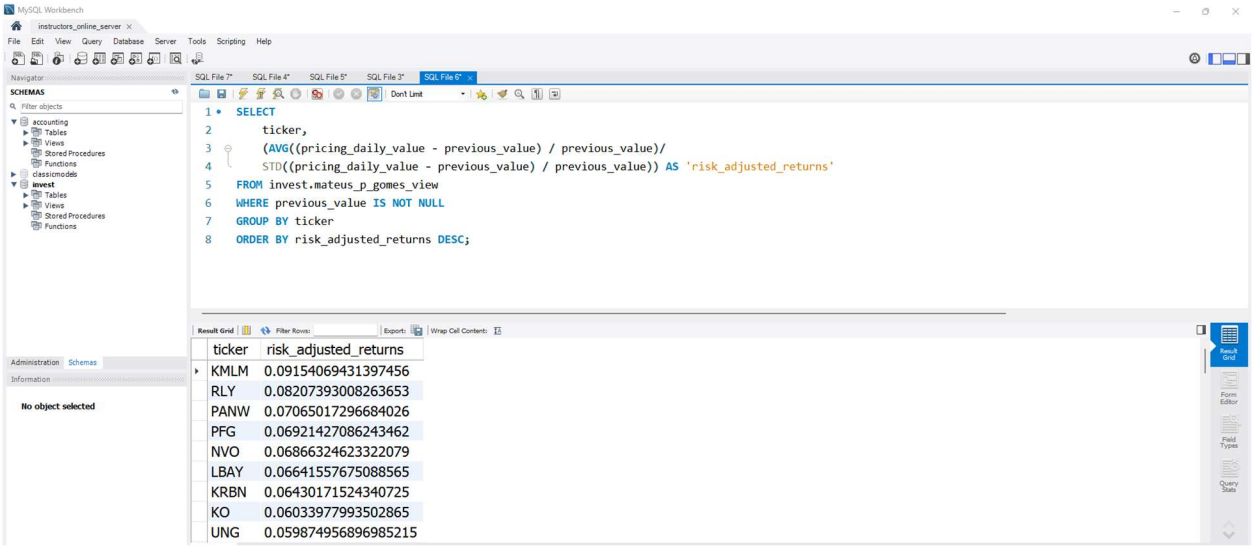

Figure 8

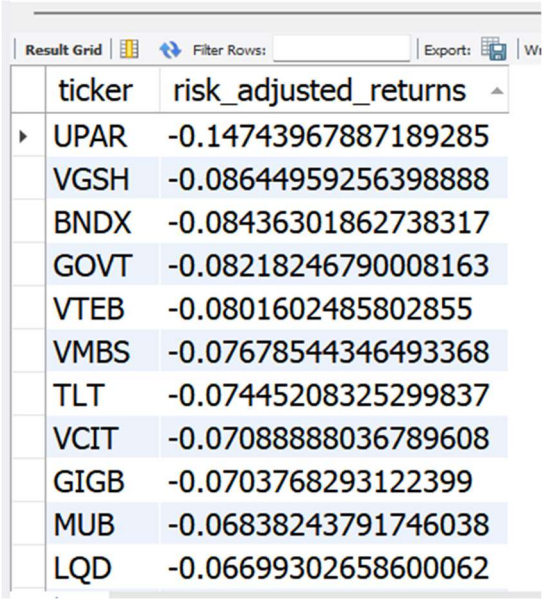

Figure 9

Key Findings

The analysis of risk-adjusted returns, calculated as the ratio of average return to standard deviation (sigma), reveals that KMLM achieved the highest risk-adjusted return, suggesting it provided superior returns relative to its volatility compared to other tickers. UPAR, conversely, had the lowest risk-adjusted return, indicating that its returns were not sufficiently high to compensate for the associated risk. KMLM's strong performance could be attributed to effective risk management or exposure to a stable

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yet profitable sector, while UPAR might face market conditions or volatility that prevent it from delivering favorable returns relative to its risk.

Recommendations

High-Risk-Adjusted Return Ticker

KMLM is the most favorable investment for those seeking high returns with a reasonable level of risk. Investors may want to consider this ticker in portfolios focused on efficient risk management and optimized returns.

Low-Risk-Adjusted Return Ticker

UPAR may not be suitable for investors seeking risk-adjusted returns, as it has underperformed in this regard. A deeper analysis into the specific risks of this ticker could be beneficial before recommending it.

Part 2

Dashboard link: A1 Final Dashboard | Tableau Public.

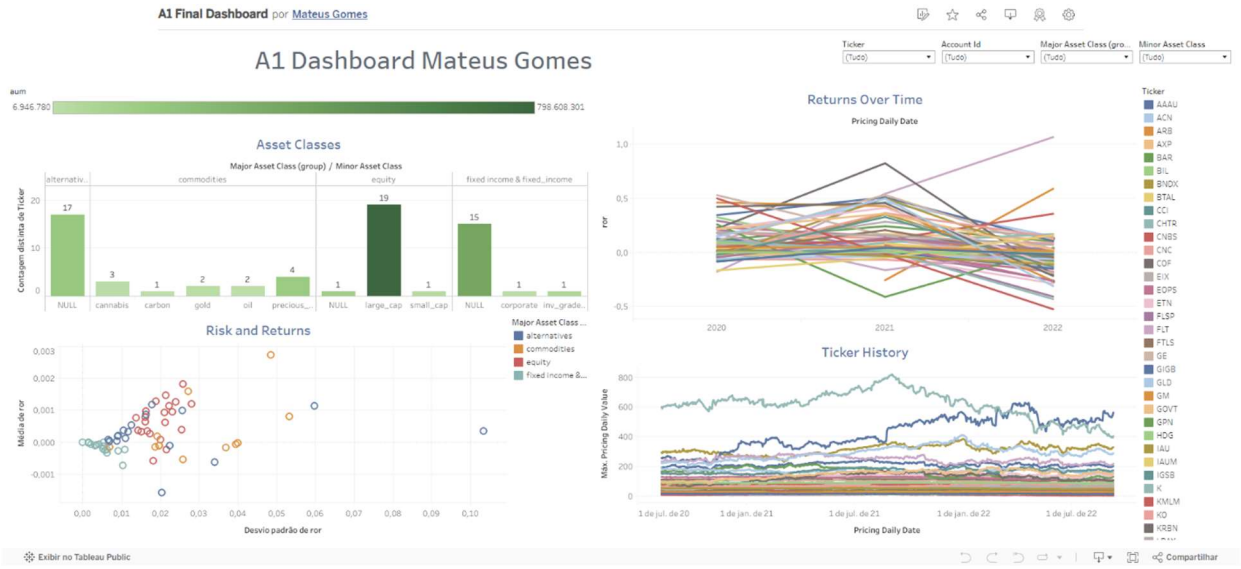

Figure 10

Key Findings

Asset Classes Allocation

The client's portfolio consists of four major asset classes: equity, fixed income, commodities, and alternatives. According to Bodie, Kane, and Marcus (2021), equities offer the highest potential returns but carry elevated risks, which aligns with the client's allocation preference. The portfolio heavily concentrates on equities, with underrepresentation in fixed income and commodities. This aggressive strategy aligns with investment theories that favor equities for higher returns over long-term horizons (Damodaran, 2020).

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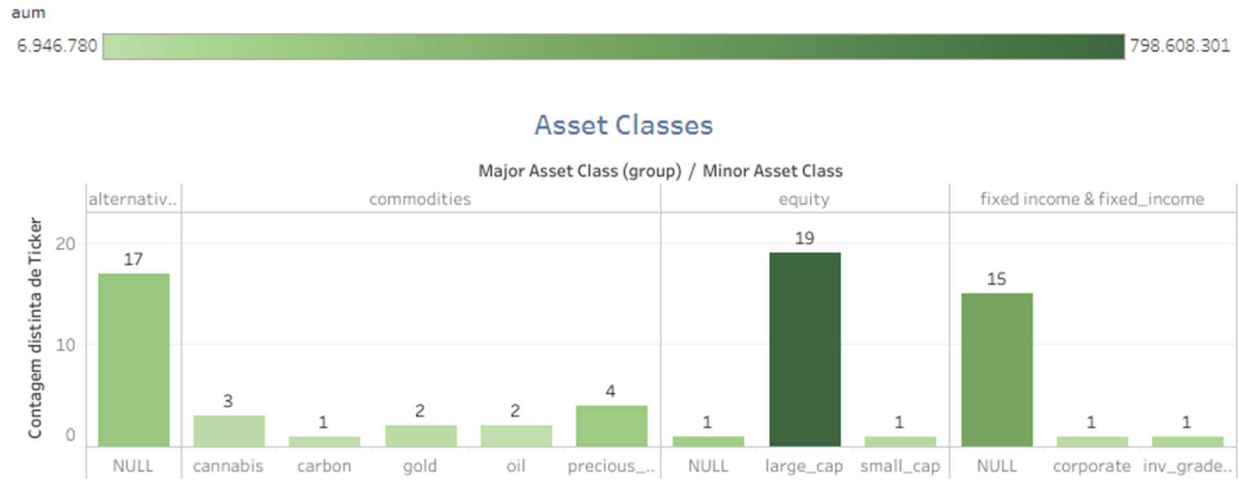

Figure 11

Portfolio Returns Over Time

The "Returns Over Time" chart reflects individual ticker performance over the review period.

Top Performing Tickers:

UNG and PFIX have delivered exceptional returns, consistent with trends in commodities and inflation-hedge funds observed in recent years (Morningstar, 2023).

KMLM has shown steady growth, indicative of strong performance in alternative investment vehicles.

Tickers with Most Negative Returns:

CNBS and CHTR reflect the volatility in niche markets, such as cannabis and telecommunications, where structural challenges have hindered growth (Miller, 2022).

Figure 12

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Risk and Returns Profile

The scatterplot reveals a high risk-return trade-off across the portfolio, a typical characteristic of aggressive investment strategies (Markowitz, 1952).

- **High Returns with High Risk**: These assets align with theories on modern portfolio management, where greater volatility often accompanies higher returns (Sharpe, 1964).
- **Moderate Returns with Lower Risk**: A cluster of tickers in this category demonstrates potential opportunities for achieving a balanced portfolio.

Figure 13

Historical Price Trends (Ticker History)

The "Ticker History" chart illustrates price trends over the past 25 months.

Top Performing Ticker:

PANW (Palo Alto Networks) showed consistent upward growth, reflecting its leadership in cybersecurity—a sector that has outperformed broader markets (Goldman Sachs, 2023).

Underperforming Ticker:

FLT highlights downward momentum, often seen in assets struggling with macroeconomic pressures (McKinsey & Co., 2022).

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Figure 14

Business Insights

The analysis of the client's portfolio over the last 25 months reveals a predominantly aggressive investment strategy characterized by heavy exposure to equity and alternative asset classes. This approach demonstrates a clear emphasis on achieving high returns, though it also exposes the portfolio to significant volatility. Such a strategy aligns with a client profile that prioritizes long-term growth potential over short-term stability, a characteristic commonly associated with aggressive or growth-oriented investors (Bodie, Kane, & Marcus, 2021). However, while this aggressive stance has delivered notable successes through top-performing assets, it also presents opportunities for optimization to ensure sustainable, consistent performance over time. In summary, the client's current portfolio reflects an aggressive growth strategy that has delivered notable successes, particularly through top-performing assets such as UNG, PFIX, and PANW.

Performance Overview and Trends

Over the review period, several assets have exhibited exceptional returns, underscoring the strength of certain strategic choices. For example, UNG and PFIX have demonstrated outstanding growth, largely benefiting from macroeconomic conditions that have favored commodities and inflation-hedge instruments. The strong performance of UNG aligns with the upward trajectory of natural gas markets, while PFIX reflects the increased demand for tools that hedge against rising interest rates—a particularly relevant strategy given recent economic volatility (Morningstar, 2023). Similarly, KMLM has emerged as a consistent performer among alternative assets, reflecting the broader investor trend toward non-traditional investments for diversification purposes.

Conversely, the portfolio also includes assets with negative returns that have detracted from overall performance. CNBS, a cannabis sector ETF, has struggled due to regulatory uncertainties and slower-than-expected growth in the sector. Additionally, CHTR, representing telecommunications, has faced challenges from increased competition and shifting market dynamics. The presence of such

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underperforming tickers highlights the need for more active portfolio monitoring and periodic reassessment to ensure alignment with market trends and client objectives.

Historical Price Trends and Volatility

An in-depth analysis of historical price trends provides further insight into the portfolio's risk-return profile. Among the tickers analyzed, PANW (Palo Alto Networks) stands out as a consistent top performer. Its impressive upward trajectory reflects strong demand for cybersecurity solutions amid an increasingly digitized and risk-conscious business environment. This sector's resilience and growth potential position PANW as a valuable cornerstone of the client's portfolio.

In contrast, FLT has shown a clear downward trend over the review period, which may reflect broader challenges such as macroeconomic pressures, operational inefficiencies, or competitive weaknesses. The divergence in performance between high-growth assets like PANW and underperformers like FLT underscores the importance of sector-specific analysis and ongoing performance tracking to identify sustainable growth opportunities.

Risk-Return Profile and Diversification Opportunities

The portfolio's scatterplot analysis indicates a high concentration of assets within the high-risk, high-return quadrant, a hallmark of aggressive investment strategies. While such an approach can generate significant gains, it also exposes the portfolio to considerable downside risk, particularly during market downturns. Modern portfolio theory (Markowitz, 1952) emphasizes the benefits of diversification as a means to optimize returns while managing risk. In this context, the current portfolio would benefit from greater diversification into asset classes that exhibit lower volatility and more stable returns, such as fixed income securities and high-quality commodities.

Furthermore, the presence of underperforming assets suggests an opportunity to reassess and rebalance the portfolio. Persistent negative returns from tickers such as CNBS and CHTR may indicate underlying weaknesses that require a strategic shift. Phasing out such assets and reallocating capital toward consistently strong performers or lower-risk investments can enhance overall portfolio stability and performance.

Recommendations

Diversify the Portfolio for Risk Management

To reduce volatility, the client should allocate a portion of their investments to fixed income securities and commodities (Bodie et al., 2021). Increasing exposure to consistent performers such as KMLM can enhance returns while reducing risk.

Reassess Underperforming Assets

Research suggests that persistently underperforming tickers like CNBS and FLT may detract from overall performance. Rebalancing the portfolio to phase out these assets can optimize returns (Miller, 2022).

Leverage Top Performers for Growth

Expanding positions in top-performing assets like UNG, PFIX, and PANW can capitalize on their upward

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trends. According to Goldman Sachs (2023), sectors like energy and cybersecurity continue to show long-term growth potential.

Implement a Balanced Risk-Return Strategy

Combining high-return assets with low-volatility options will align the portfolio with modern portfolio theory principles, reducing risk without compromising performance (Markowitz, 1952; Sharpe, 1964).

Adopt Regular Performance Monitoring

Implementing a structured monitoring framework will ensure timely identification of underperforming assets and allow for agile adjustments to the portfolio (Damodaran, 2020).

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