Journal of Mathematical Finance and Risk Management
ISSN: 3080-9983 (Print), ISSN: 3080-9991 (Online) | Vol. 2, No. 1, 2026

Designing Fund Recommendation Systems for Novice Investors: Insights from Portfolio Construction, Sentiment Analysis and Investor Suitability

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Abstract: This study presents a financial application design and development process for novice investors which provides insights into portfolio management, financial sentiment and investor suitability. Aimed to compare different assets performance, eight portfolios are constructed, including equity, cryptocurrency, and combined asset groups using equal-weighting, minimum-variance, maximum-Sharpe ratio and risk-parity methods. Their performance is showed through annual return, volatility, Sharpe ratio, maximum drawdown and the growth of a once-dollar investment. The application also uses finVADER and tests whether sentiment tilt can improve portfolio performance. However, the sentiment tilt has a week improvement in portfolio performance, suggesting that sentiment is better used as a supporting indicator than primary driver of portfolio allocation. Overall, the findings suggest that fund recommendations for novice investors should consider both portfolio performance and investor risk tolerance when supporting informed investment decision.

Keywords: Fund recommendation systems, Novice investors, Investor suitability.

1. Introduction

Beginner investors usually face several problems. For example, there are too many funds and assets to choose from; risk metrics are hard to understand; cannot identify if the sentiment signal has investment value. Moreover, investors may be attracted by crypto's high returns but overlook volatility and drawdowns. A lack of knowledge may contribute investors to purchase products that are unsuitable for them [1]. The fund's risk level may not align with an individual's risk tolerance. Thus, before making an investment, investors need to have a clear understanding of themselves.

2. Problem and Product Concept

EasyFunds is an invest app designed for novice investors, it can recommend suitable fund for users by conducting a survey. EasyFunds contains four main functional modules: fund comparison, individual fund analysis, sector sentiment monitoring, and investor suitability with adjustable portfolio allocation. Additionally, EasyFunds does not exclude high-risk assets simply because its target users lack investment experience. Aimed to help novice investors understand funds market deeply, it presents crypto-inclusive funds as clearly labelled higher-risk options, applies portfolio constraints to prevent excessive concentration and allows users to decide whether such exposure is suitable for them. The main innovation of EasyFunds is the integration of transparent fund comparison, finance-based advice and user-adjustable allocation with an explanation.

3. Data and Preprocessing

3.1. Asset Returns

EasyFunds uses daily return data from 50 equities and 10 cryptocurrencies over the period from 2 January 2020 to 29 December 2023. The equity universe covers ten sectors, while the cryptocurrency universe adds a higher-risk asset class for diversification and comparison. After cleaning and alignment, the combined return panel contains 1,006 observations across 60 assets.

Equities and cryptocurrencies have different trading date. Equity trading occur on business days, while cryptocurrencies trade seven days per week. Thus, equity funds use the equity trading calendar, and crypto funds retain the full seven-day cryptocurrency calendar. For combined funds, cryptocurrency returns are aligned with equity trading dates, so the equity and crypto assets can be included in a single aligned return dataset. The equity and combined funds are annualised using 252 trading days, while crypto funds are annualised using 365 calendar days. The missing value in calendar are handled during alignment rather than treated as investment losses. The final panel is used consistently across all fund construction methods.

3.2. News Headlines

The news datasets contain headlines related to the same 50 equities. Following alignment and exact duplicate removing, 146,836 unique headlines remained. These headlines are assigned to ticker, sector and trading date fields before sentiment aggregation.

Each headline is scored using finVADER, then averaged first by ticker and trading day and subsequently by sector. The dataset includes each stock on every trading day, which can distinguish between days without news and days with neutral emotions. No-news observations are coded as zero, while coverage index and headline counts are kept separately. Six unique headlines fall beyond the final equity trading date. They are retained only in the headline cache and excluded from the trading date sentiment index and portfolio tests.

3.3. No-look-ahead Controls

Several controls are used to prevent future information from entering the historical analysis. Portfolio parameters are estimated using only information available before each rebalance date. Funds are rebalanced monthly, on the first

eligible trading date of each month, using a rolling historical estimation window. Returns after the rebalance date are then used to evaluate out of sample performance.

The sector sentiment signal is lagged by one equity trading day. This means that the signal applied to a portfolio decision can only contain headlines available by previous trading day. The 60% sector coverage rule is also applied using contemporaneously available news coverage, preventing later information from changing whether a historical signal was considered usable. The streamlit app reads precomputed portfolio, sentiment and suitability outputs rather than rerunning the models. User-adjusted allocations are calculated only from the existing fund return series, which keeps the results consistent and avoids calculating forward data.

4. Fund Construction

4.1. Fund Design and Asset Groups

Since EasyFunds is primarily aimed at novice investors, the app does not simply present the "Highest Return" combination, but also shows how risk and return differ between different asset universes and different investment methods. Thus, the app includes three asset groups: equity-only funds, crypto-only funds and combined funds. These three groups of funds each serve a different comparative function. Firstly, equity-only funds as traditional investment foundation. Secondly, crypto-only funds represent the performance of high-risk and high-volatility assets. Thirdly, combined funds are used to examine whether adding cryptocurrency can improve diversification or risk-adjusted performance. Within each asset class, different portfolio construction methods are used, such as equal-weighting, minimum variance, maximum Sharpe ratio and risk parity. In total eight funds were designed to compare how asset universe and portfolio construction method jointly affect return, volatility and downside risk. This allows us to distinguish whether differences in the results arise from the asset class itself or from the weighting method. This structure also gives users a range of transparent choices, from lower-volatility equity portfolios to higher-risk crypto and diversified combined portfolios.

4.2. Portfolio Rules and Constraints

To ensure consistency and transparency in the product design, we established some joint investment rules. These rules were designed to make the funds comparable while limiting concentration and appropriate for a novice investor setting. The first rule is Long-only, meaning that the weight of each asset must greater than or equal to 0, short selling is not allowed. The reasons of this rule are aligning with the position of an App for novice investors; reducing additional complexity and risk with short-selling and make portfolio weights easier to understand. Secondly, all funds are monthly rebalancing, meaning the combinations are adjusted monthly rather than every day. This rule can avoid over-trading, maintain a balance between model upgrades and stability. Besides, it is a better align with actual product operation. A zero risk-free rate and zero transaction costs are assumed to keep comparisons consistent and isolate the effect of portfolio construction methods. Portfolio weights are allowed to drift between rebalances. Between rebalancing dates, portfolio weights are allowed to drift with asset returns rather than being reset daily. The estimation window follows the relevant trading calendar. Equity and combined funds use a rolling 252-day window, while crypto-only funds use a rolling 365-day window.

It is worth noting the rule regarding the weight caps which can avoid portfolio excessive concentration. For equity funds, a maximum of 10% per equity position. Since there are 50 equities, a 10% cap can prevent optimizer from allocating all capital on a small number of equities, maintain a certain level of diversification and reduce extreme weights caused by estimation errors. For crypto funds apply a 25% cap to each cryptocurrency. The 25% cap was selected as the target user of this project. For experienced investors, a 25% cap is insufficient. A 10% cap would leave very limited flexibility because the universe contains only ten cryptocurrencies, effectively forcing the portfolio close to equal weighting.

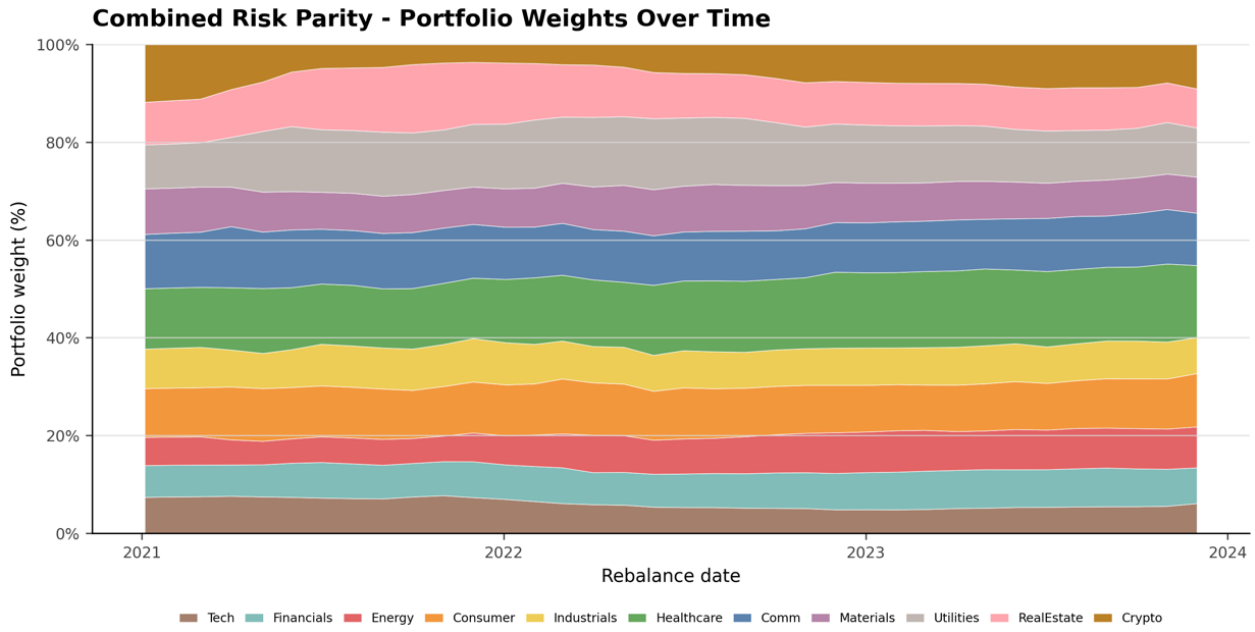
The combined funds must comply two restrictions: maximum 10% for each asset and 25% cap for crypto in total. Even if a single cryptocurrency accounts for only 10%, the combined exposure to multiple cryptocurrencies can still result in a very high overall risk. Therefore, an additional total crypto cap is required. These rules were designed to make the funds comparable while limiting concentration and appropriate for a novice investor setting.

4.3. Equity, Crypto and Combined Funds

There are eight funds: Equity Equal Weight, Equity Minimum Variance, Equity Maximum Sharpe, Crypto Equal Weight, Crypto Risk Parity, Combined Minimum Variance, Combined Maximum Sharpe and Combined Risk Parity. Before evaluating each fund's performance, there have checks at each monthly rebalance date. It included checking solver success for all optimized portfolios, testing the resulting weights against long-only and asset-ap rules and running weight-distance test to confirm that the different methods produced different allocations. Additional diagnostics recorded turnover, the number of active holdings, cap binding frequency and crypto exposure.

4.4. Portfolio Construction Methods and Weight Behaviour

Equal weight is the simple standard for comparing optimises portfolios. Minimum variance selects weights that minimise portfolio volatility, while Maximum Sharpe targets the highest historical risk-adjusted return. Risk parity balances each asset's contribution to total portfolio risk. Applying these methods across different asset groups helps separate the effect of the weighting method from the effect of the underlying assets.



rypto exposure remained moderate over the sample: average 6.96%, maximum 11.83%.
ote: equity target weights are aggregated by sector; all crypto holdings are shown as one category.
ample: Jan 2021 to Dec 2023. Source: precomputed monthly project weights.

Figure 1. Combined Risk Parity portfolio weight over time.

Figure 1 shows the portfolio weights of Combined Risk Parity over time. The allocation changed gradually across monthly rebalancing dates. Crypto exposure remained moderate throughout the sample, averaging 6.96% and reaching a maximum of 11.83%, while the portfolio remained diversified across multiple equity sectors. This suggests that crypto acted as a limited diversifier.

5. Fund Performance Results

5.1. Overall Comparison

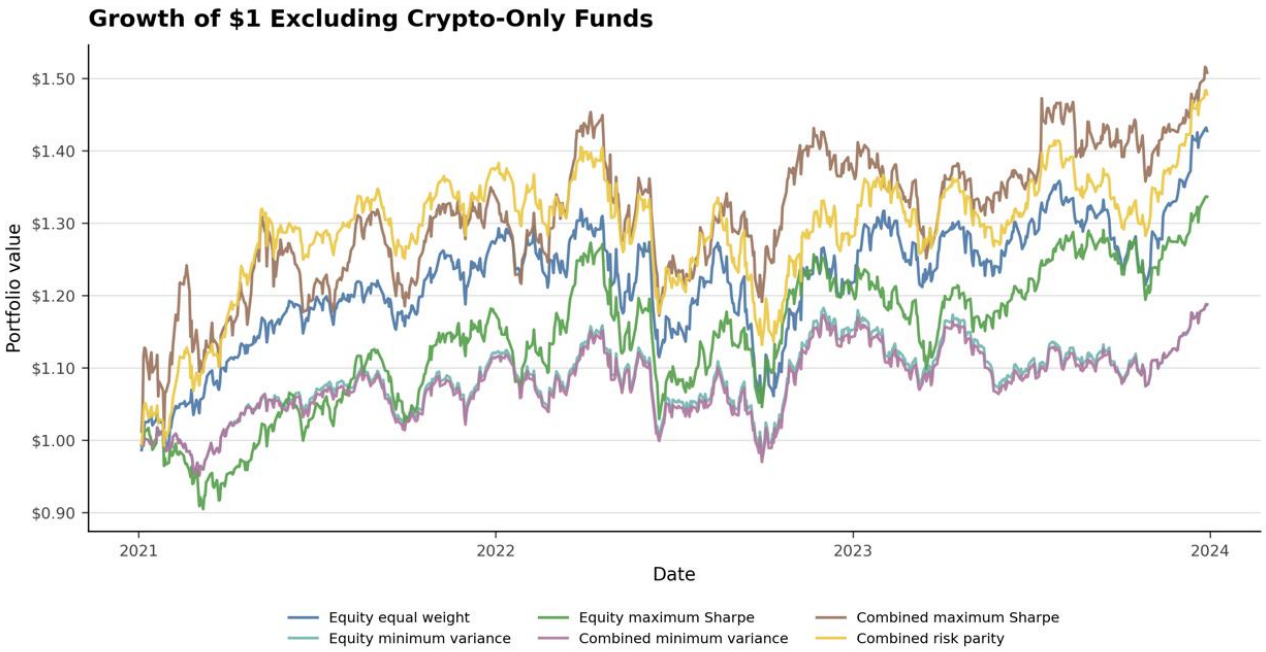
Table 1. Historical Performance of the Eight Constructed Funds

performance_metrics

fund	observations	annualized_return	annualized_volatility	sharpe_ratio	maximum_drawdown	final_growth_of_1
Combined Maximum Sharpe	753	0.1472979635058980	0.2010816628413010	0.7839249085524320	-0.19331017566351900	1.5077114634228600
Combined Minimum Variance	753	0.0590492223806878	0.1251585571728060	0.5209831718805770	-0.1578245159427650	1.1870029990438900
Combined Risk Parity	753	0.1396727165656620	0.1620188280474790	0.8881388371058800	-0.19474639690690100	1.4779661938163000
Crypto Equal Weight	1095	0.405047176336950	0.8189033644058300	0.8288002835884540	-0.8157130881593320	2.7737845161866800
Crypto Risk Parity	1095	0.4429254095228230	0.798939766536692	0.8624190122747990	-0.7987488607935950	3.0042193832454800
Equity Equal Weight	753	0.12642379781817400	0.16117980666586600	0.819292366559775	-0.2024921015251170	1.4272168148150300
Equity Maximum Sharpe	753	0.10186975669682100	0.16630019577266700	0.6666550370725840	-0.1913006962079530	1.3362546772215400
Equity Minimum Variance	753	0.05922983643187460	0.12495942826595100	0.5229771293169180	-0.15633384612360800	1.1876079988885300

Table 1 compares the historical performance of the eight funds using annual return, volatility, Sharpe ratio, maximum drawdown and the final value of a $1 investment. The two crypto only funds produced the highest returns. However, these funds came with volatility and maximum drawdowns of around 80%. Among the equity and combined funds, Combined Maximum Sharpe achieved the highest annual return, while Combined Risk Parity recorded the highest Sharpe ratio, indicating the strongest risk-adjusted performance. The Minium Variance funds had the lowest volatility and drawdowns, but also the lowest returns. Equity Equal Weight also outperformed Equity Maximum Sharpe out of sample.

5.2. Growth Over Time

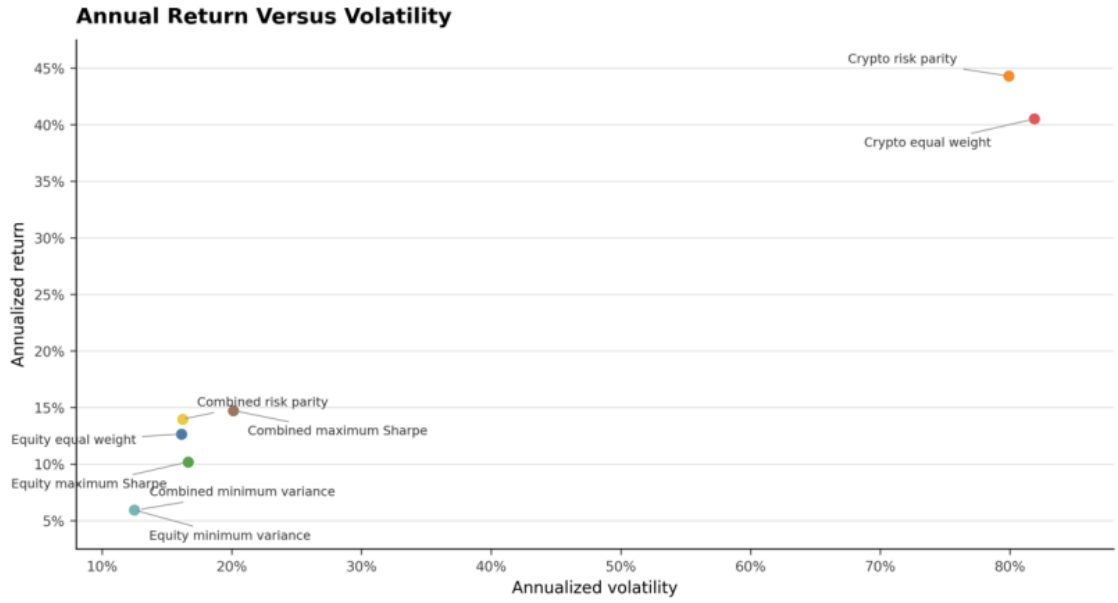


te: precomputed walk-forward out-of-sample growth paths; crypto-only funds use the daily calendar,
ıile equity and combined funds use the equity calendar. Sample: Jan 2021 to Dec 2023. Source: project backtests.

Figure 2. Fund Growth Excluding Crypto

Figure 2 shows the growth of $1 for the equity and combined funds. The two crypto-only funds are excluded from the main figure because their much larger movements would compress the other series and make the differences difficult to interpret. A linear scale in used because the remaining six funds stay within a relatively narrow value range, allowing changes in portfolio value to be read directly in dollar terms. Over the evaluation period, the combined strategies generally finished above the equity-only strategies, although all six funds experienced repeated declines. Combined Maximum Sharpe ended with the highest portfolio value, following is the Combined Risk Parity. Equity Equal Weight also showed relatively strong growth, while the two minimum-variance funds followed very similar and more conservative paths but produced lower final values.

5.3. Risk-return Trade-off



: annualization uses 252 days for equity and combined funds and 365 days for crypto-only funds.
ıle: Jan 2021 to Dec 2023. Source: project backtests.

Figure 3. Fund Return Volatility Scatter

Figure 3 shows the location of a fund on the risk-return map depends on its objective rather than on return alone. The Minimum Variance funds sot on the lower-volatility side of the chart, reflecting their focus on capital stability rather than maximum growth. Thus, the lower returns do not indicates poor performance, it may be more suitable for investors who prioritise stability and lower downside exposure. However, the figure 3 also shows the cost of this protection, as reducing

volatility is accompanied by weaker returns. In contrast, Combined Risk Parity occupies a more balanced position, offering a higher return without approaching the extreme volatility of the crypto-only funds. This aligned with the design core of EasyFunds: the most appropriate fund depends on the investor's risk capacity rather than on a single performance measure.

5.4. Downside Risk

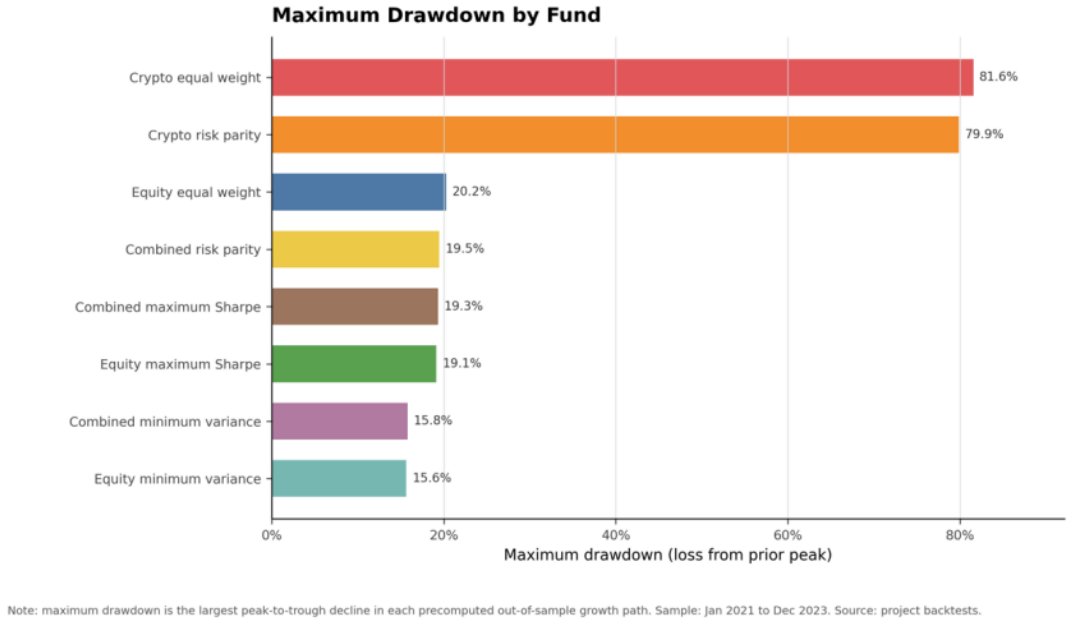


Figure 4. Fund Maximum Drawdown

Figure 4 compares the maximum drawdown of the eight funds over the evaluation period. Maximum drawdown measures the largest decline from a previous portfolio peak to a subsequent trough, so a larger value indicates a more severe historical loss. The two crypto-only funds experienced drawdowns of around 80%, far exceeding the losses recorded by the equity and combined funds, while the minimum variance funds had the smallest drawdowns at approximately 16%. Volatility and maximum drawdown presented different meaning in investment. Volatility measures the extent to which returns fluctuate over time. Maximum drawdown measures the maximum cumulative loss from a historical high to a subsequent low.

Crypto Risk Parity achieved a high historical return and a relatively strong Sharpe ratio but also experienced a maximum drawdown of almost 80%. This means that the portfolio once lost nearly four-fifths of its value from a previous peak. Even if it later recovered, many novice investors may not have been able to tolerate such a decline. In addition, the "optimal strategy" also depends on whether investors can hold on to their investments. A strategy is useful only if the investor can remain invested during its losses. Drawdowns are especially relevant from an investor-wellbeing perspective because investors often evaluate losses relative to a previous portfolio peak [2]. A previous portfolio peak can therefore make a later decline especially painful, even when two investments eventually finish at the same value. This is relevant to EasyFunds designing because the crypto-only funds achieved the highest final returns, but also experienced drawdowns close to 80%. Such losses may cause novice investors to sell before recovery, while the smaller drawdowns of the minimum-variance funds show the value of downside protection. EasyFunds therefore considers drawdown alongside return when comparing funds and assessing suitability.

6. News Sentiment Model

6.1. VADER Versus finVADER

Since EasyFunds analyses financial news, VADER was compared with finVADER to assess whether finance vocabulary provided broader sentiment coverage. The purpose of the comparison was not to prove that finVADER was more accurate, but to test whether the finance vocabulary produced broader coverage of company news language.

Table 2. Comparison of VADER and finVADER outputs

Comparison measure	Result
Headline-level correlation	0.604
Sector-month correlation	0.692
VADER exact-zero scores	48.85%
finVADER exact-zero scorces	16.86%

The moderate correlations show that the two models capture related but not identical sentiment patterns. More importantly, the proportion of exact zero scores fell from 48.85% under VADER to 16.86% under finVADER, suggesting that the finance vocabulary recognised many terms that were not captured by the general-purpose model. Thus, finVADER was selected as primary sentiment model because it provided broader financial field coverage and a wider range of useful scores. Besides, VADER was retained as a benchmark. The comparison does not establish superior accuracy because the project does not include manually

labelled sentiment data.

6.2. Sector Sentiment Construction

Below are the specific steps for generating the sentiment index. Each headline received a finVADER score. The daily news scores for the same ticker were averaged, and the five stocks within each sector were then aggregated using equal weights to form the sector sentiment index. The signal was lagged by one equity trading day to avoid incorporating future information. Coverage was also used to determine whether the sector signal was sufficiently reliable.

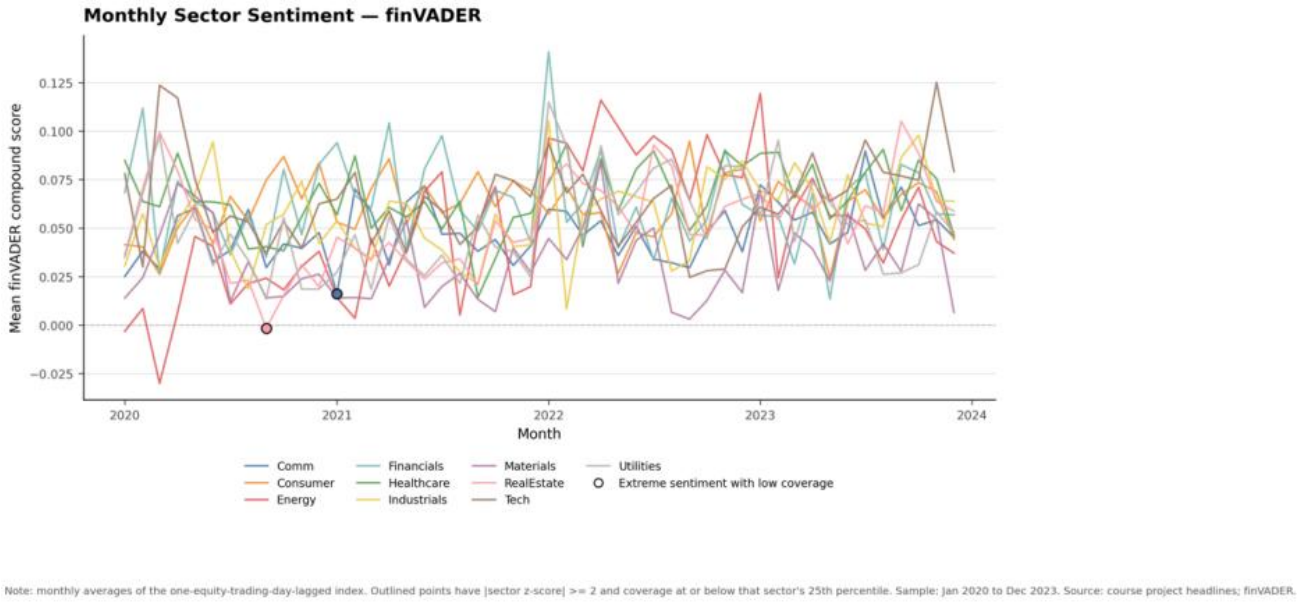


Figure 5. Monthly Sector Sentiment - finVADER

Figure 5 shows that sector sentiment change with time and sentiment varies across different sectors. Most monthly sector sentiment index is positive. Thus, this index is better suited for comparing relative changes rather than simply concluding that "a positive number indicates market optimism". The hollow circles in the figure indicate months with relatively extreme sentiment but low coverage. Therefore, looking at sentiment scores alone can be misleading, because an extreme score may be driven by news about only a handful of equities.

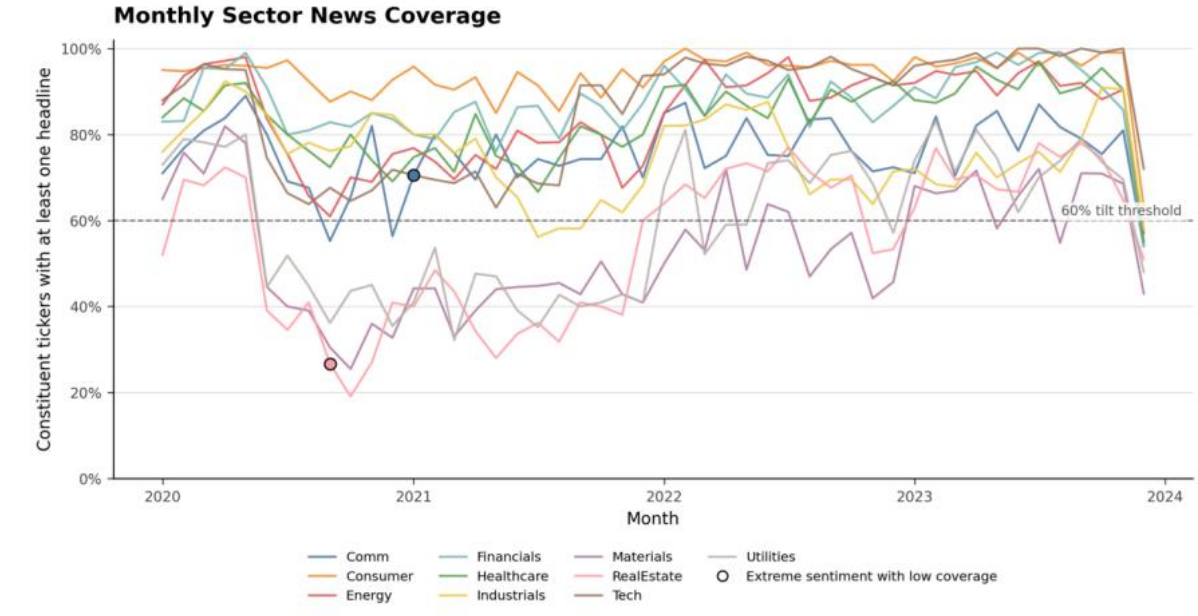


Figure 6. Monthly Sector News Coverage

Coverage in Figure 6 means the percentage of a sector's five constituent stocks that were in the news that month. For example, 100% means all five stocks had news. Coverage was generally higher for consumer, Financials and Technology, but lower and less stable for Materials, Real Estate and Utilities. Low coverage may make a sector signal less representative because it is based on only a few companies. Therefore, at least three of the five constituent tickers must have news before the signal can affect portfolio weights, as shown by the 60% threshold in Figure 5. Days without news were coded as zero for panel completeness, while separate headline and coverage indicators preserved the distinction between no news and genuinely neutral sentiment. A strong positive or negative sentiment score was also not

automatically treated as reliable. If only a few companies have news, the result might not represent the whole sector.

7. Sentiment Integration Results

7.1. Experimental Design

This experiment tests whether adding a finance-specific sentiment signal can improve portfolio performance. The testing principle is not to re-optimize a new fund, but to incorporate a sector sentiment tilt into the weightings of the existing fund. To be more specific, positive sector sentiment leads to an increase in the sector's weight; negative sector sentiment leads a decrease in sector's weight. Then recalculated the weight, while continuing to adhere to the original weight caps. At the same time, use only the sentiment from the previous equity trading day and do not use the sector signal when coverage is below 60%. It is emphasized that only minor adjustments will be made to the portfolio, without altering the fund's original core structure.

A total of two funds were selected for the experiment: Equity Equal Weight and Combined Maximum Sharpe. The basic weighting of Equity Equal Weight is the simplest and most uniform, thus allowing us to assess whether sentiment itself add value rather than being merely a result of optimizing the model's original weight. Combined Maximum Sharpe represented a more concentrated fund, both included equity and crypto, original goal was to maximize risk-adjusted returns. This result showed whether sentiment can continue to be helpful in more complex, optimized portfolios. At the same time, only adjusting equity sleeve, maintaining crypto weights can identify the sector sentiment's effect. For each fund, three versions were compared: the original fund, a VADER-tilted version and finVADER-tilted version. All tilted portfolios used the same sentiment adjustment rule, 60% coverage threshold, one-trading-day lag and portfolio constraints. This ensured that the main difference between the two tilted versions was the sentiment model itself.

7.2. Result

Table 3. Performance Comparison of Baseline and Sentiment-Tilted Portfolios

sentiment_fusion_comparison

experiment	model_role	model	fund	observations	annualized_return	annualized_volatility	sharpe_ratio	maximum_drawdown	final_growth_of_1
Equity Equal Weight	Base	No sentiment tilt	Equity Equal Weight	753	0.1264237978181740	0.1611798066658660	0.819292366559775	-0.2024921015251170	1.4272168148150300
Equity Equal Weight	Primary	finVADER tilt	Equity Equal Weight + finVADER	753	0.120881444814904	0.1607418073264390	0.7903910287835840	-0.2059780660798100	1.4063358356778500
Equity Equal Weight	Benchmark	VADER tilt	Equity Equal Weight + Sentiment	753	0.1205414222531060	0.1609351490718650	0.7877411733538780	-0.205695189070389	1.4050614509239600
Combined Maximum Sharpe	Base	No sentiment tilt	Combined Maximum Sharpe	753	0.1472979635058980	0.2010816628413010	0.7839249085524320	-0.1933101756635190	1.5077114634228600
Combined Maximum Sharpe	Primary	finVADER tilt	Combined Maximum Sharpe + finVADER	753	0.1448305656531160	0.201153677285763	0.7730074388374080	-0.193052061451045	1.4980432360373500
Combined Maximum Sharpe	Benchmark	VADER tilt	Combined Maximum Sharpe + Sentiment	753	0.1441336820005830	0.2012119057026920	0.7698068325258260	-0.1960079547258340	1.4953200643288000

The original Sharpe ratio of Equity Equal Weight is 0.819, after adding VADER tilt decreased to 0.788, finVADER tilt is 0.790. The finVADER result was a little bit better than VADER, however both these two tile were lower than original fund. The annual return also fell from 12.64% to approximately 12.1%, and the maximum drawdown worsened slightly. This suggested that, in a portfolio that is already highly diversified and evenly weighted, sentiment tile does not add any additional value. The original Sharpe ratio of Combined Maximum Sharpe is 0.784. the VADER tilt fell to 0.770, while the finVADER tilt was 0.773. Similarly, finVADER performed slightly better than VADER, but still did not outperform the base fund. The annualized return also fell from 14.73% to 14.48%. It is worth emphasizing here that even within a more concentrated, already-optimized portfolio, sentiment tilt does not further improve risk-adjusted performance. Across both experiments, finVADER produced slightly better results than VADER, but neither sentiment-tilted portfolio outperformed its original baseline. The changes in annual return, volatility and Sharpe ratio were small, suggesting that the sentiment overly had only a limited effect on portfolio weights and performance.

7.3. Interpretation

In the Equity Equal Weight experiment, the average weight of each individual stock changed by only about 0.12 percentage points and the portfolio's average overall weight change was 3.00%. The original equal-weight allocation was 2% per stock, while the tilted weights fell within the range of 1.47%-2.51%, therefore, no extreme bets occurred and the 10% cap was not triggered. This suggests that the deterioration in results was not due to an overlay aggressive sentiment tilt, but more likely because the signal itself did not provide sufficient additional information.

Of 360 sector-rebalance decisions, 56 were filtered out due to insufficient coverage, accounting for approximately 15.6%. These cases were primarily concentrated in the Materials, Real Estate and Utilities sectors, consistent with coverage chart presented earlier. The coverage rule does not remove signal arbitrarily. Instead, it acts as a data quality control in sectors where news is consistently limited.

These results suggest that the lack of improvement was not caused by an excessively aggressive tilt or failed constrains. Instead, the sentiment signal had limited influence on weights and may have contained insufficient predictive information at the chosen sector level, lag and monthly rebalancing frequency. EasyFunds therefore retains sentiment as a supporting market-monitoring tool rather than using it as the main driver of portfolio allocation.

8. Suitability Engine

8.1. Questionnaire Design

EasyFunds applies five questions covering investment objective, investments horizon, tolerable decline, likely behaviour during market decline and preference for stability versus growth. These dimensions were informed by investor guidance from ASIC MoneySmart and Vanguard Australia, both of which emphasise investment goals, time horizon and risk tolerance when considering suitable investment [3][4]. The questions are designed to capture both the investor's capacity to take risk and their willingness to accept losses. Significantly, the EasyFunds's questionnaire is a quick survey rather than a psychometrically validated risk-profiling instrument or a substitute for professional financial advice. Each questionnaire response is scored from 1 to 3, producing an initial Conservative, Balanced or Growth profile. The result is not based on the total score alone. A short investment horizon and low loss tolerance can reduce the classification to Conservative, while either condition alone caps the final

profile at Balanced. These overrides only reduce the risk classification and never increase it, providing an additional safeguard against assigning an unsuitable high-risk portfolio.

8.2. Fund Ranking

Table 4. Fund-Ranking Priorities by investor Suitability Profile

Profile	Main priorities
Conservative	Lower volatility and smaller drawdown
Balanced	Equal emphasis across all four measures
Growth	Higher return and Sharpe ratio

The eight funds are ranked different investor profile using return, Sharpe ratio, volatility and maximum drawdown. Conservative investors place greater weight on lower volatility and smaller drawdowns, while Balanced investors give equal importance to all four measures. Growth investors place more emphasis on return and Sharpe ratio. At the same time, they still considering risk. The result allows the same fund universe to produce different recommendations depending on the investor's priorities.

8.3. Crypto Scenarios

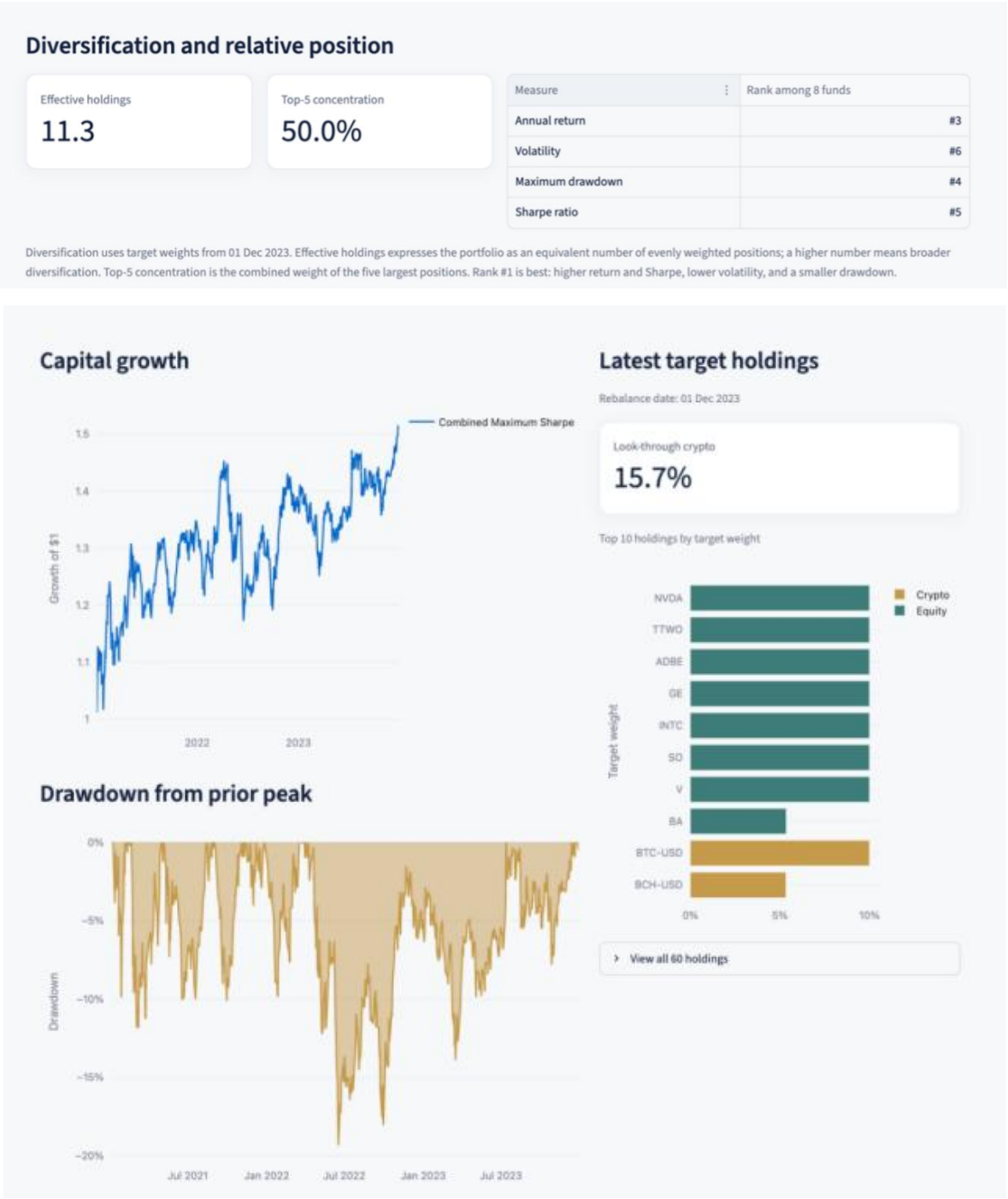
EasyFunds allows users to choose between None, Limited and Higher crypto preferences, but the final crypto exposure is still constrained by the investor's suitability profile. Conservative investors are given the lowest crypto limits, while Growth investors can accept higher exposure. For Balanced investors, a 25% crypto allocation is available only as an optional fund rather than the default recommendation. It requires explicit user confirmation and is accompanied by a warning based on the historically high volatility and drawdowns of the crypto-only funds. This allows users to express their crypto preference without overriding the risk limits implied by their suitability profile.

9. Streamlit App and Investor Journey

EasyFunds combines the analytical results and interactive investor journey rather than presenting them only as a fund option. Users can first review individual funds characteristics through the Fund Fact Sheet, which combines traditional performance measures with downside risk, recovery, diversification and relative fund rankings. This helps investors understand not only how a fund performed, but also the type of risk they may take.



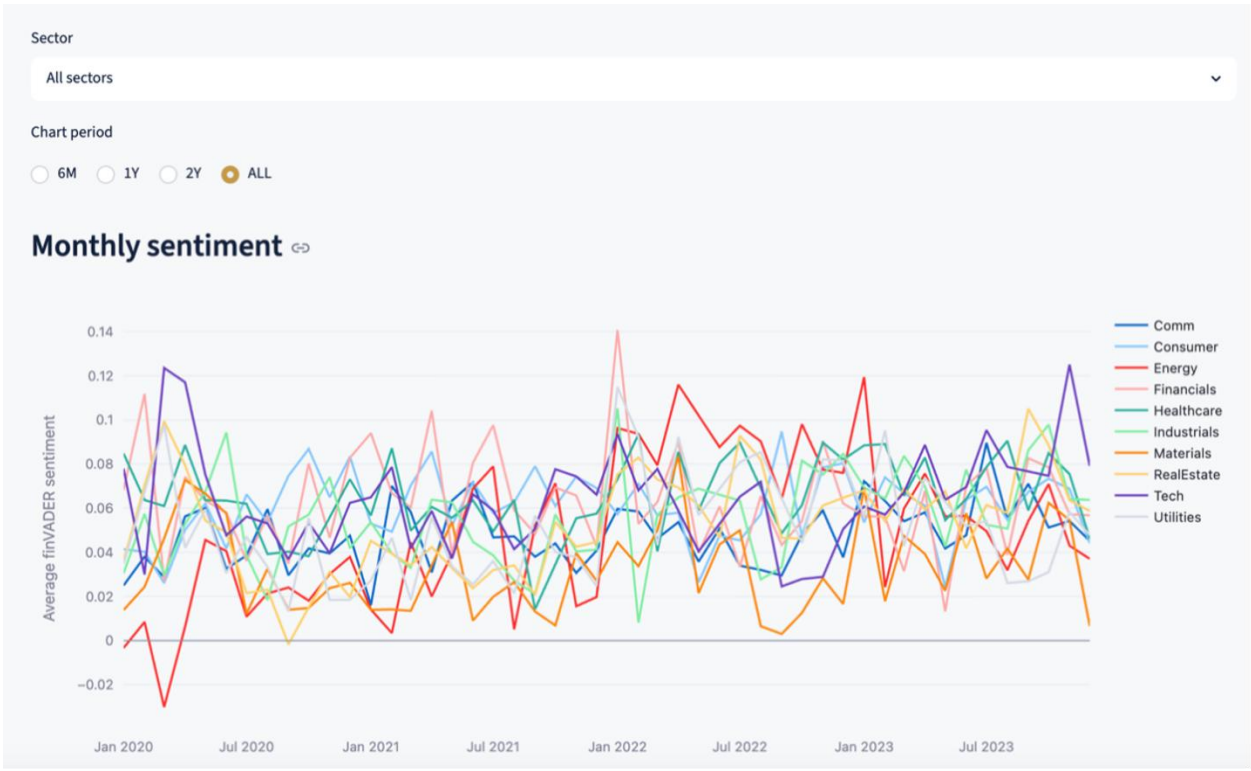
(a) Performance, downside risk, and diversification summary



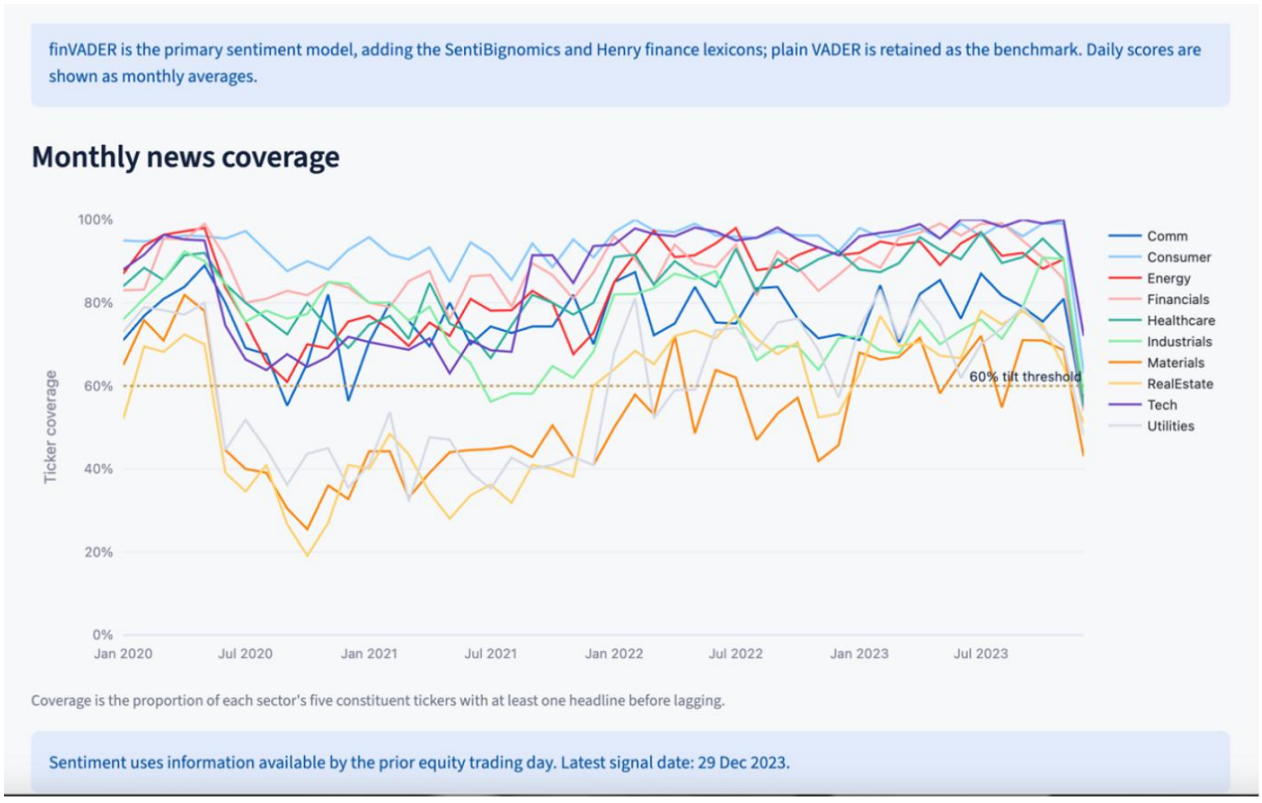
(b) Capital growth, drawdown and portfolio holdings

Figure 7. EasyFunds Fund Fact Sheet

The Sector Pulse provides a separate view of market conditions using the finVADER sentiment index together with news coverage. Sentiment is presented as a supporting market monitoring signal, reflecting the earlier finding that sentiment tilts did not improve the underlying portfolios.



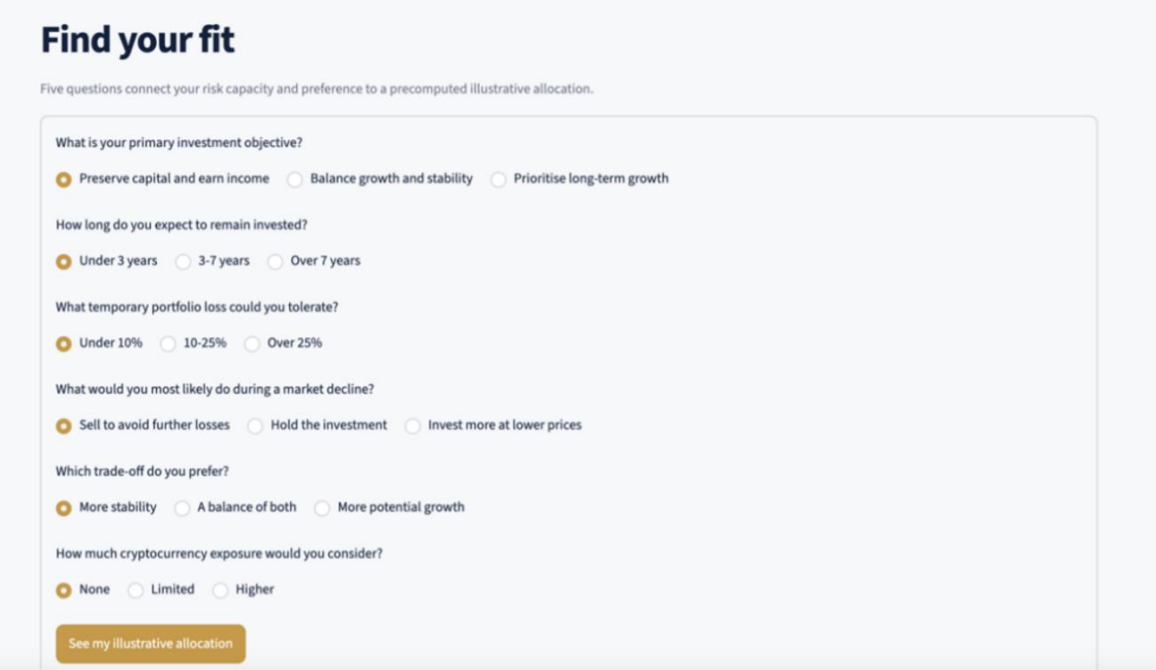
(a) Monthly sector sentiment



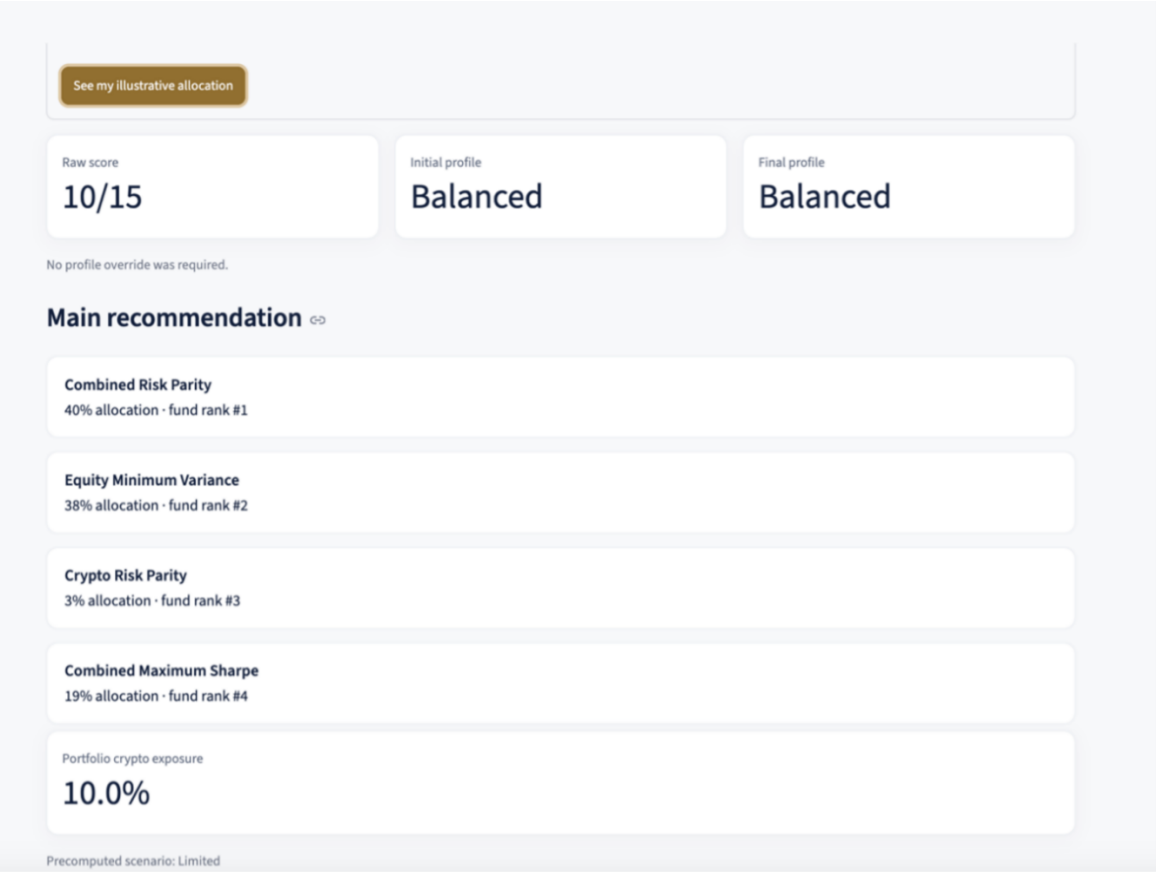
(b) Monthly sector news coverage

Figure 8. EasyFunds Sector Pulse

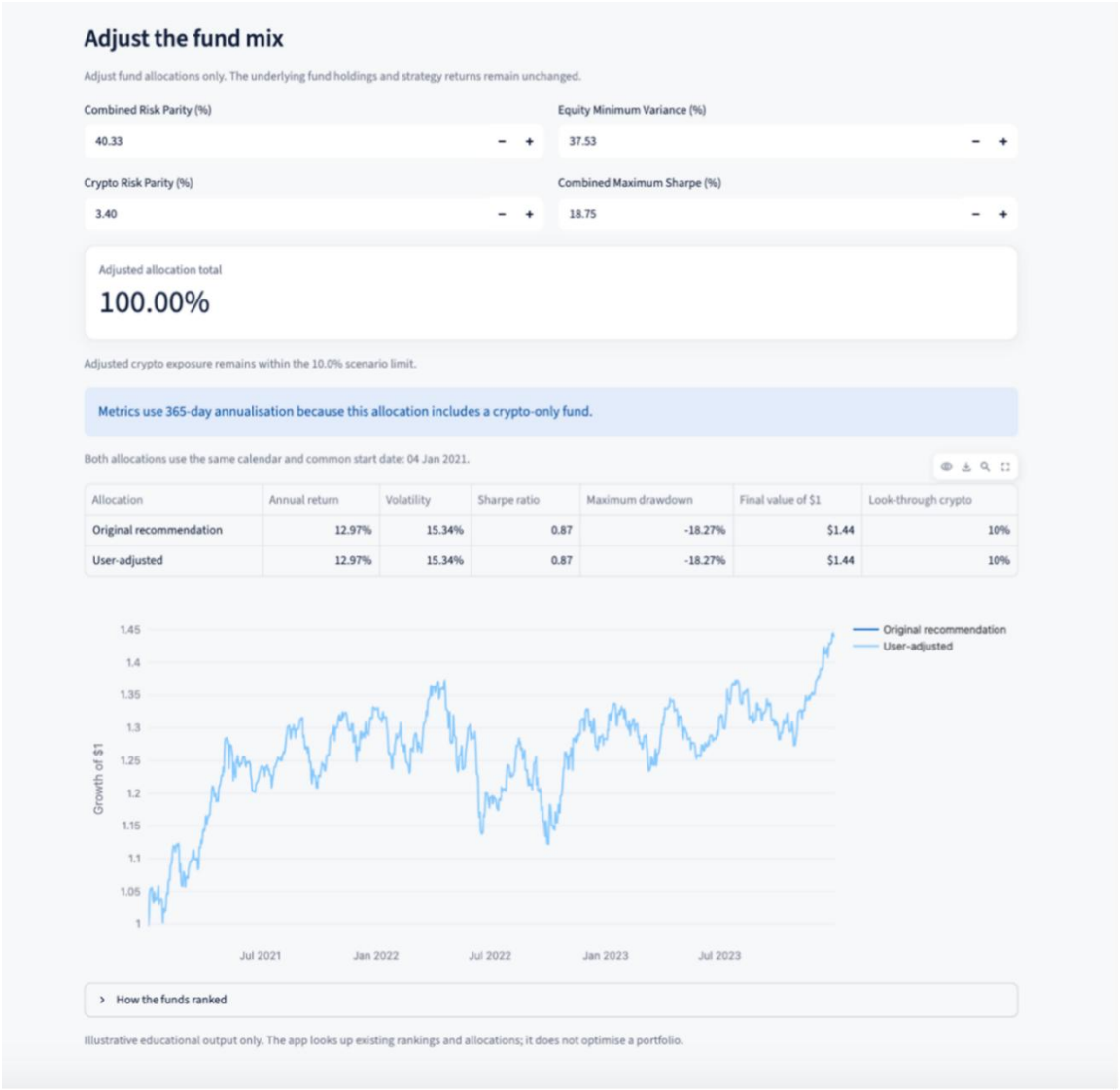
Users then complete the Find Your Fit questionnaire and receive an illustrative allocation based on their suitability profile and crypto preference. The recommendation allocation remains visible while user adjust fund weights, allowing a direct comparison between the original customised portfolios. Changes in return, volatility, Sharpe ratio, maximum drawdown, growth of $1 and look-through crypto exposure are shown immediately. If the adjusted crypto exposure exceeds the relevant suitability limit, the app provides a clear warning rather than automatically changing the option. The allocation tools also allow users to apply an illustrative annual management fee and compare gross and net-of-fee historical growth.



(a) Find Your Fit questionnaire



(b) Recommendation allocation



(c) Adjustable fund mix



(d) Illustrative fee impact

Figure 9. EasyFunds Adjustable Allocation and Illustrative Fee Impact

10. Limitations

This project has several limitations. Firstly, the 2020-2023 sample captures several unusual market regimes such as the pandemic, the boom and bust of the cryptocurrency market and rapid interest rate hikes, so the historically results may not generalise to other periods. Then, the back tests assume zero transaction costs and zero risk-free rate, while the investment universe excludes assets such as bonds and cash. Especially, optimisation is sensitive to estimation error, which may explain why Equity Equal Weight outperformed Equity Maximum Sharpe. The finVADER also remains a lexicon-based model and may miss context or company specific meaning. Sector aggregation, the one-day lag and the 60% coverage rule may further weaken short-term sentiment signals. In addition, the dataset contains headline rather than full articles, so sentiment scores are based on a noisy and incomplete proxy for the full content. Finally, the suitability questionnaire is a simplified educational prototype and does not capture an investor's full financial situation. These limitations mean that the results should be treated as historical guidance rather than predictions or personalised financial advice.

11. Real-world Recommendations

There are three several real-world recommendations reflected by this project. First, novice investors should not only focus on high returns. They should also consider volatility and maximum drawdown and whether they can tolerate large losses before choosing a high-risk fund. Second, investors should understand what a fund actually holds rather than treating it as a simple investment product. Fund holdings may span different sectors, while market news and sentiment can provide useful supporting context for understanding changes in those sectors. Third, investment recommendation should match the investor rather than simply identify the historical best performing fund. Investment horizon, loss tolerance and crypto preference should all be considered when determining a suitable allocation.

12. Conclusion

In conclusion, EasyFunds was developed to help novice investors compare funds and choose allocations based on both return and risk. The results show that Crypto-only funds generated the highest returns but also experienced the greatest volatility and drawdowns, while Combined Risk Parity provided a more balanced risk-return outcome. EasyFunds applies finVADER to score the news sentiment, but the sentiment tilt did not improve portfolio performance, so sentiment is retained as a supporting market-monitoring tool. Overall, EasyFunds combines fund analysis, suitability assessment and adjustable portfolio allocation to help investors make more informed decisions.

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