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NEW CONSTRUCTS

Reconstructing Data-driven Alpha

Executive Summary

- As evidenced by a Harvard Business School (HBS) and MIT Sloan [paper](#), new technology makes it possible to carve out a superior measure of a firm's net earnings, which is more accurate and representative of the core profitability of businesses. They call it "[Core Earnings](#)".
- Core Earnings are difficult to capture and require a thorough inspection of 10Ks & 10Qs, especially footnotes and other obscure disclosures.
- Market participants are slow to react to Core Earnings, presenting good investment opportunities as detailed in this paper.
- Invisage tested the Earnings Distortion (Core Earnings + Earnings Distortion = Net Income) signal within S&P 500 constituents universe across various investment use cases and found that all portfolios have produced at least 1.5% more annualized performance than the market benchmark.
- Smart Beta strategies, which invest in all S&P 500 companies based on Earnings Distortion, demonstrate its effectiveness as a portfolio construction factor, while the Truth stocks shine light on the performance of companies with no earnings distortion.
 - S&P 500 Smart Beta strategy produced 14% annualized return in 10yrs while S&P 500 did 12%
 - Machine Learning Model S&P 500 Smart Beta strategy produced 18.2% annualized return in 3.5yrs while S&P 500 did 13.8%
 - Truth Stocks within Russell 3000 produced 28.7% annualized return in 11yrs while the index did 12.5%
 - Truth Stocks within S&P 500 produced 17.6% annualized return in 11yrs while the index did 12.8%

[New Constructs](#) is an independent investment research that offers Core Earnings data for more than 5000 US stocks by leveraging a patented process that combines human expertise with NLP/ML/AI technologies.

[Invisage](#) is AltHub's data analytics platform that helps investors use alternative data to generate performance.

1. Introduction

While a great deal of emphasis is placed on the use of alternative data to drive alpha, a key area that is being overlooked is the application of sophisticated data science techniques and enrichment of traditional fundamental datasets as a source of new alpha.

Legacy data providers tend to focus on scale over accuracy and often lack the operational infrastructure to avoid errors, omissions & biases (usually caused by rudimentary data collection policies and inconsistent processes) that render their data & research based on it less reliable than investors realize.

New Constructs

Founded in 2002, New Constructs is an independent investment research firm that delivers novel insights into the fundamentals and valuation of businesses that are missed by traditional research providers. The firm leverages cutting-edge ML/AI/NLP technology analyses financial statements and footnotes with greater accuracy and speed than legacy data providers..

For the purposes of this paper, we have focused on **Earnings Distortion dataset**, which measures the difference of company reported earnings from Core Earnings. It is the total of all (hidden and reported) unusual losses and gains and the income tax distortion associated with these items.

$$\textit{Earnings Distortion} = \textit{Reported Earnings} - \textit{Core Earnings}$$

The Earnings Distortion dataset can identify variances due to often hidden factors such as foreign currency expenses, restructuring expenses, real estate, corporate development, legal and regulatory issues and other aspects such as pension expenses. See [here](#) for a full breakdown. These figures can be significant and are often overlooked by investors when developing earnings based valuations and profitability based factors.

Furthermore, a Harvard Business School (HBS) & MIT Sloan paper published in [The Journal of Financial Economics](#) features New Constructs novel Core Earnings and Earnings Distortions datasets and proves that [errors, omissions and biases distort fundamental](#) data provided by legacy data providers.

Further details about the dataset can be found in Appendix 1.

2. Scope and Findings of this paper

We used Invisage’s portfolio modelling and backtesting platform to apply systematic rigour and showcase in this paper how predictive and alpha-generating the New Constructs’ Earnings Distortion Dataset is.

We tested the Quarterly Earnings Distortion data within the fully replicated S&P500 constituents universe from 2010 to 2021 and assessed its predictability of future stock price performance.

We found that, even within the large-cap dominated S&P500 investment universe, Earnings Distortion was able to clearly identify the winners from losers and outperformed the market benchmark in all portfolios.

Below are some of the key questions that we tried to answer for investors who want to use the Core Earnings and Earnings Distortion data in the investment decision making process. Please reach out to us at info@invisagealpha.com for any questions on the methodology or the backtesting rules.

1. *Does Earnings Distortion influence stock price performance?*

Yes, in our opinion Earnings Distortion does influence stock price performance.

We constructed a LONG ONLY “Earnings Distortion Smart Beta” strategy* on the S&P500 to test it as a portfolio construction factor and, per below, outperformance against the marketcap weighted index indicates that it can drive superior returns.

Earnings Distortion S&P500 Smart Beta Portfolio

Portfolio Total Return	S&P 500 Total Return	Portfolio Annualized Return	S&P 500 Annualized Return	Sharpe Ratio	Sortino Ratio	Alpha	Beta
291.58%	232.30%	13.94%	12.12%	0.97	1.71	1.40%	1.01

*portfolio invested in all stocks of S&P500 at all times, weighted based on the Earnings Distortion decile

2. *Can the data be used to build statistical models? what kind of performance can be generated?*

Using the detailed Earnings Distortion data from 2010 to 2017, we trained a machine learning algorithm to predict the next quarterly return for all S&P500 constituent stocks. We tested its performance from 2018 to 2021, which showcases clear outperformance over S&P500 as well as considerably higher annualized performance compared to the Earnings Distortion Smart Beta strategy.

Earnings Distortion ML Model S&P500 Smart Beta Portfolio*

Portfolio Total Return	S&P 500 Total Return	Portfolio Annualized Return	S&P 500 Annualized Return	Sharpe Ratio	Sortino Ratio	Alpha	Beta
78.62%	56.4%	18.02%	13.73%	0.82	1.47	3.73%	1.01

*portfolio invested in all stocks where ML model predicted positive performance. At all times portfolio is invested in more than 80% of all S&P500 constituents.

3. *How do the companies that have no Earnings Distortion, i.e. that faithfully report accurate earnings, perform?*

With overwhelming evidence, we prove that companies with no Earnings Distortion (termed as “Truth Stocks”) perform better than the market. Due to the good accounting and disclosure practices, we believe Truth Stocks should be considered as an ESG product, falling within the governance bucket.

Truth Stocks (Russell 3000 Universe)

Portfolio Total Return	Russell 3000 Total Return	Portfolio Annualized Return	Russell 3000 Annualized Return	Sharpe Ratio	Sortino Ratio	Alpha	Beta
1362.19%	252.49%	28.67%	12.56%	0.99	2.06	16.63%	0.75

Truth Stocks (S&P 500 Universe)

Portfolio Total Return	S&P 500 Total Return	Portfolio Annualized Return	S&P 500 Annualized Return	Sharpe Ratio	Sortino Ratio	Alpha	Beta
536.83%	294.56%	17.62%	12.78%	0.74	1.69	4.69%	0.98

3. Data Review and Preparation

As the first step of our analysis, we reviewed the Earnings Distortion dataset for any data quality and survivorship bias issues. We found no survivorship bias issues in the data as historic delisted stocks (taken privately as well as merged/acquired by other companies) are represented accurately as well as intentional company ticker changes. We also did not notice any data quality issues on the dataset.

Similarly in current analysis, whereby we replicated the universe of the S&P 500 quarter on quarter so that it matches 100% with that of the S&P 500 index at any point in time within the analysis period, survivorship bias was addressed by liquidating the holdings of stocks being delisted, on the day they got delisted.

4. Trading Strategies

4.1. Earnings Distortion S&P500 Smart Beta Portfolio

This is a LONG ONLY portfolio created to test the top level total Earnings Distortion as a portfolio construction factor. To be able to compare the Earnings Distortion between companies with different magnitude of Earnings Distortion, we had 5 options to normalize it.

- Marketcap
- Total Assets
- Net Income
- Revenue
- Weight Average Diluted Shares Outstanding (WADSO)

To be able to allocate weights according to the normalized total earnings value, we split the normalized total distortion values into deciles. We divided the deciles with all 5 factors and tested the performance.

Data Transformation

- Normalization: Marketcap (highest performance as well as the best factor with highest demarcation of performance between the deciles)
- We inverted the sign of total distortion value before normalizing it, so that the sign matches the expected return.

Decile Creation

For creating the deciles, we used the similar methodology as the HBS & MIT Sloan paper whereby deciles for a particular date were assigned based on the distribution of Earnings Distortion values (normalized by the same factor) in the prior calendar year.

Weighting Scheme

After analyzing the performance contribution of each decile, the best combination to convert deciles into weighting scheme was to group every 2 adjacent deciles such that overall we had 5 groups in total. This was done because the highest (or lowest) performing decile was always in the top 2 (or bottom 2).

DECILE	WEIGHT
9	16.67%
8	16.67%
7	13.33%
6	13.33%
5	10.00%
4	10.00%
3	6.67%
2	6.67%
1	3.33%
0	3.33%

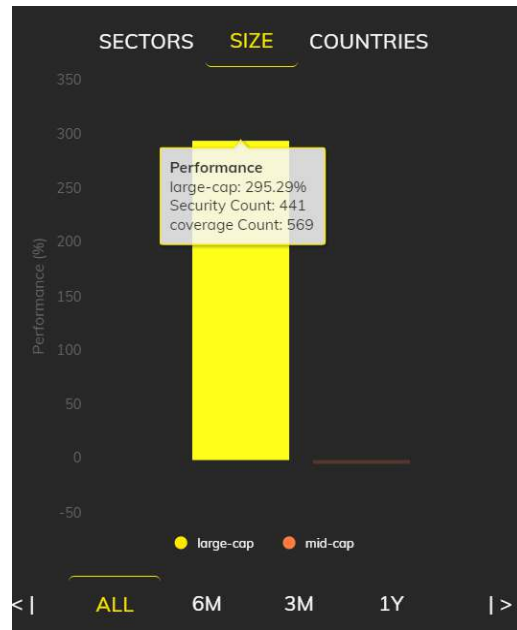
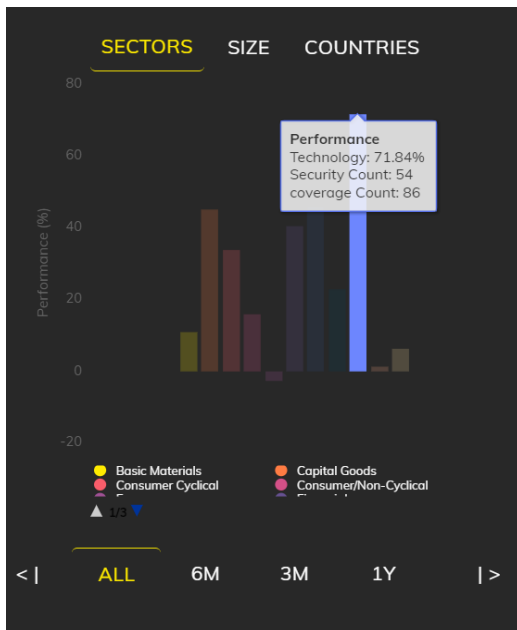
Portfolio Rules

- Start Date: 3rd January 2011
- End Date: 30th June 2021
- Universe: Invested in all S&P 500 constituent companies at all times.
- Weighting Scheme: Decile Score Weight (as mentioned above)
- Position Entry: Positions are opened 3 business days after a company files the 10-Q or 10-K
- Position Duration: Positions are held until 3 business days after the next earnings date, on which date weight is adjusted if the decile changes based on the new Earnings Distortion value.
- Trade Price: We used the market “close” price on the day of position entry or exit
- Rebalancing: Portfolios trade everyday based on new earnings releases with 3 business days lag as mentioned above. I.e. no trades are done on a day if there are no new earnings 3 business days prior. However, the weights of existing stocks in the portfolio are not rebalanced every time a new stock comes into the portfolio. Instead, a reallocation is performed on the weights of the existing stocks in a pari-passu manner.
- Book currency: USD
- Transaction costs: None for base portfolio. Performance tested with 1bps, 2bps and 5bps.
- Slippage costs: None for base portfolio. Performance tested with 1% and 1.5% slippage costs.
- Stop loss: None

Performance of Earnings Distortion S&P500 Smart Beta Portfolio

Portfolio Total Return	S&P 500 Total Return	Portfolio Annualized Return	S&P 500 Annualized Return	Sharpe Ratio	Sortino Ratio	Alpha	Beta
291.58%	232.30%	13.94%	12.12%	0.97	1.71	1.40%	1.01

Please refer to Appendix 2 for detailed description on how each of the performance measures are calculated



Effect of Transaction Cost & Slippage

Transaction Cost	Slippage	Net Total Perf	S&P 500 Total Perf	Net Annualized Perf	S&P 500 Annualized Perf	Net Sharpe Ratio	Net Sortino Ratio	Turnover
1 bps	1%	290.56%	232.30%	13.91%	12.12%	0.96	1.69	30.88%
1 bps	1.5%	290.13%	232.30%	13.91%	12.12%	0.95	1.69	30.91%
2 bps	1%	290.38%	232.30%	13.91%	12.12%	0.96	1.69	30.90%
2 bps	1.5%	289.96%	232.30%	13.90%	12.12%	0.95	1.69	30.92%
5 bps	1%	289.87%	232.30%	13.90%	12.12%	0.95	1.69	30.93%
5 bps	1.5%	289.45%	232.30%	13.89%	12.12%	0.95	1.68	30.96%

Please refer to Appendix 2 for detailed description on how transaction cost and slippage are factored in portfolio performance.

Conclusion

As stated in section 2, we think the evidence is strong enough to determine that Earnings Distortion does influence the price performance and is a superior factor to construct portfolios than marketcap.

4.2. Earnings Distortion ML Model S&P500 Smart Beta Portfolio

We used the detailed Earnings Distortion data (with 31 fields in total including the total Earnings Distortion) from 2010 to 2017 to train multiple machine learning models to predict the next quarterly return for all S&P500 constituent stocks. We tested the performance of each model from 2018 to 2021 before picking the model with highest accuracy and portfolio performance.

Best Machine Learning Model

We found the Random Forest model to be the most accurate (and with lowest mean square error)

Best Normalization Factor

Net Income

Significant Distortion Factors

Along with the detailed earnings distortion fields, we used sector and size as categorical input fields to train the model. Out of all the input features, the top 5 fields the model found most significant, amounting to 48.5% of the overall significance, are:

1. tax_distortion
2. earnings_distortion_total
3. earnings_distortion_expenses_company_defined_other
4. earnings_distortion_reported_pre_tax
5. earnings_distortion_expenses_other

Selection Criteria

Only the companies for which the model predicted positive performance over the next quarter. It is worth noting that during the entire period, portfolio is invested in more than 80% of S&P500 constituents at all times.

Rules:

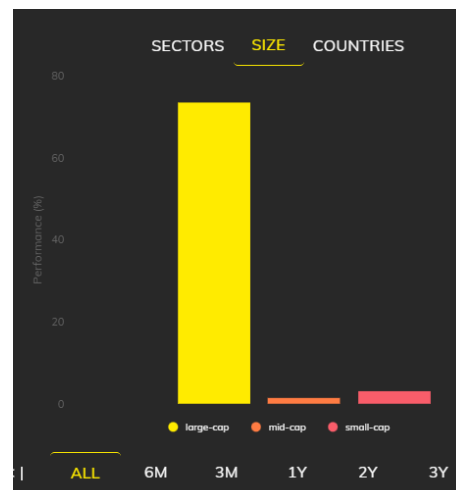
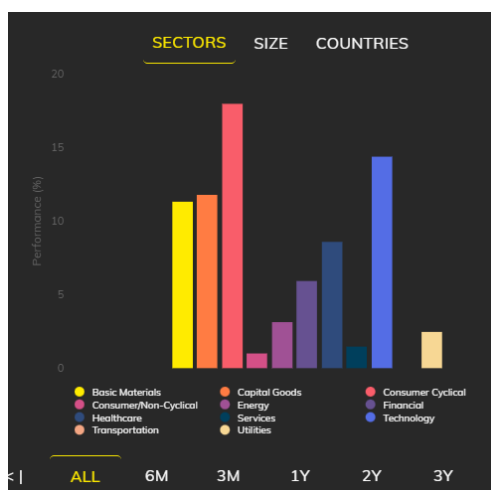
- Start Date: 8th January 2018
- End Date: 30th June 2021
- Universe: Invested in all S&P 500 companies that are predicted to have positive return over the next quarter
- Weighting Scheme: Weighted using the next quarterly return predicted by the ML model.
- Position Entry: Positions are opened 3 business days after a company files the earnings
- Position Duration: Positions are held until 3 business days after the next earnings date, on which date selection criteria is applied again to determine the position.
- Trade Price: We used the market “close” price on the day of position entry or exit

- **Rebalancing:** Portfolios trade everyday based on new earnings releases with 3 business days lag as mentioned above. I.e. no trades are done on a day if there are no new earnings 3 business days prior. However, the weights of existing stocks in the portfolio are not rebalanced every time a new stock comes into the portfolio. Instead, a reallocation is performed on the weights of the existing stocks in a pari-passu manner.
- **Book currency:** USD
- **Transaction costs:** None for base portfolio. Performance tested with 1bps, 2bps and 5bps.
- **Slippage costs:** None for base portfolio. Performance tested with 1% and 1.5% slippage costs.
- **Stop loss:** None

Performance of Earnings Distortion ML Model S&P500 Smart Beta Portfolio

Portfolio Total Return	S&P 500 Total Return	Portfolio Annualized Return	S&P 500 Annualized Return	Sharpe Ratio	Sortino Ratio	Alpha	Beta
178.62%	252.49%	18.17%	13.73%	0.82	1.47	16.63%	0.75

Please refer to Appendix 2 for detailed description on how each of the performance measures are calculated



Effect of Transaction Cost & Slippage

Transaction Cost	Slippage	Net Total Perf	S&P 500 Total Perf	Net Annualized Perf	S&P 500 Annualized Perf	Net Sharpe Ratio	Net Sortino Ratio	Turnover
1 bps	1%	76.90%	56.40%	17.86%	13.73%	0.81	1.45	264.82%
1 bps	1.5%	76.19%	56.40%	17.73%	13.73%	0.80	1.44	265.53%
2 bps	1%	76.61%	56.40%	17.81%	13.73%	0.80	1.44	265.10%
2 bps	1.5%	75.90%	56.40%	17.68%	13.73%	0.80	1.43	265.81%
5 bps	1%	75.76%	56.40%	17.65%	13.73%	0.80	1.43	265.96%
5 bps	1.5%	75.04%	56.40%	17.52%	13.73%	0.79	1.42	266.67%

Please refer to Appendix 2 for detailed description on how transaction cost and slippage are factored in portfolio performance.

Conclusion

As mentioned in section 2, the Earnings Distortion dataset is well-suited to run quantitative models and extract market superior returns. As evidenced, the machine learning model portfolio not only outperformed the S&P500 index but also performed considerably higher (based on annualized performance) compared to the Smart Beta portfolio.

4.3. Truth Stocks Portfolios

Truth Stocks are companies that have zero (or near zero) Earnings Distortion. These are the companies that faithfully report accurate earnings and have rigorous disclosure practices and accounting standards. To test how such Truth Stocks perform, we created 2 portfolios within Russell 3000 and S&P500 constituent universes.

Selection Criteria

While it was straightforward to identify the stocks with no earnings distortion in Russell 3000 constituent universe, the S&P500 had very few matches. Hence we tested a few thresholds of Earnings Distortion from 0.05% to 0.5% of the net income to identify the best performing combination.

- Earnings Distortion = \$0 for Russell 3000
- Earnings Distortion \leq 0.1% of Net Income for S&P500

Portfolio Rules

- Start Date: 1st February 2010 (S&P 500)
8th November 2010 (Russell 3000)
- End Date: 30th June 2021
- Universe: Invested in companies that pass the above selection criteria within Russell 3000 or S&P 500
- Weighting Scheme: Equally weighted across all stocks that pass the above selection criteria
- Position Entry: Positions are opened 3 business days after a company files the 10K or 10Q
- Position Duration: Positions are held until 3 business days after the next earnings date, on which date selection criteria is applied again to determine the position.
- Trade Price: We used the market “close” price on the day of position entry or exit

- Rebalancing Portfolios trade everyday based on new earnings releases with 3 business days lag as mentioned above. I.e. no trades are done on a day if there are no new earnings 3 business days prior. However, the weights of existing stocks in the portfolio are not rebalanced every time a new stock comes into the portfolio. Instead, a reallocation is performed on the weights of the existing stocks in a pari-passu manner.
- Book currency: USD
- Transaction costs: None for base portfolio. Performance tested with 1bps, 2bps and 5bps.
- Slippage costs: None for base portfolio. Performance tested with 1% and 1.5% slippage costs.
- Stop loss: None

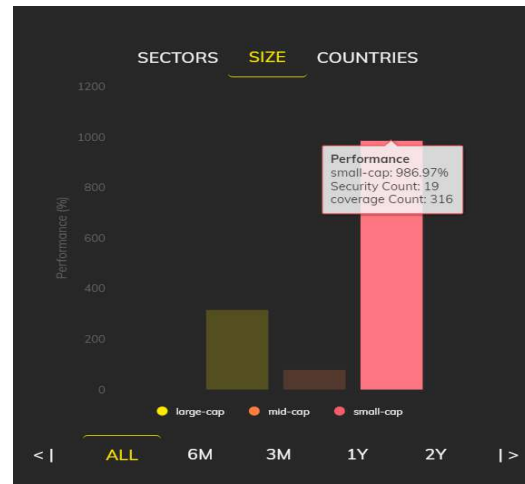
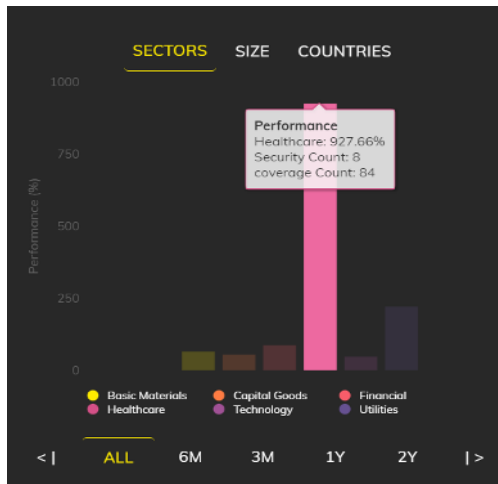
Performance

Truth Stocks (Russell 3000 Universe)

Portfolio Total Return	Russell 3000 Total Return	Portfolio Annualized Return	Russell 3000 Annualized Return	Sharpe Ratio	Sortino Ratio	Alpha	Beta
1362.19%	252.49%	28.67%	12.56%	0.99	2.06	16.63%	0.75

Please refer to Appendix 3 for detailed description on how each of the performance measures are calculated





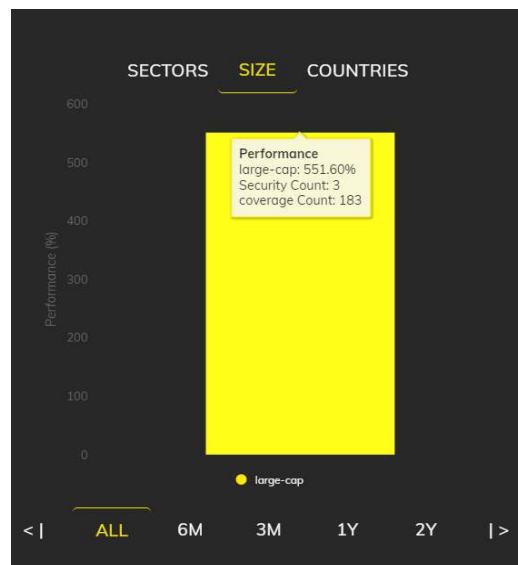
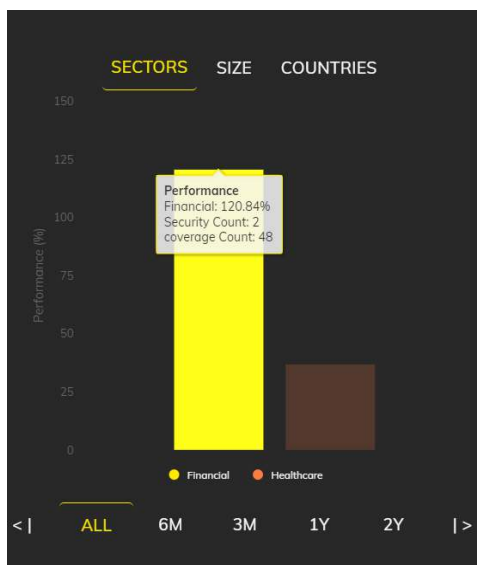
Effect of Transaction Cost & Slippage - Truth Stocks (Russell 3000 Universe)

Transaction Cost	Slippage	Net Total Perf	Russell 3000 Total Perf	Net Annualized Perf	Russell 3000 Annualized Perf	Net Sharpe Ratio	Net Sortino Ratio	Turnover
1 bps	1%	1347.97%	251.32%	28.55%	12.56%	0.97	2.03	141.20%
1 bps	1.5%	1342.04%	251.32%	28.51%	12.56%	0.97	2.01	141.75%
2 bps	1%	1345.60%	251.32%	28.53%	12.56%	0.97	2.02	141.42%
2 bps	1.5%	1339.67%	251.32%	28.49%	12.56%	0.96	2.01	141.97%
5 bps	1%	1338.49%	251.32%	28.48%	12.56%	0.96	2.00	142.08%
5 bps	1.5%	1332.56%	251.32%	28.43%	12.56%	0.96	1.99	142.63%

Truth Stocks (S&P 500 Universe)

Portfolio Total Return	S&P 500 Total Return	Portfolio Annualized Return	S&P 500 Annualized Return	Sharpe Ratio	Sortino Ratio	Alpha	Beta
536.83%	294.56%	17.62%	12.78%	0.74	1.69	4.69%	0.98

Please refer to Appendix 3 for detailed description on how each of the performance measures are calculated



Effect of Transaction Cost & Slippage - Truth Stocks (S&P 500 Universe)

Transaction Cost	Slippage	Net Total Perf	S&P 500 Total Perf	Net Annualized Perf	S&P 500 Annualized Perf	Net Sharpe Ratio	Net Sortino Ratio	Turnover
1 bps	1%	512.20%	294.56%	17.21%	12.78%	1.03	2.15	496.69%
1 bps	1.5%	501.94%	294.56%	17.04%	12.78%	1.20	2.10	503.97%
2 bps	1%	508.10%	294.56%	17.15%	12.78%	1.02	2.13	499.58%
2 bps	1.5%	497.84%	294.56%	16.97%	12.78%	1.00	2.08	506.95%
5 bps	1%	495.78%	294.56%	16.94%	12.78%	1.00	2.07	508.44%
5 bps	1.5%	485.52%	294.56%	16.76%	12.78%	0.98	2.02	516.07%

Please refer to Appendix 2 for detailed description on how transaction cost and slippage are factored in portfolio performance.

Conclusion

It is evident that companies that disclose true earnings and ensure no (or close to 0) Earnings Distortion outperform the market. Due to the good accounting and disclosure practices, we believe Truth Stocks should be considered as good ESG stocks, falling within the governance bucket.

While there is a long standing debate about ESG factors and their ability to produce alpha, as we demonstrated, niche and obscure ESG phenomena like Truth Stocks definitely have alpha capabilities.

5. Investment Use Cases and Data Integration

Based on the performance of various portfolios we created using the Earnings Distortion data, we feel it can support several investment use cases:

Use case	Details	Illustrative integration into investment workflows
Idea generation	Truth Stocks as well as Top deciles of Earnings Distortion within a chosen investment universe can be used as either a confirmatory signal or potential new idea generator	Add a screener to investment case development process
Position sizing	The level of total Earnings Distortion can be used to set conviction levels and score risk-adjusted expected returns	Incorporate Earnings Distortion into position size bands
ESG	The Truth Stocks is a unique ESG phenomenon to be used in improving the tactical as well as long term ESG footprint of portfolio	Incorporate Earnings Distortion scores within ESG data overlay
Market timing	As deciles of Earnings Distortion change quarter on quarter within the chosen investment universe, risk-on/off signals can be determined to adjust portfolio holdings	Set-up alerts to identify decile changes in Earnings Distortion for watchlist universe
Portfolio construction	At an aggregate level, Earnings Distortion can be used to identify market characteristics and align short-term signals to longer term themes	Identify Earnings Distortion changes across specific categories (e.g. value versus growth, cyclicals versus structurals) to align themes to technical indicators

Appendix 1: Core Earnings & Earnings Distortion

- **What are [Core Earnings](#)?**

- The Harvard Paper describes the Core Earnings as the predictable and recurring component of net earnings contributed by the core business activity.

“... components of firms' GAAP earnings stemming from ancillary business activities or transitory shocks are significant in frequency and magnitude. These components have grown over time and are dispersed across various sections of the 10-K. Excluding them from GAAP earnings yields a Core Earnings measure that distinguishes between the recurring and non-recurring components of net income and forecasts future performance”

- **What is Earnings Distortion?**

- It is the difference between company reported net income and the Core Earnings as defined by the above-mentioned Harvard Paper.

$$\text{Core Earnings} + \text{Earnings Distortion} = \text{Net Income}$$

- Companies with positive Earnings Distortion are effectively overstating the earnings due to positive non-recurring revenues from non-core or unusual activities.
- Companies with negative Earnings Distortion are understating the earnings due to non-recurring expenses from non-core or unusual activities.

- **Why is it important?**

- The Harvard Paper proves that market is slow to react to Earnings Distortion, presenting good opportunities for investors who can identify these distortions before the market catches-up.

“Analysts and market participants are slow to impound these earnings components' implications, particularly the amounts disclosed in footnotes. Trading strategies that exploit non-Core Earnings produce abnormal returns of 8% per year.”

- **What is the baseline performance one can expect?**

- The Harvard Paper has looked at Russell3000 stock universe from 1998 to 2017 and analyzed the performance behaviour by splitting stocks into deciles of dollar value Earnings Distortion.

“..firms in decile 10 have a value-weighted average annual return of 11.9%, and firms in decile 1 have an average return of 3.5%. The 8.4% spread in raw returns is both statistically and economically significant.”

- Russell3000 during the same time (1998 to 2017) produced an annual return of 5.48%
- They also noted that the spread in returns concentrates among the lowest decile, suggesting investors are particularly slow at pricing adjustments that overstate GAAP relative to Core Earnings (e.g. large non-recurring gains).

	Annual Returns	Factor-Adjusted Alphas and Factor Loadings				
	Raw	ALPHA	MKTRF	SMB	HML	UMD
10 (High Adjustments)	11.927 (3.71)	0.157 (0.78)	0.937 (18.46)	0.188 (2.97)	0.078 (1.19)	-0.225 (-5.63)
9	9.825 (4.34)	0.197 (1.55)	0.921 (28.75)	-0.058 (-1.45)	0.190 (4.63)	-0.091 (-3.59)
8	11.532 (4.23)	0.360 (2.53)	0.944 (26.34)	-0.154 (-3.45)	0.255 (5.54)	-0.081 (-2.87)
7	8.886 (4.62)	0.110 (0.87)	0.957 (30.24)	-0.230 (-5.85)	0.219 (5.41)	-0.043 (-1.70)
6	10.568 (4.63)	0.023 (0.17)	0.964 (28.01)	-0.143 (-3.34)	0.262 (5.95)	-0.069 (-2.56)
5	10.875 (4.57)	-0.251 (-1.67)	1.050 (27.75)	-0.104 (-2.22)	0.268 (5.52)	0.017 (0.58)
4	9.060 (3.85)	0.058 (0.37)	1.089 (27.76)	0.040 (0.82)	0.370 (7.35)	-0.054 (-1.73)
3	11.149 (2.90)	0.443 (2.41)	1.012 (21.83)	0.054 (0.94)	-0.125 (-2.10)	-0.099 (-2.71)
2	9.390 (2.90)	-0.108 (-0.58)	1.083 (23.11)	0.107 (1.83)	-0.544 (-9.06)	-0.101 (-2.73)
1 (Low Adjustments)	3.529 (1.27)	-0.504 (-1.80)	1.224 (17.37)	0.130 (1.49)	-0.725 (-8.02)	-0.248 (-4.45)
High – Low	8.398 (2.74)	0.661 (1.94)	-0.287 (-3.34)	0.057 (0.54)	0.802 (7.30)	0.022 (0.33)

- **What are the key sub-components of Earnings Distortion?**
 - New Constructs provides the total Earnings Distortion (`earnings_distortion_total`) which is further broken down into 4 individual components, namely `earnings_distortion_hidden`, `earnings_distortion_reported_pre_tax`, `earnings_distortion_reported_after_tax` and `tax_distortion`.
 - A more detailed feed is also available, which further breaks down each individual component into 26 level 2 sub categories. Please reach out to support@newconstructs.com for additional information on Earnings Distortion data feeds.

Appendix 2: Description of Performance Measures

- Sharpe Ratio: Risk adjusted return of the portfolio (without accounting for any risk free rate), calculated using the monthly returns from the inception date
- Sortino Ratio: Another risk adjusted return as Sharpe Ratio but calculated with down-side deviation instead of the standard deviation, using the monthly returns. Unlike Sharpe Ratio, any volatility in the positive returns of the portfolio is ignored and hence not punished for in Sortino Ratio
- Alpha: It is calculated by regressing the daily log returns of the portfolio with daily log returns of the benchmark from start date to end date. It is the intercept of the regression equation.
- Beta: It is calculated by regressing the daily log returns of the portfolio with daily log returns of the benchmark from start date to end date. It is the slope of the regression equation.
- Slippage: Slippage costs of applied on 10% of all trades, on either one side of the trade (BUY/SELL). Instead of randomly sampling the trades to apply the slippage, we equally applied the slippage on all trades.
 - 1% slippage cost on 10% of trades = 0.1% impact on all trades. Choosing either one side would effectively be 0.05% (5 bps) impact applied to all trades
 - 1.5% slippage cost on 10% of trades = 0.15% impact on all trades. Choosing either one side would effectively be 0.075% (7.5 bps) impact applied to all trades

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