10 TAKEAWAYS FROM 2022 TO BUILD RESILIENT STRATEGIES IN 2023

RavenPack

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From the Russian invasion of Ukraine to the energy crisis, from supply chain disruptions to global inflation, 2022 illustrated in compelling ways the importance of managing risk and catching opportunities in real time. As we begin a new chapter, it is worth looking back to what we learned over the past 12 months. This report compiles 10 data-driven insights from 2022 that better position you for the challenges of the new year.

ANTICIPATING **MACRO** TRENDS

1. **INFLATION NOWCASTING WORKS BETTER WITH SENTIMENT**
2. **NEWS ANALYTICS CAN DELIVER REAL-TIME GDP INDICATORS**
3. **REAL-TIME JOB DATA COMPLEMENTS MACRO MODELS**
4. **LISTEN TO EXECUTIVES TO BETTER GRASP THE MACRO LANDSCAPE**
5. **EARNINGS SENTIMENT BOOSTS SECTOR REBALANCING IN INDICES**

BUILDING **STRONGER PORTFOLIOS**

6. **DRAW ALPHA FROM WORKFORCE INTELLIGENCE**
7. **MAXIMIZE ALPHA CAPTURE DURING EARNINGS SEASON WITH NLP**
8. **CORPORATE CREDIT REBALANCING BENEFITS FROM SENTIMENT**
9. **ACCOUNT FOR ESG RISKS DURING EQUITY PORTFOLIO CONSTRUCTION**
10. **STEER CLEAR OF CONTROVERSY DURING BONDS SELECTION**

STAY AHEAD

AS THE WORLD WRESTLES WITH INFLATION AND A RECESSION

Whether 2023 will see a recession or a soft landing depends on many factors, but knowing *when* it happens will give a definite advantage to investors. For this, you need to form a real-time view of economic fundamentals.

Here are 5 ways to explore how alternative data can enhance strategies.

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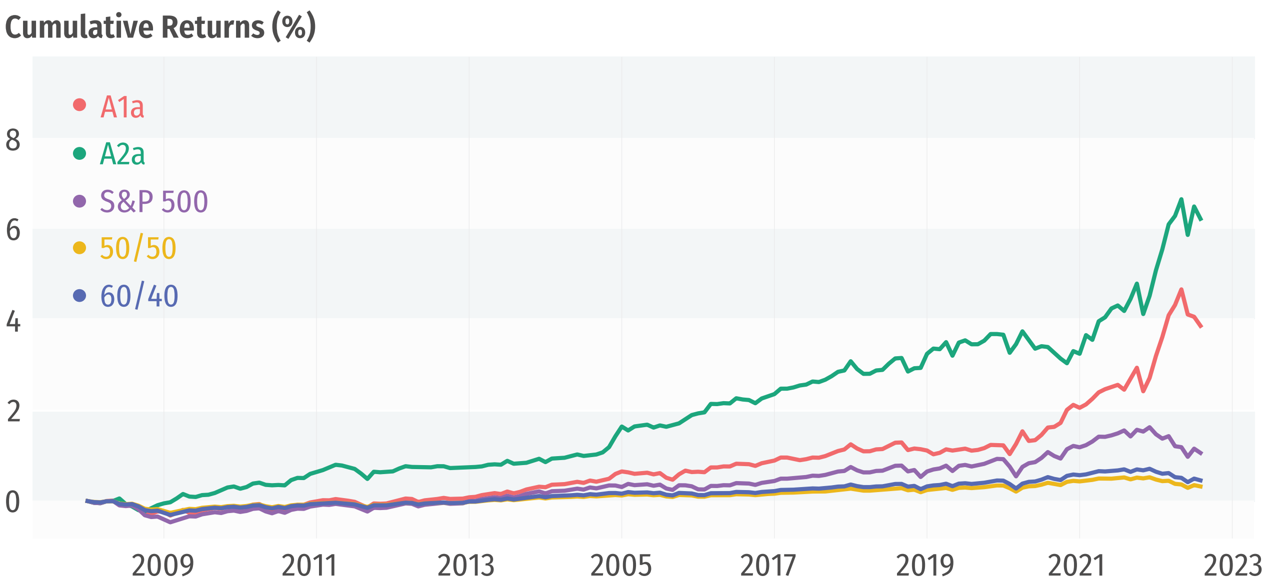
1 *INFLATION* NOWCASTING WORKS BETTER WITH *SENTIMENT*

Research shows that inflation strategies that incorporate sentiment outperform models that depend merely on past observed inflation. We tested this approach using predictions of the monthly US Consumer Price Index to allocate capital among three asset classes: an equity index, a commodity future and a risk-free asset. The proposed strategy outperforms passive investment strategies (50/50, 60/40, S&P 500). When targeting Headline and Core Consumer Price Index, this approach delivered a real Sharpe ratio (net of inflation) of 1.04 and 0.72, respectively. In gross terms, for the same targets, we get values of 1.22 and 0.88.

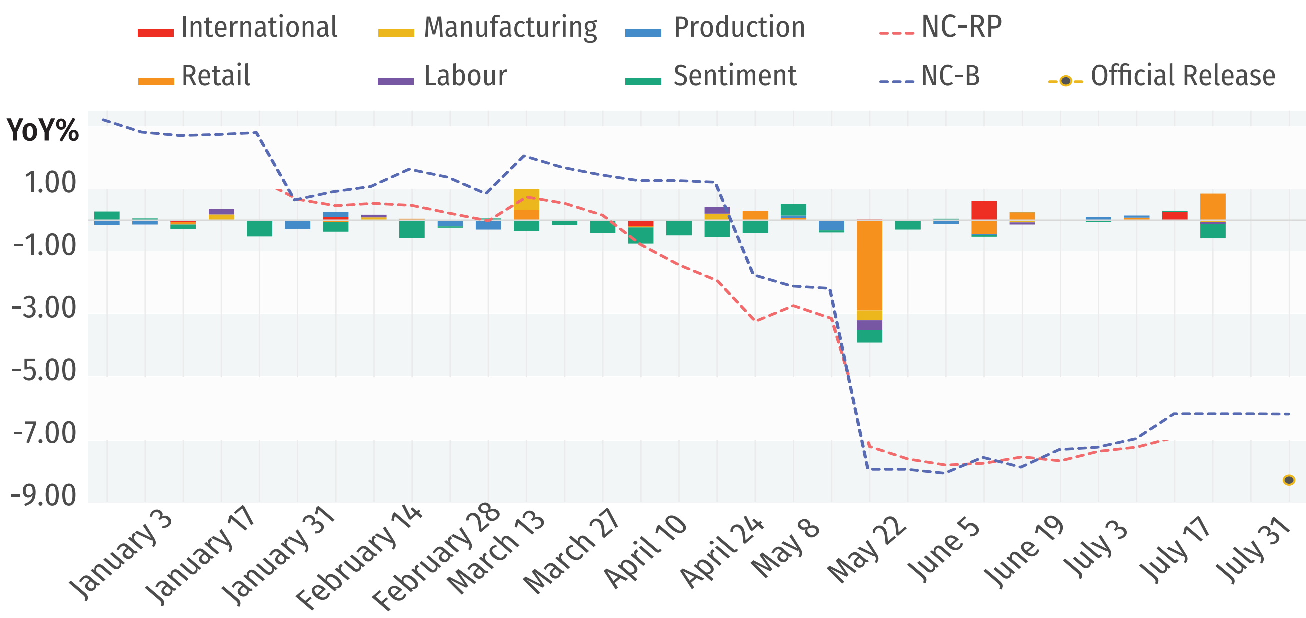
▼Real annualized cumulative returns, A1a (core CPI) and A2a (headline CPI) compared to the benchmarks: the S&P 500 Index, a passive strategy composed of 50% equities and 50% risk-free government bonds (50/50), and a passive strategy composed of 60% equities and 40% risk-free government bonds (60/40).



2 **NEWS ANALYTICS** CAN DELIVER REAL-TIME **GDP INDICATORS**

Advanced language models are now able to ¨consume¨ huge amounts of news and predict GDP in real time, solving the issue of official data lags. This is true for the largest economies like in the US, but also for developing economies like Brazil, India, and South Africa. Our **study** found that RavenPack news analytics helps improve timeliness and accuracy of traditional macroeconomic nowcasting models. Out-of-sample forecasting error improves by 5% to 25% depending on the country and the prediction period. Prediction accuracy is significantly enhanced during periods with a sparsity of core macroeconomic releases.

▼Evolution of the 2020-Q2 YoY% GDP prediction for Russia using the NC-RP DFM model incorporating RavenPack news signals (red dashed line) and the NC-B model (benchmark DFM using only macroeconomic data, blue dashed line). Colored bars represent the NR-RP model contributions of different variables to the nowcast revision.

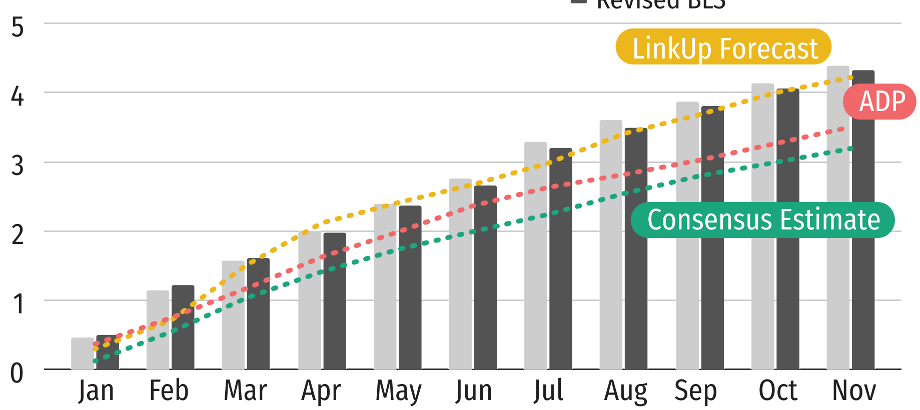


3 REAL-TIME **JOB DATA** COMPLEMENT **MACRO MODELS**

Beside inflation and GDP nowcasting, another macro indicator to track is the evolution of the job market —where official data can lag by several weeks. By looking at real time job data, it is possible to proxy macro labor figures way ahead of the release of official data, giving a valuable headstart for investors.

For instance, our partner LinkUp developed a model to forecast Non-Farm Payroll (NFP) data based on real-time job postings. Compared to consensus estimates, ADP, the initial BLS NFP, and the revised BLS numbers the LinkUp model was within 2.5% of the revised BLS numbers — an exceptionally close projection.

Cumulative Monthly Job Forecast (millions)



▲ **LinkUp Forecast, ADP, and Consensus Estimates v. Initial BLS Non-Farm Payrolls & revised BLS Non-Farm Payrolls (Jan-Nov 2022)** *Data: LinkUp*

RavenPack Job Analytics

powered by

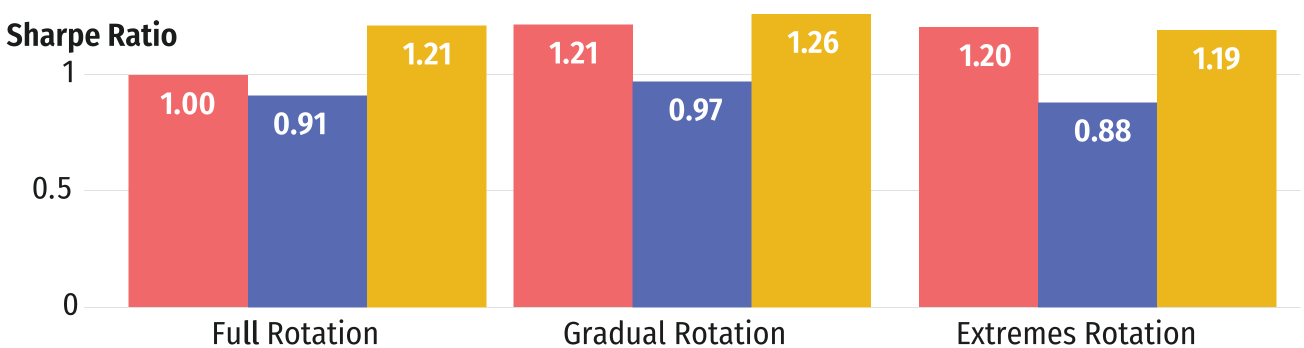
LinkUp

Leveraging LinkUp job data, RavenPack launched a new dataset of Job Analytics that applies Natural Language Processing (NLP) technology over entire job postings to provide actionable insights from company to macro trends. With data spanning back 15 years, a coverage of over 60,000 employers, a world-first knowledge graph of 5,000 roles and more than 3,000 skills, qualifications and benefits, the dataset now enables investors and analysts to track day-to-day changes in job market dynamics by sector, geography or company, find out whether Wall Street banks are now looking for crypto specialists, or if vaccination mandates are decreasing in retail.

4 LISTEN TO **EXECUTIVES** TO BETTER GRASP THE **MACRO LANDSCAPE**

Earnings calls can offer a window into the financial executives' views about the past, present, and future state of the economy. We used RavenPack event detection and sentiment scoring capabilities to analyze earnings call transcripts and create a real-time Transcript Economic Sentiment Indicator (TESI) for the U.S. Among others, we **found** that TESI can identify significant inflection points in the U.S. economic activity and detect meaningful changes in the business cycle. The model accurately detects up to 70% of the U.S. GDP upshifts and 60% of downshifts.

▼Sharpe Ratio comparison of monthly strategies based on TESI, U.S. ISM Manufacturing PMI, and the combined overlay signal strategies.



5 EARNINGS **SENTIMENT** BOOSTS **SECTOR REBALANCING** IN INDICES

News and sentiment analytics algorithms use Natural Language Processing (NLP) to analyze thousands of company news published by millions of reputable sources across the globe, all in milliseconds. Research has proven that these insights drawn from alternative data are effectively helping investors make more informed (and thus better) decisions.

One award winning example is the **Credit Suisse RavenPack Artificial Intelligence** Index, which has traded more than USD 1 billion in notional derivatives since December 2021. It leverages earnings sentiment to inform sector allocation and rebalancing strategies. The index has continued to overperform against benchmarks during the volatile market conditions in 2022.

HIGHLIGHT OF 2022

SRP
AMERICAS AWARDS
2022
Index of the Year
Credit Suisse RavenPack AI Index

The Credit Suisse RavenPack Artificial Intelligence Index won the prestigious "Index of the Year" Award from Structured Research Product.

The index is the result of a collaboration between Credit Suisse and RavenPack. It leverages the power of big data analytics to make sector allocation decisions in a tradable and systematic way. With its research-driven approach to thematic investing, RavenPack has become the innovative partner of choice for index construction. As of December 31, 2021, Credit Suisse had traded more than USD 1 billion* in notional in derivatives linked to the Credit Suisse RavenPack Artificial Intelligence Index (Bloomberg ticker: CSRPAI5E Index).

***Source: Credit Suisse. Bloomberg. Data collected from October 6, 2017 to December 31, 2021. Past performance (actual or simulated) is not an indicator of future performance.**
**** Source: Credit Suisse, S&P Global.**

Annual returns**

January 1, 2022 to December 31, 2022

Credit Suisse RavenPack AI Index (CSRPAI5E)	**–9.1%**
S&P 500®	**–19.44%**

Volatility**

January 1, 2022 to December 31, 2022

Credit Suisse RavenPack AI Index (CSRPAI5E)	**5.30%**
S&P 500®	**24.17%**

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NEW WAYS
TO CAPTURE ALPHA IN TURBULENT MARKETS

Rough seas make good sailors, especially when they have data on their side. Sentiment analysis empowers traders to assess unstructured content from multiple sources at scale, and fast and ***turn bearish markets or controversial moments into opportunities.***

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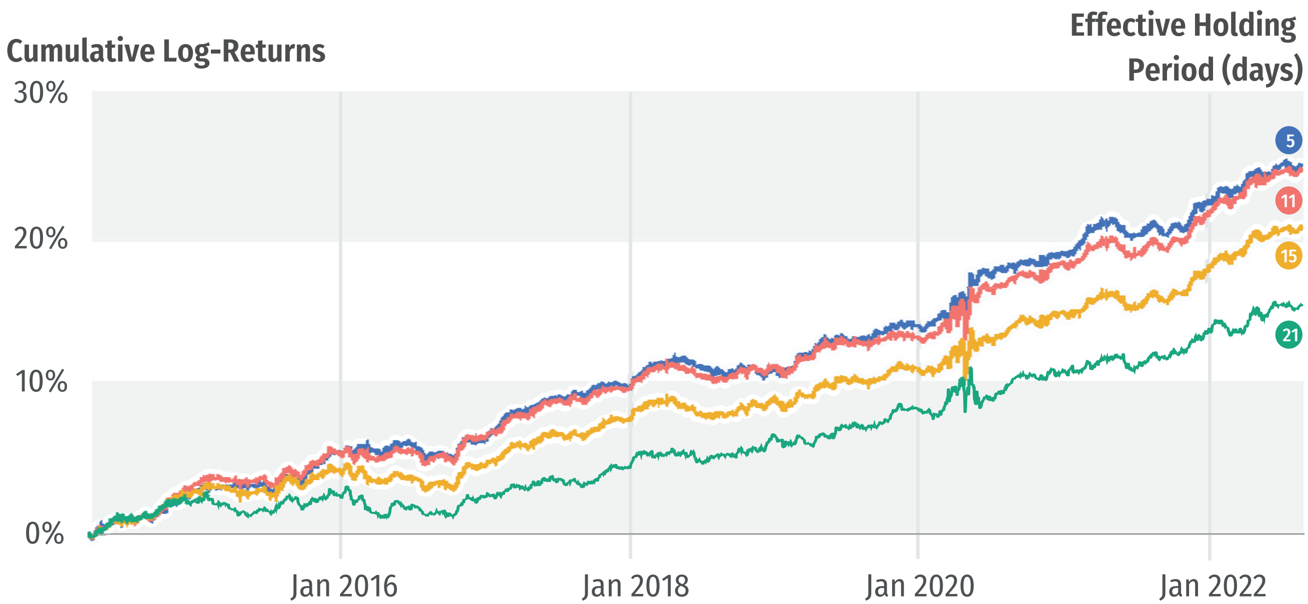
6 DRAW **ALPHA** FROM **WORKFORCE** INTELLIGENCE

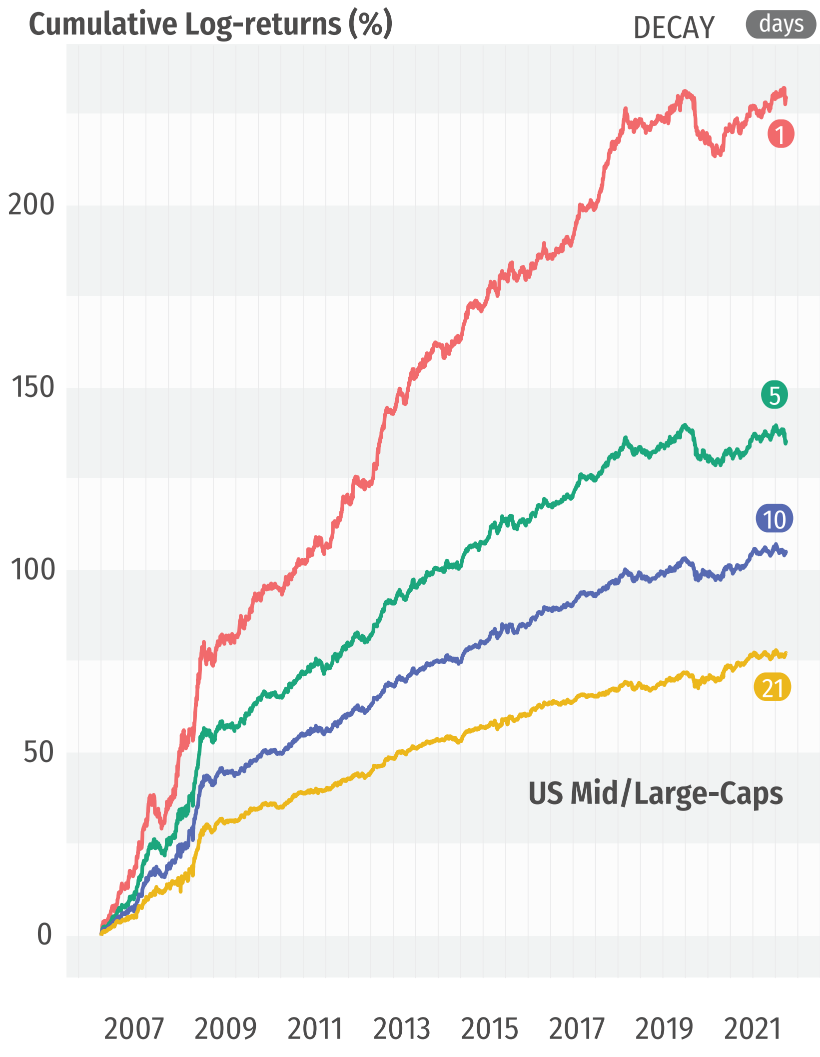
Hiring trends and patterns, as well as the actual job description provide valuable insights. We **analyzed** over 200 million job postings sourced by our data partner LinkUp directly from employers websites. We looked at positions, hiring locations and job descriptions. We discovered that monthly hiring growth is indeed positively correlated with future stock performance. What's more, companies with higher hiring growth that also recruit in similar locations month on month, outperform the rest. A long/short sector-neutral portfolio delivers an Information Ratio of 1.1 and Annualized Returns of 2.9% with a weekly holding period. We also found out that job descriptions are a source of orthogonal alpha.

▼**Cumulative log returns for the final combined portfolio using various smoothing windows, resulting in different holding periods. Results for U.S. mid/large-cap companies.**



7 MAXIMIZE **ALPHA CAPTURE** DURING EARNINGS SEASON WITH **NLP**

With hundreds of companies holding their earnings conference calls on the same day, it's hard to keep up. NLP empowers analysts and investors to capture the full breadth of short-term opportunities. Whether it's looking at **changes in the earnings calendar** or enriching transcripts data with **news sentiment** or **insider transactions**, NLP helps uncover more alpha during earnings season, with **plenty of research** to back it up.

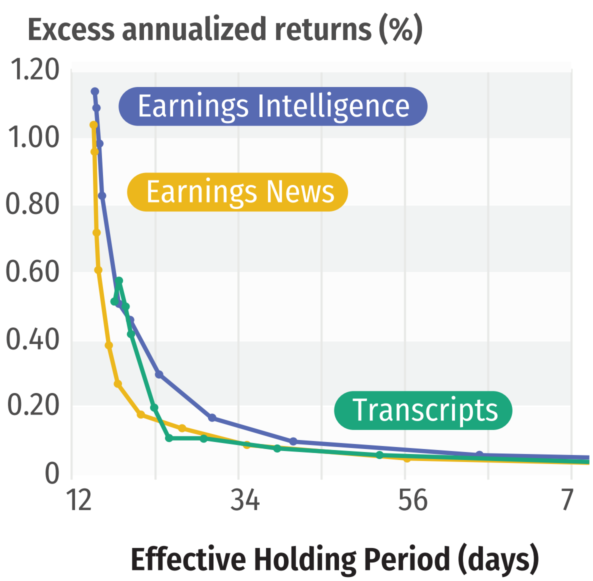


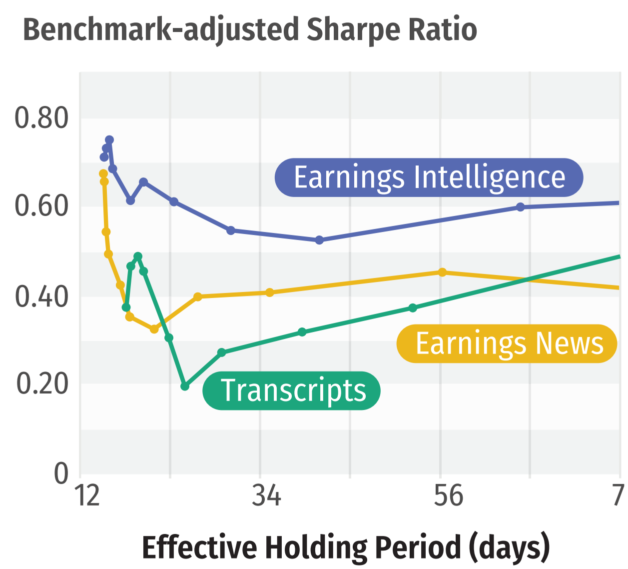
▸ **Cumulative Log-returns for the Earnings Intelligence Signals including Earnings-related news analytics, Earnings-Call Transcript analytics, Insider Transactions Data, and Earnings Dates for U.S. Mid/Large-Cap, from January 2006 through June 2022, using exponential decay lengths of 1 to 21 days over a long-short dollar-neutral portfolio with a fixed size of 320 stocks, normalizing the long and short legs of the portfolio separately to reach 50% long and 50% short exposures.**

8 **CORPORATE CREDIT** REBALANCING BENEFITS FROM **SENTIMENT**

This year is proving to be very challenging for fixed-income investors. With inflation at multi-decade highs globally, interest rates are rising rapidly with a devastating effect on bond prices. We **demonstrate** how the risk-adjusted performance of systematic credit investing strategies can be significantly enhanced by incorporating real-time analytics from RavenPack's news, earnings call transcripts, and insider transactions which offer complementary sources of alpha. Among others, we find that sentiment-tilted portfolios statistically outperform those with random tilts, dominating zero-skill strategies at the 92% (for Earnings News and Transcripts) and 95% (for Earnings Intelligence) confidence intervals.

▼**Annualized returns (left) and Sharpe Ratio (right) in excess of the U.S. investment-grade benchmark, for long-only credit portfolios using different tilting magnitudes and signals.**

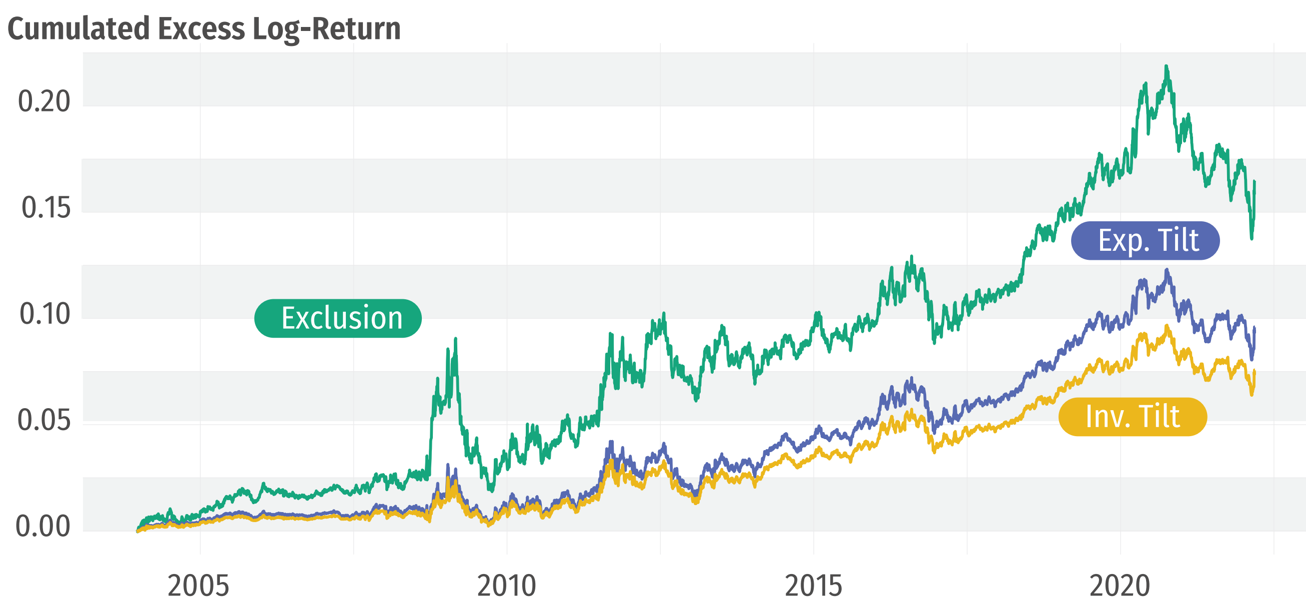




9 *ACCOUNT FOR* **ESG CONTROVERSY RISKS** *DURING* **EQUITY PORTFOLIO** *CONSTRUCTION*

Sustainability factors can severely impact the financial performance of companies. We **analyzed** the relationship between ESG risk events detected in RavenPack, and share prices of listed equities. We found that European investors price controversies more aggressively than their U.S. counterparts, which supports the commonly held view that the European investment community has achieved a more robust integration of sustainability issues into their investment process. Controversies tend to get priced in more rapidly in the U.S., necessitating a more refined timing strategy. All in all, integrating controversy-based signals into investment strategies can beneficially impact portfolio performance, but we need to be mindful that sparse signals only lead to marginal improvements.

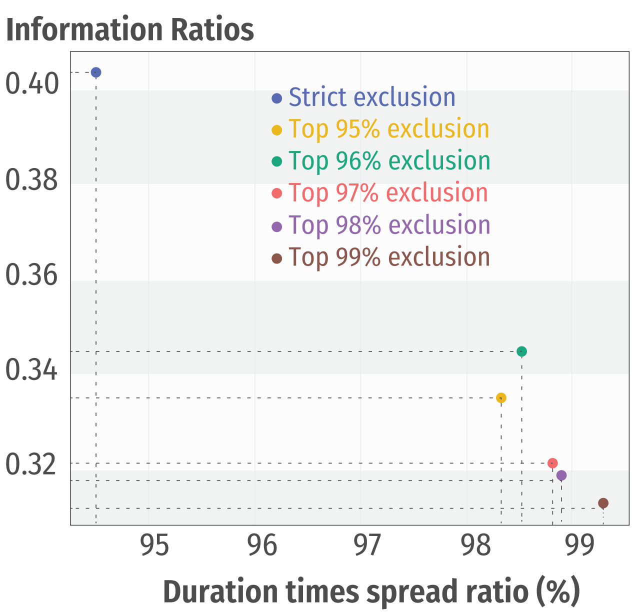
▼Cumulative excess log returns of controversy-based strategies relative to an equally-weighted benchmark of European financials with daily rebalancing, excluding companies involved in fraud-related cases(green), and 2 weighting strategy based on companies' controversy score, exponentially (purple) or inverse-weighted (yellow).

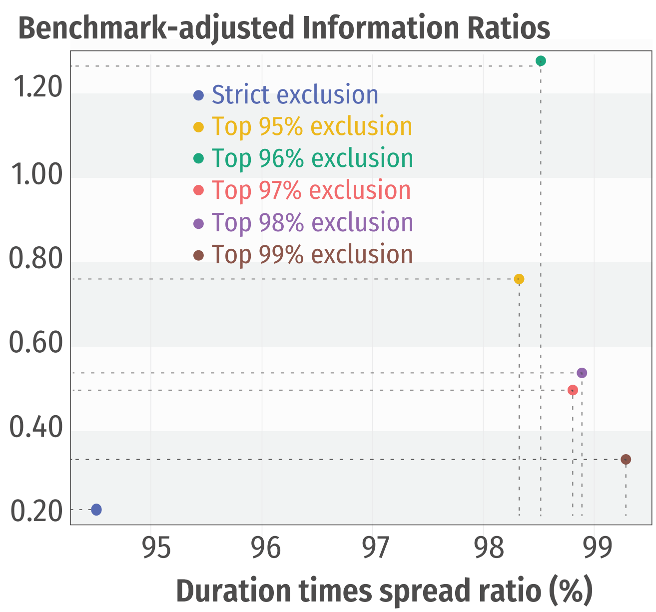


10 STEER CLEAR OF **CONTROVERSY** DURING **BONDS** SELECTION

Corporate controversy is bad news for investors. The good news is that you can track it, quantify it and embed it in your existing models to boost returns or mitigate risk. We used media attention, real-time news and NLP technology and created a methodology to help you outsmart the negative impact of controversies on corporate bonds. Our latest research **demonstrates** that corporate bonds issued by issuers involved in severe controversies underperform credit portfolios with low or no controversy bonds.

For instance, we looked at what happens when we exclude from the portfolio bond issuers with ongoing controversies detected in news, using various levels of dynamic portfolio exclusion. The Top-95% exclusion bond portfolio only trims nine controversial bond issuers at a two-month effective holding period. This adds 16 basis points and generates an information ratio of 0.76 in excess of the credit benchmark.





Benchmark-adjusted (right) information ratio (left) of credit portfolios for various levels of dynamic exclusions with a three-month lookback window, when rebalancing at a monthly frequency across the U.S. investment-grade universe.

GOING FURTHER

SHAPE YOUR DATA LAKE FOR THE ***UNKNOWN***

As we dive into the unpredictable 2023, preparedness is key.

The next chapter in the Russian invasion of Ukraine is hard to predict. What we do know is that it will continue to impact the commodities market for a while. So using **news analytics** to track in real time companies or commodities affected, as well as which companies had been hiring in Ukraine (through historical **job analytics**) can provide a rapid-response to fast-evolving situations.

The pandemic continues to produce effects. 2022 began in a wave of omicron, and while restrictions in the western world have largely been lifted, a large part of the population in China remains impacted, with direct consequences for supply chains, and new variants emerge that could further impact economic outlooks.

Alternative data powered by Language AI helps investors gain a more complete and nuanced understanding of these fast-evolving situations to make more informed and profitable decisions. In 2023, it would be hard to thrive without it.

Risk Markets Technology Awards 2022 Winner

Alternative data vendor of the year
RavenPack

RavenPack was recognized as the **Alternative Data Vendor of the Year**, by the prestigious Risk Markets Technology Awards 2022.

RavenPack is an AI platform that collects, reads, and analyzes billions of documents to help finance professionals and businesses to make more informed decisions, stay ahead of competition and mitigate emerging risks.

Our team of data scientists can help address your challenges in 2023.
Book a call to explore how data can help you make more informed decisions.

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Since its inception, RavenPack has focused on developing AI technology to measure sentiment and identify actionable events systematically, across large amounts of textual data.

Leveraging one of the largest training sets for Natural Language Processing (NLP) applications, we process content from 40,000+ news and social sources, job postings from 60.000+ companies, as well as transcripts, filings, non-English, and other relevant data for investors and analysts.

We cover more than 7,000 financial and non-financial event categories across 12+ Million entities —including companies, people, products, places, and organizations, among others.

Analytics are made available to our clients at a granular level, in real-time, across more than 40,000+ news sources, with links to the underlying textual document for full transparency. They can be further filtered and aggregated depending on end users' objectives and use cases.

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