RavenPack

</> Quantitative Research

# Trading Around the Earnings Calendar

September 2020

## Key Takeaways

Corporate executives and investor relations teams often use strategic timing to schedule and disseminate earnings results. Studies have shown that earnings delays may signal weak performance, while advancing the date may be a sign of good news. In this paper, we study the insights contained in the date changes of earnings releases, tracked using the RavenPack Earnings Dates dataset.

- We show that advances/delays in earnings announcement dates can be predictive of positive/negative earnings results.
- We also show that changes in earnings announcement dates are followed by outsized price reactions, with the resulting strategy achieving robust returns with a slow decay.
- A combined strategy of earnings announcement events and earnings calendar change events delivers Annualized Returns of 7.9% for US Mid/Large-Caps and 20.7% for Small-Caps, with Information Ratios of 0.8 and 1.4, respectively.
- Including news sentiment as an overlay, we were able to further enhance strategy performance, bringing Annualized Returns to 8.4% for Mid/Large and 24.6% for Small-Caps.

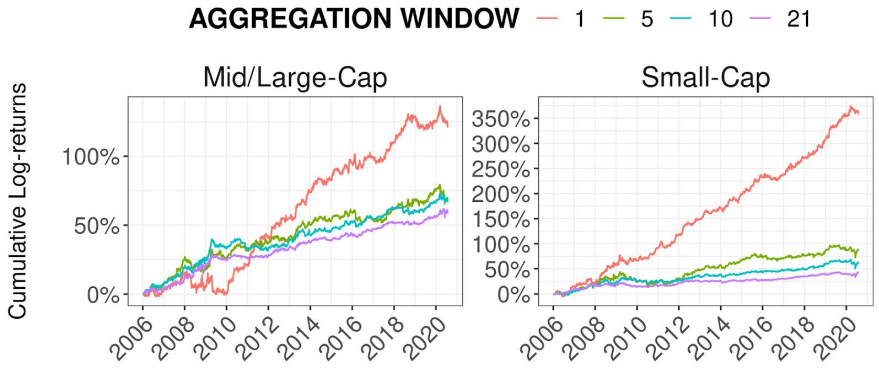


**FIGURE 0: Cumulative Log-returns for the Long-Short Sentiment Enhanced Combined Strategy.** Mid/Large-Cap (left) and Small-Cap (right) U.S. Universes, from January 2006 through July 2020, using signal aggregation windows of 1 to 21 days.
*Source: RavenPack, September 2020*



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## 1. Introduction

Publicly listed companies are required to report their performance results on a regular basis. In addition to numerous details regarding company operations, business dealings and management guidance, the disclosures include updates to relevant profitability metrics such as revenue, net income and earnings per share, which often result in large stock price movements.

Public investors have long used traditional fundamental methods to forecast company earnings. Intensifying competition and the alternative data explosion that has taken place over the past decade have led to rapid adoption of novel approaches in forecasting company performance. Corporate executives and investor relations teams often use strategic timing to schedule and disseminate earnings results [1]. Some studies have shown that earnings delays may signal weak performance, while advancing the date may be a sign of good news [2][3]. In this paper, we study the insights contained in the date changes of earnings releases, tracked using the RavenPack Earnings Dates dataset, which contains changes in the earnings calendar from 2006 for more than 8,000 listed companies. To capitalize on these insights, we explore a tangential derivative of expectations investing and introduce a simple returns prediction model.

In Section 2, we provide a brief introduction of the RavenPack Earnings Date dataset. In the following two sections, we showcase two basic trading strategies using calendar change information for both U.S. Mid/Large-Cap and Small-Cap universes to demonstrate how this data can provide consistent and idiosyncratic alpha. In Section 5, we show how incorporating news sentiment signals from RavenPack Analytics can improve model performance. In Section 6, we present a combined strategy, which uses the previous two methodologies as the building blocks. Finally, in Section 7, we provide our general conclusions.

## 2. Data Description

The RavenPack Earnings Dates dataset consists of earnings calendar change records for over 8,000 stocks globally since 2006, with a central focus on the U.S. market. Since 2016/17, the coverage has expanded significantly beyond the U.S., including the coverage of major indexes: FTSE 100, CAC 40, IBEX 35, EUROSTOXX 50, NIKKEI 225, TOPIX 500, and the HANG SENG. There are more than 242,000 earnings events recorded with unique event IDs and a full point-in-time history available for backtesting.

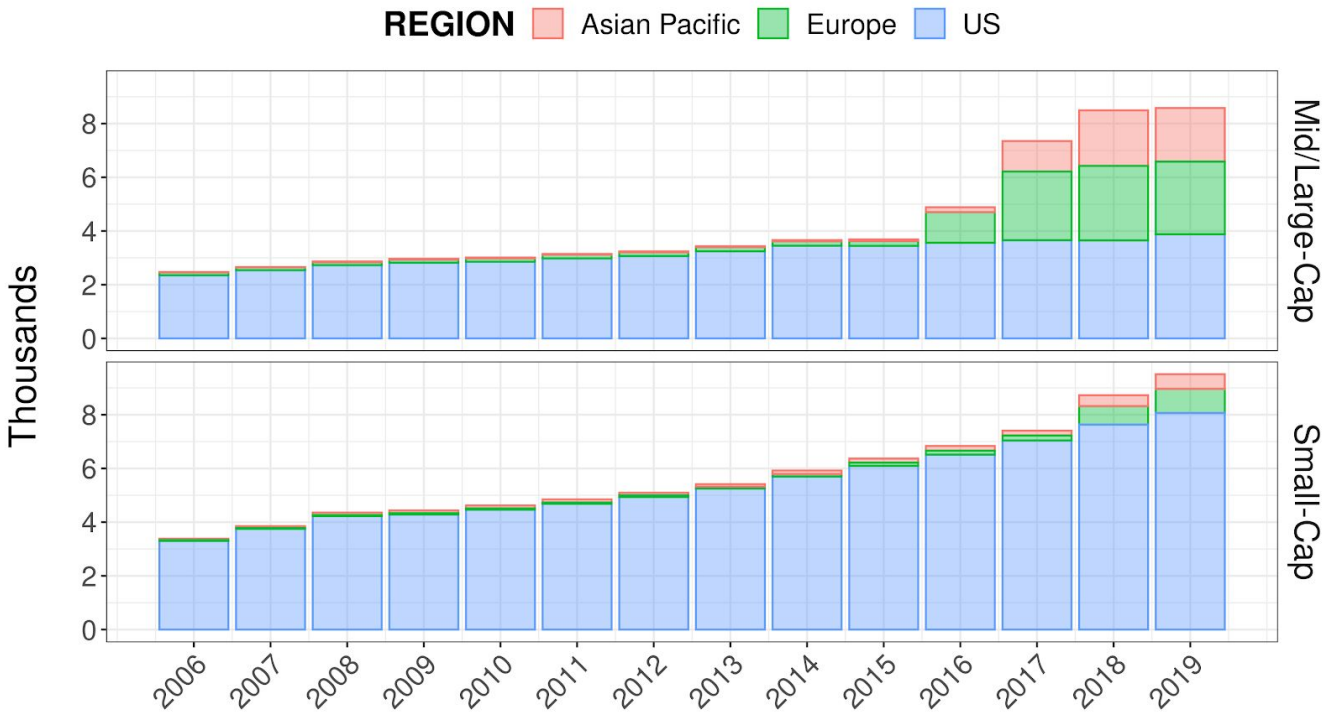


**FIGURE 1: Earnings Event Region/Cap Breakdown.** Earnings event volume over time for different regions and market caps, computed for the full archive from January 2006 through December 2019.

*Source: RavenPack, September 2020*

Each RP_EVENT_ID tracks significant modifications related to a company's specific earnings announcement event, identified by REPORTING_PERIOD. The CURRENT_EARNINGS_DATE field represents a confirmed or estimated release date and CURRENT_TIME_OF_DAY indicates whether the release is expected to hit before, during or after market hours based on news or historical patterns. In the first strategy, we focus on examining whether advancing or delaying an earnings date is predictive of post-earnings price reactions. We use first and last records of each earnings announcement event to identify it as either an *advance* or a *delay event* (i.e. the latest

earnings date is before or after the first earnings date, respectively). In Figure 2, we show the volume breakdown of advance/delay events by days for US, EU & AP regions from 2006 to 2020, broken down by Mid/Large and Small-Cap companies. While there are no significant differences between the market cap groups, most advance events appear to be moved forward by 1 day, while delays are about evenly split between 1 day and 1 week lags. In the second strategy, we examine the pre-earnings stock price reactions around changes in estimated earnings announcement dates.

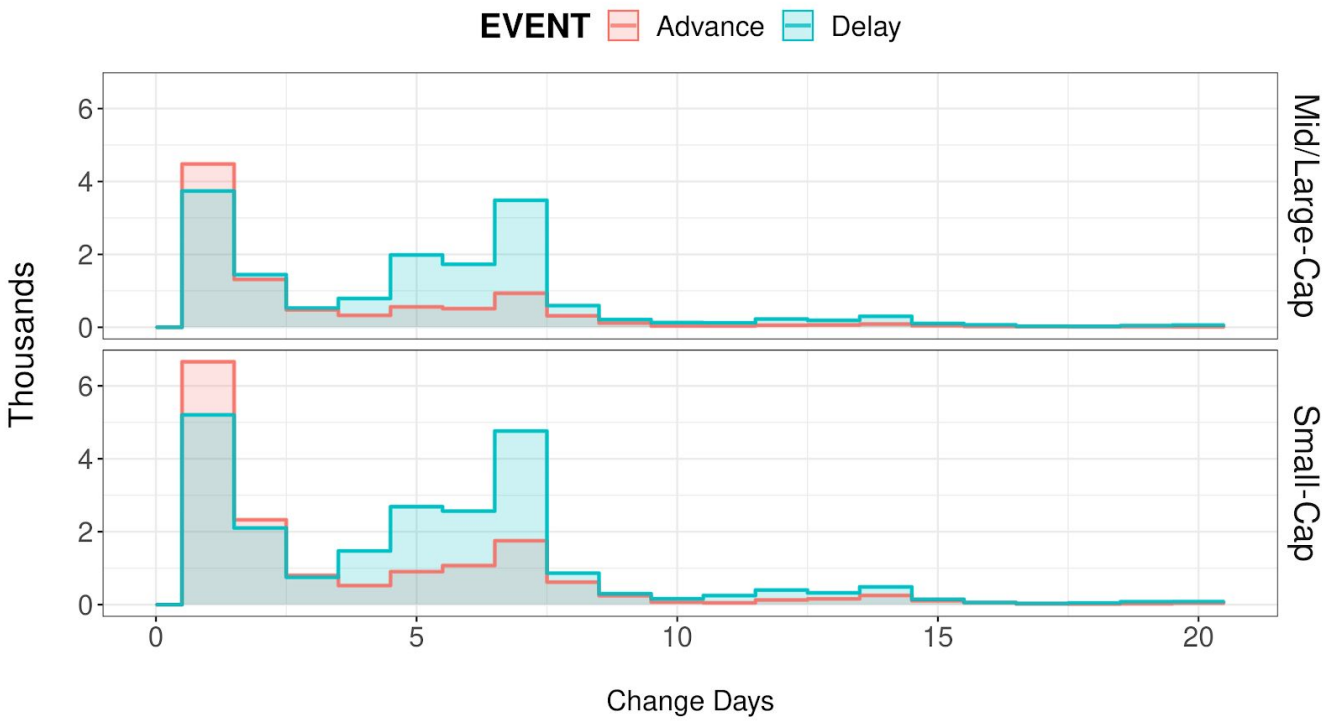


**FIGURE 2: Advance/Delay Event Breakdown.** Advance/Delay event volume for different change days, shown for the US, EU & AP regions since January 2006 to July 2020.

*Source: RavenPack, September 2020*

## 3. U.S. Portfolio Strategy - Predicting Positive/Negative Earnings Reports

Studies have shown that corporate executives strategically schedule their earnings calendars, with some claiming that an earnings delay may signal weak performance, while advancing the date may be a sign of good news [4][5]. In this section, we explore a simple strategy by studying the differences in post-earnings price reactions between advance and delay events within the US Mid/Large and Small-Cap universes.[1]

First, we split the events into two groups, delayed earnings events and advanced earnings events, based on whether the actual earnings announcement is delayed or advanced compared to its initial estimate. Figure 3 shows the mean excess returns over a 20-day period following an earnings release, illustrating price reactions conditioned on whether the initial date estimate was advanced or delayed. We can clearly observe the extent to which advanced and delayed earnings events affect post-earnings price reactions for both Large/Mid- and Small-Cap companies. Large/Mid-Cap companies show more momentum on the negative leg, while the Small-Caps have more momentum on the positive leg. The signal decays relatively quickly, with the difference between the average advance and delay reactions reaching a peak in just a few days.

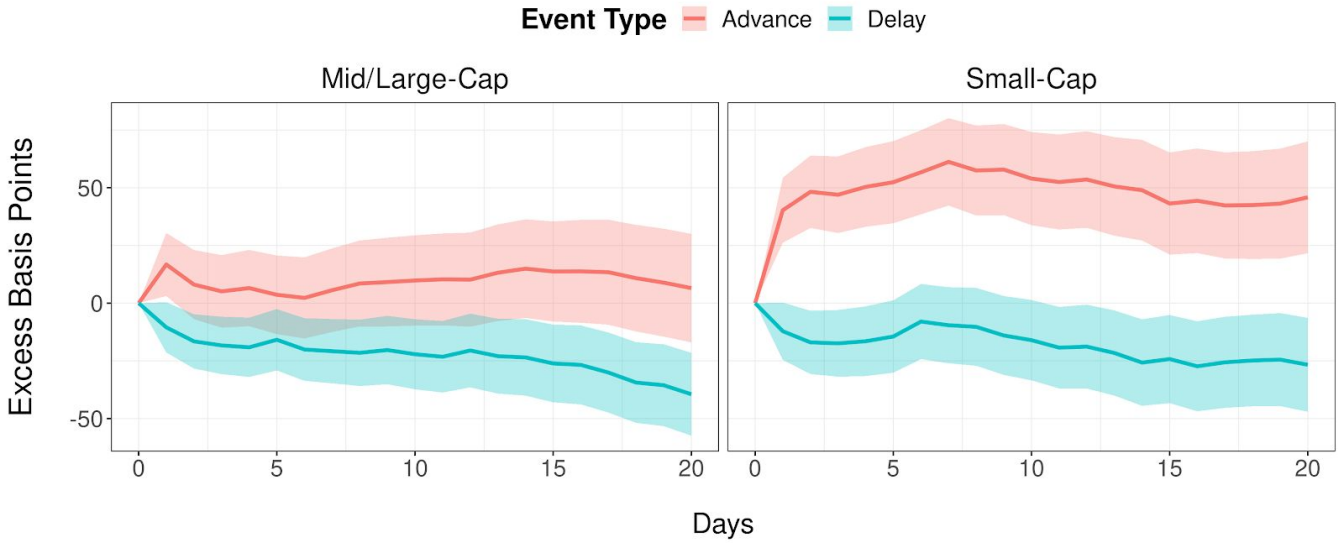


**FIGURE 3: Price Reaction for Advanced and Delayed Earnings Events for Different Market Caps on Earnings release date.** Event study using excess returns for Mid & Large-Cap (left) and Small-Cap (right) companies in the US market. Day 0 indicates the day on which the earnings report is available. Shaded areas denote 95% confidence intervals.

*Source: RavenPack, September 2020*

[1] The US market-cap categorizations are achieved by assigning top 1000 ranked companies by market-cap to Large/Mid- and 1001-3000 companies to Small-Cap groups.

Given the notable difference in behavior between the advance and delay events, our first strategy trades stocks just before the final/confirmed earnings announcement, effectively going long the stocks that advance their earnings date and shorting those that delay their earnings announcement. We construct daily long-short equal-weighted portfolios within the U.S. universe and initiate the position at the market close before an earnings release based on the advance/delay signal and exit the position at the following close, using close-to-close excess returns to analyze the strategy.[2] Figure 4 shows the cumulative log-returns for strategies with different signal aggregation windows. The 1-day aggregation window achieves the best results, with Annualized Returns of 8.0% for the Mid/Large-Caps and 19.3% for Small-Caps, and Information Ratios of 0.8 and 1.2, respectively.

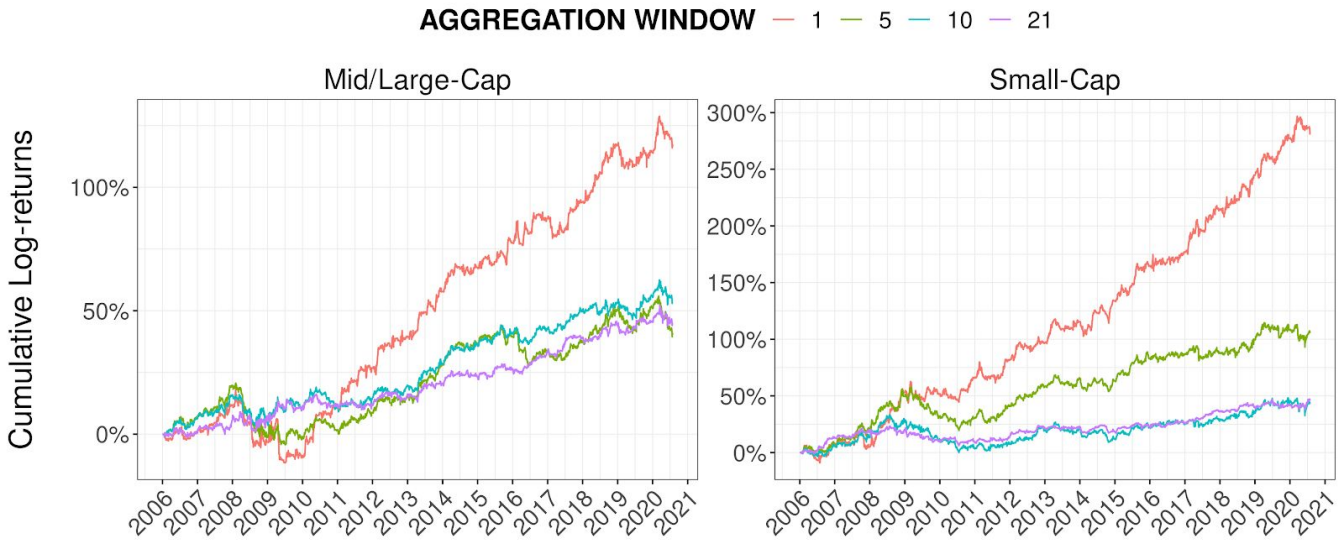


**FIGURE 4: Cumulative Log-Returns for Long-Short Portfolios when trading on earnings.** Mid/Large-Cap (left) and Small-Cap (right) US Universes, from January 2006 through July 2020, using signal aggregation windows of 1 to 21 days.

*Source: RavenPack, September 2020*

In Table 1, we summarize the backtest performance metrics for our long-short strategies across signal aggregation windows of 1 to 21 days. By increasing the aggregation window, we observe a meaningful decay in Annualized Returns and Information Ratios, in line with the observations from Figure 3 where the difference between advance and delay events is shown to remain relatively stable after the first few days.

[2] The RavenPack Earnings Date data is delivered once daily, with a cut-off at Midnight UTC.

| Aggregation Window | Market Cap | Ann. Returns | IR | Portfolio Size | Holding Period |
|---|---|---|---|---|---|
| 1 | Mid/Large | 8.0% | 0.8 | 6 | 1.5 |
| | Small | 19.3% | 1.2 | 10 | 1.2 |
| 5 | Mid/Large | 2.8% | 0.4 | 28 | 3.5 |
| | Small | 7.2% | 0.6 | 51 | 3.6 |
| 10 | Mid/Large | 3.7% | 0.6 | 55 | 5.6 |
| | Small | 2.9% | 0.3 | 101 | 6.2 |
| 21 | Mid/Large | 3.1% | 0.6 | 115 | 9.4 |
| | Small | 3.1% | 0.5 | 211 | 10.5 |

**TABLE 1: Long-short Portfolio Stats for the Earnings-based Strategy.** Annualised Returns, Information Ratios, Average Portfolio Sizes and Effective Holding Periods (inverse of the turnover) for different aggregation windows. Results for the U.S. Universe, split by market cap, from January 2006 through July 2020.

*Source: RavenPack, September 2020*

To analyze the behavior of the long and short legs, we construct long-only and short-only strategies across different market caps and aggregation windows and show the results in Figure 5. In the Mid/Large-Cap universe, short positions exhibit more consistent performance across different aggregation windows, while long positions decay over longer holding periods. On the other hand, the Small-Cap universe sees a meaningfully stronger contribution coming from the longs, with short positions decaying into the negative territory over longer holding periods.

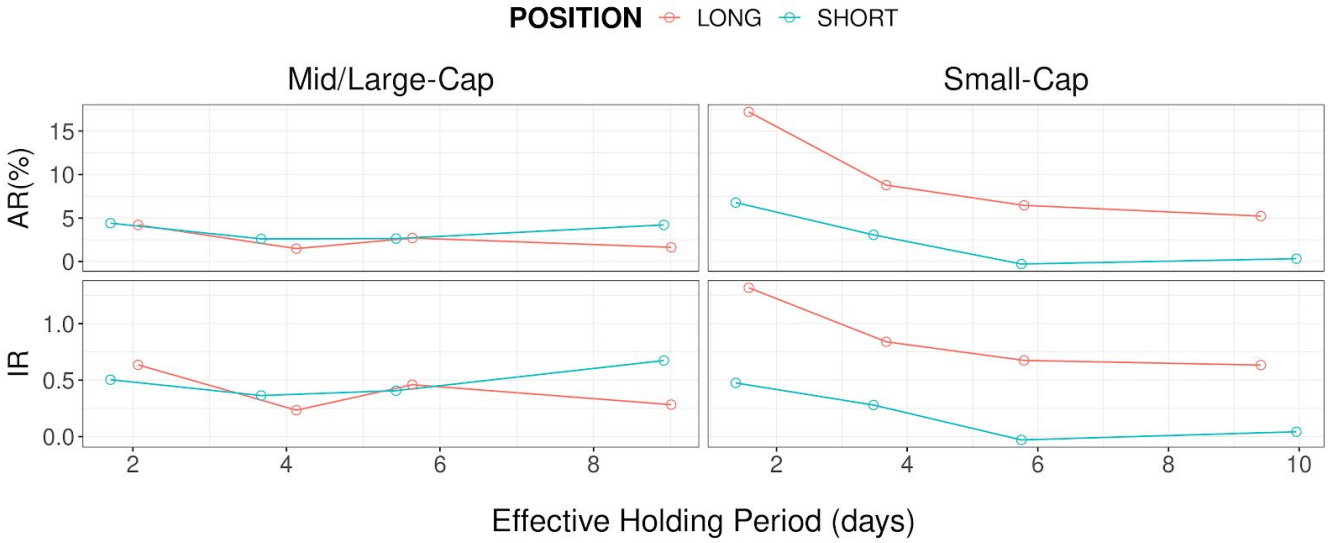


**FIGURE 5: Earnings Strategy Performance for Long and Short Legs.** Annualized returns and Information Ratios of the U.S. strategy across different effective holding periods and market caps, split by long and short legs.

*Source: RavenPack, September 2020*

## 4. U.S. Portfolio Strategy - Earnings Calendar Change Event

In the second strategy, we focus on examining price reactions around the sequential changes in earnings announcement dates. If the assumption that advance/delay events can forecast earnings results holds true, we can also assume that the market should react proportionately to earnings date changes themselves, prior to the actual earnings announcement date [6]. Indeed, Figure 6 shows that advance calendar change events outperform delay events, on average, and we can clearly observe that such events demonstrate stronger momentum than earnings events in Figure 3. Similar to the previous strategy, the Small-Cap companies exhibit greater price reactions between advance and delay events than the Mid/Large-Cap companies.

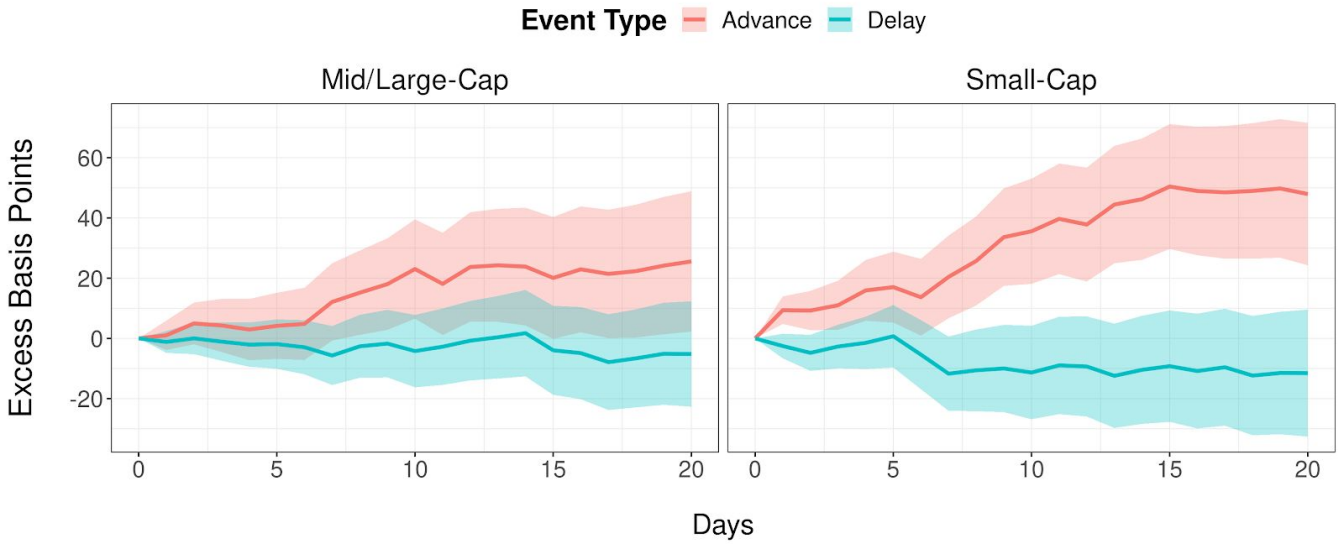


**FIGURE 6: Price Reaction for Advance/Delay Events for Different Market Caps**. Event study using excess returns for Mid/Large-Cap (left) and Small-Cap (right) companies in the U.S. market. Day 0 indicates the day on which the earnings calendar is modified. Shaded areas denote 95% confidence intervals.

*Source: RavenPack, September 2020*

To test strategy performance, we construct daily long-short equal-weighted portfolios within the US universe, this time going long/short the stocks with advance/delay events on the close following the date change. Figure 7 shows the cumulative log-returns for the strategies across different aggregation windows. Consistent with the event study in Figure 7, Mid/Large-Cap companies tend to perform better over longer holding periods than the previous strategy, given the more apparent return differential between advance and delay events over time.

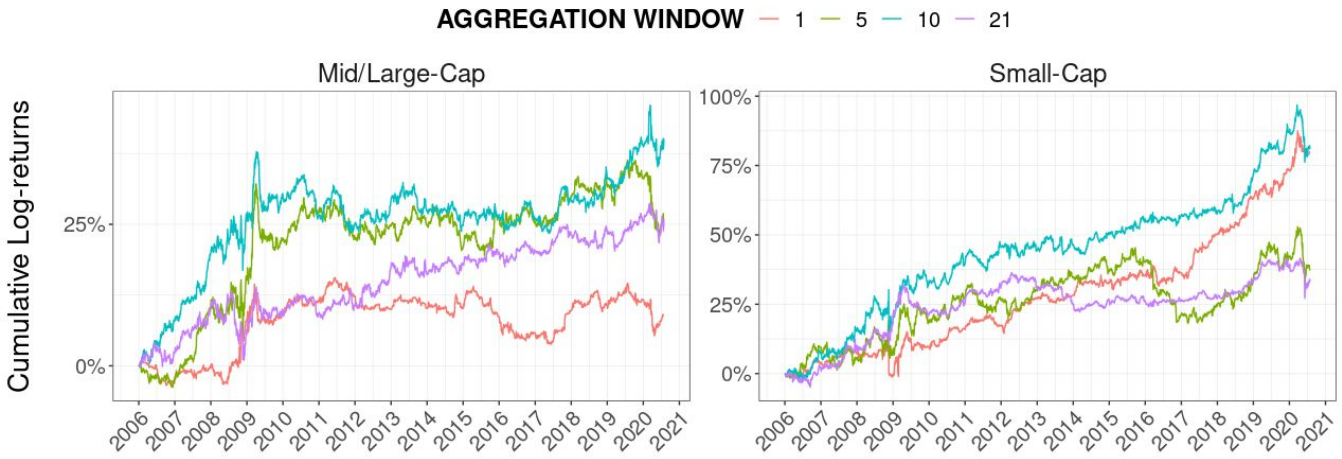


**FIGURE 7: Cumulative Log-Returns for Long-Short Portfolios when trading on date change events.** Mid/Large-Cap (left) and Small-Cap (right) U.S. Universes, from January 2006 through July 2020, using signal aggregation windows of 1 to 21 days.

*Source: RavenPack, September 2020*

In Table 2, we summarize the performance metrics for the strategy across the aggregation windows and market capitalizations. For the Mid/Large-Cap universe, Annualized Returns and Information Ratios are maximized at the 10-day aggregation window, while we observe a slower decay for the Small-Cap universe compared to the earnings-based study.

| Aggregation Window | Market Cap | Ann. Returns | IR | Portfolio Size | Holding Period |
|---|---|---|---|---|---|
| 1 | Mid/Large | 0.6% | 0.2 | 5 | 1.2 |
| | Small | 5.5% | 0.8 | 10 | 1.1 |
| 5 | Mid/Large | 1.8% | 0.3 | 25 | 3.8 |
| | Small | 2.6% | 0.3 | 47 | 4.0 |
| 10 | Mid/Large | 2.8% | 0.5 | 50 | 6.7 |
| | Small | 5.6% | 0.7 | 93 | 7.1 |
| 21 | Mid/Large | 1.8% | 0.4 | 103 | 11.5 |
| | Small | 2.3% | 0.4 | 188 | 12.1 |

**TABLE 2: Calendar Change Long-Short Portfolio Strategy Stats.** Annualised Returns, Information Ratios, Average Portfolio Sizes and Effective Holding Periods (inverse of the turnover) for different aggregation windows. Results for the U.S. Universe, split by market cap, from January 2006 through July 2020.

*Source: RavenPack, September 2020*

In Figure 8, we again separate performance by long and short legs to examine the differences between advance and delay events. Mid/Large- and Small-Cap universes share a common characteristic in that long-only strategies decay slower compared to short-only strategies. This is

consistent with our observations in Figure 6, which shows that advance events exhibit higher momentum than delay events, while the short-only strategy does not perform well, as delayed events do not deviate from 0 significantly. This suggests that we may be able to achieve better performance and lower turnover rates by adopting different decay factors for advance and delay signals separately.

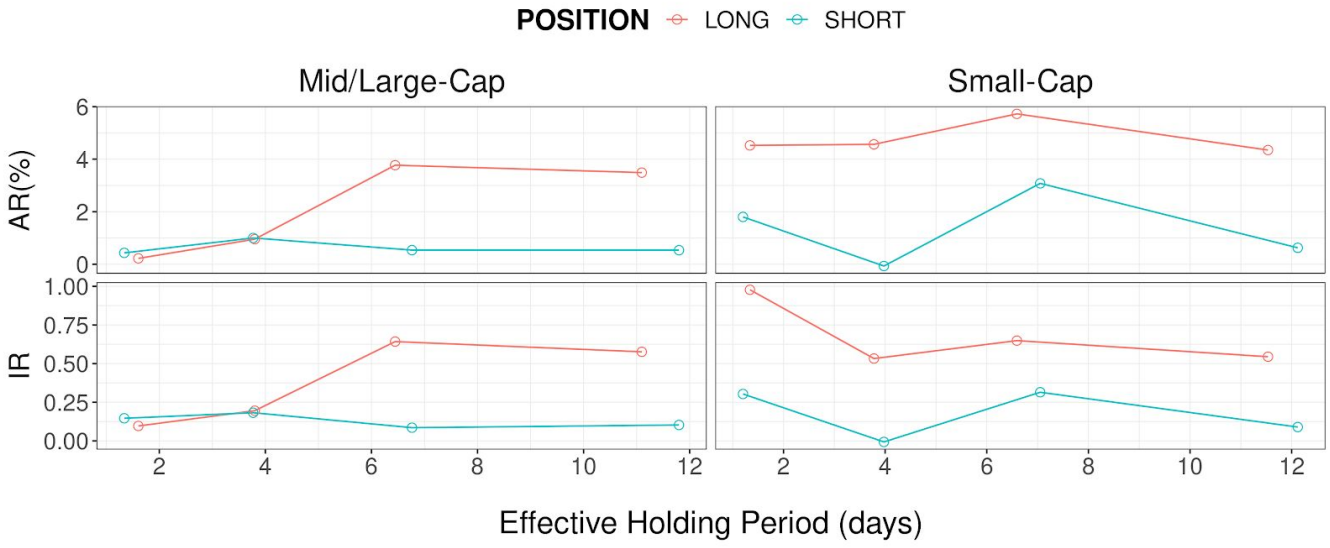


**FIGURE 8: Calendar Change Strategy Performance for Long and Short Legs.** Annualized returns and Information Ratios of the U.S. strategy across different effective holding periods and market caps, split by long and short legs.
*Source: RavenPack, September 2020*

## 5. The Influence of Sentiment on Earnings Calendar Changes

It is reasonable to assume that news related to companies' daily operations can reveal additional valuable insights and that we may be able to benefit from other sources of alternative data. In particular, we can use RavenPack Analytics[3] to track the news sentiment associated with a company, which can yield useful information about the market conditions at the time when an earnings calendar change event takes place.

To study this dynamic, we examine calendar change signals conditioned on the company news sentiment field (COMPANY_SENTIMENT),[4] which provides relevant information around the

[3] RavenPack Analytics are produced by analyzing premium newswires such as Dow Jones, Benzinga, MT Newswires, Alliance News, FX Street, The Fly, and providers of regulatory news and press releases, as well as over 19,000 web publications. In total, RavenPack tracks more than 85,000 global corporate entities, and more than 200,000 macro entities, including places, organizations, people, currencies, and commodities. More details are available in the user guide https://app.ravenpack.com/userguide
[4] A value between -1.00 and 1.00 that corresponds to the average Event Sentiment Score (ESS) over the 91 days leading up to the event. The ESS is a granular score between -1 (negative sentiment) and +1 (positive sentiment) that represents the entity-specific sentiment for any particular event defined in the RavenPack Event Taxonomy. The algorithm produces a score for more than 6,900 categories of business, economic, and geopolitical events ranging from earnings announcements to natural disasters.

positive or negative media attention which a company has been exposed to over the trailing 3 months. By performing price reaction event studies, such as the ones introduced in Sections 3 and 4, we investigate the market behaviour following the calendar change events under different conditions.

In Figure 9, we separate the sentiment condition based on its sign. We can observe that the difference between advance and delay events is larger under positive sentiment than under negative sentiment, particularly for the Mid/Large-Cap companies. Delay events tend to exhibit greater momentum in a positive sentiment environment than in a negative one. We may infer that, under a long-term positive sentiment environment, investors anticipate better earnings performance, and a delayed earnings date would, therefore, be a negative surprise. The price reaction differentials under negative sentiment are not statistically significant.

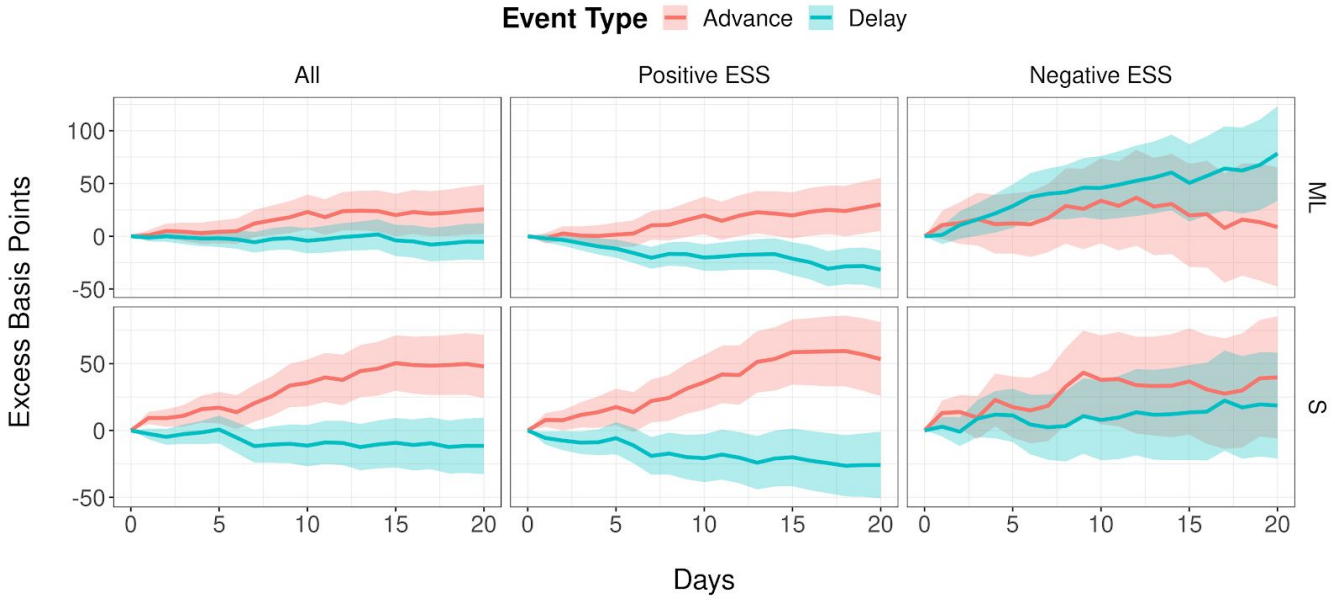


**FIGURE 9: Price Reactions for Advance/Delay Events Under Different Sentiment Conditions**. Event study using excess returns for Mid/Large-Cap (top) and Small-Cap (bottom) companies in the US market.

*Source: RavenPack, September 2020*

Using the previous event study as a guide, we devise a simple sentiment-enhanced strategy, conditioned on positive sentiment and expect to see better results, particularly for the Mid/Large-Cap companies. Figure 10 shows the performance comparison between strategies when conditioning the calendar change event signal based on company sentiment. Indeed, for both the Mid/Large- and Small-Cap universes, positive sentiment conditioning results in better

performance for the long-short strategies across all aggregation windows, emanating mainly from the improvements on the short side, consistent with our observations in Figure 9.

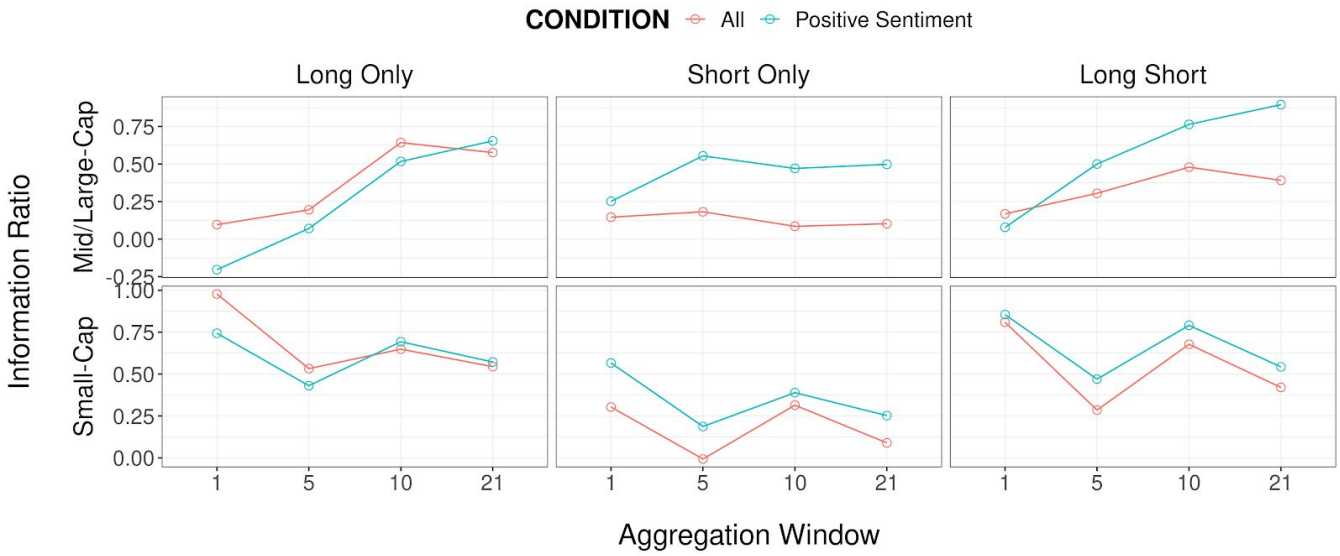


**FIGURE 10: Comparison Between Strategies Conditioned on Sentiment.** Information Ratios of the U.S. strategy conditioned on sentiment across different aggregation windows and market caps, split by long and short legs.

*Source: RavenPack, September 2020*

Another way to fold sentiment into our strategy is to track news around earnings and company guidance to obtain an additional perspective on the post-earnings price drift. Such information could complement the pre-earnings advance and delay information, allowing us to better understand direction and signal decay.

We have shown in previous research that earnings sentiment can enhance performance compared to a strategy based on traditional earnings surprise reactions [7]. To leverage these insights, we incorporate earnings-based sentiment,[5] derived from RavenPack analytics, into our Earnings Event strategy, such that we amplify our existing weights following an earnings release. More specifically, if we are long a stock just prior to an earnings announcement due to an advance event, and if earnings sentiment on the following day is positive, our sentiment-enhanced strategy will assign the stock a higher weight and hold it slightly longer. The opposite dynamic applies to the stocks we are short due to *delay events*.

[5] We use the Sum Excess Sentiment Indicator (SESI), which represents the daily sum of RavenPack's Event Sentiment Score (ESS) after subtracting the daily sentiment bias per universe. As we are interested in earnings-related events only, we focus on categories belonging to 3 of 51 available groups: earnings, dividends and revenue. For more information on SESI, refer to our 2018 paper "Effects of Event Sentiment Aggregation: Sum vs. Mean."

The upshot of this approach is to capitalize on the post-earnings drift that often follows positive or negative earnings announcements from a sentiment perspective. This strategy results in Annualized Returns improving to 9.4% from 8.0% for Mid/Large-Caps and to 24.0% from 19.3% for Small-Caps for the 1-day aggregation window, where we observe the principal improvements. The Information Ratios increase to 1.0 from 0.8 and to 1.6 from 1.2 for Mid/Large and Small-Caps, respectively. The strategy also benefits from lower turnover due to longer holding periods. Figure 11 shows the performance cumulative log-return comparison between the original earnings event strategy and the sentiment-enhanced version.

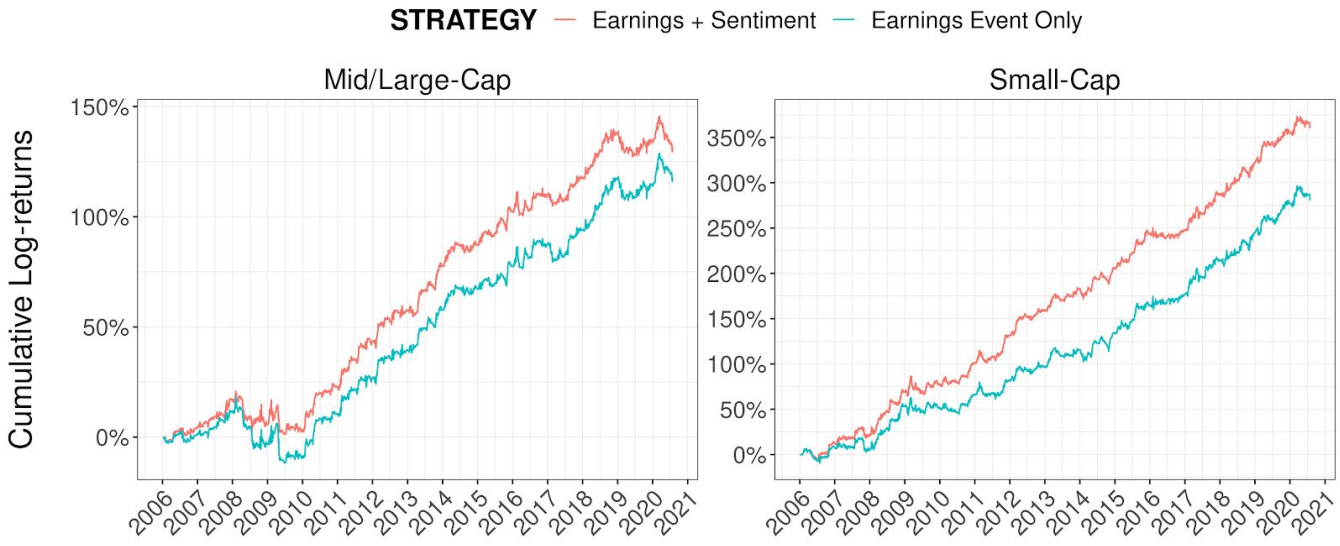


**FIGURE 11: Sentiment-enhanced Earnings Events Cumulative Log-Returns Comparison.** Mid/Large-Cap (left) and Small-Cap (right) U.S. Universes, from January 2006 through July 2020, using the daily signal.

*Source: RavenPack, September 2020*

## 6. Combined Earnings Calendar Strategy

In Sections 3 & 4, we introduced two different strategies, which focus on Earnings Announcement Events and Earnings Calendar Change Events, respectively. In this section we examine the resulting performance enhancements when the two strategies are combined.

We can see from Tables 1 & 2 that a 1-day aggregation window results in relatively small average portfolio sizes in both universes. Companies in the U.S. report their results during an earnings season that follows the completion of the quarterly fiscal period, and therefore our earnings events tend to cluster. Figure 12 shows the frequency of the two types of events we described earlier over the course of a typical year. As expected, calendar change events demonstrate marked peaks just before the earnings events. As the two strategies are independent of each other, we expect to improve strategy performance by combining the two signals and deploying capital more efficiently as a result.

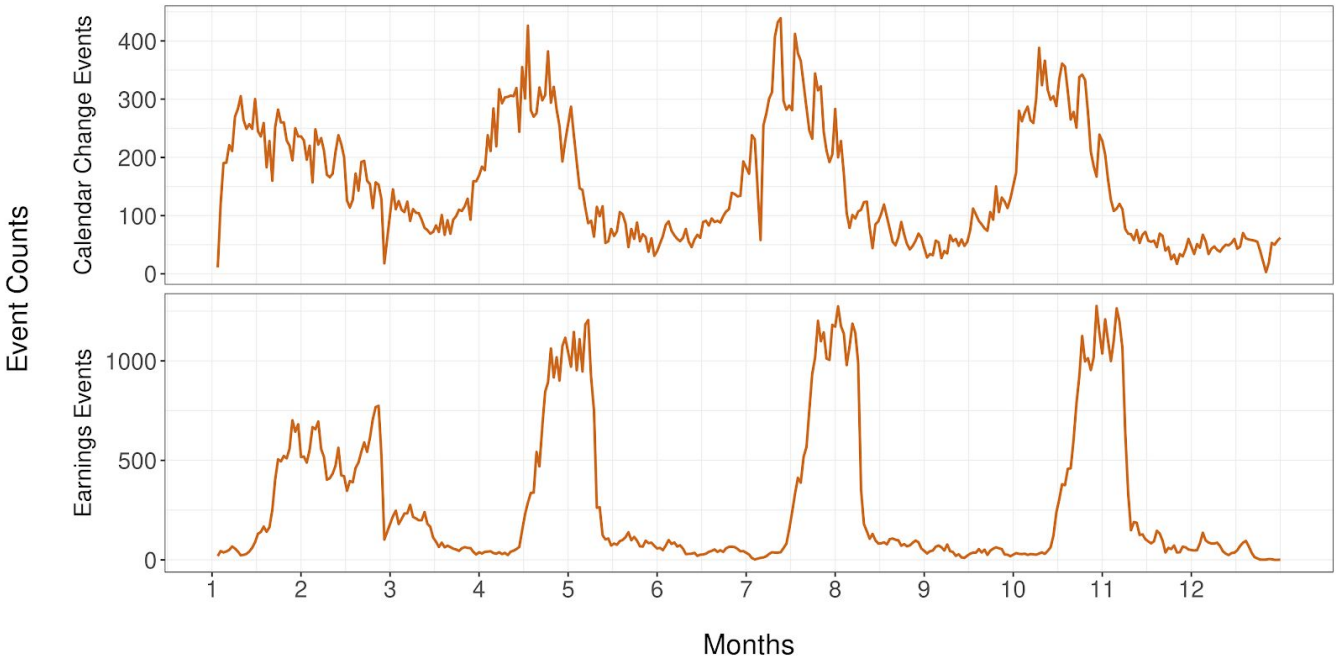


**FIGURE 12: Event Frequency Over Time.** Calendar Change Event and Earnings Event frequency counts across the U.S. Small/Mid/Large-Cap universe over time.

*Source: RavenPack, September 2020*

Figure 13 shows the performance statistics comparison between our three strategies. In the Mid/Large-Cap universe, we observe a noticeable improvement in Information Ratios across longer aggregation windows when using the combined signal. Within the Small-Cap universe, the

performance enhancement is limited to the 1-day aggregation window; however Information Ratios remain relatively stable, while the combined strategy benefits from larger average portfolio sizes.

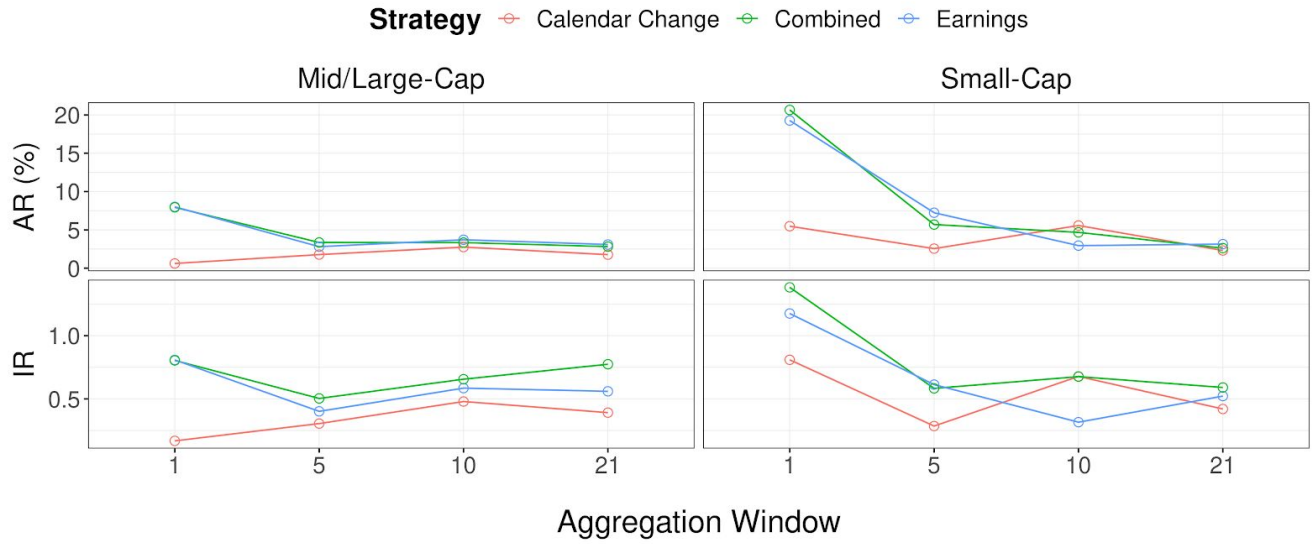


**FIGURE 13: Performance Comparison for All Three Strategies.** Annualized returns and Information Ratios of the U.S. strategies across different aggregation windows and market caps.

*Source: RavenPack, September 2020*

Finally, we combined the sentiment-enhanced versions of the two strategies to achieve further performance benefits, with Annualized Returns improving to 8.4% from 7.9% for Mid/Large-Caps and to 24.6% from 20.7% for Small-Caps, relative to the plain combined strategy. While portfolio sizes shrink somewhat over the longer aggregation windows due to the sentiment filters applied to the calendar change events strategy, the improvements are still notable, particularly for the Mid/Large-Caps. Figure 14 shows the cumulative log-returns of the combined, sentiment-enhanced long-short strategy across different aggregation windows and market caps, with the synergies particularly evident when using the 1-day aggregation window.

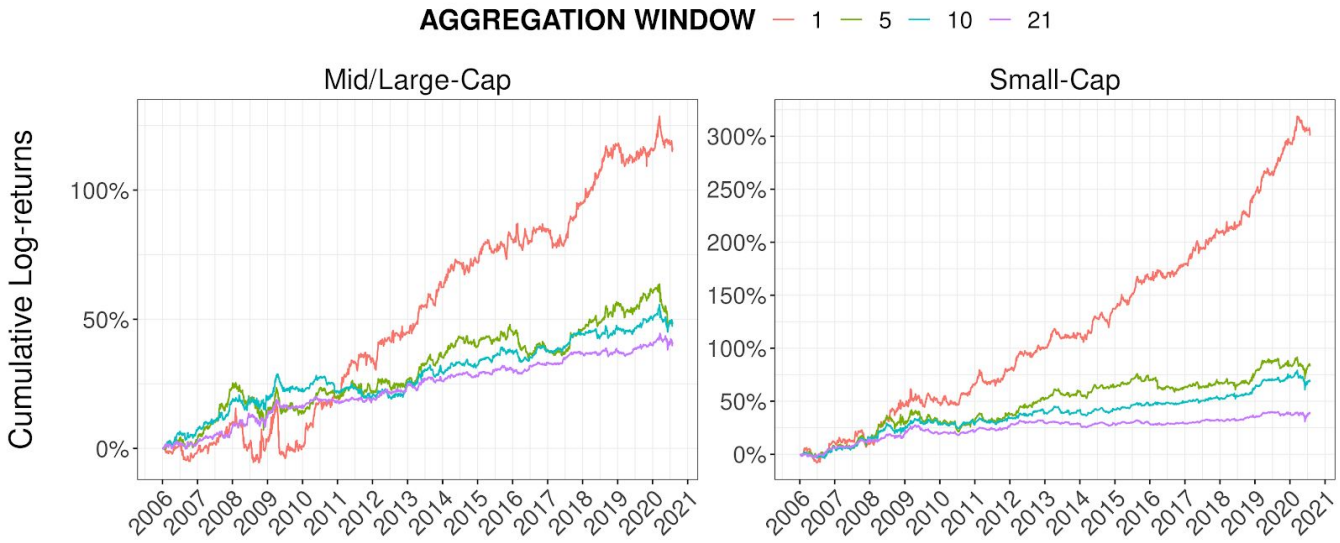


**FIGURE 14: Cumulative Log-returns for the Long-Short Sentiment Enhanced Combined Strategy.** Mid/Large-Cap (left) and Small-Cap (right), from January 2006 through July 2020, using signal aggregation windows of 1 to 21 days.
*Source: RavenPack, September 2020*

Table 3 shows the summary metrics for both the plain combined strategy and the sentiment-enhanced versions.

| Aggregation Window | Market Cap | Ann. Returns | | IR | | Portfolio Size | | Holding Period | |
|---|---|---|---|---|---|---|---|---|---|
| | | Plain Combined | Sentiment Enhanced | Plain Combined | Sentiment Enhanced | Plain Combined | Sentiment Enhanced | Plain Combined | Sentiment Enhanced |
| 1 | Mid/Large | 7.9% | 8.4% | 0.8 | 0.9 | 11 | 12 | 1.1 | 1.2 |
| | Small | 20.7% | 24.6% | 1.4 | 1.7 | 20 | 22 | 1.0 | 1.2 |
| 5 | Mid/Large | 3.4% | 4.7% | 0.5 | 0.7 | 52 | 49 | 4.0 | 4.1 |
| | Small | 5.7% | 5.9% | 0.6 | 0.6 | 94 | 85 | 4.2 | 4.4 |
| 10 | Mid/Large | 3.3% | 4.7% | 0.7 | 0.9 | 99 | 91 | 7.2 | 7.3 |
| | Small | 4.7% | 4.2% | 0.7 | 0.6 | 173 | 155 | 7.7 | 7.8 |
| 21 | Mid/Large | 2.8% | 4.1% | 0.8 | 1.0 | 183 | 170 | 12.4 | 12.6 |
| | Small | 2.6% | 2.9% | 0.6 | 0.6 | 312 | 285 | 13.8 | 14.1 |

**TABLE 3: Combined Long-Short Portfolio Strategy Stats.** Annualised Returns, Information Ratios, Average Portfolio Sizes and Effective Holding Periods (inverse of the turnover) for the plain and sentiment-enhanced combined strategies across different aggregation windows. Results for the U.S. Universe, split by market cap, from January 2006 through July 2020.

*Source: RavenPack, September 2020*

## 7. Conclusions

In this study, we explored how changes in earnings announcement dates can offer valuable insights about stock price moves surrounding earnings events. Using the RavenPack Earnings Dates dataset, we provided evidence that confirms findings from previous studies which claim that earnings delays may signal weak performance, while advancing the date may be a sign of good news.

Specifically, we performed event studies, which showed that advancing or delaying earnings announcements can be predictive of positive and negative earnings results. To test this hypothesis, we constructed long-short portfolios that capitalized on post-earnings reactions using the advance/delay event signals, which delivered Annualized Returns of 8.0% for the Mid/Large-Caps and 19.3% for Small-Caps, with Information Ratios of 0.8 and 1.2, respectively. Additionally, we showed that the actual changes in earnings announcement dates themselves are also followed by outsized price reactions. The resulting portfolio strategy based on this approach yielded Annualized Returns of 0.6% and 5.5% and Information Ratios of 0.2 and 0.8, for the Mid/Large and Small-Caps, respectively, though Mid/Large-Caps performed slightly better when using a 10-day aggregation window.

Next, we performed event studies to examine earnings calendar changes conditioned on company news sentiment and showed that the difference in price reactions following advance and delay events is the largest while on a positive sentiment trend. When trading only on earnings calendar events that coincide with positive sentiment, the Information Ratios increased for both universes across all signal aggregation windows. We also showed that when trading around earnings, using news sentiment can enhance strategy performance by taking advantage of the post-earnings drift, with Annualized Return improvements of 1.4% for the Mid/Large-Caps and 4.7% for the Small-Caps.

Finally, we showed that a blended approach combining the signals of the first two strategies enhanced overall performance, especially when enhanced with the sentiment signal. The plain combined strategy yielded Annualized Returns of 7.9% and 20.7% and Information Ratios of 0.8 and 1.4 for the Mid/Large and Small-Caps, respectively. The sentiment-enhanced strategy further improved the Annualized Returns to 8.4% and 24.6% and Information Ratios to 0.9 and 1.7 for the Mid/Large and Small-Caps, respectively.

## References

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