

The Ripple Effect

Finding Company Connections from Detailed Estimates

Authors

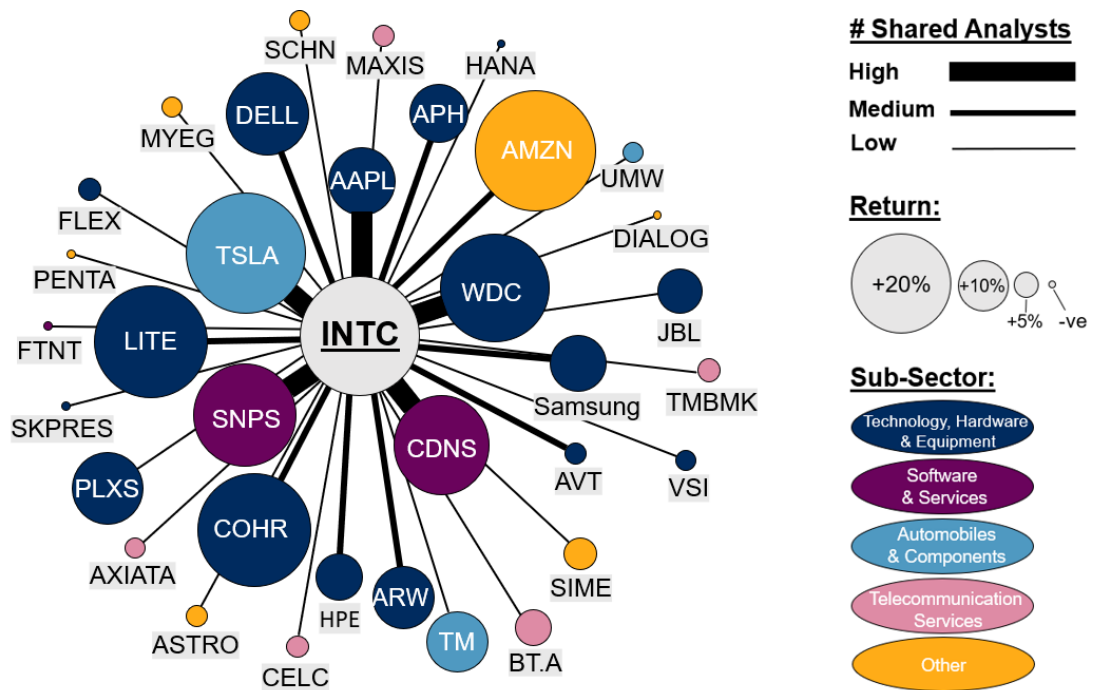
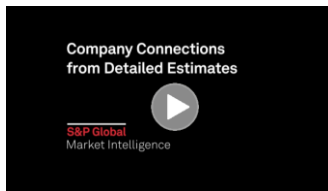
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Intel's (NASDAQ:INTC) share price jumped 9.3% on Friday, Oct 27th 2023, after the company reported strong earnings. Cadence Design Systems (NASDAQ:CDNS), which announced earlier in the week, was flat. Over the next 2 weeks (Oct 30 – Nov 14), CDNS would outperform INTC by 544 bps, as investors connected the dots between the two. INTC and CNDS do not share a GICS industry, however the two firms share something potentially more meaningful: sell-side analysts.

Figure 1: Intel Corporation's Connected Company Returns Post Announcement to November 14th, 2023, Global Universe (ex-semiconductor subsector)

Hear from the authors:



Source: S&P Global Market Intelligence Quantamental Research. Data as of 12/14/2023.

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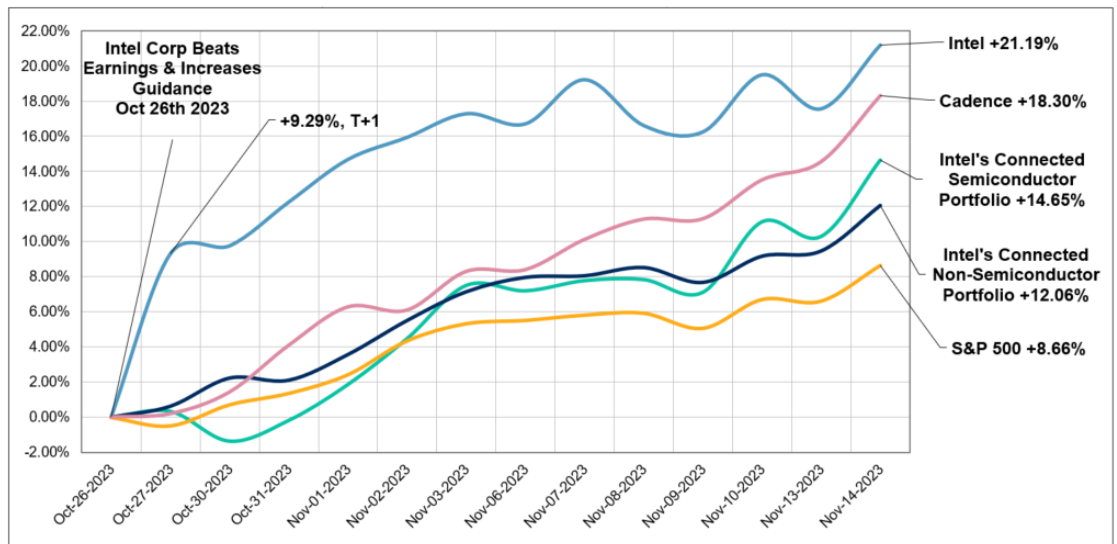
- The co-coverage of two firms by the same analyst implies a commonality or connection: the more shared analysts, the stronger the connection. This work documents a lead-lag return relationship among connected firms.
- Buying (selling) stocks with the best (worst) performing connected companies produced alpha across most developed markets, with long-short, annualized returns ranging from 3% in Japan to 8% in the US.
- Investors require more time to process information for companies with complex networks. The long-short return for a universe of small cap stocks with complex networks is 12%, vs. 8.7% for simple networks.

1. Introduction

Investors' inability to quickly update asset prices of connected companies with new value-relevant information¹ creates an investment opportunity. Ali and Hirshleifer (2019) argue that the strongest economic linkages between firms are best established using sell-side analyst coverage, as analysts are likely to co-cover firms that provide similar products or services.

Figure 2 illustrates the delay in price propagation for Intel's connected companies. A portfolio of connected semiconductor firms and non-semiconductor firms with positions weighted by the number of shared analysts outperformed the market² with a one-to-three day lag.

Figure 2: Intel & Connected Company Returns Post Intel's 2023Q3 Earnings



Source: S&P Global Market Intelligence Quantamental Research. Data as of 12/14/2023.

2. Test Results

A strategy of buying (selling) stocks with the best (worst) performing connected companies produced alpha. Consistent with the hypothesis that the alpha is driven by investor inattention, the strategy produces superior returns in the smaller, less followed Russell 2000 compared to the larger Russell 1000. Results were robust in varied geographies.

The complexity of the network matters. A size-neutral network complexity score (see methodology) was generated at the firm level and the universe was bifurcated into high and low complexity. The same strategy executed in high complexity networks returned an additional 3%.

¹ See Oyeniyi and Tortoriello (2020), Cohen and Frazzini (2007), Grinblatt and Moskowitz (1999), and, Parsons et al (2016).

² The semiconductor firms (non-semiconductor firms) portfolios outperform an equal weighted return of Intel's S&P 500 semiconductor peers by 2.9% (the S&P 500 by 3.4%).

Table 1: Analyst Momentum: Performance in the U.S. (June 1999 - Dec 2023)

Test Universe	Average Quintile Count	1-Month Information Coefficient (IC)	Annualized Long-Only Active Return	Annualized Information Ratio (Long Only Active Return)	Hit Rate (Long Only Active Return)	Annualized Long-Short Return	Annualized Information Ratio (Long-Short Return)	Hit Rate (Long-Short Return)
Russell 3000	529	0.018 ***	3.51% ***	1.21	61% ***	8.02% ***	1.61	68% ***
Russell 1000	189	0.005	1.95% ***	0.65	60% ***	4.51% ***	0.89	61% ***
Russell 2000	339	0.026 ***	4.83% ***	1.32	63% ***	10.71% ***	1.82	69% ***

Table 2: Analyst Momentum: International Performance, Developed Markets (June 2004 - Dec 2023)

Test Universe	Average Quintile Count	1-Month Information Coefficient (IC)	Annualized Long-Only Active Return	Annualized Information Ratio (Long Only Active Return)	Hit Rate (Long Only Active Return)	Annualized Long-Short Return	Annualized Information Ratio (Long-Short Return)	Hit Rate (Long-Short Return)
S&P UK BMI	78	0.020 ***	3.40% ***	0.94	60% ***	6.65% ***	1.06	62% ***
S&P Developed Europe Ex UK BMI	212	0.018 ***	1.51% **	0.55	60% ***	4.62% ***	0.84	65% ***
S&P Developed Asia Ex Japan BMI	185	0.015 ***	4.80% ***	1.37	65% ***	6.33% ***	0.71	58% ***
S&P Japan BMI	209	0.005	1.53% ***	0.51	52%	2.98% ***	0.53	51%

Table 3: Analyst Momentum: Performance in High vs Low Network Complexity (Russell 3000 Universe: June 1999 - Dec 2023)

Russell 3000 - Complexity	Average Quintile Count	1-Month Information Coefficient (IC)	Annualized Long-Only Active Return	Annualized Information Ratio (Long Only Active Return)	Hit Rate (Long Only Active Return)	Annualized Long-Short Return	Annualized Information Ratio (Long-Short Return)	Hit Rate (Long-Short Return)
High	267	0.023 ***	5.19% ***	1.19	59% **	9.66% ***	1.43	63% ***
Low	260	0.013 ***	2.38% ***	0.77	61% ***	6.91% ***	1.37	66% ***
High - Low			2.81% ***			2.75% **		

Table 4: Analyst Momentum: Performance in High vs Low Network Complexity (Russell 2000 Universe: June 1999 - Dec 2023)

Russell 2000 - Complexity	Average Quintile Count	1-Month Information Coefficient (IC)	Annualized Long-Only Active Return	Annualized Information Ratio (Long Only Active Return)	Hit Rate (Long Only Active Return)	Annualized Long-Short Return	Annualized Information Ratio (Long-Short Return)	Hit Rate (Long-Short Return)
High	171	0.023 ***	6.52% ***	1.22	62% **	11.99% ***	1.54	68% ***
Low	167	0.013 ***	2.83% ***	0.72	61% ***	8.70% ***	1.48	65% ***
High - Low			3.69% ***			3.29% **		

Tables 1-4: *** Statistically significant at 1% level; ** statistically significant at 5% level; * statistically significant at 10% level. Source: S&P Global Market Intelligence Quantamental Research. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 12/14/2023.

3. Methodology

A network of connected companies was formed from sell-side analyst coverage. [S&P Capital IQ Estimates](#) collects all sell side analyst estimates that permit collection and uses the full set to form the network.³ The network is packaged as [Company Connections: Detailed Estimates \(CCDE\)](#) and analytics are based on [The Analyst Matrix: Profiting from Sell-Side Analysts' Coverage Networks](#).⁴

The connected company momentum, termed *Analyst Momentum*, which is the weighted 1-month return of all the firms connected to a focal company, is given by:

$$\text{Analyst Momentum}_{jt} = \sum w_{it}R_{it} \quad \text{Equation 1}$$

Where w is the (number of analysts that co-cover the focal firm j and firm i) divided by the total number of connections in the network; and R_{it} is the return of stock i at time t .

The long (short) portfolio is formed from equal weighted positions in the most positive (most negative) quantile of *Analyst Momentum* values in each sector at the end of each month. Outliers were Winsorized at 3-standard deviations. Returns were adjusted for market, size, value, momentum and 1-month reversal risk factors using a traditional Fama-French regression framework.⁵

Network complexity refers to the interconnectivity of companies. As the number of companies and connections increases, the complexity of a network grows. Information propagation should be slower for companies with complex (large) networks compared to companies with simple (small) networks. This is because investors need to put in more time/effort to process all related-firm news for complex networks.

To test the above hypothesis, Equation 2 is used to divide the universe into two halves - complex and simple. This approach adjusts for size bias, as large cap companies tend to have more analyst connections than small cap companies.

$$\text{numConnections}_{it} = \beta_0 + \beta_1 \log \text{marketcap}_{it} + \varepsilon_{it} \quad \text{Equation 2}$$

Where *numConnections* is the number of connections for a given company, β_0 and β_1 are the fitted regression parameters, *logmarketcap* is the natural logarithm of the firms market capitalization and ε is the regression residual. The residuals from equation 2 serve as a proxy for network complexity, where positive (negative) ε indicate excess (reduced) complexity relative to expectation given company size.

³ Note that most buy-side firms have only the subset of detailed estimates for the sell-side firms with whom they have a broker-dealer relationship.

⁴ See the Appendix for methodology differences on Analyst Momentum between CCDE's and Oyeniya (2020).

⁵ Results are qualitatively similar if adjusted by market, size, value and momentum risk factors only. One month reversal was included for robustness.

4. Conclusion

Profitable investment strategies arising from lead-lag relationships between fundamentally connected firms have been documented in prior studies. The CCDE alpha signal presented in this report (*Analyst Momentum*) delivers statistically significant long-only and long-short returns globally. *Analyst Momentum*'s returns are stronger in a universe of stocks with the most complex networks, supporting the hypothesis that the strategy exploits investors and analysts' inability to quickly update asset prices due to limited attention and capacity to process information.

5. Appendix A

Differences in methodology between the *Analyst Momentum* signal in S&P's CCDE dataset and the Analyst Momentum signal that was constructed in The Analyst Matrix: Profiting from Sell-Side Analysts's Coverage Networks⁶:

- active analysts were defined as any analyst having an earnings estimate in the last 12 months in Oyeniji (2020), whereas the current work uses analyst recommendation. This switch increased the number of connections and the overall network by ~10%.
- current work uses a rolling 30-day window to calculate the returns used for *Analyst Momentum*, versus strict month end dates.
- overall, the changes increase the coverage and simply the logic without introducing any meaningful differences in summary statistics.

6. Data

The "Analyst Momentum" and "Number of Connected Companies" signals in this report are taken from S&P's point-in-time network dataset Company Connections: Detailed Estimates (CCDE). This dataset is derived from the S&P Capital IQ Estimates database which includes analyst forecasts for over 75 data items including company fundamentals (EPS, revenue, dividends etc.), industry estimates (REITs, oil & gas, and retail) and commodity estimates (fossils and precious metals). The database covers over 56,000+ companies (active and inactive) in over 110 countries. Estimates are sourced from more than 600 contributors. The S&P Global Estimate database also captures over 37 guidance data items for 10,000+ companies. Data history starts in 1999 for the U.S, and 1995 for other countries.

S&P Global Market Intelligence's Capital IQ Premium Financials and Compustat® North America packages were the sources of fundamental data for this study. Both are point-in-time databases, eliminating any look-ahead bias in our back-tests.

S&P Global Market Intelligence's Alpha Signals package is a comprehensive library of stock selection signals built from proprietary datasets and data partnerships. The library offers 20+ years of point-in-time data on fundamental drivers, industry factors and alternative data.

⁶ See Oyeniji and Tortoriello (2020).

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Our Recent Research

November 2023: Reading Between the Lines in Earnings Calls: 6 Things to Watch as the Q3'23 Earnings Season Unfolds

Watch for Q3'23 sentiment near 5-year highs, despite a quarter-on-quarter decline. Sentiment for Q3'23 is estimated to decline by 5% compared to last quarter; but remains on track to be the 7th most positive of the last 60 quarters. What a difference three quarters can make! As ranked by the sentiment of language on earnings calls, Q3'22 was one of the worst quarters of the last 5 years. Just 3 quarters later, Q2'23 sentiment improved 24% to make the season the 4th most positive over the period. Major drivers of positivity including abating supply chain disruption, declining inflation, and hope for a more dovish U.S. Federal Reserve roadmap.

August 2023: Breaking Boundaries: Women Poised for Milestone Achievement in Parity Amidst Otherwise Bleak Outlook

Diversity in leadership has received increasing attention. However, most data show slow, incremental improvements at best. Yet in an otherwise bleak landscape, a bright spot has emerged: an analysis of 86,000 executives from 7,300 U.S. firms over 12 years found that women could reach parity in senior leadership positions between 2030 and 2037, among companies in the Russell 3000.

June 2023: Mixed Financials Diverge from Bullish Sentiment: A Textual Review of the Q1'23 U.S. Earnings Call Season

A bullish sentiment during the Q1'23 season has taken hold. The excitement surrounding the '*iPhone Moment*' of AI, the resiliency in the labor market, the receding likelihood of a banking crisis and the end of the current rate hike cycle have all uplifted the prospects of the U.S. economy. However, the exuded level of sentiment may not be supported by the financials. The breadth of firms citing growth deteriorated on a quarterly and yearly basis. Forecasts for the next season have come down materially from their bullish Q1'23 levels. Ominous clouds are on the horizon as banks' commercial loan portfolios come under scrutiny. Vacancy rates for office buildings have hit all-time highs. For the first time in the past five seasons, banks are prominently discussing their exposures to the commercial real estate market.

April 2023: Sentiment Rebounds While Regional Banks Tip Their Hand: A Textual Review of the Q4'22 U.S. Earnings Call Season

The sentiment from S&P 500 firms' latest earnings calls rebounded for the first time in 2022. Earnings continued its recovery after hitting a trough two quarters ago. The headwind surrounding the strong dollar started to recede. Defensive sectors led the way while the cyclicals continued their struggle. The recent implosions of SVB Financial Group and Signature Bank have intensified this divergence. Other regional banks appear susceptible as the sentiment from their latest calls has turned negative, a rare historical occurrence that preceded the demise of the two, now FDIC seized, banks.

March 2023: Singing the (Banking) Blues: Navigating the Current Volatility in the Banking Industry

The collapse of Silicon Valley Bank (SIVB) led to a reassessment of liquidity and contagion risks across the banking industry. Regional banks have borne the brunt of the subsequent market sell-off. Month-to-date, regional bank stocks are down by 28%, versus 0% for the S&P 500. This report introduces a screen to help both equity and fixed income investors navigate the current volatility in the banking industry. The screen identifies regional banks with unfavorable exposures to liquidity, investor sentiment and management sentiment indicators.

February 2023: Watch Your Language: Executives' Remarks on Earnings Calls Impact CDS Spreads

While company earnings calls are targeted at equity analysts, information relevant to credit investors are discussed on these calls. This report documents that executive remarks have an impact on credit default swap spreads. The percentage change in CDS spreads of companies with the worst executive sentiment reading is larger than that of companies with the best sentiment reading post earnings call. Credit investors should consider using executive sentiment as an additional tool to gauge the direction of future CDS spread movements.

January 2023: Machines Signal Q4'22 Guidance Not Falling Off a Cliff: An In-Depth Textual Review of Q3'22 Earnings Call Transcripts

In Q3'22, the sentiment of S&P 500 firms has deteriorated to a level not seen since the IMF Greek Debt Default. Firms' focus has shifted away from pandemic-related concerns to interest rate-related ones. Financial growth is uneven. The breadth of firms citing profitability growth remains a bright spot yet the number of firms citing bottom-line growth has been mired in an "earnings recession" throughout 2022. Guidance for Q4'22 is far from falling off a cliff. This series demonstrates the richness and the intuitiveness of insights that could be surfaced algorithmically from textual data.

October 2022: Hanging on Every Negative Word: Natural Language Processing Analysis of Credit Rating Action Reports

Credit ratings are opinions about credit risk. When a credit rating changes, the analyst explains why, in a report. The 'why' is important. For an equity investor, a downgrade due to a rapid decline in a company's sales has a negative implication, whereas a downgrade due to an increase in leverage arising from a share buyback program may be viewed as positive. This study finds that the relative size of the price impact following a downgrade is dependent on the magnitude of the tone and the topics of focus in the report (Figure 1). Downgrades with strong negative sentiment underperform downgrades with positive sentiment by 2.7% over the following month.

March 2022: The Sounds of Silence: No Response Speaks Volumes

No simple remedy for gender discrimination exists. But the first step in solving any problem is collecting the data to understand it. This research shows firms that share their data on

diversity, equity, and inclusion (DEI) have taken further steps to address gender equity concerns. The S&P Global Corporate Sustainability Assessment (CSA) is a premier benchmarking survey and litmus test for inclusion in the S&P Dow Jones Sustainability Index. Firms that participated in the CSA survey in 2021 had better DEI outcomes.

October 2021: Glass Floors and Ceilings: Why Closing the Median Wage Gap Isn't Fair

The gender wage gap describes the disparity in compensation between women and men doing the same work. Progress on this issue is commonly measured by comparing the median compensation for women to men. This research demonstrates that firms are catering to the focus on median compensation and are paying women in a tighter range around the median, compared to men in equivalent positions. Effectively, women have been given a glass floor as redress for the still-present glass ceiling. This 'Gender-Based Compensation Management' not only undermines the goal of equitable pay; but because the high end of the compensation range can be much farther from the median than the low end, this paradigm is a net disadvantage for women.

September 2021: The Board Matrix: The (ESG) Value of Well-Connected Directors

Corporate boards are responsible for shaping and overseeing environmental, social and governance (ESG) policies for their organizations. This report examines the relationship between companies connected through shared board members and ESG performance. It finds that companies with strong board networks (companies with directors who serve on more than one corporate board or are well-connected) have better certain ESG outcomes than firms with weak board networks. Well-connected directors can utilize their network for information on emerging ESG trends/best practices and share this knowledge with their companies. Given their roles on multiple boards, well-connected directors are also better informed about the needs of different stakeholders (governments, communities, ESG activists) than directors with little or no network. This awareness of stakeholder management translates to better ESG performance for companies with well-connected directors.

August 2021: Technology Momentum: Peer Networks from Patents

Companies with similar patent portfolios exhibit peer group momentum. A strategy that buys (sells) stocks of focal companies in the Russell 3000 with outperforming (underperforming) technology peers produces an annualized risk-adjusted return of 5.23% in a historical backtest. The strategy returns are more pronounced for smaller companies. In the Russell 2000, the strategy demonstrates more efficacy with annualized long-short return of 7.32%. The strategy is distinct from sector momentum strategies. After controlling for sector momentum, 3.60% excess return in the Russell 3000 can be attributed to technology peer group momentum.

July 2021: Branching Out: Graph Theory Fundamentals

Investment analysis has evolved beyond financial data to non-financial, or alternative data. Typically, the focus has been on using alternative datasets that are purely time-series and tabular. Graph networks meanwhile offer investors the ability to gain deeper insights into the connections between economies, industries, and individual corporations.

May 2021: U.S Filings: No News is Good News

Company annual filings are a vital but often under-analyzed source of information for investors. Market moving content is buried within an ever-growing body of text that on average is equivalent to a 240-page novel. The filings contain subtle revisions making a computational linguistic approach imperative. Faced with this voluminous amount of text and the minute number of changes, investors have historically overlooked the newly embedded information and the implications of those additions.

March 2021: Hiding in Plain Sight – Risks That Are Overlooked

This report uses three metrics (Minimum Edit Distance, Jaccard Similarity, and Cosine Similarity) to identify companies that made significant changes to the “Risk Factors” section of their filings. These metrics can serve as alpha signals or be used to quickly identify a pool of companies that require further investigation.

January 2021: Leadership Change That Matters: A Value and Momentum Story

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March 2011: How Much Alpha is in Preliminary Data?

February 2011: Industry Insights – Biotechnology: FDA Approval Catalyst Strategy

January 2011: US Stock Selection Models Introduction

January 2011: Variations on Minimum Variance

January 2011: Interesting and Influential Papers We Read in 2010

November 2010: Is your Bank Under Stress? Introducing our Dynamic Bank Model

October 2010: Getting the Most from Point-in-Time Data

October 2010: Another Brick in the Wall: The Historic Failure of Price Momentum

July 2010: Introducing S&P Capital IQ's Fundamental US Equity Risk Model

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