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Discerning Cyber Risk:

The Sustained Negative Impacts of Cyber Incidents on Shareholder Value

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Introduction

It is well known that cyber security incidents can have an immediate and meaningful impact on the share values of publicly traded companies. What's less understood is the depth and duration of that damage and what kind of companies suffer the most.

While a handful of studies have been put forward on the impact of cyber incidents on the shareholders of publicly traded firms, these analyses have largely been anecdote-driven rather than broad-based assessments.

A new study conducted jointly by ISS STOXX and ISS-Corporate examined the impact of reported cyber incidents on share values across the U.S. Russell 3,000 index over a three-year period from 2022 through 2024.

The study shows that firms reporting significant cyber incidents underperform the market (as measured by share price) by nearly 5% on average. It also demonstrates that this underperformance is sustained over a year or more.

The results underscore the importance of maintaining an ongoing program of cyber risk measurement, cyber risk management, and continuous improvement. Diligence in managing technical risks and in ensuring sound governance oversight are critical to protecting equity stakeholders from the most negative outcomes.

Key Takeaways

- While share price underperformance manifests quickly, it is also sustained and builds over time.
- This study confirms continued share price underperformance at one full year after incidents are first reported, with a peak negative average impact of nearly -4.9% after 250 trading days.
- The Finance and Banking sector, as well as the Health Care sector, show higher negative average impacts to relative share price in the months following a reported cyber incident (peaking at -8.5% and -8.3%, respectively).

Scope of Analysis and Source Data

This study measures the correlation between reported cyber incidents and share price performance across the Russell 3000 index from 2022 through 2024. (*For more details on the exact approach used in generating the analysis, please see the **Methodology** section at the end of this document.)* With nearly 3,000 firms analyzed, it represents a broad swath of publicly traded firms in the U.S. market. While it is a broad analysis, readers should keep in mind the make-up of the Russell 3000 index, including its size and sector biases.

Incident data used in this analysis was drawn from two primary sources: events disclosed in SEC filings and those disclosed under the mandatory incident reporting requirements of various U.S. states. Most U.S. states have a mandatory reporting regime, and certain key data elements captured are consistent across the state frameworks. As larger firms with larger incidents are typically operating across a wide geographic region, the state reporting regime does a good job capturing significant incidents, even though not all states have the reporting requirement. This coverage and consistency enable a coherent analysis of incidents over a multi-year period.

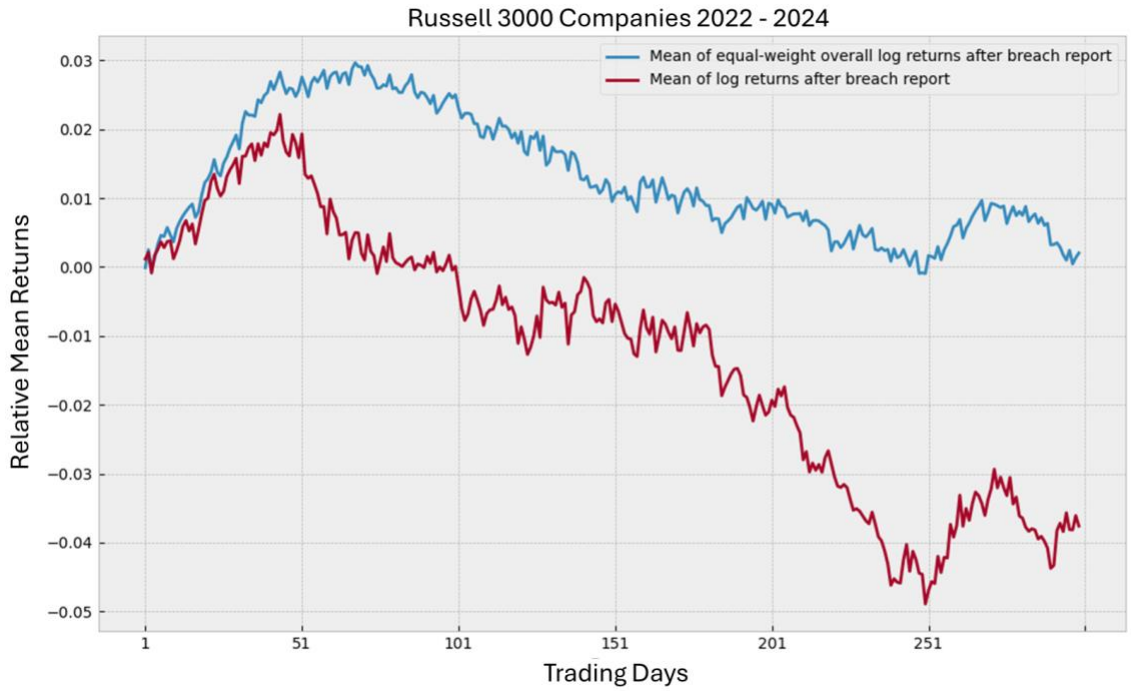
Leveraging these cyber incident data sources, all of the incidents used in this analysis are self-reported by the company suffering the incident. While many smaller cyber attacks go unreported, there are no speculative or assumed incidents used in our analysis. To eliminate the "noise" of inconsequential incidents, the events analyzed only include those with 10,000 or more "impacted individuals," a metric that is common to the US states included in the reporting frameworks leveraged by ISS. As a result, this analysis looks at the share price impact of 176 unique events, ***measured from the date the incident was first reported by the impacted firm.***

The share price information leveraged by the study uses the adjusted closing price for all trading days during calendar years 2022, 2023, and 2024, taking into account the impact of share splits and reverse share splits over that period.

Findings

The study finds a significant and sustained impact on share price for Russell 3000 index companies experiencing a significant cyber event (defined as having impacted 10,000 or more individuals). Figures 1, 2, and 3 below describe the underperformance in mean log returns for cyber incident firms relative to the mean of equal weight overall log returns for the Russell 3000 index constituent firms over the three-year period of 2022 - 2024.

Figure 1



In ***Figure 1***, the gap between the blue line (mean of equal-weight log returns) and the red line (mean log returns of incident companies) describes the share price performance gap for firms experiencing an incident, with trading days after incident report being measured along the x-axis. The performance gap is significant and sustained.

Figure 2

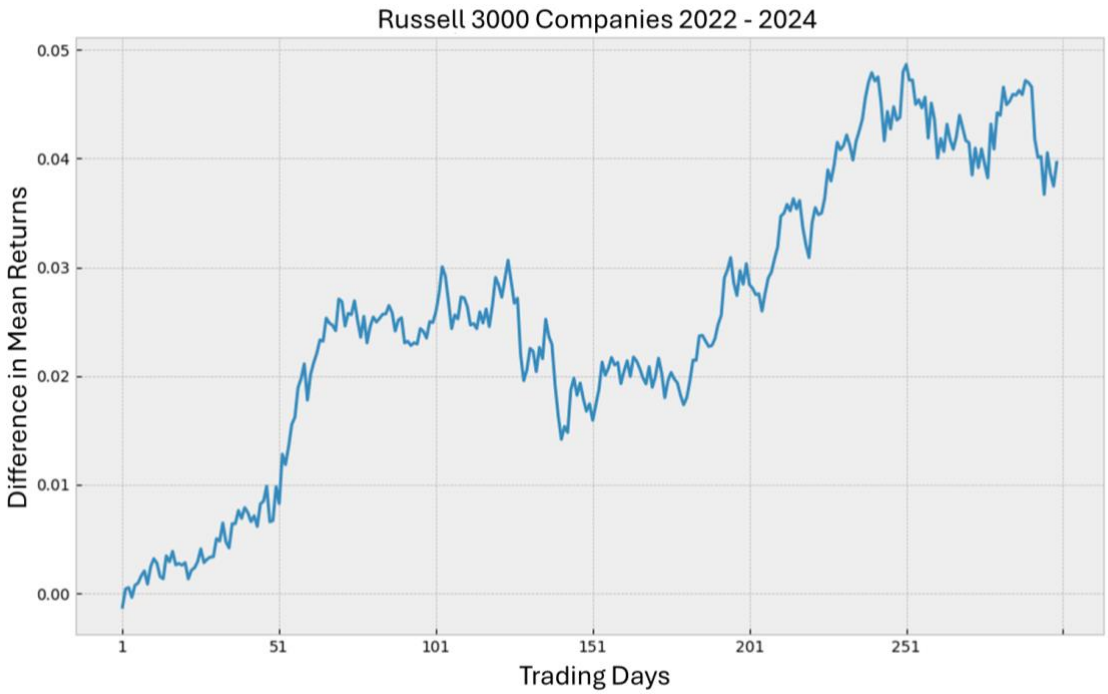


Figure 2 shows the difference between the mean log returns of the full population and the incident population – i.e. the difference in returns experienced by the overall Russell 3000 and the incident subset, or the distance between the red and blue lines from ***Figure 1***. It represents the underperformance of the incident population.

For example, the average underperformance widens to 3% at 103 days after incident disclosure.

The incident population shows lower returns than the mean returns of the Russell 3000 within a few days after incident disclosure, and this gap in performance persists over the entire measurement period. Discrete values for the difference in returns at 50-day intervals is provided below.

Figure 3

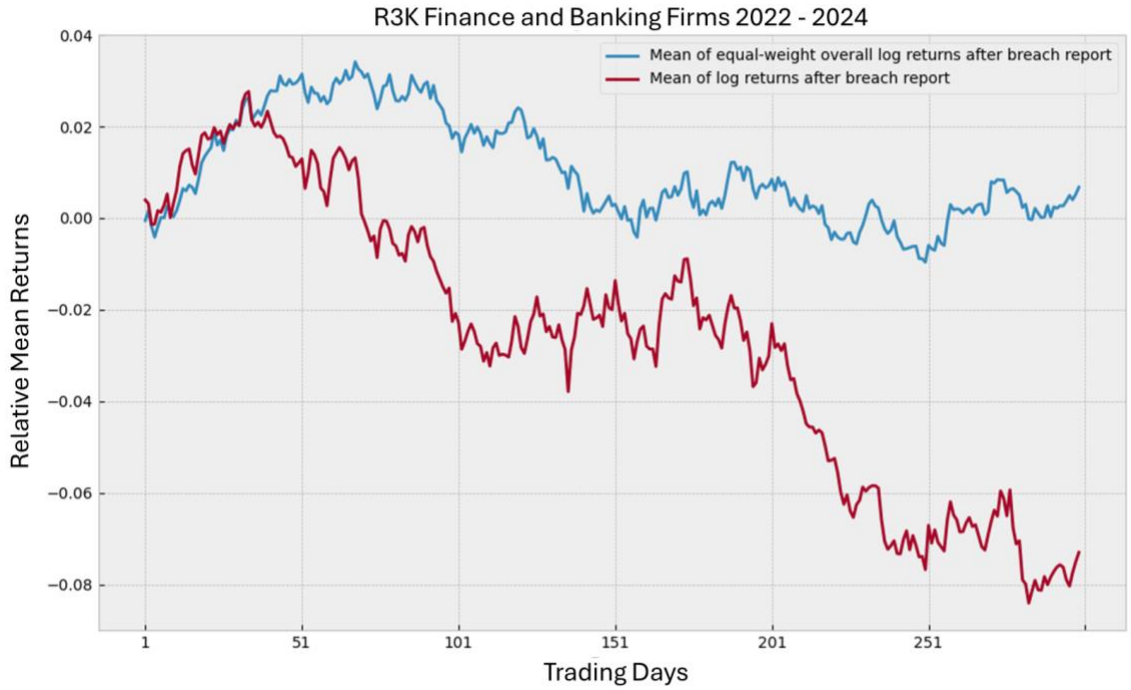
Rusell 3000 Companies 2022-2024	
Trading Days	**Difference in Mean Returns**
1	-0.13%
51	0.83%
101	2.59%
151	1.59%
201	2.84%
251	4.86%
299	3.96%

The mean underperformance for incident-impacted firms grew over time and peaked 251 trading days after the incident report date at 4.86%

Sector Subsets

Two sectors accounted for more than half of the incidents reported during the time period of the study: Finance and Banking (30%) and Health Care (28%). Incidents were more widely spread across the eight other identified sectors, with no single industry accounting for more than 11%.

Figure 4



In ***Figure 4***, the blue line represents the mean of the equal-weight log returns of the Russell 3000 Finance and Banking firms, by trading days along the x-axis. The red line represents the mean of log returns for only the incident subset within this specific sector. As with the broader population, the difference between the mean returns and the returns of the incident population is obvious and sustained, with incident firms underperforming.

Figure 5

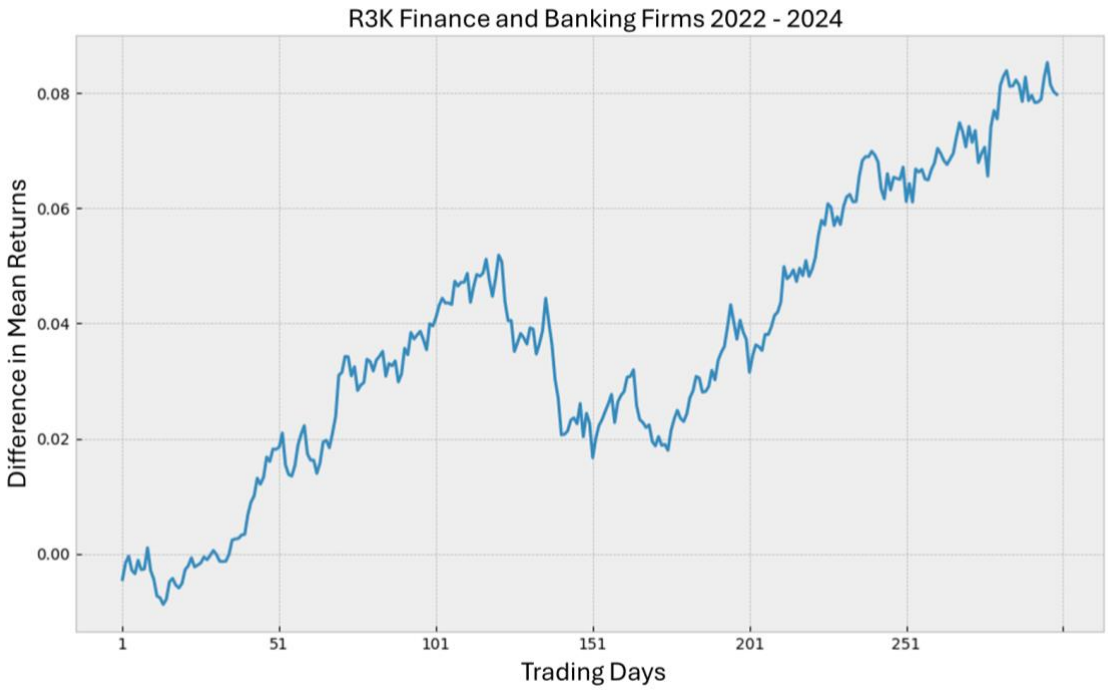


Figure 5 shows the difference between the mean log returns of the Russell 3000 Finance and Banking firms and the returns of incident population within this sector. – i.e. the difference in returns between the red and blue lines from ***Figure 4.*** It represents the underperformance of the incident population.

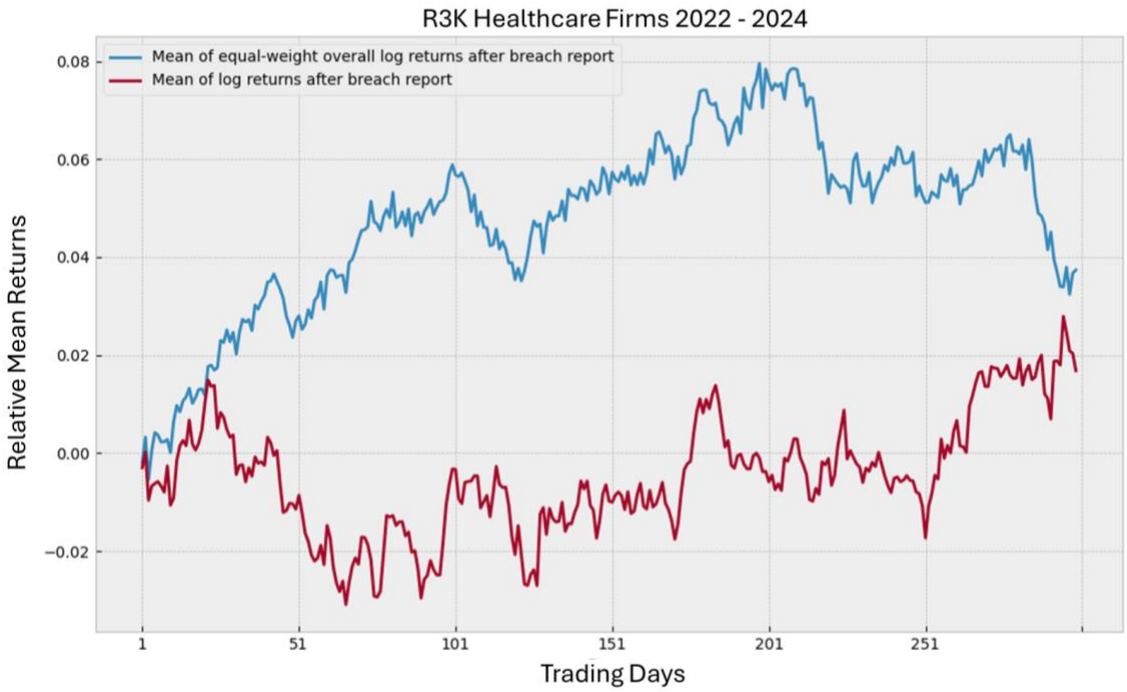
The incident population shows lower returns than the mean returns of the Russell 3000 Finance and Banking sector subset. Discrete values for the difference in returns at 50-day intervals are provided below.

Figure 6

R3K Finance and Banking 2022-2024	
Trading Days	**Difference in Mean Returns**
1	-0.45%
51	1.85%
101	4.10%
151	1.67%
201	3.15%
251	6.11%
299	7.97%

The mean underperformance for incident-impacted firms in Finance and Banking grew over time, declined around the six-month mark, and began growing again thereafter. Mean underperformance peaked at 296 trading days post-incident at 8.53%.

Figure 7



In ***Figure 7***, the blue line represents the mean of the equal-weight log returns of the Russell 3000 Health Care firms, by trading days along the x-axis. The red line represents the mean of log returns for only the incident subset within the Health Care sector. As with the broader population, the difference between the mean returns and the returns of the incident population is obvious and sustained, with incident firms underperforming. In the Health Care sector, the performance difference is markedly reduced towards the end of the study's performance window.

Figure 8

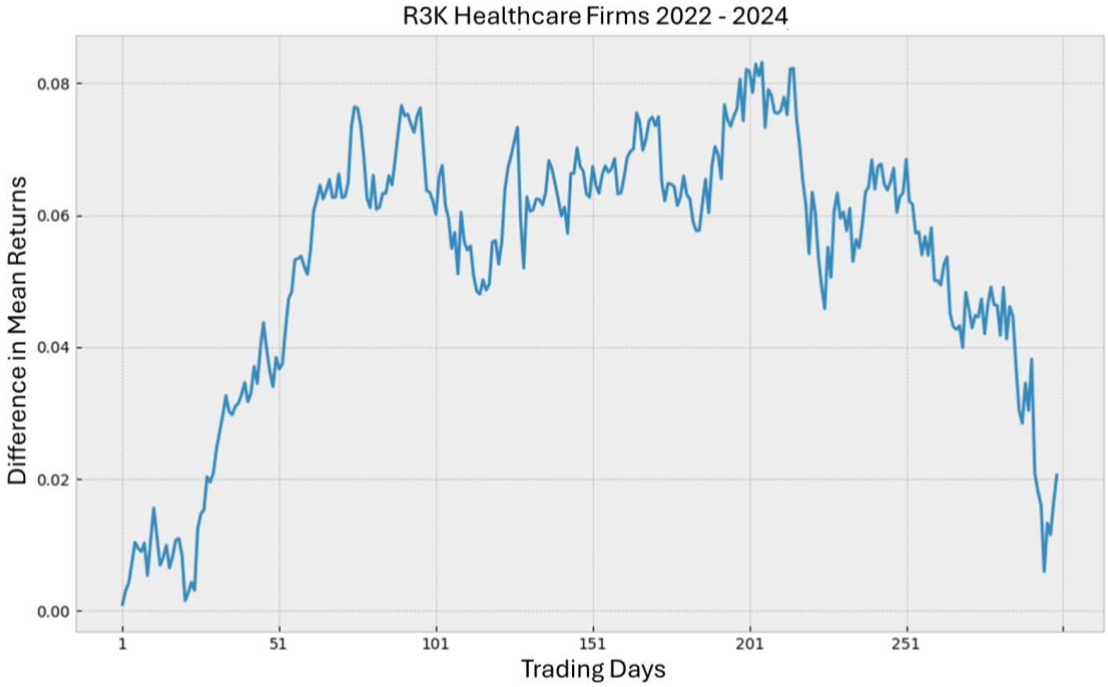


Figure 8 shows the difference between the mean log returns of the Russell 3000 Health Care firms and the returns of incident population within this sector. – i.e. the difference in returns between the red and blue lines from ***Figure 7***. It represents the underperformance of the incident population.

The incident population shows lower returns than the mean returns of the Russell 3000 Healthcare sector subset. Discrete values for the difference in returns at 50-day intervals is provided below.

Figure 9

R3K Healthcare 2022-2024	
Trading Days	**Difference in Mean Returns**
1	0.10%
51	3.67%
101	6.01%
151	6.74%
201	8.18%
251	6.85%
299	2.06%

The mean underperformance for incident-impacted firms in Health Care grew over time and peaked 205 trading days post-incident at 8.31%. As stated above, while underperformance was sustained over the analysis period, the performance gap closed substantially by the one-year mark.

Conclusions

While many factors impact the share price performance of individual firms and the broader market, this broad-based study clearly demonstrates a significant and sustained reduction in returns for firms suffering a significant cyber event in the time period following incident disclosure.

While many previous studies have identified a share price performance impact, these have often been based on smaller sample sets and "inclusion by anecdote." This broad market study of the constituent companies of a major index and its more comprehensive and systematic accounting of reported incidents provides new and powerful evidence of the shareholder impacts of cyber events. Cyber incidents are not just momentary annoyances or quickly forgotten news items. Firms that report significant cyber incidents suffer material and sustained impacts to share price performance relative to sector and broader market peers.

ISS-Corporate's cyber risk solutions provide useful insights for companies looking to measure, understand, and reduce the cyber risks that they face. The ISS Cyber Risk Score is a concise, empirical, and forward-looking metric that corresponds to the likelihood of a future cybersecurity incident. It is powered by a machine learning model trained on real breach incident exemplars to understand the mathematical relationship between risk signals and cyber incident outcomes.

The ISS Cyber Risk Score is packaged with insightful tools that help companies understand and address cyber risk, benchmark performance against relevant peers, and assess third and fourth-party exposures. A robust program of management that includes the ISS Cyber Risk Score can also contribute to a defensive diligence posture – a deliberate and demonstrable strategy for the proactive management of cyber liability.

Contact us to learn how ISS-Corporate can help your firm better understand and manage your cyber incident risk.

Contextual Information on Cyber Risk

According to IBM's recently published ***Cost of a Data Breach Report 2025***, the average cost to firms of a breach incident (globally) declined by 9% to $4.88 million – a return to 2023 cost levels. In the United States, average costs are higher at $10.22 million and rising rather than falling.[1]

Regardless of geography, for many larger publicly traded firms and their investors, those average cost figures will likely sound low and may even seem inconsequential. But the averages mask the scale of the impacts for biggest firms when they become the victims of the largest incidents.

Many will remember the UnitedHealth incident involving a ransomware attack at their Change Healthcare subsidiary, which was first reported in February of 2024. According to UnitedHealth's Q3 2024 SEC filings, the incident was expected to cost more than $2.5 billion.[2] A more recent cyber attack at Jaguar Land Rover (JLR), first reported in September of 2025, resulted in direct costs of $220 million, but had a much larger impact on losses at JLR, and discernible impacts on the broader UK economy. The Cyber Monitoring Centre estimates the economic losses to total more than GBP1.9 billion.[3]

Costs of this magnitude undoubtedly impact shareholder value; but by how much? Beyond direct costs for repair and remediation, impacts can also include lost business and reduced profits. When significant cash is diverted from profits - whether due to direct costs, lost sales, reputational damage, or other factors - future earnings and business investment are also implicated.

Companies and their investors understand the connection between earnings and share price. While market reaction to any given cyber incident is hard to predict, this study of Russell 3000 index constituent firms for the years 2022-2024 demonstrates a marked, meaningful, and sustained impact on share price for publicly traded firms that have reported substantial cyber incidents.

Recent reports have identified a flattening in the projected growth rate of the economic impact of cyber crime. Cybersecurity Ventures, a frequently cited source, now projects the impact to grow from $10.5 trillion in 2025 to $12.2 trillion in 2031 – a moderation in growth to a rate of 2 - 3%, annually.[4] Statista is somewhat less optimistic, projecting an impact of $15.6 trillion by 2029.[5] Whether you believe the higher or lower estimates, the fact remains that anything that must be measured in trillions of dollars is likely to have a material effect. Costs at these levels must impact both current returns as well as future performance for firms of all stripes.

Setting aside projections, cybersecurity risk in the United States has increased materially over the past several years, driven by higher attack frequency, broader impact across sectors, growing financial losses, and the industrialization of cybercrime, including the increased use of AI by cyber criminals. Recent data from U.S. federal law-enforcement and long-running breach studies show that cyber incidents are both more common and more costly, with ransomware, phishing, and data loss events dominating the threat landscape.

In a June 2025 paper entitled ***The Financial Impact of Cybersecurity on Stock Price and Corporate Valuation***, Westbourne + Partners argues that investors must now treat cybersecurity risk as a core driver of enterprise value. The study, referencing 118 cyber incidents over an 11-year period, finds an immediate negative impact on the share price of 5-7%. They also note a long-term valuation drag of 3% to 15% over a one to three-year period.

The Westbourne study also found significant instances of M&A repricing upon the discovery of undisclosed breaches during due diligence and cites other research that indicates that more than 20% of M&A deals are repriced or abandoned due to cybersecurity issues found during the due diligence process.[6]

While we have taken a different approach in our analysis (larger volume, limited to publicly traded companies and a more systematic inclusion of incidents), our results are largely in agreement with the Westbourne study.

Methodology

This analysis takes a simple and pragmatic approach to quantifying the effect on share price returns following a set of mutually unrelated events, each of which is associated with one ticker on one date.

For a specific event, we compute the log returns of the affected ticker beginning on the date of the event. We then compute the log returns of every ticker in the index beginning on the date of the event and compute the mean of these on a day-by-day basis, to construct the "equal-weight" index log return over the corresponding time period. These two series are computed for each event independently, using the tickers and dates corresponding to each event separately, yielding two series of returns per event—one set of series representing log returns for an individual ticker post-event, and another set of series representing the "equal-weight" index log return post-event. Finally, we compute the day-by-day mean of each of these two sets of series independently, resulting in two series of summary statistics relative to event date.

Concretely, the log return per ticker following the event is

$$r_i^{(j)} = \log\left(p_i^{(j)}\right) - \log\left(p_0^{(j)}\right),$$

where $p_i^{(j)}$ is the price of the j th ticker on the i th day following the event. Thus the two series of interest per event—the returns for the affected ticker and the mean returns for all tickers, both relative to the date of the event—for an event affecting the ticker j' in an index of n tickers are

$$r_i^{(j')} = \log\left(p_i^{(j')}\right) - \log\left(p_0^{(j')}\right)$$

and

$$\bar{r}_i^{(j')} = \frac{1}{n}\sum_{j=1}^{n} \log\left(p_i^{(j)}\right) - \log\left(p_0^{(j)}\right)$$

respectively. Note the date indices on prices have an implicit dependence on the ticker in question, while the date indices on the returns have no such dependence.

Finally, for a collection of m events of which $p_{i,k}^{(j)}$ is the price of the j th ticker on the i th day following the event k, the two series to be compared are

$$\left\langle r_i^{(j')} \right\rangle_{j'} = \frac{1}{m}\sum_{k=1}^{m} \log\left(p_{i,k}^{(j=j')}\right) - \log\left(p_{0,k}^{(j=j')}\right)$$

and

$$\left\langle \bar{r}_i^{(j')} \right\rangle_{j'} = \frac{1}{n}\sum_{j=1}^{n}\frac{1}{m}\sum_{k=1}^{m} \log\left(p_{i,k}^{(j)}\right) - \log\left(p_{0,k}^{(j)}\right)$$

respectively.

Citations

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2. UnitedHealth Group SEC form 10-Q for the period ending Sept. 30, 2024 (https://www.unitedhealthgroup.com/content/dam/UHG/PDF/investors/2024/UNH_Q3-2024_Form-10-Q.pdf)
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6. ***The Financial Impact of Cybersecurity on Stock Price and Corporate Valuation***, Westbourne + Partners (https://www.westbourne.partners/perspectives/the-financial-impact-of-cybersecurity-on-stock-price-and-corporate-valuation#:~:text=Breach%20Disclosure%20Laws:%20Strong%20mandatory,Yahoo%20acquisition%20due%20to%20breach.)