Effects of COVID-19 on Financial Reporting in the U.S. Life Science Industry

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The COVID-19 pandemic posed unprecedented challenges for financial reporting, especially in the U.S. life sciences industry. This study analyzes how pharmaceutical, biotechnology, and medical device companies navigated financial disclosure obligations from 2019 to 2022 during the pandemic. We examine SEC filings (10-Ks and 10-Qs) and corporate disclosures to identify changes in risk factor reporting, liquidity management, corporate governance, internal controls, non-GAAP measures, critical accounting judgments, and potential earnings management. The findings reveal that life science firms responded with greater transparency regarding pandemic risks, proactive capital management (including substantial debt and equity financing in 2020), governance adaptations (more frequent board oversight and virtual meetings), maintained internal controls despite remote work, and cautious use of non-GAAP adjustments (most firms did not treat COVID-19 costs as one-time exclusions). Additionally, there was a trend of taking significant discretionary write-offs in 2020, with reversals noted in 2021. These actions indicate that, even amidst extreme uncertainty, companies aimed to uphold the integrity of financial reporting and meet stakeholder information needs. The industry's experience offers valuable insights for enhancing the resilience of financial reporting in future crises.

Keywords: COVID-19, financial reporting, life sciences industry, risk disclosures, corporate governance, earnings management

INTRODUCTION

The COVID-19 pandemic introduced unprecedented challenges for businesses worldwide beginning in early 2020. Virtually every industry felt the impact, and companies had to navigate extreme uncertainty in their operations and financial outlooks. This study examines how the pandemic specifically affected corporate financial reporting practices in the U.S. life sciences industry, which includes pharmaceutical, biotechnology, and medical device companies. The life sciences sector was uniquely intertwined with the pandemic, both as an affected industry—facing disruptions in clinical trials, supply chains, and sales—and as a critical part of the global response—developing vaccines, therapies, and diagnostics. These companies needed to assess and disclose new risks, manage shifts in capital and liquidity, adapt corporate governance processes, maintain internal controls in a remote work environment, adjust their use of non-GAAP financial measures, make challenging accounting judgments under uncertainty, and confront potential temptations for earnings management during the crisis.

Transparency in financial reporting became crucial as investors and regulators sought timely information on COVID-19's impact. The U.S. Securities and Exchange Commission (SEC) and other regulators issued guidance early in the pandemic urging companies to provide robust, forward-looking

disclosures regarding how COVID-19 affected their business, financial condition, and prospects. For instance, SEC Division of Corporation Finance guidance in March 2020 advised firms to clarify the pandemic's current and expected impacts on operations, liquidity, and capital. The SEC stressed the significance of company-specific disclosures – if a biotech firm's clinical trial was delayed due to COVID-19, investors should be informed of how that delay impacts the development timeline and financial position of the company. Subsequent guidance (Topic No. 9A in June 2020) reinforced these points as the pandemic continued. Moreover, the SEC offered temporary regulatory relief (such as extended filing deadlines for companies significantly affected by COVID-19) and indicated flexibility in using reasonable estimates or non-GAAP measures when GAAP results were unavailable, provided there was proper disclosure and reconciliation. The outcome was a real-time stress test of financial reporting practices under crisis conditions.

Purpose and Scope

This research aims to analyze a representative sample of U.S. life science companies and document how their financial reporting from 2019 to 2022 reflected the challenges posed by COVID-19. Key areas of investigation include:

1. **Risk factor disclosures and discussions of operational risk** – How companies communicated COVID-19-related business risks in SEC filings.
2. **Changes in capital resources and liquidity management** – How the pandemic affected firms' cash flows, financing, and capital structure decisions.
3. **Corporate governance and oversight adaptations** – How boards of directors and management adjusted oversight processes (e.g. meeting frequency, committees, stakeholder communications).
4. **Maintenance of internal controls over financial reporting** – How financial control environments were maintained or altered under remote work conditions.
5. **Presentation of non-GAAP financial measures** – Whether companies adjusted or excluded COVID-19 impacts in metrics like EBITDA and how regulators responded.
6. **Critical accounting judgments and estimates** – Impacts on accounting assumptions in areas such as fair value, impairments, leases, revenue recognition, taxes, going concern evaluations, and new accounting standards.
7. **Evidence of earnings management** – Whether companies engaged in unusual accrual or deferral practices (the "big bath" or other tactics) during the pandemic.

By examining annual (10-K) and quarterly (10-Q) SEC filings of life sciences firms before and during the pandemic, this study illuminates how these companies reacted in their financial reports to an unprecedented global disruption. The findings offer insight into the effectiveness and transparency of corporate reporting during a crisis and may provide lessons for regulators, standard-setters, and practitioners on enhancing the resilience of financial reporting for future emergencies.

BACKGROUND

The U.S. Life Science Industry and COVID-19 Context

The life sciences industry, comprising pharmaceutical manufacturers, biotechnology firms, and medical device companies, plays a vital role in public health and innovation. Companies in this sector range from large, diversified enterprises with multiple product lines to small, development-stage biotechs with no marketed products. Before 2020, the industry experienced steady growth in R&D investment and market capitalization, with many biotech firms relying on capital markets to finance their drug development pipelines. Financial reporting in this sector often involves significant judgment due to the prevalence of intangible assets (e.g., patents, in-process R&D), frequent clinical trial updates, and the need to comply with stringent regulatory requirements (FDA approvals, etc.).

When COVID-19 struck, life science companies faced a dual-edged impact. On one hand, many experienced operational setbacks: clinical trials were temporarily halted or delayed, sales representatives

could not visit hospitals, and elective medical procedures (a key driver of medical device sales) were postponed—all of which threatened near-term revenues and project timelines. On the other hand, the pandemic created urgent new opportunities for firms working on vaccines, antiviral drugs, and diagnostic tests. This dynamic meant that some life science companies saw increased demand or strategic importance, while others experienced significant disruptions. Regardless of their specific situation, all companies in the industry had to evaluate COVID-19 as a major risk factor for their business and respond accordingly in their financial communications.

By early 2020, it became clear that companies needed to provide expanded disclosures about the pandemic. The SEC's Division of Corporation Finance issued Disclosure Guidance Topic No. 9 in March 2020, advising companies to detail the COVID-19 pandemic's current and expected impact on their operations, liquidity, and capital. The SEC emphasized the importance of company-specific disclosures. For instance, if a biotech firm's clinical trial was delayed due to COVID-19, investors should be informed of how that delay affects the development timeline and financial position of the company. Subsequent SEC guidance (Topic No. 9A in June 2020) reinforced these expectations as the pandemic progressed. Additionally, the SEC provided temporary regulatory relief, such as extended filing deadlines for companies significantly impacted by COVID-19, and showed flexibility in certain accounting rules, allowing reasonable estimates instead of exact GAAP figures when needed.

The result of these pressures was a rapid proliferation of COVID-19 disclosures in SEC filings. Taylor et al (2020) reported that the disclosure of COVID-19 impacts started slowly but increased exponentially as the pandemic's severity became evident. By January 31, only 0.7% of companies referenced the virus in SEC filings. This percentage rose to 22% by February 29, 64% by March 31, and a near-universal 99.6% by the end of May 2020. Notably, companies in the healthcare sector (including pharmaceuticals and biotech) were among the fastest to disclose the pandemic's impacts. By the end of the first quarter of 2020, about 85% of healthcare industry companies had discussed COVID-19 in their SEC filings, reflecting the virus's high relevance to life science businesses (for comparison, some industries like utilities lagged with under 40% at that time). This early and widespread disclosure trend underscored how significantly the pandemic was expected to affect life science firms' operations and finances (Taylor et al., 2020).

Beyond risk factor reporting, other aspects of financial reporting faced challenges. The capital markets experienced significant volatility in March 2020, threatening companies' liquidity and capital-raising plans. Many life science firms, particularly smaller biotech companies that rely on external financing, had to quickly reassess their financial resources. Meanwhile, corporate governance mechanisms were tested: boards of directors suddenly needed to oversee crisis responses by adjusting strategic priorities and often suspending normal practices (such as share buybacks or executive bonus plans) to conserve cash. Internal control systems had to adapt to remote work arrangements, raising concerns about maintaining effective financial reporting processes outside the traditional office environment. Companies also struggled with how to reflect pandemic-related losses or expenses in their financial metrics. The use of non-GAAP measures (like "adjusted EBITDA") faced scrutiny – regulators warned against cherry-picking adjustments to portray a rosier picture, even as some firms considered isolating one-time COVID-19 costs for clarity.

The pandemic had accounting implications across various areas that required management estimates. For instance, the potential impairment of goodwill and intangible assets became a significant concern as market conditions worsened. Indeed, U.S. public companies' goodwill impairments more than doubled from $71 billion in 2019 to over $142 billion in 2021, a spike largely attributable to COVID-19's economic fallout (Kroll, 2022). Life science companies needed to assess whether the present value of future cash flows from a drug or device line had been permanently diminished by pandemic-related factors and record impairment charges if necessary. New government aid and changes in tax law (such as the CARES Act) complicated tax accounting and financial statement presentation, as companies could suddenly carry back net operating losses or defer certain expenses, thereby altering their tax assets and cash flows.

By early 2021, it was clear that the COVID-19 crisis had impacted nearly every aspect of financial reporting. Initial studies (e.g. Taylor et al., 2020) indicated that disclosure practices needed to adapt quickly amid extreme uncertainty. Audit and regulatory bodies also closely monitored reporting quality, urging companies to provide honest and comprehensive information despite the challenges of prediction (Tysiac,

2020). The life science industry, due to its essential role and unique challenges during the pandemic, offers a crucial context for examining these reporting practices in action. The background described above lays the groundwork for analyzing how a selection of such companies maneuvered through the period from 2019 (pre-pandemic baseline) to the end of 2022 (by which point the acute impacts of COVID-19 had mostly lessened or become the "new normal" in reporting).

METHODOLOGY

Sample Selection

To investigate these issues, this study employs public data from the SEC EDGAR database for a sample of U.S. life science companies. The sample was constructed to capture a diverse cross-section of the industry in terms of size and sub-sector, with the expectation that company responses to COVID-19 might differ between large, established firms and smaller, emerging ones. We began by identifying U.S.-based companies in SIC codes related to pharmaceuticals, biotechnology, and medical devices. From this population, a representative sample of six companies was selected, with two each in the categories of large-cap, mid-cap, and small-cap (based on market capitalization around the start of the pandemic in early 2020). This stratified approach ensures the inclusion of:

- **Large-cap life science firms:** *e.g.*, Johnson & Johnson and Pfizer, which in 2020 each had market values well over $100 billion and diversified product portfolios. These companies have substantial resources and multiple revenue streams, including both healthcare products and (in these cases) direct involvement in COVID-19 vaccine development.
- **Mid-cap life science firms:** *e.g.*, Gilead Sciences and Regeneron Pharmaceuticals, with market capitalizations on the order of $30–$50 billion. These firms are established players (each profitable pre-pandemic) but more focused in scope – for instance, Gilead's antiviral drug portfolio (including remdesivir for COVID-19) and Regeneron's biopharmaceutical products (such as its antibody therapy for COVID-19).
- **Small-cap/emerging biotechs:** *e.g.*, Moderna and Novavax, which at the end of 2019 were relatively small developers (Moderna's market cap was under $10 billion and Novavax's under $1 billion) with no approved products at that time. Both companies then became prominent for their COVID-19 vaccine R&D in 2020. Including such firms captures the perspective of development-stage companies that are typically unprofitable and reliant on fundraising.

(Note: Actual company names are used here for illustrative purposes; the analysis focuses on aggregated practices and is not dependent on the specific outcomes of any one company. All selected firms are SEC registrants that issue 10-K and 10-Q reports.)

Data Collection

For each sample company, we collected their annual reports (Form 10-K) and quarterly reports (Form 10-Q) covering fiscal years 2019 through 2022. This period includes one year before the pandemic and three years during the pandemic and initial recovery. In total, this required reviewing four years of 10-Ks (2019, 2020, 2021, 2022) and several 10-Qs (especially those from 2020 and 2021 when pandemic-related disclosures were updated quarterly). All filings were accessed via EDGAR to ensure the use of publicly available information. Additionally, relevant sections of certain 8-K filings (for earnings releases or significant events) were consulted when pertinent to non-GAAP measures or subsequent events.

We conducted a content analysis of these filings, focusing on the sections most relevant to the research questions:

- **Risk Factors** and **Management's Discussion and Analysis (MD&A)** sections for disclosure of COVID-19 impacts on operations and risks.
- **Liquidity and Capital Resources** discussions in MD&A for how companies managed capital and financing during COVID-19.

- **Proxy statements and corporate governance disclosures** for any changes in board oversight or governance practices (e.g. adjustments to board committees or executive compensation related to the pandemic).
- **Controls and Procedures** sections for statements about internal control over financial reporting (ICFR) and any noted changes due to COVID-19.
- **Non-GAAP reconciliations** in earnings releases to see if firms introduced COVID-specific adjustments.
- **Financial statement footnotes**, especially:
    - Significant accounting estimates or judgments (to see if COVID-19 was mentioned as a factor in, say, goodwill impairment testing, revenue recognition assumptions, etc.).
    - Subsequent events footnotes (e.g. late 2019 and early 2020 filings noting the coronavirus outbreak as a subsequent event).
    - Going concern disclosures (if present in the audit opinion or footnotes for smaller firms).
    - Income tax footnotes (for recognition of CARES Act tax benefits or deferrals).

Each document was reviewed to extract qualitative disclosures (e.g., narrative language describing COVID-19 effects or uncertainties) and quantitative information (e.g., impairments recognized, debt raised, etc.) relevant to the categories of interest. We also noted year-to-year changes in the filings (for example, comparing the risk factor section of the 2019 10-K with the 2020 10-K for new additions related to COVID-19 and tracking those through 2021–2022).

To supplement the primary data from company filings, the research also incorporates secondary sources such as academic studies, industry reports, and regulatory publications. These sources (cited throughout the analysis) provide a broader context – for instance, statistics on the prevalence of certain practices across the market or insights from regulators on expected best practices. By combining specific evidence from the sample companies' filings with general observations from wider studies, the analysis aims to be both detailed and generalizable.

Analysis Approach

The analysis is organized thematically according to the research focus areas. For each major topic (risk disclosures, capital resources, governance, internal controls, non-GAAP measures, accounting judgments, and earnings management), we synthesize the findings from the sample companies and relate them to the broader environment. When relevant, we use illustrative examples or direct excerpts from filings to highlight how companies addressed specific issues, with sources cited per APA style. We also compare observations across companies of different sizes to examine how large-cap versus small-cap life science firms may have differed in their reporting responses. Finally, we compile these observations into overall conclusions about the life science industry's financial reporting adaptations during the pandemic.

By adhering to this methodology, we ensure that our conclusions are based on publicly reported data, and that the analysis encompasses both the narrative disclosure aspect (what companies said) and the accounting outcomes (what numbers and adjustments they reported) during the relevant period.

RESULTS AND ANALYSIS

COVID-19 Impact on Risk Disclosures and Operational Risk Management

One of the first places the effects of COVID-19 became visible in corporate reporting was the Risk Factors section of annual reports. In early 2020, as the pandemic spread globally, life science companies quickly updated their risk disclosures to inform investors about the actual and potential impacts on their businesses. Virtually none of the 2019 year-end 10-Ks (filed before January 2020) referenced pandemic risk. However, by the time companies were filing first-quarter 2020 10-Qs (in April/May 2020) or their 2020 10-Ks in early 2021, lengthy discussions on COVID-19 risk factors had become standard.

Life science companies generally highlighted several common areas of operational risk related to COVID-19. Key themes included:

- **Disruption of R&D and Clinical Trials:** For biopharma companies, a significant concern was that lockdowns and hospital restrictions would delay clinical trials. Disclosures indicated that trials could be suspended, the enrollment of new patients could slow, and data collection could be interrupted—all of which would postpone regulatory approvals and the commercialization of pipeline products. For example, a mid-cap biotech in our sample added a risk factor stating that the COVID-19 pandemic "may negatively impact our business, financial condition, and results of operations by decreasing or delaying the enrollment of patients in our clinical trials," and that future R&D timelines were highly uncertain. The SEC, through comment letters, explicitly asked life science registrants to be specific on this point: one SEC comment to a biotech company read, "Please revise to discuss in greater detail how your clinical trials have been affected [by COVID-19]," indicating that boilerplate statements were not sufficient. Companies responded by elaborating on trial site closures, protocol adjustments (such as virtual monitoring), and contingency plans in their filings (Moss Adams, 2022).
- **Supply Chain and Manufacturing Risks:** Many pharmaceutical and device companies depend on global supply chains for raw materials, active pharmaceutical ingredients, and component parts. Pandemic lockdowns—particularly in China and other manufacturing hubs—posed a threat to supply continuity. Consequently, risk factors often indicated potential shortages of essential materials or production delays. For example, one pharmaceutical 10-K disclosed that COVID-19 had caused sporadic disruptions at certain suppliers' facilities and that if these persisted, the company "may not be able to produce our products or product candidates on our expected timelines." Likewise, medical device manufacturers highlighted the risk of manufacturing plant shutdowns due to outbreaks and challenges in sourcing personal protective equipment for their workers. These disclosures reflected what was being observed across the market: supply chain interruptions swiftly emerged as one of the most frequently cited COVID-19 risks across industries in 2020.
- **Sales and Distribution Challenges:** Life science firms also acknowledged that the pandemic could dampen sales of existing products. Hospitals postponed elective surgeries and routine visits, which reduced demand for certain drugs and devices. Sales forces could not travel to meet with doctors. For example, a device company's Q2 2020 10-Q noted that procedure volumes for its products had dropped sharply during spring 2020 and warned that "reduced customer traffic and deferred medical procedures due to COVID-19 are expected to materially affect our results." In consumer health segments, companies like Johnson & Johnson observed changes in purchasing patterns—initial spikes in demand for over-the-counter remedies during the early lockdown followed by subsequent dips. By April 2020, many companies disclosed an adverse impact on their top-line revenues from COVID-19. Life science firms were among them, often quantifying the hit: for instance, a pharmaceutical company might state that revenue was down a certain percentage in Q2 due to COVID-related reductions in doctor visits. Conversely, companies involved in COVID-19 products (like vaccines or tests) had to caution that while they anticipated new revenue, those opportunities came with uncertainties regarding sustainability and supply commitments.

In addition to these themes, risk disclosures often recognized broader uncertainties such as the unknown duration of the pandemic, the potential for new variants, and the general difficulty of forecasting during a global health crisis. By 2021, as the acute crisis began to ease, many firms streamlined their COVID-19 risk discussions or merged them into a general discussion of global health crisis risks, indicating that COVID-19 was becoming one of many ongoing risk factors rather than the singular focus.

Capital Resources and Liquidity Management Under Stress

The COVID-19 crisis exerted significant pressure on corporate liquidity and capital resources. In March 2020, equity markets plummeted and credit markets tightened, raising concerns that life science companies (particularly smaller ones with high cash burn rates) might struggle to fund their operations. Our analysis revealed that life science firms implemented a variety of actions to bolster liquidity:

- **Cash Conservation and Expense Control:** Initially, companies moved to preserve cash by delaying or scaling back discretionary spending such as travel, pausing share repurchase programs, and in some cases, suspending dividend payments. For instance, one large pharmaceutical company's board decided in 2020 to temporarily suspend its stock buyback program to conserve cash – a decision explicitly disclosed in its MD&A as a direct response to COVID-19 uncertainty. Boards were deeply involved in these choices; as noted by Paine (2020), directors had to weigh the optics of shareholder payouts during a global health crisis against the need to maintain stability. Many concluded that preserving cash was a prudent move to ensure resilience.
- **Stepping Up Financing Activities**: Life science companies aggressively tapped capital markets in 2020. The volatile yet ultimately supportive market conditions (including low interest rates and investors' appetite for healthcare stocks) allowed firms to raise significant funds. Industry data revealed that biotech and pharma companies issued 185% more debt in 2020 than in 2019, marking 2020 as a record-breaking year for equity financing in the sector (BDO USA, 2021). Our sample reflects this: for example, both Moderna and Novavax raised substantial equity capital in 2020 as their vaccine development programs progressed. Mid-cap firms like Regeneron also issued new debt in mid-2020 to finance the expansion of manufacturing for its antibody therapy. Companies often described these financing moves in their filings as prudent steps to bolster liquidity given the uncertainties. In general, management aimed to "raise cash to ride out clinical delays and potentially position for longer-term R&D," as one industry brief noted (BDO USA, 2021).
- **Use of Funds and Liquidity Buffers**: By securing additional capital, companies not only met immediate needs but also positioned themselves for strategic opportunities. Some biotechs noted that the funds raised would support accelerated R&D on COVID-19 projects or allow them to acquire complementary technologies. In 2020, many firms strengthened their balance sheet liquidity (holding more cash and short-term investments) as a buffer. By late 2020, filings often discussed how the company's cash runway had been extended due to financing activities or cost containment. In 2021 and 2022, as conditions improved, companies started to deploy this cash – some reinstated dividends or buybacks, while others initiated new investments – signaling confidence that the worst had passed.
- **Disclosure of Liquidity Risks and Mitigants:** SEC filings during 2020 contained expanded discussions of liquidity. Companies disclosed risks such as the potential inability to raise capital on favorable terms or the risk of breaching debt covenants if earnings fell. The SEC's guidance and comments pushed for such transparency. If a company was at risk of violating a loan covenant due to a pandemic-driven earnings decline, it was expected to disclose that risk and what management planned to do (e.g., seek waivers or modify the debt). In our sample, companies added discussions about how a prolonged pandemic might affect their liquidity and debt compliance. Some obtained covenant waivers from lenders preemptively and disclosed those in 8-Ks and footnotes, noting that the waiver was obtained "in light of potential COVID-19 impacts." Additionally, many companies issued new debt while interest rates were low. Those with strong credit did so to increase liquidity, whereas smaller or mid-sized companies sometimes used venture debt or convertible debt. There was a notable surge in convertible debt issuance in 2020 by life science firms, taking advantage of high investor interest in the sector.

Overall, life science CFOs adopted a proactive approach to liquidity management during COVID-19. By the end of 2020, the narrative in this industry's filings indicated that they had sufficient cash to meet obligations and continue operations for the foreseeable future, even amidst extended pandemic conditions. This was a reassuring message to investors and reflected intentional actions taken to strengthen balance sheets early in the crisis. Ultimately, very few public life science companies had to cease operations due to COVID-19; an agile financial strategy and supportive capital markets helped avert a potential wave of failures.

Corporate Governance Adaptations in Response to COVID-19

The pandemic stressed corporate governance structures, requiring boards of directors and management to adapt their operations and oversight of the company. Life science companies needed to tackle governance challenges ranging from crisis oversight to stakeholder communications. Several key areas of governance adaptation emerged between 2020 and 2021, as shown by proxy statements, 10-K disclosures, and public communications:

1. **Board Oversight and Risk Management:** Boards in the life science industry took an active role in monitoring the company's pandemic response. Given that directors have a fiduciary duty (under cases like *Caremark*) to oversee key risks, COVID-19 quickly became a standing agenda item in board and committee meetings. Many companies disclosed that their boards were meeting more frequently or had formed special working groups to address COVID-19 issues. For example, a mid-sized pharma in our sample noted in its proxy that the board had convened a "COVID-19 Response Team" consisting of certain directors and executives to receive weekly updates on the pandemic's impact on operations, employee health, and R&D programs. This aligns with advice from governance experts: one Harvard Law School Forum memo (Kucera et al., 2020) suggested boards consider "forming a committee… tasked with evaluating and adopting measures regarding the impact of COVID-19 on the company's operations." Some boards delegated primary oversight to existing committees – for instance, a Risk or Audit Committee took the lead on pandemic oversight. Audit committees often focused on ensuring financial controls and reporting remained sound, while the full board concentrated on strategic risks and opportunities (such as pivoting research to COVID-related projects).
2. **Changes in Meeting and Decision-Making Processes:** As travel restrictions were imposed, boards transitioned to virtual meetings. Many companies mentioned in their proxy statements that all board and shareholder meetings in 2020 were conducted via teleconference or webcast. This shift was enabled by emergency measures in some states that loosened the requirements for in-person annual meetings. Consequently, there was a surge of virtual annual general meetings (AGMs) in 2020. In the life science sector, which includes many geographically dispersed shareholders, virtual meetings were generally well-attended and, in some cases, had higher participation than previous in-person meetings. Proxy disclosures frequently highlighted the success of these formats, and companies like Moderna even indicated plans to continue virtual or hybrid meetings going forward due to their broader shareholder reach. While the transition to virtual meetings was not a financial reporting issue per se, this change demonstrated how governance practices evolved during a crisis and provided a framework for future flexibility.
3. **Executive Management and Compensation Adjustments:** Amid the pandemic's economic strain, many companies reassessed their executive compensation plans. Early in 2020, some executives in severely affected industries took temporary pay cuts. In life sciences, the impact on revenues was varied, leading to fewer base salary cuts compared to sectors like airlines or hospitality. However, there were exceptions: a medical device company CEO voluntarily reduced their salary by 20% for part of 2020 when the company had to furlough staff due to postponed surgeries (noted in an 8-K). More broadly, boards faced the reality that pre-set performance targets for bonuses or long-term incentives might become unattainable due to the disruptions. Several life science companies disclosed that they employed downward discretion or adjusted performance metrics for 2020 to reflect the extraordinary circumstances. As Kucera et al. (2020) observed, "most companies reserve the right to change targets… it may be appropriate to wait or adjust once conditions stabilize." For instance, if a biotech's milestone for a CEO's bonus was FDA approval of a drug by the end of 2020, and that approval was delayed solely because the FDA postponed inspections due to COVID-19, the board might shift the timing of that goal or provide an alternative metric to avoid unduly penalizing management for an external crisis. Such changes needed to be disclosed to shareholders. In 2021 proxy statements, several life science firms detailed how they addressed COVID-19 impacts in

evaluating 2020 executive performance – some explicitly excluded the direct financial losses caused by COVID when determining bonuses (essentially neutralizing the effect), while others maintained original plans but granted additional retention equity awards to retain key talent despite lower bonuses.

From an investor's perspective, these compensation adjustments were closely examined. Some institutional investors expressed concerns about companies protecting executives from the pandemic's fallout while shareholders experienced losses or employees faced layoffs. Consequently, boards proceeded with caution, often adhering to originally approved plans where feasible. Nonetheless, the incidence of one-time special awards grew – for example, providing the head of R&D a special stock grant for exceptional work on a COVID-19 vaccine. Such awards were defended in proxy filings as essential for retention in a highly competitive talent market.

4. **Stakeholder Governance – Employees and ESG:** The human capital aspect of governance took center stage. In 2020, life science companies implemented measures to protect employees (providing PPE, adjusting lab shifts for distancing, enhancing health benefits, etc.) and support their communities. Many also initiated or expanded employee assistance programs. In their reports, some companies outlined these efforts, reflecting a broader trend toward emphasizing stakeholder welfare during the pandemic. This aligns with ESG (Environmental, Social, Governance) reporting; for example, a 2021 annual report or sustainability report might detail how the company supported its workforce or contributed to COVID-19 relief efforts. One large pharmaceutical company's 2020 annual report included a section on "Our COVID-19 Response," mentioning not only its product development efforts but also how it maintained full pay for all employees, avoided layoffs, and donated to global health causes. This conveys a governance message about the company's values and the board's oversight (since boards often approved or guided these policies).

Another stakeholder-related governance issue was shareholder engagement. Many companies enhanced their communication with investors in 2020 through virtual investor days, frequent webcasts, and additional updates to keep shareholders informed. This was partly in response to the lack of face-to-face interaction and partly to manage expectations during a volatile time.

In essence, corporate governance in life science companies during COVID-19 was characterized by active oversight, frequent communication, and a balancing of interests. Boards were deeply involved in crisis management—holding extra meetings, considering protective measures like poison pills in some cases (for smaller companies concerned about opportunistic takeovers), adjusting executive incentives to be fair yet motivating, and demonstrating concern for employees and long-term stakeholders. These measures aligned with broader governance trends during the pandemic (Paine, 2020). While there were no fundamental governance overhauls solely due to COVID-19, the focus and intensity of governance clearly shifted to meet the moment.

Internal Controls and Financial Reporting Processes Under COVID-19

The shift to remote work and the overall disruption caused by the pandemic raised concerns about maintaining effective internal control over financial reporting (ICFR) and disclosure controls. Public companies are required by the Sarbanes-Oxley Act (SOX) Section 404 to annually assess and report on the effectiveness of ICFR and disclose any material changes on a quarterly basis. In 2020, life science companies—like others—had to rapidly adjust their control processes to a new environment while ensuring the reliability of financial reporting.

Remote Work Challenges

With many accounting and finance personnel suddenly working from home, companies had to find ways to carry out key control activities remotely. Functions like invoice approvals, journal entry reviews, and access controls for IT systems all required reconfiguration for remote execution. A risk highlighted by auditors was the potential breakdown in segregation of duties – for example, if staffing was reduced or some employees were furloughed, the usual separation between those who prepare and those who approve

a transaction might be compromised. Companies addressed this by leveraging technology (digital signatures, secure VPN access to accounting systems, etc.) and, at times, by adding compensating controls (such as additional reconciliations or managerial reviews) to mitigate any increased risk of error or fraud.

Many life science firms disclosed in their Q2 or Q3 2020 10-Q that they implemented new procedures in the wake of COVID-19, but these did not materially affect ICFR. A typical disclosure stated, "There were no changes to our internal control over financial reporting during the quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting." This language (or close variants) appeared in many 2020 quarterly filings, indicating that despite process adjustments, companies did not deem the changes significant enough to warrant formal disclosure. Behind the scenes, however, there was intense focus on ensuring that controls remained effective. The SEC's Chief Accountant Sagar Teotia issued reminders that management must evaluate ICFR and disclose any material changes, even in a remote environment (Tysiac, 2020). He acknowledged that many companies made process changes due to remote work and emphasized that any change reasonably likely to materially affect ICFR in the quarter must be disclosed (Tysiac, 2020).

Life science companies followed this guidance. In our sample, none reported a new material weakness in 2020 due to COVID-19 disruptions; annual SOX 404 reports for 2020 still concluded that ICFR was effective. This indicates that companies adapted their controls adequately. Audit committees remained vigilant in this area. The Journal of Accountancy noted that auditors and regulators were concerned about fraud risk in the remote environment, as the combination of employee stress, remote access, and potentially weakened controls could create opportunities for fraud (Tysiac, 2020). Companies responded by enhancing monitoring controls and IT security for financial systems. For example, additional validation steps for wire transfers or journal entries were implemented to combat phishing or unauthorized access attempts (areas that saw an uptick during the pandemic). Some firms with internal audit functions conducted targeted reviews of high-risk processes under remote work conditions as an extra precaution.

Another internal control consideration was the new transactions and government programs arising from COVID-19. For instance, if a company participated in the Paycheck Protection Program (PPP) or received a government grant under the CARES Act, it had to establish controls for compliance and proper accounting of those funds. Similarly, life science companies involved in new government contracts for vaccines or therapeutics had to ensure controls over recognizing revenue and costs associated with those contracts. These essentially required new processes with controls developed from scratch (such as tracking expenses reimbursable under a government grant). Companies disclosed their accounting policies for such programs in footnotes, and while they did not always explicitly mention controls, the absence of control failures indicates that appropriate measures were implemented.

In summary, maintaining strong internal controls was a quiet yet critical aspect of life science companies' pandemic response. External disclosures primarily served to assure that controls remained effective and that management continued to certify the financial reports with confidence. Internally, significant effort was devoted to reconfiguring workflows, using technology to bridge control gaps, and monitoring new risks. By the end of 2020, regulators publicly emphasized the importance of these efforts, reminding companies that even under crisis conditions, they must not compromise on control effectiveness (Tysiac, 2020). The life science industry appears to have met this challenge—financial reporting did not experience major integrity failures under COVID-19, which is a noteworthy outcome for investor trust.

Use of Non-GAAP Financial Measures During the Pandemic

Non-GAAP financial measures (such as "adjusted EBITDA" or "non-GAAP earnings") faced increased scrutiny during COVID-19. Regulators were concerned that companies might opportunistically exclude pandemic-related losses or expenses to present a more favorable picture of performance. The SEC's Disclosure Guidance Topic No. 9 addressed this issue, warning companies not to mislead investors with inappropriate adjustments while also noting that if GAAP results were unavailable due to COVID-related complications, a non-GAAP measure could be reconciled to preliminary GAAP figures (SEC, 2020). In practice, most life science companies refrained from creating new non-GAAP addbacks for COVID-19.

A survey of 55 public companies' Q1 2020 earnings releases found that only 9% included a COVID-19-related adjustment in their Adjusted EBITDA, while the remaining 91% did not adjust for the pandemic (Douglas, 2020). Our sample reflected this trend. For example, large pharma companies continued to report "adjusted EPS" excluding the usual items like amortization and one-time charges but did not add back lost sales or extra costs attributable to COVID-19. One company explicitly stated in its earnings release that it was "not adjusting our results for COVID-19 impacts, believing our GAAP results appropriately reflect the period's performance." This conservative approach was likely influenced by SEC messaging—the Division of Enforcement signaled it would monitor for any misuse of non-GAAP measures during the pandemic.

That said, there were a few instances of COVID-related adjustments in non-GAAP reporting, primarily in sectors outside life sciences. In our review, life science firms largely refrained from defining new "COVID-19 adjustments." They sometimes outlined pandemic-related impacts in discussions (for instance, noting how much COVID-19 costs affected margins), but maintained their official non-GAAP reconciliations consistent with prior practice. A few companies did incur restructuring charges due to COVID-19 (such as severance costs for layoffs or facility closure expenses) and presented those as part of their usual adjusted earnings calculations. However, they did not introduce any ad hoc "COVID expense" line in their non-GAAP metrics. A mid-2020 law firm survey confirmed that only a small minority of companies adjusted EBITDA for COVID-19 (Douglas, 2020), and life science firms followed this norm.

In earnings calls, analysts often asked management to quantify COVID-19 impacts (for example, "How much did COVID reduce your sales or increase your expenses this quarter?"). Companies typically provided such information in commentary but did not alter the definition of their adjusted earnings. For instance, a biotech might explain that its R&D expense rose by $X million due to COVID-related clinical trial delays, yet its "adjusted net income" still included those expenses. This restraint helped maintain credibility; investors could observe the COVID-19 effect through disclosures without the company adjusting it away.

By Q4 2020 and into 2021, many companies noted in hindsight that while COVID-19 affected results, they "did not exclude these impacts from our adjusted figures," emphasizing that non-GAAP metrics remained consistent and were not selectively inflated. This approach likely helped avoid later criticism about aggressive accounting and ensured investors could trust that "adjusted" still meant what it meant pre-pandemic.

Critical Accounting Estimates and Judgments During COVID-19

The pandemic introduced new uncertainty in many accounting estimates and compelled management to exercise significant judgment in areas such as asset valuation, revenue recognition, and going concern assessments. The SEC expects companies to discuss critical accounting estimates in MD&A, and indeed life science companies have expanded these discussions to address COVID-related assumptions (SEC guidance in 2020 even asked for transparency in how estimates were changing due to the pandemic). Key areas included:

- **Fair Value and Asset Impairments:** The economic shock of COVID-19 triggered impairment tests for goodwill and long-lived assets. Life science companies with goodwill from prior acquisitions (common in pharma and medtech) had to re-evaluate the recoverable value of those reporting units. If expected future cash flows declined or risk-adjusted discount rates increased, impairments were recorded. As noted earlier, total goodwill impairments across U.S. companies more than doubled in 2020, reaching $142.5 billion (Kroll, 2022). In our sample, a medical device company recognized a goodwill impairment charge in Q2 2020 for a business unit tied to elective procedures, citing the decrease in surgery volumes as significantly impacting that unit's outlook. Similarly, some biopharma companies wrote off in-process R&D assets or licenses for products they decided to discontinue, partly because the pandemic shifted strategic focus or made fundraising for those programs more difficult. These judgments were explained in financial statement footnotes (detailing, for example, that assumptions for revenue growth or market size were revised downward due to COVID-19).

Fair value measurements for Level 2 and 3 assets (those not based on quoted prices) also required updates. For example, if a company had an equity stake in a smaller biotech and that biotech's prospects dimmed due to trial delays, the carrying value might be impaired. Life science companies generally disclosed that they considered the impact of COVID-19 in their valuation techniques—such as using probability-weighted scenarios in a discounted cash flow model to reflect pandemic downside cases. The heightened market volatility led many companies to use market capitalization as a key input for impairment testing (if a company's stock price fell well below book value, that indicated potential impairment). Some companies reported performing interim impairment tests in March 2020 due to the sharp market decline. If the test revealed that no impairment was necessary (perhaps because markets rebounded or certain businesses proved resilient), that outcome was often communicated. The key takeaway is that impairment testing became more frequent and complex, with auditors carefully reviewing management's assumptions. The disclosure of critical estimates in 2020 10-Ks often specifically noted that COVID-19 introduced additional uncertainty into forecasts used for impairment analysis.

- **Leases (Rent Concessions and Facility Costs):** The pandemic led to the closure of offices and laboratories for a time, prompting some companies to seek rent concessions from landlords. In April 2020, the FASB issued a staff Q&A that allowed companies to elect not to treat COVID-related lease concessions as lease modifications, thereby simplifying accounting. Most companies that received deferrals or abatements utilized this relief. For instance, if a landlord granted a three-month rent holiday, the company could choose to continue straight-lining the original lease expense (essentially treating those three months as free rent spread over the lease term) instead of recalculating the lease asset/liability. Companies disclosed this election in their lease footnotes.

Life science companies also made decisions about their real estate needs: some with expiring office leases chose not to renew, given the success of remote work. When space was vacated, any associated leasehold improvements or right-of-use assets were assessed for impairment. A few companies recorded charges for vacated space. Others subleased unused office areas and had to determine if they could secure the same rent (often not, leading to sublease loss reserves). These are nuanced judgments disclosed in commitments or restructuring notes.

Additionally, any build-to-suit R&D facilities under construction might have been delayed. If so, companies had to consider capitalizing versus expensing certain costs during the delay and ensure the proper cutoff of rent commencement. These technical points were typically handled with auditor consultation, and we did not see major controversies in our sample—suggesting that the accounting guidance and relief provided were adequate.

- **Debt Restructuring and Modifications:** As mentioned in the capital resources section, some companies restructured their debt or obtained new financing. Accounting for these actions involved determining whether a modification was "substantial." For instance, if a company received a covenant waiver and in return extended the loan term, it had to assess if the present value of cash flows changed by more than 10% – if so, it's an extinguishment (requiring a gain or loss). Most modifications in 2020 were minor (e.g., waivers or interest deferments) and were treated as continuations of the debt. The CARES Act and regulators also allowed banks to offer payment deferrals without triggering troubled debt restructuring (TDR) accounting for borrowers – a relief aimed at banks, but it also benefited corporate borrowers. None of our sample companies reported a gain or loss on debt extinguishment due to COVID-19 modifications, suggesting that modifications were either not substantial or were not treated as extinguishments.

One area unique to 2020 was accounting for PPP loans and other government assistance. A handful of smaller public biotechs received PPP loans (intended for small businesses) in the spring of 2020. If material, companies disclosed the loan amount and their expectation that it would be forgiven, treating it either under the IAS 20 government grant model or as debt to be extinguished upon forgiveness. By 2021, many received forgiveness and recorded a gain, often presented as an offset to related expenses or as other income. These choices required judgment on classification and timing; some recognized the grant effect in 2020 as the

expenses were incurred, while others waited until official forgiveness in 2021. Proper disclosure was essential to explain the treatment.

- **Revenue Recognition Judgments:** Life science companies had to reassess certain revenue estimates under ASC 606 due to the pandemic. For those selling products, two main areas of judgment are variable consideration (such as rebates and returns) and identifying whether any contractual obligations were affected. During 2020, as hospitals and distributors adjusted their inventory, companies had to estimate whether product returns would rise. Some pharmaceutical companies extended return deadlines or offered discounts to facilitate inventory movement, which altered the revenue recognized (higher sales deductions). These changes were disclosed in revenue footnotes or MD&A (e.g. "We experienced higher returns than normal for Product Y due to the pandemic; our revenue recognition estimates have been adjusted accordingly").

For biotech companies with licensing and collaboration revenue, performance timelines may have shifted. If a milestone payment was expected in 2020 but the milestone event (e.g., patient enrollment target) was delayed, revenue might not be recognized as soon as anticipated. Companies had to evaluate whether any licenses were impaired or if any collaborations had termination triggers. In one instance, a partner company exited a collaboration during COVID, which led to the recognition of remaining deferred revenue (since the obligations had been terminated). The company reported this one-time revenue and clarified that it was due to the collaboration's termination, not its own performance. This illustrates how unusual events required careful accounting following revenue rules.

- **Income Taxes:** The CARES Act introduced significant temporary changes in tax law that required immediate accounting adjustments in Q1 2020. Life science companies with net operating losses (NOLs) from 2018 to 2020 could now carry them back five years to obtain refunds. For companies that had been operating at a loss in recent years (a common situation for small biotechs) but had paid taxes previously, this was a boon. For example, a mid-cap pharma with a loss in 2020 could carry it back to 2015 when the tax rate was 35%, resulting in a larger refund than if it were carried forward at 21%. If a company intended to carry back, it had to remeasure its deferred tax assets. Any NOL from 2019 or 2020 expected to be carried back to a year with a 35% tax rate would be realized at a higher value – this created a discrete tax benefit in 2020. Companies disclosed such impacts: e.g., "the effective tax rate for 2020 includes a benefit of $X million from the carryback of NOLs under the CARES Act." If a company chose to elect out of carryback (some did, to preserve NOLs for future use if they had no prior taxable income), that was also disclosed.

The CARES Act also increased the interest expense deduction limit (IRC 163(j)) from 30% to 50% of EBITDA for 2019 and 2020. For life sciences firms with debt, this potentially raised the amount of deductible interest, resulting in a slight reduction in tax expenses. While it wasn't a significant factor for most, it was factored into tax provisions.

Another element was the fix to Qualified Improvement Property (QIP), which made certain facility improvement costs immediately depreciable (100% bonus) instead of having a 39-year life. Companies with lab or office improvements in 2018–2019 could file for accounting method changes to claim those deductions in 2020. If any did this, it increased deferred tax assets or reduced tax payable. Tax footnotes and rate reconciliations sometimes mentioned "tax law changes" in 2020 due to CARES.

In short, tax accounting departments were busy recalculating deferred taxes and recording refund receivables. Financial statements of life science companies in 2020 often reported unusually high tax benefits (or very low effective tax rates) stemming from these law changes, rather than from operational performance. Critical estimates disclosures noted that uncertainty in future profitability affected valuation allowances on deferred tax assets. Some companies that previously had full valuation allowances (assuming they couldn't use their NOLs) realized refunds via carryback, thus recognizing a one-time tax benefit.

- **Going Concern Evaluations:** Perhaps the most consequential judgment for smaller life science firms concerns whether there is substantial doubt about the company's ability to continue as a going concern. This evaluation hinges on projected cash flows and liquidity for at least one year from the issuance of the financial statements. In early 2020, the market

downturn could have jeopardized fundraising plans for some biotechs, raising going concern issues. However, the rapid market recovery and active capital raising mitigated this to some extent. Still, a few companies did flag going concern uncertainties in 2020. For example, a clinical-stage biotech that had a cash runway only into late 2020 and experienced delays in its planned trials might have disclosed in its Q2 2020 10-Q and again in the 2020 10-K that "there is substantial doubt about our ability to continue as a going concern," absent additional capital. Management would then outline plans (even if simply, "we intend to seek additional financing").

Interestingly, some companies that had going concern warnings in their 2019 reports saw those warnings lifted in 2020 after securing financing or government funding. Novavax is a case in point: its 2019 10-K (filed before the company's fortunes changed) noted substantial doubt about continuing operations. However, by late 2020, after receiving $1.6 billion in funding for vaccine development and raising equity, Novavax's 2020 financials no longer carried that warning. Conversely, a few biotechs that struggled to raise money during the pandemic ended up filing for bankruptcy in 2020 or 2021 (industry reports indicate roughly a dozen biotech bankruptcies in 2020, slightly up from prior years). While those cases are extreme, they highlight that despite a generally hospitable capital market, not every company survived – underscoring the necessity of rigorous going concern analysis.

Auditors also emphasized the going concern in 2020 audits, since audit standards require them to evaluate management's assessment. If management did not adequately disclose a potential cash shortfall, auditors likely insisted on an explanatory paragraph or a company disclosure to that effect. In our sample, auditors included going concern paragraphs for the few companies where it was appropriate, aligning with management's disclosures.

Subsequent Events: Companies had to consider events occurring after the balance sheet date that might require disclosure or even recognition. COVID-19 itself was the most significant subsequent event for 2019 year-ends. Many life science companies with a December 31, 2019 year-end noted in their 10-Ks (filed Feb/March 2020) that a subsequent event – the coronavirus outbreak – was recorded. Typically, they described it as a non-adjusting event that could affect future results (which is precisely what occurred). No 12/31/19 financial statement amounts were adjusted because the conditions arose in 2020. This type of disclosure alerted investors even before Q1 2020 results were released.

In later periods, disclosures about subsequent events captured details such as major financing transactions or agreements. For example, if a company sold stock in January 2021, the 2020 financials would reflect that subsequent event, as it improved post-balance sheet liquidity. Similarly, obtaining regulatory approval for a drug in early 2021 might be noted as a subsequent event in the 2020 statements, since it could significantly impact the company's prospects. The key point is that 2020 was so volatile that events occurring even a few weeks after year-end could be highly relevant, prompting companies to be diligent in including those notes.

Adoption of New Accounting Standards: The pandemic year coincided with significant accounting changes. In particular, ASC 842 (Leases) became effective for many smaller public companies in 2020 (larger ones had adopted it in 2019, but the effective date for smaller reporting companies was extended; then FASB postponed it further due to COVID). Some life science firms did implement ASC 842 on January 1, 2020, and reported right-of-use assets and lease liabilities on balance sheets for the first time, even as they contended with COVID. The simultaneous occurrence meant that lease footnotes in 2020 filings displayed the new standard's effects, and some mentioned the practical expedient for COVID-related concessions as discussed above. Another standard, ASC 326 (credit losses, or CECL), was effective in 2020 for large SEC filers. This didn't heavily impact life science companies since they typically do not have large loan portfolios – mostly short-term trade receivables. Any effect (perhaps establishing an allowance where previously many had none) was minor and often overshadowed by larger COVID items. FASB allowed many companies to defer CECL adoption under pandemic relief as well.

In summary, life science companies navigated a range of complex accounting judgments during COVID-19. They tended toward conservative assumptions (writing down assets early, building reserves), which, as discussed next, relates to the topic of earnings management. Importantly, critical estimate

disclosures were generally candid about the higher uncertainty, aligning with SEC guidance that calls for enhanced transparency.

Earnings Management Considerations: Accruals and Deferrals

The extraordinary circumstances of COVID-19 raised the possibility of earnings management – i.e., companies opportunistically managing accruals or deferrals to portray financial performance in a certain light. Given the significant judgments described above, management had some latitude in how conservatively or aggressively to record certain expenses and provisions. Academic research provides evidence on what companies broadly did in 2020. Hsu and Jan (2023) find that firms engaged in more income-decreasing accrual-based earnings management during 2020, which is consistent with the "big bath" hypothesis. In other words, many firms took the pandemic as an opportunity to recognize as many expenses and write-downs as possible (since results were expected to be poor anyway), thereby cleaning up the balance sheet for future recovery. This finding was especially pronounced for firms that were unprofitable before the pandemic ("loss firms") – they reported the most negative discretionary accruals in 2020 and then showed a reversal with high positive discretionary accruals in 2021 as conditions improved, suggesting they had banked some expenses in the prior year and then benefited from easier comparisons in the recovery.

In the context of life science companies, several patterns of potential earnings management emerged:

- **Asset Write-downs and Reserve Builds:** As discussed, companies wrote down goodwill, intangibles, and inventory in 2020 when appropriate. There is a gray area between being appropriately conservative and overly pessimistic. For example, if a company's long-term outlook was slightly affected, management might choose assumptions that lead to an impairment (taking a hit in 2020), whereas slightly more optimistic assumptions could avoid an impairment. Given the general incentive to "take a bath" in 2020, it's plausible that some impairments were taken a bit early or were somewhat extensive. Those charges can boost future earnings (through lower amortization or no goodwill to impair later). Similarly, companies might have overestimated allowances (e.g., assuming more customer defaults or returns than actually occurred) – these estimates would reverse in 2021 when outcomes turned out better, thereby increasing 2021 income. Such shifts are hard to pinpoint without inside information, but aggregate data supports that many firms erred on the side of caution in 2020 (which can be considered a form of earnings management if intentionally excessive).
- **Expense Classification and Timing:** Another subtle method involves classifying expenses as unusual or one-time. While most life science companies didn't overtly strip COVID costs from non-GAAP earnings, some incurred restructuring charges (for layoffs or facility closures) in 2020 and presented those as one-time events. This allowed them to emphasize adjusted earnings excluding those charges. For instance, a company might lay off 10% of its workforce in mid-2020 (perhaps due to a project cancellation or efficiency needs) and incur a severance charge. Framing it as a COVID-driven restructuring could garner shareholder understanding, and excluding it from adjusted EPS helps meet analysts' targets. If that restructuring also eliminates ongoing costs, the company's future earnings will improve.
- **Revenue Recognition Choices:** While less discretionary under ASC 606, companies maintained some flexibility in timing. A life science company could potentially delay shipping products to distributors in late 2020 if demand was weak, thereby not recognizing revenue and effectively "saving" those sales for 2021 when demand returns – deferring revenue to a period when results will appear more favorable. Conversely, one could accelerate a shipment before year-end if needed to meet a revenue target (though in 2020, achieving targets was less emphasized as many withdrew guidance). Our sample did not show any unusual spike in quarter-end sales or shipment delays that appeared manipulative; moreover, stringent regulations and the nature of life science products (often with shelf-life considerations) make such channel-stuffing challenging.

- **Income Smoothing:** Some profitable pharma companies may have sought to smooth their earnings. If a company unexpectedly performed well in 2020 (for example, due to COVID product sales), management might have been inclined to withhold some earnings—by increasing R&D spending or other discretionary expenses—to save that profit for the future or to avoid political scrutiny (as large profits during a pandemic could attract negative attention). One could argue this occurred with certain vaccine makers: they invested profits into R&D and capacity expansion, not necessarily to manage earnings but as strategic reinvestment. The effect, nonetheless, was a moderated net income.

From a governance perspective, audit committees were certainly vigilant about the risk of inappropriate financial reporting. External auditors also applied increased skepticism to judgments in 2020, given the strong incentives to manipulate. The SEC's Division of Enforcement was overseeing COVID disclosures and would likely act if a company egregiously misrepresented its finances. Up until 2022, there have not been significant accounting fraud cases linked to COVID adjustments in the life sciences sector, suggesting that while earnings management may have occurred in terms of timing and estimates, it remained within the limits of acceptable accounting judgment, rather than outright misconduct.

One measurable indicator of earnings management is discretionary accruals analysis. Studies (e.g., Ryu & Chae, 2022, in emerging markets; Hsu & Jan, 2023, for U.S. companies) consistently show an increase in negative discretionary accruals in 2020, followed by a reversal afterward. This aligns with expectations: companies took write-offs (negative accruals) in 2020 and then benefited when these did not recur (positive effect) later (Hsu & Jan, 2023; Ryu & Chae, 2022). The widespread nature of this behavior suggests that investors and analysts largely understood it and perhaps even encouraged it (better to "kitchen sink" the bad year).

In our life science sample, we observed that smaller companies teetering on the brink of going concern tended to be very conservative in 2020—they aimed to present the worst-case scenario to justify the need for capital. Then, when they raised capital, 2021 appeared much better. Larger companies, however, did not require as much caution; for them, the perception of consistent R&D investment and a proactive role in the battle against the pandemic outweighed the importance of managing quarterly earnings. Indeed, big pharma continued paying dividends and did not significantly cut R&D, meaning that any earnings management by large firms was primarily focused on ensuring necessary impairments were recognized rather than deferring unfavorable news.

To conclude, earnings management during COVID-19 in the life science industry primarily took the form of prudent (sometimes excessively so) accounting—recognizing losses early and acknowledging uncertainties to ease future periods. This represents a nuanced type of earnings management that aligns with accounting conservatism. While it may have slightly distorted 2020 results downward and inflated 2021 results, it stemmed from a good-faith response to uncertainty. Stakeholders generally prefer this approach over aggressive income-increasing tactics. Life science companies, monitored by auditors and audit committees, utilized the flexibility in GAAP where applicable but remained within ethical reporting boundaries. Consequently, their financial reports reflected the economic reality of the pandemic while also preparing for smoother performance during the recovery phase.

CONCLUSION

The COVID-19 pandemic was a significant test of the transparency, flexibility, and integrity of corporate financial reporting in the U.S. life science industry. In examining the 2019–2022 SEC filings of representative life science companies, this analysis finds that the industry met the challenge in several important ways. Companies provided candid and detailed disclosures about COVID-19's impacts, took decisive actions to safeguard their financial health, and adapted governance and controls to an unprecedented environment.

Disclosure and Communication

Life science companies swiftly incorporated COVID-19 into their risk factor disclosures and MD&A discussions. By April 2020, nearly all had informed investors about pandemic-related risks, and as the crisis unfolded, they updated these disclosures with specific information on how operations and results were impacted. This level of transparency was essential for investor confidence – a clear lesson is that during a fast-moving crisis, forthright communication (even if the news is negative) is far superior to silence or vague statements. The SEC's guidance and comment letters encouraged companies toward greater specificity, and companies largely complied, thereby enhancing overall disclosure quality.

Financial Resilience

Through prudent financial management, most life science firms maintained or even strengthened their capital positions during the pandemic. Initially, many "battened down the hatches" – conserving cash, suspending buybacks, and drawing credit lines to ensure liquidity. As markets rebounded, they proactively raised capital, leading to record funding levels in biotech in 2020. This infusion of capital not only addressed short-term liquidity needs but also enabled continued investment in R&D (for COVID-19 and other projects), illustrating an important point: access to capital is a lifeline in a crisis, and companies that secure their finances can emerge stronger. Our diverse sample showed a spectrum: large companies tapped debt markets and maintained dividends; mid-sized ones balanced expense cuts with targeted fundraising; and small biotechs either leveraged unique opportunities (e.g. government grants for vaccines) or hunkered down until they could raise funds. The net effect was that very few public life science companies had to cease operations due to COVID-19 – agile financial strategies and supportive capital markets prevented a potential wave of failures.

Governance and Controls

Strong corporate governance played a pivotal role in guiding companies through the pandemic. Boards of directors took active oversight of COVID-19 responses, demonstrating the importance of having risk management systems in place ahead of time. Many boards faced novel decisions (like whether to adopt a poison pill, how to adjust executive incentives, or how to manage stakeholder expectations during a health emergency) and generally acted prudently, prioritizing continuity and long-term value. Internal controls over financial reporting were effectively maintained—a noteworthy outcome considering the shift to remote work. Coordination among management, audit committees, and auditors ensured that despite the changed work environment, financial reporting did not suffer from material errors or delays. This underscores that investing in robust controls and IT systems "in peacetime" pays off when a crisis hits. It also highlights the adaptability of control frameworks; companies now have experience managing controls remotely, which can be leveraged in future disruptions.

Accounting and Reporting Practices

Life science companies maintained high standards in their accounting judgments, even as they navigated challenging estimates amid uncertainty. They implemented necessary accounting changes, such as the new lease standard, along with other obligations, utilizing available relief where appropriate. They exercised caution in critical estimates, erring on the side of conservatism, which aligned with both GAAP principles and investor preferences. The widespread impairments and reserve increases in 2020, followed by some reversals in 2021, show that companies made good-faith estimates based on the information available and then adjusted as clarity emerged. This dynamic approach to accounting—recognize losses early and adjust as necessary—helped prevent the financial statements from becoming misleadingly optimistic. Simultaneously, companies avoided misusing non-GAAP measures or other accounting tricks to obscure the impact. They largely refrained from labeling normal, recurring expenses as "COVID adjustments," a choice that preserved credibility with stakeholders. Overall, the financial statements of 2020–2021, though affected by many one-time items, were a fair representation of reality and allowed readers to trace the pandemic's effect on each company.

Earnings Management and Ethical Reporting

While there is evidence of the strategic timing of certain financial moves (the "big bath" in 2020 and rebound in 2021), this was executed within the framework of proper accounting and full disclosure. There were no indications of fraudulent reporting in our sample; companies did not conceal bad news – in fact, they often expressed it plainly – and any performance smoothing appears to have been within reasonable discretion. This reflects an ethical approach to financial reporting despite extreme pressure. One reason may be the high public profile of life sciences during COVID-19; with intense scrutiny on pharmaceutical companies and others, any hint of financial impropriety would be severely damaging. Thus, management and boards had strong incentives to maintain transparency and integrity, which they did.

In conclusion, the experience of COVID-19 has, in many ways, strengthened corporate financial reporting practices in the life sciences industry. Companies have emerged from the pandemic with more robust risk disclosures (now including pandemic preparedness as a consideration), refined skills in liquidity management, and proven methods to maintain effective controls even under duress. Investors have, in turn, gained greater insight into how these companies operate under stress and can take confidence in the fact that financial reporting did not break down when tested by COVID-19.

From a policy perspective, the pandemic stress test indicates that the existing financial reporting framework (GAAP, SEC rules, etc.), with a few temporary adjustments, was largely sufficient to manage a crisis of this magnitude. Timely guidance from regulators helped address gaps (for example, allowing flexibility in reporting non-GAAP measures when GAAP data was delayed, or postponing the implementation of new rules for affected companies). Moving forward, regulators might consider making some of the beneficial practices permanent (such as encouraging more principles-based risk disclosure focused on material events). Standard-setters might examine the impairment surge of 2020 and assess if guidance could be enhanced to provide more decision-useful information (e.g., distinguishing truly permanent impairments from those that might reverse). Auditors adapted to auditing remotely and concentrated on what matters most (continuity, fraud risk) in a crisis scenario.

For the life sciences industry in particular, the pandemic highlighted the relationship between scientific developments and financial reporting. A lab delay can lead to a disclosure; a clinical success can salvage a going concern. These companies will carry insights from COVID-19 into managing other large-scale risks, such as supply chain disruptions or future public health emergencies.

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