ACCT 5104: FUNDAMENTALS OF ACCOUNTING
Annual Report Group Project, Fall 2024
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Brief Summary

Main Lines of Business

Pfizer and Moderna operate in the pharmaceutical and biotechnology industries, respectively, though their business models and areas of focus differ significantly.

Pfizer, a global pharmaceutical giant established in 1849, is diversified across several therapeutic areas, including oncology, immunology, vaccines, and rare diseases. The company has a robust product portfolio and research pipeline, with well-known drugs such as Lipitor and Prevnar. Its COVID-19 vaccine, developed in partnership with BioNTech, has significantly contributed to recent revenues, although this demand has waned post-pandemic. Beyond vaccines, Pfizer generates income through prescription drugs, consumer healthcare, and collaborations with research institutions.

Moderna, in contrast, is a biotechnology company specializing in mRNA (messenger RNA) technology. Founded in 2010, Moderna has a narrower focus than Pfizer, emphasizing innovative treatments and vaccines. Its primary product is the Spikevax COVID-19 vaccine, which catapulted the company into prominence during the pandemic. Unlike Pfizer, Moderna has fewer commercialized products and derives most of its revenue from the COVID-19 vaccine. It invests heavily in R&D to expand its mRNA technology applications, including vaccines for other infectious diseases, personalized cancer treatments, and rare genetic conditions.

The Competitive Environment

The pharmaceutical and biotechnology industries are characterized by intense competition, regulatory scrutiny, and high barriers to entry. Key competitive forces include the rivalry among existing firms, the threat of new entrants, substitute products, and the bargaining power of both customers and suppliers.

- Rivalry among established firms is strong, as companies compete on the basis of innovation, product effectiveness, pricing, and market access. Pfizer faces stiff competition from pharmaceutical giants like Merck, Novartis, and Johnson & Johnson, while Moderna contends with specialized biotechnology firms such as BioNTech and CureVac. The COVID-19 pandemic amplified competition, with companies vying for vaccine market share.
- The threat of new entrants is moderate, given the high costs of drug development, stringent regulatory requirements, and the extensive time required to bring products to market. However, breakthrough technologies like mRNA have lowered barriers in specific niches, allowing innovative firms like Moderna to compete effectively with established players.
- Substitute products also pose a risk, particularly for older or less differentiated therapies. For instance, generic drugs compete with branded pharmaceuticals once patents expire, exerting downward pressure on prices. In Moderna’s case, reliance on the COVID-19 vaccine makes it vulnerable to substitutes, such as vaccines developed by competitors or the growing availability of oral antiviral treatments.
- The bargaining power of customers, including healthcare providers and governments, is significant. These stakeholders negotiate pricing and access, particularly in markets with universal healthcare or cost-containment policies. Pfizer's diverse product portfolio gives it leverage in negotiations, while Moderna’s dependence on a single product limits its

flexibility. Suppliers, including raw material providers and contract manufacturers, also exert bargaining power, especially for specialized inputs like lipids for mRNA production.

Competing Strategies and Implementation

- Pfizer employs a **product differentiation strategy**, leveraging its extensive R&D capabilities, brand reputation, and diverse portfolio to distinguish itself from competitors. Its focus on innovation, combined with strategic acquisitions, allows it to maintain a competitive edge in multiple therapeutic areas. For example, the acquisition of Seagen strengthens Pfizer’s oncology pipeline. Pfizer’s strategy is well-implemented, balancing mature products with pipeline development and market expansion. However, its reliance on COVID-19 revenues in recent years has exposed it to revenue volatility as the pandemic subsides.
- Moderna, on the other hand, emphasizes **focused innovation** through its mRNA platform. This strategy positions it as a pioneer in the emerging mRNA space, targeting transformative treatments and vaccines. While this approach has yielded significant short-term success, it also presents risks due to the company’s narrow revenue base. Moderna’s investment in R&D demonstrates commitment to expanding its product pipeline, but the lack of diversification makes it vulnerable to external shocks, such as declining demand for COVID-19 vaccines.
- While Pfizer’s strategy of diversification is well-suited to its size and market presence, Moderna’s approach of specializing in mRNA technology aligns with its innovative and growth-oriented goals. Both strategies are appropriate for their respective business models, but Moderna’s heavy reliance on a single product line may require adaptation as competition intensifies and market dynamics shift.

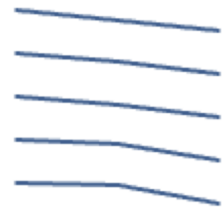
Ratio Calculation

Please find attached all formulas, computations and references in Appendix.

PFIZER	2021	2022	2023
Profititability			
Asset Turnover [1]	0.87	0.53	0.28
Return on Assets [2]	0.24	0.17	0.01
Return on Stockholders' Equity [3]	0.28	0.33	0.02
Earnings per Share on Common Stock [4]	3.91	5.58	0.38
P/E Ratio [5]	10.02	9.39	97.75
Dividends per Share [6]	1.55	1.60	1.67
Dividend Yield [7]	3.96%	3.05%	4.55%
Liquidity			
Working Capital [8]	17022.00	9121.00	-4461.00
Current Ratio [9]	1.40	1.22	0.91
Quick Ratio [10]	1.19	1.00	0.69
Accounts Receivable Turnover [11]	8.38	8.95	5.29
Days' Sales in Receivables [12]	43.54	40.80	69.04
Inventory Turnover [13]	3.61	3.81	2.60
Days' Sales in Inventory [14]	101.13	95.86	140.20
Solvency			
Fixed Assets to Long Term Liabilities [15]	1.99	2.47	2.05
Liabilities to Stockholders' Equity [16]	1.34	1.06	1.54
Times Interest Earned [17]	19.83	29.05	1.48

MODERNA

	2021	2022	2023
Profititability			
Asset Turnover [1]	1.15	0.76	0.31
Return on Assets [2]	0.76	0.33	-0.21
Return on Stockholders' Equity [3]	0.86	0.44	-0.34
Earnings per Share on Common Stock [4]	30.29	21.64	-12.34
P/E Ratio [5]	7.76	6.60	-9.85
Dividends per Share [6]	-	-	-
Dividend Yield [7]	-	-	-



	2021	2022	2023
Liquidity			
Working Capital [8]	6943.00	8508.00	7310.00
Current Ratio [9]	1.76	2.73	3.42
Quick Ratio [10]	1.52	2.29	3.15
Accounts Receivable Turnover [11]	8.09	8.45	6.01
Days' Sales in Receivables [12]	45.11	43.20	60.68
Inventory Turnover [13]	3.52	4.53	8.15
Days' Sales in Inventory [14]	103.77	80.53	44.76

	2021	2022	2023
Solvency			
Fixed Assets to Long Term Liabilities [15]	6.16	6.86	5.20
Liabilities to Stockholders' Equity [16]	0.74	0.35	0.33
Times Interest Earned [17]	738.67	331.17	-102.74

Time-series Analysis

I. Profitability

Asset Turnover

- Pfizer's **Asset Turnover** ratio declined significantly over the three-year period, from 0.87 in 2021 to 0.28 in 2023. This indicates that Pfizer's efficiency in using its assets to generate revenue has dropped sharply. In 2021, the surge in COVID-19 vaccine sales helped the company achieve a relatively high asset turnover, but as vaccine demand decreased, the company's asset base remained largely unchanged while its revenue decreased.
- Moderna's **Asset Turnover** also declined from 1.15 in 2021 to 0.31 in 2023. Moderna's high asset turnover in 2021 was driven by its strong vaccine sales, but as the pandemic waned, its asset turnover declined significantly. This decline is likely due to the company's reduced revenues and the high asset base it accumulated during the pandemic.

Return on Assets (ROA)

- **Pfizer**: Pfizer's ROA declined from 0.24 in 2021 to 0.01 in 2023. This sharp decline suggests that the company's assets are no longer yielding as high returns as they did during the height of the pandemic. As the pandemic subsided, the revenue from the COVID-19 vaccine declined, which significantly impacted the company's overall profitability.
- **Moderna**: Moderna's ROA experienced a more severe drop, from 0.76 in 2021 to -0.21 in 2023. While Moderna initially benefited from high vaccine sales, the end of the pandemic led to a sharp reduction in revenue, resulting in a negative return on assets in 2023. The company is now struggling to generate returns from its asset base, reflecting poor asset management and reduced revenue generation capacity.

Return on Stockholders' Equity (ROE)

- **Pfizer**: Pfizer's ROE declined from 0.28 in 2021 to 0.02 in 2023, indicating a substantial drop in the returns generated for shareholders. The company's strong performance in 2021, driven by vaccine sales, was followed by a sharp decline in 2023, which can be attributed to reduced demand for COVID-19 vaccines and overall lower profitability.
- **Moderna**: Moderna's ROE followed a similar trend, dropping from 0.86 in 2021 to -0.34 in 2023. The initial high ROE was driven by the company's strong vaccine sales, but the negative ROE in 2023 reflects the company's struggles post-pandemic. With falling revenues and a large equity base, Moderna is no longer providing returns for its shareholders, highlighting the impact of decreased demand for its primary product.

Earnings per Share (EPS)

- **Pfizer**: Pfizer's EPS increased from $3.91 in 2021 to $5.58 in 2022, but dropped to just $0.38 in 2023. This decline reflects the fading impact of the pandemic, as vaccine sales accounted for a large portion of its earnings. The drop in EPS is indicative of declining revenues and profitability in 2023.
- **Moderna**: Moderna's EPS was exceptionally high in 2021 at $30.29, but it dropped dramatically to -$12.34 in 2023. The drop in EPS reflects a significant reduction in revenue due to the decreased demand for the COVID-19 vaccine. The negative EPS indicates that

Moderna incurred losses in 2023, marking a complete reversal of its pandemic-era earnings.

P/E Ratio

- **Pfizer**: Pfizer's P/E Ratio fell from 10.02 in 2021 to 9.39 in 2022, before rising sharply to 97.75 in 2023. The rise in P/E in 2023, despite lower earnings, suggests that the market is placing higher expectations on Pfizer's future growth, possibly linked to its pipeline of new drugs and treatments. However, this high valuation could be seen as unsustainable if the company's earnings do not recover.
- **Moderna**: Moderna's P/E Ratio decreased from 7.76 in 2021 to 6.60 in 2022, and turned negative in 2023 at -9.85. The negative P/E in 2023 is due to the company's losses, which makes the ratio meaningless. The decline in P/E reflects lower market expectations following the reduced demand for its COVID-19 vaccine and the uncertainty about its future revenue streams.

Dividends per Share and Dividend Yield

- **Pfizer**: Pfizer increased its Dividends per Share from $1.55 in 2021 to $1.67 in 2023. The Dividend Yield remained relatively stable, dropping from 3.96% in 2021 to 4.55% in 2023, even as its earnings decreased. Pfizer's ability to maintain and slightly increase dividends despite declining earnings reflects its commitment to returning value to shareholders, although it may raise concerns about sustainability if profits continue to decline.
- **Moderna**: Moderna does not pay any dividends, which is common for biotech companies that reinvest profits into research and development. As a result, there is no Dividend **Yield** to analyze for Moderna.

II. Liquidity

1. Working Capital

- **Pfizer**: Pfizer's Working Capital dropped from $17,022 million in 2021 to -$4,461 million in 2023. This significant decline indicates that Pfizer may be facing liquidity challenges, as it no longer has enough current assets to cover its short-term liabilities. The negative working capital in 2023 suggests a potential liquidity crunch, signaling that the company could struggle to meet its short-term obligations without additional financing or asset sales.
- **Moderna**: Moderna's Working Capital has remained positive, starting at $6,943 million in 2021 and gradually increasing to $7,310 million in 2023. This positive trend suggests that Moderna has managed to maintain a solid liquidity position despite reduced revenues.

2. Current Ratio

- **Pfizer**: Pfizer's Current Ratio has steadily declined from 1.40 in 2021 to 0.91 in 2023. A current ratio below 1 suggests that Pfizer's short-term assets are insufficient to cover its short-term liabilities. This decline is a red flag, signaling potential difficulties in meeting its financial obligations.
- **Moderna**: Moderna's Current Ratio improved over the years, from 1.76 in 2021 to 3.42 in 2023. A high current ratio indicates that Moderna has a strong liquidity position and can cover its short-term liabilities comfortably, even as its revenue declines.

3. Quick Ratio

- **Pfizer**: Pfizer's Quick Ratio has also decreased from 1.19 in 2021 to 0.69 in 2023, signaling a decline in its ability to meet short-term obligations without relying on inventory. A ratio below 1 suggests potential liquidity issues.
- **Moderna**: Moderna's Quick Ratio improved from 1.52 in 2021 to 3.15 in 2023, reflecting its ability to cover short-term liabilities with liquid assets without relying on inventory.

4. Accounts Receivable Turnover

- **Pfizer**: Pfizer's Accounts Receivable Turnover decreased from 8.38 in 2021 to 5.29 in 2023. This indicates that Pfizer is taking longer to collect its receivables. The drop could reflect a slowdown in sales or possibly extended credit terms as the pandemic-induced surge in demand for vaccines wanes. A decline in turnover suggests inefficiencies in cash collection and could potentially affect liquidity.
- **Moderna**: Moderna's Accounts Receivable Turnover is more stable, fluctuating slightly from 8.09 in 2021 to 6.01 in 2023. Despite a drop in 2023, the company still maintains a relatively strong ability to collect its receivables, suggesting that its cash conversion cycle is somewhat less impacted than Pfizer's.

5. Days' Sales in Receivables

- **Pfizer**: Pfizer's Days' Sales in Receivables increased from 43.54 days in 2021 to 69.04 days in 2023. This increase indicates that it is taking Pfizer longer to collect payments from customers. The delay in payment collection could be attributed to a decrease in revenue and a potential increase in customer payment terms, possibly a response to the lower demand for vaccines post-2021.
- **Moderna**: Moderna's Days' Sales in Receivables remained fairly stable, moving from 45.11 days in 2021 to 60.68 days in 2023. While there is a slight increase, Moderna is still collecting its receivables more quickly than Pfizer. This suggests that Moderna may be better at managing customer credit and payment terms, contributing to better short-term liquidity.

6. Inventory Turnover

- **Pfizer**: Pfizer's Inventory Turnover increased slightly from 3.61 in 2021 to 2.60 in 2023. The drop in turnover suggests that Pfizer's inventory is turning over slower, which could indicate overstocking or a slowdown in sales. A lower inventory turnover may also signal inefficiency in managing inventory, leading to higher storage costs or obsolete goods.
- **Moderna**: Moderna's Inventory Turnover improved significantly from 3.52 in 2021 to 8.15 in 2023. This sharp increase indicates that Moderna has become more efficient in managing its inventory, likely due to reduced production and stockpiling as demand for vaccines falls. The company seems to have optimized its inventory management processes, allowing it to sell through stock more quickly.

7. Days' Sales in Inventory

- **Pfizer**: Pfizer's Days' Sales in Inventory increased from 101.13 days in 2021 to 140.20 days in 2023, indicating that inventory is staying on the shelves for longer. This increase is concerning as it suggests that Pfizer may have accumulated excess inventory, possibly due to decreased demand for its COVID-19 vaccine and other products.

- **Moderna**: Moderna’s Days’ Sales in Inventory decreased from 103.77 days in 2021 to 44.76 days in 2023. This sharp decrease suggests that Moderna has become much more efficient at moving inventory, likely due to reduced production and better sales forecasting in the post-pandemic environment. This efficient inventory turnover is a positive indicator of operational efficiency.

III. Solvency

1. **Fixed Assets to Long-Term Liabilities**

- **Pfizer**: Pfizer’s Fixed Assets to Long-Term Liabilities increased slightly from 1.99 in 2021 to 2.47 in 2022, and then slightly dropped to 2.05 in 2023. This suggests that Pfizer’s fixed assets are relatively well-positioned to cover its long-term liabilities. While there has been a slight decline in 2023, the ratio still indicates that Pfizer is in a solid position in terms of asset backing for its long-term debts.
- **Moderna**: Moderna’s Fixed Assets to Long-Term Liabilities decreased from 6.16 in 2021 to 5.20 in 2023, indicating that it has become more reliant on debt relative to its fixed asset base. Despite the decline, the ratio remains relatively favorable, suggesting that Moderna’s fixed assets still provide a solid buffer to cover its long-term liabilities.

2. **Liabilities to Stockholders’ Equity**

- **Pfizer**: Pfizer’s **Liabilities to Stockholders’ Equity** ratio decreased from 1.34 in 2021 to 1.06 in 2022, before rising to 1.54 in 2023. This indicates that Pfizer has been increasing its reliance on debt financing, which could heighten its financial risk, especially in an environment where revenues are declining. A higher ratio suggests that the company is more leveraged and may face more challenges in managing its debt obligations.
- **Moderna**: Moderna’s **Liabilities to Stockholders’ Equity** ratio dropped significantly from 0.74 in 2021 to 0.33 in 2023, showing that the company has reduced its debt relative to equity. This reduction in leverage makes Moderna less financially risky than Pfizer and indicates a more conservative approach to financing.

3. **Times Interest Earned (TIE)**

Times Interest Earned (TIE) measures a company’s ability to cover its interest payments with its operating income. It is calculated as EBIT / Interest Expense.

- **Pfizer**: Pfizer’s TIE ratio decreased from 19.83 in 2021 to 1.48 in 2023. This indicates a sharp decline in Pfizer’s ability to cover its interest expenses with earnings before interest and taxes (EBIT). The drop suggests that, while the company could easily cover its interest payments in 2021, it has become much more vulnerable to interest obligations in 2023. A TIE ratio below 2 is concerning, as it indicates that the company may struggle to meet its debt obligations without relying on further borrowing or asset sales.
- **Moderna**: Moderna’s TIE ratio was extremely high in 2021 and 2022 (738.67 and 331.17, respectively), reflecting its strong ability to cover interest expenses. However, in 2023, the ratio turned negative at -102.74, indicating that Moderna’s operating income was insufficient to cover its interest expenses. This negative TIE

ratio is a serious concern and signals that Moderna may be facing significant financial distress, particularly in meeting debt obligations.

Cross-sectional Analysis:

I. Profitability Comparison

1. **Asset Turnover**

- **Pfizer**: The Asset Turnover ratio for Pfizer has declined significantly, from 0.87 in 2021 to 0.28 in 2023. This suggests a severe decline in the efficiency with which Pfizer uses its assets to generate sales.
- **Moderna**: Moderna has also seen a decrease in its Asset Turnover ratio, dropping from 1.15 in 2021 to 0.31 in 2023. However, Moderna's ratio has been higher than Pfizer's in each year, which suggests that Moderna has been more efficient in utilizing its assets for generating revenue.

Moderna ranks better than Pfizer in **Asset Turnover**, indicating that Moderna has been able to make better use of its assets despite a similar downward trend in the past three years.

2. **Return on Assets (ROA)**

- **Pfizer**: Pfizer's ROA has significantly declined from 0.24 in 2021 to just 0.01 in 2023, indicating a sharp drop in its ability to generate profit from its assets.
- **Moderna**: Moderna's ROA also saw a major decrease from 0.76 in 2021 to -0.21 in 2023. The negative ROA in 2023 highlights that Moderna is no longer generating a return on its assets, which indicates operational inefficiencies or excessive investment in underperforming assets.

Pfizer has a slightly better ROA, although both companies are showing significant declines in asset profitability, with Moderna's negative ROA in 2023 being a major concern.

3. **Return on Stockholders' Equity (ROE)**

- **Pfizer**: Pfizer's ROE declined from 0.28 in 2021 to 0.02 in 2023, a clear indication of reduced profitability for shareholders. Despite the decline, Pfizer's ROE remains positive.
- **Moderna**: Moderna's ROE dropped from 0.86 in 2021 to -0.34 in 2023, indicating that the company is not generating sufficient returns for its shareholders and is now providing negative returns.

Pfizer performs better in terms of ROE, as it remains positive, while Moderna's negative ROE indicates that it is destroying shareholder value. Both Pfizer and Moderna saw steep declines in ROE, with Moderna showing a negative return in 2023, indicating poor shareholder value generation in the face of declining sales.

4. **Earnings Per Share (EPS)**

- **Pfizer**: Pfizer's EPS declined significantly from 3.91 in 2021 to 0.38 in 2023, reflecting a major drop in profitability.
- **Moderna**: Moderna's EPS was extremely high in 2021 (30.29), but it fell sharply to -12.34 in 2023. This negative EPS in 2023 reflects a substantial loss for shareholders.

Pfizer ranks better in terms of EPS, as it still has a positive EPS in 2023, while Moderna has suffered a major loss. Both companies showed significant reductions in EPS, with Moderna experiencing negative earnings in 2023, highlighting the difficulty both companies face in transitioning away from pandemic-driven revenues.

5. **P/E Ratio**

- **Pfizer**: Pfizer's P/E ratio has increased significantly from 10.02 in 2021 to 97.75 in 2023, reflecting a sharp decline in its earnings relative to its stock price. This high P/E ratio in 2023 indicates investor skepticism about Pfizer's future profitability.
- **Moderna**: Moderna's P/E ratio dropped from 7.76 in 2021 to -9.85 in 2023, indicating that the company is now making losses and its stock price is being priced based on negative earnings.

Pfizer has a better P/E ratio, although the high ratio in 2023 signals concerns about its future earnings. Moderna's negative P/E ratio indicates that it is facing substantial losses. Pfizer has a more optimistic outlook in terms of P/E, but the sharp rise in 2023 raises questions about the sustainability of that expectation. Moderna, in contrast, faces a drastically reduced or negative P/E ratio, reflecting the loss of market confidence.

6. **Dividends per Share and Dividend Yield**

- **Pfizer**: Pfizer's dividend per share increased from 1.55 in 2021 to 1.67 in 2023, and its dividend yield has also shown a positive trend.
- **Moderna**: Moderna does not pay any dividends.

Pfizer is the clear winner in terms of Dividends per Share and Dividend Yield, as Moderna does not pay dividends, reflecting its lack of profitability and retained earnings. Pfizer has maintained stable dividends, signaling a commitment to shareholders, but its ability to continue doing so may be challenged if earnings continue to decline. Moderna, however, is focused on growth and reinvestment rather than dividends.

II. Liquidity Comparison

1. **Working Capital**

- **Pfizer**: Pfizer's working capital decreased from $17,022 million in 2021 to -$4,461 million in 2023, indicating a severe liquidity crisis.
- **Moderna**: Moderna's working capital remained positive but slightly decreased from $6,943 million in 2021 to $7,310 million in 2023, reflecting a more stable liquidity position.

Moderna ranks better in terms of Working Capital, as Pfizer's negative working capital in 2023 indicates liquidity difficulties. Moderna appears to be in a more favorable liquidity position compared to Pfizer, with positive working capital that supports its ability to meet short-term obligations.

2. **Current Ratio**

- **Pfizer**: Pfizer's current ratio decreased from 1.40 in 2021 to 0.91 in 2023, suggesting that its ability to meet short-term liabilities with its current assets is now below 1, which signals potential liquidity problems.
- **Moderna**: Moderna's current ratio increased from 1.76 in 2021 to 3.42 in 2023, showing a strong liquidity position.

Moderna performs better in terms of the Current Ratio, indicating it has a much stronger ability to cover short-term obligations compared to Pfizer. Moderna's liquidity ratios are significantly stronger than Pfizer's, which has experienced a decline in its ability to cover short-term liabilities.

3. **Quick Ratio**

- **Pfizer**: Pfizer's quick ratio decreased from 1.19 in 2021 to 0.69 in 2023, which reflects a decline in its ability to cover short-term liabilities using its most liquid assets.
- **Moderna**: Moderna's quick ratio increased from 1.52 in 2021 to 3.15 in 2023, signaling that it has maintained a solid liquidity position.

Moderna ranks better in Quick Ratio, indicating it has a stronger liquidity position and can more easily cover its immediate liabilities.

4. **Accounts Receivable Turnover**

- **Pfizer**: Pfizer's accounts receivable turnover declined from 8.38 in 2021 to 5.29 in 2023, reflecting slower collection of receivables.
- **Moderna**: Moderna's turnover also declined, but it has remained stronger, from 8.09 in 2021 to 6.01 in 2023.

Moderna ranks better in Accounts Receivable Turnover, showing it collects its receivables faster and more efficiently than Pfizer. Moderna is in a much stronger position in terms of liquidity, as it has consistently maintained higher current and quick ratios than Pfizer.

5. **Days' Sales in Receivables**

- **Pfizer**: Pfizer's days' sales in receivables increased from 43.54 days in 2021 to 69.04 days in 2023, indicating slower collection of receivables.
- **Moderna**: Moderna's days' sales in receivables increased from 45.11 days in 2021 to 60.68 days in 2023.

  Moderna has a smaller increase in Days' Sales in Receivables and thus performs better in this metric, though both companies have been slower in collecting their receivables. Both companies experienced an increase in Days' Sales in Receivables, but Moderna's increase is smaller, indicating better performance in receivables management compared to Pfizer.

6. **Inventory Turnover**

- **Pfizer**: Pfizer's inventory turnover decreased from 3.61 in 2021 to 2.60 in 2023, showing that it is taking longer to sell its inventory.
- **Moderna**: Moderna's inventory turnover significantly improved from 3.52 in 2021 to 8.15 in 2023, indicating more efficient inventory management.

  Moderna ranks better in Inventory Turnover, suggesting that it is managing its inventory more efficiently than Pfizer. Moderna's Inventory Turnover is much stronger than Pfizer's, indicating better inventory management and more efficient use of inventory.

7. **Days' Sales in Inventory**

- From 2021 to 2023, Pfizer's Days' Sales in Inventory (DSI) increased significantly from 101.13 days in 2021 to 140.20 days in 2023. This trend reflects an increasing duration for Pfizer to convert its inventory into sales, indicating a potential inefficiency in inventory management. The sharp rise in 2023 could signal slower-moving inventory, possibly due to decreased demand for certain products, including its COVID-19 vaccines, as the pandemic subsided.
- In contrast, Moderna's DSI has seen a significant improvement, declining from 103.77 days in 2021 to 44.76 days in 2023. This reduction indicates that Moderna is efficiently managing its inventory and converting it into sales more quickly. The decline in DSI could result from better demand forecasting, faster product turnover, or leaner inventory practices.

  When comparing Pfizer and Moderna, Moderna's DSI is significantly better in 2023, standing at 44.76 days compared to Pfizer's 140.20 days. This difference highlights Moderna's superior inventory management practices and its ability to better align production with demand. Moderna's shorter DSI reflects efficient sales processes, while Pfizer's higher DSI raises concerns about potential inventory write-offs and higher holding costs.

III. Solvency Comparison

1. **Fixed Assets to Long-Term Liabilities**

- **Pfizer**: Pfizer's ratio decreased from 2.47 in 2022 to 2.05 in 2023, but it remains relatively stable and suggests that Pfizer can still cover its long-term liabilities with its fixed assets.

- **Moderna**: Moderna’s ratio decreased from 6.16 in 2021 to 5.20 in 2023, which indicates a slight increase in reliance on debt, though its ratio still remains solid.

  Moderna has a stronger Fixed Assets to Long-Term Liabilities ratio, indicating a better cushion of assets over liabilities compared to Pfizer. Pfizer appears to have a more stable position in terms of Fixed Assets to Long-Term Liabilities, while Moderna has seen a slight decline but still enjoys a strong asset base relative to its liabilities.

2. Liabilities to Stockholders’ Equity

- **Pfizer**: Pfizer’s ratio increased from 1.06 in 2022 to 1.54 in 2023, indicating increased reliance on debt relative to equity, which raises financial risk.
- **Moderna**: Moderna’s ratio decreased from 0.74 in 2021 to 0.33 in 2023, indicating a reduction in its leverage and financial risk.

  Moderna is in a better position in terms of Liabilities to Stockholders’ Equity, showing less reliance on debt compared to Pfizer. Moderna’s Liabilities to Stockholders’ Equity ratio shows a stronger and less risky financial position compared to Pfizer, which has seen an increase in leverage, potentially raising concerns about its ability to manage debt.

3. Times Interest Earned

- **Pfizer**: Pfizer’s TIE ratio decreased from 19.83 in 2021 to 1.48 in 2023, indicating a sharp decline in its ability to cover interest payments from operating profits.
- **Moderna**: Moderna’s TIE ratio went from extremely high levels in 2021 and 2022 to negative territory in 2023 (-102.74), signaling significant difficulty in meeting interest obligations.

  Pfizer performs better in Times Interest Earned, despite a decline, as Moderna’s negative TIE ratio in 2023 suggests a severe inability to cover interest expenses.

Altman Z-Score Computation

Pfizer

Altman's Z Score Analysis Calculation - Pfizer			
Working Capital / Total Assets			
	2021	**2022**	**2023**
Working Capital	17022.00	9121.00	-4461.00
Total Assets	181,476.0	197,205.0	226,501.0
Working Capital / Total Assets (A)	**0.09**	**0.05**	**-0.02**
Retained Earnings / Total Assets			
	2021	**2022**	**2023**
Retained Earnings	103,394.0	125,656.0	118,353.0
Total Assets	181,476.0	197,205.0	226,501.0
Retained Earnings / Total Assets (B)	**0.57**	**0.64**	**0.52**
EBIT / Total Assets			
	2021	**2022**	**2023**
EBIT	25,602.0	35,967.0	3,267.0
Total Assets	181,476.0	197,205.0	226,501.0
EBIT/Total Assets (C)	**0.14**	**0.18**	**0.01**
Market Cap / Total Liabilities			
	2021	**2022**	**2023**
Market Cap	223,000.0	294,000.0	207,000.0
Total Liabilities	104,013.0	101,288.0	137,213.0
Market Cap / Long term Liabilities (D)	**2.14**	**2.90**	**1.51**
Sales / Total Assets			
	2021	**2022**	**2023**
Total Sales	81,288.0	100,330.0	58,496.0
Total Assets	181,476.0	197,205.0	226,501.0
Return on Asset (E)	**0.45**	**0.51**	**0.26**
Altman's Z Score			
	2021	**2022**	**2023**
Final Score	**3.11**	**3.80**	**1.92**
Financial Stability	***Strong***	***Strong***	***Grey Zone***

The Altman Z-Score is calculated using the formula: $Z=1.2\times A+1.4\times B+3.3\times C+0.6\times D+1.0\times E$
Where:
A = (Working Capital / Total Assets)
B = (Retained Earnings / Total Assets)
C = (EBIT / Total Assets)
D = (Market Value of Equity / Total Liabilities)
E = (Sales / Total Assets)

Pfizer Altman Z-Score Computation:
Pfizer 2021:
Given the values: **A = 0.09, B = 0.57, C = 0.14, D = 2.14, E = 0.45**

Substituting into the formula:
$Z=1.2\times 0.09+1.4\times 0.57+3.3\times 0.14+0.6\times 2.14+1.0\times 0.45$
$Z=0.108+0.798+0.462+1.284+0.45=3.11$

Interpretation:
For 2021, Pfizer has a **Z-Score of 3.11**, which is above the threshold of 2.99, indicating **low bankruptcy risk**. Pfizer is in the **safe zone** with solid financial health.

Pfizer 2022:
Given the values: **A = 0.05, B = 0.64, C = 0.18, D = 2.90, E = 0.51**

Substituting into the formula:
$Z=1.2\times 0.05+1.4\times 0.64+3.3\times 0.18+0.6\times 2.90+1.0\times 0.51$
$Z=0.06+0.896+0.594+1.74+0.51=3.80$

Interpretation:
For 2022, Pfizer's **Z-Score of 3.80** indicates that the company is in the **safe zone**. It is a significant improvement compared to 2021, suggesting enhanced financial health in this year.

Pfizer 2023:
Given the values: **A = -0.02, B = 0.52, C = 0.01, D = 1.51, E = 0.26**

Substituting into the formula:
$Z=1.2\times -0.02+1.4\times 0.52+3.3\times 0.01+0.6\times 1.51+1.0\times 0.26$
$Z=-0.024+0.728+0.033+0.906+0.26=1.92$

Interpretation:
For 2023, Pfizer’s **Z-Score of 1.92** is below the 2.99 threshold, indicating that it has moved into the **grey zone**, with moderate bankruptcy risk. While still not in the distress zone, this drop from 3.76 to 1.89 is concerning, and the company’s financial health appears to be declining.

Pfizer (Z-Scores for 2021, 2022, and 2023)
Pfizer's Altman Z-Scores indicate the company’s fluctuating financial health over the past three years.

- **Pfizer 2021 (Z-Score = 3.11):** In 2021, Pfizer's Z-Score of **3.11** places it in the **safe zone**, indicating **low bankruptcy risk**. This was a period of strong financial health, with the company benefiting from the COVID-19 vaccine rollout. The Z-Score reflects robust profitability, low financial leverage, and a solid market position. It suggests that the company had a strong ability to meet its financial obligations and had a significant cushion against financial distress. Pfizer’s relatively healthy market value of equity and sales generated from its vaccine contributed positively to its Z-Score.
- **Pfizer 2022 (Z-Score = 3.80):** Pfizer's Z-Score increased to **3.80** in 2022, signaling an **improvement in financial health**. Despite the challenges of shifting vaccine demand, Pfizer was still benefiting from its strong portfolio, including COVID-19 vaccines and treatments, as well as other pharmaceutical products. The increase in the Z-Score reflects improved profitability and market value, and the company was still able to generate solid revenue and earnings. With a Z-Score well above the threshold of 2.99, Pfizer was in the **safe zone**, suggesting continued low bankruptcy risk.
- **Pfizer 2023 (Z-Score = 1.92):** However, in 2023, Pfizer’s Z-Score dropped significantly to **1.92**, moving into the **grey zone**. This drop suggests a **moderate bankruptcy risk**. The significant decline from the previous years could indicate challenges in maintaining high levels of profitability, possibly due to a slowdown in vaccine sales, increased competition, or changes in market conditions. The decrease in profitability could be linked to the end of emergency vaccine authorizations and the shift toward more routine sales. The lower market value of equity and potential increases in liabilities could have also played a role in the decrease. Although Pfizer is not yet in the **distress zone**, its financial health appears to have weakened, and the company may face more difficulty in meeting its financial obligations moving forward.

Moderna

Altman's Z Score Analysis Calculation - Moderna

Working Capital / Total Assets

	2021	2022	2023
Working Capital	6943.00	8508.00	7310.00
Total Assets	24,669.0	25,858.0	18,426.0
Working Capital / Total Assets (A)	**0.28**	**0.33**	**0.40**

Retained Earnings / Total Assets

	2021	2022	2023
Retained Earnings	9,958.0	18,320.0	13,606.0
Total Assets	24,669.0	25,858.0	18,426.0
Retained Earnings / Total Assets (B)	**0.40**	**0.71**	**0.74**

EBIT / Total Assets

	2021	2022	2023
EBIT	13,296.0	9,604.0	-3,904.0
Total Assets	24,669.0	25,858.0	18,426.0
EBIT/Total Assets (C)	**0.54**	**0.37**	**-0.21**

Market Cap / Total Liabilities

	2021	2022	2023
Market Cap	80,800.0	48,800.0	40,200.0
Total Liabilities	10,524.0	6,735.0	4,572.0
Market Cap / Long term Liabilities (D)	**7.68**	**7.25**	**8.79**

Sales / Total Assets

	2021	2022	2023
Total Sales	18,471.0	19,263.0	6,848.0
Total Assets	24,669.0	25,858.0	18,426.0
Return on Asset (E)	**0.75**	**0.74**	**0.37**

Altman's Z Score

	2021	2022	2023
Final Score	**8.04**	**7.70**	**6.46**
Financial Stability	***Strong***	***Strong***	***Strong***

Moderna Altman Z-Score Computation:

Moderna 2021:

Given the values: **A = 0.28, B = 0.40, C = 0.54, D = 7.68, E = 0.75**

Substituting into the formula:

$Z=1.2\times0.28+1.4\times0.40+3.3\times0.54+0.6\times7.68+1.0\times0.75$
$Z=0.336+0.56+1.782+4.608+0.75 = 8.04$

Interpretation:
For 2021, Moderna has an exceptionally high **Z-Score of 8.04**, which places it in the safe zone with very low bankruptcy risk. This strong financial health is likely due to robust earnings from its vaccine development and sales during this period.

Moderna 2022:

Given the values: **A = 0.33, B = 0.71, C = 0.37, D = 7.25, E = 0.74**

Substituting into the formula:

$Z=1.2\times0.33+1.4\times0.71+3.3\times0.37+0.6\times7.25+1.0\times0.74$
$Z=0.396+0.994+1.221+4.35+0.74=7.70$

Interpretation:
For 2022, Moderna's **Z-Score of 7.70** remains well above 2.99, indicating **low bankruptcy risk**. Though slightly lower than 2021, Moderna's financial health remains strong.

Moderna 2023:

Given the values: **A = 0.40, B = 0.74, C = -0.21, D = 8.79, E = 0.37**

Substituting into the formula:

$Z=1.2\times0.40+1.4\times0.74+3.3\times-0.21+0.6\times8.79+1.0\times0.37$
$Z=0.48+1.036+(-0.693)+5.274+0.37=6.46$

Interpretation:
For 2023, Moderna's **Z-Score of 6.46** indicates **low bankruptcy risk**. While there is a slight decline from 7.70 to 6.46, the company still maintains a very strong financial position.

Moderna's Altman Z-Scores provide insight into a company that has maintained strong financial health, primarily due to its successful vaccine production and sales.

1. **Moderna 2021 (Z-Score = 8.04):** Moderna's Z-Score of 8.04 in 2021 is exceptionally high, signaling extremely low bankruptcy risk. This reflects the company's position as a leader in the COVID-19 vaccine market, which drove an unprecedented surge in revenue and profits. The company benefited from its strong market value, high sales, and solid profitability, positioning it well above the safe zone threshold. This strong Z-Score indicates that Moderna had a very low risk of bankruptcy and was in a very stable financial condition. Moderna's ability to convert sales into profits, manage liabilities, and leverage its strong market value contributed to its high Z-Score.
2. **Moderna 2022 (Z-Score = 7.70):** Moderna's Z-Score of 7.70 in 2022, while lower than 2021, is still very high and well above the safe zone threshold. The company continued to benefit from COVID-19 vaccine sales, but there may have been some indication of slowing growth, as the demand for vaccines started to normalize. Despite this, Moderna's financial health remained strong. The company's market value of equity remained high, and it maintained a healthy level of retained earnings and EBIT (Earnings Before Interest and Taxes). The decline in the Z-Score from 2021 could be due to factors like increased competition, changes in vaccine demand, or rising costs in research and development, but overall, Moderna remained financially secure.
3. **Moderna 2023 (Z-Score = 6.46):** In 2023, Moderna's Z-Score of 6.46 is still significantly above the safe zone threshold, indicating low bankruptcy risk. While there is a noticeable decline from 2022, this is more of a moderation in financial health rather than a sharp deterioration. The decline in the Z-Score could be attributed to several factors: the ongoing adjustments in vaccine sales, potential drops in demand as COVID-19 becomes endemic, and the increased competition from other pharmaceutical companies producing similar vaccines and treatments. Despite the decline, Moderna's financial foundation remains solid, with substantial market value and retained earnings helping to maintain a relatively low bankruptcy risk.

Short-Term Lending Decision

In the short term, **Moderna** appears to be the safer choice for lending money. Several factors support this conclusion:

1. **Stronger Financial Health (Z-Score Analysis)**: Moderna has consistently maintained a high Altman Z-Scoreover the past three years (2021–2023), ranging from 8.04 to 6.46, indicating low bankruptcy risk and solid financial stability. In contrast, Pfizer's Z-Score has significantly declined from 3.11 in 2021 to 1.92 in 2023, which places the company in the grey zone (moderate bankruptcy risk). This shift suggests that Pfizer is facing increasing financial pressures, potentially affecting its ability to meet short-term obligations.

2. **Liquidity Ratios**: Moderna’s liquidity ratios, such as its current ratio (3.42 in 2023) and quick ratio (3.15 in 2023), are notably higher than Pfizer's, indicating that Moderna has more than enough short-term assets to cover its short-term liabilities. In contrast, Pfizer’s current and quick ratios have been declining, with the current ratio falling to **0.91** in 2023. This suggests that Pfizer may face liquidity challenges in the short term, increasing the risk of default on short-term debt.
3. **Cash Flow and Solvency**: Moderna's strong solvency position, demonstrated by its consistent ability to meet long-term obligations (as seen in its Times Interest Earned (TIE) ratios and Fixed Assets to Long-term Liabilities ratio), suggests that it can manage both short-term and long-term debt obligations without significant risk. Pfizer, however, has seen a deterioration in solvency, which could affect its ability to generate enough cash flow to meet short-term debt requirements.

Given Moderna’s high liquidity, strong Z-Score, and financial stability in the short term, it would be a lower-risk option for lending money.

Long-Term Lending Decision

While Moderna is the preferable option for short-term lending, the long-term lending decision requires a broader consideration of future prospects, business stability, and potential risks over a longer period. Here’s why Moderna is also the better choice for long-term lending:

1. **Sustained Profitability and Market Position**: Moderna has shown consistent profitability due to its leading position in the COVID-19 vaccine market and its strong potential to expand into other vaccine and therapeutic areas. Despite some decline in Z-Scores and profitability metrics (such as a decrease in its Earnings per Share (EPS)), Moderna’s market position remains robust with continued growth in its pipeline of mRNA-based therapies. This is crucial for long-term sustainability.
2. **Strong Market Capitalization**: Moderna’s market capitalization remains strong despite the waning demand for COVID-19 vaccines in 2023. The company’s focus on diversifying its offerings, including cancer vaccines and other infectious disease treatments, positions it well for future growth. This makes Moderna more likely to continue generating strong cash flows over the long term, providing a reliable source of repayment for long-term debt.
3. **Pfizer’s Declining Profitability and Risk Factors**: Pfizer's declining profitability, as shown by its Return on Assets (ROA) and Earnings per Share (EPS), raises concerns about its long-term financial stability. In 2023, Pfizer’s EPS dropped significantly to 0.38 from 5.58 in 2022, and its ROA turned negative, dropping from 0.17in 2022 to 0.01 in 2023. This indicates that Pfizer may struggle to generate the same level of returns in the future, particularly as it faces declining sales from COVID-19 vaccines and potential challenges in other product lines. Pfizer’s Z-Score dropping into the grey zone also suggests that its financial health is becoming riskier.
4. **Diversification and Long-Term Outlook**: Pfizer is heavily dependent on the success of its COVID-19 vaccine and related products, which faced a dramatic decline in demand post-pandemic. While Pfizer remains a large, diversified company, the shift away from pandemic-related revenue and the decline in its financial metrics indicate that its ability to maintain profitability and generate sufficient cash flows for long-term obligations could be

strained. If Pfizer cannot sustain its market leadership or adapt to new market conditions, its future financial health could be at risk.

5. **Debt and Liabilities**: Pfizer's Liabilities to Stockholders' Equity ratio has been fluctuating, reaching 1.54 in 2023, indicating relatively high levels of debt compared to equity. Over the long term, the company may struggle with the financial burden of these liabilities, especially if its revenue streams do not recover or diversify sufficiently. On the other hand, Moderna's more stable and less leveraged balance sheet, along with its continuing innovation in mRNA technologies, gives it a better chance of sustaining long-term financial stability.

In both the short term and long term, Moderna emerges as the more favorable choice for lending money. Moderna's consistently strong liquidity, solvency, and Z-Scores, along with its high profitability and low bankruptcy risk, position it as a reliable borrower with the ability to meet both short-term and long-term obligations. On the other hand, Pfizer's declining profitability, weakening liquidity, and higher bankruptcy risk make it a less attractive option for lending, especially for the long term.

Therefore, based on the analysis, **Moderna** is the preferred choice for lending money due to its strong financial position, market prospects, and low risk of default.

Investment Decision

Based on the analyses above, Moderna would be the preferable firm to invest in over Pfizer, and several key factors contribute to this decision. Here's an in-depth explanation of the reasons:

1. Stronger Profitability and Market Position

Moderna has shown a solid ability to generate strong profits, especially during and after the COVID-19 pandemic, with its mRNA-based vaccines playing a pivotal role. Despite the expected decline in demand for COVID-19 vaccines, Moderna's robust pipeline of mRNA-based therapies and its expansion into areas like cancer vaccines and other infectious diseases offer substantial growth potential. This diversification reduces reliance on a single product and positions Moderna as a leader in the rapidly evolving biotechnology field.

While Pfizer also benefited from COVID-19 vaccine sales, its performance has begun to show signs of weakness. In 2023, Pfizer's Earnings per Share (EPS) plummeted to 0.38 from 5.58 in 2022, and its Return on Assets (ROA)dropped sharply, even turning negative. The company faces increased competition in the post-pandemic world, and its growth prospects are now more uncertain. Given Pfizer's declining profitability and reliance on vaccines, investing in Pfizer presents greater risks.

2. Higher Liquidity and Financial Stability

Moderna demonstrates a strong liquidity position compared to Pfizer, as evidenced by its current ratio and quick ratio. In 2023, Moderna's current ratio was 3.42, and its quick ratio was 3.15, both indicating that it is well-positioned to meet short-term obligations. This strong liquidity is critical for investors looking for companies with solid financial health and the ability to weather market fluctuations or short-term challenges.

On the other hand, Pfizer’s liquidity has deteriorated, with its current ratio dropping to 0.91 in 2023, signaling potential trouble in meeting short-term liabilities. This decline in liquidity, combined with its growing debt levels, poses a higher risk for investors concerned about the company’s ability to manage its obligations, especially in the short term.

3. Altman Z-Score and Bankruptcy Risk

The Altman Z-Score, which is a key indicator of bankruptcy risk, is another area where Moderna excels. With an Altman Z-Score of 6.46 in 2023, Moderna remains in the safe zone with a low risk of bankruptcy. The company has shown a steady performance in terms of its financial stability over the past three years.

Conversely, Pfizer's Z-Score has fallen into the grey zone, dropping to 1.92 in 2023, signaling an increased risk of financial distress. Although Pfizer is not at immediate risk of bankruptcy, the downward trend in its Z-Score suggests that its financial health is deteriorating, and the risk of future financial instability is higher.

4. Long-Term Growth Potential and Innovation

One of the strongest arguments for investing in Moderna is its long-term growth potential. The company's success in mRNA vaccine technology has positioned it as a leader in biotechnology. Moderna has already expanded into areas like cancer vaccines and is actively working on other treatments for infectious diseases. This diversification into different therapeutic areas enhances Moderna’s future growth prospects and offers substantial upside potential for investors.

In contrast, Pfizer is increasingly facing competition in the COVID-19 vaccine market, and its inability to fully replace pandemic-related revenue sources with other innovative products raises concerns about its long-term growth trajectory. Pfizer's pipeline does contain promising drugs, but it may not be enough to offset the decline in vaccine revenue, which could limit its future market growth.

5. Market Valuation and Investment Return Potential

Looking at the Price-to-Earnings (P/E) ratio, Moderna is trading at a more attractive valuation for future growth. While its P/E ratio has risen in 2023 due to a decline in profits, this is expected in the context of reduced COVID-19 vaccine demand. The future growth potential in Moderna’s pipeline could drive significant returns for investors once new products come to market.

Pfizer, however, has a relatively low P/E ratio, indicating that its stock is priced cheaply relative to earnings, but this also suggests limited growth expectations from the market. Investors in Pfizer might experience more stable, but likely lower returns compared to Moderna’s potential for high growth, provided its innovation and new product launches succeed.

Moderna as the Better Investment Option

Moderna is the more compelling investment option compared to Pfizer, based on its strong profitability outlook, diversified growth opportunities, superior liquidity, low bankruptcy risk, and long-term innovation strategy. Moderna's leadership in mRNA technology, coupled with its expansion into other therapeutic areas, presents a robust investment opportunity with significant upside potential.

In contrast, while Pfizer remains a large, established company with strong historical performance, its declining profitability, reduced reliance on pandemic-related products, and growing financial risks make it a less attractive investment for those seeking long-term growth and stability. Therefore, for investors focused on high potential returns and a healthier financial outlook, Moderna offers the most promising opportunity.

Appendix

Appendix I

1. Asset Turnover= Sales/Average Asset

2. Return on Assets= Net Income / Average Assets

3. Return on Stockholders' Equity = Net Income / Shareholder's Equity

4. Earnings per Share on Common Stock = Net Income / Avg outstanding shares

5. P/E Ratio = Market price / EPS

6. Dividends per Share = Dividends / Avg Outstanding shares

7. Dividend Yield = Dividends per share / Price per share

8. Working Capital = Current Assets - Current Liabilities

9. Current Ratio = Current Assets/Current Liabilities

10. Quick Ratio = (Current Assets- Inventory - Prepaid Expenses)/Current Liabilities

11. Accounts Receivable Turnover = Sales/Avg Accounts Receivable

12. Days' Sales in Receivables = (Total Accounts Receivable/Total Credit Sales)*365

13. Inventory Turnover = COGS/Avg Inventory Turnover

14. Days' Sales in Inventory = Avg Inventory/COGS*365

15. Fixed Assets to Long Term Liabilities = Fixed Assets/Long-term Liability

16. Liabilities to Stockholders' Equity = Total Liabilities/Total Stockholder's Equity

17. Times Interest Earned = EBIT/Interest expense

18. Altman Z Score = 1.2*A+1.4*B+3.3*C+0.6*D+1.0E

19. A = Working Capital/Total Assets

20. B = Retained Earnings/Total Assets

21. C = EBIT/Total Assets

22. D = Market Value of Equity/Total Liabilities

23. E = Sales/Total Assets

Appendix II

Attached Files

[1] Pfizer Inc., *Annual Report 2023 (Form 10-K)*. Available:

https://drive.google.com/file/d/1cI6PL9gKJaT4ZrNDBGpfns9J_a4MtHWR/view?usp=share_link.

[2] Pfizer Inc., *Annual Report 2022 (Form 10-K)*. Available:

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[3] Pfizer Inc., *Annual Report 2021 (Form 10-K)*. Available:

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[4] Moderna Inc., *Annual Report 2023 (Form 10-K)*. Available:

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[5] Moderna Inc., *Annual Report 2022 (Form 10-K)*. Available:

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[6] Moderna Inc., *Annual Report 2021 (Form 10-K)*. Available:

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[7] Pfizer and Moderna Financial Data, *Excel Analysis Sheet*. Available:

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[8] Yahoo Finance, *Pfizer (PFE) Stock Data*. Available: https://finance.yahoo.com/quote/PFE/.

[9] Yahoo Finance, *Moderna (MRNA) Stock Data*. Available:

https://finance.yahoo.com/quote/MRNA/.

Appendix III

1. Pfizer Income Statement 2023: The Income Statement of Pfizer was extracted from the Pfizer (2023) 10-K filing, **Page 52**, and transformed into the Excel sheet tab: IS_Pfizer.

2. Pfizer Balance Sheet 2023: The Balance Sheet of Pfizer was extracted from the Pfizer (2023) 10-K filing, **Page 54**, and transformed into the Excel sheet tab: BS_Pfizer.

3. Pfizer Balance Sheet 2022: The Balance Sheet of Pfizer was extracted from the Pfizer (2022) 10-K filing, **Page 49**, and appended into the Excel sheet tab: BS_Pfizer.

4. Pfizer Balance Sheet 2021: The Balance Sheet of Pfizer was extracted from the Pfizer (2021) 10-K filing, **Page 53**, and appended into the Excel sheet tab: BS_Pfizer.

5. Moderna Income Statement 2023: The Income Statement of Moderna was extracted from the Moderna (2023) 10-K filing, **Page 105**, and transformed into the Excel sheet tab: IS_Moderna.

6. Moderna Balance Sheet 2023: The Balance Sheet of Moderna was extracted from the Moderna (2023) 10-K filing, **Page 104**, and transformed into the Excel sheet tab: BS_Moderna.

7. Moderna Balance Sheet 2022: The Balance Sheet of Moderna was extracted from the Moderna (2022) 10-K filing, **Page 114**, and appended into the Excel sheet tab: BS_Moderna.

8. Moderna Balance Sheet 2021: The Balance Sheet of Moderna was extracted from the Moderna (2021) 10-K filing, **Page 116**, and appended into the Excel sheet tab: BS_Moderna.