



# COVID-19 INVESTMENTS ANALYSIS

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# Investment Analysis Report

## Comparison COVID-19 Vaccines

### Executive Summary:

This investment report provides an analysis of four pharmaceutical companies: BNTX (BioNTech SE), JNJ (Johnson & Johnson), MRNA (Moderna Inc.), and PFE (Pfizer Inc.), spanning from January 1, 2020, to September 3, 2022. The report aims to assess the historical performance of these companies' stocks, identify key trends, and offer insights into potential investment opportunities.

The COVID-19 pandemic catalyzed a paradigm shift in the global healthcare and pharmaceutical sectors, prompting an unprecedented race for effective vaccines and treatments. Amidst this landscape, companies such as BNTX, JNJ, MRNA, and PFE emerged as key players, capturing significant attention from investors worldwide. This report analyzes the investment opportunities presented by these companies in light of their contributions to combating the pandemic and their potential for future growth.

### Four Companies Performance:

#### 1. BNTX (BioNTech SE):

- BNTX exhibited strong growth over the analyzed period, with significant volatility, especially during the COVID-19 pandemic.
- Notable milestones include the development and emergency use authorization of the BioNTech-Pfizer COVID-19 vaccine, which significantly impacted the company's stock performance.
- Despite fluctuations, BNTX demonstrated resilience and potential for future growth, particularly in the biotechnology and pharmaceutical sectors.

#### 2. JNJ (Johnson & Johnson):

- JNJ displayed relatively stable performance throughout the analyzed period.
- The company's diversified portfolio across pharmaceuticals, medical devices, and consumer health products contributed to its steady performance.
- Despite facing legal challenges and regulatory issues related to certain products, JNJ maintained its position as a blue-chip stock with consistent dividends.

#### 3. MRNA (Moderna Inc.):

- MRNA experienced substantial growth, driven primarily by its advancements in mRNA technology and the development of COVID-19 vaccines.
- The company's stock price surged during key milestones such as vaccine approvals and supply agreements with governments worldwide.
- However, MRNA's stock was subject to heightened volatility due to market speculation and concerns over vaccine efficacy and distribution.

#### 4. PFE (Pfizer Inc.):

- PFE demonstrated a resilient performance, bolstered by its collaboration with BioNTech in developing and distributing COVID-19 vaccines.
- The successful rollout and widespread adoption of the Pfizer-BioNTech vaccine positively impacted PFE's financial performance and stock valuation.
- Despite facing competition and logistical challenges in vaccine distribution, PFE maintained its position as a leading pharmaceutical company.

### **Investment Analysis**

#### **Performance Overview:**

- The selected timeframe witnessed significant market volatility driven by global events such as the COVID-19 pandemic, vaccine developments, and economic uncertainties.
- BNTX, MRNA, and PFE experienced notable fluctuations in stock prices due to their involvement in COVID-19 vaccine development and distribution.
- JNJ, being a diversified healthcare company, demonstrated relatively more stable performance compared to its peers.
- BNTX and MRNA were on the rise after January 2021, while JNJ and PFE remained stable. However, after September 2022, BNTX and MRNA began to decline. Then, in June 2022, BNTX and MRNA resumed their upward trend.

#### **Risk & Returns Analysis:**

- Returns: Among the four companies, MRNA has the highest returns with 0.4434%, followed by BNTX with 0.3959%. JNJ and PFE have comparatively lower returns.
- Risk: PFE and JNJ exhibit lower risk, with standard deviations of 1.9239% and 1.4163% respectively, indicating more stable returns. On the other hand, BNTX and MRNA have higher risk levels, with standard deviations of 6.3799% and 5.5249% respectively.
- Sharpe Ratio: The Sharpe Ratio measures the risk-adjusted return, and negative values indicate that the return does not compensate for the risk taken. All companies have negative Sharpe Ratios, indicating poor risk-adjusted returns. JNJ has the lowest Sharpe Ratio (-0.680131), followed by PFE (-0.486310), BNTX (-0.094686), and MRNA (-0.100743).
- Total returns: PFE and JNJ both experienced negative total returns, indicating a loss over the analyzed period. MRNA exhibited a relatively low negative total return compared to Pfizer and JNJ. BNTX stands out with a positive total return, indicating a gain over the analyzed period.
- Compound annual growth rate (CAGR): MRNA demonstrates the highest CAGR among the listed companies, signifying strong growth potential. PFE and JNJ show modest CAGR figures compared to MRNA and BNTX.

**Accounting Ratios Analysis:**

- BNTX demonstrates the highest values across profitability ratios, operating ratios, and liquidity ratios. PFE exhibits the highest leverage ratios among the group.
- JNJ has the highest valuation ratios.

**Risk Factors:**

- Regulatory risks associated with vaccine approvals and ongoing clinical trials impacted the stock performances of BNTX, MRNA, and PFE.
- Market sentiment surrounding healthcare policies, drug pricing regulations, and patent expirations could influence future earnings.
- Continued competition within the pharmaceutical industry may pose challenges to maintaining market share and profitability.

**Investment Opportunities:**

- Long-term investors seeking exposure to the healthcare sector may find value in well-established companies like JNJ and PFE, offering stability and potential dividend income.
- Growth-oriented investors may consider BNTX and MRNA, driven by their innovative technologies and potential for further expansion beyond COVID-19 vaccines.
- Diversification across multiple companies within the pharmaceutical sector could mitigate risks associated with individual stock performances.

**Portfolio Insights:**

- The investment portfolio benefited from exposure to leading companies in the pharmaceutical and biotechnology sectors, particularly those involved in COVID-19 vaccine development and distribution.
- While individual stock performances varied, the portfolio as a whole demonstrated resilience amid market volatility and global health crises.
- Diversification across multiple symbols helped mitigate risk and capitalize on opportunities arising from the dynamic healthcare landscape.
- Continued monitoring of regulatory developments, clinical trial outcomes, and market trends will be essential for optimizing portfolio performance and managing risk in the future.

**Overall Assessment:**

The investment portfolio, which includes the symbols BNTX, JNJ, MRNA, and PFE, exhibited a diverse range of performances from January 1, 2020, to September 3, 2022. Despite challenges posed by the COVID-19 pandemic and other external factors, the portfolio demonstrated resilience and potential for growth, highlighting the importance of strategic diversification and ongoing market monitoring.

Despite short-term volatility driven by external factors, the pharmaceutical industry remains a crucial sector for long-term investment opportunities. Investors should carefully evaluate the financial health, competitive positioning, and growth prospects of individual companies before making investment decisions. Maintaining a balanced portfolio with exposure to both established players and innovative disruptors could optimize risk-adjusted returns in the healthcare sector.

Overall, MRNA and BNTX have shown higher returns but also exhibit higher risk levels compared to PFE and JNJ. Despite negative Sharpe ratios for all companies, Pfizer and Johnson & Johnson have relatively lower risk levels and more stable returns. Investors may consider balancing risk and return preferences when including these pharmaceutical companies in their portfolios.

## References

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