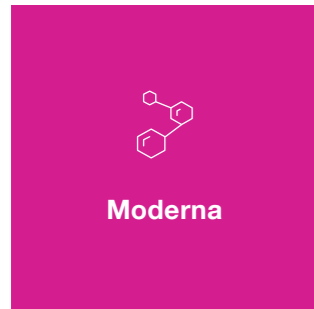


Moderna

Biotechnology

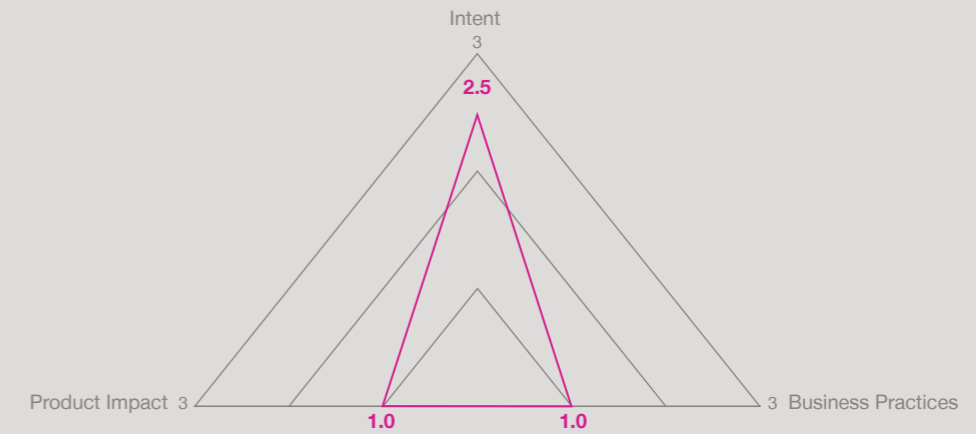


Moderna Therapeutics is a biotech company that develops medicines based on messenger RNA (mRNA). mRNA transfers information stored in our genes to the cellular machinery, called ribosome, that produces all the proteins required for a healthy life.

Investment Case

| | |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| What challenge is the Company tackling? | There are three main areas in which Moderna tackles challenges within the healthcare system. Firstly, the company is developing treatments of diseases which are untreatable with existing technologies (for example rare metabolic diseases), secondly, it has the potential to significantly improve disease management where treatments already exist (for example more effective vaccines) and finally it could reduce the total costs of bringing a successful drug to the market, that would help reduce drug pricing in the long term. |
| Is the Company's offering sufficiently different and better than the status quo? | The majority of Moderna's programmes target disease areas where there are no treatments currently available and other companies have been failing because of the limitations of their technology. If Moderna was purely financially motivated, it could have chosen an easier route by, for example, taking already approved antibodies and producing them in a better and cheaper way. Moderna also considers what role they could play in the development of treatments for ultra-rare diseases where there is no commercial motivation to develop drugs for the rest of the industry. The company is not cutting corners when running the preclinical studies. All drugs are tested in non-human primates. This is an expensive but an important step to make the transition from preclinical to clinical studies in such a new treatment modality like mRNA. |
| Is there a committed management team? What have they done before? | In the past Moderna has experienced a churn of senior leaders, most notably Joseph Bolen, a highly regarded and experienced scientist, who resigned his position as Chief Scientific Officer in 2015. Current CEO, Stephane Bancel has an engineering background and is strongly focused on operations and execution, however, other senior management present a good counterbalance. Stephen Hoge is leading the research and development platform and Melisa Moore who has fantastic scientific credentials and plays an important role in opening Moderna's science to the outside world. Together they create Moderna's bold, curious, collaborative and relentless culture embracing challenges and risks associated with mRNA technology. |
| How does the Company treat stakeholders? | As mentioned, recent high turnover at the top has raised some flags. There is no disclosure of information further down the organisation. According to the company, it is within industry standards but how this is defined is unclear. Moderna has been named by publication, Science as one of the global biopharma industry's top employers for four consecutive years. However, contrary to this, more recent Glassdoor reviews suggest that they still don't quite have the culture working well across the entire organisation, with only 60% recommending to a friend and a CEO approval rating of just 67%. |
| Is there a potential to create a profitable and defensible business? | If Moderna succeeds in bringing its therapeutics and vaccines to the market, the long-term operating margin could be at least as high as for the pharma industry (20%-40% range). However, the big difference between Moderna and pharma could be that Moderna would not need to demand as high prices as its peers to achieve the same level of profitability. This is because Moderna could achieve a higher success rate and therefore require significantly less capital to develop drugs. The success rate could improve over time thanks to the scalability of its research engine and the continuous improvement of the discovery platform via Artificial Intelligence. |
| Is the business attractively valued? | Valuation for Moderna seems extremely high driven by excitement around the Covid-19 vaccine currently in late stage trials. If Moderna is successful, the Covid-19 vaccine will be transformational and this opportunity alone could be in the range of \$30-60bn. It would also validate Moderna's platform which addresses a wide range of diseases: from the top two killer diseases (cardiovascular and cancer that together claim 16million lives every year) to rare diseases that affect 300 to 30,000 patients per disease. If the company succeeds in bringing drugs to the market across different therapeutic areas, it could become an important player in markets worth billions of dollars. Over the past two years the company continued de-risking its technological platform and we believe that the odds of success has shifted in the company's favour. With Moderna's diversified portfolio it is not difficult to construct a scenario that leads to a 5x outcome (market cap ~\$130bn) with a probability more than 5%. |

Impact Analysis



Product Impact

Moderna's product impact is direct, its focuses on getting as close to a cure as possible rather than symptom management. However, at the moment there are no current products on the market and it is potential impact that is being assessed.

Intent

The mission statement is 'Working to deliver on the promise of mRNA science to create a new generation of transformative medicines for patients' – it is painted across the walls of the company's offices to be symbolically permanent. One of the most striking aspects is the breadth of Moderna's pipeline – it currently has 21 projects of which 10 are in human trial stage (9 projects in Phase 1 and one in Phase 2). The breadth signals Moderna's intent to maximise the potential of the mRNA technology across a broad range of applications.

Business Practices

Moderna recently IPO'd and therefore it is difficult to disentangle the noise from the reality with little track record of disclosure. Remuneration and the way it treats its employees are areas of concern for which we hope to learn more about in the future.

| | Relevant Targets | Relevant Products |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Target 3.3 By 2030 end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases</p> <p>Target 3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being</p> | <p>There are three main areas in which Moderna tackles challenges within the healthcare system. Firstly, they are developing treatments of diseases which are untreatable with existing technologies (for example rare metabolic diseases), secondly, they have the potential to significantly improve disease management where treatments already exist (for example more effective vaccines) and finally they could reduce the total costs of bringing a successful drug to the market, that would help reduce drug pricing in the long term.</p> |

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