

Results

A) Technical fields and their growth in comparison

As mentioned above, all 3 are focusing on antigens and antibodies, however, Moderna has its biggest R&D field in "Medicinal preparations containing genetic material which is inserted into cells of the living body to treat genetic diseases; Gene therapy" – here the biggest patent values are determined. In this field AstraZeneca has no patent values at all.

1. AstraZeneca the biggest and most diversified player.

The only growing field in contrast the former year is interestingly a field apart from the core business: Computing, calculating, counting.

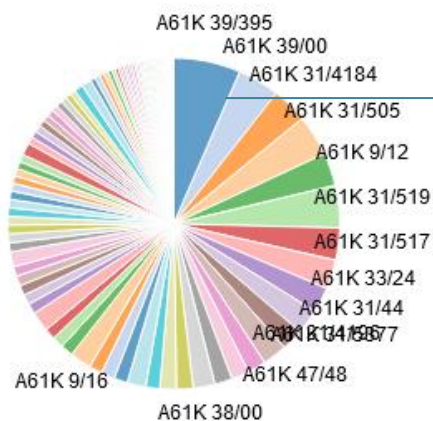
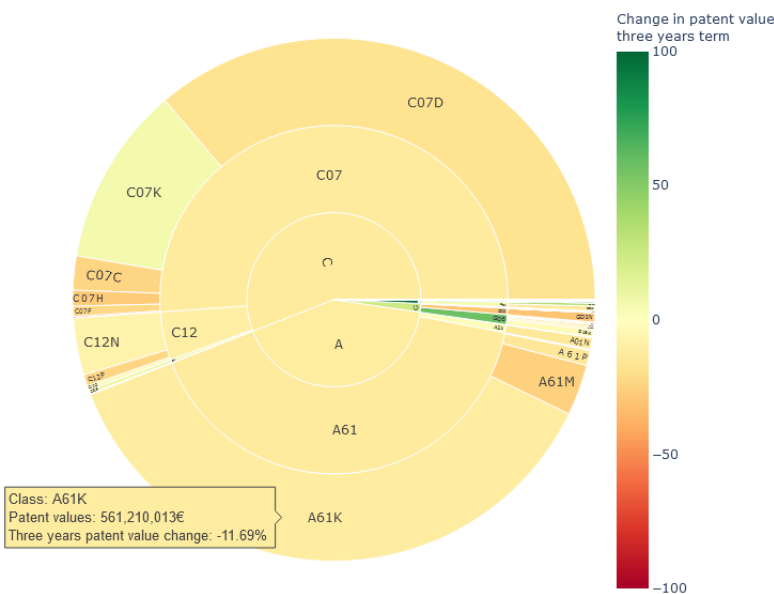
HIERARCHICAL TECHNOLOGY FIELDS OVERVIEW

ASTRAZENECA PLC

A: HUMAN NECESSITIES

A61: MEDICAL OR VETERINARY SCIENCE; HYGIENE

A61K: PREPARATIONS FOR MEDICAL, DENTAL, OR TOILET PURPOSES (devices or methods specially adapted for bringing pharmaceutical products into particular physical or administering forms A61J3/00; chemical aspects of, or use of materials for deodorisation of air, for disinfection or sterilisation, or for bandages, dressings, absorbent pads or surgical articles A61L; soap compositions C11D)

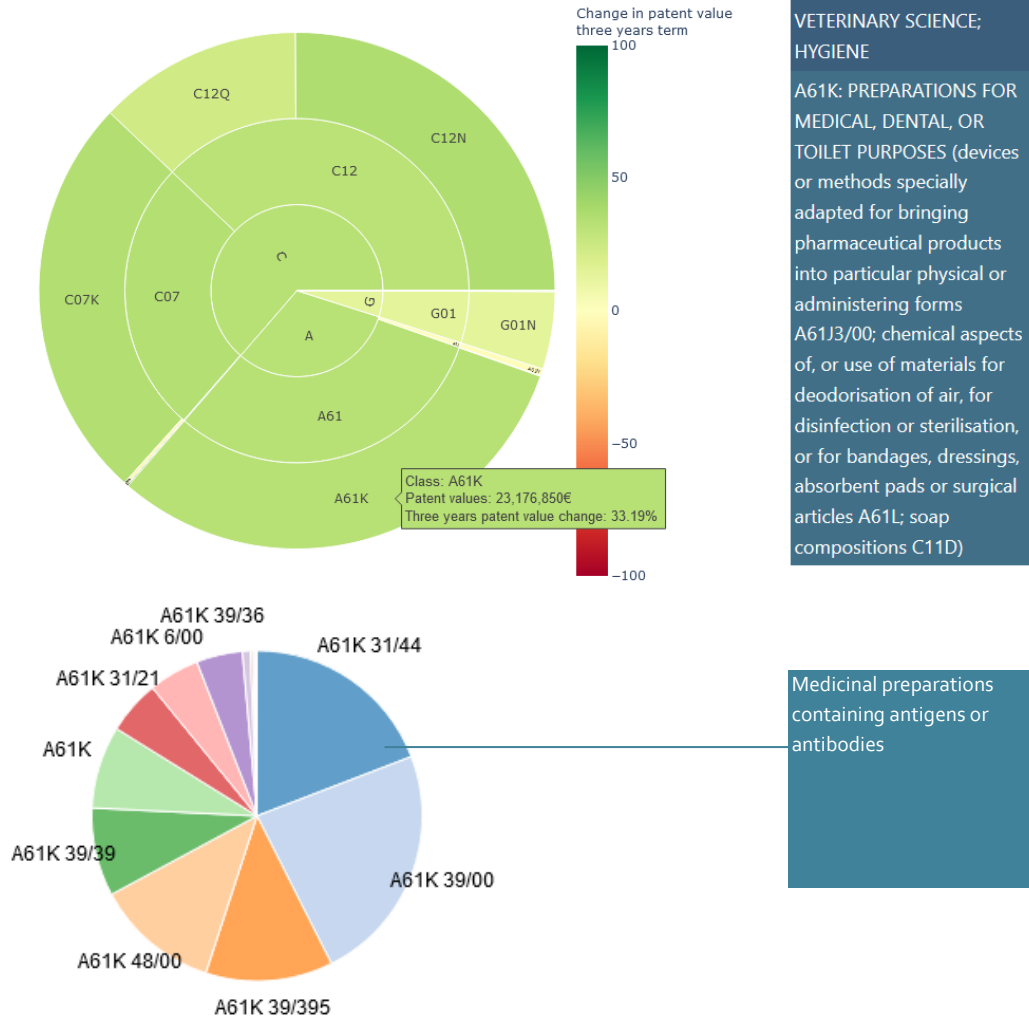


Medicinal preparations containing antigens or antibodies – Antibodies, Immunoglobulins; Immune serum, e.g. antilymphocytic serum

2. **BioNtech** – the biggest in growth in almost all areas compared to the former year.

HIERARCHICAL TECHNOLOGY FIELDS OVERVIEW

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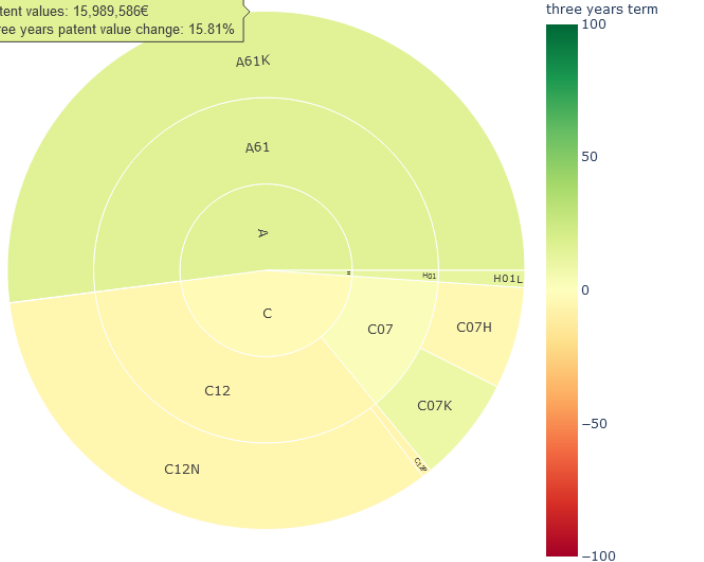


3. **Moderna** – the youngest of the three and the most focused. The area of medical preparations is growing most.

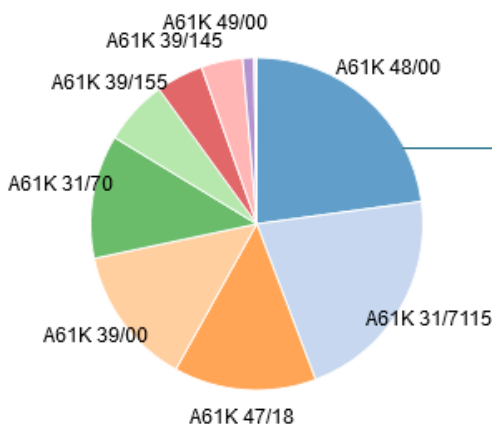
HIERARCHICAL TECHNOLOGY FIELDS OVERVIEW

MODERNA, INC.

Class: A61K
 Patent values: 15,989,586€
 Three years patent value change: 15.81%



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Medicinal preparations containing genetic material which is inserted into cells of the living body to treat genetic diseases; Gene therapy

[Sources: Data and graphs by IPR-Strategies Ltd (<https://ipr-strategies.com>) and IP-Business Information B.V. (<https://ip-bi.com>)]

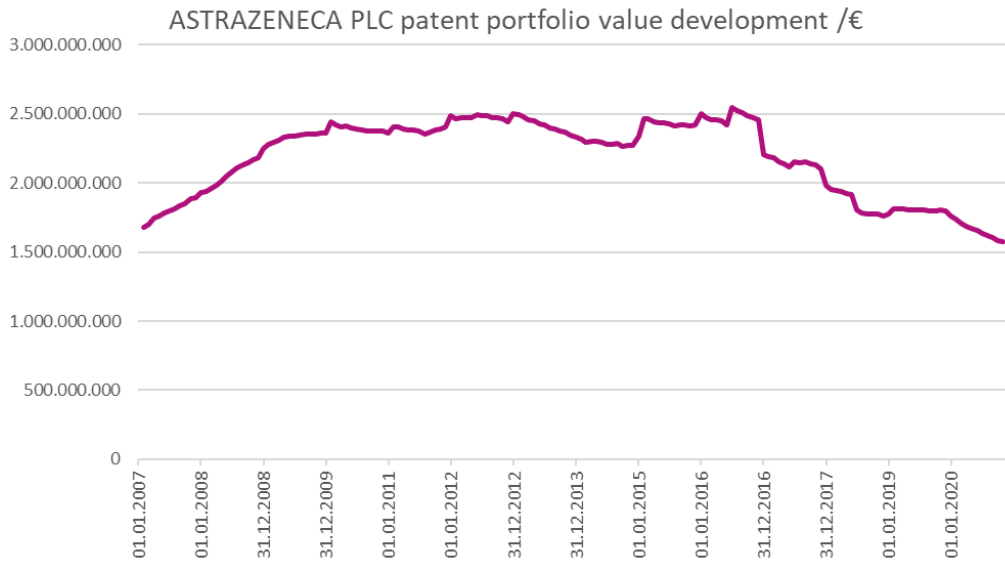
B) Value charts in comparison

Comparing the value charts of the 3 players, the biggest difference becomes visible.

1. Astrazeneca

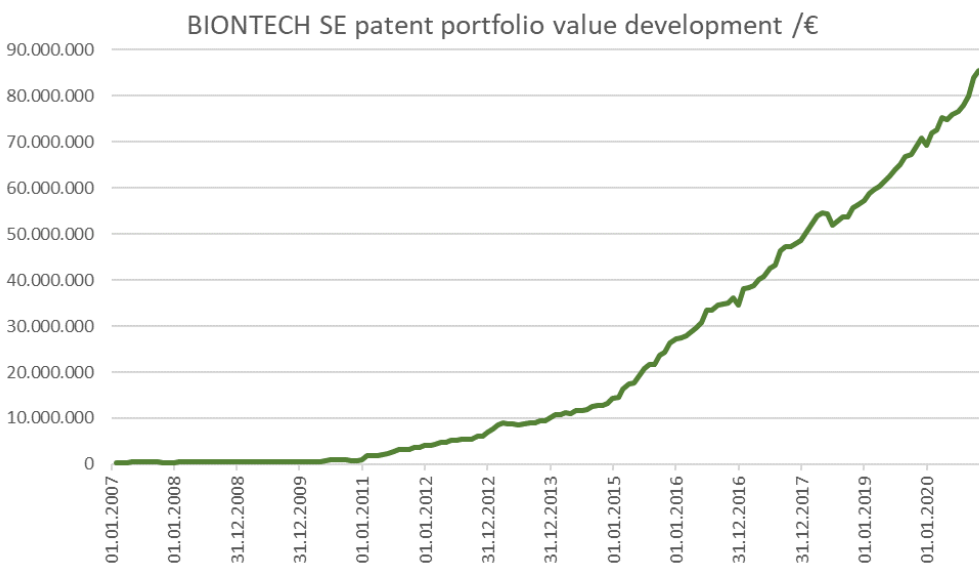
As stated before Astrazeneca ist the biggest and with 22 bn€ revenue and 1.4 bn€ profit most established company of the 3. Their incorporation was in 1992 and their current market capitalisation is 118bn€.

Looking at their patent portfolio value development, their total value is according to their size expectations the biggest. But therefor it is decreasing for already a couple of years.



2. BioNtech

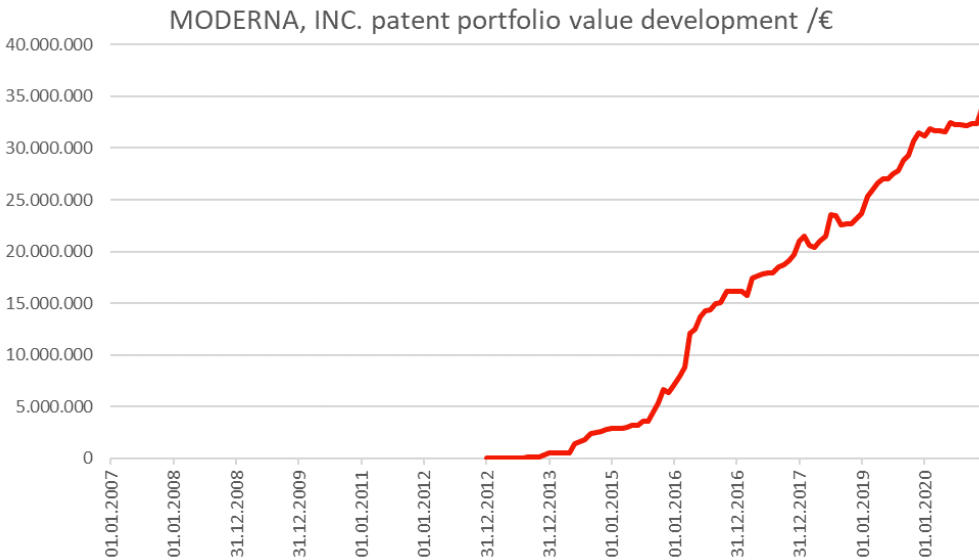
Compared to Astrazeneca, they are with a revenue of 111 m€ more than 10 times smaller. They are not yet earning money, therefor their loss is even bigger than their revenue last year, 179 m€. Their market capitalisation is 1 bn€, only 1% of the Astrazeneca-value. On the other hand, their patent portfolio development is impressive and looks like an exponential curve:



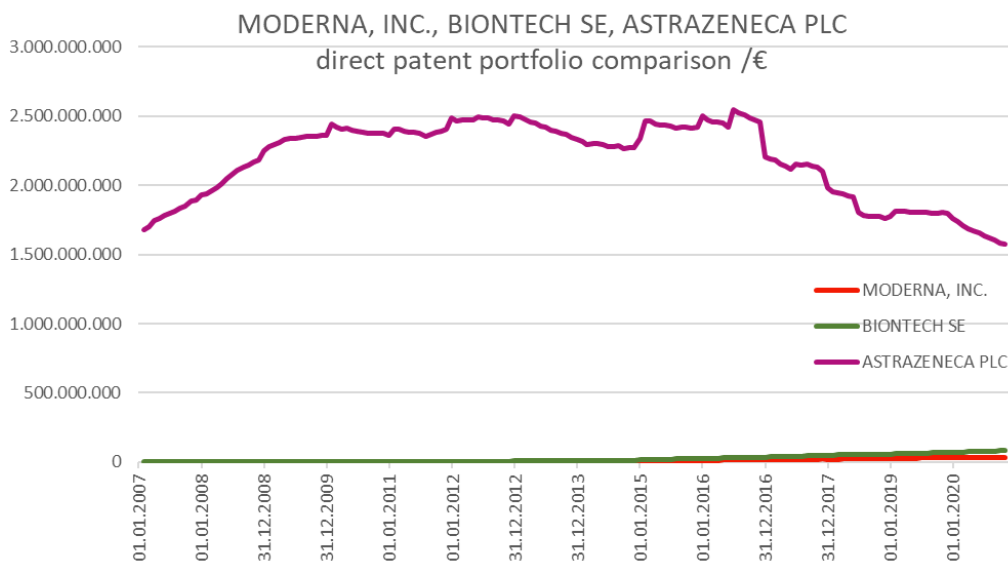
3. Moderna

Compared to the both mentioned before, they are the youngest and with respect to revenue the smallest. With 54 m€ they are half that size of BioNtech but with 458 m€ loss they are most far away from profitability so far and almost ten times higher than their revenue. Surprising is their market capitalisation of 31.4 bn€ - one quarter of that of AstraZeneca, who is – compared to Moderna - a high profitable company.

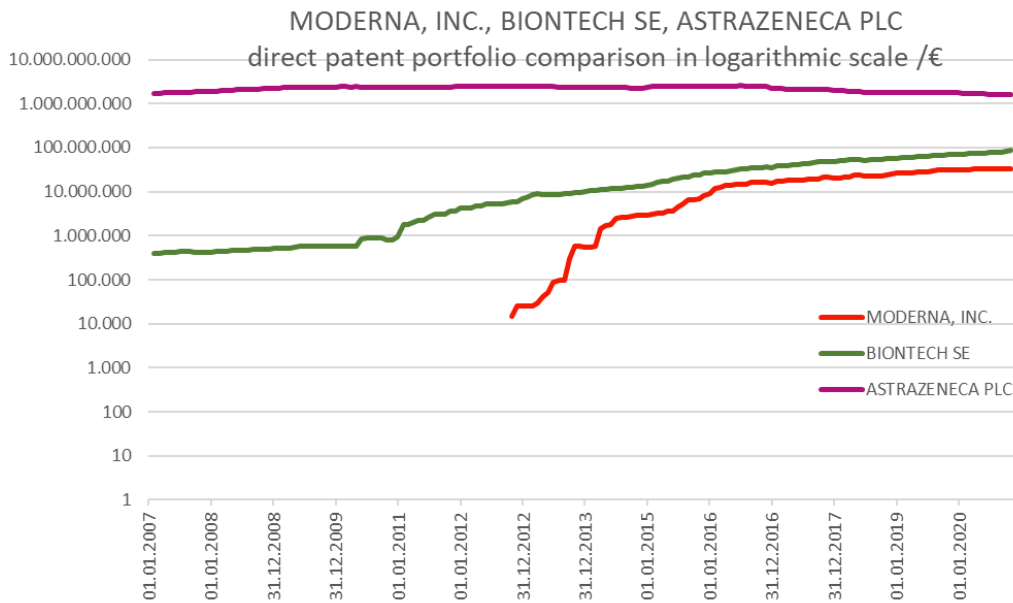
However, their patent value curve is also having a stable trend upwards.



All 3 in direct comparison shows the big difference in portfolio sizes:



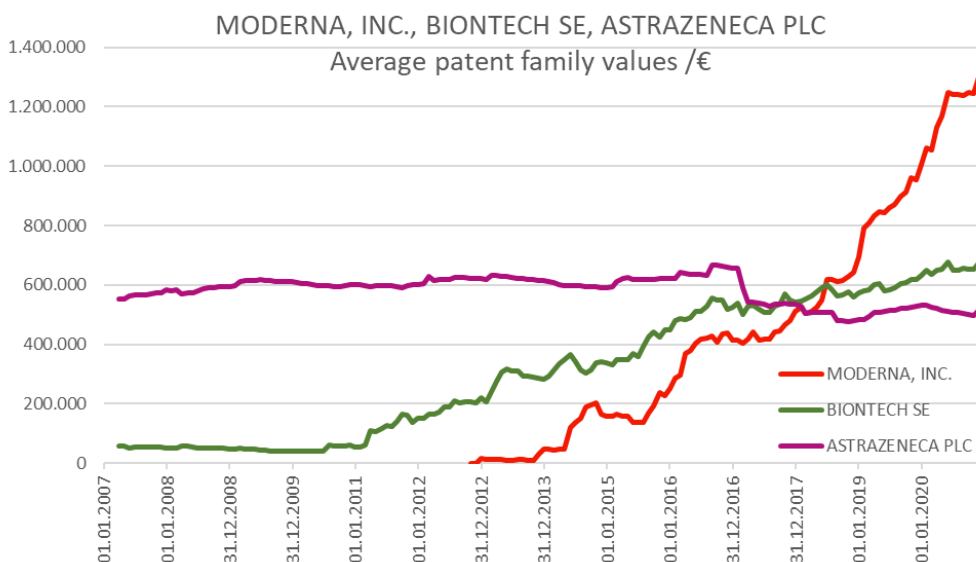
The differences of the total patent portfolio values are so huge that the two competitors BioNtech and Moderna are almost invisible compared to the AstraZeneca value chart. However, in case of a logarithmic scale the size and also the dynamics are better to see.



It is like David vs Goliath: The biggest patent portfolio size has the established AstraZeneca but the highest and most stable dynamics is seen at BioNtech. Also, Moderna has an impressive patent value development, considering that their patent portfolio is comparably small.

C) Average patent values

The average patent value is a good indication for the individual quality of the patents inside the portfolio. That means that patent portfolio sizes can also be determined by a huge number of patents. Taking this into consideration it is making sense to compare the average patent values and their trend of all the 3 companies resulting into the most surprising results:



This comparison shows impressively why Moderna is obviously so valuable in the market: They seem to have the most valuable individual patents.

The following table compares typical business data that are typically used for fundamental analysis as well as patent value data – the comparison shows pretty well how markets – represented by the market

capitalisation – value companies. The huge market capitalisation of e.g. Moderna is not explainable by their balance sheet – looking into their patents it becomes more understandable, what is valued here: The future.

	Reve- nue /m€	P/L /m€	EBIT m€	Market Cap /m€	ROE (before tax) /%	Profit Margin	Market Cap/ Rev- enue	Average Patent value /€	Patent Value trend	rel. average 3yr patent value trend	rel. total 3yr patent value trend	3yr filing trend
Astrazeneca	22.089	1.378	1.515	118.000	11	6,2%	5,34	514.317	-	-3,9%	-16,9%	-22,9%
BioNtech	111	-179	-182	1.070	-36	-161,3%	9,64	688.648	+	26,7%	102,8%	42,5%
Moderna	54	-458	-486	31.400	-44	-848,1%	581,48	1.295.162	+	153,1%	60,5%	-36,6%

[Source: Orbis Business data (<https://orbis.bvdinfo.com/>) and IPR-Strategies (<https://ipr-strategies.com/>)]

The framed columns to the right show the highest correlation to the Market Capitalisation: all are derived from their patents and contrast the “typical” fundamental data where the correlation is vice versa. The last column shows the change of patent filings – it does not correlate to the phenomenon of high market valuation.

Of course, Astrazeneca, being the biggest company amongst the 3 has the highest Market Capitalisation. They are the only ones who are really earning money. But having a closer look into the relative Market Capitalisation, it becomes obvious that something else is driving company values: The ratio Market Capitalisation by Revenue, for example, shows the huge imbalance between the “healthy”, money earning business of Astrazeneca and Moderna which is factor 100 in difference between the both in favor to Moderna. Thus, there must be other value drivers (apart from rumours, of course). Interestingly the average patent value of Moderna is way higher than the one of Astrazeneca. Also, their 1-year as well as 3-value trend is positive. Same for BioNtech, their average value is also higher than the one of Astrazeneca and the trend is positive, but not to that extend like the one of Moderna. Accordingly, their Market Capitalisation to revenue ratio is smaller than the one of Moderna but higher than the one of Astrazeneca.

Conclusion

Typically, companies are rated based on fundamental facts like revenue, size, profit. The comparison of the 3 Covid vaccine candidate manufacturers AstraZeneca, BioNtech, Moderna shows that companies with promising technologies in markets with high demands are completely differently to value. But how to value these future potentials with moderate effort? Analysing the patent situation is able to reflect this future potential as well as the future dynamic as proven here for the 3 competitors who couldn't be more different regarding their business data and balance sheets. It can comparably easily help to assess future potentials of a certain corporation. And the data are all available electronically. Interestingly, it is required to have a look at the patent values, not simple at the total count of filings.

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