

A Work Project, presented as part of the requirements for the Award of a Master's degree in Finance
from the Nova School of Business and Economics.

EQUITY RESEARCH OF NOVO NORDISK - DELIVERING VALUE THROUGH
SUSTAINABLE GROWTH

CÉSAR CERVANTES MORENO

Work project carried out under the supervision of:

João Miguel Gonçalves do Carmo Filipe

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Abstract

In this project it is analyzed the pharmaceutical company Novo Nordisk A/S. For this purpose, a deep and comprehensive study of its financial statements, balance sheet, pipeline, collaborations, taxes and cost of capital has been performed. The analysis undertaken has involved a comparison of Novo Nordisk A/S with its comparable peers within the pharmaceutical industry for a better acknowledgement of its current position in the market and its future development. The study of all the relevant fields attaining Novo Nordisk A/S share price and the inclusion of a sensitivity analysis, has allowed to get a reliable valuation of this stock.

Keywords

Valuation, Forecasting, Health, Finance, Equity Research, Insulin, Pharmaceutical Industry, Patents, Obesity, Pipeline, Pharmaceuticals

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Executive summary

This year has been a good one for Novo Nordisk A/S (NN) so far, and this trend is expected to continue in the following years. As of December 16th, 2021, NN has been the pharmaceutical company with the best share performance of the year with a +78.65% YTD. The podium is completed with Eli Lilly & Co. (+63.04%) in 2nd place, and Pfizer Inc. (+59.74%) in 3rd place¹.

This good performance of NN comes from its commercial operations. Despite the pandemic, it still managed to report growth in its sales for the last 5 years straight, a trend we expect will continue into the future (at an average CAGR of 5.06%, from DKK 111,780mn in 2016 to DKK 174,274mn in 2025). This is because the insulin market is quite inelastic, due to the nature of the disease it covers, and this industry is NN's main source of income. The successful roll-out of new products out of its strong pipeline (e.g. Wegovy, expected to be a new blockbuster drug in the almost oligopolistic obesity care industry) and the continued growth of its diabetes & obesity care segment (driven by a shift from mainly insulin operations towards a focus on GLP-1 & obesity care operations) are the main drivers within the sales of Novo Nordisk.

Regarding the main metrics, NN has been constantly outperforming its direct peers (Eli Lilly & Co., AstraZeneca, Sanofi and Pfizer Inc.) since 2016. The three metrics we have used to evaluate NN's income statement position are: Gross Margin, EBITDA Margin, and EBIT Margin². In this metrics NN delivered 84%, 46.69% and 43.01%, respectively. While the average of its direct peers for the same period are 75.79%, 31.07% and 19.95%, respectively. It can be noticed the big difference in the EBIT Margin coming from the low depreciation and amortization in NN.

As for the Net Leverage, NN delivers a negative number throughout the last years and it is expected to continue in the future. This is because of NN's aversion to debt and its big efforts in having big cash cushions. Despite their recent increase in the Debt-to-Capital Ratio, the Net Leverage stays negative, and it will increase this negative amount as the EBITDA grows at a higher pace than debt. As a comparison, since 2016, NN had an average Net Leverage of (24.23%) while its peer had an average of 139.05%.

All in considered, we estimate the target share price to be DKK816.46 in December 2022, an increase of 10.54% since the 08th of December 2021, where the share price was DKK738.60. We performed a DCF with a Terminal Growth

¹ Bloomberg Intelligence.

² All three margin metrics for NN and its peers are the average since 2016.

Rate of 4.28% and with a WACC of 6.85%. In the end, the recommendation for this stock is a BUY.

Overview

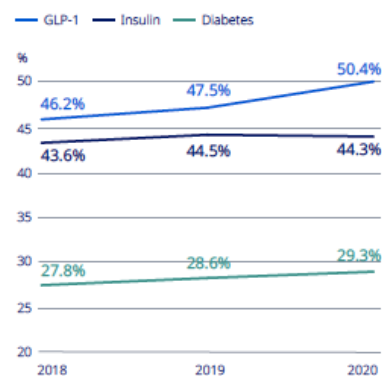
Company Description

Novo Nordisk is a global pharmaceutical company, which was founded in 1923 and which currently has its headquarters outside Copenhagen, Denmark. Novo Nordisk (NN) researches and develops a wide range of drugs from three main segments: diabetes (81% of total sales), biopharm (15%) and obesity (4%). NN's B shares are listed on the Nasdaq Copenhagen Index and in the New York Stock Exchange as American Depositary Receipts³ (ADRs). By the end of 2021, NN had a market capitalization of DKK1,716.3bn and 2.31bn outstanding shares. In terms of geographic revenues, 48% of total revenues come from North America, 27% from EMEA, 11% from China, and 14% from the Rest of the World. By 2021, NN is producing 50% of global supply of insulin and more than 32 million people in the world are using its Diabetes Care products. According to Brand Finance®, Novo Nordisk is the 15th most valuable pharmaceutical brand in the industry by value⁴.

As previously mentioned, NN is organized in three different segments providing treatment for five different diseases: Type 1 diabetes, Type 2 diabetes, Obesity, Haemophilia, and Growth disorders.

- **Diabetes segment.** This is the most important segment by revenues and by number of customers. It is composed by five different category products: Long-acting insulin (Tresiba®, Xultophy®, Levemir®), Premix insulin (Ryzodeg®, NovoMix®/NovoLog Mix®), Fast-acting insulin (Flasp®, NovoRapid®/ NovoLog®), Human insulin, and GLP-1⁵ (Victoza®, Ozempic®, Rybelsus®). As for the diabetes value market share, in 2020 NN stands in a leading position worldwide with GLP-1 accounting for 50.4% of the total GLP-1 market, insulin accounting for 44.3% of the world's insulin market, and with a 29.3% of the total diabetes market when aggregating all diabetes-related drugs. The total diabetes care has risen from DKK 87,372m to DKK 102,412m in the period 2016-2020, delivering a CAGR of 3%.

Figure 1. Diabetes value market share (%)



Source: IQVIA

³ It refers to a negotiable certificate issued by a U.S. depositary bank representing a specified number of shares, usually one share, of a foreign company's stock.

⁴ Brand Finance. 2021. "Pharma 25 2021 Ranking". Retrieved at: <https://brandirectory.com/rankings/pharma/table>

⁵ GLP-1 is a physiological regulator of appetite and food intake and the GLP-1 receptor is widely expressed in the brain.

- **Biopharm Segment.** Within biopharm, there are three main categories in which NN delivers products: first, Haemophilia (Novo Seven®, Novo Eight®, and other Haemophilia); second, Growth disorders (Norditropin®); and third, Other biopharm. Haemophilia products account for more than 50% of the total biopharm segment, whereas growth disorders and other biopharm products account for approximately 40% and 8%, respectively. Total biopharm has reduced its incidence in the company's operations in the period 2016-2020, going from DKK 22,831m to DKK 18,926m, resulting in a CAGR of -4%.
- **Obesity Care Segment.** As for obesity care, NN currently produces a single product under the name Saxenda®. In the middle-term, NN expects to transition from a single-product obesity offering to a portfolio of therapies in the future, by rolling out new products. Saxenda has grown from DKK1,577m to DKK 5,608m in the period 2016-2020, delivering a CAGR of 29%.

Regarding its geographical positioning and reach, NN splits its revenues in North America, Europe, China, and Rest of the World, with the split resulting in a 48%, 27%, 11%, and 14% of total sales respectively. It markets its products in 169 different countries across the world, it has 16 production sites distributed across 9 countries (Algeria, Brazil, China, Denmark, France, Japan, Russia, UK and US), and in addition has 10 research and development centers in five different countries (China, Denmark, India, UK and US).

In terms of its share development, according to Bloomberg, NN's current market capitalization is DKK1,716.3bn⁶. By the end of 2021, NN's total share capital is composed of DKK462,000,000, which is divided into A and B share capital. The A and B shares are calculated in units of DKK0.20, and its total shares amount to 2.31bn shares. The A share capital, consisting of 537 million shares, has a nominal value of DKK107,487,200 and the B share capital, consisting of 1,773 million shares, has a nominal value of DKK354,512,800. The company's A shares are not listed and are held by Novo Holdings A/S, a Danish public limited liability company wholly owned by the Novo Nordisk Foundation. The Foundation has a dual objective: to provide a stable basis for the commercial and research activities conducted by the companies within the Novo Group (of which Novo Nordisk A/S is the largest), and to support scientific and humanitarian purposes⁷.

⁶ 14/12/2021.

⁷ Novo Nordisk Annual Report 2020.

Industry Overview

The pharmaceuticals industry is characterized by the complexity and duration of the development of the drugs. This industry is characterized by an ample heterogeneity that notably complicates peer group analyses and often entails divergent share price performance⁸. So, an analysis within a company's population of ill patients and the projections of this caption, along with the analysis of the company's industry market share evolution is of the utmost importance.

A forecasting overview of this industry's expected growth is found in the market report conducted by Globe News Wire⁹. The total market size value is of USD 1228.45bn as of 2020, and it is expected by these analysts to grow to USD 1700.97bn in 2025, at CAGR of approximately 8% in the period. This growth is sustained by the fact that companies have now reformulated their operations, following the disruption in normal operations that the pandemic provoked. This disruption came in the forms, among others, of remote working and in the temporary stop of commercial activities. But now companies have seen restrictions ease progressively and even have learned how to take advantage of this new normality (e.g. less on-site work can lead to less on-site expenses).

The overall pharmaceutical industry is largely dominated by the North American market, which attained 46% of the market in 2020. China's rise along with other emerging economies have boosted the Asia Pacific market, making it the second largest, with a 26% share.

Given the large relevance of the specific insulin industry, within the pharmaceutical industry, in our equity research, it is insightful to explore some of the trends of such market. Healthcare advancements are a factor that increases the human life expectancy, but as the risk of diabetes grows as humans age this is leading to a swift increment in the need of insulin due to the growing prevalence of diabetes. This trend is also boosted by the increased by the continued shift towards a more sedentary lifestyle in the biggest market geography, North America, and in other geographies such as some Asian countries. Other factors such as technological advancements (e.g. pen devices & needles that minimize injuries and discomfort) and an incremental biotechnology research and development investment are proving to strongly develop the market.

⁸ Miemietz, Marietta. 2013. "CFA Institute Industry Guides: The pharmaceutical Industry". CFA Institute.

⁹ Global News Wire. 2021. "Global Pharmaceuticals Market Report 2021". Retrieved at: <https://www.globenewswire.com/en/news-release/2021/03/31/2202135/28124/en/Global-Pharmaceuticals-Market-Report-2021-Market-is-Expected-to-Grow-from-1228-45-Billion-in-2020-to-1250-24-Billion-in-2021-Long-term-Forecast-to-2025-2030.html>

R&D and Strategy

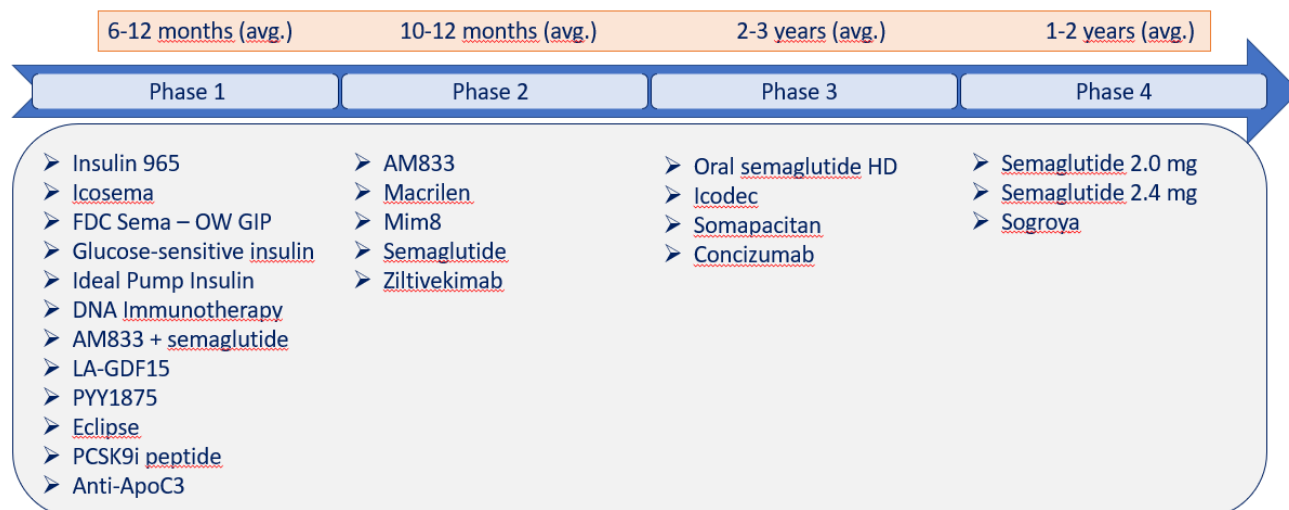
Pipeline

One of the pillars for any pharmaceutical company, is the investment and maintenance of its pipeline. This is where all the research, development, testing, and progress is done until the drug is rolled-out. First, the project is planned and designed by the pharmaceutical companies before this project can reach the clinical status. When a project for advances from this step, then this project needs to go through 4 different phases until the new product can be FDA approved and can then be brought into the market:

1. Discovery & Pre-clinical Phase: the research for a new drug is planned begun in the laboratory. The drug is then tested in the laboratory and on animals to assess basic safety issues. (5-15 years on average)
2. Clinical Phase I: after progressing from the first phase the drug is tested on healthy volunteers to ensure its effectiveness and safety. (6-12 months on average)
3. Clinical Phase II: afterwards, further testing of efficacy and safety is done in patients (with the disease), and the dose selection is studied. (10-12 months on average)
4. Clinical Phase III: testing is upscaled on thousands of patients and registration of results lead to research and studies on safety and efficacy. (2-3 years on average)
5. Regulatory review & Launch: The FDA analyzes all the information available on the new drug and its research in order to make the decision to approve or not to approve it. (1-2 years on average)

Novo Nordisk's pipeline is currently composed of more than 20 projects across its various pharmaceutical segments as of 2020. This is an indication of the importance that Novo Nordisk gives to its pipeline. However, as the company has rolled-out many drugs (5 in the last 5 years) recently, the vast majority of these pending projects are still in phase 1 or phase 2, and therefore very much out of scope of this analysis from a timing perspective. For this reason, we will only analyze in more detail those projects which are currently phase 3 or phase 4 as of 2020.

Novo Nordisk Pipeline Overview (per phase)



Source: Company Data

In phase 3, Novo Nordisk has 3 main projects:

1. Icodec: This project started phase 3 in 2020, and therefore it is very unlikely to be approved and marketed before 2025.
2. Oral Semaglutide: This project has been for a few years in phase 3 and could advance to phase 4 and even be approved during the scope of this research. However, the main development of this project could result in an extension of the Rybelsus patent expiration date, which already falls outside our forecasts scope.
3. Concizumab: This project is currently in phase 3, and it is expected to move to phase 4 by 2024 approximately. However, as with Icodec, it also results very unlikely that it will receive FDA approval before 2025.

In phase 4, pending FDA approval, Novo Nordisk has 2 projects:

1. Sogroya/Somapacitan: Sogroya is a long-acting growth hormone intended for a once-a-week dose for adults. Somapacitan is a similar drug, but intended for children, which is still in phase 3. Sogroya was approved in 2021, while Somapacitan is likely to result in a patent expiry date prolongation once it is approved by the FDA.

Sogroya's approval however does not imply that it will find its way to the market immediately. When observing the growth disorders, we can see that almost all competitors were released in the 90s and early 00s. The lack of data regarding recent launches of growth hormones and the unavailability of reliable sales forecasts or even a rumored release date are the main reason why we have chosen not to further analyze the possibility of a Sogroya roll-out, to avoid uncertainty and contamination into the model.

2. **Semaglutide 2.0:** Semaglutide 2.0 will be a long-acting GLP-1 medication intended to only need a once in a week dose. This project was submitted for approval but not successful with the FDA. Now the project was re-evaluated, and the necessary changes were implemented. The project was submitted for FDA approval again, and the authorization to go into the market is expected to come by 2022. The approval of this project will result in Ozempic 2.0, which will extend the patent protection of this sales driver even further (outside the scope of our research).

M&A and Collaborations

NN latest acquisitions reflect their strong commitment to remain as one of the market leaders by further developing their technology, expanding their knowledge and their research capacity. Its latest acquisitions are Emisphere Technologies (Nov 2020), Corvidia Therapeutics (Oct 2020), and Ziylo (Aug 2018).

- **Emisphere Technologies.** In November 2020 it was signed the definitive agreement to acquire Emisphere for \$1.8bn. This was a strategic movement as its proprietary technologies enable the oral formulation of therapeutics, including the Eligen® SNAC technology found in Rybelsus®.
- **Corvidia Therapeutics.** In October 2020 the acquisition of Corvidia further strengthened NN's pipeline by introducing the anti-IL-6 monoclonal antibody, which showed encouraging results in its early stages of research on inflammatory biomarkers in patients with atherosclerotic cardiovascular disease and chronic kidney disease.
- **Ziylo.** This spin-out from the University of Bristol was acquired by NN because of its highly promising glucose sensor, intended to overcome a recurring treatment barrier in diabetes, the risk of low blood glucose levels associated with standard insulin treatments.

Regarding collaborations, NN is engaging in important partnerships embedded in the development of two drugs which still are in the pipeline. These two drugs are Eclipse and Anti-ApoC3, which belong in the biopharm and other serious chronic diseases segments, respectively.

Eclipse: a collaboration with EpiDestiny. Currently still in the clinical phase 1. This collaboration involves the development of an oral combination treatment of the sickle cell disease and beta thalassaemia.

Anti-ApoC3: a collaboration with STATEN. Currently also in clinical phase 1. This collaboration looks for a novel monoclonal antibody intended for inhibition of ApoCIII activity.

Financial Statements Analysis

Income Statement

Novo Nordisk's total volume of sales did not show any significant evolution from 2016 to 2018, at a level of sales of approximately DKK 111,700m throughout these years. However, from 2018 to 2020, NN's figures started to rise notably, showing a 6.5% CAGR (compared to the 0% CAGR seen in the previous 2 years) and reaching a total DKK 126,946m. Within NN's main market, Diabetes, we find NN's main segment in terms of volume of sales, Insulin, by quite some distance, contributing to 56% of total sales, while other significant segment such as the other Diabetes segment, GLP-1 (18%), Obesity care (1%) and Biopharm (20%) had much less incidence. However, by 2020 we could already see a beginning to a shift in this trend, where the GLP-1 and Obesity care segments were starting to show significant growth, with their total sales share rising to 33% and 4%, respectively, in 2020. This growth in their shares came in detriment of the Insulin and Biopharm segments, that showed diminishing sales.

The rise in NN's sales volume from 2018 to 2020, after the stagnant period, and the forementioned shift in segment shares was no coincidence. The GLP-1 segment was the main driver for both events, growing at a total CAGR of 27% between 2018 and 2020, as opposed to a growth almost half of this figure (14%) between 2016 and 2018. This spontaneous growth was driven by the, very successful, roll-out of Ozempic and Rybelsus, in 2018 and 2019 respectively. Despite Ozempic's early days, it was NN's main sales driver already in 2020.

When analyzing the COGS, sales and distribution costs, R&D costs, and administrative costs for the last five years, we obtained an average over sales of 15.97%, 25.81%, 12.53% and 3.37%, respectively. We noticed that NN requires twice the cash to keep up with the sales and gain new markets and regions (sales and distribution costs), than it needs to develop brand new drugs or improvements and indications for the existing ones. In order to analyze NN's costs we selected the best comparable companies in the industry by size and segments, overweighting diabetes-focused pharma companies. The best four peers we recognized are the following: Eli Lilly & Co., AstraZeneca PLC, Sanofi and Pfizer Inc. We have analyzed the average costs of NN and its peers in the last five years and the results look healthy for NN: while the peers have had average costs of almost 69%, NN registered average costs of 54%. This result may sound excellent for NN, and it is, but we have spotted a trend of a constant cost reduction among NN's peers, while NN is stuck around the 54%. There is still a 15% margin for NN to keep as this segment's best cost-efficient margin, and we strongly believe that total costs as percentage of sales will remain, at a

Figure 2. Novo Nordisk Cost Analysis

NN Cost Analysis	AVG
COGS	15,97%
Sales and Distribution Costs	25,81%
R&D Costs	12,53%
Administrative Costs	3,37%
Total	54,00%

Source: Company Data

Figure 3. Cost Analysis Peers

Cost Analysis Peers	AVG
Eli Lilly & Co.	75,94%
Astrazeneca PLC	69,08%
Sanofi	69,21%
Pfizer Inc.	61,51%
Peers AVG	68,93%

Source: Bloomberg

low level, even with a slight diminish. Regarding comparables, we observed that Eli Lilly & Co. is the rival player with the highest costs with roughly 76% of total sales.

We have run three different margin analyses with the four forementioned comparable companies, in order to check how NN navigates through the Gross Margin, the EBITDA Margin and the EBIT Margin in the last five years. In general, we recognized a general pattern: NN overperformed all four comparables in all three margins. First, the Gross Margin, where NN is consistently established around the 84% while peers' average is about 76%. Special mention to AstraZeneca with an average of 80%. Second, the EBITDA Margin, where here again NN delivers quite well, with an average of roughly 47% while peers' ratio drops to 31%. And third, the EBIT Margin, where NN registers an EBIT Margin of 43% while peers' average drops to 20%. We observe how the difference between EBITDA and EBIT Margins due to D&A is very small for NN with an average reduction of less than 4% when peers register an average of more than 11%.

Figure 4. Gross Margin Analysis

Gross Margin	AVG
Novo Nordisk A/S	84,03%
Eli Lilly & Co.	76,24%
Astrazeneca PLC	80,08%
Sanofi	68,14%
Pfizer Inc.	78,71%
Peers AVG	75,79%

Source: Bloomberg and Company Data

Figure 5. EBIT Margin Analysis

EBIT Margin	AVG
Novo Nordisk A/S	43,01%
Eli Lilly & Co.	17,60%
Astrazeneca PLC	17,32%
Sanofi	18,82%
Pfizer Inc.	26,08%
Peers AVG	19,95%

Source: Bloomberg and Company Data

Balance Sheet

Regarding the balance sheet, NN presented strong numbers during the last five years. Total Equity jumped from DKK45.2bn in 2016 to DKK63.3bn in 2020. This pattern is well explained because of the ability of NN to generate Net Profit year after year. Despite the latest M&A efforts in order to achieve inorganic growth (2 acquisitions in 2020 and one in 2018), NN has been constantly increasing its retained earnings at a similar pace as the total equity.

Regarding 2020, NN has experienced some abrupt developments. Firstly, in intangible assets, where mainly from patents, these have come from the acquisitions of Emisphere and Corvidia Therapeutics, so we observe a huge increase from DKK5.8bn to DKK20.6bn. Another important point is regarding borrowings, NN is a company that has historically preferred to self-finance itself. That is why until 2019 NN had no long-term borrowings, and an insignificant amount in short-term borrowings. Further development of the global economy after COVID-19 outbreak has made NN to include debt in its capital structure. In 2020, NN counted with DKK2.8bn in long-term borrowings and DKK7.4bn in short-term borrowings. By Q3 2021, NN had decreased substantially its short-term borrowings to DKK 1.3bn and increased its long-term borrowings to DKK 12.3bn. We expect both these liabilities to decrease by the end of the year delivery then a Debt-to-capital Ratio¹⁰ of 17%.

¹⁰ Debt-to-capital Ratio=Debt/(Debt+Equity)

When assessing asset composition, we find that NN's biggest assets are PPE, trade receivables and cash at bank, with an average during the last five years of 36%, 20% and 15% of total assets, respectively. It is worth mentioning that intangible assets had an average of less than 5% until 2020, when it jumped to 14% thanks to inorganic growth.

Regarding liabilities, we find short-term provisions, other liabilities, and trade payables as the biggest captions, with an average for the last five years of 42%, 24% and 10% of total liabilities, respectively. As a remark, short-term provisions have been constantly increasing since 2016 due to NN's expansion to developing economies.

We studied the Net Leverage¹¹ of NN and found an interesting result: for all five last years analyzed, NN had a negative net leverage. Although this figure has been progressively reducing, this has happened due to NN's past resistance to debt and its savings efforts.

Valuation

Cost of Capital & Growth

First, we have decided to use the 10-year US Treasury Bond Yield as our risk-free rate proxy, as the majority of Novo Nordisk's operations take place in this geography. To compute the Market Risk Premium, we used additionally the OMX Copenhagen 20 Index Annual return for the last 10 years, as Novo Nordisk is listed in this index.

To compute NN's unlevered beta, we observed at the average of its comparable companies (data from Bloomberg). Not any pharmaceutical company would be a correct proxy, as a company where insulin is such a big percentage of its operations is not expected to have a great correlation with the market due to the necessity of its products. For this reason, we only took the 5 most similar companies in terms both of operations and company size (ELC, AZ, Sanofi, Vivus Inc and Pfizer). The average beta obtained for the insulin industry was of 0.28, which is in line with our expected market behavior of these firms (3 of the comparable firms had an absolute correlation with the market smaller than 40%). After relevering the industry beta, taking into account NN's capital structure, we obtained NN's levered beta of 0.32.

Novo Nordisk has an S&P rating of AA-, having recently upgraded from the A+ category. This means that its recovery rate stands at 0.85, and that its default probability stands between 0.05-0.09. As NN has only recently upgraded, we

Figure 6. Unlevered Beta Peers Analysis

Unlevered Beta Peers	Source: Bloomberg
Eli Lilly & Co.	0.22
Astrazeneca PLC	0.61
Sanofi	0.39
Vivus Inc.	0.53
Pfizer Inc.	-0.35
Average	0.28

Source: Bloomberg

¹¹ Net Leverage=Net Debt/EBITDA

have chosen to go with the less optimistic figure of this range, at 0.08. These figures combined with the yield curve for A-rated bonds in the US (I33853US Index at 10 years in Bloomberg) were used to obtain NN's cost of debt of 6.4%.

Using these factors, we were able to compute a WACC of 6.85%. Novo Nordisk's WACC has been decreasing over the last few years and our obtained result falls along these lines, as it is lower than last year's figure of 11.08%.

Regarding the Debt-to-Capital Ratio, as of 14/12/201 it is 17.22% according to Bloomberg. We expect this ratio to drop to roughly 17% because of the diminishing efforts that NN is taking to reduce its debt level. We do not expect total debt to drop to the pre-Covid situation, when it was almost insignificant, but to remain at this level because of the tax shield benefits and thereby, a reduction in the WACC is seen when compared to previous years.

We selected the DCF as the primary method to perform NN valuation as we went through a magnificent book written by Marietta Miemietz, CFA¹² where she stated that this is the best approach to perform a valuation in the pharmaceutical industry as it captures "the analyst's specific views on a company's prospectus and thus sidesteps issues that may arise from the industry's heterogeneity and resulting lack of comparability across peer groups."

Sensitivity Analysis

A sensitivity analysis is useful when conducting an equity research, especially with such limited resources, due to the uncertainty that surrounds certain factors. Given the incidence that discount rates have, we decided to conduct a sensitivity analysis on them to observe how our result would fare when these changed. Our projected growth of 4.28% is assuming a moderately optimistic scenario, in which new releases such as Wegovy continue to be successful. To better account for the possibility that our projections are too optimistic, we decided to factor up to 0.5 percentage points less. As expected, obviously the share price dropped, but considering the magnitude of this drop (17% drop when growth is 0.5% less), it is quite revealing on how much the share price actually relies on the success of its operations. On the other hand, if the growth was 0.5 percentage points higher (which could derive from an early roll-out of Sogroya for instance) the price rises 22% higher. However, these effects are smaller than if the same variance was applied to our WACC of 6.85%, as the same decrease of this rate increases our share price by 25%, while an increase has a 20% negative effect on the value. These results suggest that our end result is more dependent on factors such as NN's capital structure or the market exposure obtained from its peers, than it is on the behavior of the sales that drive growth. This is not to say that growth does

¹² Miemietz, Marietta. 2013. "CFA Institute Industry Guides: The pharmaceutical Industry". CFA Institute.

not have a big impact, as both factors have proven to be highly relevant for our model after observing such a high incidence from both on our share price

Multiple & Ratio Analysis

As a support documentation for NN's valuation we ran different multiple analysis focusing on P/E, EV/EBIT and EV/EBITDA. When assessing NN's results of the first two multiples we get the same idea that from our DCF valuation: that NN is undervalued compared to its direct peers. We got a P/E and EV/EBIT for NN of 33X and 26X, respectively. The average of the industry is situated in 37X and 35X, respectively. Finally, regarding EV/EBITDA, NN is a bit higher than the rest, presenting 23X, compared with a 20X from its peers. As the industry is quite capital-intensive, we consider EV/EBIT a better indicator than EV/EBITDA, as D&A account for a high economic cost.

At last, we analyzed the return on assets (ROA) and return on equity (ROE) ratios. We obtained, again, a big outperformance by NN when compared to its close peers. When looking at the ROA, NN has currently a multiple of 34X, which is quite superior to the average of its peers, which stands at 9X. In addition, for the ROE, NN has a multiple of 80X, which is also larger than the average of its peers at 52X.

Appendix

Abbreviations

AZ: AstraZeneca

BS: Balance Sheet

CAGR: Compound annual growth rate

CHI: China (Operations)

COGS: Costs of Goods Sold

DKK: Danish Krone

D&A: Depreciation and amortization

EBIT: Earnings before interests and taxes

EBITDA: Earnings before interests, taxes, depreciation and amortization

ELC: Eli Lilly & Co

EMEA: Europe, the Middle East and Africa (Operations)

EXP: Expired

EV: Enterprise Value

FDA: Food and Drug Administration

FAI: Fast-acting Insulin

GD: Growth Disorders

GLP-1: Glucagon-like peptide-1

HP: Haemophilia

HS: Human Insulin

IS: Income Statement

LAI: Long-acting Insulin

M&A: Mergers and acquisitions

NAO: North America (Operations)

(UK) NICE: National Institute for Health and Care Excellence

NN: Novo Nordisk

OC: Obesity Care

PPE: Property, plant and equipment

P/E: Price-earnings ratio

ROW: Rest of the World (Operations)

R&D: Research and development

USD: United States Dollar

WACC: Weighted-average cost of capital

WFH: Work from home

Figures

Appendix 1 - Reformulated Income Statement

Income Statement (in DKK million)	Accounting Financial Statements					Forecasted Financial Statements				
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Diabetes and Obesity Care Segment	88,949	92,877	93,904	102,840	108,020	119,332	132,062	134,052	144,899	155,311
Total Diabetes care	87,372	90,315	90,035	97,161	102,412	111,044	117,833	117,108	122,442	129,586
Total Obesity Care	1,577	2,562	3,869	5,679	5,608	8,288	14,228	16,943	22,457	25,725
Biopharm Segment	22,831	18,819	17,927	19,181	18,926	19,406	19,625	19,595	19,432	18,963
	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Core Operations										
Total Revenues	111,780	111,696	111,831	122,021	126,946	138,737	151,686	153,647	164,331	174,274
COGS	(17,183)	(17,632)	(17,617)	(20,088)	(20,932)	(22,892)	(24,725)	(24,584)	(25,964)	(27,535)
Gross Profit	94,597	94,064	94,214	101,933	106,014	115,846	126,961	129,064	138,367	146,739
Sales & Distribution Costs	(28,377)	(28,340)	(29,397)	(31,823)	(32,928)	(30,055)	(28,939)	(27,519)	(27,631)	(27,320)
R&D Costs	(14,563)	(14,014)	(14,805)	(14,220)	(15,462)	(17,342)	(19,719)	(19,974)	(21,363)	(22,656)
Administrative Costs	(3,962)	(3,784)	(3,916)	(4,007)	(3,958)	(3,885)	(4,247)	(4,302)	(4,601)	(4,880)
Core EBT	47,695	47,926	46,096	51,883	53,666	64,564	74,056	77,268	84,771	91,884
Statutory Taxes on Operational Income	(10,493)	(10,544)	(10,141)	(11,414)	(11,807)	(14,204)	(16,292)	(16,999)	(18,650)	(20,214)
Tax Adjustments	643	160	1,488	1,080	697	0	(0)	0	0	0
Operating Income After Tax	37,845	37,542	37,443	41,548	42,556	50,360	57,764	60,269	66,121	71,669
Financing Operations										
Financial Income	92	1,246	2,122	65	1,628	694	758	768	822	871
Financial Expenses	(726)	(1,533)	(1,755)	(3,995)	(2,624)	(1,665)	(1,820)	(1,844)	(1,972)	(2,091)
Tax Shield	(139)	(63)	81	(865)	(219)	(214)	(234)	(237)	(253)	(268)
Financial Expenses After Tax	(495)	(224)	286	(3,065)	(777)	(758)	(828)	(839)	(897)	(952)
Non-Core Operations										
Other Operating Income	737	1,041	1,152	600	460	0	0	0	0	0
Non-Core EBT	737	1,041	1,152	600	460	0	0	0	0	0
Taxes on Non-Operating Income	(162)	(229)	(253)	(132)	(101)	0	0	0	0	0
Non-Core Income After Tax	575	812	899	468	359	0	0	0	0	0
Other Comprehensive Income, net of tax	(1,191)	1,795	(2,398)	1,165	(610)	0	0	0	0	0
Non-Core Income After Tax & OCI	(616)	2,607	(1,499)	1,633	(251)	0	0	0	0	0
Total Comprehensive Income	36,734	39,925	36,230	40,116	41,528	49,602	56,936	59,430	65,224	70,718

Appendix 2 – Accounting Income Statement

Income Statement (in DKK million)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Net Sales	111.780	111.696	111.831	122.021	126.946	138.737	151.686	153.647	164.331	174.274
COGS	17.183	17.632	17.617	20.088	20.932	22.892	24.725	24.584	25.964	27.535
Gross Profit	94.597	94.064	94.214	101.933	106.014	115.846	126.961	129.064	138.367	146.739
Sales and Distribution Costs	28.377	28.340	29.397	31.823	32.928	30.055	28.939	27.519	27.631	27.320
R&D costs	14.563	14.014	14.805	14.220	15.462	17.342	19.719	19.974	21.363	22.656
Administrative costs	3.962	3.784	3.916	4.007	3.958	3.885	4.247	4.302	4.601	4.880
Other operating income, net	737	1.041	1.152	600	460	0	0	0	0	0
Operating Profit (EBIT)	48.432	48.967	47.248	52.483	54.126	64.564	74.056	77.268	84.771	91.884
Financial Income	92	1.246	2.122	65	1.628	694	758	768	822	871
Financial Expenses	726	1.533	1.755	3.995	2.624	1.665	1.820	1.844	1.972	2.091
Profit before Income Taxes (EBT)	47.798	48.680	47.615	48.553	53.130	62.205	71.478	74.656	81.977	88.921
Income Taxes	9.873	10.550	8.987	9.602	10.992	13.990	16.059	16.762	18.397	19.946
Net Profit	37.925	38.130	38.628	38.951	42.138	48.215	55.419	57.894	63.581	68.975
Statement of Comprehensive Income (in DKK million)										
Net Profit	37.925	38.130	38.628	38.951	42.138	48.215	55.419	57.894	63.581	68.975
Other Comprehensive Income										
Remeasurements of retirement benefit obligations	-205	103	87	-187	-67	0	0	0	0	0
Exchange rate adjustments of investments in subsidiaries	-7	-632	491	226	-1.689	0	0	0	0	0
Realisation of previously deferred (gains)/losses of CF Hedges	682	1.955	-2.027	1.677	329	0	0	0	0	0
Deferred gains/(losses) on CF Hedges incurred during the period	-1.911	1.987	-1.677	-329	1.384	0	0	0	0	0
Other Items	-74	-577	-27	9	10	0	0	0	0	0
Other Comprehensive Income	-1.515	2.836	-3.153	1.396	-33	0	0	0	0	0
Tax on other comprehensive income, income/(expense)	324	-1.041	755	-231	-577	0	0	0	0	0
Other Comprehensive Income, net of tax	-1.191	1.795	-2.398	1.165	-610	0	0	0	0	0
Total Comprehensive Income	36.734	39.925	36.230	40.116	41.528	48.215	55.419	57.894	63.581	68.975

Appendix 3 - Reformulated Balance Sheet

Balance Sheet (in DKK million)	Accounting Financial Statements					Forecasted Financial Statements				
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Core Operations										
Operating Cash	374	377	313	310	255	416	455	461	493	523
Inventories	14,341	15,373	16,336	17,641	18,536	20,117	21,236	21,511	23,006	24,398
Trade Receivables	20,234	20,165	22,786	24,912	27,734	29,829	32,613	33,034	34,510	36,598
Tax Receivables	1,552	958	1,013	806	289	832	910	922	986	1,046
Core Current Assets	36,501	36,873	40,448	43,669	46,814	51,194	55,214	55,928	58,995	62,564
Trade Payables	6,011	5,610	6,756	6,358	5,717	6,937	7,584	7,682	8,217	8,714
Tax Payables	3,976	4,242	4,610	4,212	3,913	4,856	5,309	5,378	5,752	6,100
Other Liabilities	14,181	14,446	14,098	15,085	17,005	18,036	19,416	19,360	20,706	21,959
Short-Term Provisions	20,461	20,755	26,161	31,120	34,814	37,459	40,955	41,485	44,369	47,054
Core Current Liabilities	44,629	45,053	51,625	56,775	61,449	67,288	73,264	73,904	79,043	83,826
Net Core Current Assets	(8,128)	(8,180)	(11,177)	(13,107)	(14,635)	(16,094)	(18,051)	(17,977)	(20,048)	(21,261)
Intangible Assets	2,714	3,325	5,145	5,835	20,657	23,585	25,787	26,120	27,936	29,627
PPE	30,179	35,247	41,891	50,551	50,269	47,926	48,782	47,533	46,052	47,188
Core Non-Current Assets	32,893	38,572	47,036	56,386	70,926	71,511	74,569	73,653	73,988	76,815
Long-Term Provisions	3,370	3,302	3,392	4,613	4,526	4,162	4,551	4,609	4,930	5,228
Core Non-Current Liabilities	3,370	3,302	3,392	4,613	4,526	4,162	4,551	4,609	4,930	5,228
Net Core Non-Current Assets	29,523	35,270	43,644	51,773	66,400	67,349	70,018	69,044	69,059	71,587
Total Core Invested Capital	21,395	27,090	32,467	38,667	51,765	51,256	51,968	51,067	49,010	50,325
Non-Core Operations										
Other Receivables and Prepayment	4,420	2,428	3,090	3,434	4,161	4,162	4,551	4,609	4,930	5,228
Derivative Financial Instruments	529	2,304	204	188	2,332	1,387	1,517	1,536	1,643	1,743
Non-Core Current Assets	4,949	4,732	3,294	3,622	6,493	5,549	6,067	6,146	6,573	6,971
Derivative Financial Instruments	2,578	309	2,024	734	1,365	1,526	1,669	1,690	1,808	1,917
Non-Core Current Liabilities	2,578	309	2,024	734	1,365	1,526	1,669	1,690	1,808	1,917
Net Non-Core Current Assets	2,371	4,423	1,270	2,888	5,128	4,023	4,399	4,456	4,766	5,054
Investments in Associated Companies	809	784	531	474	582	694	758	768	822	871
Deferred Income Tax Assets	2,683	1,941	2,893	4,121	5,865	2,913	3,185	3,227	3,451	3,660
Other Receivables and Prepayment	0	0	0	841	674	277	303	307	329	349
Other Financial Assets	1,388	978	1,242	1,334	1,066	1,387	1,517	1,536	1,643	1,743
Non-Core Non-Current Assets	4,880	3,703	4,666	6,770	8,187	5,272	5,764	5,839	6,245	6,622
Deferred Income Tax Liabilities	13	846	118	80	2,502	416	455	461	493	523
Retirement Benefit Obligations	1,451	1,336	1,256	1,334	1,399	1,665	1,820	1,844	1,972	2,091
Non-Core Non-Current Liabilities	1,464	2,182	1,374	1,414	3,901	2,081	2,275	2,305	2,465	2,614
Net Non-Core Non-Current Assets	3,416	1,521	3,292	5,356	4,286	3,191	3,489	3,534	3,780	4,008
Total Non-Core Invested Capital	5,787	5,944	4,562	8,244	9,414	7,214	7,888	7,990	8,545	9,062
Total Invested Capital	27,182	33,034	37,029	46,911	61,179	58,470	59,856	59,056	57,555	59,388
Financing Operations										
Excess Cash	18,316	18,475	15,325	15,166	12,502	16,648	19,719	21,511	24,650	27,884
Short-Term Borrowings	229	1,694	515	1,474	7,459	994	1,018	1,004	978	1,010
Long-Term Borrowings	0	0	0	3,009	2,897	8,946	9,158	9,036	8,806	9,086
Total Borrowings	229	1,694	515	4,483	10,356	9,940	10,175	10,040	9,784	10,096
Total Shareholder's Equity	45,269	49,815	51,839	57,593	63,325	65,179	69,399	70,527	72,421	77,176
						17.00%	17.00%	17.00%	17.00%	17.00%
Total Financing operations	27,182	33,034	37,029	46,911	61,179	58,470	59,856	59,056	57,555	59,388

Appendix 4 - Accounting Balance Sheet

Balance Sheet (in DKK million)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
ASSETS										
Intangible Assets	2.714	3.325	5.145	5.835	20.657	23.585	25.787	26.120	27.936	29.627
PPE	30.179	35.247	41.891	50.551	50.269	47.926	48.782	47.533	46.052	47.188
Investments in associated companies	809	784	531	474	582	694	758	768	822	871
Deferred Income Tax Assets	2.683	1.941	2.893	4.121	5.865	2.913	3.185	3.227	3.451	3.660
Other Receivables and Prepayments	0	0	0	841	674	277	303	307	329	349
Other Financial Assets	1.388	978	1.242	1.334	1.066	1.387	1.517	1.536	1.643	1.743
Total Non-Current Assets	37.773	42.275	51.702	63.156	79.113	76.783	80.333	79.492	80.233	83.437
Inventories	14.341	15.373	16.336	17.641	18.536	20.117	21.236	21.511	23.006	24.398
Trade Receivables	20.234	20.165	22.786	24.912	27.734	29.829	32.613	33.034	34.510	36.598
Tax Receivables	1.552	958	1.013	806	289	832	910	922	986	1.046
Other Receivables and Prepayments	4.420	2.428	3.090	3.434	4.161	4.162	4.551	4.609	4.930	5.228
Derivative Financial Instruments	529	2.304	204	188	2.332	1.387	1.517	1.536	1.643	1.743
Cash at Bank	18.690	18.852	15.638	15.475	12.757	17.065	20.174	21.972	25.143	28.407
Total Current Assets	59.766	60.080	59.067	62.456	65.809	73.392	81.000	83.584	90.218	97.419
Total Assets	97.539	102.355	110.769	125.612	144.922	150.175	161.334	163.076	170.451	180.857
EQUITY & LIABILITIES										
Share Capital	510	500	490	480	470	606	646	656	674	718
Treasury Shares	-9	-11	-11	-10	-8	-12	-13	-13	-13	-14
Retained Earnings	46.111	48.977	53.406	57.817	63.774	65.739	69.996	71.134	73.043	77.839
Other Reserves	-1.343	349	-2.046	-694	-911	-1.155	-1.229	-1.249	-1.283	-1.367
Total Equity	45.269	49.815	51.839	57.593	63.325	65.179	69.399	70.527	72.421	77.176
Long-Term Borrowings	0	0	0	3.009	2.897	8.946	9.158	9.036	8.806	9.086
Deferred Income Tax Liabilities	13	846	118	80	2.502	416	455	461	493	523
Retirement Benefit Obligations	1.451	1.336	1.256	1.334	1.399	1.665	1.820	1.844	1.972	2.091
Long-Term Provisions	3.370	3.302	3.392	4.613	4.526	4.162	4.551	4.609	4.930	5.228
Total Non-Current Liabilities	4.834	5.484	4.766	9.036	11.324	15.189	15.984	15.950	16.201	16.929
Short-Term Borrowings	229	1.694	515	1.474	7.459	994	1.018	1.004	978	1.010
Trade Payables	6.011	5.610	6.756	6.358	5.717	6.937	7.584	7.682	8.217	8.714
Tax Payables	3.976	4.242	4.610	4.212	3.913	4.856	5.309	5.378	5.752	6.100
Other Liabilities	14.181	14.446	14.098	15.085	17.005	18.036	19.416	19.360	20.706	21.959
Derivative Financial Instruments	2.578	309	2.024	734	1.365	1.526	1.669	1.690	1.808	1.917
Short-Term Provisions	20.461	20.755	26.161	31.120	34.814	37.459	40.955	41.485	44.369	47.054
Total Current Liabilities	47.436	47.056	54.164	58.983	70.273	69.808	75.951	76.598	81.829	86.752
Total Liabilities	52.270	52.540	58.930	68.019	81.597	84.997	91.934	92.548	98.030	103.681
Total Equity & Liabilities	97.539	102.355	110.769	125.612	144.922	150.175	161.334	163.076	170.451	180.857

Appendix 5 – Novo Nordisk Net Leverage

NN Net Leverage	2016	2017	2018	2019	2020	AVG
Net Debt	(18.461)	(17.158)	(15.123)	(10.992)	(2.401)	(12.827)
EBITDA	51.625	52.149	51.173	58.144	59.879	54.594
Net Leverage	-35,76%	-32,90%	-29,55%	-18,90%	-4,01%	-24,23%

Appendix 6 – Peers Net Leverage

Net Leverage Analysis Peers	2016	2017	2018	2019	2020	AVG
Eli Lilly & Co.	86,00%	162,00%	56,00%	207,00%	175,00%	137,20%
Astrazeneca PLC	136,00%	183,00%	174,00%	157,00%	148,00%	159,60%
Sanofi	84,00%	40,00%	184,00%	148,00%	48,00%	100,80%
Pfizer Inc.	136,00%	118,00%	112,00%	209,00%	218,00%	158,60%
Peers AVG	110,50%	125,75%	131,50%	180,25%	147,25%	139,05%

Appendix 7 – Sales Drivers Projections

Drivers by BU (in DKK million)	Accounting Financial Statements					Forecasted Financial Statements				
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Diabetes & Obesity Care Segment										
Tresiba	4,056	7,327	8,035	9,259	8,968	9,976	11,217	12,826	12,773	13,818
Xultophy	207	729	1,614	2,210	2,444	2,792	3,414	4,287	4,230	5,163
Levemir	17,083	14,118	11,195	9,307	7,027	6,597	6,456	6,205	5,843	5,406
Total Long-acting Insulin	21,346	22,174	20,844	20,776	18,439	19,366	21,087	23,317	22,847	24,388
Ryzodeg	196	492	714	993	1,291	1,559	1,880	2,291	1,811	2,239
NovoMix/NovoLog Mix	10,482	10,257	9,480	9,585	9,634	9,804	9,974	10,146	10,321	10,496
Total Premix Insulin	10,678	10,749	10,194	10,578	10,925	11,363	11,854	12,437	12,132	12,736
Fiasp	0	99	590	1,243	1,385	1,761	2,141	2,534	2,918	3,329
NovoRapid/NovoLog	19,945	20,025	18,763	18,060	16,928	17,027	17,104	17,125	17,142	17,136
Total Fast-acting insuling	19,945	20,124	19,353	19,303	18,313	18,787	19,245	19,659	20,060	20,465
Human Insulin	11,090	10,072	9,265	9,036	8,873	9,050	9,176	8,963	8,946	8,863
Total Insulin	63,059	63,119	59,656	59,693	56,550	58,565	61,363	64,377	63,985	66,452
Victoza	20,046	23,173	24,333	21,934	18,747	18,214	16,043	6,967	6,291	5,597
Ozempic	0	0	1,796	11,237	21,211	27,166	31,632	35,054	39,056	41,751
Rybelsus	0	0	0	50	1,873	2,836	4,288	5,944	8,068	10,455
Total GLP-1	20,046	23,173	26,129	33,221	41,831	48,216	51,962	47,965	53,415	57,803
Other Diabetes Care	4,267	4,023	4,250	4,247	4,031	4,263	4,508	4,767	5,041	5,331
Total Diabetes care	87,372	90,315	90,035	97,161	102,412	111,044	117,833	117,108	122,442	129,586
Obesity Care (Saxenda + Wegovy)	1,577	2,562	3,869	5,679	5,608	8,288	14,228	16,943	22,457	25,725
Total Diabetes & Obesity Care	88,949	92,877	93,904	102,840	108,020	119,332	132,062	134,052	144,899	155,311
Biopharm segment										
Novo Seven	9,492	9,206	7,881	8,119	7,203	7,145	7,017	6,741	6,318	5,672
Novo Eight	851	1,103	1,354	1,525	1,462	1,461	1,460	1,460	1,461	1,462
Other Haemophilia	129	160	341	637	997	1,133	1,209	1,250	1,293	1,303
Total Haemophilia	10,472	10,469	9,576	10,281	9,662	9,739	9,687	9,452	9,072	8,437
Norditropin	8,770	6,655	6,834	7,275	7,704	7,993	8,141	8,215	8,290	8,305
Other Biopharm	3,589	1,695	1,517	1,625	1,560	1,674	1,797	1,928	2,069	2,221
Total Biopharm	22,831	18,819	17,927	19,181	18,926	19,406	19,625	19,595	19,432	18,963
Total Sales	111,780	111,696	111,831	122,021	126,946	138,737	151,686	153,647	164,331	174,274
Total Sales in Units (mn)	944	929	836	856	795	812	827	834	837	828

Appendix 8 - DCF Valuation

in DKK million	2020	2021	2022	2023	2024	2025
EBIT*(1-Tax Rate)	37,372	42,692	49,727	52,256	57,876	63,037
Amortization	1,446	5,660	6,060	6,138	6,565	6,962
Capex	4,025	1,827	5,100	2,886	2,526	5,242
ΔNWC	3,353	7,583	7,608	2,584	6,634	7,201
Free Cash Flow	31,440	38,943	43,078	52,925	55,281	57,556
Factor		1.00	0.94	0.88	0.82	0.77
Discounted Free cash Flow		38,943	40,318	46,360	45,322	44,164

WACC	6.85%
Growth Rate	4.28%
Terminal Value	1,682,829

NPV Discounted FCF	1,897,937
NPV Excess Cash	73,849
NPV Net Debt	(43,476)
# Shares	2,287

NOVO NORDISK A/S

PHARMACEUTICALS

STUDENT: EDUARDO BURGNET, CÉSAR CERVANTES

COMPANY REPORT

17 DECEMBER 2021

44224, 44716@novasbe.pt

Novo Nordisk Equity Research

- Our recommendation to investors based on our equity research on Novo Nordisk A/S is to **BUY**. Given the 2022 target price of DKK 816.46 per share, which would result in a 10.54% expected return.
- Novo Nordisk has one of the strongest pipelines in the insulin industry, evidenced by its market leadership status in many of the industry's sub-markets. This can be seen in its investment in R&D and its continued product roll-outs (e.g. Fiasp, Xultophy, Victoza, Ozempic and Wegovy have all come out since 2016)
- It had a strong response to the pandemic's incidence, aided by the inelastic nature of the industry it operates in. Its total sales experiencing a constant growth each year between 2016 and 2020, at a CAGR of 3.23%.
- We have observed a trend shift for Novo Nordisk, from its traditional focus on Insulin drugs towards its GLP-1 and Obesity care segments. The newly released drugs from these segments and NN's sales & distribution efforts are the drivers of this change.
- After Analyzing Novo Nordisk's costs, we observed that these have been on average 21.6% lower than its peers. This trend is expected to continue in the future as new cost reduction initiatives are being taken by the company.

Company description

Novo Nordisk, based in Bagsværd, Denmark, is a leading pharmaceutical company in the world. It has presence in 169 countries worldwide and its main market is North America, with roughly 50% of total sales. Its business is divided in three segments: Diabetes Care, Obesity Care and Biopharm.

Recommendation: **BUY**

Price Target FY22: **816.46 DKK**

Price (as of 08-Dec-21) **738.60 DKK**

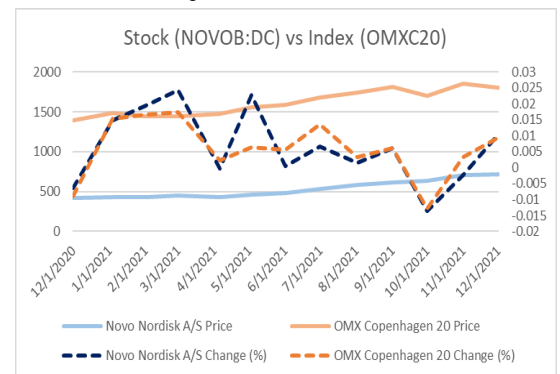
Reuters: Novob.CO, Bloomberg: NOVOB:DC

52-week range (DKK) 412.85-753.60

Market Cap (DKKbn) 1,716.3

Outstanding Shares (m) 2.312

Source: Bloomberg



Source: Bloomberg

(Values in DKK mn)	2020	2021E	2022F
Revenues	126,946	138,737	151,686
EBITDA	59,402	74,394	84,360
Net Profit	42,138	48,215	55,419
EPS	17.96	21.68	24.89
Core Result	42,556	50,360	57,764
Net Debt	(2,401)	(7,125)	(9,999)

Source: Company data and own calculations

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Executive summary

This year has been a good one for Novo Nordisk A/S (NN) so far, and this trend is expected to continue in the following years. As of December 16th, 2021, NN has been the pharmaceutical company with the best share performance of the year with a +78.65% YTD. The podium is completed with Eli Lilly & Co. (+63.04%) in 2nd place, and Pfizer Inc. (+59.74%) in 3rd place¹.

This good performance of NN comes from its commercial operations. Despite the pandemic, it still managed to report growth in its sales for the last 5 years straight, a trend we expect will continue into the future (at an average CAGR of 5.06%, from DKK 111,780mn in 2016 to DKK 174,274mn in 2025). This is because the insulin market is quite inelastic, due to the nature of the disease it covers, and this industry is NN's main source of income. The successful roll-out of new products out of its strong pipeline (e.g. Wegovy, expected to be a new blockbuster drug in the almost oligopolistic obesity care industry) and the continued growth of its diabetes & obesity care segment (driven by a shift from mainly insulin operations towards a focus on GLP-1 & obesity care operations) are the main drivers within the sales of Novo Nordisk.

Regarding the main metrics, NN has been constantly outperforming its direct peers (Eli Lilly & Co., AstraZeneca, Sanofi and Pfizer Inc.) since 2016. The three metrics we have used to evaluate NN's income statement position are: Gross Margin, EBITDA Margin, and EBIT Margin². In this metrics NN delivered 84%, 46.69% and 43.01%, respectively. While the average of its direct peers for the same period are 75.79%, 31.07% and 19.95%, respectively. It can be noticed the big difference in the EBIT Margin coming from the low depreciation and amortization in NN.

As for the Net Leverage, NN delivers a negative number throughout the last years and it is expected to continue in the future. This is because of NN's aversion to debt and its big efforts in having big cash cushions. Despite their recent increase in the Debt-to-Capital Ratio, the Net Leverage stays negative, and it will increase this negative amount as the EBITDA grows at a higher pace than debt. As a comparison, since 2016, NN had an average Net Leverage of (24.23%) while its peer had an average of 139.05%.

All in considered, we estimate the target share price to be DKK816.46 in December 2022, an increase of 10.54% since the 08th of December 2021, where the share price was DKK738.60. We performed a DCF with a Terminal Growth

¹ Bloomberg Intelligence.

² All three margin metrics for NN and its peers are the average since 2016.

Rate of 4.28% and with a WACC of 6.85%. In the end, the recommendation for this stock is a BUY.

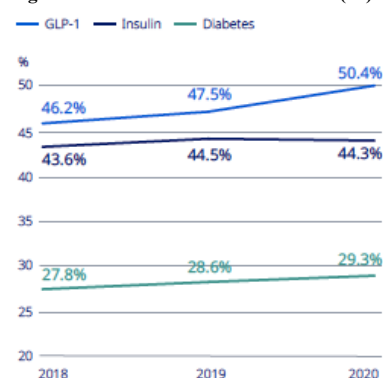
Overview

Company Description

Novo Nordisk is a global pharmaceutical company, which was founded in 1923 and which currently has its headquarters outside Copenhagen, Denmark. Novo Nordisk (NN) researches and develops a wide range of drugs from three main segments: diabetes (81% of total sales), biopharm (15%) and obesity (4%). NN's B shares are listed on the Nasdaq Copenhagen Index and in the New York Stock Exchange as American Depositary Receipts³ (ADRs). By the end of 2021, NN had a market capitalization of DKK1,716.3bn and 2.31bn outstanding shares. In terms of geographic revenues, 48% of total revenues come from North America, 27% from EMEA, 11% from China, and 14% from the Rest of the World. By 2021, NN is producing 50% of global supply of insulin and more than 32 million people in the world are using its Diabetes Care products. According to Brand Finance®, Novo Nordisk is the 15th most valuable pharmaceutical brand in the industry by value⁴.

As previously mentioned, NN is organized in three different segments providing treatment for five different diseases: Type 1 diabetes, Type 2 diabetes, Obesity, Haemophilia, and Growth disorders.

Figure 1. Diabetes value market share (%)



Source: IQVIA

- Diabetes segment.** This is the most important segment by revenues and by number of customers. It is composed by five different category products: Long-acting insulin (Tresiba®, Xultophy®, Levemir®), Premix insulin (Ryzodeg®, NovoMix®/NovoLog Mix®), Fast-acting insulin (Flasp®, NovoRapid®/ NovoLog®), Human insulin, and GLP-1⁵ (Victoza®, Ozempic®, Rybelsus®). As for the diabetes value market share, in 2020 NN stands in a leading position worldwide with GLP-1 accounting for 50.4% of the total GLP-1 market, insulin accounting for 44.3% of the world's insulin market, and with a 29.3% of the total diabetes market when aggregating all diabetes-related drugs. The total diabetes care has risen from DKK 87,372m to DKK 102,412m in the period 2016-2020, delivering a CAGR of 3%.

³ It refers to a negotiable certificate issued by a U.S. depositary bank representing a specified number of shares, usually one share, of a foreign company's stock.

⁴ Brand Finance. 2021. "Pharma 25 2021 Ranking". Retrieved at: <https://brandirectory.com/rankings/pharma/table>

⁵ GLP-1 is a physiological regulator of appetite and food intake and the GLP-1 receptor is widely expressed in the brain.

- **Biopharm Segment.** Within biopharm, there are three main categories in which NN delivers products: first, Haemophilia (Novo Seven®, Novo Eight®, and other Haemophilia); second, Growth disorders (Norditropin®); and third, Other biopharm. Haemophilia products account for more than 50% of the total biopharm segment, whereas growth disorders and other biopharm products account for approximately 40% and 8%, respectively. Total biopharm has reduced its incidence in the company's operations in the period 2016-2020, going from DKK 22,831m to DKK 18,926m, resulting in a CAGR of -4%.
- **Obesity Care Segment.** As for obesity care, NN currently produces a single product under the name Saxenda®. In the middle-term, NN expects to transition from a single-product obesity offering to a portfolio of therapies in the future, by rolling out new products. Saxenda has grown from DKK1,577m to DKK 5,608m in the period 2016-2020, delivering a CAGR of 29%.

Regarding its geographical positioning and reach, NN splits its revenues in North America, Europe, China, and Rest of the World, with the split resulting in a 48%, 27%, 11%, and 14% of total sales respectively. It markets its products in 169 different countries across the world, it has 16 production sites distributed across 9 countries (Algeria, Brazil, China, Denmark, France, Japan, Russia, UK and US), and in addition has 10 research and development centers in five different countries (China, Denmark, India, UK and US).

In terms of its share development, according to Bloomberg, NN's current market capitalization is DKK1,716.3bn⁶. By the end of 2021, NN's total share capital is composed of DKK462,000,000, which is divided into A and B share capital. The A and B shares are calculated in units of DKK0.20, and its total shares amount to 2.31bn shares. The A share capital, consisting of 537 million shares, has a nominal value of DKK107,487,200 and the B share capital, consisting of 1,773 million shares, has a nominal value of DKK354,512,800. The company's A shares are not listed and are held by Novo Holdings A/S, a Danish public limited liability company wholly owned by the Novo Nordisk Foundation. The Foundation has a dual objective: to provide a stable basis for the commercial and research activities conducted by the companies within the Novo Group (of which Novo Nordisk A/S is the largest), and to support scientific and humanitarian purposes⁷.

⁶ 14/12/2021.

⁷ Novo Nordisk Annual Report 2020.

Industry Overview

The pharmaceuticals industry is characterized by the complexity and duration of the development of the drugs. This industry is characterized by an ample heterogeneity that notably complicates peer group analyses and often entails divergent share price performance⁸. So, an analysis within a company's population of ill patients and the projections of this caption, along with the analysis of the company's industry market share evolution is of the utmost importance.

A forecasting overview of this industry's expected growth is found in the market report conducted by Globe News Wire⁹. The total market size value is of USD 1228.45bn as of 2020, and it is expected by these analysts to grow to USD 1700.97bn in 2025, at CAGR of approximately 8% in the period. This growth is sustained by the fact that companies have now reformulated their operations, following the disruption in normal operations that the pandemic provoked. This disruption came in the forms, among others, of remote working and in the temporary stop of commercial activities. But now companies have seen restrictions ease progressively and even have learned how to take advantage of this new normality (e.g. less on-site work can lead to less on-site expenses).

The overall pharmaceutical industry is largely dominated by the North American market, which attained 46% of the market in 2020. China's rise along with other emerging economies have boosted the Asia Pacific market, making it the second largest, with a 26% share.

Given the large relevance of the specific insulin industry, within the pharmaceutical industry, in our equity research, it is insightful to explore some of the trends of such market. Healthcare advancements are a factor that increases the human life expectancy, but as the risk of diabetes grows as humans age this is leading to a swift increment in the need of insulin due to the growing prevalence of diabetes. This trend is also boosted by the increased by the continued shift towards a more sedentary lifestyle in the biggest market geography, North America, and in other geographies such as some Asian countries. Other factors such as technological advancements (e.g. pen devices & needles that minimize injuries and discomfort) and an incremental biotechnology research and development investment are proving to strongly develop the market.

⁸ Miemietz, Marietta. 2013. "CFA Institute Industry Guides: The pharmaceutical Industry". CFA Institute.

⁹ Global News Wire. 2021. "Global Pharmaceuticals Market Report 2021". Retrieved at: <https://www.globenewswire.com/en/news-release/2021/03/31/2202135/28124/en/Global-Pharmaceuticals-Market-Report-2021-Market-is-Expected-to-Grow-from-1228-45-Billion-in-2020-to-1250-24-Billion-in-2021-Long-term-Forecast-to-2025-2030.html>

R&D and Strategy

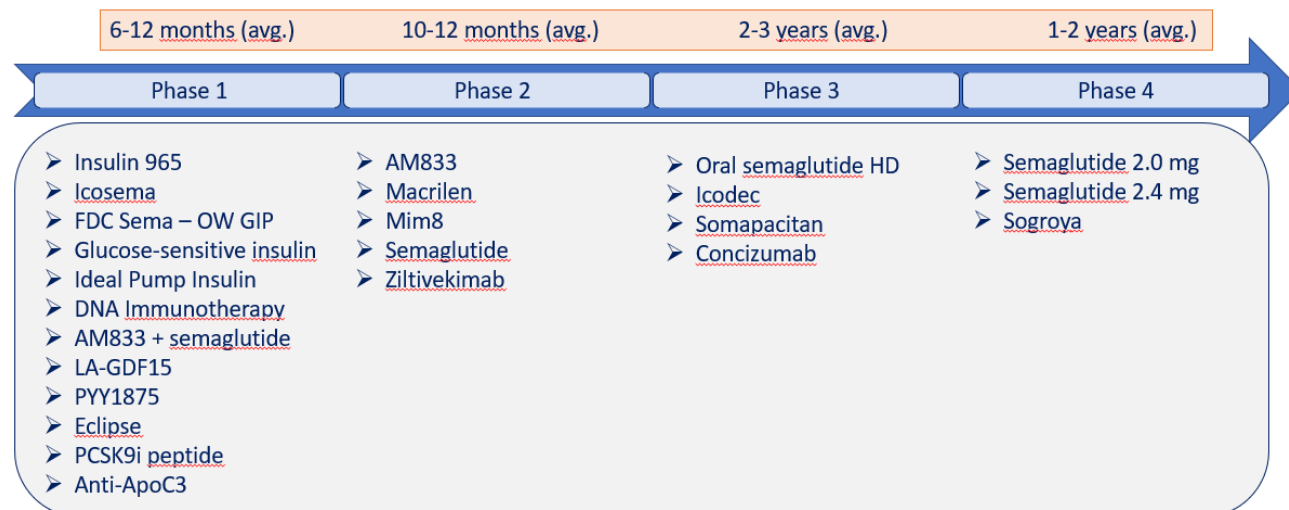
Pipeline

One of the pillars for any pharmaceutical company, is the investment and maintenance of its pipeline. This is where all the research, development, testing, and progress is done until the drug is rolled-out. First, the project is planned and designed by the pharmaceutical companies before this project can reach the clinical status. When a project advances from this step, then this project needs to go through 4 different phases until the new product can be FDA approved and can then be brought into the market:

1. Discovery & Pre-clinical Phase: the research for a new drug is planned begun in the laboratory. The drug is then tested in the laboratory and on animals to assess basic safety issues. (5-15 years on average)
2. Clinical Phase I: after progressing from the first phase the drug is tested on healthy volunteers to ensure its effectiveness and safety. (6-12 months on average)
3. Clinical Phase II: afterwards, further testing of efficacy and safety is done in patients (with the disease), and the dose selection is studied. (10-12 months on average)
4. Clinical Phase III: testing is upscaled on thousands of patients and registration of results lead to research and studies on safety and efficacy. (2-3 years on average)
5. Regulatory review & Launch: The FDA analyzes all the information available on the new drug and its research in order to make the decision to approve or not to approve it. (1-2 years on average)

Novo Nordisk's pipeline is currently composed of more than 20 projects across its various pharmaceutical segments as of 2020. This is an indication of the importance that Novo Nordisk gives to its pipeline. However, as the company has rolled-out many drugs (5 in the last 5 years) recently, the vast majority of these pending projects are still in phase 1 or phase 2, and therefore very much out of scope of this analysis from a timing perspective. For this reason, we will only analyze in more detail those projects which are currently phase 3 or phase 4 as of 2020.

Novo Nordisk Pipeline Overview (per phase)



Source: Company Data

In phase 3, Novo Nordisk has 3 main projects:

1. [Icodec](#): This project started phase 3 in 2020, and therefore it is very unlikely to be approved and marketed before 2025.
2. [Oral Semaglutide](#): This project has been for a few years in phase 3 and could advance to phase 4 and even be approved during the scope of this research. However, the main development of this project could result in an extension of the Rybelsus patent expiration date, which already falls outside our forecasts scope.
3. [Concizumab](#): This project is currently in phase 3, and it is expected to move to phase 4 by 2024 approximately. However, as with Icodec, it also results very unlikely that it will receive FDA approval before 2025.

In phase 4, pending FDA approval, Novo Nordisk has 2 projects:

1. Sogroya/Somapacitan: Sogroya is a long-acting growth hormone intended for a once-a-week dose for adults. Somapacitan is a similar drug, but intended for children, which is still in phase 3. Sogroya was approved in 2021, while Somapacitan is likely to result in a patent expiry date prolongation once it is approved by the FDA.

Sogroya's approval however does not imply that it will find its way to the market immediately. When observing the growth disorders, we can see that almost all competitors were released in the 90s and early 00s. The lack of data regarding recent launches of growth hormones and the unavailability of reliable sales forecasts or even a rumored release date are the main reason why we have chosen not to further analyze the

possibility of a Sogroya roll-out, to avoid uncertainty and contamination into the model.

2. **Semaglutide 2.0:** Semaglutide 2.0 will be a long-acting GLP-1 medication intended to only need a once in a week dose. This project was submitted for approval but not successful with the FDA. Now the project was re-evaluated, and the necessary changes were implemented. The project was submitted for FDA approval again, and the authorization to go into the market is expected to come by 2022. The approval of this project will result in Ozempic 2.0, which will extend the patent protection of this sales driver even further (outside the scope of our research).

M&A and Collaborations

NN latest acquisitions reflect their strong commitment to remain as one of the market leaders by further developing their technology, expanding their knowledge and their research capacity. Its latest acquisitions are Emisphere Technologies (Nov 2020), Corvidia Therapeutics (Oct 2020), and Ziylo (Aug 2018).

- **Emisphere Technologies.** In November 2020 it was signed the definitive agreement to acquire Emisphere for \$1.8bn. This was a strategic movement as its proprietary technologies enable the oral formulation of therapeutics, including the Eligen® SNAC technology found in Rybelsus®.
- **Corvidia Therapeutics.** In October 2020 the acquisition of Corvidia further strengthened NN's pipeline by introducing the anti-IL-6 monoclonal antibody, which showed encouraging results in its early stages of research on inflammatory biomarkers in patients with atherosclerotic cardiovascular disease and chronic kidney disease.
- **Ziylo.** This spin-out from the University of Bristol was acquired by NN because of its highly promising glucose sensor, intended to overcome a recurring treatment barrier in diabetes, the risk of low blood glucose levels associated with standard insulin treatments.

Regarding collaborations, NN is engaging in important partnerships embedded in the development of two drugs which still are in the pipeline. These two drugs are Eclipse and Anti-ApoC3, which belong in the biopharm and other serious chronic diseases segments, respectively.

Eclipse: a collaboration with EpiDestiny. Currently still in the clinical phase 1. This collaboration involves the development of an oral combination treatment of the sickle cell disease and beta thalassaemia.

Anti-ApoC3: a collaboration with STATEN. Currently also in clinical phase 1. This collaboration looks for a novel monoclonal antibody intended for inhibition of ApoCIII activity.

Financial Statements Analysis

Income Statement

Novo Nordisk's total volume of sales did not show any significant evolution from 2016 to 2018, at a level of sales of approximately DKK 111,700m throughout these years. However, from 2018 to 2020, NN's figures started to rise notably, showing a 6.5% CAGR (compared to the 0% CAGR seen in the previous 2 years) and reaching a total DKK 126,946m. Within NN's main market, Diabetes, we find NN's main segment in terms of volume of sales, Insulin, by quite some distance, contributing to 56% of total sales, while other significant segment such as the other Diabetes segment, GLP-1 (18%), Obesity care (1%) and Biopharm (20%) had much less incidence. However, by 2020 we could already see a beginning to a shift in this trend, where the GLP-1 and Obesity care segments were starting to show significant growth, with their total sales share rising to 33% and 4%, respectively, in 2020. This growth in their shares came in detriment of the Insulin and Biopharm segments, that showed diminishing sales.

The rise in NN's sales volume from 2018 to 2020, after the stagnant period, and the forementioned shift in segment shares was no coincidence. The GLP-1 segment was the main driver for both events, growing at a total CAGR of 27% between 2018 and 2020, as opposed to a growth almost half of this figure (14%) between 2016 and 2018. This spontaneous growth was driven by the, very successful, roll-out of Ozempic and Rybelsus, in 2018 and 2019 respectively. Despite Ozempic's early days, it was NN's main sales driver already in 2020.

Figure 2. Novo Nordisk Cost Analysis

NN Cost Analysis	AVG
COGS	15,97%
Sales and Distribution Costs	25,81%
R&D Costs	12,53%
Administrative Costs	3,37%
Total	54,00%

Source: Company Data

Figure 3. Cost Analysis Peers

Cost Analysis Peers	AVG
Eli Lilly & Co.	75,94%
AstraZeneca PLC	69,08%
Sanofi	69,21%
Pfizer Inc.	61,51%
Peers AVG	68,93%

Source: Bloomberg

When analyzing the COGS, sales and distribution costs, R&D costs, and administrative costs for the last five years, we obtained an average over sales of 15.97%, 25.81%, 12.53% and 3.37%, respectively. We noticed that NN requires twice the cash to keep up with the sales and gain new markets and regions (sales and distribution costs), than it needs to develop brand new drugs or improvements and indications for the existing ones. In order to analyze NN's costs we selected the best comparable companies in the industry by size and segments, overweighting diabetes-focused pharma companies. The best four peers we recognized are the following: Eli Lilly & Co., AstraZeneca PLC, Sanofi and Pfizer Inc. We have analyzed the average costs of NN and its peers in the last five years and the results look healthy for NN: while the peers have had average costs of almost 69%, NN registered average costs of 54%. This result

may sound excellent for NN, and it is, but we have spotted a trend of a constant cost reduction among NN's peers, while NN is stuck around the 54%. There is still a 15% margin for NN to keep as this segment's best cost-efficient margin, and we strongly believe that total costs as percentage of sales will remain, at a low level, even with a slight diminish. Regarding comparables, we observed that Eli Lilly & Co. is the rival player with the highest costs with roughly 76% of total sales.

Figure 4. Gross Margin Analysis

Gross Margin	AVG
Novo Nordisk A/S	84,03%
Eli Lilly & Co.	76,24%
Astrazeneca PLC	80,08%
Sanofi	68,14%
Pfizer Inc.	78,71%
Peers AVG	75,79%

Source: Bloomberg and Company Data

We have run three different margin analyses with the four forementioned comparable companies, in order to check how NN navigates through the Gross Margin, the EBITDA Margin and the EBIT Margin in the last five years. In general, we recognized a general pattern: NN overperformed all four comparables in all three margins. First, the Gross Margin, where NN is consistently established around the 84% while peers' average is about 76%. Special mention to AstraZeneca with an average of 80%. Second, the EBITDA Margin, where here again NN delivers quite well, with an average of roughly 47% while peers' ratio drops to 31%. And third, the EBIT Margin, where NN registers an EBIT Margin of 43% while peers' average drops to 20%. We observe how the difference between EBITDA and EBIT Margins due to D&A is very small for NN with an average reduction of less than 4% when peers register an average of more than 11%.

Figure 5. EBIT Margin Analysis

EBIT Margin	AVG
Novo Nordisk A/S	43,01%
Eli Lilly & Co.	17,60%
Astrazeneca PLC	17,32%
Sanofi	18,82%
Pfizer Inc.	26,08%
Peers AVG	19,95%

Source: Bloomberg and Company Data

Balance Sheet

Regarding the balance sheet, NN presented strong numbers during the last five years. Total Equity jumped from DKK45.2bn in 2016 to DKK63.3bn in 2020. This pattern is well explained because of the ability of NN to generate Net Profit year after year. Despite the latest M&A efforts in order to achieve inorganic growth (2 acquisitions in 2020 and one in 2018), NN has been constantly increasing its retained earnings at a similar pace as the total equity.

Regarding 2020, NN has experienced some abrupt developments. Firstly, in intangible assets, where mainly from patents, these have come from the acquisitions of Emisphere and Corvidia Therapeutics, so we observe a huge increase from DKK5.8bn to DKK20.6bn. Another important point is regarding borrowings, NN is a company that has historically preferred to self-finance itself. That is why until 2019 NN had no long-term borrowings, and an insignificant amount in short-term borrowings. Further development of the global economy after COVID-19 outbreak has made NN to include debt in its capital structure. In 2020, NN counted with DKK2.8bn in long-term borrowings and DKK7.4bn in short-term borrowings. By Q3 2021, NN had decreased substantially its short-term borrowings to DKK 1.3bn and increased its long-term borrowings to DKK

12.3bn. We expect both these liabilities to decrease by the end of the year delivery then a Debt-to-capital Ratio¹⁰ of 17%.

When assessing asset composition, we find that NN's biggest assets are PPE, trade receivables and cash at bank, with an average during the last five years of 36%, 20% and 15% of total assets, respectively. It is worth mentioning that intangible assets had an average of less than 5% until 2020, when it jumped to 14% thanks to inorganic growth.

Regarding liabilities, we find short-term provisions, other liabilities, and trade payables as the biggest captions, with an average for the last five years of 42%, 24% and 10% of total liabilities, respectively. As a remark, short-term provisions have been constantly increasing since 2016 due to NN's expansion to developing economies.

We studied the Net Leverage¹¹ of NN and found an interesting result: for all five last years analyzed, NN had a negative net leverage. Although this figure has been progressively reducing, this has happened due to NN's past resistance to debt and its savings efforts.

Forecasting Factors

Our approach for the forecasting of Novo Nordisk's operations until the end of our chosen time span in 2025 is driven by forecasting our sales level, as we believe it is the main driving caption in the financial statements. To forecast the number of sales, we have looked at different factors that will be explained in more detail and the logic behind their election. We have looked at Novo Nordisk's reported market share per segment and geography, population forecasts and disease expectations to obtain the number of sales per sales driver. With this sales volume and considering the patent expiry implications on price we were able to forecast the sales value until 2025. From these forecasts, we were able to extrapolate the rest of BS & IS captions.

Novo Nordisk's main source of income comes from the sale of its products across a variety of markets. Due to this international nature of the company's operations, we have decided to continue the split that Novo Nordisk performs when providing its annual reports. Thus, we will analyze the products by the forementioned 4 geographies: North America, EMEA, China & Rest of the World.

¹⁰ Debt-to-capital Ratio=Debt/(Debt+Equity)

¹¹ Net Leverage=Net Debt/EBITDA

Disease forecast

Figure 6. Disease Forecasts (CAGR)

Disease Forecasts	
Insulin	1.7%
Obesity	8.1%
Haemophilia	0.1%
Growth Disorders	0%

Source: Various; See text.

Diabetes is defined as a group of disorders of the human body's metabolism, which has its main trait in the fact that the condition develops a high level of sugar in the diagnosed person's blood, and this occurs for a prolonged period of time. Diabetes was present in 1 out of 11 people in the world in 2019. It is projected that this figure will rise to 1 in 9 in 2045, this means a growth from 463 million people today to 700 million in approximately 25 years¹².

Haemophilia is an inherited genetic disorder that prevents the human body's capacity to generate blood clots, which are required in order to stop bleeding. This condition can have dangerous repercussions for those diagnosed with it, such as a bigger risk of bleeding inside the human brain. Haemophilia cases around the globe amounted to 67,051 diagnosed cases in 2018. This figure is projected to grow to 67,678 diagnosed cases in 2028¹³.

A person that is overweight is defined as having excessive fat accumulation and that this may have an effect on that person's health, while obesity is an extension of such a definition. Obesity is more severe, and its health implications can lead to more dangerous conditions, and a person is considered obese if he or she has a BMI (Body mass Index) greater than or equal to 30. In 2016 obese population accounted for 13% of world's population¹⁴. It is projected that there will be an obese population of 42% of world's population in 2030¹⁵.

A child is diagnosed with having a growth disorder when it has problems to develop normally. This includes factors such as height, weight or sexual maturity. This condition is treated with the growth hormone, which stimulates the growth of bone and other tissues. This disorder is currently found in around 2 out of every 100,000 people¹⁶. The level of diagnosed people per year is quite stable and there is not any information that would suggest a growth in prevalence of the condition in the near future.

As a final remark, we opted not to include an additional population forecast factor to our forecasting, as we consider that these projections were already included in the disease forecasts.

¹² Williams, Rhys et al. 2019. "IDF Diabetes Atlas, 9th ed 2019". *ResearchGate*. Retrieved at: https://www.researchgate.net/publication/337253094_IDF_Atlas_9th_Edition_2019

¹³ Global Data. 2019. "Hemophilia – Epidemiology Forecast to 2028". Retrieved at: <https://store.globaldata.com/report/gdhcer207-19--hemophilia-epidemiology-forecast-to-2028/>

¹⁴ WHO. 2021. "Obesity and Overweight, Fact Sheet". Retrieved at: <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>

¹⁵ Finkelstein, Eric A. et al. 2012. "Obesity and severe obesity forecasts through 2030". *ScienceDirect*. Retrieved at: <https://www.sciencedirect.com/science/article/pii/S0749379712001468>

¹⁶ Eledrisi, Mohsen S. 2018. "Growth Deficiency in Adults". *Medscape*. Retrieved at: <https://emedicine.medscape.com/article/120767-overview>

Economy forecast

Figure 7. Economy Forecast (CAGR)

Economy Factor	
2021	6%
2022	5%
2023	4%
2024	3%
2025	3%

Source: OECD

We decided to account for a factor that would reflect the economy's behaviour, which we deemed relevant as our projections start on the back of the pandemic crisis, which has had an economic incidence. The factor reflects the world's economy CAGR per year¹⁷ starting on 2020 until 2025, in alignment with Novo Nordisk's increased global operations. The trend clearly reflects a big growth at the beginning as the economy seeks to recover from the crisis caused by the pandemic, with the trend stabilizing further into our projections scope, which aligns with our expectations.

Prices

Figure 8. Product Prices

Product	Price
Tresiba	225 DKK/ml
Levemir	205 DKK/ml
Xultophy	498 DKK/ml
NovoMix	245 DKK/ml
Ryzodeg	116 DKK/ml
NovoRapid	236 DKK/ml
Fiasp	193 DKK/ml
Human Insulin (Novolin)	95 DKK/ml
Victoza	741 DKK/ml
Ozempic	1858 DKK/ml
Rybelsus	186 DKK/ml
Saxenda	586 DKK/ml
Novo Seven	16 DKK/ml
Novo Eight	72 DKK/ml
Nordotropin	6291 DKK/ml

Source: Drugs.com

In order to have a consistent valuation, we opted to use a single price factor per medicine, regardless of its geography. This was due to the lack of information in the market regarding the different prices in each geography. To avoid biases and contamination, we decided to obtain all the prices for each product from the same source. The most consistent source which included all the prices required was *drugs.com*. The prices below were used to obtain the value of the company's sales once we obtained the forecasted unitary sales per year. However, as seen in the next section, some of the prices were affected by the patent of the medicine expiring.

Patent expiry implications

A patented product is typically protected by a trademark for a certain period of time, typically 20 years. Patents are important to protect the product, and to avoid the replication and innovation of other competitors on the product. Once the patent expires, other manufacturers can take advantage of this situation and introduce generic drugs into that specific market. These generic drugs have a disadvantage over branded drugs due to the perception from users that they are inferior to branded drugs. But on the other side, these generic drugs are usually priced lower, due to their lower manufacturing cost, and have a shorter approval period.

A recent study from the FDA showed that the median price of all drug generic products when opposed to the price of those branded, and when using average manufacturer prices, is of 40%¹⁸. This we believe is the incidence that the

¹⁷ OECD. 2021. "GDP Long-term forecast". Retrieved at:

<https://data.oecd.org/gdp/gdp-long-term-forecast.htm>

¹⁸ Conrad, Ryan & Lutter, Randall. 2019. "Generic Competition and Drug Prices: New Evidence Linking Greater Generic Competition and Lower Generic Drug Price". *FDA*. Retrieved at:

<https://www.fda.gov/media/133509/download>

expiration of patents of Novo Nordisk's products will have on prices, mainly for those products in where there are many competitors (therefore more generics entering the market) such as Victoza.

Specifically, the study also showed that prices are 54% (46% ratio) lower when there are only two generic competitors entering the market, compared to the previous branded prices. This applies to Saxenda as it currently has very little (almost none) competition from Qsymio, and it is unlikely to expect that a patent expiration will bring so much relevant generic competition into the market.

Novo Nordisk announced in September 2019, that it would launch authorized generics of its insulin products¹⁹. These are available at a 50% list price discount compared to the current price of the branded products, with the aim to swiften the effects of generics competition. This 50% price incidence is what we expect will be the effect of a patent expiring for Novo Nordisk's insulin products, as we have not found evidence suggesting otherwise.

Sales drivers

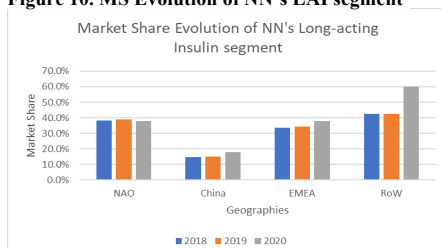
The analysis of NN's sales drivers is of utmost importance for our sales-driven forecasting, as they are the base for our projections. We have chosen to follow the product split that NN undergoes when publishing their sales reports. Please note that the graphs included are not always the same; we will not show a graph for a single projected CAGR (when the segment is driven by one product), it will be mentioned in the text; neither will be included the market share evolution per geography graph of those segments we analyze with a global outlook.

Figure 9. Long-acting Insulin Patent Situation

Patents	Tresiba	Levemir	Xultophy
NAO	2029	EXP	2029
CHI	2024	EXP	2024
EMEA	2028	EXP	2029
RoW	2027	EXP	2024

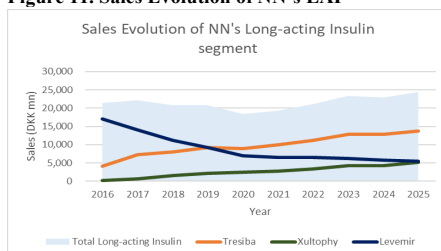
Source: Company Data

Figure 10. MS Evolution of NN's LAI segment



Source: Company Data

Figure 11. Sales Evolution of NN's LAI



Source: Company Data

■ Total Long-acting Insulin (LAI)

Long-acting insulin is the type of insulin that takes the most amount of time to show its effects on the human body. Historically, the long-acting insulin segment has been dominated by Sanofi's Lantus and NN's Levemir. However, in recent years Sanofi's Toujeo and Soliqua, and NN's Tresiba and Xultophy have been cannibalizing market share to the previous two products. The other big, and stable, player in this market is ELC's Basaglar. NN had a 37% share of this market in 2020, with its share growing in most geographies in recent years.

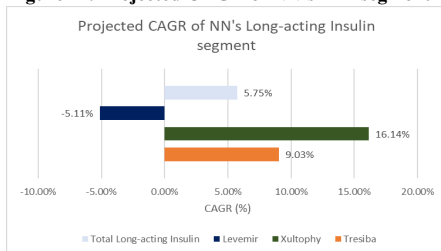
Levemir's continued decline in sales due to this sales cannibalization is expected to continue, at a less steep rate, during the length of our forecasted period.

Tresiba has a solid presence in major markets. In China, Tresiba was included on the National Reimbursement Drug List in 2020 and its hospital listings continue to

¹⁹ The Center for Biosimilars. September 2019. "Novo Nordisk Plans Authorized Generic Insulins for Early 2020".

Retrieved at: <https://www.centerforbiosimilars.com/view/novo-nordisk-plans-authorized-generic-insulins-for-early-2020>

Figure 12. Projected CAGR of NN's LAI segment



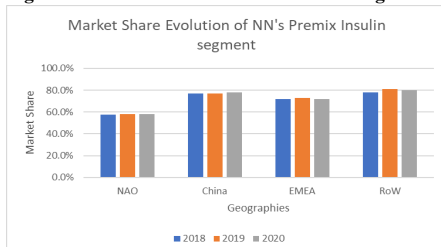
Source: Company Data

Figure 13. Premix Insulin Patent Situation

Patents	NovoMix	Ryzodeg
NAO	EXP 2029	
CHI	EXP 2024	
EMEA	EXP 2028	
RoW	EXP 2024	

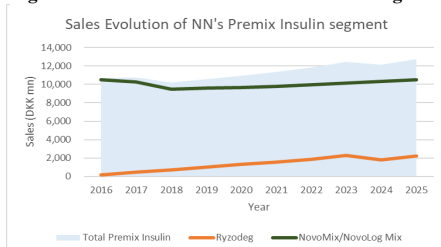
Source: Company Data

Figure 14. MS Evolution of NN's Premix segment



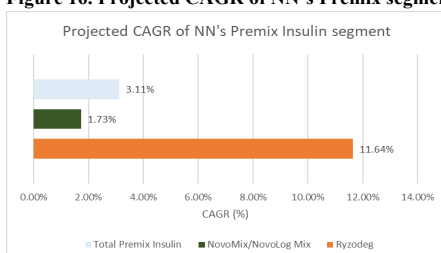
Source: Company Data

Figure 15. Sales Evolution of NN's Premix segment



Source: Company Data

Figure 16. Projected CAGR of NN's Premix segment



Source: Company Data

Figure 17. Fast-acting Insulin Patent

Patents	NovoRapid	Fiasp
NAO	EXP 2030	
CHI	EXP 2030	
EMEA	EXP 2030	
RoW	EXP 2030	

Source: Company Data

progress. A big key to its popularity it's the fact that it has the easiest packaging system in the market to use and inject. In addition, it is the most long-lived alternative available. We foresee a continued growth in Tresiba's sales.

Xultophy has showed a superior hbA1c²⁰ improvement to its competitors and has the best cardiovascular results in the segment industry. This new product has only been launched in 42 countries as of 2020 (compared to Tresiba's 91). However, Xultophy has already had a successful introduction to major markets (such as China, where we expect a similar development as Tresiba's). We believe it will prolong the exponential growth it has shown until now.

■ Total Premix Insulin

Premix insulin is a combination of short-acting and intermediate-acting insulin. Historically, this market has been dominated by NN's NovoMix/NovoLog Mix, followed by ELC's Humulin, both products showing stable tendencies in the market. In 2014, NN launched Ryzodeg while Sanofi launched Admelog in 2018, these products have had a great market impact, especially the latter. NN is the absolute market leader in this segment, with a 65.2% market share in 2020. A figure which has been stable over recent years.

NovoMix includes a variety of products under the same specifications, where the only difference is the composition of each product, depending on the weight of each of the two insulin types found in the premix insulin. This product is characterized by its market leadership position and its stability both in the level of sales and in the market share, as the premix insulin is not a fast-growing market.

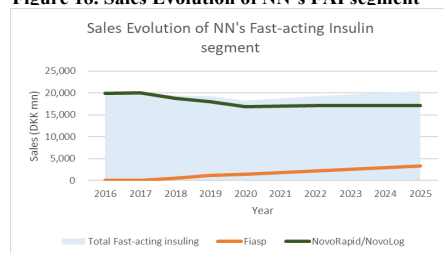
Ryzodeg was rolled out as a response to NovoMix's patent expiry. It is currently only present in 37 countries, having only recently penetrated big markets (such as China, where its slightly outperforming Tresiba's initial integration into the market). There are no (public) plans to roll out the product in NAO. With plenty of available markets still to enter, we expect a solid growth into the future.

■ Fast-acting insulin (FAI)

Fast-acting insulins minimize and control the rise in the levels of sugar in the blood, which occurs after eating. Historically, this segment has been dominated by NN's NovoRapid/NovoLog, followed by ELC's Humalog. Both products show stable sales and market share levels. Sanofi's Apidra is the company's main presence in the segment, however it cannot compete at the same level. Finally, NN rolled out Fiasp out in 2017, as a response to NovoLog's patent expiry. NN's is the absolute market leader with a market share of 50.7% in 2020.

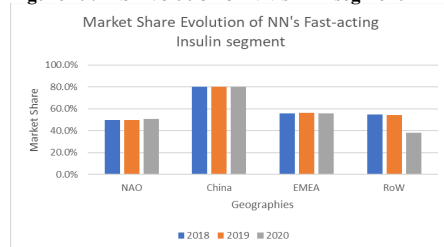
²⁰ Glycated hemoglobin. A marker that can determine the average glucose (blood sugar) levels.

Figure 18. Sales Evolution of NN's FAI segment



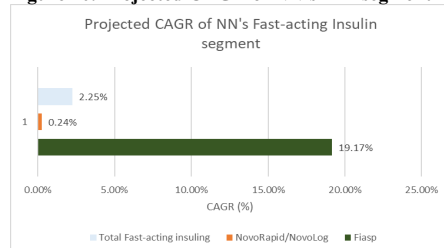
Source: Company Data

Figure 19. MS Evolution of NN's FAI segment



Source: Company Data

Figure 20. Projected CAGR of NN's FAI segment



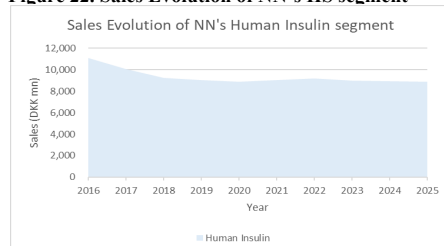
Source: Company Data

Figure 21. Human Insulin Patent Situation

Patents	Human Insulin
NAO	EXP
CHI	EXP
EMEA	EXP
RoW	EXP

Source: Company Data

Figure 22. Sales Evolution of NN's HS segment



Source: Company Data

Figure 23. GLP-1 Patent Situation

Patents	Victoza	Ozempic	Rybelsus
NAO	2023	2032	2032
China	EXP	2026	2026
EMEA	2023	2031	2031
RoW	2022	2031	2031

Source: Company Data

NovoRapid was rolled out back in 1999. Despite its falling market share due to its declining sales in most geographies, its Chinese operations have increased enough to offset these adverse effects. NovoRapid is expected to continue operating at an overall stable rate.

Fiasp is only present in 41 countries currently, presenting plenty of growth opportunities still. There are no (public) plans to roll out Fiasp in China. Recent studies demonstrated that Fiasp was more efficient than NovoRapid in aspects such as hbA1c levels after a meal and blood glucose control. It also contains ingredients that make it easier and faster to be absorbed by the human body. Fiasp's strong initial market performance until now, its characteristics and its unexplored markets make us foresee a strong growth for the product.

Human insulin (HS)

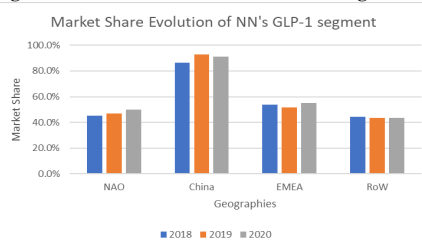
Human insulin is different than the previous studied insulin types, called analogs, as it has limitations when injected under the skin, in high concentrations it can have unpredictable behavior. NN has products such as Novolin or Insulatard, but it does not have a clear driver for this kind of insulin, as it is mainly tailored as a cheap option, therefore NN does not focus on exploiting this segment with further development. The market overall is not dominated by any product, as there is a homogeneous level of competition, of which NN possessed 36% in 2020.

For such a stable and stagnant segment in NN's case, we expect the segment to continue the stagnant trend it has shown so far. Our projections reflect this, with fluctuations due to external factors, in our CAGR of approximately 0%

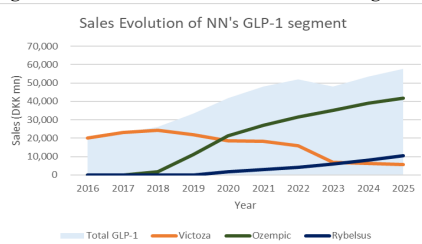
GLP-1

GLP-1 is a hormone produced and released as a reaction to food ingestion, its effects are that it causes a reduced appetite and the release of insulin into the body. The GLP-1 market has been historically dominated by NN's Victoza, while its biggest rival brands such as AZ's Bydureon & Byetta fared well below its level. But as of late there has been a change in the trend of the market, with these products losing a lot of terrain to the newly released brands from NN (Ozempic & Rybelsus) and ELC (Trulicity). NN is the global market leader of this segment, with a market share of 50.4% in 2020, a number that keeps significantly rising every year (almost 3 pp. since 2019 alone).

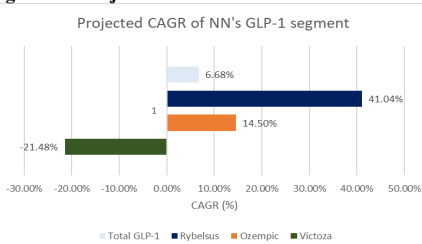
Victoza had been NN's main asset in this segment, but the pandemic and the cannibalization of its sales have been the main reason for its downwards trend recently. However, in China it maintains a certain stability as it takes advantage of the still early life of its competitors in this market, plus it has had a label expansion approved in China that will allow it to include a cardiovascular

Figure 24. MS Evolution of NN's GLP-1 segment

Source: Company Data

Figure 25. Sales Evolution of NN's GLP-1 segment

Source: Company Data

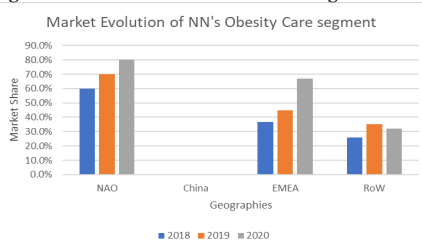
Figure 26. Projected CAGR of NN's GLP-1

Source: Company Data

Figure 27. Obesity Care Patent Situation

Patents	Saxenda
NAO	2023
CHI	EXP
EMEA	2023
RoW	EXP

Source: Company Data

Figure 28. MS Evolution of NN's OC segment

Source: Company Data

indication. We predict that despite its efforts in this market, Victoza will continue to show losses in the projected years, significantly more after its patents expire.

Ozempic is Novo Nordisk's golden fleece, its main sales driver overall. It was found to be effective at controlling blood glucose levels and in reducing the occurrence of serious health complications associated with the condition. In addition, it also leads to weight loss which is beneficial for those diagnosed with diabetes and it only requires a one a week injection to follow appropriate treatment. Ozempic is already NN's best performing product in terms of sales (it is only 3 years old). Despite its already impressive growth and notable market share, it is still only present in 52 countries. NN is making significant promotional activities for Ozempic to keep the trend going, especially in NAO. For its recent introduction in China, we have considered Tresiba's early days in the market, as a conservative proxy, due to the lack of data but with outperforming expectations. Its superior characteristics and the great response of the market so far, make us forecast a continued strong growth for the product.

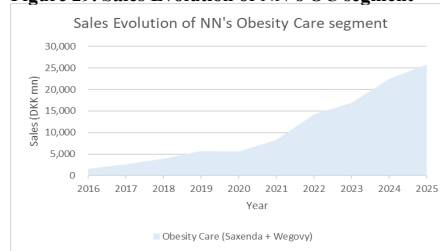
Rybelsus's is a new oral treatment for this type of diabetes, and it is the world's first once-a-day GLP-1 tablet. It is still only present in 9 countries as of 2020, but the big success it has had in its two years of life is expected to be continued. Furthermore, it was approved in 2020 for commercialization in the EU, the UK and Japan. In addition, Novo Nordisk continues to engage in promotional activities for the roll-out of Rybelsus in new geographies. We project its initial impact in the new geographies to follow a similar trend to Ozempic's. Its promising early life, along with the potential room for growth and its unique and innovative characteristics make us forecast a meteoric growth for Rybelsus.

▪ Obesity Care (OC)

Overweight or obese people are at significantly higher risk of serious health issues such as developing type 2 diabetes or even cancer. The obesity care market has been dominated by Saxenda since it was launched in 2015. It is not a market in which NN has any significant competitors, with competition coming mainly in the form of Vivus LLC's Qsymia. In addition, NN rolled out Wegovy in 2021, with the aim to further increase its market share of 64.7% in the market.

Saxenda has suffered the pandemic effect, with it halting its positive sales trend over the previous 5 years, as fewer patients initiated such a treatment. Saxenda's main downfall is that it is paid out of the pockets of the patients completely and there is no subsidy whatsoever. In 2020 the UK's NICE recommended Saxenda for obesity treatments, boosting the sales of the product in the region. Saxenda is

Figure 29. Sales Evolution of NN's OC segment



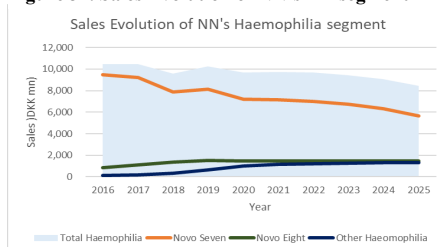
Source: Company Data

Figure 30. Haemophilia Patent Situation

Patents	Novo Seven	Novo Eight
NAO	EXP	n/a
CHI	EXP	n/a
EMEA	EXP	n/a
RoW	EXP	n/a

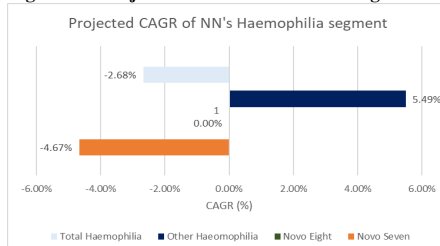
Source: Company Data

Figure 31. Sales Evolution of NN's HP segment



Source: Company Data

Figure 32. Projected CAGR of NN's HP segment



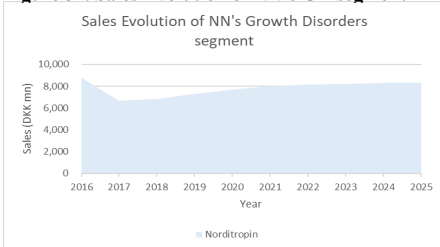
Source: Company Data

Figure 33. Growth Disorders Patent Situation

Patents	Norditropin
NAO	EXP
CHI	EXP
EMEA	EXP
RoW	EXP

Source: Company Data

Figure 34. Sales Evolution of NN's GD segment



Source: Company Data

currently only present in 55 countries and NN continues to promote the rollout of Saxenda to new markets.

Wegovy has only been launched in 2021, mainly in the US, but it has already faced demand fulfillment issues, which NN believes it will solve in 2022. It is predicted to become a new blockbuster drug. Its success is summarized in it being a weekly injection that halts its patient's appetite, which has shown results of 15% body weight loss. Due to the lack of historical data or forecasts, we have considered the projections from SEB's research²¹, which we deem to be sufficiently in line with our standards and assumptions. The roll-out of Wegovy increments our projected growth for the segment to a 35.62% CAGR until 2025.

■ Haemophilia (HP)

Haemophilia is a rare condition that affects the blood's ability to clot. The market is quite competitive, its main players being NN (NovoSeven & NovoEight) and Pfizer (Benefix & ReFacto). NN's market share stands at 12% as of 2020.

NN's main product in this segment, NovoSeven, had been on a very swift downwards trend, amplified in 2020 as it has heavily suffered the impact of the pandemic. On the other hand, NovoEight has remained quite stable. Both products are expected to maintain these recent trends. New products such as Esperoct and Refixia have been rolled-out this year, but their impact so far is quite small; their sales being almost capable of, only to a very little extent, offsetting NovoSeven's declining figures.

■ Growth Disorders (GD)

The growth hormones (used to treat growth disorders) market is dominated by NN's Norditropin, Pfizer's Genotropin and ELC's Humatrope. As of 2020, NN's market share stood at 36%, a figure that has significantly increased in recent years and that makes it the market leader.

Norditropin is NN's main player in this market. The product performed well since 1999, despite having a substitute coming through in the pipeline. Its demand increased last year, as competitors faced significant supply challenges due to the pandemic. However, its demand is also limited to an extent by its high price. Norditropin has continuous device upgrades and new indications launched. We project it to continue its upwards but stable trend, providing the overall growth disorders segment a CAGR of 1.51%.

²¹ SEB. 2021. "Equity Research Novo Nordisk". Retrieved at: <https://research.sebgroup.com/pdf/NovoNordisk090821A.pdf>

Captions Forecast

Sales

Now that we have discussed the different forecasting factors considered, we can see how this blend together to deliver our yearly forecast for each sales driver identified in Novo Nordisk's catalogue.

NN's annual reports of 2018, 2019 and 2020 provide insights into the market shares of its segments, from which we were able to extrapolate the market share evolution in each of its geographies for NN's main sales drivers and globally for its less important segments. From this historical market share evolution, we incorporated our projections for such a caption, considering at which point of life each sales driver stood in 2020. To be as precise as possible, we incorporated the experts' expectancy on the economy and on each disease group, as referenced in the Forecasting Factors section.

With this model, we were able to obtain our projected growth per year per medicine. We applied this CAGR to the unitary sales of 2020, that we obtained after dividing the number of sales of each medicine by its price. To forecast at unitary level and not gross sales is important, as it allows us to consider the patent expiry effect on the medicine's price. Finally, by multiplying the unitary sales of each year and medicine by its patent-adjusted prices, we were able to obtain our sales projections for each geography.

For those segments of NN's catalogue that were not sales drivers we could forecast the sales per geography with the data available, but rather its global sales, however the model used was the same, simply adapted to this condition.

Please note that for captions where little insight was provided by NN (Other Diabetes Care & Other Biopharm) we were not able to use the previous model. For Other Diabetes Care we used analysts' CAGR of 4.68% for the forecasted period²², as their report had a similar timespan to our projections. Similarly and to be consistent, for Other Biopharm, we used the same analysts' CAGR of 7.32% for our projections²³.

We have decided against forecasting the Other Comprehensive Income captions, as these accounting movements do not affect in any manner our free cash flow

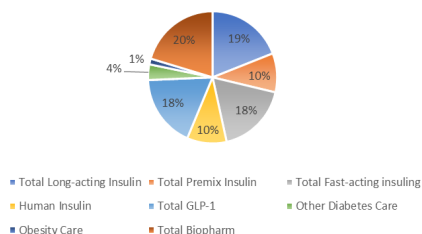
²² Mordor Intelligence. 2021. "Diabetes care devices market - growth, trends, covid-19 impact, and forecasts (2021 - 2026)". Retrieved at:

<https://www.mordorintelligence.com/industry-reports/global-diabetes-care-devices-market-industry>

²³ Mordor Intelligence. 2021. "Biopharmaceuticals market - growth, trends, covid-19 impact, and forecasts (2021 - 2026)". Retrieved at:

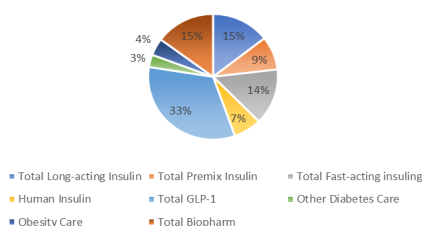
<https://www.mordorintelligence.com/industry-reports/global-biopharmaceuticals-market-industry>

Figure 35. Sales Composition in 2016 (% of total sales)



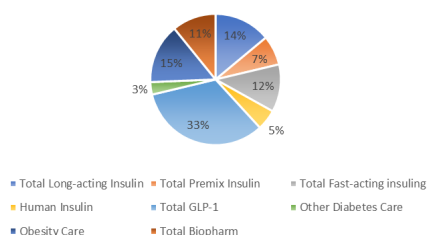
Source: Company Data

Figure 36. Sales Composition in 2020 (% of total sales)



Source: Company Data

Figure 37. Sales Composition in 2025 (% of total sales)



Source: Company Data

or valuation. A similar approach has been applied to other operating income, as these do not follow a regular activity but are rather one-off events in these statements.

In our projections, we have seen a consolidation of the trend that was starting to develop in the years prior to our forecast. We mentioned earlier in the report how we could observe a rise in the incidence of the GLP-1 segment over total sales. Our initial expectation was for this upwards trend to continue thanks to the continued roll out of the new products in the segment into new markets, but Victoza's plummet combined with strong growth in other segments such as Obesity Care (from a 4% in 2020 to a 15% in 2025) have stabilized this sales share of GLP-1 at 33% overall during our forecasted period. Despite this share over total sales not growing, the segment's gross sales have been unprecedented. Ozempic (mainly) and Rybelsus, have far more than offset a worrying performance from Victoza, compensating a -21.5% CAGR throughout our forecasted period). This has been possible thanks to Ozempic strong growth coming from an already very strong position in 2020, where its sales accounted for DKK 21,211m and they grew at a solid 14.5% CAGR to a market leader status in 2025, at DKK 41,751m. In addition, Rybelsus' past meteoric growth has also continued in our projections, growing at a 41% CAGR from 2020 until 2025, reaching DKK 10,455m. This market segment is where NN is currently focusing its main efforts, as can be seen with the soon-to-come release of Ozempic 2.0 (last phase in the pipeline) and its continued marketing and roll-out activities, and it is clear to see why, as it will potentially be the company's main asset.

However, NN is not all about GLP-1 exclusively, and it has other high performers that despite being overshadowed by the previous two products, are very interesting and important for Novo Nordisk's sales composition. Our model projects a strong growth for products such as Tresiba (9% CAGR) and Xultophy (16.1% CAGR), which is crucial to offset a declining Levemir (-5.1% CAGR). These three products belong to the long-acting insulin segment, which had historically been the company's strongest performing market within the insulin markets. It is important for NN to protect its operations there, as this segment was swiftly in decline before the new alternatives gained an importance in the market. In addition, other great performing sales driver throughout our forecasts have been Fiasp (19.2% CAGR) and Ryzodeg (11.6% CAGR), both very important as they are the newer alternatives to their comparable products of each segment (NovoRapid and NovoMix respectively), which are both stagnant. These sales drivers have been the main propellers of this segment, allowing it to reach DKK 66,452m in sales in 2025.

Finally, the Obesity Care segment has seen the biggest growth during our projections. It stood at a 1% share of total sales in 2016, rising to a 4% share in 2020 and a total 15% share in 2025. This growth was almost entirely due to the roll-out of Wegovy and the expectancy that it will achieve a blockbuster status immediately, with our model forecasting sales in this segment to rise to DKK 25,725m.

Novo Nordisk's focus in its Diabetes & Obesity Care segment is evident, and it is reflected in its Biopharm continued decreased incidence over total sales; as despite NN's strong growth, this segment is stagnant (constant total sales of approximately DKK 19,000m). This can be seen in how the Biopharm segment has halved its importance in the company overall, from a 20% sales share in 2016 to a 11% share in 2025

Costs & Main Balance Sheet Items

After the analysis of our forecast of the sales we performed a deep analysis of the developing of NN's costs and the main BS items we identified.

Regarding costs, NN experienced a constant increase in COGS topping in 2020 and 2021 with a 16.5% of sales. We expect this percentage to reduce progressively in the next years to a 15.8% in 2025 because of the decrease in raw materials and energy. As for sales and distribution costs, we forecast a slight diminishing in line with the loosening of Covid-19 restrictions. Regarding R&D costs, we expect them to increase and stabilize by 2022 in order to keep up with the global leadership in diabetes and the improvement and ampliation of NN's pipeline. Administrative costs are expected to slightly decrease because the WFH initiatives which will reduce rent as less workspace will be required. Depreciation is expected to slightly increase because of a higher depreciation coming from new production facilities and investments in facility upgrades, while for amortization, we expect a reduction in impairment losses but at the same time there was a big increase in 2020 coming from the huge increase in intangible assets because of acquisitions. As a result, amortization as a percentage of intangible assets is expected to be reduced 1.5% by 2025. Finally, interests are expected to raise because of the increase of debt in the cost structure, but as the interest rates are low and we do not expect governments to let inflation surge, the dollar amount expenditures will not surpass DKK700mn in the upcoming years.

Regarding the main balance sheet items, we will review here inventories, intangible assets, PPE and excess cash. Inventories are expected to be reduced as patients continue with their treatments and NN keeps boosting its expansion. Intangible assets increased dramatically in 2020 and are expected to remain at

that level for the upcoming years as no more M&A efforts are planned according to Bloomberg and NN's latest earnings call presentations. PPE is expected to slightly decrease as new facilities were opened in the last year in order to sell old ones. Finally, excess cash is forecasted to increase to pre-pandemic levels, as a percentage of sales, as no big cash expenditures are expected in the coming years.

Valuation

Cost of Capital & Growth

First, we have decided to use the 10-year US Treasury Bond Yield as our risk-free rate proxy, as the majority of Novo Nordisk's operations take place in this geography. To compute the Market Risk Premium, we used additionally the OMX Copenhagen 20 Index Annual return for the last 10 years, as Novo Nordisk is listed in this index.

To compute NN's unlevered beta, we observed at the average of its comparable companies (data from Bloomberg). Not any pharmaceutical company would be a correct proxy, as a company where insulin is such a big percentage of its operations is not expected to have a great correlation with the market due to the necessity of its products. For this reason, we only took the 5 most similar companies in terms both of operations and company size (ELC, AZ, Sanofi, Vivus Inc and Pfizer). The average beta obtained for the insulin industry was of 0.28, which is in line with our expected market behavior of these firms (3 of the comparable firms had an absolute correlation with the market smaller than 40%). After relevering the industry beta, taking into account NN's capital structure, we obtained NN's levered beta of 0.32.

Novo Nordisk has an S&P rating of AA-, having recently upgraded from the A+ category. This means that its recovery rate stands at 0.85, and that its default probability stands between 0.05-0.09. As NN has only recently upgraded, we have chosen to go with the less optimistic figure of this range, at 0.08. These figures combined with the yield curve for A-rated bonds in the US (I33853US Index at 10 years in Bloomberg) were used to obtain NN's cost of debt of 6.4%.

Using these factors, we were able to compute a WACC of 6.85%. Novo Nordisk's WACC has been decreasing over the last few years and our obtained result falls along these lines, as it is lower than last year's figure of 11.08%.

Regarding the Debt-to-Capital Ratio, as of 14/12/201 it is 17.22% according to Bloomberg. We expect this ratio to drop to roughly 17% because of the diminishing efforts that NN is taking to reduce its debt level. We do not expect

Figure 38. Unlevered Beta Peers Analysis

Unlevered Beta Peers	Source: Bloomberg
Eli Lilly & Co.	0.22
Astrazeneca PLC	0.61
Sanofi	0.39
Vivus Inc.	0.53
Pfizer Inc.	-0.35
Average	0.28

Source: Bloomberg

total debt to drop to the pre-Covid situation, when it was almost insignificant, but to remain at this level because of the tax shield benefits and thereby, a reduction in the WACC is seen when compared to previous years.

We selected the DCF as the primary method to perform NN valuation as we went through a magnificent book written by Marietta Miemietz, CFA²⁴ where she stated that this is the best approach to perform a valuation in the pharmaceutical industry as it captures “the analyst’s specific views on a company’s prospectus and thus sidesteps issues that may arise from the industry’s heterogeneity and resulting lack of comparability across peer groups.”

Sensitivity Analysis

A sensitivity analysis is useful when conducting an equity research, especially with such limited resources, due to the uncertainty that surrounds certain factors. Given the incidence that discount rates have, we decided to conduct a sensitivity analysis on them to observe how our result would fare when these changed. Our projected growth of 4.28% is assuming a moderately optimistic scenario, in which new releases such as Wegovy continue to be successful. To better account for the possibility that our projections are too optimistic, we decided to factor up to 0.5 percentage points less. As expected, obviously the share price dropped, but considering the magnitude of this drop (17% drop when growth is 0.5% less), it is quite revealing on how much the share price actually relies on the success of its operations. On the other hand, if the growth was 0.5 percentage points higher (which could derive from an early roll-out of Sogroya for instance) the price rises 22% higher. However, these effects are smaller than if the same variance was applied to our WACC of 6.85%, as the same decrease of this rate increases our share price by 25%, while an increase has a 20% negative effect on the value. These results suggest that our end result is more dependent on factors such as NN’s capital structure or the market exposure obtained from its peers, than it is on the behavior of the sales that drive growth. This is not to say that growth does not have a big impact, as both factors have proven to be highly relevant for our model after observing such a high incidence from both on our share price

Multiple & Ratio Analysis

As a support documentation for NN’s valuation we ran different multiple analysis focusing on P/E, EV/EBIT and EV/EBITDA. When assessing NN’s results of the first two multiples we get the same idea that from our DCF valuation: that NN is undervalued compared to its direct peers. We got a P/E and EV/EBIT for NN of 33X and 26X, respectively. The average of the industry is situated in 37X and

²⁴ Miemietz, Marietta. 2013. “CFA Institute Industry Guides: The pharmaceutical Industry”. CFA Institute.

35X, respectively. Finally, regarding EV/EBITDA, NN is a bit higher than the rest, presenting 23X, compared with a 20X from its peers. As the industry is quite capital-intensive, we consider EV/EBIT a better indicator than EV/EBITDA, as D&A account for a high economic cost.

At last, we analyzed the return on assets (ROA) and return on equity (ROE) ratios. We obtained, again, a big outperformance by NN when compared to its close peers. When looking at the ROA, NN has currently a multiple of 34X, which is quite superior to the average of its peers, which stands at 9X. In addition, for the ROE, NN has a multiple of 80X, which is also larger than the average of its peers at 52X.

Conclusions

Risks & Next Steps

Our product factor, which has an incidence on the obtained growth per year of the sales drivers was developed by ourselves and integrated into the model. That is not to say that we believe it is not correct, as we have developed this factor with the best of our knowledge and observing the trend of existing products from NN's catalogue throughout the different stages of their life. However, for a more accurate and substantial base for this part of the analysis, an academic research (which is currently not available for these specifics and has not been done it would have largely shifted our focus) analyzing all the products in the market and coming up with an average life cycle behavior could be developed to support our assumptions.

The research mentioned before could also be extended to account for product discontinuation. This possibility was not accounted in our model as there were no signs of such an event happening in NN's communications. However, the chances of a product being discontinued exist, and a more comprehensive research on the probabilities and incidence of this event could be of useful to develop a contingency plan in the case of such an event.

Similarly, with the availability of more specific data than what was publicly available a more contrasted estimation could have been performed for the launch of new products. This further research could have aided us in our projection of Wegovy's future sales. It would also allow us to comprehend better the timings that a company manages in its pipeline, as the available information does not provide deep insights into this factor of a company's operations.

Recommendation

We have projected Novo Nordisk's operations until 2025, where we observe a stabilization in the company's growth. Our model has led us to an estimated share price for 2022 of DKK816.46 per B share. This figure represents an increase of 10.54% when comparing it to Novo Nordisk's share price one year earlier, on December 8th, 2021, where the share price stood at DKK738.60. This valuation is our base, and most probable scenario, and based upon these results we recommend **BUYING** this stock. This share price falls within our expectations, as Novo Nordisk's strengths made us confident it was currently undervalued. Despite the risks mentioned earlier for this specific equity research, that once mitigated could have some incidence in our result, we are confident in our final recommendation. This valuation is our base, and most probable scenario, and based upon these results we recommend **BUYING** Novo Nordisk stock.

Appendix

Abbreviations

AZ: AstraZeneca

BS: Balance Sheet

CAGR: Compound annual growth rate

CHI: China (Operations)

COGS: Costs of Goods Sold

DKK: Danish Krone

D&A: Depreciation and amortization

EBIT: Earnings before interests and taxes

EBITDA: Earnings before interests, taxes, depreciation and amortization

ELC: Eli Lilly & Co

EMEA: Europe, the Middle East and Africa (Operations)

EXP: Expired

EV: Enterprise Value

FDA: Food and Drug Administration

FAI: Fast-acting Insulin

GD: Growth Disorders

GLP-1: Glucagon-like peptide-1

HP: Haemophilia

HS: Human Insulin

IS: Income Statement

LAI: Long-acting Insulin

M&A: Mergers and acquisitions

NAO: North America (Operations)

(UK) NICE: National Institute for Health and Care Excellence

NN: Novo Nordisk

OC: Obesity Care

PPE: Property, plant and equipment

P/E: Price-earnings ratio

ROW: Rest of the World (Operations)

R&D: Research and development

USD: United States Dollar

WACC: Weighted-average cost of capital

WFH: Work from home

Figures

Appendix 1 - Reformulated Income Statement

Income Statement (in DKK million)	Accounting Financial Statements					Forecasted Financial Statements				
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Diabetes and Obesity Care Segment	88,949	92,877	93,904	102,840	108,020	119,332	132,062	134,052	144,899	155,311
Total Diabetes care	87,372	90,315	90,035	97,161	102,412	111,044	117,833	117,108	122,442	129,586
Total Obesity Care	1,577	2,562	3,869	5,679	5,608	8,288	14,228	16,943	22,457	25,725
Biopharm Segment	22,831	18,819	17,927	19,181	18,926	19,406	19,625	19,595	19,432	18,963
	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Core Operations										
Total Revenues	111,780	111,696	111,831	122,021	126,946	138,737	151,686	153,647	164,331	174,274
COGS	(17,183)	(17,632)	(17,617)	(20,088)	(20,932)	(22,892)	(24,725)	(24,584)	(25,964)	(27,535)
Gross Profit	94,597	94,064	94,214	101,933	106,014	115,846	126,961	129,064	138,367	146,739
Sales & Distribution Costs	(28,377)	(28,340)	(29,397)	(31,823)	(32,928)	(30,055)	(28,939)	(27,519)	(27,631)	(27,320)
R&D Costs	(14,563)	(14,014)	(14,805)	(14,220)	(15,462)	(17,342)	(19,719)	(19,974)	(21,363)	(22,656)
Administrative Costs	(3,962)	(3,784)	(3,916)	(4,007)	(3,958)	(3,885)	(4,247)	(4,302)	(4,601)	(4,880)
Core EBT	47,695	47,926	46,096	51,883	53,666	64,564	74,056	77,268	84,771	91,884
Statutory Taxes on Operational Income	(10,493)	(10,544)	(10,141)	(11,414)	(11,807)	(14,204)	(16,292)	(16,999)	(18,650)	(20,214)
Tax Adjustments	643	160	1,488	1,080	697	0	(0)	0	0	0
Operating Income After Tax	37,845	37,542	37,443	41,548	42,556	50,360	57,764	60,269	66,121	71,669
Financing Operations										
Financial Income	92	1,246	2,122	65	1,628	694	758	768	822	871
Financial Expenses	(726)	(1,533)	(1,755)	(3,995)	(2,624)	(1,665)	(1,820)	(1,844)	(1,972)	(2,091)
Tax Shield	(139)	(63)	81	(865)	(219)	(214)	(234)	(237)	(253)	(268)
Financial Expenses After Tax	(495)	(224)	286	(3,065)	(777)	(758)	(828)	(839)	(897)	(952)
Non-Core Operations										
Other Operating Income	737	1,041	1,152	600	460	0	0	0	0	0
Non-Core EBT	737	1,041	1,152	600	460	0	0	0	0	0
Taxes on Non-Operating Income	(162)	(229)	(253)	(132)	(101)	0	0	0	0	0
Non-Core Income After Tax	575	812	899	468	359	0	0	0	0	0
Other Comprehensive Income, net of T	(1,191)	1,795	(2,398)	1,165	(610)	0	0	0	0	0
Non-Core Income After Tax & OCI	(616)	2,607	(1,499)	1,633	(251)	0	0	0	0	0
Total Comprehensive Income	36,734	39,925	36,230	40,116	41,528	49,602	56,936	59,430	65,224	70,718

Appendix 2 – Accounting Income Statement

Income Statement (in DKK million)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Net Sales	111.780	111.696	111.831	122.021	126.946	138.737	151.686	153.647	164.331	174.274
COGS	17.183	17.632	17.617	20.088	20.932	22.892	24.725	24.584	25.964	27.535
Gross Profit	94.597	94.064	94.214	101.933	106.014	115.846	126.961	129.064	138.367	146.739
Sales and Distribution Costs	28.377	28.340	29.397	31.823	32.928	30.055	28.939	27.519	27.631	27.320
R&D costs	14.563	14.014	14.805	14.220	15.462	17.342	19.719	19.974	21.363	22.656
Administrative costs	3.962	3.784	3.916	4.007	3.958	3.885	4.247	4.302	4.601	4.880
Other operating income, net	737	1.041	1.152	600	460	0	0	0	0	0
Operating Profit (EBIT)	48.432	48.967	47.248	52.483	54.126	64.564	74.056	77.268	84.771	91.884
Financial Income	92	1.246	2.122	65	1.628	694	758	768	822	871
Financial Expenses	726	1.533	1.755	3.995	2.624	1.665	1.820	1.844	1.972	2.091
Profit before Income Taxes (EBT)	47.798	48.680	47.615	48.553	53.130	62.205	71.478	74.656	81.977	88.921
Income Taxes	9.873	10.550	8.987	9.602	10.992	13.990	16.059	16.762	18.397	19.946
Net Profit	37.925	38.130	38.628	38.951	42.138	48.215	55.419	57.894	63.581	68.975
Statement of Comprehensive Income (in DKK million)										
Net Profit	37.925	38.130	38.628	38.951	42.138	48.215	55.419	57.894	63.581	68.975
Other Comprehensive Income										
Remeasurements of retirement benefit obligations	-205	103	87	-187	-67	0	0	0	0	0
Exchange rate adjustments of investments in subsidiaries	-7	-632	491	226	-1.689	0	0	0	0	0
Realisation of previously deferred (gains)/losses of CF Hedges	682	1.955	-2.027	1.677	329	0	0	0	0	0
Deferred gains/(losses) on CF Hedges incurred during the period	-1.911	1.987	-1.677	-329	1.384	0	0	0	0	0
Other Items	-74	-577	-27	9	10	0	0	0	0	0
Other Comprehensive Income	-1.515	2.836	-3.153	1.396	-33	0	0	0	0	0
Tax on other comprehensive income, income/(expense)	324	-1.041	755	-231	-577	0	0	0	0	0
Other Comprehensive Income, net of tax	-1.191	1.795	-2.398	1.165	-610	0	0	0	0	0
Total Comprehensive Income	36.734	39.925	36.230	40.116	41.528	48.215	55.419	57.894	63.581	68.975

Appendix 3 - Reformulated Balance Sheet

Balance Sheet (in DKK million)	Accounting Financial Statements					Forecasted Financial Statements				
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Core Operations										
Operating Cash	374	377	313	310	255	416	455	461	493	523
Inventories	14,341	15,373	16,336	17,641	18,536	20,117	21,236	21,511	23,006	24,398
Trade Receivables	20,234	20,165	22,786	24,912	27,734	29,829	32,613	33,034	34,510	36,598
Tax Receivables	1,552	958	1,013	806	289	832	910	922	986	1,046
Core Current Assets	36,501	36,873	40,448	43,669	46,814	51,194	55,214	55,928	58,995	62,564
Trade Payables	6,011	5,610	6,756	6,358	5,717	6,937	7,584	7,682	8,217	8,714
Tax Payables	3,976	4,242	4,610	4,212	3,913	4,856	5,309	5,378	5,752	6,100
Other Liabilities	14,181	14,446	14,098	15,085	17,005	18,036	19,416	19,360	20,706	21,959
Short-Term Provisions	20,461	20,755	26,161	31,120	34,814	37,459	40,955	41,485	44,369	47,054
Core Current Liabilities	44,629	45,053	51,625	56,775	61,449	67,288	73,264	73,904	79,043	83,826
Net Core Current Assets	(8,128)	(8,180)	(11,177)	(13,107)	(14,635)	(16,094)	(18,051)	(17,977)	(20,048)	(21,261)
Intangible Assets	2,714	3,325	5,145	5,835	20,657	23,585	25,787	26,120	27,936	29,627
PPE	30,179	35,247	41,891	50,551	50,269	47,926	48,782	47,533	46,052	47,188
Core Non-Current Assets	32,893	38,572	47,036	56,386	70,926	71,511	74,569	73,653	73,988	76,815
Long-Term Provisions	3,370	3,302	3,392	4,613	4,526	4,162	4,551	4,609	4,930	5,228
Core Non-Current Liabilities	3,370	3,302	3,392	4,613	4,526	4,162	4,551	4,609	4,930	5,228
Net Core Non-Current Assets	29,523	35,270	43,644	51,773	66,400	67,349	70,018	69,044	69,059	71,587
Total Core Invested Capital	21,395	27,090	32,467	38,667	51,765	51,256	51,968	51,067	49,010	50,325
Non-Core Operations										
Other Receivables and Prepayment	4,420	2,428	3,090	3,434	4,161	4,162	4,551	4,609	4,930	5,228
Derivative Financial Instruments	529	2,304	204	188	2,332	1,387	1,517	1,536	1,643	1,743
Non-Core Current Assets	4,949	4,732	3,294	3,622	6,493	5,549	6,067	6,146	6,573	6,971
Derivative Financial Instruments	2,578	309	2,024	734	1,365	1,526	1,669	1,690	1,808	1,917
Non-Core Current Liabilities	2,578	309	2,024	734	1,365	1,526	1,669	1,690	1,808	1,917
Net Non-Core Current Assets	2,371	4,423	1,270	2,888	5,128	4,023	4,399	4,456	4,766	5,054
Investments in Associated Compan	809	784	531	474	582	694	758	768	822	871
Deferred Income Tax Assets	2,683	1,941	2,893	4,121	5,865	2,913	3,185	3,227	3,451	3,660
Other Receivables and Prepayment	0	0	0	841	674	277	303	307	329	349
Other Financial Assets	1,388	978	1,242	1,334	1,066	1,387	1,517	1,536	1,643	1,743
Non-Core Non-Current Assets	4,880	3,703	4,666	6,770	8,187	5,272	5,764	5,839	6,245	6,622
Deferred Income Tax Liabilities	13	846	118	80	2,502	416	455	461	493	523
Retirement Benefit Obligations	1,451	1,336	1,256	1,334	1,399	1,665	1,820	1,844	1,972	2,091
Non-Core Non-Current Liabilities	1,464	2,182	1,374	1,414	3,901	2,081	2,275	2,305	2,465	2,614
Net Non-Core Non-Current Assets	3,416	1,521	3,292	5,356	4,286	3,191	3,489	3,534	3,780	4,008
Total Non-Core Invested Capital	5,787	5,944	4,562	8,244	9,414	7,214	7,888	7,990	8,545	9,062
Total Invested Capital	27,182	33,034	37,029	46,911	61,179	58,470	59,856	59,056	57,555	59,388
Financing Operations										
Excess Cash	18,316	18,475	15,325	15,166	12,502	16,648	19,719	21,511	24,650	27,884
Short-Term Borrowings	229	1,694	515	1,474	7,459	994	1,018	1,004	978	1,010
Long-Term Borrowings	0	0	0	3,009	2,897	8,946	9,158	9,036	8,806	9,086
Total Borrowings	229	1,694	515	4,483	10,356	9,940	10,175	10,040	9,784	10,096
Total Shareholder's Equity	45,269	49,815	51,839	57,593	63,325	65,179	69,399	70,527	72,421	77,176
						17.00%	17.00%	17.00%	17.00%	17.00%
Total Financing operations	27,182	33,034	37,029	46,911	61,179	58,470	59,856	59,056	57,555	59,388

Appendix 4 - Accounting Balance Sheet

Balance Sheet (in DKK million)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
ASSETS										
Intangible Assets	2.714	3.325	5.145	5.835	20.657	23.585	25.787	26.120	27.936	29.627
PPE	30.179	35.247	41.891	50.551	50.269	47.926	48.782	47.533	46.052	47.188
Investments in associated companies	809	784	531	474	582	694	758	768	822	871
Deferred Income Tax Assets	2.683	1.941	2.893	4.121	5.865	2.913	3.185	3.227	3.451	3.660
Other Receivables and Prepayments	0	0	0	841	674	277	303	307	329	349
Other Financial Assets	1.388	978	1.242	1.334	1.066	1.387	1.517	1.536	1.643	1.743
Total Non-Current Assets	37.773	42.275	51.702	63.156	79.113	76.783	80.333	79.492	80.233	83.437
Inventories	14.341	15.373	16.336	17.641	18.536	20.117	21.236	21.511	23.006	24.398
Trade Receivables	20.234	20.165	22.786	24.912	27.734	29.829	32.613	33.034	34.510	36.598
Tax Receivables	1.552	958	1.013	806	289	832	910	922	986	1.046
Other Receivables and Prepayments	4.420	2.428	3.090	3.434	4.161	4.162	4.551	4.609	4.930	5.228
Derivative Financial Instruments	529	2.304	204	188	2.332	1.387	1.517	1.536	1.643	1.743
Cash at Bank	18.690	18.852	15.638	15.475	12.757	17.065	20.174	21.972	25.143	28.407
Total Current Assets	59.766	60.080	59.067	62.456	65.809	73.392	81.000	83.584	90.218	97.419
Total Assets	97.539	102.355	110.769	125.612	144.922	150.175	161.334	163.076	170.451	180.857
EQUITY & LIABILITIES										
Share Capital	510	500	490	480	470	606	646	656	674	718
Treasury Shares	-9	-11	-11	-10	-8	-12	-13	-13	-13	-14
Retained Earnings	46.111	48.977	53.406	57.817	63.774	65.739	69.996	71.134	73.043	77.839
Other Reserves	-1.343	349	-2.046	-694	-911	-1.155	-1.229	-1.249	-1.283	-1.367
Total Equity	45.269	49.815	51.839	57.593	63.325	65.179	69.399	70.527	72.421	77.176
Long-Term Borrowings	0	0	0	3.009	2.897	8.946	9.158	9.036	8.806	9.086
Deferred Income Tax Liabilities	13	846	118	80	2.502	416	455	461	493	523
Retirement Benefit Obligations	1.451	1.336	1.256	1.334	1.399	1.665	1.820	1.844	1.972	2.091
Long-Term Provisions	3.370	3.302	3.392	4.613	4.526	4.162	4.551	4.609	4.930	5.228
Total Non-Current Liabilities	4.834	5.484	4.766	9.036	11.324	15.189	15.984	15.950	16.201	16.929
Short-Term Borrowings	229	1.694	515	1.474	7.459	994	1.018	1.004	978	1.010
Trade Payables	6.011	5.610	6.756	6.358	5.717	6.937	7.584	7.682	8.217	8.714
Tax Payables	3.976	4.242	4.610	4.212	3.913	4.856	5.309	5.378	5.752	6.100
Other Liabilities	14.181	14.446	14.098	15.085	17.005	18.036	19.416	19.360	20.706	21.959
Derivative Financial Instruments	2.578	309	2.024	734	1.365	1.526	1.669	1.690	1.808	1.917
Short-Term Provisions	20.461	20.755	26.161	31.120	34.814	37.459	40.955	41.485	44.369	47.054
Total Current Liabilities	47.436	47.056	54.164	58.983	70.273	69.808	75.951	76.598	81.829	86.752
Total Liabilities	52.270	52.540	58.930	68.019	81.597	84.997	91.934	92.548	98.030	103.681
Total Equity & Liabilities	97.539	102.355	110.769	125.612	144.922	150.175	161.334	163.076	170.451	180.857

Appendix 5 – Novo Nordisk Net Leverage

NN Net Leverage	2016	2017	2018	2019	2020	AVG
Net Debt	(18.461)	(17.158)	(15.123)	(10.992)	(2.401)	(12.827)
EBITDA	51.625	52.149	51.173	58.144	59.879	54.594
Net Leverage	-35,76%	-32,90%	-29,55%	-18,90%	-4,01%	-24,23%

Appendix 6 – Peers Net Leverage

Net Leverage Analysis Peers	2016	2017	2018	2019	2020	AVG
Eli Lilly & Co.	86,00%	162,00%	56,00%	207,00%	175,00%	137,20%
Astrazeneca PLC	136,00%	183,00%	174,00%	157,00%	148,00%	159,60%
Sanofi	84,00%	40,00%	184,00%	148,00%	48,00%	100,80%
Pfizer Inc.	136,00%	118,00%	112,00%	209,00%	218,00%	158,60%
Peers AVG	110,50%	125,75%	131,50%	180,25%	147,25%	139,05%

Appendix 7 – Sales Drivers Projections

Drivers by BU (in DKK million)	Accounting Financial Statements					Forecasted Financial Statements				
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Diabetes & Obesity Care Segment										
Tresiba	4,056	7,327	8,035	9,259	8,968	9,976	11,217	12,826	12,773	13,818
Xultophy	207	729	1,614	2,210	2,444	2,792	3,414	4,287	4,230	5,163
Levemir	17,083	14,118	11,195	9,307	7,027	6,597	6,456	6,205	5,843	5,406
Total Long-acting Insulin	21,346	22,174	20,844	20,776	18,439	19,366	21,087	23,317	22,847	24,388
Ryzodeg	196	492	714	993	1,291	1,559	1,880	2,291	1,811	2,239
NovoMix/NovoLog Mix	10,482	10,257	9,480	9,585	9,634	9,804	9,974	10,146	10,321	10,496
Total Premix Insulin	10,678	10,749	10,194	10,578	10,925	11,363	11,854	12,437	12,132	12,736
Fiasp	0	99	590	1,243	1,385	1,761	2,141	2,534	2,918	3,329
NovoRapid/NovoLog	19,945	20,025	18,763	18,060	16,928	17,027	17,104	17,125	17,142	17,136
Total Fast-acting insuling	19,945	20,124	19,353	19,303	18,313	18,787	19,245	19,659	20,060	20,465
Human Insulin	11,090	10,072	9,265	9,036	8,873	9,050	9,176	8,963	8,946	8,863
Total Insulin	63,059	63,119	59,656	59,693	56,550	58,565	61,363	64,377	63,985	66,452
Victoza	20,046	23,173	24,333	21,934	18,747	18,214	16,043	6,967	6,291	5,597
Ozempic	0	0	1,796	11,237	21,211	27,166	31,632	35,054	39,056	41,751
Rybelsus	0	0	0	50	1,873	2,836	4,288	5,944	8,068	10,455
Total GLP-1	20,046	23,173	26,129	33,221	41,831	48,216	51,962	47,965	53,415	57,803
Other Diabetes Care	4,267	4,023	4,250	4,247	4,031	4,263	4,508	4,767	5,041	5,331
Total Diabetes care	87,372	90,315	90,035	97,161	102,412	111,044	117,833	117,108	122,442	129,586
Obesity Care (Saxenda + Wegovy)	1,577	2,562	3,869	5,679	5,608	8,288	14,228	16,943	22,457	25,725
Total Diabetes & Obesity Care	88,949	92,877	93,904	102,840	108,020	119,332	132,062	134,052	144,899	155,311
Biopharm segment										
Novo Seven	9,492	9,206	7,881	8,119	7,203	7,145	7,017	6,741	6,318	5,672
Novo Eight	851	1,103	1,354	1,525	1,462	1,461	1,460	1,460	1,461	1,462
Other Haemophilia	129	160	341	637	997	1,133	1,209	1,250	1,293	1,303
Total Haemophilia	10,472	10,469	9,576	10,281	9,662	9,739	9,687	9,452	9,072	8,437
Norditropin	8,770	6,655	6,834	7,275	7,704	7,993	8,141	8,215	8,290	8,305
Other Biopharm	3,589	1,695	1,517	1,625	1,560	1,674	1,797	1,928	2,069	2,221
Total Biopharm	22,831	18,819	17,927	19,181	18,926	19,406	19,625	19,595	19,432	18,963
Total Sales	111,780	111,696	111,831	122,021	126,946	138,737	151,686	153,647	164,331	174,274
Total Sales in Units (mn)	944	929	836	856	795	812	827	834	837	828

Appendix 8 - DCF Valuation

in DKK million	2020	2021	2022	2023	2024	2025
EBIT*(1-Tax Rate)	37,372	42,692	49,727	52,256	57,876	63,037
Amortization	1,446	5,660	6,060	6,138	6,565	6,962
Capex	4,025	1,827	5,100	2,886	2,526	5,242
ΔNWC	3,353	7,583	7,608	2,584	6,634	7,201
Free Cash Flow	31,440	38,943	43,078	52,925	55,281	57,556
Factor		1.00	0.94	0.88	0.82	0.77
Discounted Free cash Flow		38,943	40,318	46,360	45,322	44,164

WACC	6.85%
Growth Rate	4.28%
Terminal Value	1,682,829

NPV Discounted FCF	1,897,937
NPV Excess Cash	73,849
NPV Net Debt	(43,476)
# Shares	2,287

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Report Recommendations

Buy	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
Hold	Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period.
Sell	Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period.

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