Cochlear Limited

Recommendation

Using intensive market research and independent valuations, we consider Cochlear Limited to be a profitable health care company that maintains a strong competitive advantage within the hearing loss solutions/Implant industry. Initially, we believe that Cochlear's commitment to globalisation and R&D will propel its potential opportunities beyond its current competitors. Our Composite Valuation model is primarily based on Cochlear's historical operations which produced an estimated share price of $178.75. With an active share price of $197.00, our recommendation to short-term investors would to be SELL and capitalise on the over-valuation. However, for long-term investors, we suggest that you HOLD and capitalise on companies future earnings.

Backgrounds Information

Based in Sydney Australia Cochlear Limited (COH) is a global leader that designs, manufactures and supplies of innovative hearing solutions. Cochlear is the 5th largest healthcare stock listed on the ASX and is among the S&P ASX top 50, with a market capitalisation well over $12B. The hearing aid and implant manufacturing industry are exposed to the very high level of competition, the main competitors that will be examined in this valuation are Sonova Holding AG and Demant A/S. Together these companies hold almost 50 per cent of the market share within the hearing implant industry. The global Cochlear implant market was valued at approximately USD$1.6B in 2018 and is expected to grow at an annual rate of approximately 11% over the next 10 years. The expected growth in this industry Is mostly due to technological advancements, increased penetration via larger geographical reach and government subsidies. Cochlear is at the forefront of this industry with an estimated 60% of market share. This is attributable to its diversified range of products, significant R&D and a large global presence. Leading into 2020 Cochlear's sales revenue had grown by 7% and total revenue had exceeded $1.4B globally. Cochlear's largest market in America, with the region generating approximately 47% of the total revenue. While the Asia Pacific only accounted for 16% of the total revenue this is expected to grow significantly with the company establishing a new manufacturing plant in China.

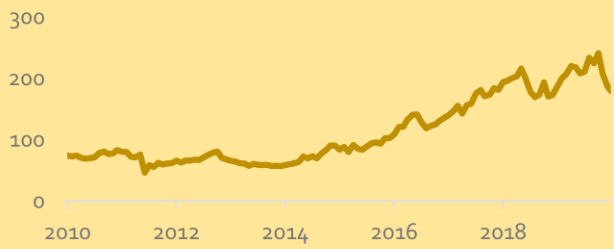
Current Price: $197.00 **ASX**: COH.AX

Valuation: $ 178.75 **Industry**: Health Care

Dividend Yield: 1.35%

Recommendation: SELL

Price Performance ($)



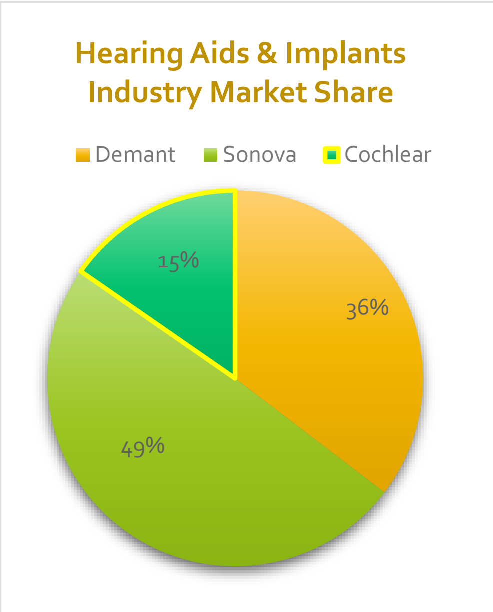
Historical Revenue

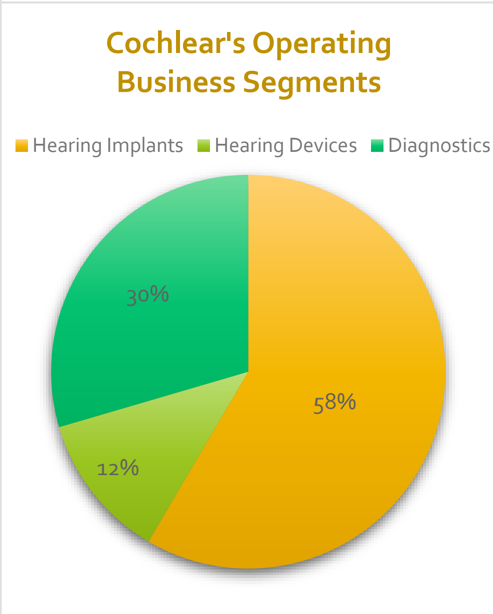
Industry Outlook

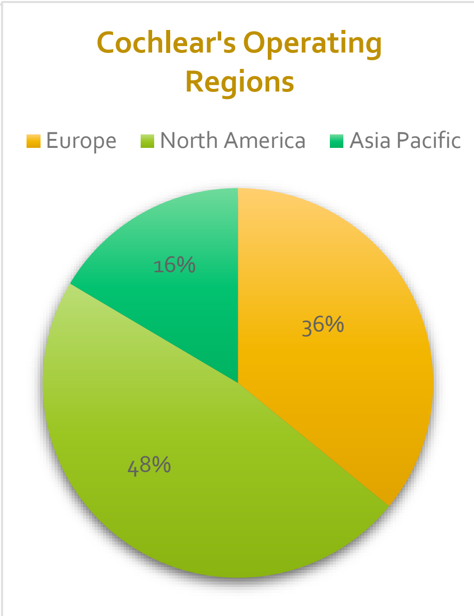
Based in favourable industry dynamics Cochlear's current position relative to its competitors Sonova and Demant appears strong. This includes the minimal threat of new entrants, low bargaining power of both suppliers and buyers and marginalised product substitution. Cochlear operates in a heavily specialised, capital intensive industry, largely based on the huge resources required for ongoing R&D. This makes it particularly difficult for any new entrants to establish themselves in the market. When considering the current circumstances, the threat of new viable competitors is very minimal. In terms of manufacturing, Cochlear's strong market presence accounts for roughly 50% of all hearing implants supplied globally. However, The World Health Organisation states that the existing supply of Cochlear implants and hearing aids only fulfil 10% of the aggregated world demand. This unmet demand across the globe presents a major opportunity for growth in the hearing implant industry, with Cochlear well placed to improve its market penetration. Since Cochlear provides a large majority of this supply both within Australia and globally, the influence of the consumer relative to the company is minimised as it will take more time and production to meet the demand for hearing solutions. Irrespective of the current COVID-19 pandemic This trend should remain constant for the foreseeable future.

Forecasted Revenues

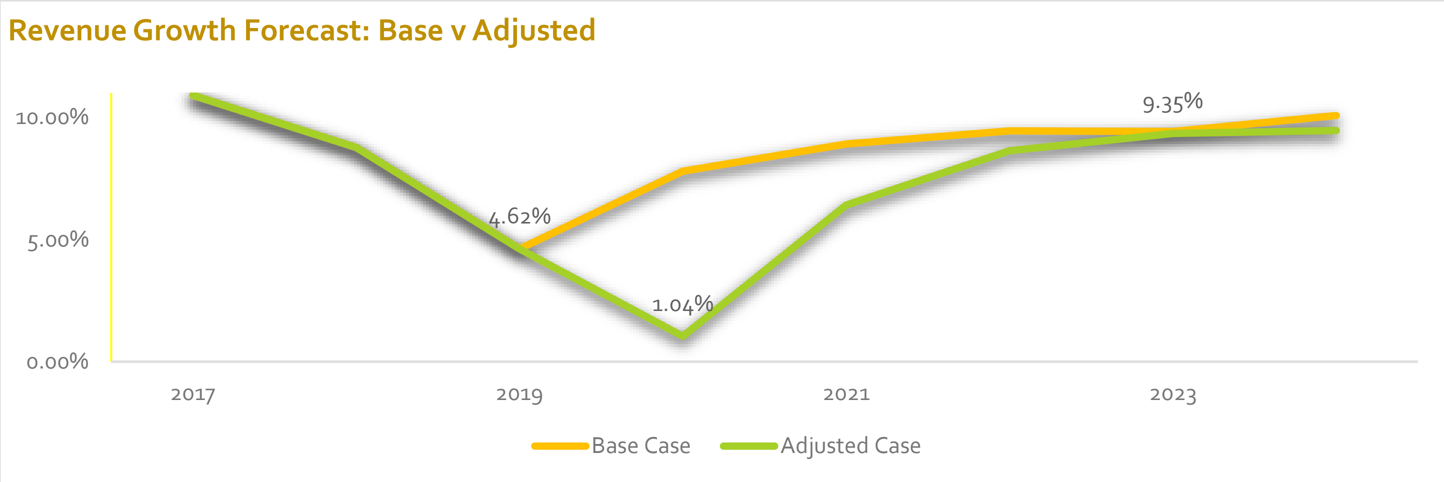
Cochlear's revenue is separated into three distinct segments, Cochlear Implants, Cochlear Acoustics and Upgrades, with all these segments operating in 3 major regions, Americas, Europe and the Middle East, and the Asia Pacific. Cochlear operates globally through various regional subsidiaries of the same name.







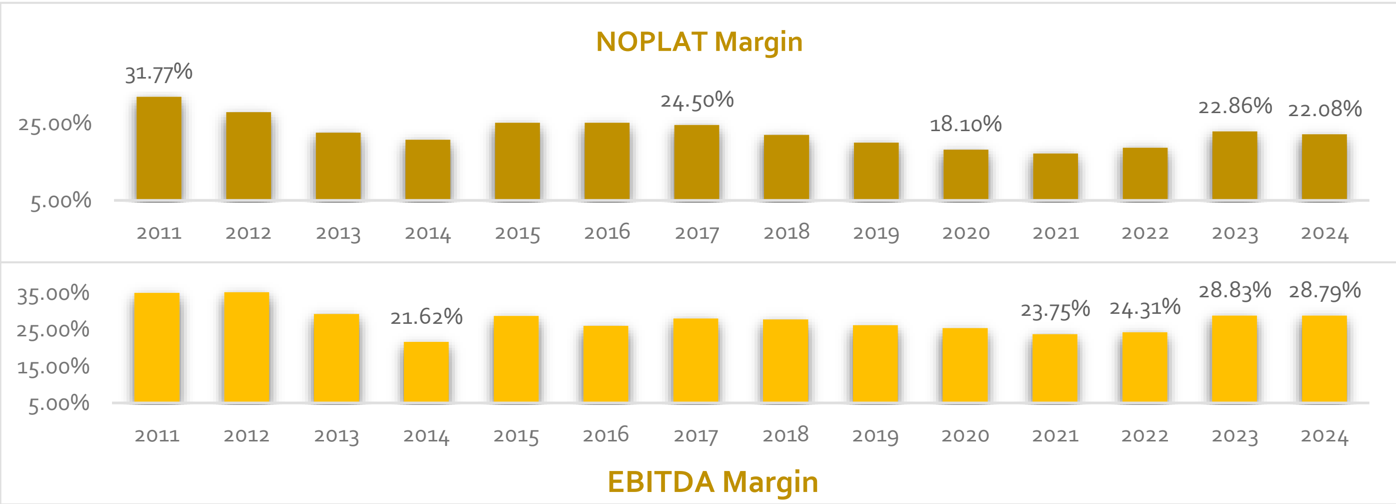
Cochlear's revenue is largely dependent on its cochlear implant business, taking up 58% of their total business operations. Furthermore, Cochlear is also the leading cochlear implant manufacturer and retailer, holding 62.9% of the market share, easily to dominating competitors in the market. Furthermore, Cochlear has engaged with all 3 regions, with its largest operating region to be in the Asia Pacific, especially after the opening of the factory in China, which is identified as an emerging market in the region. We have used a top-down approach based on fundamental drivers of growth, coupled with the effects of the Covid-19 pandemic, inhibiting organic growth from restrictions in place globally.



The revenue forecast was generated by separating Cochlear's business segments and analysing the historical data with the forecasting in terms of business regions where Cochlear operates. The forecast model was projected individually with data available to us regarding prevalence in hearing loss in both children and adults, according to the Gross National Income of the country. The distinction was made in consideration with the prevalence in hearing loss, and the proportion of Cochlear's business segmentation. Consideration for the penetration rate of Cochlear's market share within each region was allowed when producing the growth rates for each year.

Margins

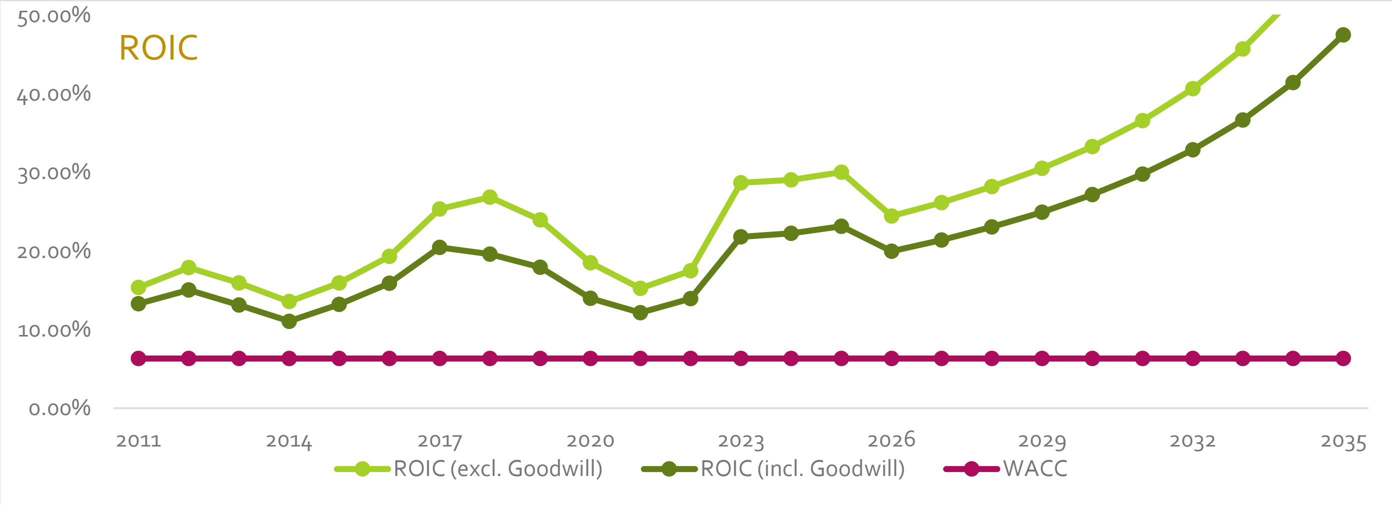
The Covid-19 pandemic has affected all industries around the world while manufacturing and retailing were held to a pause, we note that a large amount of business by companies in this industry would suffer from the pause of elective surgery procedures. We forecast that this will take a large hit to Cochlear in the first half of 2020. A pickup from the fall of the pandemic will occur once operations are resuming. Furthermore, the newly approved Osia 2 Implant by the FDA will boost sales in the American region. We realise that the industry is sensitive and customer retention is unstable. We believe that the organic growth from 2021 onwards will meet with the base case.



Cochlear's EBITDA margins have been clear since 2015, holding a central EBITDA margin of 25%. The drop of EBITDA in 2014 was due to the provisions of the patent dispute with AB and AMF in 2007. This was just after the court ruled against Cochlear, in favour of AB and AMF for A$128mil. We predict the EBITDA of Cochlear to increase and stay constantly up to 28.74% in 2024, constant over the long term. Furthermore, we predict further NOPLAT growth in 2020, forecasting 18.1%, and will continue to grow in 2023 and 2024. We predict long term stability with the NOPLAT Margin as with the EBITDA margin above, maintaining Cochlear's revenue and market share growth into the future.

Return on Invested Capital

The Return on Invested Capital (ROIC) evaluates a company's ability to translate potential investments into profitable returns. The figure below illustrates the forecasted ROIC for Cochlear with explicit forecasting period of (2020 – 2024). Our model forecasts an initial decline in ROIC leading into 2020 this was a purposeful adjustment to account for the COVID-19 pandemic.

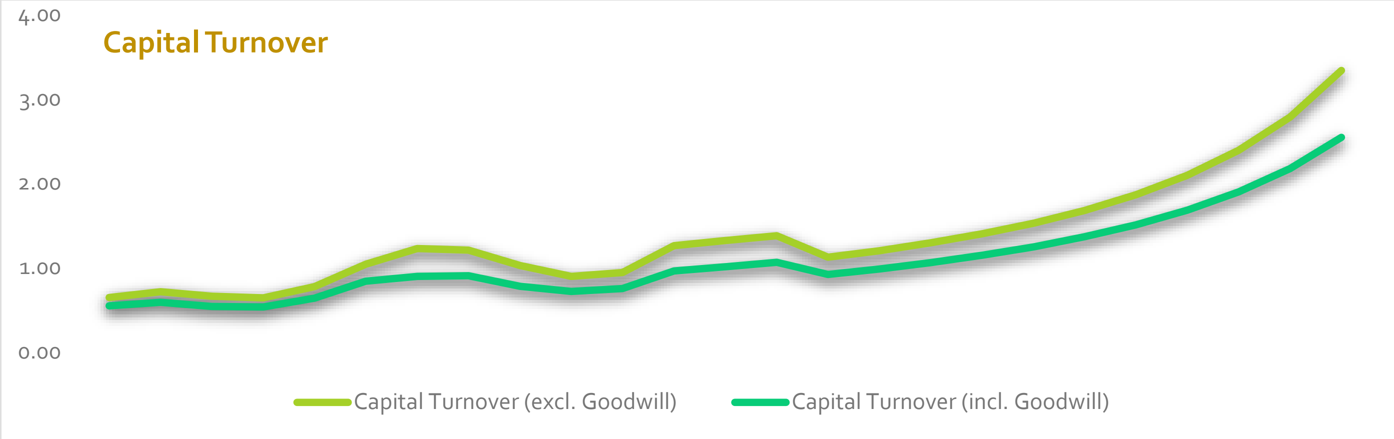


As stated in forecited revenues the pandemic will limit Cochlear's operational and investment capabilities in2020. The main implications are that Cochlear's manufacturing will be suspended and associated consumer demand will be drastically reduced. Therefore, to reflect these implications our valuation model implies an initial decline Cochlear's ROIC. However, after the 2020 period, our model forecasts sustainable profitability and growth. The basis for this projection was Cochlear ability to use its market share to pursue new growth opportunities. Our research suggests these growth opportunities will translate into strong positive returns. Some of these associated opportunities include;

- Increasing the company's investment in R&D by 10% to $184m in 2019 (13% of sales revenue). This new investment could potentially diversify the current product line even more and increase operational efficiency (i.e. manufacturing and design). This opportunity allows Cochlear to cut its marginal costs or increase its marginal productivity in efforts to maintain a competitive advantage over its competitors
- In November 2019, Cochlear invested (AUD $21 million) in Nyxoah S.A., a medical device company focused on the development of nerve stimulation therapy for the treatment of obstructive sleep Apnea. The investment could potentially diversify Cochlear's core technologies in an effort to gain long-term leverage in totally implantable hearing solutions.

Capital Turnover

The Capital Turnover ratio measures how well Cochlear utilises its working capital to sustain its current profitability. The figure below illustrates the forecasted capital turnover within the explicit forecasting period of (2020 – 2024). The associated trend is very comparable to the ROIC measure indicating an initial decline leading into 2020.



Similarly, after 2020 Cochlear shows sustainable profitability with a continually rising trend in capital turnover. Our research indicates that a rise in capital turnover can be linked to Cochlear's capital expenditure and revenue growth.

- Leading into 2020 cochlear was expected to increase its Capital expenditure by $180 million primarily for the continued development of its China manufacturing facility, fitting of its new office in Denver Colorado as well as investments in new IT platforms to strengthen the companies connected health, digital and cybersecurity capabilities.
- Subsequently, capital expenditure was then expected is expected to drop to around $100 million in 2021.

Despite our model adjusting for these increases in capital expenditure Cochlear capital turnover continues to trend positively. This implies that the Cochlear can efficiently capitalise on investments such as the china manufacturing facility and new IT systems to generate greater returns.

Composite Valuation

To obtain a more accurate and robust valuation we implemented a composite of external valuations independent of our initial DCF for Cochlear. Specifically, we integrated the Multiple Based Valuations of Price to Earnings (P/E) and Enterprise Value Multiple (EVM). The composite valuation is structured such as each measure is assigned a corresponding weight that reflects influence.

Valuation Method	Share Price	Weight
DCF	$ 177.77	50%
Absoulte P/E	$ 179.94	30%
Relative P/E	$ 180.82	10%
EVM	$ 178.03	10%
Aggregate	**$ 178.75**	100%

We consider our initial DCF Valuation to be most influential approach in measuring Cochlear's value. Our reasoning for the DCF approach is the extensive detail that can be incorporated in forecasting each line item particularly revenue. Subsequently, the DCF approach can be easily adjusted to capture all the major business/industry assumptions about Cochlear. However, the DCF approach is not a perfect technique as it has its limitations. The key limitation is that Cochlear's discount factor is determined by CAPM and WACC. This is an unrealistic procedure as WACC cannot capture changes in forecasted risk and assumes a constant business risk for Cochlear. Therefore, the DCF valuation was assigned a weight of 50% to offset these limitations.

The remaining 50% was assigned to the external multiple based valuations, the valuation measure was selected based on their relative simplicity and that they incorporate actual market transactions. However, the multiples valuations presented have each their associated limitations. The P/E and EVM disregard the intrinsic value and future position for Cochlear's business operations. As such these valuation method can be easily misinterpreted with limited capabilities for conclusive comparisons. The EVM was given significantly lower weighting as the measure heavily relies on book values which does not reflect the current competitiveness of Cochlear's industry. Therefore, the P/E and EVM valuation measure were assigned a weight of 40% and 10% respectively.

DCF Valuation

A key assumption that should be considered in our DCF valuation is how we substantiated Cochlear risk relative to its industry and competitors. A table of the financial summary can be found in Appendix Table 1. Within the DCF we had decided to estimate our using monthly historical returns opposed to weekly returns. We feel that in the short term Cochlear's risks have increased due to the ongoing COVID-19 pandemic, especially in relation to reimbursements and foreign exchange rate fluctuations.

- We fear that many of Cochlear's manufacturing will be gradually decreased and eventually suspended in 2020.
- Similarly, in a macroeconomic viewpoint future customer in the short to medium term will not be able to afford to services due to the aftereffects of the COVID-19 pandemic, i.e. increasing unemployment and government spending being cut in relation to Cochlear implants.

Furthermore, we fell that because Cochlear has only entered into short term forward exchange contracts to hedge short term fluctuations, the company has unknowingly left itself open to long term fluctuations which might arise as a consequence of a second wave of the COVID-19 pandemic. Based on these factors regarding Cochlear's exposure to risk we decided to implement the DCF approach using a monthly beta estimate of 0.85.

P/E Valuation Results

To accurately value Cochlear using the P/E, we had to consider the principle components of Earnings per Share (EPS), Absolute P/E and Relative P/E.

Earnings per Share (EPS)

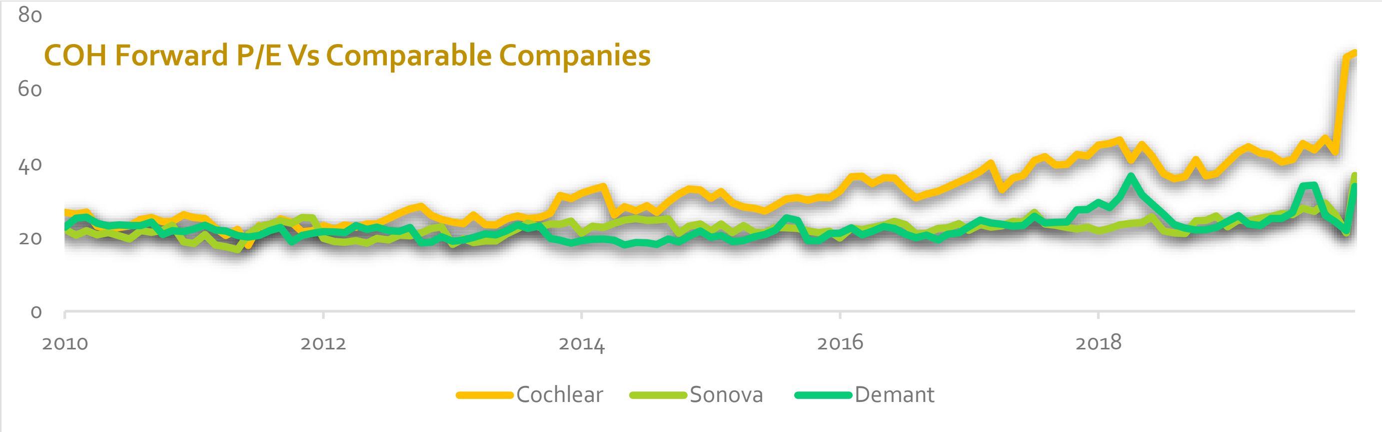
Before the starting our P/E valuation we needed to determine Cochlear's EPS relative to our normalised forecasted earnings. Normalised earnings provide a more accurate measure for Cochlear's financial health as the process removes the effects of seasonality, unusual transactions and reconciliation between tax expense. This can be seen in Appendix Table 3.

- Cochlear's EPS was determined by normalising the reported earnings for the 2018 and 2019 and applying the same principle to the forecasted earnings for 2020. A majority of the normalisation procedure was accounted for within our forecast drivers. However, the only adjustment required is was a deduction for an R&D allowance that Cochlear receives in a tax relief scheme.

Items such as the 'other operating revenue' and impairment of assets are set to zero. We believe these items are considered volatile and non-maintainable items which cannot be forecasted into the future. After integrating these items into the forecasted earnings, the diluted normalized EPS for 2020 earning was calculated to be $4.25 per share.

Absolute P/E

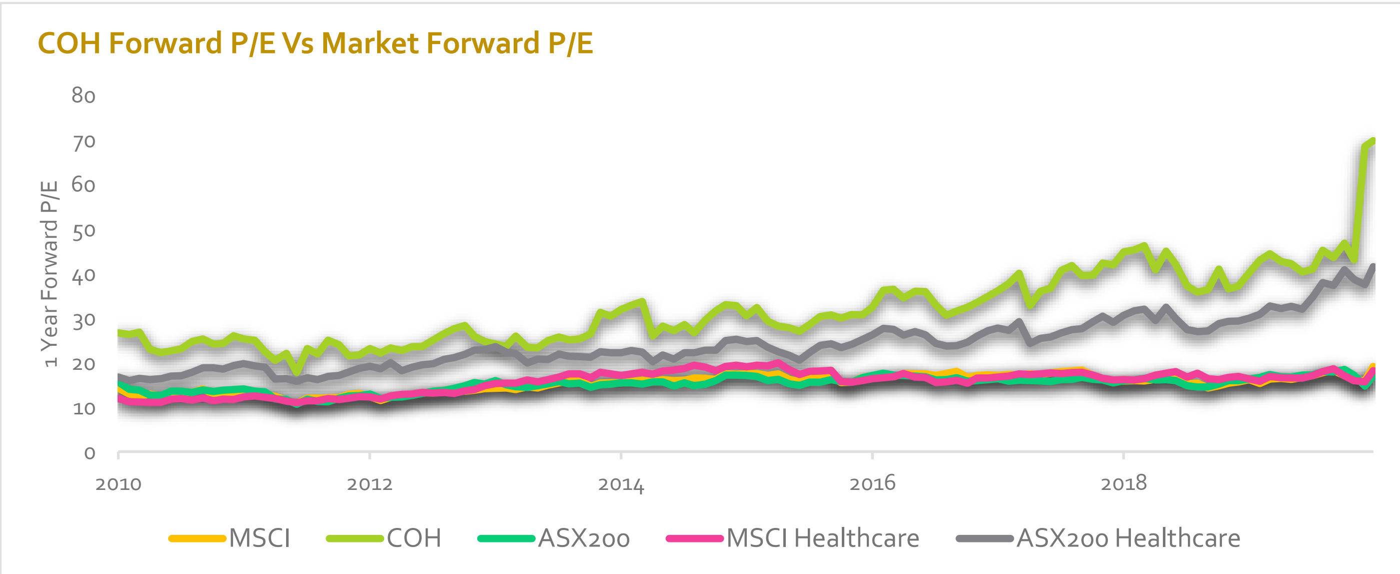
P/E valuation consists of three distinct determinants that influence Cochlear's projected valuation they are the cost of capital, quality of earning and growth potential. Based on our industry we claim that dominant market share and advancement in R&D allows Cochlear to sustain a relatively low cost of capital relative to its competitors. Subsequently, Cochlear has strong potential growth for as the current supply implants and hearing aids only fulfil 10% of the aggregated world demand. Based on these determinants we believe Cochlear should be valued at a premium relative to Sonova and Demant this is tabulated in appendix Table 3.



The provided figure justifies this conclusion by illustrating Cochlear's 1 year forward P/E against its competitors. We have selected the 3-year average as our associated measure for Cochlear as we believe the latest 1 year forward P/E is not an accurate representation of Cochlear's potential business earnings. Our main justification for selecting a 3-year average for is that Cochlear's historical forward P/E has strong fluctuation indicated by the standard deviation of 8.75 which is significantly higher than that of Sonova and Demant. Therefore, the average P/E measure was used in the valuation to offset the fluctuations in earnings. Similarly, we also believe the 3-year average is skewed slightly towards low-end which is an indicative the current implications regarding the COVID-19 pandemic. Therefore, using an absolute P/E of 42.31 and EPS of 4.25, Cochlear's share price is valued at $179.94.

Relative P/E

Our industry outlook establishes that Cochlear is at the forefront of the implant/hearing solutions industry with an estimated market share of. Therefore logically, we should recognise that changes in the Australian Market, Australian Healthcare, International Healthcare and World market would have implications on Cochlear's valuation. Therefore, to gauge Cochlear's relativity associated weights were assigned to each market/industry.



The weight 60% was given to the Australian Healthcare sector as Cochlear maintains operational control of nearly 75% of all hearing implants in Australia. The is justified in the figure above as Cochlear's forward P/E follows a comparable trend to the ASX200 Healthcare. The remaining weight was distributed equally as Cochlear generates its earnings through a domestic and global capacity. Therefore, using a relative P/E of 42.51 and EPS of 4.25, Cochlear's share price is valued at $180.82.

EVM Valuation Results

The calculation of the EVM (enterprise valuation multiple) was broken up into the three distinct determinants the historic EVM of Cochlear, the comparable companies Sonova and Demant and the Fundamental Determinants. The final EVM was found by creating a weighted average of the three components. The fundamental determinants have the largest weighting of 85%, as we believe it is indicated if the current COVID-19 pandemic and the positive direction Cochlear is forecasted. The historic component was given a weighting of 10% as it relies too heavily on the company's book values which does not reflect the current Industry dynamics. A low weight of 5% was given to comparable companies is due to their fundamental differences, as Sonova and Demant are not at specialised relative to Cochlear. Applying this final EVM gives a share price of $166.96,

Method	EVM	Weight
Historic	28.64	10%
Comparable Companies	18.38	5%
Fundamental Determinants	42.90	85%
Final EVM	40.25	100%

Scenario Analysis

While the base case in our forecast drivers and valuation considers the impact of the Covid-19 pandemic and the disruptions to Cochlear's growth, we recognise that there may be scenarios that will affect the valuation of Cochlear's performance going into the future, given the circumstances.

The three scenarios considered for our composite valuation include:

- Patent Infringement Dispute with AMF and AB.
- Threat from Competitors within the Market
- Government Corporate Tax Rate Changes

Our scenario analysis has valued Cochlear based on the 3 scenarios listed below. We have given each of the scenarios a probability of success, giving the valuation a share price of $176.57, lower than the composite share price above.

Scenario Analysis		
Valuation Method	Share Price	Weight
Scenario 1	$ 171.44	15%
Scenario 2	$ 177.24	35%
Scenario 3	$ 177.64	50%
Aggregate	$ 176.57	100%

Patent Infringement Dispute

The Alfred E. Mann Foundation for Scientific Research (AMF) with Advanced Bionics (AB), who is partly owned by Sonova Limited, one of Cochlear's biggest competitors in the industry, brought Cochlear America, a subsidiary of Cochlear Limited into legal proceedings over the infringement of 2 currently expired patents in Cochlear's implant and aid products in 2007. After a long-standing legal dispute, the United States District Court for Central California decided in favour of AMF and AB, ordering Cochlear to pay U$131.2mil at the time, or A$138mil in damages to AMF and AB. This decision was appealed by Cochlear Limited and ruled upon in 2018, where the decision was ruled in favour towards AMF and AB, forcing Cochlear to pay U$268mil or A$438mil in damages. Cochlear set aside provisions of $21.7mil to handle the legal dispute, but the appeal decision for the 2014 ruling was over 17 times more than what Cochlear has anticipated. This decision to double the initial fine was because of "willful infringement" of the patent in question. Furthermore, AMF seeks approximately U$123mil (A$201mil) in pre-judgment interest and approximately U$14.5mil (A$23.7mil) in attorney fees and costs, in addition to the $268mil USD fine. This is still being decided by the United States District Court for Central California. Cochlear appealed the 2018 decision but to no avail, Cochlear has expressed interest to appeal the decision to the US Full Court of Appeals.

The scenario analysis begins with the possibility with the potential fines, legal fees and interest that Cochlear may have to pay as a result of the patent infringement. Noting that Cochlear will enter into debt agreements to repay the fine, we made changes to long term debt, along with carrying cost of long-term debt would equate to a higher interest expense, and while WACC would remain in perpetuity, Cochlear will adopt a dividend/earnings ratio to repay the debt in the future. An addition in long-term provisions will also be included for this setback. We assume that this scenario will occur in 2021.

	A	B	C	D
Enterprise Value	11,492	11,493	11,494	11,571
Stock Price	$ 166.27	$ 170.18	$ 170.18	$ 179.12
Probability	25%	25%	25%	25%

It is noted that as the amount payable decreases, we see a rise in stock price, this is due to the increasing level of provision, coupled with the increasing interest expense. Although the dividend/earning ratio is reduced, the magnitude of the liability exceeds the level of savings Cochlear can make. We have assigned each outcome an equal quarter chance (25%) that may happen, as the allowance of the appeal means that the outcome is not yet decided and cannot be predicted. The scenario share price of Cochlear is $171.44, this low valuation compared to the other techniques is because of the large number of provisions and liability Cochlear may have to pay (almost 50% of revenue in FY19 if Outcome A occurs).

A

Full Court of Appeals rules **against** earlier decision of patent infringement, US District Court rules in favour of **AMF** and **AB**.

$ 438 $ 201 $ 23.7 **$ 663**

B

Full Court of Appeals rules **against** earlier decision of patent infringement, US District Court rules in favour of **Cochlear**.

$ 438 **$ 438**

C

Full Court of Appeals **overturns** earlier decision of patent infringement, US District Court rules in favour of **AMF** and **AB**.

$ 201 $ 23.7 **$ 225**

D

Full Court of Appeals **overturns** earlier decision of patent infringement, US District Court rules in favour of **Cochlear.**

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Threat from Competitors within the Market

The highly competitive and sensitive nature of the hearing implant industry globally is dominated by 3 key companies, Cochlear, Sonova and Demant. Along with a few other smaller companies that operate locally in its region, such as GN hearing. Within these companies, the globally operating nature of these companies have operations in key regions labelled as, the Americas, Europe & the Middle East and the Asia Pacific. While each company has its specialised business segment that they are known for, such as Cochlear specialising in implants while Demant specialises in hearing aids instead, all companies have a piece of the pie when it comes to generating revenue from each business segment, from each region of the world. The sensitive nature of competition within each region and the business segment will affect market share highly, as a new upgrade of a non-patented product will cause consumers to switch from one company to the other. This makes customer loyalty retention a big task for companies in the industry, like Cochlear. As we anticipate Cochlear's release of its new Osia 2 system and its recent approval from FDA in America will drive its revenue growth upwards.

This scenario tests the extent of different events resulting in a change in market share. We have analysed events that affect Cochlear negatively, neutrally and positively. These events are Outcomes A, B and C respectively. While the base case of the valuation notes that the market share is divided amongst the top 3 companies, while Sonova and Demant dominate the hearing aids industry, while Cochlear holds a 62% share in the hearing implant industry.

A

Sonova enters the hearing implant market within their dominant regions where they operate, namely Europe and the Middle East.

B

Sonova leaves the Asia Pacific Market but capitalizes on the gains on the American market in all business segments.

C

It is noted that the larger the market share Cochlear has, the larger the stock price will be in our valuation. This is similar to the forecasting method of "Penetration Rates" where the larger piece of a pie is given to Cochlear. It is noted that the supposed increased revenue growth is only seen in the first 2 years of forecasting, wherein the long term, this growth from the external shocks will be bundled together with the organic growth of Cochlear.

	A	B	Base	C
Enterprise Value	11,392	11,401	11,493	11,571
Stock Price	$ 176.01	$ 176.17	$ 177.77	$ 179.12
Probability	15%	25%	50%	10%

We hypothesize that Sonova will enter the hearing implant market within Europe and the Middle east, decreasing market share within the European region. Given that the European and Middle Eastern market is already a developed market for hearing aids and implants, it is highly unlikely that Sonova would expend additional effort to expand their hearing implants into EMEA. Although this will inhibit growth, the decrease in market share does not make a large difference as we assume that the growth in other regions such as the Asia Pacific region will drive growth in the next 5 years.

Furthermore, the neutral outcome B states that Sonova will leave the Asia Pacific market and capitalizes on the gains in the American Market within all its segments. If Sonova leaves the Asia Pacific Market, we could see that this will affect Cochlear as Cochlear could capitalise on the other two business segments, namely hearing implants and upgrades. On the other hand, Cochlear's product launch of Osia 2 might be diminished in size of exposure, due to Sonova's new-found presence in the Americas region. This may happen as Sonova has large ties with the American market, but given the emerging market of Asia Pacific, this poses an unlikely event.

Lastly, in the event that Sonova leaves the hearing implant market, Cochlear, being the dominant player in that particular market can capitalise on the leave of Sonova, and also Sonova will hand over customer retention schemes to Cochlear, increasing Cochlear's revenue stream. We understand that because of Sonova's leave in the market, there will be customers who will not want to engage with Cochlear as it is a very sensitive market, we have made considerations to split the remaining market share with Demant as well.

Government Corporate Tax Rate Changes

In our base case, we have forecasted the drivers for the revenue forecasts of Cochlear, negating most macroeconomic issues, but it is noted that for a company to maintain a stable level of WACC, there are certain parameters where the government may dictate. Due to the Covid-19 crisis, the Australian Government may implement large stimulus packages to keep the economy afloat. This has put them in huge swathes of debt and to pay this debt back they will need to raise more revenue. To do this, the Government could increase the corporate tax rate, greatly effecting Cochlear after-tax profit or they could decrease the tax rate, in the hope for some trickle down into the economy, increasing Cochlear after-tax profit.

	A	B	Base	C	D
Enterprise Value	11,340	11,419	11,493	11,569	11646
Stock Price	$ 175.13	$ 176.45	$ 177.77	$ 179.09	$ 180.42
Probability	5%	30%	40%	20%	5%

This change to the corporate tax rate has seen to change the stock price, where the higher the tax the lower the share price will go. Currently, the era of the pandemic seems that the necessity of recovering government debt is well defined, so we put down a greater probability in the government increasing their tax rate from 30% to 35% to cover at least some of the debt. Furthermore, this change in scenario sees a great change in ROIC (both including and excluding goodwill), where the lower the tax rate, the higher ROIC will be in subsequent years. This is understandable as the lower the tax rate, the income from the capital invested will be lower hence yielding a greater return.

A
The Australian Government increase the corporate tax rate to 40% to raise revenue to pay off their debt

B
The Australian Government increase the corporate tax rate to 35% to raise revenue to pay off their debt

Base
The Government decides to leave the corporate tax rate at its current rate and find other ways to pay off debt

C
The Australian Government decreases the corporate tax rate to 25% to promote investment and growth

D
The Australian Government decreases the corporate tax rate to 20% to promote investment and growth

Appendix

Industry and Model Assumptions

Our composited valuation produces a share price of $177.64. The KGW model that was used to generate this valuation sustains key underlying assumptions. Relative changes among these assumptions could potentially impact the model's valuation procedure for Cochlear.

Industry Assumptions

- We have assumed that the Cochlear has a market share as the company is heavily specialised in a capital-intensive industry with competitive advantage largely based on the huge resources required for ongoing R&D
- The model also assumes that Cochlear will continue to be the primary supplier in an effort to address the global shortage of cochlear implants and hearing solution.
- A key assumption of our initial revenue forecast is that the current COVID-19 pandemic will have negative implications on Cochlear's functional and investment operations.

Model Assumptions

- Cochlear's Revenue is forecasted to have positive growth with an initial decline for the remainder of 2020. This forecasting procedure assumes that operational practices of cochlear will decline due to COVID-19 pandemic
- Since the EBITA margin is expressed as a percentage of operating profit the item was forecasted to remain consistent with slight positive adjustment to reflect revenue growth.
- We have decided to forecast the WACC from the perspective of an Australian Investor, as Cochlear's major investors are Australian investment firms. Thus, we have decided to use the S&P ASX 200 index as our market index.
- The capital structure in our model was estimated using a combination of market value and estimated values and calculated by "*Market Value of Equity + Capitalized Operating Lease + Book Value of Debt (all interest-bearing securities) – Excess Cash*"
- A monthly beta was selected as our estimated measure of risk for cochlear as opposed to a weekly beta. This decision was made to avoid systematic biases and to reflect our intuition regarding Cochlear's risk relative to the market.
- Our Model uses and Equity Risk Premium (ERP) of 6.8% and Cost of Debt (COD) of 3.5% to calculate Cochlear's WACC/discount factor. The COD is obtained on the basis of a Bloomberg Barclays US Aggregate "A" rated bond and the ERP is based provided implied interest rates.

DCF Financial Summary (Table 1)

Financial Summary
Cochlear

Profit and Loss	2018	2019	2020	2021	2022
Sales and Revenue	**1363.7**	**1426.7**	**1441.55**	**1533.89**	**1666.43**
Ebidta	**372.1**	**375.4**	**381.203**	**407.651**	**445.089**
Depr & Amort	-28.1	-32.1	-50.651	-79.431	-76.191
Ebit	**337.9**	**336.9**	**330.553**	**328.22**	**368.898**
Associates	0	0	0	0	0
Net interest exp.	-6.775	-7.9	-4.5	-4.9507	-6.2765
Reported Pbt	**340.5**	**365.6**	**364.602**	**350.943**	**392.369**
Income Tax	-94.7	-88.9	-109.38	-105.28	-117.71
Profit after Tax	**245.8**	**276.7**	**255.221**	**245.66**	**274.658**
Minorities	0	0	0	0	0
Preffered dividends	0	0	0	0	0
Reported NPAT	**245.8**	**276.7**	**255.221**	**245.66**	**274.658**

Balance Sheet	2018	2019	2020	2021	2022
Cash & equivalents	27.478	29.114	29.0731	30.6778	33.3286
Inventories	167.4	195.4	199.488	225.865	266.583
Receivables	316.7	319.7	348.421	362.116	388.975
Other current assets	38.6	41.3	50.5202	53.7565	58.4014
Current assets	**584.2**	**635**	**627.502**	**672.415**	**958.842**
Property, plant & equip.	163.1	216.9	345.972	346.66	0
Intangibles	47	105.2	61.8936	65.8584	71.5489
Other non-current assets	362.6	422.1	453.755	488.515	515.902
Non-current assets	**572.7**	**744.2**	**861.62**	**901.033**	**587.451**
Total assets	**1156.9**	**1379.2**	**1489.12**	**1573.45**	**1546.29**
Payables	287.7	359.5	301.426	319.386	323.205
Interest bearing debt	152.1	183.8	315.614	314.535	198.205
Other liabilities	106.3	110	85.773	87.1101	89.0291
Total liabilities	**546.1**	**653.3**	**702.813**	**721.031**	**610.439**
Net assets	**1156.9**	**1379.2**	**1489.12**	**1573.45**	**1546.29**
Ordinary equity	610.8	725.9	786.309	852.417	935.853
Minority interests	0	0	0	0	0
Preferred capital	0	0	0	0	0
Total shareholder funds	**610.8**	**725.9**	**786.309**	**852.417**	**935.853**
Net debt					

Cashflow	2018	2019	2020	2021	2022
EBIT	337.9	336.9	330.553	328.22	368.898
Net interest	-6.775	-7.9	-4.5	-4.9507	-6.2765
Depr & Amort	-28.1	-32.1	-50.651	-79.431	-76.191
Tax paid	-110.75	-98.2	-99.14	-107.33	-111.5
Working capital	-2.3199	24.164	-68.053	-26.839	-45.47
Other	3.7	12.6	0.39167	5.56389	6.18519
Operating cashflow	**373.48**	**412.164**	**313.542**	**386.376**	**405.803**
Capex	-49.7	-114.6	-179.72	-80.119	270.469
Acquisitions & Invest	6.624	-33.7	-13.538	-23.619	-18.579
Asset sale proceeds					
Other	-6.087	-16.767	10.168	-3.41	-4.8942
Investing cashflow	**-49.163**	**-165.07**	**-183.09**	**-107.15**	**246.996**
Dividends paid	-161.1	-181.8	-167.69	-161.41	-180.46
Equity raised	-21.247	7.6	-27.516	-23.71	-16.949
Other	-29.99	268.638	-81.855	-51.831	-73.914
Financing cashflow	**-212.34**	**94.4381**	**-277.06**	**-236.95**	**-271.32**
Total cashflow	**-30.352**	**15.464**	**-171.06**	**-0.9702**	**334.098**
Adjustments	0	0	0	0	0
Net Change in Cash	**-30.352**	**15.464**	**-171.06**	**-0.9702**	**334.098**

EPS Estimation (Table 2)

Calendar Year	2018 (Actual)	2019 (Actual)	2020 (Forecasted)
Reported Earnings (Net Income, millions)	245.80	276.70	255.22

Normalisation Adjustments			
Amortisation of Acquisition Costs	-4.90	-4.60	0.00
Research and Development Allowance	-9.80	-9.70	-9.75
Non-Deductable expenses	0.10	0.00	0.00
Non-assessable income	0.00	-3.40	0.00
Write-Down of Inventory	6.60	2.80	0.00
Non-Operating Income	-10.20	-29.00	0.00
Proceeds from the Sale of Non-Current Assets	-0.30	0.00	0.00
Normalised Earnings	227.30	232.80	245.47

Opening Number of Ordinary Shares	57.53	57.69	57.72
New Shares Issued during Period	0.02	0.03	-
Closing Number of Shares	57.55	57.72	57.72

Total Shares	57.55	57.72	57.72
Diluted Normalised EPS	3.95	4.03	4.25

PE Valuation (Table 3)

Comparables	Latest Absolute P/E	Average	SD	High	Low
Cohlear	69.86	42.31	8.75353	51.07	33.56
Sonova	36.68	24.41	2.62519	27.03	21.78
Demant	33.70	26.07	3.46414	29.54	22.61
Comparables Average	**46.75**	**30.93**			

COH Relative to:	Latest	Relative	Weight	Relative P/E x Weight
ASX200	16.97			
ASX200 Healthcare	41.55	1.68121512	60%	1.008729072
MSCI	19.14	3.649893941	20%	0.729978788
MSCI Healthcare	18.23	3.832422676	20%	0.766484535
			100%	**2.505192395**

Cohlear acting in premium

Weighted Relative P/E x Australian Market P/E (latest):

Relative P/E	42.51787481

	Latest	Average	Low	High	Comps Latest	Comp Average
Absolute PE	69.86	42.31	33.56	51.07	46.75	30.93
EPS	4.25	4.25	4.25	4.25	4.25	4.25
Share Price	297.0989748	179.9437399	142.717	217.1707288	198.7970387	131.5379458

	Latest	Low	High
Realative P/E	42.51787481	33.76433981	51.2714
EPS	4.25	4.25	4.25
Share Price	180.8198005		

EVM Valuation (Table 4)

Company	Cochlear (AUD)	Sonova (CHF)	Demant (DKK)
Estimated EBITDA	271.69	603.90	2741.63
Less Income from Non-Operating Assets	0.00	0.00	0.00
EBITDA from Operations	271.69	603.90	2741.63
Market Value of Equity	11509.70	11145.22	37754.42
Value of Non-Equity Claims			
Net Debt (Debt less Excess Cash)	-178.45	357.24	7371.82
Non-controlling interest	0.00	6.30	5.00
Capitalised Operating Leases	1037.41	285.00	2038.00
Retirement Related Liability	0.00	73.50	0.00
Employee Options	0.00	19.90	0.00
Enterprise Value	12368.66	11887.16	47169.24
Less Value of Non-Operating Assets			
Financial Investment	98.20	321.50	963.00
Retirement Benefit Assets	0.00	73.50	0.00
Enterprise Value of Operations	12270.46	11492.16	46206.24
Enterprise Value of Operations in AUD	12270.46	18042.69	10165.37
Enterprise Value Multiple in AUD	45.16	19.03	16.85
Weighting for COH EVM	0.00	0.70	0.30
EVM for Cochlear based on Comparables		18.38	

Method	EVM	Weight
Historic	28.64	10%
Comparable Companies	18.38	15%
Fundamental Determinants	49.68	75%
Final EVM	42.88	100%

EVM	42.88
EBITDA	271.69
Other Assets	5.40
Non-Equity Claims	225.00
Mkt Value Equity	11430.53
Outstanding Shares	64.21
Share Price	178.03

*Larger weight given to Sonova due to higher similarities to cochlear.

Scenario 1 Results

8b. S1 Results

Scenario 1 Stock price	171.44

** The probability of each outcome is unknown and uncertain, so we have decided to give each of the outcomes an equal chance of happening.

Outcome A

Fine	$	438
Interest Fees	$	201
Legal Fees	$	24
Total	$	663

	2020	2021	2022	2023	2024
ROIC (Excl Goodwill)	18.48%	15.24%	17.44%	28.62%	28.98%
ROIC (Incl Goodwill)	13.96%	12.17%	13.93%	21.77%	22.18%

Enterprise Value	11492
Stock Price	166.27
Probability	25%

Outcome B

Fine	$	438
Interest Fees	$	-
Legal Fees	$	-
Total	$	438

	2020	2021	2022	2023	2024
ROIC (Excl Goodwill)	18.48%	15.24%	17.45%	28.66%	29.01%
ROIC (Incl Goodwill)	13.96%	12.17%	13.94%	21.80%	22.20%

Enterprise Value	11493
Stock Price	170.18
Probability	25%

Outcome C

Fine	$	-
Interest Fees	$	201
Legal Fees	$	24
Total	$	225

	2020	2021	2022	2023	2024
ROIC (Excl Goodwill)	18.48%	15.23%	17.46%	28.70%	29.10%
ROIC (Incl Goodwill)	13.96%	12.16%	13.95%	21.83%	22.27%

Enterprise Value	11494
Stock Price	170.18
Probability	25%

Outcome D

Fine	$	-
Interest Fees	$	-
Legal Fees	$	-
Total	$	-

	2020	2021	2022	2023	2024
ROIC (Excl Goodwill)	18.48%	28.83%	28.79%	0.00%	0.00%
ROIC (Incl Goodwill)	13.96%	12.16%	13.95%	21.80%	22.22%

Enterprise Value	11571
Stock Price	179.12
Probability	25%

Scenario 2 Results

8d. S2 Results

Scenario 2 Stock price	177.241

Outcome A

Hearing Implants	43.05%
Europe	8.46%

	2020	2021	2022	2023	2024
COCHLEAR LIMITED TOTAL REVENUE GROWTH	0.64%	6.25%	8.62%	9.32%	9.42%
ROIC (Excl Goodwill)	18.39%	15.17%	17.42%	28.59%	28.95%
ROIC (Incl Goodwill)	13.90%	12.11%	13.91%	21.73%	22.15%

Enterprise Value	11392
Stock Price	176.01
Probability	15%

Outcome B

Hearing Implants	55.00%
North America	10.00%
Asia Pacific	30.00%

	2020	2021	2022	2023	2024
COCHLEAR LIMITED TOTAL REVENUE GROWTH	0.78%	6.30%	8.60%	9.30%	9.40%
ROIC (Excl Goodwill)	23.94%	18.42%	15.19%	17.43%	28.60%
ROIC (Incl Goodwill)	13.92%	12.13%	13.92%	21.75%	22.16%

Enterprise Value	11401
Stock Price	176.17
Probability	25%

Base Case

	2020	2021	2022	2023	2024
COCHLEAR LIMITED TOTAL REVENUE GROWTH	1.04%	6.41%	8.64%	9.35%	9.46%
ROIC (Excl Goodwill)	18.48%	15.23%	17.46%	28.67%	29.03%
ROIC (Incl Goodwill)	13.96%	12.16%	13.95%	21.80%	22.22%

Enterprise Value	11493
Stock Price	177.77
Probability	50%

Outcome C

Hearing Implants	70.00%
Europe	15.24%
North America	21.85%
Asia Pacific	25.18%

	2020	2021	2022	2023	2024
COCHLEAR LIMITED TOTAL REVENUE GROWTH	1.26%	6.50%	8.67%	9.39%	9.51%
ROIC (Excl Goodwill)	18.53%	15.26%	17.48%	28.72%	29.09%
ROIC (Incl Goodwill)	14.00%	12.19%	13.97%	21.85%	22.27%

Enterprise Value	11571
Stock Price	179.12
Probability	10%

Scenario 3 Results

8f. S3 Results

Scenario 3 Stock price	177.64

Outcome A

Tax Rate 40%

	2020	2021	2022	2023	2024
ROIC (Excl Goodwill)	17.18%	13.02%	15.19%	25.25%	25.12%
ROIC (Incl Goodwill)	12.98%	10.40%	12.13%	19.20%	19.23%
WACC	6.31%				

Enterprise Value	11340
Stock Price	175.13
Probability	5%

Outcome B

Tax Rate 35%

	2020	2021	2022	2023	2024
ROIC (Excl Goodwill)	17.83%	14.12%	16.32%	26.96%	27.08%
ROIC (Incl Goodwill)	13.47%	11.28%	13.04%	20.50%	20.72%
WACC	6.32%				

Enterprise Value	11419
Stock Price	176.45
Probability	30%

Outcome C

Tax Rate 25%

	2020	2021	2022	2023	2024
ROIC (Excl Goodwill)	19.13%	16.33%	18.59%	30.38%	30.99%
ROIC (Incl Goodwill)	14.46%	13.04%	14.85%	23.11%	23.71%
WACC	6.32%				

Enterprise Value	11569
Stock Price	179.09
Probability	20%

Outcome D

Tax Rate 20%

	2020	2021	2022	2023	2024
ROIC (Excl Goodwill)	19.79%	17.44%	19.73%	32.09%	32.94%
ROIC (Incl Goodwill)	14.95%	13.92%	15.76%	24.41%	25.21%
WACC	6.32%				

Enterprise Value	11646
Stock Price	180.42
Probability	5%

Base Case

Tax Rate 30%

	2020	2021	2022	2023	2024
ROIC (Excl Goodwill)	18.48%	15.23%	17.46%	28.67%	29.03%
ROIC (Incl Goodwill)	13.96%	12.16%	13.95%	21.80%	22.22%
WACC	6.32%				

Enterprise Value	11493
Stock Price	177.77
Probability	40%