Valuation of the company Medtronic

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Abstract:
In 2018, The medical device global market was estimated to grow with over five percent per year to reach a market size of nearly 800 billion dollars by 2030. The growth of this market was largely expected to be a result of the economic development in the emerging markets and the aging of the world population. Medtronic, as the biggest medical device company in the world, was ready to take advantage of that market growth.
On the 1st of October 2018, Medtronic had a rating of overweight with a target share price of 103,29 dollars and a closing price of 99,49 dollars. This reflects that the financial analyst community believes that the Medtronic is an undervalued stock.
The aim of this thesis was to estimate a theoretical valuation of Medtronic and validate the view of the financial analyst community. The resulting valuation was based on a conducted strategic analysis, financial analysis, financial forecasting. These three steps were used to estimate a financial valuation of the company Medtronic and its share price.
The strategic analysis was conducted using one of the most widely used strategic analysis tool the SWOT analysis.
The financial analysis helped measure the historical financial performance of Medtronic.
The financial forecasting focused on developing a view of the future financial performance of Medtronic.
The financial valuation was the final step of this thesis research resulting in an estimated financial valuation of Medtronic. This thesis used the discounted cash flow valuation as the main valuation method.
The resulting valuation of Medtronic's share was estimated to 179,61 dollars. This result was higher than the share price of Medtronic on the 1st of October of 99,49 dollars as well as the target price of the financial analyst community. The result of this thesis supports that the Medtronic share was undervalued on the 1st of October 2018.

Keywords:	Medtronic, medical technology, financial valuation, discounted cash flow valuation
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1 INTRODUCTION

The medical device global market is estimated to grow by over five percent per year to reach a market size of nearly 800 billion dollars by 2030. This market growth will be fueled by the increase in sales of new innovative medical devices and medical services. The background of this sales increase stems from the worldwide increase in common lifestyle diseases, such as atherosclerosis, heart related diseases, cancer, chronic obstructive pulmonary diseases, stroke and others. The growth of the lifestyle diseases is largely a result of the economic development in emerging markets such as India and China and the aging of the global world population. (KPMG. 2018)

Medtronic is the biggest medical device company in the world based on 2017 revenue. The revenue of Medtronic was 29.7 billion dollars in 2017 growing from 28.8 billion in 2015. (Medtronic.com/Overview)

Medtronic is putting efforts into maintaining its status as the biggest medical device company by focusing on helping their healthcare customers deliver more value towards their patients. Through that effort, Medtronic is changing its product offering from merely medical devices to a solution offering based on technologies and services. (KPMG. 2018)

The renewed portfolio has put Medtronic in a unique supplier position towards its customers (Morningstar. 2018). It is estimated that Medtronic will remain the biggest medical technology company by 2022 with a level of sales of 39.9 billion dollars. The increase from 2015 to 2022 would represent a compound annual growth rate of 4.7%, that is largely due to the estimated growth in the medical technology market. (Evaluate MedTech. 2016)

On the 1st of October 2018, the financial analyst community seems to think that Medtronic represents an interesting investment object. The average rating of Medtronic is overweight with a target price of $103.29. (MarketWatch. Medtronic PLC)

On the 1st of October, the Medtronic share closed on the New York Stock Exchange at the price level of $99.49. If you compare that price with the target price of $103.29 estimated by the financial analysts, there is a delta of approximately 3.6%. In other words, the financial analyst community believes that the Medtronic stock is undervalued.

1.1 Research aim

This thesis is a study that aim to estimate a theoretical valuation of the publicly traded company Medtronic. This thesis researches an estimated financial valuation of the

company based on a strategic and financial analysis and forecast. The discovered estimate is then used to validate the estimation of the financial analyst community.

1.2 Research motivation

If the stock market is efficient then all the listed stock should be correctly priced. As there is a difference between the financial analysts estimate and the market price, this thesis validates the estimated target price by conducting an independent valuation and compare the result with the analysts target price. The result in this thesis constitutes a contribution to the existing financial research literature on the topic of the Medtronic company.

1.3 The problem statement

The objective of the thesis is to produce an estimation of the valuation of the company. The aim of this study would be to assess whether the share price of the company is undervalued, equal or overvalued compared with the stock market traded price level.
In this thesis, the research question is:

What is the estimated price level of the company and how is that estimation compared with the stock market traded price level of the company?

This thesis was carried out as a student thesis work as part of a bachelor's degree in financial management. The outcome of this thesis is a documentation on how to conduct valuation of listed company stocks and estimate their stock should-be price level versus the actual stock market traded price level.

1.4 The delimitations of this thesis project

In this section, the chosen delimitations in this thesis project is introduced. Each of these delimitations are boundaries that are assumed in the conducted research of this thesis project.

1.4.1 Going concern

It is assumed that the company is an accounting going concern. This means that the company is expected to be in operation and is assumed not going to go into liquidation for a

long time. A company that is a going concern is usually not in bankruptcy nor in liquidation of their assets.
A company that is going concern is under the obligation of preparing their financial statements according to the GAAP or IFRS depending on their choice and under the jurisdiction they operate. (PWC. 2017)

1.4.2 Research timeframe

The timeframe of this study was chosen to be a five-year period from year 2013 until the start of this thesis project in year 2018. This time frame was selected as to allow a large enough time frame that would enable a production of a sufficient level of quality of the results of this thesis project. This was a compromise of avoiding using older data that might skew the estimate of the future of the company while attempting to keep a high level of reliability of the outcome of this thesis project. (Berk. 2011)
The value of the company was estimated per the date of 1st of October 2018. Any public information that might have surfaced after that date was not be taken into account in the conducted valuation.

1.4.3 Market efficiency

In an efficient stock market, the stock market participants are all privy to all the information about all the stock that are listed on the stock market all the time. This situation leads to that all the prices of all the listed stock are reflecting all the information about that stock at any time. This further results into that the future stock prices will reflect all the future information that will become available to all about the listed stocks. And since it is impossible to predict the future happenings that will result into future information about the listed stocks, it is thus impossible to predict the future prices of the listed stocks. This is the reason that the stock prices are understood to follow a random walk and cannot be predicted. (Berk. 2011)

1.4.4 The company studied as one entity

The company is a large multinational entity that is organized into several business areas. The author had the choice of analyzing each business area separately or the company as one entity. As the company is gaining advantage through the synergies that the different

business areas are creating and that the investors are purchasing a small percentage of the company, the author chose to analyze the company as one whole entity.

1.4.5 Information sources

The information sources used in this thesis are limited to only using public information sources. As the author did not have access to any internal data of the company, the result of this study is an outsider's estimate of the value of the company.
In the case of availability of internal information, the input data used would have resulted in a higher quality valuation outcome.

1.5 Expected outcome

The result of this thesis project is expected to show a fundamental financial analysis and estimated valuation of the company Medtronic and its corresponding stock price.
This allows the reader to compare the market value of the Medtronic stock and the estimation of it. The result tools the reader to make an assessment if the stock was under or overvalued in the marketplace and the level of attractiveness that the company represented as an investment object.

2 METHODOLOGY AND RESEARCH APPROACH

2.1 Research approach

The framework for conducting a business analysis using the financial statement of a company requires going through four distinct steps. These steps are firstly, strategic analysis; secondly, financial analysis; thirdly, financial forecasting and fourthly, financial valuation. These four steps are introduced below. (Palepu. 2004) (Koller et al. 2015)

2.1.1 Strategic analysis

The business strategy analysis is conducted to discover the main drivers for profit, to discover the main risk in generating that profit and to assess the potential the company to generate these potential profits. In short, the business strategy analysis is composed of understanding the company's general business environment, the industry in which it operates and the ability of the company in creating a sustainable competitive advantage. The results of the strategic analysis help the analysis to create a more informed foundation on which to forecast the possible development of the company's business efforts. (Palepu. 2004)

2.1.2 Financial analysis

The financial analysis is an activity that is conducted in two steps, which are described below.

The first step is where the analysis discovers the distortion that the accounting has introduced in the process of documenting the business status of the company. Once these distortions have been identified, the analyst has to "fix" these distortions through a reformulation process, in order for the financial reporting to reflect the business reality of the company. As a result of the first step, the reliability of the financial data has been improved and is ready to be used in the second step of the financial analysis. (Palepu. 2004)

The second step of the financial analysis is where the reformulated financial reporting is used to measure the past and present financial performance of the company. This is done through conducting a profitability and liquidity analysis, comparing the company's financial results with the key competitors and finally conducting a free cash flow analysis. The results of the financial analysis equip the analyst with a solid foundation to use as an input for the financial forecasting step introduced below. (Palepu. 2004)

2.1.3 Financial forecasting

The forecasting is creating the understanding of the potential future financial development of the company based on the earlier discoveries of the present and past performance of the company. In working through this step, it is important to be as comprehensive as possible, in order to avoid the risk of reaching an unrealistic future view of the company. The Financial forecasting report represents a single summary of the analyst's estimate of the company's future development based on the executed strategic and financial analysis. This report is then used as an input for the creating the financial valuation of the company. (Palepu. 2004)

2.1.4 Financial valuation

The financial valuation is using the conducted financial forecast data as an input to produce an estimate of the financial value of the company.
The main four valuation methods available are the discounted dividends, the discounted abnormal earnings, the valuation based on multiples and the discounted cash flow. The discounted dividends express the valuation of the company as the present value of the forecasted future dividends. (Koller et al. 2015)
The discounted cash flow (DCF) method is based on understanding the estimated future cash flows that the company is expected to generate. These cash flows are then discounted with the company's cost of capital, resulting in an estimate value of the company.
The multiples method is based on identifying peer companies market values and converting these values into standardized ratios and applying these ratios to the company sought to be valued. (Koller et al. 2015)
The DCF and multiples method will be used in this thesis research project.

2.2 Structure of this study

This thesis is structured in such a way as to support the production of a high-quality valuation of the company. The structure of this document is initially introducing the reader into the subject of this thesis project, then followed by an overview the company in details. The study continues by going through the strategic analysis of the company. The following step in this thesis is to look into a financial analysis of the company. The financial analysis combined with the strategic analysis is then used as a basis to estimate a financial forecast of the company future performance. All these taken steps are used to

estimate a valuation of the company. Finally, the reader is given a summary of this research study and a conclusion that is drawn out of all the work conducted.
An overview of the full structure of this study can be found in the figure below.

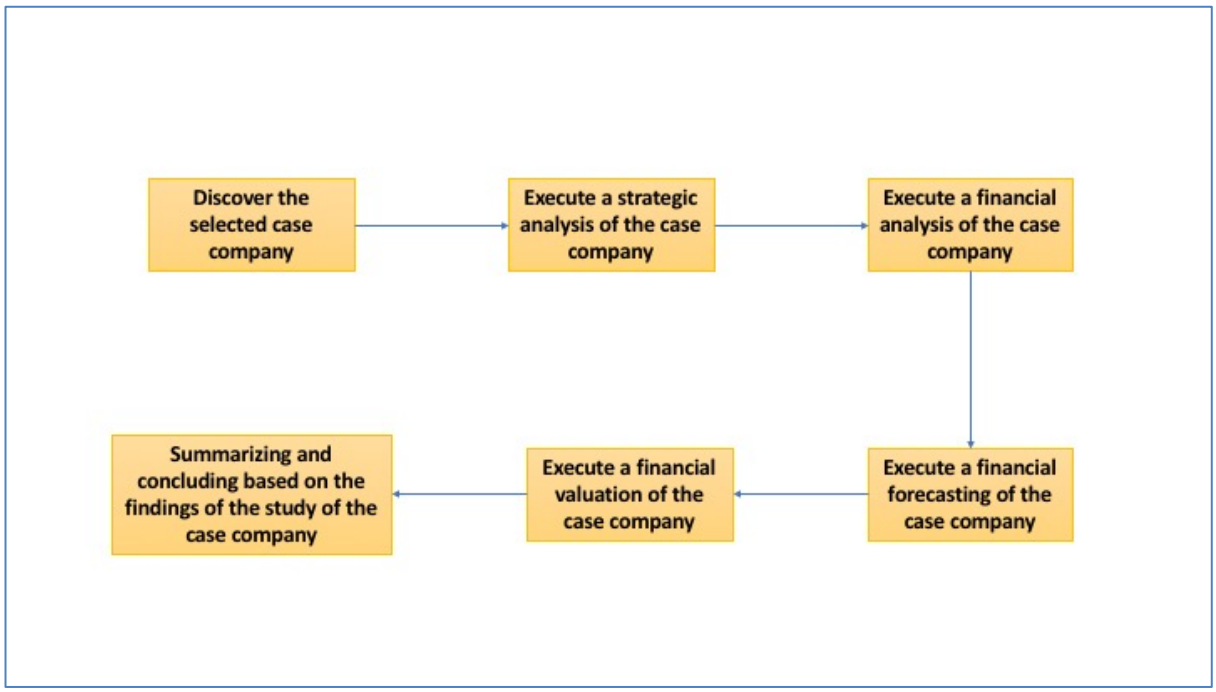

Figure 1. Structure of thesis study

2.3 Collected data

The data used as the basis for this thesis work is publicly available information. As it is challenging to verify the reliability level of the collected data, this thesis project used only credible sources of information. Furthermore, it is assumed that the data collected was of an accuracy enough for avoiding influencing significantly the company valuation results.

3 COMPANY PRESENTATION OF MEDTRONIC

This chapter gives an overview of the company Medtronic and helps the reader of this thesis to better understand the characteristics of the company.

Medtronic is a medical technology, services and solutions company. The principle head office is in Dublin, Ireland and the main operational office is in Minneapolis, Minnesota. (Medtronic.com/About Medtronic)

As introduced earlier, Medtronic is the biggest medical device company in the world based on year 2017 revenue. The revenue of Medtronic was 29.7 billion dollars in year 2017 growing from 28.8 billion in year 2015. Medtronic is operating in the medical technology industry that has become a 400 billion dollars industry. (Medtronic.com/About Medtronic)

Medtronic is present in more than 150 countries, has more than 86.000 employees and has more than 46.000 patents. (Medtronic.com/About Medtronic)

3.1 History

Medtronic was started as a medical equipment repair shop in Minneapolis in1949 by Earl Bakken and Palmer Hermundslie. They expanded their business mainly through reselling other companies' products. Through their repair business activities, they developed an external battery powered artificial pacemaker in 1957. Through that product development, Medtronic developed an implantable pacemaker in 1960. Following that groundbreaking innovation, Medtronic developed many more medical innovations such as implantable mechanical devices, medicine delivery devices and advanced surgical equipment. They today possess medical technologies towards nearly 40 medical conditions. (Medtronic.com/History)

Medtronic has also acquired numerous companies starting the year 1998, where they acquired Physio-Control Corporation. The aim of those acquisitions is to increase its expertise in either new or existing product areas. These acquisitions continued after the financial crisis in 2008 and culminated into the biggest medical device acquisition in history with the 42,9 billion dollars purchase in 2014 of Covidien plc a medical product company based in Ireland. Following the Covidien acquisition, Medtronic continued acquiring medical technology companies every year from 2015 to the year of 2018. (Medtronic.com/History)

3.2 Corporate overview

According to the Medtronic CEO Omar Ishrak, Covidien and most of the latest acquisitions have been successfully integrated into the Medtronic organization. The combination of the acquisitions with a corporate focus on fundamental strategy of innovation is providing the company with an increased diversification in its product portfolio. (Medtronic.com/Corporate Governance)

3.3 Business areas

As introduced earlier, Medtronic provides technologies towards nearly 40 medical conditions. These technologies have improved the lives of 71 million people in the last financial year 2017-2018. The conditions addressed include areas such as heart failure, Parkinson's disease, urinary incontinence, Down's syndrome, obesity, chronic pain, spinal disorders and diabetes. (Medtronic.com/Business)
Medtronic has divided its approximately 30 billion dollars business activities of year 2018 into 4 groups. These groups are described in more details below. (Medtronic.com/Business)

3.3.1 Cardiac and vascular group

This group develops treatments towards aortic and peripheral vascular conditions, cardiac rhythm and heart failure conditions, and coronary and structural heart conditions. The group's activities are divided into three divisions named: Cardiac Rhythm & Heart Failure, Coronary & Structural Heart, and Aortic & Peripheral Vascular. The Cardiac Rhythm & Heart Failure is providing products that address heart failures and rhythm disorder. The Coronary & Structural Heart is providing products that address coronary artery disease and heart valve disorder. The Aortic & Peripheral Vascular is providing products that address aortic disease, peripheral vascular disease and venous disease. Its 2018 business revenue is approximately 11,4 billion dollars or 38% of the total business. (Medtronic.com/Facts and Stats)

3.3.2 Minimally invasive therapies group

This group contains two divisions; the Surgical Innovations division and the Respiratory, Gastrointestinal & Renal division. The Surgical Innovations division is providing products that address general surgical devices and tools that are typically used by medical

surgeons. The Respiratory, Gastrointestinal & Renal division is providing products that address the minimally invasive gastrointestinal diagnostics and therapies, respiratory monitoring, airway management and ventilation therapies and treatment of renal disease. Its 2018 business revenue is approximately 8,7 billion dollars or 29% of the total business. (Medtronic.com/Facts and Stats)

3.3.3 Restorative therapies group

This group develops therapies towards the spine, the brain, pain and specialty therapies. The group's activities are divided into four divisions named; Spine, Brain Therapies, Specialty Therapies and Pain Therapies. The Spine division is providing products that address the treatment of the spine and musculoskeletal system. The Brain Therapies division is providing products that address the treatment of neurological diseases and neuro procedures. The Pain Therapies division is providing products that address the need for spinal cord stimulation, implantable drug infusion for chronic pain. Its 2018 business revenue is approximately 7,7 billion dollars or 26% of the total business. (Medtronic.com/Facts and Stats)

3.3.4 Diabetes group

This group develops Type 1 and Type 2 diabetes solutions towards advanced insulin management, multiple daily injections solutions and non-intensive diabetes therapies. This group is not divided into divisions, but it functions as one entity. Its full year 2018 business revenue is approximately 2,1 billion dollars or 7% of the total business. (Medtronic.com/Facts and Stats)

3.4 Market areas

As introduced earlier, Medtronic is present in more than 150 countries. Medtronic has divided its approximately 30 billion dollars business activities in year 2018 into three geographical areas. These areas are US; Non-US Developed Markets, and Emerging Markets. These areas are described in more details below. (Medtronic.com/Locations)

3.4.1 US

This market area represents the US and US territories and is the largest sales of Medtronic, with 15,9 billion dollars or 53% of total revenue in 2018. In the area, the sales decreased by 5% year on year from 2017. (Medtronic.com/Locations)

3.4.2 Non-US Developed Markets

This market area represents Japan, Australia, New Zealand, Korea, Canada, and the countries of Western Europe. Non-Us developed markets represents the second largest sales of Medtronic with 9,6 billion dollars or 32% of total revenue in 2018. In the area, the sales increased by 6% year on year from 2017. (Medtronic.com/Locations)

3.4.3 Emerging Markets

This market area represents Middle East, Africa, Latin America, Eastern Europe, and the countries of Asia that are not included in the non-U.S. developed markets. The emerging market area represents the smallest sales of Medtronic, with 4,5 billion dollars or 15% of total revenue in 2018. In the area, the sales increased by 12% year on year from 2017. (Medtronic.com/Locations)

3.5 Main target customer base

The main customers of Medtronic are primarily the hospitals, the clinics, third party healthcare providers, distributors and other institutions, including governmental health care programs and group purchasing organizations. (Medtronic.com/Overview)

3.6 Ownership structure

The Medtronic shares are largely held by nearly 2000 institutional investors with a percentage ownership of nearly 85% in year 2018. In year 2018. the company insiders are holding less than 0,1% of the Medtronic shares. The top five Medtronic shareholders are Vanguard group with 8,01%, Blackrock with 7,24%, Wellington Management company with 5,71%, Massachusetts Financial Services with 4,31% and State Street Corporation with 3,93%. (Yahoo.com/finance)

3.7 Management and board composition

The chairman of the board and chief executive officer is Omar Ishrak. Omar has been in both of those roles since 2015 and CEO with Medtronic since 2011. Omar joined from GE healthcare, where he has been working from 1995 to 2011. The chief financial officer is Karen Parkhill since 2015. Karen joined Medtronic from the banking sector where she had been working from 1992 to 2015.The chief human resource officer is Carol Surface and she joined Medtronic in 2015 and has a long executive background in HR. The president of the biggest business group Cardiac and vascular group since 2015 is Michael Coyle. Michael has been with Medtronic since 2009 and has an extensive background from the medical technology and pharmaceutical sectors. The rest of the management team is a team of successful professionals that have solid careers behind them in the field of medical technology and in the field of finance. The board of Medtronic is composed of one insider that is the chairman Omar Ishrak and 10 outsider board directors. (Medtronic.com/Corporate Governance)

The board of Medtronic setup is in compliance with the standards set by the NYSE for an independent board. (NYSE.com)

3.8 The Medtronic mission and strategy

The mission of Medtronic was defined in 1960 and it has six priorities. This mission statement is still used by Medtronic at the time of writing this thesis. The strategic priorities are detailed in the table below.

Priority one	To contribute to human welfare by alleviating pain, restoring health and extending life
Priority two	To direct the growth of the company towards areas where they can maximize their strengths and avoid areas where the company cannot contribute with valuable solutions
Priority three	To support the company to be recognized as providing the highest quality and reliability
Priority four	To make a fair profit
Priority five	To recognize the worth of the employees
Priority six	To be a good citizen as a company

Table 1. The six priorities of the Medtronic mission. (Medtronic.com/Strategy)

The strategy of Medtronic is relying on three primary strategies, Therapy Innovation, Globalization and Economic Value. These three strategies are explained further in the table below.

Therapy Innovation	Delivering a strong launch cadence of meaningful therapies and procedures.
Globalization	Addressing the inequity in health care access globally, primarily in emerging markets.
Economic Value	Becoming a leader in value-based health care by offering new services and solutions to improve outcomes and efficiencies, lower costs by reducing hospitalizations, improve remote clinical management, and increase patient engagement.

Table 2. The three primary strategies of Medtronic. (Medtronic.com/Priorities)

3.9 Financial reporting calendar

Medtronic's financial reporting calendar is from the start of May to the end of April. (Medtronic.com/Investors)

3.10 The Medtronic share

Medtronic's share was first listed on the NASDAQ in 1964 and then began trading on the New York Stock Exchange in 1977. Currently the Medtronic share is still listed on NYSE with the symbol MDT. (Medtronic.com/Investors)

The last 10 years performance of the Medtronic stock is detailed in the figure below:

Figure 2 The last 10 years performance of the Medtronic stock. (Medtronic.com/Investors)

3.11 Summary

Medtronic is a company with a revenue of nearly 30 billion dollars in revenue, 86.000 employees and is holding more than 46.000 patents. It is providing technologies towards nearly 40 medical conditions and has improved the lives of 71 million people in the last financial year 2017-2018. Medtronic has a long history of developing new products and improving existing products. On top of the internal value creation, Medtronic has successfully acquired and integrated a large number of corporate acquisitions that have expanded and improved their product offerings. The US represents more than half of their business and the developed part of the world represent 85 percent of their business. 85 of their shareholders are institutional investors, their management team is a group of experienced business leaders and their board is having one insider in a team of 11 persons. The strategy of Medtronic is focused on creating innovation, increasing their business in emerging market and in increasing positive outcome for the patients using their technologies.

4 STRATEGIC ANALYSIS

This chapter introduces the strategic analysis tools that are used to analyze the company. As the business environment is changing constantly, it is necessary to understand the aspects that influence the welfare and development of the company.

4.1 Strategic analysis overview

The strategic analysis methods and tools are supporting the analysis of the environment in which the company is operating. The outcome of the strategic analysis helps the analyst build an understanding of the company's ability to compete in the marketplace. (Lynch. 2012)

Some of the most used strategic analysis tools worldwide are: PESTEL analysis, Porter's Five Forces model analysis and SWOT analysis. (Albana et al. 2017)

PESTEL and the Porter's five model analysis are introduced shortly, and the SWOT analysis is introduced in detail below.

4.1.1 The PESTEL analysis

The PESTEL analysis is a tool that allows the analyst to identify influences on the business activity that the analyst is studying. The PESTEL analysis is useful as it assesses the case company in relation to the environment in which it operates. These sources of influence are stemming from a Political, an Economic, a Social, a Technological, an Environmental and a Legal origin. In other words, this tool allows the analyst to identify external factors that would influence the studied business activity in the future. (Lynch. 2012)

4.1.2 The Porter's Five Forces analysis

The Porter's Five Forces analysis is looking at the external market effect that new entrants, substitute products, customer demand, suppliers and the competition are bringing upon the studied business activity. This analysis helps the researcher to discover the studied company's industry market conditions and what forces are catalyzing or hindering the financial prosperity of the case company. (Lynch. 2012)

4.1.3 The SWOT analysis

The SWOT analysis was developed in the 1960s by the strategy research community. It is believed that the origin of SWOT stems from Harvard Business School as well as other business schools in the USA. One particular scholar Kenneth Andrews has been key in popularizing the use of SWOT in the business community. Kenneth helped confirm that good strategic work needs to differentiate between the external situation that an organization is facing and the internal qualities that an organization is having to face that external situation. Andrew separated the external situation into two entities, threats and opportunities and the internal qualities into two entities, strengths and weaknesses. The SWOT was initially mainly used in the manufacturing industry, but it has now spread to virtually all parts of the business world. The SWOT analysis has been criticized of being flawed. Some of these flaws are that the results of the analysis are subjective and that the especially the evaluated internal strengths and weaknesses are biased by the analyst's observations and evaluations and thus lead to distorted results. (Hill et al. 1997)

The SWOT analysis relies on the fact that the main role of a business is to achieve a long-term advantage in the marketplace in all the business sector where it is active. This advantage can only be achieved through a thorough understanding of the external and internal forces that shapes the ability of the organization to position itself in the marketplace. (De Wit. 2001)

Toward the external world, the company must understand the market in which it operates and the competitors against which it competes. This external scrutiny supports the organization to discover the opportunity and threats that represent the environment in which the business operates. The external scrutiny helps the organization to look internally at its capabilities to compete in the external environment. This internally scrutiny supports the organization to identify its strengths and weaknesses in facing the external environment. (De Wit. 2001)

The strategic analysis is measuring the ability of an organization to utilize its internal capabilities in doing business in the external marketplace that contains opportunities and threats. The SWOT analysis is not a static analysis, but rather a continuous analysis of how well the company is conducting business today and in the future. (De Wit. 2001)

In conducting a SWOT analysis, it is essential that the analyst is understanding the studied company's long-term objectives, action plans and set priorities that will help the company's business to adapt to the changing environment of the marketplace. (De Wit. 2001)

As a summary of the above, the SWOT analysis is thus looking at the internal Strengths and Weaknesses that the company is presenting internally, the external Opportunities and Threats that the business activity is subjected to from the external world. The SWOT

analysis helps the analyst with understanding the company's ability to compete in the marketplace. This outside-in and inside-out gathered understanding also supports the analyst in the effort of forecasting the future financial situation for the company. (De Wit. 2001)

In the following sections, the conducted SWOT analysis of Medtronic is documented. As introduced in the theoretical framework chapter, the SWOT analysis is the first effort of a series of activities that will lead to a valuation of Medtronic. Each of the four elements of the SWOT analysis are covered in detail.

4.2 SWOT analysis - Strengths

In the next sub-sections, some of the main strengths of Medtronic are reviewed

4.2.1 Patented technologies

Medtronic has more than 46.000 patents and these constitute a protection of the business of Medtronic. The protection comes in the form of a barrier for the competitors to make products that contain any of the intellectual properties that are covered by the Medtronic patents. The patents are a legal protection of innovations that is used in Medtronic's products. The competitors of Medtronic are forced to develop different technologies than the patented ones if they want to provide products in the same market segment as Medtronic. This patent protection allows Medtronic to sell more of their products or sell them at a higher margin. This in turn allows Medtronic to generate higher revenue or higher product profit margin. Both these actions will lead to higher corporate profit for Medtronic.

4.2.2 Less sensitive to economic cycles

The customers of Medtronic are purchasing the Medtronic products to help directly or indirectly with medical conditions. These purchases have a higher probability to continue through the ups and downs of the economic cycles than the regular consumer discretionary spending that a customer might have. In order words, the Medtronic products will not be the first thing that customers stop purchasing due to a deteriorating economy. This in turn allows Medtronic to have a more stable level of revenue behavior than a consumer discretionary company.

4.2.3 Corporate innovation culture

Therapy Innovation is the first pillar of Medtronic's strategy and seem to be the base of overall activities. Medtronic is committed to maintain their technological leadership and stay ahead of their competitors through constantly innovating. This drive for innovations will support the continuous development of Medtronic's business from a revenue and profit perspective. (Medtronic.com/Strategy)

4.2.4 Strong brand

According to Brand Finance, Medtronic is the 4th most valuable brand in the healthcare sector. (Brand Finance)

The strong brand value of Medtronic in the healthcare sector allows the company to have a higher customer acquisition and retention level and that is likely to lead to a higher corporate profit margin. One of the underlying reasons for this is that customers tends to want to pay more for getting the best help towards their disease(s). (Stahl et al. 2012)

4.2.5 Economies of scale

Medtronic is a large multinational organization with a large scale multinational operational setup.

This large-scale multinational setup helps generate economies of scale as a result. These economies of scale come from the ability of reducing the price per unit of product with an increased production volume.

The achieved economies of scale also act as a barrier of entry for any potential competitor that would like to cater to the same market. The barrier is in the form of a higher cost of production for the competitor as it does not have the high production volumes that would allow for a lower product unit cost. As the cost is higher per unit, the business case for the potential competitor is less interesting.

Finally, the economies of scale are also giving Medtronic financial advantages in the area of research and development, marketing as demonstrated by the strong brand of Medtronic and distribution. (Lynch. 2012)

4.3 SWOT analysis - Weakness

The following sub-sections provide analysis of some of the main weaknesses of Medtronic.

4.3.1 Majority of business in the US

Medtronic is a multinational company and is present in more than 150 countries. But Medtronic is still getting more than half of its revenue from the US market. This is a risk for the Medtronic business as it relies too much one particular market area. This is considered in the Medtronic strategic plan and actions are taken to increase the revenues from other markets than the US.

4.3.2 High acquisitions rate

Medtronic has undertaken a considerable number of acquisitions over the last decades. These acquisitions take time and considerable efforts to integrate into Medtronic. The integration will need to tackle many different key integration issues such as people integration, Technology integration, products integration, operations integration, brand integration, customers integration, suppliers and partners integration. Medtronic will need to constantly work on keeping the company corporate culture and corporate ways of working the same across the whole organization in order for the company to act as one business entity towards its stakeholders. The less integrated Medtronic is, the more internal frictions there are likely to be present. These frictions might induce some performance issues across or in parts of Medtronic. (Frankel et al. 2017)

4.3.3 Intellectual property litigation

As Intellectual property is a high value asset in the Medical technology industry. That high value represents an incentive for patent infringement lawsuits. This situation forces Medtronic, as a leader in this industry, to be engaged in many ongoing lawsuits. This activity represents a direct cost and indirect cost for the operational activities of Medtronic.

4.3.4 Governmental oversight

The medical technology sector is providing their products to be used by the patients and other people that are suffering from a medical disorder or disease. This fact puts it into the attention of both governmental organizations and other political interest groups.
This exposes the medical technology sector under extra scrutiny and monitoring in the form of specific legislations and regulations from the authorities. In the US, this regulation is executed by the FDA. In the EU, there is an EU level scrutiny in the form of the

European Union Medical Device Regulation. This regulation is valid in the EU, Norway, Liechtenstein, Iceland, Turkey and Switzerland. (WHO. Regulations of medical devices) (WHO. Regulations of medical devices global atlas)

4.3.5 General public relations exposure

The medical technology is exposed to a higher level of public attention due to the fact that the medical technology products are used by general members of the public. This usage is then touching directly and indirectly a large portion of the population. This broad population exposure is leading to an increased positive or negative reputation boost as a result. The perceived results of using the medical technology offering may lead to positive or negative fluctuation of the reputation of the medical technology sector. This situation is potentially impacting the future business prospect of medical technology companies in general. As a leader in the medical technology sector, Medtronic is exposed to this risk more than an average medical technology company. (ECRI Institute)
As an example, the organization PETA became a small shareholder in Medtronic in order to be able to participate into their annual shareholder meeting and speak up against the testing on animals. (PETA)

4.4 SWOT analysis - Opportunities

In the sub-sections below, some of the main opportunities of Medtronic are reviewed.

4.4.1 Increasing revenue outside of the US market

Medtronic is a multinational company and is present in more than 150 countries. As reviewed earlier, Medtronic is getting approximately 16 billion dollars revenue from the US market that has a population of approximately 329 million. The number of inhabitants in the rest of the developed world market segment is approximately 756 million and the present revenue is approximately 9 billion dollars. The emerging market segment represents a revenue of approximately 4 billion dollars and the population of that part of the world is approximately 6320 billion. (CIA world factbook)
The developing world represent a significant opportunity if comparing with the level of generated revenue in the US. This is one of the key strategic pillars of Medtronic and time will show if this strategy is successful.

4.4.2 Development of the lifestyle diseases in the world

Lifestyle diseases, also called noncommunicable diseases, are estimated to be the result of 41 million or 71 percent of the world population deaths. 80 percent of the lifestyle diseases caused deaths are cardiovascular with 17.9 million deaths, cancers with 9 million deaths, respiratory diseases with 3.9 million death and diabetes with 1.6 million deaths. (WHO. Noncommunicable diseases)

These lifestyle diseases related deaths represent a possibility to help to reduce these numbers for Medtronic. This is another of the key strategic pillars of Medtronic and time will show if this strategy is successful.

4.4.3 Aging world population

As the average national age increases in a nation, the need for medical treatment is increasing proportionally. This is a natural development as statistically an aging population is likely to need more treatment as a result of increased medical challenges. (WHO. Global health and aging)

Medtronic, as the largest medical technology provider, is well positioned to cater to this need of the world aging population.

4.4.4 Private and public health insurance scheme

Private and public health insurances cover some or the total part of the purchase of medical technology products. This leads to an increased possibility of the purchase of Medtronic's products and services, as the patients will not bear the full cost of the purchase of medical technology products. This creates a situation that the purchase decision of the medical technology is to a large extend disconnected for the cost of the medical technology. (Mercer capital)

4.4.5 Emergence of new technologies

The new emerging technologies such as artificial intelligence, minimal invasive surgery, predictive analytics, electronic medical data records, 3D printing, robotic surgery and big data analytics are fueling the creation of new medical technologies. (KPMG. Medical devices 2030)

This in turn, enables Medtronic either through acquisition or organic development to bring new medical technologies to market. This situation will allow Medtronic to address a presently unfulfilled healthcare needs, resulting into increased revenue and profit.

4.5 SWOT analysis - Threats

Some of the main Threats of Medtronic are reviewed in the next sub-sections.

4.5.1 Competition

Today, the nearly 400 billion dollars medical device market is relatively fragmented. None of the medical device companies are having more than 30 percent of the market. Medtronic as the biggest market player has less than 8 percent of the 400 billion dollars market in term of revenue. The medical device market can be characterized as a competitive market where there are many companies present. Each individual company has limited ability to set prices above the market price level. Medtronic is thus operating in a competitive market and needs to constantly work to stay relevant in the medical device marketplace. (Evaluatemedtech. World Preview) (Joekes et al. 2008)

4.5.2 Multiple direct and indirect customer groups

Due to the nature of the medical device market, Medtronic will need to cater to multiple direct and indirect customer groups. These customer groups include but are not limited to patients, medical doctors, medical nurses, other relevant medical professionals, private health insurance companies, public insurance companies and medical device regulators. This market setup represents many hurdles and barriers, that Medtronic will need to overcome in order to secure a profitable business. As an example, one of the challenges for Medtronic is to identify who is the user and who is the customer of a specific product among the multiple interested parties relevant in the medical device market. Medtronic will also need to put attention to understanding and influencing the health legislation and regulation, the healthcare provider structure and networks, hospital and clinic setup and the healthcare professional network setup. (Porter et al. 2006)

4.5.3 Health related legislation, regulation and recommendation

Medtronic is providing their products under the umbrella of the present and anticipated health related legislations and regulations. This situation represents a risk in the

Medtronic business model due to the possibility of changes to any current law, rule and recommendation. This risk requires extra effort for Medtronic, which in turn increases the operating costs of Medtronic. (US FDA) (EU medical devices regulations)
As a global company, Medtronic has risks associated with the prevailing international and national legislation, regulation and recommendation. And these risks need to be addressed as its activities expand further into new countries.

4.6 Summary of the strategic analysis

In this thesis project, the SWOT method has been as a tool in discovering the position of Medtronic with regards to their business objectives. The SWOT analysis discover information that helps to forecast the probability of succeeding in achieving the set business targets.
The conducted SWOT analysis of Medtronic paints a company that is operating in a highly regulated sector, but that the medical technology market is less sensitive to economic cycle. Many of the Medtronic customers are less sensitive to the cost of the Medtronic product due to private and public health insurance schemes.
The current world demography and increase in the lifestyle diseases are indicating an increased need for medical technology products and services.
Medtronic possesses a large intellectual property portfolio, a strong corporate innovation culture, a strong brand and economies of scale, which puts into a strong competitive position. More than half of Medtronic's revenue is dependent on the US market and that is a risk that Medtronic will need to address. At the same time, Medtronic has large untapped opportunity in the non-US market as well as in the emerging markets.
Medtronic has executed a high amount of acquisitions in the last decade and will need to ensure that the integration of those happens successfully. Medtronic is prone to attract litigation actions and that risk represents extra needed resources to attend to these actions. Legal efforts are also needed to be made by Medtronic to understand and comply with all the relevant regulations, recommendations and taxations in the markets where it operates. As the biggest medical technology company, Medtronic is enjoying in good and bad a high level of public exposure. Medtronic will need to work with its public relations to navigate successfully that exposure.
The medical technology sector is highly competitive, and Medtronic will need to constantly work to stay relevant in that marketplace. This work is made difficult by the

complexity in accessing the customer through different professional healthcare groups such as medical doctors, nurses and other medical staff of both hospital and healthcare service network.

5 FINANCIAL ANALYSIS

The financial analysis is helping the analyst to discover the historical financial health of the company. It is producing information that is complementing the conducted strategic analysis and their combination supports the creation of the financial forecasting covered later in this thesis document. (Kemp et al. 2015)

In this chapter, the reader is introduced to the actual historical financial analysis of Medtronic. This information is complementing the knowledge produced by the strategic analysis detailed in the previous chapter.

The value that a company creates in the form of its earnings, is determined by the return on its invested capital (ROIC), the growth of its revenue and its ability to maintain both in the future. The ROIC is calculated by the division of the net operating profit less adjusted taxes (NOPLAT) by the invested capital. The invested capital is the sum of the operating working capital, net fixed assets and other assets. These items will be discovered in the following sections below. (Koller et al. 2015)

5.1 Accounting principles

The International Accounting Standards Board publishes the International Accounting Standards that specifies the accounting principles as “Accounting policies are the specific principles, bases, conventions, rules and practices applied by an entity in preparing and presenting financial statements”. The company's reported financial information is thus dependent on the chosen accounting policies by the company. The company might need to change the accounting policy that it uses, due to a mandatory change as a result of the introduction of a new mandatory accounting standard. The company can also choose to change its accounting policy in case of a new policy that is better reflecting its financial status and development. It is therefore necessary before using the available financial data for analysis purposes, to understand if any changes happened for the collected financial data. In the case of any occurred changes, the analyst needs to correct for any accounting distortion that would have been introduced in the financial analysis result. (Deloitte. Accounting Standards. IFRS) (Deloitte. Accounting Standards. US GAAP)

The production of a company's financial statements falls under the responsibility of the Chief Executive Officer of the company. The financial audit of the produced financial statement is giving the company’s stakeholders assurance that the financial statements are representing the financial status of the company. The auditors of the financial audit are giving an opinion of how well the financial statements are representing the true status

of the company. It is important to pay attention to the fact that the auditors are expressing an opinion and not a guarantee of the true nature of the financial statements. This opinion is of course an educated opinion and is made by highly skilled professionals that conduct a judgement of the financial statements with a sceptic mindset to discover any discrepancies. It is important to pay attention to the fact that an audit is not a guarantee that potential fraud is detected, and that the company's CEO carries the responsibility to prevent and detect fraud. (PWC. 2017)

The auditor of the case company's annual reports of year 2014 to 2018 is the auditing firm PricewaterhouseCoopers and there were no comments towards the content of the reports. The lack of comments is not in itself a guarantee that the content of the reports is irrefutable, but rather that the auditor believes that the report is representing true and fair view of the case company's financial status and performance. (Medtronic.com)

Medtronic is reporting the financial statements in compliance with the US GAAP and its accounting policies have not changed significantly during the analyzed period of year 2014 to 2018. (Medtronic.com)

5.2 Preparing the financial statements for analysis

In order to enable an analysis of the historical financial data, the company's financial statements have to be reformulated. The purpose of that reformulation is to highlight the operating financial information apart from the financing financial information. The main reason for this separation is that the operating activities are the core future value creator for the company. The financing activities do not constitute the core future value creator for the company and merely represent how the past operating activities have been financed. (Koller et al. 2015)

In this chapter, the equity statement, the balance sheet and income statement will be reformulated in the following sections. The equity statement is reformulated with the aim of eliminating any changes in the ownership interest that would result in changes in the comprehensive income. The income statement and the balance sheet are reformulated with the goal of clearly separating operating and financial income. This helps the analyst to identify the operating catalysts in the development of the return on invested capital (ROIC) and return on equity (ROE). The ROIC and ROE are key inputs in the forecasted estimates and the resulting valuation of the company. The reformulation of the cash flow statement is done to identify the cash flow generated by the operational activities. This is

because of the fact that the operational activities represent the core activities of the company. (Palepu et al. 2004) (Koller et al. 2015)

The reported financial statement of Medtronic from year 2014 to 2018 is used to produce a reformulated financial statement that contains mainly relevant financial data for financial analysis purposes. The primary objective with the reformulation is to discover the operating and the financing elements of the Medtronic business activities. With this discovery, the analyst is able to identify the elements that are future value creating, meaning the operating parts. The analyst is also enabled to identify the elements that are used to finance the operating parts, meaning the financing elements. The reformulation of the financial statements will result in the determination of the two components of the ROIC, the NOPLAT and the invested capital. (Palepu et al. 2004) (Koller et al. 2015)

Medtronic has revised some revenue recognitions related to their accrual costs in their post-implant support services business from reporting year 2015 and 2016. This revision has resulted in an adjustment of 86 million dollars to the retained earnings. (Medtronic.com)

5.2.1 Reformulating the equity statement

In the accounting documentation, the measured equity represents the part that is left after all other stakeholders, but the owners are getting what is owed to them by the company. Any accounting introduced distortions would be stemming from distortions in the measured liability and assets. And any needed reformulation in the equity statement can be handled by the reformulation of the balance sheet and income statement. (Palepu et al. 2004)

Medtronic has not raised funds using any type of hybrid securities. Medtronic has issued stock options to employees as part of their reward scheme.

Medtronic is using the Black-Scholes model as a pricing model to estimate the option value. These estimates are reporting both as an expense and as an increase of equity in accordance with the US GAAP effective 2005. (US FASB)

In 2016, FASB issued guidance allowing the recognition of current and deferred income taxes associated with an intra-entity asset transfer before an asset had been sold to a third-party. This change resulted in an increase of in the beginning retained earnings with 296 million dollars in year 2018. (Medtronic.com)

As a result of the corporate tax cuts enacted in 2018 by the renewed US new corporate tax laws, Medtronic had to realize a loss of 203 million dollars and an increase in retained earnings of the same amount. (Medtronic.com)

There is no need to reformulate the equity statement due to any of the above listed items. But the equity statement will need to be reformulated for the ease of including that information into the further financial analysis of Medtronic. This reformulation will highlight the equity status at the beginning of each year, any changes related to Medtronic's income and changes related to the shareholders' equity.

The reformulated equity statement highlights the shareholder's equity related transactions and the income related transactions. The reformulated equity statement is produced in the table in the appendix 3. A summary of the reformulated equity statement is displayed in the table below:

MEDTRONIC PLC (MDT) Reformulated statement of equity					
Fiscal year ends in April. USD in millions	2014-04	2015-04	2016-04	2017-04	2018-04
Equity in the start of the year	**18 671**	**19 443**	**53 144**	**51 997**	**50 330**
Shareholders' equity related transactions - Total	-2 188	31 699	-4 021	-4 927	-3 929
Medtronic income related transactions - Total	2 960	2 002	2 854	3 280	4 421
Change in equity	772	33 701	-1 147	-1 667	492
Equity in the end of the year	**19 443**	**53 144**	**51 997**	**50 330**	**50 822**

Table 3 A summary of the reformulated equity statement of Medtronic

5.2.2 Reformulating the balance sheet

The US GAAP accounting rules dictate that the balance sheet is including both operating and non-operating assets as well as financing assets. The reformulation will be based on the foundation of accounting that states that the assets are equal to the liabilities plus the equity. The liabilities are the sum of operating liabilities and interest-bearing debt and the assets are mainly operating assets. It can thus be derived that the operating assets are equal to the operating liabilities plus debt plus equity. When looking at the previous statement, it can be deducted that the capital invested in the company is equal to the debt plus the equity as well as equal to the net operating assets. The net operating assets are equal to the operating assets minus the operating liabilities.

A corporation typically has between 0.5 percent to 2 percent of their revenue as operating working capital. (Koller et al. 2015)

In the case of this thesis project, one percent of revenue is used as an operating working capital to reflect the longer sales lead time that the medical device sector has due to the complex purchase decision making process. The operating working capital is mainly held in cash and the rest of held cash will, in this thesis, be considered cash for financing purposes.
As Medtronic has taken acquisition actions in all the measured years, the goodwill was included into this reformulation to enable an analysis of how well Medtronic is utilizing the investors' investments. The goodwill is one of the most important operating assets and it is largely related to the acquisitions that Medtronic has been executing before and during the years that are analyzed. The goodwill represents the amount by which the purchase price was higher than the fair value of a particular acquisition. The total goodwill represents the accumulated goodwill of the sum of executed acquisitions. This is especially visible with the increase of goodwill in 2015 where Medtronic acquired Covidien.

The reformulated balance sheet is highlighting the division into a financial and an operating part. This helps the analyst to discover the capital used in the operating part of the company and the capital that stems from investors. The reformulated balance sheet is depicted below:

MDT Balance Sheet reformulated						
MEDTRONIC PLC (MDT) BALANCE SHEET						
Fiscal year ends in April. USD in millions	2013-04	2014-04	2015-04	2016-04	2017-04	2018-04
Operating assets						
Operating current assets						
Cash and cash equivalents (1% of revenue)	166	170	203	288	297	300
Accounts receivable	3 727	3 811	5 112	5 562	5 591	5 987
Inventories, net	1 712	1 725	3 463	3 473	3 338	3 579
Operating current assets - Total	5 605	5 706	8 778	9 323	9 226	9 866
Operating non-current assets						
Property, plant, and equipment, net	2 490	2 392	4 699	4 841	4 361	4 604
Goodwill	10 329	10 593	40 530	41 500	38 515	39 543
Other intangible assets, net	2 673	2 286	28 101	26 899	23 407	21 723
Tax assets	232	300	774	1 383	1 550	1 465
Operating non-current assets - Total	15 724	15 571	74 104	74 623	67 833	67 335
Operating assets - Total	**21 329**	**21 277**	**82 882**	**83 946**	**77 059**	**77 201**
Operating liabilities						
Current debt obligations	910	1 613	2 434	993	7 520	2 058
Accounts payable	681	742	1 610	1 709	1 555	1 628
Current accrued compensation	1 011	1 015	1 611	1 712	1 904	1 988
Current accrued income taxes	88	164	935	566	633	979
Current deferred tax liabilities	16	19	119			
Non-current Accrued compensation and retirement benefits	752	662	1 534	1 759	1 724	1 425
Non-current Accrued income taxes	1 183	1 343	2 476	2 903	2 405	3 051
Non-current Deferred tax liabilities	340	386	4 700	3 729	2 978	1 423
Operating liabilities - Total	**4 981**	**5 944**	**15 419**	**13 371**	**18 719**	**12 552**
Invested Capital	**16 348**	**15 333**	**67 463**	**70 575**	**58 340**	**64 649**
Net working capital	**624**	**-238**	**-6 641**	**-4 048**	**-9 493**	**-2 686**
Financial assets						
Cash and cash equivalents (for financing purposes)	753	1 233	4 640	2 588	4 670	3 369
Investments	10 211	12 838	14 637	9 758	8 741	7 558
Other current assets	1 283	1 433	2 789	1 931	1 865	2 187
Current assets held for sale					371	
Other assets	1 324	1 162	1 737	1 421	1 232	1 078
Noncurrent assets held for sale					5 919	
Financial assets - Total	**13 571**	**16 666**	**23 803**	**15 698**	**22 798**	**14 192**
Financial liabilities						
Other accrued expenses	1 244	2 006	2 464	2 185	2 618	3 431
Current liabilities held for sale					34	
Long-term debt	9 741	10 315	33 752	30 109	25 921	23 699
Other liabilities	278	235	1 819	1 916	1 515	889
Noncurrent liabilities held for sale					720	
Financial liabilites - Total	**11 263**	**12 556**	**38 035**	**34 210**	**30 808**	**28 019**
Net financial liabilities (debt)	-2 308	-4 110	14 232	18 512	8 010	13 827
Total equity	**18 671**	**19 443**	**53 230**	**52 063**	**50 330**	**50 822**
Invest capital (Equity + debt)	**16 363**	**15 333**	**67 462**	**70 575**	**58 340**	**64 649**

Table 4 Reformulated balance sheet

5.2.3 Reformulating the income statement

The reformulation of the income statement needs to reflect any of the changes that have been discussed earlier in the sections covering the equity and balance sheet. (Palepu et al. 2004)

As the ROIC and the ROE are driven by the net operating profits less adjusted taxes (NOPLAT), the goal of the reformulation of the income statement is to help determine the NOPLAT. The reported accounting income statement includes both operating elements and non-operating elements. The NOPLAT is determined by the operating elements in the reported income statement. (Koller et al. 2015)

The reformulation of the income statement will focus on highlighting the operating elements of the income statement and enable the determination of the NOPLAT as a result. The NOPLAT is the part of the profit that the operating activities have generated after taxes. Thus, the NOPLAT represents the cash that is available for payout towards the debt and equity investors. The net income of Medtronic only gives information about the what is available towards the equity investors. This is because the net income represents the amount that would be available solely to the equity investors and is not available to debt investors. The NOPLAT represents the monetary value that is generated by the operating activities irrespective of how Medtronic is financing its operations. The estimated taxes on operating profit would be the taxes amount that Medtronic would report if it was 100% equity financed company. (Koller et al. 2015)

The depreciation is included in the cost of goods sold (COGS) and the amortization is stated separately. An overview of the depreciation and amortization over the measured period is listed in the table below:

Fiscal year ends in April. USD in millions	2013-04	2014-04	2015-04	2016-04	2017-04	2018-04
Depreciation and amortization	-819	-850	-1 306	-2 820	-2 917	-2 644
Depreciation	-488	-501	-573	-889	-937	-821
Amortization of intagibles	-331	-349	-733	-1 931	-1 980	-1 823
Cost of products sold (including depreciation)	-4 126	-4 333	-6 309	-9 142	-9 291	-9 055
Cost of products sold (excluding depreciation)	-3 638	-3 832	-5 736	-8 253	-8 354	-8 234

Table 5 The historic depreciation and amortization overview of Medtronic.

An overview of the conducted estimation of the taxes related to both the operating and the financing part of Medtronic's business are introduced below. The tax rate used in these calculations was the U.S. federal statutory tax rate, which were 35 percent before year 2018 and 21 percent year 2018 forward. The aim of this estimation is to discover the

taxes on the financial income, also called the tax shield and to discover the taxes on operating income. This helps understand the net interest expenses that are left after the taxes.

MDT taxes on financial and operating elements calculations, for analysis purposes						
MEDTRONIC PLC (MDT) taxes calculations						
Fiscal year ends in April. USD in millions.	2013-04	2014-04	2015-04	2016-04	2017-04	2018-04
U.S. federal statutory tax rate	35,0 %	35,0 %	35,0 %	35,0 %	35,0 %	30,5 %
Income tax provision	-784	-640	-811	-798	-578	-2 580
Financial income, net	-181	-108	-280	-1 025	-728	-976
Taxes on the financial income - tax shield	-63	-38	-98	-359	-255	-298
Taxes on operating income	-847	-678	-909	-1 157	-833	-2 878
Net interest expense left after tax	-118	-70	-182	-666	-473	-678

Table 6 The estimations of the taxes on both the operating and financing part of Medtronic business.

As explained above, the reformulated income statement helps the analyst get an overview of the income that is related to the operating activities and the income that is related to the financing activities of Medtronic. As a result, NOPLAT is discovered. The resulting reformulated income statement is introduced below.

MDT Income Statement, for analysis purposes						
MEDTRONIC PLC (MDT) INCOME STATEMENT						
Fiscal year ends in April. USD in millions	2013-04	2014-04	2015-04	2016-04	2017-04	2018-04
Operating income						
Revenue	16 590	17 005	20 261	28 833	29 710	29 953
Cost of products sold (excluding depreciation)	-3 638	-3 832	-5 736	-8 253	-8 354	-8 234
Gross profit	12 952	13 173	14 525	20 580	21 356	21 719
Operating expenses						
Research and development expense	-1 557	-1 477	-1 640	-2 224	-2 193	-2 253
Selling, general, and administrative expense	-5 698	-5 847	-6 904	-9 469	-9 711	-9 974
Restructuring charges, net	-172	-78	-237	-290	-363	-30
Acquisition-related items	49	-117	-550	-283	-220	-104
Certain litigation charges	-245	-770	-42	-26	-300	-61
Divestiture-related items						-114
Gain on sale of businesses						697
Special charge		-40	38		-100	-80
Other expense, net	-108	-181	-118	-107	-222	-505
Operating expenses - total	**-7 731**	**-8 510**	**-9 453**	**-12 399**	**-13 109**	**-12 424**
EBITDA	**5 221**	**4 663**	**5 072**	**8 181**	**8 247**	**9 295**
Depreciation	-488	-501	-573	-889	-937	-821
Amortization of intangible assets	-331	-349	-733	-1 931	-1 980	-1 823
Depreciation and amortization	-819	-850	-1 306	-2 820	-2 917	-2 644
EBIT	**4 402**	**3 813**	**3 766**	**5 361**	**5 330**	**6 651**
Taxes on operating income	-847	-678	-909	-1 157	-833	-2 878
Net operating profit less adjusted taxes (NOPLAT)	**3 555**	**3 135**	**2 857**	**4 204**	**4 497**	**3 773**
Financial Income						
Investment loss				-70		-227
Interest income		271	386	431	366	397
Interest expense		-379	-666	-1 386	-1 094	-1 146
Financial income, net	**-181**	**-108**	**-280**	**-1 025**	**-728**	**-976**
Taxes on the financial income - tax shield	-63	-38	-98	-359	-255	-298
Financial income, net after taxes	**-118**	**-70**	**-182**	**-666**	**-473**	**-678**
Net income	3 467	3 065	2 675	3 538	4 024	3 095
Net loss attributable to noncontrolling interests					4	9
Net income attributable to Medtronic	3 467	3 065	2 675	3 538	4 028	3 104

Table 7 The reformulated income statemen that highlights the operating elements of the income statement.

5.2.4 Reformulating the cash flow statement

The reformulation of the cash flow statement is highlighting the cash flow generated by the operations and the cash flow invested in the operational activities. Corrections might need to be done in the areas of tax allocations, the changes to cash reserves, investment and divestment in external companies and any conducted financial transactions. The main

goal of the reformulation is to determine the cash flow that is generated by the operational activities separated from the financing activities. This is done by adding the net financials after taxes to the cash flow from operations. As the case company invests into the operational activities, that action is considered as a negative cash flow from the investment perspective. (Palepu et al. 2004)

In the event of sales or acquisition of another company, the cash flow statement records the net cash of the transaction, meaning that the cash gained/lost in the acquisition/sales is deducted from the cash used/gained in the acquisition/sales during the company sales/acquisition transaction. This is not the case with the balance sheet that contains all the acquired or sold assets and liabilities. An adjustment is then needed to eliminate the adverse in the cash flow calculation. This adjustment requires that the debt is added to the cash flow in the investment part and eliminated in the financing part. (Palepu et al. 2004)

Any investment in stocks or other securities represents a change from cash to a like cash asset. The reformulation would need to eliminate what looks like an investment but really is not and a would thus lead to a decrease in free cash flow if not eliminated. The investment in stock or similar vehicles would also need to be eliminated from investment and added to financing side. (Palepu et al. 2004)

The free cash flow is the cash flow that is stemming from the operating activities of Medtronic minus any investments made into the operating activities and is independent of the financing setup. The free cash flow is available to both the equity and debt investors. The free cash flow can be calculated by the NOPLAT minus the change in invested capital (net investment).

The gross cash flow and the gross investment is discovered by adding the depreciations and amortizations to the NOPLAT and the net investment. The free cash flow can be determined by the gross cash flow minus the gross investment. The gross cash flow is the total cash that stems from the operating activities or NOPLAT plus the depreciations and amortizations. The gross investment is the portion of the gross cash flow that is invested back into the operating activities. The gross investment is determined by changes in the operating working capital and capital expenditures (CAPEX). The CAPEX is any changes in tangible and intangible assets and can be calculated by the change in total operating non-current assets. (Koller et al.2015)

MDT Cash Flow						
MEDTRONIC PLC (MDT) Statement of CASH						
Fiscal year ends in April. USD in millions.	2013-04	2014-04	2015-04	2016-04	2017-04	2018-04
EBIT	4 402	3 813	3 766	5 361	5 330	6 651
Taxes on operating income	-847	-678	-909	-1 157	-833	-2 878
Net operating profit less adjusted taxes (NOPLAT)	3 555	3 135	2 857	4 204	4 497	3 773
Depreciation and amortization	-819	-850	-1 306	-2 820	-2 917	-2 644
Gross cash flow	4 374	3 985	4 163	7 024	7 414	6 417
change in working capital	N/A	-862	-6 403	2 594	-5 445	6 806
Change in operating non-current assets - Total	N/A	-153	58 533	519	-6 790	-498
Gross investment	N/A	-1 015	52 130	3 113	-12 235	6 308
Free cash flow	**N/A**	**5 000**	**-47 967**	**3 912**	**19 649**	**109**

Table 8 The reformulated cash flow statement that is highlighting the cash flow generated by the operations and the cash flow invested in the operational activities.

5.3 Profitability analysis

In this section, the profitability of Medtronic is studied using the information discovered previously in this chapter.

5.3.1 Return on invested capital (ROIC)

The yearly Medtronic's profitability is measured by the return on invested capital. The ROIC is giving an indication of how well the operating parts of Medtronic has been performing. The ROIC is calculated by dividing the NOPLAT (see Table 6) by the invested capital (see Table 5). The capital invested data used in the calculation is the status of the beginning of the year. (Koller et al.2015)

The determined ROIC is detailed in the table below:

MDT return on invested capital, for analysis purposes						
MEDTRONIC PLC (MDT) ROIC calculations including goodwill						
Fiscal year ends in April. USD in millions.	2013-04	2014-04	2015-04	2016-04	2017-04	2018-04
NOPLAT	3 555	3 135	2 857	4 204	4 497	3 773
Invested capital	16 348	15 333	67 463	70 575	58 340	64 649
ROIC		19,18 %	18,63 %	6,23 %	6,37 %	6,47 %

Table 9 Return on Invested Capital.

The ROIC is maintained at a similar level in 2014 and 2015, but a major decline happens in 2016 onwards. The invested capital increased dramatically in relation with the

acquisition of Covidien in 2015. The part of the invested capital that increased the most was the goodwill with 30 billion dollars and other intangible assets with 26 billion dollars in 2015. This seems to indicate that Medtronic was not able to create value through the acquisition of Covidien and that a considerable part of the value was diverted to the selling investors. These findings seem to be in line with the expectations stipulated by Koller et al. (Koller et al. 2015)

5.3.2 The analysis of Medtronic's goodwill and other intangible assets

The goodwill is a measure of the extras that Medtronic has paid for its acquisitions and is adjusted for any potential impairment annually. The goodwill is reported in the balance sheet minus any accumulated impairment loss. (Koller et al. 2015)
The development of Medtronic's goodwill and other intangible assets is illustrated in the table below:

Fiscal year ends in April. USD in millions	2013-04	2014-04	2015-04	2016-04	2017-04	2018-04
Goodwill	10 329	10 593	40 530	41 500	38 515	39 543
Other intangible assets, net	2 673	2 286	28 101	26 899	23 407	21 723
Intangible assets - Total	13 002	12 879	68 631	68 399	61 922	61 266
Total equity	18 671	19 443	53 230	52 063	50 330	50 822
Invested Capital	16 348	15 333	67 463	70 575	58 340	64 649
Goodwill/Equity	55,32 %	54,48 %	76,14 %	79,71 %	76,52 %	77,81 %
Goodwill/capital invested	63,18 %	69,09 %	60,08 %	58,80 %	66,02 %	61,17 %
total intagible assets/Equity	69,64 %	66,24 %	128,93 %	131,38 %	123,03 %	120,55 %
total intagible assets/capital invested	79,53 %	84,00 %	101,73 %	96,92 %	106,14 %	94,77 %
Changes Year on Year						
Goodwill		2,56 %	282,61 %	2,39 %	-7,19 %	2,67 %
Other intangible assets, net		-14,48 %	1129,27 %	-4,28 %	-12,98 %	-7,19 %
Intangible assets - Total		-0,95 %	432,89 %	-0,34 %	-9,47 %	-1,06 %

Table 10 The development of Medtronic's goodwill and other intangible assets.

Medtronic's goodwill and other intangible assets increased dramatically in 2015. It is clear, that the Covidien acquisition has increased the equity and the invested capital as well. Medtronic has not impaired their goodwill dramatically 2016 onwards, which could indicate that Medtronic considers the Covidien acquisition as successful. The goodwill and the total intangible assets versus invested capital are showing a steady trend and the goodwill as well as the total intangible assets represent a large portion of the invested capital. This supports the fact that Medtronic has been constantly acquiring other companies and that it has rendered Medtronic sensitive to a potential large goodwill or intangible asset impairment, as the representing loss would impact the equity and the capital invested

level significantly. In other words, Medtronic cannot afford to impair their goodwill too much with the present level of equity and level of invested capital.

The development of ROIC including or excluding goodwill gives an indication if the acquisitions are a positive strategic decision. The overview of the ROIC is given in the table below:

MDT return on invested capital, for analysis purposes						
MEDTRONIC PLC (MDT) ROIC calculations excluding goodwill						
Fiscal year ends in April. USD in millions.	2013-04	2014-04	2015-04	2016-04	2017-04	2018-04
NOPLAT	3 555	3 135	2 857	4 204	4 497	3 773
Invested capital	16 348	15 333	67 463	70 575	58 340	64 649
ROIC		19,18 %	18,63 %	6,23 %	6,37 %	6,47 %
Invested capital - excluding goodwill	6 019	4 740	26 933	29 075	19 825	25 106
ROIC - excluding goodwill		52,09 %	60,27 %	15,61 %	15,47 %	19,03 %

Table 11 The development of the ROIC and the goodwill.

Both with and without the goodwill, the Medtronic ROIC falls dramatically in 2015 as a result of the Covidien acquisition and remains fairly constant in years 2016-2017 and increases slightly in year 2018. It is an indication that the Covidien acquisition reduced the shareholder value and the operating performance deteriorated in 2015 as a result. But this is only an indication as it is hard to judge the future financial result of the Covidien acquisition, as cost savings and cross-selling upsides can take many years to realize. (Koller et al. 2015)

The ROIC before the Covidien acquisition in 2015 was above 50 percent excluding the goodwill and nearly 20 percent including the goodwill. This is an indication that Medtronic pre-acquisition of Covidien, would have likely created more value from organic growth as an alternative of shareholder value creation for Medtronic. (Koller et al. 2015)

5.3.3 The analysis of the tax impact on the Medtronic ROIC

An analysis of the ROIC versus the pre-tax ROIC was conducted and documented in the table below. As it can be seen, the pre-tax ROIC shows similar trend as the post-tax ROIC and that the operating tax rate does not seem to be a major cause for a observed decrease of the ROIC.

Fiscal year ends in April. USD in millions.	2013-04	2014-04	2015-04	2016-04	2017-04	2018-04
ROIC		19,18 %	18,63 %	6,23 %	6,37 %	6,47 %
cash tax rate on EBIT	19,25 %	17,78 %	24,14 %	21,58 %	15,62 %	43,27 %
Pretax ROIC		23,32 %	24,56 %	7,95 %	7,55 %	11,40 %

Table 12 The pre-tax ROIC.

5.3.4 The operating margin and the capital efficiency

The above discovered pre-tax ROIC can also be determined by multiplying the operating margin with the capital efficiency. The operating margin is given by the division of EBIT divided by the revenues and the capital efficiency is given by the revenues divided by the invested capital. The development of the operating margin and the capital efficiency are detailed in the table below:

Fiscal year ends in April.	2013-04	2014-04	2015-04	2016-04	2017-04	2018-04
EBIT	4 402	3 813	3 766	5 361	5 330	6 651
Revenue	16 590	17 005	20 261	28 833	29 710	29 953
Invested Capital	16 348	15 333	67 463	70 575	58 340	64 649
Operating margin	26,53 %	22,42 %	18,59 %	18,59 %	17,94 %	22,20 %
Capital efficiency	101,48 %	110,90 %	30,03 %	40,85 %	50,93 %	46,33 %

Table 13 The operating margin and the capital efficiency.

The operating margin shows a relatively stable development while the capital efficiency has deteriorated dramatically in 2015. This reinforced the case, that the goodwill and total intangible assets as part of the fixed assets, have had a significant impact on the ROIC of Medtronic in 2015 and forward. To illustrate this development, Medtronic was able to generate more than one dollar for every dollar of capital invested and after the Covidien acquisition that ability decreased to 30, 40, 50 and 46 cents per every dollar of capital invested respectively in 2015, 2016, 2017 and 2018.

5.4 Summary of the financial analysis

During the financial analysis of the financial statements, it is important that the analyst discovers any potential issues that the case company might have. These red flags could be achieving an adequate earnings level, a decreasing trend in the cash flow, an increasing trend in the debt build-up, an increase in the inability to collect receivables, an increase in the inventory levels or any abnormal changes on the levels of sales, inventory and receivables.

Medtronic's last five years' historical performance is analyzed in detail. The return on invested capital (ROIC) is determined and the building blocks of the ROIC are studied to understand the factors that determine the present business health of Medtronic.

Medtronic is reporting in compliance with the US GAAP accounting rules and had no negative comments from the accounting auditing firm PricewaterhouseCoopers.

The financial statements are reformulated to discover the operating and financing elements of the Medtronic business. Attention is put into understanding the value generating activities in Medtronic. In that process, the return on invested capital with its components, the net operating profit less adjusted taxes and the invested capital have been discovered.

Medtronic made a major acquisition of a company Covidien in 2015. This acquisition seems to have reshaped Medtronic from a financial perspective. The Medtronic's ROIC declined due to the Covidien acquisition and there are indications that Medtronic was not able to create immediate value through that acquisition. This development seems to be in line with the theoretical findings made in the financial research literature. (Koller et al. 2015)

The main drivers for a deterioration of the operating business health of Medtronic stems from the increase of goodwill and other intangible assets related to the Covidien acquisition. As a result, the immediate operating performance of Medtronic deteriorated and has only slightly recovered during the last three years. As an illustration of that deterioration, Medtronic was able to generate more than a dollar for every dollar invested before the Covidien acquisition. After the acquisition, Medtronic has generated less than 50 cents per invested dollar.

In this chapter, the research attention was on the past performance of the case company. In the next chapter, the research attention will turn towards the future development of the case company from a financial perspective.

6 FINANCIAL FORECASTING

In this chapter, the research focuses on developing a future looking perspective of the development of Medtronic. In that effort, the analysis gives an estimation of the future development of Medtronic through the forecasting of the future financial data of the case company.

The financial forecasting is estimating the future financial development of Medtronic. This forecast is based on the findings in the strategic and financial analysis achieved in the previous chapters.

The result of this forecast is the key information that supports the creation of the valuation of the case company that will be covered later in this thesis document. The quality of the financial forecasting data is fundamental in achieving the higher quality valuation result. In achieving quality, it is imperative that attention is paid mainly to the operational financial data. The reason for this is that the operational activities are the main generator of future value. (Palepu et al. 2004) (Koller et al. 2015)

6.1 Forecasting assumptions

In order to produce a comprehensive forecasted future performance of the company, it is recommended to produce a forecast of the income statement, balance sheet and cash flow. By producing all three forecasts, the analysis increases the probability of avoiding reaching wrong results. The drivers for the forecasting of the future performance of non-financial case companies are typically revenue forecast. Often the financial forecasting is able to assume that the asset turnover (asset turnover equal to revenues divided by net assets) remains relatively stable. In the cases where it is assumed, the analysis can assume that the working capital level and the investment in PP&E (property, plant and equipment) grows proportionally to the sales growth. The forecasting can also assume that the growth of most of the expenses remains proportional to the sales growth. In general, the forecasting work benefits from a forecast of all accounting data such as revenues, earnings, assets and liabilities. These forecasts are typically based on the understanding of the expected growth, profitability, needed investments, and needed financing of the company. (Palepu et al. 2004)

The forecast of the financial statements conducted in the sections below is based on the expected Medtronic business size, Medical device market size and business/market growth rates that were introduced in the introduction chapter of this thesis.

As a pre-stage, it is important to determine the length and detail of the planned forecast. The forecast is divided into 3 periods in this research project.

The first period is a near future forecasted period from 2019 until 2023 where it is expected that Medtronic's revenue will grow with 6% a year and reach a revenue level of approximately 40 billion dollars in 2022. (Evaluate Medtech. 2016)

A second period from 2024 until 2031, in this period Medtronic is expected to grow similar with the medical device market growth of 5 percent. (KPMG. 2018)

The last period will be a steady state forecast covering the remaining years until perpetuity. The steady state period will be a period where Medtronic is estimated to grow with a constant rate of the inflation of two percent and earn a constant rate of return on the invested capital. (Koller et al. 2015) (US department of labor)

Despite Medtronic having been very active on the acquisition front, it is very difficult to predict such activity in the future. The forecast made in this thesis will assume that no future acquisition is made.

In this thesis, the financial forecasting assumes that capital efficiency remains relatively stable. The analysis assumes that the invested capital level and the investment in PP&E (property, plant and equipment) will grow proportionally to the revenue growth. The forecasting also assumes that most expenses will remain proportional to revenue growth taking into account the forecasted profit margins. (Palepu et al. 2004)

In order to limit the complexity of the conducted forecasting, this research project is using nominal financial number. This allow for the valuation to be conducted without taking into account any expected future inflation.

The forecast of the financial statements conducted in the sections below is based on the expected Medtronic business size, Medical device market size and business/market growth rates that were introduced in the introduction chapter of this thesis.

6.2 Income statement forecast

The key data in the production of the forecasted income statement are recommended to be revenue and taxes. The taxes are defined by the authorities and are from 2018 onward 21 percent in the US and 35 percent before 2018 and five years back. All the other income statement will be forecasted as a fixed percent of the revenue. (Palepu et al. 2004)

As discussed in the forecasting assumptions paragraph, the revenue will grow with 6 percent from 2019 until 2023, then with 5 percent from 2024 until 2031 and finally with 2 percent after that. The line item analysis shows that three biggest cost drivers are the costs

of products sold (COGS), the SGA costs and the R&D costs. The COGS, SGA and R&D costs represent nearly 70 percent of the revenue.

The COGS increased dramatically in 2015/2016 with 5-6 percent and has shown a decreasing trend with 1 percent year on year in 2017 and 2018. As it is expected that Medtronic will more active in more countries, that would lead to a small increase in COGS. At the same time, it is assumed that Medtronic will be able to realize some level of efficiency gain that would lead to a small decrease in COGS. These changes will out-balance each other and the COGS will remain constant at 27 percent. The SGA and R&D costs remains at similar levels. This is because of the nominal increase in both SGA and R&D resulting from to the expected increase in revenue is covered by the slight increase of activity that Medtronic is expected to have in the emerging markets. In this research, it is assumed that SGA costs will remain at 33 percent and R&D costs will remain at 8 percent.

The line item analysis also shows that the rest of the operating costs represent on average 2 percent of revenue. For the forecast purposes, it is assumed that the rest of the operating costs are 2 percent of revenue and are classified as other expenses in order to simplify the work conducted in this thesis.

The depreciation and amortization are expected to be at a similar level as year 2018 at 8 percent. The net financial expenses are expected to be similar to the year 2018 at 3 percent of revenue.

To further simplify the forecast work, it is assumed that there is no contribution due to non-controlling interest and the net income is totally attributable to Medtronic.

The line item analysis and the income statement forecast in percentages can be found in the table in appendix 4. The resulting income statement forecast is depicted in the table below:

MDT Income Statement, for analysis purposes													
MEDTRONIC PLC (MDT) INCOME STATEMENT													
Fiscal year ends in April. USD in millions	Estimate 2019-04	Estimate 2020-04	Estimate 2021-04	Estimate 2022-04	Estimate 2023-04	Estimate 2025-04	Estimate 2026-04	Estimate 2027-04	Estimate 2028-04	Estimate 2029-04	Estimate 2030-04	Estimate 2031-04	Estimate 2032-04
Operating income													
Revenue	31 750	33 655	35 675	37 815	40 084	42 088	44 192	46 402	48 722	51 158	53 716	56 402	57 530
Cost of products sold (excluding depreciation)	-8 573	-9 087	-9 632	-10 210	-10 823	-11 364	-11 932	-12 529	-13 155	-13 813	-14 503	-15 229	-15 533
Gross profit	23 178	24 568	26 042	27 605	29 261	30 724	32 261	33 874	35 567	37 346	39 213	41 173	41 997
Operating expenses													
Research and development expense	-2 540	-2 692	-2 854	-3 025	-3 207	-3 367	-3 535	-3 712	-3 898	-4 093	-4 297	-4 512	-4 602
Selling, general, and administrative expense	-10 478	-11 106	-11 773	-12 479	-13 228	-13 889	-14 584	-15 313	-16 078	-16 882	-17 726	-18 613	-18 985
Other expense, net	-635	-673	-713	-756	-802	-842	-884	-928	-974	-1 023	-1 074	-1 128	-1 151
Operating expenses - total	**-13 653**	**-14 472**	**-15 340**	**-16 260**	**-17 236**	**-18 098**	**-19 003**	**-19 953**	**-20 951**	**-21 998**	**-23 098**	**-24 253**	**-24 738**
EBITDA	**9 525**	**10 097**	**10 702**	**11 344**	**12 025**	**12 626**	**13 258**	**13 921**	**14 617**	**15 347**	**16 115**	**16 921**	**17 259**
Depreciation and amortization	-2 540	-2 692	-2 854	-3 025	-3 207	-3 367	-3 535	-3 712	-3 898	-4 093	-4 297	-4 512	-4 602
EBIT	**6 985**	**7 404**	**7 848**	**8 319**	**8 818**	**9 259**	**9 722**	**10 208**	**10 719**	**11 255**	**11 818**	**12 408**	**12 657**
Taxes on operating income	-1 667	-1 767	-1 873	-1 985	-2 104	-2 210	-2 320	-2 436	-2 558	-2 686	-2 820	-2 961	-3 020
Net operating profit less adjusted taxes (NOPLAT)	**5 318**	**5 637**	**5 975**	**6 334**	**6 714**	**7 050**	**7 402**	**7 772**	**8 161**	**8 569**	**8 997**	**9 447**	**9 636**
Financial Income													
Financial income, net	**-953**	**-1 010**	**-1 070**	**-1 134**	**-1 203**	**-1 263**	**-1 326**	**-1 392**	**-1 462**	**-1 535**	**-1 611**	**-1 692**	**-1 726**
Taxes on the financial income - tax shield	-200	-212	-225	-238	-253	-265	-278	-292	-307	-322	-338	-355	-362
Financial income, net after taxes	**-752**	**-798**	**-845**	**-896**	**-950**	**-997**	**-1 047**	**-1 100**	**-1 155**	**-1 212**	**-1 273**	**-1 337**	**-1 363**
Net income attributable to Medtronic	4 566	4 840	5 130	5 438	5 764	6 052	6 355	6 673	7 006	7 357	7 724	8 111	8 273

Table 14 Medtronic's Income statement forecast

6.3 Balance sheet forecast

The forecast of the balance sheet is based on a proportion of the forecasted revenue. If the balance sheet as a result gets out of balance, the equity side of the balance sheet is used to rebalance the balance sheet. (Palepu et al. 2004) (Koller et al. 2015)

As stated earlier, it is assumed that Medtronic do not engage in further acquisitions. The goodwill is, as a result, kept as a constant size of the nearly 40 billion dollars. The rest of the intangible assets is decreasing with an average of 8 percent in the period of 2015 to 2018. It is assumed that this decrease halts as a result of the stabilization of the Covidien acquisition activities. The intangible assets grow with the rate of inflation of 2 percent that the real value of the intangible assets stay constant. (US department of labor)

The long-term proportion between PP&E and revenue is relatively stable over time. It is thus assumed that the PP&E grow as the revenue from 2018 onwards. In line with the estimate in the financial analysis chapter, the operating cash level is 1 percent of the revenue. All the other balance sheet items are approximately the same proportion of the revenue as in the historical value of 2018. The values in percent are illustrated in the table in appendix 5. The resulting forecasted balance sheet is displayed in the table below:

MDT Balance Sheet reformulated													
MEDTRONIC PLC (MDT) BALANCE SHEET													
Fiscal year ends in April. USD in millions	Estimate 2019-04	Estimate 2020-04	Estimate 2021-04	Estimate 2022-04	Estimate 2023-04	Estimate 2025-04	Estimate 2026-04	Estimate 2027-04	Estimate 2028-04	Estimate 2029-04	Estimate 2030-04	Estimate 2031-04	Estimate 2032-04
Operating assets													
Operating current assets													
Cash and cash equivalents (1% of revenue)	318	337	357	378	401	421	442	464	487	512	537	564	575
Accounts receivable	6 350	6 731	7 135	7 563	8 017	8 418	8 838	9 280	9 744	10 232	10 743	11 280	11 506
Inventories, net	3 810	4 039	4 281	4 538	4 810	5 051	5 303	5 568	5 847	6 139	6 446	6 768	6 904
Operating current assets - Total	10 478	11 106	11 773	12 479	13 228	13 889	14 584	15 313	16 078	16 882	17 726	18 613	18 985
Operating non-current assets													
Property, plant, and equipment, net	4 880	5 173	5 483	5 812	6 161	6 469	6 793	7 132	7 489	7 863	8 257	8 669	8 843
Goodwill	39 543	39 543	39 543	39 543	39 543	39 543	39 543	39 543	39 543	39 543	39 543	39 543	39 543
Other intangible assets, net	22 157	22 601	23 053	23 514	23 984	24 464	24 953	25 452	25 961	26 480	27 010	27 550	28 101
Tax assets	1 270	1 346	1 427	1 513	1 603	1 684	1 768	1 856	1 949	2 046	2 149	2 256	2 301
Operating non-current assets - Total	67 851	68 663	69 506	70 382	71 291	72 159	73 056	73 983	74 942	75 933	76 958	78 019	78 788
Operating assets - Total	**78 328**	**79 769**	**81 279**	**82 861**	**84 519**	**86 048**	**87 640**	**89 296**	**91 020**	**92 815**	**94 684**	**96 631**	**97 773**
Operating liabilities													
Current debt obligations	2 223	2 356	2 497	2 647	2 806	2 946	3 093	3 248	3 411	3 581	3 760	3 948	4 027
Accounts payable	1 588	1 683	1 784	1 891	2 004	2 104	2 210	2 320	2 436	2 558	2 686	2 820	2 877
Current accrued compensation	1 905	2 019	2 140	2 269	2 405	2 525	2 652	2 784	2 923	3 069	3 223	3 384	3 452
Current accrued income taxes	953	1 010	1 070	1 134	1 203	1 263	1 326	1 392	1 462	1 535	1 611	1 692	1 726
Current deferred tax liabilities													
Non-current Accrued compensation and retirement benefits	1 588	1 683	1 784	1 891	2 004	2 104	2 210	2 320	2 436	2 558	2 686	2 820	2 877
Non-current Accrued income taxes	3 175	3 366	3 567	3 781	4 008	4 209	4 419	4 640	4 872	5 116	5 372	5 640	5 753
Non-current Deferred tax liabilities	1 588	1 683	1 784	1 891	2 004	2 104	2 210	2 320	2 436	2 558	2 686	2 820	2 877
Operating liabilities - Total	**13 018**	**13 799**	**14 627**	**15 504**	**16 434**	**17 256**	**18 119**	**19 025**	**19 976**	**20 975**	**22 024**	**23 125**	**23 587**
Invested Capital	**65 311**	**65 970**	**66 652**	**67 357**	**68 085**	**68 792**	**69 521**	**70 271**	**71 044**	**71 840**	**72 661**	**73 506**	**74 186**
Net working capital	**-2 540**	**-2 692**	**-2 854**	**-3 025**	**-3 207**	**-3 367**	**-3 535**	**-3 712**	**-3 898**	**-4 093**	**-4 297**	**-4 512**	**-4 602**
Financial assets													
Cash and cash equivalents (for financing purposes)	3 351	3 332	3 312	3 291	3 268	3 248	3 227	3 205	3 182	3 157	3 132	3 105	3 094
Investments	7 938	8 414	8 919	9 454	10 021	10 522	11 048	11 601	12 181	12 790	13 429	14 101	14 383
Other current assets	2 223	2 356	2 497	2 647	2 806	2 946	3 093	3 248	3 411	3 581	3 760	3 948	4 027
Current assets held for sale													
Other assets	953	1 010	1 070	1 134	1 203	1 263	1 326	1 392	1 462	1 535	1 611	1 692	1 726
Noncurrent assets held for sale													
Financial assets - Total	**14 464**	**15 112**	**15 798**	**16 526**	**17 298**	**17 979**	**18 694**	**19 446**	**20 235**	**21 063**	**21 933**	**22 846**	**23 229**
Financial liabilities													
Other accrued expenses	3 493	3 702	3 924	4 160	4 409	4 630	4 861	5 104	5 359	5 627	5 909	6 204	6 328
Current liabilities held for sale													
Long-term debt	25 083	26 588	28 183	29 874	31 666	33 250	34 912	36 658	38 491	40 415	42 436	44 558	45 449
Other liabilities	953	1 010	1 070	1 134	1 203	1 263	1 326	1 392	1 462	1 535	1 611	1 692	1 726
Noncurrent liabilities held for sale													
Financial liabilites - Total	**29 528**	**31 299**	**33 177**	**35 168**	**37 278**	**39 142**	**41 099**	**43 154**	**45 312**	**47 577**	**49 956**	**52 454**	**53 503**
Net financial liabilities (debt)	15 064	16 188	17 379	18 642	19 980	21 163	22 405	23 708	25 077	26 514	28 024	29 608	30 274
Equity													
Equity correction	-575	-1 039	-1 549	-2 107	-2 718	-3 193	-3 706	-4 259	-4 855	-5 496	-6 185	-6 924	-6 910
Total equity	**50 247**	**49 783**	**49 273**	**48 715**	**48 104**	**47 629**	**47 116**	**46 563**	**45 967**	**45 326**	**44 637**	**43 898**	**43 912**
Invest capital (Equity + debt)	**65 311**	**65 971**	**66 652**	**67 357**	**68 084**	**68 792**	**69 521**	**70 271**	**71 044**	**71 840**	**72 661**	**73 506**	**74 186**

Table 15 Medtronic's Balance sheet forecast

6.4 Cash flow forecast

The data from the expected income statement and balance sheet can be used to discover the expected cash flow statement. (Palepu et al. 2004)

As reviewed in the previous chapter, the free cash flow can be found with the help of the following equation:

$$Free\ cash\ flow = NOPLAT + depreciation + amortization - changes\ in\ working\ capital - CAPEX$$

The resulting forecasted free cash flow is illustrated in the table below:

MDT Cash Flow													
MEDTRONIC PLC (MDT) Statement of CASH													
Fiscal year ends in April. USD in millions.	Estimate 2019-04	Estimate 2020-04	Estimate 2021-04	Estimate 2022-04	Estimate 2023-04	Estimate 2025-04	Estimate 2026-04	Estimate 2027-04	Estimate 2028-04	Estimate 2029-04	Estimate 2030-04	Estimate 2031-04	Estimate 2032-04
EBIT	6 985	7 404	7 848	8 319	8 818	9 259	9 722	10 208	10 719	11 255	11 818	12 408	12 657
Taxes on operating income	-1 667	-1 767	-1 873	-1 985	-2 104	-2 210	-2 320	-2 436	-2 558	-2 686	-2 820	-2 961	-3 020
Net operating profit less adjusted taxes (NOPLAT)	5 318	5 637	5 975	6 334	6 714	7 050	7 402	7 772	8 161	8 569	8 997	9 447	9 636
Depreciation and amortization	-2 540	-2 692	-2 854	-3 025	-3 207	-3 367	-3 535	-3 712	-3 898	-4 093	-4 297	-4 512	-4 602
Gross cash flow	7 858	8 330	8 829	9 359	9 921	10 417	10 938	11 485	12 059	12 662	13 295	13 960	14 239
change in working capital	-146	152	162	171	182	160	168	177	186	195	205	215	90
Change in operating non-current assets - Total	-516	-812	-843	-876	-910	-868	-897	-927	-958	-991	-1 025	-1 060	-770
Gross investment	-662	-660	-682	-704	-728	-708	-729	-750	-773	-796	-820	-846	-679
Free cash flow	**8 520**	**8 989**	**9 511**	**10 064**	**10 649**	**11 124**	**11 666**	**12 235**	**12 832**	**13 458**	**14 115**	**14 805**	**14 918**

Table 16 Medtronic's free cash flow forecast

6.5 Forecasted profitability

The return on invested capital tends to, over time, to move towards the cost of equity capital of the case company. Any extraordinary financial performance, that generates different than expected normal financial returns, will converge towards the expected normal financial returns. (Palepu et al. 2004)

The estimated Return on Invested Capital is given in the table below:

MDT return on invested capital, for analysis purposes												
MEDTRONIC PLC (MDT) ROIC												
Fiscal year ends in April. USD in millions.	Estimate 2019-04	Estimate 2020-04	Estimate 2021-04	Estimate 2022-04	Estimate 2023-04	Estimate 2025-04	Estimate 2026-04	Estimate 2027-04	Estimate 2028-04	Estimate 2029-04	Estimate 2030-04	Estimate 2031-04
NOPLAT	5 318	5 637	5 975	6 334	6 714	7 050	7 402	7 772	8 161	8 569	8 997	9 447
Invested capital	65 311	65 970	66 652	67 357	68 085	68 792	69 521	70 271	71 044	71 840	72 661	73 506
ROIC	8,23 %	8,63 %	9,06 %	9,50 %	9,97 %	10,35 %	10,76 %	11,18 %	11,61 %	12,06 %	12,52 %	13,00 %

Table 17 Medtronic's ROIC forecast

With the estimated forecast, the ROIC will be steadily improving from 2018 onwards with a ROIC of 13% in 2031.

6.6 Summary of forecasting

The result of the forecast is based on the combined result of the executed strategy analysis and the financial analysis. This forecast is describing a possible financial development of Medtronic based on listed assumptions and estimations. It is important to remember that

the Medtronic's development might end up different from the one anticipated in this forecast.

The key forecasted data is summarized in the table below:

MDT Cash Flow													
MEDTRONIC PLC (MDT) Key forecasted data													
Fiscal year ends in April.	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
USD in millions.	2019-04	2020-04	2021-04	2022-04	2023-04	2025-04	2026-04	2027-04	2028-04	2029-04	2030-04	2031-04	2032-04
Revenue	31 750	33 655	35 675	37 815	40 084	42 088	44 192	46 402	48 722	51 158	53 716	56 402	57 530
EBITDA	9 525	10 097	10 702	11 344	12 025	12 626	13 258	13 921	14 617	15 347	16 115	16 921	17 259
EBIT	6 985	7 404	7 848	8 319	8 818	9 259	9 722	10 208	10 719	11 255	11 818	12 408	12 657
Net operating profit less adjusted taxes (NOPLAT)	5 318	5 637	5 975	6 334	6 714	7 050	7 402	7 772	8 161	8 569	8 997	9 447	9 636
Net income attributable to Medtronic	4 566	4 840	5 130	5 438	5 764	6 052	6 355	6 673	7 006	7 357	7 724	8 111	8 273
Invested Capital	65 311	65 971	66 652	67 357	68 084	68 792	69 521	70 271	71 044	71 840	72 661	73 506	74 186

Table 18 Medtronic's key forecasted data

In the next chapter, the constructed forecast of Medtronic is summarized into an estimate of the value of the case company.

7 FINANCIAL VALUATION

The financial valuation is the process of translating the case company's forecasted financial data into an estimated financial valuation. This process is a common activity in the financial sector, the corporate world and as well in general when a business decision is made. An example of this situation could be when the consumer decides to purchase a kilo of tomatoes and another case could be the investment banker preparing a private company for an IPO (Initial Public Offering). (Palepu et al. 2004)

The main four valuation methods available are the discounted dividends, the discounted abnormal earnings, the valuation based on multiples and the discounted cash flow. (Palepu et al. 2004)

The two most popular method of the four introduced above are the multiples and the discounted cash flow. (Koller et al. 2015)

The multiples is a popular valuation method largely because it does not need any of the steps taken in the strategic analysis, financial analysis and financial forecasting. But this valuation approach requires discovering comparable companies to the case company, which is a challenging task. (Palepu et al. 2004)

The multiples is covered in more details in the multiples valuation section below.

The discounted cash flow method is relying on the production of many years of cash flows forecasts. These forecasted cash flows are discounted at the case company's cost of capital to deduct an estimate of the present value of the case company. (Palepu et al. 2004)

A crucial part of the DCF valuation is estimating the case company’s cost of capital. This value is used to discount the future cash flows into a present value of these cash flows. After the discovery of valuation has been achieved, a sensitive analysis is conducted to discover the level of changes in the different parameters have on the final valuation of the case company. (Koller et al. 2015)

The DCF valuation method is covered in more details in the discounted cash flow section below.

7.1 Discounted cash flow valuation method

The discounted cash flow valuation model is measuring the present discounted value of the future estimated cash flows of the company. The discount rate used in this method represents the risk that the company has as an investment object. (Berk et al. 2011)

There are two ways to measure the value of the company. The first one is to measure the entire enterprise value of the company and deduct the debt part to obtain the equity value

part of the company. The second one is to measure directly the equity part of the company. (Palepu et al. 2004)

In this thesis, the first method of measuring the value of the company is used. As a consequence, the future cash flow needs to be discounted with the weighted average cost of capital (WACC) of the company. The WACC is the cost of capital that reflects the risk of total company's business. (Palepu et al. 2004) (Berk et al. 2011)

The value of the company is calculated using the following formula (Berk et al. 2011):

$$V_0 = \frac{FCF_1}{1 + r_{wacc}} + \frac{FCF_2}{(1 + r_{wacc})^2} + \cdots + \frac{FCF_N}{(1 + r_{wacc})^N} + \frac{V_N}{(1 + r_{wacc})^N}$$

where:

$V_0 = Value\ of\ the\ enterprise\ at\ year\ 0$

$FCF_i = Free\ Cash\ Flow\ at\ year\ i$

$r_{wacc} = the\ case\ company's weighted\ average\ cost\ of\ capital$

$V_N = The\ terminal\ value\ of\ the\ enterprise\ at\ year\ N$

If it is assumed that the company has a constant long-term growth rate g_{FCF} for the free cash flow after year N, then the terminal value can be expressed as (Berk et al. 2011):

$$V_N = \frac{FCF_{N+1}}{r_{wacc} - g_{FCF}} = \left(\frac{1 + g_{FCF}}{r_{wacc} - g_{FCF}}\right) * FCF_N$$

where:

$g_{FCF} = The\ long\ term\ growth\ rate$ of free cash flow

$FCF_i = Free\ Cash\ Flow\ at\ year\ i$

$r_{wacc} = the\ case\ company's weighted\ average\ cost\ of\ capital$

$V_N = The\ terminal\ value\ of\ the\ enterprise\ at\ year\ N$

7.2 Determining weighted average cost of capital (WACC)

As explained above, there is a need to discover the discount rate WACC that mirrors the risk that the company represents as an investment object. Another way to describe the WACC, is to consider the investor's possibility to choose other investment objects with similar risk level as the company. These other investment objects reward the investor with a certain level free cash flow. The company has the possibility of funding its activities through raising a combination of both equity and debt. Debt is attractive as it is a cheaper financing vehicle due to a combination of the cost of debt and the tax deduction that debt is creating for the company. Equity financing is attractive as it considered a protection

against a bankruptcy risk for the company. The cost of capital WACC is thus represented by a certain portion of cost of equity and a certain portion of cost of debt. These portions are equal to the part debt and equity of the full capital of the company. (Berk et al. 2011)
The increasing of the financing through debt is limited to an optimum combination of debt and equity. Beyond that optimum combination, the increase of debt level increases the bankruptcy risk and lead to an unwanted increase of the cost of debt. In practice, it is not easy to reach and maintain the point of optimum combination. The debt interest is deductible in the taxable income of a company, and this increases the amount of income available to investors. This investor gain is called a tax shield. A company can optimize the tax-saving view by reaching debt levels that render their taxable income level equal to their total interest expense. In practice, the average business has an interest expense level well below their taxable income and thus is not taking full advantage of the available tax shield. (Berk et al. 2011)
The formula on how to calculate the WACC is (Berk et al. 2011):

$$r_{wacc} = \frac{E}{E+D} r_e + \frac{D}{E+D} r_d (1 - T_c)$$

where:

$r_{wacc} = the\ case\ company's\ weighted\ average\ cost\ of\ capital$

$E = The\ market\ value\ of\ the\ equity\ of\ the\ case\ company$

$D = The\ market\ value\ of\ the\ debt\ of\ the\ case\ company$

$r_e = The\ cost\ of\ equity\ of\ the\ case\ company$

$r_d = The\ cost\ of\ debt\ of\ the\ case\ company$

$T_C = The\ marginal\ tax\ rate\ of\ the\ case\ company$

In the following sections, the cost of equity and the cost of debt are discovered in more details.

7.3 Capital structure

As reviewed above, the capital structure is the relative proportion of debt and equity that a company is using to finance its operating activities. (Berk et al. 2011)
The optimum way to estimate the capital structure of a company is the market value of the company issued equity and debt. In practice it might be challenging to measure the market value of the debt. An alternative is to use the book value of the net financial obligations as a measure of debt. The company's value is given by the sum of the debt and equity. (Koller et al. 2015)

The capital structure of Medtronic is estimated by using the book value of the net financial debt and the market value of the equity.
The historical value of the Medtronic capital structure is depicted in the table below:

MDT Capital structure						
MEDTRONIC PLC (MDT) capital structure						
Fiscal year ends in April. USD in millions except share price.	2013-04	2014-04	2015-04	2016-04	2017-04	2018-04
Closing share price	46,68	58,82	74,45	79,15	83,09	81,29
Total outstanding number of shares	1 028	1 014	1 109	1 426	1 391	1 368
Market value of Medtronic equity	47 987	59 643	82 565	112 868	115 578	111 205
Net financial obligations	-2 308	-4 110	14 232	18 512	8 010	13 827
Debt / Value	0,00 %	0,00 %	14,70 %	14,09 %	6,48 %	11,06 %
Equity / Value	100,00 %	100,00 %	85,30 %	85,91 %	93,52 %	88,94 %

Table 19 The capital structure of Medtronic

The debt before the acquisition is considered zero before 2015 where Medtronic acquired Covidien. In 2016 onwards, the debt level is between 11 and 12 percent.
As WACC-based models are giving a more accurate result if the debt to value remains constant through the period estimated, it is assumed that the debt ratio remains 11 percent and the equity is 89 percent throughout the forecasted period in this thesis project. (Koller et al.)

7.4 Risk free rate

The risk-free rate represents the rate that an investment in an asset of which we have certainty that the return on investment will realize. The risk-free investment is considered having no default risk and no reinvestment risk. The financial community is often using the yield of the US 10-year Treasury bond as a measure of the risk-free rate. In the time of executing this thesis project, the US 10-year Treasury bond is around 3 percent. (Berk et al. 2011) (Investing.com. United States 10-Year Bond Yield)

7.5 Cost of debt

The cost of debt represents the interest rate of the debt of the company. In order to determine the cost of debt, it is necessary to discover the total amount of interest paid and divide that by the total amount of outstanding debt. If any changes in the debt and capital structure is expected, it is necessary to estimate the future cost of debt based on these

expectations to reflect the future capital structure of the company. Often, the cost of debt could also be extracted from the yield to maturity of the company's corporate bonds. The interest rates of the company's bank loans can also be used to determine the cost of debt. (Berk et al. 2011)

The yield of the Medtronic corporate bonds on the 1st of October 2018 could not easily be found in publicly available financial information sources and the cost of debt was determined using the Medtronic credit rating as stated by Koller et al. (Koller et a. 2015)

Medtronic issued a bond in 2015 with a maturity date of 2025, that is rated by Moody's as A3. (Marketsinsider.com)

With the help of the guidelines stated by Koller et al., Medtronic has a risk premium of approximately 1 percent over the 10-years US Treasury bond. As discovered above, the risk-free rate is 3 percent. The cost of debt before taxes is thus estimated to be 4 percent. (Koller et a. 2015)

7.6 Cost of equity

As introduced in the previous section, the cost of equity is an element of the WACC. The cost of equity can be estimated using the capital asset pricing model (CAPM). (Berk et al. 2011)

7.6.1 Capital Asset Pricing Model (CAPM)

The capital asset pricing model assumes that the investor is diversified by purchasing the market portfolio. The market portfolio is the portfolio that hold a portion of all the traded assets and thus has a market risk, which only a non-diversifiable risk. In other words, an investor invests a portion of her/his investment into risk-free assets and a portion into market risk assets. (Berk et al. 2011)

Under these assumptions, the CAPM is stating that the cost of equity of the company can be calculated using the equation below:

$$r_e = r_f + \beta(r_m - r_f)$$

where:

$r_e = the\ case\ company's\ cost\ of\ equity$

$r_f = The\ riskfree\ rate$

$r_m = The\ expected\ return\ of\ the\ market$

$\beta = The\ beta\ of\ the\ case\ company's\ stock$

$$(r_m - r_f) = The\ market\ risk\ premium$$

As this equation shows, in order to calculate a specific expected return on a stock, there is a need to discover the risk-free rate, the market risk premium and the company's stock's beta. (Berk et al. 2011)
These three parameters are discussed in the sections below.

7.6.2 The market risk premium and risk-free rate

The risk-free rate represents the rate of return that an investment in an asset of which we have certainty that the return realizes. The risk-free investment is considered having no default and no reinvestment risk. The financial community is often using the yield of the US 10-year Treasury bond as a measure of the risk-free rate. (Berk et al. 2011)
During this thesis work the US 10-year Treasury bond was around 3 percent. (Investing.com. United States 10-Year Bond Yield)
The market risk premium represents the return of the market portfolio return minus the risk-free rate. Some researchers have estimated the market risk premium to be in the range of 3 percent to 5 percent based on the historical behavior of the last 50 years and an expectation of the future behavior. (Berk et al. 2011)
According to Pablo Fernandez and his team from IESE Business School, the average Market risk premium used for the USA in the financial world was 5.7 percent. (Fernandez et al. 2013)
For the purpose of this thesis research, it is assumed that the market risk premium is 5,7 percent.

7.6.3 The Beta

The Beta represents how sensitive the return of the company's stock is to return of the overall market. The estimation of the future beta of the company is challenging as it is based on all the investors' expectation of the company as well as the overall market's future returns. There are two ways in discovering the beta of the company. One way is to graphically plot the company's return as a function of the market return and then find the best-fitting line based on the plotted points. The slope of that line represents the beta of the company. The other way is to use the statistical tool, called linear regression, that finds the best-fitting line. This can be calculated by using a computer-based spreadsheet. When estimating the beta, it is common to use five years view of monthly return data.

This is a compromise of avoiding using older data while attempting to keep a high level of reliability of the resulting beta estimate. (Berk et al. 2011)
The monthly return data calculation for Medtronic and the S&P 500 is visualized in the table in Appendix 1. (Yahoo.com/Finance)
The conducted regression to determine the beta is depicted in the figure in Appendix 2. The regression output in appendix 2 shows that the beta of Medtronic is estimated to be 0,6006. The publicly available 3 years trailing is determined to be 0,57. The small difference in these numbers might be because this thesis's estimate is based on 5 years trailing data. (Yahoo.com/Finance)

7.6.4 The cost of equity

The estimate of the cost of equity is listed in the table below:

Calculation of cost of equity	
Risk free rate	3,00 %
beta	0,6006
market risk premium	5,70 %
cost of equity	6,42 %

Table 20 The cost of equity estimation of Medtronic

The cost of equity is thus estimated to be 6,42 percent for Medtronic. This estimate will be used in the rest of this thesis.

7.7 The WACC calculation

Once all the needed components of the WACC are determined, the WACC can then be estimated. The calculated WACC is then the discount rate used to determine the present value of the company. The needed input and the resulting estimate of the WACC of Medtronic of 6,06 percent is shown in the table below:

MDT WACC estimation	
cost of debt	4,00 %
cost of equity	6,42 %
US tax rate	21,00 %
debt/value	11,00 %
equity/value	89,00 %
WACC estimate	6,06 %

Table 21 The estimate of Medtronic's WACC

7.8 The discounted cash flow valuation method

The valuation of Medtronic is discovered using the discounted cash flow valuation method.

By inputting the discovered data into the DCF model, it is possible to estimate the estimated price of a Medtronic common share. The estimated free cash flow is discounted by the discovered WACC. The details of the calculations leading to the estimate of the Medtronic share price are depicted in the table below.

MDT Discounted Cash Flow Valuation													
MEDTRONIC PLC (MDT)													
Fiscal year ends in April.	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	
USD in millions except share price.	2019-04	2020-04	2021-04	2022-04	2023-04	2025-04	2026-04	2027-04	2028-04	2029-04	2030-04	2031-04	
Free cash flow	8 520	8 989	9 511	10 064	10 649	11 124	11 666	12 235	12 832	13 458	14 115	14 805	
WACC	6,06 %	6,06 %	6,06 %	6,06 %	6,06 %	6,06 %	6,06 %	6,06 %	6,06 %	6,06 %	6,06 %	6,06 %	
Discount factor	0,9428	0,8889	0,8381	0,7902	0,7450	0,7024	0,6622	0,6244	0,5887	0,5550	0,5233	0,4934	
Present Value of the period cash flow	8 033	7 991	7 971	7 952	7 933	7 814	7 726	7 639	7 554	7 469	7 386	7 304	
The sum of present values from 2019 until 2031	92 772												
long term growth of the free cash flow after year 2031	2 %												
The value of the terminal value in 2031	371 544												
The discount factor of the terminal value	0,4934												
The present value of the terminal value	183 304												
The enterprise value of Medtronic	276 076												
The debt value of Medtronic	30 368												
The equity value of Medtronic	245 708												
Outstanding shares	1 368												
Estimated price per share	**179,61**												

Table 22 The DCF valuation of Medtronic

The estimate of the Medtronic share price is 179,61 dollars on the 1st of October 2018. The closing price of Medtronic was 99,49 dollars on the 1st of October 2018. Based on this conducted valuation, it is recommended investors to invest in Medtronic shares as a long-term investment. The Medtronic share would be considered undervalued based on the conducted valuation in this thesis.

7.9 Sensitivity analysis

This conducted valuation is based on many uncertain assumptions. It is thus useful to challenge the reached estimate by conducting a sensitive analysis. (Koller et al. 2015)

The goal of a sensitivity analysis is, through changing some key variables, to observe how much the resulting valuation varies. The possible resulting valuation changes will have

an effect on the estimated case company's valuation and stock price. The estimated WACC and growth of the free cash flow are key variables that shape the estimated valuation. The estimated terminal value represents by far the largest portion of the total valuation and seems to be sensitive to the long-term growth rate as well as the WACC. In the table below, the resulting change to the estimated share price due to 0,5 percent step changes in WACC and the long-term growth rate are illustrated.

Long-term Growth from 2031 onwards	WACC						
	4,56 %	5,06 %	5,56 %	6,06 %	6,56 %	7,06 %	7,56 %
0,50 %	205,83	181,58	162,17	146,18	133,11	121,97	112,44
1 %	226,24	196,69	173,68	155,13	140,22	127,69	117,1
1,50 %	253,31	216,05	188,03	166,03	148,73	134,44	122,53
2 %	290,95	241,74	206,4	179,61	159,1	142,52	128,95
2,50 %	346,87	277,46	230,78	197,01	172,04	152,37	136,63
3 %	438,63	330,52	264,68	220,08	188,6	164,66	145,99
3,50 %	616,97	417,59	315,04	252,15	210,58	180,39	157,66

Table 23 The sensitivity analysis of Medtronic valuation result

As can be observed, both variables have considerable influence on the estimated share price. It seems that the share price is more sensitive to changes in the WACC and its elements the risk-free rate, the expected return of the market and the beta of Medtronic.

7.10 Multiples valuation

The multiples valuation is using the market prices of the Medtronic's peer companies to estimate the value of Medtronic. The investor uses those prices as a benchmark to estimate the value of Medtronic. This is based on a concept that is broadly used in all types of investments. The concept is that similar assets usually have similar prices. This concept is clearly seen applied in the property market, where similar properties are usually selling for similar prices. (Palepu et al. 2004)

This valuation method requires as a first step, the identification of the peer companies that are similar to Medtronic. Once they are identified, an estimation of Medtronic is made based on the average of the data of the peer companies. The main characteristics that the analyst is researching are the Medtronic's ability to generate profit versus the enterprise or equity value of Medtronic. (Palepu et al. 2004)

The multiples might seem, at first glance, to be easy for most analysts; but in reality, it is challenging to identify optimal peer companies for Medtronic. The selection of an optimum multiple for comparison purposes can also be challenging. It is thus clear that

despite the wide usage of this method by analysts, valuations based on multiples will need to be used with some level of reservations. (Palepu et al. 2004)

It is recommended to use measures with the enterprise value rather than the equity value as there is a risk that debt versus equity ratio might result in less accurate results. A peer company to Medtronic is a company that have similar level of cash flow generation, represents similar level of risk from an investment perspective, similar expected level of growth in its business and is considered to be in the same industry as Medtronic. Academic financial experts are recommending using the multiples method as a second step after conducting a valuation based on the discounted cash flow model as a validation of a conducted a valuation of Medtronic. (Koller et al. 2015)

In this thesis, the multiples valuation method is only used as a validation of the result of the conducted DCF valuation method above. Some of the main used multiples in the financial industry are the Price/earnings (P/E) and the Price/Book value (P/BV). (Koller et al. 2015)

In this thesis, these two multiples are chosen for the purpose of the discovery of multiples valuation of Medtronic.

7.10.1 Medtronic peer companies

The main public stand-alone medical technology companies that are listed in the US stock exchange are the following companies: Cardinal Health, Stryker and Baxter. (The statistics portal)

These companies will be used as Medtronic's peer companies in this thesis. The multiple ratios for these companies, as well as for Medtronic, are listed in the table below. (Yahoo.com/Finance)

Company (1st of October 2018)	P/E	P/BV
Cardinal Health	22,66	2,73
Stryker	51,41	6,78
Baxter	35,20	4,54
Average peer companies	**36,42**	**4,68**
Medtronic	43,07	2,67

Table 24 Key multiples of Medtronic and its peer companies on the 1st of October (Yahoo.com/Finance)

The key ratios of the average of the peer companies are clearly different from Medtronic's ratios, but will be used to determine the Medtronic share price in the sections below.

7.10.2 Price/earnings (P/E) valuation

The price per earning is given by the following formula:

$$\frac{P}{E} = \frac{Share\ price\ (end\ of\ year)}{Earnings\ per\ share}$$

The P/E is an indication of the multiple times the investor has to pay to receive the company's earnings. This ratio is commonly used and gives an indication if a particular company is reasonably priced. The downside of this multiple is that it is dependent on the company's capital structure. (Palepu et al. 2004)

The average peer companies' P/E ratio for Medtronic is then 13,79and this number can then be used to estimate the share price of Medtronic by using the following formula:

$$Share\ price = \frac{Net\ earnings\ (end\ of\ year) \times {}^{P}/_{E}}{Outstanding\ number\ of\ shares}$$

The estimation of the share is given in the table below.

P/E based share price	
Average peer companies P/E	36,42
Earnings	3 104
Total outstanding number of shares	1 368
Share price	82,64

Table 25 The estimation of the Medtronic share price using the P/E ratio

The result is an estimate of Medtronic share price to be at 82,64 dollars. This is considerably lower than the price 179,61 dollars estimated using the DCF valuation method.

7.10.3 Price/Book value valuation (P/BV)

The price to book value is calculated using the formula below.

$${}^{P}/_{BV} = \frac{Share\ price}{Book\ value\ per\ share}$$

The average peer companies' Price/book value is 4,14 and can be entered on to the share price formula given below.

$$Share\ price = \frac{\frac{P}{BV} \times Average\ expected\ equity}{Outstanding\ number\ of\ shares}$$

Where the average expected equity is the average equity forecasted in the 2019 to 2032 period. The average equity value is estimated to be 50,82 billion dollars.
The share price is estimated to be 173,99 dollars using the calculation as given in the table below:

P/BV based share price	
Equity 2018-04	50 822
Total outstanding number of shares	1 368
Book value per share	37
Share price 2018-04	80,13
P/BV	4,68
Average expected equity	50 822
Share price	173,99

Table 26 The estimate of Medtronic's share price using the Price to book value ratio

This estimated share price is similar to the estimated share price of 179,61 dollars using the using the DCF valuation method.

7.10.4 Summary of the multiples' valuation

The Medtronic's average value of the peer companies' ratios are used to estimate the Medtronic share price to 82,64 dollars using the P/E ratio multiples method and 173,99 dollars using the P/BV ratio multiples method. The P/E multiples method is resulting in an estimated share price that is close to the current share price level at the time of writing this thesis, while the P/BV gives a very close result to the DCF method estimation.

7.11 Valuation summary

The Discounted Cash Flow method represents a powerful tool in discovering the valuation of the company. The multiples method is a useful in supporting the analyst in conducting valuation of the case company. It provides faster way to the estimate of the value of the case company. (Koller et al. 2015)
The valuation of Medtronic and its corresponding share price have been estimated using the discounted cash flow method. The method is using the achieved results of the previous chapters as input. The main inputs were the estimated weighted average cost of capital that was estimated to 6,06 percent and the growth factor after 2031 estimated to be 2

percent. This valuation resulted in an estimated share price of Medtronic to be 179,61 dollars.

The sensitive analysis of the resulting share price shows that both the growth and the WACC estimates influence considerably the estimated share price. WACC changes are especially resulting in considerable changes in the Medtronic estimated share price.

The results from the using the DCF valuation method shows that especially the terminal value reflecting the long term is challenging to estimate. Given the large size of the terminal estimate of the total value of the business valuated, it makes the valuation more of a guess of what the value might end up being with little certainty attached to it.

The multiples method is useful in supporting the conducted financial valuation. Its simplicity and ease to use provides faster approach to the estimation of the value of the case company. But this ease and simplicity comes with the risk that resulting valuation is far from the actually realized future business outcome for the valuated business. This is clearly represented by the estimated share prices of 82,64 dollars using the P/E ratio multiples method and 173,99 dollars using the P/BV ratio multiples method. The outcome of the P/BV helps validate the result of the DCF valuation method, while the P/E based result is lower than that and fail in validating it.

8 CONCLUSION AND DISCUSSION

8.1 Conclusion

This thesis was aiming at estimating the theoretical valuation of Medtronic and, through comparing the resulting estimate to the stock market traded price level, estimating if the Medtronic share price is under-, over-, or correctly valued by the stock market actors.

This conducted valuation research was built on using the publicly reported financial statement and other public information available about Medtronic. The research was conducted in 4 distinct steps starting with a strategic analysis of Medtronic, then followed by a financial analysis of Medtronic, the first two steps helped create a financial forecast of Medtronic's future business and finally estimating a financial valuation of Medtronic as a business.

Medtronic is the largest medical device company in the world based on revenue with a revenue of nearly 30 billion dollars in 2017 and is expected to remain in that position up until 2022 with a revenue of nearly 40 billion dollars. Medtronic has a diversified product offering and is addressing many different disease areas such as heart failure, Parkinson's disease, urinary incontinence, Down's syndrome, obesity, chronic pain, spinal disorders and diabetes.

The medical device market is expected to grow with a yearly rate of 5 percent and reach a market size of 800 billion dollars in year 2030. The main source of growth stems from the worldwide increase in lifestyle diseases, especially in the emerging markets such as India and China as well as the increased aging in the world population.

The strategic analysis was focused on a company analysis using the SWOT analysis method. The result of the SWOT analysis documented that Medtronic operates in a highly regulated market that is less sensitive to the economic cycles. This market is estimated to grow due to a combination of aging world population and increase in lifestyle diseases in the world. Medtronic is well positioned to succeed by having a strong corporate innovation culture and a large intellectual property portfolio. While heavily reliant on the US Market currently, Medtronic's global presence makes the emerging market a large opportunity ready to be tapped.

As the biggest player in a lucrative market, Medtronic is often a target for legal as well as public relations attacks. The medical technology market is very competitive and Medtronic, despite being the biggest player, has only eight percent market share. On top of the struggle with the competition, Medtronic's access to its existing and potential customer base is complex as well as highly legislated.

The financial analysis discovered that Medtronic had a return on invested capital of nearly 20 percent before year 2015 where Medtronic undertook a major acquisition of Covidien. After the acquisition the ROIC dropped to less than 7 percent and barely above the estimated weighted average cost of capital of 6,06 percent. There is an indication that Medtronic decreased shareholder value through the Covidien acquisition, but only the future will show if the Medtronic is able to realize potential upsides of that major transaction. This development is confirmed with a relatively stable operating margin of around 20 percent, but a dramatical deterioration of the capital efficiency of Medtronic from above 100 percent to below 50 percent before and after year 2015.

The financial forecast was broken into three periods. The first period was a near future forecasted period of 2019 until 2023 where it is expected that Medtronic's revenue will grow with six percent a year and reach a revenue level of approximately 40 billion dollars in 2022. The second period was 2024 until 2031 and in this period Medtronic's revenue is expected to grow similar as the market growth at five percent. The last period was a steady state forecast covering the remaining years until perpetuity. The steady state period will be a period where Medtronic's revenue is estimated to grow with a constant rate of the inflation of two percent and earn a constant rate of return on the invested capital. In the forecasting, it was assumed that the invested capital and the PP&E will grow at the same rate as the revenue growth. It was also assumed that most expenses remain proportional to the revenue level. The forecasting shows that it is expected that Medtronic's return on invested capital is going to improve steadily to a level of 13 percent in 2031. This level is still below the level of around 20 percent that Medtronic had before 2015.

The valuation of Medtronic was primarily conducted through the use of the discounted cash flow (DCF) method and supported through the use of the multiples valuation method. The valuation attempted to estimate the share price of Medtronic on the 1st of October 2018.

The DCF method estimated the Medtronic share price to be 179,61 dollars. The finding indicated that Medtronic has a huge potential upside as an investment object when compared with its share price of 99,49 dollars on the 1st of October 2018. The estimated discount factor for Medtronic in the form of the WACC is 6.06 percent with a market risk-free rate of 3 percent, a net debt level of 11 percent and a market risk premium of 1 percent.

In order to identify the sensitivity of the estimated share price to changes in the estimated WACC and the long-term growth, a sensitivity analysis of the share price was conducted. The result was that the share price is mostly sensitive to changes in the WACC.

The supporting multiples valuation resulted in estimated share prices of 82,64 dollars using the Price/earnings ratio and 173,99 dollars using the Price/book value ratio. These results partially helped support the estimate reached through the DCF method.
Based on the findings of the conducted valuation, it was estimated that the Medtronic share is undervalued on the 1st of October 2018 with approximately 80 percent and represents a good investment. This estimation is different from the financial analyst community estimated target price of 103,29 dollars. The difference is nearly of 74 percent, but both this thesis's results and the financial analyst community are aligned in estimating that the Medtronic share price is undervalued.

8.2 Discussion

In assessing the quality of the result of this conducted valuation, it is important to bear in mind that the result is based on many assumptions and judgements made during the analysis. As the sensitivity analysis showed, considerable change to the final valuation happens when the underlying data changes. When viewing a result of a valuation, it is also key to remember that it is a guess of what might happen in the future. And as nobody knows with certainty what might happen in the future, it is crucial that investment decision is taken using as many valuation estimation and other estimation of what might happen in the future development of the target investment.
In this thesis, if the timeframe and scope were larger, it would have been useful to consider conducting a thorough PESTEL and Porter's five forces analysis. This extra effort could have been combined with a detailed analysis of the Medtronic competitors. As Medtronic has a strategy that requires continuing in producing innovation, in diversifying its customer base and increasing value for its customer base; more efforts could be put in modeling different scenarios based on the outcome of these strategic efforts. In general, producing more information supporting the estimation of the future potential of Medtronic would increase the probability of estimating a valuation of Medtronic with less error. Another area that could be studied further is the discrepancy between this thesis DCF based target share price and the consensus share price stated by the financial analyst community.
As Warren Buffet stated: "investors must realize that it's impossible to predict what will happen in markets or the world and that the only way to survive bad times is to invest in companies that are strong enough to weather catastrophic events." (Buffet Warren. 2018).

The thesis author has realized through the conducted thesis work that the science of valuation of companies is not an exact science. The conducted valuation is based on a forecasted view of the future development of the studied business. Any person's guess on how the future will develop is as good as the next person's guess. But the key in financial valuation is to identify the financially strong companies through the help of the existing financial valuation tools and methods.

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APPENDIX

9.1 Appendix 1: The monthly return of S&P 500 and Medtronic

Medtronic plc (MDT) Time period: April 2013 - April 2018			S&P 500 Time period: April 2013 - April 2018		
MDT Close Adjusted for Div, & Splits	Monthly return	Monthly return %		Monthly return	Monthly return %
$ 60,82			1859,45		
$ 61,98	$1,16	1,91%	1872,34	12,89	0,69%
$ 59,25	-$2,73	-4,40%	1883,95	11,61	0,62%
$ 57,63	-$1,62	-2,73%	1923,57	39,62	2,10%
$ 58,15	$0,52	0,90%	1960,23	36,66	1,91%
$ 59,18	$1,03	1,77%	1930,67	-29,56	-1,51%
$ 57,25	-$1,93	-3,26%	2003,37	72,70	3,77%
$ 54,82	-$2,43	-4,24%	1972,29	-31,08	-1,55%
$ 62,43	$7,61	13,88%	2018,05	45,76	2,32%
$ 65,46	$3,03	4,85%	2067,56	49,51	2,45%
$ 66,11	$0,65	0,99%	2058,90	-8,66	-0,42%
$ 67,89	$1,78	2,69%	1994,99	-63,91	-3,10%
$ 71,47	$3,58	5,27%	2104,50	109,51	5,49%
$ 72,51	$1,04	1,46%	2067,89	-36,61	-1,74%
$ 70,78	-$1,73	-2,39%	2085,51	17,62	0,85%
$ 71,18	$0,40	0,57%	2107,39	21,88	1,05%
$ 74,11	$2,93	4,12%	2063,11	-44,28	-2,10%
$ 84,64	$10,53	14,21%	2103,84	40,73	1,97%
$ 80,55	-$4,09	-4,83%	1972,18	-131,66	-6,26%
$ 76,79	-$3,76	-4,67%	1920,03	-52,15	-2,64%
$ 70,47	-$6,32	-8,23%	2079,36	159,33	8,30%
$ 71,37	$0,90	1,28%	2080,41	1,05	0,05%
$ 71,66	$0,29	0,41%	2043,94	-36,47	-1,75%
$ 69,46	-$2,20	-3,07%	1940,24	-103,70	-5,07%
$ 67,04	-$2,42	-3,48%	1932,23	-8,01	-0,41%
$ 64,62	-$2,42	-3,61%	2059,74	127,51	6,60%
$ 71,29	$6,67	10,32%	2065,30	5,56	0,27%
$ 68,45	-$2,84	-3,98%	2096,95	31,65	1,53%
$ 72,43	$3,98	5,81%	2098,86	1,91	0,09%
$ 68,91	-$3,52	-4,86%	2173,60	74,74	3,56%
$ 65,77	-$3,14	-4,56%	2170,95	-2,65	-0,12%
$ 66,25	$0,48	0,73%	2168,27	-2,68	-0,12%
$ 61,25	-$5,00	-7,55%	2126,15	-42,12	-1,94%
$ 65,47	$4,22	6,89%	2198,81	72,66	3,42%
$ 66,66	$1,19	1,82%	2238,83	40,02	1,82%
$ 68,35	$1,69	2,54%	2278,87	40,04	1,79%
$ 71,19	$2,84	4,16%	2363,64	84,77	3,72%
$ 69,38	-$1,81	-2,54%	2362,72	-0,92	-0,04%
$ 60,36	-$9,02	-13,00%	2384,20	21,48	0,91%
$ 54,30	-$6,06	-10,04%	2411,80	27,60	1,16%
$ 60,37	$6,07	11,18%	2423,41	11,61	0,48%
$ 46,98	-$13,39	-22,18%	2470,30	46,89	1,93%
$ 44,85	-$2,13	-4,53%	2471,65	1,35	0,05%
$ 43,12	-$1,73	-3,86%	2519,36	47,71	1,93%
$ 43,79	$0,67	1,55%	2575,26	55,90	2,22%
$ 49,79	$6,00	13,70%	2584,84	9,58	0,37%
$ 53,44	$3,65	7,33%	2673,61	88,77	3,43%
$ 52,81	-$0,63	-1,18%	2823,81	150,20	5,62%
$ 54,98	$2,17	4,11%	2713,83	-109,98	-3,89%
$ 55,63	$0,65	1,18%	2640,87	-72,96	-2,69%
$ 45,91	-$9,72	-17,47%	2648,05	7,18	0,27%
$ 45,85	-$0,06	-0,13%	2705,27	57,22	2,16%
$ 43,28	-$2,57	-5,61%	2718,37	13,10	0,48%
$ 42,79	-$0,49	-1,13%	2816,29	97,92	3,60%
$ 47,35	$4,56	10,66%	2901,52	85,23	3,03%
$ 46,66	-$0,69	-1,46%	2913,98	12,46	0,43%
$ 41,29	-$5,37	-11,51%	2711,74	-202,24	-6,94%
$ 40,20	-$1,09	-2,64%	2760,17	48,43	1,79%
$ 33,00	-$7,20	-17,91%	2506,85	-253,32	-9,18%
$ 36,13	$3,13	9,48%	2643,85	137,00	5,47%

Table 27 The monthly return of S&P 500 and Medtronic

9.2 Appendix 2: The estimate of Medtronic's Beta using regression method

Adjusted R S	0,048929819							
Standard Err	0,072428455							
Observations	59							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0,020899237	0,02089924	3,98393277	0,05072191			
Residual	57	0,299015218	0,00524588					
Total	58	0,319914456						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	-0,009872683	0,009628697	-1,0253394	0,30953488	-0,0291538	0,00940845	-0,0291538	0,00940845
X Variable 1	0,600553937	0,300881869	1,99597915	0,05072191	-0,0019516	1,20305949	-0,0019516	1,20305949
Summary output for Medtronic:								
(S&P index, 5 years monthly data)								
	Coefficients	Standard Error						
Beta	0,6006	0,3009						

Figure 3 The estimate of Medtronic's Beta using regression method

9.3 Appendix 3: The reformulated equity statement of Medtronic

MDT shareholder's equity					
MEDTRONIC PLC (MDT) Reformulated statement of equity USD in millions					
Fiscal year ends in April. USD in millions.	2014-04	2015-04	2016-04	2017-04	2018-04
Equity in the start of the year	**18 671**	**19 443**	**53 144**	**51 997**	**50 330**
Shareholders' equity related transactions					
Issuance of shares under stock purchase and award plans	1 307	649	491	428	329
Ordinary shares issued in connection with the Covidien plc acquisition, net of taxes		33 787			
Repurchase of ordinary shares	-2 553	-1 920	-2 830	-3 544	-2 097
Stock-based compensation	145	439	375	348	-11
Dividends to shareholders	-1 116	-1 337	-2 139	-2 376	-2 494
Tax benefit from exercise of stock-based awards	29	81	82	92	344
Changes to noncontrolling ownership interests				125	
Shareholders' equity related transactions - Total	-2 188	31 699	-4 021	-4 927	-3 929
Medtronic income related transactions					
Net income (loss)	3 065	2 675	3 538	4 024	3 095
Other comprehensive (loss) income	-105	-587	-684	-744	1 030
Cumulative effect of change in accounting principle					296
Effect of change in revenue recognition		-86			
Medtronic income related transactions - Total	2 960	2 002	2 854	3 280	4 421
Change in equity	772	33 701	-1 147	-1 667	492
Equity in the end of the year	**19 443**	**53 144**	**51 997**	**50 330**	**50 822**

Table 28 The reformulated equity statement of Medtronic

9.4 Appendix 4: Medtronic's income statement forecast in percent

MDT Income Statement, for analysis purposes, % of revenue													
MEDTRONIC PLC (MDT) INCOME STATEMENT													
Fiscal year ends in April.	Estimate 2019-04	Estimate 2020-04	Estimate 2021-04	Estimate 2022-04	Estimate 2023-04	Estimate 2025-04	Estimate 2026-04	Estimate 2027-04	Estimate 2028-04	Estimate 2029-04	Estimate 2030-04	Estimate 2031-04	Estimate 2032-04
Operating income													
Revenue	6,00 %	6,00 %	6,00 %	6,00 %	6,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	2,00 %
Cost of products sold (excluding depreciation)	-27,00 %	-27,00 %	-27,00 %	-27,00 %	-27,00 %	-27,00 %	-27,00 %	-27,00 %	-27,00 %	-27,00 %	-27,00 %	-27,00 %	-27,00 %
Gross profit	73,00 %	73,00 %	73,00 %	73,00 %	73,00 %	73,00 %	73,00 %	73,00 %	73,00 %	73,00 %	73,00 %	73,00 %	73,00 %
Operating expenses													
Research and development expense	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %
Selling, general, and administrative expense	-33,00 %	-33,00 %	-33,00 %	-33,00 %	-33,00 %	-33,00 %	-33,00 %	-33,00 %	-33,00 %	-33,00 %	-33,00 %	-33,00 %	-33,00 %
Other expense, net	-2,00 %	-2,00 %	-2,00 %	-2,00 %	-2,00 %	-2,00 %	-2,00 %	-2,00 %	-2,00 %	-2,00 %	-2,00 %	-2,00 %	-2,00 %
Operating expenses - total	-43,00 %	-43,00 %	-43,00 %	-43,00 %	-43,00 %	-43,00 %	-43,00 %	-43,00 %	-43,00 %	-43,00 %	-43,00 %	-43,00 %	-43,00 %
EBITDA	30,00 %	30,00 %	30,00 %	30,00 %	30,00 %	30,00 %	30,00 %	30,00 %	30,00 %	30,00 %	30,00 %	30,00 %	30,00 %
Depreciation and amortization	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %	-8,00 %
EBIT	22,00 %	22,00 %	22,00 %	22,00 %	22,00 %	22,00 %	22,00 %	22,00 %	22,00 %	22,00 %	22,00 %	22,00 %	22,00 %
Taxes on operating income	21,00 %	21,00 %	21,00 %	21,00 %	21,00 %	21,00 %	21,00 %	21,00 %	21,00 %	21,00 %	21,00 %	21,00 %	21,00 %
Net operating profit less adjusted taxes (NOPLAT)	16,75 %	16,75 %	16,75 %	16,75 %	16,75 %	16,75 %	16,75 %	16,75 %	16,75 %	16,75 %	16,75 %	16,75 %	16,75 %
Financial Income													
Financial income, net	-3,00 %	-3,00 %	-3,00 %	-3,00 %	-3,00 %	-3,00 %	-3,00 %	-3,00 %	-3,00 %	-3,00 %	-3,00 %	-3,00 %	-3,00 %
Taxes on operating income	-0,63 %	-0,63 %	-0,63 %	-0,63 %	-0,63 %	-0,63 %	-0,63 %	-0,63 %	-0,63 %	-0,63 %	-0,63 %	-0,63 %	-0,63 %
Financial income, net after taxes	-2,37 %	-2,37 %	-2,37 %	-2,37 %	-2,37 %	-2,37 %	-2,37 %	-2,37 %	-2,37 %	-2,37 %	-2,37 %	-2,37 %	-2,37 %
Net income attributable to Medtronic	14,38 %	14,38 %	14,38 %	14,38 %	14,38 %	14,38 %	14,38 %	14,38 %	14,38 %	14,38 %	14,38 %	14,38 %	14,38 %

Table 29 Medtronic's income statement forecast in percent

9.5 Appendix 5: Medtronic's Balance sheet forecast in percent

MDT Income Statement, for analysis purposes, % of revenue													
MEDTRONIC PLC (MDT) INCOME STATEMENT													
Fiscal year ends in April. USD in millions	Estimate 2019-04	Estimate 2020-04	Estimate 2021-04	Estimate 2022-04	Estimate 2023-04	Estimate 2025-04	Estimate 2026-04	Estimate 2027-04	Estimate 2028-04	Estimate 2029-04	Estimate 2030-04	Estimate 2031-04	Estimate 2032-04
Operating income													
Revenue	31 750	33 655	35 675	37 815	40 084	42 088	44 192	46 402	48 722	51 158	53 716	56 402	57 530
Change in revenue	6,00 %	6,00 %	6,00 %	6,00 %	6,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	2,00 %
MDT Balance Sheet reformulated													
Operating assets													
Operating current assets													
Cash and cash equivalents (1% of revenue)	1,00 %	1,00 %	1,00 %	1,00 %	1,00 %	1,00 %	1,00 %	1,00 %	1,00 %	1,00 %	1,00 %	1,00 %	1,00 %
Accounts receivable	20,00 %	20,00 %	20,00 %	20,00 %	20,00 %	20,00 %	20,00 %	20,00 %	20,00 %	20,00 %	20,00 %	20,00 %	20,00 %
Inventories, net	12,00 %	12,00 %	12,00 %	12,00 %	12,00 %	12,00 %	12,00 %	12,00 %	12,00 %	12,00 %	12,00 %	12,00 %	12,00 %
Operating non-current assets													
Property, plant, and equipment, net	6,00 %	6,00 %	6,00 %	6,00 %	6,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	2,00 %
Other intangible assets, net	2,00 %	2,00 %	2,00 %	2,00 %	2,00 %	2,00 %	2,00 %	2,00 %	2,00 %	2,00 %	2,00 %	2,00 %	2,00 %
Tax assets	4,00 %	4,00 %	4,00 %	4,00 %	4,00 %	4,00 %	4,00 %	4,00 %	4,00 %	4,00 %	4,00 %	4,00 %	4,00 %
Operating liabilities													
Current debt obligations	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %
Accounts payable	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %
Current accrued compensation	6,00 %	6,00 %	6,00 %	6,00 %	6,00 %	6,00 %	6,00 %	6,00 %	6,00 %	6,00 %	6,00 %	6,00 %	6,00 %
Current accrued income taxes	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %
Current deferred tax liabilities	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %
Non-current Accrued compensation and retirement benefits	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %
Non-current Accrued income taxes	10,00 %	10,00 %	10,00 %	10,00 %	10,00 %	10,00 %	10,00 %	10,00 %	10,00 %	10,00 %	10,00 %	10,00 %	10,00 %
Non-current Deferred tax liabilities	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %	5,00 %
Financial assets													
Cash and cash equivalents (for financing purposes)	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %
Investments	25,00 %	25,00 %	25,00 %	25,00 %	25,00 %	25,00 %	25,00 %	25,00 %	25,00 %	25,00 %	25,00 %	25,00 %	25,00 %
Other current assets	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %	7,00 %
Current assets held for sale	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %
Other assets	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %
Noncurrent assets held for sale	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %
Financial liabilities													
Other accrued expenses	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %	11,00 %
Current liabilities held for sale	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %
Long-term debt	79,00 %	79,00 %	79,00 %	79,00 %	79,00 %	79,00 %	79,00 %	79,00 %	79,00 %	79,00 %	79,00 %	79,00 %	79,00 %
Other liabilities	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %	3,00 %
Noncurrent liabilities held for sale	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %	0,00 %

Table 30 Medtronic's balance sheet forecast in percent