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VARIAN MEDICAL SYSTEMS' ACQUISITION BY SIEMENS HEALTHINEERS

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A STANDALONE VALUATION BASED ON INTRINSIC CHARACTERISTICS

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Abstract

In an era marked by high-value mergers and acquisitions in the MedTech industry, Siemens Healthineers (SH) contemplated the strategic acquisition of Varian Medical Systems (VMS), a pivotal event in the medical technology industry, particularly in oncology. The group part provides an overview of both companies, market positions, and the pre-acquisition synergy that developed from their collaboration. It explores the medical device industry, the competitive landscape, and the significance of cancer care. The aim of the present case study is to explore the process of valuation and calculate the price of VMS, the initial step in gauging the final acquisition price.

Keywords (Mergers & Acquisitions, MedTech, Intrinsic Valuation, Siemens Healthineers, Varian Medical Systems, Intrinsic Value, Price per Share, Financial Statement Analysis)

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Table of Contents

Group Part

Introduction

In the winter morning hours of December 2019, Dr. Bernd Montag, the visionary CEO of SH, found himself at the board of directors' room, standing on the precipice of a decision that would echo through the realms of the healthcare industry, particularly the oncology field.

It all started in 2011, when Siemens AG., a German multinational technology conglomerate with operations ranging from the rail transportation and energy systems to the healthcare and radiation therapy markets, decided to selectively exit the oncology sector. Competitors solely focused on cancer treatment had been consistently completing acquisitions, this way solidifying their place in the market. Not to any surprise, Siemens found itself lagging and decided to leave the playing field to the experts, but not without a plan of revival.

A year after, Siemens AG. announced a partnership with VMS, one of the competitors that drove them out of the sector, envisioning the creation of a world without fear of cancer. "As part of this collaboration, Siemens will continue to serve the global radiation oncology markets. We will help improve cancer care worldwide through high-quality imaging and therapy systems, bringing our core competencies for excellence in imaging engineering to the table" - Walter Märzendorfer, CEO of Radiation Oncology and Computed Tomography at Siemens AG. The "EnVision Better Cancer Care" endeavor skillfully integrated Siemens' diagnostic imaging strengths with VMS therapeutic expertise. This collaboration sought to establish a holistic approach to oncology, weaving together diagnostics, treatment planning, and therapeutic execution. This partnership gained international recognition and would significantly impact the healthcare landscape.

Not long after, with the healthcare division growing immensely and exhibiting higher profit margins than other divisions (Siemens AG 2014), Siemens AG. decided it was time to devote extra attention to the division. Thus, a newly and separately managed company called Siemens Healthineers was created, bringing Bernd Montag to lead the company. Dr. Montag had been at Siemens for 20 years already and was holding a variety of essential positions within the medical imaging landscape, ultimately steering the Imaging & Therapy Systems division, and later transitioning to the top role as CEO.

Moreover, his extensive travels from SH headquarters in Erlangen, Germany brought him to VMS's base in California on numerous occasions to discuss and improve the strategic collaboration. The experiences and insights he gained from those visits played a critical role in shaping the future trajectory of the company and its alliance with VMS.

A couple of years down the line, Bernd started to intensely observe the industry dynamics and identified a potential opportunity with VMS. The partnership had been going quite well and both parties were benefiting immensely from the mutual representation of products and equipment. With this in mind, he consulted his CFO, Jochen Schmitz, to evaluate the feasibility and implications of making VMS part of SH living organism.

In late 2018, Montag met with SH Board of Directors to lay out the facts, benefits, and challenges, aiming to provide a clear and unbiased overview of the potential acquisition. With almost 25 years of experience, Montag approached the acquisition idea with both enthusiasm and caution as he was no stranger to the complexities of the medical technology world. As he contemplated the acquisition of VMS, he was acutely aware of the myriad considerations that laid ahead. He recognized the immense challenge of strategic, financial, and cultural integration: complexities of cross-border company mergers; VMS's financial response; the potential market volatility, cultural

clashes, and regulatory challenges. Furthermore, the implications of distinct technologies and potential unknown liabilities remained at the forefront of his decision-making process.

One year later, in the early morning hours of December 2019, Dr. Montag was sipping his steaming coffee in the executive boardroom while waiting for the rest of the board to vote on the potential acquisition. The forthcoming board meeting wasn't just a typical agenda item for Dr. Montag; it was a moment where his vote would have immense significance. He knew this decision would shape the trajectory of the company as he contemplated the fundamental question – would this acquisition become the pivotal catalyst for a synergistic future, where SH and VMS would advance in the universal effort of creating a world without fear of cancer, or would it potentially damage the healthy tissue of the collaboration, ultimately affecting SH vitality?

Siemens Healthineers' Background

In 1847, within the industrious atmosphere of Berlin, Werner von Siemens and Johann Georg Halske established Siemens AG., marking the beginning of an organization that would grow to have a significant impact on various industries globally. Before it restructured, Siemens AG. operated through nine divisions, each playing a critical role in the company's overall operations. These were Power and Gas, Wind Power and Renewables, Energy Management, Building Technologies, Mobility, Digital Factory, Process Industries and Drives, Financial Services, and Healthcare. Among these, the Healthcare division, later known as SH, was particularly noteworthy. It held the highest profit margins, ranging from 15-19%, in contrast to the other divisions, such as Power and Gas, which had margins of 11-15% (Siemens AG 2014). The Healthcare division's performance was a reflection of its importance within Siemens AG. portfolio and its position in the market, characterized by a strong presence in medical imaging and laboratory diagnostics.

A significant shift occurred in 2014 when Siemens Healthcare announced its decision to divest its hospital information systems business to Cerner Corp and its Audiology Solutions division to EQT and the Strüngmann family. Despite these changes, the division maintained strong financial performance, with revenues reaching €12.429 billion as reported in the 2014 annual report. The strategic chapter unfolded further when Joe Kaeser, the Chief Executive Officer of Siemens AG., announced during the annual results press conference in May 2014, the intention to establish Siemens Healthcare GmbH. Marked by its official foundation on May 1, 2015 (Siemens AG 2015), this development signaled Siemens AG. robust strategy to strengthen its position in the healthcare sector, adeptly navigating through the intricate healthcare landscape with a dedicated subsidiary, while also underscoring its steadfast commitment to addressing global healthcare challenges.

The transformation into an independent entity, SH, was formalized through a spin-off agreement on October 1, 2015 (Siemens AG 2015) followed by a rebranding on May 1, 2016. The company's financial and market growth post-separation was underscored by its Initial Public Offering (IPO) in March 2018, with shares initially priced at €28 and the company valued at approximately €28 billion (Siemens Healthineers 2018). SH first Annual General Meeting on February 6, 2019 (Siemens Healthineers 2019), in Erlangen, and its inclusion in the MDAX in September 2018 and the DAX in August 2020, further signaled its robust position in the MedTech sector (Deutsche Börse Group 2020/2021).

SH segments include Imaging, Advanced Therapies and Diagnostics. The Imaging segment stands out for its revenue contributions, driven by strong sales in advanced imaging technologies. Advanced Therapies delivers crucial medical devices for cardiology and surgery, while Diagnostics provides a broad spectrum of clinical laboratory equipment and tests, vital for patient

care. Together, these divisions reflect SH dedication to shaping the future of healthcare by offering state-of-the-art medical solutions.

Siemens Healthineers' Business Overview – Current

SH has established itself as one of the foremost global MedTech companies, boasting a workforce of more than 52,000 employees and conducting business in 180 countries, with a direct presence in 75 of them. In FY2019, it has reported sales of €14.5 billion, an adjusted profit of €2.5 billion, and an adjusted net income of €1.6 billion (Siemens Healthineers 2019). The company has made a significant impact in the healthcare industry, with over 240,000 patients connecting to their network of more than 600,000 active systems every hour. Furthermore, they have formed partnerships with over 90% of the world's leading 100 healthcare providers (European Association for Hospital Managers 2019).

The company's business operations are diversified and can be divided into three segments. Imaging is the largest segment, accounting for 63% of revenues and 74% of adjusted profit in the fiscal year of 2019 (Siemens Healthineers 2019). The Food & Drug Administration (FDA) defines medical imaging as "different technologies that are used to view the human body in order to diagnose, monitor, or treat medical conditions". The company's Imaging portfolio includes equipment for magnetic resonance, computed tomography, x-ray systems, molecular imaging and ultrasound (Siemens Healthineers 2019). Diagnostics is the company's second largest segment and constitutes 28% of revenues and 15% of adjusted profit. Products from this segment are targeted at healthcare providers in the fields of laboratory, molecular and point-of-care diagnostics. They cover testing disciplines in many different areas such as immunochemistry, hematology, coagulation, urinalysis, blood gas and PCR testing (Siemens Healthineers 2019). Lastly, the Advanced Therapies segment accounts for 11% of the company's revenue and 13% of adjusted

profit (Siemens Healthineers 2019). This segment offers devices for image guided minimally invasive treatments across many fields such as cardiology, interventional radiology, surgery and radiation oncology. Two leading products are angiography systems and mobile C-arms (Siemens Healthineers 2019).

Revenue of Siemens Healthineers by segment for the fiscal years of 2018 and 2019

(In € millions)	**2018**	**2019**
Siemens Healthineers	13,429	14,518
Imaging	8,153	8,938
Diagnostics	3,962	4,133
Advanced Therapies	1,479	1,606

Table 1: Revenue of Siemens Healthineers by segments for fiscal years of 2018 and 2019 (SH Annual Report 2019)

From a geographical perspective, the company also exhibits diversification as their sales are spread across different regions. The percentage of revenues generated in EMEA, Americas and Asia-Australia are 32%, 40% and 28%, respectively. Over the past two years, the key geographical markets have remained in a relatively favorable condition, resulting in a slight uptick in market growth in the EMEA region and the Americas (Siemens Healthineers 2019).

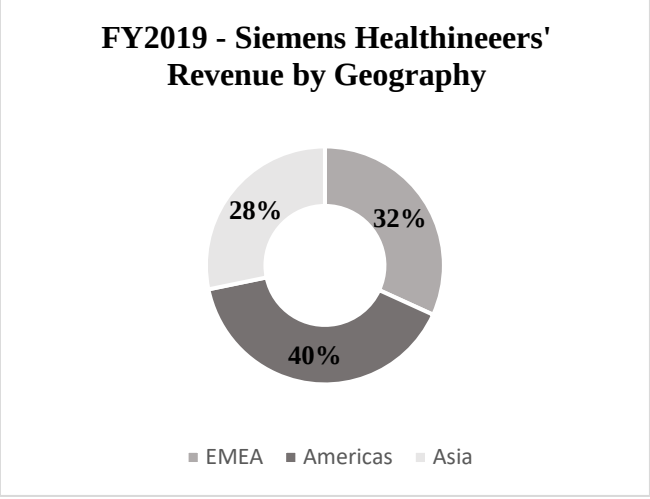


Figure 1: Siemens Healthineers' Revenue by Geography in FY2019 (SH Annual Report 2019)

It is crucial to highlight that the company's business model doesn't solely depend on equipment sales. The company's approach goes beyond product sales; it encompasses a comprehensive strategy that involves offering value-added services to meet customer needs. These services are split into three fields: customer services such as education and skills management, enterprise services such as asset management, and digital services such as population health management. These three services make up around 40% of their total revenue (Siemens Healthineers 2019). Levering on these, the company can provide value all along the customer value chain.

Additionally, throughout the period from January 2019 to December 2019, SH delivered a commendable Total Shareholder Return (TSR) of 18.23%, despite trailing behind the S&P 500's more substantial return of 31.49% for the same interval (S&P Global 2019).

Varian Medical Systems' Background

On August 30 of 1937, in the midst of growing international tension, Sigurd and Russel Varian unveiled the klystron tube, a high-frequency amplifier that was designed to generate microwaves holding a unique purpose – warning the population about potential Nazi bombing raids (Varian Medical Systems n.d.). Little did they know that this invention would become a linchpin in the global development of microwave technology in cancer treatment.

Ten years later, Varian Associates was founded. This new venture emerged from the collective brilliance of a group of scientists, including the Varian brothers themselves. With a modest initial capital of $22,000 and just six full-time employees, the company set out to explore uncharted technological frontiers (Varian Medical Systems n.d.).

In its first decade of existence, Varian Associates had already set in motion a wave of advancements. They introduced four new klystrons (Varian Medical Systems n.d.), laying the

foundation for the development of nuclear magnetic resonance (NMR) instruments which are used, for example, to supply biochemical information at molecular levels for tumor research (Li Deng 2017). By the end of 1950s, Varian Associates' linear accelerator (LINAC) found its first application in examining the structural integrity of rocket motors (Varian Medical Systems n.d.). The LINAC technology would ultimately become machines that aim radiation at cancer tumors with pinpoint accuracy, sparing nearby healthy tissue (Mercy n.d.). Their LINAC line of radiotherapy systems would eventually become the company's most successful product line (Mote Stansell n.d.). In 1959, Varian Associates achieved another significant milestone, becoming a listed company on the New York Stock Exchange with shares priced at 1 dollar and a valuation of $1.56 million (Securities and Exchange Comission 1959).

The 1960s were marked by Varian Associates' entry into the medical equipment domain by introducing their first fully rotational radiotherapy LINAC (Mote and Stansell n.d.). The 1970s brought further advancements in the LINAC technology, offering unprecedented control over radiation dosage and higher energy X-rays without the need for larger machines (Varian Medical Systems n.d.).

The 1980s presented a period of restructuring and diversification, requiring new leadership to bring their balance sheet in line with their technological capabilities. By 1989, Varian Associates reported $1.3 billion in sales and a workforce spanning international borders (Mote and Stansell n.d.). One year later, J. Tracy O'Rourke came on board as chairman and CEO and continued with the restructuring by creating 3 divisions based upon marketing similarities instead of technological similarities. By 1994, earnings had increased from $45 million in 1991 to $60 million in 1993, and total corporate debt was reduced from about $110 million in 1989 to almost zero in 1993 (Mote and Stansell n.d.).

In 1999, the previous internal division was deemed insufficient, and Varian Associates underwent a transformative restructuring, reorganizing into three independent public companies. The resulting companies were Varian Inc., Varian Semiconductor Equipment Associates Inc., and Varian Medical Systems (VMS) (Varian Medical Systems 1999). VMS entered the 21st century with revenues of $590 million (Securities and Exchange Commission 2001).

In the early 2000s, VMS introduced software for managing patient data, entering the domain of oncology data management and, around 2007, entered the market for proton therapy, an alternative to the popular radiation therapy (Varian Medical Systems n.d.). It is in the same year, that VMS enters the FORTUNE 1000 and becomes a member of the S&P 500 stock index with a stock price of roughly $46, the closing price of 2007 (Macrotrends n.d.).

In 2012, after Siemens AG. decision to "selectively exit" the radiotherapy market (Tirrell, Bloomberg 2011), VMS and Siemens AG. signed a strategic global partnership to provide advanced diagnostic and therapeutic solutions for cancer treatment (Varian Medical Systems 2012), setting high expectations for the future global radiation oncology business.

One year later, VMS celebrated its 65th birthday with an international team of 6,200 employees located at manufacturing sites in North America, Europe, and China, approximately 70 sales and support offices around the world (Varian Medical Systems 2013) and holding over 520 active patents worldwide (Varian Medical Systems n.d.).

For the next handful of years, VMS focused mainly on developing its software solutions through the acquisition of Velocity's software platform, Noona Healthcare, Mobius Medical Systems and Evinance Innovation, Inc., refining its offer of cancer care management and delivery and enhancing its end-to-end cancer treatment capabilities (Varian Medical Systems n.d.). VMS's

proton therapy systems also pioneered patient treatment in proton therapy centers of various countries such as United States, the Netherlands and Thailand, showing the company's commitment to this cancer treatment alternative.

In 2019, VMS entered the market for interventive cancer care expanding its portfolio with acquisitions that added technologies for microwave ablation, cryotherapy, and microsphere embolization (Varian Medical Systems 2019). To accelerate innovation and broaden its status to a global cancer care solution provider, VMS acquired Cancer Treatment Services International (CTSI), an entity that operated the American Oncology Institute in Hyderabad and 10 multidisciplinary cancer centers across the Indian subcontinent as well as a U.S.-based Oncology Solutions division that provides cancer care professional services to healthcare providers worldwide (Varian Medical Systems 2019).

As of 2019, VMS operates mainly in two segments that focus on the manufacturing and selling of physical apparatus and digital software in the fields of Oncology Systems (radiotherapy focused) and Proton Therapy for cancer treatment. Proton therapy segment constitutes a minor percentage of the revenues when compared to Oncology Systems. VMS improved its revenues from $2.9 billion to $3.2 billion during this time, maintaining its status as a colossus player in the cancer treatment market.

Varian Medical Systems' Business Overview - Current

Currently, VMS is one of the global leaders in radiation therapy, being the player with the highest market share in the global Radiation Therapy market (Prescient & Strategic Intelligence 2020) and having as direct competitors Elekta AB and Accuray Incorporated (Varian Medical Systems 2019). As of FY2019, VMS reported sales of $3.23 billion, an adjusted profit of $386.2 million, and

adjusted net income of $291.9 million (Varian Medical Systems 2019). The company has over 10,000 employees worldwide, conducts business in all five continents and presents manufacturing facilities for their products in North America, Europe, and China (Varian Medical Systems 2019).

The company's business surrounds solutions in radiation therapy, medical oncology and interventional oncology, an emerging area of cancer care. It engages in the creation, production, marketing, and maintenance of hardware and software items for cancer treatment through radiation and proton therapy. Its software offerings encompass patient care administration, treatment preparation, and medical oncology practice decision support (Varian Medical Systems 2019). VMS operates under two reportable segments: Oncology Systems and Proton Solutions. The prior is focused on the manufacturing, and delivery of hardware, software and services that relate to cancer treatment via radiation-based practices. The latter focuses on products and systems for delivering proton therapy, another form of external beam radiotherapy using proton beams (Varian Medical Systems 2019). VMS has a non-reportable third segment, Interventional Solutions, that focuses on products for interventional oncology procedures and treatments. Oncology Systems is VMS's main source of revenue, accounting for 95% of the revenues, while Proton Solutions is responsible for almost 5%. The complexity and high cost of proton therapy which requires significant education, and the rapidly evolving pricing pressure explain the discrepancy in the revenue percentages of the two segments (Varian Medical Systems 2019). However, as technology evolves and further research on proton therapy is done, the revenue ratio between the two segments may be subject to change as proton therapy shows promise of having fewer side effects than conventional radiation-based therapy.

Revenue of Varian Medical Systems by segment for the fiscal years of 2018 and 2019

(In $ millions)	**2018**	**2019**
Varian Medical Systems	2,919	3,225
Oncology Systems	2,770	3,062
Proton Solutions	149	144
Other (Interventional Solutions)	-	19

Table 2: Revenue of Varian Medical Systems by segment for the fiscal years of 2018 and 2019 (VMS Annual Report 2019)

Services within the reported segments of VMS are provided and encompass hardware phone support, repairment on linear accelerators, obsolescence protection of hardware, software support, software upgrades, hosting as a service and clinical consulting services. As of 2019, product sales accounted for 55% of total revenues while services for 45% (Varian Medical Systems 2019).

In terms of geography, the majority of VMS's revenues are brought about by the Americas' region with 47%, followed by EMEA (Europe, Middle East and Africa) including India, with 33% and lastly, APAC (Asia Pacific) with 20% (Varian Medical Systems 2019).

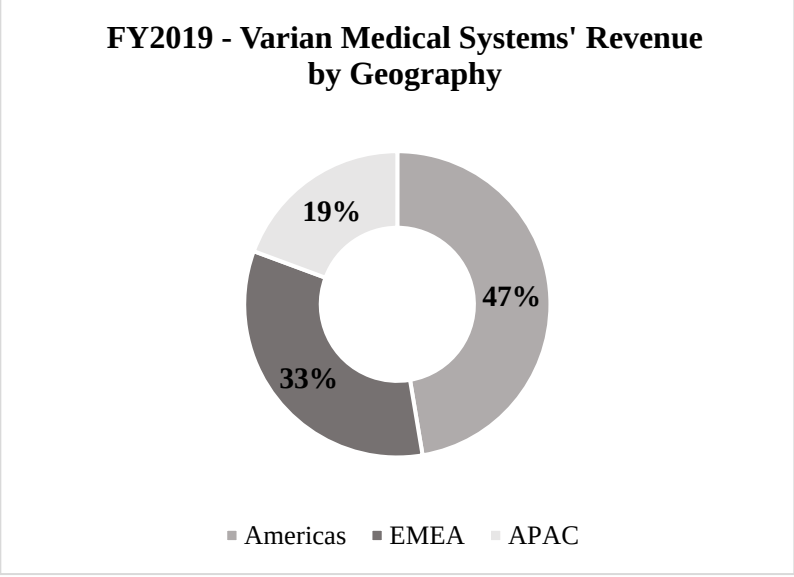


Figure 2: Varian Medical Systems' Revenue by Geography (VMS Annual Report 2019)

Additionally, despite being founded over seven decades ago, VMS continues to experience growth in recent years, increasing their revenue from $2.491 billion in 2015 to $3.225 billion in 2019, a

nearly 30% rise. Furthermore, from October 2017 to the end of 2019, VMS's Total Shareholder Return (TSR) outperformed the S&P 500 TSR in the same period, delivering a 42% total return to investors compared to the S&P 500's 34% return. Moreover, in the last 3 years, VMS has significantly expanded its reach to over 4 million cancer patients, representing a growth of over 40%, from 2.8 million patients (Fortuna Advisors 2020). In light of this, we can observe that VMS has a pivotal role within the cancer care and radiation oncology sector and is set to sustain its growth trajectory within the industry.

Pre-Acquisition Partnership

In 2012, VMS and Siemens AG. embarked on a global strategic partnership with the common goal of improving clinical capabilities and treatment offerings within the fields of image-guided radiotherapy and radiosurgery (Varian Medical Systems 2012). More than a one-time deal, this partnership led to a long and fruitful alliance between both companies that resulted in significant advancements.

An important factor within such a partnership was the joint marketing and representation of products for imaging and treatment in the radiation oncology sector. That would enable both companies to offer comprehensive solutions that cover the entire clinical workflow. VMS agreed to represent Siemens AG. diagnostic imaging products worldwide, including CT (computer tomography), PET/CT (positron emission tomography with computed tomography), and MRI (magnetic resonance imaging). In exchange, Siemens AG. would have to include VMS's radiotherapy and radiosurgery products within its line (Varian Medical Systems 2012). That would massively benefit healthcare professionals and patients.

The partnership went beyond marketing and representation. VMS and Siemens AG. attempted to harness the strength and technologies to create new solutions that would translate into further impact. Solutions such as ARIA connectivity, which enabled the integration of VMS's IT networks and Siemens AG. discontinued linear accelerators, were co-developed (Fitt 2021). When announced, Tim Guertin, president and CEO of VMS at the time stated, "This is an exciting development that will enable VMS to enhance and expand its clinical offerings for the benefit of cancer patients around the globe" (Varian Medical Systems 2012).

Fast forward to today, and the partnership, known as the "EnVision" partnership, remains strong (Fitt 2021). It marked the beginning of an enduring collaboration between the two companies, serving as a true testament to their commitment to innovation. The focus remains on their common purpose of shaping the future of cancer and saving people's lives.

Medical Device Industry

Medical devices have a deep-rooted history in human civilization. Human beings have been fabricating tools for thousands of years to treat a multitude of health-related problems. What began as rudimentary tools has evolved into a sophisticated field of medical care thanks to breakthrough technological advancements. Nowadays, through these revolutionary advancements, the medical equipment industry continues to push the boundaries of what is possible in improving the quality of healthcare and enhancing the overall well-being of individuals worldwide.

The medical device industry (also known as the medical technology industry) is comprised of instruments and machines intended for the prevention, detection, treatment, and correction for health purposes of structures of the body, illnesses, and diseases. The industry is poised for steady growth, with global annual sales forecast to rise by over 5% a year and reach nearly $800 billion

by 2030 (KPMG 2018). Medical devices are sold in the market with a broad price range, from a couple hundred to up to multiple million. These price variations are influenced by factors like the type of device, the reputation of the brand, technological innovations, and the condition in which they are sold. The price of medical equipment is one that is on a constant rise yearly due to the increasing cost of raw materials like chemicals, metals, and plastics that is driving production costs up. According to the US Bureau of Labor Statistics time series data, the average price increase in 2019 was approximately 1.4%. The useful life of these medical devices ranges from 5 years to 15 years, with diagnostic imaging and radiotherapy ranging from 7 years to 10 years (Queensland Health 2021). With the systematic rise of the geriatric population, the industry needs to continue breaking the barriers of health science to keep up. These projections reflect increasing demand for innovative new devices and services, as lifestyle diseases become more prevalent, and economic development unlocks the huge potential in emerging markets.

The European Commission classifies medical devices based on their risks and regulatory controls required for adequate safety and performance that include Class I, IIa, IIb, and III devices. The risk variance is categorized as low, medium, medium to high, and high. Class I and class II do not need premarket approval, only premarket notification (also known as 510-K) (Hattangadi et al, 2012). In the United States, the regulatory process is controlled by the Food and Drug Administration (FDA), and in Europe by the European Medicines Agency (EMA). The average cost to bring a medical device to market through the 510(k) pathway is $31 million compared to the PMA pathway with average costs of $94 million. In addition, the approval process for a new medical device can range from weeks to many months, depending on its complexity and risks (Drugwatch 2019). Medical devices can be broken down into multiple different market segments, in which the top 5 include In Vitro Diagnostics (IVD), Cardiology, Diagnostics imaging,

Orthopedics, and Ophthalmics (EvaluateMedTech World Preview 2016). Through these segment streams, companies can then look to generate revenue through several different means. The first is by selling their products to hospitals, healthcare facilities, and to government, research, and educational institutions. Another way is by providing services such as equipment repair and maintenance, consultancy, and IT and software to healthcare facilities and institutions to assist and improve their operations. Companies can diversify their portfolio by acquiring other businesses with different medical products and services, allowing them to have a competitive advantage (Nieves 2022). By stepping out of their conventional manufacturing role and exploring holistic solutions, medical device companies can strengthen their value chain.

Competitive Landscape

The medical device industry is characterized by continuous growth, intense competition, and a strong emphasis on innovation, backed by significant investments in research and development (R&D). In the global market landscape of 2019 and recent years leading up, the United States maintained its leadership position, boasting a substantial 43% market share, while Europe followed closely with a 27% market share. Within Europe, Germany continued as the dominant player, commanding a significant 27.1% market share, and displaying a strong focus on export activities. Notably, the field of medical technology exhibited remarkable dynamism in terms of intellectual property, with nearly 14,000 patent applications filed at the European Patent Office (EPO) during the year. This marked a substantial 0.9% increase in patent applications compared to the previous year, positioning medical technology as the second highest sector in Europe. Impressively, 39% of all medical device patent applications hailed from EPO member countries, with an additional 40% originating from the United States (MedTech Europe 2020). Prominent companies within this industry comprise well-established, financially strong manufacturers with a longstanding presence

in the market. They boast diverse product portfolios, cutting-edge technologies, and robust global sales and marketing networks, contributing to their prominent position. SH, together with its top competitors, maintain the leading market positions in the large and high growth markets within most of its business segments. These competitors of SH can be categorized based on the three-segment markets. Within the Imaging market and the Advanced Therapies market, GE Healthcare (US) and Philips (Netherlands) stand out as the other two major competitors (Siemens Healthineers 2019). Among these three big players, SH holds the global top spot in both Imaging and Advanced Therapies with market shares of 31% and 32%, respectively (Siemens Healthineers 2018). The Diagnostics market is characterized by a range of global players competing internationally across various market segments. These entities also face challenges from regional competitors and specialized companies that focus on niche technologies. (Siemens Healthineers 2019). In this segment, SH is the second-largest global player in Diagnostics with a 15% market share (Siemens Healthineers 2018). Significant entry barriers exist in these markets due to stringent regulatory factors and the intricate nature of device development. As a result, market segments are dominated by key players, with the top three holding substantial shares of 68%, 48%, and 80% in the accessible markets for Imaging, Diagnostics, and Advanced Therapies, respectively (Deutsche Bank Markets Research 2018).

Out of the three segments, the Imaging market is one of which sparks the heaviest competition due to the segment having the highest revenue out of its segments for several fiscal years (Siemens Healthineers 2019). The top competitors of the imaging market, GE Healthcare and Philips, are of similar global strength and are also spin-offs of corporate conglomerates. In alignment with the boundless notion to diversify their portfolios and the evolving landscape of healthcare, where data-driven approaches and AI integration are becoming increasingly vital, both GE Healthcare and

Philips Healthcare have taken significant steps to digitalize healthcare by introducing their respective data solutions platforms. For instance, GE Healthcare is poised to launch its intelligence platform, Edison, in 2022. Meanwhile, Philips Healthcare has been consistently enhancing its own platform, unveiling its IntelliSpace Radiation Oncology solution on April 26, 2019 (Phillips 2019).

The partnership SH has had with VMS since 2012 allowed them to provide advanced diagnostic and therapeutic solutions and services for treating cancer with image-guided radiotherapy and radiosurgery. Although the partnership was one of prosperity and great mutual success, exemplifying their commitment to innovation in the healthcare industry, VMS was continuing to grow as the leader in the radiation oncology sector alongside Accuray Inc. and Elekta AB (Varian Medical Systems 2019). In fact, SH exited the area of radiotherapy a year prior to their partnership in 2012, because of VMS's strong foothold in the business area in combination with its strength in oncology and innovation power in healthcare AI. Consequently, if SH ever wanted to fully reenter the radiotherapy market again, they would encounter internal competition from their trusted strategic ally and market share leader VMS.

As stated, the medical device industry is characterized by a significant concentration of employment and revenue within a selected group of major companies. These leading medical device companies consistently seek opportunities to enhance their product offerings, actively exploring the prospect of acquiring smaller firms specializing in specific therapeutic areas. This has prompted consideration of whether acquiring VMS is a strategic move, not only to harness its AI-assisted analytics for competition with GE Healthcare and Philips but also to redefine cancer diagnosis and care, solidifying its role as a comprehensive healthcare partner. In this competitive landscape, strategic developments are essential for MedTech companies to maintain their relevance and competitive edge.

Cancer Care

Cancer is the second leading cause of death in the world. In 2019, it was responsible for 9.7 million deaths around the world, representing nearly 1 in every 6 deaths worldwide (Our World in Data 2019). There were an estimated 23.6 million diagnosed cancer cases in 2019, indicating a 26.3% increase since 2010 (JAMA Oncology 2021). Additionally, it is projected that by 2030, there will be 26 million new cancer cases and 17 million cancer deaths annually. The main factor contributing to this increase is the growth and aging of the population, driven by the rise in life expectancy and low fertility rates. The majority of cases, around 80.2%, occur in individuals aged 55 and above, and those who are 65 and older make up 55% of the newly diagnosed cases. As humans grow older, their immune system's effectiveness declines and cells gradually deteriorate, increasing the risk of defective cells that lead to cancer (Cancer Center 2023). Moreover, as people live longer, everyday exposure to risk factors and carcinogenic substances accumulates, increasing the likelihood of developing cancer. In 2019, the leading cause of cancer-related fatalities were tracheal, bronchial, and lung cancer types, accounting for 21% of deaths, followed by colon and rectal cancer at 11%, stomach cancer at 10%, and breast cancer at 7%, with the remaining cancer types representing each less or equal to 5% of the total deaths (Our World in Data 2019).

Fortunately, the rapid progress in science and technology over the last decades has yielded several cancer treatments, including radiation therapy, chemotherapy, immunotherapy, and others. Even though the absolute number of cancer deaths has increased worldwide by 75% since 1990, the age standardized death rate from cancer decreased by 15% in the same period, showing that cancer is less lethal now due to more effective treatments (Our World in Data 2019). In the United States of America, the number of deaths per 100,000 population reduced from 193.9 in 1950 to 146 in 2019, registering an approximately 25% decrease (Statista 2023).

Nevertheless, as the world's population ages and there is no cure for the disease, the cancer care market is set to grow, with the radiation oncology segment expected to see a surge in demand.

Radiation Oncology

Radiation therapy, also known as radiotherapy, works by using radiation to destroy cancer cells, allowing for the careful targeting of the tumor. This minimizes the harm done to the surrounding healthy tissue, reducing secondary effects when compared to more invasive therapies such as chemotherapy. Radiation therapy is used to treat almost all types of cancer, with more than 50% of all people with cancer obtaining it as part of their treatment (Mayo Clinic 2023).

The global radiation oncology market size reached $7.2 billion in 2019 and is expected to grow at a compounded annual growth rate (CAGR) of 8.4% until 2030, reaching a $17.19 billion market size by then (Prescient & Strategic Intelligence 2020). The market growth will be driven by higher demand for radiotherapy, as the number of cancer cases is expected to increase. Furthermore, the advancements in its technology have also improved the precision and applicability of radiotherapy, potentially expanding its use across a broader spectrum of cases. Moreover, most of the anticipated increase in new cancer diagnoses until 2030 is expected to occur in low- and middle-income countries, such as India and China. These regions currently experience a shortage of radiotherapy equipment, resulting in patients often enduring prolonged wait times for treatment. It is estimated that these countries alone will require over 12,000 additional radiotherapy treatment machines, contributing to the growth of the radiation oncology global market (Varian Medical Systems 2020).

The radiation oncology market can be further segmented into two categories: External Beam Radiation Therapy (EBRT), which uses a device called medical linear accelerator to create and direct high-energy beams into a precise point of the patient's body, thus killing the cancer cells,

and Internal Beam Radiation Therapy (IBRT), also known as brachytherapy, which uses an implanted metal radioactive seed to distribute the radiation to the patient's body. The first, EBRT, is the most common, followed by IBRT. VMS offers an array of EBRT devices and technologies. These encompass technologies such as Intensity-Modulated Radiation Therapy (IMRT), Volumetric Modulated Arc Therapy (VMAT), Stereotactic Radiosurgery (SRS), and Stereotactic Body Radiation Therapy (SBRT). Additionally, the company produces proton therapy devices, an alternative EBRT modality utilizing proton particles generated through a cyclotron, in contrast to X-ray beams emanating from a linear accelerator. Moreover, the company also specializes in brachytherapy, a form of IBRT, and offers devices such as BRAVOS, GammaMedplus iX, in this segment (Varian Medical Systems 2020).

Oncology systems/software

In addition to radiation oncology hardware (i.e., the EBRT or IBRT devices used to deliver radiotherapy), software has been playing an increasingly crucial role in cancer treatments. Artificial intelligence (AI), which according to Oxford Languages is defined as "(…) computer systems able to perform tasks normally requiring human intelligence (…)", has allowed to increase quality and consistency throughout the various phases of cancer treatment. Cancer survival rates increase if the tumor is detected in its early stage. As Dr. Chris Sander, professor in residence of cell biology at Harvard Medical School, told ABC News, "The more we can do gradually to move cancer treatment to an earlier stage where it's detected earlier and treated earlier, that should be a major change in the way we deal with the cancer problem" (ABC News 2023). Currently, artificial intelligence and machine learning algorithms are used in the early detection of cancer by aiding radiologists in reading medical images. The use of this technology can aid both the speed and accuracy of early detections, although some figures in the industry, such as Dr. Britany Fasy who

is an associate professor of computational topology at Montana State University, fear that it might lead to overdiagnosis – “If you’re on the lookout for something, then, if you look in enough places, you'll start to see it” (ABC News 2023). Additionally, AI is being used for other tasks that were previously done by humans, such as therapy planning. The traditional approach, known as forward planning, involves a manual trial-and-error process where the planner specifies and adjusts plan parameters based on their experience and decisions. The outcome, however, largely depends on the planner's expertise and effort. With AI it is possible to create a more consistent plan, with a process called inverse planning, therefore reducing the human experience variability factor. According to a preliminary study published in the International Journal of Radiation Oncology, Biology, Physics in 2018, in 88% of the cases AI treatment plans were preferred or found equivalent to human-generated treatment plans (UHN Research n.d.), (International Journal of Radiation Oncology, Biology, Physics 2018).

SH invested about €1.3 billion in R&D in FY2019, with a heavy focus on AI, having now more than 40 AI-supported products and applications. In the past year the company released the AI-Rad Companion Chest CT, a software that used AI to analyze image data, aiding radiologists by automatically detecting and marking lung nodules on CT images, potentially leading to a sooner discovery and to earlier treatment.

VMS offers a range of software products, including Eclipse™ Treatment Planning System, a treatment planning software that provides 3D image viewing, treatment simulation, radiation dosage calculation, and verification. It utilizes AI in the form of "inverse planning" to assist physicians in quickly developing optimal treatment plans based on desired radiation dose outcomes for tumors and surrounding tissues. It also includes RapidPlan, a knowledge-based

planning tool that uses machine-learned statistical models to predict the quality of an IMRT treatment based on a patient's anatomy (Varian Medical Systems 2019).

Stakeholders

In the event of a potential acquisition of VMS by SH, a multitude of stakeholders might find themselves at a crossroads of change and opportunity. This prospective strategic move, particularly influential in the oncology sector, could significantly alter the dynamics of the medical technology industry. Employees of SH and VMS could face a future of transformative change. They might encounter shifts in corporate culture and management, along with possible reevaluations of their roles. This hypothetical merger could open doors to new professional opportunities, although it may also bring challenges, including the risk of job redundancies due to overlapping functions. The Boards of Directors of both companies, if the acquisition were to proceed, would find themselves steering a complex integration process. Their decisions could shape the strategic trajectory and competitive stance of the combined entity, influencing its future in the global market. From a customer standpoint, healthcare providers using products from these companies could potentially see an expanded and integrated range of solutions. Such a merger could enhance treatment options in cancer care, potentially leading to more effective and efficient patient outcomes. The CEOs and executive leadership teams of both companies would play a crucial role in this hypothetical scenario. Their vision and decision-making would be instrumental in navigating the integration process, with the goal of realizing the potential benefits of the acquisition. Competitors in the medical technology and oncology sectors, such as GE Healthcare, Philips, Elekta AB, and Accuray Incorporated, might need to reassess their strategies in response to a strengthened SH in the oncology market. Investors and shareholders of both SH and VMS could anticipate potential impacts on stock performance, closely monitoring the prospective

financial benefits like revenue growth and cost synergies. Regulatory bodies would be key players in this scenario, scrutinizing the acquisition for compliance with antitrust laws and market fairness. Their rulings could significantly influence the feasibility and terms of the potential deal. Patients and the general public could ultimately benefit from such a merger. The combined research and development capabilities of SH and VMS could lead to advancements in cancer care technologies and treatments, improving healthcare outcomes. Suppliers and business partners of the two companies might also find themselves adjusting to new dynamics. This prospective merger could lead to changes in existing relationships and create opportunities for new collaborations.

In essence, the potential acquisition of VMS by SH could represent a transformative moment in the medical technology field, particularly in oncology. It presents a scenario filled with possibilities, challenges, and significant implications for a wide range of stakeholders, from the internal teams of both companies to the broader healthcare community and patients worldwide.

Affected stakeholders by the potential acquisition

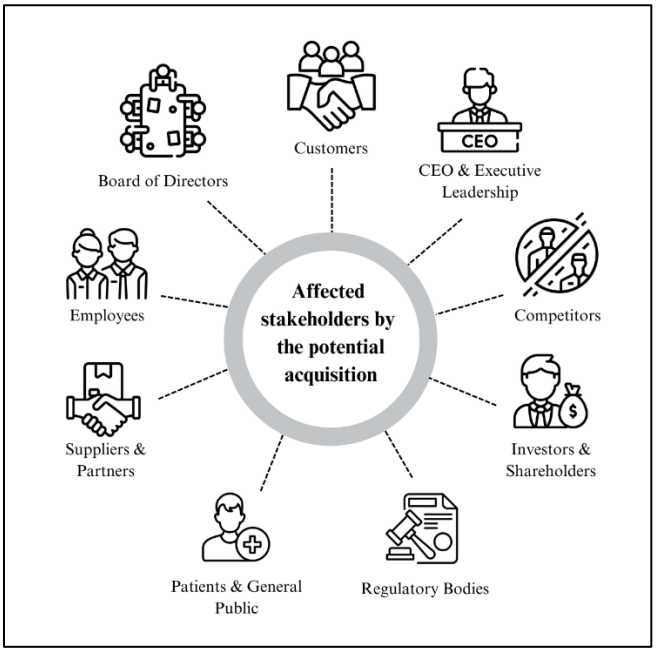


Figure 3: Affected stakeholders by the potential acquisition

Acquisition Decision

On a brisk December morning, the winter sun casts its rays into the board meeting room, as they reached a crucial juncture demanding a decision. The air of the room was charged with anticipation as they deliberated on the next chapter of their enduring alliance with Varian Medical Systems (VMS). Dr. Montag reflected on the fruitful partnership that had evolved over the years, considering its positive impact on both the MedTech industry and the oncology sector. With cancer being a leading cause of death and the number of new cases expected to rise in the next decades, VMS's mission of a world without fear of cancer resonated deeply with Siemens Healthineers (SH) strategic goals. The long tenured CEO was clear about his desire to uphold his company's connection with them. The uncertainty, however, revolved around which way the connection should continue. While he recognized the growth potential in oncology and SH capacity to contribute, he couldn't shake off concerns about the strategic, financial, and cultural challenges posed by a cross-border acquisition of such magnitude. Afterall, putting 8 years of mutual company success at risk was no easy decision.

It was the moment for Dr. Montag to make a yes or no definitive decision on the acquisition. Could this acquisition be the catalyst for a united and synergistic future, propelling SH and VMS toward their common goal of a cancer-free world, or will it entail potential risk to their collaboration, possibly affecting the overall vitality of SH?

As the pivotal question of whether SH should proceed with the acquisition loomed, several related queries emerged – what would be the correct valuation of VMS? How should they structure and finance the deal? What would be the strategic implications for SH and the broader MedTech industry? What regulatory risks does a cross-border acquisition like this carry? What elements of synergies and value creation could arise?

Individual Part - Guilherme Serrado

Case Synopsis

Siemens Healthineers's (SH) CEO, Dr. Bernd Montag, faced a transformative decision about the potential acquisition of Varian Medical Systems (VMS), a key player in the oncology sector. SH, a renowned German medical technology company with global influence, has been a leading provider of innovative healthcare solutions in the areas of Imaging, Diagnostics, and Advanced Therapies. The acquisition decision, weighing heavily on Dr. Montag, signifies a critical crossroad for SH, contemplating a strategic leap into the oncology sector that could significantly alter its market trajectory. To gauge the acquisition price for VMS, Bernd must initiate its standalone valuation process, as it serves as the foundational basis for determining the ultimate acquisition cost.

Learning Objectives

The present case study offers students the opportunity to learn about different intrinsic valuation tools and their characteristics. More importantly, it offers the methodology to perform such valuations by going through the process of (i) reorganizing financial statements, (ii) forecasting performance using value drivers, (iii) elaborating the cash flow map and stabilizing long-term value drivers, (iv) estimating a reasonable discount rate and using the correct one for each valuation tool and (v) reaching a final and reasonable price per share of the company in question based on the students own assumptions.

Target Audience

This case study is intended for undergraduate, postgraduate and MBA students interested in learning how to perform a firm valuation through various discounting cash flow methods.

Additionally, students will cover what are the characteristics of the methods one should consider when choosing one, as well as how to estimate a reasonable discount rate for each of the methods to arrive at a final price.

Teaching Plan

This case study is supposed to be taught in three classes in any course that teaches topics related to intrinsic valuations. Students are expected to read the case study and go through part of the 2019 annual report to understand VMS's business and performance in more depth. The following questions are supposed to encourage students to discuss and make reasonable assumptions that allow the execution of a final valuation. Questions 1 and 2 for the first class, question 3 for the second class and questions 4 and 5 for the third class.

Assignment Questions

1. What are the best valuation methods to calculate VMS's price?
2. How should the reorganized financial statements of VMS look like?
3. How should the forecasted financial statements and cash flow map look like?
4. In the context of VMS, how should the discount rate be estimated?
5. What is VMS's price per share?

Case Analysis

Introduction

This analysis attempts to explain the typical valuation process of known techniques to arrive at a final price per share, the starting point of determining the final acquisition price assumed by the acquirer. The valuation tools utilized in this analysis are Enterprise Discounted Cash Flow (DCF), Adjusted Present Value (APV) and Equity Cash Flow (ECF). These techniques include a process

of reorganizing financial statements, defining value drivers, forecasting performance using publicly available information, elaborating the cash flow map, estimating the cost of capital, and applying the discount rate to the cash flows to arrive at a final enterprise value and price. Throughout the analysis, students are encouraged to attentively read the information provided by the company and industry in question, critically assess and identify what is the valuable information that allow reasonable assumptions to be made and apply the information to reach a final price per share.

Valuation and Techniques

The first thing to consider when contemplating performing a valuation is that uncertainty is inherent to the process. No matter how complex, careful, or detailed your valuation model is, uncertainty will inevitably present itself as the final numbers are based around estimates and assumptions about the future of the company and the economy (Damodaran 2012) .

Now, the existing types of valuation go under three main designations: Intrinsic, Relative and Contingent Claim valuations. The first one, intrinsic valuation, as the name suggests, is about valuing a company based upon its core characteristics. This type of valuation is done by measuring the dimension of the expected cash flows the business generates and the uncertainty on their generation. The second valuation type, relative valuation, is based on the value of a company being derived from other comparable companies by using a common variable such as earnings, cash flows, book value, or revenues (Damodaran 2012). Even though this type of valuation is of heightened desirability when valuing companies that do not have an abundance of information disclosed on cash flow generation, it does not take into account the important differences among firms (Berk DeMarzo 2019). The third type, contingent claim valuation, is based on the application of option pricing techniques to evaluate the value of a business with assets that have option like

features, such as financial assets (e.g., stocks and bonds) or real assets (e.g., patents, real estate, or investment projects) (Damodaran 2012).

In this analysis the utilized method will be intrinsic valuation. Due to VMS's public nature, there is good publicly available information that allows for the incorporation of data about the firm's profitability, cost of capital, future growth potential as well as the execution of a sensitivity analysis. Although VMS has comparable players well established in the cancer treatment medical device industry such as Elekta AB, Accuray Inc. and Eckert & Ziegler, due to the number of akin firms being rather small and exhibiting differences that would not capture specific and important aspects of VMS, relative valuation was disregarded. Furthermore, in the discount cash flow valuation the analyst is required to be very explicit about the assumptions made, allowing the reader to understand exactly where those estimates come from. Due to the complexity of option pricing models and the difficulty in identifying the options within VMS, this type of valuation is also disregarded.

Valuation Process

Reorganizing Financial Statements

The first step in starting the valuation process of a public company is reading about the industry, through the company's annual report (AR) and reorganizing its financial statements, mainly the Income Statement and Balance Sheet, into operating, non-operating and financial categories. Traditional financial statements are not organized for robust assessment of operating performance and value (Koller, Goedhart and Wessels 2010, 133), and thus companies may report income or costs that are not directly related to their operations that if included could inflate or shrink the final valuation. The reorganization phase is crucial because it requires one to read through the notes of the different captions, leading to a deeper understanding of the company's operations.

Looking at first glance at VMS's income statement (Exhibit 1), we can easily determine that revenues and cost of revenues are directly related to the operations. Research and development (R&D), selling, general and administrative (SG&A), acquisition-related expenses and impairment charges require us to look through the notes to assess if these captions include non-operating parts. Since the markets for cancer treatment and services are characterized by rapidly evolving technology to drive down prices and optimize treatments for more effectiveness, R&D expenses are inherent to the operating activities of the company. SG&A expenses are considered operating as well as Acquisition-related expenses since targeted acquisition became part of VMS's leadership strategy. Lastly, due to their infrequent and unforeseeable nature, impairment charges are deemed as non-operating. Interest income and other income, net captions are evaluated to be non-operating since they are tied to available-for-sale securities, and gains on sales of equity investments in privately held companies, some in their start-up phase. Interest expense is directly tied to the incurred debt and so it is deemed financial. Next, we have taxes on earnings. Taxes usually require a breakdown since the statutory tax rate does not capture the amount of taxes paid, calling for a tax adjustment (Exhibit 2). Of the six remaining captions from the income statement, five are allocated to the non-operating category since they are not directly related to the operations. Finally, income attributable to non-controlling interests is deemed financial as it should be considered a financing cash flow similar to dividends (Koller, Goedhart and Wessels 2010). This way we get the income statement reorganized by these three categories (Exhibit 3). These three results added together must equal the reported comprehensive income.

Next, we must reorganize the balance sheet (Exhibit 4) into the same categories. Accounts receivable, inventories, property plant and equipment (PP&E) are deemed operating because the manufacture and development of hardware, software and services for cancer solutions and its

commercialization inevitably includes holding assets on these accounts. Goodwill and intangible assets are also assumed as operating due to their acquisition strategy being a key aspect of their growth going forward. On the other hand, captions such as short-term investments, deferred tax assets and assets of discontinued operations are considered non-operating. The three remaining asset captions require a breakdown due to non-operating and financial characteristics. Cash and cash equivalents must be broken down between operating cash (operating) and excess cash (financial). Since VMS does not disclose how much cash is needed to run operations, and there is no accessible industry standard, a default 2% of revenues is assumed (Exhibit 5). Prepaid expenses and other current assets (Exhibit 6) and other assets (Exhibit 7) have non-operating qualities, and so a breakdown is required. Within liabilities and equity, accounts payable, accrued liabilities and deferred revenues are deemed operating while liabilities related to discontinued operations have a non-operating allocation. The caption other long-term liabilities must be broken down since it included an account related with benefit pension plans which does not arise directly from the activity of VMS (Exhibit 8). The remaining debt- and equity-related captions (Exhibit 4) are placed under the financial category. Once allocations are made, we get the reorganized balance sheet in which operating and non-operating invested capital must equal the financial assets, also known as sources of funding (Exhibit 9).

Forecasting Performance - Value Drivers & Assumptions

The next step is to forecast the financial statements we have just reorganized to elaborate the cash flow map. The forecasting period was initially determined to be 15 years; however, the period ought to be extended if the growth rate does not stabilize as it will be used to compute the terminal value. Regarding the forecasting mechanics, the assumptions used should be a combination of historical performance and a forward-looking perspective.

First and foremost, tied to the long-term growth in cash flows, revenue growth is one of the key drivers we must carefully assess to conduct a thorough valuation. As mentioned in the case description, VMS operates in three different segments: Oncology Systems (OS), Proton Solutions (PS) and Interventional Solutions (IS).

Firstly, the segment OS is responsible for 95% of the total revenues. This segment is based on the commercialization of cancer treatment systems that include hardware such as medical linear accelerators (LINACS) and brachytherapy afterloaders, standalone software for cancer patient management and other uses as well as software required for machine well-functioning and maintenance services for both software and hardware products. Being the rise in cancer incidence one of the fundamental market forces driving long-term growth of the oncology market, the projections of new cancer diagnoses for 2020 onwards per region (Exhibit 10) are assumed as the main driver of revenues together with growth projections of private market research. The number of radiotherapy machines needed per region was one other considered driver, but due to the lack of disaggregated information from VMS, it was disregarded.

Secondly, the segment PS is responsible for 5% of revenues and is focused on delivering an alternative form of external beam radiotherapy using proton beams. Although this kind of therapy is quite promising for cancer treatment because it has been shown to spare a larger portion of healthy tissues than other types of radiotherapy, these findings are still based on small studies (Mohan, Grosshans 2017). Furthermore, the adoption of proton therapy by clinics is extremely expensive as proton therapy facilities are large-scale construction projects that are time consuming, involve significant customer investment and often complex project financing (Varian Medical Systems 2019). This way, it is expected that as more R&D is done, total cost of ownership (TCO) of these facilities is reduced and proton therapy can become less expensive. Considering VMS

intent to continue betting on R&D, it is assumed that proton therapy costs can be reduced over the years which will translate into a lower TCO to clinics and treatment centers consequently making this treatment also less expensive to patients. This way, the main value driver is the predicted number of new cancer diagnoses for 2020 onwards per region paired with available information from private market research on the proton therapy market.

Thirdly, the segment IS is responsible for less than 1% of revenues and is focused on delivering localized cancer treatment using heat or extreme cold to kill abnormal cancerous cells. VMS entered this segment in 2019 via inorganic growth with the acquisition of Endocare and Alicon. As VMS pursues its growth strategy through inorganic means to broaden its operations, the expectation is that revenues in this segment will increase as the company acquires other firms and intangible assets within this sector. The primary catalysts for revenue growth in this segment are derived from this insight, coupled with projections of an escalating number of new cancer diagnoses and growth predictions sourced from private research data available in 2019.

In Exhibit 11, revenue estimation is conducted by segments, and within the OS segment, a detailed breakdown is made per geographical region. This level of segmentation is not extended to the other segments as regional distinctions were not deemed significant. Additionally, to incorporate the value driver (new cancer diagnoses per region) into revenue projections, a proportional adjustment is implemented to account for fluctuations in the predicted growth of new cancer diagnoses (Exhibit 12). To mitigate more pronounced drops, this adjustment is gradually moderated in subsequent forecasted years. In the OS segment, the Americas revenue growth is estimated by doing an average of the previous 5-year period together with the prediction of private market research (Exhibit 13) CAGR for 2020-2030 for the radiotherapy market, initially yielding a growth of 7.1% and converging to 8.4% in 2025. Due to the decrease in growth of the predicted number

of new cancer diagnoses (Exhibit 10) in 2026 and 2031 of around 0.2%, a deceleration of revenue growth is assumed of 3%. The EMEA (Europe, Middle East, Africa) region, including India, had a quite volatile historical performance. With the focus on emerging markets and the acquisition of CTSI (Cancer Treatment Services International), which opened a hospital in India, revenues are expected to rise in the first few forecasted years. A growth of 15% is assumed for 2020, and a slow decrease (1.32%) in yearly growth is observed until 2025. Due to the decrease in growth of the predicted new cancer diagnoses, growth is projected to drop 0.8% in 2026 and another 1.7% in 2031, remaining stable at 5.9% for the rest of the forecasting period. The last region, APAC (Asia-Pacific), is assumed to keep the same growth percentage in 2020 as in 2019 (14%) and slowly converge to the private market research CAGR of 8.4% in 2025. Owed to a growth decrease of the value driver in both 2026 and 2031, growth is assumed to drop around 2.5% in both years stabilizing at 3.7% for the rest of the forecasting period.

In the PS segment, growth was about 10% in FY2016 and FY2017, dropping to -18% and -3% in FY2018, and FY2019, respectively. In 2020, growth is estimated slightly above private market research projections (Exhibit 14), due to an increase in proton solutions orders in 2019 from 2018 stated in the AR. In 2026, to reflect the decrease in the projected number of new cancer diagnoses, revenue is estimated to drop 3%. In 2031, there was another decline in the forecasted number of new cancer diagnoses. However, due to the assumption that advancements in R&D will result in a reduction in the TCO for proton therapy machinery, the anticipated decrease in revenue growth is estimated to be less pronounced than initially expected.

In the IS segment, revenue was close to non-existent in the previous years. The entrance into this segment makes it reasonable to assume revenues will exhibit a higher growth than expected by private market research projections (Exhibit 15). Seven percent is assumed for 2020, dropping to

private market research CAGR in 2025. Again, to reflect a drop in the projected number of new cancer diagnoses, revenue is estimated to drop by 1.5% in 2026 and 2031, stabilizing at 1.9% for the rest of the forecasting period. After forecasting revenues, we must forecast the rest of the income statement. The next caption is the total cost of revenues which value driver is the percentage of total revenue. Total cost of revenues remained at an average of 57% of total revenues in the prior five years. Due to VMS's explicit intent to invest in R&D and improve operational efficiency together with the assumption that the portion of revenue coming from software and services will rise in comparison to that of hardware, total cost of revenue is assumed to stay at 57% the first five years and drop 2% every 5-year period stabilizing in 2031 at 53%. Given that cancer stands as a prominent global cause of death, the cancer treatment sector witnesses substantial investments in R&D aimed at discovering advanced and more efficacious treatments. In alignment with this commitment, VMS anticipates continued investment in R&D. Consequently, R&D expenses were projected to commence at an average of the preceding 5 years (7.9%) and incrementally rise by 1.5% over the next decade, ultimately reaching 9.4% of total revenues. SG&A expenses are assumed to grow together with total revenues, and acquisition-related expenses are projected to stay at 10% of goodwill as exhibited in FY2019. The non-operating captions are kept as the average of the previous five years for the whole forecasting period since you do not need a robust forecast of nonoperating income for an accurate valuation (Koller, Goedhart and Wessels 2010). The forecasted income statement can be observed in Exhibit 16.

Next, we set foot in forecasting the balance sheet. With revenues outside the United States accounting gradually more to the total revenues (57%, 55% and 53% in 2019, 2018, and 2017, respectively) and with certain international and emerging markets having typically longer periods from placement of orders to revenue recognition, the average collection period is expected to

increase. The average collection period is assumed to increase from an average (previous three years) of 121 days by 2.5% in 2025, and again in 2030 reaching 127 days. Inventories and accounts payable are expected to stay stable since no information was found to counter this trend. PP&E are forecasted as a percentage of total revenue and are kept at an average of 11% of sales throughout the forecasting period. Goodwill and Intangible assets are kept at the current values because of the empirical literature documenting how the typical acquisition fails to create value (any synergies are transferred to the target through high premiums (Koller, Goedhart and Wessels 2010). Non-operating invested capital is estimated to keep current values of FY2019 forever since they will not have a significant role in the valuation. In the financing part of the balance sheet, the remaining captions are the excess cash and total debt, many times referenced as "the plug" (Koller, Goedhart and Wessels 2010), since they are to be used to balance the balance sheet. The forecasted balance sheet can be observed in Exhibit 17.

Cash Flow Map and Long-Term Value Drivers

After forecasting both financial statements, we elaborate the cash flow map. At this stage we must take the operating result from the forecasted income statement, add depreciation and amortization, the noncash expenses, and add the change in operating invested capital to arrive at the operating free cash flows. Depreciation and amortization (D&A) are forecasted separately from the income statement as the percentage of the historical average of PP&E, Goodwill, and Intangible Assets because VMS does not include isolated captions on these expenses (Exhibit 18). D&A, capital expenditure, change in net working capital, change in other assets and other long-term liabilities were added to the NOPLAT (operating result) yielding historical and forecasted operating free cash flows. Non-operating cash flows stayed the same, as the forecast assumed historical values. Finally, the financing cash flows follow the same logic: financial result plus the change in balance

sheet captions of financial-deemed categories. To make sure everything makes sense, the free cash flow from operating and non-operating sources and financial cash flow must equal zero. The full cash flow map can be observed in Exhibit 19. As can be observed in Exhibit 20, the return on new invested capital (RONIC) and the growth rate start to stabilize in 2033. The stabilized growth rate of 4.5% is the one utilized to compute the terminal value.

Estimating the Cost of Capital

As mentioned in a previous chapter, valuation techniques based on discounted cash flows require an opportunity cost that investors face for investing their funds in a particular business instead of others with similar risk (Koller, Goedhart and Wessels 2010). In this specific case, we must derive for the DCF the weighted average cost of capital (WACC), for the APV the unlevered cost of capital (Ru) and for the ECF the levered cost of equity (Re). Since the WACC requires the estimation of both the Ru and Re, its calculation will provide both costs. The WACC, then, is composed of three components: Cost of Equity (Re), After Tax Cost of Debt and Target Capital Structure. Firstly, the cost of equity in this analysis is derived by using the Capital Asset Pricing Model (CAPM) as it provides a practical way to identify an investment with similar risk (Berk, DeMarzo 2019). Under the CAPM, the Re requires the following three components: Risk-free rate (rf), the Market Risk Premium (MRP) and the Beta of VMS (ße). The risk-free rate of 1.92% is determined by looking at the 10-year US treasury bond yield at year close of 2019. The specific period of 10 years is chosen because the short-term bond rate misestimates the opportunity cost of investment for longer-term projects (Koller, Goedhart and Wessels 2010). Since a 10-year period is used for the risk-free rate, the MRP of 8.86% is derived by looking at the average 10-year historical yield of a market portfolio proxy, the MSCI World, and subtracting the risk-free rate. The beta of VMS is calculated by using an industry-derived unlevered beta and re-levering it to

the company's target capital structure. The company's set of comparables used is a group of 7 companies, 4 of them solely in the cancer treatment market along with 3 companies in the medical device industry. A raw beta regression is performed for all of them within a 5-year period (31/12/2014 - 31/12/2019) with monthly observations against MSCI World, this way using 60 data points. Using more frequent return periods, such as daily and weekly returns, leads to systematic biases (Koller, Goedhart and Wessels 2010, 250), and thus are not used. The raw betas are unlevered using the historical 5-year average capital structures, assuming the risk of taxes to be the same as the risk of the assets as well as a debt beta of 0. After assessing averages, percentiles and the median, the average of unlevered betas of the comparables companies excluding that of VMS was used as the chosen unlevered beta (0.840) (Exhibit 21), since it seemed the most reasonable. Utilizing the CAPM, we get an unlevered cost of equity of 9.37%. To relever the beta, a target net debt to value was assumed of 0.1. Historically, VMS exhibited a negative net debt to value consistently, meaning a capital structure mainly composed of equity financing. Nevertheless, interest charges for debt are tax deductible and since VMS plans to keep acquiring companies in the future, an opportunity could exist to finance these acquisitions with debt and increase its value. Furthermore, with an enviable interest coverage ratio of 44, it is probable that VMS can issue debt at overall lower interest rates. This way, the unlevered beta was relevered by multiplying it by one minus the targeted net debt to value of 0.1, yielding an equity beta of 0.934. The levered cost of equity of 10.20% is then determined using the CAPM. The cost of debt was calculated by subtracting the product of the probability of default and loss given default from VMS's yield to maturity. Initially, VMS's rating is established based on its interest coverage ratio, surpassing 8.5, aligning with an investment-grade AAA rating and an estimated spread of 0.75% (Exhibit 22). Subsequently, VMS's yield to maturity is determined by adding the spread to the risk-free rate.

The probability of default, set at 0.003%, is derived by annualizing the average 10-year cumulative issuer-weighted global default rate for AAA-rated companies (Exhibit 23). Lastly, the loss given default, identified as 43%, is defined as the 10-year mean of average annual losses (Exhibit 24). Utilizing the formula, the cost of debt is computed at 2.67%. Finally, applying the WACC formula leads to the calculation of a cost of capital of 9.39%.

DCF, APV & ECF – Varian's Final Price

After having derived the different costs of capital, the only thing missing is applying the rate to the expected cash flows to discount them into the present. In the DCF model, we take the operating free cash flow of 2034 and compute the terminal value by use of the perpetuity formula. This gives us the operating value in 2033, requiring us to discount back the remaining years while adding each year's cash flow. After discounting, VMS's operating value is $11,627 million. By adding 2019's non-operating invested capital and subtracting net debt and minority interest we get an equity value of $11,918.1 million. VMS had 90.8 million shares outstanding at the end of 2019 implying a share price of $131.26 (Exhibit 25). In the APV model, we follow the same logic, but discount both the operating free cash flows and tax shields by the unlevered cost of equity. In the end, VMS's implied share price was $132.99. Not possible to observe from the DCF, a target net debt to value of 10% allows VMS an increase in value of $107 million from the tax shields (Exhibit 26). Lastly, in the ECF model we take the operating cash flow and the change in net debt and minority interest arriving to the cash flows available to equity holders. The present value of the terminal value (PV[TV]) was again computed using the perpetuity formula. Next, we just need to discount the remaining equity cash flows to the present and add it to the PV(TV), yielding an equity value of $11,726 million, and an implied share price of $129.14 (Exhibit 27).

Conclusion

In conclusion, under the outlined assumptions, the three models yield an average share price of $131 or an equity value of $11,894.8 million for VMS. This stands in contrast to the market's established share price of $142.01 and an equity value of $12,895 million in 2019. The apparent undervaluation prompts considerations about investors' perceptions regarding VMS's cost of capital and anticipated cash flows, which may deviate from the projections in this analysis. It is crucial to recognize that this valuation is conducted under specific assumptions, introducing a divergence from market dynamics shaped by information asymmetry, subjectivity, market inefficiencies, and risk adjustments.

Nonetheless, the standalone valuation serves as the initial step in determining the ultimate acquisition price. In the case of SH, this implies that the acquisition price should consistently exceed $131 per share. Subsequently, SH must delve into assessing the synergistic advantages associated with holding VMS's assets to arrive at a conclusive acquisition price. This process reiterates a typical intrinsic valuation process underlying the derivation of the final acquisition cost and underscores the subjective nature of valuation.

Table of Figures

Figures

Tables

Appendix

Exhibit 1 – VMS Reported Income Statement with Allocation (FY2015 to FY2019)

Consolidated Income Statement (Reported) *(in $ millions)*	*2/10/2015* ***FY2015***	*30/09/2016* ***FY2016***	*29/09/2017* ***FY2017***	*28/09/* ***FY2(***	*27/09/2019* ***FY2019***	***Allocation***
Total Revenue	2,491	2,594	2,619	2,919	3,225	*Operating*
Total Cost of Revenues	(1,459)	(1,489)	(1,505)	(1,646)	(1,855)	*Operating*
Gross income	**1,032**	**1,105**	**1,114**	**1,274**	**1,370**	***N/A***
Research and development expenses	(195)	(200)	(210)	(234)	(248)	*Operating*
Selling, general and administrative expenses	(441)	(472)	(553)	(544)	(623)	*Operating*
Impairment charges	-	(2)	(51)	(22)	(51)	*Non-operating*
Acquisition related expenses	-	(3)	(2)	(36)	(62.8)	*Operating*
Operating income	396	427	298	437	386	***N/A***
Interest income	14	17	14	17	15	*Non-operating*
Interest expense	(8)	(12)	(11)	(7)	(9)	*Financial*
Other income, net	-	-	2	4	28	*Non-operating*
Operating income before taxes (EBT)	401	432	303	452	421	***N/A***
Taxes on earnings	(89.9)	(110.1)	(77.1)	(301.8)	(128.6)	*Breakdown*
Net earning (loss) from discontinuing operations	101	77	(7)	-	-	*Non-operating*
Net income	**412**	**400**	**219**	**150**	**292**	***N/A***
Defined benefit pension and post-retirement benefit plans	(2)	(17.2)	19	9	(27)	*Non-operating*
Derivative instruments	(1.0)	-	-	-	2	*Non-operating*
Available-for-sale securities	(0.1)	0.1	-	-	-	*Non-operating*
Currency translation adjustment	(24.8)	2.8	13	(5)	(12)	*Non-operating*
Comprehensive earnings	**384.1**	**385.4**	**251.2**	**153.8**	**255.4**	***N/A***
Comprehensive income attributable to the non-controlling interests	(0.5)	(0.4)	(0.7)	(0.4)	(0.3)	*Financial*
Comprehensive income attributable to Varian Medical System's shareholders	**383.6**	**385.0**	**250.5**	**153.4**	**255.1**	***N/A***

Source: VMS Annual Report 2019, 2018 and 2017 (Own Illustration)

Exhibit 2 – VMS Taxes on Earnings Breakdown (FY2015 – FY2019)

	21/01/2015 FY2015	30/03/2016 FY2016	29/03/2017 FY2017	28/03/2018 FY2018	27/03/2019 FY2019	Allocation
Taxes						
Percentage						
Statutory Taxes (Federal statutory income tax rate)	35.0%	35.0%	35.0%	24.6%	21.0%	*N/A*
Impact of U.S. Tax Reform	0.0%	0.0%	0.0%	46.3%	2.1%	*N/A*
State and local taxes, net of federal tax benefit	0.5%	0.2%	0.9%	0.5%	2.6%	*N/A*
Non-U.S. income taxed at different rates, net.	(12.6%)	(9.3%)	(8.4%)	(0.6%)	1.5%	*N/A*
Foreign-derived intangible income deduction	0.0%	0.0%	0.0%	0.0%	(1.4%)	*N/A*
Resolution of tax contingencies due to expiration of statutes of limitatic	0.0%	(1.2%)	(1.7%)	(2.5%)	(1.8%)	*N/A*
Excess stock deduction	0.0%	0.0%	0.0%	(1.5%)	(1.6%)	*N/A*
Goodwill impairment	0.0%	0.0%	0.0%	0.0%	2.5%	*N/A*
Change in acquirer's deferred taxes related to purchase accounting	0.0%	0.0%	0.0%	(1.8%)	0.7%	*N/A*
In-process R&D expense	0.0%	0.0%	0.0%	0.0%	1.1%	*N/A*
Other	(0.5%)	0.8%	(0.4%)	1.8%	3.9%	*N/A*
Effective Tax Rate (SUM)	**22.4%**	**25.5%**	**25.4%**	**66.8%**	**30.6%**	*N/A*
Value						
Statutory Taxes (Federal statutory income tax rate)	(140.5)	(151.3)	(106.1)	(111.2)	(88.4)	*Breakdown*
Impact of U.S. Tax Reform	-	-	-	(209.3)	(8.8)	*Operating*
State and local taxes, net of federal tax benefit	(2.0)	(0.9)	(2.7)	(2.3)	(10.9)	*Operating*
Non-U.S. income taxed at different rates, net.	50.6	40.2	25.5	2.7	(6.3)	*Operating*
Foreign-derived intangible income deduction	-	-	-	-	5.9	*Operating*
Resolution of tax contingencies due to expiration of statutes of limitatic	-	5.2	5.2	11.3	7.6	*Non-operating*
Excess stock deduction	-	-	-	6.8	6.7	*Non-operating*
Goodwill impairment	-	-	-	-	(10.5)	*Non-operating*
Change in acquirer's deferred taxes related to purchase accounting	-	-	-	8.1	(2.9)	*Non-operating*
In-process R&D expense	-	-	-	-	(4.6)	*Operating*
Other	2.0	(3.5)	1.2	(8.1)	(16.4)	*Non-operating*
Total	(89.891)	(110.3)	(77.0)	(302.0)	(128.8)	*N/A*
Adjustment from Annual Reports	(0.01)	0.16	(0.11)	0.20	0.16	*Non-operating*
Total Reported	(89.90)	(110.10)	(77.10)	(301.80)	(128.60)	*N/A*
Statutory Taxes (Federal statutory income tax rate)						
Operating	(138.5)	(150.2)	(122.2)	(113.1)	(91.7)	*N/A*
Non-operating	(4.7)	(5.3)	12.4	0.2	1.5	*N/A*
Financial	2.8	4.1	3.7	1.7	1.8	*N/A*
Total	*(140.5)*	*(151.3)*	*(106.1)*	*(111.2)*	*(88.4)*	*N/A*
Tax Adjustment						
Operating	*48.6*	*39.3*	*22.7*	*(208.9)*	*(24.8)*	*N/A*
Non-operating	*2.0*	*1.9*	*6.3*	*18.3*	*(15.4)*	*N/A*

Source: VMS Annual Report 2019 (Own breakdown & calculation)

Exhibit 3 – VMS Reorganized Income Statement (FY2015 – FY2019)

Reformulated Income Statement *(in $ millions)*	*2/10/2015* **FY2015**	*30/09/2016* **FY2016**	*29/09/2017* **FY2017**	*28/09/2018* **FY2018**	*27/09/2019* **FY2019**
Operating					
Revenues	2,491	2,593.7	2,619	2,919	3,225
Cost of Revenues	(1,459)	(1,489)	(1,505)	(1,646)	(1,855)
Research and development expenses	(195)	(200)	(210)	(234)	(248)
Selling, general and administrative expenses	(441)	(472)	(553)	(544)	(623)
Acquisition related expenses	-	(3)	(2)	(36)	(63)
Operating Result Before Taxes	**396**	**429**	**349**	**460**	**437**
Statutory Taxes	(138)	(150)	(122)	(113)	(92)
Tax Adjustments	49	39	23	(209)	(25)
Operating Result After Taxes (NOPLAT)	**306**	**318**	**250**	**138**	**320**
Non-operating					
Impairment charges	-	(2)	(51)	(22)	(51)
Other income, net	-	-	2	4	28
Interest income	14	17	14	17	15
Non-operating Result Before Taxes	**14**	**15**	**(35)**	**(1)**	**(7)**
Statutory Taxes	(5)	(5)	12	0	2
Tax Adjustment	2	2	6	18	(15)
Other comprehensive income (sum of CI)	73	63	25	4	(37)
Non-operating Result After Taxes	**83**	**75**	**8**	**21**	**(58)**
Financial					
Finance costs	(8)	(12)	(11)	(7)	(9)
Financial Result before taxes	**(8)**	**(12)**	**(11)**	**(7)**	**(9)**
Tax shields	2.8	4.1	3.7	1.7	1.8
Comprehensive income attr. to the non-controlling interests	(0.5)	(0.4)	(0.7)	(0.4)	(0.3)
Financial Result After Taxes	**(6)**	**(8)**	**(8)**	**(6)**	**(7)**
Comprehensive income attr. To Varian Medical Systems	383.6	385.0	250.5	153.4	255.1
Reported by VMS	383.6	385.0	250.5	153.4	255.1

Source: VMS Annual Report 2019, 2018 and 2017 (Own Reformulation)

Exhibit 4 – VMS Reported Balance Sheet with Allocation (FY2015 to FY2019)

Consolidated Balance Sheet (Reported) *(in $ millions)*	*21/09/2015* **FY2015**	*30/09/2016* **FY2016**	*29/09/2017* **FY2017**	*28/09/2018* **FY2018**	*27/09/2019* **FY2019**	**Allocation**
ASSETS						
Cash and Cash Equivalents	846	811	716	505	531	*Breakdown*
Short-term investments	-	95	-	-	-	*Non-operating*
Accounts receivable	771	770	962	1,010	1,106	*Operating*
Inventories	613	442	418	438	552	*Operating*
Prepaid expenses and other current assets	164	141	190	233	206	*Breakdown*
Current assets of discontinued operations	-	356	11	2	-	*Non-operating*
Current Assets	***2,393***	***2,615***	***2,297***	***2,188***	***2,395***	***N/A***
Property, plant and equipment, net	379	259	255	275	312	*Operating*
Goodwill	284	220	223	294	612	*Operating*
Intangible assets	73	84	72	101	301	*Operating*
Deferred tax assets	119	137	147	102	85	*Non-operating*
Other assets	331	227	301	293	397	*Breakdown*
Non-current assets of discontinued operations	-	273	-	-	-	*Non-operating*
Non-current Assets	**1,186**	**1,199**	**998**	**1,064**	**1,706**	***N/A***
TOTAL ASSETS	***3,579***	***3,815***	***3,294***	***3,253***	***4,102***	***N/A***
LIABILITIES & EQUITY						
Accounts payable	203	159	162	190	249	*Operating*
Accrued liabilities	347	384	375	420	460	*Operating*
Deferred revenues	668	609	755	730	766	*Operating*
Short-term borrowings	108	330	350	-	410	*Financial*
Current maturities of long-term debt	50	49	-	-	-	*Financial*
Current liabilities of discontinued operations	-	83	3	-	-	*Non-operating*
Current liabilities	**1,377**	**1,613**	**1,645**	**1,340**	**1,884**	***N/A***
Long-term debt	338	287	-	-	-	*Financial*
Other long-term liabilities	138	156	127	324	440	*Breakdown*
Non-current liabilities from discontinued operations	-	4	-	-	-	*Non-operating*
Non-current liabilities	**476**	**447**	**127**	**324**	**440**	***N/A***
TOTAL LIABILITIES	**1,852**	**2,060**	**1,773**	**1,664**	**2,324**	***N/A***
Common stock at $1 par value	98	94	92	91	91	*Equity*
Capital in excess of par value	682	679	716	778	846	*Equity*
Retained earnings	1,018	1,069	779	780	934	*Equity*
Accumulated other comprehensive lost	(87)	(101)	(69)	(65)	(102)	*Equity*
Total Varian stockholders' equity	**1,712**	**1,741**	**1,518**	**1,584**	**1,768**	***N/A***
Non-controlling interest	15	4	4	4	9	*Financial*
TOTAL EQUITY	**1,726**	**1,744**	**1,522**	**1,589**	**1,778**	***N/A***
Redeemable noncontrolling interest of discontinued operations	-	10	-	-	-	*Financial*
TOTAL EQUITY AND LIABILITIES	**3,579**	**3,815**	**3,294**	**3,253**	**4,102**	***N/A***

Source: VMS Annual Report 2019 (Own Illustration)

Exhibit 5 – VMS Cash and Cash Equivalents Breakdown (FY2015 to FY2019)

	2/10/2015	30/09/2016	29/09/2017	28/09/2018	27/09/2019	
	FY2015	**FY2016**	**FY2017**	**FY2018**	**FY2019**	**Allocation**
Cash and Cash Equivalents						
Operating Cash	50	52	52	58	65	*Operating*
% of revenues	*2%*	*2%*	*2%*	*2%*	*2%*	***N/A***
Excess Cash	796	760	664	446	467	*Financial*

Source: Own elaboration

Exhibit 6 – VMS Prepaid Expenses and Other Current Assets Breakdown (FY2015 to FY2019)

	2/10/2015	30/09/2016	29/09/2017	28/09/2018	27/09/2019	
	FY2015	**FY2016**	**FY2017**	**FY2018**	**FY2019**	**Allocation**
Prepaid expenses and other current assets (PRE)						
Prepaid income taxes	48	41	60	48	51	*Operating*
Prepaid sales taxes	-	-	-	18	21	*Operating*
Prepaid compensation	12	10	12	14	14	*Operating*
Advance payment to suppliers	20	17	15	17	15	*Operating*
Available-for-sale securities	-	-	-	39	-	*Non-operating*
RPTC senior secured debt	-	-	25	25	-	*Non-operating*
Other current receivables	34	29	29	24	47	*Operating*
Other prepaid expenses	51	44	50	49	58	*Operating*

Source: VMS Annual Report 2019, 2018, 2017 (Own Illustration)

Exhibit 7 – VMS Other Assets Breakdown (FY2015 – FY2019)

	2/10/2015 FY2015	30/09/2016 FY2016	29/09/2017 FY2017	28/09/2018 FY2018	27/09/2019 FY2019	Allocation
Other assets (OA)						
Long-term receivables	77	114	115	72	74	*Operating*
Deferred Compensation Plan ("DCP") assets	57	61	73	75	79	*Operating*
Equity Investments	65	19	27	39	64	*Non-operating*
Long-term available-for-sale securities	93	-	60	23	58	*Non-operating*
Californian Proton Therapy Center ("CPTC") Term Loan	-	-	-	44	44	*Non-operating*
RPTC senior secured debt	-	-	-	-	24	*Non-operating*
Other	40	33	26	39	54	*Operating*

Source: VMS Annual Report 2019, 2018, 2017 (Own Illustration)

Exhibit 8 – VMS Other Long-Term Liabilities (FY2015 – FY2019)

	2/10/2015 FY2015	30/09/2016 FY2016	29/09/2017 FY2017	28/09/2018 FY2018	27/09/2019 FY2019	Allocation
Other long-term liabilities (OLL)						
Income taxes payable	45	46	49	189	180	*Operating*
Deferred revenues	-	-	7	39	73	*Operating*
Deferred income taxes	32	25	17	31	75	*Operating*
Contingent consideration	-	-	-	23	42	*Operating*
Defined benefit pension plans	-	-	-	9	31	*Non-operating*
Other	62	85	55	33	38	*Operating*

Source: VMS Annual Report 2019, 2018, 2017 (Own Illustration)

Exhibit 9 – VMS Reformulated Balance Sheet (FY2015 – FY2019)

Reformulated Balance Sheet *(in $ millions)*	*2/10/2015* **FY2015**	*30/09/2016* **FY2016**	*29/09/2017* **FY2017**	*28/09/2018* **FY2018**	*27/09/2019* **FY2019**
Operating					
Operating cash	50	52	52	58	65
Accounts receivable	771	770	962	1,010	1,106
Inventories	613	442	418	438	552
(PRE) Prepaid income taxes	48	41	60	48	51
(PRE) Prepaid sales taxes	-	-	-	18	21
(PRE) Prepaid compensation	12	10	12	14	14
(PRE) Advance payment to suppliers	20	17	15	17	15
(PRE) Other current receivables	34	29	29	24	47
(PRE) Other prepaid expenses	51	44	50	49	58
Property, plant and equipment, net	379	259	255	275	312
Goodwill	284	220	223	294	612
Intangible assets	73	84	72	101	301
(OA) Long-term receivables	77	114	115	72	74
(OA) Deferred Compensation Plan ("DCP") assets	57	61	73	75	79
(OA) Other	40	33	26	39	54
Sum of operating assets	**2,506**	**2,176**	**2,360**	**2,531**	**3,360**
Accounts payable	(203)	(159)	(162)	(190)	(249)
Accrued liabilities	(347)	(384)	(375)	(420)	(460)
Deferred revenues	(668)	(609)	(755)	(730)	(766)
(OLL) Income taxes payable	(45)	(46)	(49)	(189)	(180)
(OLL) Deferred revenues	-	-	(7)	(39)	(73)
(OLL) Deferred income taxes	(32)	(25)	(17)	(31)	(75)
(OLL) Contingent consideration	-	-	-	(23)	(42)
(OLL) Other	(62)	(85)	(55)	(33)	(38)
Sum of operating liabilities	**(1,357)**	**(1,307)**	**(1,420)**	**(1,655)**	**(1,883)**
Operating Invested Capital	**1,149**	**869**	**940**	**876**	**1,477**
Non-Operating					
Short-term investments	-	95	-	-	-
(PRE) Available-for-sale securities	-	-	-	39	-
(PRE) RPTC senior secured debt	-	-	25	25	-
Current assets of discontinued operations	-	356	11	2	-
Deferred tax assets	119	137	147	102	85
(OA) Equity Investments	65	19	27	39	64
(OA) Long-term available-for-sale securities	93	-	60	23	58
(OA) Californian Proton Therapy Center ("CPTC") Term Loan	-	-	-	44	44
(OA) RPTC senior secured debt	-	-	-	-	24
Non-current assets of discontinued operations	-	273	-	-	-
Sum of non-operating assets	**277**	**879**	**271**	**275**	**275**
Current liabilities of discontinued operations	-	(83)	(3)	-	-
(OLL) Defined benefit pension plans	-	-	-	(9)	(31)
Non-current liabilities from discontinued operations	-	(4)	-	-	-
Sum of non-operating liabilities	**-**	**(87)**	**(3)**	**(9)**	**(31)**
Non-Operating Invested Capital	**277**	**792**	**269**	**267**	**244**
TOTAL INVESTED CAPITAL	**1,427**	**1,661**	**1,208**	**1,142**	**1,721**
Net Financial Assets					
Excess cash	796	760	664	446	467
Short-borrowings	(108)	(330)	(350)	-	(410)
Current maturities of long-term debt	(50)	(49)	-	-	-
Long-term debt	(338)	(287)	-	-	-
Non-controlling interest	(15)	(4)	(4)	(4)	(9)
Redeemable noncontrolling interest of discontinued operations	-	(10)	-	-	-
Total Net Financial Assets	**285**	**80**	**310**	**442**	**48**
Varian Stockholders' equity	**1,712**	**1,741**	**1,518**	**1,584**	**1,768**
TOTAL SOURCES OF FUNDING	**1,427**	**1,661**	**1,208**	**1,142**	**1,721**

Source: VMS Annual Report 2019, 2018 and 2017 (Own Reformulation)

Exhibit 10 – Projections of Cancer Incidents from 2020 until 2035 – WHO

New Cancer Diagnosis per Region	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
United States																
Canada																
NA	2,556,862					2,815,471					3,070,906					3,317,886
Latin America & Caribbean	1,470,274					1,688,680					1,925,663					2,177,249
Americas	4,027,136	4,118,316	4,211,560	4,306,915	4,404,429	4,504,151	4,598,590	4,695,010	4,793,451	4,893,956	4,996,569	5,092,525	5,190,324	5,290,001	5,391,593	5,495,135
Growth		2.26%	2.26%	2.26%	2.26%	2.26%	2.10%	2.10%	2.10%	2.10%	2.10%	1.92%	1.92%	1.92%	1.92%	1.92%
Europe	4,398,443					4,662,744					4,913,808					5,142,033
Middle East	588,222					689,473					808,404					944,218
Africa	1,109,209					1,300,771					1,527,194					1,791,960
India	1,324,413					1,503,917					1,692,968					1,888,147
EMEA	7,420,287	7,562,087	7,706,596	7,853,867	8,003,952	8,156,905	8,308,276	8,462,455	8,619,496	8,779,451	8,942,374	9,101,412	9,263,279	9,428,025	9,595,700	9,766,358
Growth		1.91%	1.91%	1.91%	1.91%	1.91%	1.86%	1.86%	1.86%	1.86%	1.86%	1.78%	1.78%	1.78%	1.78%	1.78%
APAC	7,433,355	7,615,346	7,801,792	7,992,803	8,188,491	8,388,970	8,569,604	8,754,127	8,942,624	9,135,179	9,331,881	9,502,292	9,675,815	9,852,507	10,032,426	10,215,630
Growth		2.45%	2.45%	2.45%	2.45%	2.45%	2.15%	2.15%	2.15%	2.15%	2.15%	1.83%	1.83%	1.83%	1.83%	1.83%

CAGR of Cancer Incidents			
	2020 - 2025	2025 - 2030	2030 - 2035
Americas	2.26%	2.10%	1.92%
EMEA	1.91%	1.86%	1.78%
APAC	2.45%	2.15%	1.83%
Total	6.62%	6.11%	5.53%

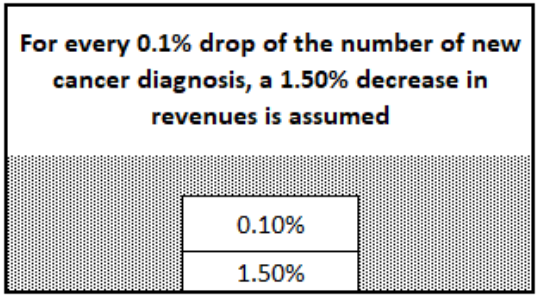
Source: World Health Organization Cancer Today Section (Own Elaboration)

Exhibit 11 – VMS Revenue Estimation (2020 – 2039) w/ historical values

	2/09/2015	30/09/2016	29/09/2017	28/09/2018	27/09/2019																				
Revenue Estimation *(in $ millions)*	**FY2015**	**FY2016**	**FY2017**	**FY2018**	**FY2019**	**FY2020**	**FY2021**	**FY2022**	**FY2023**	**FY2024**	**FY2025**	**FY2026**	**FY2027**	**FY2028**	**FY2029**	**FY2030**	**FY2031**	**FY2032**	**FY2033**	**FY2034**	**FY2035**	**FY2036**	**FY2037**	**FY2038**	**FY2039**
Breakdown by segment & region																									
Oncology Systems																									
Americas	1,156	1,234	1,257	1,351	1,451	1,555	1,670	1,798	1,940	2,098	2,274	2,408	2,549	2,700	2,859	3,027	3,125	3,227	3,331	3,440	3,551	3,666	3,785	3,908	4,035
YoY Growth		*7%*	*2%*	*8%*	*7%*	*7.1%*	*7.4%*	*7.6%*	*7.9%*	*8.1%*	*8.4%*	*5.9%*	*5.9%*	*5.9%*	*5.9%*	*5.9%*	*3.2%*	*3.2%*	*3.2%*	*3.2%*	*3.2%*	*3.2%*	*3.2%*	*3.2%*	*3.2%*
EMEA	727	713	691	883	1,001	1,151	1,308	1,470	1,633	1,791	1,942	2,089	2,247	2,417	2,600	2,797	2,962	3,137	3,323	3,520	3,728	3,948	4,182	4,429	4,691
YoY Growth		*-2%*	*-3%*	*28%*	*13%*	*15%*	*13.7%*	*12.4%*	*11.0%*	*9.7%*	*8.4%*	*7.6%*	*7.6%*	*7.6%*	*7.6%*	*7.6%*	*5.9%*	*5.9%*	*5.9%*	*5.9%*	*5.9%*	*5.9%*	*5.9%*	*5.9%*	*5.9%*
APAC	464	484	489	536	610	695	784	877	970	1,062	1,152	1,223	1,298	1,379	1,464	1,555	1,613	1,673	1,735	1,800	1,867	1,937	2,009	2,085	2,162
YoY Growth		*4%*	*1%*	*10%*	*14%*	*14%*	*12.9%*	*11.8%*	*10.6%*	*9.5%*	*8.4%*	*6.2%*	*6.2%*	*6.2%*	*6.2%*	*6.2%*	*3.7%*	*3.7%*	*3.7%*	*3.7%*	*3.7%*	*3.7%*	*3.7%*	*3.7%*	*3.7%*
Proton Solutions	144	163	183	149	144	158	173	189	206	224	245	259	273	289	305	322	334	347	360	373	387	402	417	433	449
YoY Growth		*13%*	*12%*	*-18%*	*-3%*	*10%*	*9.5%*	*9%*	*9%*	*9%*	*9%*	*6%*	*6%*	*6%*	*6%*	*6%*	*4%*	*4%*	*4%*	*4%*	*4%*	*4%*	*4%*	*4%*	*4%*
Interventional Solutions (Other)	0.4	0.5	0	0	19	21	22	24	25	26	28	29	30	31	32	33	34	34	35	36	36	37	38	38	39
YoY Growth		*25.0%*	*-100.0%*	*#DIV/0!*	*#DIV/0!*	*7.0%*	*6.6%*	*6.3%*	*5.9%*	*5.6%*	*5.2%*	*3.6%*	*3.6%*	*3.6%*	*3.6%*	*3.6%*	*1.9%*	*1.9%*	*1.9%*	*1.9%*	*1.9%*	*1.9%*	*1.9%*	*1.9%*	*1.9%*
Total Revenue	**2,491**	**2,594**	**2,619**	**2,919**	**3,225**	**3,580**	**3,958**	**4,357**	**4,773**	**5,202**	**5,639**	**6,006**	**6,398**	**6,815**	**7,260**	**7,734**	**8,068**	**8,418**	**8,785**	**9,168**	**9,570**	**9,991**	**10,432**	**10,893**	**11,377**

Source: Own elaboration

Exhibit 12 – Proportion assumed for Revenue Growth



Source: Own elaboration

Exhibit 13 – Global Radiotherapy Market Projections (2020 – 2030)

Global Radiotherapy Market (2020 - 2030)	
Mkt Research Company	*CAGR Estimations*
PS Market Research	8.4%

Source: Prescient & Strategic Intelligence 2020

Exhibit 14 – Proton Therapy Market Projections (2018 – 2022)

Proton Therapy Market (2018 - 2022)	
Mkt Research Company	*CAGR Estimations*
TechNavio	9%

Source: TechNavio 2019

Exhibit 15 – Interventional Radiology Market Projections (2019 – 2027)

Interventional Radiology Market (2019 - 2027)	
Mkt Research Company	*CAGR Estimations*
Transparency Market Research	5.2%

Source: Transparence Market Research 2019

Exhibit 16 – VMS Forecasted Income Statement (2020 – 2039) w/ historical values

Forecasted Income Statement (in $ millions)	ACTUALS » 31/12/2015 FY2015	30/09/2016 FY2016	29/09/2017 FY2017	28/09/2018 FY2018	27/09/2019 FY2019	FORECASTS » FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039
Operating																									
Total Revenue	2,491	2,594	2,619	2,919	3,225	3,580	3,958	4,357	4,773	5,202	5,639	6,006	6,398	6,815	7,260	7,734	8,068	8,418	8,785	9,168	9,570	9,991	10,432	10,893	11,377
Total Revenue growth		4%	1%	11%	10%	11%	11%	10%	10%	9%	8%	7%	7%	7%	7%	7%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Total Cost of Revenues	(1,459)	(1,489)	(1,505)	(1,646)	(1,855)	(2,041)	(2,256)	(2,483)	(2,721)	(2,965)	(3,214)	(3,304)	(3,519)	(3,748)	(3,993)	(4,254)	(4,276)	(4,462)	(4,656)	(4,859)	(5,072)	(5,295)	(5,529)	(5,773)	(6,030)
% of Total Revenue (Average FY2015 - FY2019)	*58.6%*	*57.4%*	*57.5%*	*56.4%*	*57.5%*	*57%*	*57%*	*57%*	*57%*	*57%*	*57%*	*55%*	*55%*	*55%*	*55%*	*55%*	*53%*	*53%*	*53%*	*53%*	*53%*	*53%*	*53%*	*53%*	*53%*
Research and development expenses	(195)	(200)	(210)	(234)	(248)	(281)	(317)	(355)	(396)	(440)	(485)	(526)	(570)	(617)	(668)	(724)	(755)	(788)	(822)	(858)	(895)	(935)	(976)	(1,019)	(1,064)
% of Total Revenue (note)	*7.85%*	*7.73%*	*8.02%*	*8.01%*	*7.68%*	*7.9%*	*8.0%*	*8.2%*	*8.3%*	*8.5%*	*8.6%*	*8.8%*	*8.9%*	*9.1%*	*9.2%*	*9.4%*	*9.4%*	*9.4%*	*9.4%*	*9.4%*	*9.4%*	*9.4%*	*9.4%*	*9.4%*	*9.4%*
Selling, general and administrative	(441)	(472)	(553)	(544)	(623)	(680)	(752)	(827)	(906)	(988)	(1,071)	(1,141)	(1,215)	(1,294)	(1,379)	(1,469)	(1,532)	(1,599)	(1,668)	(1,741)	(1,817)	(1,897)	(1,981)	(2,069)	(2,161)
% of Total Revenue (Average FY2015 - FY2019)	*18%*	*18%*	*21%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*
Acquisition Related Expenses	-	(3)	(2)	(36)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)
% of Goodwill (FY2019)	*0%*	*1%*	*1%*	*12%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*	*10%*
Operating Result Before Taxes	396	429	349	460	437	515	571	628	687	746	806	973	1,031	1,093	1,157	1,225	1,442	1,507	1,576	1,647	1,722	1,801	1,883	1,969	2,059
Statutory taxes	(138)	(150)	(122)	(113)	(92)	(108)	(120)	(132)	(144)	(157)	(169)	(204)	(217)	(229)	(243)	(257)	(303)	(317)	(331)	(346)	(362)	(378)	(395)	(414)	(432)
% (Current value)	*35%*	*35%*	*35%*	*25%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*
Tax Adjustments	49	39	23	(209)	(25)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Result (NOPLAT)	306	318	250	138	320	407	451	496	542	590	637	769	815	863	914	968	1,139	1,191	1,245	1,301	1,361	1,423	1,488	1,556	1,627
Non-operating Result																									
Impairment charges	-	(2)	(51)	(22)	(51)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)
Other income, net	-	-	2	4	28	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Interest income	14	17	14	17	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Non-operating Result Before Taxes	14	15	(35)	(1)	(7)	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Statutory taxes	(5)	(5)	12	0	2	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)
Statutory tax rate	*35%*	*35%*	*35%*	*25%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*
Tax adjustment	2	2	6	18	(15)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other comprehensive income	73	63	25	4	(37)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-operating Result	83	75	8	21	(58)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Financial																									
Finance Costs (Interest Expense)	(8)	(12)	(11)	(7)	(9)	(8)	(25)	(26)	(28)	(29)	(31)	(33)	(35)	(37)	(39)	(41)	(43)	(45)	(47)	(49)	(51)	(53)	(56)	(58)	(61)
% of Total Debt (t-1)		*-2%*	*-2%*	*-2%*	*0%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*
Financial Result Before Taxes	(8)	(12)	(11)	(7)	(9)	(8)	(25)	(26)	(28)	(29)	(31)	(33)	(35)	(37)	(39)	(41)	(43)	(45)	(47)	(49)	(51)	(53)	(56)	(58)	(61)
Statutory taxes	3	4	4	2	2	2	5	5	6	6	7	7	7	8	8	9	9	9	10	10	11	11	12	12	13
Statutory tax rate	*35%*	*35%*	*35%*	*25%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*	*21%*
Non-controlling interests	(0.5)	(0.4)	(1)	(0.4)	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
% of Total Equity	*0.03%*	*0.02%*	*0.05%*	*0.03%*	*0.02%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*
Financial Result	(6)	(8)	(8)	(6)	(7)	(7)	(20)	(21)	(22)	(23)	(25)	(26)	(28)	(29)	(31)	(32)	(34)	(35)	(37)	(39)	(40)	(42)	(44)	(46)	(48)
Comprehensive income attr. to VMS	383.6	385.00	250.5	153.4	255.1	402	433	477	522	567	613	744	788	835	885	937	1,107	1,157	1,209	1,264	1,322	1,382	1,445	1,511	1,580

Source: Own elaboration

Exhibit 17 – VSM Forecasted Balance Sheet (2020 – 2039) w/ historical values

Forecasted Balance Sheet (in $ millions)	ACTUALS » 2/10/2015 FY2015	30/09/2016 FY2016	29/09/2017 FY2017	28/09/2018 FY2018	27/09/2019 FY2019	FORECASTS » FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039
Operating Business																									
Operating Cash	50	52	52	58	65	72	79	87	95	104	113	120	128	136	145	155	161	168	176	183	191	200	209	218	228
% of Revenue (5% of Revenue)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Accounts Receivable	771	770	962	1,010	1,106	1,189	1,314	1,447	1,585	1,727	1,919	2,044	2,178	2,320	2,471	2,632	2,815	2,937	3,065	3,199	3,339	3,486	3,639	3,800	3,969
Average collection period (AVG FY2017 - FY2019)		108	121	123	120	121	121	121	121	121	124	124	124	124	124	124	127	127	127	127	127	127	127	127	127
Inventories	613	442	418	438	552	553	611	673	737	803	871	895	953	1,015	1,081	1,152	1,158	1,208	1,261	1,316	1,374	1,434	1,497	1,564	1,633
Average holding period (AVG FY2017 - FY2019)		129	104	95	97	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
(PRE) Prepaid income taxes	48	41	60	48	51	45	50	55	60	66	71	86	91	96	102	108	127	133	139	145	151	158	166	173	181
% of Operating Statutory Taxes (AVG FY2015 - FY2019)	35%	28%	49%	43%	56%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%
(PRE) Prepaid sales taxes	-	-	-	18	21	23	26	28	31	34	37	39	42	44	47	50	53	55	57	60	62	65	68	71	74
% of Revenue (FY2019)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
(PRE) Prepaid compensation *(AVG FY2015 - FY2017)*	12	10	12	14	14	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
(PRE) Advance payment to suppliers	20	17	15	17	15	22	24	26	29	31	34	35	37	40	42	45	45	47	49	52	54	56	59	61	64
% of Total Cost of Revenues (AVG FY2015 - FY2017)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
(PRE) Other current receivables	34	29	29	24	47	42	46	51	56	61	66	71	75	80	85	91	95	99	103	108	112	117	123	128	134
% of Total Revenue (AVG FY2015 - FY2017)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
(PRE) Other prepaid expenses	51	44	50	49	58	65	72	79	87	95	103	107	114	122	130	139	141	148	154	161	168	175	183	191	199
% of Total Expenses AVG FY2015 - FY2017)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Property, plant and equipment, net	379	259	255	275	312	387	428	471	516	562	609	649	691	736	784	835	871	909	949	990	1,034	1,079	1,127	1,177	1,229
% of Total Revenue (AVG FY2015 - FY2019)	15%	10%	10%	9%	10%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Goodwill (current values)	284	220	223	294	612	612	612	612	612	612	612	612	612	612	612	612	612	612	612	612	612	612	612	612	612
Intangible assets (current values)	73	84	72	101	301	301	301	301	301	301	301	301	301	301	301	301	301	301	301	301	301	301	301	301	301
(OA) Long-term receivables	77	114	115	72	74	119	133	138	140	157	178	188	197	209	224	240	250	260	271	284	296	309	322	337	352
% of Total Revenue (AVG FY2015 - FY2017)	3%	4%	4%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
(OA) Deferred Compensation Plan ("DCP") assets (AVG FY2015 - FY2017)	57	61	73	75	79	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
(OA) Other (current value)	40	33	26	39	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54
Sum Of Operating Assets	2,506	2,176	2,360	2,531	3,360	3,564	3,832	4,103	4,383	4,688	5,049	5,281	5,554	5,846	6,161	6,496	6,764	7,012	7,272	7,545	7,829	8,128	8,440	8,767	9,110
Accounts payable	(203)	(159)	(162)	(190)	(249)	(232)	(256)	(282)	(309)	(336)	(365)	(375)	(399)	(425)	(453)	(483)	(485)	(506)	(528)	(551)	(575)	(601)	(627)	(655)	(684)
Average Payable Period (AVG FY2016 - FY2019)		44	39	39	43	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
Accrued liabilities	(347)	(384)	(375)	(420)	(460)	(513)	(567)	(625)	(684)	(746)	(808)	(861)	(917)	(977)	(1,041)	(1,109)	(1,156)	(1,207)	(1,259)	(1,314)	(1,372)	(1,432)	(1,495)	(1,561)	(1,631)
% of Total Revenue (AVG FY2015 - FY2017)	14%	15%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%
Deferred revenues	(668)	(609)	(755)	(730)	(766)	(916)	(1,012)	(1,114)	(1,221)	(1,330)	(1,442)	(1,536)	(1,636)	(1,743)	(1,857)	(1,978)	(2,064)	(2,153)	(2,247)	(2,345)	(2,448)	(2,555)	(2,668)	(2,786)	(2,910)
% of Total Revenue (AVG FY2015 - FY2017)	27%	23%	29%	25%	24%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%
(OLL) Income taxes payable	(45)	(46)	(49)	(189)	(180)	(37)	(41)	(45)	(49)	(54)	(58)	(70)	(74)	(79)	(83)	(88)	(104)	(108)	(113)	(118)	(124)	(129)	(135)	(142)	(148)
% of Operating Statutory Taxes (AVG FY2015 - FY2017)	32%	31%	40%	167%	197%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%
(OLL) Deferred revenues	-	-	(7)	(39)	(73)	(81)	(90)	(99)	(108)	(118)	(128)	(136)	(145)	(154)	(165)	(175)	(183)	(191)	(199)	(208)	(217)	(226)	(236)	(247)	(258)
% of Total Revenue (% of Revenue in FY2019)	0%	0%	0%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
(OLL) Deferred income taxes	(32)	(25)	(17)	(31)	(75)	(22)	(24)	(27)	(29)	(32)	(34)	(41)	(44)	(46)	(49)	(52)	(61)	(64)	(67)	(70)	(73)	(77)	(80)	(84)	(88)
% of Operating Statutory Taxes (AVG FY2015 - FY2018)	23%	16%	14%	28%	82%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
(OLL) Contingent consideration (current value)	-	-	-	(23)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)
(OLL) Other (AVG FY2015 - FY2019)	(62)	(85)	(55)	(33)	(38)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)	(55)
Sum Of Operating Liabilities	(1,357)	(1,307)	(1,420)	(1,655)	(1,883)	(1,897)	(2,088)	(2,288)	(2,497)	(2,713)	(2,932)	(3,116)	(3,312)	(3,521)	(3,744)	(3,981)	(4,150)	(4,326)	(4,510)	(4,704)	(4,906)	(5,117)	(5,339)	(5,571)	(5,815)
Operating Invested Capital	**1,149**	**869**	**940**	**876**	**1,477**	**1,667**	**1,744**	**1,815**	**1,886**	**1,975**	**2,117**	**2,165**	**2,241**	**2,325**	**2,417**	**2,514**	**2,614**	**2,686**	**2,762**	**2,841**	**2,924**	**3,010**	**3,101**	**3,196**	**3,296**
Non-operating																									
Short-term investments	-	95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(PRE) Available-for-sale securities	-	-	-	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(PRE) RPTC senior secured debt	-	-	25	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Current assets of discontinued operations	-	356	11	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred tax assets	119	137	147	102	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
(OA) Equity Investments	65	19	27	39	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
(OA) Long-term available-for-sale securities	93	-	60	23	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
(OA) Californian Proton Therapy Center ("CPTC") Term Loa	-	-	-	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
(OA) RPTC senior secured debt	-	-	-	-	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Non-current assets of discontinued operations	-	273	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum Of Non-operating Assets	277	879	271	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275
Current liabilities of discontinued operations	-	(83)	(3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(OLL) Defined benefit pension plans	-	-	-	(9)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)
Non-current liabilities from discontinued operations	-	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum Of Non-operating Liabilities	-	(87)	(3)	(9)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)	(31)
Non-operating Invested Capital	**277**	**792**	**269**	**267**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**	**244**
Total Invested Capital	**1,427**	**1,661**	**1,208**	**1,142**	**1,721**	**1,910**	**1,988**	**2,059**	**2,130**	**2,219**	**2,360**	**2,409**	**2,485**	**2,568**	**2,660**	**2,758**	**2,858**	**2,929**	**3,005**	**3,084**	**3,167**	**3,254**	**3,344**	**3,439**	**3,539**

Exhibit 17 – VSM Forecasted Balance Sheet (2020 – 2039) w/ historical values (cont.)

Financial																									
Excess Cash	(796)	(760)	(664)	(446)	(467)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt	496	666	350	-	410	1,251	1,331	1,413	1,499	1,590	1,689	1,776	1,869	1,966	2,068	2,175	2,276	2,377	2,484	2,595	2,710	2,831	2,958	3,090	3,228
NetDebt	(300)	(94)	(314)	(446)	(57)	1,251	1,331	1,413	1,499	1,590	1,689	1,776	1,869	1,966	2,068	2,175	2,276	2,377	2,484	2,595	2,710	2,831	2,958	3,090	3,228
Non-controlling interests	15	14	4	4	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Net Financial Assets	(285)	(80)	(310)	(442)	(48)	1,251	1,331	1,413	1,499	1,590	1,689	1,776	1,869	1,966	2,068	2,175	2,276	2,377	2,484	2,595	2,710	2,831	2,958	3,090	3,228
Equity																									
VMS Stockholders' Equity	1,712	1,741	1,518	1,584	1,768	659	657	645	631	629	671	633	616	602	592	582	582	552	521	490	457	422	387	350	312
Total Sources of Financing	**1,427**	**1,661**	**1,208**	**1,142**	**1,721**	**1,910**	**1,988**	**2,059**	**2,130**	**2,219**	**2,360**	**2,409**	**2,485**	**2,568**	**2,660**	**2,758**	**2,858**	**2,929**	**3,005**	**3,084**	**3,167**	**3,254**	**3,344**	**3,439**	**3,539**
Total Invested Capital	**1,427**	**1,661**	**1,208**	**1,142**	**1,721**	**1,910**	**1,988**	**2,059**	**2,130**	**2,219**	**2,360**	**2,409**	**2,485**	**2,568**	**2,660**	**2,758**	**2,858**	**2,929**	**3,005**	**3,084**	**3,167**	**3,254**	**3,344**	**3,439**	**3,539**
Total Sources of Financing	**1,427**	**1,661**	**1,208**	**1,142**	**1,721**	**1,910**	**1,988**	**2,059**	**2,130**	**2,219**	**2,360**	**2,409**	**2,485**	**2,568**	**2,660**	**2,758**	**2,858**	**2,929**	**3,005**	**3,084**	**3,167**	**3,254**	**3,344**	**3,439**	**3,539**

Source: Own elaboration

Exhibit 18 – VMS Depreciation and Amortization Forecasting w/ historical values (2020 – 2039)

	ACTUALS »					FORECASTS »																			
	31/12/2015	*30/09/2016*	*29/09/2017*	*28/09/2018*	*27/09/2019*																				
	FY2015	*FY2016*	*FY2017*	*FY2018*	*FY2019*	*FY2020*	*FY2021*	*FY2022*	*FY2023*	*FY2024*	*FY2025*	*FY2026*	*FY2027*	*FY2028*	*FY2029*	*FY2030*	*FY2031*	*FY2032*	*FY2033*	*FY2034*	*FY2035*	*FY2036*	*FY2037*	*FY2038*	*FY2039*
Depreciation and Amortization	69	80	77	73	93	145	150	155	160	165	170	175	179	185	190	196	200	204	208	213	218	223	228	234	240
% of PP&E, Goodwill and Intangible Assets (Average FY2015 - FY201	*9%*	*14%*	*14%*	*11%*	*8%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*

Source: VMS Annual Report 2019, 2018, 2017 (Own elaboration)

Exhibit 19 – VMS Cash Flow Map (2020 – 2039) w/ historical values

Cash Flow Map (in $ millions)	ACTUALS » 2/10/2015 FY2015	30/09/2016 FY2016	29/09/2017 FY2017	28/09/2018 FY2018	27/09/2019 FY2019	FORECASTS » FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039
Operating																									
Operating Result Before Taxes	396	429	349	460	437	515	571	628	687	746	806	973	1,031	1,093	1,157	1,225	1,442	1,507	1,576	1,647	1,722	1,801	1,883	1,969	2,059
Taxes	(138)	(150)	(122)	(113)	(92)	(108)	(120)	(132)	(144)	(157)	(169)	(204)	(217)	(229)	(243)	(257)	(303)	(317)	(331)	(346)	(362)	(378)	(395)	(414)	(432)
Tax Adjustments	49	39	23	(209)	(25)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NOPLAT	**306**	**318**	**250**	**138**	**320**	**407**	**451**	**496**	**542**	**590**	**637**	**769**	**815**	**863**	**914**	**968**	**1,139**	**1,191**	**1,245**	**1,301**	**1,361**	**1,423**	**1,488**	**1,556**	**1,627**
Depreciation, Amortization	69	80	77	73	93	145	150	155	160	165	170	175	179	185	190	196	200	204	208	213	218	223	228	234	240
Operating Gross Cash Flow	**374**	**398**	**327**	**211**	**413**	**553**	**601**	**651**	**702**	**755**	**807**	**944**	**994**	**1,048**	**1,104**	**1,163**	**1,339**	**1,395**	**1,453**	**1,514**	**1,578**	**1,646**	**1,716**	**1,789**	**1,867**
Capital Expenditures		93	(64)	(193)	(648)	(221)	(191)	(198)	(205)	(211)	(218)	(214)	(222)	(230)	(238)	(247)	(236)	(242)	(248)	(254)	(261)	(268)	(276)	(284)	(292)
Δ Net working capital		125	(50)	(32)	(119)	92	(37)	(39)	(41)	(42)	(90)	(26)	(40)	(43)	(46)	(49)	(87)	(39)	(41)	(43)	(45)	(47)	(49)	(51)	(54)
Δ Other Assets		(35)	(5)	27	(21)	(35)	(14)	(5)	(2)	(17)	(21)	(10)	(9)	(12)	(16)	(16)	(9)	(10)	(11)	(12)	(12)	(13)	(14)	(14)	(15)
Δ Other Long term Liabilities		18	(28)	188	93	(172)	15	16	16	17	17	27	15	16	17	19	32	15	16	17	18	19	19	20	21
Operating (Unlevered) Free Cash Flow		**599**	**179**	**202**	**(281)**	**218**	**373**	**425**	**471**	**500**	**495**	**721**	**738**	**780**	**822**	**871**	**1,039**	**1,119**	**1,169**	**1,222**	**1,278**	**1,336**	**1,397**	**1,460**	**1,527**
Non-Operating																									
Non-Operating Result		75	8	21	(58)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Δ Other non-operating invested capital		(515)	524	2	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Operating Cash Flow		**(440)**	**532**	**23**	**(35)**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Free Cash Flow		**159**	**711**	**225**	**(316)**	**219**	**375**	**426**	**473**	**502**	**497**	**722**	**740**	**781**	**823**	**872**	**1,040**	**1,121**	**1,171**	**1,223**	**1,279**	**1,338**	**1,398**	**1,462**	**1,529**
Financing																									
Financial Result before taxes	(8)	(12)	(11)	(7)	(9)	(8)	(25)	(26)	(28)	(29)	(31)	(33)	(35)	(37)	(39)	(41)	(43)	(45)	(47)	(49)	(51)	(53)	(56)	(58)	(61)
Tax Shield	3	4	4	2	2	2	5	5	6	6	7	7	7	8	8	9	9	9	10	10	11	11	12	12	13
Non-controlling interests	(1)	(0)	(1)	(0)	(0)	(0)	(0.2)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Δ Net Det		206	(220)	(133)	390	1,308	80	82	86	91	100	86	93	97	102	107	100	102	106	111	116	121	126	132	138
Δ Non-controlling interests		(1)	(10)	-	5	(9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt Financing + Non-c. interests Cash Flow	**(6)**	**198**	**(238)**	**(138)**	**387**	**1,292**	**61**	**62**	**63**	**67**	**75**	**60**	**65**	**68**	**72**	**75**	**66**	**66**	**69**	**72**	**75**	**79**	**82**	**86**	**90**
Equity Cash Flow		**(356)**	**(473)**	**(87)**	**(71)**	**(1,511)**	**(435)**	**(488)**	**(536)**	**(569)**	**(571)**	**(782)**	**(805)**	**(849)**	**(895)**	**(947)**	**(1,107)**	**(1,187)**	**(1,240)**	**(1,296)**	**(1,355)**	**(1,416)**	**(1,481)**	**(1,548)**	**(1,618)**
Financing Cash Flow		**(159)**	**(711)**	**(225)**	**316**	**(219)**	**(375)**	**(426)**	**(473)**	**(502)**	**(497)**	**(722)**	**(740)**	**(781)**	**(823)**	**(872)**	**(1,040)**	**(1,121)**	**(1,171)**	**(1,223)**	**(1,279)**	**(1,338)**	**(1,398)**	**(1,462)**	**(1,529)**

Source: Own elaboration

Exhibit 20 – VMS Long-term Value Drivers (2020 -2039) w/ historical values

Long Term Value Drivers (in $ millions)	ACTUALS » 2/10/2015 FY2015	30/09/2016 FY2016	29/09/2017 FY2017	28/09/2018 FY2018	27/09/2019 FY2019	FORECASTS » FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039
Operating Invested Capital	1,149	869	940	876	1,477	1,667	1,744	1,815	1,886	1,975	2,117	2,165	2,241	2,325	2,417	2,514	2,614	2,686	2,762	2,841	2,924	3,010	3,101	3,196	3,296
Operating Result	306	318	250	138	320	407	451	496	542	590	637	769	815	863	914	968	1,139	1,191	1,245	1,301	1,361	1,423	1,488	1,556	1,627
Operating ROIC		31.5%	27.6%	15.2%	27.2%	25.9%	26.4%	27.9%	29.3%	30.5%	31.1%	35.9%	37.0%	37.8%	38.6%	39.3%	44.4%	44.9%	45.7%	46.5%	47.2%	47.9%	48.7%	49.4%	50.1%
Operating RONIC			24%	-158%	-285%	14.5%	23.0%	58.3%	65.3%	66.2%	52.8%	93.7%	94.8%	63.3%	61.2%	58.4%	176.2%	51.4%	75.5%	74.8%	74.5%	74.9%	75.1%	75.0%	74.9%
RR			28%	-46%	188%	46%	17%	14%	13%	15%	22%	6%	9%	10%	10%	10%	9%	6%	6%	6%	6%	6%	6%	6%	6%
Operating Cash Flows		599	179	202	(281)	218	373	425	471	500	495	721	738	780	822	871	1,039	1,119	1,169	1,222	1,278	1,336	1,397	1,460	1,527
Growth			-70.1%	12.8%	-239.4%	-177.4%	71.3%	13.8%	10.9%	6.1%	-1.0%	45.5%	2.5%	5.6%	5.4%	5.9%	19.3%	7.7%	4.5%	4.5%	4.6%	4.6%	4.5%	4.6%	4.6%

Growth Rate used

Source: Own elaboration

Exhibit 21 – VSM Unlevered Beta (ßu) Computation

	Comparables		Beta			ßtx = ßa ßd = 0	Unlevered Beta (ßu | ßa)					
							Averages				Percentils & Median	
	Company Name	Ticker	ße	E/V	D/V	ßu | ßa						
Cancer MedTech	Varian Medical Systems	VAR	0.954	1.03	-0.01	**0.985**	0.927	0.912	0.858	0.840	VAR	0.985
	Elekta AB	EKTA	0.41	0.99	0.01	**0.404**					Maximum	1.674
	Accuray Inc	ARAY	2.07	0.81	0.20	**1.674**					75th Percentile	1.177
	Eckert & Ziegler	EUZ	0.435	1.03	-0.06	**0.449**					**Median**	0.533
	Ray Search	RAYB	1.141	0.98	0.02	**1.121**					25th Percentile	0.459
MedTech	Siemens Healthineers	SH	0.518	0.91	0.09	**0.469**					Minimum	0.404
	MedTronic	MDT	0.604	0.88	0.12	**0.533**						
	Phillips	PHIA	1.368	0.90	0.09	**1.233**						

Source: Own elaboration

Exhibit 22 – Rating Estimation by Interest Coverage Ratio

Table 8.6: Interest Coverage Ratios and Ratings: High Market Cap Firms

Interest Coverage Ratio	*Rating*	*Spread*
> 8.5	AAA	0.75%
6.5-8.5	AA	1.00%
5.5 ♦6.5	A+	1.50%
4.25- 5.5	A	1.80%
3- 4.25	A-	2.00%
2.5-3	BBB	2.25%
2- 2.5	BB	3.50%
1.75-2	B+	4.75%
1.5-1.75	B	6.50%
1.25-1.5	B-	8.00%
0.8-1.25	CCC	10.00%
0.65-0.8	CC	11.50%
0.2-0.65	C	12.70%
<0.2	D	14.00%

Source: NYU Stern

Exhibit 23 – Annual Default Study: Corporate Default and Recovery Rates, 1920-2017

Exhibit 36

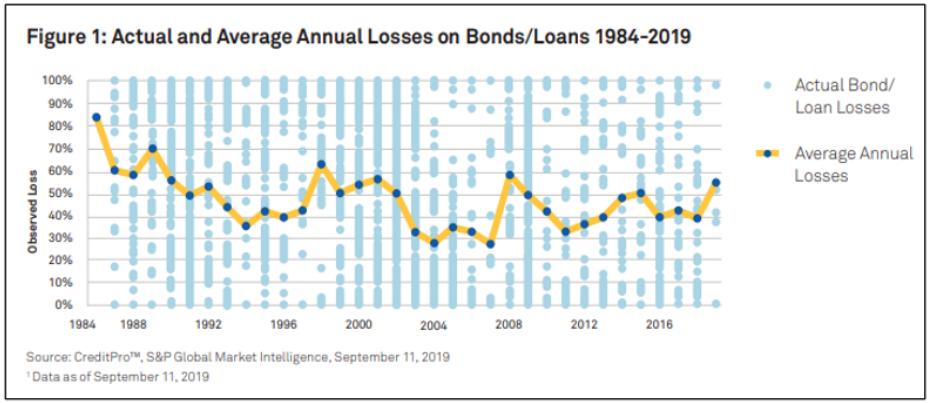
Average Cumulative Issuer-Weighted Global Default Rates By Alphanumeric Rating, 1998-2017

Rating	1	2	3	4	5	6	7	8	9	10
Aaa	0.00%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Aa1	0.00%	0.00%	0.00%	0.00%	0.03%	0.09%	0.09%	0.09%	0.14%	0.24%
Aa2	0.00%	0.01%	0.14%	0.29%	0.38%	0.48%	0.59%	0.71%	0.89%	1.05%
Aa3	0.05%	0.13%	0.18%	0.25%	0.39%	0.54%	0.80%	1.00%	1.10%	1.20%
A1	0.11%	0.25%	0.43%	0.64%	0.89%	1.18%	1.47%	1.73%	1.97%	2.23%
A2	0.07%	0.20%	0.39%	0.58%	0.85%	1.26%	1.64%	2.08%	2.60%	3.23%
A3	0.07%	0.19%	0.42%	0.63%	0.95%	1.14%	1.41%	1.75%	2.19%	2.62%
Baa1	0.15%	0.39%	0.64%	0.91%	1.10%	1.31%	1.50%	1.69%	1.87%	2.17%
Baa2	0.19%	0.43%	0.69%	0.97%	1.20%	1.48%	1.71%	1.90%	2.23%	2.57%
Baa3	0.25%	0.60%	0.96%	1.35%	1.81%	2.19%	2.59%	3.18%	3.70%	4.33%
Ba1	0.31%	1.20%	2.15%	3.01%	4.15%	5.15%	6.04%	6.78%	7.67%	8.62%
Ba2	0.68%	1.60%	2.84%	4.12%	5.24%	6.10%	6.83%	8.02%	9.39%	10.96%
Ba3	0.96%	2.67%	4.65%	6.85%	8.42%	9.97%	11.62%	13.52%	15.27%	16.72%
B1	1.33%	4.06%	7.10%	10.13%	12.86%	15.34%	17.89%	20.27%	22.59%	24.72%
B2	2.79%	7.28%	11.95%	16.47%	19.93%	23.02%	25.74%	28.09%	30.42%	32.40%
B3	3.84%	9.31%	15.25%	20.17%	24.60%	28.57%	31.72%	34.37%	36.85%	38.80%
Caa1	4.78%	11.14%	17.18%	22.42%	26.88%	30.42%	33.32%	36.02%	39.11%	42.13%
Caa2	9.46%	17.86%	25.19%	31.72%	36.83%	40.94%	44.63%	48.38%	51.99%	52.76%
Caa3	19.70%	31.91%	40.07%	45.14%	49.15%	51.73%	55.22%	58.36%	59.16%	59.16%
Ca-C	32.87%	43.91%	51.64%	56.52%	59.58%	61.00%	62.94%	64.12%	64.52%	64.52%
IG	0.12%	0.28%	0.49%	0.70%	0.94%	1.18%	1.43%	1.71%	2.01%	2.35%
SG	4.16%	8.42%	12.46%	15.93%	18.76%	21.12%	23.20%	25.11%	26.97%	28.58%
All	1.76%	3.49%	5.07%	6.38%	7.42%	8.28%	9.03%	9.72%	10.40%	11.03%

Source: Moody's Investors Service

Exhibit 24 – Actual and Average Annual Losses on Bonds/Loans 1984-2019

Observable Estimates	
2010	43%
2011	33%
2012	37%
2013	40%
2014	49%
2015	51%
2016	40.5%
2017	43%
2018	40%
2019	57%
Average	**43%**



Source: Credit Pro, S&P Global Market Intelligence

Exhibit 25 – VSM Discounted Cash Flow (DCF) Method

Discounted Cash Flow (DCF)

(in $ millions)	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033
Operating (Unlevered) Free Cash Flow		218	373	425	471	500	495	721	738	780	822	871	1,039	1,119	1,169
Operating PV	**11,627**	12,501	13,301	14,124	14,979	15,884	16,880	17,744	18,671	19,644	20,666	21,735	22,737	23,752	24,812
Non-operating Invested Cap	244														
Enterprise Value	**11,870**														
Net Debt	(57)														
Non-controlling interests	9														
Equity Value	**11,918.1**														
Shares outstanding (in thous	90.8														
Implied Share Price (in $)	**131.26**														
$VAR Close 2019 (in $)	142.01	» Overpriced													

Source: Own elaboration

Exhibit 26 – VMS Adjusted Present Value (APV) Method

Adjusted Present Value Method (APV)																
(in $ millions)	**FY2019**	**FY2020**	**FY2021**	**FY2022**	**FY2023**	**FY2024**	**FY2025**	**FY2026**	**FY2027**	**FY2028**	**FY2029**	**FY2030**	**FY2031**	**FY2032**	**FY2033**	**FY2034**
Unlevered FCF		218	373	425	471	500	495	721	738	780	822	871	1,039	1,119	1,169	1,222
Unlevered Enterprise Value	**11,677**	**12,553**	**13,356**	**14,183**	**15,040**	**15,948**	**16,947**	**17,814**	**18,744**	**19,721**	**20,746**	**21,819**	**22,824**	**23,843**	**24,907**	-
Tax shield		2	5	5	6	6	7	7	7	8	8	9	9	9	10	10
Value of Tax Shields	**107**	**116**	**121**	**127**	**133**	**140**	**146**	**153**	**160**	**167**	**175**	**183**	**191**	**200**	**208**	-
Operating Levered Enterprise Value	**11,785**	**12,669**	**13,478**	**14,310**	**15,173**	**16,088**	**17,093**	**17,967**	**18,904**	**19,888**	**20,921**	**22,002**	**23,015**	**24,042**	**25,116**	-
Nonoperating Invested Capital	244															
Levered Enterprise Value	**12,028**															
Net Debt	(57)															
Non-controlling interests	9															
Equity Value	**12,076**															
Shares outstanding (in millions)	90.8															
Implied Share Price (in $)	**132.99**															
$VAR Close 2019 (in $)	142.01	» Overpriced														

Source: Own elaboration

Exhibit 27 – VMS Equity Cash Flows (ECF) Method

Equity Cash Flow (ECF)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
(in $ millions)	**FY2019**	**FY2020**	**FY2021**	**FY2022**	**FY2023**	**FY2024**	**FY2025**	**FY2026**	**FY2027**	**FY2028**	**FY2029**	**FY2030**	**FY2031**	**FY2032**	**FY2033**	**FY2034**
Net Income	255	402	433	477	522	567	613	744	788	835	885	937	1,107	1,157	1,209	1,264
Depreciation and Amortization	93	145	150	155	160	165	170	175	179	185	190	196	200	204	208	213
Gross Cash Flow	**348**	**547**	**583**	**631**	**682**	**732**	**783**	**919**	**968**	**1,020**	**1,075**	**1,133**	**1,306**	**1,361**	**1,418**	**1,477**
CAPX	(648)	(221)	(191)	(198)	(205)	(211)	(218)	(214)	(222)	(230)	(238)	(247)	(236)	(242)	(248)	(254)
Change in NWC	(119)	92	(37)	(39)	(41)	(42)	(90)	(26)	(40)	(43)	(46)	(49)	(87)	(39)	(41)	(43)
△ Other Assets	(21)	(35)	(14)	(5)	(2)	(17)	(21)	(10)	(9)	(12)	(16)	(16)	(9)	(10)	(11)	(12)
△ Other Long term Liabilities	93	(172)	15	16	16	17	17	27	15	16	17	19	32	15	16	17
△ Net Det	390	1,307	80	82	85	91	100	86	93	97	102	107	100	101	106	113
△ Non-controlling interests	5	(9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ECF	**48**	**1,510**	**435**	**488**	**536**	**569**	**571**	**782**	**805**	**849**	**895**	**947**	**1,106**	**1,187**	**1,240**	**1,298**
Discount Factor		0.91	0.82	0.75	0.68	0.62	0.56	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.26	
Discounted ECF	5,911	1,371	358	365	364	350	319	396	370	354	339	325	345	336	318	
PV(TV)	5,815															
Equity Value	**11,726**															
Shares outstanding (in millions)	91															
Implied Share Price (in $)	**129.14**															
$VAR Close 2019 (in $)	142.01	» Overpriced														

Source: Own elaboration

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