RESEARCH REPORT

November 9, 2019

Medical Device Industry Report

Who is Best Equipped?

For the assessment of Medtronic, Abbott and Danaher, the Healthcare team decided to adopt a segmented approach in determining the quality of each name. As such, the team has designed a set of criteria that we feel capture the shifting economics of the industry. These include:

1. Strength of current product portfolio

2. R&D strategy including both organic and inorganic success

After thorough industry and company analysis, we feel that these two criteria capture the key value drivers in the medical devices space. The strength of the current portfolio represents the competitive position of the company in the market today, and the evaluation of R&D strategy allows us to obtain a better sense of how well the company is positioning themselves going forward, both from a strategic and capital allocation perspective.

The medical devices industry is undergoing a large shift in regards to the value-based healthcare model. While this is expected to create short-term pricing pressure, we believe that it sets up the industry to increasingly benefit the large players in the long run.

For our next report, the Healthcare team plans on taking a deeper look at both Medtronic and Danaher. While there remain many questions to be answered, these names display strong growth prospects and ability to leverage size in an industry that structurally rewards scale.

Healthcare

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Industry Overview

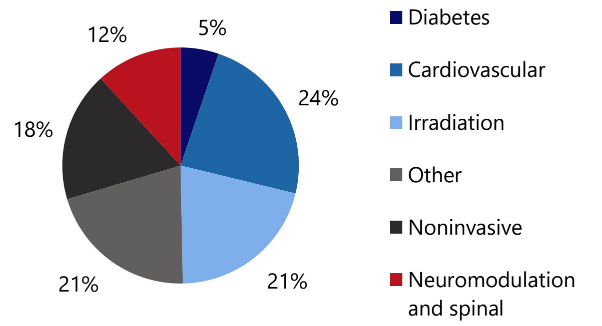
The medical device industry makes products ranging from surgical gloves to artificial joints. It plays a crucial role in developing new technologies that can improve the ability to diagnose and treat a variety of illnesses. The industry has a relatively small number of large, diversified companies and a large number of smaller companies. These smaller entities are mainly engaged in R&D of new devices for specific therapeutic areas, much like a small pharmaceutical company would be. The industry is distinctive for its tendencies to make frequent, incremental changes to products, creating a quickly evolving competitive landscape.

Emerging markets also play a large role in the industry. Between 35%-40% of domestic U.S. production is ultimately exported, with foreign sales representing 40%-50% of overall revenues for U.S. medical device companies in 2017 (including foreign subsidiaries).

As can be seen through Exhibit II, the different segments of the medical devices industry are expected to grow at varying rates due to multiple factors such as competition within the segment, external demand, and regulatory hurdles. While these estimates are never to be fully relied on, they provide qualitative context for the expected performance of each business line.

Exhibit I

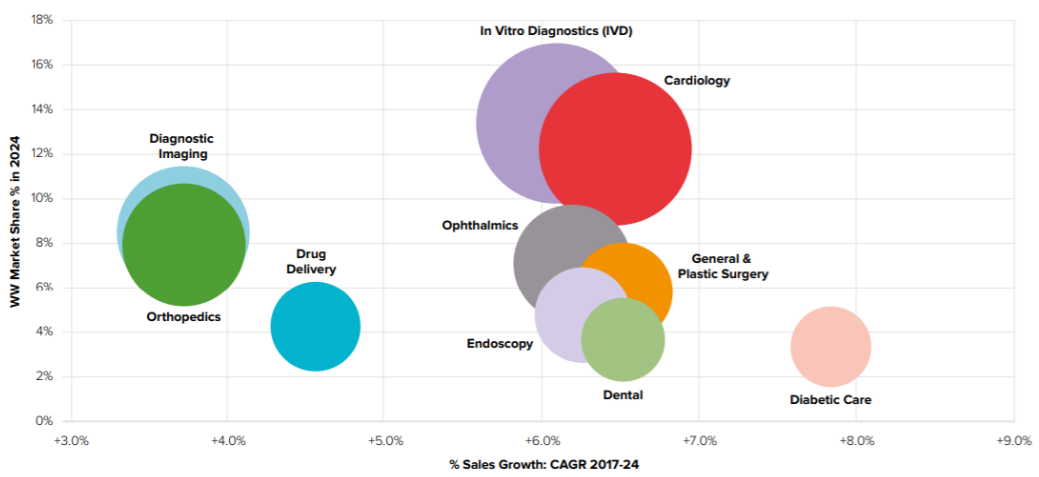
2018 Percentage of US Market by Revenue



Source(s): IBISWorld

Exhibit II

Analysis on Estimated Top 10 Device Areas in 2024



Source(s): EvaluateMedtech

Industry Overview

Value-Based Healthcare

Driven in major part by the world's largest healthcare payer, the U.S. federal government, healthcare reimbursement is moving from a "fee-for-service" model to a "value-based" one. Value-based healthcare (VBHC) is a model in which providers, including hospitals and physicians, are paid based on patient health outcomes. This differs from a fee-for-service model where providers are compensated based on simply the quantity of healthcare services provided. The "value" in value-based healthcare is derived from measuring long-term health outcomes against the cost of the device or delivery.

For device manufacturers, the challenges that come with the shift to VBHC are a marked departure from how the relationship between device manufacturers, payers, and providers has been conducted in previous years. Physicians have historically been the key influencers that impact medical device buying decisions, however, this has been expanding in recent years. Physicians increasingly prefer being employed by large hospitals and other healthcare organizations as opposed to owning individual practices. This shift is changing the manufacturer-buyer dynamics, as they are forced to cater to a wider range of customers including insurance providers, government agencies and hospital groups.

In addition to affecting volume, value-based reimbursement is expected to affect the degree to which manufacturers will have to prove that new devices provide better outcomes for a given cost basis. If manufacturers can't demonstrate an increased level of performance for the same cost or a comparable level of performance for a reduced cost compared to existing solutions, new device designs are unlikely to be adopted. The combination of decreased volume and increased scrutiny will make the medical device market increasingly competitive between manufacturers.

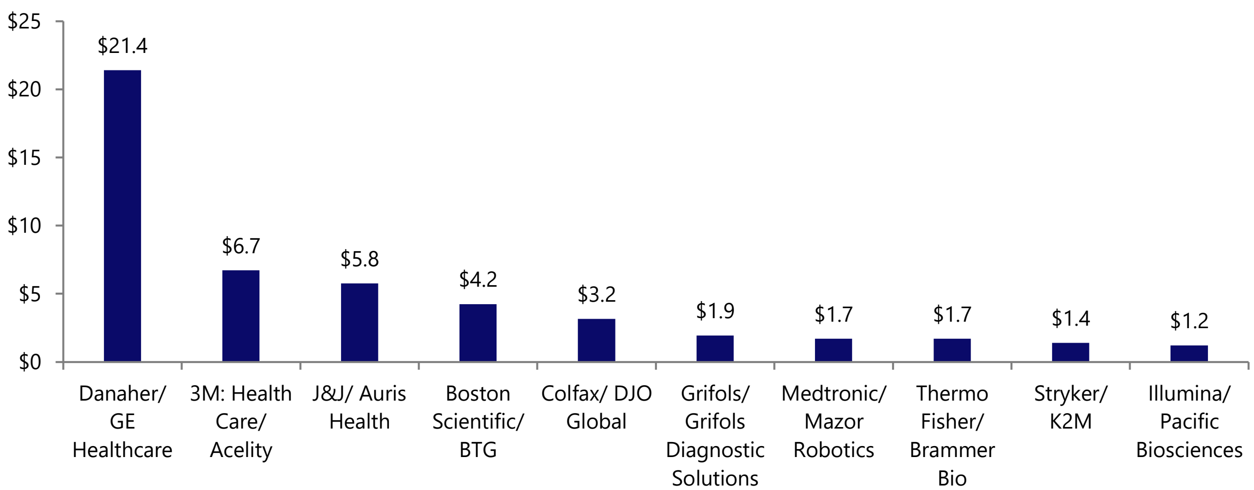
With the saturation in the high-end device segment and commoditization in the low-end segment, the adoption of these new value-based models are essential to the ongoing strength of the dominant players. Medtronic is an example of a leading medical device company that is actively employing this shift. To improve operations, Medtronic formed Medtronic Hospital Solutions to create partnerships with hospitals, creating formulary-like relationships that increase customer captivity.

This shift to value-based pricing is expected to further emphasize the dominance of the major providers, due primarily to economies of scale creating the opportunity for lower pricing. In a 2018 study of medical device manufacturing by the Economic Development Administration, it was found that "Retailers of Class 1 medical devices emphasized that they are buying from fewer vendors than in the past. In other words, they purchase their products from a select group of producers." This was attributed to economies of scale in which the larger producers can sell products at a lower price, provide valuable brand recognition, and have the abilities to meet fluctuations in demand". Therefore, although the shift to VBHC is expected to create a more challenging environment overall, the large players are expected to be the main beneficiaries at the end of the day, as they continue to amass scale and insulate their efficiencies.

This emphasis on scale has meant that consolidation across segments is becoming the buzz word in the medical device industry. Large players are aiming to increase the scope of product offerings and provide superior outcomes at lower total cost of care through the acquisition of smaller niche players. As has been touched on in previous reports, this trend can also be seen within the pharmaceutical industry, as the emphasis on scale has pushed manufacturers away from organic R&D and towards acquisitions as the primary lever of growth.

Exhibit III

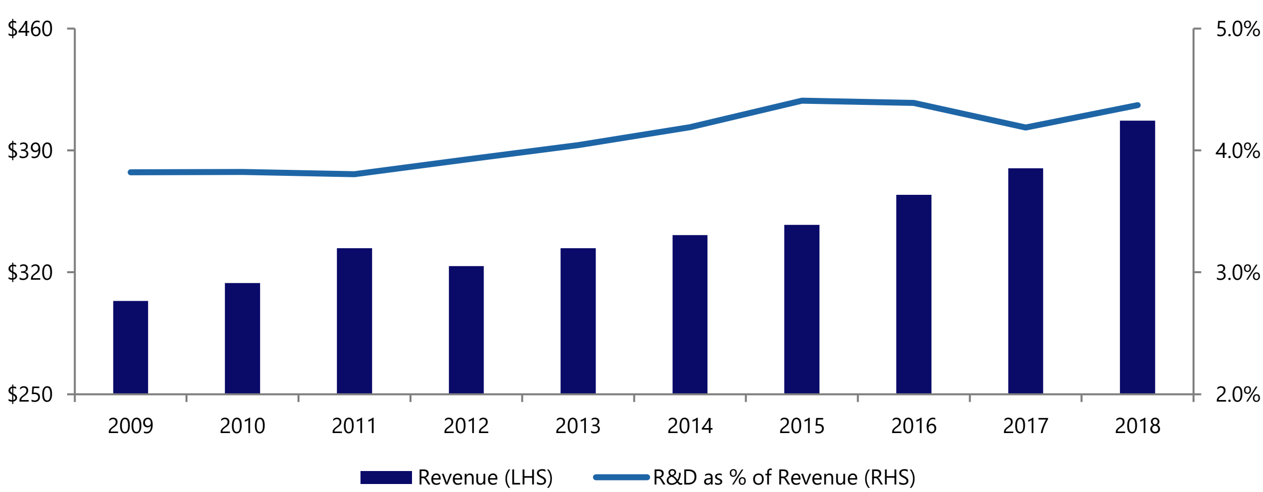
2018-2019 Global Medical Devices Mergers by Value ($B)



Source(s): Ernst & Young

Exhibit IV

Revenue and R&D spend of U.S. and European Medical Devices Companies ($B)



Source(s): Magia Medtech Alliance

Industry Overview

Regulations

The US Food and Drug Administration's Center for Devices for Radiological Health (or USFDA/CDRH) regulates the medical device industry in the United States. The process for full regulatory approval includes premarket notification and premarket approval, along with the class-specific regulatory specifications.

Premarket notification is a marketing clearance process wherein a device manufacturer must notify the FDA of its intent to introduce a new device in the U.S. market at least 90 days in advance. This could be either a device attempting to be marketed for the first time or a device with significant changes to the existing product that could have a possible impact on safety and efficiency.

Premarket approval is a marketing approval process required for new innovative devices that don't have any substantially equivalent devices currently legally marketed in the U.S.

Medical device companies catering to the U.S. market must abide by the regulatory controls as specified by the FDA's Center for Devices for Radiological Health. The organization establishes control measures by considering the potential risk levels of a medical device. These classes range from lowest risk (class I) to highest risk (class III), with corresponding rigor in terms of regulatory hurdles.

Despite the advertised rigor of this approval process, a number of cleared devices have been the subject of litigation. These devices include metal-on-metal hip implants manufactured by Wright Medical (WMGI) and Zimmer Biomet (ZBH) and transvaginal mesh manufactured by Johnson & Johnson (JNJ), CR Bard (BCR), and Boston Scientific.

Exhibit V

FDA Regulatory Specifications by Equipment Class

Class	Risk-level	Regulatory Specifications	Product Examples
Class I	Minimum potential risk	Registering device manufacturing facilities, providing list of marketed devices to FDA, complying with Good Manufacturing Practices, reporting any device removal or corrections	Elastic bandages, examination gloves, and stethoscopes
Class II	Low to medium risk	Construction of the device, requirements to ensure proper installation, use, and maintenance, post-market surveillance	Powered wheelchairs, infusion pumps, blood pressure monitors, and electrocardiographs
Class III	High risk products	Everything above, plus additional premarket approval and safety testing	Cardiac pacemakers and replacement heart valves

Source(s): US Food and Drug Administration

Medtronic (NYSE:MDT): Company Overview and Key Segments

Medtonic is a medical technology, services and solutions company comprised of four key segments: 1) cardiac and vascular ($11.5B in revenue), 2) minimally invasive therapies ($8.5B in revenue), 3) restorative therapies ($8.2B in revenue) and 4) diabetes ($2.4B in revenue). Medtronic is the largest pure-play med-tech company in the world, which a wide breath of products and offerings. It has global manufacturing and R&D facilities, and has a distribution network in over 150 countries.

Cardiac and Vascular (38% of total revenue)

The cardiac and vascular segment of Medtronic's business is its largest segment. Product innovation is the key driver for growth, and Medtronic must constantly evolve their products within this space as the speed of new product improvements from competitive pressure is high.

Minimally Invasive (29% of total revenue)

The minimally invasive segment consists of two parts: the surgical innovations division, and the respiratory, gastrointestinal & renal division. The former develops both advanced and surgical products, whereas the latter designs products in gastrointestinal diagnostics, respiratory monitoring and renal disease (a quickly emerging field). While it reported 6.1% YoY decline, the highly-anticipated surgical robotics platform is set to come online within the next year, presenting reason for optimism within this segment.

Restorative Therapies (26% of total revenue)

The restorative therapies segment consists of spine , brain and pain therapy divisions. The company is targeting mid-single-digit growth in this segment through to 2021, mostly due to upcoming product introductions.

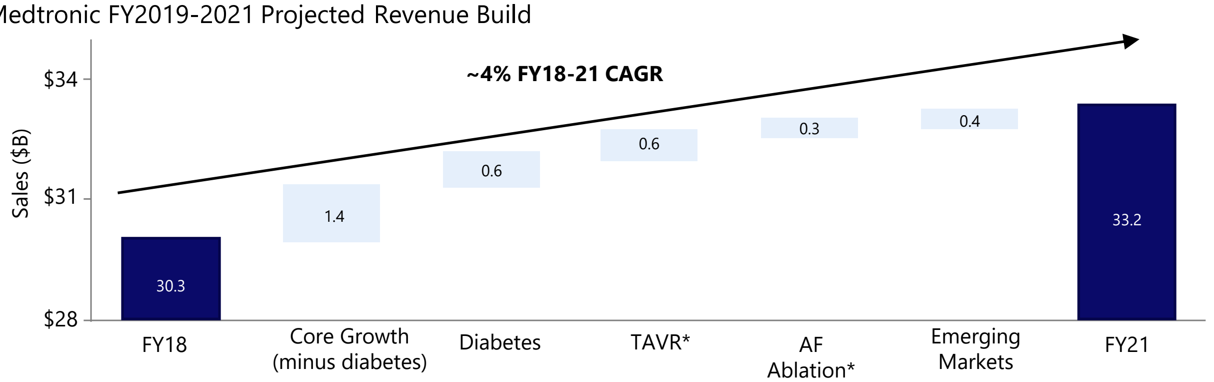
Diabetes (7% of total revenue)

The diabetes segment consists of products and services for the management of Type I and Type II diabetes. Medtronic has built a strong partnership with UnitedHealthcare (NYSE:UNH) as the preferred in-network provider of insulin pumps, and has a similar agreement with Aetna. These ensure a relatively predictable revenue stream for this segment. In addition, this segment has shown strong growth in the emerging markets of Europe, Latin America and Asia Pacific, resulting in a 16.6% YoY growth from 2018-2019. This has been identified as the segment with a very strong growth potential in the coming years.

*In the graph below, TAVR and AF Ablation represent new technologies of focus in the cardiac and vascular segment.

Exhibit VI

Medtronic FY2019-2021 Projected Revenue Build



Source(s): Company Reports, Credit Suisse estimates

Medtronic (NYSE:MDT): R&D Strategy

Acquisition of Covidien in 2015

By acquiring Ireland-based Covidien plc in 2015 for $43B, Medtronic officially became the largest med-tech company in the world. Whereas part of the motivation was to re-incorporate in a low-tax country (with a corporate tax rate of 16%), Medtronic's acquisition now provides an acceleration in the strength of surgical devices portfolio. In addition, this acquisition allows a diversification into product categories such as weight-loss surgery and laparoscopic procedures (when a surgeon inserts a tiny camera into the patient's body and operates it remotely). This diversification should make it more competitive in the U.S. market, where the healthcare reform efforts have created increasing pricing pressure. This acquisition has been widely regarded as transformational, increasing the share price by 37.5% since the acquisition, building over a dozen billion-dollar brands and offering a strong portfolio of complementary goods Medtronic was able to achieve over half of its synergies in one year, beating analysts' expectations.

Highest Tuck-In M&A Activity in Industry

After closing in on the Covidien acquisition, Medtronic went on a "record-breaking shopping spree" and announced 13 smaller acquisitions. In 2019, Medtronic spent $2.3B on R&D (~7.6% of revenue), over 60% of which was allocated towards acquisitions. It currently has more than 2x the tuck-in acquisition rate of their next-best competitor, Abbott. These offer an unparalleled speed-to-market, as these "small bolt-on acquisition targets" make up the majority of Medtronic's pipeline. The company has displayed a very disciplined approach of ensuring mid-teen risk-adjusted rate of returns and minimal-to-no dilution of earnings, making it a market leader in this regard.

Nascent Footing in Emerging Markets

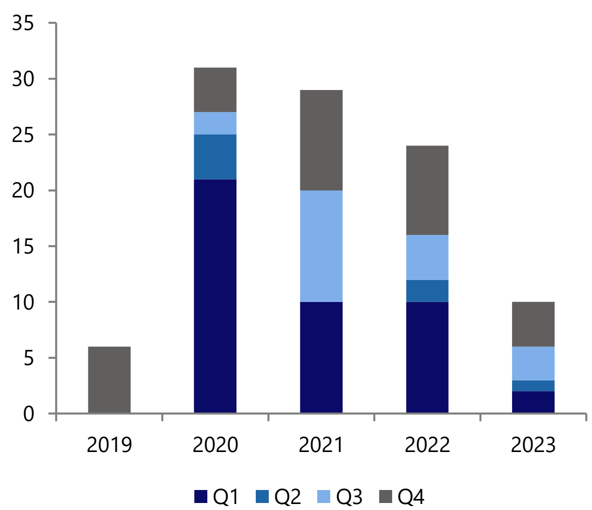
Currently, over 10% of Medtronic's revenue comes from emerging markets, which have recorded double-digit growth for the past 5 years. This is a head-start in a space that has many precarious regulatory headwinds; in addition, as the switching rate for medical devices is quite low (as their use is quite specialized), the first-to-market advantage is quite prominent. Management has cited this as one of their predominant growth levers going forward, and as such will necessitate a deeper dive in the following report.

Strategic Shift towards Digital Transformation

In July 2019, Medtronic entered into a partnership with Viz.ai, a healthcare start-up backed by Alphabet's VC arm that uses artificial intelligence to help professionals recognize early signs of stroke. This is one of the many aggressive investments that the management has made into the optimization of its processes using AI. It has also recently purchased Israel-based Mazor Robotics, which strengthens Medtronic's position as a global innovator in enabling technologies for spine surgery.

Exhibit VII

Number of Pipeline Products by Estimated Approval Date



Source(s): Company Reports

Abbott Laboratories (NYSE:ABT): Company Overview

Abbott Laboratories is a diversified healthcare corporation, with a strong international presence in both developed and emerging markets. As of 2018, ~2/3 of the company's $30.6B in total revenue originated from outside America. Abbott's four main segments are: diagnostic, established pharmaceutical, nutritional, cardiovascular and neuromodulation products.

Pharmaceutical: Abbott's pharmaceutical segment, consisting of generic drugs, sells directly to wholesalers, government agencies, healthcare facilities and independent retailers or pharmacies. This market is highly competitive and commoditized by nature, with other pharmaceutical companies able to create the same generic drugs. Major products include Creon to treat pancreatic exocrine insufficiency, Duphaston, Lipanthyl, Serc and Influvac.

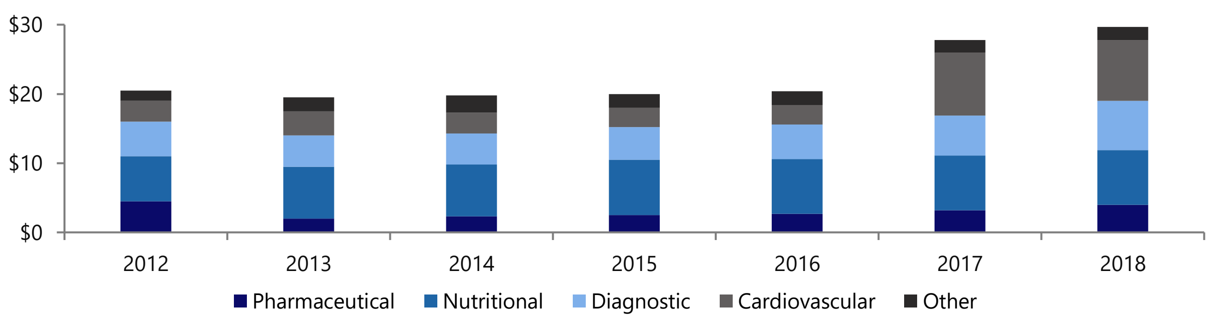
Di*agnostic*: Diagnostic products include diagnostic systems and tests, which are sold directly to blood banks, hospitals, commercial labs or clinics. Over the past years, Abbott's strong acquisition performance have established them as market leaders of various products and enhanced their economies of scale. However, competition through technological innovation and performance is fierce and Abbott must maintain its advantage when competitors introduce new products. Major products include the Alinity family of instruments, m2000 and i-STAT.

Nutritional: Including pediatric and adult nutritional products, Abbott sells directly to consumers, institutions and retailers. Primary marketing efforts are concentrated towards consumers, physicians and other health care professionals. Abbott faces fierce competition from other diversified consumer and health care manufacturers through ads, formulation, packaging, price and retail distribution. Therefore, introduction of new products and ingredient innovations is crucial to staying competitive. Major products include Similac, Ensure and Pedialyte.

Cardiovascular and Neuromodulation: Rhythm management, electrophysiology, heart failure, vascular and structural heart devices for the treatment of cardiovascular diseases and neuromodulation devices for chronic pain and movement disorders are included under this segment. The devices are sold directly to hospitals, ambulatory/surgery centres and physician offices, giving Abbott a stable customer base. Similar to other medical devices, cardiovascular products are subject to fierce innovative competition. Major products include FreeStyle Libre, Confirm Rx, MitraClip and Proclaim.

Exhibit VIII

Segment Revenue from 2012 to 2018 ($B)



Source(s): Abbott Laboratories

Abbott Laboratories (NYSE:ABT): Product & Segment Analysis

Given that Abbott operates in diversified segments without one dominant product generating revenue, analysis of their top five products was done by choosing products from each of Abbott's segments that best represented that segment. Therefore, analysis alternates between looking at the overall segment and the chosen products.

Established Pharmaceutical Segment – Generic Drug Portfolio

Abbott's strategy in their pharmaceutical segment is to sell a portfolio of generic drugs in emerging markets, where access to many drugs is still limited. Therefore, its pharmaceutical segment derives the most revenue from geographies such as China, India and Brazil. However, with ~20% operating margin, competition in the generic drug business is becoming fiercer, as domestic governments are providing extra support for local pharmaceutical companies and FDA continues to approve more generic drugs.

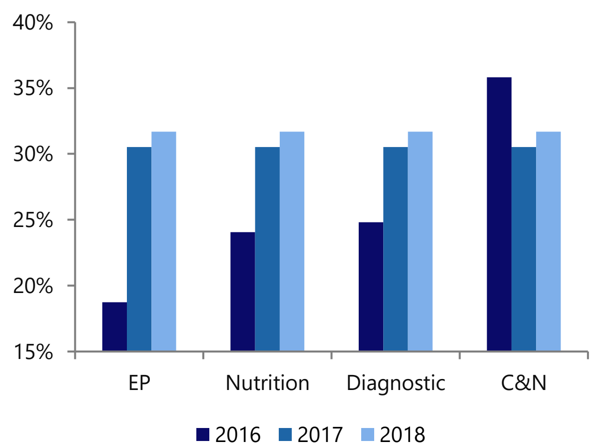
If the second generic competitor is able to sell for half the price of a brand drug, by the sixth competitor, generics can only be sold for a quarter of the brand's original price. Although the global generic drugs market is expected to grow at a 10.5% CAGR to 2020, it will be difficult for Abbott to capture the full growth due to competition. Furthermore, there is a high degree of currency risk involved with international sales and it has had a negative impact on Abbott's performance in 2019.

Nutritional Segment – Similac

Similac is Abbott's major product line in the nutrition segment (including both powders and liquids) that provide nutrients, proteins and minerals for infants. Abbott is able to capture a 23% operating margin in this market leading and mature segment. Due to the rising aging and geriatric population and growing demand in emerging markets, there is a lot of potential in this segment. Abbott is well-positioned to capitalize on these trends given the new manufacturing plants they have been opening recently

Exhibit IX

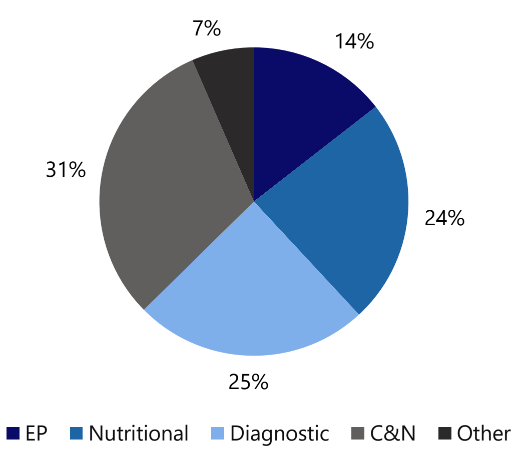
Abbott Laboratories Operating Margins 2016-2018



Source(s): Abbott Laboratories

Exhibit X

2018 Revenue by Segment



Source(s): Abbott Laboratories

Abbott Laboratories (NYSE:ABT): Product & Segment Analysis

in China and India. Furthermore, Abbott's products sell ~50% to the U.S. market and ~50% internationally, creating a diversified customer base. While slightly more uncertain, Asia-Pacific is expected to be the fastest growing regional market due to high birth rates and high reports of malnutrition. Towards 2025, the clinical nutrition market is expected to continue at a CAGR of 4.6%. Abbott competes globally with Nestle, Fresenius Kabi and Danone but local players in every geographic region have been increasing in prevalence lately, creating a more competitive landscape.

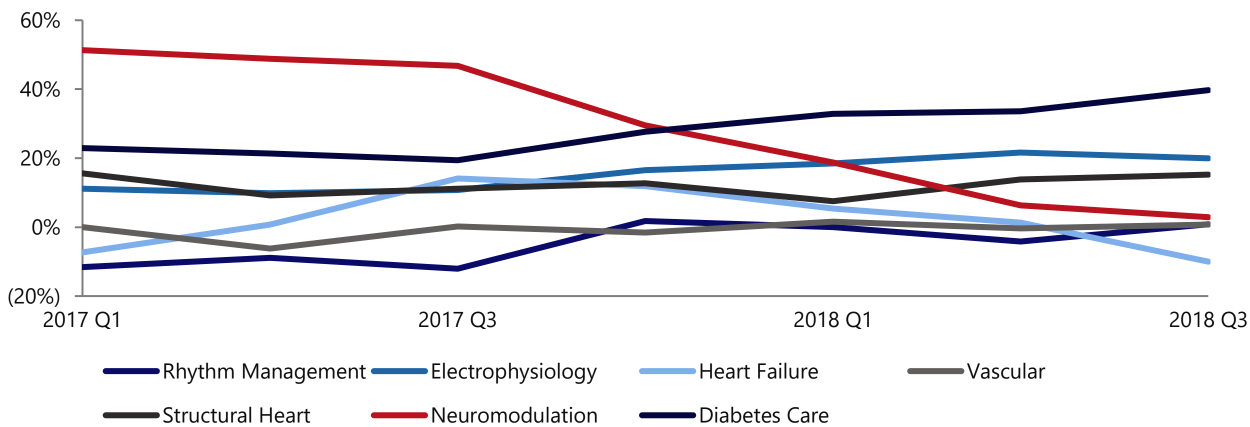
Diagnostic – Alinity Family of Instruments

In Diagnostic devices, the Core Laboratories sub-segment accounts for 60% of the segment's revenues, which is heavily defined by Abbott's new Alinity family of instruments and their legacy ARCHITECT system. Alinity is a family of systems across immunoassay, clinical chemistry, point of care, hematology, blood and plasma screening and molecular diagnostics. Alinity has performed successfully in U.S. and Europe in recent years, but more so Europe as Alinity's earlier launch enabled it to offer more advanced features ahead of time. European customers are consistently transitioning to new multi-year contracts, with Abbott securing a win rate of 90%+ every year. There are no imminent threats to lowering Abbott's win rate.

More approvals for Alinity are expected in U.S. throughout 2019 and 2020, propelling heightened growth in comparison to ARCHITECT, a more mature product. The combination of Alinity's growth and ARCHITECT's maturity have enabled it to maintain a 25% operating margin. In the vitro diagnostics market, other manufacturers include Bio-Rad Laboratories, Ortho-Clinical Diagnostics Inc., Siemens Healthineers AG and Roche Diagnostics International Ltd. However, the Alinity system has shown signs of being more efficient than its competitors, which secures Abbott's position in Diagnostics in the upcoming years. With nearly 151M blood and source plasma donations every year, demand for diagnostic devices will be higher to scan for infectious diseases.

Exhibit XI

U.S. Medical Devices Revenue Growth by Segment



Source(s): RBC Capital Markets

Abbott Laboratories (NYSE:ABT): Product & Segment Analysis

Cardiovascular and Neuromodulation – FreeStyle Libre and MitraClip

Within this diverse segment, vascular, rhythm management and neuromodulation have been pain points for Abbott in the recent years. Although the neuromodulation market is growing in the double digits, Abbott needs to improve execution to gain market share. Therefore, diabetes and structural heart are more promising sub-segments, propelling the segment's margins to 32%.

As a global leader in glucose monitoring, Abbott strengthens its position with Freestyle Libre, their latest product which uses a small sensor to provide real-time glucose readings anytime for 14 days at a time. With each scan, a real-time glucose result, an 8-hour historical trend and a directional trend arrow of glucose levels are provided to help users manage their diabetes.

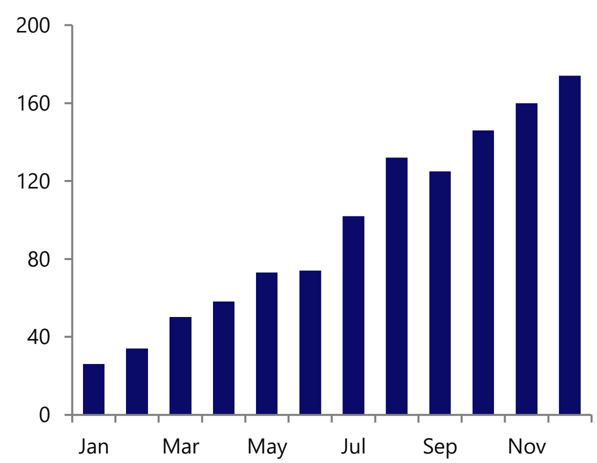
FreeStyle Libre sells ~$500M per quarter with more expected growth with the approval of FreeStyle Libre 2 in Europe. Worldwide users of FreeStyle is expected to exceed 1.5M and reach $2B in sales by 2020. The global diabetes market is expected to grow, with prevalence increasing in developed and emerging markets. As over 50% of people with diabetes are undiagnosed, growth in the next 20 years will be strong. Although Abbott has a first-mover's advantage in this space, competitors such as Dexcom and Senseonic are beginning to catch up.

Within Structural Heart, MitraClip treats primary and secondary mitral regurgitation and accounts for 50% of the category's revenue, with ~$700M in 2019. MitraClip has dominated the mitral repair sector but competitors are preparing to enter the space as well. Boston Scientific is planning to expand the mitral valve repair technology it recently acquired and Edwards Lifesciences is working on a device of their own. However, a successful COAPT trial was recently conducted on secondary MR patients, which opened MitraClip to a bigger patient population and impeded the ongoing trials of competitor devices. As a result, competition should be mitigated for a while and sales are expected to continue growing at 20% for the next 2-3 years.

In conclusion, Abbott's operations within the 4 segments are relatively strong. Their pharmaceutical generic drug portfolio is weaker due to fierce generic competition and headwinds in China but their nutrition business has been faring well in both domestic and international markets, appearing as a stable source of revenue. The diagnostics system portfolio is promising and Alinity's strong contracting history is a good indicator. FreeStyle and MitraClip both have a lot of future potential as well and competition seems to be well managed in the last few years.

Exhibit XII

FreeStyle Libre U.S. Prescriptions 2018



Source(s): IQVIA

Abbott Laboratories (NYSE:ABT): M&A Strategy

Abbott's M&A strategy focuses on acquiring high quality businesses that add to their product portfolio and divesting less lucrative businesses, as opposed to a consistent tuck-in strategy. As a result, Abbott has not made a major acquisition since 2017, when they integrated St. Jude Medical and Alere into their business.

St. Jude Medical: On January 4, 2017, Abbott acquired St. Jude Medical, a global medical device manufacturer, to expand future growth opportunities in their current product portfolio. Many R&D pipeline benefits are expected since combined, Abbott will be able to compete in every niche of the cardiovascular and neuromodulation device market and hold either number 1 or 2 market leader position. Specifically, St. Jude has a strong portfolio in atrial fibrillation, heart failure, structural heart and chronic pain devices, which are highly complementary to Abbott's coronary and mitral valve disease devices. By combining operations and cutting out unnecessary expenses, cost synergies are expected with Abbott's experience in acquisitions.

Alere: On October 3, 2017, Abbott acquired Alere, specializing in diagnostic devices and services, which established Abbott in point-of-care testing devices and expanded their global diagnostic presence. Demand for fast and actionable information on diseases is rising and adding Alere's systems expands Abbott's testing platform.

Divestitures: Abbott regularly divests businesses that they feel have minimal opportunities for growth. In 2015, Abbott sold its Animal Health business to Zoetis to strengthen their focus on devices and nutrition. In 2016, Abbott sold Abbott Medical Optics (AMO), their vision care business to Johnson & Johnson, as it was a lower growth segment without as many opportunities.

Abbott has experience with restructuring their business to account for acquisitions and divestitures without any notable failures. All acquired businesses have been integrated seamlessly, reflecting management's efficiency in selecting high quality targets and devising good integration plans.

Exhibit XIII

Abbott Laboratories and St. Jude Medical Combined Cardiovascular Portfolios

Area of Focus	Abbott	St. Jude Medical	Combined	Rank
Coronary Stents	●		●	#1
PCI Optimization		●	●	#1
Cardiac Rhythm		●	●	#2
Left Ventricular		●	●	#1
Heart Valves		●	●	#2
Mitral Repair	●		●	#1
Atrial Fibrillation	●	●	●	#2
Heart Failure		●	●	#1

Source(s): Abbott Laboratories

Danaher (NYSE:DHR): Company Overview

Company History

Danaher is a conglomerate of medical device companies that design and manufacture in three core segments: Life Sciences, Diagnostics, and Environmental & Applied Solutions.

Danaher was founded in 1969 under a Japanese business philosophy of continuous business improvement – *kaizen*. Since inception, it has employed a turnaround acquisition strategy, consolidating companies with established brands, meaningful market share and broad distribution channels. Once acquired, subsidiaries are grouped according to constantly shifting product lines and commercial markets. None of Danaher's segments from 1990 exist today, and all that remains is the company's firm kaizen philosophy. Through multiple acquisitions in the late 1990s, Danaher has grown into a leading global medical devices player. Its strategy remains to continue for acquisitions to drive operations.

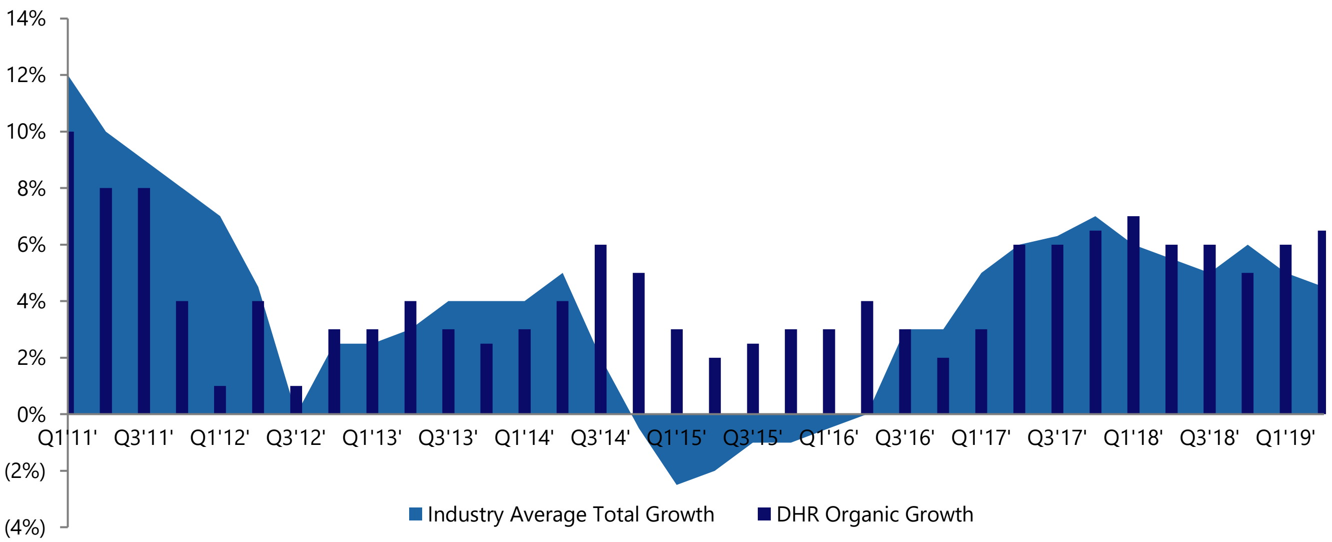
Business Model

Across all segments, Danaher operates under a razor/razorblade model, where the company sells an instrument for lower margins, and higher margin replaceable reagents to be used with the instrument applications. These reagents, also known as consumables, generate ~2-4x the original instrument revenue over the instrument's life. The products are sold in a bundle, and thus the cycle time of a customer typically lasts 8-to-10 years with regular interaction with Danaher's sales teams. In all three segments, application of these medical devices are mission-critical to client business operations. Due to this unique business model, DHR has been able to match organic revenue growth with the total industry's overall growth (Exhibit XIV).

Eight metrics are used to measure performance across every operating company at Danaher: core revenue growth, operating margin expansion, return on invested capital, quality (external defects), on-time delivery, internal fill rate and employee turnover.

Exhibit XIV

Danaher Organic Revenue Growth vs. Total Industry Average Growth



Source(s): Company Reports, RBC Capital Markets

Danaher (NYSE:DHR): Segments Analysis

Life Sciences (32% of 2018 Revenue)

Danaher owns 15% share in the $40B life sciences market and offers reagents in varying forms of spectrometry. Within Life Sciences consumables (replacement agent) consists of 65% of revenues while the instrument sales pertain to the remaining 35%. The life sciences segment mainly develops high-precision microscopes and add-ons in life science research. Recently, in response to slowing revenue growth Danaher has sought to penetrate inorganically into biomedical research tools.

Diagnostics (31% of 2018 Revenue)

The Diagnostics segment can be broken into critical care and clinical lab instruments, which both develop diagnostic systems for hospitals or clinical networks. The diagnostics revenue growth has been stagnating, as a result of early-stage market maturity in the United States. As of 2018, 37% of DHR's diagnostic revenues were in high-growth markets, growing at a rate beyond 10%. Despite stagnation within the U.S., this segment poses the highest margins of 26.6% and has a loyal customer base of 84% recurring revenues.

Environmental & Applied Science (22% of 2018 Revenue)

This segment is divided into water quality and product identification. This line operates with one key subsidiary that initiates bolt-on acquisitions, as opposed to functioning as a separate entity. The water quality business involves precision flow meters that analyze and disinfect various forms of water in residential and industrial settings.

Product identification is an old legacy platform which involves providing solutions for color and packaging design, printing, traceability for pharmaceutical and industrial products.

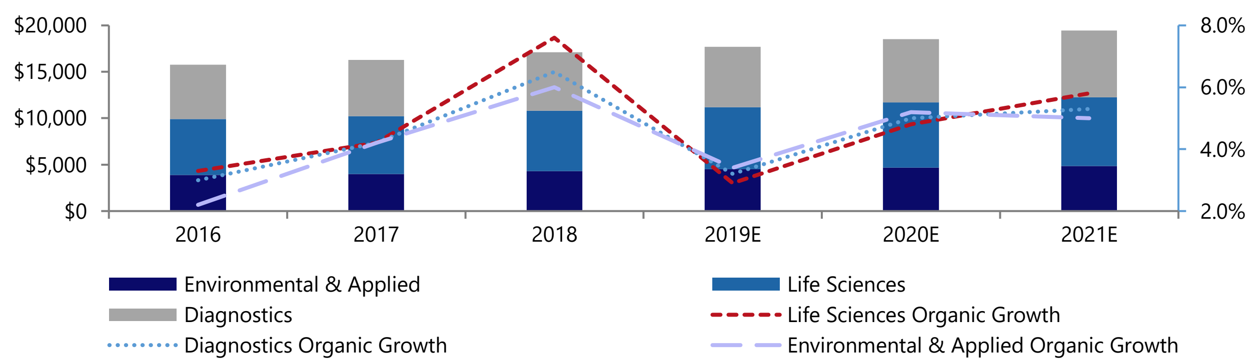
Dentistry (15% of 2018 Revenue)

Danaher used to offer Dentistry products and devices, but has chosen to spin out its dentistry segment as a separate entity in 1H19, raising $750M through a 19.4% IPO of the dentistry business.

All of the aforementioned segments have significant manufacturing operations tied to China, which has created bearish sentiment regarding customer retention as well as new sales in lieu of global trade tensions.

Exhibit XV

Danaher Revenues by Segment (LHS in $M) vs. Organic Growth Rates (RHS in %)



Source(s): Earnings Calls, J.P. Morgan

Danaher (NYSE:DHR): Life-Sciences Subsidiaries

Leica Microsystems (12.5% of 2018 Life Science Revenue)

Leica manufactures high-precision microscopes used in life science research. Primary microscopy products include light microscopes (visible light), confocal microscopes (laser), stereo microscopes and macroscopes (3D visualization), surgical microscopes and sample preparation products for electron microscopy as well as digital cameras and application-specific software.

SCIEX (12.5% of 2018 Life Science Revenue)

SCIEX developed the very first commercialized triple quadrupole mass spectrometry instrument. This enabled an atmospheric pressure ion source (API III), a breakthrough instrument for the pharmaceutical industry that enabled the analysis of drug metabolites in the blood of clinical trial patients. With further iterations of API, SCIEZX remains the dominant provider of triple quadrupole MS instruments (the largest MS instrument market opportunity), with a higher market share than Thermo Fisher Scientific. A subsidiary, Molcular Devices (MDS) sells a portfolio of microplate readers, cellular imaging systems, and drug discovery applications that has over 100,000 placements in research laboratories worldwide.

Pall Corporation (50% of 2018 Life-Sciences Revenue)

Pall is a leading provider of filtration, separation and purification technologies. Its product is used to remove solid, liquid and contaminants from liquids and gases in the biopharmaceutical, food, medical, aerospace, microelectronics and industrial sectors. They develop filters treated with gamma rays to separate white blood cells from whole blood in order to prevent the rejection of platelets during blood transfusions. The bioprocessing company is currently experiencing mid-double digit growth from increased market demand since its 2015 acquisition.

Integrated DNA Technologies (N/A)

In April 2018, Danaher acquired Integrated DNA technologies, a privately-held provider of nucleic acid products for life science research, for $2.8B. The company's primary business is the production of custom oglinucelotides for molecular biology applications such as next-gen sequencing, CRISPR genome editing, and manufactures products used in diagnostic tests for cancer. This represents Danaher's expansion into the genomics market, gaining an established platform for double-digit organic revenue growth and operating margins in the mid-30%.

Exhibit XVI

Danaher Corp. Life Sciences Acquisition History ($M)

Year	Company	Price ($M)	Sales	EV/Sales	Description
2010	AB SCIEX	$900	$650	1.4x	Mass Spectrometry instruments for life science research
2010	Molecular Devices	$200	N/A	N/A	Microplate readers, cellular imagin systems (attachments for spectrometry)
2015	Pall Corporation	$13,800	$2,800	4.9x	Water filtration and separation systems for life science research
2017	Phenomenx	$700	$200	3.5x	Novel chemistry for chromatographic separations
2018	Integrated DNA Tech	$2,800	$260	10.8x	Nuceleic acid products
2019	GE Biopharma	$21,400	$2,800	7.6x	Biopharmaceutical workflows

Source(s): Company Filings

Danaher (NYSE:DHR): Diagnostics Subsidiaries

Radiometer (10% of Diagnostics Revenues)

Danaher initially entered diagnostics through the acquisition of Radiometer in 2004. Radiometer was formed in 1935 to develop measuring devices for the Danish radio industry and evolved over time to address diagnostic needs in healthcare. Now, they develop blood gas analyzers which are used to measure the concentrations of oxygen, carbon dioxide and other gases in blood which essentially indicates how well a patient's lungs are functioning. Blood gas levels of ill patients can rapidly change and thus consistent monitoring will be necessary. Management states ~500k samples are tested per day through Radiometer equipment.

Leica Biosystems (10% of Diagnostics Revenues)

In 2005, Danaher acquired Leica Microsystems for $550M, gaining entry into the anatomical pathology market. Leica manufactures high-precision microscopes for pathology and surgery. The company is split into Lecia Biosystems and Leica Microsystems (life sciences segment). Leica Biosystems offers a complete workflow solution for anatomical pathology, including biopsy tissue processors and microtomes (tissue slices), cryostats, staining automation, histology consumables, probes and microscopes.

Beckman Coulter (63% of Diagnostics Revenues)

In 2011, Danaher acquired Beckman Culter to expand diagnostics presence to hospitals and clinical laboratories. Its biomedical testing instruments and consumables are used to analyze patient samples throughout the world, especially China where the company has made inroads (around 1,000 sales and support personnel in China against 200 in 2015). The company sells analyzers for chemistry, immunoassay, hematology, flow cytometry and microbiology as well as urinalysis.

Cepheid (15% of Diagnostics Revenues)

Danaher entered the molecular diagnostics market with Cepheid in 2016, a leading provider of fully-integrated systems for detection of infectious disease for hospitals and clinical laboratories. Cepheid's GeneXpert system is unique in that it integrates sample preparation with real time PCR detection. Through a proprietary closed-cartridge technology, the instrument is available with a broad test menu which includes hospital-acquired infections, critical infectious disease and women's health. In 2018, Cepheid's revenues grew 25% and has gained 3,000 new clients since the acquisition.

Exhibit XVII

Danaher Corp. Diagnostics Acquisition History ($M)

Year	Company	Price ($M)	Sales	EV/Sales	Description
2004	Radiometer	$730	$300	2.4x	Blood gas analyzers in hospitals
2005	Leica Mycrosystems	$550	$660	0.8x	Microscopes used in pathology
2006	Vision Systems	$520	N/A	N/A	Automated systems for tissue processing
2011	Beckman Coulter	$6,800	$3,700	1.8x	Diagnostic systems in hospitals
2012	Iris International	$338	$118	2.9x	Automated urine microscopy
2012	Aperio technologies	N/A	N/A	N/A	Digital pathology solutions
2013	HemoCue	$300	$100	3.0x	Point-of-care tests for glucose, urine alumin and white blood cell count
2014	Devicor	N/A	$170	N/A	Breast Biopsy systems
2016	Cepheid	$4,000	$625	6.4x	Rapid molecular diagnostic systems and tests

Source(s): Bloomberg, Company Filings

Danaher (NYSE:DHR): Environmental & Applied Subsidiaries

WaterQuality: McCrometer

All of Danaher's water quality subsidiaries operate under McCrometer, which develops precision flow meters for liquid, steam and gas flow measurement. Unlike the Life Sciences or Diagnostics segment, acquisitions made are typically smaller, bolt-on acquisitions to supplement McCrometer's current business measures. One of its arms, Hach, manufactures a wide range of solutions that detect and measure the chemical and microbiological parameters of water. Additionally, it operates Trojan Technologies, which manufactures ultraviolet disinfection systems, which disinfect billions of gallons of municipal and industrial water every day. Finally, Chem Treat commercializes industrial water treatment solutions to address corrosion, scaling and biological growth problems in boiler, cooling water, and industrial wastewater.

Danaher's WaterQuality segment has grown its EBITDA margin 15% to 25% since 2005, and through acquisition grew revenues from $350M to an industry-leading $2.5B.

Product Identification: VideoJet

VideoJet is a leading global provider coding and marking solutions, which includes large and small character ink jet printers, laser coding systems, thermal transfer printers and labeling equipment. These printers are used throughout the world to apply variable data to shipping containers, product packages and pallets.

Product Identification: Linx

Linx provides solutions used to give products unique identities by printing date, lot and bar codes by applying alphanumeric codes, logos and graphics to a wide range of surfaces at a variety of production line speeds, angles and locations.

Following the completion of the IPO of its Dental segment, it is very likely that Danaher separates its Environmental & Applied subsidiaries into a standalone entity, which is a project management has alluded to in its 1Q19 earnings call. If so, newly raised capital could play an instrumental role for Danaher to shift capital into aggressive M&A into the biotechnology segments.

Exhibit XVIII

Danaher Corp. Environmental & Applied Solutions Acquisition History ($M)

Year	Company	Platform	Price ($M)	Sales	EV/Sales	Description
1996	McCrometer	WQ	N/A	N/A	N/A	Precision flow meters for liquid, steam and gas measurement
1999	Hach	WQ	$325	$128	2.5x	Analytical instruments, test kits and reagents for water quality
2002	Videojet	PI	$400	$300	N/A	Manufacturer of coding and marking solutions
2003	Willett International	PI	$110	$110	1.0x	Product Identification equipment and consumables
2004	ALLTEC	PI	N/A	N/A	N/A	Laser marking, coding and engrabing
2004	Trojan Tech	WQ	$185	$100	N/A	Water treatment solutions using UV technologies
2005	LINX Printing Tech	PI	$158	$93	1.7x	Coding and marking solutions for batch coding of products
2007	ChemTreat	WQ	$435	$200	2.2x	Industrial water treatment to eliminate corrosion & mineral deposits
2011	FOBA	PI	N/A	N/A	N/A	Precision systems for laser marking and engraving
2011	EskoArtwork	PI	$470	$247	1.9x	Integrated solutions for packaging, sign and display finishing
2012	X-Rite	PI	$625	N/A	N/A	Integrated colour solutions through measurement systems, softwre
2012	Pantone	PI	N/A	N/A	N/A	The Pantone Matching System common colour language
2017	AVT	PI	$100	$63	1.6x	Vision inspection technology to automate quality control in factories
2018	Blue Software	PI	$95	$170	0.6x	Packaging label and artwork management software solutions

*WQ = water quality, PI = product identification

Source(s): Bloomberg, Company Filings

Danaher (NYSE:DHR): Capital Allocation Strategy

Strong Cash Flow Generation

In the last twelve months, Danaher produced $4B in free cash flow, doubling its figures YoY and converting 137% of net income into free cash flow. Despite SG&A costs rising 8% YoY, DHR has begun to expense costs it would have otherwise capitalized, and thus the net change in cash flow is positive.

Danaher has not repurchased stock over the last five years, deciding instead to return cash to shareholders through dividends or capital deployment in acquisitions. Since January 1, 2014, the company has executed $24B in acquisitions. Upon acquisitions, all business segments take ownership of their respective P&L and balance sheet, with performance judged across four critical success areas: organic growth relative to market, organic operating margin expansion, working capital management, and trailing 5-year ROIC. The corporate umbrella manages support services, procurement, human resources and information technology.

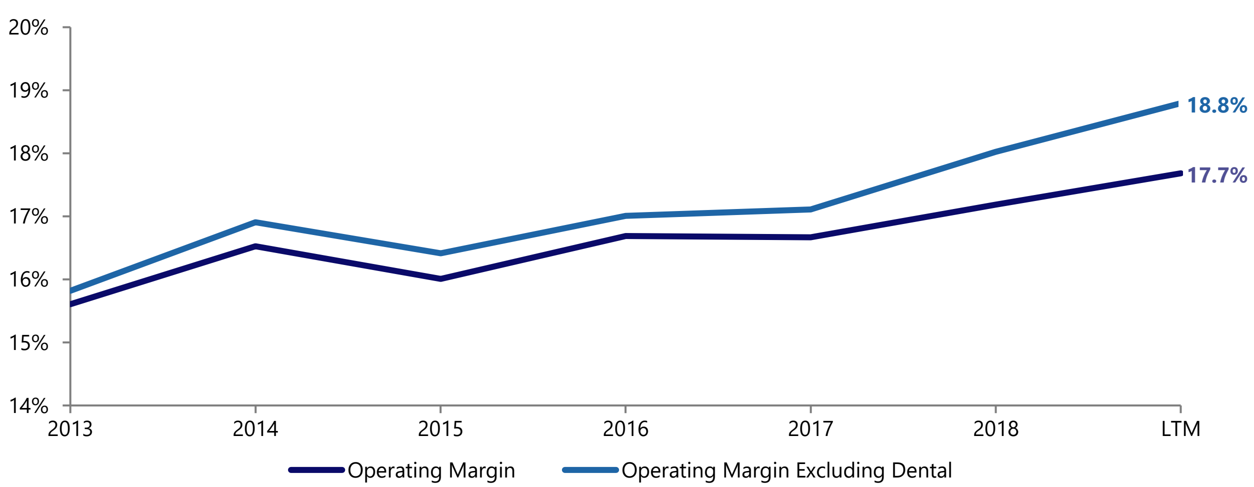
Divestitures

In 2016, Danaher spun out its industrial businesses to form an independent, publicly-traded company, Fortive Corporation (NYSE: FTV) and is planning to spin out its dental business in a similar fashion (NYSE:NVST)

We view Danaher's spin-off to be a strong assessment of management's ability to deploy capital given the platform's relative underperformance over the last few years. Spinning off its business will aid in expanding Danaher's margins for the remaining business (Exhibit XIX). Danaher believes greater shareholder value will be created through the separation of this entity, which can respond quickly to market developments and acquisitions. Long-term growth has been stagnant (~2%) compared to other platforms and it has a slower mix of captive consumables. Around 50% of dental product sales are through a direct channel with distributors utilized by customers for a range of products in North America, while operating a varying business model to that of the remaining three segments.

Exhibit XIX

Danaher Operating Margin Comparison Including and Excluding Dentistry Segment



Source(s): Company Filings

Danaher (NYSE:DHR): Danaher Acquisition Strategy

GE BioPharma Acquisition

On February 25th, Danaher announced it was acquiring GE's Biopharma business for $21.4B, at a 17x EV/EBITDA multiple (20% premium). The deal is to be financed through a $3B equity offering and a new debt issuance. GE Biopharma provides instruments that support research of biopharmaceutical drugs, including chromatography hardware & consumables.

The deal is expected to produce $100M of cost savings within three years. In particular, GE's chromatography is expected to be complementary to Pall's filtration business, providing higher levels of operation efficiency for high-growth applications such as gene therapy projects. Spectroscopy and chromatography are two processes tied together in the value chain. Spectroscopy, Pall's core competency, will detect individual components among a compound, whereas chromatography is the isolation of said compounds into individual components.

In order to finance buyout activities, Danaher raised €6.25B in September at less than 1% interest and another $4B in October. In addition, Danaher had to sell its label-free biomolecular and chromatography business to Sartorius AG for $750M to gain regulatory approval. This symbolizes an exchange for its current chromatography business.

Danaher Business System (DBS)

Danaher's operations, culture, managerial decisions and acquisition performance is defined by the company's "Danaher Business System." Operationally, DBS is similar to the "Toyota Way" with management constantly re-evaluating manufacturing processes.

DBS is run on the basis of improving cost structure by expanding gross margins and lowering G&A as a percentage of sales while reinvesting in top line growth through strong customer relationships. The DBS program is difficult to place a firm value on, but fundamentally represents management's execution on all subsidiaries with five core values: quality of management, customer engagement, continuous improvement, product innovation, and focus on shareholder value. As such, it is representative of the culture developed at Danaher. The culture appears to be well-received, as it was rated 3.5/5 stars out of ~400 reviews on glassdoor (Exhibit XX).

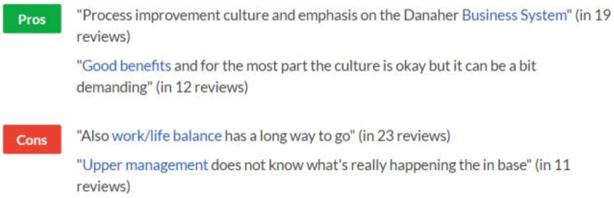
Danaher has sales and service representatives in 60 countries to maintain customer relationships. DBS is designed to allow the sales team to remain accountable with respective call points, and facilitates new integration of businesses. An example is the coordinated selling efforts between Beckman Coulter and Cepheid (Diagnostics) in China. The company integrated Cepheid into Beckman Coulter's customer base, which has expanded Cepheid's top line by 50% since its acquisition in 2015. Additionally, since implementation of Pall in 2016, it has enhanced the productivity of its workforce to expand operating margins by 8%, expecting to realize $350M in cost savings by the end of 2019.

DBS Toolkit

Danaher's Business System additionally includes the DBS toolkit, which is a collection of internal, codified, internal documents on driving growth and sales performance. This program has 25 years of data including thorough application of every acquisition done to date by the parent company. Management prides itself in the ability to swiftly integrate new businesses. Consequently, through DBS, management can make acquisitions of familiar business models with limited downside risk.

Exhibit XX

Danaher Glassdoor Review


Pros

"Process improvement culture and emphasis on the Danaher Business System" (in 19 reviews)

"Good benefits and for the most part the culture is okay but it can be a bit demanding" (in 12 reviews)

Cons

"Also work/life balance has a long way to go" (in 23 reviews)

"Upper management does not know what's really happening the in base" (in 11 reviews)

Source(s): Danaher Glassdoor

Exhibit XXI

Danaher Corp – Operating Unit Organic Growth

Segment	Operating Unit	Estimated Mix	LTM Growth	Product Categorization
Life Science	Pall	50.0%	DD	Spectrometry
	SCIEX	12.5%	HSD	Spectrometry
	Beckman Life Science	12.5%	HSD	Microscopy
	Leica Microsystems	10.0%	HSD	Micrsocopy
	IDT	5.0%	MT	Microscopy
	Molecular Devices	5.0%	N/A	Spectrometry
	Phenomenex	5.0%	N/A	Microscopy
	Total	**100.0%**	**7.5%**	
Diagnostics	Beckman Coulter Diagnostics	62.5%	LSD	Diagnostics
	Cepheid	15.0%	DD	Diagnostics
	Radiometer	10.0%	HSD	Diagnostics
	Leica Biosystems	10.0%	HSD	Diagnostics
	HemoCue	2.5%	N/A	Diagnostics
	Total	**100.0%**	**6.7%**	
E&A Solutions	Videojet	30.0%	HSD	Product ID
	Esko	20.0%	Decline	Product ID
	HACH	30.0%	DD	Water Quality
	ChemTreat	10.0%	MSD	Water Quality
	Trojan	10.0%	HSD	Water Quality
	Total	**100.0%**	**6.50%**	

Legend: LSD- low-single-digit; MSD- mid-single-digit; HSD- high-single-digit; DD- Double-digit; MT- mid-teens

Source(s): Company Filings

Danaher (NYSE:DHR) Key Findings

Through an assessment of DHR's operating units, Danaher's most robust product categories are within the Life Sciences segment, followed by Diagnostics and its Water Quality segment, whereas its Product ID category has begun to see declining sales. As such, the healthcare team favourably views Danaher's decision to further expand in its Life Science segment.

Ultimately, it is most important to monitor Pall's filtration containers and Beckman Coulter's hematology analyzers for a better assessment of Danaher's core segment growth.

Given DHR's diversified product portfolio, proven acquisition strategy and products in the pipeline, DHR is a robust business that will warrant a buy at an attractive entry point.

Evaluation of Med-Tech Space at Large

When assessing Medtronic, Abbott and Danaher, the QUIC Healthcare team decided to adopt a segmented approach to the determination of their outlook. As such, the team has designed a series of criteria that will inform our decision for a further deep-dive on one of the names. These are informed by our industry and company-specific analyses presented in the following report.

In summary, while the medical devices space is undergoing a shift in overall landscape, we believe that this will further benefit the large players in the long run. A visual representation of the analysis we have conducted is shown below. As demonstrated by this assessment, we believe Medtronic and Dahaner warrant deeper dives, which we will pursue in our next report.

Exhibit XXII

Strength of Business Fundamentals of Key Holdings in Medical Devices Space

	Medtronic (NYSE:MDT)		**Abbott (NYSE:ABT)**		**Danaher (NYSE:DHR)**	
	Medtronic		Abbott		DANAHER	
Strength of Current Product Portfolio	Cardiac and Vascular		Established Pharma		Microscopy	
	Minimally invasive therapies		Nutritional (Similac)		Diagnostics	
	Restorative therapies		Diagnostics (Alinity)		Spectrometry	
	Diabetes		FreeStyle Libre		Water Quality	
	Covidien		MitraClip		Product ID	
R&D Strategy						
Accretion of R&D Pipeline	Exhibited through drivers identified on Page 9		Acquisitions complement current product portfolio		Substantial share key segments and aggressive inorganic growth in key markets	
Ability to Integrate Synergies	Exhibited primarily through Covidien and tuck-in acquisitions		Integration of products is smooth without notable issues		DBS System allows for timely, seamless integration within key segments	

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