

February 12, 2020

Cardiovascular Devices

Health Care Sector

Industry Rating

Overweight

Investment Thesis

The Cardiovascular Devices market is a growing industry due to aging population in the United States. Leaders in the market are Medtronic and Abbott with other large competitors including Johnson & Johnson, Boston Scientific Corporation, and Edwards Life Sciences. Through new technology and modern innovation, the market can keep up in the rising demand for cardiovascular treatment. The numbers continue to grow as the population is set to age and become more obese over the next 10 years. For these reasons we are taking an overweight stance on the Cardiovascular Devices market.

Drivers of Thesis

- As the United States population continues to age, more cardiovascular devices will be needed to treat cardiovascular diseases. The United States will see a shift in age demographics as citizens over the age of 65 will reach a record of 20.6% of the population⁸.
- Increase in leading causes of cardiovascular diseases, such as obesity, will lead to increase in demand for cardiovascular devices.
- New innovative technology will simplify cardiovascular procedures and increase the total number of procedures being done because of shorter surgery time and quicker recovery time.
- Penetration into the Asia Pacific market will diversify revenue away from a North American, primarily United States, dominated market.

Risks to Thesis

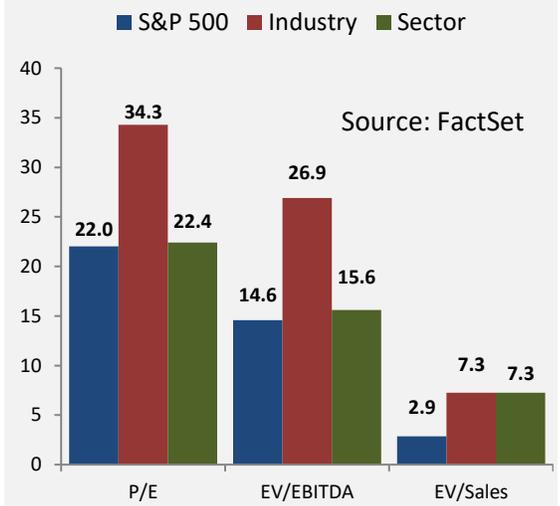
- Fears with the spread of the Coronavirus could send markets into a recession, decreasing procedures and revenues as hospitals and physicians are focused on fighting the disease.
- Cut in Medicare and Medicaid funding by the United States could hurt adults 65+ seeking procedures.

Key Industry Statistics

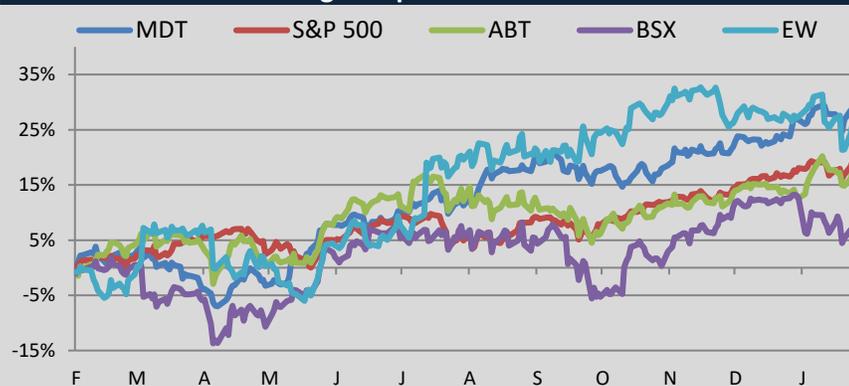
Market Cap	(In \$ Billions)
Johnson & Johnson (JNJ)	\$400.80
Medtronic (MDT)	\$159.43
Abbott Laboratories (ABT)	\$155.30
Boston Scientific Corp. (BSX)	\$58.80
Edwards Lifesciences (EW)	\$48.47

Key Industry Ratios

P/E	34.28x
EV/EBITDA	26.89x
EV/Sales	7.26x
P/Sales	6.8x
ROA	10.56%
ROE	20.06%
ROIC	19.92%



Leading Companies Vs. S&P 500



Industry Description

The Cardiovascular Devices industry is a subsector of the healthcare sector composed of companies that make medical equipment designed to cure cardiovascular disease (CVD). Common devices produced include catheters, ECG's, cardiac monitors, and pacemakers. These products are aimed to prevent strokes, heart attacks, and blood clots while also curing coronary heart diseases.

EXECUTIVE SUMMARY

The amount of cardiovascular diseases is growing due to the aging population and declining health in the United States, which is causing an increase in the cardiovascular devices market.

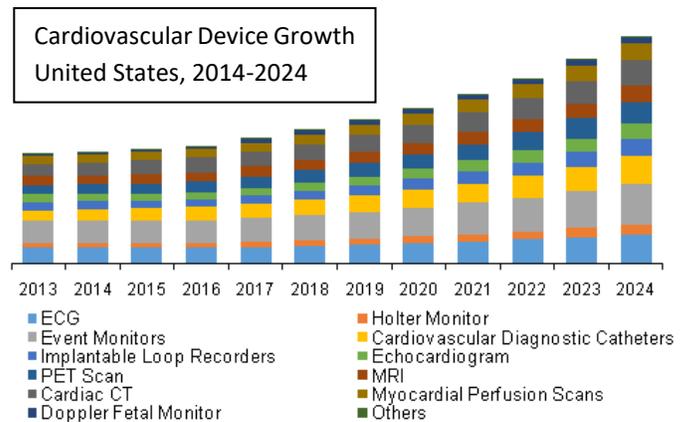
The cardiovascular device market is expected to grow at a CAGR of 6.8% through 2026¹. By 2034, the U.S. is projected to have more adults over the age of 65 than children under the age of 18². Another driver of the industry is the increase in minimally invasive procedures which allow surgeons to operate with cutting open the chest, but rather going through veins and arteries that connect to the heart. This allows for quicker procedures and quicker recovery times for patients³.

The United States dominates the Cardiovascular Devices market with a share of over 50%⁴. The Asia Pacific market is rising rapidly, specifically with China. China is becoming a larger segment due to their aging population, similar to the United States. Because of China’s boom in population from 1950-1980, the population in China is beginning to age and will have more adults 65+ than children under 18 by 2030. This represents an opportunity for increased market expansion⁵.

Our overweight position on the Cardiovascular Devices stems from the increase in age over the population in the United States and China and the need for minimally invasive procedures. We believe that the firms that are best positioned to be successful and grow in this market are the firms that have been the leaders in the industry or have made acquisitions to position themselves into a larger share of the market. Medtronic has been the market leader with the largest sales stemming from Cardiovascular Devices at \$11.5 billion. Medtronic products have worked for physicians and they will continue to be loyal to this brand. Abbott made the acquisition of St. Jude at the beginning of 2017 to acquire their cardiovascular segment. They had not operated in this market but immediately became the second largest competitor and posted sales of \$8.8 billion in 2019 for Cardiovascular Devices. They are one of the best positioned to continue competing at the top of the market because of continued growth since the St. Jude acquisition.

INDUSTRY DESCRIPTION

The Cardiovascular Devices market is set to reach \$69.08 billion by 2026 with a CAGR of 6.8% during the same time period¹. The reason for the strong outlook for this market is due to the need of the Cardiovascular Devices to treat cardiovascular diseases. These diseases include strokes, heart arrhythmia, heart failure, or congenital heart diseases.

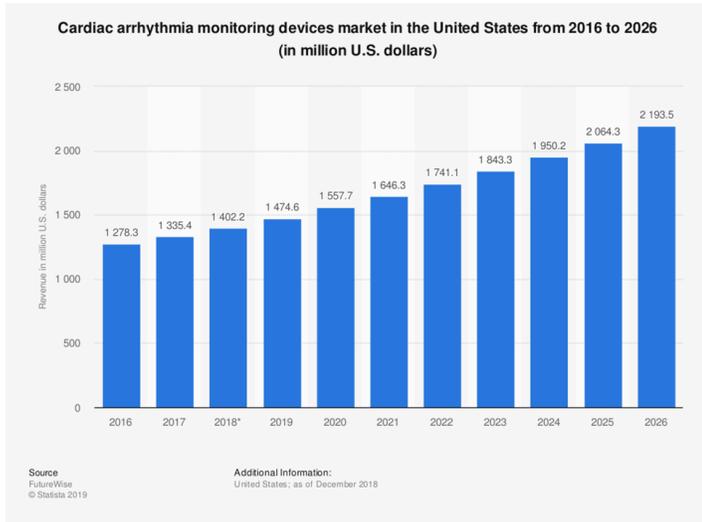


Source: Grand View Research⁶

Above is the breakdown of the products by revenue in the Cardiovascular Devices market. The products that are expected to see the highest growth are Event Monitors, Cardiovascular Diagnostic Catheters, and ECG’s. The two firms that lead the market in Event Monitors and ECG’s are Medtronic and Abbott. Medtronic recorded almost \$7 billion in sales from these products in 2019 and Abbott recorded almost \$4 billion in sales. A comparative breakdown of other competitors in this market will be included in the Competition section.

Heart Arrhythmia

A heart arrhythmia is an abnormal heart rate for an individual. Most heart arrhythmias are harmless to an individual, and they will live with them. However, some can be life threatening and can cause strokes or heart attacks. All heart arrhythmias must be monitored to by medical devices to diagnose severity. Most often, patients without life threatening symptoms will wear the cardiac arrhythmia monitoring device in their everyday life so it can register when the heart has an arrhythmia and record it for the physician to analyze⁷.



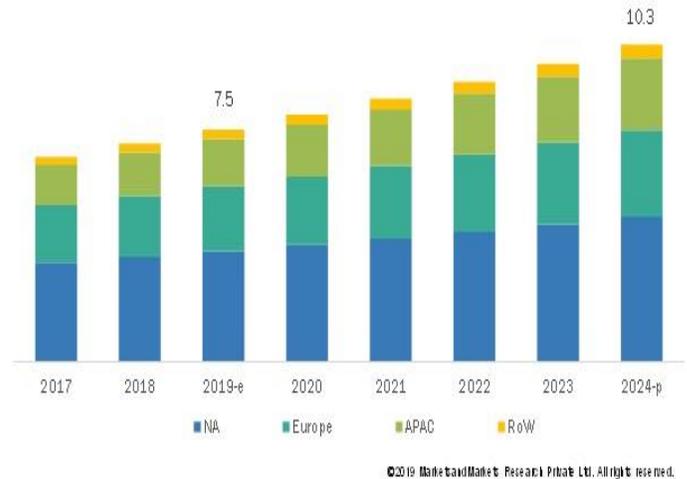
Source: Statista

The graphic above shows the growth in cardiac arrhythmia devices of an implied CAGR of 5.01% through 2026⁸. The high growth for this segment helps create strong growth for Cardiovascular Devices overall. Medtronic is the leader in cardiac arrhythmia devices with over \$5 billion in sales for 2019 compared to Johnson and Johnson with just under \$3 billion and Abbot with \$2.1 billion.

Electrocardiogram

An Electrocardiogram (ECG) allows for physicians to measure heart rates and diagnose on irregularities that may be present. Some of these irregularities can be life threatening if arteries or ventricles are clogged. ECG's are commonly used in practice as it only requires electrical nodes to be attached to the outside skin of a patient's body and no surgery is required. Most companies combine ECG's and cardiac arrhythmia devices into one revenue segment and do not break out them out separately. Medtronic produces the largest sales, historically, in the heart arrhythmia and ECG market and we believe this will continue due to brand loyalty from physicians.

DIAGNOSTIC ELECTROCARDIOGRAPH MARKET, BY REGION (USD BILLION)



Source: Markets and Markets¹⁰

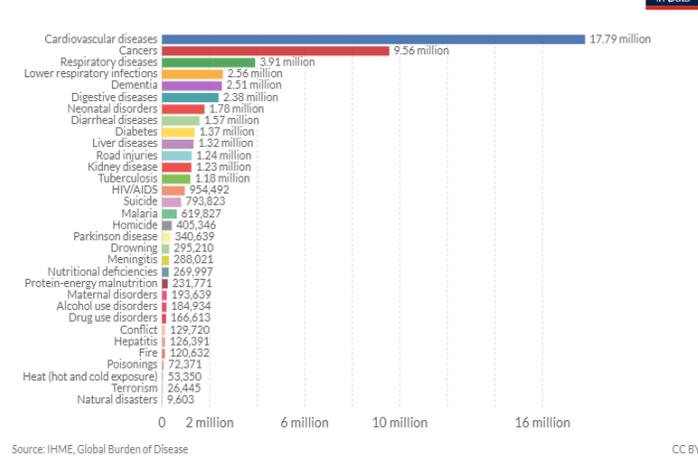
Above is a graph showing the expected rise in ECG per region. With an increasing emphasis on noninvasive treatments for cardiovascular diseases, ECG's will continue to rise in demand at an implied 5-year CAGR of 6.55%⁹.

Catheterization

With obesity rising around the world, led by the United States, increase in the likelihood of strokes and heart failure is increasing. When plaque builds up in the arteries and ventricles leading to the heart, heart failure can occur⁹. To prevent these issues from happening, catheters are used preemptively in individuals showing signs of potential cardiovascular disease along with individuals who have already experienced strokes or heart attacks. Over one million cardiac catheterizations are performed annually, making it one of the most common cardiovascular procedures. A cardiac catheterization is valued at \$57,494 for the total hospital charge¹³. Increasing factors that lead to catheters being needed, paired with increasing healthcare costs, shows the market for catheterizations is going to continually increase and create high revenue for the medical companies supplying the devices.

Increase in Cardiovascular Disease

Number of deaths by cause, World, 2017



Source: Our World in Data¹¹

The graph above shows the causes of deaths around the world for 2017, published in 2019. The reason cardiovascular disease is almost doubling the next highest death rate is due to high blood pressure and smoking. These are the two leading death factors and the two leading causes of cardiovascular diseases. As technology innovations for Cardiovascular Devices continues to advance, they will be able to slow the marginal rate of deaths due to cardiovascular diseases. This will increase the value of the market and allow it to continue increased growth¹¹.

In the United States, 47% of Americans have one of the three leading risk factors for cardiovascular diseases. These include high blood pressure, high blood cholesterol, and smoking¹². High blood pressure and high blood cholesterol are both directly linked to obesity, which is steadily rising in the United States. The number of people diagnosed with cardiovascular diseases is going to continue to increase which will continue to expand the Cardiovascular Devices market.

RECENT DEVELOPMENTS

The Cardiovascular Devices market is becoming more competitive as new entrants try to penetrate that market and take market share away from some of the large competitors. One company that is smaller than the others and has penetrated the Cardiovascular Device market through specialization is Edwards Life Sciences and their Transcatheter Aortic Valve Replacement (TAVR) which generates over \$2 billion in sales for 2019, the largest out of the 5 main competitors. Because of this, the healthcare companies are being forced to spend a lot of money on research and development to create more innovative practices. The landscape is shifting to minimally invasive therapies that speed up the surgery process on the cardiovascular system.

Demand for Quality

The healthcare industry is shifting from traditional fee-for-service (FFS) to a value-based care (VBC). The reason for this is that fee-for-service focused on quantity of patients seen and treated and charged based on total numbers. This creates moral hazard to some who feel the patients were not in the best interest of the providers. Now, value-based care is being implemented which focuses on the quality of care for the patient. Health care providers are under pressure to perform quality care that produces results for patients and keeps them from repeated visits and tests. This change is putting pressure on the individual MedTech companies because it is forcing product innovations. The increase in product innovation will make the market for Cardiovascular Devices more competitive and there will be an increase on research and development spending.

Product and Surgery Innovation

With the changing landscape in payments to a value-based care, companies in the Cardiovascular Devices market are being pressured to create new technology for treatment.

An example of this is Medtronic with their new TAVR Heart Valve. This procedure creates a synthetic heart valve that can replace a failing or diseased heart valve and act as a health heart valve for the patient's body. This minimally invasive procedure helps cut down on recovery time for the patient and the time needed to perform the surgery¹³. Many other companies are taking similar approaches as Medtronic to fit the new value-based care mold. A

common trend in the market is heading towards innovative technology that works and reduces patients time in the hands of a physician. This is positive for the market because it will make procedures that once took a lengthy time period to plan, execute, and recover will be done much quicker. More consumers will engage in procedures they once hesitated from as they become more common.

MARKETS AND COMPETITION

INDUSTRY TRENDS

Positive Outlook

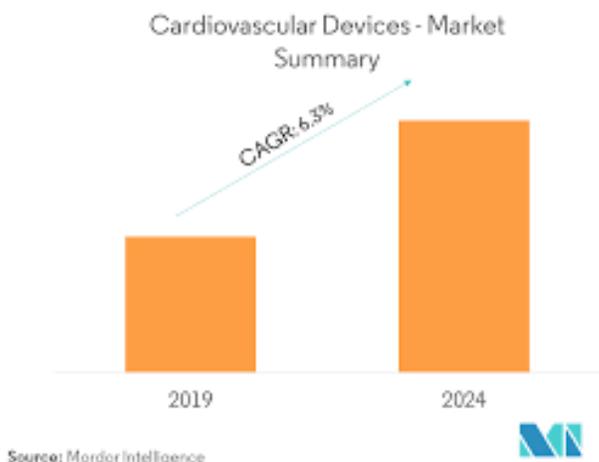
The Cardiovascular Devices industry is trending upwards. In the graph below, it is forecasted that the Cardiovascular Devices Market revenue is set to grow at a 5-year CAGR of 6.3% until 2024, which can be seen in the graph below.

Barriers to Entry

The Cardiovascular Devices market is dominated by the top companies that rely on tough barriers of entry to maintain market control and keep a high concentration. Having access to the latest technology through funding and economies of scale are two of the biggest reasons that it is difficult to enter this market. The other factor that restricts entry is loyalty of product from health care providers to individual brands. With the increase in value-based care, providers are not open to switching when they have products that yield high results.¹⁴

Competition

The competition within the Cardiovascular Devices market is highly concentrated between industry leaders Medtronic, Abbott Laboratories, Boston Scientific Corporation, Edwards Life Sciences, and Johnson & Johnson. The reason for the high competition is the acquisition level in the industry is very high. Many new developers look to create niche products that could compete with what the larger companies are doing. These large companies then use excess capital to absorb them into their own profiles. An example of this is Abbott Laboratories with St. Jude Medical. St. Jude Medical was a top competitor in the Cardiovascular Devices market until they were acquired by Abbott on January 4th, 2017. The acquisition was directly targeted for the products of St. Jude, such as Cardiac Monitors and Coronary Stents. This propelled Abbott to be in direct competition for the number one spot with Medtronic.¹⁵ This trend is very likely to continue as these companies will continue to grow larger, giving them more resources to purchase emerging players in the market.

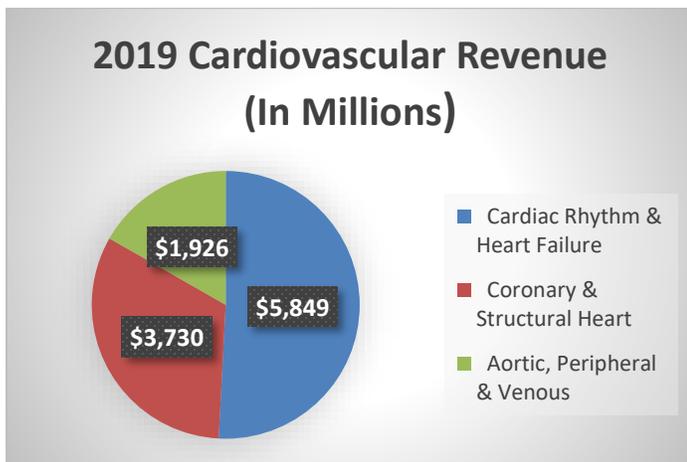


Total healthcare spending is also expected to increase from 2020-2024 at a CAGR 2.94%, this is an uptick from 2015-2020 which grew at a rate of 2.57%. This value of healthcare spending is set to grow over \$500 billion from 2020-2025²³. This upward trend in revenue and spending is derived by living in a society that is growing older and becoming increasingly unhealthy.

Medtronic

Medtronic is the largest players in the Cardiovascular Devices market with the second largest overall market cap and the highest revenues for Cardiovascular Devices. Headquartered in Dublin, Ireland and operated out of Fridley, Minneapolis, Medtronic is a healthcare equipment company that generates 37.65% of sales from its Cardiac and Vascular Group and another 27.77% from its Minimally Invasive Therapies Group.¹⁶ Medtronic has a hold of 39.5% on the medical device manufacturing

industry because they also produce products to cure diabetes and spinal conditions.¹⁵

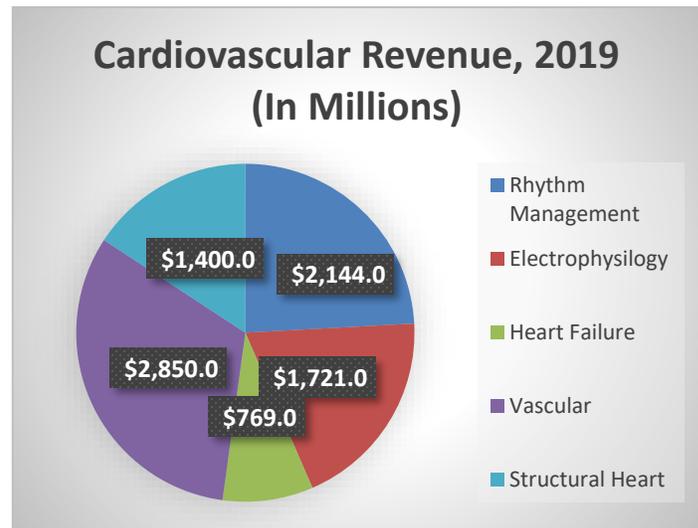


The graph above shows the Cardiovascular segment of the Medtronic Portfolio which generated \$11.5 billion in revenue for 2019. Medtronic covers most all products that fall in the Cardiovascular Device market, with cardiac rhythm & heart failure products being their largest revenue stream and the company’s focus. We believe that cardiac rhythm & heart failure products, such as heart arrhythmia devices and ECG’s, will be the highest growing product moving forward and that will allow for Medtronic to continue to lead the Cardiovascular Device market.

Recently, Medtronic acquired Stimpagen LLC for an undisclosed amount to boost their spinal care portfolio. Medtronic had made other small acquisitions over the last year, but none that showed large value.¹⁷ Medtronic will continue to be on top of the Cardiovascular Devices industry due to their innovative edge and large market share. Further acquisitions could allow them to separate from Abbott Laboratories as a clear leader.

Abbott Laboratories

Abbott Laboratories is a health care company based outside of Chicago, Illinois that specializes in cardiovascular products, diagnostics, and pharmaceuticals. Abbott has a product line similar to Medtronic with their cardiovascular diseases and diabetes treatments. Abbott generated \$8.8 billion in revenue within the Cardiovascular Device market, making them the second largest player in this sector.



The graph above breaks down Abbott’s cardiovascular revenue for 2019. They break out their subsegments more than Medtronic, however, the Rhythm Management, Electrophysiology, and Heart Failure segment would be comparative to Medtronic’s Cardiac Rhythm & Heart Failure segment. These segments include the heart arrhythmia devices and ECG’s, which we expect to grow at the highest rate among devices.

Abbott took a major leap forward in the Cardiovascular Devices market with their acquisition of St. Jude Medical in 2017. This acquisition gave them growth of 69.3% in 2017 and have high growth projected through 2022.¹⁴ Because of this large acquisition, Abbott is positioned to be one of the largest companies in the sector and compete with Medtronic at the top for new innovation and top revenue earnings. The two companies will help drive the market forward.

Boston Scientific

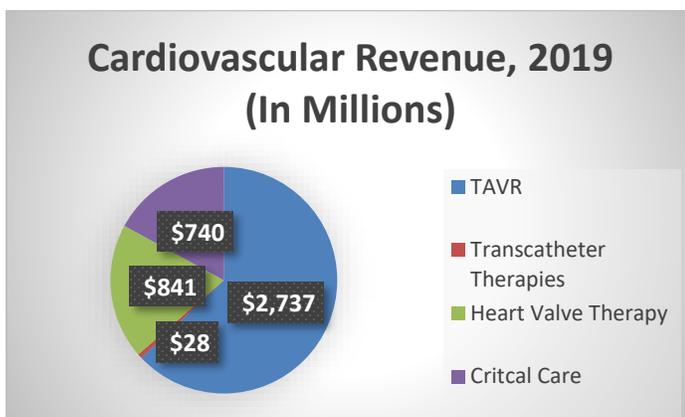
Boston Scientific is a healthcare equipment company headquartered outside of Marlborough, Massachusetts. Boston Scientific specializes in Cardiovascular Devices with their Cardiovascular segment and their Rhythm Management segment. Together these segments make up about 70% of the company revenue, \$6.81 billion.¹⁷

Boston Scientific has continually made acquisitions to broaden their portfolio, their most noticeable being the acquisition of BTG Plc, which closed in August of 2019. This acquisition was to increase their pharmaceuticals product, essentially adding their entire pharmaceuticals portfolio through the acquisition worth \$4.2 billion.¹⁷ Strong growth

from Boston Scientific through the acquisition of BTG will increase revenues for the company as a whole and allow them to continue competing with Medtronic and Abbott by being able to invest in research and development.

Edwards Life Sciences

Edwards Life Sciences is the smallest of the competitors with a market cap of \$48.4 billion. Based out of Irvine, California, Edwards Life Sciences focuses only on cardiovascular devices, and specifically, their Transcatheter Aortic Valve Replacement (TAVR) devices. Out of the \$4.3 billion the company did in sales in 2019, \$2.7 billion came from their TAVR devices. The graph below shows the company sales breakdown.



Edwards Life Sciences generates all of their profit from Cardiovascular Devices but is still one of the smallest firms in the market. However, they are one of the leaders in transcatheter products and will remain competitive because they have found their niche. Because there is so much M&A action in this market, we think Edwards Life Sciences could be bought out by one of the bigger companies in the market to immediately boost their cardiovascular devices portfolio.

Johnson & Johnson

Johnson & Johnson is one of the largest healthcare companies, with a market cap of \$400.80 billion, and has a massive portfolio spanning across multiple sectors. Johnson and Johnson is a competitor in the Cardiovascular Devices market with their heart arrhythmia devices and their catheters. In 2019, Johnson & Johnson generated almost \$3 billion of their \$82 billion from heart arrhythmia and catheter devices. Out of all the companies, Johnson & Johnson's portfolio is least focused on this market, but they still have a presence and ability to compete with any

of the other top companies, like Medtronic. It will be very important to watch Johnson & Johnson to see if they look to make any acquisitions to expand their portfolio in this segment. Because of their size and AAA debt rating, Johnson & Johnson has the ability to make a big move to immediately boost their portfolio size from more than just catheters and arrhythmia devices. If they do make an acquisition, we believe they will be one of the biggest competitors with Medtronic and Abbott.

ECONOMIC OUTLOOK

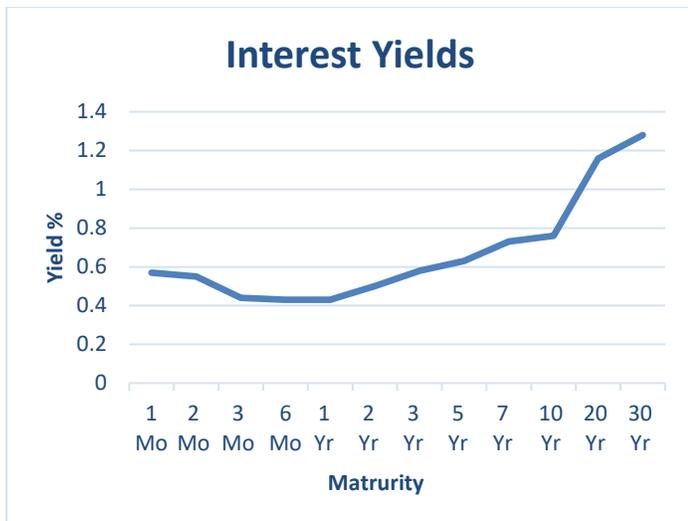
Coronavirus

The coronavirus that began in Wuhan, China, has shifted markets and taken over headlines globally. The deadly virus has no known cure, and no one has a grasp on how it is spreading. The disease has caused a lockdown on Wuhan and other Chinese cities, along with factories and business shutdowns and travel cut off by major airlines. This has caused major supply chain disruption and businesses to close stores all together in the region.

A stop of the spread in the Coronavirus will keep investors confident, and markets will continue to do well as they have during the decade long expansion. However, if the Coronavirus continues to spread without an ability to contain it, it could cause major disruption globally and send markets further down. This could affect the market for Cardiovascular Devices because physicians and hospitals will become focused on fighting the virus and not about doing medical procedures like cardiovascular procedures. This could hurt growth in the short-term for the market.

As of February 11th, the Coronavirus has marginally decreased in number of new cases. President Xi of China has been optimistic recently in the ability for China to stop the spread of the disease. This will help markets globally, and regionally in China.¹⁷

Interest Rates



The current yield curve is inverted which can be a signal that the economy is headed towards a recession²⁰. This is significant for a medical device company because it could affect the number of overall procedures being done if consumers have less disposable income. This could be problematic for the companies operating in the Cardiovascular Devices market because a lot of these companies carry a lot of debt. The debt accumulates from the large number of acquisitions that have been made across the industry. If an economic downturn came and revenues were to decline, upcoming debt payments could really hurt companies. It will be very important to monitor the economy and debt payments for companies covered in this sector.

Unemployment

Unemployment affects the number of people that can receive and afford expensive medical procedures. The United States has hit record numbers of unemployment and the latest job call, Friday, February 7th, showed continued growth in payroll employment. Strong employment numbers run parallel with a strong economy, giving a positive outlook for a stable and growing economy moving forward²¹.

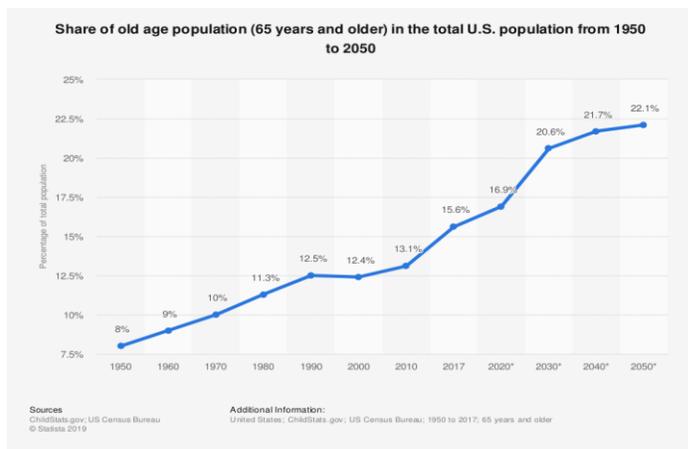


Source: FRED²¹

CATALYSTS FOR GROWTH

Aging Population Growth

The Baby Boomer generation is aging and will become the largest generation of senior citizens at one time. For the first time in United States history, there is projected to be more adults over the age of 65 than children under the age of 18.²

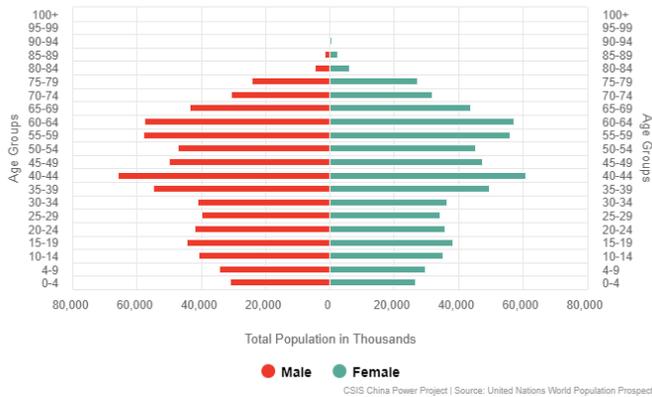


Source: Statista

The above graph shows the rise in adults over the age of 65 until 2050 relative to the rest of the population. This is important for the economic outlook of this industry because cardiovascular disease is most prevalent in adults over the age of 65. In the shorter term, between 2020 and 2030, the population above the age of 65 is expected to grow by almost 5%. This is the largest expected increase over any 10-year period, and a strong driver in our bullish outlook on the Cardiovascular Devices industry.

China is seeing similar aging to the United States because they had an exponential boom in babies from 1960-1980 and then implemented government regulations to slow childbirth.

Population History and Projections for China



Source: Csis.org¹⁸

Asia Pacific is an emerging region for the Cardiovascular Devices market and will be driven significantly by China and their large population. The above projection looking forward to 2030 shows that with China’s aging population, they will experience an increase in cardiovascular diseases that are similar to the United States. This trend will help expand the market and help push growth through from 2020-2030¹⁸.

Increase in Obesity

Increase in obesity can cause increase in high blood pressure, one of the leading factors of cardiovascular diseases and a driver for an increase in the demand for cardiovascular devices. 42.8% of Americans between the age of 40-59 are considered obese and 41% of adults aged 60 and over are considered obese. These numbers are predicted to grow to almost 50% by 2030 and the number of sever obesity is expected to rise to 24.2% in the United States²². The increase in obesity, especially among the 60+ demographic, will be a key catalyst to monitor. The projections show more cardiovascular diseases which will drive higher revenues within the market.

INVESTMENT POSITIVES

- Increase in aging population caused by the maturing baby boomers will cause more cardiovascular diseases, increasing demand in the market.
- Increase in obesity among the entire population will cause an increase in cardiovascular diseases.

- New innovative products will help create minimally invasive procedures. This will increase the number of procedures being done by shortening the total time they take.
- Penetration into the Asia Pacific market where an aging Chinese population can help drive revenues into the North American dominated industry

INVESTMENT NEGATIVES

- Fear of the Coronavirus could send markets into a recession which would decrease the number of procedures being done and hurt revenue earnings within the market.
- Potential cuts in Medicare and Medicaid spending by the government in the future could hurt healthcare companies and the healthcare market overall.

KEYS TO MONITOR

It will be important to measure the continued growth of obesity levels and cardiovascular diseases in the United States, as they are the two of the big drivers of the overweight holding. Another key metric to follow will be the federal funds rate and inflation. With these companies holding so much debt, it is important that inflation does not begin to rise, but rather stay stable. It will be important to follow the FOMC actions and their handle on controlling inflation.

Another key monitor will be the 2020 United States presidential election. With democratic nominees proposing Medicare for all plans and some radical changes to the healthcare landscape, it will be important to monitor how the markets react to changing news and how the election turns out. It will also be key to monitor the house and senate races. Right now, the house is controlled by the democrats and the senate is controlled by the republicans. If this political gridlock continues, it will be good for stable overall markets, which is a positive for the Cardiovascular Devices market.

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