Medtech Moat Review Reveals Importance of Switching Costs

In medical technology, intangible assets form a moat's base, but switching costs typically determine a moat's width.

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Contents

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Executive Summary

We have reviewed the moat ratings on five medical technology companies: Agilent, Baxter, Danaher, Illumina, and Waters. These companies have dug moats through intangible assets and customer switching costs, in our opinion. Intangible assets, including the ability to develop patent-protected products, remain essential to attracting customers, but the switching costs that medtech firms layer on top of their differentiated product sets typically determine their moat width. The strongest switching cost on this list relates to the life science tools that get specified in the regulatory documents of a drug's manufacturing process, and demand for those tools can last for as long as a drug remains relevant. However, contractual relationships and razor/razor blade business models built into the life of an installed system can create customer switching costs, too.

Key Takeaways

- Medical technology firms typically dig moats through intangible assets and customer switching costs.
- Intangible assets remain an important moat source, and when we see an ongoing ability to innovate to remain relevant in their target markets, we usually give medtech firms credit for this moat source, although intangible assets in isolation usually are not enough to dig a moat.
- On top of intangible assets, the durability of customer switching costs usually determines the width of a medtech firm's moat: none if limited, narrow if moderate, and wide if long. All the firms below enjoy moderate to long switching cost durability that corresponds to narrow and wide moat ratings.
- While four of the five companies below kept their previous moat ratings in our review process, we have increased our moat rating on Danaher to wide from narrow previously after considering its substantial switching cost durability, which puts it more in line with other wide-moat medtech companies. We moderately increased our fair value estimate on Danaher related to this higher moat rating, as well.
- From a valuation perspective, Baxter remains significantly undervalued in our opinion, while Danaher also appears moderately undervalued on a price/fair value basis.

Exhibit 1 Medtech Moat Review

Company	Ticker	Moat Rating	Price	Fair Value	Price to Fair Value	Durability of Switching Costs in Years	Key Switching Cost Sources
Waters	WAT	Wide	$378	$340	1.11	17	Spec'In + Equipment Life
Agilent	A	Wide	$139	$151	0.92	15	Spec'In + Equipment Life
Danaher	DHR	Wide	$235	$285	0.82	12	Spec'In + Equipment Life
Illumina	ILMN	Narrow	$143	$144	0.99	7	Equipment Life
Baxter	BAX	Narrow	$30	$62	0.49	5	Equipment Life + Contracts

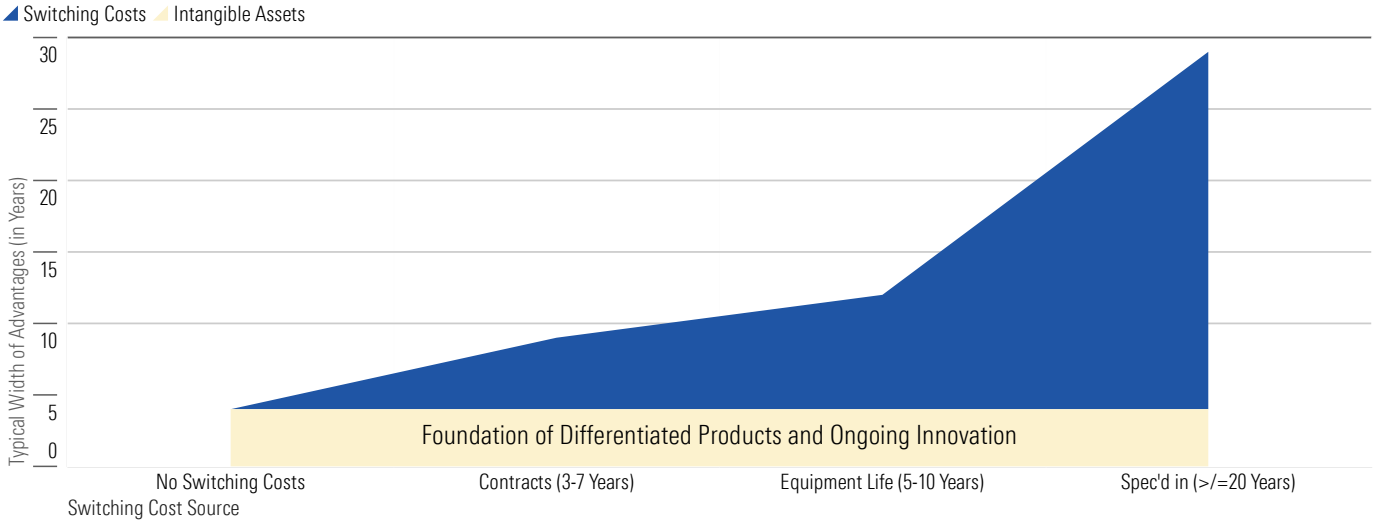
Source: Morningstar as of Dec. 13, 2024.

Medtech Firms Typically Dig Moats With a Combination of Intangible Assets and Switching Costs

Most of the medical technology firms that we cover dig economic moats through intangible assets and switching costs as the key moat sources. In general, the firm's intangible assets—the ability to develop differentiated products covered by patents—are required to get noticed by customers at least initially and to remain relevant in future product cycles. However, the switching costs that medtech firms layer on top of those intangible assets typically determine the moat width of medtech firms—none if switching costs are limited, narrow if switching costs are moderately long, and wide if switching costs are very long. This dynamic is highlighted in the exhibit and descriptions below.

Exhibit 2 Medtech Moat Width Potential Typically Varies by Switching Cost Durability

In Years



Source: Morningstar as of December 2024.

- Intangible Assets

  First, a medical technology firm must develop a product that meets an unmet need to attract demand from end users, which often includes biopharmaceutical firms in life sciences and caregivers in diagnostics and basic medical supplies, on this list. While medtech products often have patent protection for 20 years that keeps competitors from directly copying specific features—which can be important in these precise scientific end markets—medtech product cycles typically only range from three to five years in the companies below, or much shorter than a patent's length. That product cycle length is what we focus on when trying to determine the part of a medtech firm's moat width that is associated with the intangible assets of a medtech firm, assuming we think the firm can continue innovating and introducing new medtech products.

- Switching Costs

  Medtech firms tend to layer switching costs on top of their intangible assets, too, and the durability of those switching costs usually determines the moat width of medtech companies, including the following in the companies highlighted in this report:

  - The most durable switching cost that we see in life sciences is when a tool is specified as part of the drug manufacturing processes on file with the various regulatory agencies around the world, such as the US Food and Drug Administration. Once a drug's manufacturing process is set, drug manufacturers typically do not want to spend more time, invest more money, or face additional regulatory scrutiny to reopen the drug's application just to switch out a specific life science tool, especially since one life science tool typically represents a very small percentage of the cost to manufacture a drug. In fact, most life science tools spec'd into the production of a drug enjoy demand for the relevant lifetime of that drug including branded, generic/biosimilar, over-the-counter, and other versions of the molecule, which amounts to well to over 20 years on successful drugs. For example, Waters tools are still being sold on each batch of Tylenol, which was approved by the FDA in the 1950s.
  - The useful life of equipment often indicates how long related sales—typically dedicated consumables and contracted maintenance services—will continue, if customers want to keep using their installed equipment. Usually, it is cheaper just to keep using an installed system than to buy a competitive system, and the useful life of equipment typically ranges between five and 10 years.
  - Contractual agreements—such as multiyear group purchasing organization contracts that guarantee a minimum level of demand from customers—can create switching costs for at least that period and often longer as many incumbent suppliers are included for multiple contract periods.

  To determine the durability of a company's switching cost moat source, we identify the most relevant switching cost source for each business segment or end market of a company. Then, we estimate how long that switching cost is likely to last for each segment or customer base. Then, we weight each segment's switching cost durability by the segment's portion of total revenue to get to the company's estimated switching cost durability for the company overall.

  For example, we use the customer end markets that Waters targets to estimate its overall switching cost durability, which we estimate at 17 years. That overall switching cost durability estimate for Waters multiplies 57% of the firm's revenue from biopharmaceutical clients by 25 years because those tools are typically spec'd into the manufacturing process of a drug, which can have very long relevant lives, plus 43% of revenue from other clients multiplied by seven years, or the typical useful life of Waters' analytical instruments during which the firm can derive service and consumable sales. Adding those weighted figures together gets to 17 years of overall switching cost durability for Waters.

Exhibit 3 Waters Switching Cost Durability Example

End Market	Biopharmaceuticals	Other	Total Company
% of Total Revenue	57%	43%	
Switching Cost Source	Spec'd In	Equipment Life	
Switching Cost Durability (in Years)	25	7	
Revenue-Weighted Switching Cost Durability	14	3	17

Source: Morningstar as of December 2024.

The following exhibit summarizes the key moat-related information for the five medtech companies covered in this report, ranging from Waters on the wider end of the moat spectrum down to Baxter on the narrower end, with durability of switching costs ultimately determining the moat width of each firm.

Exhibit 4 Medtech Moat Summary

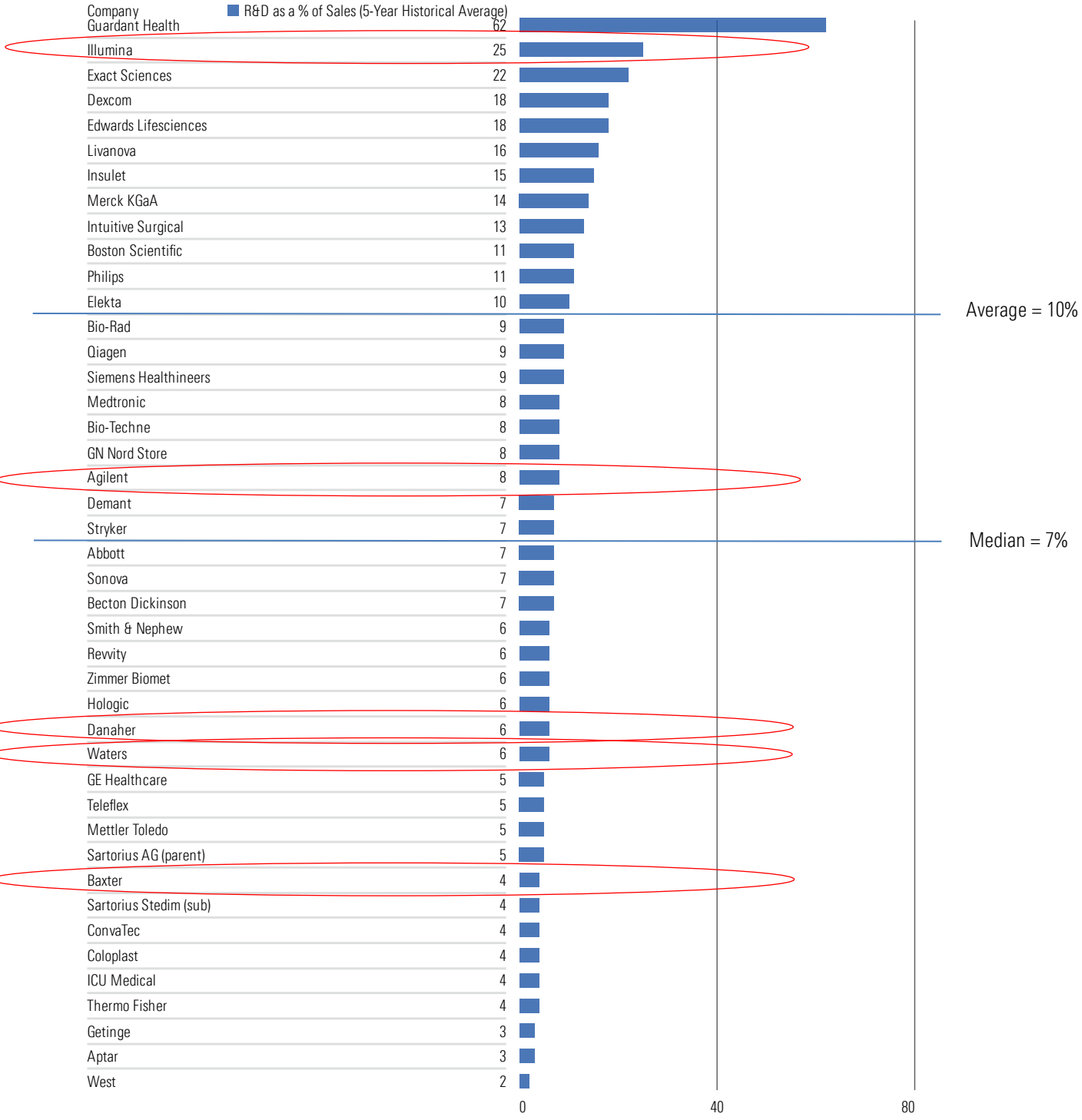
Company	Ticker	Moat Rating	Year 5e ROIC	Year 5e WACC	Durability of Switching Costs in Years	Key Switching Cost Sources
Waters	WAT	Wide	30%	7%	17	Spec'In + Equipment Life
Agilent	A	Wide	27%	7%	15	Spec'In + Equipment Life
Danaher	DHR	Wide	14%	7%	12	Spec'In + Equipment Life
Illumina	ILMN	Narrow	21%	9%	7	Equipment Life
Baxter	BAX	Narrow	13%	8%	5	Equipment Life + Contracts

Source: Morningstar as of December 2024.

Deeper Dive Into Intangible Assets

Intangible assets are a core building block of medical technology firms. However, unlike biopharmaceutical firms, medtech firms often focus on innovation that is evolutionary, rather than revolutionary. As long as a medtech firm's existing technology doesn't fall too far behind competitive options, the various switching costs that typically surround the technology can usually keep customers in the fold for multiple years while the firm develops a product with features similar to competitors'. However, ongoing innovation is required to succeed in the long run, and medical technology companies need to keep investing in new product development to remain relevant to customers, which can be seen by their ongoing research and development investments that were 10% of sales on average and 7% of sales at median over the past five years in our medtech coverage universe. The companies reviewed in this report are circled in red below. Notably, R&D requirements differ by their target markets, but in general, we believe these firms have the ability to continue innovating to remain relevant in their target markets, which informs our view that they all have an intangible asset moat source.

Exhibit 5 Medtech Innovation and R&D Intensity
R&D as a % of Sales (2018-23 Average)



Source: Morningstar analysis of company reports as of December 2024.

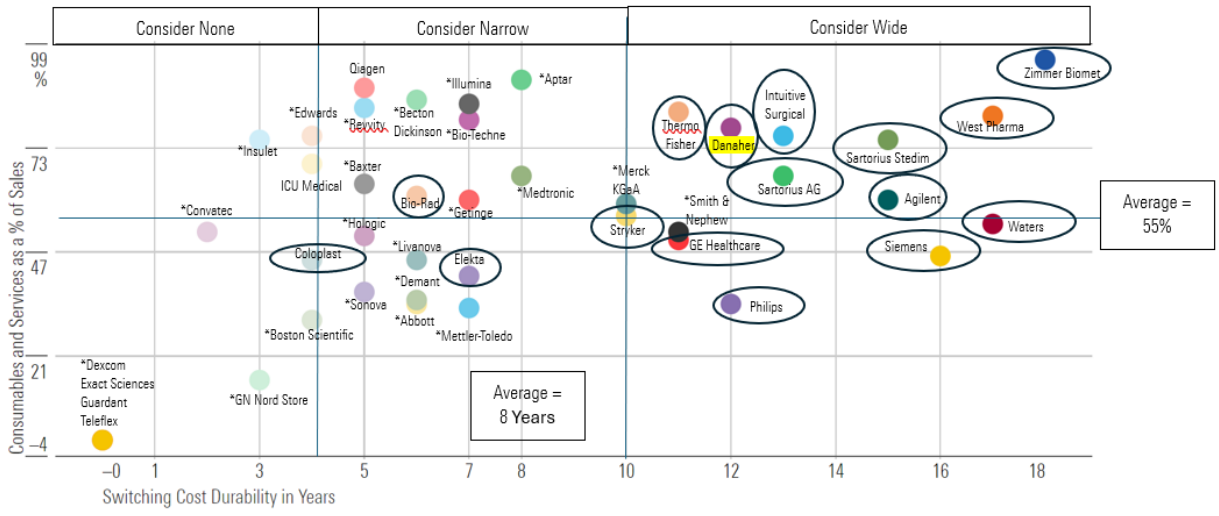
Deeper Dive Into Switching Costs

The key correlating factor for moat width in the medtech industry appears to be switching cost durability for customers, which we measure in years, as shown below. In our coverage universe, most wide-moat companies have switching cost durability of at least 10 years, narrow-moat companies typically have at least four years of durable switching costs, and no-moat companies typically have limited switching costs.

We have also examined recurring revenue streams as an indicator of moat width since razor/razor blade business models often arise when customer switching costs are present. While we continue to appreciate razor/razor blade business models, recurring revenues as a percentage of sales ultimately appear less indicative of moat width, in our opinion. For example, Waters enjoys some of the most durable switching costs that we cover in medtech, but it sells a lot of instruments rather than consumable/services. While instrument sales can be delayed in uncertain times, eventually those instruments must be replaced by customers, especially biopharmaceutical firms, who avoid changing workflows because of regulatory or reproducibility concerns.

After considering the above factors and where these companies rank in terms of switching cost durability below, we think Danaher deserves a higher moat rating (wide up from narrow). Its previous narrow moat rating looked low relative to other medtech firms, especially its closest life science/diagnostic peer, Thermo Fisher (wide moat), which has a similar business model, mergers and acquisitions strategy, and switching cost durability as Danaher.

Exhibit 6 Switching Cost Durability in the Medtech Industry



Circled = Wide Moat
* = Narrow Moat
Blank = None

Source: Morningstar as of December 2024.

Moat Ratings by Company

Agilent (Wide Moat)

Exhibit 7 Agilent Moat Summary

Company	Ticker	Moat Rating Proposed	Year 5e ROIC	Year 5e WACC	Durability of Switching Costs in Years	Key Switching Cost Sources
Agilent	A	Wide	27%	7%	15	Spec'In + Equipment Life

Source: Morningstar as of December 2024.

Profile

Originally spun out of Hewlett-Packard in 1999, Agilent has evolved into a leading life science and diagnostic firm. Today, Agilent's measurement technologies serve a broad base of customers with its three operating segments: life science and applied tools, cross lab consisting of consumables and services related to life science and applied tools, and diagnostics and genomics. Over half of its sales are generated from the biopharmaceutical, chemical, and advanced materials end markets, which we view as the stickiest end markets, but it also supports clinical lab, environmental, forensics, food, academic, and government-related organizations. The company is geographically diverse, with operations in the US and China representing the largest country concentrations.

Exhibit 8 Agilent Segment Analysis

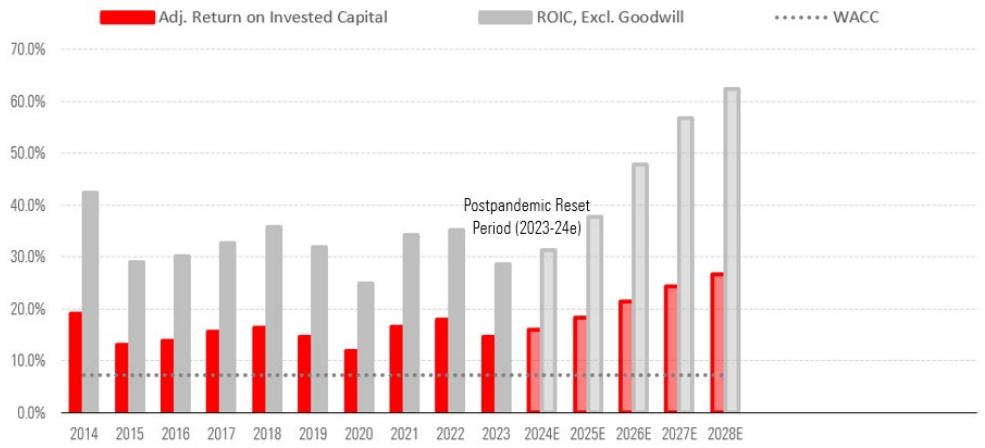
Segment	Moat	Moat Sources	% of EBIT	% of Revenue	Operating Margin
Biopharmaceuticals	Wide	IA, SC	na	36%	na
Chemicals/Advanced Materials	Wide	IA, SC	na	23%	na
Other	Narrow	IA, SC	na	41%	na
Consolidated	Wide	Intangible Assets/ Switching Costs	100%	100%	20%

Source: Morningstar as of December 2024.

Moat Rating

We believe a wide moat surrounds Agilent's analytical instrument business, consisting primarily of chromatography (gas and liquid), mass spectrometry, and other testing tools. Intellectual property and ongoing innovation create an intangible asset moat source while regulatory and reproducibility factors contribute to switching costs for end users. Both moat sources are crucial to Agilent's ongoing advantages in its target markets, and Agilent enjoys strong returns on invested capital including goodwill of more than double its capital costs, by our calculations. Additionally, from an environmental, social, and governance perspective, Agilent faces limited risks that would not affect our wide-moat view of the firm. In fact, it is one of the few companies in healthcare that could benefit from ESG-related efforts to exercise quality controls on the products humans ingest, such as food, water, and pharmaceuticals.

Exhibit 9 Agilent ROIC History and Projection



Source: Morningstar as of December 2024.

Intangible Assets

Agilent offers differentiated technology that is protected by various intangible assets, including patents, copyrights, and trademarks. This portfolio of intellectual property and its innovation prowess in chosen fields keep competitors from directly copying its technology. Since even slightly differentiated technical features can cause an end user to prefer one tool over another similar tool in Agilent's precise scientific end markets, we see intangible assets around its differentiated technology as a significant moat source. The differentiated properties of Agilent's tools affect the performance, accuracy, and speed of the various research projects they enable, and differentiated product features create intangible assets that inform decisions to use those tools in specific applications, particularly at the beginning of a project. In order to remain relevant to scientists in early project phases, Agilent must continue to innovate, and we believe its ongoing innovation also contributes to its intangible assets in this business. Agilent has significant incentive to develop new products that contribute to positive mix benefits, although it enjoys some like-for-like pricing power as well.

Switching Costs

- Analytical Instruments

After the initial choice of tools based primarily on intangible assets, Agilent benefits from substantial switching costs in most of its end markets. For example, roughly 35% of Agilent's revenue is generated from the development and manufacturing of biopharmaceuticals, which is an extremely sticky business, which can be seen in the exhibit below. In this end market, Agilent's analytical tools are critical components of the production methods for various drugs, which are specified directly in each molecule's regulatory approval application. Regulators require the same production method throughout a drug's lifecycle, and any changes to the manufacturing process, including the quality assurance and quality control tests often performed on Agilent's tools, would require time, money, and additional regulatory scrutiny to reopen a drug's application to receive approval from regulators to change that process. Those regulatory requirements, as well as reproducibility concerns such as employee training and learning

curves, create highly durable switching costs for biopharmaceutical customers that result in a very long potential benefit period for Agilent in this highly regulated market. For branded small molecules, that period can last up to 20 years from discovery until patent expiration. For large molecules (or biologics), that period can last even longer due to their difficult-to-duplicate manufacturing processes. Also, once a drug's key patents expire, generic and biosimilar manufacturers often seek to mimic the same production methods that were used by the branded manufacturer to reduce product variability, and that adoption by generic and biosimilar manufacturers can create an even longer benefit period for Agilent on a specific molecule.

Exhibit 10 Analytical High Performance Liquid Chromatography Market Share History

Vendors	2011	2013	2015	2017	2019	2021	2023
Waters	26%	26%	26%	27%	25%	26%	25%
Agilent	19%	18%	17%	17%	16%	16%	19%
MilliporeSigma [Merck]	4%	5%	14%	14%	16%	15%	15%
Thermo Fisher	11%	10%	9%	9%	9%	9%	9%
Shimadzu	8%	9%	9%	9%	9%	9%	8%
JT Baker/Avantor	1%	1%	1%	3%	3%	3%	3%
VWR	2%	2%	2%	na	na	na	na
Phenomenex (Danaher)	2%	2%	2%	2%	2%	3%	3%
Hitachi	3%	2%	2%	2%	2%	1%	1%
Other	17%	17%	17%	16%	18%	18%	17%
Total	100%	100%	100%	100%	100%	100%	100%

Source: SDi by Science and Medicine Group research reports.

We see narrower, but still strong, moats around Agilent's analytical instruments that are used in other less regulated end markets, and we think intangible assets and switching costs, primarily around the long useful life of equipment, support Agilent's moat in most of those end markets, as well. For example, Agilent leads the market in gas chromatography tools that are often used in the chemicals and advanced materials end markets. As shown in the exhibit below, Agilent generates about triple the revenue of its closest peer in gas chromatography products, and we believe its differentiated technology, strong reputation, and innovative capabilities create an intangible asset advantage in gas chromatography in particular. Also, Agilent's gas chromatography instruments have very long useful lives around 10 years, and those long lives contribute to the durability of Agilent's economic profits even outside the highly regulated biopharmaceutical end market. Specifically, while a customer uses these instruments, Agilent should generate recurring consumable and service revenue, and we believe other switching costs persist due to training and workflow productivity concerns for end users in these highly specialized applications, which has led to very stable market shares in gas chromatography, especially.

Exhibit 11 Gas Chromatography Market Share History

Vendors	2011	2013	2015	2017	2019	2021	2023
Agilent	36%	35%	36%	35%	34%	36%	38%
Shimadzu	14%	11%	11%	12%	12%	12%	12%
MilliporeSigma [Merck]	7%	10%	9%	10%	10%	9%	8%
PerkinElmer	8%	9%	8%	8%	7%	8%	7%
Thermo Fisher	8%	9%	8%	7%	8%	7%	8%
Restek	2%	2%	2%	3%	3%	3%	3%
SCION Instruments (Techcomp)	2%	3%	2%	2%	2%	2%	2%
Phenomenex (Danaher)	1%	1%	1%	1%	1%	1%	1%
Other	21%	20%	23%	22%	23%	22%	21%
Total	100%	100%	100%	100%	100%	100%	100%

Source: SDi by Science and Medicine Group research reports.

- Diagnostics

  Agilent's remaining diagnostics business also has advantages with intangible assets associated with its differentiated testing platforms along with some switching costs. In this division, Agilent's tools primarily help clinicians diagnose and then develop therapeutic plans for patients with a concentration in oncology indications. Through its 2012 acquisition of Dako, Agilent enjoys a top-tier position in the anatomical pathology market for tissue-based cancer diagnostics. Relative to the broader diagnostics market, the company's installed instrument base in this business and related consumable sales make this a decent specialty segment where pathologists perform sophisticated and time-consuming tests. Overall, we think this division's solid prospects combined with intangible assets and the switching costs associated with its large installed base contribute to Agilent's competitive advantages.

Baxter (Narrow Moat)

Exhibit 12 Baxter Moat Summary

Company	Ticker	Moat Rating Proposed	Year 5e ROIC	Year 5e WACC	Durability of Switching Costs in Years	Key Switching Cost Sources
Baxter	BAX	Narrow	13%	8%	5	Equipment Life + Contracts

Source: Morningstar as of December 2024.

Profile

Baxter offers a variety of medical supplies and equipment to providers. From its legacy operations, Baxter sells injectable therapies for use in care settings, including IV pumps, administrative sets, and solutions; nutritional products; and surgical sealants and hemostatic agents. Baxter expanded its portfolio of hospital-focused offerings by acquiring Hillrom in late 2021, which added basic equipment like hospital beds, operating room equipment, and patient monitoring tools to the portfolio. Baxter has signed an agreement to sell its kidney care tools by early 2025.

Exhibit 13 Baxter Segment Analysis

Segment	Moat	Moat Sources	% of EBIT	% of Revenue	Operating Margin
Legacy Baxter-Medical Products, Therapies, Pharmaceuticals	Narrow	IA, SC	74%	71%	19%
Legacy Hillrom-Healthcare Systems and Technologies	None	na	26%	29%	16%
Consolidated	Narrow	Intangible Assets/ Switching Costs	100%	100%	18%

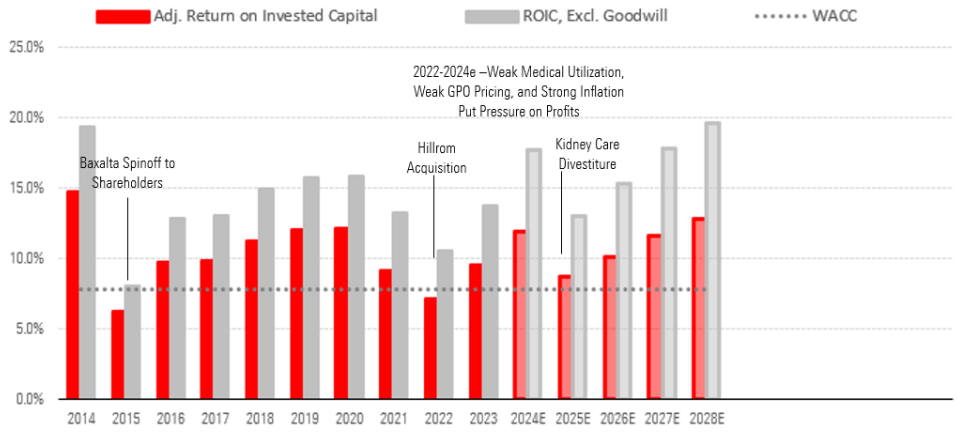
Source: Morningstar as of December 2024.

Moat Rating

Baxter has dug a narrow moat around providing essential medical supplies and capital equipment. It claims top-tier positions in most of its product lines and typically competes with a concentrated group of peers. Overall, we think it would be difficult for new firms to successfully enter its targeted niches primarily because of the intangible assets surrounding its proprietary products and the switching costs associated with some of them that form the basis of Baxter's moat.

Because of those factors, we see a relatively long runway for the company to generate economic profits with its existing technology and pipeline of new products. Going forward, Baxter appears focused on improving margins in its remaining businesses after a tough few years during and after the pandemic when weak medical utilization trends, the ill-timed Hillrom acquisition, and inflationary pressures cut into Baxter's economic profitability. With inflationary pressures easing, medical utilization rising, and more room for Baxter to boost its own pricing on renegotiated group purchasing organization contracts starting in 2025, we suspect Baxter will be able to increase and keep its ROICs moderately above weighted average cost of capital going forward.

Exhibit 14 Baxter ROIC History and Projection

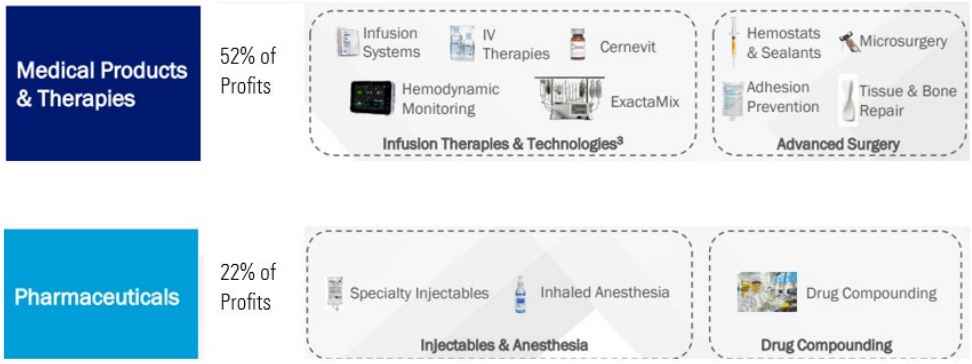


Source: Morningstar as of December 2024.

Legacy Baxter (About 75% of Ongoing Profits)—Medical Products/Therapies and Pharmaceuticals

Baxter's legacy segments produce injectable therapies, such as IV solutions, nutritional products, and generic pharmaceuticals that are sold into the hospital setting and are sometimes administered through infusion systems, like ones that Baxter also sells. We believe these segments have narrow moats with similar moat sources surrounding them—intangible assets and customer switching costs—as other medtech firms. For intangible assets, the company possesses numerous trademarks and patents around its various products, but we think the differentiated features and the company's reputation surrounding the reliable production of these essential medical supplies tends to be the strongest part of its intangible asset moat source. Like other medical technology players, Baxter benefits from customers' switching costs, too, either in the form of razor/razor blade business models and/or contractual agreements for some of these offerings.

Exhibit 15 Legacy Baxter Product Offerings



Source: Morningstar Analysis of Baxter Reports as of December 2024.

- Infusion Pumps

  In our opinion, the strongest moat in the legacy Baxter operations surrounds one of its smaller offerings—infusion pumps. Infusion pumps help hospital staff, primarily nurses, automatically administer medical therapies and often lead to recurring consumable sales of administrative sets for producers, like Baxter. Infusion pumps can be differentiated from an intangible asset perspective in this oligopoly of competitors, which includes Becton Dickinson and ICU Medical primarily in the United States and Fresenius SE and B. Braun overseas. But most importantly, the pumps have relatively long lives (seven to nine years, typically), which gives them a long period to enjoy recurring sales on administrative sets after the pumps are placed. Some pumps offer networking software that helps these devices become embedded further in the workflow of providers, too, which keeps many hospitals in the fold even after the useful life of the pump is completed. Overall, during replacement cycles, hospitals often stick with familiar technology to ensure smooth therapy administration and prevent workflow disruptions for their nursing staffs, which helps companies like Baxter benefit from customer switching costs in this razor/razor blade business model.

- Injectable Therapies

  Also in its legacy product set, Baxter sells a variety of IV solutions, nutritional products, and generic pharmaceuticals. Baxter typically faces limited competition in its injectable therapy markets where top-tier competitors include Fresenius SE, B. Braun, and the former Hospira assets (now at ICU Medical and Pfizer), and we see significant barriers to entry around these businesses. Specifically, we estimate that it takes nearly half a billion dollars and several years to build a manufacturing facility that would allow a new entrant to gain enough scale to enter the IV solutions business. But that sort of investment would not even guarantee a new entrant could garner any business in this market because of the group purchasing organization contracting structure that locks out competition for at least the initial three years of each contracting period and typically much longer given the ongoing advantages and trust that GPOs often display in incumbent suppliers. For example, reports suggest that Baxter controls about half of the IV Solutions market in the US. Hospital customers often choose Baxter as a supplier of IV Solutions because of its reputation for being able to reliably produce this essential medical supply at a reasonably low cost, which we view as an intangible asset in this market. To gain access to this low-cost medical supply, customers are willing to sign multiyear contracts negotiated by GPOs that come with annual volume guarantees for Baxter. Overall, we think these GPO contracts help the company and other incumbent players keep new entrants at bay while also reinforcing their scale advantages that keep new entrants from successfully penetrating this business.

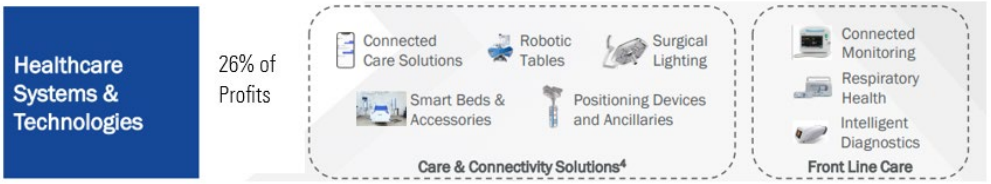
  We see similar dynamics in Baxter's nutritional and generic pharmaceutical businesses, although even more intangible assets are possible in these end markets on top of the tough regulatory and reputational requirements that are needed to make headway in IV Solutions. For example, unique delivery systems and differentiated formulations, akin to Coke and Pepsi recipes in consumer goods, can help Baxter's nutritional products stand out to hospital customers. Even in generic pharmaceuticals, Baxter primarily participates in markets with complex manufacturing and administration requirements. In both its inhaled anesthetics and injectable therapy franchises, Baxter typically faces competition from only a few competitors primarily due to manufacturing complexity, which is much more favorable than oral

generics. For example, Baxter excels in aseptic premix product manufacturing, which is required to keep some molecules stable and helps ensure safety when nurses administer those products. Offering ready-to-use injectables in the care setting can improve patient safety and reduce the time associated with administration tasks, which creates a valuable tool for caregivers on the front lines of care and helps Baxter generate some mix benefits even in these "generic" niches.

Healthcare Systems/Technologies (No Moat and About 25% of Ongoing Profits)

While the late-2021 Hillrom acquisition added some proprietary offerings primarily with intangible assets to Baxter's portfolio, the price paid and subsequent reduction in demand for those products make us think that the deal destroyed moderate value for Baxter from a moat perspective. Also, those products, which now make up Baxter's healthcare systems and technologies segment, probably were on the weak end of the narrow moat spectrum at best, in our opinion, prior to Baxter's acquisition of them. The current product portfolio of smart beds, OR equipment, and patient monitoring devices can be intangible asset-heavy, too. While some switching costs are present when digitally connected equipment is integrated into a hospital's operations, these offerings largely appear to lack the key moat source that pushes many medical technology companies into the narrow-moat category—customer switching costs—and we do not see a strong moat, if any, surrounding this business.

Exhibit 16 Legacy Hillrom Offerings



Source: Morningstar Analysis of Baxter Reports as of December 2024.

Renal (Divestiture Pending in Early 2025)

Baxter's kidney care segment is being divested by early 2025 and will no longer play a role in our moat analysis for the firm. After Baxter finally revealed the weak margins in that business in recent years, we believe that segment (14% of its 2023 operating profits) may have even been mildly destructive to Baxter's moat. Additionally, the company is receiving less than fair value on this asset from its acquirer related to weak market sentiment in dialysis, right now, which further pushes down our view of that segment on Baxter's economic profitability.

Danaher (Wide Moat)

Exhibit 17 Danaher Moat Summary

Company	Ticker	Moat Rating Proposed	Year 5e ROIC	Year 5e WACC	Durability of Switching Costs in Years	Key Switching Cost Sources
Danaher	DHR	Wide	14%	7%	12	Spec'In + Equipment Life

Source: Morningstar as of December 2024.

Profile

In 1984, Danaher's founders transformed a real estate organization into an industrial-focused manufacturing company. Then, through a series of mergers, acquisitions, and divestitures, Danaher now focuses primarily on manufacturing scientific instruments and consumables in the life science and diagnostic industries after the late 2023 divestiture of its environmental and applied solutions group, Veralto.

Exhibit 18 Danaher Segment Analysis

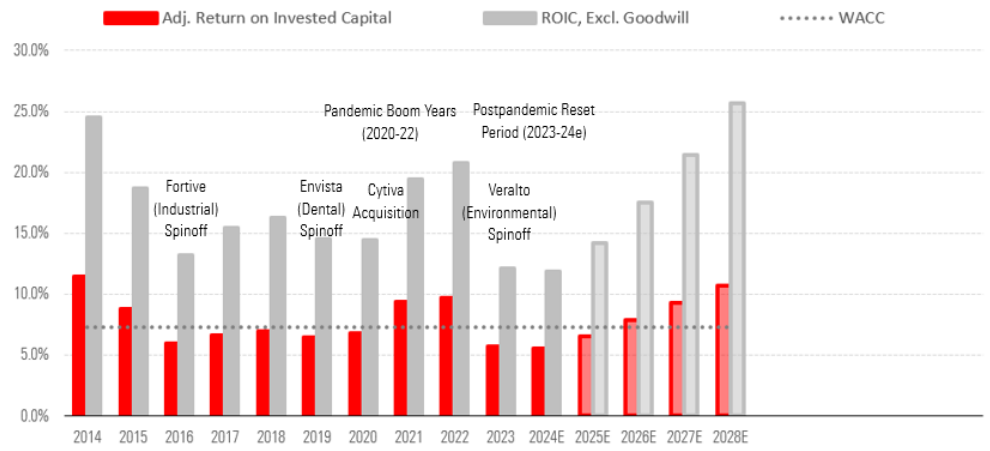
Segment	Moat	Moat Sources	% of EBIT	% of Revenue	Operating Margin
Biotechnology	Wide	IA, SC	35%	30%	27%
Life Sciences	Narrow	IA, SC	21%	30%	17%
Diagnostics	Narrow	IA, SC	44%	40%	25%
Consolidated	Wide	Intangible Assets/ Switching Costs	100%	100%	22%

Source: Morningstar as of December 2024.

Moat Rating

We believe a wide moat surrounds Danaher's diversified set of businesses, and we see intangible assets and switching costs as its moat sources. Also, we do not see any major ESG risks at Danaher that would cut into its economic profitability at this time. However, investors should note that Danaher's merger, acquisition, and divestiture activities have cut into its GAAP returns on invested capital including goodwill in recent years.

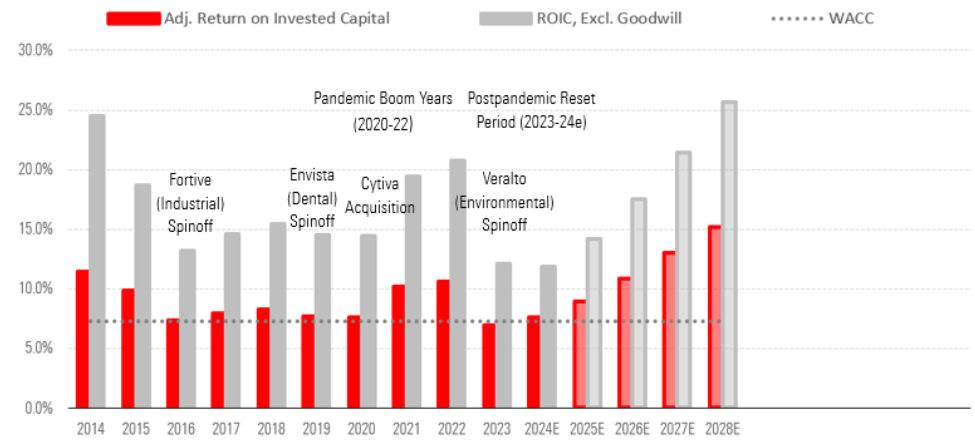
Exhibit 19 Danaher GAAP ROIC History and Projection



Source: Morningstar as of December 2024.

However, when we adjust the firm's invested capital base for the market value delivered directly to shareholders through spinoffs like Fortive (industrials) in 2016 and Veralto (environmental and applied solutions) in 2023, the ROIC story looks better. Also, in the near term, Danaher's ROICs look likely to improve as margins increase after the 2023-24 reset period in its target markets and after recent acquisitions are pushed through the Danaher Business System, which tends to boost revenue growth and margins at acquisition targets through continuous improvement initiatives. Also, ROICs may rise, as intangible assets from recent acquisitions like Cytiva (biotechnology) in 2020 are amortized in the invested capital base. Overall, our new wide moat rating recognizes the attractive fundamental qualities of Danaher's current businesses, which we expect to help the company deliver economic profitability for the long run.

Exhibit 20 Danaher ROIC's Adjusted for Value Delivered to Shareholders With Divestitures



Source: Morningstar as of December 2024.

Intangible Assets

Danaher offers differentiated technology that is protected by various intangible assets, including patents, brands, copyrights, and trademarks. Those intangible assets prevent identical copycats for a long period of time. Since even slightly differentiated technical features can cause an end user to prefer one tool over another in Danaher's precise scientific end markets, we see intangible assets around its differentiated technology and its ability to innovate in its target markets.

Switching Costs

Also, once its products are chosen due to their differentiated features for a specific application, Danaher is often able to layer on substantial switching costs for customers. Danaher's tools enable the essential operations of its clients, and switching to a competitor's technology could change the outcome of those operations, which would be undesirable for users once Danaher's products are incorporated into their workflow. Nearly 80% of Danaher's revenue streams are recurring in nature, and most of those sales are considered captive, meaning customers cannot use another supplier if they want to keep using Danaher's instruments or equipment. That dynamic highlights the razor/razor blade model that Danaher pursues with its differentiated technology. However, the durability of Danaher's competitive advantages differs by product set.

- Biotechnology

  Within its biotechnology segment (over one third of profits), we believe Danaher has dug a wide moat with particularly long revenue streams related to durable switching costs for customers along with intangible assets. The differentiated properties of Danaher's tools affect the performance, accuracy, and speed of the various research projects they enable, and those product features create intangible assets that inform decisions to use those tools in specific applications at the beginning of a research project. After those initial decisions are made, we see a particularly sticky business in its tools to help biopharmaceutical clients manufacture drug therapies. Once Danaher's products are chosen as part of the production process of a molecule near the beginning of the clinical trial process, the client is unlikely to switch suppliers for that tool due to regulatory and reproducibility factors. Additionally, if that molecule is successfully marketed, the revenue stream would likely continue through the product's lifecycle. From discovery to patent expiration, Danaher could generate recurring revenue for at least 20 years on a molecule in the branded phase and even longer if generic or biosimilar manufacturers choose to use the same manufacturing process beyond a drug's patent expiration. That long durability of these revenue streams gives us confidence that this segment has a wide moat around it.

- Life Sciences

  In its life sciences segment (over 20% of profits), we see a narrower moat than in biotechnology because they are typically used in shorter-duration projects, currently. However, concerns about reproducibility in the customers' test results during the course of a research project can create some inertia to switch from this segment's technologies, and there are recurring revenue sales for the life of its equipment in this narrower moat segment, as well. However, the company also sells some building blocks of cell and gene therapies in this segment. As cell and gene therapies become more prevalent, Danaher could enjoy more-durable switching costs eventually in this segment because those products would be spec'd into

each therapy's manufacturing process, similar to the highly durable switching costs in the biotechnology segment discussed above.

- Diagnostics

  In diagnostics (less than 45% of profits), Danaher provides a broad set of tools—including clinical chemistry, immunoassays, hematology, tissue-based, and molecular diagnostics—which it sells primarily to hospitals, physician offices, and reference labs for use on patients' blood, urine, or tissue samples. Economic moats in this business are typically derived from a mix of intangible assets and switching costs. Getting a diagnostic system placed in a lab initially relates to the differentiated features of Danaher's proprietary technology, which contributes to the intangible assets moat source of this segment. However, once placed and in regular use, we see some switching costs in Danaher's diagnostic tools, too, although shorter in durability than its other segments. Specifically, displacing an established diagnostic platform can be challenging for competitors since labs are hesitant to replace systems that are integrated into their workflows. So even when a test is relatively simple scientifically, customers often show loyalty to tools that make their workflows easier, creating an inertia-related switching cost for incumbent players like Danaher in this end market.

Illumina (Narrow Moat)

Exhibit 21 Illumina Moat Summary

Company	Ticker	Moat Rating Proposed	Year 5e ROIC	Year 5e WACC	Durability of Switching Costs in Years	Key Switching Cost Sources
Illumina	ILMN	Narrow	21%	9%	7	Equipment Life

Source: Morningstar as of December 2024.

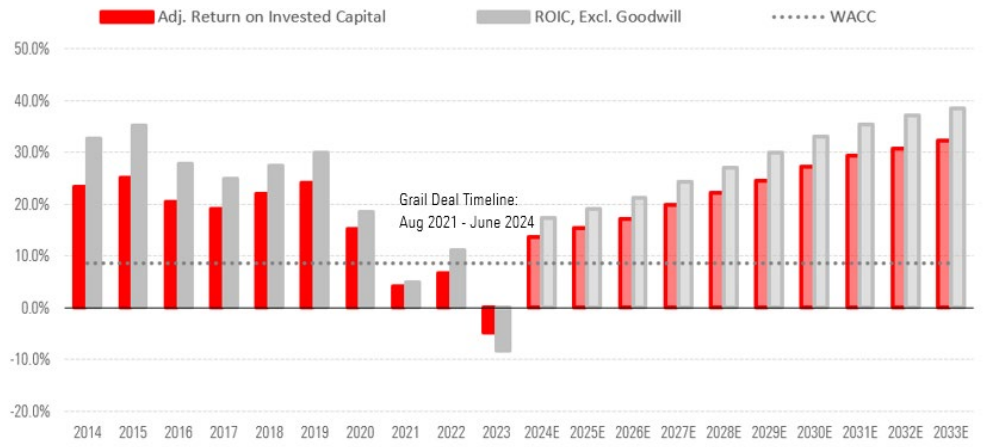
Profile

Illumina provides tools and services to analyze genetic material with life science and clinical lab applications. The company generates over 90% of its revenue from sequencing instruments, consumables, and services. Illumina's high-throughput technology enables whole genome sequencing in humans and other large organisms. Its lower throughput tools enable applications that require smaller data outputs, such as viral and cancer tumor screening. Illumina also sells microarrays (9% of 2023 sales) that enable lower-cost, focused genetic screening with primarily consumer and agricultural applications.

Moat Rating

We believe Illumina operates with a narrow moat around its genetic analysis tools and services that have intangible assets and switching costs for customers associated with them. Since purchasing Solexa with its genome reader instrument in 2007, Illumina's continued innovation significantly reduced the cost of sequencing, thereby enabling the rapid expansion of sequencing applications. While disruptive technologies remain a high-risk concern in this still early-stage industry, we think the firm's differentiated technology, ongoing innovation, and large installed system base create significant entry barriers for competitors. Also quantitatively, after Illumina divested the Grail liquid biopsy assets in mid-2024, we expect it to generate ROICs over WACC for at least the next decade.

Exhibit 22 Illumina ROIC History and Projection



Source: Morningstar as of December 2024.

Intangible Assets

Illumina relies on intangible assets, such as the more than 2,300 issued or pending patents in the United States and nearly 15,000 issued or pending patents outside of the US as of early 2024, to keep competition at bay. After application, patents enjoy 20-year terms, which keeps competitors from directly copying the company's technology. Admittedly, competitors can develop similar technology that reaches beyond the legal power of patents, but even slightly differentiated technical features can cause an end user to prefer one tool over another similar tool in the company's precise scientific end markets. Also, even for a highly experienced player like Illumina, it took five years to develop its latest sequencing platform, the NovaSeq X, which we use as a barometer for how long it could take for a competitor to engineer a similar product. While new entrants are emerging, it may be difficult to fully supplant Illumina based on its differentiated technology and proven track record of innovation in this field.

Specifically, thanks to Illumina's strong emphasis on internal innovation, including spending over 20% of sales on R&D on average during the past five years to advance its sequencing technology and lower the cost per genome, we expect its tools to remain relevant to end users for the foreseeable future. For reference, after the Human Genome Project took 13 years and $2.7 billion to complete in 2003, Illumina's technology helped reduce the cost of whole genome sequencing faster than Moore's law in semiconductors—to $1,000 by 2014. This pace of cost reduction and innovation has been unparalleled in the field and has created significant entry barriers for potential rivals, in our opinion. The firm is not resting on its laurels, either; with the new NovaSeq X Series (launched in 2023), Illumina can now enable a roughly $200 genome including bioinformatics onboard the system, which means the company has roughly reached the $100 genome when considering only the sequencing part of the process.

Switching Costs

Illumina also benefits from switching costs in its very large installed system base of close to 22,000 instruments. For end users wishing to use an Illumina sequencing system, dedicated flow cells and

reagents from Illumina are required to complete the sequencing process, and most of Illumina's consumables (over 70% of the company's sales) are dedicated. With its large installed base of sequencers, Illumina should be able to count on significant revenue streams from those consumables and maintenance-related services, going forward, and we estimate nearly 80% of its sales naturally recur, including instrument-related services. The useful life of its instruments typically extends between five and 10 years, and as long as Illumina's sequencing tools remain relevant to end users, it should be able to count on substantial recurring revenue for the useful life of its instruments.

We expect Illumina's sequencing technology to remain relevant for a relatively long period, too. Illumina's genomic sequencing technology enjoys extensive citations in industry publications, and customer workflows have been developed around its systems that need to be repeated consistently. Therefore, we think end users would need a significant reason to jump ship from Illumina's tools from a reproducibility and end user training perspective. These switching costs should be pervasive in life science labs, but they also appear important in clinical labs because regulators play a role in ensuring test accuracy while the labs also need a standardized approach for a typically less skilled workforce than in research labs.

Disruptive Technology Risks

Nonetheless, disruptive technology remains a key ongoing threat. For example, BGI Genomics, which operates primarily in China, announced in early 2020 that its custom-built technology can sequence a genome for $100. In China (9% of Illumina's 2023 sales), this homegrown competitor may be preferred by the Chinese government and end users, and if BGI is allowed to operate more widely, Illumina's dominance of the genomic sequencing market may dissipate somewhat. Other new startups like Ultima Genomics and Element Biosciences are entering the fray with cheap technology, too, and diagnostic leader Roche recently highlighted its aim to enter the clinical sequencing market in the intermediate term, although few details are known about Roche's potential entry. In general, other sequencing techniques could emerge that eclipse Illumina's technology eventually. However, even with those potential new entrants, we expect Illumina to remain economically profitable because of its intangible assets and switching costs on its very large installed system base for at least the next 10 years, which informs our narrow moat rating.

Waters (Wide Moat)

Exhibit 23 Waters Moat Summary

		Moat Rating	Year 5e		Durability of Switching	
Company	Ticker	Proposed	ROIC	WACC	Costs in Years	Key Switching Cost Sources
Waters	WAT	Wide	30%	7%	17	Spec'In + Equipment Life

Source: Morningstar as of December 2024.

Profile

Water sells liquid chromatography, mass spectrometry, and thermal analysis tools. These analytical instruments provide essential information on various products, such as their molecular structures and

physical properties, to help clients enhance the health and well-being of end users. As a percentage of sales in 2023, Waters generated 57% from biopharmaceutical customers, 31% from industrial clients, and 12% from academic/government institutions.

Exhibit 24 Waters Segment Analysis

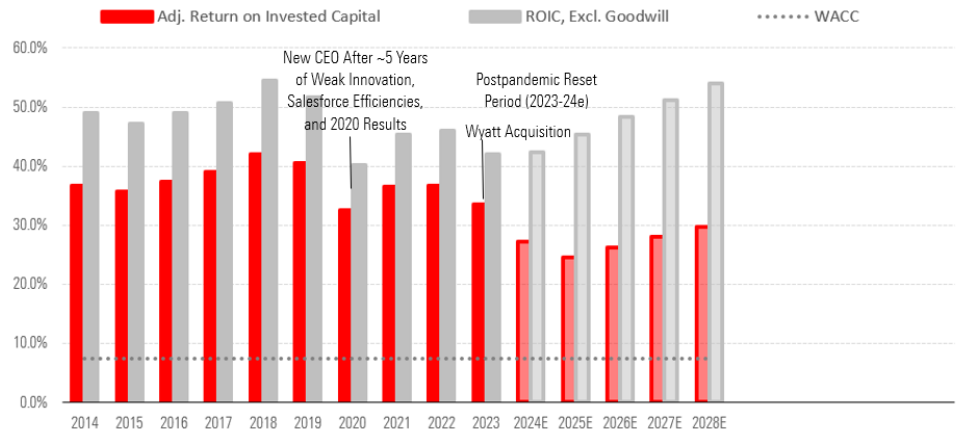
Segment	Moat	Moat Sources	% of EBIT	% of Revenue	Operating Margin
Biopharmaceuticals	Wide	IA, SC	na	57%	na
Other	Narrow	IA, SC	na	43%	na
Consolidated	Wide	Intangible Assets/ Switching Costs	100%	100%	28%

Source: Morningstar as of December 2024.

Moat Rating

We believe a wide moat surrounds Waters' analytical instrument business, consisting of liquid chromatography, mass spectrometry, and thermal analysis tools. Intellectual property and ongoing innovation create an intangible asset moat source, while regulatory and reproducibility factors contribute to highly durable switching costs, in our opinion. Both moat sources are crucial to Waters' advantages in its target markets, and with these advantages, Waters enjoys profitability near the top of the life science market, with returns on invested capital well over 20%, by our calculations.

Exhibit 25 Waters ROIC History and Projection



Source: Morningstar as of December 2024.

Intangible Assets

Waters offers differentiated technology that is protected by various intangible assets, including patents, copyrights, and trademarks. This intellectual property keeps competitors from directly copying its technology. Since even slightly differentiated technical features can cause an end user to prefer one tool over another similar tool in Waters' precise scientific end markets, intangible assets around its differentiated technology remain a moat source. The differentiated properties of Waters' tools affect the performance, accuracy, and speed of the various projects they enable, and differentiated product

features create intangible assets that inform decisions to use those tools in specific applications, particularly at the beginning of a project. To remain relevant to scientists in early project phases, Waters must continue to innovate effectively, too, and its ongoing innovation, especially after a CEO change in 2020, gives us confidence in its ability to stay relevant in its chosen markets in the long run.

Switching Costs

After the initial choice of its tools based on intangible assets, Waters benefits from substantial switching costs in most of its end markets, and its key liquid chromatography platforms enjoy very sticky revenue streams, which can be seen in the exhibit below.

Exhibit 26 Analytical High Performance Liquid Chromatography Market Share History

Vendors	2011	2013	2015	2017	2019	2021	2023
Waters	26%	26%	26%	27%	25%	26%	25%
Agilent	19%	18%	17%	17%	16%	16%	19%
MilliporeSigma [Merck]	4%	5%	14%	14%	16%	15%	15%
Thermo Fisher	11%	10%	9%	9%	9%	9%	9%
Shimadzu	8%	9%	9%	9%	9%	9%	8%
JT Baker/Avantor	1%	1%	1%	3%	3%	3%	3%
VWR	2%	2%	2%	na	na	na	na
Phenomenex (Danaher)	2%	2%	2%	2%	2%	3%	3%
Hitachi	3%	2%	2%	2%	2%	1%	1%
Other	17%	17%	17%	16%	18%	18%	17%
Total	100%	100%	100%	100%	100%	100%	100%

Source: SDi by Science and Medicine Group research reports.

These revenue streams are particularly sticky with very long potential "legs" in the biopharmaceutical end market, which accounts for over 55% of Waters' revenue. In this end market, Waters' analytical tools are critical components of the production methods for various drugs, which are specified directly in each molecule's regulatory application for approval in markets around the world. Regulators require that the specified method be used to produce a drug, unless updated with regulators, which would add time, money, and regulatory scrutiny to the production process that most end users (drugmakers) do not want to spend, especially just to change out one life science tool that represents a small percentage of the relevant drug's manufacturing cost. With those regulatory factors and other reproducibility and employee training factors, Waters benefits from significant switching costs at its biopharmaceutical customers that can lead to decades-worth of demand for its tools. For example, in the branded phase of a small molecule drug's life, that period can last roughly 20 years from discovery until patent expiration. For large molecules (or biologics), that period can last even longer because of the difficult manufacturing process. Also, once a drug's key patents expire, generic and biosimilar manufacturers often try to mimic the same production methods as the branded manufacturer to reduce product variability, and that adoption by generic and biosimilar manufacturers can create an even longer benefit period for Waters if a molecule remains in demand by consumers. Overall, Waters' concentration in the highly regulated biopharmaceutical end market extends the prospects for economic profits over such a long period that

we view Waters as a wide-moat firm, which sets the company apart from the many narrow-moat life sciences and diagnostic companies that typically enjoy less concentration in this highly durable field.

Because of less-intense regulatory requirements, we see narrower, but still strong, moats around Waters' others end markets—such as material science, food, and environmental applications. However, intangible assets and switching costs support Waters' moat in most of those end markets, too. Throughout its operations, Waters' analytical instruments have long useful lives (typically five to seven years), and Waters often benefits from a razor/razor blade business model during each instrument's lifecycle.

Also, even though only about half of the company's revenue is what is considered recurring (consumables and services) and the other half is generated from one-time sales (instruments and informatics), the latter typically recurs eventually due to workflow reproducibility and regulatory concerns. Pricing power for the organization appears positive overall, too, with annual price appreciation primarily from consumables and services. Waters has noted that its pricing power rises with the regulation of its end markets, which correlates well with our view of the wider moat in biopharmaceutical applications compared with its other end markets. We think that relates to the interoperability of Waters' consumable products, including chromatography columns, on competitive instrumentation. Therefore, in less regulated markets, the end users appear more sensitive to technological differences and pricing on related products and services during and at the end of an instrument's lifecycle than in more regulated markets. However, we think some reproducibility- and training-related switching costs are still present in most of Waters' end markets, even if they are not as highly regulated as the biopharmaceutical business.

Research Methodology for Valuing Companies

Overview

At the heart of our valuation system is a detailed projection of a company's future cash flows, resulting from our analysts' research. Analysts create custom industry and company assumptions to feed income statement, balance sheet, and capital investment assumptions into our globally standardized, proprietary discounted cash flow, or DCF, modeling templates. We use scenario analysis, in-depth competitive advantage analysis, and a variety of other analytical tools to augment this process. We think analyzing valuation through discounted cash flows presents a better lens for viewing cyclical companies, high-growth firms, businesses with finite lives (mines, for example), or companies expected to generate negative earnings over the next few years. That said, we don't dismiss multiples altogether but rather use them as supporting cross-checks for our DCF-based fair value estimates. We also acknowledge that DCF models offer their own challenges (including a potential proliferation of estimated inputs and the possibility that the method may miss short-term market-price movements), but we believe these negatives are mitigated by deep analysis and our long-term approach.

Morningstar's Equity Research Group ("we," "our") believes that a company's intrinsic worth results from the future cash flows it can generate. The Morningstar Rating for stocks identifies stocks trading at a discount or premium to their intrinsic worth—or fair value estimate in Morningstar terminology. Five-star stocks sell for the biggest risk-adjusted discount to their fair values, whereas 1-star stocks trade at premiums to their intrinsic worth.

Four key components drive the Morningstar rating:

- our assessment of the firm's economic moat.
- our estimate of the stock's fair value.
- our uncertainty around that fair value estimate.
- the current market price.

This process ultimately culminates in our single-point star rating.

Economic Moat

The Morningstar Economic Moat Rating is a structural feature that Morningstar believes positions a firm to earn durable excess profits over a long period of time, with excess profits defined as returns on invested capital above our estimate of a firm's cost of capital. The economic moat rating is not an indicator of the investment performance of the investment highlighted in this report. Narrow-moat companies are those that Morningstar believes are more likely than not to achieve normalized excess returns for at least the next 10 years. Wide-moat companies are those that Morningstar believes will earn excess returns for 10 years, with excess returns more likely than not to remain for at least 20 years. Firms without a moat, including those that have a substantial threat of value destruction-related risks related to environmental, social, and governance; industry disruption; financial health; or other idiosyncratic issues, are more susceptible to competition. Morningstar has identified five sources of economic moats: intangible assets, switching costs, network effect, cost advantage, and efficient scale.

Fair Value Estimate

Each stock's fair value is estimated by using a proprietary discounted cash flow model, which assumes that the stock's value is equal to the total of the free cash flows of the company is expected to generate in the future, discounted back to the present at the rate commensurate with the riskiness of the cash flows. As with any DCF model, the ending value is highly sensitive to Morningstar's projections of future growth.

Fair Value Uncertainty

The Morningstar Uncertainty Rating represents the analysts' ability to bound the estimated value of the shares in a company around the fair value estimate, based on the characteristics of the business underlying the stock, including operating and financial leverage, sales sensitivity to the overall economy, product concentration, pricing power, exposure to material ESG risks, and other company-specific factors. Based on these factors, analysts classify the stock into one of several uncertainty levels: Low, Medium, High, Very High, or Extreme. Our recommended margin of safety—the discount to fair value demanded before we'd recommend buying or selling the stock—widens as our uncertainty of the estimated value of the equity increases.

Market Price

The market prices used in this analysis and noted in the report come from exchanges on which the stock is listed, which we believe is a reliable source.

Morningstar Rating for Stocks
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