

WESTPEAK RESEARCH ASSOCIATION

Keysight Technologies, Inc. (NYSE:KEYS)

Technology – Testing and Measurement Solutions

Unlocking Value Through Electronic Testing

May 5, 2020

Keysight Technologies provides electronics testing and measurement equipment and solutions. In 2014, Keysight was spun-off from Agilent Technologies (previously part of Hewlett-Packard), and is a leader in the testing and measurement space.

Thesis

Keysight is strongly positioned to provide first-to-market solutions in high-growth areas such as 5G, next-generation automotive, and IoT. We believe a recent company reorganization and shift in their revenue mix towards R&D sales and software solutions will lead to margin expansion and stable, recurring cash flows in the near to medium-term. With a diverse customer base in over 100 countries, consistent market share capture, and inevitable demand for these network technologies, we see Keysight Technologies as an attractive, long-term investment, despite recent macro-economic uncertainty.

Drivers

The development of 5G technology is poised to reshape the wireless network space and the global race to be leaders in this technology is leading to numerous products and services being developed in this space. Measuring and testing is crucial to development and Keysight has the greatest depth and breadth of solutions. High single digit growth expectations over the next 10 years in automotive electronics, and the proliferation of IoT also drive growth for Keysight's unique range of testing solutions.

Valuation

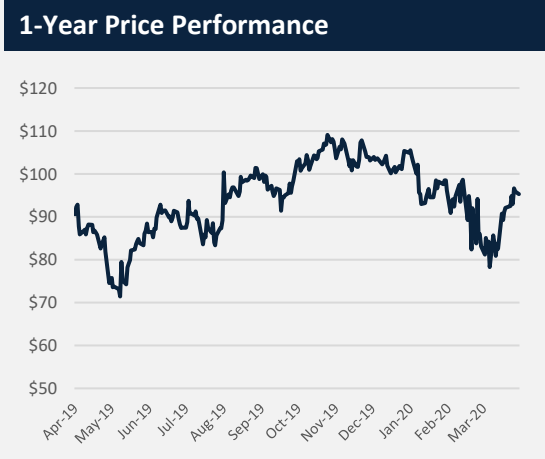
Our target share price for Keysight Technologies is \$117.61, which represents a return potential of 22.5% based on the current price of \$96.02. We arrived at our target price through a discounted cash flow analysis and comparable company analysis, weighted at 0.60 and 0.40 respectively. We initiate a **BUY** rating on Keysight Technologies.

Analyst: Sean Kadota, BCom. '21
contact@westpeakresearch.com

Equity Research	US
Price Target	USD\$ 117.61
Rating	Buy
Share Price (May 5 th Close)	USD\$ 96.02
Total Return	22.5%

Key Statistics	
52 Week H/L	\$109.08/\$73.69
Market Capitalization	\$18.34B
Average Daily Trading Volume	1,936K
Net Debt	\$227M
Enterprise Value	\$18.57B
Net Debt/EBITDA	0.22x
Diluted Shares Outstanding	191M
Free Float	99%
Dividend Yield	N/A

WestPeak's Forecast			
	2020E	2021E	2022E
Revenue	\$4.73B	\$5.38B	\$6.00B
EBITDA	\$1.33B	\$1.72B	\$1.98B
Net Income	\$826M	\$1.18B	\$1.31B
EPS	\$4.32	\$6.18	\$6.87
P/E	21.6x	18.3x	15.1x
EV/EBITDA	15.5x	14.1x	13.1x

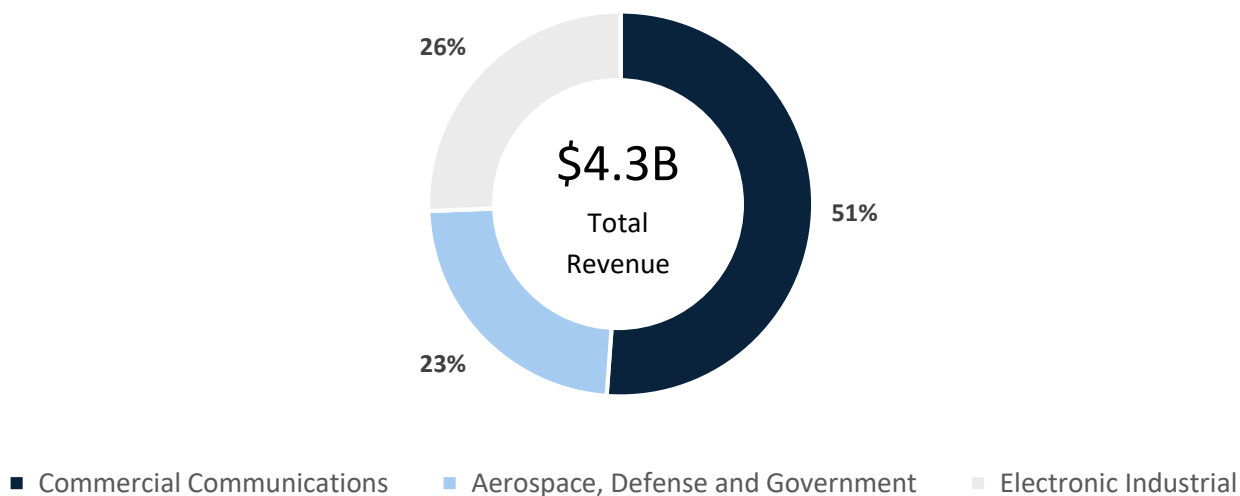


Business Overview/Fundamentals

Company Overview

Keysight Technologies' offerings consist of a wide array of both hardware and software measurement and testing solutions focused on several industries. This includes testing tools in the development of wireless networks, aerospace and defense, IoT (Internet of Things) connectivity, network security, and the next-generation automotive space. Keysight breaks down their offerings into two major business segments, the Communications Solutions Group (CSG) and the Electronic Industrial Solutions Group (EISG). The CSG segment is further broken down into two main revenue streams: Commercial Communications and Aerospace, Defense and Government.

Revenue by Business Segment



Source: Keysight Historical Segment Restatement Q1'20

Segments

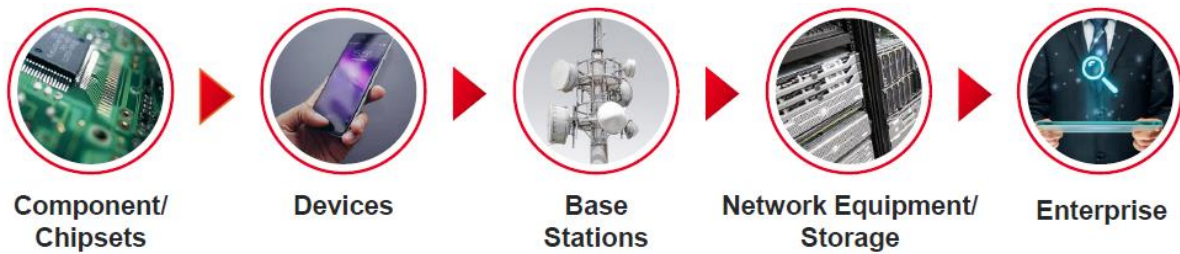
Communications Solutions Group

The Communications Solutions Group (CSG) serves customers in the worldwide communications market. This includes their measuring and testing tools for development of wireless and wired communications, network applications and security, as well as the area of aerospace and defense. These customers are primarily commercial companies, worldwide agencies, and government agencies.

The CSG is the area of the Keysight which has established itself as a leader in the 5G trial and standards space. This involves solutions such as precision field measurement tools to verify network coverage, 5G network simulation tools, and design libraries to simplify manufacturing workflows. In 2017, Keysight acquired Ixia, a company that focuses on equipment to

monitor and test networks, and recently it was fully integrated into the CSG to help create end-to-end solutions that run the full 5G architecture stack. Keysight was an early mover into development of this space and with their strong technical expertise, significant head start, and both physical and technological infrastructure in place, we see this as being one of the biggest driving factors for Keysight growth over the next ten years.

Examples of solutions offered for wireless to wireline convergence



Source: Investor Day Presentation 2020

In addition to 5G development, a major area of the CSG is in aerospace and defense. This is an area that Keysight has been in for many years. Although this is a stable source of revenue for the company, 2019 was a record year, generating over \$1B in revenue. We see that Keysight’s long-standing established position in this space as very important due to the opportunity to work on technologies long before they are commercially available. Examples of this include RADAR and MM wave technology. RADAR is now being used in next-generation automotive and MM wave in commercial communication technology. We believe the established relationships with customers in these areas give Keysight an edge over its competitors who may not be able to source contracts and develop proprietary solutions in time for commercial testing of these technologies.

Examples of solutions addressing defense modernization



Source: Investor Day Presentation 2020

Electronic Industrial Solutions Group

The Electronic Industrial Solutions Group (EISG) serves electronic industrial end markets, with the major areas being the next-generation automotive and energy space, semiconductor design and manufacturing, IoT, consumer electronics, education, and medical electronics. Customers of this segment are primarily original electrical equipment manufacturers (OEMs), and any companies that supply electronic industrial products and services.

The EISG solutions are focused on providing end-to-end simulation and testing of devices through the innovation lifecycle. Three key growth trends they are focused on include (1) the proliferation of connected devices, (2) the transformation within the automotive industry towards connected cars and electric vehicles, and (3) the rising demand for larger storage, faster processing, and efficient circuitry regarding massive data volumes.

In each of these areas, we see reasonably high growth potential. Some sources (Bain Market Research) see the overall IoT market doubling by the end of 2021, with a potential CAGR close to 30% over the next five years. EISG offers solutions such as over-the-air IoT device testing, design simulation softwares, compliance solutions, and infrastructure tests.

Despite a slowdown of global car sales, spending on automotive technology and infrastructure is still increasing. We saw high single digit growth of the EISG over 2019, and we expect to continue seeing high single digit growth in this segment.

Company Strategy

Shifting the Business from Product-Focused Solutions to End-to-End Industry Focused Solutions

Starting in 2016, Keysight began reorganizing their business from siloed divisions to solutions centered around industries. The goal has been to transition their once fragmented product-focused offerings into full end-to-end solutions. This reorganization is just reaching completion and has also involved the earlier mentioned integration of Ixia into the CSG.

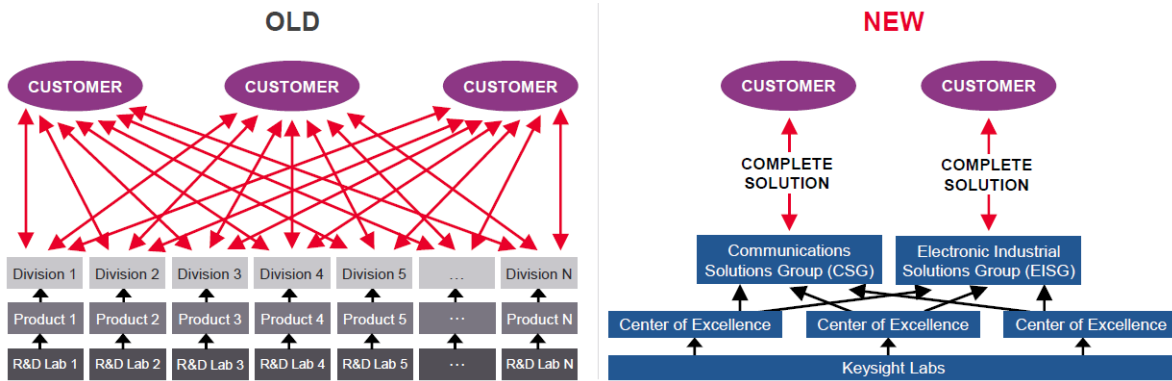
To ensure the success of this business model, substantial planning and commitment has gone towards capturing high potential growth industries early in development. The level of foresight needed to determine where to play next is something Keysight has had a strong track record in. This also involves strategic acquisitions to cover gaps in their network solutions that are not efficient building in-house.

Keysight has streamlined their R&D process to maximize efficiency by breaking this area of the organization into three components. The Keysight Labs includes the central teams focused on game-changing breakthroughs; the R&D Centers focus on solutions that have versatile utility towards many different applications; and the Solutions Group which partner with leading customers to develop high-value solutions with faster time-to-market than standalone competitors are able to achieve.

Keysight's commitment to reorganizing their divisions into end-to-end solutions is already seeing success, and we believe that it will continue to play a key role in how the company performs. By carefully choosing high growth areas that lateral into many different products and services, Keysight is able to highly specialize in these areas. We believe that by utilizing their strong technical expertise, foundational knowledge on technology not available to commercial industries, and streamlined R&D processes with global exposure, Keysight has the ability to build both depth and breadth in their testing

solutions that other companies are unable to replicate. The move towards complete solutions also allows for better customer relationship management and cross-selling opportunities.

Keysight’s Product-Focused Model Vs. Industry-Focused Model

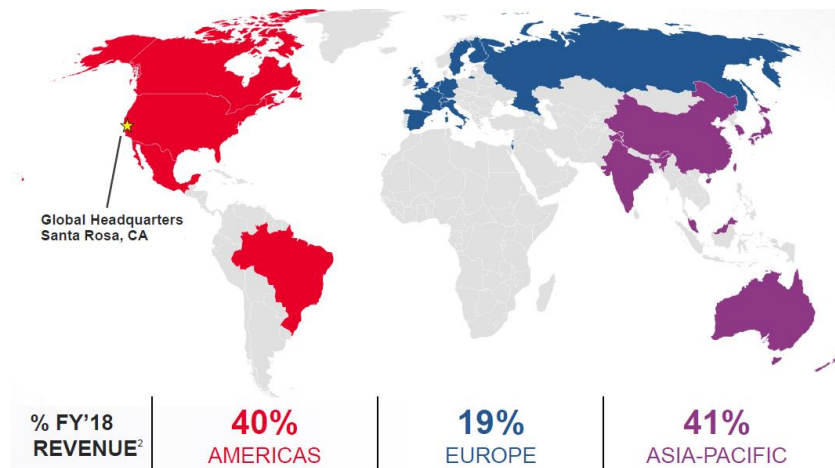


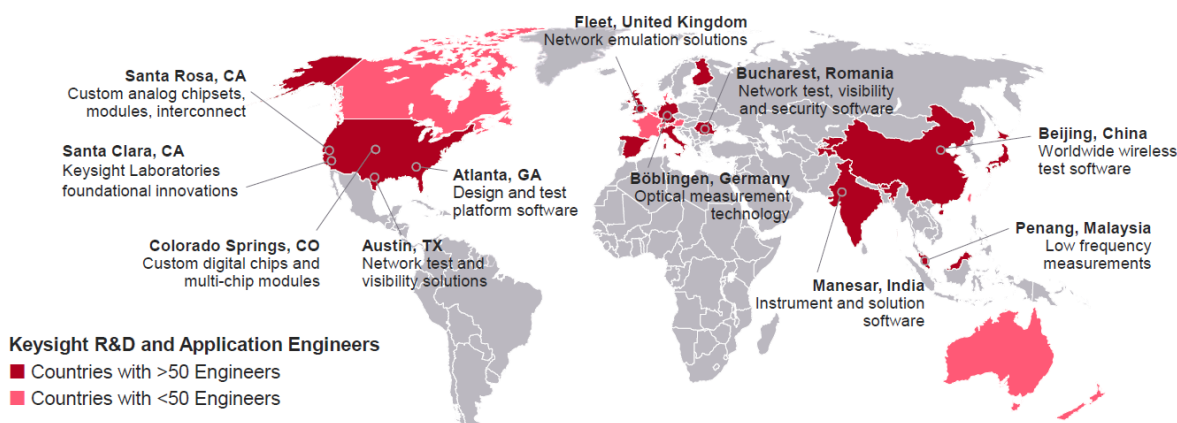
Source: Investor Day Presentation 2019

Global Infrastructure and Strategic Placement of R&D Centers and Technical Sales Teams

Keysight has over 32,000 customers located in over 100 countries. A key area that Keysight excels in is customer relationship management. To ensure customers have timely access to engineers, and technical sales teams can easily contact customers, Keysight has strategically located R&D centers and employees in these crucial areas around the globe. We see Keysight’s existing global infrastructure in important growth areas as an advantage over competitors who are less globally established. International expansion is not only capital-intensive for smaller companies, but also challenging from an organizational, human capital perspective as well. On top of Keysight being able to box out competition, we also see this as a key advantage in Keysight’s ability to share knowledge and best practices across their organization from vastly differing products and services being developed in different regions.

Keysight Technologies Global Revenues and R&D Centers





Source: Keysight Investor Presentation 2019

A Formula for Intelligent Decisions, and Capitalizing on Growth Trends Earlier Than Competitors

Keysight has had a track record of moving into growth areas early on and capitalizing on these decisions to drive value. This has been a conscious effort from management and we believe that through the development and implementation of a number of activities, they have positioned themselves to perpetually capture growth trends earlier than competitors. These activities include: an exceptional focus on technical expertise, a commitment to high R&D spending, and the aforementioned development of global infrastructure and access to exclusive technologies through their aerospace and defense/government relationships. We further break down our analysis of these key processes in our investment thesis section.

A Shift Towards High Margin, Recurring Revenue Streams

Over the past few years, Keysight has actively been moving from offering more hardware solutions to software solutions. This has also been a part of their reorganization to provide end-to-end industry solutions rather than product focused solutions which have often biased hardware. This increase in the software mix and thus subscription-based revenues has led to an increase in annual recurring revenue, from \$472M in FY15 to \$838M in FY19. As a percentage of total revenue, this represents an increase from 12% to 19%. We believe that Keysight will continue to move in this direction, solidifying their ability to generate stable cash flows.

Starting in 2018, the company has also been shifting their manufacturing mix to focus on high margin R&D sales. This has led to gross margin expansion from 56.5% in FY15 to 63.2% in FY19. We see that there is still room for Keysight to shift their product mix, and we believe gross margins will increase over the next three years, levelling off at around 67%.

Industry Analysis

Keysight Technologies operates within the electronics measurement and testing space, however their broad range of products and services, as well as their versatility in both hardware and software solutions mean the applications of their offerings span several industries. This includes considerations regarding the wireless communication industry, the automotive industry, aerospace and defense, and several other areas.

Electronic Testing and Measurement

The electronic testing and measurement space is relatively fragmented, though several well-diversified international players exist. These players however tend to focus on different areas of testing. Historically, companies started out designing similar hardware solutions that had the capability to test electronics being developed. This includes equipment such as digital oscilloscopes, logic analyzers, and signal generators which are essential to the engineering and assembly of electronic devices. The decision to focus on measurement solutions for a specific area or even product is an important decision due to a high level of technical expertise, machinery precision, and thus R&D required.

Although there are several large international players, over time they have focused on different areas. For example, one of the largest players, Fortive Corporation (which generates annual revenue around \$7.3B vs Keysight at \$4.3B), focuses on field instrumentation, transportation sensing, automation and franchise distribution. While there is overlap with several of Keysight's offerings, very few competitors have established themselves in 5G testing and aerospace/defense the way Keysight has done. Three notable companies however do come up, Viavi Solutions, a Japanese company by the name of Anritsu Corporation, and a private company, Rohde & Schwarz. Viavi and Anritsu have made the move into 5G, while Rohde & Schwarz is a player in aerospace & defense, looking to move into 5G testing.

Growth in the testing and measurement space is expected to be around 4% to 5% CAGR through 2024, however growth in this industry is also highly dependent on the industries it serves. Company specific growth becomes even more complicated as it is highly dependent on the decisions made by the company in terms of where to focus.

Commercial Communications

Within commercial communications, Keysight Technologies is heavily invested in the development of 5G technology. The development of this new network architecture is expected to enable significant changes in this space, towards IoT and device communication. High growth in development of 5G is expected to last over the next few years, with major players such as Nokia, Qualcomm, Huawei, and others telecommunication companies expected to spend nearly \$26 billion in aggregate by 2022 in the development and maintenance of this technology.

As mentioned, Viavi and Anritsu are two of Keysights main competitors in this space, however both are significantly smaller companies. Here we can see a comparison of the three companies:

(in US\$ mm)	Keysight Technologies	Viavi Solutions	Anritsu Corp
Market Cap	17,496	2,636	2,777
Enterprise Value	17,723	2,685	2,482
LTM Revenue	4,392	1,168	987
Number of Employees	13,600	3,600	3,778

Keysight is much larger and the company's access to resources on a global scale as well as the much greater range and depth of 5G offerings puts Keysight far ahead of these players according to Forbes IHS Markit.

Aerospace and Defense

Aerospace and Defense (A&D) is one of the major end-user areas that several electronic measurement and testing companies are focused on. There are high growth expectations around test equipment in this area. A&D vendors working towards higher frequencies, greater bandwidth, as well as changing customer requirements due to IoT are all reasons spending will increase in this area. In the U.S. defense spending has been growing under President Trump, and in many other places in the world such as China, India, South Korea and Russia, spending on defense is expected to increase as well. We see these as all big growth drivers for this space in the near to medium term.

Keysight has been in the A&D space for decades. Their long-established reputation and relationships have given them an edge over competition. While Keysight is the market leader, several other players also offer solutions in this space. This includes Rohde and Schwarz, a private company looking to also break into 5G, as well as Teledyne Technologies, an electronics and automation solution that has been around since the 1960.

Next-Generation Automotive

The automotive space has also been an important focus for Keysight Technologies. Measurement and testing in this space has always been crucial due to the significant risks and costs of failure in the auto and transportation industry. Recently advances in IoT and autonomous driving have been further drivers of growth for measurement and testing solutions in this space. Self-driving technology has the potential to disrupt the automotive industry, and spending on development of this technology has been estimated at nearly \$50 billion in 2016 from just the top five equipment manufacturers in this space. Increases in automotive electronics are expected to jump from 35% to 50% by 2030, and electric vehicles have the potential to increase upwards of 100x over the next 20 years.

Despite the current cooling of global auto sales, development in this area over the medium to long-term is inevitable and we see this fueling long-term growth for Keysight. While other companies such as Fortive play in the automotive testing space, we see Keysight's unparalleled expertise in network architecture and IoT as a significant edge over competitors, especially regarding next-generation automotive testing. This is due to the current push towards autonomous driving technology by big businesses and global governments.

Management Team

The Keysight management team is comprised of several members who have both a technical background, as well as longstanding experience in the business. Nearly all members have been with Keysight from the time it was still a part of Hewlett-Packard, and later Agilent Technologies before spinning off to become Keysight Technologies in 2014. The team has a strong track record of delivering on commitments made during their time in the company pre- and post-spinoff. Here we can see several of the commitments they fulfilled over the past fiscal year.

	COMMITMENT	STATUS	PROGRESS
Top-line Growth	Sustained 4% - 5% revenue growth	✓	<ul style="list-style-type: none"> ✓ Achieved core growth^{1,2} of 13% in FY18 and 11% FY19 ✓ Five consecutive years of market share gains³
Operating Margin^{1,4}	Deliver 40% OM incremental on 4% core growth Baseline operating margin of 21% - 22% by FY21	✓	<ul style="list-style-type: none"> ✓ Reached 24% operating margin in FY19
Free Cash Flow Conversion¹	Free cash flow conversion 80% - 90% in FY19	✓	<ul style="list-style-type: none"> ✓ 97% free cash flow conversion in FY19
EPS¹ Growth	Deliver ≥10% EPS growth	✓	<ul style="list-style-type: none"> ✓ 17% EPS CAGR since launch ✓ EPS growth of 28% in FY18 followed by 46% in FY19
Acquisitions	Anite synergies Ixia mid-teens accretion to adj. EPS within 24 months	<ul style="list-style-type: none"> ✓ ✓ 	<ul style="list-style-type: none"> ✓ Anite technology is key to our 5G success ✓ Ixia targeted return is delayed, not reduced ✓ Markets are strengthening, business results are improving, and strategic thesis remains intact
Growth Initiatives	Drive growth in targeted market opportunities (5G, Next-Generation Automotive, Software and Services)	✓	<ul style="list-style-type: none"> ✓ In aggregate, growth initiatives well ahead of plan with >30% revenue growth in FY19 ✓ Services back on track with \$553M FY19 orders

Source: Investor Day Presentation 2020

Mr. Ron Nersesian – Chairman, President, Chief Executive Officer

Mr. Ron Nersesian is Chairman, President, and CEO of Keysight Technologies. Mr. Nersesian was with Agilent before Keysight was spun off from it. He was the executive VP and COO of Agilent as of November 2011 and the following year, was promoted to president and COO. During his time as president, he headed key initiatives to transform a major division of the business and made strides in increasing profitability of core business segments. During his tenure, Agilent’s stock price rose from \$27.39 to \$42.74, representing an increase of 56% (25% CAGR) during this two-year time period.

When Keysight was announced to be spun out of Agilent, Mr. Nersesian was appointed as President and CEO of the new company. When he took over, difficult decisions had to be made around the company strategy. While some investors thought Keysight would never be a growth company and recommended cutting R&D, Mr. Nersesian increased it, and focused on high growth areas such as 5G. These decisions led to substantial payoffs, and since Keysight’s inception, the stock has risen from \$29.75 to \$91.60, an increase of 208% (22% CAGR).

Mr. Nersesian has continuously delivered on commitments and surpassed targets, year after year. Given his vast experience in the field and strong track record, we believe the he will continue to be a key factor in unlocking Keysight’s long-term growth potential.

Mr. Nersesian’s total compensation for FY2019 was \$11,124,216 USD, a 9% increase from 2018. Of this total, 9% was base salary, 67% was stock-based compensation, 21% was performance-based compensation, and the remaining 3% were pension value related and other compensation. We see that a large percentage of his compensation is tied to performance, together the SBC and performance-based compensation make up 88% of his total pay. We see this compensation structure as positive due to the alignment of his goals to the company’s. The much greater weighting on SBC helps alleviate potential governance issues around performance-based compensation incentivizing short-term targets rather than long-term goals.

Mr. Jay Alexander – Senior Vice President, Chief Technology Officer

Mr. Jay Alexander is a Senior VP and CTO of Keysight Technologies. Prior to Keysight, Mr. Alexander was in a number of leadership roles within Agilent's Electronic Measurement Group. This included serving as the VP and general manager for the Oscilloscope and Protocol Division. During this time, Mr. Alexander worked with Mr. Nersesian to turn around this division. While in this position, this division was able to triple revenue and profits using a strategy of market leading products and app specific software solutions. After holding this position for six years, he moved into the CTO role of Keysight when it was spun off in 2014.

Mr. Alexander leads Keysight's central planning and technology development team. His focus is on managing new technologies and optimizing resources to grow in areas that provide competitive advantage within the electronic testing ecosystem. He has played a key role in the company's reorganization towards end-to-end industry focused solutions. This is already beginning to see success through expanding margins, top-line growth, and the ability to streamline development of market-leading solutions. He has also played an important role in the strategic acquisitions Keysight has made over the past few years to quickly build full stack solutions in areas such as 5G, automotive, and more recently quantum computing. The strategic placement of global R&D centers close to customers was also something Mr. Alexander played a role in.

Similar to Mr. Nersesian, Mr. Alexander played an important part in Agilent's growth as well as Keysight's recent success. Many of the strategic decisions he has headed have contributed to building a moat around Keysight's business, and we believe he is a valuable member of management that will ensure long-term sustainability as well as a growth technology pipeline for the company.

Mr. Alexander's total compensation for FY2019 was \$2,772,089 USD, a 7% increase from 2018. Of this total, 5% was base salary, 55% stock-based compensation, 24% performance-based compensation, and the remaining 3% related to changes in pension value and other compensation. We see that this compensation structure is similar to Mr. Nersesian's with a slightly lower weighting toward performance-based compensation. This structure however still represents a 79% performance related compensation, with a significant amount being SBC.

Mr. Neil Dougherty – Senior Vice President, Chief Financial Officer

Mr. Neil Dougherty is a Senior VP and CFO of Keysight Technologies. He has been with the company for about 24 years holding various roles within Hewlett-Packard and Agilent. Starting in 2010, he served as a senior director for corporate development at Agilent, giving him significant experience heading decisions around domestic and international acquisitions and divestitures. He then moved on to become Agilent Technologies' vice president and treasurer, and then Keysight's CFO during the spinoff in 2014.

Being a part of HP, Agilent, and now Keysight at its conception, Mr. Dougherty has played important roles in many of the strategic decisions made by the company. He has been a key player in enabling a variable cost structure through flexible staffing to manage potential macro-economic risk; he has been responsible for some of the decisions around altering product mixes towards higher margins and recurring revenue; and very importantly, his experience in corporate development in the industry has allowed him to be a key player in developing the M&A funnel for the company. We see

Mr. Dougherty in a similar light in which his long-term experience in the industry will allow him to make intelligent decisions around the long-term growth of the company.

Mr. Dougherty's total compensation for FY2018 was \$3,093,438 USD, a 13% increase from 2018. Of this total, 5% was base salary, 51% stock-based compensation, 25% performance-based compensation, and the remaining 6% related to changes in pension value and other compensation. We see that this compensation structure is very similar to Mr. Alexander's.

Investment Theses

Market View

While the market is generally in agreement around Keysight's ability to capture substantial value as development of the 5G network progresses, there are questions regarding how dominant they will be. Furthermore, as development within 5G matures, investors wonder if Keysight will lose significant growth potential. Finally, potential macro-economic headwinds around global political tensions and the recent Covid-19 pandemic are pushing down Keysight's stock price, which has seen strong performance over the past few years.

Thesis 1: Global Infrastructure and Established Aerospace & Defense/Government Contracts Create Competitive Moat

Mentioned in our analysis of Keysight's company strategy, they have made early decisions to move into 5G, placing them in a strong position to capture value in this space. While the market sees competitors potentially hindering Keysight's ability to fully dominate this space, we believe that they have taken steps to solidify themselves as the long-term superior 5G measurement and testing company.

While being an early mover in this space is not implicative of a sustainable advantage, Keysight's early commitment to customer service has led to the decision to build out global infrastructure in locations near key customers. These R&D centers and strategically located sales staff allow the company to offer service and expertise that competitors are not capable of. This has resulted in strong relationships with customers in over 100 countries.

In addition to geographically diversified revenue, a secondary but equally important implication of Keysight's strategic placement of R&D centers has been their ability to share knowledge and apply best practices across the organization. We believe that this gives Keysight an edge over competitors in their capability to serve the worldwide market and is also an important component in our third thesis.

Keysight has also been a major player in serving the aerospace & defense/government space. In FY2019 Keysight reported \$1B from this revenue stream. Being such a prominent player in this area gives them the ability to work on technologies long before they become available for commercial usage. Examples of this have included RADAR and MM wave technology.

We believe that although there may be some doubts around Keysight's defensibility, we see that very early decisions to develop 5G testing, coupled with their strategic global expansion of R&D centers allows them to ensure strong relationships with customers. Furthermore, Keysight's longstanding experience in the aerospace & defense space and subsequent

exposure to highly exclusive technologies, gives them an edge over competitors. In the near to medium term, we believe competitors will not be able to compete with the level of both testing and customer service that Keysight is capable of.

Thesis 2: Value Potential Still Left To Be Realized Around Recent Reorganization

As we mentioned in our section on Keysight's company strategy, a reorganization of divisions to be more industry focused rather than product focused has been underway and is already seeing success. Furthermore, this quarter Ixia was finally fully integrated into the CSG. While we believe the resulting margin expansion and past earnings beats have been priced into the stock, we expect to see further realization of value.

We have seen that previously; management has been conservative in their estimates of Keysight's earnings potential throughout FY2019. We believe that the current share price has yet to incorporate the full value potential of the recent integration, the reorganization to industry focused divisions, and the move towards higher margin, recurring revenue streams.

Despite management meeting commitments around these areas, we believe that recent macro-economic factors such as Covid-19 have overshadowed Keysight Technologies' true value potential.

Thesis 3: Keysight has Developed a Formula To Continue Capturing Towards Growth

While a first-mover advantage is not necessarily considered a sustainable competitive advantage, the ability to repeatedly be first-movers in high growth areas is something Keysight has had a strong track record in. In 2014 Keysight was awarded the Global Frost and Sullivan Award for Market Leadership due to their excellence in capturing the highest market revenue in their industry. We believe that Keysight's success comes from several synergistic activities.

(1) *Exceptional focus on technical talent* – Keysight employs approximately 13,600 people. Of their aggregate workforce, approximately 22% or 3000 of them are engineers and nearly half of these engineers hold M.S. or Ph.D. degrees. Keysight has been able acquire these highly sought-after workers by building strong talent pipelines with leading research universities such as Stanford, UCSD, Georgia Tech, Bristol, Tsinghua, and Oulu. Furthermore, effective human capital management has led to low attrition rates of approximately 6%.

(2) *High R&D spending and global presence* – As mentioned earlier, Keysight's high R&D spending on various centers placed around the globe gives them access to expertise and exposure to trends on a global scale. This leads to an information asymmetry over competitors. Management has stated that R&D will remain at approximately 16% of revenue indefinitely.

(3) *Established relationships with aerospace/defense/government customers* – Keysight has established relationships and a significant number of contracts, with annual revenue totaling approximately \$1B in this space. This uniquely positions them to work with the development of technologies that may still be years away from commercial usage. This not only widens the level of expertise for Keysight as previously mentioned, but also allows them to make better decisions much earlier around strategic decisions to further develop testing capabilities within a specific space.

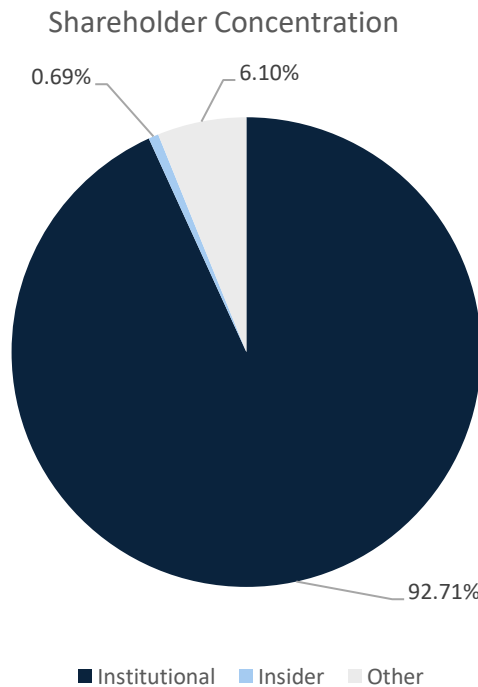
(4) *Experienced management team* – Keysight’s management team is comprised of individuals who have both strong technical backgrounds and long-term experience within the company and industry. This together with the aforementioned factors has led to smart decisions around the direction of the company, as well as successful acquisitions such as Ixia.

In our analysis of the company, we see these factors as crucial components that give Keysight an edge in making successful, strategic decisions and capitalizing on growth trends much earlier than competitors. We do not believe that as 5G matures, so will the company. We instead see Keysight transitioning into other high growth areas, while continuing to be leaders in these new spaces.

Shareholder Base and Liquidity

Shareholder Base

Keysight Technologies currently has 187.4 million shares outstanding and a free float of 186.7M, representing a free float of over 99%. The largest shareholder of Keysight stocks is The Vanguard Group which holds an 11.42% of free float. In aggregate, the top 10 shareholders hold about 41.18% which represents a relatively high concentrated shareholder base. Insiders comprise of about 0.69% ownership. Here we can see what ownership looks like for this Keysight’s stock.



Source: Keysight Investor Relations – “Stock Information”

Shareholders	Shares	% O/S	Insider? (Y/N)
The Vanguard Group, Inc.	21,408,339	11.42%	N
T. Rowe Price Associates, Inc.	14,180,752	7.57%	N
BlackRock Fund Advisors	10,243,827	5.47%	N
State Street Global Advisors (SSgA)	7,785,263	4.15%	N
Fidelity Management & Research Company	5,527,815	2.95%	N
BlackRock Advisors, LLC	4,109,501	2.19%	N
J.P. Morgan Investment Management, Inc.	4,071,485	2.17%	N
TIAA-CREF Investment Management, LLC	3,796,890	2.03%	N
Geode Capital Management, LLC	3,114,136	1.66%	N
Primecap Management Company	2,947,850	1.57%	N
Top 10 Shareholders	77,185,858	41.18%	

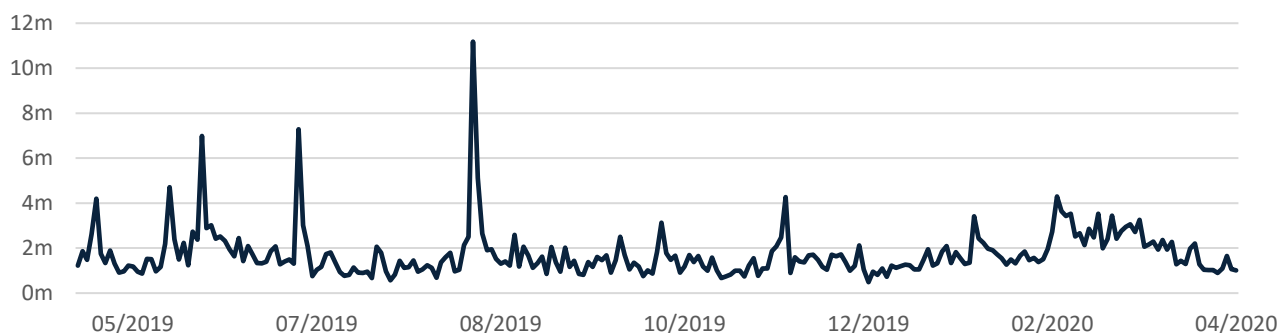
Holders	Shares	% O/S	Value (\$MM)
Growth	62,165,485	33.17%	\$6,228.65
Index	55,025,975	29.36%	\$5,418.20
Value	30,983,268	16.53%	\$3,027.51
Alternative	8,887,666	4.74%	\$900.42
GARP	8,289,825	4.42%	\$822.15
Other	5,089,031	2.72%	\$510.66
Yield	2,340,777	1.25%	\$219.62

Source: Keysight Investor Relations – “Stock Information”

Liquidity

As of April 2019, the average trading volume for Keysight was approximately 1.735M. Over this period of time, the volume weighted average price was \$93.77, which implies the average year-to-date amount traded being approximately \$162.7M. Given Keysight’s market cap of \$17.5B and the free float of 186.7M shares we do not see a significant liquidity risk entering or exiting a position.

Year-To-Date Daily Trading Volume



Source: BarChart

Valuation

Our final valuation used a 5-year discounted cash flow (DCF) model, which took into account both an exit multiple and a perpetual growth method. We also used a comparable company analysis (CCA) which took into account both an EV/EBITDA multiple and P/E multiple. The DCF was weighted at 60%, and the CCA at 40% due to company-specific decisions playing a large factor in expected growth outcomes. This made it difficult to find comparable companies that are also positioned in very similar ways to Keysight. The result of our valuation methodology is an implied share price of \$117.61.

Discounted Cash Flow Analysis Assumptions

Communication Solutions Group Revenue – We see this as being one of the most substantial areas of growth for the company. Keysight is well positioned to capture significant growth due to their strong presence in 5G testing. We expect to see continued double digit growth in this area over the next few years, dropping only this year due to macroeconomic headwinds.

Electronic Industrial Solutions Group Revenue – Although not poised to capture as much growth as the CSG, the proliferation of IoT, expectations around substantial increases in next generation electronic testing needs, and demand for smaller, more efficient chipsets are all reasons we expect to see continued high single digit growth around 8% over the next few years, tapering off to 5% within four years.

Gross Margin – With Keysight’s recent reorganization, we have already begun seeing consistent margin expansion from 57.5% to 59.8% from FY2019 Q1. The integration of Ixia into the CSG was just completed this quarter, and we expect to further see gross margin expanding as Keysight recognizes these synergies. In our model we assumed that over a four-year period, it would rise to 65% and remain stable at this level.

SG&A margin – While we see the overall SG&A expense rising, especially with Keysight’s recent announcement to increase their sales force, as a percentage of revenue we see this staying around 18% and stabilizing here for the indefinite future. With high revenue growth expectations, we believe that this will be enough to keep up with the company’s current growth plans.

R&D – In the recent investor day, management announced their commitment to keeping R&D at 16% of revenue to capitalize on several areas they believe have high growth potential. We have kept our forecast in line with management.

Capex – With the current shift towards R&D sales and software-centric solutions, we see capex growing at a slightly slower pace than revenue. Our projection has capex underpacing revenue, however still continuously increasing year over year.

Depreciation & Amortization – We used straight-line depreciation with an effective use life of property, plant, and equipment of 6 years, which is in line with historical data.

Effective Tax Rate – An effective tax rate of 22% was applied which is in line with their expectations.

WACC – We used the CAPM method to find the cost of equity. Using a risk-free rate based on the current US 5-year T-bill, an expected market return of 8.8%, a market risk premium of 8.3%, and a beta of 1.10 we came to a cost of equity of 9.6%.

The cost of debt was calculated using the company's stated long-term debt interest rate of 4.5% and effective tax rate of 22%, which resulted in a WACC of 9.03%.

Terminal Multiple – We used a terminal EV/EBITDA multiple of 13x in our calculation, which is below the FY2020 forward multiple of 17x.

Perpetual Growth Rate – We opted to use a 3% perpetual growth rate in model. While some areas of the company are expected to grow at rates up to 5% into the indefinite future such as their communications network technologies and next-generation automotive, revenue streams from A&D are not expected to experience such high growth.

Comparable Company Analysis

Teradyne Inc. (NASDAQ: TER) – Teradyne automates two important elements, repetitive manual tasks and electronic tests. This company focuses on wireless testing solutions, semiconductor testing, as well as defense and aerospace testing.

National Instruments Corporation (NASDAQ: NATI) – National Instruments has been a producer of automated testing equipment and virtual instrumentation software for 40 years. The company is highly focused on automated testing and automated measurement systems.

Viavi Solutions (NASDAQ: VIAV) – Viavi is one of Keysight's more important competitors as they are currently looking to capture growth from 5G testing as well. Although the company is significantly smaller, they are one of the few companies who have multiple solutions within this space.

Fortive Corporation (NYSE: FTV) – Fortive has over 20 businesses in the areas of field instrumentation, transportation, and automation. Fortive is the largest player in terms of market cap, however, has not made many moves into network or 5G solutions.

Teledyne Technologies Incorporated (NYSE: TDY) – Teledyne consists of four major segments: digital imaging, instrumentation, engineered systems, and aerospace/defense electronics. The company has been around since the 60's however has experienced a number of reorganizations.

Anritsu Corporation (TYO: 6754) – Anritsu is Japanese-headquartered electronics testing company that operates internationally. Similarly to Keysight, they are looking to capture growth in the 5G space.

Recommendation

To reiterate our position, we believe that Keysight being an early mover into development of 5G solutions, is in a strong position to capture growth in this space. Furthermore, the extremely high level of technical expertise required, the difficulties around producing high precision equipment, and Keysight's move to build out global infrastructure in key customer areas creates a moat for their business. We believe that the recent reorganization to focus on end-to-end full stack solutions, as well as the move to software-centric solutions and R&D sales will lead to further margin expansion and revenue growth over the next four years.

Our target share price for Keysight Technologies is \$117.61 which represents a return potential of 22.5% based on the current price of \$96.02. The target price was arrived at through a 0.60 weighting on the discounted cash flow analysis and a 0.40 weighting of the comparable company analysis. This was due to the nature of companies in the electronic testing and measurement space comprising of differing areas of focus. This led to difficulties around finding suitable comparables to Keysight Technologies. The DCF model took both an EV/EBITDA exit multiple as well as a perpetuity growth rate into consideration. The comparable company analysis included several competitors within the electronic testing space and took into consideration the P/E and EV/EBITDA multiples. Based on our assessment of Keysight Technologies, we initiate a **BUY** rating.

Catalysts

Legislative Support for Autonomous Driving

The US government has increasingly supported policies that encourage growth in autonomous driving testing and development at both the state and federal level. The Obama administration first proposed allotting \$4 billion in the federal budget for driverless car research and development in 2016. More recently, Trump's Transportation Secretary detailed that the department's role in overseeing regulations is "voluntary guidance" from automakers. The continuation of this attitude towards testing in autonomous driving will lead to the passing of more policies that encourage growth in the industry. A growth in autonomous driving leads to an increased demand for testing from Keysight's services.

Cooperative Alliances Between 5G Companies Accelerate Development

If more cooperative alliances could be formed with capable companies involved in the roll out of 5G, this may lead to the accelerated development and deployment of this network. This would create positive expectations for products and services related to 5G and IoT, driving up demand for electronic measurement and testing.

In the recent merger of T-mobil and Sprint, the two companies have taken steps to combine their networks. Furthermore, to meet the state utilities commission's approval, conditions such as requiring T-Mobil to offer 5G speeds to 93% of California population are required to be met.

Very recently the U.S. Department of Commerce signed off on a bill to allow companies within the country to work with China's Huawei on setting standards for 5G networks. These decisions create upticks in the interest, growth, and development of 5G technology.

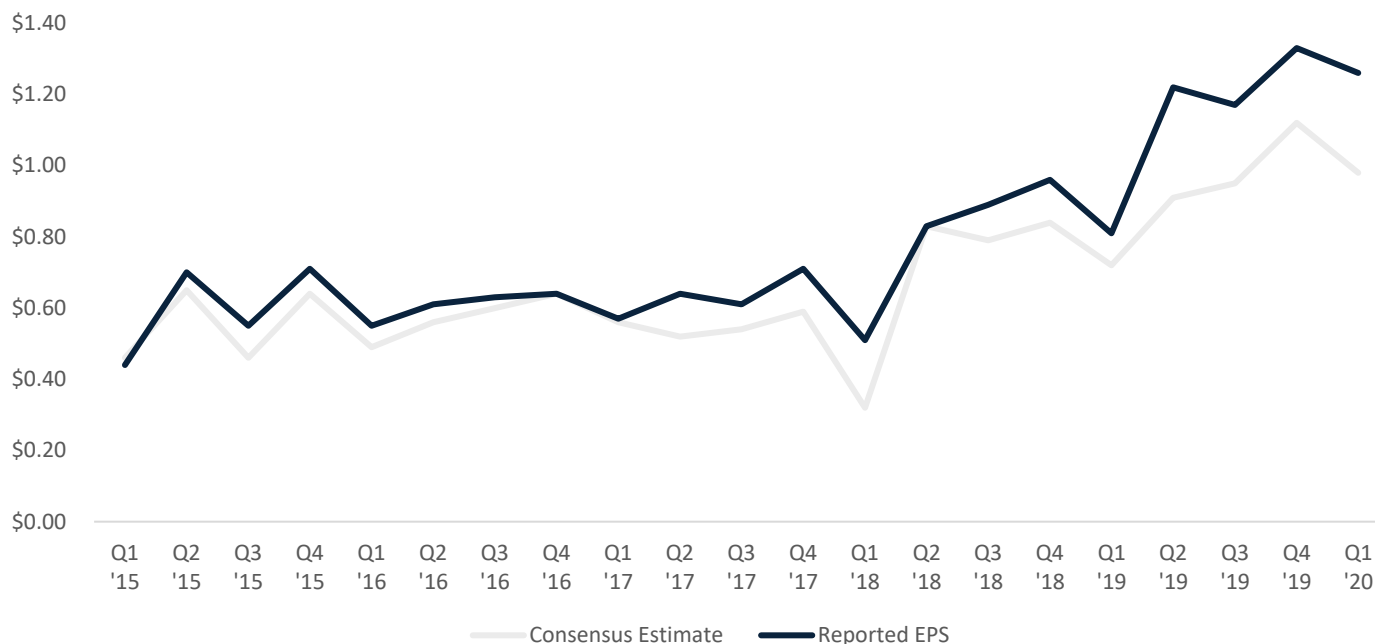
Emergence of Related Architecture Technologies

The emergence of related technologies, or technologies that benefit existing network architectures can stimulate growth and capital inflow into development and thus increase the need for testing of these products and services. This in turn would lead to higher demand of for Keysight and would be a positive factor on their stock price. Historically this has been seen in the development of networks such as 2G, 3G, and LTE.

Further Earnings Beats

We have discussed Keysight management’s strong track record of meeting and even surpassing commitments. We believe that management’s realistic goals have led to the company continually beating consensus earnings estimates, and this is something we would like to look out for in future earnings calls for the company.

Keysight Historical Earnings Beats



Source: MarketBeat – Keysight Technologies Historical Earnings Information

Risks

Changing Government Regulations

The political landscape surrounding new technologies such as 5G and IoT is turbulent and uncertain. Regulations are continuously changing and there is potential for increasing government interference. This is particularly in the case of security issues that may arise from the network architecture itself. In the case of 5G, American regulations are shifting with the widespread adoption of this network architecture, pioneered by Chinese company, Huawei. There are serious concerns around Huawei installing backdoors that the Chinese government may be able to use to access sensitive information.

These policies affect all industry players, including Keysight as they are a major player in facilitating the commercialization of these technologies. Government regulations could slow down the rollout of 5G, create mandatory processes that slow down development, or block companies from participating which will also slow down activity in this space.

Some regulations may be more company targeted such as in Huawei’s case, while others may affect the entire industry. While we see that this risk may affect Keysight’s key customers and stock price stability, we believe that overall Keysight

will remain relatively unexposed to this risk due to the absolute need for testing and measurement, regardless of governmental impediments in this space.

Unaccounted Environmental Costs Around 5G

Keysight's near-term future success is highly dependent on success of the 5G infrastructure rollout. While we see the implementation of 5G as imminent and already in the works, there are a few concerns environmental policymakers have highlighted.

There are concerns around how 5G and IoT will lead to a significant rise in energy consumption. Wireless networks are energy-guzzlers and the rising numbers of connected devices will substantially increase the need for energy-intensive data centres. Furthermore, there are some studies which highlight public health concerns around the 5G network potentially increasing involuntary exposure to radiofrequency radiation.

We believe that these environmental costs may not be properly factored into expectations around the 5G industry as a whole. The costs of carbon offsets and complex solutions around potential health issues related to increased radiation may slow down the 5G rollout. This risk may depress the industry as a whole, leading to lesser demand for Keysight, however we would like to note that Keysight may also be able to capture value from a greater need in stringent testing regarding environmental and health concerns.

Security Issues Specific to Keysight Technologies

Keysight is heavily reliant on the security of its infrastructure and architecture to deliver products and services as the current industry leader. As with any company in the technology space, software security is a vulnerable point, especially as Keysight delivers test automation software on emerging technologies in order to deploy it for commercial uses. As well as this, Keysight being in Aerospace & Defense means they are often working on contracts regarding highly sensitive information.

While we see a potential security breach of Keysight as unlikely, this could be incredibly damaging for the company. Not only are lawsuits expensive, but a breach could result in damage to the company's reputation, dampening future sales.

Appendix 1: Model Summary

	Oct-15	Oct-16	Oct-17	Oct-18	Oct-19	Jan-20	Apr-20	Jul-20	Oct-20	Oct-20	Oct-21	Oct-22	Oct-23	Oct-24	Oct-25
(Figures in mm USD)	FY2015	FY2016	FY2017	FY2018	FY2019	Q1-2020	Q2-2020	Q3-2020	Q4-2020	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025
Income Statement															
Revenue	2,856	2,918	3,189	3,878	4,303	1,095	1,202	1,207	1,225	4,728	5,378	5,998	6,693	7,391	8,050
EBITDA	530	540	373	(84)	1,019	283	324	361	366	1,334	1,722	1,979	2,209	2,439	2,657
Net Income	513	335	102	165	621	163	196	229	238	826	1,182	1,313	1,488	1,664	1,831
Earnings Per Share	3.00	1.95	0.56	0.86	3.25	0.85	1.02	1.20	1.25	4.32	6.19	6.88	7.79	8.71	9.59
Cash Flow Statement															
Capital Expenditures	(92)	(91)	(72)	(132)	(120)	(32)	(30)	(31)	(32)	(125)	(133)	(164)	(196)	(229)	(263)
Acquisitions	(574)	(10)	(1,702)	(11)	(88)	(5)	(5)	(5)	(5)	(20)	(120)	(120)	(120)	(120)	(120)
Divestitures	-	(10)	(8)	(20)	(1)	-	-	-	-	-	-	-	-	-	-
Dividend Payment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dividend Per Share	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Dividend Payout to Earnings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dividend Payout to Core FCF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dividend Yield	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Balance Sheet															
Current Assets	1,505	1,854	2,177	2,378	3,215	3,326	3,576	3,804	4,055	4,055	5,228	6,514	7,984	9,628	11,433
Non-Current Assets	2,003	1,949	3,756	3,446	3,408	3,515	3,477	3,445	3,418	3,418	3,526	3,642	3,767	3,901	4,044
Assets	3,508	3,803	5,933	5,824	6,623	6,841	7,053	7,249	7,473	7,473	8,754	10,156	11,752	13,529	15,477
Current Liabilities	686	644	819	1,462	1,003	982	1,070	1,123	1,199	1,199	1,546	1,927	2,362	2,838	3,351
Non-Current Liabilities	1,520	1,646	2,804	1,929	2,616	2,732	2,755	2,777	2,800	2,800	2,902	3,014	3,140	3,279	3,431
Liabilities	2,206	2,290	3,623	3,391	3,619	3,714	3,824	3,900	4,000	4,000	4,448	4,941	5,502	6,118	6,782
Shareholders' Equity	1,302	1,513	2,310	2,433	3,004	3,127	3,229	3,349	3,474	3,474	4,307	5,215	6,249	7,411	8,695
Cash	483	783	818	913	1,596	1,689	1,904	2,126	2,355	2,355	3,404	4,604	5,880	7,328	8,949
Debt	1,099	1,100	2,038	1,291	1,788	1,916	1,916	1,916	1,916	1,916	1,916	1,916	1,916	1,916	1,916
Net Debt	616	317	1,220	378	192	227	12	(210)	(439)	(439)	(1,488)	(2,688)	(3,964)	(5,412)	(7,033)
Minority Interests	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt/EBITDA	1.2 x	0.6 x	3.3 x	n/a	0.2 x	0.8 x	0.0 x	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Operating Metrics															
Return on Equity (ROE)	39.4%	22.1%	4.4%	6.8%	20.7%					23.8%	27.4%	25.2%	23.8%	22.5%	21.1%
Return on Assets (ROA)	14.6%	8.8%	1.7%	2.8%	9.4%					11.0%	13.5%	12.9%	12.7%	12.3%	11.8%
Return on Invested Capital (ROIC)	23.2%	14.4%	1.6%	4.9%	12.9%					15.6%	19.4%	19.8%	19.3%	18.6%	17.8%
Valuation Metrics															
Stock Price (High)	\$ 38.74	\$ 38.26	\$ 45.34	\$ 70.40	\$ 104.54	\$ 109.08	\$ 99.85	N/A	N/A	\$ 109.08	\$ 109.08	\$ 109.08	\$ 109.08	\$ 109.08	\$ 109.08
Stock Price (Low)	\$ 28.33	\$ 21.38	\$ 35.30	\$ 41.33	\$ 53.21	\$ 92.57	\$ 77.93	N/A	N/A	\$ 77.93	\$ 77.93	\$ 77.93	\$ 77.93	\$ 77.93	\$ 77.93
Stock Price (Average)	\$ 33.54	\$ 29.82	\$ 40.32	\$ 55.87	\$ 78.88	\$ 100.83	\$ 88.89	N/A	N/A	\$ 93.51	\$ 93.51	\$ 93.51	\$ 93.51	\$ 93.51	\$ 93.51
Diluted Shares Outstanding (Average)	171.0	172.0	182.0	191.0	191.0	191.0	191.0	N/A	N/A	191.0	191.0	191.0	191.0	191.0	191.0
Market Capitalization (Average)	5,734.5	5,129.0	7,338.2	10,670.2	15,065.1	19,257.6	16,978.0	N/A	N/A	17,859.5	17,859.5	17,859.5	17,859.5	17,859.5	17,859.5
Enterprise Value (Average)	6,350.5	5,446.0	8,558.2	11,048.2	15,257.1	19,484.6	16,990.1	N/A	N/A	17,420.0	16,371.5	15,171.2	13,895.2	12,447.1	10,826.8
P/E	11.2 x	15.3 x	71.9 x	64.7 x	24.3 x					21.6 x	18.3 x	15.1 x	12.0 x	10.7 x	9.8 x
EV/EBITDA	12.0 x	10.1 x	22.9 x	n/a	15.0 x					15.5 x	14.1 x	13.1 x	6.3 x	5.1 x	4.1 x
FCF Yield to Market Capitalization	9.3%	6.7%	2.4%	0.4%	3.3%					3.7%	6.0%	7.2%	7.6%	8.5%	9.4%
FCF Yield to Enterprise Value	8.4%	6.4%	2.0%	0.4%	3.3%					3.8%	6.5%	8.5%	9.8%	12.2%	15.4%
Free Cash Flow															
EBIT	431.0	406.0	148.0	(394.0)	711.0	203.0	249.7	292.3	302.2	1,047.3	1,517.7	1,760.3	1,972.4	2,183.4	2,379.9
Tax Expense	125.0	(31.0)	(77.0)	576.0	(94.0)	(39.0)	(54.9)	(64.3)	(66.5)	(230.4)	(333.9)	(387.3)	(433.9)	(480.3)	(523.6)
D&A	99.0	134.0	225.0	103.0	96.0	24.0	24.1	24.6	25.0	97.7	110.8	136.6	163.3	190.9	219.6
Capital Expenditures	(92.0)	(91.0)	(72.0)	(132.0)	(120.0)	(32.0)	(30.3)	(30.9)	(31.5)	(124.8)	(133.0)	(163.9)	(195.9)	(229.1)	(263.5)
Changes in NWC	(27.0)	(72.0)	(50.0)	(112.0)	(94.0)	(65.0)	(17.5)	(22.8)	(16.9)	(122.2)	(92.3)	(54.7)	(150.0)	(150.5)	(142.4)
Unlevered Free Cash Flow	536.0	346.0	174.0	41.0	499.0	91.0	171.0	198.8	212.3	667.5	1,069.4	1,291.0	1,355.9	1,514.3	1,670.0
Valuation Summary															
Current Price	\$ 96.02														
Target Price	\$ 117.61														
Total Return	22.5%														
Recommendation	BUY														
DCF Valuation															
Perpetuity Growth Implied Price	\$ 118.13	30%													
Exit Multiple Implied Price	\$ 135.20	30%													
Comps Valuation															
Comps - EV/EBITDA Implied Price	\$ 91.96	20%													
Comps - P/E Implied Price	\$ 116.07	20%													

Appendix 2: Discounted Cash Flow Analysis

	Oct-15	Oct-16	Oct-17	Oct-18	Oct-19	Jan-20	Apr-20	Jul-20	Oct-20	Oct-20	Oct-21	Oct-22	Oct-23	Oct-24	Oct-25	
(Figures in mm USD)	FY2015	FY2016	FY2017	FY2018	FY2019	Q1-2020	Q2-2020	Q3-2020	Q4-2020	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	
WACC Calculations																
Cost of Equity																
Risk-free rate	0.5%															
Expected market return	8.8%															
Market Risk Premium	8.3%															
Beta	1.10															
Cost of Equity	9.6%															
Cost of Debt																
Pre-tax cost of debt	4.5%															
Effective tax rate	22.0%															
Cost of Debt	3.5%															
WACC																
Market value of equity	18,340															
Market value of debt	1,916															
Total Capitalization	20,256															
Cost of equity	9.6%															
Cost of debt	3.5%															
WACC	9.05%															
Free Cash Flow																
EBIT	431.0	406.0	148.0	(394.0)	711.0	203.0	249.7	292.3	302.2	1,047.3	1,517.7	1,760.3	1,972.4	2,183.4	2,379.9	
Less: Tax expense	125.0	(31.0)	(77.0)	576.0	(94.0)	(39.0)	(54.9)	(64.3)	(66.5)	(230.4)	(333.9)	(387.3)	(433.9)	(480.3)	(523.6)	
Add: Depreciation and amortization	99.0	134.0	225.0	103.0	96.0	24.0	24.1	24.6	25.0	97.7	110.8	136.6	163.3	190.9	219.6	
Less: Capital expenditures	(92.0)	(91.0)	(72.0)	(132.0)	(120.0)	(32.0)	(30.3)	(30.9)	(31.5)	(124.8)	(133.0)	(163.9)	(195.9)	(229.1)	(263.5)	
Less: Change in net working capital	(27.0)	(72.0)	(50.0)	(112.0)	(94.0)	(65.0)	(17.5)	(22.8)	(16.9)	(122.2)	(92.3)	(54.7)	(150.0)	(150.5)	(142.4)	
Unlevered Free Cash Flow	536.0	346.0	174.0	41.0	499.0	91.0	171.0	198.8	212.3	667.5	1,069.4	1,291.0	1,355.9	1,514.3	1,670.0	
Discount factor						-	0.25	0.50	0.75	0.75	1.75	2.75	3.75	4.75	5.75	
Present Value of Unlevered Free Cash Flow						-	167.3	190.4	199.0	556.7	946.0	1,017.3	979.7	1,003.4	1,014.7	
Discounted Cash Flow Valuations																
Perpetuity Growth Method																
Perpetuity Growth Rate	3.0%															
PV sum of unlevered FCF	5,518															
Terminal value	17,272															
Enterprise Value	22,790															
Add: Cash	1,689															
Less: Debt	1,916															
Less: Other EV adjustments	-															
Equity Value	22,563															
Shares outstanding	191															
Implied Share Price	\$ 118.13															
Exit Multiple Method																
Terminal EV/EBITDA Multiple	13.0 x															
PV sum of unlevered FCF	5,517.9															
Terminal value	20,533.2															
Enterprise Value	26,051.1															
Add: Cash	1,689.0															
Less: Debt	1,916.0															
Less: Other EV adjustments	-															
Equity Value	25,824.1															
Shares outstanding	191.0															
Implied Share Price	\$ 135.20															
WACC																
Perpetuity Growth Rate																
		WACC														
		10.05%	9.55%	9.05%	8.55%	8.05%										
2.00%	\$ 90.70	\$ 97.17	\$ 104.57	\$ 113.11	\$ 123.07											
2.50%	\$ 95.27	\$ 102.50	\$ 110.85	\$ 120.58	\$ 132.08											
3.00%	\$ 100.48	\$ 108.64	\$ 118.16	\$ 129.40	\$ 142.88											
3.50%	\$ 106.49	\$ 115.79	\$ 126.78	\$ 139.96	\$ 156.05											
4.00%	\$ 113.49	\$ 124.23	\$ 137.12	\$ 152.85	\$ 172.48											
Terminal EV/EBITDA Multiple																
		WACC														
		10.04%	9.54%	9.04%	8.54%	8.04%										
11.0 x	\$ 113.20	\$ 115.92	\$ 118.73	\$ 121.62	\$ 124.60											
12.0 x	\$ 121.05	\$ 123.98	\$ 127.00	\$ 130.12	\$ 133.33											
13.0 x	\$ 128.90	\$ 132.04	\$ 135.28	\$ 138.61	\$ 142.05											
14.0 x	\$ 136.75	\$ 140.10	\$ 143.55	\$ 147.11	\$ 150.77											
15.0 x	\$ 144.60	\$ 148.16	\$ 151.83	\$ 155.60	\$ 159.50											

Appendix 3: Comparable Company Analysis

(Figures in mm USD)

Company	Ticker	Share Price	Diluted Shares Outstanding	Equity Value	Cash	Debt	Other EV Adjustments	Enterprise Value	2020E		2021E	
									EV/EBITDA	EV/EBITDA	P/E	P/E
Teradyne Inc.	(NASDAQ: TER)	\$ 60.50	192.6	11,652.6	804.5	398.5	-	11,246.6	16.8 x	15.1 x	23.3 x	19.8 x
National Instruments Corporation	(NASDAQ: NATI)	\$ 36.91	133.3	4,919.1	439.8	-	-	4,479.3	17.5 x	17.9 x	30.3 x	30.0 x
Viavi Solutions Inc.	(NASDAQ: VIAV)	\$ 11.90	231.2	2,751.3	556.9	606.1	-	2,800.5	15.1 x	11.2 x	66.1 x	16.8 x
Fortive Corporation	(NYSE: FTV)	\$ 57.77	350.7	20,259.9	1,205.2	6,328.4	13.2	25,396.3	17.3 x	14.7 x	29.3 x	17.0 x
Teledyne Technologies Incorporated	(NYSE: TDY)	\$ 316.87	37.5	11,882.6	236.8	849.7	-	12,495.5	20.6 x	21.3 x	29.5 x	33.3 x
Anritsu Corporation	(TYO: 6754)	\$ 20.49	137.4	2,816.6	417.2	121.0	1.4	2,521.9	16.9 x	13.5 x	33.4 x	26.5 x
Keysight Technologies Inc.	(NYSE: KEYS)	\$ 96.02	191	18,339.8	1,689.0	1,916.0	-	18,566.8	18.2 x	13.9 x	29.5 x	22.2 x
Median									17.3 x	15.1 x	29.5 x	19.8 x
Mean									17.5 x	16.0 x	35.7 x	23.4 x
High									20.6 x	21.3 x	66.1 x	33.3 x
Low									15.1 x	11.2 x	23.3 x	16.8 x
									EV/EBITDA Implied Price		P/E Implied Price	
Median									\$ 91.30	\$ 104.06	\$ 96.02	\$ 85.76
Mean									\$ 91.96	\$ 110.65	\$ 116.07	\$ 101.14
High									\$ 108.53	\$ 147.34	\$ 214.95	\$ 144.06
Low									\$ 79.22	\$ 76.71	\$ 75.66	\$ 72.47

1 USD : JPY 0.0094

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