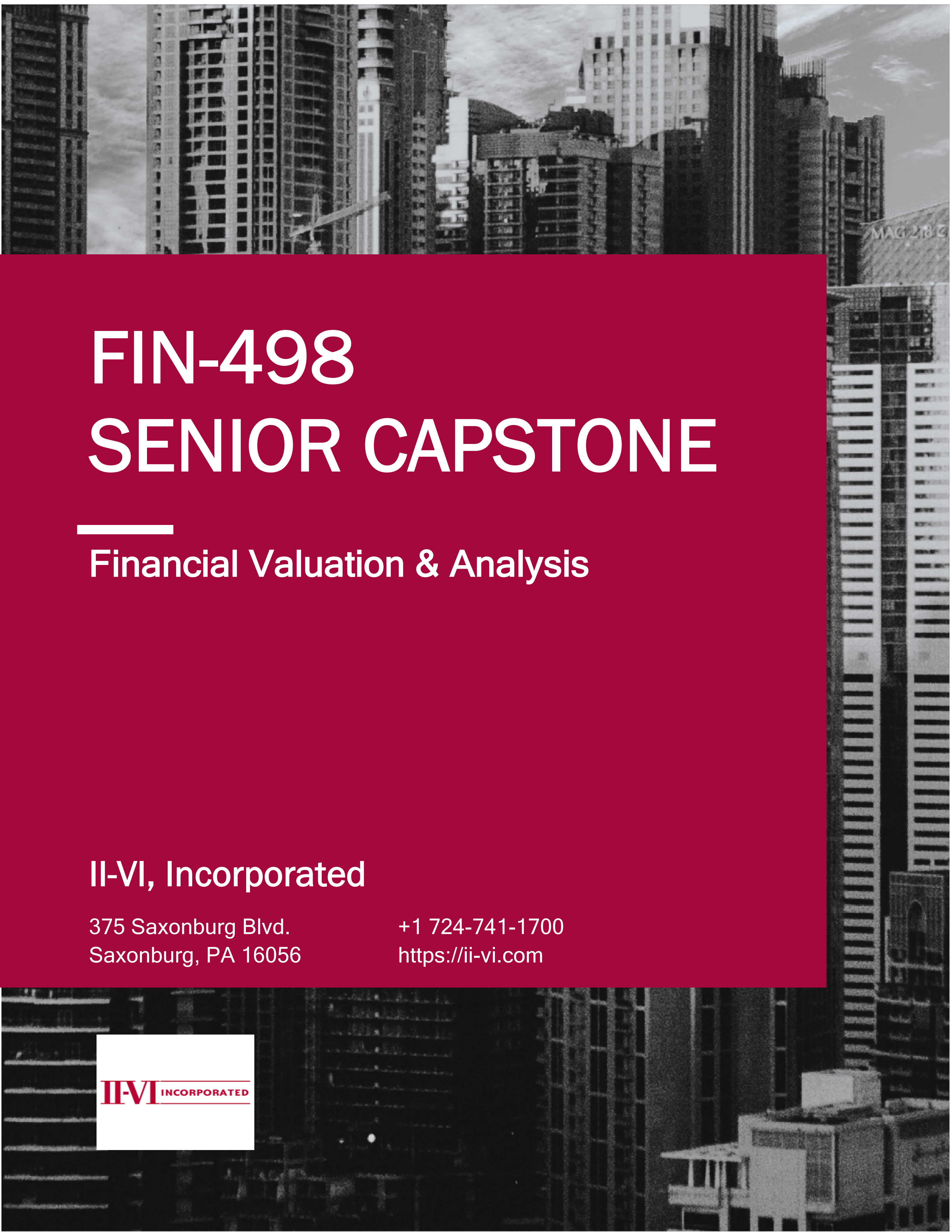

FIN-498
SENIOR CAPSTONE

Financial Valuation & Analysis

II-VI, Incorporated

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Saxonburg, PA 16056

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05/15/2022
Student
Washington & Jefferson College
60 S. Lincoln Street
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II-VI Inc.

Upon the request for an analysis and valuation of II-VI, under the limitations of the FIN-498 Capstone Instructions, I have performed a comprehensive outlook on the company II-VI. The valuation is of II-VI Inc. as of 12/31/2021. The valuation in question was ensued to evaluate the financial attributes of the company's character, and the intrinsic value of the companies publicly traded stock. The estimate of the value of II-VI's stock is that of what results from a conclusive valuation stated below.

Restrictions of the scope of works and or data available relevant for analysis:

- Data is as of 12/31/2021

Estimations of the fair Market Value is on a controlling interest, non-marketable basis for 100% of II-VI Inc. voting diluted common shares as of 12/31/2021 as described within the valuation report.

The conclusion is $62.89 Per Share, as summarized below. The conclusion is subject to conditions and assumption characteristics of years 5 years prior to analysis.

The conclusion of the option of value is under the assumption that the company is still in operation and functioning to maximize shareholder wealth.

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Company Overview: II-VI Inc.

Understanding the Business:

II-VI Incorporated, an engineered martials and optoelectronic components company based in Saxonburg, Pennsylvania founded in 1971 by Carl Johnson. The companies' beginnings are rooted in manufacturing optical components, lenses, and mirrors in the use of producing lasers. Development includes that of a diversified applications in industrial, communications, aerospace & defense, semiconductor capital equipment, life sciences, consumer electronics, and automotive markets. II-VI launched its initial IPO in 1987, which catalyzed the companies leverage and was followed by a string of acquisitions leading the company to develop in the proceeding years in various markets. The company organically grew following a string of ongoing acquisitions with the first being that of Virgo Optics in 1995, and Lightning Optical in 1996 bringing to fruition II-VI's one-micron solid state lasers division. The acquisitions of the companies broadened the company's magnitude to different markets and subsets of the laser production industry. Most recent and notable is that of the censoring markets in the acquiring of numerous companies and most relevantly the merger to Coherent, Inc. that closed in the early months of 2022. The governance of the company has maintained relative stability through the years with Carl Johnson as founder and CEO. However, in 2007 Johnson was succeeded by Francis Kramer, who held president of the company from 1985 up until Johnson's move to Chairmen of the board until retirement in early 2014, who was then succeeded by Vincent D. Mattera, Jr. in 2016. The governance within the company has maintained relatively monopolized and consistent since its beginnings and the board is primarily those who have been present since founded. The company deals through a global sales network and distributes on a large scale to 16 subsidiaries worldwide. With 22,000 worldwide employees and 73 global locations, II-VI has become a leader in predominantly the laser market, and facilitates behind the scenes of government, and commercial consumers. The company is in addition to Saxonburg, PA. also headquartered in the Silicon Valley and Asia in addition to their small United States Headquarters.

Mission:

"Enabling the world to be safer, healthier, closer, and more efficient"

Vision:

"A world transformed through innovative materials vital to a better life today and the sustainability of future generations"

II-VI's Key Products Include:

Optical Communications- That of Finisar Optical transceivers and cables, as well as optical engines, communication components, wavelength management equipment and optical instruments.

Optoelectronic Devices- HPL Bars and Stacks, SE pumps and seeds, GaAs Optoelectronics, InP Optoelectronics, and VCSEL's.

Optics- Such as Industrial Laser Optics, Thermal Imaging Optics, Life Sciences Optics, Diffractive, and All-Purpose Optics.

Laser Systems- Such as Laser Cutting, Micromachining, and Lapping. In addition, Mono Dimond cutting equipment.

Laser Processing Tools and Components- Laser Processing Heads, Beam Delivery Systems, DPSS Lasers, Laser Diode Modules, and Laser Engines.

Electronic Devices- Such as Discrete Low-Noise Amplifiers, Broadband Switches, and MMIC Amplifiers.

Epitaxial Wafers- Such as RF, Photonics, and Power Electronics Epitaxial Wafers.

Silicon Carbide Substrates- Such as SiC Power Electronics and SiC for RF Electronics.

Thermoelectric- Thermoelectric Coolers, Power Generators, and Thermoelectric Systems.

Ceramics and Metal-Matrix Composites/ Rare Metals- Such as Reaction-Bonded Ceramics, Metal -Matrix Composites, Rare Specialty Metals, and Scandium Recovery Technology.

II-VI Key Markets

Communications

- ROADM Systems
- Coherent Transmission
- Datacenter Interconnects
- Submarine Transmission
- 5G Wireless
- 5G Optical Infrastructure
- Datacom Transceivers and Active Optical Cables

Industrial

- High-Power 1 µm Laser Processing • High-Power CO_2 Laser Processing
- CO_2 Laser Microprocessing
- CO Laser Microprocessing

- Ultraviolet Laser Microprocessing • Ultrafast Laser Microprocessing

Automotive

- High-Power Electronics
- In-Cabin Interaction
- LiDAR Sensing
- Thermal Management Systems

Semiconductor Capital Equipment

- FEOL Photolithography
- MEOL Inspection and Testing
- BEOL Dicing, Packaging, and Testing

Life Sciences

- Flow Cytometry
- Fluorescence Imaging
- Fluorescence Spectroscopy • Genome Sequencing
- Clinical Lasers
- FDA-Approved Assemblies
- PCR Analysis

Aerospace & Defense

- Intelligence, Surveillance, and Reconnaissance (ISR) • High-Energy Laser Systems
- Missiles and Ordnance
- Electromagnetic Interference and Survivability

Consumer Electronics

- 3D Sensing in Biometrics
- 3D Sensing in VR and AR
- Human-Machine Interfaces • Internet of Things (IoT)

II-VI Key Customers:

While the company disperses to predominantly the personal service industry, followed suit by the construction services, mining machinery, casinos and gaming, wholesale, electric wiring and social media industries. While this broad outlook can give insight to the markets to which the company has a presence it is by no means limited to those markets, with a standing in over 30 diversified markets. Notably, II-VI can be accredited as a key supplier to conglomerates such as Apple, being the largest per market cap among the thousands of consumers of their very broad range of products. More notable customers from various industries would include Comcast Corporation, Cisco Systems Inc., Meta Platforms Inc., Alphabet Inc., Intel, Toyota, Tesla, and Boeing. While this list is comprehensive in nature, it gives insight to not only the scale to which II-VI's product is utilized, but also the diversity in which they supply, and make up some of the world's most household names and products.

II-VI Key Suppliers:

II-VI is supplied to by those of the Aerospace and Defense industry making a large majority of the industry in which they use products from this industry to manufacture their own. And with the product in which the company manufactures the steel and iron industry also has a presence for reasons being that a majority of the product would consist of steel, iron, metals, and aluminum. While the list non comprehensively is simply ostentatious being how intricate the result the company seeks would be impossible to wrap one's head around, one can imagine product of this stature would require a decent amount of technology, in addition to various materials. Companies such as Arcelomittal, Berkshire Hathaway Inc., Intel Corporation, 3M Company, and Thermo Fisher Scientific Inc. are among some of the largest suppliers the companies deal with in an official setting. While the scope of produce entailed in the production for the company, in addition to products of various service and managerial purposes to make the business run, deal with an endless list of large and small companies to ensure adequate operation and production.

II-VI Key Competitors:

II-VI's top competitors include that of Acacia Communications that entails similar productions in communications equipment. In addition, China Aerospace Times, Dupont Electronics& Industrial, IBIDEN, Jenoptik, Sumitomo Electric, Komatu and Broadcom also make up much of the competition among the various categories II-VI products their products in alignment with the specific markets each competitor occupies. While II-VI is to reiterate broad, being that while the level to which their competitors operate is largest, the company does not exist in one market or production line. With this taken into consideration it would also be noted that many of their competitors in specific markets would also be considered customers being that the nature of their products and the reliance upon one another for components. This fact allots for the company's apparent stability being the spread is diversified.

II-VI Business Cycle:

II-VI's business lifecycle is consistent in nature upon analysis. While there are market specific dips universally faced across all markets since the company's fruition, it has proven too often move adjacent to the S&P 500 in recessionary periods. Upon analyzing II-VI's performance comparatively to the market index for a period of 5 years, the company appeared to move in tangent with that of the index. With this in mind it would be assumed that the life cycle of the company is cyclical to markets. However, when markets were in expansionary periods, II-VI outperformed markets significantly. Inversely there were circumstances in which the company also experienced low returns in comparison to index averages. What is to be noted for a potential investor in the company's current state is due to the nature of acquisitions and expansion into diversified markets in recent years. II-VI has experienced exceptional perpendicular relationships to the market for the years of 2020 and 2021, this can be attributed to the extent they have diversified across multiple industries. So, while at a glance the company would seemingly appear to have a parallel business cycle, it would be safe to assume that they have made significant strides in the realm of diversification and have instead moved towards consistently beating the market and moving not in tangent, but in excess of the benchmark. To conclusively categorize the cyclical cycle of the company it would be best stated that they have consistent growth and presence in the market, and to reiterate while they may have macroeconomic influences, they are consistent and stable, all while increasing profitability. While II-VI functions in the shadows of some of the world's largest companies, their string of strategic acquisitions and modeling momentum have set them apart exponentially from some of their larger and smaller counterparts.

PESTEL Analysis

- **Political Factors Impacting II-VI Inc.:**
  - Political factors are key in assessing profitability of the company. With II-VI operating within the Scientific & Technical product within dozens of countries, the company is at risk of exposure and subject to various political environments.
  - Political stabilization across the counties in which the company's business is done and the technical sector of that economy allots for continued demand for product.
  - Political and governmental risk specific to each country in which business is held in correlation with technological sector corruption shifts regulations.
  - Governmental interference in relative sectors effects the extent to which the company can operate.
  - Taxation and price regulations of company specific importing.

- Legislation pertaining to wages and employee treatment that can correlate with the company's morals and policy.

- **Economic Factors Impacting II-VI Inc.:**
  - Macroeconomic factors such as inflation rates, interest rates, exchange rates and economic cycles affect the markets in which the company operates within. Microeconomic factors such as the competitive nature of the specific sectors affects the company's performance and operation as well.
  - Governmental intervention tactics in the realm of the free markets a d technological company.
  - Exchange rate and international stability
  - Skill level and adequacy of scientific and technological workers in country and abroad
  - Labor costs and overall workforce productivity affecting production.
  - Business cyclical stage and current market effect.
  - Economic growth and decline faced within home country.

Social Factors Impacting II-VI:

- Societal compositing socioeconomically
- Country's education level at a consumer, producer, and management level
- Cultural impact of home country's disposition on leisure, and work ethic.
- Environmental feelings specific to industry, and public interest and or opinion on the matter
- Movement towards technological based communication and reliance societally.
- Carbon footprint of the company and social regulatory standards upheld.

Technological Factors Impacting II-VI:

- Advancements in the technology business in correlation with the company's core operations.
- Covid-19 technology demand, and company outreach pertaining to adapting to demand.
- Development of technology in the car industry, and adaptation to the unique markets.
- Recent technological width changes amongst industry competitors.
- Cost structure challenges in Scientific, Technological, and Industrial Sector.
- Technological diffusion of needs in an everchanging market of technological advancements.

Environmental Factors Impacting II-VI:

- Environmental standards impact on profitability of companies within the sector universally.
- Environmental laws relevant to states of production but also states in which business is done.
- Recycling initiatives enacted upon the industry and companies presiding.
- Waste management strategies specific to the sector and the business and how the companies go about handling waste.
- Company attitude towards ecological production of company products.
- Renewable energy tactics the company institutes.
- Air and Water pollution regulations in the industry.

Legal Factor Impact on II-VI:

- Intellectual Property rights of the company and country legal framework surrounding the industry in country of production.
- Anti-Trust laws in Scientific and technical Instruments.

- Copyright, patent, and intellectual property laws applicable to II-VI.
- Consumer, producer, and supplier insurance.
- Healthy, Safety, and Employment laws presiding over the company and their management.

Industry & Competitive Analysis

Numerous competitors are engrained in the Scientific & Technological Markets and the industries overall profitability. While the company's revenue grew moderately slow compared to the average of competitors, this can also allude to the risk bore by investors. Total Revenue increases for the company in the 4th quarter in 2021 grew at a rate of about 2.6%, while competitor average revenue growth was 14.17%. However, in the same quarter the net margin proved to be relatively higher than competitors at 8.4%, indicating higher profitability than that of the companies' competitors. In addition, Net Income Comparisons indicate a decline in net income relative to competitors in the industry. This data could be due to the nature of the year in question, being the reliance on technology as the medium during the pandemic put a pivotal need on many of the companies specializing in this communicative technology, and while II-VI has a presence in this industry, it may not be to the extent many do, being that II-VI has only in recent years made moves towards communications. II-Vi deals primarily in the laser and optoelectronics market, and with this in mind can explain why there was seemingly slower growth comparative to competitors. Among these competitors Te Connectivity ltd can be attributed for $3,818 Million of the industries revenue with 82,000 employees. Commonscope Holding Company Inc. is attributable to $2,224 Million of the industries revenue with 20,000 employees. Lastly of note Anixter International Inc. makes up $2071 Million of the industries revenue. However, while II-VI's revenue is of a smaller proportion at 806 million for the year 2021 with 20,000, it is notable that the company's Net

Income was positive in that year, while many competitors of higher market cap had negative net income for the year.

Using Porter's Fiver Forces pertaining to II-VI Inc. a better conceptualization of competitive advantage in the Scientific & Technological industry. This analyzation utilizing Porter's Five Forces can help investors understand the company's strategic position and how they plan to expand upon profitability.

- *Threats of New Entrants*
  - New entering companies to the industry could elicit innovative strategies but cause external pressure to II-VI to compete among similar production.
  - New products and survives keeping reliable consumers and incentivizing new business.
  - Allocation of capital towards research and development where II-VI can define the regulations and norms of the industry, leaving competitors of new entery to follow by example.
- *Bargaining Power of Suppliers:*
  - Having Multiple Suppliers and building a supply chain that is efficient and serves business purposes.
  - Material variability in production, to combat potential changes in vital material costs.

  - Having suppliers that depend on the business of the company and a loyal and reliable long-standing relationship relative to II-VI's business.
- *Bargaining Power of Buyers:*
  - Build a substantial conglomerate of customers, to combat bargaining power in a small pool of customers, and hence add efficiency to sales and production.
  - Innovate new products across various markets, in order to keep prices non-negotiable for those that have been in production for substantial periods of time.
  - New product development will help the diffusion of existing customers to competitors.
- *Threat of Substitution*
  - Movement into the service industry opposed to just production broadening customer reliability.
  - Understanding key buyers opposed to just that of which buys their product, understanding the nature of the consumer and capitalizing upon it.
- Rivalry Factors among Competition:
  - Differentiating themselves as a company within the industry in a way that can be up help and evolved upon.
  - Increase relative growth and scale within the industry to better rise to value of higher tier competition.
  - Cooperation and Collaboration with partners and competitors through acquisition.

II-VI Inc. strategically sets itself apart from those of the industries in which they produce and operate. II-VI maintains their competitive advantage through strategic market entrance. They reach this objective by inserting themselves via acquisitions and mergers that have made their business expand beyond the realms of their initial product. The innate capabilities of the company allow them to capitalize on what they specialize in, but the tools, resources, and skill required in that of one industry they can apply to the various they have become a part of. Many companies of similar stature simply stay in the realm of specialty, which is their strategy on staying competitive in the everchanging industry. To counteract this II-VI broadened their borders to what they are capable and as referenced in the analysis, produce in 7 strategic markets. This is unique and provides a competitive advantage to the company, making them almost diversified and stable within their own walls. While investors may look to various companies for the numerous purposes of diversifying in the scientific and technological markets, II-VI has strategically packaged themselves as just that. because of this their financial stability compared to that of competitors would be considered safer and provides reliant and consistent returns.

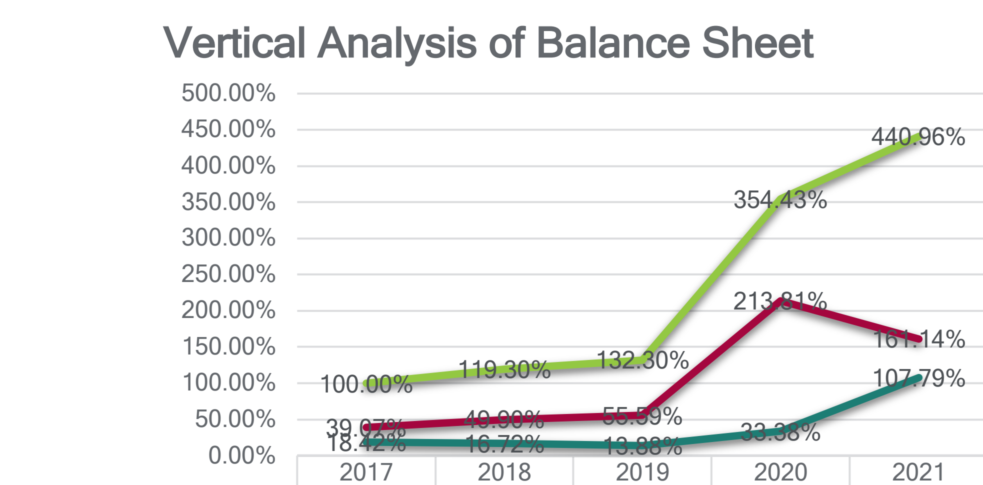
While the industries in which II-VI functions are relatively competitive, the unique thing about II-VI and the company in the industry is that they can remain vital. In addition to the vital nature of the products manufactured, they are also intertwined into the wellbeing and manufacturing of endless amounts of products across countless industries. They function in the shadows as a key component of some of the largest companies in the world. While they may just be a small component, the specialization they provide in key components is something not to be ignored. As need for advanced products in the laser, optoelectrical, life science, and communications markets among others progresses as technology becomes the medium, instead of just being a producer in one of the many markets encompassed in the industry as many competitors are, they have a stake in each. This notion of strategic markets is the company’s competitive advantage. In addition, they manufacture and are headquartered in Pennsylvania, and have grown beyond the limits of the state. This speaks to their outreach in the industry as they do not manufacture strategically across 73 locations worldwide, each with an innate reasoning for distribution.

Analysis of Financial Statements: II-VI Inc.

Vertical Analysis of Balance Sheet (in thousands)

II-VI's Cash and Short-Term Investments have remained relatively stable throughout the years of 2017 through 2019. The percentage of Cash to total assets in 2017 being 18.41%, respectively with 2018 being 16.72% and 2019 being 13.87%. However, in the years of 2020 and 2021 being 33.38% and 107.78%. This exponential growth in recent years can be attributed to extreme changes in their levels of receivables in more recent years. The companies' levels of debt have also grown relative to total assets assets, with 2019 long term debt being 31.14% of total assets and going up to 155% in the year 2020. In addition, the company's goodwill changing exponentially changed in the years 2019 to 2020. In addition, while the company's current assets were 47.52 percent of total assets, in the year 2021 compared to total assets of the base year accounted for 204% growth relative to total assets of the base year. Notably the company's shareholders equity as a percentage of total assets have grown exponentially in the years 2020 and 2021 compared to the base year of 2017.

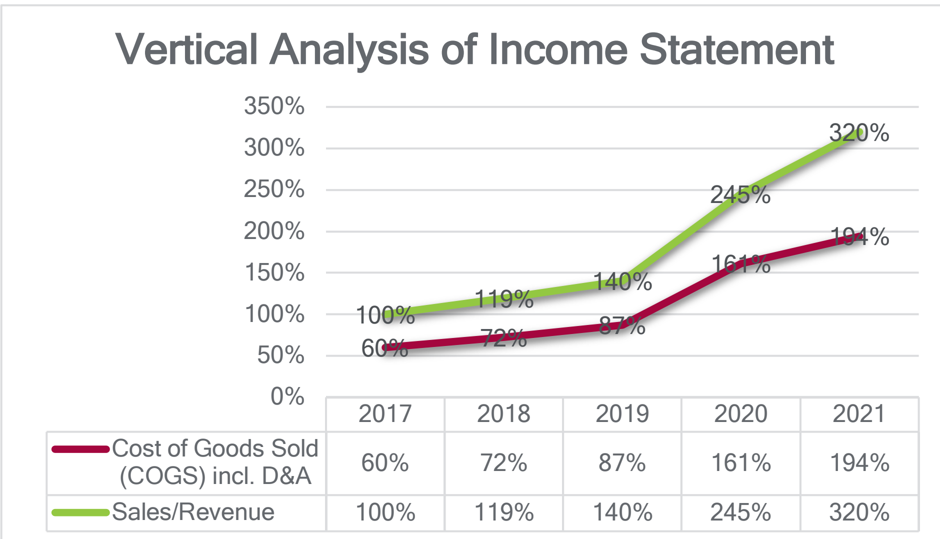
(Exhibit 2.A)



	2017	2018	2019	2020	2021
Total Liabilities	39.07%	49.90%	55.59%	213.81%	161.14%
Total Assets	100.00%	119.30%	132.30%	354.43%	440.96%
Cash & Short Term Investments	18.42%	16.72%	13.88%	33.38%	107.79%

Vertical Analysis of Income Statement (all values in thousands)

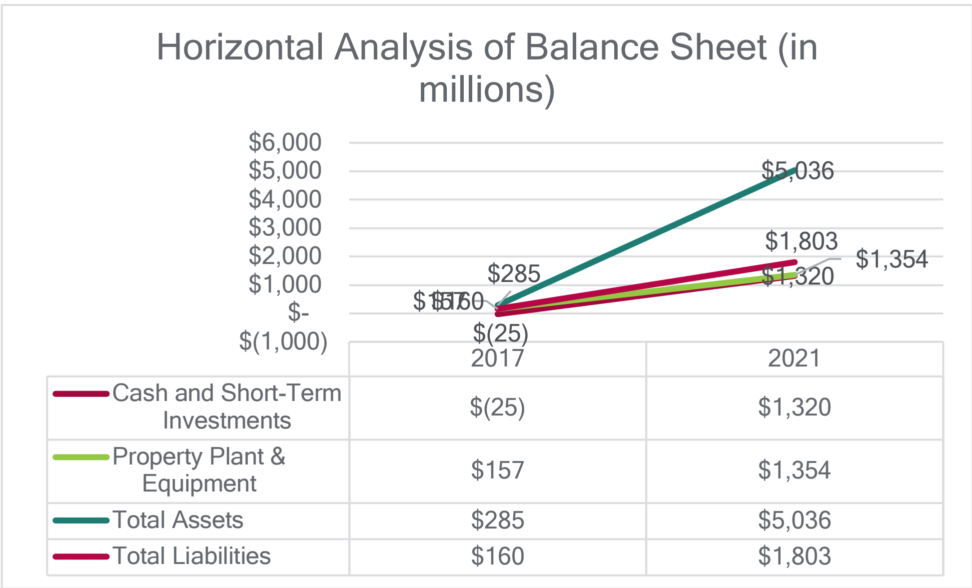
II-VI's revenues have grown exponentially from the base year of 2017 until recently as of 2021. Compared to the base years revenues of 972 in thousands the companies' revenues as of 2021 were 3,106. This growth in revenue was substantially a 320% increase. In addition, the company also had exponential changes in their cost of goods sold, with an 194% increase compared to base year numbers. This would indicate that they have expanded their horizons on the levels of development and manufacturing, ultimately alluding to an advancement and growth in the company's operations. ***(Exhibit 2.B)***



Horizontal Analysis of Balance Sheet (all values in thousands)

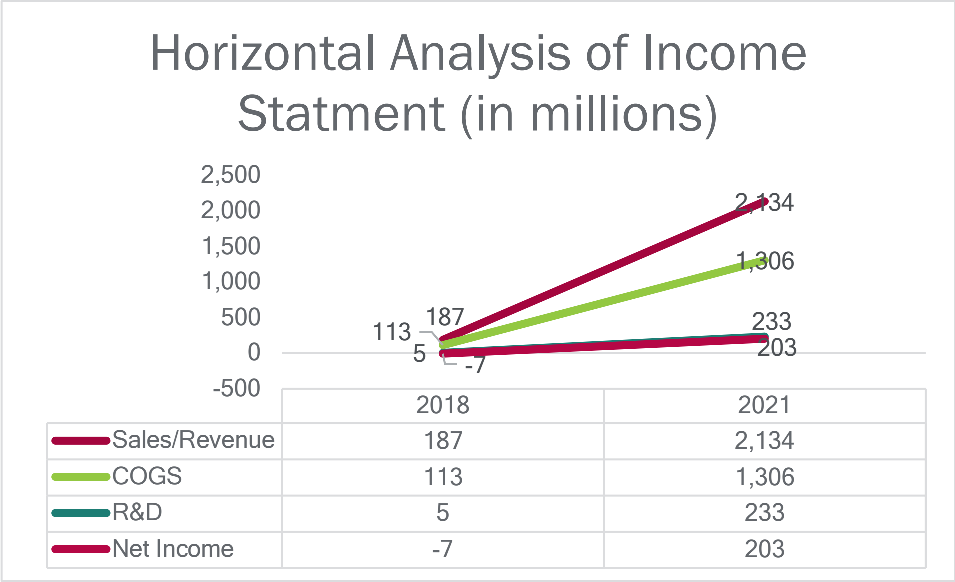
II-VI's cash and short-term investments increased by 107% from 2017 till 2021. In addition, property, plant & equipment also grew exponentially with a 141% increase, making evident that the company has expanded in the realm of assets and the extent to which they manufacture within the market and industry. While the company's total assets sat at $6,513 in the year 2021, their total liabilities held at $2,380. Respectively this would indicate that the company has a surplus of equity, indicating good growth and expansion within the industry.

The company's long-term debt also grew exponentially with a 98.72%. This would indicate that II-VI's operational and infrastructure growth, perhaps due to the nature of their expansion into strategic markets via acquisition. In correlation with the company's assets and liabilities, the company's equity grew 279.7% from 2017 to 2021. This would be evidence of growth via shareholder wealth, and hence allude to a presence in the market that has grown. The value of the company's common stock has also had substantial changes as common stock par value has grown 137.3%, indicating that they have issued an immense number of new shares. ***(Exhibit 3.A)***



<u>Horizontal Analysis of Income Statement (all values in thousands)</u>

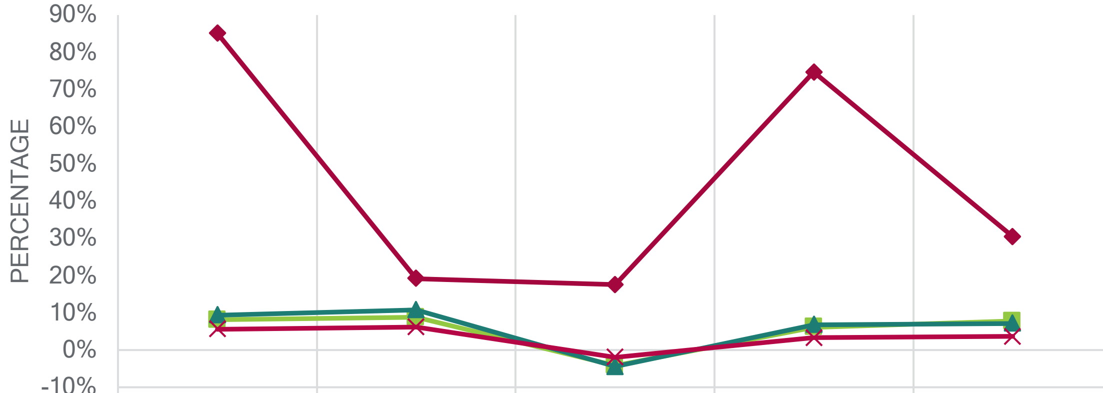
As of 2021 the company experienced a 219.54% increase in revenues from 2017. In addition, the company also experienced a 223.63% increase in the cost of goods sold from the base year. This would translate into the expansion in the scientific and technological industry as a company. In correlation with growth in this regard the company also saw a 204% increase in research and development, which is associate with their mission to evolve into strategic markets, and into different areas of production. This can contribute to their strategy being sufficient for sustained growth. This solidifies from their net income numbers increasing by 213.68% from the year 2017 until 2021. This translates into 95 million to 298 million in net income in the stated time frame. ***(Exhibit 3.B)***



<u>**Key Ratio Analysis Compared to Industry Average:**</u>

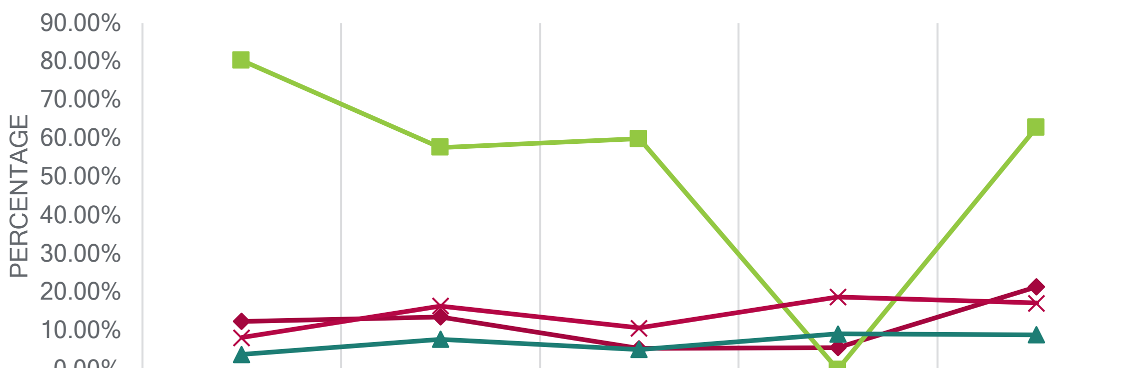
II-VI's revenue growth consistently outperformed compared to that of the Scientific and Technological Instruments industry. Throughout the years beginning in 2018 the company experienced a 19.21% revenue growth, with the industry only performing on average with a 13.70% growth across the board. Where II-VI showed immense strength was in the years of the COVID-19 pandemic. In the year 2020, the company experienced a 74.68% revenue growth. The industry produced only a 5.74% growth that same year. This notion may be attributed to their presence in the technological market, but still gives insight to the company's consistent performance such as a pandemic, where many companies suffered, II-VI saw exponential growth and evolved with the landscape. In correlation with findings pertaining to revenue growth, the company also experienced immense growth in their income. While the company fluctuated taking a large loss of income growth in the year 2020 with a -162.34% income growth rate, the company experienced a 543.92% growth rate the following year, opposed the industries 14.83% growth in 2021. II-VI had relatively higher current ratios compared to the industry from the years 2017-2019, however the industry saw slightly higher ratios in 2020 and 2021. While this is by no means a negative attribute as the ratios is relatively stable, it can be attributed to the company taking on more long-term debt opposed to their short-term obligations. However, their quick ratio is consistently higher than the industry average over the 5 years of analysis, and almost double to that of the industry. This would indicate the prospect of financial stability within the company, making them relatively liquid. The company also maintained a higher interest coverage ratio compared to that of the market in the year 2021, holding a 34.47 times interest earned compared to the industries 24.34. This can be attributed to greater interest expenses compared to competitors of the industry. II-VI experienced lower profit margins than that of the industry consecutively over the horizon of analysis. Industry P/E ratios available indicate that in 2021 the industry P/E was 25.55. II-VI experienced a price to earnings of 31.06. While data for the industry available pertaining to P/E is only available for 2021, II-VI held a P/E ratio of 31.06, while the industry held 25.55. This would mean relative to earnings the company's market value, hence signaling those investors expect higher return on II-VI compared to that of the industry. II-VI's market to book ratio also decreased over the horizon of analysis due to their growing share price. This can be analyzed in the company's M/B ratio of 2.05 in 2021 and the industry holding a 5.76, indicating that the company is undervalued compared to that of the scientific and technical instruments industry.

II-VI INC. KEY FINANCIAL RATIO ANALYSIS



	2017	2018	2019	2020	2021
Revenue Growth	85%	19.21%	17.58%	74.68%	30.50%
Profit Margin	8.08%	8.81%	-4.18%	6.16%	7.76%
Return on Assets	9.39%	10.78%	-4.41%	6.86%	7.20%
Return on Equity	5.64%	6.17%	-1.96%	3.32%	3.65%

INDUSTRY KEY FINANCIAL ANALYSIS



	2017	2018	2019	2020	2021
Revenue Growth	12.55%	13.70%	5.47%	5.74%	21.47%
Profit Margin	80.30%	57.66%	59.97%	0	62.92%
Return on Assets	3.92%	7.89%	5.24%	9.27%	8.99%
Return on Equity	8.31%	16.51%	10.77%	18.83%	17.28%

Summary of Financial Statement Analysis:

Within the common size analysis of the balance sheet total current liabilities and assets in addition to cash and short-term investments. Cash and ST Investments made up 18.42% of total Assets in 2017 and 33.38% in 2020. This can be attributed to the debt and liabilities taken on throughout the years changing as the company has expanded. In addition, their current assets and current liabilities have grown as a percentage of total assets and hence also alludes to company growth.

Within the income statements common size analysis, it is important to note that sales have increased substantially over the horizon analysis. With sales in the base year of 2017 being $972,000,000, and in 2021 being $3,106,000,000. In addition to elaborate on the company's growth, Property Plant and Equipment has also grown exponentially over the analyzation period. In addition, the cost of goods sold has also increased 194% since the base year. While net income has fluctuated a year due to the pandemic it has made up in spades the distance and can be considered relatively stable for growth. In addition, operating income has also grown, which means the company is relatively health and should be viewed as so in the eyes of a potential investor.

Within the trend analysis compared to that of the industry, in graphical form the companies appear to move in similar ways in relation to their revenue, profit margin, ROE and ROA. It is also important to add that II-V I outperforms the industry average in these regards but also lacks in other regards such as spiritic dips in income compared to the industry. II-VI's revenue growth while like the industry was higher, as they have expanded into other markets within the industry and self-diversified. And while the industry has higher profit margins, meaning that the cost of production is high, as the nature of the product is complex and costly, the revenues received as compensation still pulls them above the industry average.

ROE and ROA are also both higher within the company compared to that of the industry, due to growth in income comparative to the industry. In addition, the company saw spikes of asset growth in the year 2020 with a 167.93% Asset growth with the industry only gaining a 43% growth. In addition, while the company's income growth varied over the analyzation period, with a -7.63% drop in 2018 and a -162.34% drop in 2020, the company also saw a 543.92% income growth rate in 2021, while the industry experienced a 14.83% income growth. In the realms of volatility, the company seems to stay consistent where it matters pertaining to the analysis, and while there are some facets to magnify such as income growth it should not deter one away from the company. Within the company's current and quick ratios, the company stayed relatively consistent with the industry, meaning that their ability to take on debt is like that of the industry average, while slightly lower than the industry, it is not alarmingly below or above the average regarding indicators such as these.

Valuation of II-VI Inc.- Public Comparable Methodology

Description of Analysis and Advantageous Discussion

The approach taken within the comparable analysis is used to vale II-VI Inc. by comparing valuation multiples to that of their peers within the industry. The valuation methods in question are multiples in which subsidizes a metric to gage financial performance of the company compared to peers selected of similar financial stature within the same markets that II-VI operated within. The objective of such valuation is allowed for a comparative outlook on if the company subjected to analysis trades in a similar multiples fashion compared to those of similar demographics within the industry. The advantageous characteristics of this method opposed to others can be attributed to available information on public companies, valuation using the multiples to instill a benchmark as a foundation for analysis and folding in foundational attributes into the conclusive valuation.

Analysis will consecutively include key metrics such as P/E, P/B and P/S ratios. In addition, metrics such as EV/Sales, and EV/ EBITDA will be included in the valuation. To simplify the metrics a basic understanding of what they represent will set a good framework for deciphering the analysis. P/E is an equity based multiple approach found by taking the market price by the company's earnings per share. P/B is the price to book ratio and is found by dividing the share price at the time of analysis by the company's book value per share. P/S is calculated by taking share price divided by net sales per share to represent the price to sales ratio. Next analysis finds the enterprise value and divides this number by the revenue for the company. Lasty in addition to these multiples approaches the enterprise value is taken divided by the EBITDA for the company.

The emphasis of this analysis will be taking median values for such multiples and comparing them to that of comparable companies. The analysis will span over 6 similar companies within the industry. Due to the nature of II-VI's operations and presence in the market, five companies will represent best similarities as the company is unique in nature and comparable outside the range of selected companies would skew the analysis. The conclusions found through analysis should represent how II-VI performs in comparison to other companies of similar stature within the Scientific and Technological Instruments industry.

Peer Group Selection:

As priorly stated the peer group comparable to II-VI is of a smaller stature due to the nature of their vast product and operations. The companies are a selection of companies in competition and or operating in similar industries to II-VI while also maintaining a similar status within that same industry. The 6 companies selected as a peer group consists of Sumitomo Electric, Lumentum Holdings Inc., IBIDEN, Jenoptik, Franklin Electric Co. Inc., and EnerSys. These companies were selected for multiple reasons, one of which being they are of the same industry being the Scientific and Technological Instruments. In addition, they are competitors, but also have similar product lines and are of similar size and capitalization relative to II-VI. The range of market capitalization ranges from $3 Billion to $8 Billion with a median value of $5.4 Billion. In addition, all the companies hold an enterprise value ranging from $3 to $14 Billion with a median enterprise value of $5.8 Billion. While the industry and competitors of II-VI holds outliers far above and below, the choice of peer selection represents justly as a valid comparable analysis peer group. The characteristics that make up the peer group selection also encompasses similar characteristics across the board, and II-VI lies in the upper middle of the market capitalization and enterprise value among the peers. II-VI's market price was of middle ground of its peers with a market price as of December 31st, 2021, holding at 63.33. Sumitomo Electric held at 10.59, Lumentum Holdings Inc. at 86.95, IBIDEN at 43.32, Jenoptik at 24.38, Franklin Electric Co. Inc. at 81.11 and EnerSys at 70.86. The company's revenue had the third highest revenue as of December 31st, 2021, at $3.106

Billion, with the top company being Sumitomo Electric at $868.7 Billion, and with the smaller of the companies being in the range of $219 Million held by Jenoptik and EnerSys holding $814 Million in revenues for the year in question. While the companies had a range of net incomes II-VI was of the middle upper grounds holding $67.66 Million.

Company Name	Market Cap(B)	EV(B)	EV/Sales	EV/EBITDA	P/E	P/B	P/S
II-VI Inc.	$ 7,260,000,000.00	$ 8,410,000,000.00	10.42	50.21	17.18	2.1	2.53
		1000000000					
Sumitomo Electric	$ 8,259,000,000.00	$ 14,040,000,000.00	0.02	0.38	9.71	0.7	0.36
Lumentum Holdings Inc.	$ 6,271,000,000.00	$ 7,030,000,000.00	15.73	54.77	14.53	3.88	4.73
IBIDEN	$ 8,300,000,000.00	$ 8,540,000,000.00	0.08	0.25	25.38	2.82	2.54
Jenoptik	$ 2,130,000,000.00	$ 2,330,000,000.00	16.49	58.61	26.15	2.87	2.46
Franklin Electric Co. Inc.	$ 4,400,000,000.00	$ 4,550,000,000.00	10.53	70.21	29.07	4.76	2.87
EnerSys	$ 3,310,000,000.00	$ 4,020,000,000.00	4.76	52.46	14.45	2.11	1.08
Average	$ 5,445,000,000.00	$ 6,751,666,666.67	7.94	39.45	19.88	2.86	2.34
Median	$ 5,335,500,000.00	$ 5,790,000,000.00	7.65	53.62	19.96	2.85	2.50

Median	EV/Sales	EV/EBITDA	P/E	P/B	P/S
EV	$ 6,170,292,706.33	$ 8,980,325,632.34			
Equity Value	$ 5,020,292,706.33	$ 8,980,325,632.34	$ 8,432,671,711.29	$ 9,835,571,428.57	$ 2,017,754,318.62
Equity Value Per Share	$ 43.28	$ 77.42	$ 72.70	$ 84.79	$ 17.39

II-VI Inc.'s multiples an EV/EBITDA of 50.21, an EV/Sales of 10.42, P/E of 17.18, P/B of 2.1 and P/S of 2.53. The median of the 6 companies within the peer group entail an EV/EBITDA of 53.62, EV/Sales of 7.65, P/E of 19.96, P/B of 2.85 and a P/S of 2.50. The values between II-VI and the comparable median they are relatively similar in P/S and P/B. However, they are lower pertaining to EV/EBITDA and P/E. They are not higher regarding any of the multiple analyses. Due to the ratio valuations of the comparable companies in comparison to that of II-VI, while the metrics do not deviate far from industry peers, it would be safe to assume that some value of II-VI is unrealized. From the relevant information it would be just to state to some extent the company is undervalued.

Multiples Selection:

Within the analysis, P/E, P/B, EV/Sales, EV/EBITDA, DCF perpetuity growth model, and DCF exit multiple valuation methods were utilized. Due to the nature of their valuation outcomes being of relevant stature in relation to the implied share price. Hence due to skewed estimates in proximity to that share price, P/S valuations was not included in the range.

Final Range of Values using Comparable Analysis:

Maximum	EV/Sales	EV/EBITDA	P/E	P/B	P/S
EV	$ 13,309,107,485.60	$ 11,759,930,292.77			
Equity Value	$ 12,159,107,485.60	$ 10,609,930,292.77	$ 12,284,528,521.54	$ 16,456,000,000.00	$ 3,817,591,170.83
Equity Value Per Share	$ 104.82	$ 91.46	$ 105.90	$ 141.86	$ 32.91

II-VI Inc.-Level	EV/Sales	EV/EBITDA	P/E	P/B	P/S
EV	$ 6,404,352,207.29	$ 6,607,179,180.77			
Equity Value	$ 5,254,352,207.29	$ 5,457,179,180.77	$ 8,401,682,188.59	$ 9,875,904,761.90	$ 1,888,618,042.23
Equity Value Per Share	$ 45.30	$ 47.04	$ 72.43	$ 85.14	$ 16.28

Minimum	EV/Sales	EV/EBITDA	P/E	P/B	P/S
EV	$ 16,142,034.55	$ 41,874,128.66			
Equity Value	$ (1,133,857,965.45)	$ (74,125,871.34)	$ 4,103,294,528.52	$ 2,420,000,000.00	$ 290,556,621.88
Equity Value Per Share	$ (9.77)	$ (0.64)	$ 35.37	$ 20.86	$ 2.50

Multiples	Value
EV/SALES (HIGH)	16.49
EV/EBITDA (HIGH)	70.21
P/E (HIGH)	29.07
P/B (HIGH)	4.76
EV/SALES (LOW)	0.02
EV/EBITDA (LOW)	0.25
P/E (LOW)	9.71
P/B (LOW)	0.7
P/S (LOW)	0.36

Valuation of II-VI Inc.- Discounted Cash Flow Methodology

Description of Analysis and Advantageous Characteristics:

The discounted method of valuation unto II-VI seeks to provide insight into forecasted projections using a determined terminal valuation estimation. This methodology can be compartmentalized into several steps in order to estimate the stock's value intrinsically. Projecting a period for valuation, estimating free cash flows, calculating discount rate, terminal value, present value, then adjust and perform a sensitivity analysis to value the company and stock price. The perpetuity growth method and exit multiple method were used in valuation. These methodologies prepare for precise values to be projected over a horizon period of a set number of years. Terminal Valuation will be adjunct to the cash flows of the final projection year and all cash flows within the horizon will be taken at present value. This allows for detailed, precise and relatively accurate estimation of the stocks intrinsic value.

The advantageous nature of using the discounted cash flow method or the DCF is without comparable analysis, to intrinsically value the company's stock. In correlation with this notion also allows for assumptions, future expectations, and financial attributes relevant to valuation in opposition to that of historic valuation methods. Considering short-term and long-term research, the DCF aims to and provides accurate estimations for value. The other unique attribute of a method such as the DCF is it can be manipulated in unorthodox and flexible ways in order to form to the company at the core of valuation, and because of this reflect the company and industry in which it takes part in, leaving the client with a very concise and trustworthy valuation.

Calculation of Free Cash Flows:

In calculating FCF an understanding of the company's financial abilities pertaining to revenues generation, ability to make good on debts the company has taken on, and the company's ability to maximize the wealth of shareholders. With these facets in mind, it is imperative in the calculation of free cash flows.

Chronological Order of process:

1. Earnings before interest & taxes * (1-tax rate)
2. + Depreciation & Amortization
3. + Change it net working capital
4. – Change in CAPEX

Final formula of FCF: $EBIT * (1 - t) + D\&A + \Delta NWC - \Delta CAPEX$

Forecast Period& Assumptions of DCF Model:

Due to the nature of II-VI within the Scientific & Technological Instruments industry and the circumstances of advancements as they have had time to grow in a short span due to acquisitions and expansions into different markets, the company has experienced relatively stable and expedited growth from fruition. To this effect a horizon period of five years suffices to relay adequate valuation, as the company is healthy and stable, but the nature of their growth is relatively unpredictable, and as they expand into different markets, all while having a healthy foundation for analysis, it is thought of a middle ground horizon period while also considering the company has proven to make strategic moves upwards and can skew forecasting.

When valuating with the discounted cash flow methodology, assumptions are baked in valuation. Assumptions such as end of year treatment, cash flows are concrete pertaining to operation, and those cash flows are investing in nature to fuel other operations and in turn provide maximum value for the company and the shareholders all while happening in an assumption-based market that has no fluctuation that could skew analysis. In addition to that of the facets described there is a growth rate that implies characteristics such as size, time period, tax-based realities, volatility, and debt leverage. II-VI's forecasted period uses a growth rate based on analyst assumptions varying over the horizon period unto a terminal growth rate as of 2026 of 4%

Estimation of Terminal Value:

Exit Multiple:

The exit multiple approach to valuation uses assumptions that the company will be projected at year end using market multiples. EBITDA is a cornerstone of this valuation, and the multiple being utilized. This can be conceptualized by taking EBITDA by the exit multiple factors of the comparable businesses.

1. Formulate horizon period.
2. Forecast free cash flows to the business.
    a. EBITDA using assumed growth rate
    b. Depreciation & Amortization using assumed growth rate
    c. Tax rate expenditure using assumed growth rate
    d. CAPEX using assumed growth rate
    e. Change in net working capital using assumed growth rate
3. Calculation of unlevered cash flows.

a. (-) (depreciation & amortization) from EBITDA= EBIT
b. EBIT (-) taxes = Net Income
c. (+) depreciation, amortization & Capex (-) change in net working capital = unlevered cash flow

4. Estimation of terminal values.
    a. Determine suitable exit multiple from industry average EBITDA multiple
    b. Take ending year EBITDA (*) EBITDA exit multiple.

Perpetuity Growth Rate Methodology:

This methodology lays under the assumption that the business will continue growth and generation of capital providing positive return. In addition, it is assumed under this method that cash will grow consistently and without volatility in perpetuity from a certain forecasted year.

Chronological Steps:

1. Select suitable horizon period.
2. Forecast free cash flows
    a. Sales using assumed growth rate.
    b. EBIT using assumed growth rate.
    c. Taxes using assumed growth rate.
3. Estimate OCF= EBIT (-) taxes
4. FCF= OCF (-) change in net working capital & change in CAPEX
5. Estimate terminal value
    a. Forecasted end of year FCF / (cost of capital- end year growth rate)

Enterprise & Equity Value Per Share of II-VI Inc.:

Perpetuity Growth Method		Exit Multiple Method	
Present Value of Explicit FCF	$ 15,971,213,726,831.80	Present Value of Explicit FCF	$ 540,712,445.45
Terminal Value	$ 90,736,687,771,450.00	Terminal Value	$ 13,823,786,994.47
Terminal Year EBITDA (2027)	$ 6,773,933,783,502.00	Terminal Year EBITDA (2027)	
Perpetuiry Growth Rate	$ 0.04	Exit Multiple	53.64
Terminal Value	$ 54,380,576,046,748.60	**Terminal Value**	$ 8,284,912,292.59
Discount Rate	$ 0.06	Discount Rate	5.5%
Present Value of Terminal Value	$ 54,380,576,046,748.60	**Present Value of Terminal Value**	$ 8,284,912,292.59
Enterprise Value	$ 70,351,789,773,580.40	**Enterprise Value**	$ 8,825,624,738.05
Implied Equity Value & Share Price		Implied Equity Value & Share Price	
Enterprise Value	$ 70,351,789,773,580.40	Enterprise Value	$ 8,825,624,738.05
Add: Cash and Cash Equivalants	$ 1,591,892,000.00	Add: Cash and Cash Equivalants	$1,591,892,000
Less: Debt	$ 4,300,000,000.00	Less: Debt	$ 4,300,000,000.00
Implued Equity Value	$ 70,354,749,773,580.40	Implied Equity Value	$ 7,175,624,738.05
Diluted Shares Outstanding	1160000000000.00	Diluted Shares Outstanding	1160000000000.00
Implied Price Per Share	**$ 60.65**	**Implied Price Per Share**	$ 61.86

Sensitivity Analysis:

Purpose of the Analysis:

Through analyzing outcomes under varying assumptions to determine sensitivity of different factors that allows to test variability and better understand the model and search h for margins of error. The sensitivity analysis allows any impacts of varying characteristics to be modeled and help predict in happenstances outside the range of analysis.

Changes in Assumptions:

When utilizing sensitivity analysis, the changing of assumptions and estimations made within calculations allows impacts of II-VI's business to be analyzed. Changes in assumptions in the perpetuity method entail a reduction and addition of 1% to the growth rate and the weighted average cost of capital. Changes in the assumptions in the exit multiple method include an addition of 1 to the EV/EBITDA based multiple and the sqame as a percent to the weighted average cost of capital.

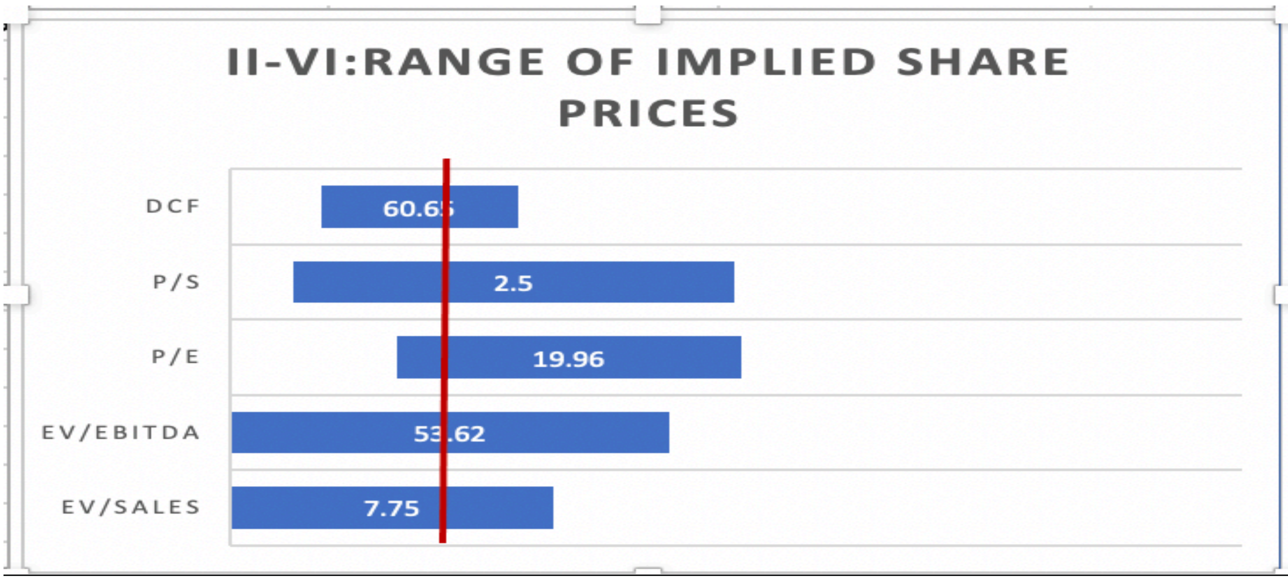
Results:

	Sensativity Analysis Table					
				WACC		
	$60.65	**8.78%**	**9.78%%**	**10.78%%**	**11.78%**	**12.78%**
Growth Rate	**5.00%**	46.55	39.26	34.48	31.12	28.63
	6.00%	62.19	48.91	41.18	36.15	32.59
	7.00%	95.25	65.43	60.65	43.22	37.88
	8.00%	212.73	100.35	68.78	53.97	45.33
	9.00%	-736.50	224.45	105.60	72.36	55.67

	Sensativity Analysis Table					
				WACC		
	$ 61.86	8.78%	9.78%	10.78%	11.78%	12.78%
Exit Multiple	51.62	65.73	62.39	51.2	56.18	53.32
	52.62	67.22	63.78	60.53	57.45	54.53
	53.62	68.68	65.18	61.86	58.73	55.75
	54.62	70.13	66.57	63.2	60	56.97
	55.62	71.59	67.96	64.53	61.27	58.19

Summary of Values- Provided by Different Methods

Football Fields Valuation Chart:



Through analyzation via football field valuation chart, insight can be taken to an implied share price. Through using the multiples throughout analysis or the DCF method growth rate, weights can be attributed to further analysis. The weights are equal values pertaining to each value as represented as a percentage of the whole value.

<u>**Investment Recommendations:**</u>

Method	Valuation	Weight	Weighted Value
P/E	$ 72.70	0.22	$ 15.86
P/S	$ 17.39	0.05	$ 0.91
EV/Sales	$ 43.28	0.13	$ 5.62
EV/EBITDA	$ 77.42	0.23	$ 17.98
DCF (Perpetuity Method)	$ 60.65	0.18	$ 11.04
DCF (Exit EBITDA Multiple)	$ 61.86	0.19	$ 11.48
Total	$ 333.30	1.00	$ 62.89

Through analysis denoted in the conclusive intrinsic value provided for II-VI Inc.'s stock would be considered overvalued at the time of valuation as of December 31st, 2021. However, with this facet in mind through a complex understanding of the nature of the company and growth potential and outlooks beyond the realm of the relevant analysis would give way to possible undervaluation. In current valuation conditions II-VI's stock price as of May 13th at close was $63.88.

While this conclusively would make the company overvalued, I would not deter the investor to not invest. Investors should take a long-term position, being that there is unrealized potential for growth historically. This is an investment for those who take a long-term approach looking for lower volatility and prefer lower but consistent returns. The company is growth oriented and continues to self-diversify, with this in mind would see this as a sound investment.

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