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Analysis of CyberOptics Corporation

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CyberOptics Corporation

CYBE / NASDAQ

Initiating Coverage:

Investment Rating:

PRICE:	20.29 USD	S&P 500:	2,760.17	DJI:	25,538.46	RUSSELL 2000:	1,533.27

- This analysis looks at CyberOptics over the last four years in order to predict whether to purchase, hold, or sell stock within the near future. By using key metrics to calculate the company's WACC, I am able to make a decision with some measure of certainty.

Valuation	**2017 A**	**2018 E**	**2019 E**
EPS	0.19	0.43	0.68
P/E	91.8	44.4	24.7
CFPS	0.52	0.75	1.20
P/CFPS	39.02	25.48	17.63

Market Capitalization		**Stock Data**
Equity Market Cap (USD):	143,616,300	52-Week Range (USD): 12.9 – 22.30
Enterprise Value (USD):	150,588,300	12-Month Stock Performance: 38.31%
Shares Outstanding (K):	7,078	Dividend Yield: 0%
Estimated Float (K):	6,890	Book Value Per Share (USD): 7.76
3-mo Avg. Daily Volume (K):	41.05	Beta: .99

Company Quick View:

Location: *5900 Golden Hills Drive, Minneapolis, MN 55416*
Industry: *Optical Instruments and Lenses SIC 3827 / Optical Instrument and Lens Manufacturing NAICS 333314*
Description: *CyberOptics is a developer and manufacturer of high precision sensing technology solutions which are used for the purposes of metrology and 3D scanning, surface mount technology, and within the semiconductor markets to improve efficiency.*
Key Products & Services: *Key products include surface mount technology, sensing technology, metrology, and semiconductor production and manufacturing.*
Website: *https://CyberOptics.com/*

Analyst: *Laura Benson*

MINNESOTA STATE UNIVERSITY MOORHEAD

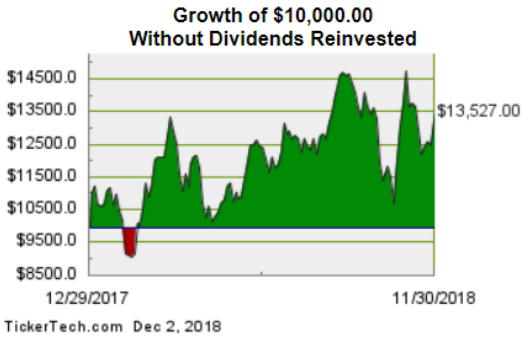
STOCK PRICE PERFORMANCE

Figure 1: 5-year Stock Price Performance

5-year Stock Price Performance Yahoo Finance

The year to date total return for CyberOptics' stock between 12/29/17 and 11/30/18 is 35.27 percent. The annualized gain is 38.31 percent.

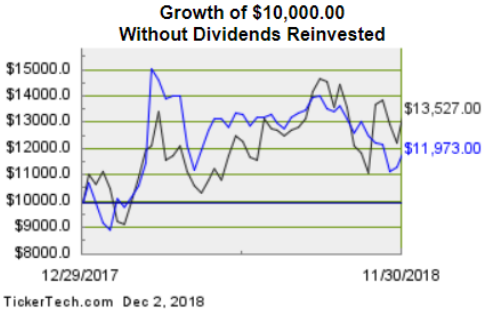
	CYBE
Start date:	12/29/2017
End date:	11/30/2018
Start price/share:	$15.00
End price/share:	$20.29
Dividends collected/share:	$0.00
Total return:	35.27%
Annualized Gain:	38.31%
Starting investment:	$10,000.00
Ending investment:	$13,527.00
Years:	0.92



CyberOptics Growth Ticker Tech

In the current 2018 year, CyberOptics has seen a comeback in their growth. Their stock dropped significantly during the previous year due to Q3 and Q4 revenue estimates being lower than market estimates. However, over the past year CyberOptics' stock has seen an unsteady, but upward trend due in part to new innovations to current products.

	CYBE	OCLR
Start date:	12/29/2017	12/29/2017
End date:	11/30/2018	11/30/2018
Start price/share:	$15.00	$6.74
End price/share:	$20.29	$8.07
Dividends collected/share:	$0.00	$0.00
Total return:	35.27%	19.73%
Annualized Gain:	38.31%	21.44%
Starting investment:	$10,000.00	$10,000.00
Ending investment:	$13,527.00	$11,973.00
Years:	0.92	0.92

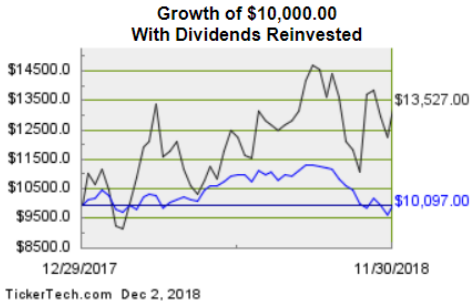


CyberOptics and Oclaro Growth Ticker Tech

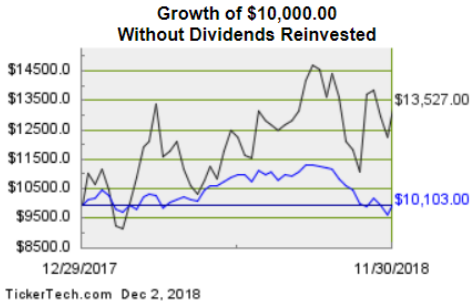
Compared to a similar company, Oclaro, there was a similar trend in growth. This can be explained by the cyclical nature of the semiconductor market. The boom and busts of the cycles depend on the demand for products which require semiconductor components, and can

be somewhat easier to predict than other technology based stock companies. However, this does still pose a potential risk to an investor.

	CYBE	RUT
Start date:	12/29/2017	12/29/2017
End date:	11/30/2018	11/30/2018
Start price/share:	$15.00	$152.46
End price/share:	$20.29	$152.62
Starting shares:	666.67	65.59
Ending shares:	666.67	66.16
Dividends reinvested/share:	$0.00	$1.41
Total return:	35.27%	0.97%
Annualized Gain:	38.31%	1.06%
Starting investment:	$10,000.00	$10,000.00
Ending investment:	$13,527.00	$10,097.00
Years:	0.92	0.92



	CYBE	RUT
Start date:	12/29/2017	12/29/2017
End date:	11/30/2018	11/30/2018
Start price/share:	$15.00	$152.46
End price/share:	$20.29	$152.62
Dividends collected/share:	$0.00	$1.41
Total return:	35.27%	1.03%
Annualized Gain:	38.31%	1.12%
Starting investment:	$10,000.00	$10,000.00
Ending investment:	$13,527.00	$10,103.00
Years:	0.92	0.92



CyberOptics and Russell 2000 Growth Ticker Tech

When compared to the Russell 2000, CyberOptics has a much higher return but is more volatile in comparison.

INVESTMENT SUMMARY

On the November 30th close date, the stock price of CyberOptics was USD 20.29. Using my model, I forecasted a price of USD 18.95. Because this stock is overvalued, I recommend holding.

INVESTMENT THESIS

After performing my analysis of CyberOptics I recommend holding the stock of the company. Using the five-tier scale on Yahoo Fiance of strong buy, buy, hold, underperform, and sell, I would recommend that this stock be placed somewhere between hold and underperforming. By using both my analysis and relative valuation, the stock price falls short of what is reported in the stock market.

COMPANY DESCRIPTION

Dr. Steven K Case founded CyberOptics in 1984. At the time, Dr. Case was a professor of electrical engineering at the University of Minnesota. The company went public in 1987 on the NASDAQ exchange under the ticker CYBE. Since then, the company has operated primarily in the optical instruments and lenses manufacturing segment. The company's three primary operations fall under Surface-mount technology (SMT), Semiconductors, and Metrology technologies. They have a global reach,

working highly within Asian markets to develop and create their products.

CyberOptics corporate strategy as stated on its website is to, "deliver profitable growth by developing and manufacturing high precision proprietary 3D sensors and leveraging them in key vertical markets" and their vision is to be "the global technology leader in high precision 3D sensors".

Previous acquisitions include Kestra Ltd. in 1999, Imagenation in 2001, and both LDI and GKS in 2014. In 2015, CyberOptics announced a strategic agreement with KLA Tencor, and to date continues a working relationship, supplying them with their technology as part of a business agreement. CyberOptics operates on an original equipment manufacturer (OEM) basis, and as such have several other working agreements in which they are the sole technology supplier for some companies in both Asia and Europe.

Presently, CyberOptics employs 177 full time employees and is headquartered in Minneapolis, MN. CyberOptics leases properties in Minneapolis and Bloomington in Minnesota, and abroad in Singapore, the United Kingdom, and China, with the hopes to expand further into other foreign markets.

CyberOptics currently operates in three distinctive economic sectors that all fall under the general category of optical instruments and lenses, or 3D high precision sensors. Its surface-mount technology (SMT) market sales accounted for approximately 63 percent of total revenues in 2017, and is the primary focus of the company. The semiconductor market sales accounted for approximately 11 percent of total revenues in 2017. This segment of the company is still growing, and CyberOptics is optimistic about potential product applications. The 3D scanning and metrology market accounted for approximately 21 percent of total revenues for 2017. This market is growing as well and it is used in a wide variety of industries in which precision measurement is required.

Export sales account for a large percentage of total sales, because the global capacity for electronics assembly and semiconductor production does not occur within the United States because of the relatively high manufacturing cost. A primary target customer is the SMT electronic circuit board assembly market. As such, Asia accounted for 46 percent of 2017 sales, Europe accounted for 22 percent of 2017 sales, and about 3 percent account for sales to other countries in America such as Canada and Mexico. The remaining sales account for domestic markets.

In each of the three major areas of CyberOptics operations, there are different competitors. In SMT, the main competition relates to sensor and vision systems developed by other OEMs using their own design teams for incorporation into their own products. Specific competition includes companies such as Cognex Corporation. They also face threats

to their solder paste inspection (SPI) and automated optical inspection (AOI) systems by many Korean based companies, such as Koh Young Tech, Mirtec Ltd., and Parmi, as well as other global competitors such as Test Research Inc and Viscom.

In their 3D scanning and metrology area, there is little effective competition due to the fragmented nature of the market. In this type of market, it is difficult for one company to influence effectively the market as a whole. Competition still exists but is much less likely to have a significant sway on consumers as a result. However, CyberOptics does acknowledge competition against companies such as Hexagon and Zeiss.

In their semiconductor industry, CyberOptics feels relatively confident in their WaferSense products as being unique to the marketplace. The main competition comes from manual techniques used by a large majority of customers to monitor semiconductor fabrication or flat panel display manufacturing equipment.

The optical instruments market is rapidly expanding alongside the increasing advances in technology. Their uses range from contact lenses to smartphones, and as such are highly researched by a wide variety of companies around the world. Within CyberOptics, they have made significant gains in both their AOI (within SMT) markets and 3D scanning inspection systems. In 2017, an ultra-high resolution sensor earned five prestigious awards for reducing measurement times from hours down to mere seconds.

Much of the government regulation applies to lasers. Products containing lasers are classified as Class I, II, or IIIb, under applicable rules and regulations of the Center for Devices and Radiological Health (CDRH) of the Federal Drug Administration (FDA). There have not been recent changes within this sect of regulation.

INDUSTRY ANALYSIS

CyberOptics' primary NAICS is optical instrument and lens manufacturing (333314), and their primary SIC is Optical instruments and lenses (3827). The company has two secondary NAICS codes, for instruments and related products manufacturing for measuring, displaying, and controlling industrial process variables (334513), and semiconductor and related device manufacturing (334413). The company also has two secondary SIC codes, for process control instruments (3823), and semiconductors and related devices (3674).

Current and Expected Degree of Competition

Rivalry among existing enterprises (high): Currently, industry growth in the semiconductor market is higher than other markets. Within this space, companies can be moderately competitive with one another. Competitors are constantly attempting to manufacture a product that is smaller, faster, and cheaper than one another. As technology improves,

so does the product. There is little differentiation between these products though. However, competition can only become so aggressive due to high switching costs between one supplier to the next.

Threats of new entries (very low): Currently, the costs to enter the semiconductor markets are high. To get started, you have to maintain an already low fixed cost per unit. Therefore, you must achieve economies of scale from the very beginning, which makes this threat low. Consequently, the first entrants into the market had an overall advantage over other companies, who are then able to build relationships with buyers and other sellers of parts and materials. Access to distribution channels can be achieved easily due to the high number of buyers who require the various semiconductor components used in different electronics today. However, the established companies such as Intel and HP have set standards on building capacities and research and development that make these standards difficult to achieve in order to acquire these channels of distribution.

Threats from substitutes (very low): Semiconductor products are technologically advanced and require specialized equipment to construct. There are no substitutes in the manner you may consider strawberry over raspberry jam. They are also very difficult to counterfeit. However, there are counterfeits on the market but their performance is subpar when compared to a fully functioning semiconductor component within the same electronic or respective final good.

Bargaining power of parties involved

Bargaining power of suppliers (very low): One of the primary materials used in the production of semiconductor components is silicon. Silicon dioxide, otherwise known as quartz, is the second most abundant mineral on Earth. The raw materials used in the production of semiconductor components are not rare, which makes the cost of changing suppliers relatively minimal. However, although the bulk of the product itself requires silicon rare earth metals are still used in production which can make the cost a little higher. Semiconductors themselves do not differ that much in terms of design, other than the speed at which they process. As technology improves, so do the components.

Bargaining power of buyers (very low): Buyers are price sensitive. Due to the fact that this is a company based in the technology sector, the components it produces must be the most up to date in order to meet some of the high-end buyers in the market. Otherwise, they can simply move to another supplier. However, the cost of switching is high. For a buyer to switch their entire semiconductor line from one supplier to another can affect how their products work. There are few substitutes to

semiconductor products other than what is available, and so that makes this a weak force. So overall, once a buyer chooses a supplier of semiconductors, they typically work with them on a long-term basis.

PEER ANALYSIS

Company	Ticker Symbol	Market Cap	PE ratio	P / BV	EV / EBITDA	Debt / Assets	ROA	ROE
CyberOptics	CYBE	USD 121,756,180	136.29	2.58	36.37	12.13%	0.44%	1.92%
Nova Measuring Instruments Ltd.	NVMI	605,107,620	14.15	2.46	7.95	19.96%	12.51%	19.86%
Camtek Ltd.	CAMT	249,390,720	11.74	2.96	13.10	28.98%	7.51%	17.27%
Oclaro	OCLR	1,392,805,920	22.67	2.39	10.83	17.87%	6.61%	11.20%
Tencor	KLAC	13,426,922,000	16.86	8.57	8.43	71.16%	17.23%	54.45%

Source: Yahoo Finance December 1, 2018

When compared to industry peers, CyberOptics has by far the highest PE ratio for the 2018 year. This can be explained either by the numerator, as having a higher share price, or the numerator as having comparatively lower earnings. The price to book value ratio stays consistent for all companies except Tencor. However, this ratio is less helpful indicator for the semiconductor industry, where there are few fixed assets. The EV / EBITDA multiple can help to explain the value of the company at a glance. If it is too high, the company may be overvalued. A comparison at CyberOptics tells me that it does appear to be overvalued when looked at amongst other companies operating in the semiconductor space.

The relative debt to assets is a measure of financial risk. Between the five companies, CyberOptics has the lowest amount of financial risk at 12.13 percent and has more flexibility. The measure of return on assets is the lowest for CyberOptics, suggesting either a low net income or a high amount of assets. The latter assumption does not make sense given the industry they operate in. The measure of return on equity is also the lowest for CyberOptics, suggesting either a low net income or a high amount of equity. Given the previous options, I would also assume it is given that their net income was low.

For the purpose of this analysis, I will use Oclaro as a benchmark company in the semiconductor industry. They are similar in size, and closest in product mixes.

MANGEMENT BACKGROUND AND PERFORMANCE

At CyberOptics, the top three executives are Michael Selzer, Chairman; Subodh Kulkarni, the President and CEO; and Jeffrey Bertelsen, the VP, CFO, COO, and Secretary. Michael Selzer has been with the company since 1999. Prior to his position with CyberOptics, Selzer served as a consultant to various medical product companies. Subodh Kulkarni has been with CyberOptics since 2009 and was promoted to the position of President and CEO as of 2014. Kulkarni has held various research management positions within other companies. He has won several awards within the electronics industry and holds a Ph.D. in Chemical Engineering. Jeffrey Bertelsen joined CyberOptics in 2005, and was promoted to his multiple positions in 2014, and again earning a Secretary position in 2016.

The top executives earn varying salaries as well as other compensation options, decided on by an appointed committee. The salary amounts are from the most recent 2017 annual report. Kulkarni's salary and compensation totaled USD 686,254. Selzer's salary and compensation totaled USD 76,800. Bertelsen's salary and compensation totaled USD 395,858. Compensation options include standard employee benefits, such as 401k options, health, dental, ESPP, and life insurance options. Alongside the standard employee benefits, there are performance-based cash bonuses as well as long term equity awards. All executive compensation is evaluated and determined by the Compensation Committee of the Board of Directors. The Compensation Committee is comprised of Irene Qualters, Alex Cimochowski, and Michael Selzer (all independent under NASDAQ listing standards).

The Board of Directors is comprised of five members. These five members are Subodh Kulkarni, Michael Selzer, Irene Qualters, Craig Gates, and Vivek Mohindra. Of the five members, two are independent. Those two members are Qualters and Gates. They are compensated USD 71,800 each. Qualters has been on the Board since 1999, and Gates since 2012. Mohindra has only been on the Board since February of 2018, and as such an accurate compensation number is not available.

SHAREHOLDER ANALYSIS

Approximately 61.9 percent of shares are held by institutions, and 2.46 percent by insiders. Of those, the top five holders are as follows with their current market value as of June 29th, 2018.

Holder	Shares	% Outstanding	USD Value
Wellington Management Company, LLP	594,879	8.45	10,618,590
Dimensional Fund Advisors LP	484,598	6.88	8,650,074
Royce & Associates LP	484,160	6.88	8,642,256
Vanguard Group, Inc.	329,573	4.68	5,882,878
Heartland Value Fund	300,000	4.26	5,235,000

Source: Yahoo Finance December 1, 2018

Within the last six months, the company has sold 8,000 shares over four different transactions. They have not repurchased any shares.

Over the last year, there have been four insider transactions. The first was by former Director Alex Cimochowski. He sold 1,000 shares for USD 16.50 per share on February 28, 2018. The second and third transactions were stock awards on December 7th, 2018 for 10,000 and 5,000 shares by Kulkarni and Bertelsen, respectively. The last transaction was on November 21, 2017 for a conversion of exercise of derivative security in the amount of 10,000 shares at USD 8.71 per share by Bertelsen.

INVESTMENT RISK

Socio-Cultural - Lifestyle changes affect several industries

Children are being exposed to electronics at younger ages. There are even applications and devices aimed specifically at children and their development. This suggests the market is evolving, and changing, to include the usage of technologies that will require semiconductors.

Technology

Due to the fact that semiconductors are used in many different products that are based around technology that is constantly having new breakthroughs and innovations, components can be made obsolescent within years.

There has been a transition to a 10nm node, which is much smaller than previous models. It provides increased power and performance but there

are problems related to both cost and resources consumed in the process of creating a single node.

There is rising demand for AI based application across different industries and products. This will create new growth opportunities for semiconductor manufacturers and suppliers. Currently, there is enormous potential for growth and innovation alongside the technology for autonomous vehicles to support increased connectivity, battery performance, and enhanced sensors, among other technologies. During the coming 2019 year, 5G technology will be more readily available for adoption into augmented reality and virtual reality gaming. This will create significant growth opportunities for semiconductor companies.

There is also a rising demand for cloud or internet-based application. This kind of technology must be more secure, be smaller, and consume less power before it can expand to meet consumer demands.

Political / Legal

Beginning this year the corporate tax rate decreased from 35 percent to 21 percent and created a favorable business environment for companies in the U.S. semiconductor industry. This also encourages investments in the U.S.

FINANCIAL RATIO ANALYSIS

Productivity Ratios

CyberOptics seems to stay very similar to the benchmark, Oclaro, aside from the 2016 and 2017 years in which they won several awards for new innovations. The receivables turnover stays steady around five times. CyberOptics inventory turnover is slightly lower than Oclaro's, averaging 3.9 compared to 5.4 times. The operating working capital turnover stays steady around two to three times. CyberOptics net fixed asset turnover is 12.9, nearly three times that of Oclaro's rate of 4.9 times. However, total asset turnover remains consistent around 1 times, and invested capital turnover remains constant between 1 and 2 times.

Liquidity Ratios

CyberOptics has a higher current ratio than Oclaro, but both companies have raised their liquidity from 2013 to 2017. This is also the case for the quick ratio, cash ratio, as well as the short-term investments over invested capital ratio. While high liquidity ratios can be a good thing, as it means there is excess capital on hand, a ratio that is too high can be a sign that management is too focused on liquidity and not investing their capital in effective ways.

Financial Risk

CyberOptics has a significantly lower debt to equity ratio than Oclaro. The company averages 0.15 compared to 1.05. Due to the nature of the industry both companies operate in, that being a less capital-intensive industry, having a lower debt to equity ratio is considered normal. Too low however, such as CyberOptics, may indicate they are not taking advantage of the increased profits that financial leverage may provide. It also has no financial debt over the four years in comparison to Oclaro, although Oclaro only has on average a financial debt to equity ratio of .05 which is still very low. This is not unusual for companies operating in the semiconductor industry. CyberOptics also has a significantly lower debt to assets ratio than Oclaro. The company averages 0.13 compared to 0.47. Although in both cases, this ratio is decreasing, which indicates a trend that the companies have been able to pay off their debts and other liabilities.

Profatability/Valuation Ratios

When compared to Oclaro, CyberOptics has maintained steady gross profit from 2013 to 2017 around 49 percent. This is much better than the benchmark which averaged 20.36 percent. Going from 2013 to 2017, the profitability ratios trend upwards. Oclaro as the benchmark saw more volatility in its EBITDA margin going from -22.4 percent to 19.8 percent over the five years whereas CyberOptics went from -10.6 percent to 6.2 percent, despite its larger gross profit margins. This similar pattern of high range continues for the profitability ratios.

Over the five years, profitability and returns appear to be increasing based on both the return on assets (ROA) and over the four years based on the return on invested capital (ROIC). CyberOptics saw an increase from -11.74 percent to 1.89 percent and -8.61 percent to 3.88 percent respectively. The average ROA was -1.3 percent, and the average ROIC was 3 percent. Oclaro saw an increase from -28.94 percent to 18.6 percent, and -35.13 percent to 47.99 percent respectively. The average return on assets was -8.6 percent, and the average return on invested capital was -0.3 percent. Overall, CyberOptics saw less volatility over the time period of their financial statements.

FINANCIAL PERFORMANCE AND PROJECTIONS

For this financial analysis I am forecasting sales using the percentage of sales approach. The premise behind this approach is that most Balance Sheet and Income Statement accounts vary according to sales. By considering industry data as well as appropriate judgement, I am able to create a forecast for CyberOptics.

The sales of the semiconductor market are cyclical according to three major events within this cycle. This cycle is commonly referred to as

the boom bust cycle. The events are capital spending ups and downs, process migration glitches, and demand slowdowns. If companies cannot accurately predict how many components to produce during a new innovation, this causes the migration glitch and a surge of demand, then followed by a slowdown once that demand is satisfied.

In tandem with the percent of sales approach, I forecast the weighted average cost of capital (WACC) using measures of debt and equity in combination with a measure of the company's measure of beta and both the risk free rate and market risk premium.

In calculating the beta, it was necessary for me to use an outside measure in order to forecast sales. I used a metric calculated by Professor Aswatch Damodaran of New York University. This metric was the unlevered beta for the semiconductor industry.

VALUATION

The price of CyberOptic's stock at closing on November 30th was USD 20.29 per share. By using a valuation model that discounts free cash flow using WACC, I calculated a price for the stock at USD 18.95 which supports the fact that the market price of the stock is similar to the its intrinsic value. As a secondary comparison, I calculated the relative valuation with a multiple of Enterprise value to both sales and EBITDA using Oclaro as a benchmark. I obtained a price for CyberOptics of USD 6.16 and USD 15.24 respectively. These prices indicate an overvalued market price. However, I believe that CyberOptics deserves better multiples than those associated to Oclaro. Therefore, I recommend holding the stock.

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Cyberoptics Corp. (NMS: CYBE)
In thousands of USD

Income Statement	**12/31/2015**	**12/31/2016**	**12/31/2017**	**12/31/2018**	**12/31/2019**	**12/31/2020**	**12/31/2021**	**12/31/2022**
Sales	$ 41,130.00	$ 66,240.00	$ 53,333.00	$ 58,132.97	$ 62,783.61	$ 67,178.46	$ 71,880.95	$ 76,193.81
Costs of goods sold (COGS)	$ 21,088.00	$ 35,165.00	$ 26,354.00	$ 29,066.49	$ 31,391.80	$ 33,589.23	$ 35,940.48	$ 38,096.90
Sales, general and administrative expense (SGA)	$ 20,237.00	$ 22,836.00	$ 23,679.00	$ 23,253.19	$ 21,974.26	$ 20,153.54	$ 21,564.29	$ 19,048.45
Depreciation	$ 1,968.00	$ 2,086.00	$ 2,285.00	$ 2,223.59	$ 2,401.47	$ 2,569.58	$ 2,749.45	$ 2,914.41
Operating profit	**$ (2,163.00)**	**$ 6,153.00**	**$ 1,015.00**	**$ 3,589.71**	**$ 7,016.07**	**$ 10,866.12**	**$ 11,626.74**	**$ 16,134.04**
Interest expense	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interest income	$ 102.00	$ 238.00	$ (107.00)	$ 215.66	$ 567.55	$ 653.88	$ 765.85	$ 885.23
Nonoperating income (Expense)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Earnings before taxes (EBT)	$ (2,061.00)	$ 6,391.00	$ 908.00	$ 3,805.38	$ 7,583.62	$ 11,520.00	$ 12,392.59	$ 17,019.27
Tax expense	$ 28.00	$ (5,171.00)	$ (404.00)	$ 799.13	$ 1,592.56	$ 2,419.20	$ 2,602.44	$ 3,574.05
Net income before extraordinary items	$ (2,089.00)	$ 11,562.00	$ 1,312.00	$ 3,006.25	$ 5,991.06	$ 9,100.80	$ 9,790.15	$ 13,445.22
After-tax extraordinary income (Expense)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Net income (NI)	**$ (2,089.00)**	**$ 11,562.00**	**$ 1,312.00**	**$ 3,006.25**	**$ 5,991.06**	**$ 9,100.80**	**$ 9,790.15**	**$ 13,445.22**
Dividends-- preferred	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dividends-- common	$ -	$ -	$ -	$ -	$ -	$ 2,275.20	$ 2,502.72	$ 2,752.99
Additions to RE	$ (2,089.00)	$ 11,562.00	$ 1,312.00	$ 3,006.25	$ 5,991.06	$ 6,825.60	$ 7,287.43	$ 10,692.23

Balance Sheet	**12/31/2015**	**12/31/2016**	**12/31/2017**	**12/31/2018**	**12/31/2019**	**12/31/2020**	**12/31/2021**	**12/31/2022**
Assets								
Cash	$ 4,274.00	$ 10,640.00	$ 6,944.00	$ 7,557.29	$ 8,161.87	$ 8,733.20	$ 9,344.52	$ 9,905.20
Inventory	$ 13,265.00	$ 11,531.00	$ 14,393.00	$ 14,533.24	$ 15,695.90	$ 16,794.62	$ 17,970.24	$ 19,048.45
Accounts receivable	$ 8,150.00	$ 10,895.00	$ 10,772.00	$ 11,626.59	$ 12,556.72	$ 13,435.69	$ 14,376.19	$ 15,238.76
Other short-term operating assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Short-term investments	$ 6,439.00	$ 8,028.00	$ 8,263.00	$ 21,745.37	$ 25,053.00	$ 29,342.76	$ 33,916.84	$ 42,120.54
Total current assets	$ 32,128.00	$ 41,094.00	$ 40,372.00	$ 55,462.49	$ 61,467.50	$ 68,306.27	$ 75,607.79	$ 86,312.95
Net plant, property, & equipment (PPE)	$ 2,368.00	$ 2,438.00	$ 2,307.00	$ 2,615.98	$ 2,825.26	$ 3,023.03	$ 3,234.64	$ 3,428.72
Other long-term operating assets	$ 1,915.00	$ 1,804.00	$ 1,746.00	$ -	$ -	$ -	$ -	$ -
Long-term investments	$ 8,270.00	$ 8,921.00	$ 9,334.00	$ -	$ -	$ -	$ -	$ -
Total assets	**$ 44,681.00**	**$ 54,257.00**	**$ 53,759.00**	**$ 58,078.48**	**$ 64,292.76**	**$ 71,329.30**	**$ 78,842.43**	**$ 89,741.67**
Liabilities and Equity								
Accounts payable (AP)	$ 5,778.00	$ 6,217.00	$ 4,294.00	$ 5,813.30	$ 6,278.36	$ 6,717.85	$ 7,188.10	$ 7,619.38
Accruals	$ 1,959.00	$ 3,756.00	$ 2,285.00	$ 2,906.65	$ 3,139.18	$ 3,358.92	$ 3,594.05	$ 3,809.69
Other operating current liabilities	$ 481.00	$ 328.00	$ 393.00	$ 581.33	$ 627.84	$ 671.78	$ 718.81	$ 761.94
All short-term debt	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total current liabilities	$ 8,218.00	$ 10,301.00	$ 6,972.00	$ 9,301.28	$ 10,045.38	$ 10,748.55	$ 11,500.95	$ 12,191.01
Long-term debt	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Deferred taxes	$ 11.00	$ (5,323.00)	$ (5,742.00)	$ (6,511.04)	$ (7,031.93)	$ (7,524.16)	$ (8,050.85)	$ (8,533.90)
Preferred stock	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other long-term liabilities	$ 247.00	$ 381.00	$ 247.00	$ -	$ -	$ -	$ -	$ -
Total liabilities	$ 8,476.00	$ 5,359.00	$ 1,477.00	$ 2,790.23	$ 3,013.45	$ 3,224.39	$ 3,450.10	$ 3,657.10
Par plus PIC Less treasury (and other adjustments)	$ 45,949.00	$ 47,080.00	$ 49,152.00	$ 49,152.00	$ 49,152.00	$ 49,152.00	$ 49,152.00	$ 49,152.00
Retained earnings (RE)	$ (9,744.00)	$ 1,818.00	$ 3,130.00	$ 6,136.25	$ 12,127.31	$ 18,952.91	$ 26,240.33	$ 36,932.56
Total common equity	$ 36,205.00	$ 48,898.00	$ 52,282.00	$ 55,288.25	$ 61,279.31	$ 68,104.91	$ 75,392.33	$ 86,084.56
Total liabilities and equity	**$ 44,681.00**	**$ 54,257.00**	**$ 53,759.00**	**$ 58,078.48**	**$ 64,292.76**	**$ 71,329.30**	**$ 78,842.43**	**$ 89,741.67**

Cyberoptics Corp. (NMS: CYBE)

In thousands of USD

Statement of Cash Flows	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019	12/31/2020	12/31/2021	12/31/2022
Operating Activities								
Net income	$ (2,089.00)	$ 11,562.00	$ 1,312.00	$ 3,006.25	$ 5,991.06	$ 9,100.80	$ 9,790.15	$ 13,445.22
Depreciation	$ 1,968.00	$ 2,086.00	$ 2,285.00	$ 2,223.59	$ 2,401.47	$ 2,569.58	$ 2,749.45	$ 2,914.41
Change in deferred tax	$ 41.00	$ (5,334.00)	$ (419.00)	$ (769.04)	$ (520.88)	$ (492.23)	$ (526.69)	$ (483.05)
Change in inventory	$ (1,608.00)	$ 1,734.00	$ (2,862.00)	$ (140.24)	$ (1,162.66)	$ (1,098.71)	$ (1,175.62)	$ (1,078.21)
Change in accounts receivable	$ (205.00)	$ (2,745.00)	$ 123.00	$ (854.59)	$ (930.13)	$ (878.97)	$ (940.50)	$ (862.57)
Change in other short-term operating assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Change in accounts payable	$ 1,065.00	$ 439.00	$ (1,923.00)	$ 1,519.30	$ 465.06	$ 439.49	$ 470.25	$ 431.29
Change in accruals	$ (1,268.00)	$ 1,797.00	$ (1,471.00)	$ 621.65	$ 232.53	$ 219.74	$ 235.12	$ 215.64
Change in other current liabilities	$ (9.00)	$ (153.00)	$ 65.00	$ 188.33	$ 46.51	$ 43.95	$ 47.02	$ 43.13
Net cash from operating activities	**$ (2,105.00)**	**$ 9,386.00**	**$ (2,890.00)**	**$ 5,795.23**	**$ 6,522.97**	**$ 9,903.63**	**$ 10,649.18**	**$ 14,625.86**
Investing Activities								
Investment in PPE	$ (1,418.00)	$ (2,156.00)	$ (2,154.00)	$ (2,532.57)	$ (2,610.75)	$ (2,767.34)	$ (2,961.06)	$ (3,108.49)
Investment in other long-term oper. ass.	$ 93.00	$ 111.00	$ 58.00	$ 1,746.00	$ -	$ -	$ -	$ -
Net cash from investing activities	**$ (1,325.00)**	**$ (2,045.00)**	**$ (2,096.00)**	**$ (786.57)**	**$ (2,610.75)**	**$ (2,767.34)**	**$ (2,961.06)**	**$ (3,108.49)**
Financing Activities								
Change in short-term investments	$ 48.00	$ (1,589.00)	$ (235.00)	$ (13,482.37)	$ (3,307.63)	$ (4,289.76)	$ (4,574.08)	$ (8,203.70)
Change in long-term investments	$ 1,807.00	$ (651.00)	$ (413.00)	$ 9,334.00	$ -	$ -	$ -	$ -
Change in short-term debt	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Change in long-term debt	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Preferred dividends	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Change in preferred stock	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Change in other long-term liabilities	$ 234.00	$ 134.00	$ (134.00)	$ (247.00)	$ -	$ -	$ -	$ -
Change in common stock (Par + PIC)	$ 444.00	$ 1,131.00	$ 2,072.00	$ -	$ -	$ -	$ -	$ -
Common dividends	$ -	$ -	$ -	$ -	$ -	$ (2,275.20)	$ (2,502.72)	$ (2,752.99)
Net cash from financing activities	**$ 2,533.00**	**$ (975.00)**	**$ 1,290.00**	**$ (4,395.37)**	**$ (3,307.63)**	**$ (6,564.96)**	**$ (7,076.80)**	**$ (10,956.69)**
Net cash flow	$ (897.00)	$ 6,366.00	$ (3,696.00)	$ 613.29	$ 604.58	$ 571.33	$ 611.32	$ 560.67
Starting cash	$ 5,171.00	$ 4,274.00	$ 10,640.00	$ 6,944.00	$ 7,557.29	$ 8,161.87	$ 8,733.20	$ 9,344.52
Ending cash	**$ 4,274.00**	**$ 10,640.00**	**$ 6,944.00**	**$ 7,557.29**	**$ 8,161.87**	**$ 8,733.20**	**$ 9,344.52**	**$ 9,905.20**

Ratio Analysis	2017		2016		2015		2014		2013	
	CYBE	**OCLR**	**CYBE**	**OCLR**	**CYBE**	**OCLR**	**CYBE**	**OCLR**	**CYBE**	**OCLR**
Productivity Ratios										
Growth in sales	-19.5%	47.3%	61.1%	19.5%	-11.5%	-12.7%	39.6%	-33.3%	N/A	N/A
Receivables turnover	4.95	4.91	6.08	4.36	5.05	4.56	5.85	4.68	5.08	5.63
Inventory turnover	3.71	5.95	5.74	5.34	3.10	5.14	3.99	5.50	2.94	4.96
Operating working capital turnover	2.12	1.73	2.91	2.30	2.35	1.88	2.84	2.29	2.16	5.13
Net fixed asset turnover	13.16	5.11	15.62	5.92	9.60	7.28	9.44	6.27	16.85	5.41
Total asset turnover	0.99	0.94	1.22	1.14	0.92	1.05	1.00	1.07	0.75	1.29
Invested capital turnover	1.83	1.29	2.45	1.66	1.89	1.50	2.19	1.68	1.92	2.63
Liquidity Ratios										
Current ratio	5.79	3.75	3.99	2.49	3.91	2.75	3.71	2.19	5.64	1.44
Quick ratio	3.73	3.02	2.87	1.83	2.30	2.10	2.33	1.68	3.61	0.95
Cash ratio	2.18	1.85	1.81	0.83	1.30	1.14	1.38	0.75	2.44	0.37
Short-tern investments over invested capital	0.28	0.08	0.30	0.00	0.30	0.00	0.30	0.00	0.60	0.00
Financial Risk (Leverage) Ratios										
Total debt-to-equity ratio	0.03	0.24	0.11	1.16	0.23	1.13	0.22	0.76	0.15	1.94
Total debt-to-equity ratio (excluding deferred taxes)	0.14	0.29	0.22	1.16	0.23	1.13	0.22	0.76	0.15	1.92
Total financial debt-to-equity ratio	0.00	0.01	0.00	0.04	0.00	0.03	0.00	0.05	0.00	0.12
Interest coverage ratio (accounting-based)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Interest coverage ratio (cash-based)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total debt-to-assets ratio	0.03	0.20	0.10	0.54	0.19	0.53	0.18	0.43	0.13	0.66
Total financial debt over invested capital	0.00	0.01	0.00	0.02	0.00	0.01	0.00	0.03	0.00	0.04
Long-term financial debt over invested capital	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.02	0.00	0.04
Profitability/Valuation Ratios										
Gross profit margin	50.6%	39.0%	46.9%	28.3%	48.7%	16.3%	49.6%	12.8%	49.0%	5.4%
EBITDA margin	6.2%	19.8%	12.4%	3.9%	-0.5%	-13.8%	0.9%	-21.3%	-10.6%	-22.4%
Operating profit margin	1.9%	19.8%	9.3%	3.9%	-5.3%	-13.8%	-3.2%	-21.3%	-15.7%	-22.4%
NOPAT margin	2.0%	19.7%	8.8%	3.7%	-5.2%	-16.1%	-3.2%	6.2%	-18.4%	-21.0%
Earnings before taxes margin	1.7%	17.6%	9.6%	2.2%	-5.0%	-14.5%	-2.9%	-23.9%	-16.2%	-21.8%
Net margin	2.5%	21.3%	17.5%	2.1%	-5.1%	-16.6%	-3.2%	4.6%	-18.5%	-20.9%
Return on Assets	1.9%	18.6%	11.3%	4.4%	-4.8%	-14.4%	-3.2%	-22.7%	-11.7%	-28.9%
Net investment rate	208.4%	185.1%	90.6%	120.7%	-22.5%	8.3%	-259.7%	41.6%	-283.0%	-180.8%
Dividend payout ratio	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ROIC	3.9%	48.0%	26.6%	6.6%	-10.1%	-20.6%	-8.6%	-35.1%	N/A	N/A

Calculating Projected FCF	Most Recent 12/31/17	Projected 12/31/18	Projected 12/31/19	Projected 12/31/20	Projected 12/31/21	Projected 12/31/22
Marginal tax rate	-44.5%	21.0%	21.0%	21.0%	21.0%	21.0%
Reported income tax expense	(404)	799	1,593	2,419	2,602	3,574
Taxes reported but not paid	(419)	(769)	(521)	(492)	(527)	(483)
Actual taxes paid	15	1,568	2,113	2,911	3,129	4,057
Plus tax saved due to net interest expenses	(48)	(45)	(119)	(137)	(161)	(186)
Minus tax paid on non-operating income	0	0	0	0	0	0
Tax on operating income	(33)	1,523	1,994	2,774	2,968	3,871
Net operating profit after taxes (NOPAT)	1,048	2,067	5,022	8,092	8,658	12,263
NOPAT adjusted for extraordinary income	1,048	2,067	5,022	8,092	8,658	12,263
Operating current assets	32,109	33,717	36,414	38,964	41,691	44,192
Operating current liabilities	6,972	9,301	10,045	10,749	11,501	12,191
Net operating working capital	25,137	24,416	26,369	28,215	30,190	32,001
Operating long term capital	4,053	2,616	2,825	3,023	3,235	3,429
Invested Capital (adjusted for any special asset impairment of accounting changes)	29,190	27,032	29,194	31,238	33,425	35,430
Net Investment	2,183	(2,158)	2,163	2,044	2,187	2,005
Free cash flow (including extraordinary income)	(1,135)	4,225	2,859	6,048	6,472	10,257

Calculating Value	Most Recent 12/31/17	Projected 12/31/18	Projected 12/31/19	Projected 12/31/20	Projected 12/31/21	Projected 12/31/22	Projected 12/31/37
WACC	12.60%	12.60%	12.60%	12.60%	12.60%	12.60%	12.60%
Assumed long-term return on invested capital							12.60%
Horizon value							247,184
Value of operations	97,170	105,191	115,588	124,107	133,276	139,815	247,184
Value of operations adjusted for half-year convention	103,111	111,622	122,656	131,695	141,425	148,364	262,298
Value of investments	17,597	21,745	25,053	29,343	33,917	42,121	236,353
Total value of firm	120,708	133,368	147,709	161,038	175,342	190,485	498,652
Value of all debt, preferred stock, and other nonoperating liabilities	247	0	0	0	0	0	0
Value of equity	120,461	133,368	147,709	161,038	175,342	190,485	498,652
Number of shares	6,980	6,980	6,980	6,980	6,980	6,980	6,980
Estimated price per share, end of fiscal year	**$ 17.26**	**$ 19.11**	**$ 21.16**	**$ 23.07**	**$ 25.12**	**$ 27.29**	**$ 71.44**

Price per share on target date

Most recent actual fiscal year end	12/31/2017
Target valuation date	11/30/2018
Most recent fiscal year-end prior to target date	12/31/2017
Number of days from target to fiscal year-end prior to target	334.00
Value of operations on target date	110,873
Value of investments on target date	21,393
Total value of firm on target date	132,266
Value of debt, preferred stock, and other nonoperating liabilities on target date	21
Value of equity on target date	132,245
Number of shares on target date	6,980
Price per share, target date	**$ 18.95**