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Teradyne (TER)

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Sector: Technology

Industry: Semiconductor Equipment & Materials

Company Description: Teradyne designs, manufactures, sells, and supports semiconductor test products and services on a worldwide basis.

SELL

Current Price:	$33
Target Price:	$34
Market Cap:	5.9B
NOPAT (T12M)	209.3M
Adj. NI Margin (LF)	21.5%
ROE	20.5%
ROIC:	9.5%
WACC:	11.1%
Debt/E.V.	.08
Short Int. % of Float	7.36%

Thesis: The company has seen poor growth this year which is forecasted to continue into next year. The stock has a minimal upside absolutely not worth holding further. The money we have into Teradyne should be invested in a more profitable company.

Catalysts:

- Short Term: Market to new customers
- Long Term: Pay off debt

1) Key Stats	2) I/S	3) B/S	4) C/F	5) Ratios	6) Segments	7) Addl	8) ESG	9) Custom			
11) Adj Highlights	12) GAAP Highlights		13) Earnings	14) Enterprise Value		15) Multiples		16) Per Share		17) Stock Value	
In Millions of USD	2010 Y	2011 Y	2012 Y	2013 Y	2014 Y	2015 Y	2016 Y	2017 Y	Current/LTM	2018 Y Est	2019 Y Est	2020 Y Est
12 Months Ending	12/31/2010	12/31/2011	12/31/2012	12/31/2013	12/31/2014	12/31/2015	12/31/2016	12/31/2017	09/30/2018	12/31/2018	12/31/2019	12/31/2020
Market Capitalization	2,555.8	2,502.3	3,173.8	3,378.3	4,286.8	4,209.3	5,059.1	8,187.6	5,908.1			
- Cash & Equivalents	1,055.5	754.6	1,006.3	1,199.6	1,298.8	1,008.3	1,612.8	1,903.7	1,324.4			
+ Preferred & Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
+ Total Debt	74.0	162.5	173.4	186.7	0.0	0.0	352.7	366.0	376.4			
Enterprise Value	1,574.3	1,910.2	2,340.8	2,365.4	2,987.9	3,200.9	3,799.0	6,649.8	4,960.1			
Revenue, Adj	1,566.2	1,429.1	1,656.8	1,427.9	1,647.8	1,639.6	1,753.3	2,136.6	2,060.7	2,075.8	2,198.3	2,523.3
Growth %, YoY	101.5	-8.8	15.9	-13.8	15.4	-0.5	6.9	21.9	1.2	-2.8	5.9	14.8
Gross Profit, Adj	857.6	724.0	892.1	808.8	878.8	917.2	959.6	1,221.1	1,181.7	1,193.1	1,250.4	1,431.8
Margin %	54.8	50.7	53.8	56.6	53.3	55.9	54.7	57.2	57.3	57.5	56.9	56.7
EBITDA, Adj	504.7	354.8	431.3	343.4	355.8	390.4	417.0	641.2	578.4	611.4	636.6	741.0
Margin %	32.2	24.8	26.0	24.1	21.6	23.8	23.8	30.0	28.1	29.5	29.0	29.4
Net Income, Adj	377.2	356.3	216.0	166.3	187.0	202.4	301.7	438.2	387.6	421.7	423.1	509.4
Margin %	24.1	24.9	13.0	11.6	11.4	12.3	17.2	20.5	18.8	20.3	19.2	20.2
EPS, Adj	1.72	1.57	0.94	0.71	0.85	0.95	1.49	2.18	1.99	2.23	2.41	3.04
Growth %, YoY	–	-8.4	-40.6	-24.6	19.8	12.5	56.6	46.1	-2.4	2.6	8.0	26.0
Cash from Operations	566.3	273.8	403.1	268.7	492.1	423.1	455.2	626.5	436.3			
Capital Expenditures	-76.0	-86.1	-119.1	-106.7	-169.0	-89.9	-85.3	-105.4	-120.4	-105.7	-101.7	-108.5
Free Cash Flow	490.2	187.7	284.0	162.0	323.1	333.2	369.9	521.1	315.9	371.5	440.8	501.7

Business & Earnings:

Teradyne is based in North Reading, Massachusetts. They are a developer and supplier of automatic test equipment. The divisions for Semiconductor Test and Systems Tests are organized by the products they deliver. The market for their test products is concentrated with a limited number of significant customers accounting for a substantial portion of the purchases of test equipment. One customer drives significant demand for our products both through direct sales and sales to the customer's supply partners. Teradyne expect that sales of their test products will continue to be concentrated with a limited number of significant customers for the foreseeable future. Therefore, if something happens to one of their customers, this is going to cause a significant decrease in revenue. As stated by Teradyne, "Despite the strong first quarter results, the demand outlook for 2018 mobile device test capacity declined sharply in the quarter and our second quarter guidance reflects that revised outlook," Chief Executive Mark Jagiela said in an interview talking about the results of the first quarter of 2018. When looking at the key stats exhibit above, the revenue growth is very important to look at. Revenue growth has decreased since 2017 which can be tied to the large decline in the price per share. Net income and free cash flow also substantially drop from this decrease in revenue. For 2019, revenue is not forecasted to grow by much more than 5% which is not going to cause any serious stock price spike to where we would make a generous return. Cash and other equivalents as well as the market cap have seen significant decreases as well for this year. The company is going to continue to lack organic growth in this highly competitive market. There is nothing that I have come across that stands out indicating that the stock will have any significant price increase in the short term future. Since revenue, the operating costs, and discount rate all heavily affect the value and price of this company's stock, any of these could have a detrimental effect on stock price as well.

Compare Current Stats Against 12/09/18				
Ownership Type	12/09/18	Curr	Change	
11) Investment Advisor	82.44	82.45	+0.01	☐
12) Hedge Fund Manager	5.91	5.91	0.00	☑
13) Insurance Company	4.02	4.02	0.00	☐
14) Pension Fund	2.59	2.59	0.00	☐
15) Government	1.65	1.65	0.00	☐
16) Bank	1.32	1.32	0.00	☐
17) Sovereign Wealth Fund	1.14	1.14	0.00	☐
18) Individual	0.39	0.38	-0.01	☐
19) Brokerage	0.34	0.34	0.00	☐
20) Holding Company	0.07	0.07	0.00	☐
21) Other	0.06	0.06	0.00	☐

Ownership:

It is important to look at ownership of Teradyne. The exhibit above highlights these points well. From 2012 to 2015, this company had a favorable amount of hedge funds purchasing their stock. If you compare the highest percentage of ownership of hedge funds owning their stock in 2015, it reached around 13%. It currently sits at the lowest point that it has seen in years hovering in the high 5% range. In a matter of 2 or 3 months, it dropped almost 5% this year to where it currently stands. Hedge fund analysts are obviously far less confident in this stock. The short interest percentage of the float is about 7.4% which is a substantial amount of the available shares being short sold. The short interest has been the higher this year than the previous 3 years. This ownership is very important to note due to what other analysts are seeing and predicting.

Debt & Capital Structure:

Refer to the capital structure on the top of the key stats chart on the bottom of page one. This outlines the capital structure from 2010 to the latest filing in the end of September of this year. The company paid off their debt from early years and had no debt in 2014 or 2015. However, with recent acquisitions and operations, the debt has gone back to around 8% of the enterprise value. This does not seem extremely substantial, but the majority of the companies that could be compared to Teradyne have less that .15 for the ratio of debt to enterprise value. Companies like National Instruments Corp. have no debt. The industry seems to not be able to support large amounts of debt which is important to note. When looking at the type of debt that Teradyne holds, a large portion of it falls under a speculative grade rating, which is not ideal. The subordinated debt that they have was originally rated B1 and has not changed since. Also, the long term foreign issuer credit decreased in its rating from BB- to B+. For their senior unsecured debt which sits high on the priority of debt, it is rated A-. Even though this is investment grade, senior debt only holding this rating is less than optimal.

Acquisitions & Value:

In total, Teradyne has publicly acquired 11 organizations. The first acquisition was in August of 2000. Since then, they have acquired companies like Eagle Test Systems for $361 million, Universal Robots for $285 million, and the most recent purchase of Mobile Industrial Robots for $148 million this year (2018). However, it is critical to look at the comparison between the return on investment capital to the weighted average cost of capital. It indicates that the company is destroying significant shareholder value upon current operation. The ROIC measures to be close to 9.5% and the WACC is sitting around 11%. Teradyne sees the majority of growth that they see to be inorganic from the acquisitions causing an increase in revenue.

Bear:

For the bear case, I simulated a decrease in revenue of 3% from the predicted revenue for the next 5 years. After that, the next 5 years have a decrease of 1.5% in revenue. This results in this stock having an intrinsic value of around $26 and a target price of $28. The upside probability calculated by the proforma is 0% for this simulation. Not only is this return very poor, that would express that the stock is currently overvalued.

Intrinsic Value Distribution--Probability (Upside)=8%
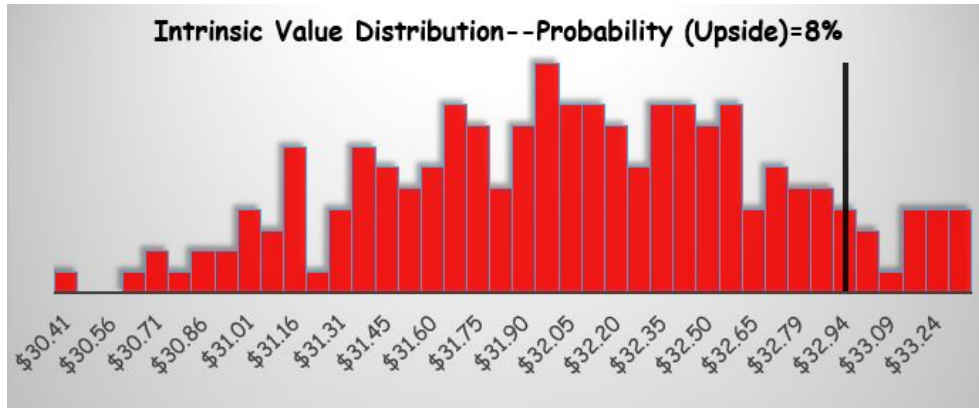
Base Case:

For the base case, the proforma was calibrated to have an intrinsic value as close as possible to its current share price, which is $32 per share. The upside probability of 8% is very poor with a target of $34. The revenue estimates were not adjusted for this case. They were left alone to simulate what would happen to the share price if actual estimates are accurate to what occurs in the future ignoring the declining market and competitors being much more stable growth than Teradyne.

Bull Case:

For the bullish case, I did the same type of revenue adjustment as I did on the bear case. I increased the revenue for the next 5 years by 3%. After that, I increased the revenue for the following 5 years by 1.5%. This produced an intrinsic value of $38 and a target value of $41. Even if the price went up, this return is still very poor and is not worth keeping in our portfolio any further. When considering the decline in the current market combined with competitors having a much more stable business and stock price, I find that the likelihood that an increase in price would happen to be unlikely.

Conclusion:

This company is lacking growth this year since the company has had negative revenue this year compared to last. Next year has poor forecasted growth as well. The lack of a drastic increase in any earnings or cash flows is another reason why the stock price will most likely not see any extremely high growth. Since the target price for all cases simulated provide a minimal gain if any, it is not worth holding this stock further. Since the market is currently seeing a decline, this combined with the increased competition will probably cause the stock price to either stay stagnant or decrease further in the short term. The intelligent move would be to sell our shares in this stock and invest them into another company with a more attractive potential return.

CENTER FOR GLOBAL FINANCIAL STUDIES

Teradyne, Inc. (TER)

NEUTRAL

Analysis by Michael Graves
12/11/2018

Current Price: $32.96
Dividend Yield:

Intrinsic Value: $29.96
Target Price: $34.30

Target 1 year Return: 5.16%
Probability of Price Increase:

Description

Teradyne, Inc. designs, develops, manufactures, sells, and supports automatic test equipment worldwide.

General Information

Sector	Information Technology
Industry	Semiconductors and Semiconductor Equipment
Last Guidance	May 8, 2018
Next earnings date	January 24, 2019

Market Assumptions

Estimated Equity Risk Premium	5.88%
Effective Tax rate	23%

Market Data

Market Capitalization	$5,588.88
Daily volume (mil)	1.68
Shares outstanding (mil)	175.25
Diluted shares outstanding (mil)	197.81
% shares held by institutions	101%
% shares held by insiders	87%
% shares held by hedge funds	7%
% shares held by insiders	8.42%
Short interest	7.55%
Days to cover short interest	4.45
52-week high	$58.58
52-week low	$30.22
Volatility	28.55%

Past Earning Surprises

Quarter ending	Revenue	EBITDA
10/1/2017	6.47%	N/A
12/31/2017	5.44%	-45.82%
4/1/2018	2.68%	-47.55%
7/1/2018	4.18%	-102.55%
9/30/2018	2.13%	4.81%
Mean	4.87%	-50.82%
Standard error	1.0%	#VALUE!

Market and Credit Score

Recommendation (STARS) Value=5	
Recommendation (STARS) Description=Hold	
Quality Ranking Value=D	
Quality Ranking Description=Below Average	
Short Score=2	
Market Signal Probability of Default % (Merton Ratings)=1.55%	
CreditModel Score (Moss Ratings)=bb-	

Industry and Segment Information

LTM Revenue by Geographic Segments

Taiwan=55%	
China=12%	
United States=12%	
Europe=8%	
Japan=8%	

LTM Revenue by Business Segments

Semiconductor Test=78%	
Industrial Automation=8%	
System Test=5%	
Wireless Test=5%	

Peers

KLA-Tencor Corporation	Advantest Corporation
Cologrix, Inc.	Amkor Technology, Inc.
MKS Instruments, Inc.	FormFactor, Inc.
Applied Materials, Inc.	Xperi Corporation
Lam Research Corporation	Advanced Energy Industries, Inc.

Management

	Position	Total Compensation Grew	Stock Price Growth During Tenure
Jagiela, Mark	CEO, President & Director	23.74% per annum over 5y	2.2% per annum over 5y
Dereker, Gregory	VP, CFO & Treasurer	5.95% per annum over 5y	2.2% per annum over 5y
Gray, Charles	VP, General Counsel & Secretary	7.51% per annum over 5y	2.2% per annum over 5y
Robbins, Bradford	President of LitePoint		14.88% per annum over 5y
Smith, Gregory	President of Semiconductor Test		8% per annum over 5y
Kienzler-Rabinowitz, Michal	Vice President of Human Resources		

Profitability

	TER (LTM)	TER Historical	Peers' Median (LTM)
Return on Capital (GAAP)	8.4%	100.42%	-1.57%
Operating Margin	45%	15.77%	54.24%
Revenue/Capital (GAAP)	8.88	5.86	-8.83
ROE (GAAP)	2.2%	-15.6%	5.4%
Net margin	-15.5%	5.8%	14.2%
Revenue/Book Value (GAAP)	-8.28582314	-2.25	8.45

Invested Funds

	TER (LTM)	TER Historical	Peers' Median (LTM)
Cash/Capital	2.4%	14.6%	26.7%
NWC/Capital	-2.5%	57.7%	2.4%
Operating Assets/Capital	188.7%	-57.4%	65.5%
Goodwill/Capital	8.8%	155.5%	-8.5%

Capital Structure

	TER (LTM)	TER Historical	Peers' Median (LTM)
Total Debt/Market Capitalization	8.88	1.85	-8.82
Cost of Debt	5.8%	5.8%	5.7%
CGFS Rating (F-score, Z-score, and default Probability)	A		
WACC	18.4%	11.4%	

Porter's 5 forces (Scores are generalized)

Bargaining Power of Suppliers— MIDDLE TIER 28

Bargaining Power of Customers— MIDDLE TIER 64

Threat of New Competition— LOWEST TIER 28

Overall Position attract Point— MIDDLE TIER 30

Intensity of Existing Rivalry— MIDDLE TIER 42

Threat of Substitutes— HIGHEST TIER 100

Forecast Assumptions

	Explicit Period [10 years]	Continuing Period
Revenue Growth CAGR	5%	2.5%
Average Operating Margin	28%	28%
Average Net Margin	15%	16%
Growth in Capital CAGR	7%	2%
Growth in Claims CAGR	-1%	2%
Average Return on Capital	5%	7%
Average Return on Equity	18%	7%
Average Cost of Capital	11%	11%
Average Cost of Equity	11%	11%

Valuation

Intrinsic Value Distribution- Probability (Upside)=0%

Sensitivity Attribution Analysis

Revenue

Operating costs

Capital expenditures

Discount Rate