

October 11, 2017

Company Name: TER
Kevin Boland

Sector: Technology
Industry: Hardware
Current Price: \$38.61
Target Price: \$45.08

Company Description: Teradyne is a global leading supplier of automation equipment for test and industrial applications. Teradyne’s four official segments for revenue are Semiconductor Test, System Test, Wireless Test and Industrial Automation. The test systems are used on semi-conductors, wireless products, data storage and complex electronics systems in the consumer electronics, wireless, automotive, industrial, computing, communications, and aerospace and defense industries. The industrial automation includes robots, used by global manufacturers, to improve quality, increase manufacturing efficiency and decrease manufacturing costs.

BUY

Current Price:	\$38.61
Target Price:	\$45.08
Market Cap:	7.6B
ROIC:	18.77%
WACC:	10.3%
EBIT Margin	22.7%
D/E	1.48

Catalysts:

- **Short Term (within the year):** Consistent revenues of Semiconductor Test and growth in market
- **Mid Term (1-2 years):** Universal Robots increase in demand, investment and growth
- **Long Term (3+):** Focused Capital Allocation: Acquisitions, R&D, Repurchase of shares and dividend payment



Thesis:

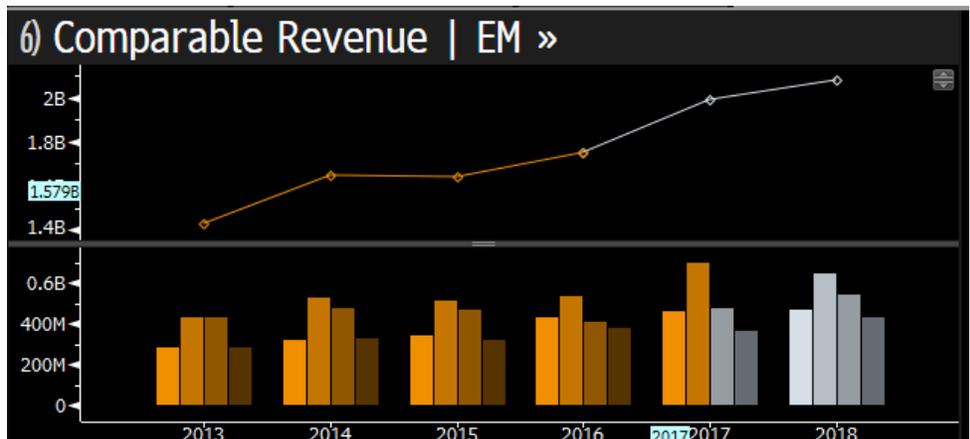
Teradyne's stock price has an excellent opportunity to grow over the next few years and beyond. It is positioned in one of the fastest growing and most successful industries and has customers in other lucrative industries that can increase sales. The Universal Robotics segment of Teradyne is in high demand at the moment and expects to see tremendous revenue growth of over 50% by the end of the year. Combined with the steady revenues from the revenue-leading Semiconductor Test segment, Teradyne is well balanced and a relatively low risk. The company has also shown a focused capital allocation strategy that bodes well for shareholders. They plan to repurchase shares and pay dividends throughout the rest of the year. By acquiring other company's Teradyne has diversified its own product line and entered new segments. This focus on improvement and innovation is what will maintain Teradyne's success in a very competitive industry.

Earnings Performance:



- Q2'17 sales of \$697M, up 31% from Q2'16
- Strength in Mobility, Automotive, Analog, Image Sensor and Microcontrollers in SemiTest
- Q2'17 UR sales of \$39M, up 57% from Q2'16

Q2 2017 revenues increased to \$697 million, up 31% from Q2 2016. These large increases can be attributed mainly to the company's Semiconductor Test and Universal Robot's products. Semiconductor Test was the larger of the two, contributing to \$593 million (77% of sales) this quarter and \$949 million for the first half of the year. Semiconductor Test also drove EPS figures as well. EPS is currently \$1.34 for the first half of the year, ahead of the yearly EPS target plan of \$2. Net income expanded to \$175 million for Q2, its highest quarterly figure to date. Looking ahead, Teradyne expects 3Q revenues to be in the range of \$455 to \$485 million. Teradyne earnings are seasonal, with Quarter 2 being the largest sales period. While the revenues next quarter will be down from Q2 2017, they are likely to surpass Q3 2016 revenues of \$410 million.



Industry Outlook:

Teradyne operates in the technology industry with a focus on hardware and software. This year technology has performed quite well. The S&P 500 Technology Hardware and Equipment Index has grown over 27% YTD. Teradyne has mainly followed this macro trend and has recently shown the ability to break past the industry. The technology sector is poised to continue this growth trend as well. It is a very competitive industry that requires constant innovation and diversification to stay ahead. One of the areas of growth in this industry is in robotics. Teradyne's acquisition of Universal Robotics in 2015 had positioned them well to gain off of the growth of demand for robotics.



It is also important to note that Teradyne's customers are involved in industrials and machinery. The S&P Industrials Sector Index has also been successful this year, growing just above 13% YTD. With an increased growth in technology and relative increased spending from customers, Teradyne has experienced much growth this year with the opportunity for more in the future.

Semiconductor Test:

Semiconductor Test products and services are designed for integrated circuits to improve manufacturing capabilities. As mentioned previously, Semiconductor Test is the driver behind revenues for Teradyne, contributing historically 70% to 80% of overall revenue. So far, 1H revenues have increased by 22% compared to 1H revenues of last year. This can be attributed to the strength of their customers industry and the ability to spend more money. Semiconductor Test is also on track to achieve profit margins of 50% for the year. This is compared to overall profit margins of 22% for the company. This is a good sign that Teradyne's largest segment has over double the company's profit margin. Management also expects the market for Semiconductor Test to increase by 8% by the end of 2017. This business segment provides a solid foundation for the rest of the company to grow. It has been consistent for years and the added growth for the rest of the year will give the company the ability to allocate more capital into areas that need it.

Semiconductor Test Segment Summary

Semiconductor Test
 2nd Qtr Orders: \$369M
 2nd Qtr Sales: \$593M

1H'17 SOC sales of \$876M up 22% from 1H'16

Mobility, Automotive, Analog, Microcontroller and Memory end markets driving 1H'17 strength

1H'17 Memory Test sales up 25% from 1H'16, results driven by NAND final test



Universal Robotics

In 2015, Teradyne acquired Universal Robots for \$315 million cash. This acquisition makes up the entire Industrial Automation segment of the business. Universal Robots are the leading supplier of collaborative robots, which are low-cost, easy-to-deploy and simple-to-program. They work alongside production workers to improve quality, increase manufacturing efficiency and decrease manufacturing costs. Due to this segment being in the early-adoption phase, Universal Robots has not made a profit yet. However, management is determined to expand this high demand segment. With Q2 2017 revenues increasing 57% and 1H 2017 revenues increasing 81%, the segment is on track to reach the annual revenue growth target of 50% or greater. These increased revenues all come at a time where prices for Universal Robots were increased. Even when prices are raised, customers are expressing their demands by continuing to buy the products. In order to keep demand high, Universal Robots are investing in features like higher resolution cameras and 3D scanners to make the ease of implementing robots increase. In the Q2 earnings call, it was reported that Operating Expenses for Universal Robotics would increase from \$7 million a quarter in late 2015 to \$16 million for Q2 2017. This added investment was designed to target three key areas to

Industrial Automation

2nd Qtr Orders: \$33M
 2nd Qtr Sales: \$39M

1H'17 sales of \$76M up 81% vs 1H'16

Continue to strengthen UR's distribution capabilities

Expanding array of applications showcased on UR+

continue growth. First, distribution capabilities are being strengthened by providing more support and training to existing customers. New offices are also being opened to create new partnerships and a greater geographic reach of a very large potential market. Secondly, Teradyne has opened its Universal Robots software to third-party developers, who create new applications for sale. Lastly, global distribution channels are being developed that can serve large and small deployments of Universal Robots. These committed investment will create a better and more effective product that will be ready for increases in market size in the years to come.

OPEX

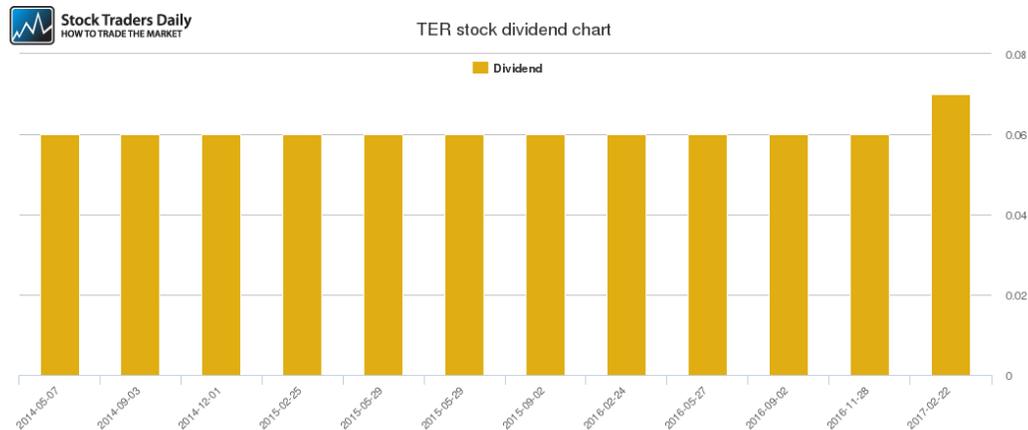
Annual Non-GAAP OPEX ⁽¹⁾				
	2014	2015	2016	2017E
UR ⁽²⁾		\$14M	\$43M	↑ +~\$25M
Test	\$525M	\$514M	\$513M	→ ~Flat
Variable Comp	\$46M	\$61M	\$53M	↑ +~\$25M
Total OPEX	\$571M	\$589M	\$609M	↑ +~\$50M

- UR OPEX increasing to ~\$20M per quarter by late 2017 on further distribution, UR+ and R&D investments
- Test OPEX ~flat YoY in 2017 excluding changes in variable compensation tied to profitability levels

Capital Allocation:

To maintain a competitive advantage and offer a wider range of innovative products, Teradyne has begun acquiring other firms within the industry, through highly-selective analysis. In 2013, Teradyne acquired ZTEC Instrument, a supplier of modern wireless test instruments for \$17 million cash. In 2014, Teradyne acquired Avionics Interface Technologies, a supplier for testing communication buses, for \$21 million cash. In 2015, Teradyne acquired Universal Robots, the leading supplier of collaborative robots, for \$315 million cash. All of these cash acquisitions have saved Teradyne money and represented the overall health of the balance sheet. It also shows how forward-thinking they are by expanding old segments and, in the case of Universal Robots, creating new segments as well. These acquisitions may take time to see their true value, but they will eventually with the right time and investment. Teradyne also has \$600 million cash on hand if, if they were to find another acquisition opportunity.

Teradyne has also rewarded its shareholders over the past few years by implementing share repurchase programs and issuing dividends. Over the past 12 quarters, Teradyne has paid a dividend of \$.06 or \$.24 for a full year. They plan on continuing this trend throughout the rest of the year, with a goal of \$56 million in dividends paid in 2017. Teradyne also plans on repurchasing \$200 million of their own stock for the rest of the year, with the ability to repurchase as much as \$500 million. Since the start of buybacks in 2015, Teradyne has repurchased 25.4 million shares. All of these actions create more value to the stock. With less shares in circulation and a quarterly payment, shareholders are rewarded for their continued investment.



Overall, Teradyne’s current Capital Allocation activities express their vision for the future of the company. They are focused on long-term investments through acquisitions and have shown their desire to devote research and development to these new operations. Along the way, it seems that Teradyne will be rewarding shareholders through dividends and repurchases of shares. Even if these activities end it shows the current health of the company, as they are able to pay back their investors.

Conclusion:

Teradyne has installed the proper initiatives to foster revenue growth. They are investing in other companies through acquisition, as well as investing money in themselves. They have an innovative product line that will continue to spark demand in this growing technology industry. The luxury of having Semiconductor Test nearing maturity will allow the continued effort of proper capital allocation for Teradyne. We can expect to see this stock price increase within the next few quarters as segments become more effective and profitable due to these capital investments within the company.

Teradyne, Inc. (TER)

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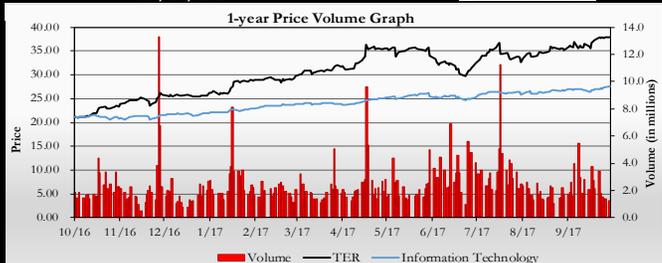
NEUTRAL

Analysis by Kevin Boland
10/13/2017

Current Price: **\$38.61**
Divident Yield: **0.7%**

Intrinsic Value: **\$40.87**
Target Price: **\$45.08**

Target 1 year Return: 17.48%
Probability of Price Increase: 98%



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	November 3, 2015
Next earnings date	October 24, 2017
Estimated Country Risk Premium	7.52%
Effective Tax rate	24%
Effective Operating Tax rate	28%

Market Data	
Market Capitalization	\$7,638.29
Daily volume (mil)	1.13
Shares outstanding (mil)	197.83
Diluted shares outstanding (mil)	201.62
% shares held by institutions	84%
% shares held by investments Managers	81%
% shares held by hedge funds	10%
% shares held by insiders	0.41%
Short interest	4.35%
Days to cover short interest	3.39
52 week high	\$38.63
52-week low	\$20.22
Volatility	25.47%

Past Earning Surprises		
Quarter ending	Revenue	EBITDA
7/3/2016	-1.83%	-12.21%
10/2/2016	-14.66%	-1.32%
12/31/2016	5.67%	10.83%
4/2/2017	-4.69%	-6.38%
7/2/2017	-0.07%	-0.59%
Mean	-3.12%	-1.94%
Standard error	3.3%	3.8%

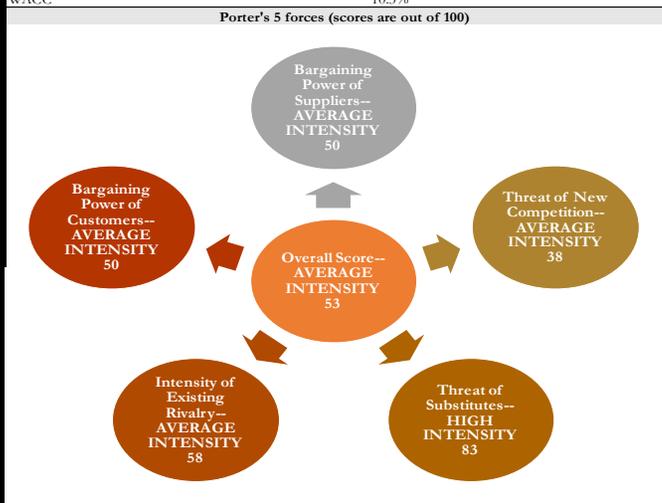
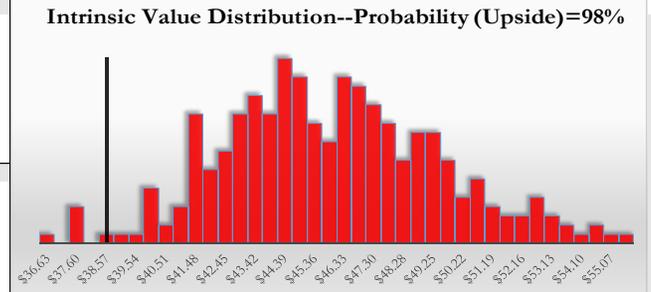
Management		Position	
Jagiela, Mark	Chief Executive Officer, Pre	21.75% per annum over 5y	5.06% per annum over 5y
Beecher, Gregory	Chief Financial Officer, Vic	5.46% per annum over 5y	5.06% per annum over 5y
Gray, Charles	Vice President, Secretary an	3.64% per annum over 5y	5.06% per annum over 5y
Vahy, Walter	President of Systems Test Gr	8.55% per annum over 4y	3.31% per annum over 4y
Robbins, Bradford	President of Wireless Test D	-9.02% per annum over 2y	14.48% per annum over 2y
Smith, Gregory	President of Semiconductor T	N/M	N/M

Profitability		TER (LTM)		TER (5 years historical average)		Peers' Median (LTM)	
Return on Capital (GAAP)	36.7%	19.67%	35.86%				
Operating Margin	19%	15.38%	13.68%				
Revenue/Capital (GAAP)	1.94	1.28	2.62				
ROE (GAAP)	21.3%	9.6%	26.1%				
Net margin	20.1%	12.1%	14.4%				
Revenue/Book Value (GAAP)	1.06	0.80	1.81				

Invested Funds		TER (LTM)		TER (5 years historical average)		Peers' Median (LTM)	
Cash/Capital	58.5%	40.0%	41.7%				
NWC/Capital	9.7%	6.7%	18.1%				
Operating Assets/Capital	21.8%	33.2%	25.1%				
Goodwill/Capital	10.1%	17.3%	15.1%				

Capital Structure		TER (LTM)		TER (5 years historical average)		Peers' Median (LTM)	
Total Debt/Market Capitalization	0.15	0.09	0.32				
Cost of Existing Debt	4.0%	9.2%	5.0%				
CGFS Rating (F-score, Z-score, and default Probability)	BBB	BBB	A				
WACC	10.3%	16.5%	11.4%				

Peers	
KLA-Tencor Corporation	
Entegris, Inc.	
MKS Instruments, Inc.	
Applied Materials, Inc.	
Lam Research Corporation	
FormFactor, Inc.	
Xcerra Corporation	
Amkor Technology, Inc.	



Period	Revenue Growth Forecast	Return on Capital Forecast
Base Year	11%	8.1%
7/2/2018	7%	9.0%
7/2/2019	5%	9.3%
7/2/2020	11%	9.9%
7/2/2021	10%	10.2%
7/2/2022	9%	10.1%
7/2/2023	8%	10.6%
7/2/2024	7%	10.2%
7/2/2025	6%	9.7%
7/2/2026	5%	9.3%
7/2/2027	4%	8.8%
Continuing Period		8.4%

Valuation	
NOPAT Margin Forecast	
16.8%	0.48
17.5%	0.52
19.1%	0.49
20.3%	0.49
21.1%	0.48
21.5%	0.47
23.1%	0.46
23.2%	0.44
23.0%	0.42
22.8%	0.41
22.7%	0.39
22.5%	0.37
Revenue to Capital Forecast	
16.8%	0.48
17.5%	0.52
19.1%	0.49
20.3%	0.49
21.1%	0.48
21.5%	0.47
23.1%	0.46
23.2%	0.44
23.0%	0.42
22.8%	0.41
22.7%	0.39
22.5%	0.37
WACC Forecast	
10.3%	\$40.31
10.3%	\$44.41
10.3%	\$48.53
10.4%	\$52.94
10.4%	\$57.75
10.6%	\$62.73
10.7%	\$67.92
10.7%	\$73.27
10.8%	\$78.75
10.8%	\$84.33
10.9%	\$90.01
10.9%	

