# CFA Institute Research Challenge

## Hosted by

## CFA Society of Minnesota

## University of Minnesota Duluth Team #2

The CFA Institute Research Challenge is a global competition that tests the equity research and valuation, investment report writing, and presentation skills of university students. The following report was submitted by a team of university students as part of this annual educational initiative and should not be considered a professional report.

Date: 1/18/19
Ticker- NASDAQ: TECH
Sector: Healthcare
Industry: Life Sciences Tools & Services

Current Price: $161.95 (1/17/19)
Recommendation: **SELL**
Target Price: **$120**
Downside: -25%

| Market Data (As of 1/17/2019) | |
|---|---|
| 52-Week Range | $128.06 - $206.03 |
| Market Cap | $6.055B |
| Shares Outstanding | 37.77M |
| Float | 98.70% |
| Beta | 0.88 |
| Price/Sales | 9.5 |
| Price/Earnings (LTM) | 48.6 |
| Price/Earnings (NTM) | 32.7 |
| PEG (NTM) | 3.2 |
| Institutional Ownership | 95.00% |
| **Key Financials (5-Year Average)** | |
| Gross Margin | 64.64% |
| EBIT Margin | 31.55% |
| Net Margin | 21.78% |
| ROA | 9.58% |
| ROE | 12.09% |
| ROIC | 10.82% |
| Cash Ratio | 4.36% |
| FCF Per Share | $3.46 |
| Inventory Turn | 3.37 |
| **Current Metrics** | |
| Diluted EPS (LTM) | $3.33 |
| Enterprise Value | $6.723B |
| Total Debt | $561.5M |
| EBITDA (LTM) | $221.71M |
| EV / EBITDA | 30.32 |

**Figure 1** - *Sources: Factset, Team Analysis*

| Weighted Valuation | | |
|---|---|---|
| Valuation Method | Weighting | Price |
| DCF | 50% | $ 134.31 |
| Relative Multiples | 50% | $ 104.98 |
| Price Target | | $ 119.64 |

**Figure 2** - *Sources: Team Analysis*

## Highlights

**Recommendation**

We initiate a **Sell** recommendation on Bio-Techne ("TECH", "the Company", "the Business", or "the Firm") based on a one-year target price of $120 (Figure 2), implying a 25% over-valuation from current price levels. Our sell recommendation is supported by the following catalysts:

**Bio-Techne's Heavy Reliance on a Growth by Acquisition Strategy Leads to Large Transactions with an Extended Timeline Prior to Accretion towards TECH's Business. Correspondingly, TECH's Increasing Debt Leverage Makes This Strategy Execution Increasingly More Difficult.**

Bio-Techne's heavy reliance on the ability to strategically acquire businesses that synchronize with the Firm's current product mix and supplements sales growth and margin expansion (Appendix XVI). We believe that the acquisition strategy is strong, but the Company will not realize the harmonies of acquired targets in a timely fashion. We believe investors have over-priced the synergies these acquisitions are set to create in the future, and see little evidence of results added to the bottom line of the financials to the extent expected. Through our financial analysis of the company, we believe the expected results of the acquisitions are not being transposed to the company's financial results, and will take several years to materially impact, versus the one-to-two year timeline conveyed by management's discussion regarding acquisitions. To note, Bio-Techne's debt used to fund its acquisitions is tied to a variable interest rate. Federal Reserve Chairman Jerome Powell plans the continuation of interest rate hikes into 2019, which in turn will impair Tech's ability to continue this growth by acquisition strategy at the same pace we have seen in prior years.

**Increasing Competition Amongst the Company's High-Growth Product Pipeline Will Yield Lower Growth in the Firm's Financials Subsidized by Bio-Techne's Inability to bring Premier Products to Large Key-Growth Geographical Regions Due to Intellectual Property Risk.**

Management expressed that the two most significant growth factors influencing Bio-Techne in the future will be its innovative products, such as liquid biopsy, augmented by the Company's strategy to grow in expansionary regions including China, India, and Eastern Asia. Increased intellectual property theft in these regions has resulted in TECH's decision to keep Premier Products in safer markets, this is paired with increased competition in TECH's high growth potential products. These factors among the other catalysts will substantially affect the company's ability to continue to increase sales and maintain a strong bottom line.

**Bio-Techne's Inability to Consistently Attract, Manufacture, and Fulfill Customer OEM Orders Dismisses the Ability to Continue Long-Term Revenue and Earnings Growth.**

Management has attempted to subside the inconsistencies of the OEM revenue line which makes up 23% of TECH's revenue. The inability to accurately predict future orders paired with a lack-luster supply chain, affects financial performance and long-term growth possibilities for Bio-Techne. Management has stressed the possibility of an increase in OEM's effect on revenue, yet has missed guidance in this segment in both FY2017 and FY2018, leading to our belief of instabilities existing in this segment of TECH's business. The issues the company has had with this revenue segment has been hidden by acquisitions to offset these consistent revenue misses. Supply chain issues that we believe affect this segment may also spill into other segments of the business which would result in the inability to meet investor expectations.

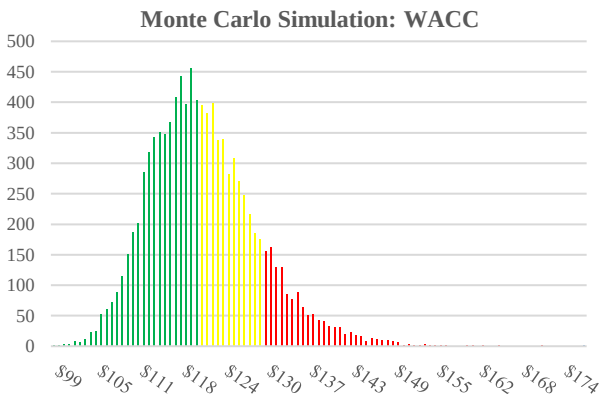



**Figure 3** - *Sources: Team Analysis*

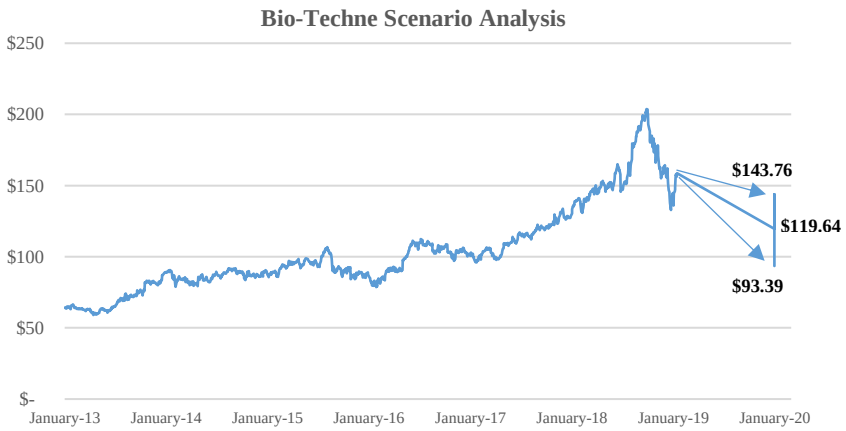



**Figure 4** - *Sources: Team Analysis*

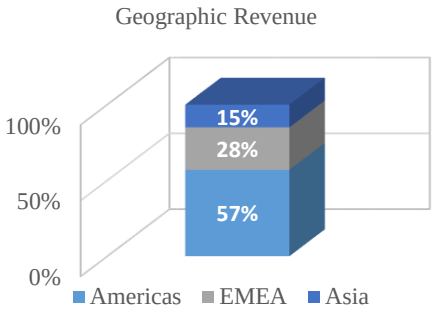



**Figure 5** - *Sources: Company*

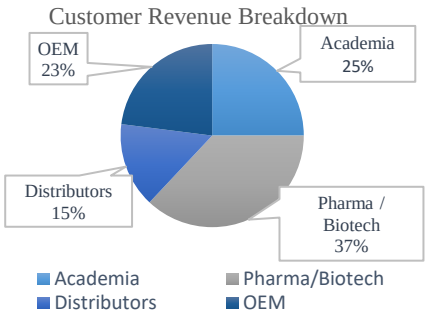



**Figure 6** - *Sources: Company*

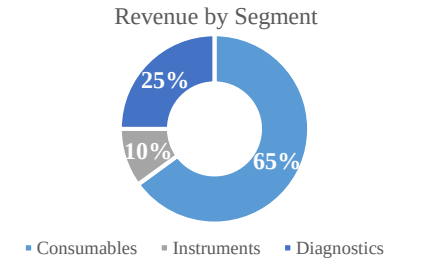



**Figure 7** - *Sources: Company*

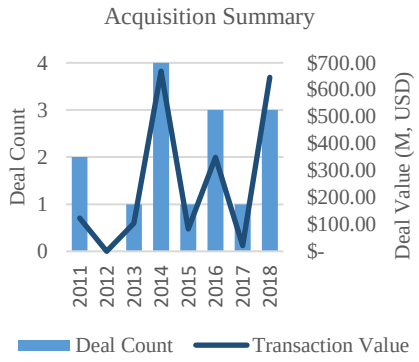



**Figure 8** - *Sources: Company*

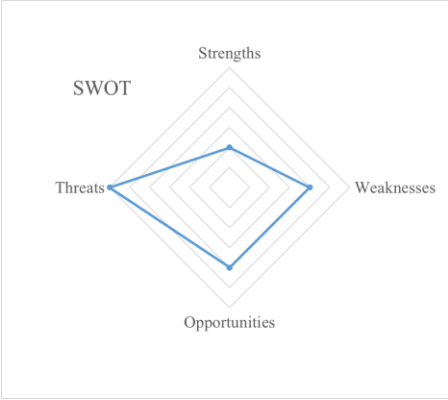



**Figure 9** - *Sources: Team Estimates*

## Business Description

Bio-Techne Corporation (NASDAQ: TECH) was originally founded as Techne Corporation in 1976 and currently operates as a holding company for its Bio-Technology and Clinical Diagnostics brands. TECH is headquartered in Minneapolis, MN employing 2,100 people worldwide through 35 locations. For the FY18, TECH realized revenues of $643 Million, which breaks down to 65% from Consumables, 25% from Diagnostics, and 10% from Instruments (Figure 7). Bio-Techne serves OEM manufacturers, Pharmaceutical and Biotechnology firms, distributors, and is utilized in academic settings worldwide (Figure 6). Geographically, Revenue breaks down to 57% from the Americas, 28% from the EMEA region, and 15% from Asia, Bio-Techne realizes the highest growth potential from its international operations (Figure 5). Through flagship business offerings TECH develops purified proteins and reagent solutions. (This is most notably comprised of cytokines, growth factors, antibodies, immunoassays, etc.) Bio-Techne also designs and manufactures diagnostic products providing FDA-regulated controls, calibrators, hematology controls and other reagents to be used by its OEM and clinical customers. The third area of operation in genomics is centered on in-situ hybridization assays for research and clinical applications and oncology assays such as the ExoDx®Prostate (EPI) test that is used for prostate cancer diagnosis. Bio-Techne's products are key pieces utilized in biological and clinical research or testing as well as pharmaceutical development and testing. Reportable business segments to overview are Protein Sciences and Diagnostics & Genomics.

### Protein Sciences Segment

The Protein Sciences division of Bio-Techne is the largest and most profitable segment with revenues in FY2018 coming in at $483M (growing at a 13% 5 yr. CAGR). This segment gives Bio-Techne base upper single-digit organic growth, allowing it to acquire gap-filling businesses that supplement the flagship business and provide inter-business synergies. Protein Sciences provides reagents for life sciences, diagnostic, and therapeutic applications. TECH is established as one of the leading providers in this segment and the main drivers of forward growth are the adaptation to the automated western blot and multiplex immunoassay platforms, as well as revenue sharing with OEM customers. There is a large opportunity for growth through geographic expansion, notably in China, Central and Southern Europe, Canada, and India. Protein sciences is driven by subsidiary R&D Systems which has over 3,500 proteins in its portfolio, correlating to 37% utilization worldwide. These proteins are utilized across cell therapy, immunotherapy, bioprocessing, and specialty media supplement industry segments. The Protein Sciences segment is at the core of research, diagnostics, and pharmaceuticals through its instruments, reagents, and consumables.

### Diagnostics and Genomics Segment

This segment in total generated $161.2M in revenue for FY18, growing at a 38% 5 yr. CAGR. The Diagnostics division provides calibration and control products, biological components (such as markers and toxicology products), and instruments. Addressable markets are approximately $1B for quality controls and calibrators, and an additional adjacent targeted reagent/assay market of $1B. Through its diagnostics business, TECH receives ongoing requests for customized development of reagents and assays. Bio-Techne has commercial expertise and international presence (50% of revenue is derived outside of the US in diagnostics). Strategies to move this business forward involve increasing the OEM agreements that allow for a shared wallet and geographic expansion (China and EMEA). Bio-Techne's Genomics division products give molecular and morphological information through In-Situ Hybridization (ISH) from the ACD division. ISH is essentially the entry-point for genomics, which aids in research processes and ties together other Bio-Techne offerings. Exosome Diagnostics is the other piece of TECH's Genomics division (Exosome Dx), this area of the business produces liquid biopsies which flag exosomes (intracellular communication molecules). The benefit of this is exosomes are released by all living cells and play a part in health and disease. Exosomes can stimulate tumor growth and inhibit immune cells before disease has reached late-stage. Exosome diagnostics assists in the full treatment process beginning with screening & early detection, monitoring, personalizing treatment, and targeting therapy. Currently, Exosome Dx will have a focus on prostate cancer, bladder cancer, and kidney transplant rejection tests. Future commercialization of these post commercial clinicals will provide expansion capability for the platform.

### Digital Solutions & Business Key Take-Aways

Bio-Techne has also moved to create a greater digital solution for its customers across its marketing & sales operations. TECH has optimized its channels by creating a one-stop shop model consolidating its online presence. Bio-Techne has stuck to its capital deployment strategy of returning $96 million to shareholders through dividends and organic growth CAPEX. The main area of focus has been growth through acquisition ($664M over the LTM) (Figure 8) most recently being the acquisition of ACD and Exosome Dx for $575M. Overall, revenues for TECH have increased 16% on a 5 yr. CAGR basis. Normalizing this 5 yr. CAGR between organic and inorganic growth, the company has seen organic growth at an average of roughly 6% per year. This results in roughly 10% of growth being sourced inorganically for the same period.

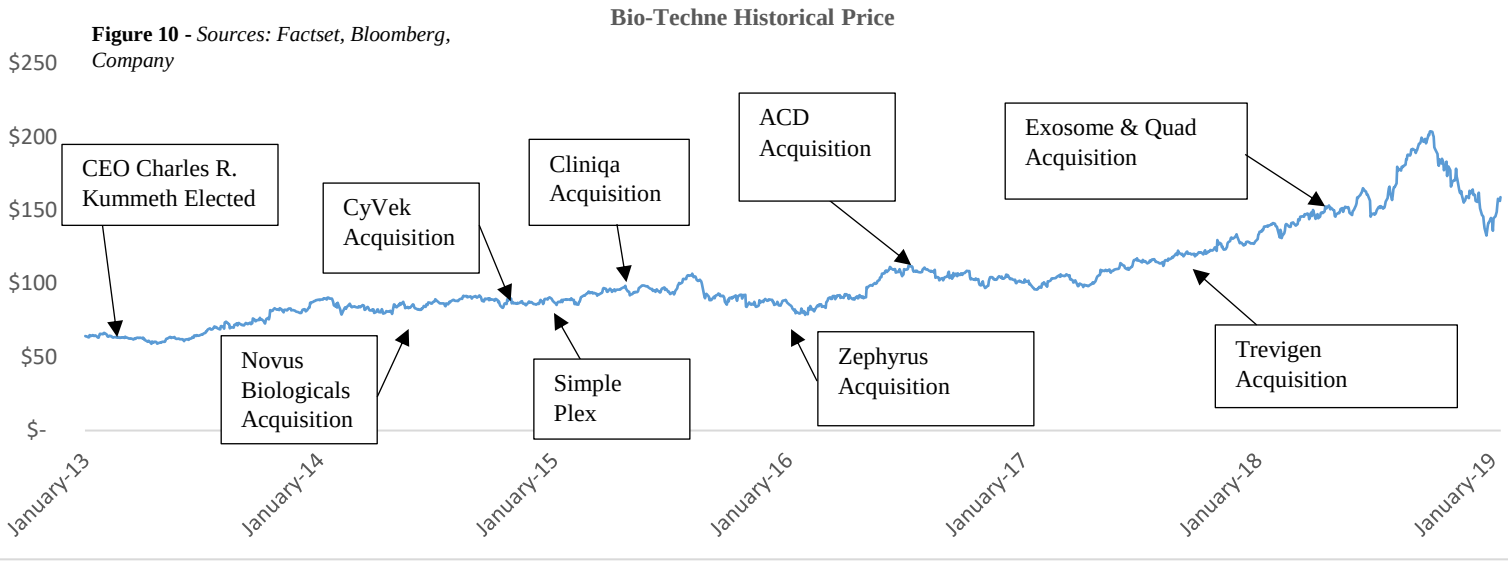



**Figure 10** - *Sources: Factset, Bloomberg, Company*

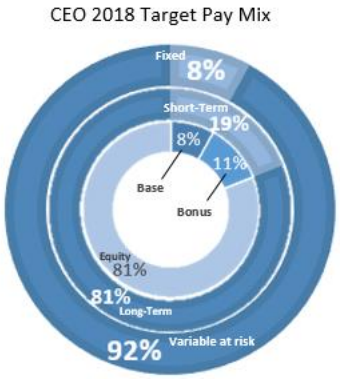



**Figure 11** - *Sources: Company Proxy Statement*

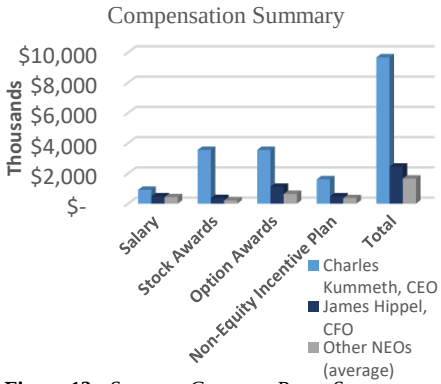



**Figure 12** - *Sources: Company Proxy Statement*

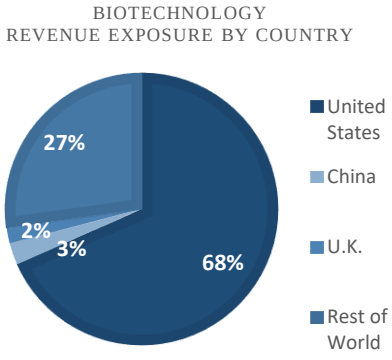



**Figure 13** - *Sources: Capital IQ, Bloomberg*

## Corporate Governance

### Management

**Charles R. Kummeth** (58) President and Chief Executive Officer Since 2013
Prior to joining Bio-Techne, Mr. Kummeth served as President of Mass Spectrometry and Chromatography at Thermo Fisher Scientific Inc. and was President of that company's Laboratory Consumables division from 2009 to 2011. Previously, Mr. Kummeth served various roles during a 24 year career at 3M Corporation, where from 2006 to 2008 he served as Vice President of the Company's Medical Division.

**James T. Hippel** (47) CFO and Principal Accounting Officer Since 2014
Mr. Hippel joined Bio-Techne in 2014 as the Company's CFO. Mr. Hippel previously served as Senior Vice President and CFO for Mirion Technologies, Inc. Prior to Mirion Technologies, Mr. Hippel served as Vice President of Finance at Thermo Fisher Scientific, Inc. Additionally, Mr. Hippel held a financial leadership position within Honeywell International's Aerospace Segment for nine years.

### Compensation

| Name and Principal Position | Fiscal Year | Salary [1] | Bonus | Stock Awards [2] | Option Awards [2] | Non-Equity Incentive Plan Compensation [3] | All Other C ompensation | Total |
|---|---|---|---|---|---|---|---|---|
| Charles Kummeth, *President and CEO* | 2018 | $911,000 | – | $3,550,008[4] | $3,550,081[5] | $1,610,925[6] | $42,860[7] | $9,664,874 |
| | 2017 | 880,000 | — | 3,550,140[4] | 3,549,359[5] | 1,053,594 | 43,798 | 9,076,890 |
| | 2016 | 800,000 | — | 2,500,044[4] | 2,908,732[5] | 1,221,097 | 38,241 | 7,468,114 |
| James Hippel, *Senior Vice President of Finance and CFO* | 2018 | 476,100 | --- | 370,000[8] | 1,110,007[9] | 483,485[10] | 9,295[11] | 2,448,887 |
| | 2017 | 460,000 | — | 349,988[8] | 1,049,814[9] | 356,310 | 10,660 | 2,226,773 |
| | 2016 | 425,000 | — | 216,980[8] | 685,875[9] | 421,660 | 9,042 | 1,758,557 |
| David Eansor, *Senior Vice President-Biotechnology* | 2018 | 455,000 | --- | 181,248[12] | 543,753[13] | 403,181[14] | 8,100[15] | 1,591,282 |
| | 2017 | 430,000 | — | 162,522[12] | 487,412[13] | 256,210 | 11,061 | 1,347,206 |
| | 2016 | 400,000 | — | 108,490[12] | 342,938[13] | 282,110 | 7,950 | 1,141,488 |
| Robert Gavin, *Senior Vice President-Protein Platforms* | 2018 | 393,750 | --- | 162,490[16] | 487,488[17] | 322,662[18] | 8,100[19] | 1,374,490 |
| | 2017 | 375,000 | — | 150,015[16] | 449,909[17] | 226,426 | 13,889 | 1,215,239 |
| | 2016 | 350,000 | — | 108,490[16] | 342,938[17] | 136,278 | 5,250 | 942,956 |
| Brenda Furlow, *Senior Vice President – General Counsel* | 2018 | 385,000 | — | 143,731[20] | 431,239[21] | 250,132[22] | 8,100[23] | 1,218,802 |
| | 2017 | 350,000 | — | 125,001[20] | 374,931[21] | 166,834 | 7,950 | 1,024,716 |
| | 2016 | 300,000 | --- | 86,796[20] | 274,342[21] | 137,373 | 7,950 | 806,461 |

**Figure 12.1** - *Sources: Company Proxy Statement*

Bio-Techne's Executive Compensation Committee (the Committee) oversees the executive compensation program, which includes a base salary, short-term incentives, and long-term incentives (Figure 12 and 12.1). The Committee aligns pay by using short - and long-term incentives. Short-term incentives are the annual cash bonus performance payouts, which are earned if annual performance goals are achieved. Annual performance goals are based on growth of organic revenue and adjusted operating income. When comparing to key competitors such as Thermo Fisher Scientific Inc., Bio Rad Laboratories Inc., and PerkinElmer, performance goals are typically based on organic revenue growth and earnings growth. Base Salaries are not automatically adjusted annually. The Committee determines an increase is earned based on changes in the officer's responsibilities, demonstrated performance, or relevant market data. Long-term incentives (LTI) push executives to deliver long-term stockholder value, while also providing a retention vehicle for the Company's executives. LTI awards include stock options and restricted stock units, where the mix is at this point 50% time-based awards and 50% performance vesting awards. About 92% of the CEO's target total direct

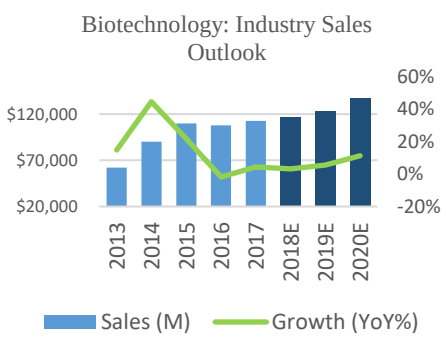



**Figure 14** - *Sources: Capital IQ, FactSet*

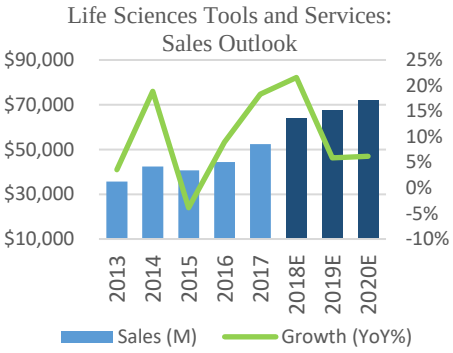



**Figure 15** - *Sources: Capital IQ, FactSet*

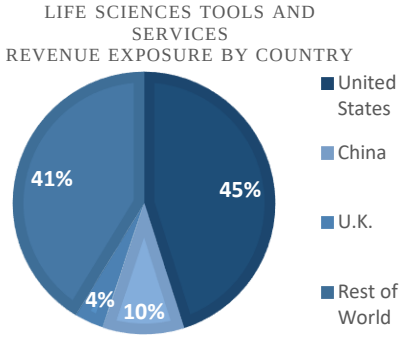



**Figure 16** - *Sources: Capital IQ, FactSet*

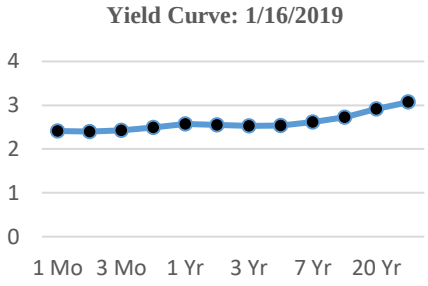



**Figure 17** - *Sources: U.S. Treasury, FactSet*

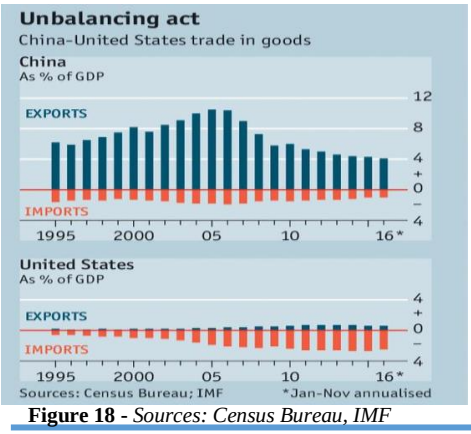



**Figure 18** - *Sources: Census Bureau, IMF*



compensation was tied to the Company's performance, where other NEOs' had approximately 74% of target direct compensation tied to the Company's performance. Stock ownership requirements require the CEO to own stock valued at 3x his base salary, and other NEOs' to hold stock at 1x base salaries. More information on Management & Board of Directors can be found on Appendix I.

## Industry Overview

### Biotechnology

The Biotechnology Industry is highly competitive and fragmented, the industry consists of companies involved in the use of living organisms to discover new products and run certain processes. To create therapeutic and preventive medicine, companies engage in the application of genetic engineering (genomics), protein engineering (proteomics), the manufacturing of equipment, and provide services to the Biotechnology Industry. These are highly innovative and dynamic markets due to its competitive nature. New technologies are continuously being developed to create efficacies and more efficient products. The United States makes up 68.4% of total revenue within the industry while no other country exceeds 10%. (Figure 13) China has generated the highest degree of growth Y/Y (+24.5%), while the U.S. has decreased by (-2.7%) Y/Y. The industry is characterized as being highly volatile and historically has displayed signs of seasonality, Q4 being particularly strong. YTD, the Biotech Industry has depreciated (-3.1%) and has slightly appreciated 0.4% on a three-year basis. Industry outlook can be noted in Figure 14.

### Life Sciences Tools and Services

The Life Sciences Tools and Services Industry is made up of companies involved in drug discovery and development by using analytical tools and other instruments. Both academic and industry scientists within the life sciences field are provided with services and consumables, which include reagent solutions, protein platforms, immunoassays, and specific instruments for the research and development of cell biology, biotechnology, and genetics. Demand among these end markets has been historically strong, showing some signs of seasonality within Academia. The Life Sciences Tools and Services Industry experiences less volatility and is highly competitive as improved reagents and instruments are being frequently introduced to better serve customer needs. This industry has grown by 16.1% YTD and 64.2% over the last three years. Currently valued at $63 billion, the industry is estimated to reach $67.5 billion by 2019. Currently, the United States accounts for 45.1% of total revenue, while China accounts for 10% and no other country exceeds 5% (Figure 16). Industry outlook can be noted in Figure 15.

### Macroeconomic outlook

The Life Sciences segment of the Healthcare industry has outperformed the overall Healthcare sector in 2018 (22% vs. 10%) which has provided an area of investment safety compared to the sector as a whole. Volatility has been seen across Biotech, Pharmaceuticals, and others in the Healthcare industry. This has given Life Sciences premium valuations compared to the rest of the sector. Looking forward to the next year and beyond, the landscape is projected to be very different than it has over the past decade. Some key factors to note are: rising interest rates (Figure 17), currency exchange headwinds, and trade policy (Figure 18), all of which we believe will materially impact business operations for Bio-Techne.

### Rising Interest Rate Environment

We believe future increases in interest rates will materially impact the cost of borrowing for corporations. Economic activity and growth has increased in 2018, and The Federal Reserve has continued to raise interest rates throughout the year. This had been a key impact on market sentiment and overall economic outlook for 2019 and beyond. Currently, the Fed has set target interest rates at a range of 2.25-2.5% which will be the center of attention over the next year as we move from an accommodative policy. On 12/19, the Federal Reserve announced that it would set the target interest rate level at 2.5% and plans to continue rate hikes over the next year based on its current outlook. The measures the Fed takes to move interest rates over the course of 2019 will play a large factor in the global and U.S. equity markets based on the direction that the Federal Reserve decides to take. To note, TECH utilizes variable rate debt instruments and is more subject to the risk if it is unable to hedge effectively against these rate increases. (Figure 17)

### Tariff and Trade Policy

Developments and further progression of the trade war between the United States and China has considerably impacted growth potential derived from this geographical region. The uncertainty around the direction this trade animosity will go and the impact it has been having on businesses with revenue exposure in the Chinese marketplace has affected sentiment and valuation levels in these respective equities. The Chinese and Asia region is a large end-market for the Life-Sciences industry (Second largest to the U.S.) that has been growing at 10%-20% depending on the product offering. Given the current political actions being taken against this large growth potential region, Life Science names exposed to China have seen downward pressure as effects of policy materialize including foreign currency exchange headwinds on top of tariffs (Figures 18 & 19). It has been noted that Agilent and Thermo-Fischer (China exposure: 21%, 10%) have still seen underlying growth from this region. Thermo-Fischer yielded 20% growth in the 3Q18, and it looks like the effects from trade policy are somewhat priced in. The key factor to consider here is the size and scope of the larger companies

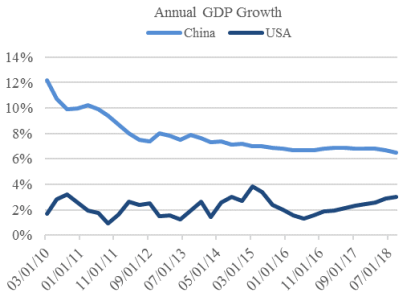



**Figure 19** - *Sources: Capital IQ, FactSet*

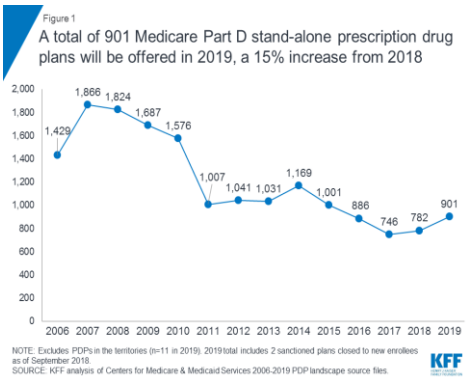



**Figure 20** - *Sources: KFF*

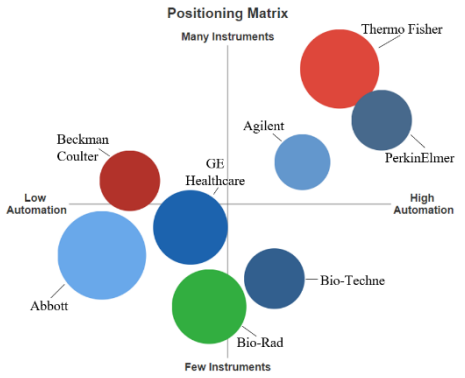



**Figure 21** - *Sources: Company, Team Analysis*

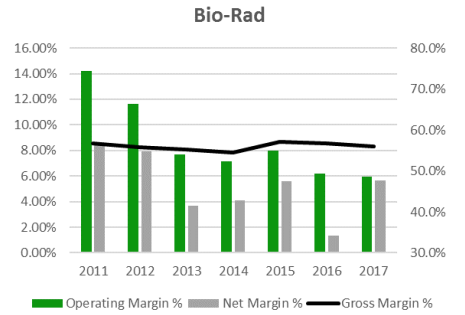



**Figure 22** - *Sources: FactSet, Team Analysis*

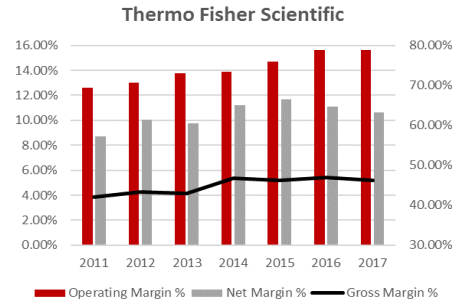



**Figure 23** - *Sources: FactSet, Team Analysis*

exposed to China. Bio-Techne is a relatively smaller firm compared to the latter, and we see this as a larger risk to TECH compared to its peers in China. Large competitors in the Chinese marketplace may be able to execute corporate plans and put a squeeze on Bio-Techne. Also to note that Bio-Techne has strategized to keep its large growth potential products out of the Chinese marketplace in fear of intellectual property infringement. This will put greater pressure on Bio-Techne in this international segment compared to peers. Additionally, President Xi's China 2025 plan is placing downward pressure on companies pursuing expansion into this market. The initiative places pressure on Multi-National Corporations who operate in the Bio-Technology space as China tries to avoid the middle income trap by becoming more efficient, boosting innovation, and raising productivity in domestic healthcare output.

**Drug Pricing Concerns**

Biotechnology and Life Sciences firms have had the ability to price products significantly higher than the cost, allowing the companies to have impressively high margins. Many companies in these industries are very specialized serving niche markets with little to no competition. Patent protection around pharmaceuticals and therapies are key to reduced competition in this space. In addition, many companies have turned to mergers and acquisitions in an attempt to curb competition and fuel growth. While these strategies may help a company grow, there is also a chance deals are unsuccessful or dilutive which can result in downward pressure on the Company's business. Biotechnology and Life Science firms also rely heavily on R&D spending from pharmaceutical companies who use the outputs of these industries to assist in the development and testing of new pharmaceutical products. Bi-Partisan support for legislation lowering prescription drug prices could be a substantial hit to Bio-Tech, Life Sciences, and Pharmaceutical companies. In this scenario, TECH might have to cut earnings guidance due to the reduced spending on R&D from loss of pharmaceutical sales. Additionally, there is also Bi-Partisan support for Medicare's ability to leverage purchasing power in negotiating the cost of products and tests (Figure 20). This could also significantly impact the revenue of the industry as Medicare would be able to purchase the already needed products Biotechnology provides at a lower cost. This could materially reduce the revenue recognized by Medicare purchases and could affect overall sales and margin strength the industry has seen historically.

**Competitive Landscape**

The Life Sciences Tools & Services Industry is highly competitive and fragmented due to the large number of participants in this space. Many of these competitors offer a wide range of proteins and reagents and all of these competitors supply instruments and lab equipment that can increase the accuracy of results, simplify the research process, and reduce the amount of time required to produce results through instrument automation. Many competitors operate in different areas of the Life Sciences Industry making it difficult to find direct competitors. We believe that we have identified the most relevant competitors by focusing on the largest area of differentiation, which is each company's portfolio of instruments, as these will drive recurring revenue for each of these companies (Figure 21).

**Bio-Rad Laboratories Inc. (BIO or Bio Rad):** Bio-Rad operates globally in the U.S., Europe, and China and engages in the production and development of specialty chemicals for use in research, Biochemical, and pharmaceutical application. The company has two reporting segments, Life Sciences and Clinical Diagnostics. The company competes against Bio-Techne's Diagnostics and Genomics segment as well as the Protein Sciences segment. Bio-Rad has a five-year sales CAGR of 0.9%, a five-year average gross margin of 55.9%, operating margin of 6.98%, and net margin of 4.07% (Figure 22). The company was founded in 1952, is headquartered in Hercules California, and has a market cap of $6.61 billion.
**Our Take:** We view Bio-Rad as Bio-Techne's most direct competitor as the company competes in many of the same areas and produces instruments similar to Bio-Techne. The company has made some unsuccessful acquisitions as Bio-Rad has made multiple dilutive acquisitions that have forced the company to impair its goodwill.

**Thermo Fisher Scientific Inc. (TMO or Thermo Fisher**): Thermo Fisher operates globally through four business segments including Life Sciences Solutions, Analytical Instruments, Specialty Diagnostics, and Laboratory Products and Services. The company competes against Bio-Techne's Diagnostics and Genomics segment as well as the Protein Sciences segment. Thermo Fisher has a five-year sales CAGR of 10.8%, a five-year average gross margin of 45.82%, operating margin of 24.2%, and a net margin of 10.88% (Figure 23). The company was founded in 2006, is headquartered in Waltham Massachusetts, and has a market cap of $97.13 billion. **Our Take:** Thermo Fisher is much larger than Bio-Techne and offers a wider range of products. The company's size gives the company an advantage when acquiring companies and a larger portfolio of products. Thermo Fisher provides many different supplies needed to perform western blots and assays, while Bio-Techne is producing automated instruments to perform the same tasks that deliver better, and more consistent results.

**PerkinElmer (PKI):** PerkinElmer operates globally through two business segments; Discovery and Analytical Solutions, and Diagnostics. The company primarily competes against Bio-Techne's Protein Sciences segment. PerkinElmer has a five-year sales CAGR of 1.3%, a five-year average gross margin of 44.41%, operating margin of 17.83%, and a net margin of 8.3% (Figure 24). The company was founded in 1937, is headquartered in Waltham Massachusetts, and has a market cap of $9.67 billion.

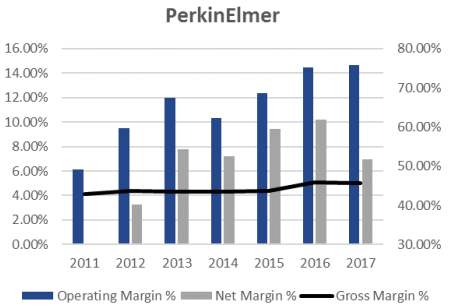



**Figure 24** - *Sources: FactSet, Team Analysis*

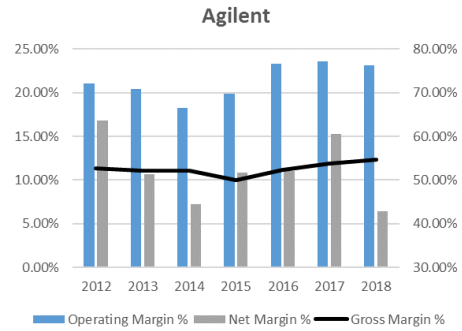



**Figure 25** - *Sources: FactSet, Team Analysis*

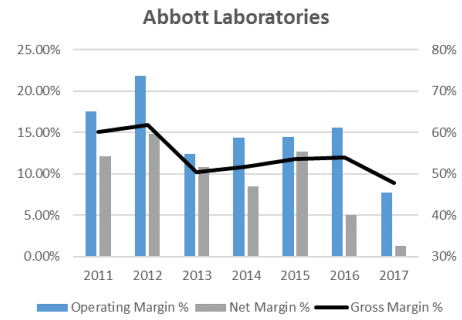



**Figure 26** - *Sources: FactSet, Team Analysis*

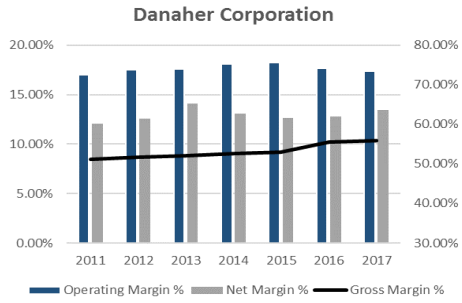



**Figure 27** - *Sources: FactSet, Team Analysis*

| Bio-Techne's Position | TECH LT-Debt (M) | LT Debt/ EBITDA | Industry |
|---|---|---|---|
| Too Levered | $800.00 | 3.61x | Max Multiple |
| | $750.00 | 3.40x | |
| | $700.00 | 3.15x | |
| | $650.00 | 2.93x | |
| Current Position | $600.00 | 2.70x | Industry Average |
| | $550.00 | 2.50x | |
| | $500.00 | 2.25x | |
| Safe Zone | $450.00 | 2.00x | Safe Zone |
| | $400.00 | 1.80x | |
| | $350.00 | 1.55x | |
| | $300.00 | 1.35x | |

**Figure 28** - *Sources: FactSet, Team Analysis*

**Our Take:** PerkinElmer's strategy is very similar to Bio-Techne where the company acquires other companies to continue growing. PerkinElmer has a stronger focus on reproductive health and immunodiagnostics and less on life sciences where it provides less differentiated products to the market.

**Agilent Technologies, Inc. (A or Agilent):** Agilent operates globally by supplying instruments, software, consumables and services for application across the whole lab. The company operates through three segments including Life Sciences & Applied Markets, Diagnostics & Genomics, and Agilent CrossLab Business. Agilent primarily competes against Bio-Techne's Diagnostics and Genomics segment as the two companies manufacture similar products and instruments. Agilent has a five-year sales CAGR of (-8.2%), a five-year average gross margin of 52.6%, operating margin of 21.6%, and net margin of 10.2% (Figure 25).
**Our Take:** Agilent has a much larger portfolio of instruments that provide more automation than many competitors, including Bio-Techne. Agilent supplies 23 product categories that primarily consist of different instruments. While the company may have a larger selection of instruments, Bio-Techne supplies many more reagents and proteins than Agilent.

**Abbott Laboratories (ABT or Abbott):** Abbott operates globally by discovering, developing, and manufacturing a wide range of healthcare products. The company has four segments including; Established Pharmaceutical Products, Nutritional Products, Diagnostic Products, Cardiovascular and Neuromodulation Products. Abbott primarily competes against Bio-Techne's Diagnostics and Genomics segment through its supply of Life Science instruments. Abbott has a five-year sales CAGR of (-7.2%), a five-year average gross margin of 51.56%, operating margin of 12.92%, and net margin of 7.65% (Figure 26).
**Our Take:** Abbott primarily competes against Bio-Techne's immunoassays, hematology, and other diagnostic products but many of the instruments the company directly competes against lack the automation that Bio-Techne can provide. Diagnostics is a smaller portion of Abbott's revenue, contributing to 21% of total revenue. We believe that Bio-Techne provides higher automation but less instrumentation than Abbott.

**GE Healthcare Life Sciences:** GE Healthcare Life Sciences is privately held subsidiary of GE. The company operates globally through two business segments; BioPharma and Pharmaceutical Diagnostics. The company primarily competes against Bio-Techne's Protein Sciences segment. The BioPharma segment produces solutions that can be applied to cell and protein research to develop new drugs and cell therapies. The Pharmaceutical Diagnostics segment creates solutions to enhance diagnostic imagining.
**Our Take:** GE Healthcare Life Sciences has a broad portfolio of automated and semi-automated instruments, some of which compete with the likes of Bio-Techne. While GE Healthcare Life Sciences may provide more automation, the company lacks the robust portfolio of reagents and proteins to support recurring revenue from its instruments.

**Beckman Coulter:** Beckman Coulter is privately held international subsidiary of Danaher Corp. (DHR) and produces instruments and automated processes to aid hospitals and researchers to achieve faster and more accurate results. The company primarily competes against Bio-Techne's Diagnostics and Genomics segment. It has been stated by Bio-Techne's management that Beckman Coulter is a leader and a larger competitor than Bio-Techne especially in hematology. The company was founded in 1935 and is headquartered in Brea, California. (Figure 27)
**Our Take:** Beckman Coulter has a diverse range of instruments and reagents to support its flow cytometry, genomics, and cell analysis, but the company's instruments lack the automation that the industry is headed toward. Additionally, Beckman Coulter cannot compete against the large range of controls, reagents, and proteins that are supplied by Bio-Techne.

## Investment Summary

**Bio-Techne's Heavy Reliance on a Growth by Acquisition Strategy Which has led to Large Transactions with an Extended Timeline Prior to Accretion towards TECH's Business. Furthermore, TECH's Increasing Debt Leverage Makes This Strategy Execution Increasingly More Difficult.**
Bio-Techne has elected to grow its business substantially in prior years through strategic acquisitions with the goal of creating synergies between product lines and services. TECH's sales growth has been heavily fueled by its acquisitions creating unpredictable and unsustainable top line growth, which management is hopeful will become accretive in the future. The Company's growth relies on management's ability to continue strategic acquisitions in the future. We believe TECH will not be able to consistently capitalize on this strategy in the coming years. The first issue that we have identified is based on the Company's debt schedule. Bio-Techne's debt is based on a variable debt schedule. With future forecasted interest rates set to increase, it will become more expensive for the Company to borrow. Debt leverage is also a concern, as the Company holds a debt multiple higher than its competitors after capitalization of over 2.5x, slowing or eliminating TECH's ability to continue to bring on debt for acquisition purposes. (Figure 28) We fully expect further interest rate hikes in 2019 as stated by Federal Reserve Chairman Jerome Powell. This will increase borrowing costs for the Company with high leverage compared to its respective industry. Bio-Techne recently issued a revolver of up to $600 million with the ability to increase an additional $250 million. We believe the large amount of goodwill on the Company's balance sheet as a result of its prior acquisitions shows shortage to the expected synergies and margin expansion, which investors have priced in to the stock, signaling a future pullback. Stockholders expect for the Company to continue following the growth by acquisition strategy to provide TECH's large growth metrics. We believe that within our investment horizon, the increased cost to borrow in

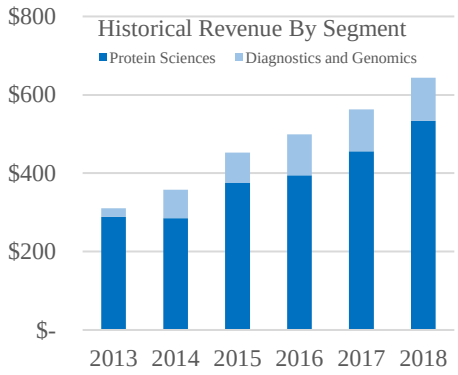



**Figure 29** - *Sources: Company*

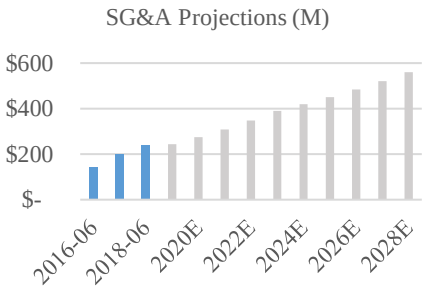



**Figure 30** - *Sources: Company, Team Analysis*

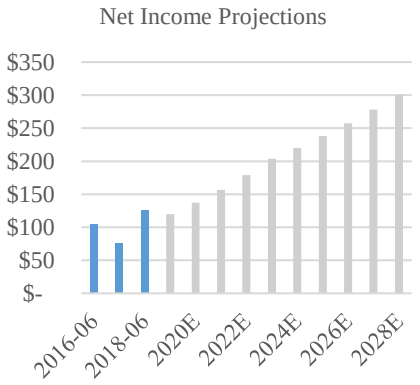



**Figure 31** - *Sources: Company, Team Analysis*

| | | |
|---|---|---|
| Target Price | $ | 120 |
| Bull Case | $ | 144 |
| Base Case | $ | 119 |
| Bear Case | $ | 93 |

**Figure 32** - *Sources: Team Analysis*

| TECH: DCF Calculation | | |
|---|---|---|
| Terminal Value | $ | 3,520 |
| Total Present Value | $ | 5,456 |
| Cash | $ | 169 |
| Value of Debt | $ | 589 |
| Equity Value | $ | 5,036 |
| Shares | $ | 38 |
| Implied Share Price | $ | 134.31 |
| Misvaluation | | -15.95% |

**Figure 33** - *Sources: FactSet, Team Analysis*

addition to the lagging accretion of prior acquisitions will delay TECH from making any significant acquisitions in the near-term. As a result, we believe there will be a loss in equity value of the Firm and a correction in the stock price. Without the ability to continue driving synergies, inorganic growth, and margin expansion from these acquisitions, shareholders will be disappointed and reduce exposure in the stock until this issue is fixed and these acquisitions become accretive or less dilutive to TECH's financials. (Figures 30 & 31)

**Bio-Techne's Increasing Competition among the Company's High Growth Product Pipeline will Result in a Decay in the Company's Financials Subsidized by TECH's Inability to bring Premier Products to High Growth Geographical Locations.**

Management has stated that two of the largest growth factors influencing Bio-Techne will be innovative products like liquid biopsy amplified by the Company's ability to grow in large regions including China, India, and Eastern Asia. Increased intellectual property theft in these regions paired with increased competition among products in the Premier Product pipeline substantially affect the ability for Bio-Techne to continue to increase sales and maintain a strong bottom line. The Company's Premier Product line that has seen increasing competition, is also the source of funding for many of TECH's acquisitions. Because of the increase in competition, we believe the Company is going to have to competitively price products in order to continue a growth in sales, causing an unplanned decrease in margin strength. Additionally, we feel that management has over stated the ability to organically grow at such a rapid pace internationally, as stated at TECH's investor day presentation, Bio-Techne cannot and will not bring top tier products to countries like China due to the high risk of intellectual property theft or infringement. An example of this inability falls with the most recent innovative solution offered by TECH, the EPI test, which is a liquid biopsy providing a non-invasive way to test for prostate cancer. Recently, one of TECH's competitors, Guardant Health, conducted an initial public offering to gain funding for the expansion of a very similar product. Guardant has seen large growth potential for its liquid biopsy testing and its stock price has appreciated as a result. This, paired with TECH's inability to bring high margin, high growth products to China, the Chinese government's plan to increase spending on healthcare we believe will lessen the growth potential that management has stated.

**The Company's Inability to Consistently Attract, Manufacture, and Fulfill Customer OEM Orders Dismisses the Ability to Continue Long-Term Revenue and Earnings Growth.**

One of the larger concerns that has become more relevant recently is Bio-Techne's inability to deliver consistency in its OEM business division. OEM makes up approximately 27% of revenue for Bio-Techne in any given year. (Figure 29) In Fiscal year 2017 and 2018, management missed the mark and reported soft OEM revenue. Bio-Techne has key relationships with its competitors with the most significant being Thermo Fisher. These relationships compose the OEM market that TECH operates in and relies on for growth. Management has identified the Diagnostics and Genomics segment of the business as the biggest growth driver and has been the target of most of TECH's acquisitions. With 57% of the revenue in this segment provided by OEM orders, these relationships are key to Bio-Techne's growth expectations and have suffered the last couple of years. An example of this challenge was the acquisition of ACD which materialized on the financials in 1Q2019. The ACD acquisition provided double-digit inorganic sales growth for the segment, which was not realized in the bottom line financials. This was due to a delay in OEM sales according to management. As a result, ROE has contracted 214 – basis points due to lower asset turns. We believe there are supply chain issues within the company that management has not communicated to investors which is causing the lackluster results in addition to slower growth within some of the Company's key relationships. By conducting operating efficiency analysis, we found material evidence of the issues OEM is having on the financials of the Company. Inventory Turns and Asset Turns have been slowing from 2016 and have contracted 20-basis points and 5-basis points respectively on the surface. This may seem marginal, but we believe it signals there will be further implications of these issues in the future and could likely be masked by further acquisitions.

## Valuation

### Valuation Technique

Our 12-month price target of $120 was derived from a combination of intrinsic and industry relative multiples valuation methods. Our intrinsic valuation method consists of a Discounted Cash Flow ("DCF") while our multiples valuation approach includes an average blend of an industry median NTM & TTM Price-to-Earnings ("P/E") ratios, PEG, P/S, P/Bk, and EV-to-EBITDA, ultimately implying TECH is overvalued by approximately 25% from current price levels (Figure 33). Key assumptions of our valuation methods below:

### Ten-Year DCF Model

In calculating our price target, we place the most weight on our DCF model due to our confidence in our FCF estimates. DCF's are inherently sensitive, which forces us to pay attention to the details of our model. As a result, we conducted numerous sensitivity analyses using key metrics that heavily influence our valuation estimates which include Weighted Average Cost of Capital ("WACC"), Revenue Growth, COGS-to-Sales, SG&A-to-Sales, and Operating Tax Rate metrics (See appendices VII, VIII, & IX for sensitivity analyses). We believe these inputs are highly dependent on historical performance, economic outlook, management's

| Terminal Value | | |
|---|---|---|
| FCF 2028 Value | $ | 342 |
| WACC | | 7.38% |
| Terminal Value Growth Rate | | 2.50% |
| Terminal Value | $ | 3,520 |

**Figure 34** - *Sources: Team Analysis*

| WACC Calculation | |
|---|---|
| Equity Assumptions | |
| Cost of Equity | 8.02% |
| Beta | 0.78 |
| RF Rate | 2.78% |
| Market Return | 7.95% |
| Market Premium | 5.17% |
| Estimated Size Premium | 1.23% |
| Estimated Value Premium | -1.31% |
| Capital Structure Portion of Equity | 89.61% |
| Debt Assumptions | |
| Cost of Debt | 2.35% |
| Capital Structure Portion of Debt | 10.39% |
| Tax Rate (2019 Expected) | 20.46% |
| **WAAC** | 7.38% |

**Figure 35** - *Sources: FactSet, Team Analysis*

| Implied Valuations | Measure | Implied Price | Misvaluation |
|---|---|---|---|
| Forward EPS | $ 4.58 | $94.83 | -40.85% |
| Trailing EPS | $ 3.31 | $147.79 | -7.81% |
| Growth Rate | 10.20 | $78.34 | -51.13% |
| Sales per share | $16.90 | $60.86 | -62.04% |
| Book value per share | $28.69 | $135.94 | -15.21% |
| EBITDA per share | $ 5.97 | $112.10 | -30.08% |
| Average Implied Share Price | | $104.98 | |
| Misvaluation | | 35% | |

**Figure 36** - *Sources: FactSet, Team Analysis*


**Figure 37** - *Sources: Team Analysis*

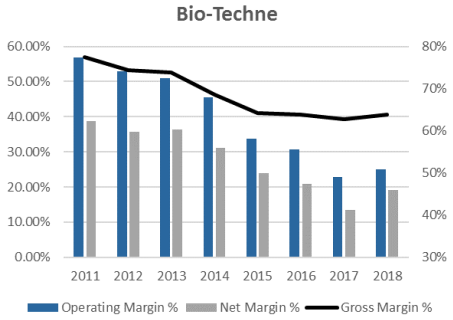



**Figure 38** - *Sources: FactSet, Company*

guidance, our own growth assumptions, and TECH's ability to maintain, grow, or shrink market share. A more detailed explanation of the key metric assumptions we made is detailed below in addition to Appendix IV. Appendix V will give more detail on Key Assumptions.

**Weighted Average Cost of Capital**

WACC is an extremely sensitive factor in our DCF model, and was one of the most important assumptions we use for our discount rate (Figure 35). Within our valuation framework, we used a WACC of 7.38%. We estimated our Cost of Equity Capital using the Fama-French Three-Factor Model (FF) which provided a value of 8.02%. Key elements of our FF assumptions were an estimated one-year forward risk-free rate of 2.78%, an estimated market return of 7.95%, yielding a market premium of 5.17% , a size premium of 1.23%, and value premium of -1.31%. The second element of our equation, Cost of Debt, was computed using a blended interest rate analysis on TECH's Debt which consisted of TECH's Revolvers and Term Loans outstanding divided by the interest expense for the LTM. Our average Cost of Debt was calculated at 2.35% before taxes. We estimated an operating tax rate of 20.46% sourced from historical data and a capital structure weighted 89.61% to equity and 10.39% to debt, giving our WACC a value of 7.38%. Our sensitivity analysis using a WACC between 5.88% and 8.88% yielded a price range of $112.39-$134.99 for Bio-Techne.

**Operational Assumptions**

Some important operational assumptions used when calculating our pro-forma financials are as follows: short-term sales growth rate 12.46% reflective of the past three years of operation. We chose this because Bio-Techne's organic growth is upper single-digit and has further been supplemented by acquisition. In the recent acquisition activity and the interest rate environment, we believe that TECH is near capacity for large deals and will only take on small, tuck-in acquisitions that will not boost top line significantly in the near-term. Our long-term sales growth rate is half way between our short and terminal growth rates at 7.48% with our terminal rate of 2.5% reflecting global expansion opportunity (Figure 34). The remainder of our assumptions for the key income statement and the balance sheet items were computed using 3-year historical average ratios as guidance. We believe this time period is appropriate because it best reflects the nature of operations going forward compared to the longer term. Taking these measures into account, along with our estimated WACC, we arrived at an estimated enterprise value of $5.6B for TECH. Adjusting for mid-year, excess cash, and total debt, we estimate an equity value of $5.0B. Using an estimated shares outstanding of 37.7 million, we arrived at a per share value of $134.31 for TECH.

**Relative Multiples Valuation**

Our relative valuation was based on industry multiples calculated from the Life Sciences Services & Tools Industry (Figure 36). We utilized all companies with positive multiples in the GICS sub-industry of Life Science Tools & Services to capture the full scope of valuations in the landscape Bio-Techne resides. Companies identified for this valuation after removing negative outliers were Illumina Inc., Waters Corporation, Mettler-Toledo International, Thermo Fisher Scientific, Bio-Rad Laboratories, Charles River Laboratories, Agilent Technologies, Cambrex Corporation, PerkinElmer, IQVIA Holdings, and PRA Health Sciences, Inc. We chose these peers to best reflect Bio-Techne's closest associated business peers by industry group (GICS) taking measures of P/E (Trailing and Forward), PEG, P/Sales, P/Book, and EV/EBITDA for each company and TECH. Calculating the median value for each multiple provided us a basis for our multiples valuation method. Using Bio-Techne's respective per share values and the industry median values yielded an implied price for each measurement, and these prices were then averaged to a value of $104. Overall, valuations contained in our relative multiples analysis provided us with an over valuation of 34.52% for Bio-Techne. All financial modeling and assumptions can be found on Appendix II, III, IV, and V.

## Financial Analysis

**Income Statement Analysis**

In order to conduct our financial analysis, we began by analyzing the income statement from the top-down. Since 2014, Bio-Techne has seen a substantial contraction in margins beginning with gross margins through net margins. Some of this is explainable as the company has conducted several acquisitions with aspirations of fueling long-term organic growth. Since 2014, Gross Margins have contracted 503-basis points over the past five years, bringing down current gross margins to 63.54% as of 1Q19. We believe the margin contraction across the income statement can be attributed to the temporarily dilutive acquisition targets. Ineffective synergies lack of efficiency improvement have outweighed the near-term gap filling strategy from management's initiative (See Appendix X). Secondly, TECH has had margin strength prior due to operations in its Premier Product lines. This product line was produced and marketed with little to no competition. Market saturation is starting to take a toll on the Company's Financial strength and we expect to see this worsen as TECH begins to evolve and move into high-cost, high-competition markets. We also believe the Company will not be able to counteract these contractions due to the inability to bring high growth, high margin products into Emerging Markets like China and Eastern Asia due to the Intellectual Property risks associated. EBITDA (Figure 44) and Operating Margins have experienced the most significant reduction with basis point contractions of 1,736 and 2,229 respectively, bringing margins down to 33.52% and 23.23% respectively in 1Q19 (Figure 38). SG&A has had the most material contraction and we believe this will continue moving

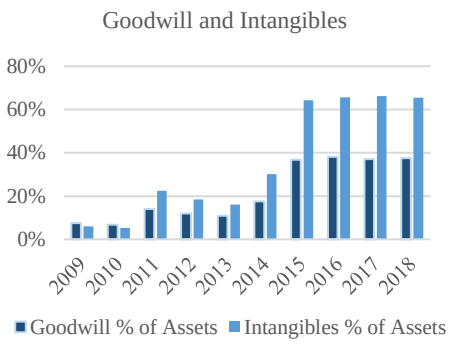



**Figure 39** - *Sources: FactSet, Company*

| Year | Coverage Ratio |
|---|---|
| 2009 | - |
| 2010 | - |
| 2011 | - |
| 2012 | - |
| 2013 | - |
| 2014 | - |
| 2015 | 122.89x |
| 2016 | 112.2x |
| 2017 | 25.54x |
| 2018 | 22.13x |

**Figure 40** - *Sources: Factset. Company*

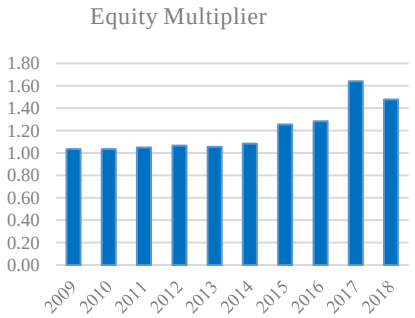



**Figure 42** - *Sources: FactSet, Company*

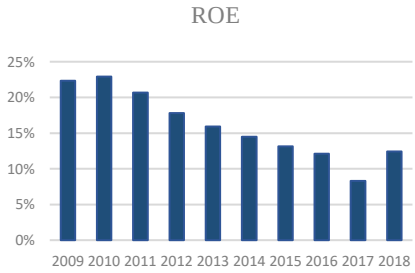



**Figure 43** - *Sources: FactSet, Team Analysis*

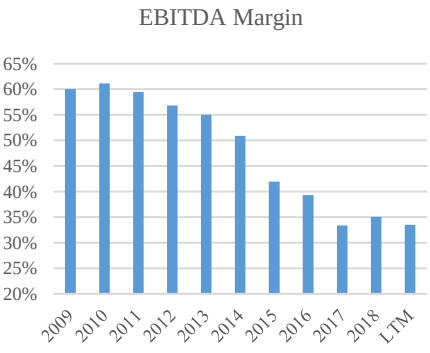



**Figure 44** - *Sources: FactSet, Team Analysis*

forward. Current and future labor markets should continue to be strong, which places pressure on wages and compensation for TECH's employees. TECH has historically sought out a large percentage of its labor force with PHD level education and experience, which requires higher than normal compensation levels. We also believe there will be an increase in depreciation and amortization costs as the company continues to deploy large amounts of goodwill for acquisitions. (Figure 39) As we continue to flow down through the income statement, we have seen a 1,172-basis point contraction in net margins since 2014 with the current net margin at 19.29% as of 1Q19 (Figure 41). We believe this will be lower in future quarters and years due to the aforementioned delay in acquisition synergy realization. TECH had an operating tax rate of 0% last year which will change in the future with a new corporate tax rate of 21% and the company's inability to continue a 0% effective tax rate. TECH has been historically in line with the corporate tax rate. Changes in R&D tax laws should also contribute to possible increased tax liabilities into the future due to tax reform. TECH also recently financed its large acquisitions with a $250M revolver, bringing long-term debt to roughly $600M. This is tied to a variable interest rate based on the LIBOR rate plus 1.25% with the ability to increase the revolver another $250M. (Figure 40) Lastly, TECH has liability of possibly $325M in milestone payments from TECH's acquisition of ACD and Exosome Diagnostics. Please see Appendix X for further discussion of our Income Statement Analysis.

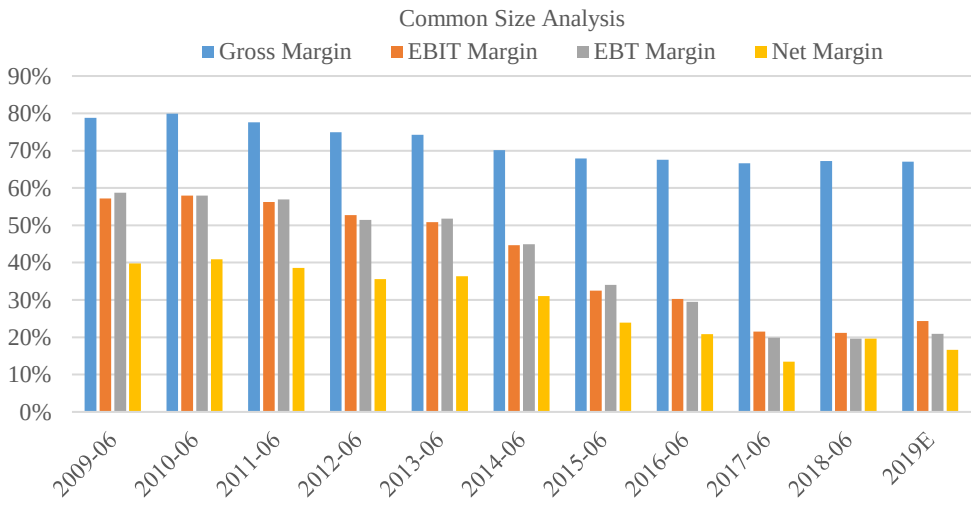



**Figure 41** - *Sources: Investor Relations, Team Assumptions*

**Balance Sheet Analysis**

In order to gain insight and further understanding of TECH's balance sheet and returns, we conducted a DuPont analysis to provide clarity around TECH's Return on Assets (ROA) and Return on Equity (ROE) along with analysis of other key items of the balance sheet. The firm's combination of contraction in ROA paired with the contraction in ROE is worrisome. ROA has contracted at 553-basis points while ROE has contracted at 214-basis points over a five-year period (Figure 43). Bio-Techne has seen a significant decrease in ROE due to margin contractions. This continues to signal poor performance for the company which has not yet been fully realized by the street. The trend is concerning for two main reasons. One, the equity multiple (Figure 42) has expanded 48-basis points while ROE continues to trend downward. The issue is sourced from ROA, asset turnover, and profit margin, which continue to weaken year over year. TECH has seen dilutive acquisitions over the last five years causing continued decay in efficiency, execution, and overall financial performance. An increase in the equity multiplier paired with a large decrease in ROA, TECH is in for a long-road to recovery which continues to signal over-valuation. Secondly, the reduction in ROE would be less of a concerning factor if the Company was not seeing a material effect on its equity multiplier. Bio-Techne's growth by acquisition plan will continue to raise the debt leverage of the company, thus increasing the equity multiplier. Costs continue to rise faster than sales, and if you normalize the company's sales growth performance excluding outlier of sales, the growth of the company is significantly lower than the growth in costs. The returns TECH is providing to investors are significantly lower than the valuation in which traded on. In the near term we expect to see a continued contraction in the return of the company due to decreasing margins and inability to create synergy, costs savings, increase in operating efficiency, or significant organic sales growth from the acquisitions management has completed. (Figure 44) The balance sheet has shown significant changes in only a few locations. Respectively because of acquisitions, we have seen a fairly substantial increase in net debt on the balance sheet. Though we believe TECH will not make further significant acquisitions in the near-term, we believe due to the increasing interest rate environment that there will continue to be a slight increase in net debt based on our estimates. There has also been a significant increase in intangible assets from the acquisition which we believe will remain steady going into the future (Figure 39). Please also see Appendix X for further discussion of our Balance Sheet Analysis.

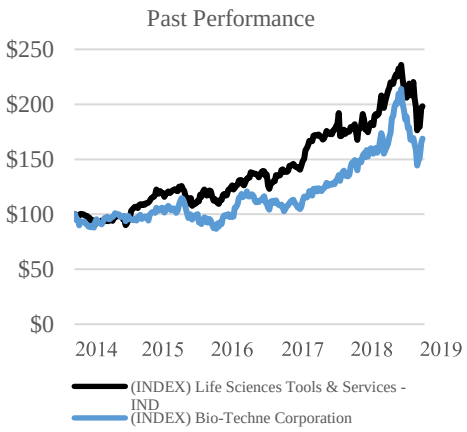



**Figure 45** - *Sources: FactSet*

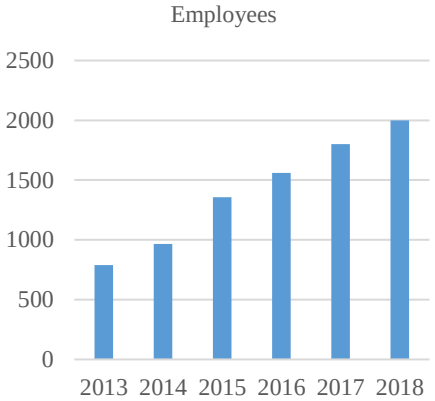



**Figure 46** - *Sources: Bloomberg, Company*

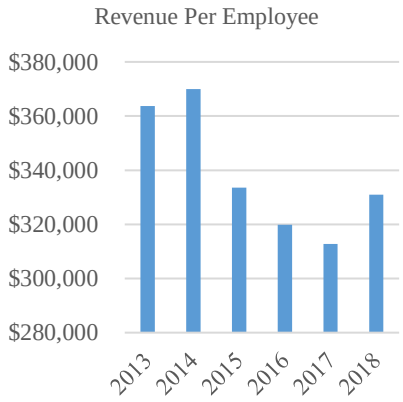



**Figure 47** - *Sources: FactSet, Bloomberg*

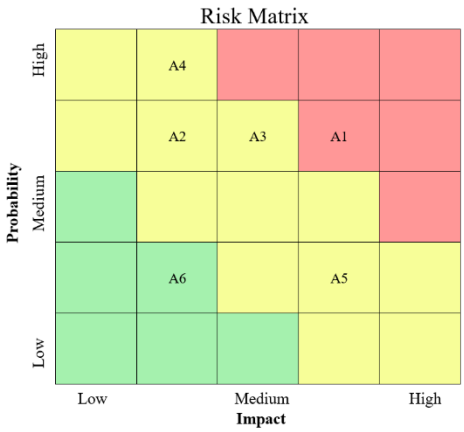



**Figure 48** - *Sources: Team Analysis*

**Cash Flow Analysis**

Bio-Techne has experienced a negative five-year CAGR in FCF of -12.39%. See Appendix II for information regarding how FCF was calculated. More recently, from 2017 to 2018, we have seen a decrease in FCF mainly due to a large increase in investment activity for acquisitions. Due to our expectations of slowing acquisitions, we believe we will see growth in FCF as a whole in the coming years but this could remain an issue with rising expenses for the company. We see issues in free cash flow margin, which has experienced decay and we believe will continue moving forward. TECH has had increasing trouble generating FCF compared to sales as a result of margin contractions which creates concern for TECH financially. We believe the growth in net FCF will continue to deteriorate, as the firm did not pay income taxes in 2018. The resumption of income tax in the years ahead should lower the amount of free cash flow the firm is able to generate, providing further evidence suggesting an overvaluation of the company. Please see Appendix II and X regarding how we calculated our ratio analysis and further discussion.

## Risks

**Acquisition Growth Strategy**

Bio-Techne relies heavily on acquisitions to fuel growth as the company has completed fifteen acquisitions over the last six years. The company has focused on bolt-on acquisitions in order to fill gaps and expand Bio-Techne's product portfolio. There is high competition among buyers and high valuations for many biotechnology companies which can result in a high value of goodwill for the acquiring company with the threat that the investment could be dilutive. This strategy is also becoming more expensive for Bio-Techne as the company has $561.5 million in variable debt obligations and interest rates are at all-time highs and increasing.

**Competition**

The Biotechnology industry is a highly competitive and fragmented industry with many players controlling niche portions of the market. This means that Bio-Techne faces competition from start-ups to large multinational companies that may have more resources than Bio-Techne. Many of these competitors are also focusing on geographic expansion, especially in China. If Bio-Techne is unable to be competitive with the rest of the industry, we could expect to see a loss of market share. Bio-Techne competes in markets that are federally regulated and must comply with the current and ever-changing environmental, health and safety, and food and drug regulations. Bio-Techne is also awaiting reimbursement coverage for clinical laboratory testing for the company's EPI test, a non-invasive urine test that can accurately predict prostate cancer. The schedule for reimbursement is uncertain and reimbursements are subject to change if there is support to give Medicare more pricing power concerning drug prices. Management was expecting to receive reimbursement by the end of 2018 but we are yet to hear any word on when we can expect that to actually happen.

**Margin Contraction**

Bio-Techne's margins have been contracting over the past eight years since the peak in 2010 with gross margin down (-15.6%) from 79.4% to 63.8%, EBITDA margin down (-26%) from 61.1% to 35.1%, and net margin down (-21.2%) from 40.8% to 19.6% all over the same period. This can be attributed to higher COGS and the company's M&A strategy. Since the year 2013, when Charles Kummeth took over as CEO, COGS has grown at higher rates than sales growth except for 2018 where sales outpaced COGS by 3.4%. If the company is not able to recover from this trend the company may have to impair goodwill as acquisitions are becoming dilutive. Bio-Techne is also facing a tight job market, meaning it has to pay higher wages and use other incentives in order to attract and maintain its employees, ultimately lowering margins.

**Employee Retention**

Bio-Techne relies on the ability to acquire and retain highly knowledgeable and skilled employees. The company's employees and sales force is made up of experienced scientists and others with industry experience in order to develop new solutions, deliver sales for the company and information for the customer (Figures 46 & 47). The current job market is very tight with unemployment around 3.7%. The tight job market could, in turn, decrease margins as the company will need to pay higher wages and use other incentives to attract and maintain employees. Because Bio-Techne is a serial acquirer, the company also faces the challenge of retaining the employees that it acquires through M&A deals. Employees acquired in an acquisition are less likely to stay with Bio-Techne because there is a new culture with different expectations and many choose to part ways with the company.

**Intellectual Property Risks**

Bio-Techne's management team revealed to us on our investor day that the company cannot and will not bring its premier products into China due to the threat of IP theft or infringement. Bio-Techne has identified China as a high growth market but will be unable to fully capitalize on the opportunity due to this threat. In addition, competition in China is strong as many other biotechnology companies are also working to move into China in an attempt to grow rapidly with the strong demand for healthcare. While the U.S. and other countries are fighting the theft of intellectual property, hardly any progress has been made, in some cases it has gotten even worse. Chinese violators are not being punished adequately and some operate with impunity so there is virtually nothing stopping them from stealing and using trade secrets from foreign competition.

**Appendix:**

**Appendix I: Management & Board**

**Charles R. Kummeth, MBA (59), President, Chief Executive Officer & Director Since 2013**

Mr. Kummeth began his career with Bio-Techne on April 1st, 2013 as the companies Chief Executive Officer (CEO). Prior to joining Bio-Techne, he served as President of Mass Spectrometry and Chromatography at Thermo Fisher Scientific among various other roles during his tenure at the company. He also serves on the board for Bio-Techne as well as on the boards of Sparton and Avantor.

**Jim Hippel (48), Chief Financial Officer Since 2014**

Mr. Hippel began his tenure with Bio-Techne on April 1st, 2014 starting as the company's Chief Financial Officer (CFO). Mr. Hippel served as Senior Vice President and CFO for Mirion Technologies prior to joining Bio-Techne's management team. In addition, he has served as the Vice President of Finance for Thermo Fisher.

**David Eansor (58), President, Protein Sciences Segment, Since 2015**

Mr. Eansor's career began with Bio-Techne upon the acquisition of Novus Biologicals in July of 2014. Mr. Eansor was then promoted to Vice President in 2015 where he manages the Protein Sciences Segment of the business. Prior to Novus and Bio-Techne, Mr. Eansor served as Senior Vice President of the Bioscience Division at Thermo Fisher Scientific.

**Kim Kelderman (--), President, Diagnostics and Genomics, Since 2018**

Mr. Kelderman's tenure began on April 30, 2018 with Bio-Techne serving as the company's President of Diagnostics and Genomics. Mr. Kelderman was employed by Thermo Fisher as well prior to joining the management team at Bio-Techne. During his tenure at Thermo Fisher, he led three different businesses for the company including Platforms and Content of the Genetic Sciences.

**Brenda Furlow (61), General Counsel, Secretary and Chief Compliance Officer, Since 2014**

Ms. Furlow began her tenure with Bio-Techne as Senior Vice President and General Counsel in August of 2014. Ms. Furlow's experience prior to Bio-Techne included affiliation with Alphatech Counsel, SC where she served as General Counsel for emerging growth technology. She also General Counsel for TomoTherapy prior to Bio-Techne.

| Director | Audit | Executive Compensation | Nominations & Governance | Science & Technology |
|---|---|---|---|---|
| Robert V. Baumgartner | X | | Chair | |
| Charles A. Dinarello, M.D. | | | | X |
| John L. Higgins | Chair | | X | |
| Joseph Keegan, Ph.D. | | X | | |
| Charles R. Kummeth | | | | |
| Roeland Nusse, Ph.D. | | | X | Chair |
| Alpna Seth, Ph.D. | | | X | X |
| Randolph C. Steer, M.D., Ph.D. | | Chair | | X |
| Harold J. Wiens | X | X | | |
| **Number of meetings held during FY 2018** | **12** | **4** | **3** | **2** |

**Robert V. Baumgartner (-), Board of Directors, Chairman, Since 2003**

Mr. Baumgartner has served on the Company's Board since 2003 and as Chairman since 2012. Mr. Baumgartner has served as Executive Chairman, Director of the Center for Diagnostic Imaging, Inc., an operator of diagnostic imaging centers, since 2001. Until August, 2015, Mr. Baumgartner also served as Chief Executive Officer of that company.

**Alpna Seth, PH.D. (-), Board of Directors, Since 2017**

Dr. Alpna Seth currently serves as the Chief Operating Officer of Vir Biotechnology, Inc. Prior to joining Vir in July 2017, Dr. Seth was Senior Vice President and Global head of the Biosimilars business for Biogen, Inc. headquartered in Zug, Switzerland since 2014. Dr. Alpna Seth holds a Ph.D. in Biochemistry and Molecular Biology from University of Massachusetts Medical School and conducted research at Harvard.

**Randolph C. Steer, M.D., PH.D (-), Board of Directors, Since 1990**

Randolph C. Steer, M.D., Ph.D., has served on the Company's Board since 1990. Dr. Steer is currently an independent biotechnology consultant. He served as President and Chief Operating Officer of Capstone Therapeutics Corp. from April 2006 to October 2011. Dr. Steer was elected to the Mayo Clinic Board of Trustees in November 2011.

**John L. Higgins (-), Board of Directors, Since 2009**

John L. Higgins has served on the Company's Board since 2009. Mr. Higgins has been President and Chief Executive Officer of Ligand Pharmaceuticals, Inc. since January 2007 and has been a member of Ligand's Board of Directors since March 2007. Mr. Higgins also serves as Chairman of CoMentis, Inc., a biopharmaceutical company, and has served as a director of numerous public and private companies.

**Roeland Nusse, PH.D. (-), Board of Directors, Since 2010**

Roeland Nusse, Ph.D., has served on the Company's Board since May 2010. Dr. Nusse has served as Chairman of the Department of Developmental Biology at Stanford University since 2007. Dr. Nusse has been a professor or associate professor in the Department of Developmental Biology at Stanford University and an investigator at the Howard Hughes Medical Institute since 1990. He has also been the chair of the Department of Developmental Biology at Stanford since 2007.

**Harold Wiens (-), Board of Directors, Since 2014**

Harold J. Wiens has served on the Company's Board since May 2014. He is a 30-plus year veteran of The 3M Company. Mr. Wiens began his 3M career in 1968 and held multiple domestic and international engineering and production management roles, including Memory Technologies Group Manufacturing Manager for the Europe location, Managing Director and Executive Vice President of Sumitomo 3M, and, most recently, Executive Vice President of 3M's Industrial Sector.

**Joseph D. Keegan, PH.D. (-), Board of Directors, Since 2017**

Dr. Joseph Keegan currently serves as a director and advisor for Interspace Diagnostics (Nasdaq: IDXG) as well as a number of privately held life science companies, including as Chair of Labcyte, Inc., and also as director at Carterra, Inc., and Nanomedical Diagnostics. From 2007 until its sale to Pall Corporation in 2012, Dr. Keegan served as President and Chief Executive Officer of ForteBio, Inc. Dr. Keegan joined ForteBio from Molecular Devices Corporation, where he served as President and Chief Executive Officer from 1998 to 2007.

## Appendix II: Pro Forma Financials & Performance Metrics

| TECH: Income Statement | 2016-06 | 2017-06 | 2018-06 | 2019E | 2020E | 2021E | 2022E | 2023E | 2024E | 2025E | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Revenue** | $ 499 | $ 563 | $ 643 | $ 723 | $ 813 | $ 914 | $ 1,028 | $ 1,156 | $ 1,243 | $ 1,336 | $ 1,436 | $ 1,543 | $ 1,659 |
| Cost of goods sold | $ 162 | $ 188 | $ 211 | $ 238 | $ 267 | $ 301 | $ 338 | $ 380 | $ 409 | $ 439 | $ 472 | $ 508 | $ 546 |
| Gross Profit | $ 337 | $ 375 | $ 432 | $ 485 | $ 546 | $ 614 | $ 690 | $ 776 | $ 834 | $ 897 | $ 964 | $ 1,036 | $ 1,113 |
| **Operating Expenses** | | | | | | | | | | | | | |
| Research and Development | $ 45 | $ 54 | $ 55 | $ 65 | $ 74 | $ 83 | $ 93 | $ 105 | $ 113 | $ 121 | $ 130 | $ 140 | $ 150 |
| Sales, general and administrative | $ 141 | $ 200 | $ 241 | $ 244 | $ 274 | $ 309 | $ 347 | $ 390 | $ 420 | $ 451 | $ 485 | $ 521 | $ 560 |
| *Depreciation and Amortization* | $ 43 | $ 60 | $ 64 | $ 71 | $ 79 | $ 89 | $ 100 | $ 113 | $ 121 | $ 130 | $ 140 | $ 150 | $ 162 |
| *Adjusted SG&A* | $ 98 | $ 140 | $ 177 | $ 174 | $ 195 | $ 219 | $ 247 | $ 278 | $ 298 | $ 321 | $ 345 | $ 370 | $ 398 |
| Other Operating Expenses | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Total Operating Expenses | $ 186 | $ 254 | $ 296 | $ 310 | $ 348 | $ 391 | $ 440 | $ 495 | $ 532 | $ 572 | $ 615 | $ 661 | $ 710 |
| **Operating Income (EBIT)** | $ 151 | $ 121 | $ 136 | $ 176 | $ 198 | $ 222 | $ 250 | $ 281 | $ 302 | $ 325 | $ 349 | $ 375 | $ 403 |
| **Non-Operating Items** | | | | | | | | | | | | | |
| Interest Expense | $ 2 | $ 7 | $ 10 | $ 25 | $ 25 | $ 25 | $ 25 | $ 25 | $ 25 | $ 25 | $ 25 | $ 25 | $ 25 |
| Other income (expense) | $ (1) | $ (1) | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **Earnings before taxes (EBT)** | **$ 147** | **$ 112** | **$ 126** | **$ 151** | **$ 172** | **$ 197** | **$ 225** | **$ 256** | **$ 277** | **$ 300** | **$ 324** | **$ 350** | **$ 378** |
| Provision for income taxes | $ 43 | $ 36 | $ - | 30.819652 | $ 35 | $ 40 | $ 46 | $ 52 | $ 57 | $ 61 | $ 66 | $ 72 | $ 77 |
| **Net Income** | **$ 104** | **$ 76** | **$ 126** | **$ 120** | **$ 137** | **$ 157** | **$ 179** | **$ 204** | **$ 220** | **$ 238** | **$ 258** | **$ 278** | **$ 301** |
| | | | | | | | | | | | | | |
| **Per share Data** | | | | | | | | | | | | | |
| *EPS (Basic)* | $ 2.81 | $ 2.04 | $ 3.36 | $ 3.19 | $ 3.66 | $ 4.18 | $ 4.77 | $ 5.43 | $ 5.87 | $ 6.35 | $ 6.87 | $ 7.42 | $ 8.02 |
| *EPS (Diluted)* | $ 2.80 | $ 2.03 | $ 3.31 | $ 3.14 | $ 3.60 | $ 4.11 | $ 4.69 | $ 5.34 | $ 5.78 | $ 6.25 | $ 6.76 | $ 7.30 | $ 7.89 |
| **Non-GAAP Measures** | | | | | | | | | | | | | |
| *EBITDA* | $ 192 | $ 179 | $ 201 | $ 246 | $ 277 | $ 311 | $ 350 | $ 394 | $ 423 | $ 455 | $ 489 | $ 526 | $ 565 |
| *EBITDA per share* | $ 5.16 | $ 4.80 | $ 5.36 | $ 6.57 | $ 7.38 | $ 8.30 | $ 9.34 | $ 10.50 | $ 11.29 | $ 12.13 | $ 13.04 | $ 14.01 | $ 15.06 |
| | | | | | | | | | | | | | |
| **Other Information** | | | | | | | | | | | | | |
| Dividends | $ (48) | $ (47) | $ (48) | $ (48) | $ (55) | $ (63) | $ (72) | $ (82) | $ (88) | $ (96) | $ (103) | $ (112) | $ (121) |
| Share repurchases | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **Retained Earnings** | **$ 56** | **$ 29** | **$ 78** | **$ 72** | **$ 82** | **$ 94** | **$ 107** | **$ 122** | **$ 132** | **$ 143** | **$ 154** | **$ 166** | **$ 180** |
| | | | | | | | | | | | | | |
| **Common Stock Outstanding** | 37.2 | 37.3 | 37.5 | 37.5 | 37.5 | 37.5 | 37.5 | 37.5 | 37.5 | 37.5 | 37.5 | 37.5 | 37.5 |
| **Fully Diluted Common Stock** | 37.3 | 37.5 | 38.1 | 38.1 | 38.1 | 38.1 | 38.1 | 38.1 | 38.1 | 38.1 | 38.1 | 38.1 | 38.1 |

| TECH: Balance Sheet | 2016-06 | 2017-06 | 2018-06 | 2019E | 2020E | 2021E | 2022E | 2023E | 2024E | 2025E | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Assets** | | | | | | | | | | | | | |
| **Current Assets** | | | | | | | | | | | | | |
| Operating Cash | $ 10 | $ 11 | $ 13 | $ 14 | $ 16 | $ 18 | $ 21 | $ 23 | $ 25 | $ 27 | $ 29 | $ 31 | $ 33 |
| Excess Cash | $ 86 | $ 147 | $ 169 | $ 108 | $ 146 | $ 191 | $ 243 | $ 302 | $ 392 | $ 490 | $ 595 | $ 710 | $ 834 |
| Accounts Receivable | $ 93 | $ 117 | $ 120 | $ 140 | $ 157 | $ 177 | $ 199 | $ 224 | $ 241 | $ 259 | $ 278 | $ 299 | $ 321 |
| Inventory | $ 57 | $ 60 | $ 86 | $ 86 | $ 96 | $ 108 | $ 122 | $ 137 | $ 147 | $ 158 | $ 170 | $ 182 | $ 196 |
| Other Current Assets | $ 8 | $ 13 | $ 11 | $ 14 | $ 15 | $ 17 | $ 19 | $ 22 | $ 23 | $ 25 | $ 27 | $ 29 | $ 31 |
| **Total Current Assets** | **$ 254** | **$ 348** | **$ 398** | **$ 361** | **$ 431** | **$ 511** | **$ 603** | **$ 708** | **$ 828** | **$ 958** | **$ 1,099** | **$ 1,251** | **$ 1,415** |
| | | | | | | | | | | | | | |
| **Long-term Assets** | | | | | | | | | | | | | |
| Net Property, Plants, and Equipment | $ 132 | $ 135 | $ 145 | $ 176 | $ 198 | $ 222 | $ 250 | $ 281 | $ 302 | $ 325 | $ 349 | $ 375 | $ 403 |
| Equity and other investments | $ - | $ 40 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 |
| Goodwill | $ 431 | $ 579 | $ 848 | $ 848 | $ 848 | $ 848 | $ 848 | $ 848 | $ 848 | $ 848 | $ 848 | $ 848 | $ 848 |
| Intangible Assets | $ 311 | $ 452 | $ 446 | $ 446 | $ 446 | $ 446 | $ 446 | $ 446 | $ 446 | $ 446 | $ 446 | $ 446 | $ 446 |
| Value of Knowledge Base | | | | $ 158 | $ 179 | $ 202 | $ 228 | $ 257 | $ 284 | $ 310 | $ 337 | $ 364 | $ 393 |
| Other Long-term Assets | $ 2 | $ 4 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 |
| **Total Long-term Assets** | **$ 876** | **$ 1,210** | **$ 1,195** | **$ 1,634** | **$ 1,677** | **$ 1,725** | **$ 1,778** | **$ 1,838** | **$ 1,886** | **$ 1,935** | **$ 1,986** | **$ 2,040** | **$ 2,096** |
| **Total Assets** | **$ 1,130** | **$ 1,558** | **$ 1,593** | **$ 1,995** | **$ 2,108** | **$ 2,236** | **$ 2,381** | **$ 2,546** | **$ 2,714** | **$ 2,893** | **$ 3,085** | **$ 3,291** | **$ 3,512** |
| | | | | | | | | | | | | | |
| **Liabilities** | | | | | | | | | | | | | |
| **Current Liabilities** | | | | | | | | | | | | | |
| Short-term Debt | $ 4 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Accounts Payable | $ 21 | $ 17 | $ 18 | $ 23.28 | $ 26 | $ 29 | $ 33 | $ 37 | $ 40 | $ 43 | $ 46 | $ 50 | $ 53 |
| Taxes payable | $ 2 | $ 2 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 |
| Accrued Liabilities | $ 23 | $ 45 | $ 45 | $ 48 | $ 54 | $ 61 | $ 69 | $ 77 | $ 83 | $ 89 | $ 96 | $ 103 | $ 111 |
| Deferred Revenues | $ 5 | $ 6 | $ 7 | $ 8 | $ 9 | $ 10 | $ 11 | $ 12 | $ 13 | $ 14 | $ 15 | $ 16 | $ 17 |
| Other current liabilities | $ - | $ 65 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **Total Current Liabilities** | **$ 54** | **$ 136** | **$ 80** | **$ 88** | **$ 98** | **$ 109** | **$ 122** | **$ 136** | **$ 145** | **$ 156** | **$ 166** | **$ 178** | **$ 191** |
| | | | | | | | | | | | | | |
| **Long-term Liabilities** | | | | | | | | | | | | | |
| Long-term Debt | $ 92 | $ 344 | $ 339 | $ 589 | $ 589 | $ 589 | $ 589 | $ 589 | $ 589 | $ 589 | $ 589 | $ 589 | $ 589 |
| Newly-issued Debt | | | | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Deferred taxes liabilities | $ 63 | $ 121 | $ 86 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Other Long-term Liabilities | $ 42 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 | $ 9 |
| **Total Long-term Liabilities** | **$ 196** | **$ 473** | **$ 435** | **$ 598** | **$ 598** | **$ 598** | **$ 598** | **$ 598** | **$ 598** | **$ 598** | **$ 598** | **$ 598** | **$ 598** |
| **Total Liabilities** | **$ 250** | **$ 609** | **$ 514** | **$ 686** | **$ 696** | **$ 707** | **$ 720** | **$ 734** | **$ 743** | **$ 754** | **$ 764** | **$ 776** | **$ 789** |
| | | | | | | | | | | | | | |
| **Shareholders' Equity** | | | | | | | | | | | | | |
| Common Stock | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Additional Paid-In Capital | $ 179 | $ 199 | $ 247 | $ 247 | $ 247 | $ 247 | $ 247 | $ 247 | $ 247 | $ 247 | $ 247 | $ 247 | $ 247 |
| Accumulated Retained Earnings | $ 771 | $ 799 | $ 877 | $ 949 | $ 1,031 | $ 1,125 | $ 1,231 | $ 1,353 | $ 1,485 | $ 1,628 | $ 1,782 | $ 1,948 | $ 2,128 |
| Accumulated Other Comprehensive Losses / Earnings | $ (70) | $ (49) | $ (45) | $ (45) | $ (45) | $ (45) | $ (45) | $ (45) | $ (45) | $ (45) | $ (45) | $ (45) | $ (45) |
| Value of Knowledge Base | | | | $ 158 | $ 179 | $ 202 | $ 228 | $ 257 | $ 284 | $ 310 | $ 337 | $ 364 | $ 393 |
| **Total Shareholders' Equity** | **$ 879** | **$ 950** | **$ 1,079** | **$ 1,309** | **$ 1,412** | **$ 1,529** | **$ 1,661** | **$ 1,812** | **$ 1,971** | **$ 2,140** | **$ 2,320** | **$ 2,514** | **$ 2,723** |
| **Total Liabilities + Shareholders' Equity** | **$ 1,130** | **$ 1,558** | **$ 1,593** | **$ 1,995** | **$ 2,108** | **$ 2,236** | **$ 2,381** | **$ 2,546** | **$ 2,714** | **$ 2,893** | **$ 3,085** | **$ 3,291** | **$ 3,512** |

| TECH: Free Cash Flow Calculation | 2016-06 | 2017-06 | 2018-06 | 2019E | 2020E | 2021E | 2022E | 2023E | 2024E | 2025E | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Net Operating Profit Less Adjusted Taxes (NOPLAT)** | | $ 96 | $ 108 | $ 140 | $ 157 | $ 177 | $ 199 | $ 224 | $ 240 | $ 258 | $ 278 | $ 298 | $ 321 |
| *Add*: Rent Expense | | $ 10 | $ 11 | $ 11 | $ 11 | $ 10 | $ 11 | $ 10 | $ 10 | $ 10 | $ 10 | $ 10 | $ 10 |
| *Less:* Implied *Interest Expense* | | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ - |
| *Add*: Value of Knowledgebase | | $ 54 | $ 55 | $ 65 | $ 74 | $ 83 | $ 93 | $ 105 | $ 113 | $ 121 | $ 130 | $ 140 | $ 150 |
| *Less*: Amortization of Knowledgebase | | $ 36 | $ 42 | $ 46 | $ 53 | $ 60 | $ 67 | $ 76 | $ 86 | $ 95 | $ 103 | $ 112 | $ 121 |
| **Adjusted NOPLAT** | | $ 121 | $ 129 | $ 166 | $ 185 | $ 207 | $ 232 | $ 259 | $ 274 | $ 292 | $ 311 | $ 333 | $ 360 |
| *Add*: Depreciation and Amortization Expense | | $ 60 | $ 64 | $ 71 | $ 79 | $ 89 | $ 100 | $ 113 | $ 121 | $ 130 | $ 140 | $ 150 | $ 162 |
| *Less*: Change in Net Operating Working Capital | | $ 12 | $ 106 | $ (45) | $ 60 | $ 69 | $ 79 | $ 91 | $ 111 | $ 120 | $ 130 | $ 140 | $ 152 |
| *Less*: Increase in Current Operating Assets | | $ 94 | $ 50 | $ (37) | $ 70 | $ 80 | $ 92 | $ 105 | $ 120 | $ 130 | $ 141 | $ 152 | $ 164 |
| *Add*: Increase in Operating Current Liabilities | | $ 82 | $ (56) | $ *8* | $ *10* | $ *11* | $ *12* | $ *14* | $ *9* | $ *10* | $ *11* | $ *12* | $ *13* |
| *Less*: Capital Expenditures | | $ 3 | $ 10 | $ 31 | $ 22 | $ 25 | $ 28 | $ 31 | $ 21 | $ 23 | $ 24 | $ 26 | $ 28 |
| **Free Cash Flow** | | **$ 166** | **$ 77** | **$ 251** | **$ 183** | **$ 202** | **$ 225** | **$ 250** | **$ 264** | **$ 280** | **$ 297** | **$ 317** | **$ 342** |

| TECH: Performance Metrics | 2016-06 | 2017-06 | 2018-06 | 2019E | 2020E | 2021E | 2022E | 2023E | 2024E | 2025E | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Short-term Liquidity** | | | | | | | | | | | | | |
| Current Ratio | 4.70 | 2.56 | 4.98 | 4.09 | 4.39 | 4.68 | 4.95 | 5.21 | 5.70 | 6.16 | 6.60 | 7.02 | 7.41 |
| Cash Ratio | 1.78 | 1.16 | 2.28 | 1.38 | 1.65 | 1.91 | 2.16 | 2.40 | 2.87 | 3.32 | 3.75 | 4.16 | 4.54 |
| Acid-test (or Quick) Ratio | 3.50 | 2.02 | 3.78 | 2.97 | 3.26 | 3.53 | 3.79 | 4.04 | 4.53 | 4.98 | 5.42 | 5.83 | 6.22 |
| Accounts Recievable Turnover | 3.62 | 3.21 | 3.60 | 3.47 | 3.47 | 3.47 | 3.47 | 3.47 | 3.47 | 3.47 | 3.47 | 3.47 | 3.47 |
| Inventory Turnover | 8.75 | 9.38 | 7.48 | 8.46 | 8.46 | 8.46 | 8.46 | 8.46 | 8.46 | 8.46 | 8.46 | 8.46 | 8.46 |
| Days' Sales in Receivables | 99.35 | 112.32 | 100.00 | 103.86 | 103.86 | 103.86 | 103.86 | 103.86 | 103.86 | 103.86 | 103.86 | 103.86 | 103.86 |
| Days' Sales in Inventory | 41.12 | 38.37 | 48.15 | 42.57 | 42.57 | 42.57 | 42.57 | 42.57 | 42.57 | 42.57 | 42.57 | 42.57 | 42.57 |
| **Capital Structure and Solvency** | | | | | | | | | | | | | |
| Total Liabilities to Equity | 28.44% | 64.11% | 47.64% | 52.45% | 49.32% | 46.27% | 43.33% | 40.50% | 37.72% | 35.22% | 32.95% | 30.87% | 28.97% |
| Total Debt Ratio | 8.50% | 22.08% | 21.28% | 29.53% | 27.94% | 26.34% | 24.74% | 23.14% | 21.70% | 20.36% | 19.09% | 17.90% | 16.77% |
| Long-term Debt to Assets | 8.14% | 22.08% | 21.28% | 29.53% | 27.94% | 26.34% | 24.74% | 23.14% | 21.70% | 20.36% | 19.09% | 17.90% | 16.77% |
| Long-term Debt to Equity | 10.47% | 36.21% | 31.42% | 45.01% | 41.72% | 38.53% | 35.45% | 32.51% | 29.89% | 27.53% | 25.38% | 23.43% | 21.63% |
| Fixed Assets to Equity | 15.02% | 14.21% | 13.44% | 13.44% | 14.01% | 14.55% | 15.06% | 15.53% | 15.34% | 15.19% | 15.05% | 14.93% | 14.82% |
| Current Liabilities to Total Liabilities | 21.60% | 22.33% | 15.56% | 12.87% | 14.10% | 15.45% | 16.92% | 18.51% | 19.55% | 20.64% | 21.78% | 22.96% | 24.20% |
| **Operating Performance** | | | | | | | | | | | | | |
| Gross Profit Margin | 67.54% | 66.61% | 67.19% | 67.11% | 67.11% | 67.11% | 67.11% | 67.11% | 67.11% | 67.11% | 67.11% | 67.11% | 67.11% |
| Operating Profit Margin | 30.26% | 21.49% | 21.15% | 24.30% | 24.30% | 24.30% | 24.30% | 24.30% | 24.30% | 24.30% | 24.30% | 24.30% | 24.30% |
| Net Profit Margin | 20.84% | 13.50% | 19.60% | 16.56% | 16.87% | 17.14% | 17.38% | 17.60% | 17.72% | 17.83% | 17.94% | 18.03% | 18.12% |
| FCF Margin | 25.44% | 29.47% | 12.01% | 34.74% | 22.47% | 22.12% | 21.89% | 21.66% | 21.23% | 20.92% | 20.70% | 20.54% | 20.60% |
| **Return on Investment** | | | | | | | | | | | | | |
| Return on Assets | 9.20% | 4.88% | 7.91% | 6.00% | 6.51% | 7.01% | 7.51% | 8.00% | 8.12% | 8.23% | 8.35% | 8.46% | 8.56% |
| Return on Equity | 11.83% | 8.00% | 11.68% | 9.15% | 9.72% | 10.26% | 10.76% | 11.23% | 11.18% | 11.13% | 11.10% | 11.07% | 11.04% |
| Return on Invested Capital | | 8.93% | 7.79% | 8.94% | 9.60% | 10.28% | 11.02% | 11.78% | 12.04% | 12.38% | 12.76% | 13.17% | 13.72% |

## Appendix III: Sales Worksheet & Capitalization Tables

| Bio-Techne (TECH): Sales Worksheet | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Net Revenue** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| Total Revenues | $257.40 | $293.96 | $269.05 | $289.96 | $314.56 | $310.58 | $ 357.76 | $452.25 | $499.02 | $563.00 | $642.99 |

| **Growth:** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **Average** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Growth | 14.20% | -8.47% | 7.77% | 8.48% | -1.27% | 15.19% | 26.41% | 10.34% | 12.82% | 14.21% | 9.97% |

| **Net Revenue by Segment:** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **5-YR CAGR** |
|---|---|---|---|---|---|---|---|
| Protein Sciences (Core Biotechnology (RSD), Protein Platforms (ASD)) | $288.16 | $285.14 | $374.69 | $394.66 | $455.97 | $533.42 | 13.11% |
| Diagnostics and Genomics (ACD, Diagnostics (Formerly Clinical Controls), ExosomeDx) | $ 22.42 | $ 72.62 | $ 78.17 | $104.61 | $107.24 | $110.64 | 37.61% |
| **Total** | **$310.58** | **$357.76** | **$452.86** | **$499.27** | **$563.21** | **$644.07** | **15.71%** |

| **Growth:** | **2014** | **2015** | **2016** | **2017** | **2018** | **Average** |
|---|---|---|---|---|---|---|
| Protein Sciences (Core Biotechnology (RSD), Protein Platforms (ASD)) | -1% | 31% | 5% | 16% | 17% | 14% |
| Diagnostics and Genomics (ACD, Diagnostics (Formerly Clinical Controls), ExosomeDx) | 224% | 8% | 34% | 3% | 3% | 54% |
| **Total** | **15%** | **27%** | **10%** | **13%** | **14%** | **16%** |

| **Proportion** | **2014** | **2015** | **2016** | **2017** | **2018** | **Average** |
|---|---|---|---|---|---|---|
| Protein Sciences (Core Biotechnology (RSD), Protein Platforms (ASD)) | 93% | 80% | 83% | 79% | 81% | **83%** |
| Diagnostics and Genomics (ACD, Diagnostics (Formerly Clinical Controls), ExosomeDx) | 7% | 20% | 17% | 21% | 19% | **17%** |

| **Short-Term Sales Forecasts:** | **Average** |
|---|---|
| Three Year Growth Rate | **12.46%** |
| Five Year Growth Rate | **15.79%** |
| Ten Year Growth Rate | **9.97%** |
| Implied Segment Growth Rate | **20.52%** |
| Value Line | **8.00%** |

**TECH: Capitalized Lease Worksheet**

| | 2014-06 | 2015-06 | 2016-06 | 2017-06 | 2018-06 | 2019E | 2020E | 2021E | 2022E | 2023E | 2024E | 2025E | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sales | $ 358 | $ 452 | $ 499 | $ 563 | $ 643 | $ 723 | $ 813 | $ 914 | $ 1,028 | $ 1,156 | $ 1,243 | $ 1,336 | $ 1,436 | $ 1,543 | $ 1,659 |
| Rent Expense (in Millions) | $ 1.60 | $ 4.90 | $ 8.10 | $ 9.80 | $ 10.80 | $ 10.65 | $ 10.53 | $ 10.28 | $ 10.52 | $ 10.41 | $ 10.41 | $ 10.41 | $ 10.41 | $ 10.41 | $ 10.41 |
| Value of Leased Assets | $ 34 | $ 56 | $ 67 | $ 74 | $ 73 | $ 72 | $ 71 | $ 72 | $ 71 | $ 71 | $ 71 | $ 71 | $ 71 | $ 71 | $ - |
| Implied Interest Expense | $ 1.54 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ 3 | $ - |
| **Rent Expense-to-Sales** | 0.45% | 1.08% | 1.62% | 1.74% | 1.68% | 1.47% | 1.29% | 1.12% | 1.02% | 0.90% | | | | | |
| **Average Rent Expense-to-Sales** | 1.33% | | | | | | | | | | | | | | |

**TECH: Capitalizing R&D Expense**

| | |
|---|---|
| **Expected Useful Life** | 3.00 Years |

| Year | 2009-06 | 2010-06 | 2011-06 | 2012-06 | 2013-06 | 2014-06 | 2015-06 | 2016-06 | 2017-06 | 2018-06 | 2019E | 2020E | 2021E | 2022E | 2023E | 2024E | 2025E | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sales | $ 264 | $ 269 | $ 290 | $ 315 | $ 311 | $ 358 | $ 452 | $ 499 | $ 563 | $ 643 | $ 723 | $ 813 | $ 914 | $ 1,028 | $ 1,156 | $ 1,243 | $ 1,336 | $ 1,436 | $ 1,543 | $ 1,659 |
| R&D Expense (in millions) | $ 24 | $ 25 | $ 26 | $ 28 | $ 29 | $ 31 | $ 41 | $ 45 | $ 54 | $ 55 | $ 65 | $ 74 | $ 83 | $ 93 | $ 105 | $ 113 | $ 121 | $ 130 | $ 140 | $ 150 |
| **Capitalzing R&D Asset** | | | | | | | | | | | | | | | | | | | | |
| Starting Value | $ - | $ 24 | $ 41 | $ 53 | $ 64 | $ 71 | $ 79 | $ 93 | $ 107 | $ 126 | $ 139 | $ 158 | $ 179 | $ 202 | $ 228 | $ 257 | $ 284 | $ 310 | $ 337 | $ 364 |
| R&D Expense | $ 24 | $ 25 | $ 26 | $ 28 | $ 29 | $ 31 | $ 41 | $ 45 | $ 54 | $ 55 | $ 65 | $ 74 | $ 83 | $ 93 | $ 105 | $ 113 | $ 121 | $ 130 | $ 140 | $ 150 |
| Amortization | $ - | $ 8 | $ 14 | $ 18 | $ 21 | $ 24 | $ 26 | $ 31 | $ 36 | $ 42 | $ 46 | $ 53 | $ 60 | $ 67 | $ 76 | $ 86 | $ 95 | $ 103 | $ 112 | $ 121 |
| Ending Balance | $ 24 | $ 41 | $ 53 | $ 64 | $ 71 | $ 79 | $ 93 | $ 107 | $ 126 | $ 139 | $ 158 | $ 179 | $ 202 | $ 228 | $ 257 | $ 284 | $ 310 | $ 337 | $ 364 | $ 393 |
| **Financial Ratio** | | | | | | | | | | | | | | | | | | | | |
| R&D Expense-to-Sales Ratio | 9.09% | 9.29% | 8.97% | 8.89% | 9.32% | 8.66% | 9.07% | 9.02% | 9.59% | 8.55% | | | | | | | | | | |

# Appendix IV: Valuation & WACC

**TECH: Enterprise DCF Valuation**

| Forecast Year | Free Cash Flow | Discount Factor | Present Value |
|---|---|---|---|
| 2019E | $ 251 | 0.9313 | $ 234 |
| 2020E | $ 183 | 0.8673 | $ 158 |
| 2021E | $ 202 | 0.8076 | $ 163 |
| 2022E | $ 225 | 0.7521 | $ 169 |
| 2023E | $ 250 | 0.7004 | $ 175 |
| 2024E | $ 264 | 0.6523 | $ 172 |
| 2025E | $ 280 | 0.6075 | $ 170 |
| 2026E | $ 297 | 0.5657 | $ 168 |
| 2027E | $ 317 | 0.5268 | $ 167 |
| 2028E | $ 342 | 0.4906 | $ 168 |
| Terminal Value | $ 7,175 | 0.4906 | $ 3,520 |
| Present Value | | | $ 5,265 |
| Midyear Adjustment Factor | | | 1.0362 |
| Value of Operations | | | $ 5,456 |
| Add: Value of Excess Cash | | | $ 169 |
| **Enterprise Value** | | | $ 5,625 |
| Less: Current Value of Debt | | | $ 589 |
| **Equity Value** | | | $ 5,036 |
| Shares Outstanding | | | 37.50 |
| **Estimated Equity Value per Share** | | | **$ 134.31** |
| Current Share Price | | | $ 159.92 |
| **Misvaluation** | | | **-16.02%** |

**TECH: Weighted Average Cost of Capital Calculation**

| Market Values | | |
|---|---|---|
| **Value of Debt** | $ | 589,000,000 |
| **Value of Capitalized Leases** | $ | 73,122,855 |
| **Value of Equity** | $ | 5,709,428,353 |
| *Shares Outstanding* | | 37,765,765 |
| *Current Stock Price* | $ | 151.18 |
| **Enterprise Value** | $ | 6,371,551,208 |

| Cost of Equity Capital | |
|---|---|
| **Estimated Premia** | |
| *Estimated Risk Free Rate* | 2.78% |
| *Estimated Market Return* | 7.95% |
| *Estimated Market Premium* | 5.17% |
| *Estimated Size Premium* | 1.23% |
| *Estimated Value Premium* | -1.31% |
| *Estimated Momentum Premium* | 3.06% |
| **Cost of Equity Capital Method** | |
| *Rolling Beta* | |
| *Standard CAPM* | 6.96% |
| *Fama-French Three-factor Model* | 8.02% |
| *Carhart Four-factor Model* | 10.90% |

| Cost of Debt Capital | |
|---|---|
| **Average Cost of Debt** | 2.35% |

| Tax Rate | |
|---|---|
| **Operating Tax Rate** | 20.46% |

| Weighted Average Cost of Capital (WACC) | | |
|---|---|---|
| **% of Capital Structure to Debt** | | 10.39% |
| **% of Capital Structure to Equity** | | 89.61% |
| **Tax Rate Choice** | Operating Tax Rate | 20.46% |
| **Cost of Equity Capital Choice** | Fama-French Three-factor Model | 8.02% |
| **Cost of Debt Capital Choice** | Average Cost of Debt | 2.35% |
| **Weighted Average Cost of Capital** | | 7.38% |

| Yield Curve Information | |
|---|---|
| Two-year | 2.73% |
| One-year | 2.68% |
| Implied one-year forward interest rate | **2.78%** |

| Implied Market Risk Premium | |
|---|---|
| Dividend Yield on SPY | **1.73%** |
| Growth Rate of S&P 500 | **6.11%** |
| Implied Market Return | **7.95%** |

| Short-Term Debt | | | Total |
|---|---|---|---|
| Current portion of LTD | | | $ 12.50 |
| **Long-Term Debt** | **Out** | Available | Total |
| Revolvers | | | |
| Senior Unsecured Revolver | $ 311.50 | $ 289.00 | $ 311.50 |
| Term Loans | | | |
| Senior Unsec. Term Loan | $ 250.00 | $ 250.00 | $ 250.00 |
| Total Debt From MRQ | | | $ 561.50 |
| Interest Expense (LTM) | | | $ 13.18 |
| Periodic Interest Rate for 2018 | | | 2.35% |

## Appendix V: Key Assumptions

| Pro-forma | | | | |
|---|---|---|---|---|
| **Sales Assumptions** | **Source** | **Source Value** | **Override** | **Model Input** |
| Short-Term Sales Growth | Three Year Growth Rate | 12.46% | | 12.46% |
| Long-term Sales Growth | Halfway between ST & T | 7.48% | | 7.48% |
| Terminal Sales Growth | OECD | 1.30% | 2.50% | 2.50% |

| Pro-forma | | | | |
|---|---|---|---|---|
| **Income Statement Assumptions** | **Source** | **Source Value** | **Override** | **Model Input** |
| COGS-to-Sales | 3-yr. Average | 32.89% | | 32.89% |
| SG&A-to-Sales | 3-yr. Average | 33.75% | | 33.75% |
| D&A-to-Sales | 3-yr. Average | 9.75% | | 9.75% |
| Interest Expense-to-Total Debt (Lagged) | 3-yr. Average | 4.27% | | 4.27% |
| Temporary Tax Rate | 3-yr. Average | 20.46% | | 20.46% |
| Dividend Payout Ratio | 10-yr Average | 40.17% | | 40.17% |
| Repurchase Payout Ratio | 3-yr. Average | 0.00% | | 0.00% |
| R&D-to-Sales | 3-yr. Average | 9.05% | | 9.05% |

| Pro-forma | | | | |
|---|---|---|---|---|
| **Balance Sheet Assumptions** | **Source** | **Source Value** | **Override** | **Model Input** |
| Operating Cash Ratio | Textbook | 2.00% | | 2.00% |
| Cash-to-Sales | 3-yr. Average | 25.20% | | 25.20% |
| Accounts Receivables-to-Sales | 3-yr. Average | 19.36% | | 19.36% |
| Inventory-to-COGS | 3-yr. Average | 35.95% | | 35.95% |
| Other Current Asset-to-Sales | 3-yr. Average | 1.87% | | 1.87% |
| Net PPE-to-Sales | 3-yr. Average | 24.33% | | 24.33% |
| Accounts Payable-to-COGS | 5-yr. Average | 9.79% | | 9.79% |
| Accrued Liabilities-to-SG&A | 3-yr. Average | 27.02% | | 27.02% |
| Deferred Revenues-to-Sales | 3-yr. Average | 1.05% | | 1.05% |
| Employee Compensation and Benefits-to-SG&A | 3-yr. Average | 0.00% | | 0.00% |

| | |
|---|---|
| **Current Price** | $ 159.72 |
| DCF | |
| **Implied Share Price** | $ 134.31 |
| **Misvaluation** | -15.91% |
| Relative Multiples | |
| **Implied Share Price** | $ 104.98 |
| **Misvaluation** | -34.27% |
| Average Target | |
| **Implied Share Price** | $ 119.64 |
| **Misvaluation** | -25.09% |

| | |
|---|---|
| **WACC** | 7.38% |

**Sales Assumptions:** Our team estimated a short-term sales growth rate of 12.46% which represents the three-year growth rate of the company. The growth represents both major acquisitions of ACD and Exosome. We believe this sales number may be high, however our team decided to factor in the possibility of continued inorganic growth from acquisitions into the future. The OECD recommends a terminal growth rate of 1.30% representing global growth. We overrode this with a terminal growth rate of 2.50% which we believe represents the growth of global healthcare development. Lastly, our long-term growth rate is halfway between our short-term and terminal growth rates.

**Income Statement Assumptions:** Our team used the three-year averages for all income statement assumptions excluding dividend payout rate in which we used a ten-year average. These estimates incorporate the previous acquisitions and the effects they have placed on the company in order to better represent the future of the company's income statement ratios.

**Balance Sheet Assumptions:** Similarly to the Income Statement Assumptions, we used a three-year average as it is more representative of the current financial position of the company due to prior acquisitions. We only used a different average assumption for our AP-to-SG&A as there is little change in this ratio.

**Appendix VI: Regression Analysis**

*Fama French Cost of Equity Capital*

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.549002155 |
| R Square | 0.301403366 |
| Adjusted R Square | 0.235909932 |
| Standard Error | 0.052776186 |
| Observations | 36 |

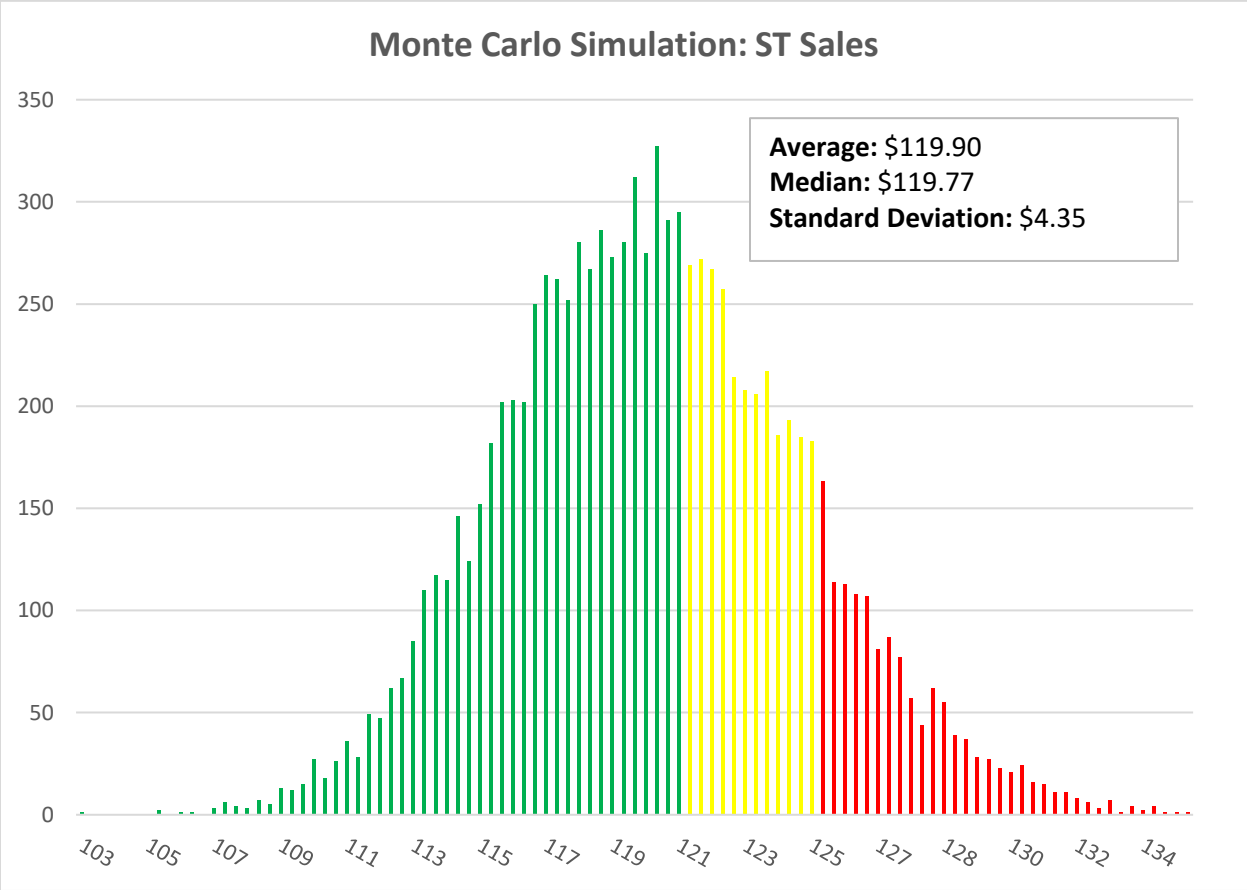
ANOVA

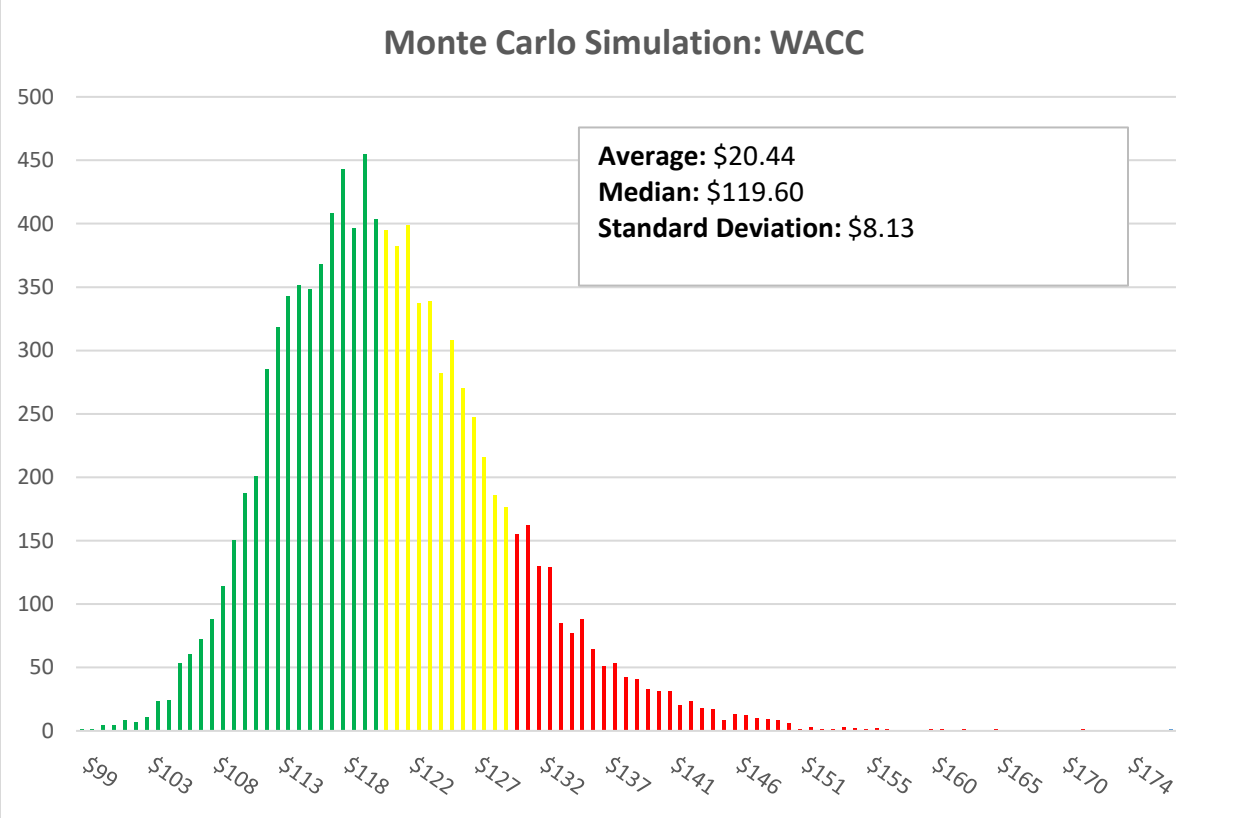
| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 3 | 0.038454537 | 0.012818179 | 4.602039406 | 0.008685508 |
| Residual | 32 | 0.089130424 | 0.002785326 | | |
| Total | 35 | 0.127584961 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 0.005674821 | 0.009243342 | 0.613936072 | 54.36% | -0.013153251 | 0.024502893 | -0.013153251 | 0.024502893 |
| MKTRF | 0.776501215 | 0.30106402 | 2.579189685 | 1.47% | 0.163253874 | 1.389748557 | 0.163253874 | 1.389748557 |
| SMB | 0.067124001 | 0.365800505 | 0.183498928 | 85.56% | -0.677987245 | 0.812235246 | -0.677987245 | 0.812235246 |
| HML | -0.875932417 | 0.352762116 | -2.483068271 | 1.85% | -1.594485333 | -0.157379501 | -1.594485333 | -0.157379501 |

**Fama French Cost of Equity Capital:** Our team estimated our WACC using the Fama French Three-Factor Model. The model represents the betas needed to calculate our market size and value premiums. SMB represents "small minus big" which is the thought that small firms generally outperform large firms. HML represents high minus low which is thought to measure the value effect of the stock.

**Appendix VII: Monte Carlo Simulations**



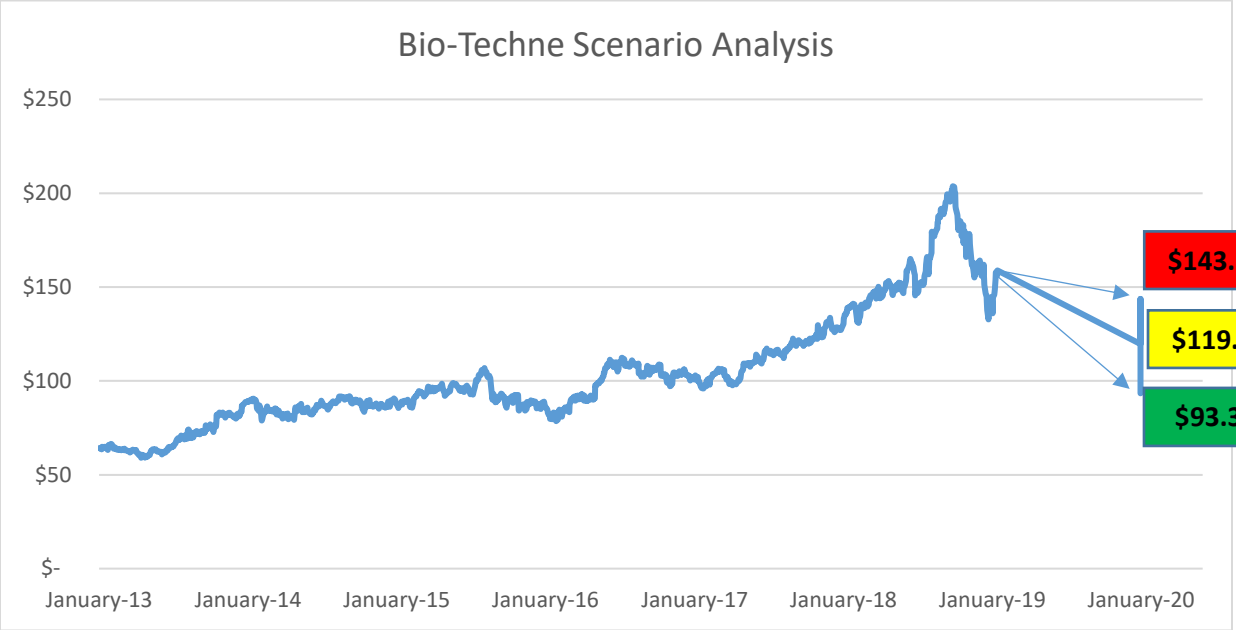
**Appendix VIII: Sensitivity Analysis**

| | | Short-Term Sales | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 9.46% | 10.46% | 11.46% | 12.46% | 13.46% | 14.46% | 15.46% |
| WACC | 5.88% | $134.99 | $140.63 | $146.62 | $152.99 | $159.75 | $166.93 | $174.55 |
| | 6.38% | $123.56 | $128.40 | $133.53 | $138.99 | $144.78 | $150.93 | $157.45 |
| | 6.88% | $114.75 | $118.97 | $123.45 | $128.20 | $133.25 | $138.60 | $144.28 |
| | 7.38% | $107.76 | $111.48 | $115.44 | **$119.64** | $124.10 | $128.82 | $133.83 |
| | 7.88% | $102.07 | $105.40 | $108.93 | $112.68 | $116.66 | $120.87 | $125.34 |
| | 8.38% | $ 97.35 | $100.35 | $103.54 | $106.92 | $110.50 | $114.29 | $118.30 |
| | 8.88% | $ 93.38 | $ 96.10 | $ 99.00 | $102.06 | $105.31 | $108.75 | $112.39 |

| | | Long-Term Sales | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 4.48% | 5.48% | 6.48% | 7.48% | 8.48% | 9.48% | 10.48% |
| Terminal Growth | 1.75% | $105.71 | $108.00 | $110.38 | $112.86 | $115.42 | $118.09 | $120.85 |
| | 2.00% | $107.47 | $109.85 | $112.33 | $114.91 | $117.58 | $120.36 | $123.24 |
| | 2.25% | $109.39 | $111.88 | $114.47 | $117.16 | $119.95 | $122.85 | $125.86 |
| | 2.50% | $111.52 | $114.12 | $116.83 | **$119.64** | $122.56 | $125.60 | $128.75 |
| | 2.75% | $113.87 | $116.60 | $119.44 | $122.39 | $125.46 | $128.64 | $131.95 |
| | 3.00% | $116.49 | $119.36 | $122.35 | $125.46 | $128.68 | $132.03 | $135.51 |
| | 3.25% | $119.43 | $122.46 | $125.62 | $128.89 | $132.30 | $135.84 | $139.51 |

| | | Short-Term Sales | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 9.46% | 10.46% | 11.46% | 12.46% | 13.46% | 14.46% | 15.46% |
| COGS | 29.89% | $110.50 | $114.40 | $118.54 | $122.93 | $127.59 | $132.53 | $137.77 |
| | 30.89% | $109.58 | $113.43 | $117.51 | $121.84 | $126.43 | $131.29 | $136.45 |
| | 31.89% | $108.67 | $112.46 | $116.47 | $120.74 | $125.26 | $130.06 | $135.14 |
| | 32.89% | $107.76 | $111.48 | $115.44 | **$119.64** | $124.10 | $128.82 | $133.83 |
| | 33.89% | $106.84 | $110.51 | $114.41 | $118.54 | $122.93 | $127.58 | $132.51 |
| | 34.89% | $105.93 | $109.54 | $113.38 | $117.45 | $121.77 | $126.35 | $131.20 |
| | 35.89% | $105.01 | $108.57 | $112.34 | $116.35 | $120.60 | $125.11 | $129.89 |

**Appendix IX: Scenario Analysis**




| Scenario Summary | | Current Values: | Base Case | Bull Case | Bear Case |
|---|---|---|---|---|---|
| **Changing Cells:** | | | | | |
| | **Short-Term Sales** | 12.46% | 12.46% | 15.00% | 8.00% |
| | **Long-Term Sales** | 7.48% | 7.48% | 7.00% | 5.00% |
| | **Terminal Growth** | 2.50% | 2.50% | 2.50% | 2.00% |
| | **WACC** | 7.38% | 7.38% | 6.50% | 8.00% |
| **Result Cells:** | | | | | |
| | **Share Price** | $ 119.64 | $ 119.64 | $ 143.76 | $ 93.39 |

## Appendix X: Analysis of Selected Financials

| TECH: Performance Metrics | 2016-06 | 2017-06 | 2018-06 | 2019E | 2020E | 2021E | 2022E | 2023E | 2024E | 2025E | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Short-term Liquidity** | | | | | | | | | | | | | |
| Current Ratio | 4.70 | 2.56 | 4.98 | 4.09 | 4.39 | 4.68 | 4.95 | 5.21 | 5.70 | 6.16 | 6.60 | 7.02 | 7.41 |
| Cash Ratio | 1.78 | 1.16 | 2.28 | 1.38 | 1.65 | 1.91 | 2.16 | 2.40 | 2.87 | 3.32 | 3.75 | 4.16 | 4.54 |
| Acid-test (or Quick) Ratio | 3.50 | 2.02 | 3.78 | 2.97 | 3.26 | 3.53 | 3.79 | 4.04 | 4.53 | 4.98 | 5.42 | 5.83 | 6.22 |
| Accounts Recievable Turnover | 3.62 | 3.21 | 3.60 | 3.47 | 3.47 | 3.47 | 3.47 | 3.47 | 3.47 | 3.47 | 3.47 | 3.47 | 3.47 |
| Inventory Turnover | 8.75 | 9.38 | 7.48 | 8.46 | 8.46 | 8.46 | 8.46 | 8.46 | 8.46 | 8.46 | 8.46 | 8.46 | 8.46 |
| Days' Sales in Receivables | 99.35 | 112.32 | 100.00 | 103.86 | 103.86 | 103.86 | 103.86 | 103.86 | 103.86 | 103.86 | 103.86 | 103.86 | 103.86 |
| Days' Sales in Inventory | 41.12 | 38.37 | 48.15 | 42.57 | 42.57 | 42.57 | 42.57 | 42.57 | 42.57 | 42.57 | 42.57 | 42.57 | 42.57 |
| **Capital Structure and Solvency** | | | | | | | | | | | | | |
| Total Liabilities to Equity | 28.44% | 64.11% | 47.64% | 52.45% | 49.32% | 46.27% | 43.33% | 40.50% | 37.72% | 35.22% | 32.95% | 30.87% | 28.97% |
| Total Debt Ratio | 8.50% | 22.08% | 21.28% | 29.53% | 27.94% | 26.34% | 24.74% | 23.14% | 21.70% | 20.36% | 19.09% | 17.90% | 16.77% |
| Long-term Debt to Assets | 8.14% | 22.08% | 21.28% | 29.53% | 27.94% | 26.34% | 24.74% | 23.14% | 21.70% | 20.36% | 19.09% | 17.90% | 16.77% |
| Long-term Debt to Equity | 10.47% | 36.21% | 31.42% | 45.01% | 41.72% | 38.53% | 35.45% | 32.51% | 29.89% | 27.53% | 25.38% | 23.43% | 21.63% |
| Fixed Assets to Equity | 15.02% | 14.21% | 13.44% | 13.44% | 14.01% | 14.55% | 15.06% | 15.53% | 15.34% | 15.19% | 15.05% | 14.93% | 14.82% |
| Current Liabilities to Total Liabilities | 21.60% | 22.33% | 15.56% | 12.87% | 14.10% | 15.45% | 16.92% | 18.51% | 19.55% | 20.64% | 21.78% | 22.96% | 24.20% |
| **Operating Performance** | | | | | | | | | | | | | |
| Gross Profit Margin | 67.54% | 66.61% | 67.19% | 67.11% | 67.11% | 67.11% | 67.11% | 67.11% | 67.11% | 67.11% | 67.11% | 67.11% | 67.11% |
| Operating Profit Margin | 30.26% | 21.49% | 21.15% | 24.30% | 24.30% | 24.30% | 24.30% | 24.30% | 24.30% | 24.30% | 24.30% | 24.30% | 24.30% |
| Net Profit Margin | 20.84% | 13.50% | 19.60% | 16.56% | 16.87% | 17.14% | 17.38% | 17.60% | 17.72% | 17.83% | 17.94% | 18.03% | 18.12% |
| FCF Margin | 25.44% | 29.47% | 12.01% | 34.74% | 22.47% | 22.12% | 21.89% | 21.66% | 21.23% | 20.92% | 20.70% | 20.54% | 20.60% |
| **Return on Investment** | | | | | | | | | | | | | |
| Return on Assets | 9.20% | 4.88% | 7.91% | 6.00% | 6.51% | 7.01% | 7.51% | 8.00% | 8.12% | 8.23% | 8.35% | 8.46% | 8.56% |
| Return on Equity | 11.83% | 8.00% | 11.68% | 9.15% | 9.72% | 10.26% | 10.76% | 11.23% | 11.18% | 11.13% | 11.10% | 11.07% | 11.04% |
| Return on Invested Capital | | 8.93% | 7.79% | 8.94% | 9.60% | 10.28% | 11.02% | 11.78% | 12.04% | 12.38% | 12.76% | 13.17% | 13.72% |

**Short Term Liquidity:** Bio-Techne currently has an unfavorable mix of short-term liquidity ratios, slightly due to the growth by acquisition strategy the Company has adopted since 2014. From our perspective, we would like to see a more favorable mix from the Company as management believed these acquisitions would be accretive. TECH has seen significant contraction over a five-year period in the Company's Current ratio but has seen a large jump in 2018 due to the large acquisition of cash due to a newly issued line of credit. Likewise, a jump can be seen in both the Cash ratio and Acid-Test (Quick) ratio due to the new line of credit. The area of most concern that we have identified is in relation to TECH's turnover ratios. Accounts Receivable, Accounts Payable, Inventory, Day's Sales in Receivables, and Day's Sales in Inventory have all seen material decay. The ratios have current levels of 3.60, 15.93, 7.48, 100, and 48.15 respectively. Turnover ratios would be classified under operating efficiency rather than liquidity, however, the performance of these ratios is evidence of dilution from the Company's acquisitions.

**Operating Performance:** TECH has seen a long-term gross margin contraction due to what we identify as unfavorable acquisition targets and a move toward a capital intensive and competitive market in diagnostics and genomics. Bio-Techne's five-year gross margin average is 64.64% and we estimate there will be continued contraction in the years to come. Operating Margins are at a five-year average of 31.55% and have seen a large shift downward the prior two years. EBITDA has also seen contraction but has been less significant due to the increasing amount of intangible assets and goodwill on the balance sheet resulting in increasing depreciation and amortization. Net Profit Margins have a five-year average of 21.78% and we estimate continued contraction as TECH did not pay any income taxes in FY2018. Lastly, FCF has seen contraction with a five year average of 26.45 and FY2018 margin of 12.01%. Reference Appendix II to evaluate how our team calculated Free Cash Flow.

**Long-Term Solvency:** TECH has moved toward a more highly levered balance sheet, and as a result has seen a large shift in their Capital Structure and Solvency. Debt-to-EBITDA has increased significantly due to the acquisitions of Exosome and ACD, currently at 2.5x. However, if you capitalize the balance sheet, the leverage is actually higher and above average from their peer group. Total Debt Ratio has moved from 8.50% to 21.28% in a three-year period as has the company's Long-Term (LT) Debt to Assets. LT Debt to Equity is currently at 31.42%, Fixed Assets to Equity is 13.44% and Current Liabilities to Total Liabilities at 15.56%.

**Return on Investment:** In order to see how we calculated ROI, please refer to Appendix II. ROA and ROE have dropped significantly over a five-year period attributed to dilution of their acquisitions resulting in a worsening condition of their turnover ratios. Subsequently, ROIC has seen a shift as well.

## Appendix XI: Leveraged Buy-Out Analysis

### Leveraged Buyout Analysis for Company (TECH)

| Select Operating and Financial Data | |
|---|---|
| Current Date | 1/16/2019 |
| Current Share Price | $159.00 |
| Fully Diluted Shares Outstanding | 38,810,000.0 |
| Market cap | $ 6,170,790,000.00 |
| Current Debt | $ 589,000,000.00 |
| Current Cash | $ 164,000,000.00 |
| Current Net Debt | $ 425,000,000.00 |
| Enterprise Value | $ 6,595,790,000.00 |
| LTM Revenue | $ 661,350,000.00 |
| LTM EBITDA | $ 221,710,000.00 |
| Free cash flows after debt paydown | $ 145,270,000.00 |
| EV / EBITDA multiple | 29.7x |

| LBO Assumptions | | |
|---|---|---|
| Exit Date | 2021 | |
| LBO Debt Capacity (Net debt/EBITDA) | 4.5x | |
| Minimum cash balance | 500,000,000.0 | |
| EBITDA multiple in exit year | 29.7x | |
| Financial Sponsor Required Equity Return | 25.0% | IRR |

| Select Operating and Financial Data | | Projected Annual Forecast | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2018A | 2019E | 2020E | 2021E | 2022E | 2023E | 2024E | 2025E |
| Revenue | 661,350,000.0 | 740,712,000.0 | 829,597,440.0 | 929,149,132.8 | 1,040,647,028.7 | 1,165,524,672.2 | 1,305,387,632.8 | 1,462,034,148.8 |
| *Revenue Growth Rate (%)* | | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% |
| EBITDA | 225,400,000.0 | 252,448,000.0 | 282,741,760.0 | 316,670,771.2 | 354,671,263.7 | 397,231,815.4 | 444,899,633.2 | 498,287,589.2 |
| *EBITDA Margin (%)* | 34.1% | 34.1% | 34.1% | 34.1% | 34.1% | 34.1% | 34.1% | 34.1% |
| Free cash flow after required debt paydown | 145,270,000.0 | 162,702,400.0 | 182,226,688.0 | 204,093,890.6 | 228,585,157.4 | 256,015,376.3 | 286,737,221.5 | 321,145,688.1 |
| *FCF Margin (%)* | 22.0% | 22.0% | 22.0% | 22.0% | 22.0% | 22.0% | 22.0% | 22.0% |
| Cash | 164,000,000.0 | 500,000,000.0 | 500,000,000.0 | 500,000,000.0 | 500,000,000.0 | 500,000,000.0 | 500,000,000.0 | 500,000,000.0 |
| Debt | 589,000,000.0 | 1,220,992,600.0 | 1,088,765,912.0 | 934,672,021.4 | 756,086,864.0 | 550,071,487.7 | 313,334,266.2 | 42,188,578.2 |
| Net Debt | 425,000,000.0 | 720,992,600.0 | 588,765,912.0 | 434,672,021.4 | 256,086,864.0 | 50,071,487.7 | (186,665,733.8) | (457,811,421.8) |

| Debt Schedule | Projected Annual Forecast | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2019E | 2020E | 2021E | 2022E | 2023E | 2024E | 2025E |
| LBO Debt, Beginning of Period | 997,695,000.0 | 1,220,992,600.0 | 1,088,765,912.0 | 934,672,021.4 | 756,086,864.0 | 550,071,487.7 | 313,334,266.2 |
| - Required paydown | 50,000,000.0 | 50,000,000.0 | 50,000,000.0 | 50,000,000.0 | 50,000,000.0 | 50,000,000.0 | 50,000,000.0 |
| - Optional paydown (after min cash balance) | 173,297,600.0 | (182,226,688.0) | (204,093,890.6) | (228,585,157.4) | (256,015,376.3) | (286,737,221.5) | (321,145,688.1) |
| LBO Debt, End of Period | 1,220,992,600.0 | 1,088,765,912.0 | 934,672,021.4 | 756,086,864.0 | 550,071,487.7 | 313,334,266.2 | 42,188,578.2 |

Questions:

| | |
|---|---|
| 1.What is the implied Enterprise Value in the exit year? | 10,551,338,120.5 |
| 2.What is the implied Equity Value at the exit year? | 10,295,251,256.5 |
| 3.What is the maximum amount financial sponsors can invest in this company? | 4,216,934,914.6 |

Questions:

| | |
|---|---|
| 1.How much do sponsors have to acquire this company and pay off it's debt? | 5,214,629,914.6 |
| 2.What is the highest purchase price the sponsors would be willing to pay for TECH shares today? | $123.41 |
| 3.Given TECH's market trading level, is an LBO likely? | (22%) |

**Leveraged Buy-Out Analysis:** Per our analysis on Capital IQ, the recent pullback in the healthcare space of the market has boosted M&A activity paired with strengthening of the underlying economy, we conducted an LBO analysis to determine the possibility of Bio-Techne being the target of an acquisition. Upon our analysis, we concluded that they would not be an acquisition target as the offering price of our model is $123.41 which is below the current trading price of the company and provides no premium to shareholders unless the Company were to fall below this threshold in the equity markets.

## Appendix XII: DuPont Analysis

| TECH: DuPont Analysis | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | Trend (2008-2018) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Profit Margin | 40.23% | 39.87% | 40.80% | 38.73% | 35.71% | 36.24% | 31.01% | 23.82% | 20.94% | 13.51% | 19.60% | |
| Times: Asset Turnover | 0.54 | 0.54 | 0.54 | 0.51 | 0.47 | 0.41 | 0.44 | 0.47 | 0.46 | 0.42 | 0.41 | |
| Times: Equity Multiplier | 1.04 | 1.04 | 1.03 | 1.04 | 1.06 | 1.06 | 1.07 | 1.17 | 1.27 | 1.47 | 1.55 | |
| ROE: | 22.59% | 22.39% | 22.69% | 20.54% | 17.79% | 15.75% | 14.60% | 13.10% | 12.23% | 8.34% | 12.46% | |

## Appendix XIII: Relative Multiples Valuation

| Company Name | Ticker | Price | Shares Outstanding | Market Cap (in billions) | Forward P/E Ratio | Trailing P/E Ratio | PEG Ratio | Price/Sales | Price/Book | Dividend Yield | Debt/Assets | EV/EBITDA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Bio-Techne Corporation** | TECH | $160.32 | 37,766,000 | $ 6,054.65 | 31.60 | 44.70 | 3.39 | 8.76 | 5.16 | 0.87 | 21.28 | 25.67 |
| **Illumina, Inc.** | ILMN | $305.63 | 147,000,000 | $ 44,927.61 | 46.18 | 44.60 | 2.27 | 11.75 | 11.68 | 0.00 | 22.67 | 40.31 |
| **Waters Corporation** | WAT | $198.74 | 75,746,000 | $ 15,053.76 | 21.19 | 772.76 | 2.12 | 6.74 | 6.86 | 0.00 | 37.52 | 18.20 |
| **Mettler-Toledo International Inc.** | MTD | $580.15 | 25,045,000 | $ 14,529.86 | 25.40 | 43.51 | 2.28 | 6.00 | 28.91 | 0.00 | 38.43 | 24.90 |
| **Thermo Fisher Scientific Inc.** | TMO | $234.63 | 402,576,000 | $ 94,456.41 | 19.12 | 33.97 | 1.80 | 3.61 | 3.00 | 0.32 | 37.07 | 17.96 |
| **Bio-Rad Laboratories, Inc. Class A** | BIO | $236.56 | 24,860,000 | $ 7,097.31 | 34.75 | 58.64 | 1.34 | 3.32 | 2.43 | 0.00 | 10.18 | 24.64 |
| **Charles River Laboratories International, Inc.** | CRL | $117.03 | 48,096,000 | $ 5,628.67 | 18.33 | 43.09 | 1.69 | 2.86 | 4.96 | 0.00 | 39.08 | 14.69 |
| **Agilent Technologies, Inc.** | A | $ 70.03 | 318,533,000 | $ 22,306.87 | 22.43 | 66.64 | 2.34 | 4.29 | 4.51 | 0.92 | 21.06 | 18.03 |
| **Cambrex Corporation** | CBM | $ 42.51 | 33,560,000 | $ 1,426.64 | 14.38 | 15.69 | 1.23 | 3.00 | 2.89 | 0.00 | - | 8.13 |
| **PerkinElmer, Inc.** | PKI | $ 83.08 | 111,239,000 | $ 9,241.74 | 20.19 | 51.92 | 1.50 | 3.59 | 3.22 | 0.38 | 32.93 | 22.76 |
| **IQVIA Holdings Inc** | IQV | $124.74 | 198,046,000 | $ 24,704.26 | 19.36 | 16.65 | 1.42 | 2.24 | 2.51 | 0.00 | 44.96 | 16.99 |
| **PRA Health Sciences, Inc.** | PRAH | $ 99.38 | 64,975,000 | $ 6,457.22 | 19.23 | 68.99 | 1.35 | 2.65 | 6.23 | 0.00 | 40.07 | 20.76 |

| Industry Numbers | Average | Median |
|---|---|---|
| Forward P/E | 24.35 | 20.69 |
| Trailing P/E | 105.10 | 44.65 |
| PEG Ratio | 1.89 | 1.74 |
| Price/Sales | 4.90 | 3.60 |
| Price/Book | 6.86 | 4.74 |
| EV/EBITDA | 21.09 | 19.48 |
| FCF Yield | 3.21 | 2.92 |
| ROIC | 9.60 | 5.68 |

| Implied Valuations | Measure | Implied Price | Misvaluation |
|---|---|---|---|
| Forward EPS | $ 4.58 | **$94.83** | -40.85% |
| Trailing EPS | $ 3.31 | **$147.79** | -7.81% |
| Growth Rate | 10.20 | **$78.34** | -51.13% |
| Sales per share | $ 16.90 | **$60.86** | -62.04% |
| Book value per share | $ 28.69 | **$135.94** | -15.21% |
| EBITDA per share | $ 5.97 | **$112.10** | -30.08% |
| Debt per share | $ 0.29 | | |
| Cash per share | $ 0.15 | | |

| Company Selection | Average Price Target | Average Misvaluation |
|---|---|---|
| Bio-Techne Corporation | **$104.98** | **-34.52%** |

**Relative Multiples Valuation:** Our team decided to use a relative multiples valuation which analyzed Forward P/E Ratios, Trailing P/E Ratios, PEG Ratios, Price/Sales, Price/Book, Dividend Yield, Debt/Assets, and EV/EBITDA. Our team used the competition which we stated in our paper in addition to other competitors who we believe operate in the same industries as Bio-Techne.

## Appendix XIV: Porters Five Forces Analysis

| Bio-Techne (TECH): Porter's Five Forces | | | |
|---|---|---|---|
| | Biotechnology Segment | Protein Platforms Segment | Diagnostics Segment |
| Intensity of Rivalry | High<br>-- Many companies within this segment supply the worldwide market for protein related and chemically based research and reagents<br>-- Consolidation trends creating fewer customers to target.<br>-- Increasing technological advances and market needs leading to increasing demand for new products. | Medium/Low<br>-- A number of competitors in supplying instruments and reagents for ELISAs and traditional Western blot users.<br>-- The dynamic nature of this segment creates fierce competition among companies, pressuring companies to allocate more capital to R&D. | High<br>-- Competitive nature of developing new products within this segment to cater to customers needs and to discover breakthrough products.<br>-- Consolidation trends increases the intensity of rivalry.<br>-- Larger companies acquire small developing companies to fit the needs of the business. |
| Threat of New Entrants | Medium<br>-- New entrants provide innovation and new pressures to corporations already existing in the industry.<br>-- Lower pricing, lower costs, and new strategies put increased pressure on mature companies.<br>-- However, it takes time and is very costly for new entrants to become well established. Smaller companies within this industry may become acquisition targets for larger companies. | Medium<br>-- IP and Work-flow incorporation makes it difficult for new entrants to gain market share<br>-- Innovative and dynamic industry forcing companies to stay protactive in development of new products. New entrants may provide to solutions that end customers prefer. | Low/Medium<br>-- Very time consuming and expensive for new entrants to become established<br>-- New entrants can potentially provide cheaper prices, prompting price competition<br>-- Innovative industry, if new entrant has an enhanced products, it could cause companies to transition to new solutions. |
| Bargaining Power of Buyers | Medium<br>-- TECH specializes in many areas, causing buyers to have few sources to purchase from. | Low<br>-- Bio-Techne has monopolized its own gold standard in the reagent market<br>-- Consistent demand for products | Low<br>-- Some specialization reducing buyers bargaining power<br>-- Moderate number of competitors within the industry, allowing buyers to potentially influence prices. |
| Bargaining Power of Suppliers | Low/Medium<br>-- Many companies, including Bio-Techne, develops a majority of its own proteins, growth factors, immunoassays, and other reagents, thus reducing the company's reliance on outside suppliers<br>-- Bio-Techne and many competitors in the industry buy raw materials from multiple suppliers, reducing the bargaining power of any single supplier. | Low<br>-- Many components are produced in-house for TECH, only sourcing some consumables, subassemblies and autosamplers<br>-- Not being dependent on one single supplier is a postitive, reducing bargaining power for the supplying company | Medium/High<br>-- Increasing level of regulations and testing, leading to higher costs for suppliers, thus higher purchasing costs for TECH and competitors<br>-- Bi-Partisan support for drug price regulations and Medicare gaining higher pricing power leverage |
| Threat of Substitutes Products | Medium<br>-- Advanced technology keeps the industry competitive and allows smaller companies to grow with breakthrough discoveries.<br>-- End customer's needs are constantly changing, prompting them to consider switching new different products.<br>-- High switching costs | Medium<br>-- although different solutions provided by competition exist, the build out of customer work-flows relies on reagents used in the past, essentially making them a key piece of the project | Medium/High<br>--Genomics is a diverse business industry with many applications that can be adapted to take market share from existing products |

**Appendix XV: SWOT Analysis**

STRENGTHS

-- Diversified business offerings creating multiple sources of revenues
-- Pricing power in protein platforms segment
--High customer retention in Protein Sciences due to work-flow adoption of TECH's products
--Highly educated and experienced workforce

THREATS

-- Introduction of new efficient and effective products in the industry.
--Inability to adapt to a rapidly changing industry.
-- Intellectual Property infringement risk sourced from identified high-growth regions.
-- Inability to timely synergize acquisitions under the Bio-Techne model

WEAKNESSES

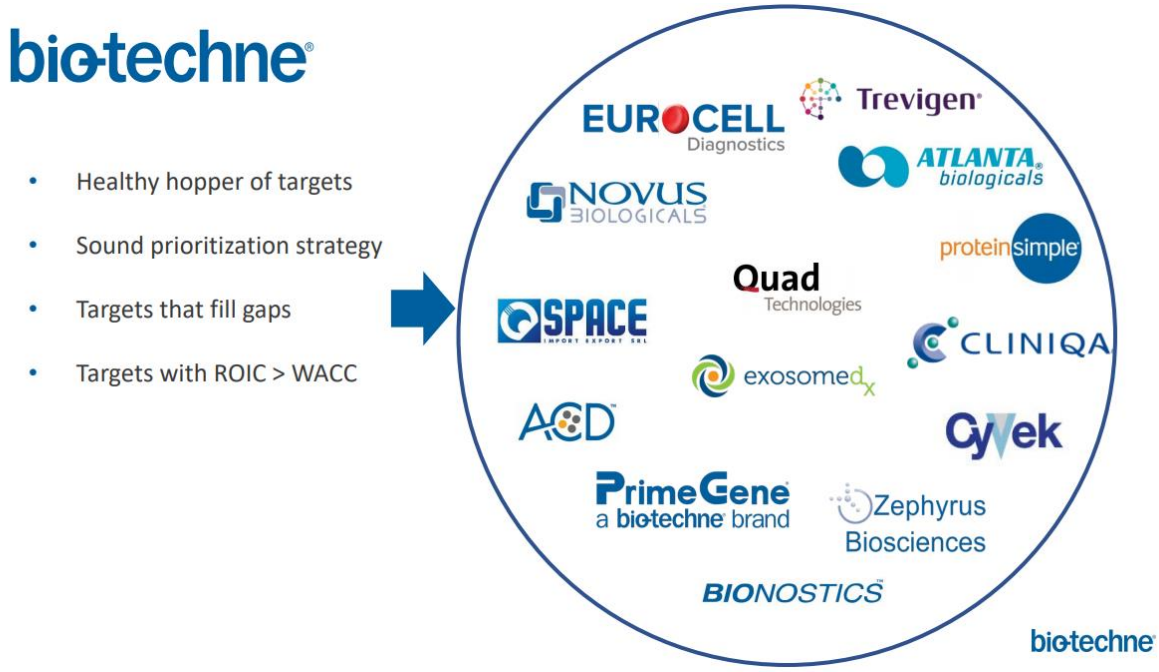
-- Previous acquisitions have an extended timeline to accretion.
-- Small international presence compared to peers
-- Nearing Capacity for reasonable Debt Leverage

OPPORTUNITIES

-- International Expansion
-- New Break-Through products and innovations

-- Potential acquisition target for a larger company

**Appendix XVI: Acquisition Hopper**



**Appendix XVII: Works Cited**


**(1)** Bio-Techne Corporation (2018, 09-10) *Investor Relations*, Last Retrieved 1/15/2019, https://investors.bio-techne.com/

**(2)** Federal Reserve. (2018, 12-15) *Press Release Meeting*, Retrieved from, https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm

**(3)** Bloomberg Terminal

**(4)** Thomson Reuters

**(5)** Capital IQ Research and Company Viewer

**(6)** Factset.com

**(7)** Congress.Gov (12/20/2017). U.S. Tax Cuts and Jobs Act. (01/03/2018). Retrieved from https://www.congress.gov/bill/115thcongress/house-bill/1/text

**(8)** U.S. Department of the Treasury (web). Treasury Yields (01/11/2018). Retrieved https://www.treasury.gov/resourcecenter/data-chart-center/interest-rates/Pages/Historic-Yield-Data-Visualization.aspx

**(9)** Google Finance

**(10)** Yahoo! Finance

**(11)** Morningstar

**(12)** Value Line

**(13)** Moody's

**(14)** Bio-Techne Management Team

**(15)** Seeking Alpha

**(16)** White House (2018, 5-11) *President Donald J. Trump's Blueprint to Lower Drug Prices,* Retrieved: https://www.whitehouse.gov/briefings-statements/president-donald-j-trumps-blueprint-lower-drug-prices/

**(17)** CMS (2019, 1-3), *Proposed Changes to Lower Drug Prices in Medicare Advantage and Part D,* Retrieved: https://www.cms.gov

**(18)** Stephen, Sunderland. "Innovation in China, "Made in China 2025" and Implications for Healthcare MNCs" July 2018 Retrieved: https://www.lek.com/sites/default/files/insights/pdf-attachments/Chinas-Healthcare-Innovation-by-Made-in-China-2025-and-Implications-for-MNCs_JUL06.pdf

**(19)** Securities and Exchange Commission (01/2019), *EDGAR Filing System*, Retrieved https://www.sec.gov/cgi-bin/browse-edgar?company=tech&owner=exclude&action=getcompany

**(20)** Derik de Bruin, Michael Ryskin, Juan E. Avendaro, Ivy Ma, "2019 Year Ahead: Solid Growth still expected for Tools; Dx still a mixed bag" January 3rd, 2019 Retrieved: https://rsch.baml.com/r?q=NCAuvJHUDTnk4r1o3c1LbA__&activityid=105149252&id_token=eyJhbGciOiJFUzI1NiIsImtpZCI6ImJvZmFwaW5ndG9rZW5rZXkifQ.eyJzdWIiOiI1OTY4NzU1MjkiLCJhdWQiOiJyc2NoLmJhbWwuY29tIiwib3JnX2lkIjoiIiwiaXNzIjoiaHR0cHM6Ly9mZWRzc28tZGV2LmJhbmtvZmFtZXJpY2EuY29tIiwiZW50aXR5aWQiOiIiLCJleHAiOjE1NDcyMjU2NDcsImlhdCI6MTU0NzIyNTM0NywiY2xpZW50X2lkIjoiIn0.nSCmpXaDgeMcvvPxmyB9OG5wr-pSjRpkuqb2BKcl6zmwrxgsVoi1sbL48SNcApaaduQYwBN3BZUFT9eWX1yxlQ&vk=CAPIQ

**(21)** Henry J Kaiser Family Foundation (2019, 1-15) *Health Policy Research*, Retrieved: https://www.kff.org/global-health-policy/

**(22)** The Economist, *The Economist Special Reports*, Retrieved: https://www.economist.com/sections/special-reports

## Disclosures:

**Ownership and material conflicts of interest**

The author(s), or a member of their household, of this report does not hold a financial interest in the securities of this company.
The author(s), or a member of their household, of this report does not know of the existence of any conflicts of interest that might bias the content or publication of this report.

**Receipt of compensation**

Compensation of the author(s) of this report is not based on investment banking revenue.

**Position as an officer or a director**

The author(s), or a member of their household, does not serve as an officer, director, or advisory board member of the subject company.

**Market making**

The author(s) does not act as a market maker in the subject company's securities.

**Disclaimer**

The information set forth herein has been obtained or derived from sources generally available to the public and believed by the author(s) to be reliable, but the author(s) does not make any representation or warranty, express or implied, as to its accuracy or completeness. The information is not intended to be used as the basis of any investment decisions by any person or entity. This information does not constitute investment advice, nor is it an offer or a solicitation of an offer to buy or sell any security. This report should not be considered to be a recommendation by any individual affiliated with CFA Society of Minnesota], CFA Institute, or the CFA Institute Research Challenge with regard to this company's stock.