

# FUNDAMENTAL ANALYSIS DEPARTMENT TECHNOLOGY INDUSTRY REPORT



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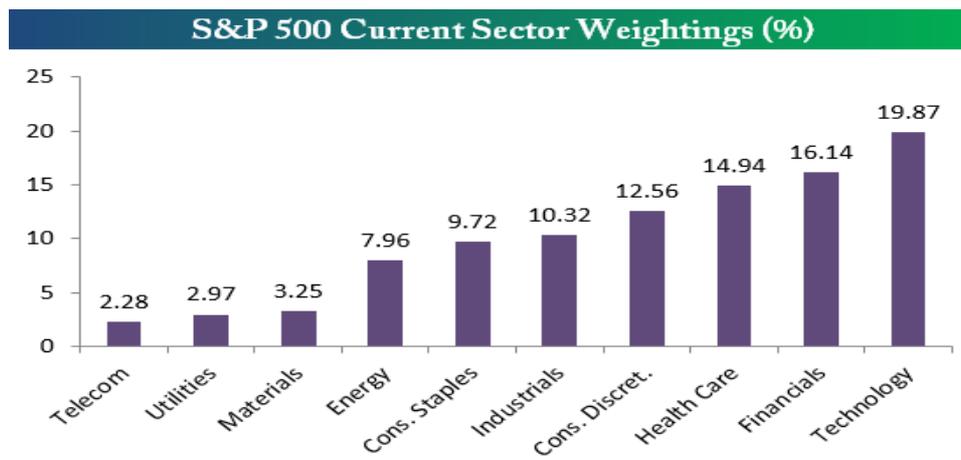
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## Introduction

With the rapid advancement of technology, more and more technology firms and start-ups are seen entering the market. This presents numerous investment opportunities for both corporate and retail investors. As such, the technology industry has gained a lot more attention from investors worldwide in recent years. Today, the technology industry is the largest sector with the most number of firms. Currently, about 20% of companies in the S&P500 belong to the technology sector as shown in Figure 1 below.



**Figure 1**

The tech sector appeals to many investors due the high growth nature of tech firms. This means that investors could potentially enjoy high capital gains in a relatively short period of time. However, the risk of investing in tech companies is generally high as well. Performance of technology stocks are greatly affected by analyst and investor's expectations. If expectations are not met, the stock could lose value very rapidly, vice versa. This makes tech stocks very volatile in nature. Hence, the tech sector generally attracts investors with a large risk appetite. Despite the risk, the tech sector has consistently outperformed the S&P500 index in the past year as shown in Figure 2 below. This means that solely investing in tech stocks could potentially yield higher returns than investing in a market-weighted portfolio.

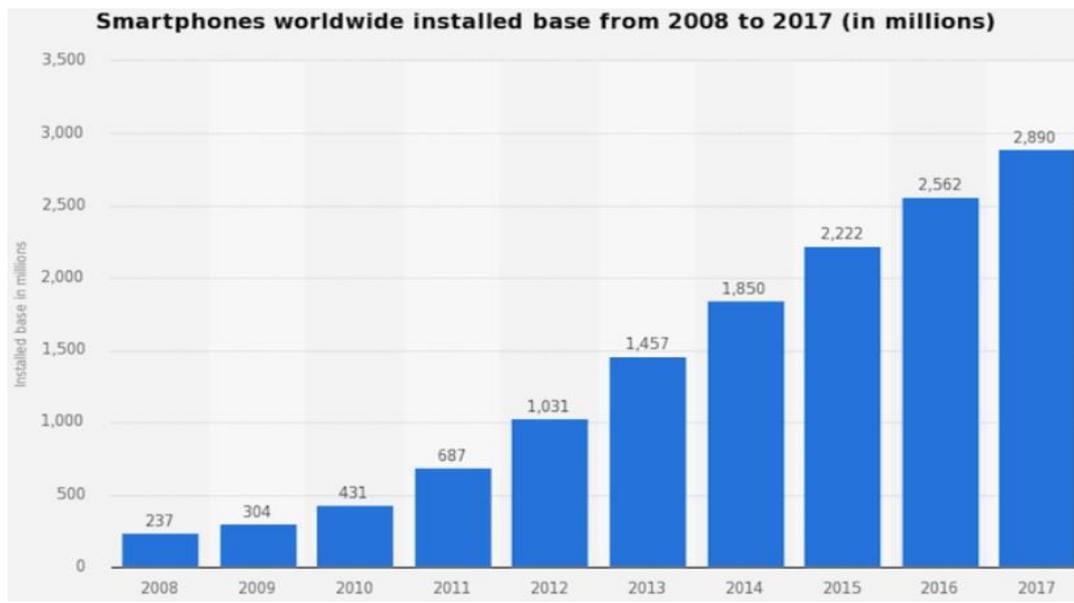


**Figure 2**

## Emerging Trends

To capture investment opportunities within the tech sector, it is important for investors to identify subsectors within the industry which could potentially experience high growth in the near future. As of today, the following subsectors might be attention-worthy: Mobile, Internet of Things, Social Media, Cyber Security, Big Data Analytics.

### Mobile

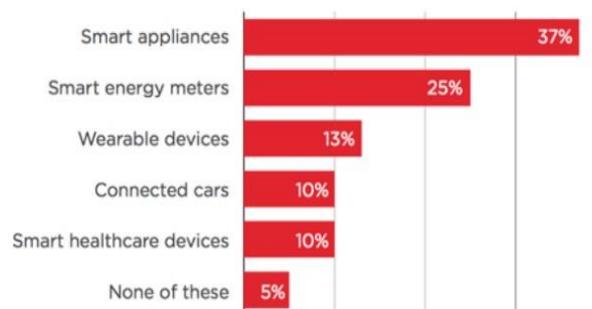


**Figure 3**

From the graph, the number of smartphones worldwide increased about 10 times from 2008 to 2014 and is expected to increase at a CAGR of 14.1% for the next 2 years. This shows that the market of smartphones is still growing and smartphone companies can be expected to do well in future.

### Internet of Things

Which connected device are you most likely to use in the next five years?



Source: KRC Survey, n=2000

**Figure 4**

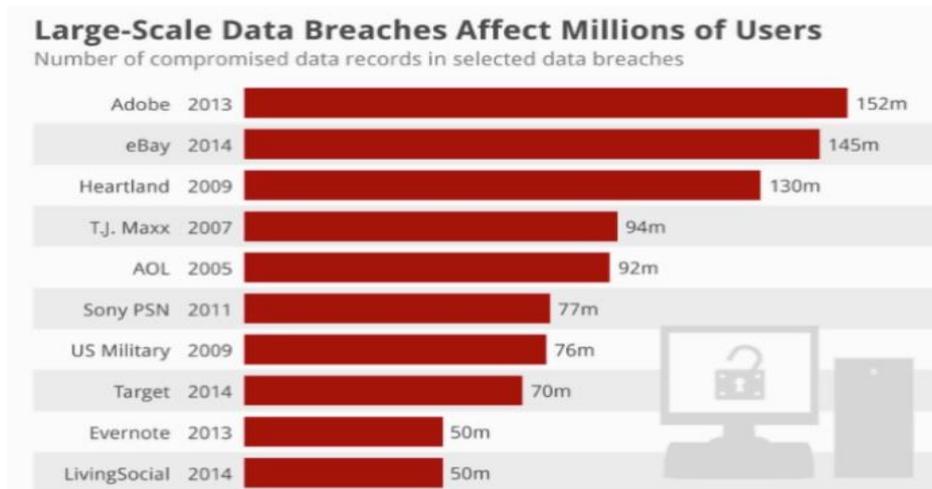
Based on a survey by KRC Research, 95% of the respondents said that they are likely to use a device from the IoT segment in the next five years. In the context of global population, this indicates huge

potential growth in the IoT segment as new technology is being developed.

### Social Media

Social media platforms such as Facebook, Instagram and LINE have been experience extraordinary growth in the past few years. Even if growth slows down, it will unlikely be negative. This means that social media companies will only get larger, making them the ones to look out for.

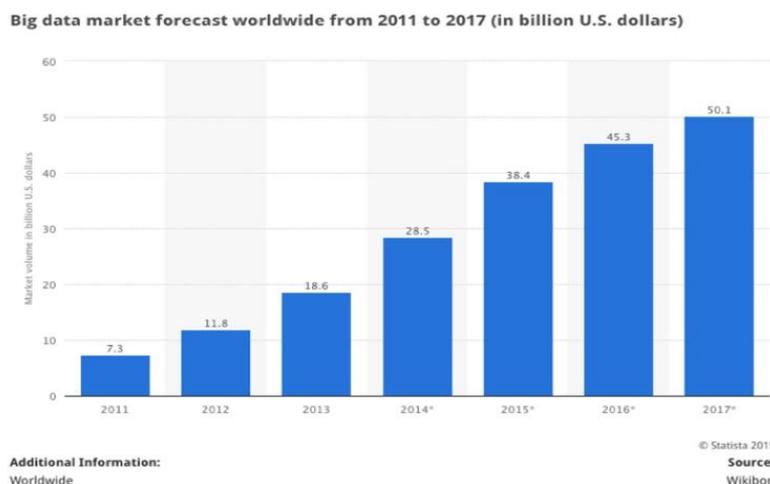
### Cyber Security



**Figure 5**

Data breaches have become a very serious issue in recent years as hackers are becoming more efficient. From the graph, the largest attacks that have ever occurred happened after the tech boom. This suggests that as technology becomes more advanced, we are becoming more vulnerable to hackers. This presents a profit-making opportunity for firms producing software security products.

### Big Data Analytics



**Figure 6**

Last but not least, big data analytics. From the graph, the big data market is forecasted to grow at a CAGR of 20.7% for the next 3 years. This means that demand for big data analytics is expected to increase and big data firms can be expected to profit greatly in the next few years.

However, price movements of tech stocks are generally volatile as they are very susceptible to analyst reports.

In most cases, if analyst estimates are not met, these stocks are likely to tumble quickly in a short period of time and vice versa. As such, investors who wish to invest in tech stocks should be aware and prepared to face volatile price movements.

## Key Performance Indicators

### Free Cash Flow

The amount of free cash flow (FCF) a company has is a good indicator of its performance. It is an advantage for tech companies to have substantial amounts of free cash as this would mean not only will the company be able to spend more on R&D, but also reduces their risk of leverage when borrowing to expand. In addition, a track record of strong FCF may allow tech companies to obtain loans at favorable interest rates. Lastly, in times of crisis, when the availability of credit is scarce, companies with strong FCF will be able to tide through by relying on their own cash flow and reducing capital expenditure.

However, a tech company does not need to have high positive FCF. Heavy investments can lead to high capital expenditure, resulting in low FCF. In this case, low FCF might not reflect badly on the company if these investments that are made have the potential of higher returns.

### Book to Bill Ratio

Book-to-bill ratio is the ratio of orders received to units shipped and billed for a specific period. It is an indicator that is closely watched by investors for an indication of the performance and outlook for tech companies.

A book-to-bill ratio greater than 1 indicates that more orders were received than filled, indicating strong demand for the tech company's products. A book-to-bill ratio of less than 1 indicates that fewer orders were received than filled, indicating a weaker demand for the company's product.

### R&D as Percentage of Sales

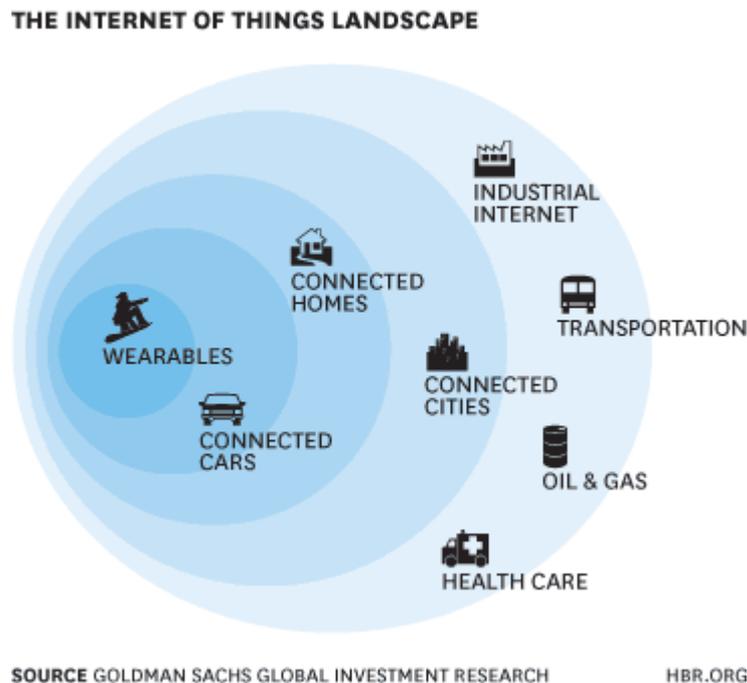
R&D as a percentage of sales is an important indicator in the tech industry. Firstly, it signifies how much a tech company is able to spend on innovation from its total amount of sales and thus, will be an indicator of growth potential of the company. Secondly, R&D as a percentage of sales is indicative of the health of a company as companies who are not doing well financially may cut back on R&D spending.

However, high level of spending in research R&D as a percentage of sales may not necessarily yield good results. If the company has a high level of R&D but is unable to effectively reduce costs or generate new products in return, the huge spending in R&D will only weaken the company's financial position. Therefore, this metric must be used in context with the company's R&D track record. One such example is Blackberry. Even though Blackberry was sitting on a huge hoard of cash and investing large amounts of cash in R&D, its products have time after time failed to generate enough sales and even breakeven with costs. Since then, Blackberry has seen its share price tumble significantly from its peak.

## Key Drivers for Tech Sector Companies

### Internet of Things

IoT is a network of physical objects and devices embedded with sensors, electronic software and network connectivity that allows them to retrieve and send data seamlessly.



**Figure 7**

*Increasing connectivity* – consumers are starting to look for connection devices not only limited to their phones, but also everyday objects like their wearables. This will lead in an expansion of internet connectivity through these IoTs

*Increased Intelligence* – As the IoT evolves, wearable devices will transition from just performing monitoring and reporting functions into more sophisticated functions such as remotely controlling other things in the IoT, automatically triggering actions, and learning and adapting to situations, e.g. location-aware augmented reality, where the device captures data from the surroundings, which the data is interactive and can be digitally manipulated.

*Reduction in costs* – Many IoT devices rely on multiple sensors to monitor the environment around them. The cost of these sensors declined 50% in the past decade, according to Goldman Sachs. Prices are expected to continue dropping at a steady rate, leading to an even more cost-effective sensors.

### Big Data Analytics

Big Data is one of the fastest-growing areas in the technology sector. It is used to process and analyse massive amounts of data, such as information on customer behaviour or log data from telecom networks, making it possible for example to solve new kinds of complex business problems or establish revenue streams based on data-intensive digital services. The share of Big Data in the technology sector is expected to grow from the current level of 1% to around 5% by 2016.

## Business

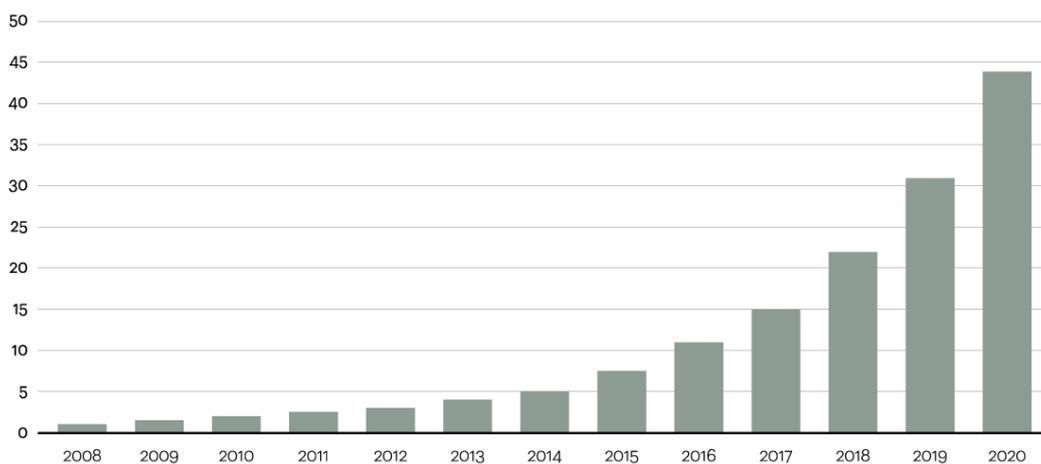
Opportunity to enable innovative new business models allows for the potential for new insights that drive competitive advantage, upon spotting consumer trends and monetizing upon these opportunities. Creation of new industries and offering businesses additional revenue streams from previously dormant sources are very possible with a growing Big Data market. Opportunities in Big Data are considerable, but strong human and capital resources are necessary to organise and utilise it accordingly.

## Technical

Data collected and stored continues to grow exponentially, which is increasingly ubiquitous and stored in many different formats.

**Data is growing at a 40 percent compound annual rate, reaching nearly 45 ZB by 2020**

**Data in zettabytes (ZB)**



Source: Oracle, 2012

**Figure 8**

## Case Study 1: Alphabet Inc. (GOOGL)

Alphabet Inc. (GOOGL), previously better known as Google Inc., provides technology products and information organization services. Advertising in general is responsible for an expected 89.86% of total revenue for January 2016, delivered through AdWords, AdSense, AdExchange etc. Over the years, the Company has integrated the search experience to ChromeOS, the Chrome browser, and capitalized on what is known as Every-As-A-Service (XAAS) and Internet of Things (IoT) with the cloud-based entertainment store Google Play. Aside from the more ubiquitous services like Gmail, Docs and Google+, Alphabet has over the years also cultivated its purpose as a kind of standalone “university” for cutting edge technology research.

### Positioned to Integrate IoT Services

IoT growth has been posited to grow to anywhere from 50 to 200 billion in 5 years time, with some estimated going to as far as 11 trillion in years. However these huge growth numbers are largely speculative, and it is uncertain how well-positioned tech companies are to capture this market. Despite Alphabet’s initial inertia with hardware devices, its subsidiary Nest Labs specializing in home automation and security has taken a promising turn in 2015. The acquisition of Revolv, specializing in wireless communication between disparate IoT devices, allows Nest Labs to strategically consolidate a fragmented market supply. North America remains to be the largest market for home automation and smart homes, projected to grow at 17% CAGR from 2015 to 2020. On top of access and entertainment control, the primary motivating factor for smart home adoption is energy efficiency through optimally controlling appliance use from the background. The real estate industry is also witnessing an ongoing change to integrate more smart appliances, and demand for efficient home automation will follow future costs of consuming energy.

### Moonshot Projects with High Growth Potential

Alphabet’s year-on-year revenue growth based on previous quarter earnings is about 13.02%, compared to its sector average of -2.74%. However, earnings alone do not seem to account for the seemingly inexhaustible optimism for how much room the Company has to run going forward, with GOOGL being priced at 34.11 PE (Q3 TTM). Currently, investors have largely imperfect information about Alphabet’s moonshot projects, but a few promising projects have come under the radar. In 2013, Alphabet’s early stage venture capital arm Google Ventures pumped US\$258 million of its US\$300 million fund into Uber, making it its largest shareholder at the time when Uber required the most latitude for growth. Today, Uber is valued at around US\$51 billion after the latest round in funding (without going public), having grown from nothing in 2012 to 160,000 users by the end of 2014, then doubling in number every six months. Currently, Uber is quickly gaining traction in China, managing 100,000 rides every day. Alphabet itself is taking the plunge into the car-on-demand market with its driverless car moonshot, integrating its current Ad services into carsharing. 2015 also saw the rebranding of the Google Life Sciences division into Verily, which specializes in research in disruptive medical and pharmaceutical technologies, looking to capitalize on the American market which presently spends one-sixth of its GDP on healthcare. Together with Calico, the late stage tech VC Google Capital and Google X moonshots which can no longer be dismissed as “vanity projects” on the side, they have an estimated earnings of between US\$500 million and US\$4 billion per annum.

### Stock Profiles

*Alphabet Inc. (NASDAQ:GOOGL) current price: 793.96*

We recommend Alphabet Inc. (GOOGL), which is currently trading at US\$793.96 per share on 30 December 2015. Despite Google having been founded for 17 years and restructured in 2015, it enjoys very high topline growth relative to its status as an old tech company (its net income growth is 17.24% on a 5 year average). EPS growth is also robust, standing at 14.86% on a 5-year average as compared to the industry average of -11.06%. On the whole, the tech industry is doing well in terms of staying connected to fundamentals, and fears of a tech bubble forming may very well be

exaggerated. US tech companies command 19.84% of total market capitalization, versus tech companies being responsible for 18.65% of net total income and 29% of total cash flows returned to investors in dividends and buybacks. This is important given that technology products are slowly becoming interconnected, with multiple services dispensed across a few platforms controlled by major industry players (Google share of the mobile organic search market is 89%). Based on the above analysis on Google's willingness to embark on high-risk high reward moonshot projects, and solid returns from advertising revenue, investors can safely assume the Company will be proactively searching for new revenue streams and opportunities.

### **Strong Financial Position**

In terms of total advertising, Google holds 68.11% market share and takes 89.86% of total revenue. Even though Google can be understood to dominate the market for general-purpose search engines, it faces some competition from vertical search engines, e-commerce websites and social media websites. Users tend to navigate directly to specific content with their dedicated sites, such as LinkedIn for job queries, WebMD for health queries and Amazon and eBay for e-commerce. The age of social media has also witnessed the rise in reliance on Facebook and Twitter for product referrals. However, Alphabet shines in its strong financial position and optimistic investor outlook backed by its growth potential. In terms of market capitalization, Alphabet's US\$535.32 billion is almost twice of Amazon or Facebook, which starts upwards from the US\$300 billion mark, 10 times that of eBay or LinkedIn, and 20 times of Twitter. With this in mind, Alphabet's debt-to-equity ratio reflects a moderately low leverage risk. At 0.07, it is much lower than Amazon (0.52), eBay(0.46), Twitter (0.41), and LinkedIn (0.23), but does worse than Facebook (0.01). Companies that maintain a low D/E ratio will incur less interest expense relative to the debt it has taken on. Alphabet also has one of the most respectable quick ratios amongst the highlighted competition – 4.03. Its ability to meet debt obligations with its most liquid assets is far better than Yahoo (2.88), Amazon (0.51), LinkedIn (3.28), but trails behind Facebook (7.83) and Twitter (8.67).

### **Recommendation: Buy**

## Case Study 2: Intel (INTC)

Intel designs and manufactures advanced integrated digital technology platforms. A platform consists of a microprocessor and chipset, and may be enhanced by additional hardware, software, and services. These platforms are sold primarily to original equipment manufacturers (OEMs), original design manufacturers (ODMs), and industrial and communications equipment manufacturers in the computing and communications industries. The platforms are used to deliver a wide range of computing experiences in notebooks (including Ultrabook™ devices), 2 in 1 systems, desktops, servers, tablets, smartphones, and the Internet of Things (including wearables, transportation systems, and retail devices). Intel also develops and sells software and services primarily focused on security and technology integration. The company was incorporated in California in 1968 and reincorporated in Delaware in 1989.

### Market Dominance in Microprocessors

Intel has a staggering 99% market share on the server microprocessor market, with almost more than 95% of the world's servers are powered with Intel's Xeon Chips. Achieving an impressive average growth 13.2% of over the past 8 quarters on server microprocessor chips, we estimate a 10% per annum of growth will continue in the next two to four years. This figure is an estimate based on the current 15% CAGR growth of the server microprocessor market.

### Expected Rebound of Global PC Demand

Intel's Skylake has received over 800 design wins from different manufacturers, who will be using Skylake in their sales of laptops, notebooks and hybrid 2-in-1s. With Intel's estimates of around 500-750 million consumers with PCs that are 4-7 years old, the Company is poised to generate significant amounts of sales in the coming year from the market looking to replace their computer hardware.

### Huge Potential in Taking Data Center Market

As cloud computing continues to garner significant investment, Intel's server processor business will be an indirect beneficiary. Recently, tablets are the preferred choice to compute data through cloud servers that would require substantial server capacities, providing a platform for Intel's profitable server processor business. In the coming 5 years, we expect DCG to grow at 17.40%, with the DCG segment given a pro-rated revenue weight at 29.18%.

### Stock Profiles

*Intel Corporation (INTC US Equity) Current Price: 28.67USD*

We employed the discounted cashflow (DCF) valuation method to arrive at a one year target price of USD\$31.76. As Intel is a company with segments of vastly different natures, revenue projection was decomposed according to division. Over the past 5 years, Intel has reliably met its "tick-tock" model of microarchitectural improvement with each cycle lasting 2 years. The revenue projection for 2015 (Skylake – "Tock") averages the growth of the previous two "Tock" designations in 2013 and 2011. As Intel is set to continually shrink its process technology to 10nm in 2016 with the release of Kaby Lake ("Tick"), the revenue earnings projected averages the growth of the previous two "Tick" designations in 2014 and 2012. This method cannot reliably forecast the potential and limitations of improving transistor gate lengths forever, and the later years employ a division-based projections weighted according to percent revenue in 2015. Intel has much potential to develop its presence in the System-on-Chip market, where no major player in the semi-conductor industry has gained a certain foothold due to its requirements in complex engineering and technical knowhow. This roughly represents 5.41% of Intel's current revenue and is poised to grow the fastest at 19.14%. Its other growth drivers come from IoT segments, which are augmented by its need for more data centers in DCG. Their combined growth average 14%, coupled with SoC, offsets the downturn in the

traditional PC Client Group, which is responsible for 57.12% of Intel's revenue today

**Recommendation: Buy**

## Case Study 3: NeoPhotonics

Over the years, NeoPhotonics have absorbed an impressive range of companies relative to its market capitalization and enterprise value (US\$385.3 million). In late 2011, the Company acquired Santur Corporation, which is a leader producer of tunable lasers and 100Gbps transceiver modules. The integration of NeoPhotonics' circuits into Satur lasers, modulators and photodiodes indicate that the Company is looking to move into the profitable and quickly expanding market for laser technology. According to the January 2015 study by Industrial Laser Solutions editorial, 2014 saw a moderate (adjusted) 6% increase in sales revenue in the sector over 2013. NeoPhotonics is poised to be in an excellent post-economic downturn position since laser technology is a key component in manufacturing recovery in emerging economies, i.e. its applications in energy, transportation, agricultural machinery, aerospace, communications, medical devices and fabricated metal products. In 2013, the Company also acquired LAPIS Semiconductor Co., Ltd in Japan, which is a producer of high performance lasers and photodiodes. Then in 2015, certain liabilities of EMCORE Corporation's tunable laser product lines were acquired. The EMCORE line has high compatibility with the Company's original products and its later acquisitions, specializing in super high performance 400Gbps lasers.

These management decisions have indicated that the management team continues to carve out a niche in the highly competitive semiconductor business, with the Company putting special emphasis on communications technology whose importance can be seen from the prior analysis on Alphabet Inc. Given healthy financials after several acquisitions, and with IoT products typically demanding mutual integration via communication technology to take off, (the IoT market is postulated to be US\$50-200 billion by 2020) NeoPhotonics is a company to watch out for.

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