

## Software 2018 Outlook: Still Room for Appreciation Despite Rich Valuations

### Key Takeaway

**We believe secular forces are as positive as we've seen in nearly two decades of covering Software due to advances in foundational computing tech that have turned the economic equation on its head, while cyclical forces are also on the upswing, reflected in rate hikes that could have an opposite effect. Regulatory changes, such as US tax rates and GDPR, will have implications for 2018 and beyond, while ASC 606 may cause confusion but little fundamental impact.**

**Software Significantly Outperformed in 2017...** Software stocks rose 42.0% vs. S&P 500 19.4% and NASDAQ 28.2%. The 23 pt outperformance was modestly eclipsed only twice since the turn of the century. Within our coverage, "Growth" averaged 60% returns, while "Value" names also posted strong, albeit more modest 26% average returns.

**...Pushing Valuations to Lofty Levels...** The flip side to this is that Software valuations are at or near peak levels relative to historical norms, whether looking at forward P/E relative to the S&P, or the % of stocks trading at or below 5.1x EV/Recurring Rev.

**...But Secular Forces Remain as Good as We've Seen...** as performance improvements and price declines of foundational computing tech over the last 10-15 years enable Software to fulfill its promise at a reasonable cost, driving the business of Software for years to come.

**...Coupled With a Favorable IT Spending Backdrop.** About half of global Software demand (that which we can gauge) is well positioned for modest growth: US gov't IT spending and discretionary budgets of the biggest European gov't IT spenders are both poised for over 2% growth, while financial services spending should grow at least modestly.

**Lower Corporate Tax Rate Will Benefit Some...** We estimate that within our coverage, PAYC will benefit the most from the lower federal rate, increasing FCF by 14%, followed by ALRM (11%), CA (11%), RHT (5%), ORCL (4%), SSNC (3%), and VMW (3%), all else equal.

**...While Deemed Repatriation May Benefit All** for the next few years as more cash in large tech companies' coffers will likely drive M&A and capital returns (and executive pay). We estimate that our covered companies with the most foreign-held funds available for use in the US after paying repatriation fees are: MSFT (\$110B), ORCL (\$49B), and VMW (\$7B), followed by CTXS (\$2B), CA (\$1.5B), RHT (\$1B), and SYMC (\$1B).

**Other Regulatory Changes, such as GDPR and ASC 606 Will Have Far-Reaching Implications from Positive to Neutral.** GDPR should supplement positive security trends, especially for solutions that are not widely deployed, likely benefiting VRNS and SAIL the most in our coverage. ASC 606 may cause confusion and increase volatility in reporting, but have little to no fundamental impact on companies.

**2018 Set Up Well for M&A.** Aggregate value of large deals declined to \$19B in 2017 from a record \$93B in 2016, as valuations expanded. We expect Software M&A deal volume and sizes to rebound in 2018, as repatriation increases available funds, interest rates remain low, and lower tax increases the base value of recurring revenue, though valuations are rich.

**Interest Rates and GDP.** Equity markets have been robust during rate increase cycles, with US Software outperforming the S&P. However, these cycles coincided with strong GDP growth, which has yet to materialize in this cycle, raising the risk, though tax reform could drive GDP higher. Best positioned for rate hikes in our coverage are: PAYC (every 25 bp rate increase = 2% 2018 EPS benefit) and CHKP (every 25 bps = 1% benefit).

**Our Top Picks:** Buy-rated ORCL (\$61 PT), PANW (\$183 PT), and APTI (PT \$30 PT)

**Ratings/PT Changes:** We're upgrading to Buy: ALRM (\$46 PT, from \$44) and NICE (\$112 PT, from \$87), and downgrading to Underperform: SYMC (\$23 PT, from \$30). We're raising PTs for Buy-Rated RNG (\$60, from \$52), SPLK (\$105, from \$88), and VMW (\$165 from \$140).

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## Executive Summary

This report will address several factors that will have far reaching, long-term implications on Software stocks throughout the world. We believe the secular forces for the business of Software are as positive as we have seen in our almost two decades of covering the space due to advances in foundational computing technologies that have turned the economic equation on its head, while cyclical forces are also on the upswing, which are also reflected in increased interest rates that could have an opposite effect unless those macro forces gain steam. In addition, changes in regulatory demands, such as GDPR and US corporate tax rates will have implications (mostly positive) for years, while foreign exchange translation should boost reported results and ASC 606 may cause some confusion, but little fundamental impact.

Software's 2017 42.0% return easily outperformed the S&P 500's 19.4% stock appreciation, marking a strong return to outperformance following the first underperformance in five years in 2016. Software stocks have typically moved more than the market during both times of market appreciation and declines. Even with the outsized gains in 2017, we believe that Software is well-positioned to continue outperformance in 2018, given persistent, strong secular tailwinds, coupled with indications of a favorable macro backdrop and healthy IT spending in key markets. Meanwhile, a lower corporate tax rate under the Tax Cuts and Jobs Act passed at the end of 2017 should boost profits and cash flow (for other sectors too) starting in 2018, while one-time repatriation of overseas funds should also contribute to both increased M&A activity and capital returns.

Below we summarize the basic foundational elements of our Outlook, along with what appear to be additional outside forces on the Software sector, which are likely to have a net positive effect in 2018.

Our Top Picks for 2018 include Buy-rated Oracle (ORCL, \$61 Price Target); Buy-rated Palo Alto Networks (PANW, \$183 Price Target), and Buy-rated Apptio (APTI, \$30 Price Target).

## Supportive Basic Foundational Elements

### Software Significantly Outperformed in 2017 ...

In 2017, Software stocks (represented by the S&P North America Technology Software Index) rose 42.0% compared to up 19.4% for the S&P 500 and up 28.2% for the Nasdaq. The significant 23% outperformance of Software in 2017 was only eclipsed twice since the turn of the century, exiting the aftermath of the Tech Bubble in 2003 and emerging from the Great Recession in 2009, and only modestly at that, as Software outperformed by 24% in each of those years. Within our coverage, performance of "Growth" stocks was very strong, with all the names in this group appreciating (except BNFT) over the year, at an average price return of 60%. The best performers were RNG, SOPH-LN, TEAM, and VRNS. "Value" names were also strong, although appreciated more modestly, averaging 26% price increases, which we note is also above the S&P 500 performance. VMW, 4704-JP (Trend Micro), INTU, MSFT were the upward outliers.

### ... Pushing Valuations to Lofty Levels ...

Within Software, P/E multiples for "Growth" stocks expanded an average 19% to 55.1x NTM EPS, while "Value" P/E multiples increased an average 11% to 22.6x. Relative Software valuations appear expensive, as the P/E of Software relative to the S&P 500 was 1.67x at the end of 2017 and 1.75x today, which is materially above the historical average of 1.53x. Software intrinsic valuations appear even more expensive, as only 13% of about 100 Software names that we track are trading at or below what we calculate as the intrinsic value of their recurring revenue streams today. This is down from 30% a year ago and meaningfully below the 36% historical average since the last recession.

Regardless of where the industry trades, there are some Software stocks in our coverage that appear to be trading near or below what we calculate as the intrinsic value of the cash flow from their existing recurring revenue stream even if cash flow never grew again (e.g., BNFT at 4.0x EV/Mtn, CA at 4.3x EV/Subscription, SYMC at 5.5x EV/recurring, CVLT at 5.8x EV/recurring, and APTI at 6.4x EV/Subscription). Note that not all recurring revenue is of the same value.

### **... But Secular Forces Remain as Good as We've Seen ...**

We remain more positive on the prospects for the aggregate Software sector than perhaps we have been in our careers, which spans almost two decades covering the space and more than a decade working in technology prior to that. This view has been consistent for the past few years and recent field discussions and reported results only serve to validate it further. Our constructive bias is not necessarily due to new concepts in Software. Frankly, many of the new economic opportunities in Software are not novel concepts, but the application of them have become more practical today in that they now can be done at a reasonable cost. In other words, the economic equation has been turned on its head so that for instance, a project to extract value from unstructured data may cost less than the value extracted for the first time in history. This is primarily because of advances we have experienced in what we refer to as core computing technologies over the last 10-15 years that provide the foundation of Software solutions. What we're talking about are developments, such as: much faster and cheaper memory, multi-core processors that make it easy to use all that memory, much faster and cheaper compute (including parallel processing) and storage, and perhaps most importantly, much faster, cheaper, broader, and near ubiquitous bandwidth – the Internet. These are the building blocks for logical Software concepts that may have been discussed for a decade or more, but were not practical, including: Cloud, SaaS (Software-as-a-Service), Big Data, IoT (Internet of Things), AI (Artificial Intelligence) and ML (Machine Learning), SOA (Service Oriented Architectures), Digital Marketing, and others.

### **... Coupled With a Favorable IT Spending Backdrop**

We believe that **about half of global Software demand is well positioned for modest growth for 2018**, similar to 2017. Discretionary budgets of the most relevant European Governments (European Governments represent 8-14% of worldwide software spending) are expected to increase over 2% on average in 2018, down slightly vs. 2017. US Government IT spending (about 9% of worldwide Software spending) is forecast to increase about 1.7% (and subject to update in March), decelerating from estimated 4.2% growth in 2017. Japan (about 6% of worldwide Software and 9% of worldwide IT) total IT expenditures are forecast to grow about 3%, per government data, an uptick from 2.3% in 2017. We believe that IT budgets in the financial services vertical (23%) will grow at least modestly in 2018. We will attempt to monitor impacts to IT budgets of financial services vertical, which can change more quickly than other forces.

## **Net Positive Additional Outside Forces**

### **US Corporate Tax Reform – Software Beneficiaries**

The massive overhaul of US tax rules under the Tax Cuts and Jobs Act should be a net benefit to most Software companies, though perhaps not as much as for some sectors, as many software companies do not pay much tax today. Regardless, lowering the top federal marginal income tax rate from 35% to a flat 21% rate, all else equal, should increase EPS and cash flows. Combined with the additional cash available from a one-time deemed repatriation, M&A activity, capital investments, and capital returns should all increase. Increasing bonus depreciation percentages that will allow qualified capex (e.g., machinery, equipment, and leasehold improvements) to be expensed upfront should accelerate capital investments in the near-term, and given corporations more disposable income, perhaps driving demand further.

- **Lower Corporate Tax Rate.** We estimate that within our coverage universe, PAYC will be the biggest beneficiary, with tax savings as a percentage of 2018 FCF equal to about 14%, followed by ALRM (11%), CA (11%), RHT (5%), ORCL (4%), SSNC (3%), and VMW (3%).
- **Deemed Repatriation.** *We estimate that within our coverage universe, the companies that would have the most foreign cash and equivalents available for use in the US after paying their respective one-time mandatory repatriation taxes, include MSFT (\$110 billion), ORCL (\$49 billion), and VMM (\$7 billion), followed by CTXS (\$2B billion), CA (\$1.5 billion), RHT (\$1 billion), and SYMC (\$1 billion).* Our mini-case study of spending by four technology/software corporations (HP, IBM, Oracle, and Microsoft) after the last one-time repatriation in 2004-2005, shows increases in M&A and/or capital return to shareholders.
- **Modified Territorial System; GILTI/FDII and BEAT provisions.** Under the new modified territorial system, the active foreign income of US C corporations will no longer be subject to US taxes (passive income will still be). However, new provisions – the FDII tax, GILTI tax, and BEAT – impose minimum US taxes on applicable foreign income, aimed to prevent practices that shift income to low tax jurisdictions. We discuss the GILTI/FDII and BEAT provisions in detail and considerations when trying to evaluate the impact on financial results, but don't believe we can reasonably predict the company-specific impacts at this point. Frankly, we believe that companies are still trying to evaluate the impacts themselves.
- **Lower Taxes = Higher “Base Value” for Recurring Cash Flows.** We note that all else equal, a reduction in the cash tax rate from 35% to 21%, would increase the calculated base value EV/Recurring Revenue multiple for the NPV of future recurring cash flow streams for a license/maintenance company to 6.2x from 5.1x, and to 5.4x from 4.5x for SaaS companies, also supporting increased M&A.

### 2018 Setup for Strong Software M&A Activity ...

Aggregate deal value of \$19 billion among large deals (about \$1 billion or higher) in 2017 fell short of our expectations, significantly below the record \$93 billion in 2016, \$30 billion in 2015, and \$24 billion average in 2010-2014. We attribute the moderation in part to the robust performance of public Software equities, reflected in record deal valuations paid by both strategic acquirers and private equity sponsors, although the latter exhibited more discipline. Meanwhile, large deal volume remained solid (13 versus 22 in 2016, 9 in 2015, and average of 10 in 2010-2014), as did the number of Software deals above \$100 million – 75 in the US, below 89 in 2016 and a record 96 in 2015, but in line with 73 in 2014. We expect Software M&A deal volume and sizes to rebound in 2018, as the demand environment for Software assets remains unchanged and interest rates remain historically low even despite more planned rate hikes. Persistent lofty valuations do present a potential barrier, but deemed repatriation that will take effect in 2018 – which may have constrained some demand in 2017 – paves the path for increased M&A activity.

### ... And Potentially Accelerated IPO Activity

After modest Software IPO activity in the last two years (12 in 2017 and 10 in 2016), we believe the secular and cyclical forces noted above have positioned 2018 to see materially more transactions, given a broad range of private companies with the requisite financial characteristics that are disrupting existing markets and creating new ones. Investors should stay tuned and pay attention to private names when they're ready to start engaging with public investors.

**GDPR to Further Bolster Positive IT Security Trends**

In our recent [“Cybersecurity Survey – From the Source 2.0”](#), buyers indicated spending expectations were accelerating to +8.8% over the NTM, up from +7.6% a year ago. Budgets appear to be supported by continued large-scale attacks reported in the media and from GDPR’s implementation. Ongoing multi-year trends favor consolidated solutions, next-generation endpoint solutions, third-party email security providers, identity solutions, and pure play cloud vendors.

In addition to the existing trends in IT security persisting in 2018, we believe security spending will benefit from the implementation of GDPR regulations in the European Union in May 2018. GDPR is likely to be particularly beneficial to the vendors of security solutions offering products that are not as widely deployed in enterprises today, including DLP, archiving, IAM, and we believe, protection from internal threats. Vendors in our coverage universe most likely to benefit include Varonis and SailPoint, though CA, ORCL and SYMC should also benefit.

**Markets Have Risen with Rate Increases, but Risk Given Modest GDP Growth**

We consider market dynamics that may influence Software stocks, including the three interest rate increases in 2017 and the FOMC’s indication for three more hikes in 2018. Equity markets have performed robustly during cycles of interest rate increases, and US Software equities have outperformed the S&P during these cycles. We note however, these prior periods of short-term rate increases were a reaction to strong GDP growth. Given the current expectation for modestly accelerating GDP growth—the latest Fed forecast for real GDP growth is 2.5% in 2018 and 2.1% in 2019—we believe this pending rate increase cycle has some risk given relatively muted growth prospects compared to previous rate hike cycles.

- We believe that the best-positioned companies within our coverage during a rising rate environment include PAYC (every 25 basis point rate increase yields a 2% benefit to 2018 EPS) and CHKP (every 25 basis point rate increase yields a 1% benefit to 2018 EPS) others that have relatively high shareholder capital returns, including dividend yields (CA, MSFT) would likely see pressure in such an environment. If the economy were to accelerate more meaningfully than expected, we’d expect growth stocks to benefit more than value stocks.

**FX Tailwinds Return**

While not a fundamental driver of Software performance, foreign exchange translation effects can influence the perception of reported results, and frankly, also affect real cash flow. If current currency rates hold into the future, we expect FX translation effects to provide a 270 basis point tailwind to revenue in 2018 for a typical US-based Software company, versus an estimated 10 basis point headwind in 2017.

- **Potential FX Swing Factors.** We note two potential factors that could impact FX rates. The first is that higher interest rates could cause the US dollar to appreciate. The second is that if a lower US corporate tax rate yields stronger economic growth than investors and economists expect, this could also increase demand for US investments and strengthen the dollar. All else equal, an appreciating US dollar would result in FX headwinds and potentially mute or outweigh our current expectation for a FX tailwind in 2018. Additionally, FX headwinds could negatively impact the bottom-line results of US-based Software companies with international exposure, because they generally have a disproportionately higher percentage of costs based in the US vs revenues. We note, however, that the positive impact from lower corporate taxes could more than offset any negative FX impacts, but the exact net effect would obviously vary by company.

**ASC 606: Confusion and Increased Volatility, But Little Fundamental Impact**

We believe that adoption of ASC 606, the new revenue recognition standard, would effectively increase alignment between billings and reported revenues for companies that sell products via term licenses. Reported revenues would become a more accurate assessment of the business dynamics (i.e., reported license in any given quarter would better reflect new business growth, or lack thereof), though reporting will likely be more volatile too. We expect SaaS vendors to be largely unaffected by these changes. However, we note that for SaaS companies, we already attempt to calculate New Subscription ACV (a proxy for new business growth). ASC 606 would effectively require term license and maintenance Software companies to disclose revenue that would be more comparable to our new business calculation for SaaS companies. We plan to publish a report with more detailed analysis of the expected impacts for each company within our coverage universe.

**How to Play Our Coverage Universe in 2018**

We provide quick summaries for each of our companies under coverage below, including several ratings changes (ALRM, SYMC, and NICE) that have associated reports referenced.

**Top Picks**

We identify the following top picks for 2018:

- **Oracle (ORCL, \$61 PT)** – The year when 12c R2 really matters. Oh yeah ... and that Cloud stuff too. Maintain Buy.
- **Palo Alto Networks (PANW, \$183 PT)**. Elegant Platform Architecture that plays well to customer desire for consolidated solutions, while also in the sweet spot of a major product refresh cycle. Maintain Buy.
- **Apptio (APTI, \$30 PT)**. Huge opportunity; reasonable expectations; and rare reasonable valuation. Maintain Buy.

**Our Coverage****Buy:**

- **Alarm.com (ALRM, \$46 PT)**. Huge opportunity and should benefit more than most from lower taxes. Upgrading to Buy from Hold. See our accompanying note, [Upgrading to Buy - Taxes, Improved Valuation, and Large Market Opportunity](#), for more details.
- **Apptio (APTI, \$30 PT)**. Huge opportunity, reasonable expectations, and rare reasonable valuation.
- **Atlassian (TEAM, \$53PT)**. Great company with unique and attractive sales model and resulting cash flow profile, which we believe is sustainable. The only issue is valuation at 22.6x EV/TTM Recurring Revenue.
- **Benefitfocus (BNFT, \$35 PT)**. Has had 4 CFOs in 19 months in addition to recently replacing the Founder/CEO with the COO Ray August. Doesn't seem to be very well run even as it is well positioned to become a de facto standard for employee benefits management. Trades like a company with execution issues and could be an attractive take-out candidate.
- **CA Technologies (CA, \$38 PT)**. Hasn't grown and it's unclear if it ever will. If it eventually grows modestly, it can see meaningful upside from here. It's not expected and this is typically the short side of a pair trade in this market. Well run. If it doesn't grow, it will be stagnant in a buoyant market. A 3% dividend yield that could be increased, along with the potential that real growth finally materializes keeps us at a Buy, but ...



- **CallidusCloud (CALD, \$32PT)**. Huge opportunity for everything in between (EIB) CRM and ERP. Should continue to see benefit from several engines of growth.
- **Check Point Software (CHKP, \$126 PT)**. Demonstrated long term value creator, but at a lull in product cycle.
- **Commvault (CVLT, \$66 PT)**. Reasonably priced and strong strategic vision, but upstarts are a real threat and large incumbents can do unnatural things in regard to pricing of big deals.
- **Instructure (INST, \$43 PT)**. Well positioned for the future, but corporate LMS and/or other talent management offerings need to contribute more meaningfully before academic LMS market slows. Potential take out target.
- **Mimecast (MIME, \$38 PT)**. Well run, predictable ratable model, and continued tailwinds from onerous threat environment and the transition to cloud.
- **MuleSoft (MULE, \$32 PT)**. Among the largest opportunities out there. Slow sales capacity build to maintain culture is understandable, but may slow growth. Remain Buy.
- **NICE (NICE, \$112 PT)**. Potential for accelerated top-line growth, continued margin improvement, strategic initiatives to expand up-/down-market working, advanced itself as the leading customer engagement platform. Upgrading to Buy from Hold. See our note, [Upgrading to Buy—Rather Be Fashionably Late Than Miss the Party](#), for more details.
- **Nutanix (NTNX, \$39 PT)**. Transitioning towards a pure-play software company.
- **Oracle (ORCL, \$61 PT)**. The year when 12c R2 really matters. Oh yeah ... and that Cloud stuff too.
- **Palo Alto Networks (PANW, \$183 PT)**. Elegant Platform Architecture that plays well to customer desire for consolidated solutions, while also in the sweet spot of a major product refresh cycle.
- **Paycom (PAYC, \$95 PT)**. Best positioned for increased interest rates and among those best positioned for lower US corporate tax rate. Rich valuation justified.
- **RingCentral (RNG, \$60 PT)**. Huge opportunity and well positioned. Monster 135% return unlikely to be replicated, but should continue to be a larger company over time. We're raising our price target to \$60, from \$52, on increased conviction in the company's long-term cash flow generation.
- **SailPoint (SAIL, \$18 PT)**. Recent IPO and well positioned for the current trends in the identity governance market and poised to benefit from the implementation of GDPR.
- **Splunk (SPLK, \$105 PT)**. Suspect results are even better than financials would indicate since not enough data given for accurate assessment. Way to truly play Big Data. We're raising our price target to \$105 from \$88 on increased conviction in the company's ability to leverage this trend and yield long-term cash flow generation.

- **Varonis (VRNS, \$55 PT).** Plays as well as anyone to the imminent benefits from GDPR, as protection from insider threats are not broadly deployed.
- **VMware (VMW, \$165 PT).** ELA renewals to increase again, though not as great as last year? Businesses beyond Compute contributing meaningfully, including EUC, NSX, VSAN. AWS partnership provides backstop. We're raising our price target to \$165 from \$140 on increased conviction in the company's non-Compute businesses and ability to monetize these into long-term cash flow generation.

**Underperform:**

- **Citrix (CTXS, \$60 PT).** If you can't sell more, simply raise prices on maintenance. Will this work? Unclear since renewal rates are already below 90%. VMW much stronger competitor today.
- **Microsoft (MSFT, \$57 PT).** We suspect Windows provided material bottom line benefit relative to the PC market, and while we understand what better mix can do in principle, the practical reasoning for better mix is unclear. Still significant risk for Azure, but it still may not matter .... But we can't with good conscience upgrade.
- **Symantec (SYMC, \$23 PT).** Numbers look challenging for the December quarter, and very difficult thereafter. Stock could work if they eventually hit current consensus numbers, but they have continued to push improved results to another day. It will soon be another day. It will probably take Silver Lake and Bain longer to make this work than investors thought. Downgrade to Underperform from Hold. See our accompanying note, [Downgrading to Underperform - The Honeymoon is Over](#), for more details.

**Hold:**

- **Red Hat (RHT, \$119 PT).** Has done an admirable job in expanding its domain beyond RHEL, but it's unclear how sustainable this is and it's trading as if it is sustainable, raising the risk profile.
- **salesforce.com (CRM, \$97 PT).** Enterprise outperformed mid-market in 2017; will this continue in 2018? Can SFDC continue to expand in a meaningful way beyond SFA into Service, Marketing, and perhaps most importantly, PaaS?
- **SS&C Technologies (SSNC, \$58 PT).** Potential upside to DST synergies and accretion, and hopefully rebounded organic growth between now and deal close around 3Q.
- **Tableau (DATA, \$67 PT).** Benefited from investor confusion in 2017 and may continue to in 2018. 4Q17 numbers have some risk, but very little risk to 2018 numbers. Cannot with good conscience raise rating, but fast money can do well to buy after 4Q17.
- **Workday (WDAY, \$101 PT).** The year of cash flow.

Chart 1: Coverage Universe

| Name                 | Ticker | Rating       | Market    |          | Old          | New          | % Upside<br>/(Downside) |
|----------------------|--------|--------------|-----------|----------|--------------|--------------|-------------------------|
|                      |        |              | Cap (\$M) | Price    | Price Target | Price Target |                         |
| Alarm.com            | ALRM   | Buy          | 1,885     | \$38.27  | \$44         | \$46         | 20%                     |
| Apptio               | APTI   | Buy          | 1,131     | \$24.00  | \$30         | \$30         | 25%                     |
| Atlassian            | TEAM   | Buy          | 13,213    | \$54.87  | \$53         | \$53         | (3%)                    |
| Benefitfocus         | BNFT   | Buy          | 841       | \$25.15  | \$35         | \$35         | 39%                     |
| CA Technologies      | CA     | Buy          | 14,340    | \$34.47  | \$38         | \$38         | 10%                     |
| CallidusCloud        | CALD   | Buy          | 2,002     | \$29.75  | \$32         | \$32         | 8%                      |
| Check Point Software | CHKP   | Buy          | 17,208    | \$103.57 | \$126        | \$126        | 22%                     |
| CommVault            | CVLT   | Buy          | 2,537     | \$52.65  | \$66         | \$66         | 25%                     |
| Instructure          | INST   | Buy          | 1,082     | \$33.70  | \$43         | \$43         | 28%                     |
| Mimecast             | MIME   | Buy          | 1,956     | \$32.10  | \$38         | \$38         | 18%                     |
| MuleSoft             | MULE   | Buy          | 3,526     | \$24.32  | \$32         | \$32         | 32%                     |
| NICE Ltd.            | NICE   | Buy          | 5,763     | \$92.63  | \$87         | \$112        | 21%                     |
| Nutanix              | NTNX   | Buy          | 7,120     | \$36.73  | \$39         | \$39         | 6%                      |
| Oracle               | ORCL   | Buy          | 215,306   | \$50.27  | \$61         | \$61         | 21%                     |
| Palo Alto Networks   | PANW   | Buy          | 14,451    | \$154.23 | \$183        | \$183        | 19%                     |
| Paycom               | PAYC   | Buy          | 5,201     | \$88.35  | \$95         | \$95         | 8%                      |
| RingCentral          | RNG    | Buy          | 4,280     | \$51.50  | \$52         | \$60         | 17%                     |
| SailPoint            | SAIL   | Buy          | 1,436     | \$16.10  | \$18         | \$18         | 12%                     |
| Splunk               | SPLK   | Buy          | 13,864    | \$90.57  | \$88         | \$105        | 16%                     |
| SS&C Technologies    | SSNC   | Buy          | 10,556    | \$49.71  | \$58         | \$58         | 17%                     |
| Varonis              | VRNS   | Buy          | 1,630     | \$52.90  | \$55         | \$55         | 4%                      |
| VMware               | VMW    | Buy          | 55,893    | \$135.33 | \$140        | \$165        | 22%                     |
| Microsoft            | MSFT   | Underperform | 703,002   | \$90.14  | \$57         | \$57         | (37%)                   |
| Citrix               | CTXS   | Underperform | 14,100    | \$91.19  | \$60         | \$60         | (34%)                   |
| Symantec             | SYMC   | Underperform | 18,328    | \$27.52  | \$30         | \$23         | (16%)                   |
| Red Hat              | RHT    | Hold         | 23,568    | \$126.60 | \$119        | \$119        | (6%)                    |
| salesforce.com       | CRM    | Hold         | 81,221    | \$110.04 | \$97         | \$97         | (12%)                   |
| Tableau              | DATA   | Hold         | 6,210     | \$74.07  | \$67         | \$67         | (10%)                   |
| Workday              | WDAY   | Hold         | 26,415    | \$112.26 | \$101        | \$101        | (10%)                   |

Source: Factset and Jefferies Research

## A Look Back at 2017

In 2017, Software stocks (represented by the *S&P North America Technology Software Index*) outperformed the S&P 500 Index by almost 23% and the Nasdaq by 14%, with the Software index rising 42% compared to 19% for the S&P 500 and 28% for the Nasdaq. This significant outperformance returns software to its norm; as Software stocks have typically moved greater than the market during both times of market appreciation and declines. We remind investors that this sharp rebound follows 2016; which was the first year of relative underperformance compared to the S&P 500 in five years and just the second in a decade. Software significantly and consistently outperformed through the year, peaking at an outperformance of 30% in the end of November; before trading off 7% relative to the S&P 500 in the last month of the year. Software has continued to

outperform in the beginning of 2018, up 550 bps and outpacing the gains of the S&P 500 which is only up 470 bps.

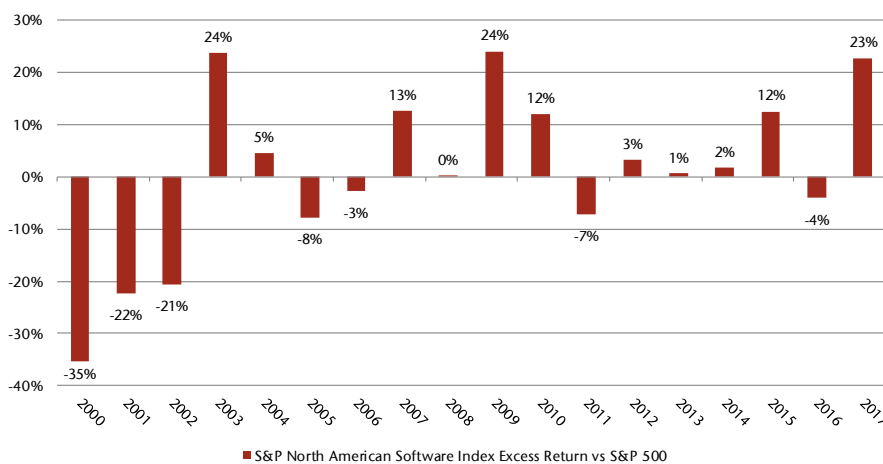
Within our coverage, performance was very strong across Growth names, while Value names generally saw increases for the year in line with the general markets. Growth performance was strong, with all the names in this group showing stock appreciation of at least 16% (average was 60%) over the year, except for BNFT which declined 9%, with the strongest performance coming from RNG, SOPH-LN, and TEAM. Value names generally saw more modest, although still strong appreciation, averaging 26% price increases, with VMW, 4704-JP (Trend Micro), INTU, and MSFT the upward outliers.

At 1.67x at the end of 2017, the P/E of Software relative to the S&P 500 was above the end of 2016 (at 1.47x) and also richer than the historical average of 1.53x. The number of software names traded at or below 5.1x EV/Maintenance-like revenue relative to the end of 2016 was down significantly (14% as of December 29, 2017, a reduction from the 30% at the close of December 30, 2016). This ratio is also significantly below recent history, indicating fewer stocks are trading at or below the intrinsic value of their recurring revenue streams.

**Software Outperformed the S&P in 2017**

Software stocks ended the year up 42% compared to up 19% for the S&P 500 Index and up 28% for the Nasdaq. Software stock outperformance relative to the S&P 500 Index of over 23% in 2017 was a return to relatively consistent recent outperformance after 2016 saw the first year of underperformance since 2011 and was only the second year of underperformance in the past 10 years. The significant 23% outperformance of Software in 2017 was only eclipsed twice since the turn of the century, exiting the aftermath of the Tech Bubble in 2003 and emerging from the Great Recession in 2009, and only modestly at that, as Software outperformed by 24% in each of those years. See Chart 2 below.

**Chart 2: Annual Software Stock Price Performance Relative to the S&P 500**

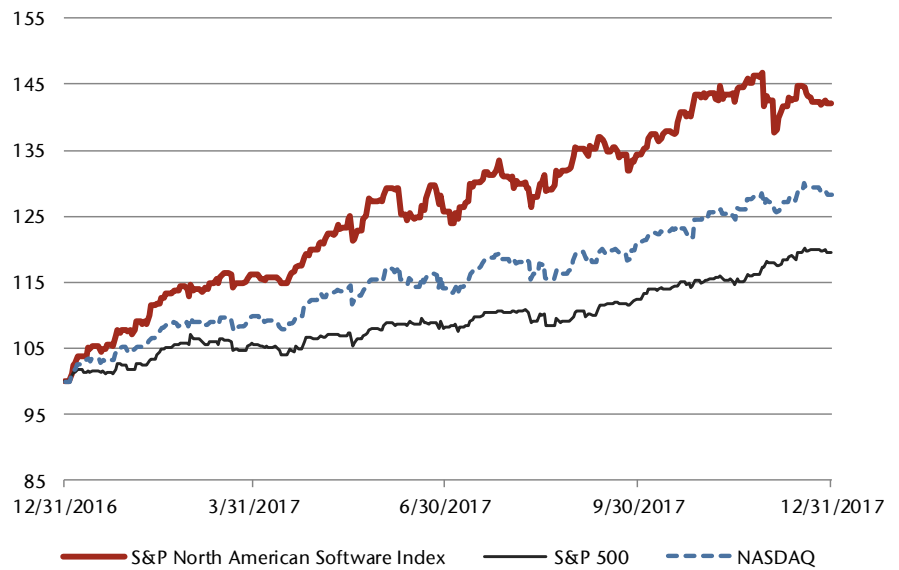


**Source: Factset and Jefferies Research**  
**Note: Software returns are represented by the S&P North American Technology Sector/Software Index**

As shown in Chart 3 below, Software began the year strongly and consistently, outperforming the S&P 500 by 30% by the end of November, after which Software underperformed the index by 7%, and ended the year outperforming the S&P 500 by 23%.

**Chart 3: Software Stock Performance Relative to the S&P 500 and Nasdaq in 2017**

Indexed to 100

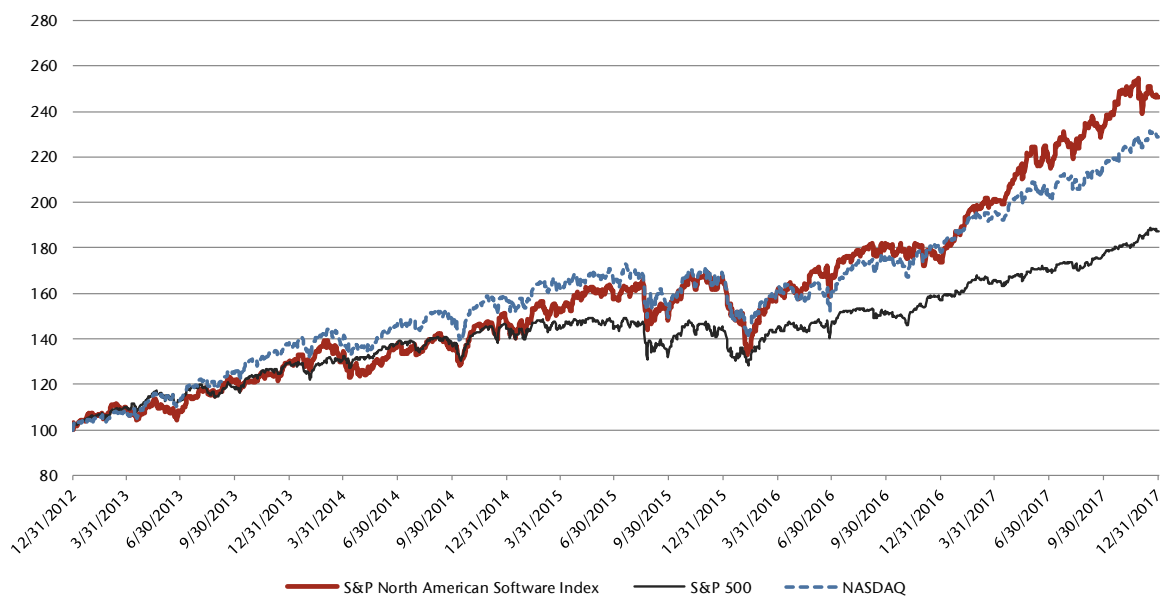


Source: Factset and Jefferies Research

Note: Software returns are represented by the S&P North American Technology Sector/Software Index

Looking back over a longer five-year period, 2017 brought Software ahead relative to the NASDAQ (Nasdaq up 129% in past five years), also ahead of the 88% gains of the S&P over the same period, relative to 146% for Software. See Chart 4 below.

**Chart 4: Software Stock Performance Relative to the S&P 500 and Nasdaq from 2013 through 2017**



Source: Factset and Jefferies Research

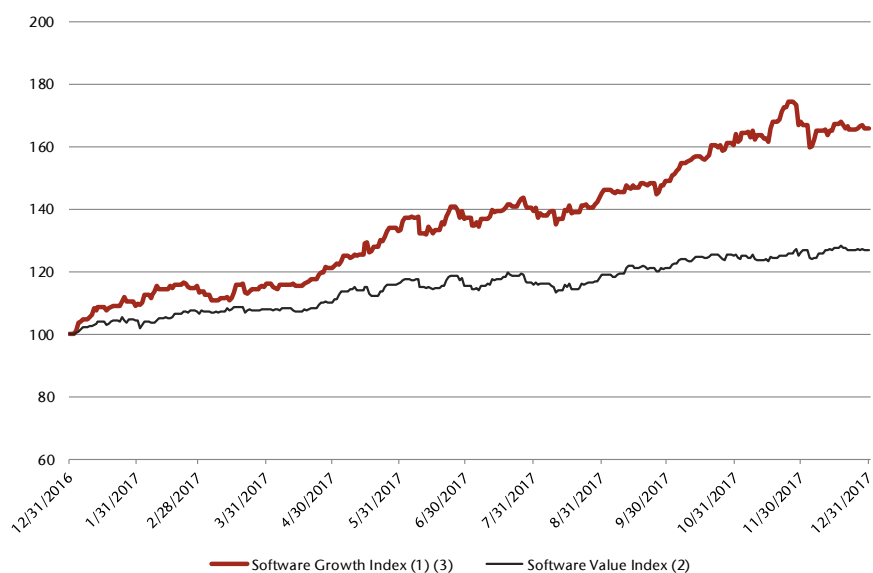
Note: Software returns are represented by the S&P North American Technology Sector/Software Index

### Growth vs. Value: Start to Finish Outperformance by Growth Stocks

Within our coverage universe, we evaluated the performance of indices comprised of “Growth” and “Value” stocks. We determine these indices by categorizing our coverage universe into Growth and Value buckets. The assignments are based on our best judgement and discretion.

While Value stocks outperformed in 2016, Growth stocks led the way with a much more meaningful outperformance in 2017. Growth stock appreciation outpaced Value stocks from start to finish, particularly after the first quarter when Growth stocks outperformed Value stocks by 30% following the month of April. See Chart 5 below.

**Chart 5: Growth vs. Value Stocks in 2017**



**Source: Factset and Jefferies Research**

- (1) Growth Index includes: ADBE, ALRM, APTI, BNFT, CALD, CRM, DATA, INST, MB, MIME, MULE, NTN, PANW, PAYC, RHT, RNG, SAIL, SOPH-LN, SPLK, SSNC, TEAM, VRNS, WDAY.
- (2) Value Index includes: CA, CHKP, CVLT, CTXS, INTU, MSFT, ORCL, NICE, SGE-LN, SYMC, VMW, 4704-JP (Trend Micro)
- (3) MULE was an IPO with stock appreciation measured as of IPO pricing of \$17 on 3/17/2017. SAIL was an IPO with stock appreciation measured as of IPO pricing of \$12 on 11/17/2017.

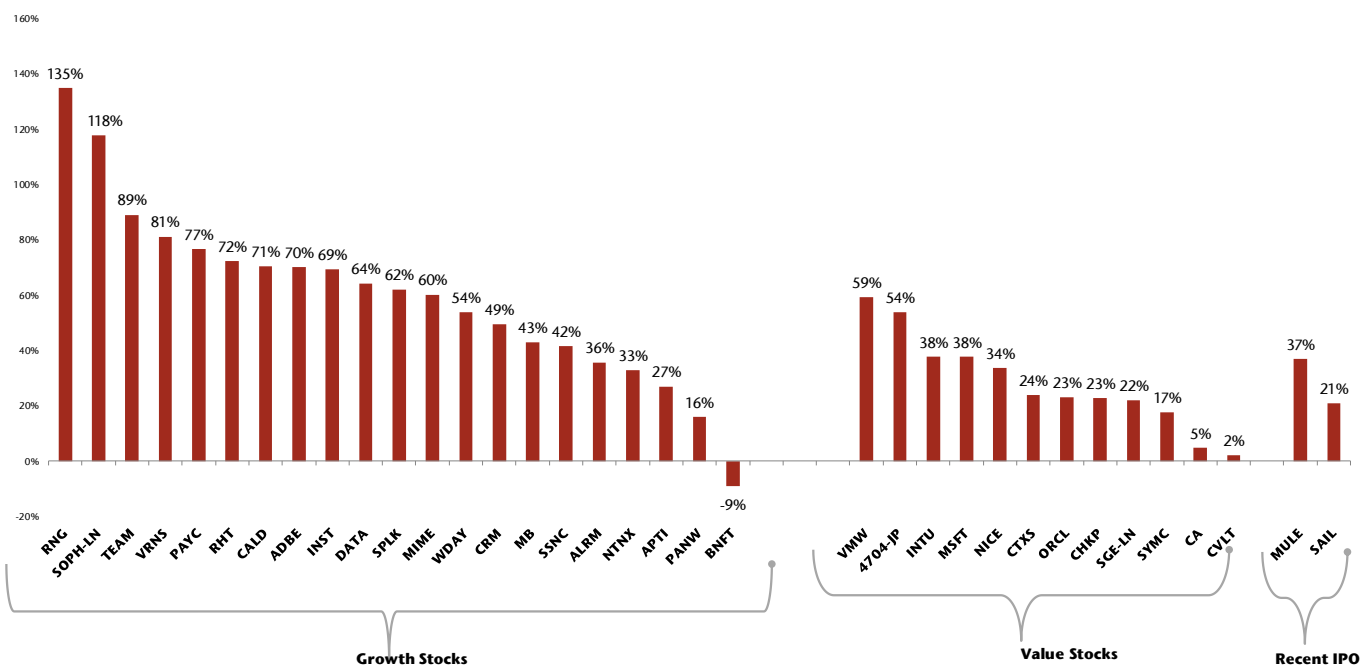
Performance was very strong for most Growth names while Value names also saw strong stock appreciation, albeit more modestly. The Growth names in our index all showed gains in 2017 except for BNFT, with RNG, SOPH-LN, and TEAM increasing by the largest amount during the year on better-than-expected financial performance in addition to other factors (speculation around RNG as an acquisition candidate; SOPH-LN benefited from an attractive backdrop for demand for security, while its solid medium-term guidance helped allay investor concerns on its business model; while TEAM offers investors material growth and a unique business model).

The worst performer within Value was CVLT, which only appreciated by 2%, as the company saw some execution issues during the year, although we note that it was one of the best performers in the peer group for 2016. CA was also a laggard as it appreciated only 5% during the year. The strongest performers were VMW (strong outperformance relative to expectations), 4704-JP (Trend Micro), INTU, and MSFT (strong Cloud revenue

and better Windows results relative to a continued lackluster PC market) which saw stock increases of 59%, 54%, 38%, and 38% respectively.

Overall, Growth names which are typically more volatile, saw consistently strong market appreciation outside of BNFT. BNFT was the worst performer of our Growth universe, declining 9% while the second worst name in the growth coverage peer group appreciated 16%; as the company struggled to execute amid management turnover following regulatory uncertainty related to the new political regime. The best Growth performers included RNG (strong financial execution & acquisition candidate), SOPH-LN (attractive backdrop for demand for security software, along with its solid medium-term guidance allaying investor concerns), TEAM (secular tailwinds, unique business model and strong performance), and VRNS (strong execution and secular tailwinds). See Chart 6 below.

**Chart 6: Stock Price Performance by Company in 2017**



Source: Factset and Jefferies Research. All returns in USD except SOPH-LN and SGE-LN which are GBP and 4704-JP (Trend Micro) which is JPY.

Notes:

- 1) The assignment to Growth or Value is based on our judgement and discretion.
- 2) MULE was an IPO with stock appreciation measured as of IPO pricing of \$17 on 3/17/2017. SAIL was an IPO with stock appreciation measured as of IPO pricing of \$12 on 11/17/2017
- 3) ADBE, INTU, and MB are covered by Brent Thill; SOPH-LN and SGE-LN are covered by Vijay Anand; and 4704-JP is covered by Hiroko Sato.

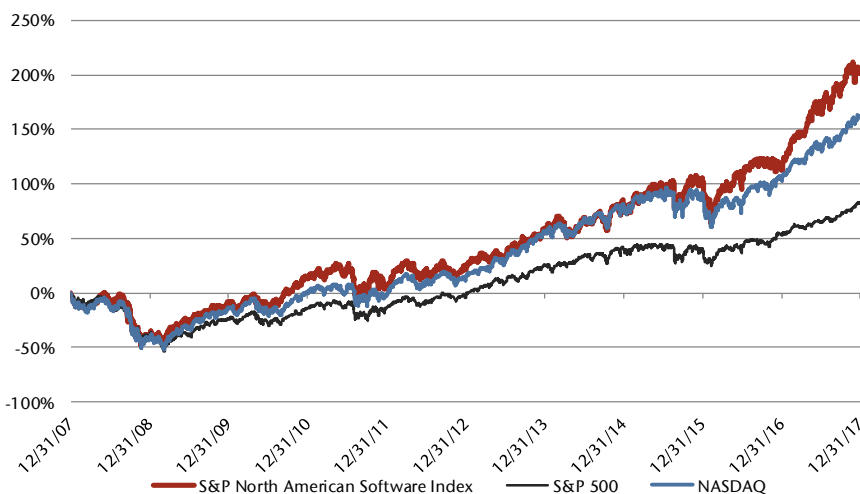
## Historical Stock Performance

### Offense and Defense of Software Business Models Yield Long-Term Outperformance

A longer-term view of software performance relative to the broader market continues to be favorable, which we attribute partly to the dual-threat nature of most Software business models. Maintenance revenue streams (or subscription renewals) that tend to be highly recurring and highly profitable provide a defensive avenue for investors in a

difficult macro environment. On the other hand, license sales (or new subscriptions) are more cyclical in nature (or secular in some cases) and hence, provide a more offensive avenue for investors in an improving and/or booming macro environment. We believe this dual-threat nature of most Software business models have helped Software stocks outperform the broader market since before the Great Recession. See Chart 7 below. Software stocks not only declined less than the S&P 500 did during the 2008 global financial crisis, but they also saw greater appreciation coming out of the downturn and have largely maintained that outperformance since.

**Chart 7: Relative Performance Since the End of 2007**



Source: Factset and Jefferies Research

## Historical Operating Performance

Using an ETF proxy for the S&P North American Technology Software Index, Software company revenue growth once again outpaced that of the broader market, accelerating after two years of moderate growth. Software sector revenue was up 10.0% year-over-year in 2017 (10.1% on a constant currency basis), compared to a 6.2% increase for the S&P 500 constituents. By comparison, the Software sector grew revenue by 0.2% in 2015 (6.3% cc) and 3.7% in 2016 (3.1% cc). We note, however, that the two largest software companies (MSFT and ORCL) collectively accounted for about 62% of the Software sector's total revenues in the last two years, but certainly exhibit moderating top line growth. Excluding these companies, the Software sector grew 13.1% year-over-year in 2017 (13.2% cc), compared to 7.0% in 2016 (6.3% cc), and 4.9% in 2015 (11.1% cc). See Chart 8 below.

Meanwhile, non-GAAP EPS for the Software sector increased 10.1% year-over-year in 2017, compared to 9.4% growth for the S&P 500. When excluding MSFT and ORCL, non-GAAP EPS for the Software sector increased 9.8% year-over-year. We note that Software's margin leverage (excluding MSFT and ORCL) is better than that seen by the broader S&P constituents reflecting in our opinion the superior business model of software. See Chart 8 below.



**Chart 8: Software Operating Performance vs. S&P 500**

|  | CY2013   | CY2014   | CY2015   | CY2016   | CY2017E  |
|--|----------|----------|----------|----------|----------|
| <b>Software Index <sup>1</sup></b>         |          |          |          |          |          |
| Total Revenue (billions)                   | 175.2    | 188.4    | 188.7    | 195.8    | 215.5    |
| y/y change %                               |          | 7.5%     | 0.2%     | 3.7%     | 10.0%    |
| y/y change % (cc) <sup>4</sup>             |          | 8.7%     | 6.3%     | 3.1%     | 10.1%    |
| Non-GAAP EPS (\$)                          | 49.31    | 57.28    | 74.15    | 81.09    | 89.30    |
| y/y change %                               |          | 16.2%    | 29.4%    | 9.4%     | 10.1%    |
| Total Revenue ex. MSFT & ORCL <sup>3</sup> | 63.7     | 65.2     | 68.4     | 73.2     | 82.8     |
| y/y change %                               |          | 2.4%     | 4.9%     | 7.0%     | 13.1%    |
| y/y change % (cc) <sup>4</sup>             |          | 3.6%     | 11.1%    | 6.3%     | 13.2%    |
| Non-GAAP EPS ex. MSFT & ORCL               | 43.80    | 51.89    | 68.85    | 75.58    | 82.98    |
| y/y change %                               |          | 18.5%    | 32.7%    | 9.8%     | 9.8%     |
| <b>S&amp;P 500 <sup>2</sup></b>            |          |          |          |          |          |
| Total Revenue                              | 10,285.3 | 10,675.1 | 10,314.0 | 10,493.9 | 11,140.6 |
| y/y change %                               |          | 3.8%     | -3.4%    | 1.7%     | 6.2%     |
| Non-GAAP EPS                               | 1,787.34 | 2,012.31 | 2,051.68 | 2,152.57 | 2,355.06 |
| y/y change %                               |          | 12.6%    | 2.0%     | 4.9%     | 9.4%     |

Source: Factset, iShares, and Jefferies Research.

(1) Software index is represented by the iShares North American Tech-Software ETF (IGV), excluding ATVI, EA, FICO, TTWO, TIVO, and ZNGA.

(2) S&P 500 is represented by the iShares S&P 500 ETF (IVV)

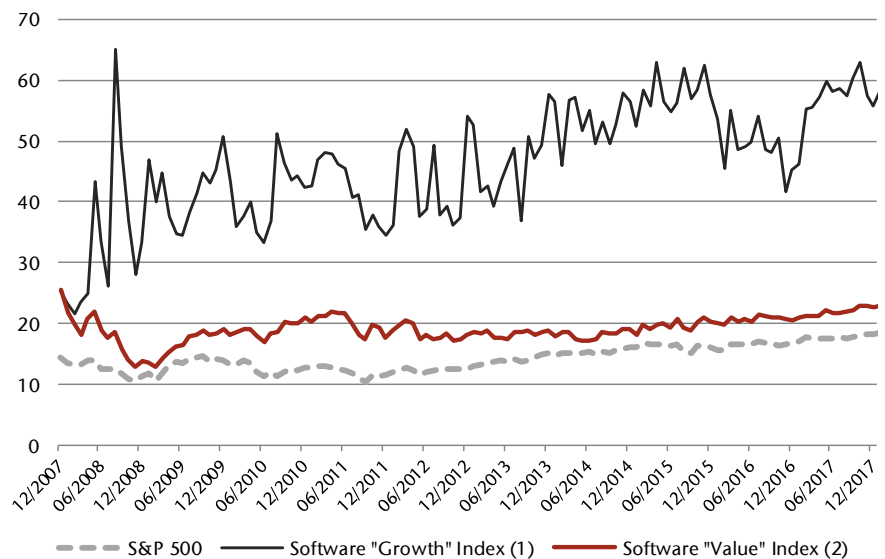
(3) ORCL revenue is non-GAAP revenue minus services and hardware revenue as reported by the company in its filings

(4) Constant Currency revenue growth based on Jefferies estimated annual currency impact based on Rev Weightings of 23% in 1Q, 24% in 2Q, 25% in 3Q and 28% in 4Q.

## Value vs. Growth

By the end of 2017, Value stock multiples expanded 11% to 22.6x NTM EPS, while Growth stock multiples increased 19% to 55.1x, which is slightly below the Tech Bubble levels for the aggregate Software sector. Value names were boosted by the multiple expansion of MSFT, NICE, 4704-JP and VMW. See Chart 9 below.

While growth names generally have performed better than value stocks over the last couple of years (excluding 2016), their valuations have also expanded more, which may cap further meaningful appreciation of the group as a whole. However, we do expect those growth names with secular winds at their backs to continue to grow revenue meaningfully, which should nevertheless have a positive effect on their stock prices. On the flip side, we expect some value names that have not worked over the last year or two to outperform this year. See the section "How to Play Our Coverage Universe in 2018" later in this report. Though value names may be easier to buy when valuation is considered, we expect specific stock selection in both groups to be paramount, rather than simply buying one group over the other.

**Chart 9: Software Index Valuations (NTM P/E)**

**Source: FactSet and Jefferies Research**

NTM P/E multiples were capped at 110x; otherwise data was excluded from peer group average.

- (1) Growth Index includes: ADBE, ALRM, APTI, BNFT, CALD, CRM, DATA, INST, MB, MIME, MULE, NTNX, PANW, PAYC, RHT, RNG, SAIL, SOPH-LN, SPLK, SSNC, TEAM, VRNS, WDAY.
- (2) Value Index includes: CA, CHKP, CVLT, CTXS, INTU, MSFT, ORCL, NICE, SGE-LN, SYMC, VMW, 4704-JP (Trend Micro)

### **“Growth” Valuations Rebound, Remaining Rich... Some Supported by Secular Trends**

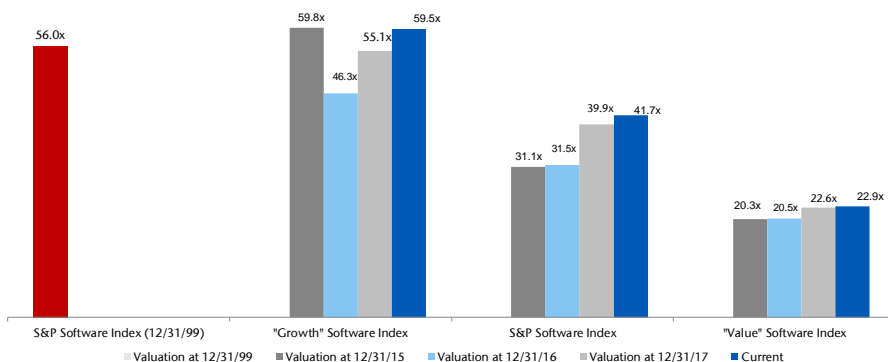
Valuations (based on NTM P/E) for Growth software rebounded to 55.1x at the end of 2017 after last year’s decline, not far off the 56.0x for aggregate Software during the tech bubble exiting 1999, implying rich valuations. However, these multiples have climbed further and are at 59.5x today. See Chart 10 below. While the group looks expensive relative to history, we continue to believe stock selection and fundamental analysis are key to driving opportunity within Growth Software. Many Growth companies are levered to secular themes (e.g., big data, cloud, security, GDPR), which we believe will drive revenue growth and eventual meaningful profit and cash flow via the high operating leverage inherent in Software models. In addition, the recent corporate tax code changes will likely increase earnings for some software companies, reducing the multiple, all else equal. For instance, we expect the lower US federal tax rate to have about a 12% increase in non-GAAP EPS for the average company in our coverage universe. See Chart 48.

While they are meaningfully above the overall S&P Software index, we believe higher multiples for some Growth stocks are justified based on their potential and likely future cash flows. At the same time, we often see the valuations assigned by the market of “Growth” names exceed the likely future growth of these companies. Furthermore, we believe that Growth stocks will remain more influenced by macroeconomic factors than Value stocks since they are more dependent on new license and subscription sales (which is likely contributing to the recent outperformance of growth), versus maintenance and subscription renewals that oftentimes provide the foundation for the valuations of Value stocks. However, we do note that the SaaS model masks the real growth of new business for these companies, and although we attempt to tease out a reasonable proxy (i.e., new

subscription ACV), the market has often either ignored this (e.g., CRM) or seemed confused by it (e.g., WDAY) in prior years.

**Chart 10: Valuation Comparison: S&P Software Index in 1999 vs. Software Indices Today**

NTM P/E



Source: Factset and Jefferies Research

Notes: NTM P/E multiples were capped at 110x; otherwise data was excluded from peer group average. Growth Index includes: ADBE, ALRM, APTI, BNFT, CALD, CRM, DATA, INST, MB, MIME, MULE, NTNX, PANW, PAYC, RHT, RNG, SAIL, SOPH-LN, SPLK, SSNC, TEAM, VRNS, WDAY. Value Index includes: CA, CHKP, CVLT, CTXS, INTU, MSFT, ORCL, NICE, SGE-LN, SYMC, VMW, 4704-JP (Trend Micro)

As shown in Chart 11 below, the top two Value names (VMW and 4704-JP) appreciated through both earnings and multiple expansion. Almost all of our Growth names were up on the year (+60% on average), with the average multiple expanding 19%. The Growth names that performed best (RNG, SOPH-LN, and TEAM) all had strong financial performances throughout the year. Within the growth group, we'd be more inclined to side with those names that are still building their businesses on the back of real secular trends (such as Big Data, Cloud, Security, GDPR, IoT, and Digital Marketing, etc.), and be cautious on corporations that simply will not be able to maintain future growth rates, especially those that may have benefitted from a wide misunderstanding of the true growth because of characteristics of subscription models, for instance.

Chart 11: Valuation and Stock Performance of Software Companies Across Value and Growth

|                 | Ticker                  | Stock Price (2) |                 |            |                 |           | Market Cap | NTM P/E     |             |            |             |            |
|-----------------|-------------------------|-----------------|-----------------|------------|-----------------|-----------|------------|-------------|-------------|------------|-------------|------------|
|                 |                         | Dec '16         | Dec '17         | 2017 Δ     | Current         | YTD Δ     |            | Dec '16     | Dec '17     | 2017 Δ     | Current     | YTD Δ      |
| <b>Growth</b>   | ADBE                    | \$102.95        | \$175.24        | 70%        | \$196.49        | 12%       | 96,858     | 26.4        | 31.0        | 17%        | 34.3        | 11%        |
| <b>Names</b>    | ALRM                    | \$27.83         | \$37.75         | 36%        | \$38.27         | 1%        | 1,804      | 44.3        | 40.6        | -8%        | 40.5        | 0%         |
|                 | APTI                    | \$18.53         | \$23.52         | 27%        | \$24.00         | 2%        | 970        | N/A         | N/A         | N/A        | N/A         | N/A        |
|                 | BNFT                    | \$29.70         | \$27.00         | -9%        | \$25.15         | -7%       | 784        | N/A         | N/A         | N/A        | N/A         | N/A        |
|                 | CALD                    | \$16.80         | \$28.65         | 71%        | \$29.75         | 4%        | 2,026      | 48.2        | 55.8        | 16%        | 56.8        | 2%         |
|                 | CRM                     | \$68.46         | \$102.23        | 49%        | \$110.04        | 8%        | 79,482     | 54.4        | 60.5        | 11%        | 64.3        | 6%         |
|                 | DATA                    | \$42.15         | \$69.20         | 64%        | \$74.07         | 7%        | 5,797      | N/A         | N/A         | N/A        | N/A         | N/A        |
|                 | INST                    | \$19.55         | \$33.10         | 69%        | \$33.70         | 2%        | 1,003      | N/A         | N/A         | N/A        | N/A         | N/A        |
|                 | MB                      | \$21.30         | \$30.45         | 43%        | \$32.95         | 8%        | 1,535      | N/A         | N/A         | N/A        | N/A         | N/A        |
|                 | MIME                    | \$17.90         | \$28.67         | 60%        | \$32.10         | 12%       | 1,840      | N/A         | N/A         | N/A        | N/A         | N/A        |
|                 | NTNX                    | \$26.56         | \$35.28         | 33%        | \$36.73         | 4%        | 5,892      | N/A         | N/A         | N/A        | N/A         | N/A        |
|                 | PANW                    | \$125.05        | \$144.94        | 16%        | \$154.23        | 6%        | 14,172     | 39.2        | 39.3        | 0%         | 41.3        | 5%         |
|                 | PAYC                    | \$45.49         | \$80.33         | 77%        | \$88.35         | 10%       | 5,148      | 43.7        | 52.1        | 19%        | 55.1        | 6%         |
|                 | RHT                     | \$69.70         | \$120.10        | 72%        | \$126.60        | 5%        | 22,409     | 27.5        | 37.0        | 34%        | 38.7        | 5%         |
|                 | RNG                     | \$20.60         | \$48.40         | 135%       | \$51.50         | 6%        | 3,931      | N/A         | N/A         | N/A        | N/A         | N/A        |
|                 | SOPH - LN               | GBP 2.62        | GBP 5.70        | 118%       | GBP 6.42        | 13%       | 4,150      | N/A         | N/A         | N/A        | N/A         | N/A        |
|                 | SPLK                    | \$51.15         | \$82.84         | 62%        | \$90.57         | 9%        | 12,812     | 103.6       | 100.3       | -3%        | 107.7       | 7%         |
|                 | SSNC                    | \$28.60         | \$40.48         | 42%        | \$49.71         | 23%       | 10,233     | 14.9        | 18.2        | 22%        | 21.7        | 19%        |
|                 | TEAM                    | \$24.08         | \$45.52         | 89%        | \$54.87         | 21%       | 12,705     | 60.7        | 82.4        | 36%        | 97.8        | 19%        |
|                 | VRNS                    | \$26.80         | \$48.55         | 81%        | \$52.90         | 9%        | 1,473      | N/A         | N/A         | N/A        | N/A         | N/A        |
|                 | WDAY                    | \$66.09         | \$101.74        | 54%        | \$112.26        | 10%       | 23,575     | N/A         | 88.4        | N/A        | 96.3        | 9%         |
|                 | <b>Average</b>          |                 |                 | <b>60%</b> |                 | <b>8%</b> |            | <b>46.3</b> | <b>55.1</b> | <b>19%</b> | <b>59.5</b> | <b>8%</b>  |
| <b>Value</b>    | 4704-JP                 | JPY 4,155.00    | JPY 6,390.00    | 54%        | JPY 6,160.00    | -4%       | 7,649      | 25.0        | 30.1        | 20%        | 28.9        | -4%        |
| <b>Names</b>    | CA                      | \$31.77         | \$33.28         | 5%         | \$34.47         | 4%        | 14,427     | 12.3        | 13.1        | 7%         | 13.6        | 3%         |
|                 | CHKP                    | \$84.46         | \$103.62        | 23%        | \$103.57        | 0%        | 16,928     | 17.2        | 18.1        | 5%         | 18.0        | 0%         |
|                 | CTXS                    | \$89.31         | \$88.00         | -1%        | \$91.19         | 4%        | 13,740     | 16.7        | 18.1        | 9%         | 18.7        | 3%         |
|                 | CVLT                    | \$51.40         | \$52.50         | 2%         | \$52.65         | 0%        | 2,432      | 45.6        | 41.6        | -9%        | 41.4        | -1%        |
|                 | INTU                    | \$114.61        | \$157.78        | 38%        | \$164.29        | 4%        | 42,001     | 24.9        | 30.1        | 21%        | 30.5        | 1%         |
|                 | MSFT                    | \$62.14         | \$85.54         | 38%        | \$90.14         | 5%        | 695,393    | 20.0        | 23.8        | 19%        | 24.9        | 5%         |
|                 | NICE                    | \$68.76         | \$91.91         | 34%        | \$92.63         | 1%        | 5,641      | 17.6        | 20.7        | 18%        | 20.7        | 0%         |
|                 | ORCL                    | \$38.45         | \$47.28         | 23%        | \$50.27         | 6%        | 208,098    | 14.2        | 15.4        | 8%         | 16.3        | 6%         |
|                 | SGE - LN                | GBP 6.55        | GBP 7.98        | 22%        | GBP 8.02        | 0%        | 11,991     | 20.0        | 22.9        | 15%        | 22.9        | 0%         |
|                 | SYMC                    | \$23.89         | \$28.06         | 17%        | \$27.52         | -2%       | 17,062     | 15.1        | 15.2        | 1%         | 14.8        | -2%        |
|                 | VMW                     | \$78.73         | \$125.32        | 59%        | \$135.33        | 8%        | 54,557     | 16.9        | 22.5        | 34%        | 24.3        | 8%         |
|                 | <b>Average</b>          |                 |                 | <b>26%</b> |                 | <b>2%</b> |            | <b>20.5</b> | <b>22.6</b> | <b>11%</b> | <b>22.9</b> | <b>1%</b>  |
| <b>IPO</b>      | MULE                    | \$17.00         | \$23.26         | 37%        | \$24.32         | 5%        | 3,161      | N/A         | N/A         | N/A        | N/A         | N/A        |
|                 | SAIL (1)                | \$12.00         | \$14.50         | 21%        | \$16.10         | 11%       | 1,377      | N/A         | N/A         | N/A        | N/A         | N/A        |
|                 | <b>Average</b>          |                 |                 | <b>29%</b> |                 | <b>8%</b> |            | <b>N/A</b>  | <b>N/A</b>  | <b>N/A</b> | <b>N/A</b>  | <b>N/A</b> |
| <b>Indicies</b> | <b>S&amp;P 500</b>      | <b>2,238.83</b> | <b>2,673.61</b> | <b>19%</b> | <b>2,802.56</b> | <b>5%</b> | <b>N/A</b> | <b>16.8</b> | <b>18.2</b> | <b>9%</b>  | <b>18.4</b> | <b>1%</b>  |
|                 | <b>S&amp;P Software</b> | <b>453.56</b>   | <b>644.00</b>   | <b>42%</b> | <b>679.64</b>   | <b>6%</b> | <b>N/A</b> | <b>31.5</b> | <b>39.9</b> | <b>27%</b> | <b>41.7</b> | <b>5%</b>  |

Source: Source: Factset and Jefferies Research.

ADBE, INTU, and MB are covered by Brent Thill; SOPH-LN and SGE-LN are covered by Vijay Anand; 4704-JP (Trend Micro) is covered by Hiroko Sato.

(1) MULE was an IPO with stock appreciation measured as of IPO pricing of \$17 on 3/17/2017. SAIL was an IPO with stock appreciation measured as of IPO pricing of \$12 on 11/17/2017

(2) Current Prices as of 1/17/18 market close

(3) Notes: NTM P/E multiples were capped at 110x; otherwise data was excluded from peer group average.

### “Value” Modestly Expensive

On the other hand, Value stocks appreciated (similar to the aggregate software space) and are now trading at about 22.9x NTM P/E after the market increase in the first few weeks of 2018 (versus 22.6x at the end of the year), which is just about half the multiple of the broader Software space. This begs the question of whether this group is littered with value traps – or opportunity. Some Software stocks that fit the so-called “Value” moniker appear to be trading near or below what we calculate as the intrinsic value of the cash flow from their existing recurring revenue stream even if cash flow never grew again

(e.g., CA at 4.3x EV/recurring, SYMC at 5.5x EV/recurring, CVLT at 5.8x EV/recurring, and APTI at 6.4x EV/Subscription). This should give investors some confidence in buying them, since few have rapidly evolving negative secular stories, though they're not without risk.

If these "Value" companies were to trip over something positive, it could be a meaningful catalyst for the stock. However, we are painfully aware of the risk in recommending stocks with this kind of profile. Unless they do indeed trip over something positive, instill a constructive change from within, or someone other than the public markets (either private equity or an acquiring IT vendor) is willing to pay something closer to the intrinsic value, these stocks can languish at what appear to be discontinuities in the market for years.

We firmly believe that for any stock, there is an intrinsic value that is based on the net present value of its future free cash flow – but we also realize that at any given time, a stock is only worth the value that the market assigns it. We typically like the risk versus reward trade-off in such situations, with the realization that something may be needed to unlock this value in the public markets. Within our coverage universe, we believe meaningful opportunity still exists with ORCL, CA (though growth has been elusive for some time), CVLT, and APTI. While we realize that investors are intrigued, if not excited about the opportunities with MSFT, we continue to believe that there is a significant amount of risk associated with its transition to the Cloud, along with MSFT's ties to the PC ecosystem, which still drives the majority of the company's profit, neither of which is implied in the current stock price, and both of which will likely continue to challenge free cash flow.

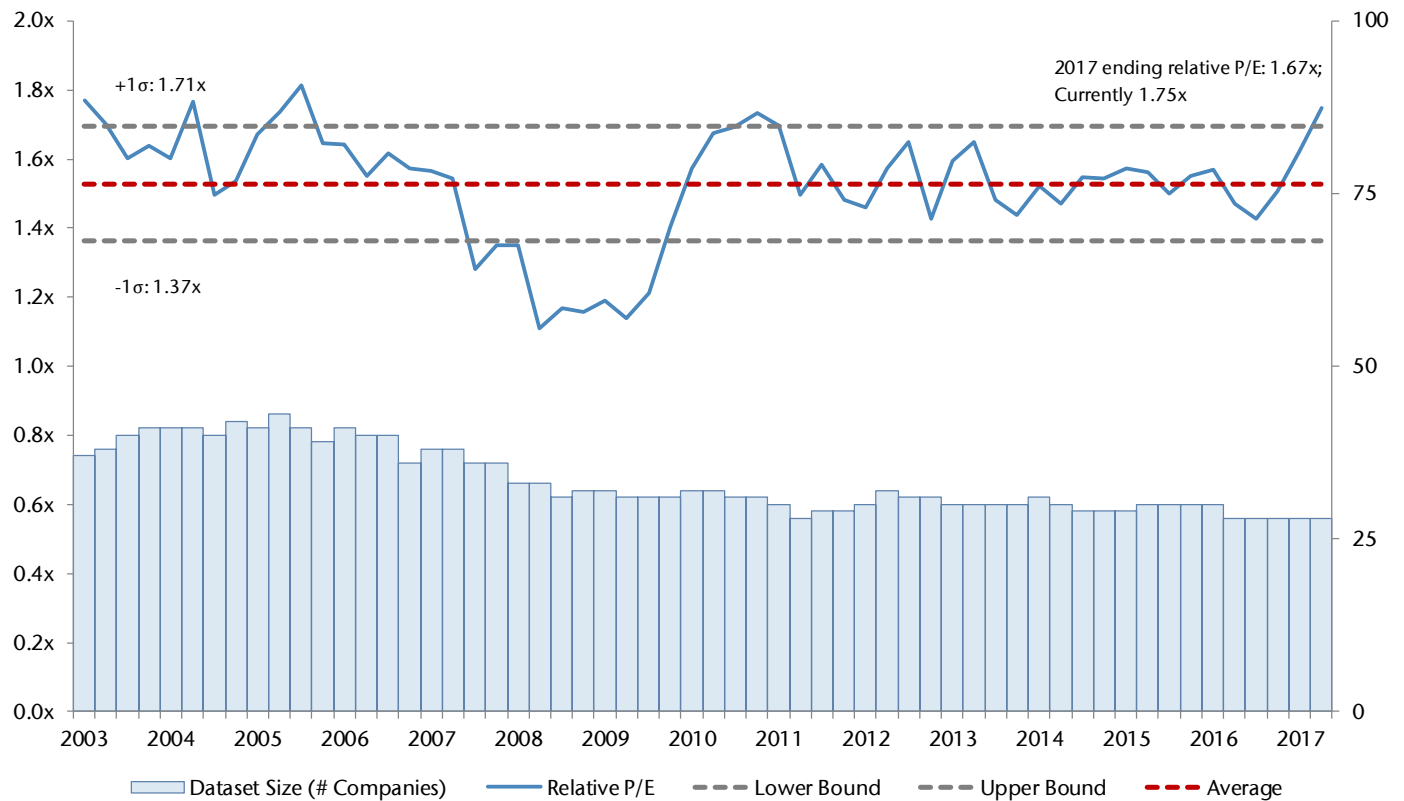
## It All Comes Down to Valuation

We base all of our price targets on what we consider to be a rigorous, academic approach to a three-stage DCF in order to estimate the intrinsic value of a Software stock (or any stock for that matter). However, we do consider other valuation metrics, which can be traced back to the net present value of future cash flow. For instance, we consider the forward P/E of Software (as a proxy for cash flow) relative to that for the market (S&P 500), while we also consider the portion of software stocks trading at or below what we estimate to be about the intrinsic value of their recurring revenue streams if they were run efficiently. In conclusion, Software stock valuations are currently at or near historical highs.

### Software Relative Valuation Expensive vs History

The P/E of Software was 1.67x that of the S&P 500 at the end of 2017 and is currently about 1.75x, meaningfully above the 1.47x at the end of 2016 and above the historical average of 1.53x. See Chart 12 below. Note that we believe Software has traded at a relative multiple greater than one for some time and we expect it to for the foreseeable future for a couple of reasons: (1) the industry's generally higher growth prospects relative to world GDP (as a proxy for the S&P growth), and (2) we believe software would likely trade at a premium to the S&P given its flexibility relative to most industries. Software is based on intellectual assets, not the fixed assets many other industries are based on.

Chart 12: Software P/E Valuations Relative to S&P 500

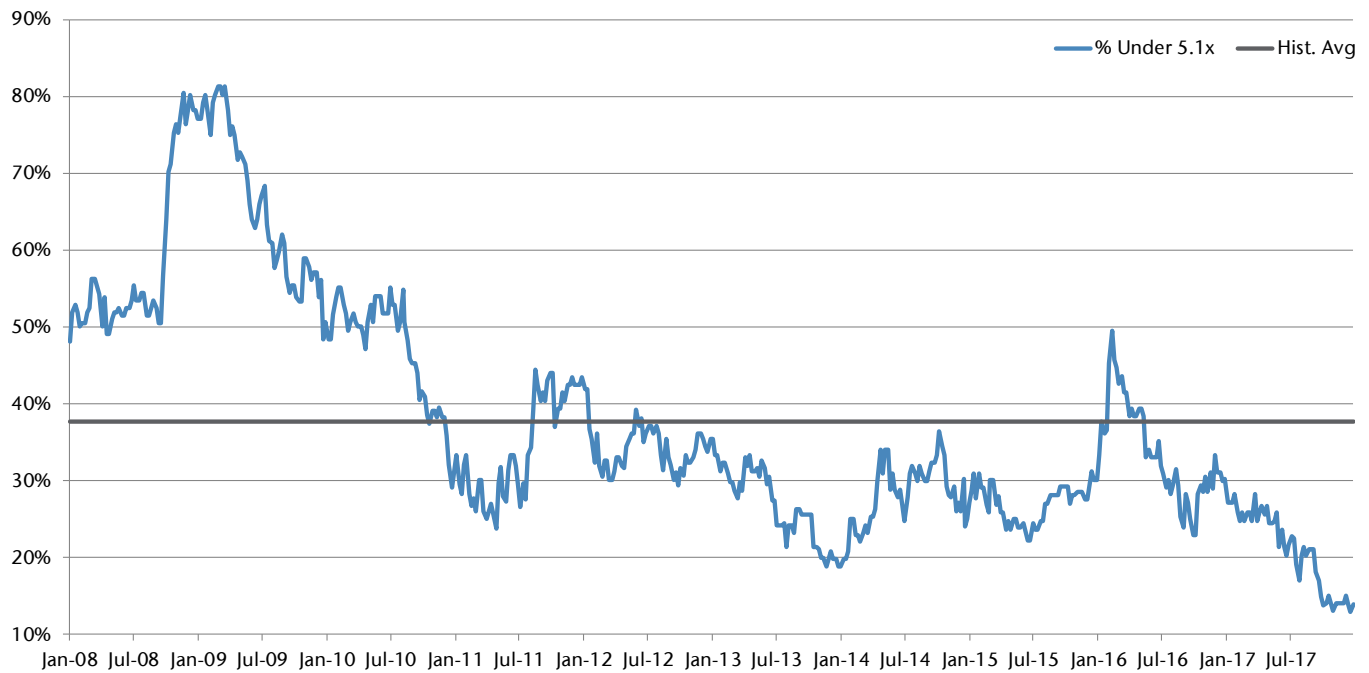


Source: Factset and Jefferies Research

**Few Names Trading at or Below Intrinsic Value of Recurring Revenue**

Finally, we consider the portion of software stocks trading at or below 5.1x EV/TTM Maintenance-like revenue, which was down to 14% from 30% compared to the end of 2016. As of January 17, the percentage of Software stocks trading at or below 5.1x EV/TTM Maintenance-like revenue remained 13%. See Chart 13 below. This ratio is significantly below recent history, as an average of 27% of stocks were trading below this level over the last three years and an average of 36% since the Great Recession. **The current portion of stocks trading below 5.1x EV/Recurring Revenue is at the lowest it's been since we started tracking this metric on a regular basis ten years ago, indicating generally rich valuations for the sector.**

Chart 13: Software Stocks Trading At or Below 5.1x EV/Maintenance – December, 2007 to January 17, 2018



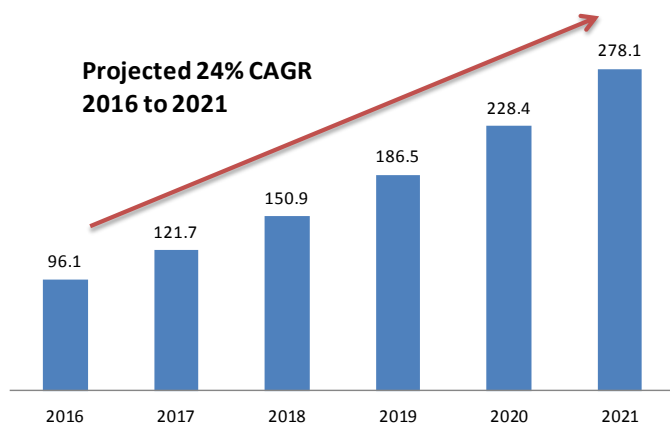
Source: Factset and Jefferies Research

## Positive Industry Thesis Remains Intact

We remain more positive on the prospects for the aggregate Software sector than perhaps we have been in our careers, which spans almost two decades covering the space and more than a decade working in technology prior to that. This view has been consistent for the past few years and recent field discussions and reported results only serve to validate it further. Our constructive bias is not necessarily due to new concepts in Software. Frankly, many of the new economic opportunities in Software are not novel concepts, but the application of them have become more practical today in that they now can be done at a reasonable cost. In other words, the economic equation has been turned on its head so that for instance, a project to extract value from unstructured data may cost less than the value extracted for the first time in history. This is primarily because of advances we have experienced in what we refer to as core computing technologies over the last 10-15 years that provide the foundation of Software solutions.

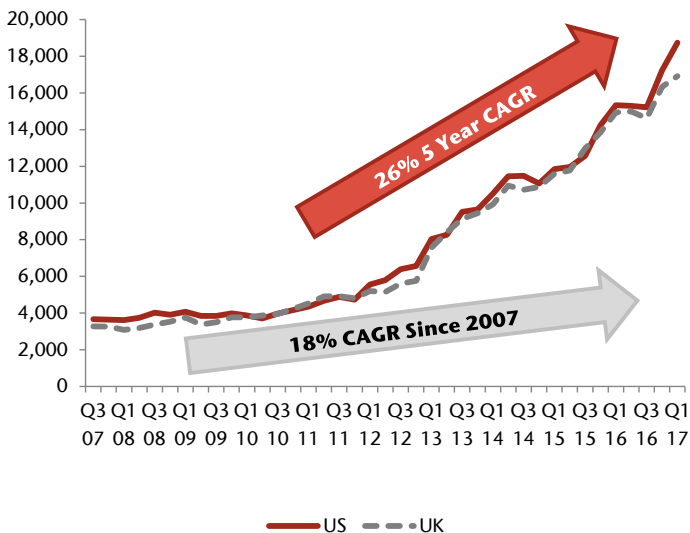
What we're talking about are developments, such as: much faster and cheaper memory, multi-core processors that make it easy to use all that memory, much faster and cheaper compute (including parallel processing) and storage, and perhaps most importantly, much faster, cheaper, broader, and near ubiquitous bandwidth – the Internet. See Charts 14 and 15 below. These are the building blocks for logical Software concepts that may have been discussed for a decade or more, but were not practical, including: Cloud, SaaS (Software-as-a-Service), Big Data, IoT (Internet of Things), AI (Artificial Intelligence) and ML (Machine Learning), SOA (Service Oriented Architectures), Digital Marketing, and others.

**Chart 14: IP Traffic per Month, Global in Exabytes (EB)**



Source: Cisco Visual Networking Index, 2016

**Chart 15: US and UK Average Connection Speeds (kbps)**



Source: Akamai: State of the Internet Connectivity Visualization

### Market Has Recently Rallied Strongly ...

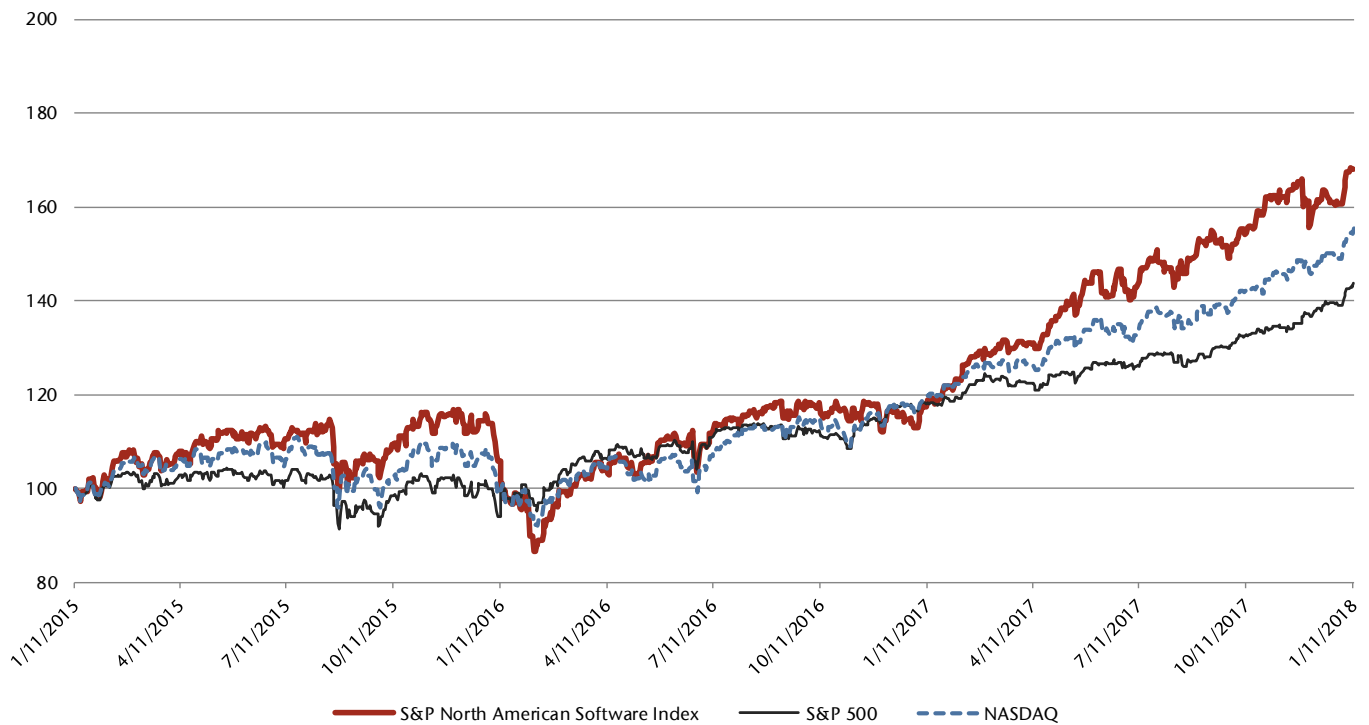
This not only applies to Software, **but to the whole market**. The stock market has rallied 5% year-to-date (as measured by the S&P 500; and up 19% in 2017) and Software is up 6% (as measured by the iShares North American Software ETC, IGV; up 42% in 2017) over the same period. Our positive view of Software trends will affect other sectors. Software advances certainly have a trickledown effect on the enterprises that deploy them, implying an increased potential market, or model efficiency, or both. See Chart 16 below. But does this support the broad market rally that we've experienced over the past year?



Investors are nervous that valuations are stretched at this time and stocks may falter on earnings news unless results are especially strong. While we see this as healthy skepticism and believe there could be a correction, or at least a dip in the market driven by these fears, it may provide an opportunity for many (but not all) Software names.

**Chart 16: Software Stock Performance Relative to the S&P 500 and Nasdaq, 3-Year Trailing**

Indexed to 100

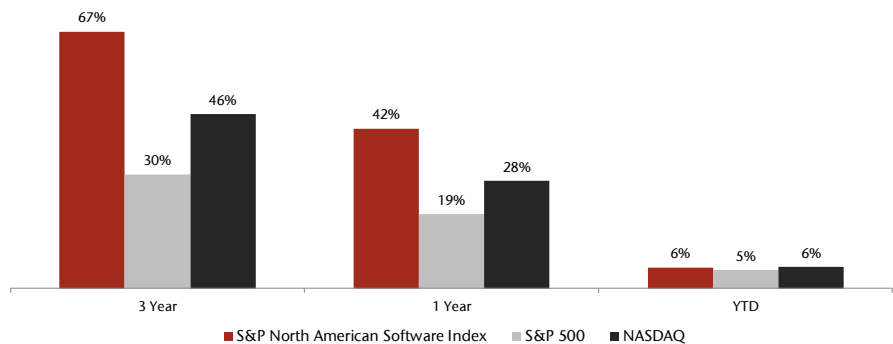


Source: Factset and Jefferies Research

Note: Software returns are represented by the S&P North American Technology Sector/Software Index

### ... But So Have Software Businesses

The performance of Software businesses is detailed in the “Historical Operating Performance” section of this report, depicting accelerating revenue growth. See Chart 16 above. We believe the market rally is largely justified for the aggregate software space, as it and the Internet sector have the most to gain from the benefits noted above. In turn, we believe other sectors will benefit from improved Software, which will enable companies to become more efficient and effective providers of products and services. However, it seems to us that the broader market may have become somewhat stretched in some instances. In addition, this sometimes chaotic, better world lends itself to misunderstanding, and we believe some software names may be riding waves that they have no right to. See Chart 17 below.

**Chart 17: Software Index Performance Versus Market Indices**

Source: FactSet and Jefferies Research; As of January 17, 2018

### Expect Software to Benefit for Years to Come

We expect Software names truly leveraged to the advances in core computing technologies to benefit for years to come, as **new** markets are only just beginning, and many **transition** markets still have far to go. We see three primary consequences from this:

- 1) **Expands Existing Markets.** This does not necessarily threaten existing technologies in some cases, but certainly expands the potential use of certain categories of technology to a much broader audience. For instance, relatively easily consumed SaaS solutions have enabled a segment of the corporate end market to utilize enterprise-class technology where they couldn't previously--the SMB--which typically doesn't have the resources (cash or expertise) to deploy on premise technologies, providing greenfield opportunities for otherwise mature software segments. salesforce.com was a good example of this up until less than two years ago when it first started to see meaningful success at penetrating the enterprise. NetSuite and AWS are also examples of this trend, by expanding ERP and IT infrastructure, respectively, to the SMB.
- 2) **Jumpstarts New Markets.** Some of these logical concepts that are now practical have jumpstarted new, significant markets, as the use of IT is expanded to address workloads that were not typically attempted in the past.
  - For instance, extracting value from machine data was previously difficult, but can now be broadly applied at a reasonable economic cost relative to the value extracted, so names like Splunk and perhaps others should benefit.
  - This also applies to technology companies that apply existing technologies, such as Hadoop and NoSQL data stores, to problems that were much too difficult to solve with traditional data technologies, such as the relational database. These opportunities are largely incremental, though there is certainly some risk of cannibalization that we will continue to monitor (i.e., Hadoop in analytical processing and NoSQL in some transaction processing).
  - In addition, parts of digital marketing (including marketing automation) are relatively new areas of value creation for enterprises. Hubspot is certainly one public company that has leveraged this, while Eloqua (acquired by Oracle) and ExactTarget's (acquired by salesforce.com) Pardot business also

provide sophisticated marketing automation functionality that could not exist in their current form just ten years ago.

- Markets still on the come include AI (Artificial Intelligence) and ML (Machine Learning). How these markets evolve is still unclear. Will AI and ML become embedded across all solutions and become incremental value as a feature to many applications? Or will they become independent markets where the neutral technology is applied across various applications? An example of how this is playing out is in the endpoint security market. Companies such as Cylance were early in applying AI to endpoint security, but now it seems that all vendors profess to have this functionality, which makes it confusing for customers (and analysts) as to who really has what and the differentiation between what one vendor calls AI, and whether others provide the same value.
  - Finally, the Internet has evolved into a relatively dependable enterprise platform, enabling the creation of some applications that could not be imagined otherwise, such as digital marketing and marketing automation, along with the Internet of Things (IoT). Saying IoT is in its infancy today may be too mature a description.
- 3) **Presents Risks to Some Existing Vendors/Markets.** While we believe these advances will support the growth of existing and new markets, at the same time, we're likely to see increased risks to established markets and vendors. On premise software vendors that cater to the SMB are likely most at risk, as it seems logical to us that these corporate consumers of IT are most likely to move to Cloud solutions en masse to avoid the costs associated with datacenters (while also expanding software markets as they consume more IT than they ever had—because they now can through Cloud based solutions). Those that cater to enterprises should fare better, especially those that offer hybrid solutions, or those that can be consumed either on premise or in a Cloud, since most large enterprise IT purchasers speak of a hybrid environment for the foreseeable future. Large enterprises have only started to move to SaaS solutions en masse for some applications over the past few years. Even in a segment like Human Capital Management (HCM), where a leader like Workday has been at it for longer than that, only about half of the Fortune 500 companies have transitioned to a SaaS HCM solution. Gartner believes SaaS deployments of HCM software by large organizations in North America will grow from 45% of the market in 2016 to more than 60% by 2020. Similarly, Gartner believes that 50% of large organizations in emerging regions will acquire modern SaaS HCM technology by 2020, up from 10% in 2010. We also note that IDC's forecasted growth for the HCM/Payroll market reflects this trend, with on premise software expected to be about flat from 2016 to 2020, while SaaS revenue is anticipated to grow at about a 13% CAGR over that same period. See Chart 18 below. The success of Workday in the enterprise Human Capital Management (HCM) market and Oracle's aggressive response is a recent example of how this might play out. Again, this could also result in greater use of IT overall, as easier to consume Cloud solutions encourage increased usage by enterprises and SMBs alike.

**Chart 18: Worldwide HCM and Payroll Accounting Software Revenues – On Premise vs. SaaS**

|   | <u>2016</u>   | <u>2017E</u>  | <u>2018E</u>  | <u>2019E</u>  | <u>2020E</u>  | <u>2021E</u>  | <u>CAGR, '16-'21</u> |
|---|---------------|---------------|---------------|---------------|---------------|---------------|----------------------|
| HCM Software Revenues, On Premise                     | 4,446         | 4,334         | 4,292         | 4,260         | 4,237         | 4,175         | -1.3%                |
| <i>% of Total On Prem + SaaS HCM Revenues</i>         | 34%           | 31%           | 29%           | 26%           | 24%           | 21%           |                      |
| Payroll Accounting Software Revenues, On Premise      | 2,701         | 2,706         | 2,760         | 2,810         | 2,854         | 2,898         | 1.4%                 |
| <i>% of Total On Prem + SaaS Payroll Revenues</i>     | 65%           | 61%           | 58%           | 56%           | 53%           | 51%           |                      |
| <b>HCM/Payroll Software Revenues, On Premise</b>      | <b>7,147</b>  | <b>7,040</b>  | <b>7,052</b>  | <b>7,070</b>  | <b>7,091</b>  | <b>7,072</b>  | <b>-0.2%</b>         |
| <i>% of Total On Prem + SaaS HCM/Payroll Revenues</i> | 42%           | 38%           | 36%           | 33%           | 30%           | 28%           |                      |
| HCM Software Revenues, SaaS                           | 8,446         | 9,575         | 10,725        | 12,193        | 13,775        | 15,531        | 13.0%                |
| <i>% of Total On Prem + SaaS HCM Revenues</i>         | 66%           | 69%           | 71%           | 74%           | 76%           | 79%           |                      |
| Payroll Accounting Software Revenues, SaaS            | 1,486         | 1,714         | 1,958         | 2,215         | 2,502         | 2,828         | 13.7%                |
| <i>% of Total On Prem + SaaS Payroll Revenues</i>     | 35%           | 39%           | 42%           | 44%           | 47%           | 49%           |                      |
| <b>HCM/Payroll Software-as-a-Service Revenues</b>     | <b>9,932</b>  | <b>11,289</b> | <b>12,683</b> | <b>14,408</b> | <b>16,277</b> | <b>18,358</b> | <b>13.1%</b>         |
| <i>% of Total On Prem + SaaS HCM/Payroll Revenues</i> | 58%           | 62%           | 64%           | 67%           | 70%           | 72%           |                      |
| <b>Total HCM/Payroll Software &amp; SaaS Revenues</b> | <b>17,078</b> | <b>18,329</b> | <b>19,735</b> | <b>21,478</b> | <b>23,369</b> | <b>25,431</b> | <b>8.3%</b>          |

Source: IDC Worldwide Human Capital Management and Payroll Applications Forecast, 2016–2021, June 2017

### ... But Beware Pretenders

With this opportunity comes deserved excitement, and with this excitement can come hype, and with hype comes room for “white lies” or the ability to present something in a way that is not quite accurate. Software outperformed the market (23 percentage points about the S&P 500 in 2017, following four percentage points of underperformance in 2016). The gains in the Software sector have been broad-based – beyond those names that likely benefit from the developments noted above. We believe the rally is justified for some stocks, but others have been riding waves that they don’t belong on – and they’ll likely come crashing onto the shore. For instance, try to find a company that doesn’t say they are leveraging AI (Artificial Intelligence). Many are, but that doesn’t mean that their solutions are useful to clients or on par with leaders in this field. In addition, any company that is struggling for whatever reason seems to pivot its business model to a subscription transition for a more favorable view from investors. A move to a subscription model can increase the value of a software company, but there logically would have to be a customer incentive to move to subscription, in addition to just a vendor benefit. “It’s just like Adobe” is the rallying cry. The problem is that it often is not just like Adobe as we believe is the issue with Tableau’s model transition.

## The IT Spending Backdrop; Geographic and Vertical Exposure

### Summary

Only 15 years ago, the macro economy was thought to have little effect on spending patterns in the broader IT sector and Software specifically, as secular trends seemed to outweigh any cyclical effects. This is no longer the case. The macro economy certainly impacts corporate IT purchasing decisions around the world today, as do geopolitical factors (see *Geopolitical and Other Considerations*). For instance, nearly a decade of artificially sustained, historically low worldwide interest rates has provided support for

equities. This support could persist; despite the rising interest rate environment that began in earnest in 2017, rates are still low relative to historical norms. Increased federal government spending has similarly provided stimulus to the US economy during and after the recession of 2008 and 2009. The current presidential administration has turned the corner with steep budget cuts planned for most federal departments, but despite this, the forecasted federal US IT spending within the budget is expected to grow modestly. Meanwhile, prolonged austerity programs in Europe likely have had an even greater impact to European companies given region's outsized government contributions to IT spending, though these effects are less influential today. Finally, from a tactical perspective, if currency exchange rates remain where they are today, we expect the positive impact (average two percent benefit) to the top-line results of US-based Software companies.

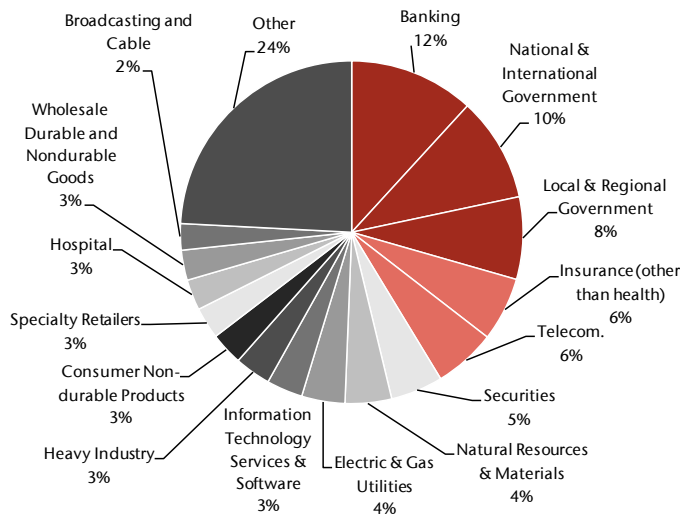
We believe that **about half of global Software demand (the half we can gauge) is well-positioned for modest growth for 2018**, following modest growth in 2017. Discretionary budgets of the most relevant European governments (which altogether represent 8-14% of worldwide software spending) are expected to increase low single digits in aggregate, similar to in 2017. This would mark a fourth consecutive year of growth after four years of declines. US Government IT spending (about 6% of worldwide IT spending) is forecasted to grow 1.7% in 2018 (as of May 2017 data based on the new presidential administration budget), decelerating from estimated 4.2% growth in 2017. Japan (about 9% of worldwide IT and 6% of worldwide Software spending) total IT expenditures are forecast to grow nearly 3% in 2018, per government data and our estimates, an uptick from 2.3% in 2017. We believe that IT budgets in the financial services vertical (representing 23% of worldwide spending) will grow at least modestly in 2018, while industry analysts (IDC and Gartner) project approximately mid-single-digit growth. We will attempt to monitor impacts to IT budgets of the financial services vertical, which can change more quickly than other forces.

### **Governments and Financial Services Represent Half of Global Software Spending**

According to the latest data from Gartner, worldwide IT spending totaled over \$3.0 trillion in 2016, and is expected to grow at a 3% CAGR through 2021, while within this, worldwide Software spending was over \$460 billion, and expected to grow at an 8% CAGR through 2021. We consider the diverse end-markets and geographies that spend on Software and IT, as shown below. Government and the global financial services industry (including banking, insurance, and securities companies) are the two verticals with the highest concentration of corporate consumers. As a result, we intend to follow the health of government budgets and the financial services industry in greater depth and will update investors periodically as developments occur.

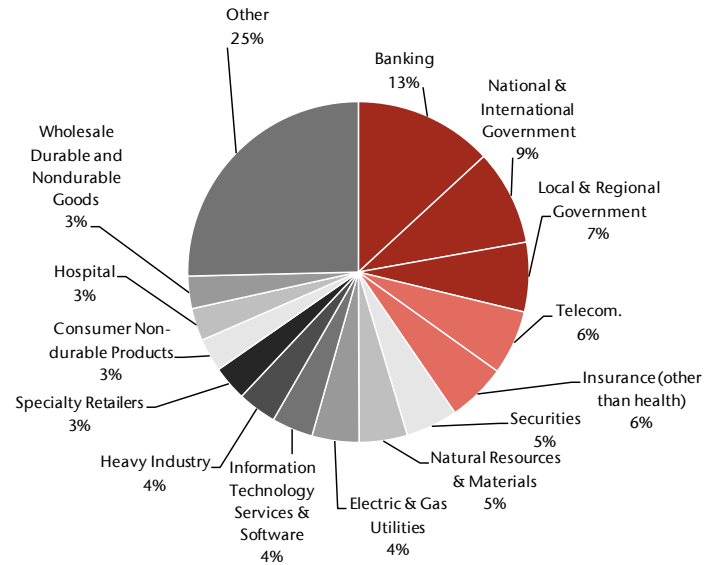
Per Charts 19 and 20 below, governments (national, local, and regional) were responsible for 18% of worldwide Software spending and 16% of worldwide IT spending in 2016. Meanwhile, the global financial services industry was responsible for 23% of worldwide Software spending and 24% of worldwide IT spending. We discuss government spending on IT in more detail below and how this number likely underestimates this important vertical's impact, especially in Europe, which has surprised investors with shortfalls in years past. Software and IT also serve geographically diverse end-markets, with the greatest concentration in North America, which accounts for 49% of Software spending and 39% of IT spending, according to Gartner. The US represents over 90% of total North American Software and IT spending, or 45% of worldwide Software and 36% of worldwide IT spending. See Charts 21 and 22 below. **In summary, we believe that about half of global Software and IT spending is sourced through three demand sources: US government (about 6-9%), European governments (about 8-14%), and the financial services vertical (about 23%).**

**Chart 19: Worldwide Software Spending by Vertical/Industry (CY2016)**



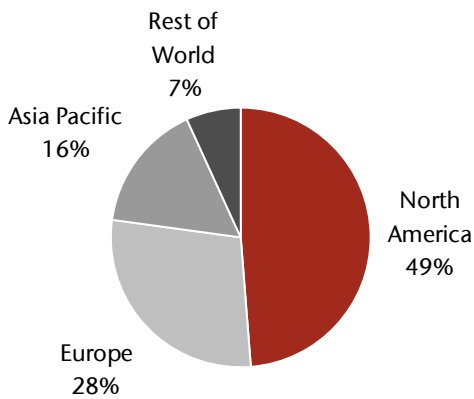
Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

**Chart 20: Worldwide IT Spending by Vertical/Industry (CY2016)**



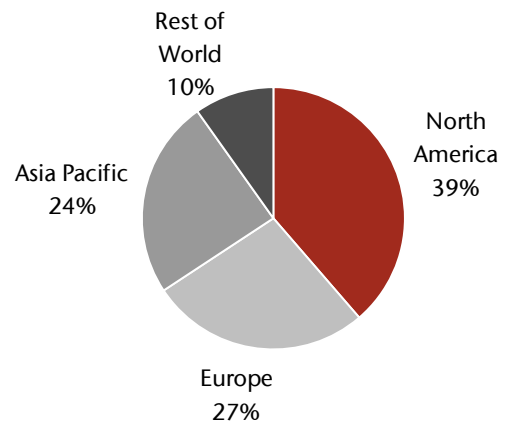
Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

**Chart 21: Worldwide Software Spending by Geography (CY2016)**



Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

**Chart 22: Worldwide IT Spending by Geography (CY2016)**



Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

## US Government Influence on Worldwide Software and IT Spending Remains Significant

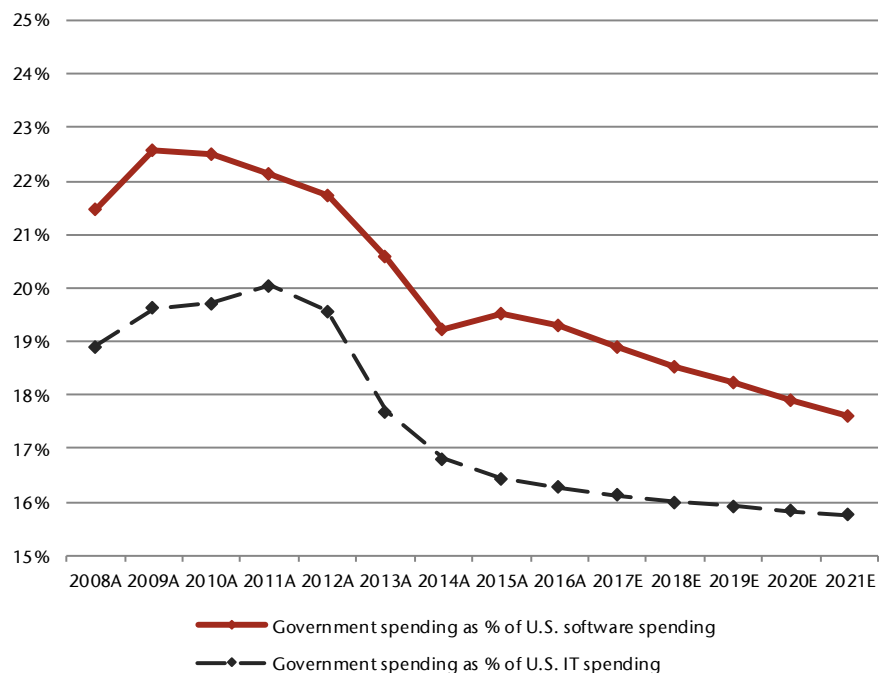
### US Government Share of IT/Software Spending Still Significant

Per Chart 23 below, US Governments (including federal, state, and local) represented approximately 19% of US Software spending and 16% of US IT spending in 2016. This marks a continued decline from a peak of about 23% in 2009, inflated due to federal government programs aimed at stimulating the economy during and after the 2008-2009 recession. Nonetheless, the US government remains one of the most significant contributors to US technology expenditures, even while Software and IT spending in other verticals have modestly outpaced the government. Additionally, despite the modest

decline in US government contribution, aggregate US software and IT spending have continued to slightly outpace global spending. **As a result, US government still accounts for approximately 9% of global Software spending (= 19% x 45%) and 6% of global IT spending (= 16% x 36%) in 2016, unchanged from a year ago.**

After the uptick in US federal government spending during the recession to levels that have moderated recently, Gartner forecasts government's share of spending will continue to decrease modestly to near 18% of US Software spending by 2021, around levels prior to the recession, while the government's contribution to total US IT spending is expected to decline only modestly but remain near 16%. Slightly lower government contribution to US Software spending, per Gartner, is attributable to lower projected growth in US government spending relative to overall US Software spending. Gartner estimates US government spending on Software to grow at a 6.4% CAGR from 2016-2021, while overall US Software spending is anticipated to grow at an 8.4% CAGR during the same period. Meanwhile, Gartner expects US government's IT spending to increase at a 3.1% CAGR from 2016-2021, near overall US IT spending growth of 3.7%.

**Chart 23: Government Spending as % of Total US Software and IT Spending**



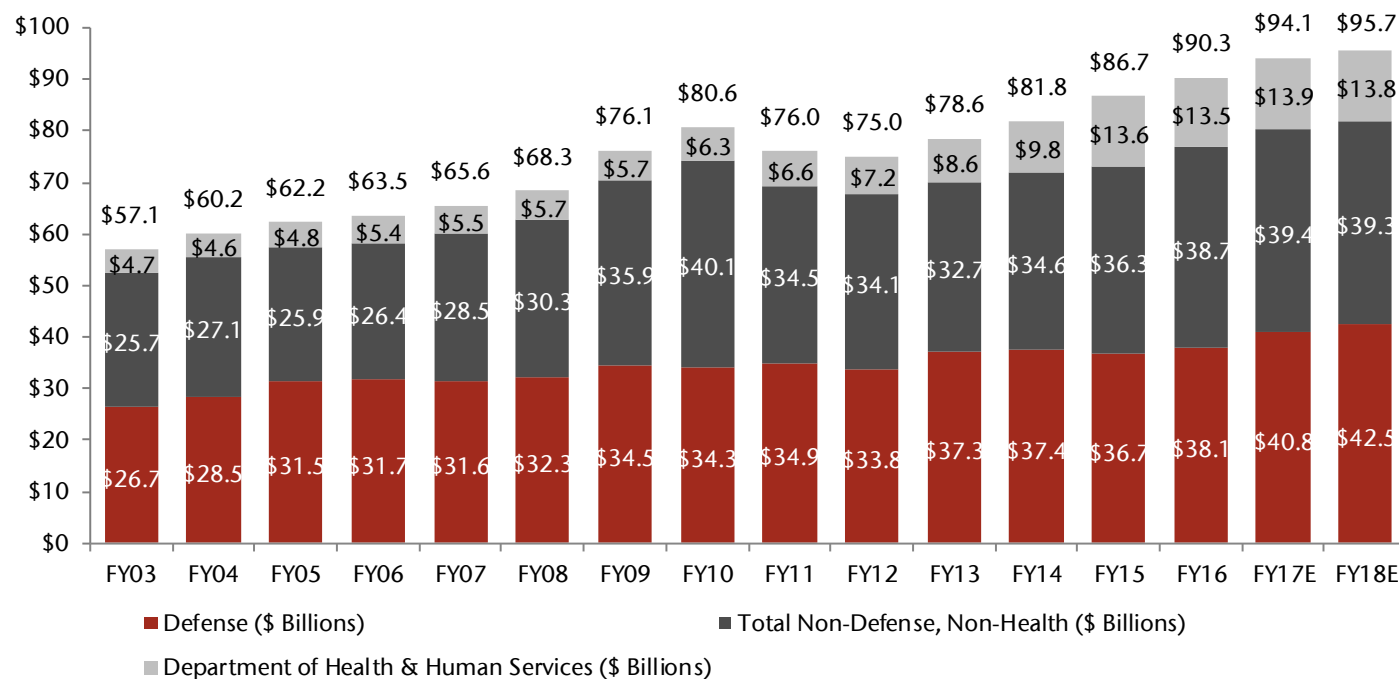
Source: Gartner (Worldwide Enterprise IT Spending by Vertical Industry Market, 3Q17, 3Q16, 3Q15, 3Q13, 3Q11, and 3Q10 Updates)

### Modest US Federal IT Spending Growth Projected for 2018

The US Federal Government increased its spending on IT every fiscal year (ending September) from 2004 through 2010, including acceleration in 2009 and 2010, as it attempted to offset the macro weakness of the recession in 2008-2009. After two years of contraction, spending grew in 2013-2017. See Chart 24 below. According to the latest President's IT Budget as of May 8, 2017, total US federal IT spending was estimated to have grown 4.2% in fiscal 2017 (September end), or 1.6% growth excluding defense and health care IT spending. **According to the latest budget, US federal IT spending is projected to grow more modestly in fiscal 2018, at 1.7% in aggregate, driven by defense and health care IT spending.**

In our view, the forecasted deceleration in US federal IT spending in fiscal 2018 is consistent with the current presidential administration’s planned cuts to both mandatory and discretionary spending. We believe that compared to the magnitude of planned budget cuts in other areas across most federal departments (with the exception of defense, homeland security, and veteran affairs), IT spending seems relatively untouched. Despite the implied growth moderation in the budget, which could change in the next update, federal IT spending is expected to reach a record \$95.7 billion in 2018.

Chart 24: US Federal Government IT Expenditures, Fiscal Years



Source: Office of Management and Budget, as of May 2017

## European Software and IT Spending— As Much Politics as Economics

European governments have an even greater impact on IT and software spending than in the US, because they provide heavier subsidies to various industry verticals than in other parts of the world. These verticals include healthcare, transportation, education, and even manufacturing in some instances. We believe direct plus indirect government spending in Europe account for 30-40% or perhaps even up to 50% of IT spending (including software) in the region. Therefore, it’s important to track the discretionary government budgets of the largest IT spenders in the region, particularly the UK, Germany, and France, and to a lesser extent Netherlands and Italy. The top three country spenders account for 55% of software spending and 54% of aggregate European IT spending. **Based on the latest government budget forecasts for the UK, Germany, and France, we see a 2.3% weighted average increase in 2018 governmental discretionary spending, a slight decline from 2017 and an improvement from 2016.**

### European Governments Represent 8-14% of Worldwide IT/Software Spending

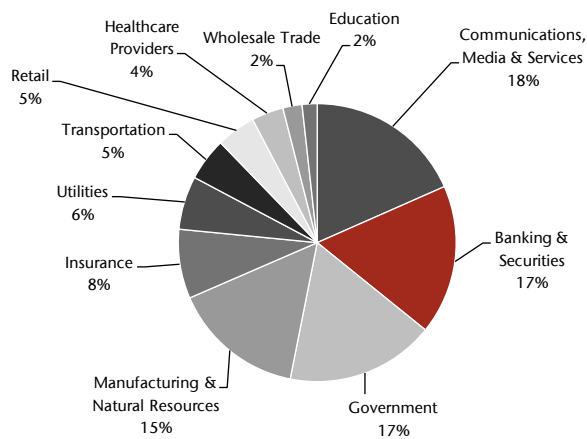
According to Gartner, European governments represented approximately 17% of direct software spending and 16% of direct IT spending in Europe in 2016. These percentages are unchanged from 2014. See Charts 25 and 26 below. Given that Europe accounts for about 28% of worldwide software spending and 27% of worldwide IT spending, one



might conclude that European governments account for approximately 5% of total global software spending (= 17% x 28%) and 4% of aggregate IT spending (= 16% x 27%). However, we believe that this is only part of the story, and somewhat misleading.

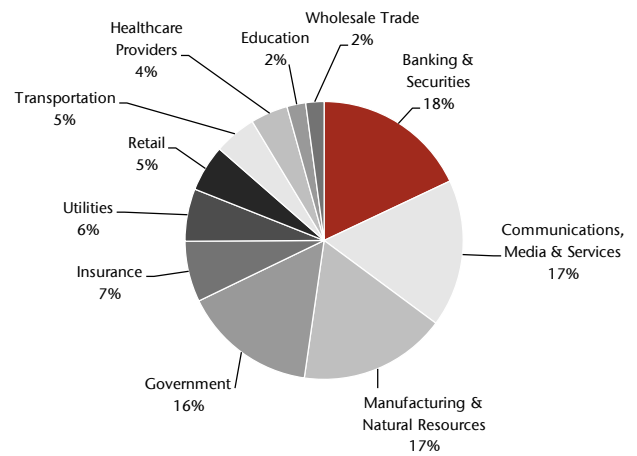
Instead, we estimate that spending on Software by European governments represents about 8-14% of worldwide Software and IT spending. Europe represents about 28% of worldwide Software spending and 27% of worldwide IT spending, with European governments representing 30-40% or perhaps as high as 50% of spending in the region, so [28% x (30-50%) ≈ 8-14% worldwide software spending; 27% x (30-50%) ≈ 8-14% worldwide IT spending].

**Chart 25: European Software Spending by Vertical/Industry (CY2016), \$131B**



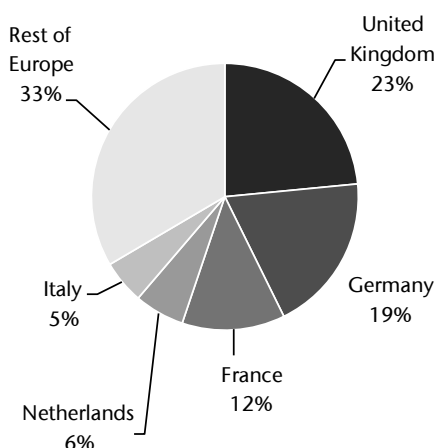
Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

**Chart 26: European IT Spending by Vertical/Industry (CY2016), \$813B**



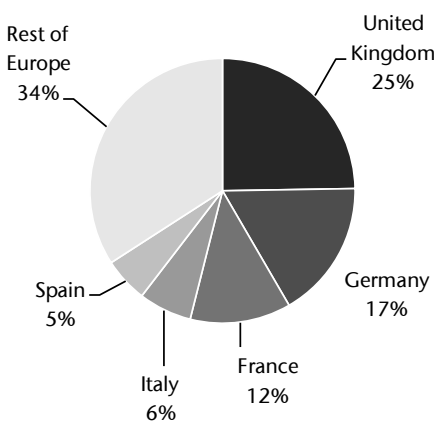
Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

**Chart 27: European Software Spending Country (CY2016), \$131B**



Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

**Chart 29: European IT Spending Country (CY2016), \$813B**



Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

**Chart 28: European Software Spending by Country (CY2016), \$131B**

| Country                | 2016 Spend (\$B) | % of Europe |
|------------------------|------------------|-------------|
| United Kingdom         | 30.85            | 23%         |
| Germany                | 25.30            | 19%         |
| France                 | 16.40            | 12%         |
| Netherlands            | 7.99             | 6%          |
| Italy                  | 6.94             | 5%          |
| Switzerland            | 4.74             | 4%          |
| Spain                  | 4.66             | 4%          |
| Sweden                 | 4.55             | 3%          |
| Russia                 | 3.99             | 3%          |
| Rest of Eastern Europe | 3.20             | 2%          |
| Belgium                | 3.03             | 2%          |
| Denmark                | 2.88             | 2%          |
| Norway                 | 2.70             | 2%          |
| Poland                 | 2.41             | 2%          |
| Finland                | 2.03             | 2%          |
| Austria                | 1.89             | 1%          |
| Ireland                | 1.80             | 1%          |
| Czech Republic         | 1.74             | 1%          |
| Rest of Western Europe | 1.55             | 1%          |
| Hungary                | 0.92             | 1%          |
| Rest of Europe         | 1.91             | 1%          |
| <b>Total</b>           | <b>131.48</b>    | <b>100%</b> |

Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

**Chart 30: European IT Spending by Country (CY2016), \$813B**

| Country                | 2016 Spend (\$B) | % of Europe |
|------------------------|------------------|-------------|
| United Kingdom         | 200.98           | 25%         |
| Germany                | 137.30           | 17%         |
| France                 | 99.98            | 12%         |
| Italy                  | 52.73            | 6%          |
| Spain                  | 44.34            | 5%          |
| Netherlands            | 41.71            | 5%          |
| Russia                 | 28.90            | 4%          |
| Switzerland            | 26.83            | 3%          |
| Sweden                 | 26.14            | 3%          |
| Belgium                | 19.57            | 2%          |
| Rest of Eastern Europe | 16.98            | 2%          |
| Norway                 | 15.34            | 2%          |
| Denmark                | 15.25            | 2%          |
| Rest of Eurasia        | 13.20            | 2%          |
| Poland                 | 12.38            | 2%          |
| Finland                | 12.00            | 1%          |
| Austria                | 11.61            | 1%          |
| Ireland                | 8.87             | 1%          |
| Czech Republic         | 7.64             | 1%          |
| Portugal               | 6.81             | 1%          |
| Rest of Europe         | 14.10            | 2%          |
| <b>Total</b>           | <b>812.66</b>    | <b>100%</b> |

Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

Unfortunately, specific IT or software spending from European government sources is not readily available. Therefore, we track the “discretionary” budgets (total government expenditures less interest expense and social security, unemployment, and welfare payments) for the most important IT spending countries in Europe below. Note that the UK government’s fiscal year ends in March, while the fiscal years for Germany, France, Netherlands and Italy are aligned with the calendar year.

### Continued Modest Growth for Major Euro Gov’t Discretionary Spending

The outlook for discretionary spending by the three largest European country contributors to worldwide Software and IT spending in 2018 appears positive in aggregate. On a weighted average basis of the countries’ IT spending (representing a total 54% of European IT spending), we see a 2.3% increase in governmental discretionary spending for these three countries in 2018. See Chart 31 below. This is a slight deceleration from the projected 2.9% growth for 2017 (based on 10-11 months of actual data), but an improvement from 1.1% growth in 2016. It would also mark a fourth consecutive year of modest growth following four years of spending contraction.

We note that the expected modest growth deceleration from 2017 is primarily due to moderated growth in Germany, which represents nearly one fifth of total European Software spending. Germany’s 2018 budget plan implies a 2.0% increase in discretionary governmental expenditures, down from 5.8% projected growth in 2017. Meanwhile, UK discretionary growth is expected to accelerate to 2.7% in fiscal 2019 (ending March 31, 2019) as of the November budget update, versus 1.5% projected growth in fiscal 2018. France’s 2018 government draft budget implies a 1.7% increase in discretionary expenditures, in line with the projected 1.6% increase in 2017.

**Chart 31: Estimated European Government IT Spending Growth (UK, Germany, France), 2017 and 2018**

| Country | % IT Spending in Region | 2017 Growth                       |                 | 2018 Growth                       |                 |
|---------|-------------------------|-----------------------------------|-----------------|-----------------------------------|-----------------|
|         |                         | Govt. Discretionary Budget Growth | Weighted Growth | Govt. Discretionary Budget Growth | Weighted Growth |
| UK      | 25%                     | 1.5%                              | 0.7%            | 2.7%                              | 1.2%            |
| Germany | 17%                     | 5.8%                              | 1.8%            | 2.0%                              | 0.6%            |
| France  | 12%                     | 1.6%                              | 0.4%            | 1.7%                              | 0.4%            |
| Total   | 54%                     |                                   | 2.9%            |                                   | 2.3%            |

Source: Jefferies estimates, UK HM Treasury and Office for Budget Responsibility documents (July and November 2017), Germany Bundesministerium der Finanzen documents (December 2017), French government and European Commission documents (October 2017)

- **UK Discretionary Spending Expected to Increase in 2018.** The preliminary UK government budget forecast released in November 2017 indicates that total discretionary spending is now expected to increase 2.7% in its March-ending fiscal 2019 (the most comparable period to calendar 2018). This is higher than the 1.5% estimated growth in fiscal 2018. See Charts 36 and 37. The UK represents the largest contributor to European Software and IT spending, at 23% of total European Software spending and 25% of total European IT spending.
  - **Positive Discretionary Budget Outlook Post-Brexit.** In the UK’s 2017 Autumn Statement (i.e., pre-budget report) released on November 22, total governmental expenditures are projected to grow 1.5% in fiscal 2018 and 2.7% in fiscal 2019. This is notably better than the November 2016 forecasts for 0.0% in fiscal 2018 and 1.1% growth

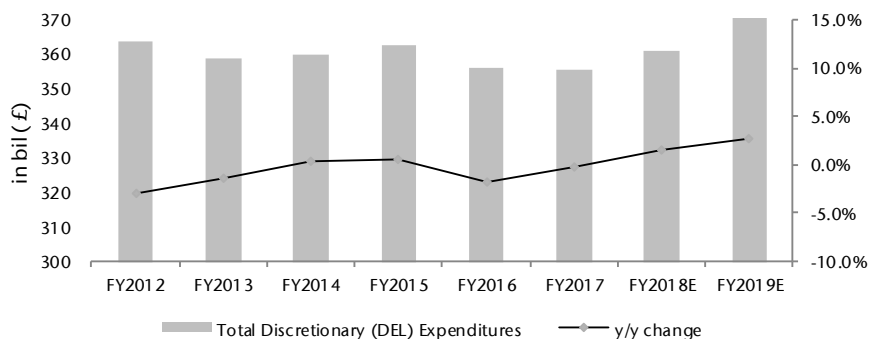
in fiscal 2019, shortly following the EU referendum (Brexit). We view the positive discretionary spending growth and expected acceleration next year as an early indication of the UK government's willingness to spend to support economic growth. We also believe this should assuage any concerns following Brexit last year about the government's primary focus on running a balanced budget that would lead to discretionary spending cuts. Note that discretionary expenditures declined 20 basis points in fiscal 2017 and declined 1.7% in fiscal 2016. See Charts 32 and 33 below.

**Chart 32: UK Government Expenditure**  
(£ billions, March FY end)

|  | FY2012       | FY2013       | FY2014       | FY2015       | FY2016       | FY2017       | FY2018E      | FY2019E      |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Resource Departmental Expenditure Limits (DEL) * | 333.6        | 331.2        | 330.7        | 325.0        | 325.4        | 328.6        | 326.0        | 332.4        |
| Resource Annually Managed Expenditures (AME) **  | 312.4        | 344.6        | 350.2        | 360.7        | 364.0        | 362.8        | 386.5        | 397.8        |
| <b>Public sector current expenditures</b>        | <b>646.0</b> | <b>675.7</b> | <b>680.9</b> | <b>685.7</b> | <b>689.4</b> | <b>691.4</b> | <b>712.5</b> | <b>730.2</b> |
| Capital DEL *                                    | 49.8         | 49.1         | 51.8         | 54.6         | 49.6         | 51.9         | 56.9         | 61.1         |
| Capital AME **                                   | 19.4         | 30.9         | 21.2         | 23.1         | 23.5         | 27.3         | 26.0         | 18.0         |
| <b>Public sector capital expenditures</b>        | <b>69.1</b>  | <b>80.0</b>  | <b>73.1</b>  | <b>77.8</b>  | <b>73.0</b>  | <b>79.1</b>  | <b>82.9</b>  | <b>79.1</b>  |
| <b>Total Managed Expenditures</b>                | <b>715.1</b> | <b>755.7</b> | <b>754.0</b> | <b>763.5</b> | <b>762.5</b> | <b>770.6</b> | <b>795.4</b> | <b>809.3</b> |
| y/y change                                       | NA           | 5.7%         | -0.2%        | 1.3%         | -0.1%        | 1.1%         | 3.2%         | 1.7%         |
| <b>Resource DEL, Excluding Depreciation</b>      | 314.3        | 309.7        | 308.4        | 307.8        | 306.7        | 303.6        | 304.0        | 309.6        |
| <b>Capital DEL</b>                               | 49.8         | 49.1         | 51.8         | 54.6         | 49.6         | 51.9         | 56.9         | 61.1         |
| <b>Total Discretionary (DEL) Expenditures</b>    | <b>364.1</b> | <b>358.8</b> | <b>360.2</b> | <b>362.5</b> | <b>356.2</b> | <b>355.4</b> | <b>360.9</b> | <b>370.7</b> |
| y/y change                                       | -3.0%        | -1.5%        | 0.4%         | 0.6%         | -1.7%        | -0.2%        | 1.5%         | 2.7%         |

Source: UK HM Treasury and Office for Budget Responsibility Autumn Statement 2017 (November 2017), UK HM Treasury Public Expenditure Statistical Analyses (July 2017), and Jefferies estimates

**Chart 33: UK Government Discretionary Expenditure Trend**



Source: UK HM Treasury and Office for Budget Responsibility Autumn Statement 2017 (November 2017), UK HM Treasury Public Expenditure Statistical Analyses (July 2017), and Jefferies estimates

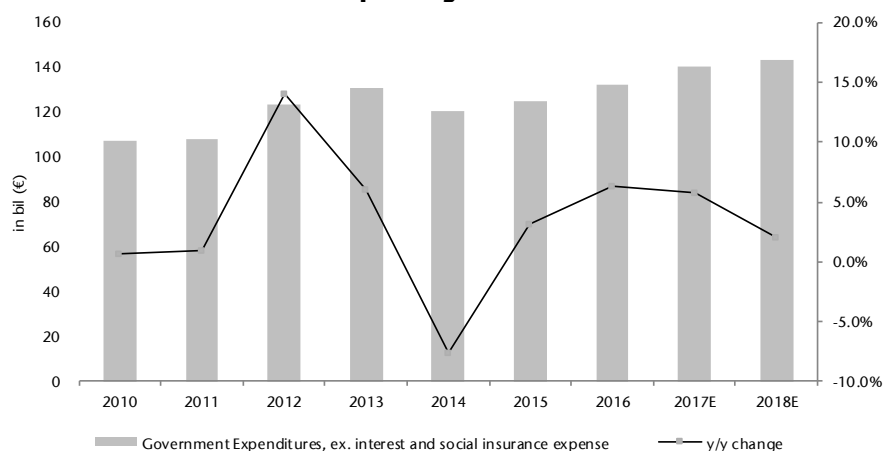
- Germany.** Germany's 2018 discretionary government budget is expected to increase 2.0%, following 5.8% growth implied in the latest 2017 budget estimate (with 11 months of actual data). We approximate Germany's discretionary government budget by excluding interest expense, social insurance payments and welfare from total budgeted expenditures. The expected 2.0% increase in 2018 discretionary spending is due to 2.0% growth in total budgeted government expenditures, and modest increases in social insurance payments and interest expense. See Charts 34 and 35 below.

**Chart 34: Germany Government Expenditure**  
(€ billions, December FY end)

|   | 2009         | 2010         | 2011         | 2012         | 2013         | 2014         | 2015         | 2016         | 2017E        | 2018E        |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>Total Government Expenditures</b>                                      | 254.2        | 270.6        | 296.2        | 306.8        | 307.8        | 295.5        | 299.3        | 310.6        | 329.1        | 337.5        |
| <i>y/y change</i>   |              | 6.5%         | 9.5%         | 3.6%         | 0.3%         | -4.0%        | 1.3%         | 3.8%         | 6.0%         | 2.6%         |
| <b>Government Expenditures, ex. interest expense</b>                      | 254.2        | 270.6        | 263.4        | 276.3        | 276.5        | 269.6        | 278.2        | 293.1        | 310.6        | 316.8        |
| <i>y/y change</i>   |              | 6.5%         | -2.7%        | 4.9%         | 0.1%         | -2.5%        | 3.2%         | 5.3%         | 6.0%         | 2.0%         |
| <b>Government Expenditures, ex. interest and social insurance expense</b> | <b>106.4</b> | <b>107.1</b> | <b>108.2</b> | <b>123.4</b> | <b>130.8</b> | <b>120.8</b> | <b>124.6</b> | <b>132.5</b> | <b>140.1</b> | <b>143.0</b> |
| <i>y/y change</i>   |              | 0.6%         | 1.0%         | 14.0%        | 6.0%         | -7.6%        | 3.2%         | 6.3%         | 5.8%         | 2.0%         |

Source: Germany Bundesministerium der Finanzen monthly reports (2009-2016; December 2017) and Jefferies estimates

**Chart 35: German Government Spending Trend**



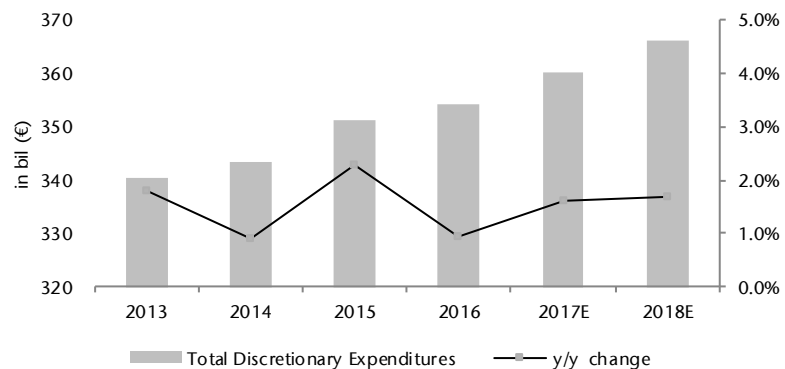
Source: Jefferies estimates and Germany Bundesministerium der Finanzen monthly reports (2009-2016; December 2017)

- **France.** According to the French government draft budget released in October 2017, 2018 discretionary spending is expected to increase 1.7% following a similar 1.6% projected increase in 2017 and 0.9% increase in 2016. See Charts 36 and 37 below.

**Chart 36: French Government Expenditures and Calculation of Discretionary Budget**  
(€ billions; December FY end)

|   | 2012         | 2013         | 2014         | 2015         | 2016         | 2017E        | 2018E        |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>Total Expenditure Target</b>   | 1,183.6      | 1,206.9      | 1,226.1      | 1,243.2      | 1,257.1      | 1,270.4      | 1,278.2      |
| <b>Subtract Compensation of Employees, Social Payments &amp; Interest Exp</b> |              | 866.6        | 882.8        | 892.1        | 902.7        | 910.4        | 912.0        |
| <b>Total Discretionary Expenditures</b>                                       | <b>334.3</b> | <b>340.3</b> | <b>343.3</b> | <b>351.2</b> | <b>354.4</b> | <b>360.1</b> | <b>366.2</b> |
| <i>y/y change</i>   |              | 1.8%         | 0.9%         | 2.3%         | 0.9%         | 1.6%         | 1.7%         |

Source: Jefferies estimates and French government and European Commission documents (October 2017)

**Chart 37: French Government Discretionary Spending Trend**

Source: Jefferies estimates and French government and European Commission documents (October 2017)

- Netherlands.** Dutch government discretionary spending is expected to increase 5.9% in 2018, following a projected 4.1% increase in 2017 (as of the draft budget plan released in October 2017). According to the draft budget, nominal GDP is expected to increase 4.2% in 2018, following 4.4% growth in 2017.
- Italy.** Italian government discretionary spending is forecast to increase 1.7% in 2018, following projected 0.6% growth in 2017 (as of the draft budget plan released in October 2017). According to the draft budget, nominal GDP is expected to increase 3.1% in 2018, following 2.1% growth in 2017.

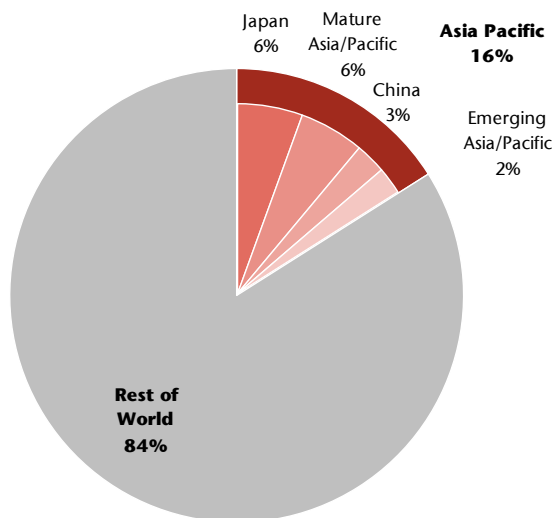
## Asia-Pacific Spending – Smaller Portion of the Pie

### Asia Pacific IT Spending Dominated by Japan and China

According to Gartner, the Asia Pacific region represented about 16% of Software and 24% of worldwide IT spending in 2016. Japan is the largest contributor in the region, accounting for 6% of Software and 9% of IT spending worldwide. China, despite having the second largest economy in the world, spends less than Japan on enterprise technology, at only 3% of Software and 6% of worldwide IT spending worldwide. This is due in part to rampant Software piracy in China, as well as lower Internet penetration and human capital and machinery intensive manufacturing representing a large mix of GDP relative to more developed countries. Together, Japan and Greater China (incl. Hong Kong & Taiwan) comprise about 56% and 65% of Software and IT spending, respectively, in the Asia Pacific region. Australia, the third largest spender in the region, represents about 17% of Software spending and 10% of IT spending in the region. See Charts 38-41 below.

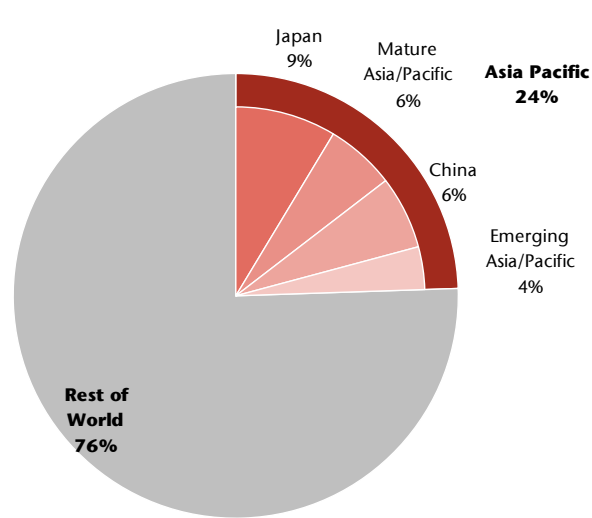
Enterprise Software spending in China is expected to grow at an approximate 12% CAGR from 2016-2021, according to Gartner, outpacing the average worldwide Software spending growth forecast of 8%, while Japan's 6% projected CAGR is expected to lag the average. Therefore, it's plausible that an indication of slowdown in China's economic outlook could cause a knee-jerk reaction by investors, as was the case two years ago. However, given China's relatively small share of global technology spending, the direct impact from an economic slowdown is very limited. Based on the latest World Bank forecasts, Chinese GDP growth is expected to remain relatively constant at 6.3% in 2018 versus a projected 6.5% in 2017. Meanwhile, Japanese IT spending is expected to increase to nearly 3% in 2018, an acceleration from 2016 and 2017.

**Chart 38: Asia Pacific Regions as a Percentage of Worldwide Software Spending**



Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

**Chart 39: Asia Pacific Regions as a Percentage of Worldwide IT Spending**



Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

**Chart 40: APAC Software Spending by Country (CY2016), \$74B**

| Country                       | Spend (\$B) | % of APAC   | % of Worldwide |
|-------------------------------|-------------|-------------|----------------|
| Japan                         | 25.7        | 35%         | 6%             |
| Australia                     | 12.4        | 17%         | 3%             |
| China                         | 12.2        | 16%         | 3%             |
| India                         | 6.1         | 8%          | 1%             |
| South Korea                   | 4.8         | 6%          | 1%             |
| Singapore                     | 3.0         | 4%          | 1%             |
| Taiwan                        | 2.0         | 3%          | 0%             |
| Hong Kong                     | 1.8         | 2%          | 0%             |
| New Zealand                   | 1.7         | 2%          | 0%             |
| Malaysia                      | 1.6         | 2%          | 0%             |
| Rest of Emerging Asia/Pacific | 1.2         | 2%          | 0%             |
| Thailand                      | 1.1         | 1%          | 0%             |
| Indonesia                     | 0.7         | 1%          | 0%             |
| <b>Total</b>                  | <b>74.1</b> | <b>100%</b> | <b>16%</b>     |

Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

**Chart 41: APAC IT Spending by Country (CY2016), \$735B**

| Country                       | Spend (\$B) | % of APAC   | % of Worldwide |
|-------------------------------|-------------|-------------|----------------|
| Japan                         | 259         | 35%         | 9%             |
| China                         | 188         | 26%         | 6%             |
| Australia                     | 76          | 10%         | 3%             |
| India                         | 51          | 7%          | 2%             |
| South Korea                   | 45          | 6%          | 1%             |
| Rest of Emerging Asia/Pacific | 27          | 4%          | 1%             |
| Singapore                     | 22          | 3%          | 1%             |
| Hong Kong                     | 14          | 2%          | 0%             |
| Taiwan                        | 13          | 2%          | 0%             |
| Malaysia                      | 12          | 2%          | 0%             |
| Indonesia                     | 11          | 1%          | 0%             |
| Thailand                      | 9           | 1%          | 0%             |
| Other                         | 9           | 1%          | 0%             |
| <b>Total</b>                  | <b>735</b>  | <b>100%</b> | <b>24%</b>     |

Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

**Japan – Accelerating Growth Outlook for the Largest Asia-Pacific Spender**

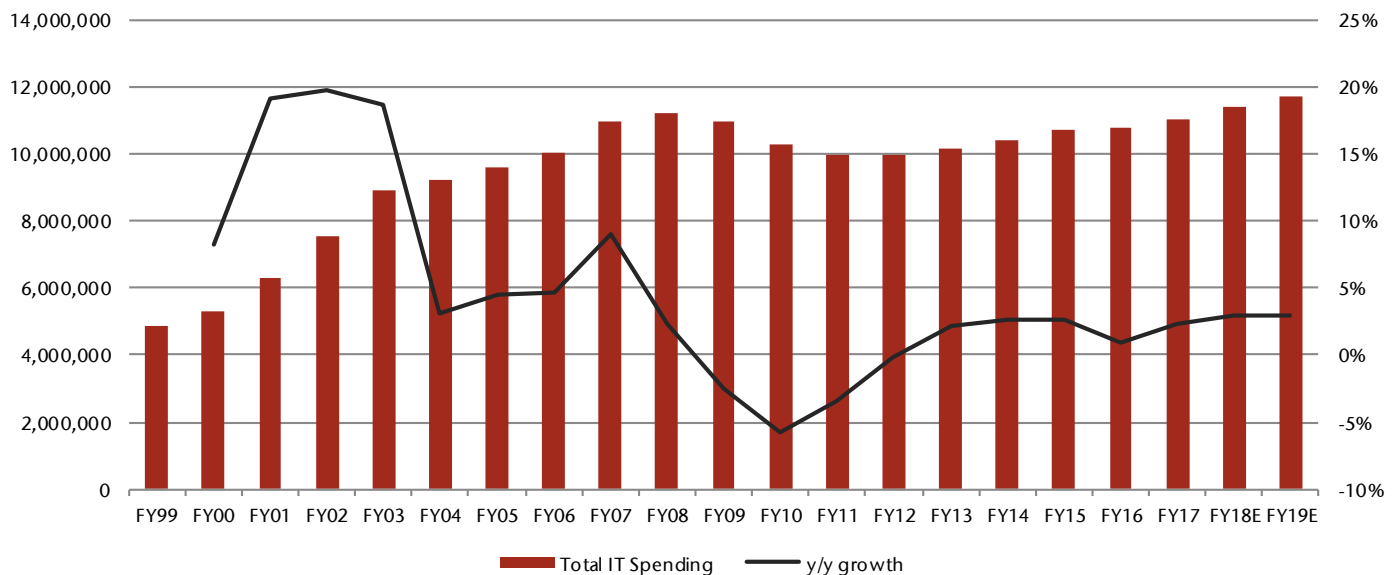
Japan is the largest software and IT spender in the Asia Pacific region. According to the Ministry of Economy, Trade, and Industry (METI), Japanese IT expenditures grew 2.3% in fiscal 2017 (ended March), after growing 80 basis points in fiscal 2016 and between 2% to 3% growth each year in the three preceding years. We project Japanese IT spending growth to accelerate to 2.9% in fiscal 2018 (ended March 31, 2018), followed by 2.9% growth in fiscal 2019 (ended March 31, 2019). See Chart 42 below.

Using our projected 2018 IT spending growth as a proxy for Japanese Software spending growth, this would equate to 0.16% in global Software growth (= 5.5% global software

spending from Japan x 2.9% projected growth in Japan IT spending). This is an indication of the relative minor significance of the Asia Pacific region to IT and Software spending, as the largest spending country in the region has little impact on worldwide demand even with the nearly 3% growth projected for 2018 to be the highest since 2007 (9% growth).

**Chart 42: Total IT Spending, Japan (Historical and Forecast)**

JPY, Millions



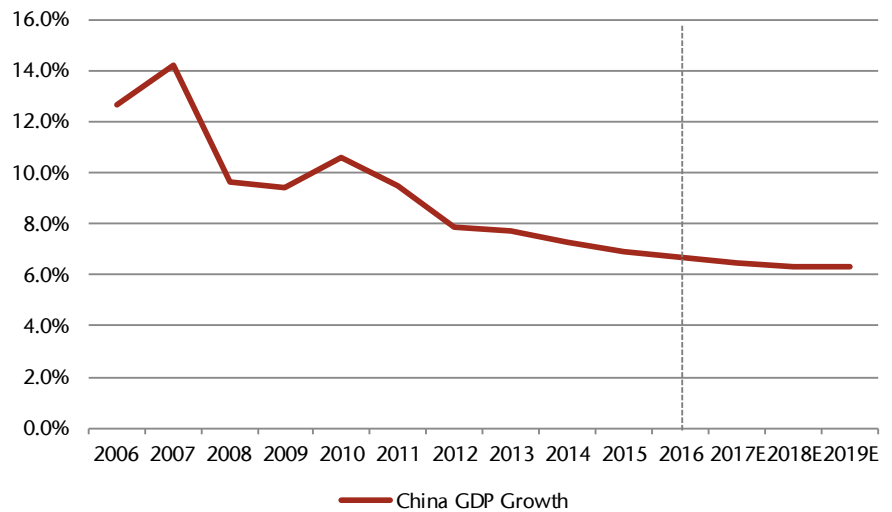
Source: Japan Ministry of Economy, Trade, and Industry, Jefferies estimates

### China – Less of a Contributor to Global IT Spending than Might Be Perceived

Although China is one of the world's largest economies, it only accounts for about 2.6% of global software spending, according to Gartner. This is attributable to rampant piracy, a higher mix of human labor and machinery intensive manufacturing contribution to GDP (where less Software is required), and Internet penetration among only about half of the total population, versus over 80% in the most developed nations. Conversely, this also indicates that this could be a significant contributor at some point in the future. We previously conducted an analysis of China's impact on global Software spending, the conclusions of which still apply. See *Macro Matters: China Has Impact but Not a Lot* report, published on October 23, 2015. **We calculate that every 5% growth (decline) in Chinese Software spending contributes (deducts) only 13 basis points of worldwide Software spending growth.** Therefore, while China's impact on the global economy is vast, we assert that its impact on the Software sector is meaningfully less, and that the Software industry is relatively insulated from direct China specific risk.

Compared to other regions around the world, it is more difficult to find reliable and accurate data of Chinese IT spending (as well as reliable GDP data). Gartner forecasts China's software spending to grow 13% in 2017 and at a 12% CAGR from 2016-2021. However, we note that many investors continue to worry about deceleration in Chinese GDP growth. The World Bank currently projects GDP growth to slow from 6.5% forecasted growth in 2017 to 6.3% in 2018 and 2019. See Chart 43 below.



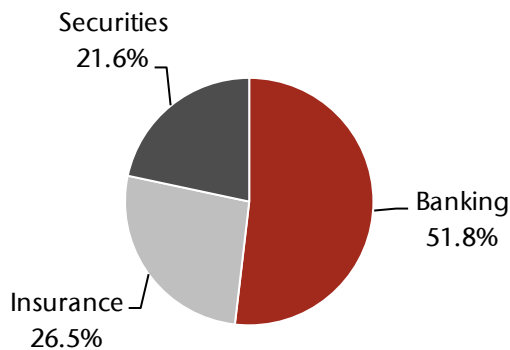
**Chart 43: Chinese Real GDP Growth – Historical and Forecast**

Source: The World Bank, Global Economic Prospects, June 2017

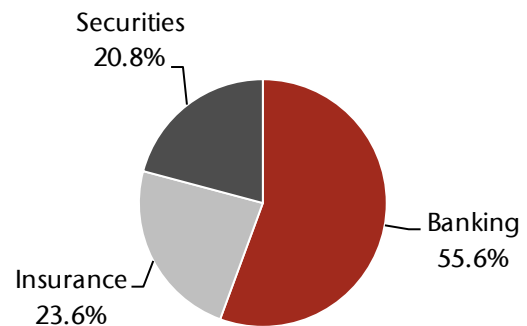
## Financial Services

The financial services industry (including banking, insurance, and securities) is the largest IT spending vertical in the world, accounting for nearly a quarter of worldwide software and IT spending, according to Gartner. Of the \$105 billion in financial services software spending in 2016, banking comprised 52%, the insurance industry accounted for 27%, and the securities industry accounted for 22%, similar to 2014. See Charts 44 and 45 below. Based on our limited field checks, ***we believe that IT budgets in the financial services vertical should grow at least modestly in 2018***. IDC projects that IT budgets in the financial services sector will grow at an over 5% CAGR from 2017-2021, while Gartner projects that Software spending in the financial services industry will grow at an approximately 8% CAGR from 2017-2021 with relatively even growth across securities, banking, and insurance. However, we note that IT budgets for financial services companies are much more flexible than for governments, so these forecasts could certainly change. This is something we will periodically monitor.

**Chart 44: Worldwide Financial Services Software Spending (CY2016): \$105 billion, 23% of WW Total**



**Chart 45: Worldwide Financial Services IT Spending (CY2016): \$710 billion, 24% of WW Total**



Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

Source: Gartner (Enterprise IT Spending by Vertical Industry Market, Worldwide, 2015-2021, 3Q17 Update)

## US Corporate Tax Reform

The Tax Cuts and Jobs Act passed through both chambers of the US Congress and signed by President Trump into law at the end of 2017, setting the stage for a sweeping tax reform to take effect starting in 2018. In Chart 46 below, we highlight the various noteworthy changes to legislation affecting US domiciled corporations, listed in what we estimate to be the order of importance as they pertain to enterprise Software companies. We discuss the most significant provisions and note the major beneficiaries in our coverage universe, including:

- **Lower Corporate Rate Tax.** Significant reduction in federal taxes from a 35% top marginal rate to 21% flat rate. Major beneficiaries, measured in terms of tax savings as a percentage of consensus 2018/F2019 FCF estimates include: Paycom (14%), Alarm.com (11%), and CA Technologies (11%).
- **Deemed Repatriation.** Deemed repatriation of, and one-time mandatory tax assessed on, foreign accumulated cash and other assets held overseas. Our covered companies that will have the most foreign-held cash and equivalents available for use in the US after the one-time tax include Microsoft: (\$110 billion), Oracle (\$49 billion), and VMware (\$7 billion), followed by Citrix (\$2 billion), CA Technologies (\$1.5 billion), Red Hat (\$1 billion), and Symantec (\$1 billion).
- **Modified Territorial Tax System.** Actively generated foreign income (e.g., from sales of products through normal business operations) by controlled foreign corporations will no longer be subject to US tax (via a 100% dividends received deduction), unless the foreign tax paid is less than certain thresholds defined under certain provisions described below. Under previous law, active foreign income is subject to US tax but was not paid until repatriated to the US (was deferred). Additionally, new provisions—the Global intangible low-taxed income (GILTI) tax, Foreign-Derived Intangible Income (FDII) tax, and Base-Erosion Anti-Abuse Tax (BEAT)—impose minimum US taxes on applicable foreign income. These provisions are aimed at preventing practices that shift income to low tax jurisdictions.

- **Impact of GILTI/FDII and BEAT Provisions.** We acknowledge that some of our covered companies, especially the large, multinational ones, have significant amounts of intangible assets, and may engage in income shifting practices to varying degrees. We discuss the GILTI/FDII and BEAT provisions and some considerations when trying to evaluate the impact on the financial results of Software companies, but don't believe we can reasonably predict the company-specific impacts at this point. Frankly, we believe that companies are still trying to evaluate the impacts themselves.
- **Immediate Expensing of Capex.** From 2018-2025, qualifying capital investments (i.e., generally assets with depreciable lives of 20 years or less, and include machinery, equipment, and leasehold improvements) can be expensed immediately (via 100% bonus depreciation). Within our covered companies, Mimecast currently has the highest adjusted capex as a percentage of revenue, at 10%, followed by Paycom (10%), Instructure (9%), CallidusCloud (8%), and Microsoft (8%). We adjust capex by excluding our estimates for capital investments with useful lives of over 20 years (e.g., new buildings), which don't qualify for immediate expensing under the new rules.
- **Limitation on interest deductibility to 30% of EBITDA.** We expect this new provision to have very limited impact on our covered companies, for which interest expense across the board falls below this threshold. Note that Software companies generally have much lower leverage ratios relative to companies in other industries.

Chart 46: US Corporate Tax Reform Summary Table

|   | Current Tax Law   | Tax Cuts and Jobs Act 2017  | Major Beneficiaries Within our Coverage  |
|---|---|---|--|
| <b>US Federal Rate</b>                                | - 35% top federal marginal rate   | - Flat 21% rate   | PAYC, ALRM, and CA                       |
| <b>Deemed Repatriation</b>                            | NA  | - One-time mandatory tax on post-1986 accumulated deferred foreign income, as of last tax year before 2018<br>- Rate of 15.5% on foreign "cash position" (i.e. cash and equivalents) and 8% on remaining foreign assets<br>- Foreign tax credits or deductions due to foreign taxes already paid allowed to partially offset repatriation tax (based on formula)<br>- Repatriation tax liability may be paid over 8 year period   | MSFT, ORCL, VMW, CTXS, CA, RHT, and SYMC |
| <b>Taxation of Foreign Income</b>                     | - Worldwide tax system; foreign income of US companies subject to US taxes and applicable US rates<br>- Taxes not payable until income repatriated to US<br>- Tax liability partially offset by foreign tax credits and deductions (assuming foreign taxes already paid are less than US taxes on the foreign income)                     | - Modified territorial tax system: starting in 2018, US C corps will not be subject to US tax on routine (i.e., active) foreign income from controlled foreign corporations, via 100% dividends received deduction<br>- No tax credits or deductions allowed for foreign taxes paid on foreign income subject to 100% dividends received deduction<br>- Subpart F income (generally outside of core operations, and passive income), investments in US property, and sales of shares of foreign subs, still subject to US taxes   |  |
| <b>Global intangible Low-Taxed Income (GILTI) Tax</b> | - See "Taxation of foreign income" above<br>- All foreign income (generally taxed at lower rates than in US) taxable at US rates, but deferred until repatriated  | - Foreign income deemed attributable to intangible assets--calculated as "net tested income" (generally active income) in excess of statutory 10% return on "qualified business asset investments"--subject to top 21% marginal rate US tax<br>- 10.5% effective rate in 2018-2025 for C corps (via 50% GILTI deduction); 13.125% rate post-2025 (via 37.5% deduction)<br>- C corps entitled to tax credit equal to 80% of foreign taxes paid attributable foreign "net tested income"; therefore, in general C corps with foreign tax rates of 13.125% or higher will owe no GILTI taxes |  |
| <b>Foreign-Derived Intangible income (FDII) Tax</b>   | - See "Taxation of foreign income" above<br>- Some corporations may be incentivized to shift intangible assets and associated income to low tax foreign jurisdictions, paying low foreign taxes and deferring US taxes on that income until repatriated   | - Imposes a reduced tax rate on foreign services and property income deemed attributable to intangible assets held in the US<br>- 13.125% effective rate for C corps in 2018-2025 (via 37.5% FDII deduction) and 16.4% rate post-2025 (via 21.875% deduction)<br>- FDII calculated as US corp's domestic "deduction eligible income" (generally active income) in excess of a statutory 10% return on tangible "qualified business asset investments" deemed attributable to providing services or selling property outside the US  |  |
| <b>Base Erosion Anti-Abuse (BEAT) Minimum Tax</b>     | - See "Taxation of foreign income" above<br>- Current law allows some income shifting from US to related foreign parties  | - Applicable to corporations w/ at least \$500M of annual revenue in last 3 tax years, >3% of tax deductions arising from payments to foreign affiliates (i.e., base erosion payments)<br>- Minimum tax amount equal to specified rate applied to income base that adds back base erosion payments; 5% rate in 2018, 10% in 2019-2025, and 12.5% in 2026  |  |
| <b>New Capital Investments</b>                        | - Typically depreciated over multiple years (over asset's useful life)<br>- Current bonus depreciation rules allow immediate expensing of a percentage of acquisition cost for certain qualifying assets with useful life of 20 years or less (percentages were 50% in 2017, 40% in 2018, 30% in 2019, and phased out completely in 2020) | - Certain capital investments (i.e., qualified asset with depreciable life of 20 years or less) expensed immediately and in full, via increase in bonus depreciation percentage to 100% in 2018-2022<br>- New bonus depreciation percentages are phased out by 20% per year, in 2023-2027   | MIME, PAYC, INST CALD, MSFT, DATA        |
| <b>Interest Expense</b>                               | - Fully deductible  | - Deductibility limited to 30% of taxable income before interest expense or income and D&A (roughly EBITDA) in 2018-2021; then limited to 30% of taxable income before interest expense or income (roughly EBIT), starting in 2022  |  |
| <b>R&amp;D investments</b>                            | - Expensed when incurred<br>- Some development costs (e.g. internal use software) are capitalized<br>- R&D tax credit, based on current year R&D expense  | - Preserves R&D tax credit<br>- Starting in 2022, domestic R&D investments need to be amortized over 5 years and foreign R&D investments over 15 years<br>- All software development costs will be considered R&D   |  |
| <b>Net operating Losses (NOLs)</b>                    | - NOLs can be carried back to prior two tax years and carried forward for 20 years  | - Eliminates NOL carryback and limits<br>- Carryforwards limited to 80% of taxable income each year   |  |
| <b>Corporate AMT</b>                                  | - 20% of AMT income, to extent that AMTI exceeds exemption of \$40,000 (subject to phase out)   | - Eliminates corporate AMT  |  |

Source: Jefferies Research

## Lower US Corporate Tax Rate

Lowering the federal marginal income tax from a top marginal rate of 35% to a flat 21% rate is the centerpiece of the tax overhaul. All else equal, the corporate tax rate reduction should increase both reported earnings and cash flows for companies in most sectors. As an intended effect of the new tax bill, this should increase spending throughout the economy (since there will be more income to spend), including investments in IT and enterprise Software. While enterprise Software companies across the board stand to benefit from this indirect revenue trickle effect, some should also see direct tax savings from the lower tax rate.

We believe that in general, the direct income benefit from lower taxes to the Software industry may be less than that for other industries, primarily because many Software companies are not yet profitable and therefore do not pay taxes today, or have net operating losses that are used to offset taxable income. There are many Software companies that either don't yet pay cash taxes, or already have effective tax rates near the new 21% rate. On the other hand, Software companies that are profitable with no remaining NOLs and generate most of their income in the US, stand to benefit the most.

We note that mature companies that generate meaningful profits (e.g., Oracle) and pay the highest absolute amount of taxes may not necessarily receive the largest cash flow benefits from the lower rate due to their relatively low overall effective tax rates. Similarly, Microsoft (which we exclude from our analysis) has historically allocated a large percentage (over 60%) of pre-tax income to international operations, where it has this income marked as permanently reinvested, and thereby defers US taxes on it. Microsoft has also had a number of one-time tax adjustments, as well as reported a pre-tax income loss in fiscal 2016 (ended June), due primarily to deferral of Windows 10 revenue, and a very minimal gain on 2017 making it difficult to estimate a normalized cash tax for the company.

***Within our coverage companies that are profitable with no available NOLs and are currently paying US cash taxes, we estimate that the biggest beneficiaries of a lower corporate tax rate (measured in tax savings as a percentage of 2018 free cash flow) are PAYC (14%), ALRM (11%), and CA (11%), followed by RHT (5%), ORCL (4%), SSNC (3%), and VMW (3%).*** See Chart 47 below.

Our methodology is as follows:

- 1) **Reported Overall GAAP Effective Tax Rate.** We start with each company's most recent **annual GAAP reported effective tax rate as an initial proxy** for its cash tax rate, given that the two should be approximately equal over time, assuming that most differences between book and cash taxes are temporary in nature. (We acknowledge that we can approximate the cash taxes paid in a given period, but we don't know the associated taxable income base, so we cannot actually calculate an effective cash tax rate using public company filings.) But we know that the effective tax rate (and cash tax rate) can swing, sometimes significantly, from year to year, so we attempt to estimate a normalized rate.
- 2) **Calculated Normalized US Effective Tax Rate.** We know the US and international tax rates, based on the reported pre-tax income and tax payment disclosures in each company's 10-Ks. Using each company's disclosed reconciliation to the US federal statutory rate (35%), we calculate a **normalized US tax rate for each, by starting with the federal rate, add state and local taxes, deduct R&D credits and domestic activities production credits (which**

**are usually fairly consistent year-over-year), and include any other adjustments that we believe persist over time.**

- i. In determining an appropriate normalized US tax rate, we observe the various items of reconciliation to the US federal statutory rate over several years. Our calculated normalized US rates for the companies in our table are between 29% and 43%.
- 3) **New US Effective Tax Rate.** We calculate a **new US effective tax rate** based on the new 21% US federal rate, while keeping the other adjustments (from step 2) constant.
  - 4) **Normalized vs. New Overall Effective Tax Rate.** Using the normalized US tax rate and the foreign tax rate (which doesn't change), and weighting them according to the company's reported US and foreign pre-tax income mix, we calculate a **normalized overall effective cash tax rate** for each company. We then calculate a **new overall effective tax rate** based on the new 21% US federal rate (from step 3). *In this analysis, we use the most recently reported geographic pre-tax income mix; that is, we assume no change in the jurisdiction of pre-tax income due to the new US federal tax rate and changes to taxation of foreign income (discussed in the next section).*
    - **Normalized Overall Effective Tax Rate** = (Normalized US Tax Rate \* % of US Pre-Tax Income) + (Foreign Tax Rate \* % of Foreign Pre-Tax Income)
    - **New Overall Effective Tax Rate** = (New US Tax Rate \* % of US Pre-Tax Income in US) + (Foreign Tax Rate \* % of Foreign Pre-Tax Income)
  - 5) **Tax Savings.** The tax savings arise from the difference between the normalized overall effective tax rate (based on the old 35% US top marginal rate) and the new overall effective tax rate (based on the new 21% federal rate), multiplied by consensus pre-tax income.
 
$$= \text{Consensus Pre-Tax Income} * (\text{New Overall Effective Tax Rate} - \text{Normalized Overall Effective Tax Rate})$$
  - 6) **Tax Savings as a Percentage of 2018/2019E FCF** = Tax Savings / 2018E or fiscal 2019E Consensus FCF.

We provide an example below using CA Technologies.

- 1) CA's reported fiscal 2018 (March ended) overall effective tax rate was 27.8%. We assume that this approximates CA's cash tax rate in the year.
- 2) Upon closer inspection, we determine that CA's normalized US effective tax rate is equal to 34.4%, which we arrive at by adjusting the 35% federal rate by state and local taxes and domestic activities production credits.
- 3) The new US effective tax rate is 20.2% (effectively normalized US tax rate we calculated, minus the difference between the current 35% federal rate and the new 21% federal rate).
- 4) Normalized overall effective tax rate of **30.4%** is comprised of a 34.4% US rate and 19.6% foreign rate, weighted by their respective pre-tax income mixes. The new overall effective tax rate of **20.2%** is comprised of a 20.4% US rate and 19.6% foreign rate, weighted by their respective pre-tax income mixes.

## Technology

Software

January 18, 2018

- **Normalized Overall Effective Tax Rate** =  $(34.4\% * 73.3\%) + (19.6\% * 26.7\%) = 30.4\%$
  - **New Overall Effective Tax Rate** =  $(20.4\% * 73.3\%) + (19.6\% * 26.7\%) = 20.2\%$
- 5) **Tax Savings** = 2018 Consensus Pre-Tax Income of \$1,031.8 million \*  $(30.4\% - 20.2\%) = \$105.9$  million
- 6) **Cash Tax Savings as % of F2019E FCF** =  $\$105.9$  million /  $\$1,031.8$  million = 10.7%

**Chart 47: Estimated Cash Tax Savings from 21% US Federal Corporate Tax Rate (Ranked by Estimated % Impact to 2018/F2019 FCF)**

| Company           | Ticker | F2016 Effective Tax Rate | 2016/F2017 Normalized US Tax Rate (35% Fed) <sup>(1)</sup> | US % of Pre-tax Income | 2016/F2017 International Tax Rate | Normalized Overall Effective Tax Rate (35% US Fed) <sup>(2)</sup> | Normalized US Effective Tax Rate (21% US Fed) <sup>(2)</sup> | New Overall Effective Tax Rate (21% US Fed Rate) <sup>(3)</sup> | 2018/F2019 Consensus GAAP Pre-Tax Income (\$M) | 2018/F2019 Consensus FCF (CFO - Capex), \$M | 2018/F2019 Estimated Tax Savings (\$M) | 2018/F2019 Estimated FCF Impact, % |
|-------------------|--------|--------------------------|--|------------------------|-----------------------------------|---|--|---|--|---|--|------------------------------------|
| Paycom            | PAYC   | 23.4%                    | 36.0%  | 100.0%                 | NA                                | 36.0%   | 22.0%  | 22.0%   | 72.9   | 72.7  | 10.2                                   | 14.0%                              |
| Alarm.com         | ALRM   | 29.4%                    | 29.4%  | 100.0%                 | NA                                | 29.4%   | 15.4%  | 15.4%   | 30.6   | 40.0  | 4.3                                    | 10.7%                              |
| CA Technologies   | CA     | 27.8%                    | 34.4%  | 73.3%                  | 19.6%                             | 30.4%   | 20.4%  | 20.2%   | 1,031.8  | 1,010.0                                     | 105.9                                  | 10.5%                              |
| Red Hat           | RHT    | 20.8%                    | 31.7%  | 58.5%                  | 23.3%                             | 28.2%   | 17.7%  | 20.0%   | 495.9  | 806.0                                       | 40.6                                   | 5.0%                               |
| Oracle            | ORCL   | 18.9%                    | 35.3%  | 30.7%                  | 15.4%                             | 21.5%   | 21.3%  | 17.2%   | 13,249.0                                       | 13,202.1                                    | 569.0                                  | 4.3%                               |
| SS&C Technologies | SSNC   | 19.9%                    | 36.2%  | 41.7%                  | 15.5%                             | 24.1%   | 22.2%  | 18.3%   | 281.8  | 483.5                                       | 16.5                                   | 3.4%                               |
| VMware            | VMW    | 19.5%                    | 35.0%  | 32.5%                  | 12.1%                             | 19.5%   | 21.0%  | 15.0%   | 1,947.6  | 2,813.7                                     | 88.5                                   | 3.1%                               |

Note: Fiscal year ended March shown for CA; fiscal years ended May shown for RHT and ORCL.

(1) We calculate a normalized US tax rate, generally equal to the 35% federal rate, plus state and local taxes, minus R&D credits and domestic activities production credit.

(2) We calculate a normalized overall effective tax rate, based on our calculated normalized US tax rate and the reported international tax rate

(3) We calculate a new overall effective rate rate, based on a new normalized US effective tax rate using the new 21% federal rate and adjusting for the items in (1), and the reported international tax rate.

Source: Company data and Jefferies Research



**Impact of Lower Tax Rate on Non-GAAP EPS**

We also attempt to analyze the impact of the lower US federal tax rate on non-GAAP EPS. See Chart 47 below. **We estimate that the companies within our coverage that will have the biggest potential positive impacts to calendar 2018 or fiscal 2019 (first full unreported year) non-GAAP EPS are Alarm.com (30%), Paycom (20%), Commvault (18%), Tableau (15%), CA Technologies (14%), and SailPoint (12%).** We exclude companies that have negative non-GAAP pre-tax income, companies that report near-zero non-GAAP overall effective tax rates, and companies for which the mix of US and foreign pre-tax income is highly volatile (which makes it difficult to calculate a normalized US tax rate).

Additionally, we want to emphasize that although we present this analysis, we view the impact of the lower US tax rate on free cash flow (see Chart 46) as much more significant than the impact on non-GAAP EPS. After all, we use a discounted cash flow analysis as our primary valuation method for all of our covered companies. Non-GAAP EPS does not always accurately reflect cash flows, while the non-GAAP tax rate assumed by each company is subject to discretion. For instance, several of the companies shown in Chart 47 did not pay any US cash taxes in their latest fiscal year, including Microsoft, Citrix, Commvault, Tableau, and SailPoint.

We apply a methodology similar to our analysis of the estimated cash tax savings as a percentage of free cash flow (see Chart 46 above). For each of the companies shown in our table, we:

- 1) Show our estimated calendar 2018E or fiscal 2019E (first full unreported year) non-GAAP overall effective tax rates, based either on company guidance or historical rates that have been generally consistent.
- 2) We calculate a normalized US tax rate under the prior tax code, generally equal to the 35% federal rate, plus state and local taxes, minus R&D credits and domestic activities production credit.
- 3) We impute a foreign non-GAAP tax rate based on: the overall effective non-GAAP tax rate (item 1), the reported mix of US and foreign pre-tax income (as of each company's latest 10-K filing), and the normalized US tax rate using the old 35% US federal rate (item 2).
- 4) We calculate a new US normalized US tax rate using the new 21% US federal rate (while holding the adjustments in item unchanged).
- 5) Holding the pre-tax income mix and the implied non-GAAP foreign tax rate constant, we calculate a new non-GAAP overall effective tax rate.
- 6) Applying the difference in the old and new overall effective tax rates based on the old 35% and new 21% US federal rates, and holding non-GAAP pre-tax income and diluted share count constant, we calculate the estimated impact on non-GAAP EPS.

**Chart 48: Impact of Lower Tax Rate on Non-GAAP EPS**

| Jefferies Estimates for Calendar 2018/Fiscal 2019, Assuming <b>35%</b> Federal US Tax Rate |      |                                   |                                       |                                |                                  |   |                           | Jefferies Estimates for Calendar 2018/Fiscal 2019, Assuming <b>21%</b> Federal US Tax Rate |                               |                                    |                                       |                                  |  |                               |
|--|------|-----------------------------------|---------------------------------------|--------------------------------|----------------------------------|---|---------------------------|--|-------------------------------|------------------------------------|---------------------------------------|----------------------------------|--|-------------------------------|
|  |      | Non-GAAP<br>Pre-Tax<br>Income (1) | Non-GAAP<br>Effective Tax<br>Rate (2) | Non-GAAP<br>US Tax<br>Rate (3) | US % of<br>Pre-tax<br>Income (4) | Implied Foreign<br>Non-GAAP<br>Tax Rate (5) | Non-GAAP<br>Net<br>Income | <b>2018E/F2019E<br/>Non-GAAP<br/>EPS</b>   | Non-GAAP<br>Pre-Tax<br>Income | New<br>Non-GAAP<br>Tax<br>Rate (6) | New<br>Non-GAAP<br>US Tax<br>Rate (7) | New<br>Non-GAAP<br>Net<br>Income | <b>New<br/>2018E/F2019E<br/>Non-GAAP<br/>EPS</b> | <b>Estimated<br/>% Impact</b> |
| Alarm.com  | ALRM | 65.1                              | 35.0%                                 | 29.4%                          | 100.0%                           | NA  | 42.3                      | <b>\$0.84</b>  | 65.1                          | 15.4%                              | 15%                                   | 55.1                             | <b>\$1.09</b>                                    | <b>30%</b>                    |
| Paycom   | PAYC | 130.2                             | 35.0%                                 | 36.0%                          | 100.0%                           | NA  | 84.6                      | <b>\$1.41</b>  | 130.2                         | 22.0%                              | 22%                                   | 101.5                            | <b>\$1.70</b>                                    | <b>20%</b>                    |
| Commvault  | CVLT | 84.5                              | 37.0%                                 | 37.8%                          | 80.5%                            | 33.9%                                       | 53.3                      | <b>\$1.10</b>  | 84.5                          | 25.7%                              | 24%                                   | 62.8                             | <b>\$1.29</b>                                    | <b>18%</b>                    |
| Tableau  | DATA | 26.3                              | 30.0%                                 | 59.6%                          | 73.3%                            | -51.2%                                      | 18.4                      | <b>\$0.21</b>  | 26.3                          | 19.7%                              | 46%                                   | 21.1                             | <b>\$0.25</b>                                    | <b>15%</b>                    |
| CA Technologies  | CA   | 1,480.2                           | 28.5%                                 | 34.4%                          | 73.3%                            | 12.3%                                       | 1,058.3                   | <b>\$2.55</b>  | 1,480.2                       | 18.2%                              | 20%                                   | 1,210.3                          | <b>\$2.92</b>                                    | <b>14%</b>                    |
| SailPoint  | SAIL | 4.0                               | 46.0%                                 | 30.9%                          | 47.2%                            | 59.5%                                       | 2.2                       | <b>\$0.02</b>  | 4.0                           | 39.4%                              | 17%                                   | 2.4                              | <b>\$0.03</b>                                    | <b>12%</b>                    |
| Red Hat  | RHT  | 842.2                             | 28.0%                                 | 31.7%                          | 58.5%                            | 22.8%                                       | 606.4                     | <b>\$3.25</b>  | 842.2                         | 19.8%                              | 18%                                   | 675.4                            | <b>\$3.62</b>                                    | <b>11%</b>                    |
| SS&C Technologies  | SSNC | 643.9                             | 28.0%                                 | 36.2%                          | 41.7%                            | 22.2%                                       | 463.6                     | <b>\$2.15</b>  | 643.9                         | 22.2%                              | 22%                                   | 501.2                            | <b>\$2.32</b>                                    | <b>8%</b>                     |
| VMware   | VMW  | 2,818.7                           | 21.0%                                 | 35.0%                          | 32.5%                            | 14.3%                                       | 2,226.7                   | <b>\$5.51</b>  | 2,818.7                       | 16.5%                              | 21%                                   | 2,354.8                          | <b>\$5.83</b>                                    | <b>6%</b>                     |
| Oracle   | ORCL | 16,563.6                          | 23.5%                                 | 35.3%                          | 30.7%                            | 18.3%                                       | 12,671.1                  | <b>\$3.02</b>  | 16,563.6                      | 19.2%                              | 21%                                   | 13,382.5                         | <b>\$3.19</b>                                    | <b>6%</b>                     |
| Citrix   | CTXS | 840.7                             | 20.0%                                 | 29.9%                          | 24.3%                            | 16.8%                                       | 672.6                     | <b>\$4.87</b>  | 840.7                         | 16.6%                              | 16%                                   | 701.2                            | <b>\$5.08</b>                                    | <b>4%</b>                     |
| Microsoft  | MSFT | 35,744.8                          | 23.0%                                 | 33.6%                          | 2.0%                             | 22.8%                                       | 27,523.5                  | <b>\$3.54</b>  | 35,744.8                      | 20.0%                              | 20%                                   | 28,589.0                         | <b>\$3.68</b>                                    | <b>4%</b>                     |
|  |      |                                   |                                       |                                |                                  |   |                           |  |                               |                                    |                                       |                                  | <b>Average</b>                                   | <b>12%</b>                    |

(1) We exclude companies with negative non-GAAP pre-tax income: INST and MULE.

(2) We show our estimated calendar 2018E or fiscal 2019E non-GAAP overall effective tax rates, either based on company guidance or historical rates that have been generally consistent.

We exclude companies that report near-zero non-GAAP overall effective tax rates (these companies generally use non-GAAP tax rates that are near their GAAP tax rates):

APTI, BNFT, CALD, NTXS, RNG, and WDAY, and VRNS.

(3) We estimate a normalized US tax rate, generally equal to the 35% federal rate, plus state and local taxes, minus R&D credits and domestic activities production credit.

(4) We use GAAP US vs. foreign pre-tax income mix (reported by each company in its latest 10-K) as a proxy for non-GAAP pre-tax income mix.

We exclude companies for which the mix of US and foreign pre-tax income is volatile: SYMC, PANW, CRM, and SPLK.

(5) We impute the implied foreign non-GAAP tax rate used by each company based on the non-GAAP US tax rate and US% of pre-tax income (Items 3 and 4).

(6) Based on our calculated new non-GAAP US tax rate (see Item 7) and implied foreign non-GAAP tax-rate (Item 5), weighted by pre-tax income mix.

(7) We calculate a new non-GAAP US tax rate, based on the new 21% federal rate, and adjusted for the items described in Item 3.

**Source: Company data and Jefferies Research**

## Indirect Effects of a Lower US Corporate Tax Rate

There are likely to be several additional indirect effects from a lower US corporate tax rate and we identify a couple below:

### Lower Corporate Tax Could Potentially Cause FX Headwind

One potential caveat of decreased corporate taxes is the impact on the dollar and foreign exchange rates. If the dollar strengthens on the back of higher economic growth stimulated by lower corporate taxes, this would create a top-line FX translation headwind for US-based Software companies that have global exposure. Note that if current FX rates hold, we expect approximately two percentage points of benefit to the reported results of an average US-based Software company. Additionally, given that most Software companies have R&D costs primarily based in the US, those expenses (which would not decrease on a reported basis as top-line results would) could provide a headwind to bottom line results. However, the net impact of a stronger dollar would vary depending on the company, and could be more than offset by the tax savings arising from the new tax policy.

### Lower Tax Rate Raises Base Value Multiples for Software Companies

We note that all else equal, a reduction in the cash tax rate from 35% to 21%, would increase the base value multiple for the NPV of future recurring cash flow streams for a license/maintenance company to 6.2x from 5.1x, and to 5.4x from 4.5x for SaaS companies. This is based on our calculation that the NPV of the future cash flow from \$1 million of enterprise software maintenance is about \$5.1 million, and that the net present value of the future cash flow from \$1 million of enterprise SaaS subscription is about \$4.5 million. Our other assumptions include that an efficiently run license and maintenance Software model generates 85% operating margins, and 75% for subscription models (due to the cost of running datacenters), no growth in the maintenance stream, and 11% cost of equity (which assumes the CAPM model, and implies beta = 1.0, and a risk-free rate of 4.45%). See our weekly piece, "The Right Price" for more details.

In other words, given this tax rate change, we would consider 6.2x EV/TTM Maintenance to be the base value for a license and maintenance Software company, and 5.4x for a SaaS company. Therefore, ***a lower tax rate could increase the acquisition activity by disciplined acquirers that place strong consideration on the value of the recurring revenue stream.***

## Deemed Repatriation – Potential Benefit for Software M&A and Capital Return

### One-Time Deemed Repatriation and Mandatory Tax

Under current tax law, the foreign income of US domiciled companies is subject to US tax, but US companies can choose to defer this income indefinitely, and thereby not pay the US taxes assessed on foreign income until it is repatriated. When US companies actually repatriate the cash and other accumulated earnings held overseas, they must pay taxes on these funds at their respective US rates (generally 35% assuming the top federal marginal rate, less foreign taxes credits equal to the foreign taxes already paid). The new tax bill "deems" all accumulated foreign income held by US domiciled companies as of the last tax year prior to 2018 as repatriated in 2018, and assesses a one-time tax on these funds. A 15.5% rate applies to foreign "cash position" (which includes cash, cash equivalents, net accounts receivable, and marketable securities), while an 8% rate is assessed on the remaining foreign accumulated earnings, or "non-cash position" (which includes reinvestments in fixed assets and M&A). Companies have the option to pay these taxes over an eight-year period based on a schedule outlined in the tax bill.

To be clear, companies with accumulated foreign earnings will have to pay this one-time tax on the entirety of these accumulated earnings, regardless of the amount that is permanently reinvested foreign operations, and regardless of whether or not they intend to bring back the funds to the US. This is different from previous times when the federal government gave companies the *option* to repatriate funds at a reduced one-time tax rate. We note that this could have a punitive effect on companies that intend to reinvest their foreign funds to support operations in those jurisdictions. However, as we show in our analysis below, the maximum taxes that would be paid by each of our covered companies (those that have foreign operations) is only a fraction of each company's foreign cash position. So while potentially punitive, the deemed repatriation tax wouldn't cause any foreign cash constraint issues for any of the companies. Additionally, as noted above, some portion, of foreign taxes already paid are deductible against this one-time tax.

### Repatriation Tax Holiday Should Drive M&A and Capital Return

The US government's implementation of deemed repatriation and changes to taxation of foreign income are aimed to increase job creation and stimulate the US economy – at least that's the intent. This isn't the first time a presidential administration has enacted a one-time repatriation for foreign income, so there is historical precedent for its potential effect. During the last one-time repatriation in 2004-2005, a subsequent Senate review concluded that instead of increasing jobs (jobs actually declined in aggregate for the corporations that repatriated the most funds) and R&D investments, corporations spent the repatriated funds on share repurchases and higher executive pay. Similar to the conclusion of the Senate review, our analysis of spending by the four technology/software corporations that repatriated the most funds in 2004-2005 (HP, IBM, Oracle, and Microsoft) shows that their increased cash piles were used for M&A or capital return. See [Mini Case Study: Learnings from Last Repatriation Tax Holiday](#) below. Also, as shown in Chart 57 in our M&A section, the aggregate number of US technology and software M&A deals (over \$100 million in deal value) increased significantly from 2004-2007. We acknowledge this was during a period of economic expansion and other factors may have affected M&A, but we believe increased availability of funds across the industry was one of them.

One could make the argument that capital infusion into the economy, regardless of how it is spent, ultimately drives growth (even at the expense of immediate post-merger job cuts), and thus the US government's goal was achieved regardless of how the funds were allocated. But it should really have come as no surprise that when given the choice, companies would spend on whatever benefits its most important stakeholders the most, which in the case of public companies, shareholders usually rank near the top. **Therefore, we believe that this time around, deemed repatriation should fuel more Software M&A in the near-term, and potentially increase capital return to shareholders too.** For our M&A discussion, see [Expect Increased Software M&A in 2018](#).

Companies could certainly choose to spend repatriated funds for other purposes too, such as for reinvestment, or reducing debt. However, we believe debt reduction is less likely, because Software companies generally have lower leverage ratios than companies in other industries. Also, as we note in the [Limitation on Interest Expense Deductibility](#) section, interest expenses for our covered companies across the board fall below the new limit of 30% of EBITDA, so there is even less of a need to reduce debt.

### Best-Positioned to Benefit from Deemed Repatriation

**We estimate that within our coverage, the companies that would have the most foreign cash and equivalents available for use in the US after paying their respective one-time mandatory repatriation taxes (i.e., cash that was held overseas and now will be available for use in the US), include Microsoft (\$110 billion), Oracle (\$49 billion), and VMware (\$7 billion), followed by Citrix (\$2 billion), CA Technologies**

**(\$1.5 billion), Red Hat (\$1 billion), and Symantec (\$1 billion).** See Chart 49 below for more details.

We conservatively assume that each company would pay the full one-time mandatory tax on repatriated foreign funds and assets, despite having already paid some taxes on this income. The tax bill does allow for some portion of foreign taxes already paid to be deductible against the repatriation tax, based on a formula. However, we cannot reasonably estimate this amount because we neither know the aggregate amount of foreign taxes already paid by each company, nor the amount of foreign taxes already paid that are actually allowable as deductions against this tax. We also note that the 8% tax assessed on non-cash positions (which includes our estimate of foreign-held intangible assets) is small relative to the total funds available after repatriation.

For each company, we apply the 15.5% statutory one-time tax rate on its foreign “cash position” and the 8% statutory one-time tax rate on its foreign “non-cash position”. Some companies disclose cash, cash equivalents, and marketable securities held outside of the US, which we believe is a reasonably close proxy for foreign cash position. (The definition of “cash position” in the tax bill includes net accounts receivable, which may or not be included in each company’s disclosed cash and equivalents, but in general net A/R for our covered companies is a negligible portion of total accumulated foreign cash and equivalents. Additionally, a couple of our covered companies (Red Hat and CA) disclose their total foreign-held assets, which we use to infer the non-cash position (total foreign assets minus the foreign cash position). For the companies that don’t disclose foreign-held cash or foreign-held total assets, we use their disclosed mix of foreign long-lived assets or property and equipment (almost all of the companies disclose one of these figures on an annual basis) as a percentage of the total, and apply that percentage to the most recently reported total cash and equivalents and non-cash assets. See the notes in our table for more details.

**Chart 49: Potential Foreign Cash Repatriation for US-Based Coverage Companies**

in millions of \$

Ranked by Estimated After-Tax Foreign Cash &amp; Equivalents Available in US Post-Repatriation

| Company            | Ticker | Total Cash & Equivalents | Domestic Cash & Equivalents | Foreign Cash Position (1) | Max Tax on Foreign Cash Position @ 15.5% Rate | Foreign Non Cash Position (2), (3) | Max Tax on Foreign Non Cash Position @ 8.0% Rate | Total Est. Accumulated Foreign Earnings | Max Tax on Accumulated Foreign Earnings | Implied Tax Rate on Accumulated Foreign Earnings | After-Tax Foreign Cash & Equivalents Available in US Post-Repatriation | % of Foreign Cash Position | Total Cash & Equivalents Available in US Post-Repatriation | As of Quarter Ended |
|--------------------|--------|--------------------------|-----------------------------|---------------------------|---|------------------------------------|--|---|---|--|--|----------------------------|--|---------------------|
| Microsoft          | MSFT   | 138,471                  | 6,371                       | 132,100                   | 20,476  | 20,484                             | 1,639  | 152,584                                 | 22,114                                  | 14.5%  | 109,986  | 83%                        | 116,357  | 09/30/17            |
| Oracle             | ORCL   | 71,580                   | 13,080                      | 58,500                    | 9,068   | 4,880                              | 390  | 63,380                                  | 9,458                                   | 14.9%  | 49,042   | 84%                        | 62,122   | 11/30/17            |
| VMware             | VMW    | 11,612                   | 3,380                       | 8,232                     | 1,276   | 247                                | 20   | 8,479                                   | 1,296                                   | 15.3%  | 6,936  | 84%                        | 10,316   | 09/30/17            |
| Citrix             | CTXS   | 2,559                    | 89                          | 2,470                     | 383   | 107                                | 9  | 2,577                                   | 391                                     | 15.2%  | 2,079  | 84%                        | 2,167  | 09/30/17            |
| CA Technologies    | CA     | 2,822                    | 959                         | 1,863                     | 289   | 466                                | 37   | 2,329                                   | 326                                     | 14.0%  | 1,537  | 82%                        | 2,496  | 09/30/17            |
| Red Hat            | RHT    | 2,314                    | 1,034                       | 1,280                     | 198   | 166                                | 13   | 1,446                                   | 212                                     | 14.6%  | 1,068  | 83%                        | 2,103  | 08/31/17            |
| Symantec           | SYMC   | 2,026                    | 626                         | 1,400                     | 217   | 1,833                              | 147  | 3,233                                   | 364                                     | 11.2%  | 1,036  | 74%                        | 1,662  | 09/29/17            |
| salesforce.com     | CRM    | 3,629                    | 3,121                       | 508                       | 79  | 595                                | 48   | 1,103                                   | 126                                     | 11.5%  | 382  | 75%                        | 3,502  | 10/31/17            |
| Workday            | WDAY   | 3,211                    | 2,821                       | 390                       | 60  | 87                                 | 7  | 477                                     | 67                                      | 14.1%  | 323  | 83%                        | 3,144  | 10/31/16            |
| Palo Alto Networks | PANW   | 2,281                    | 1,984                       | 296                       | 46  | 67                                 | 5  | 363                                     | 51                                      | 14.1%  | 245  | 83%                        | 2,229  | 10/31/17            |
| Tableau Software   | DATA   | 943                      | 658                         | 286                       | 44  | 0                                  | 0  | 286                                     | 44                                      | 15.5%  | 241  | 85%                        | 899  | 09/30/17            |
| Commvault          | CVLT   | 495                      | 306                         | 189                       | 29  | 10                                 | 1  | 199                                     | 30                                      | 15.1%  | 159  | 84%                        | 464  | 09/30/17            |
| Nutanix            | NTNX   | 349                      | 163                         | 186                       | 29  | 83                                 | 7  | 268                                     | 35                                      | 13.2%  | 150  | 81%                        | 314  | 10/31/17            |
| CallidusCloud      | CALD   | 176                      | 106                         | 71                        | 11  | 31                                 | 3  | 102                                     | 13                                      | 13.2%  | 57   | 81%                        | 163  | 09/30/17            |
| SS&C Technologies  | SSNC   | 103                      | 23                          | 80                        | 12  | 291                                | 23   | 372                                     | 36                                      | 9.6%   | 45   | 56%                        | 68   | 09/30/17            |
| Splunk             | SPLK   | 1,063                    | 1,023                       | 41                        | 6   | 9                                  | 1  | 50                                      | 7                                       | 14.1%  | 34   | 83%                        | 1,056  | 10/31/17            |
| Mulesoft           | MULE   | 182                      | 146                         | 35                        | 5   | 2                                  | 0  | 37                                      | 6                                       | 15.1%  | 29   | 84%                        | 176  | 09/30/17            |
| Ring Central       | RNG    | 172                      | 146                         | 26                        | 4   | 7                                  | 1  | 33                                      | 5                                       | 13.9%  | 21   | 82%                        | 168  | 09/30/17            |
| Apptio             | APTI   | 136                      | 115                         | 20                        | 3   | 2                                  | 0  | 22                                      | 3                                       | 14.9%  | 17   | 84%                        | 132  | 09/30/17            |
| Instructure        | INST   | 67                       | 58                          | 9                         | 1   | NA                                 | NA   | 9                                       | 1                                       | 15.5%  | 8  | 85%                        | 65   | 09/30/17            |
| Sailpoint          | SAIL   | 18                       | 13                          | 5                         | 1   | NA                                 | NA   | 5                                       | 1                                       | 15.5%  | 5  | 85%                        | 17   | 09/30/17            |
| Alarm.com          | ALRM   | 85                       | 85                          | 0                         | 0   | 0                                  | 0  | 0                                       | 0                                       | NA   | 0  | NA                         | 85   | 09/30/17            |
| Paycom             | PAYC   | 67                       | 67                          | 0                         | 0   | 0                                  | 0  | 0                                       | 0                                       | NA   | 0  | NA                         | 67   | 09/30/17            |
| Benefitfocus       | BNFT   | 55                       | 55                          | 0                         | 0   | 0                                  | 0  | 0                                       | 0                                       | NA   | 0  | NA                         | 55   | 09/30/17            |

## Notes

To estimate the tax-effected deemed repatriation amounts for each company, we apply the 15.5% statutory one-time tax rate on the foreign "cash position" of each company and the 8% statutory one-time tax rate on the foreign "non-cash position" of each company.

(1) The following companies disclose cash, cash equivalents, and marketable securities held outside of the US: MSFT, ORCL, VMW, CTXS, CA, SYMC, RHT, PANW, CVLT, and SSNC.

For each of these companies, we use this data as a proxy for their foreign cash position. For companies that don't disclose foreign-held cash and equivalents, we use their disclosures of foreign assets as a percentage of the total assets (see Notes 2 and 3 below), and apply that percentage to the most recently reported total cash and equivalents.

For DATA, which has about 30% of revenue outside of the US but no long-lived assets held outside of the US, we estimate foreign-held cash in proportion to its foreign revenue mix.

For INST and SAIL, which have foreign operations but don't disclose the amounts of foreign-held assets, we estimate foreign-held cash in proportion to its foreign revenue mix.

(2) We define foreign "non-cash position" as foreign non-current assets, excluding any long-term marketable securities, deferred tax assets (which are written off per the new tax rules), and goodwill.

We exclude goodwill because we assume that the acquisitions made by most of the US-based companies included were of domestic assets and thus the related goodwill is allocable to the US.

We estimate foreign non-cash position for each company by applying the percentage of total assets, long-lived assets, or PP&E (depending on which of these is disclosed) held outside of the US, to our estimate of total non-cash position as of the most recently report quarter.

(3) The following companies disclose the geographical mix of total assets: CA and RHT

The following companies disclose the geographical mix of long-lived assets: MSFT, ORCL, CVLT, SSNC, CRM, WDAY, DATA, NTNX, MULE, CALD, RNG, and APTI.

The following companies disclose the geographical mix of net property and equipment: VMW, CTXS, SYMC, PANW, and SPLK.

PAYC and BNFT have 100% of operations within the US, while ALRM has over 99% of operations in the US.

**Source: Company data and Jefferies Research**

## Mini Case Study: Learnings from Last Repatriation Tax Holiday

In October 2004, the US Congress passed the Homeland Investment Act (part of the broader American Jobs Creation Act) that allowed US multinational corporations a one-year window ended in 2005 to repatriate overseas earnings at a reduced effective tax rate of 5.25%, rather than 35% top federal marginal rate. The bill stipulated that the repatriated earnings must be spent within the US, outlined in a domestic reinvestment plan, and limited to: worker hiring and training, infrastructure, R&D, capital investments (including acquisitions of US businesses), and corporate financial stabilization aimed at job creation and retention.

In October 2011, the Senate's Permanent Subcommittee on Investigations released a bipartisan report reviewing the uses of the repatriated cash by 19 major multinational corporations, including the 15 corporations that repatriated the most funds. In aggregate, 843 corporations repatriated \$312 billion of qualified funds in 2004-2005, including \$149 billion in aggregate by the top 15. The conclusion was that contrary to the intended purpose for repatriated cash, US jobs at 12 of the 19 surveyed corporations declined over the subsequent three years, while the pace of R&D expenditures decelerated slightly in aggregate over the same period versus the three prior periods. Meanwhile, stock repurchases and executive compensation increased significantly following cash repatriation. While these were strictly prohibited uses of the repatriated cash, there was no way to legally track or substantiate the use of the repatriated funds. Among the 19 major corporations surveyed were four technology companies: Hewlett Packard (#3 in amount repatriated), IBM (#5), Oracle (#15), and Microsoft (outside of top 15). We discuss their uses of cash on R&D, capex, capital returns (share repurchases plus dividends), and acquisitions below. Refer to Charts 50 and 51 below.

### Oracle

In its Section 965 Domestic Reinvestment Plan filed with the IRS near the end of its 2005 fiscal year, Oracle stated its intent to spend its \$3.1 billion of repatriated cash on the acquisitions of capital investments, and specifically PeopleSoft, Inc., which was completed on January 7, 2005, and Retek Inc., which was completed on April 12, 2005. Oracle acquired PeopleSoft for \$8.7 billion in net cash and Retek for \$530 million in net cash. Oracle's stated alternative uses for the repatriated funds were for salaries, bonuses, and commissions for US employees, agents, and contractors, followed by investments in US research and development as a second alternative use. Oracle's share repurchases as a percentage of free cash flow (operating cash flow minus capex) was relatively consistent in fiscal 2005 and 2006 compared to fiscal 2004. Oracle repatriated the maximum amount of cash available for repatriation under the American Jobs Creation Act.

### Microsoft

In its Section 965 Domestic Reinvestment Plan, Microsoft stated the intent to invest its \$780 million in repatriated cash on various R&D projects in the form of salaries, wages, and bonuses for US employees, followed by investments in advertising and marketing as an alternative use. Microsoft stated that any amounts not invested as planned in fiscal 2006 would be invested the next year. We note that R&D expense (excluding stock option expense) increased by \$487 million in fiscal 2006 and \$537 million in fiscal 2007, but R&D expense as a percentage of revenue decreased by about 600 basis points in fiscal 2005 relative to the three prior years, and continued to fall by 40 basis points in 2006 and 100 basis points in 2007. Also, capex declined to an average 1.7% as a percentage of revenue in fiscal 2005-2007 versus an average 2.6% in fiscal 2002-2004. While there was no evidence of the repatriated cash being allocated to M&A or capital return, we note that Microsoft did coincidentally announced and paid a one-time special dividend of \$36 billion in fiscal 2005. It also spent \$2 billion on acquisitions from fiscal 2005-2007, versus

\$1 billion in fiscal 2002-2004. Of Microsoft's \$60.6 billion of cash and investments held at the end of fiscal 2004, only about \$2.3 billion was in undistributed foreign earnings; the \$780 million repatriated was about one-third of the amount allowed.

**Hewlett Packard**

HP's Section 965 Domestic Reinvestment Plan filing with the IRS was not available in the Senate Subcommittee report. HP repatriated \$14.5 billion of foreign funds, which was the maximum amount allowed under the legislation. From fiscal 2005 to 2007, the company's R&D expense (excluding stock option expense) decreased from 4.0% to 3.4% of revenue, versus 6.0% in fiscal 2002, 5.0% in 2003 and 4.5% in 2004. Capex as a percentage of revenue remained relatively stable before and after repatriation. Meanwhile, total capital return (share repurchases plus dividends) was an average 110% of free cash flow in fiscal 2005-2007 versus 76% in fiscal 2002-2004. Additionally, HP spent \$1.5 billion of cash on acquisitions in fiscal 2005-2006, similar to the \$1.3 billion in fiscal 2003-2004, but spent \$6.8 billion on acquisitions in fiscal 2007, which may have used some of the repatriated cash.

**IBM**

IBM's Section 965 Domestic Reinvestment Plan filing with the IRS was not available in the Senate Subcommittee report. IBM repatriated \$9.5 billion of foreign funds, which was the maximum amount allowed under the legislation. IBM's R&D expense (excluding stock option expense) increased to an average 6.3% in fiscal 2005-2007 following repatriation versus an average 5.8% in fiscal 2002-2004. Capex as a percentage of revenue remained relatively stable before and after repatriation. Capital return as a percentage of free cash flow nearly doubled from an average 26% in fiscal 2002-2004 to an average 45% in fiscal 2005-2006 and was 97% in fiscal 2007, which may have included some repatriated cash. Additionally, IBM spent \$3.8 billion of cash, or 19% of free cash flow on acquisitions in 2006, above the 8.5%, or under \$2 billion in the prior three years.



**Chart 50: Uses of Cash Following 2004-2005 Cash Repatriation for Oracle and Microsoft**

\$ in millions

| <b>Oracle</b>                   |          |            |              |               |              |              |
|---------------------------------|----------|------------|--------------|---------------|--------------|--------------|
| FY ended May 31                 | FY02     | FY03       | FY04         | FY05          | FY06         | FY07         |
| Cash/marketable securities      | 6,247    | 6,519      | 8,587        | 4,771         | 7,605        | 7,020        |
| Amount Repatriated              |          |            |              | 3,100         |              |              |
| Revenue                         | 9,673    | 9,475      | 10,156       | 11,799        | 14,380       | 17,996       |
| <i>y/y Change</i>               | -10.9%   | -2.0%      | 7.2%         | 16.2%         | 21.9%        | 25.1%        |
| R&D expense, non-GAAP *         | 1,076    | 1,159      | 1,254        | 1,481         | 1,859        | 2,110        |
| <i>% of revenue</i>             | 11.1%    | 12.2%      | 12.3%        | 12.6%         | 12.9%        | 11.7%        |
| Operating Cash Flow             | 3,135    | 3,050      | 3,195        | 3,552         | 4,541        | 4,274        |
| <i>% of revenue</i>             | 32.4%    | 32.2%      | 31.5%        | 30.1%         | 31.6%        | 23.7%        |
| Capex                           | 278      | 291        | 189          | 188           | 236          | 319          |
| <i>% of revenue</i>             | 2.9%     | 3.1%       | 1.9%         | 1.6%          | 1.6%         | 1.8%         |
| Free cash flow (OCF less Capex) | 2,857    | 2,759      | 3,006        | 3,364         | 4,305        | 3,955        |
| <i>% of revenue</i>             | 29.5%    | 29.1%      | 29.6%        | 28.5%         | 29.9%        | 22.0%        |
| Share repurchases               | 2,792    | 2,653      | 1,499        | 1,343         | 2,067        | 3,937        |
| <u>Dividends</u>                | <u>0</u> | <u>0</u>   | <u>0</u>     | <u>0</u>      | <u>0</u>     | <u>0</u>     |
| Repurchases + Dividends         | 2,792    | 2,653      | 1,499        | 1,343         | 2,067        | 3,937        |
| <i>% of free cash flow</i>      | 97.7%    | 96.2%      | 49.9%        | 39.9%         | 48.0%        | 99.5%        |
| Acquisitions                    | 0        | 46         | 21           | 10,656        | 3,953        | 5,005        |
| <i>% of free cash flow</i>      | 0.0%     | 1.7%       | 0.7%         | 316.8%        | 91.8%        | 126.5%       |
| <b>Microsoft</b>                |          |            |              |               |              |              |
| FY ended June 30                | FY02     | FY03       | FY04         | FY05          | FY06         | FY07         |
| Cash/marketable securities      | 38,652   | 49,048     | 60,592       | 37,751        | 34,161       | 23,411       |
| Amount Repatriated              |          |            |              | 780           |              |              |
| Revenue                         | 28,365   | 32,187     | 36,835       | 39,788        | 44,282       | 51,122       |
| <i>y/y Change</i>               | 12.1%    | 13.5%      | 14.4%        | 8.0%          | 11.3%        | 15.4%        |
| R&D expense, Non-GAAP *         | 6,299    | 6,595      | 7,779        | 6,097         | 6,584        | 7,121        |
| <i>% of revenue</i>             | 22.2%    | 20.5%      | 21.1%        | 15.3%         | 14.9%        | 13.9%        |
| Operating Cash Flow             | 14,509   | 15,797     | 14,626       | 16,605        | 14,404       | 17,796       |
| <i>% of revenue</i>             | 51.2%    | 49.1%      | 39.7%        | 41.7%         | 32.5%        | 34.8%        |
| Capex                           | 770      | 891        | 1,109        | 812           | 1,578        | 2,264        |
| <i>% of revenue</i>             | 2.7%     | 2.8%       | 3.0%         | 2.0%          | 3.6%         | 4.4%         |
| Free cash flow (OCF less Capex) | 13,739   | 14,906     | 13,517       | 15,793        | 12,826       | 15,532       |
| <i>% of revenue</i>             | 48.4%    | 46.3%      | 36.7%        | 39.7%         | 29.0%        | 30.4%        |
| Share repurchases               | 6,069    | 6,486      | 3,383        | 8,057         | 19,207       | 27,575       |
| <u>Dividends</u>                | <u>0</u> | <u>857</u> | <u>1,729</u> | <u>36,112</u> | <u>3,545</u> | <u>3,805</u> |
| Repurchases + Dividends         | 6,069    | 7,343      | 5,112        | 44,169        | 22,752       | 31,380       |
| <i>% of free cash flow</i>      | 21.4%    | 22.8%      | 13.9%        | 111.0%        | 51.4%        | 61.4%        |
| Acquisitions                    | 0        | 1,063      | 4            | 207           | 649          | 1,150        |
| <i>% of free cash flow</i>      | 0.0%     | 3.3%       | 0.0%         | 0.5%          | 1.5%         | 2.2%         |

\* Non-GAAP R&amp;D expense excludes stock options in fiscal 2005-2007 (GAAP required expensing stock starting in 2005).

Source: Jefferies estimates and company data

**Chart 51: Uses of Cash Following 2004-2005 Cash Repatriation for HP and IBM**

\$ in millions

| <b>Hewlett Packard</b>          |              |              |              |              |              |              |
|---------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| FY ended October 31             | FY02         | FY03         | FY04         | FY05         | FY06         | FY07         |
| Cash/marketable securities      | 11,429       | 14,591       | 12,974       | 13,929       | 16,422       | 11,445       |
| Amount Repatriated              |              |              |              | 14,500       |              |              |
| Revenue                         | 56,588       | 73,061       | 79,905       | 86,696       | 91,658       | 104,286      |
| <i>y/y Change</i>               | 25.1%        | 29.1%        | 9.4%         | 8.5%         | 5.7%         | 13.8%        |
| R&D expense, non-GAAP *         | 3,368        | 3,686        | 3,563        | 3,490        | 3,521        | 3,537        |
| <i>% of revenue</i>             | 6.0%         | 5.0%         | 4.5%         | 4.0%         | 3.8%         | 3.4%         |
| Operating Cash Flow             | 5,444        | 6,057        | 5,088        | 8,028        | 11,353       | 9,615        |
| <i>% of revenue</i>             | 9.6%         | 8.3%         | 6.4%         | 9.3%         | 12.4%        | 9.2%         |
| Capex                           | 1,710        | 1,995        | 2,126        | 1,995        | 2,536        | 3,040        |
| <i>% of revenue</i>             | 3.0%         | 2.7%         | 2.7%         | 2.3%         | 2.8%         | 2.9%         |
| Free cash flow (OCF less Capex) | 3,734        | 4,062        | 2,962        | 6,033        | 8,817        | 6,575        |
| <i>% of revenue</i>             | 6.6%         | 5.6%         | 3.7%         | 7.0%         | 9.6%         | 6.3%         |
| Share repurchases               | 671          | 751          | 3,309        | 3,514        | 6,057        | 10,887       |
| <u>Dividends</u>                | <u>801</u>   | <u>977</u>   | <u>972</u>   | <u>926</u>   | <u>894</u>   | <u>846</u>   |
| Repurchases + Dividends         | 1,472        | 1,728        | 4,281        | 4,440        | 6,951        | 11,733       |
| <i>% of free cash flow</i>      | 39.4%        | 42.5%        | 144.5%       | 73.6%        | 78.8%        | 178.4%       |
| Acquisitions **                 | (3,557)      | 149          | 1,124        | 641          | 855          | 6,793        |
| <i>% of free cash flow</i>      | -95.3%       | 3.7%         | 37.9%        | 10.6%        | 9.7%         | 103.3%       |
| <b>IBM</b>                      |              |              |              |              |              |              |
| FY ended December 31            | FY02         | FY03         | FY04         | FY05         | FY06         | FY07         |
| Cash/marketable securities      | 5,975        | 7,647        | 10,570       | 13,686       | 10,656       | 16,146       |
| Amount Repatriated              |              |              |              | 9,500        |              |              |
| Revenue                         | 81,186       | 89,131       | 96,293       | 91,134       | 91,424       | 98,786       |
| <i>y/y Change</i>               | -5.5%        | 9.8%         | 8.0%         | -5.4%        | 0.3%         | 8.1%         |
| R&D expense, Non-GAAP           | 4,750        | 5,077        | 5,673        | 5,378        | 6,107        | 6,153        |
| <i>% of revenue</i>             | 5.9%         | 5.7%         | 5.9%         | 5.9%         | 6.7%         | 6.2%         |
| Operating Cash Flow             | 13,066       | 14,569       | 15,323       | 14,914       | 15,019       | 16,094       |
| <i>% of revenue</i>             | 16.1%        | 16.3%        | 15.9%        | 16.4%        | 16.4%        | 16.3%        |
| Capex                           | 5,350        | 4,974        | 5,056        | 4,634        | 5,166        | 5,505        |
| <i>% of revenue</i>             | 6.6%         | 5.6%         | 5.3%         | 5.1%         | 5.7%         | 5.6%         |
| Free cash flow (OCF less Capex) | 18,416       | 19,543       | 20,379       | 19,548       | 20,185       | 21,599       |
| <i>% of revenue</i>             | 22.7%        | 21.9%        | 21.2%        | 21.4%        | 22.1%        | 21.9%        |
| Share repurchases               | 3,087        | 3,232        | 5,418        | 7,145        | 7,739        | 18,828       |
| <u>Dividends</u>                | <u>1,005</u> | <u>1,085</u> | <u>1,174</u> | <u>1,250</u> | <u>1,683</u> | <u>2,147</u> |
| Repurchases + Dividends         | 4,092        | 4,317        | 6,592        | 8,395        | 9,422        | 20,975       |
| <i>% of free cash flow</i>      | 22.2%        | 22.1%        | 32.3%        | 42.9%        | 46.7%        | 97.1%        |
| Acquisitions                    | 3,158        | 1,836        | 1,738        | 1,482        | 3,799        | 1,009        |
| <i>% of free cash flow</i>      | 17.1%        | 9.4%         | 8.5%         | 7.6%         | 18.8%        | 4.7%         |

\* Non-GAAP R&amp;D expense excludes stock options in fiscal 2005-2007 (GAAP required expensing stock starting in 2005).

\*\* In fiscal 2002, HP recognized \$3.6 billion of cash acquired in the Compaq acquisition.

Source: Jefferies estimates and company data

### Cash Repatriation Could Increase Enterprise Software Spending

Large enterprises across all industry verticals usually have budgeted operating and capital expenditures for Software investments each fiscal year. Since cash repatriation should **stimulate spending across the economy, enterprise Software vendors may indirectly benefit from higher budgets. We plan to explore the potential effect of the new corporate tax law on demand in a future report.**

## Modified Territorial Tax System

### 100% Dividends Received Deduction

**Explanation.** The tax bill changes US treatment of foreign taxes from a “worldwide” system under which worldwide earnings of US companies are subject to US tax, to a “modified territorial” system under which the US federal government will only tax income generated in the US (with some exceptions). Starting in 2018, US domiciled C corporations will no longer be subject to US taxes on actively generated income in foreign jurisdictions (e.g., the sale of products and services that *take place* outside of the US). US C corporations will be entitled to a “100% dividends received deduction (DRD)” on “dividends” received from its controlled foreign corporations (defined as foreign entities in which the corporation owns at least a 10% interest). In this context, “dividends” essentially means the US corporation’s share of earnings in the active business operations of its controlled foreign entities (not passive income such as investment portfolio income), regardless of whether these earnings are actually distributed or not. This is in stark contrast to the worldwide system whereby income generated in foreign jurisdictions are subject to US tax, although not payable until that income is repatriated. In conjunction with the deemed repatriation of foreign accumulated earnings, the 100% DRD effectively wipes clean the foreign tax slate (or most of it), and going forward the US multinational corporations can repatriate these foreign earnings tax-free. We note that “Subpart F income”, which includes foreign passive and portfolio income, will continue to be taxed by the US (albeit at the new 21% rate).

**Impact on Software Companies.** We believe that the 100% DRD will support a continued M&A spree for large, multinational Software companies that will start with use of the funds available from the deemed repatriation. Software companies (and others) have intentionally stashed their foreign income overseas and avoided having to pay the higher US tax on the income. With this new provision, Software companies will have ready access to their overseas capital, which could increase their opportunities for strategic acquisitions, especially within the US.

### Limitations on Income Shifting (“GILTI”, “FDII”, and BEAT Taxes)

**Minimum Foreign Taxes and Favorable Treatment of Domestic IP.** While actively generated (i.e., non-passive) foreign income will *generally* be free from US taxes going forward, the new tax bill also introduces provisions that require US corporations to pay minimum US taxes on foreign income that meet certain criteria. These provisions are also collectively aimed at preventing practices that shift income to low tax jurisdictions. The GILTI tax is a flat rate—10.5% for C corporations in 2018-2025—imposed on the “excess foreign income” above on a standard rate of return on foreign tangible assets; this excess foreign income is deemed attributable to intangible assets. Generally, US C corporations that pay below a 13.125% tax rate on active foreign income are subject to the additional GILTI tax starting in 2018. The related FDII provision is intended to have a “patent-box” effect and disincentive corporations from shifting intellectual property overseas. The FDII tax effectively gives C corporations a reduced flat rate—13.125% in 2018-2025—on domestic gross income above a standard rate of return on US tangible assets that is attributable to foreign sales of services or property. Under the combined GILTI and FDII provisions, corporations will theoretically be taxed at the same effective tax rate on foreign income deemed attributable to intangible assets, regardless of where the

intangible assets are held. The base erosion anti-abuse tax (BEAT) is specifically targeted at limiting large corporations from reducing their US tax liability through payments or transfers to foreign related parties. We explain each provision in more detail below.

**Impact on Software Companies.** In particular, the GILTI and FDII tax provisions were written specifically with large technologies companies in mind, likely including Apple, Google, and Microsoft. These companies hold significant amounts of intangible assets such as patents and other forms of intellectual property, to which a meaningful percentage of product costs are allocated. They have long employed practices that involve transferring their intellectual property rights to controlled foreign companies in low tax jurisdictions. The costs of products sold in the US and other higher-tax regions are attributed to royalty and licensing fees paid to these foreign subsidiaries in the low tax jurisdictions. As a result, the sales generated in the US carry lower margins and are taxed at higher rates, while the high margin royalty income in foreign jurisdictions is taxed at lower rates. Technically, royalties are considered passive income defined under Subpart F in the US tax code, and are subject to immediate US tax. However, these foreign subsidiaries are also involved in active business operations (i.e., the sale of products). Through a liberal interpretation of Subpart F in the US tax code, companies engaging in this income shifting practice have been able to treat these royalties and licensing fees as part of active foreign income, on which US taxes are deferred until repatriated. The GILTI and FDII provisions are aimed at preventing this behavior from continuing by imposing minimum taxes foreign income deemed attributable to intangible assets, and incentivizing US corporations to keep intellectual property developed or acquired within the US.

We also acknowledge that some companies within our Software coverage, especially the large, multinational ones have significant amounts of intangible assets, and may engage in shifting income to low tax jurisdictions to varying degrees. However, without additional color from our covered companies, we don't believe we can reasonably predict the company-specific impacts of these foreign tax provisions. With that said, we note some factors to consider to determine the potential impact on foreign tax rates, earnings, and cash flows on our covered Software companies:

- 1) The GILTI/FDII provisions are likely to potentially impact companies that have a disproportionately high foreign pre-tax income mix relative to foreign revenue mix, as this is a preliminary indicator of potential income shifting.
- 2) However, most multinational Software companies already pay foreign tax rates that are near (or in some cases much higher than) the 10.5% GILTI tax rate. The foreign income attributable to intangible assets to which the GILTI tax applies is already included in this foreign tax rate. Note that in general, corporations with foreign tax rates above 13.125% should be exempt from paying the GILTI tax, because 80% of foreign taxes paid that can be attributable to the GILTI are deductible against the GILTI tax ( $80\% * 13.125\% = 10.5\%$ ).
- 3) The FDII provision attempts to incentivize US corporations to keep intangible assets in the US by taxing income attributable to these assets at a reduced 13.125% rate, but only to the extent that these domestic intangible assets generate foreign income. However, when considered together with the GILTI tax, corporations that already hold intangible assets overseas, are generating income on these assets, and already pay a foreign tax rate near the 10.5% GILTI tax rate (see point 2 above), don't really have an incentive to move those assets. Additionally, since the favorable FDII tax rate applies only to the corporation's mix of "excess domestic returns" attributable to foreign income using domestic IP, we could actually see corporations with disproportionately high pre-tax

income mixes (see point 1 above) go higher, or remain unchanged. So again, the effects are unclear.

- 4) Therefore, at this point, we are unsure of if, and how, Software companies engaging in income shifting activities will decide to shift their intangible assets around, and what the net impact would be, especially when taken into consideration with the lower US corporate tax rate. Frankly, we believe that companies are still trying to evaluate the impacts themselves.

#### **The GILTI, FDII, and BEAT Provisions in More Detail:**

- **Global intangible low-taxed income (GILTI).** This GILTI minimum tax is imposed on foreign income that exceeds a statutory rate of return on all foreign tangible assets; this excess amount represents gross income derived from intangible assets. GILTI is calculated as the excess of foreign “net tested income” over a fixed 10% rate of return on the tax basis of the corporation’s “qualified business asset investments” (QBAI). “Net tested income” includes all foreign net income (gross receipts less applicable deductions) other than income that is effectively connected with the US trade or business, Subpart F income (passive), and income received from related entities, among some other exclusions. QBAI is defined broadly as tangible property used in the corporation’s active foreign trade or businesses. This excess amount is subject to tax at the new 21% US corporate rate, but eligible C corporations (which include all of our covered US based companies) are entitled to a 50% deduction from 2018-2025, followed by a 37.5% deduction after 2025. Therefore, the effective GILTI tax is 10.5% in 2018-2025 and 13.125% post-2025. Additionally, C corporations are entitled to a tax credit equal to 80% of foreign taxes paid attributable foreign “net tested income”. This means that in general, C corporations paying foreign tax rates of 13.125% or higher will not owe any GILTI taxes (since foreign taxes are imposed on all income generated in the jurisdiction without regard to whether they are attributable to tangible or intangible assets).
- **Foreign-derived intangible income (FDII).** Conceptually, the FDII tax works in conjunction with the GILTI tax, and was designed as a means to minimize incentives to transfer intangible assets outside of the US. The FDII calculation is conceptually similar to GILTI but applies to *domestic* “deemed eligible income”, which broadly includes all domestic net income while excluding essentially all foreign income and foreign tax credits. This domestic income in excess of a 10% statutory rate of return on domestic tangible QBAI is deemed attributable to intangible assets. The portion of this domestic income attributable to intangible assets is subject to a favorable tax rate to the extent of income from foreign sales of services or property as a percentage of the total domestic income. The effective rate for C corps is 13.125% in 2018-2025 (FDII is taxed at the 21% US rate but subject to a 37.5% deduction) and 16.4% rate post-2025 (via a 21.875% deduction).
- **Base Erosion Anti-Abuse Tax (BEAT).** The BEAT is a form of an alternative minimum tax designed to address concerns about US corporations that engage in “base erosion” transactions that reduce their US taxable income base. Base erosion payments are generally tax-deductible payments made to foreign affiliates, including payments for services, royalties, interest, and purchases of depreciable assets (but excludes costs of goods sold). The BEAT imposes a minimum tax on a global income base that adds back these payments to foreign related parties. The BEAT is applicable to corporations with at least \$500 million of annual gross receipts (i.e., revenue) in the last three taxable years, and with at

least 3% of tax deductions arising from base erosion payments. The BEAT tax rate is 5% rate in 2018, 10% in 2019-2025, and 12.5% in 2026.

## Other Corporate Tax Reform Items

### **Immediate Expensing of Capital Investments**

The new tax bill contains a provision that will allow most new capital investments to be expensed in full and written off against profits in the first year, instead of depreciated over their useful lives under current tax law. This bill accomplishes this by increasing the rates for bonus depreciation—which allows companies to immediately deduct a percentage of the acquisition cost of qualifying assets—to 100% for five years starting in 2018. The bonus depreciation rates are then phased out over the next five years (by 20 percent per year). Under current tax law, the bonus depreciation rates are 50% in 2017, 40% in 2018, and 30% in 2019. Qualifying investments refer to assets that have depreciable lives of 20 years or less, and include machinery and equipment, leasehold improvements to the interiors of buildings, and computer software, among other assets. New building construction will not qualify for the new bonus depreciation rates under these new rules. We believe that construction of data centers may or may not qualify for the new bonus depreciation rates, depending on their useful lives and whether or not they are part of an existing building.

**Impact on Software Companies.** Allowing businesses to immediately expense capital expenditures is aimed at encouraging more upfront investments, and should result in businesses taking larger deductions for capital investments during the first five years of the plan. All else equal, we expect that this change will decrease both income and tax liabilities for Software (and other) companies. Additionally, it would increase volatility in the year-over-year comparability of bottom line results on the income statement, especially for companies that have variable capital expenditures over time. However, all else equal, this change should also increase the comparability of GAAP net income and free cash flow. This is because applicable capital expenditures under the new rule will be reflected as both an expense on the income statement and cash outflow from investment, instead of as a capitalized asset on the balance sheet under current rules. Depreciation of capital expenditures prior to the rule taking effect will still be a non-cash expense added back to the cash flow statement.

In Chart 52 below, we show adjusted capex as a percentage of total revenue for our covered companies; we adjust capex by excluding our estimates for capital investments with useful lives of over 20 years (e.g., new buildings), which wouldn't be qualified for immediate expensing under the new rules. By this measure, Mimecast currently has the highest capex as a percentage of revenue at 10%, followed by Paycom (10%), Instructure (9%), CallidusCloud (8%), and Microsoft (8%).

**Chart 52: Adjusted LTM Capex as % of LTM Revenue***In millions of \$*

| Company              | Ticker | LTM            | LTM     | % of        | LTM                | % of        |
|----------------------|--------|----------------|---------|-------------|--------------------|-------------|
|                      |        | Revenue        | CapEx   | Revenue     | Adjusted Capex (1) | Revenue     |
| Mimecast             | MIME   | 222            | 22.2    | 10.0%       | 22.2               | 10.0%       |
| Paycom               | PAYC   | 407            | 54.6    | 13.4%       | 39.1               | 9.6%        |
| Instructure          | INST   | 147            | 12.9    | 8.8%        | 12.9               | 8.8%        |
| CallidusCloud        | CALD   | 240            | 19.9    | 8.3%        | 19.9               | 8.3%        |
| Microsoft            | MSFT   | 99,181         | 8,098.0 | 8.2%        | 8,098              | 8.2%        |
| Tableau              | DATA   | 878            | 61.6    | 7.0%        | 61.6               | 7.0%        |
| Nutanix              | NTNX   | 876            | 56.2    | 6.4%        | 56.2               | 6.4%        |
| RingCentral          | RNG    | 465            | 20.5    | 4.4%        | 20.5               | 4.4%        |
| salesforce.com       | CRM    | 9,923          | 540.2   | 5.4%        | 419.6              | 4.2%        |
| Oracle               | ORCL   | 38,905         | 2,037.0 | 5.2%        | 1,537              | 4.0%        |
| Palo Alto Networks   | PANW   | 1,869          | 174.7   | 9.3%        | 64.7               | 3.5%        |
| Benefitfocus         | BNFT   | 253            | 8.0     | 3.2%        | 8.0                | 3.2%        |
| NICE Ltd.            | NICE   | 1,264          | 39.8    | 3.1%        | 39.8               | 3.1%        |
| Red Hat              | RHT    | 2,777          | 87.0    | 3.1%        | 87.0               | 3.1%        |
| Citrix               | CTXS   | 2,955          | 90.5    | 3.1%        | 90.5               | 3.1%        |
| Splunk               | SPLK   | 1,158          | 32.1    | 2.8%        | 32.1               | 2.8%        |
| VMware               | VMW    | 7,644          | 209.0   | 2.7%        | 209.0              | 2.7%        |
| Apptio               | APTI   | 180            | 4.7     | 2.6%        | 4.7                | 2.6%        |
| Varonis              | VRNS   | 199            | 4.8     | 2.4%        | 4.8                | 2.4%        |
| Alarm.com            | ALRM   | 320            | 10.6    | 3.3%        | 7.6                | 2.4%        |
| SS&C Technologies    | SSNC   | 1,648          | 38.8    | 2.4%        | 38.8               | 2.4%        |
| Atlassian            | TEAM   | 677            | 15.3    | 2.3%        | 15.3               | 2.3%        |
| Symantec             | SYMC   | 4,571          | 103.0   | 2.3%        | 103.0              | 2.3%        |
| MuleSoft             | MULE   | 263            | 5.1     | 1.9%        | 5.1                | 1.9%        |
| Workday              | WDAY   | 2,000          | 137.8   | 6.9%        | 36.1               | 1.8%        |
| SailPoint            | SAIL   | 163            | 2.4     | 1.4%        | 2.4                | 1.4%        |
| CA Technologies      | CA     | 4,078          | 53.0    | 1.3%        | 53.0               | 1.3%        |
| CommVault            | CVLT   | 668            | 7.0     | 1.0%        | 7.0                | 1.0%        |
| Check Point Software | CHKP   | 1,835          | 28.7    | 1.6%        | 3.7                | 0.2%        |
|                      |        | <b>Average</b> |         | <b>4.6%</b> |                    | <b>3.9%</b> |
|                      |        | <b>Median</b>  |         | <b>3.1%</b> |                    | <b>3.1%</b> |

(1) We adjust reported capex for the following companies for our estimates for capital investments with useful lives of over 20 years: PAYC, CRM, ORCL, PANW, ALRM, WDAY, and CHKP.

**Source: Company data and Jefferies Research**

### Limitation on Interest Expense Deductibility

The new tax bill imposes a limit on the deductibility of interest expense equal to 30% of “adjusted taxable income”, versus full interest deductibility under the prior rules. The tax bill defines the calculation of adjusted taxable income, but as it pertains to the Software (and most other industries), the calculation is very similar to EBITDA in 2018-2021, and EBIT starting in 2022.

**Impact on Software Companies.** Based on a preliminary company-specific analysis, we expect this new provision to have very limited impact on our covered companies. This

makes sense when observing that Software companies generally have low leverage ratios relative to companies in other sectors. Most of the companies in our coverage universe do have some debt or capital leases on which they pay interest expense that would be subject to this provision. However, ***across the board, interest expense falls below the deductibility limit.***

### **R&D Expenses to be Amortized Starting in 2022**

Under current tax law, research investments and most development costs are required to be expensed as incurred. Some development costs that provide a future benefit (e.g., internal use software and other software development costs) can be capitalized. Additionally, companies can claim R&D tax credits, which are applied to current year taxable income. According to the new tax bill, starting in 2022, companies will have to capitalize and amortize domestic R&D investments over a five-year period and foreign R&D investments over a 15-year period.

***Impact on Software Companies.*** When this rule takes effect, we expect income and tax liabilities to increase for Software (and other) companies, since they will only be able to deduct 20% of R&D expenses (in the case of domestic R&D) in the current year, instead of the entire amount. All else equal, this would also decrease comparability between GAAP net income and free cash flow (since most of R&D expense in a current period would no longer show up on the income statement, but would still show up as a cash outflow).

In Chart 53 below, we show LTM GAAP R&D expense as a percentage of revenue for each of our covered companies, ranked from highest to lowest. Generally, R&D expense for Software companies primarily consists of employee salaries, which can be a significant percentage of revenue. However, we note that this new rule doesn't take effect until 2022, so we don't expect any near-term impact.



**Chart 53: LTM GAAP R&D Expense as % of LTM Revenue***In millions of \$*

| Company              | Ticker | LTM Revenue | LTM R&D (GAAP) | % of Revenue |
|----------------------|--------|-------------|----------------|--------------|
| Atlassian            | TEAM   | 677         | 338            | 49.9%        |
| Workday              | WDAY   | 2,000       | 849            | 42.4%        |
| Tableau              | DATA   | 878         | 329            | 37.4%        |
| Nutanix              | NTNX   | 876         | 278            | 31.7%        |
| Instructure          | INST   | 147         | 45             | 30.7%        |
| Splunk               | SPLK   | 1,158       | 293            | 25.3%        |
| VMware               | VMW    | 7,644       | 1,693          | 22.1%        |
| Varonis              | VRNS   | 199         | 43             | 21.9%        |
| Apptio               | APTI   | 180         | 39             | 21.9%        |
| MuleSoft             | MULE   | 263         | 56             | 21.3%        |
| Alarm.com            | ALRM   | 320         | 66             | 20.6%        |
| Symantec             | SYMC   | 4,571       | 927            | 20.3%        |
| Benefitfocus         | BNFT   | 253         | 51             | 20.0%        |
| Red Hat              | RHT    | 2,777       | 546            | 19.7%        |
| Palo Alto Networks   | PANW   | 1,869       | 357            | 19.1%        |
| SailPoint            | SAIL   | 163         | 30             | 18.4%        |
| Oracle               | ORCL   | 38,905      | 6,179          | 15.9%        |
| RingCentral          | RNG    | 465         | 72             | 15.5%        |
| CA Technologies      | CA     | 4,078       | 621            | 15.2%        |
| salesforce.com       | CRM    | 9,923       | 1,501          | 15.1%        |
| CallidusCloud        | CALD   | 240         | 36             | 15.1%        |
| Citrix               | CTXS   | 2,955       | 430            | 14.6%        |
| Microsoft            | MSFT   | 99,181      | 13,505         | 13.6%        |
| NICE Ltd.            | NICE   | 1,264       | 172            | 13.6%        |
| CommVault            | CVLT   | 668         | 90             | 13.4%        |
| Mimecast             | MIME   | 222         | 29             | 12.9%        |
| Check Point Software | CHKP   | 1,835       | 189            | 10.3%        |
| SS&C Technologies    | SSNC   | 1,638       | 153            | 9.3%         |
| Paycom               | PAYC   | 407         | 30             | 7.3%         |

Source: Company data and Jefferies Research

**Net Operating Loss (NOL) Limitation**

Starting in 2018, NOLs will be limited to 80% of taxable income. Many Software companies still have a significant amount of NOLs (both at the federal and state levels) that offset payment of cash taxes. This new provision means that Software companies will have to start paying cash taxes earlier than they would have had to under previous law.

## Geopolitical and Other Considerations

### FX Tailwinds Return

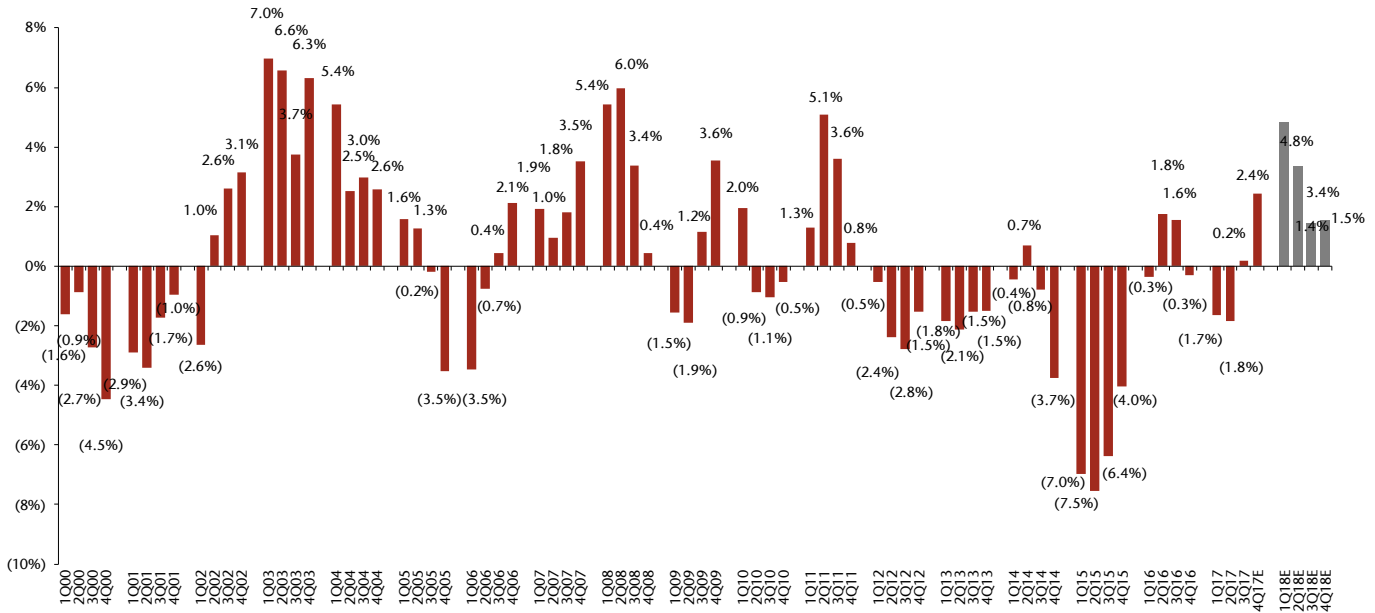
Another factor related to both economic and political issues, but is usually seen as a tactical issue when considering growth, is foreign exchange translation effects on results reported in US dollars, which is what most software companies do since they're typically

(but not always) domiciled in the United States. Therefore, we evaluate historical and forecast foreign currency impacts on what we believe to be the average software company. See Chart 54 below.

We estimate that recent impact from foreign currencies was slightly negative in 2017 after being positive for the first time in five years during 2016. We are forecasting that FX impact should reverse and be positive in the fourth quarter of 2017, with the tailwinds remaining as we move into 2018 even with elevated second half year-over-year comps. We estimate the impact to the fourth quarter of 2017 was a tailwind of about 2.4%. We expect the positive effects of foreign exchange translation on reported revenue numbers to remain in 2018, with a total impact of 2.7% for the year, versus an estimated headwind of 0.1% in 2017. If this estimate holds, this will only be the second time in seven years for foreign exchange translation to have a positive effect on reported results, and the 2.7% magnitude of 2018's impact will be greater than the modest 0.6% impact in 2016.

We believe that most investors are most interested in revenue growth on a constant currency basis as the best fundamental gauge of the sales operations of the company. However, these effects also affect the bottom line, which can be of greater concern, as profit (including cash flow) may have a similar effect depending on whether the vendor hedges its currency exposure and how it does that. This potential tailwind is meaningful and could be more impactful than to revenue, especially for companies that do not actively hedge or have little natural hedges in place (i.e., expenses in foreign currencies).

**Chart 54: Estimated historical and forecast year-over-year FX translation effects for a "typical" software company**



Source: Company data, Bloomberg, and Jefferies Research. As of Jan 17, 2018.

## General Data Protection Regulation (GDPR)

### Regulation

The European Union has adopted the General Data Protection Regulation (GDPR), which is set to go into effect in May 2018. The legislation is centered around the governance of and the use of data pertaining to European citizens and threatens significant fines and penalties for non-compliance. The regulation applies to all companies handling relevant data describing European citizens (regardless of whether companies are located in the European Union or not).

Compared to the prior Data Protection Directive, which is currently in effect, GDPR imposes stricter obligations with regard to data security, while also offering some high-level guidance on appropriate security standards. One of the provisions in the regulation requires that IT security organizations “implement **appropriate** technical and organizational measures” taking into account “the state of the art and the costs of implementation”. While the regulation provides some basic guidance on what is considered “appropriate”, we believe it still leaves much leeway for interpretation.

GDPR also imposes new standards on breach notifications, requiring disclosure to a Supervisory Authority within 72 hours of an organization becoming aware of a breach.

Fines from non-compliance with GDPR can be strict, and in the worst-case scenario be up to €20 million or 4% of worldwide revenue, whichever is greater.

### Beneficiaries

While we believe that the main beneficiaries of GDPR’s implementation will be security vendors, we expect the benefit to be greatest for companies who either:

- offer solutions centered on the governance of data and/or the securing of personal data, or
- offer security solutions that are not yet widely deployed, but may be required to be considered “appropriately” protected. For instance, we believe that most enterprises today have already deployed solutions such as firewalls, endpoint protection, etc. which may suffice for meeting the “state of the art” criterion from the regulation. However, solutions that protect from internal threats and some Identity and Access Management (IAM) offerings are not broadly deployed today, and may be required to provide “appropriate” protection.

Companies in the aforementioned categories include Varonis (VRNS) and SailPoint (SAIL). Both offer Data Access Governance (DAG) solutions, which can monitor and control the access of individuals in an organization to unstructured data. In addition, SailPoint’s flagship offering is Identity Governance and Administration (IGA), which is not broadly deployed, especially in the mid-market. Recently available SaaS solutions make the implementation of such products much more attainable by a much broader audience of corporate customers.

In our recent “[Cybersecurity Survey – From the Source 2.0](#)”, we inquired with corporate IT security buyers about which security categories would benefit the most from GDPR’s implementation. We have reproduced the information below in Chart 55. The top three categories in order were:

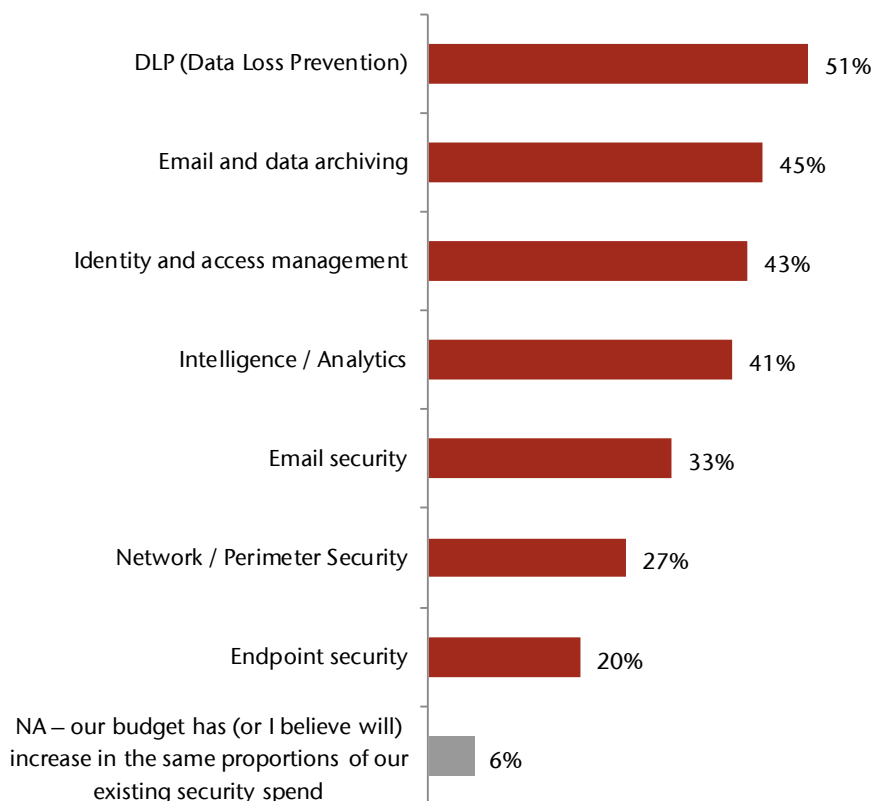
- Data Loss Protection (DLP) – offered by companies such as Symantec (SYMC), McAfee, and Forcepoint
- Email and data archiving – companies such as Mimecast (MIME)

- Identity and Access Management (IAM) – companies such as SailPoint (SAIL), Oracle (ORCL), IBM, and CA

We believe these categories are logical, as they all relate to controlling access to (Email and IAM) or the flow of data (DLP), and are oftentimes not broadly deployed across all corporations.

**Chart 55: Of those that have had or expect increased budgets or a reallocation of security spending: Given existing or expected changes to your IT security budget due to GDPR, which areas have increased (or do you expect to increase) in incremental spending?**

*Respondents could select multiple items*



Source: Jefferies Research, n=49

## Potential Impact of ASC 606

New standards for revenue recognition and contract costs were issued by the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) in May 2014. These new standards will take effect for public companies with fiscal years beginning after December 15, 2017 (and a year later for private companies). We believe that Software companies selling products under term license arrangements will be significantly impacted by the new revenue recognition rules. Some companies selling perpetual license or subscription-based products could be impacted too. According to the new rules, the license portion of some term-license and on-premise subscription arrangements would be recognized at a point in time (typically upon shipment or when the product is made available for download), rather than ratably over the term of the contract per the current norm. This would also significantly reduce or eliminate the

recognition of deferred revenue arising from the term license under current reporting standards (since there would be no deferred portion). The maintenance portion of the term license would still be recognized ratably. We note that several exceptions exist for the upfront recognition of term-license, resulting in some term license agreements that will still be recognized upfront. These instances could cause less comparability of the reported results of Software companies that utilize such arrangements.

Additionally, the new contract expense rules (which **requires** sales commissions to be capitalized and amortized, and over a longer period than they currently are) should impact all of our covered companies to some degree (with the exception of Atlassian, which has negligible sales commissions). Spreading out sales commission amortization over a longer period would likely inflate operating margins in the near term. ASC 606 should not have an impact on cash flow over time, although accelerated revenue recognition may accelerate the timing of when cash taxes are paid. The tax impact will fluctuate between quarters and years, but we believe ASC 606 should be a net neutral to cash flow, and therefore a DCF-based valuation methodology to approximate the intrinsic value of a stock. In Chart 56 below, we illustrate the expected impacts of ASC 606 on key reported line items.

**Chart 56: Impacts on Different Line Items from Shift in Accounting Standards for a Hypothetical Software Company**

|                             | Impact          | ASC 605   | ASC 606 (4)  |
|-----------------------------|-----------------|---|--|
| <b>Revenue:</b>             |                 |   |  |
| Perpetual License           | Minimal         | Upfront   | Upfront  |
| Maintenance                 | None            | Ratably across the contract                       | Ratably across the contract                        |
| Term License/Subcription    | Significant     | Ratably across the contract                       | License upfront; maintenance ratably over contract |
| Term-Perpetual License      | Significant     | Ratably across the contract                       | License upfront; maintenance ratably over contract |
| SaaS                        | None            | Ratably across the contract                       | Ratably across the contract                        |
| Appliance                   | Minimal         | Upfront   | Upfront  |
| Professional Services       | Minimal         | Upon project completion or as incurred over time  | As incurred over time                              |
| <b>S&amp;M Expense (1)</b>  | Some            | Recognized upfront or some deferred over contract | Capitalize more commissions over longer period     |
| <b>Taxes</b>                | Some            |   | Accelerated timing of cash tax payments            |
| <b>Net Income &amp; EPS</b> | Significant (2) |   | Inflated during periods of new business signings   |
| <b>Deferred Revenue</b>     | Significant (2) |   | Less than before due to accelerated rev. rec.      |
| <b>Acc. Receivables</b>     | Some            |   | Includes unbilled receivables                      |
| <b>Billings</b>             | None (3)        | Billings = Revenue + QoQ ΔDR                      | Billings = Revenue + QoQ ΔDR - QoQ ΔUnbilled AR    |
| <b>CFO</b>                  | Minimal         |   | Impact of accelerated cash tax payments            |

Source: Company data and Jefferies Research

Notes:

- (1) Change is limited to change in treatment of incremental contract acquisition costs (e.g. sales commissions)
- (2) The magnitude of this impact would depend on the company's use of term-license arrangements
- (3) Billings calculations would change such that the net impact on calculated billings is zero
- (4) Impacts also from adoption of ASC 340-40

We believe that adoption of ASC 606 would effectively increase alignment between billings and reported revenues for companies that sell products via term licenses. Reported revenues would become a more accurate assessment of the business dynamics (i.e., reported license in any given quarter would better reflect new business growth, or lack thereof), though reporting will likely be more volatile too. We expect traditional SaaS vendors to be largely unaffected by these revenue recognition changes. However, we note that for SaaS companies, we already attempt to calculate New Subscription ACV (what we believe best approximates the new business momentum for SaaS companies). ASC 606 would effectively require term license and maintenance Software companies to disclose revenue that would be more comparable to our new business calculation for SaaS companies. We plan to publish a report with more detailed analysis of the expected impact for each company within our coverage universe in the near future.

# Software Deal Activity

## Expect Increased Software M&A in 2018

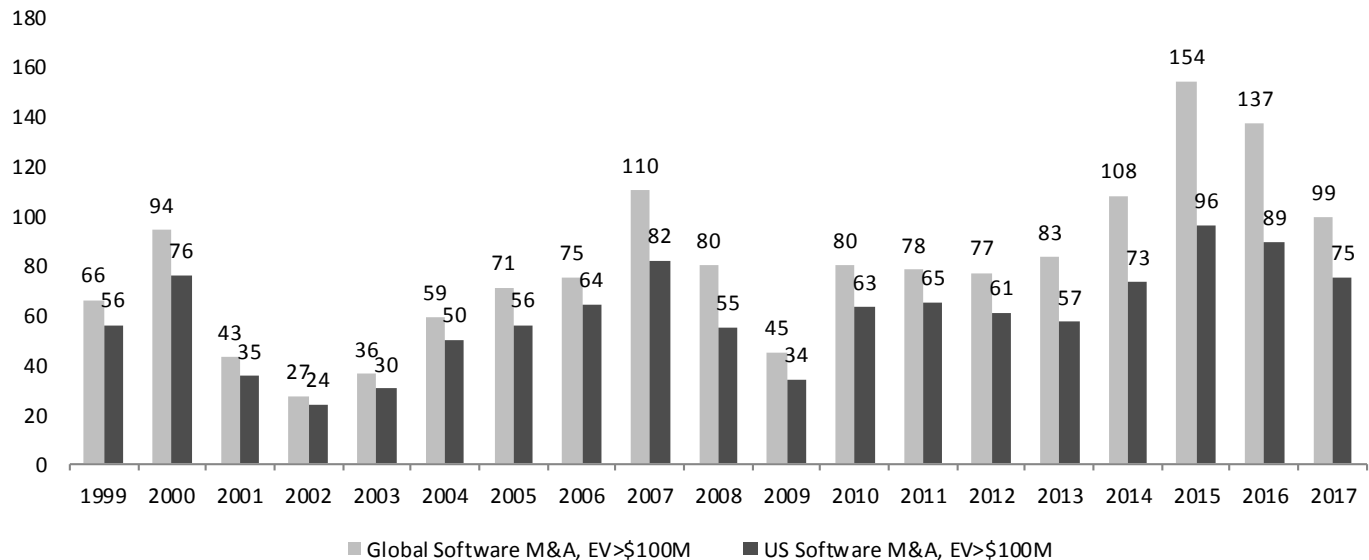
In our 2017 outlook, we had predicted that following a record year in both the number and aggregate value for large deals (approximately \$1 billion or greater), the momentum would continue into the year. We believed that strong demand from both strategic acquirers and private equity sponsors, coupled with near-zero interest rates, would serve as underlying catalysts for strong deal activity. While these dynamics still hold true, the booming market elevated valuations and aggregate deal value of \$19 billion among large deals in 2017 fell short of our expectations, significantly below the record \$93 billion in 2016 and \$30 billion in 2015, and closer to the \$24 billion average from 2010-2014. We attribute the moderation in aggregate deal value in part to the stellar performance of the Software sector in public equity markets in 2017 that have inflated takeover multiples. This was evidenced in record deal valuations (per our data that goes back to 1999), more so by strategic acquirers, which paid on average 7.2x LTM revenues for targets. PE sponsors also paid a record 4.7x LTM revenues according to our data, but demonstrated more discipline than in 2015-2016 when they paid more in line with strategic acquirers. The anticipation of a one-time cash repatriation as part of a tax reform package may also have delayed some demand. Nonetheless, large deal activity remained solid, with 13 large Software deals in the year, compared to 22 in 2016, 9 in 2015, and an average of 10 per year in 2010-2014. Total global and US acquisitions over \$100 million remained healthy too at 99 and 75 deals, respectively, though moderated relative to elevated levels of 137 global and 89 US deals in 2016 and a record year of 154 global and 96 US deals in 2015. Additionally, there were 12 US Software IPOs in 2017, similar to the ten in 2016.

We expect there to be increased Software M&A deal volume and sizes in 2018 relative to 2017 supported by repatriation, perhaps closer to the level we saw in 2016. The demand environment for attractive Software assets remains unchanged—there continues to be a steady flow of high growth public and private companies in the sector and we believe increased appreciation over the years for the highly recurring and profitable nature of customer renewals in the Software model. Persistent lofty valuations do present a potential barrier, especially to disciplined strategic and PE sponsors. However, interest rates remain at historically low levels even despite three more planned rate hikes in 2018. Finally, and perhaps more importantly, the passage of deemed repatriation in 2018 as part of the new tax bill will give large companies access to their overseas funds, paving the path for increased consolidation. See the section, [Repatriation Tax Holiday – One-Time Benefit for Software M&A and Capital Return](#) for more details.

## 2017 Software M&A Characteristics

### Moderation in Software M&A Activity

In 2017, there were 99 Software M&A deals over \$100 million completed worldwide, including 75 in the US. This marks moderation from the elevated level of deal activity in 2016 and a record year in 2015, though similar to 2014, which was also a strong year relative to four relatively stagnant years of post-recession deal activity from 2010 to 2013. See Chart 57 below.

**Chart 57: Number of Global and US Software M&A Deals, \$100M Deal Value or Greater**

Source: Bloomberg and Jefferies Research

**Moderated Deal Volume and Size in 2017 versus 2016**

2016 was a record year for the aggregate value of large Software M&A deals at \$93 billion. Even after excluding the \$26 billion Microsoft LinkedIn mega-deal, the total value of the 21 other large deals in 2016 was over two times that in 2015, nearly three times the annual average from 2010-2014 (following the 2008-2009 recession and when interest rates were near-zero), and nearly eight times the annual average from 1999-2009.

On the other hand, the aggregate value of the 13 large deals (near or above \$1 billion) in 2017 was \$19 billion, below historical levels. The largest deal was Cisco's \$3.6 billion acquisition of AppDynamics, and at a whopping 17.4x EV/LTM revenue, or 23.2x EV/LTM recurring revenue. The average deal size was \$1.5 billion, versus \$4.2 billion in 2016, \$3.3 billion in 2015, and \$2.5 billion in 2010-2014. However, the moderated deal volume and price tags came at higher valuations. See Charts 58 and 59 below. The average EV/LTM revenue paid by acquirers this year was 6.4x, versus 5.1x in 2016, 4.4x in 2015, 6.0x in 2010-2014, and 4.2x in 1999-2009.

**Private Equity Remained Active But More Disciplined**

Private equity sponsors remained involved in acquisitions of Software companies this year, including Elliott Management's \$1.6 billion acquisition of Gigamon for 5.3x EV/LTM revenue, and Thoma Bravo's \$1.5 billion acquisition of Barracuda Networks for 4.0x EV/LTM revenue. In 2017, six of the 13 large deals announced, or 46%, were PE buyouts, versus 41% (9 of 22) in 2016 and 67% (6 of 9) in 2015. In contrast, between 2010-2014, there was an average of 10 large Software M&A deals each year, but only about two of them were PE buyouts, while from 1999-2000 that ratio was less than 20%.

In 2017, PE sponsors again paid higher valuations for Software companies relative to the past, but also exhibited more discipline versus strategic acquirers relative to the last couple of years when we saw a significant narrowing of the multiples paid by the two groups. On average, PE sponsors paid 4.7x EV/LTM revenue for large deals in 2017, versus 4.0x in 2016, 4.4x in 2015, 3.1x in 2010-2014, and 2.7x in 1999-2009. On average, strategic acquirers paid 7.2x EV/LTM revenue for large deals in 2017, versus 5.9x in 2016, 4.1x in 2015, 6.9x in 2010-2014, and 4.5x in 1999-2009.

**Chart 58: Software M&A Deals Approximately \$1B or Greater, 2016-2017 (PE Sponsor Deals Shaded)**

Software M&amp;A Activity, ~\$1 Billion EV or Higher, 2017

| Acquirer                   | Target                          | Target Description                | Date Announced | Enterprise Value (\$M) | EV/LTM Rev | EV/ LTM Mtn(Sub) |
|----------------------------|---------------------------------|-----------------------------------|----------------|------------------------|------------|------------------|
| Cisco Systems              | AppDynamics                     | APM & mobile app                  | 1/24/2017      | 3,593                  | 17.4x      | 23.2x            |
| Cisco Systems              | BroadSoft                       | Managed comm. software & services | 10/23/2017     | 1,900                  | 5.4x       | 11.4x            |
| Elliot Management          | Gigamon                         | Enterprise network management     | 10/26/2017     | 1,600                  | 5.3x       | 15.3x            |
| Keysight Technologies      | Ixia                            | Network performance testing       | 1/30/2017      | 1,600                  | 3.2x       | NA               |
| Thoma Bravo                | Barracuda Networks              | Security                          | 11/27/2017     | 1,474                  | 4.0x       | 5.1x             |
| Centerbridge Partners      | Syncsort (Clearlake Capital)    | Data integration & mgmt software  | 7/6/2017       | 1,260                  | 4.2x       | NA               |
| Oracle                     | Aconex                          | Collaboration/SaaS                | 12/17/2017     | 1,200                  | 9.7x       | 9.7x             |
| Clearlake Capital Group    | LANDESK Software [Thoma Bravo]  | Systems mgmt                      | 1/3/2017       | 1,150                  | 2.6x       | NA               |
| HGGC                       | Idera Software                  | Database mgmt tools               | 5/31/2017      | 1,125                  | 5.9x       | NA               |
| McKesson Corporation       | CoverMyMeds                     | Medical e-authorization software  | 1/25/2017      | 1,100                  | NA         | NA               |
| Siris Capital Group        | Intralinks (Synchronoss) *      | Content management                | 10/17/2017     | 977                    | 3.4x       | NA               |
| Digicert (Thoma Bravo)     | Symantec web security assets ** | Security                          | 8/3/2017       | 950                    | 3.2x       | NA               |
| Hewlett Packard Enterprise | Nimble Storage                  | Flash storage arrays & systems    | 3/7/2017       | 917                    | 2.3x       | 13.9x            |

|                                |               |             |              |
|--------------------------------|---------------|-------------|--------------|
| <b>2017 Total Deal Value</b>   | <b>18,846</b> |             |              |
| <b>2017 Deal Average</b>       | <b>1,450</b>  | <b>6.4x</b> | <b>13.8x</b> |
| <b>Average of PE Deals ***</b> | <b>1,264</b>  | <b>4.7x</b> | <b>10.2x</b> |
| <b>Average of Non-PE Deals</b> | <b>1,609</b>  | <b>7.2x</b> | <b>16.2x</b> |

Notes:

\* We use TTM revenue ended 9/30/16 for Intralinks, which is the last available data.

\*\* We estimate that the deal value for Symantec's sale of its web security assets to DigiCert (a Thoma Bravo portfolio company) was about equal to the total price that Symantec paid for the business in 2010, or \$1.3 billion. Symantec disclosed that deal value was comprised of \$960M in cash and 27% common stock ownership in DigiCert.

\*\*\* Multiples are not really meaningful given limited sample size

**Software M&A Activity, ~\$1 Billion EV or Higher, 2016**

| Acquirer                        | Target                   | Target Description               | Date Announced | Enterprise Value (\$M) | EV/LTM Rev | EV/ LTM Mtn(Sub) |
|---------------------------------|--------------------------|----------------------------------|----------------|------------------------|------------|------------------|
| Microsoft                       | LinkedIn                 | Social networking app            | 6/13/2016      | 25,972                 | 8.1x       | NA               |
| Oracle                          | NetSuite                 | ERP apps                         | 7/26/2016      | 9,347                  | 11.0x      | 13.9x            |
| Micro Focus International       | HPE Software Division    | ADM/Data analytics/Security/ITOM | 9/7/2016       | 8,800                  | 2.9x       | NA               |
| Symantec                        | Blue Coat                | Security                         | 6/12/2016      | 4,650                  | 6.2x       | 10.7x            |
| Apollo Global Management        | Rackspace                | Managed Cloud Computing          | 8/26/2016      | 4,300                  | 2.1x       | NA               |
| TPG                             | McAfee                   | Security                         | 9/7/2016       | 4,200                  | 2.0x       | NA               |
| Siemens                         | Mentor Graphics          | Electronic design automation     | 11/14/2016     | 4,079                  | 3.7x       | 8.6x             |
| IBM Corporation                 | Truven Health Analytics  | Data analytics/Vertical app      | 2/18/2016      | 3,555                  | 6.0x       | NA               |
| KKR                             | Epicor Software          | ERP apps                         | 7/5/2016       | 3,300                  | 3.3x       | NA               |
| salesforce.com                  | Demandware               | CRM/e-Commerce/SaaS              | 6/1/2016       | 2,840                  | 11.2x      | 13.2x            |
| Thoma Bravo                     | Qlik                     | Business intelligence app        | 6/2/2016       | 2,630                  | 4.2x       | 10.9x            |
| KKR                             | Optiv Security           | Managed security services        | 9/12/1906      | 2,448                  | 2.6x       | NA               |
| Symantec Corp.                  | LifeLock                 | Security                         | 11/21/2016     | 2,300                  | 3.5x       | 3.7x             |
| Verizon                         | Fleetmatics              | Fleet mgmt/Verticalapp/SaaS      | 8/1/2016       | 2,237                  | 7.5x       | 7.5x             |
| Francisco Partners/Elliott Mgmt | Dell Software Group      | NSM/Security/IAM                 | 6/20/2016      | 2,200                  | 1.6x       | NA               |
| Vista Equity Partners           | Marketo                  | CRM/Marketing                    | 5/31/2016      | 1,697                  | 7.5x       | 8.5x             |
| LogMeIn                         | GoTo (Citrix)            | Video conferencing app           | 7/26/2016      | 1,620                  | 5.2x       | NA               |
| Vista Equity Partners           | Cvent                    | Event mgmt/SaaS                  | 4/18/2016      | 1,504                  | 8.0x       | 8.0x             |
| Genesys                         | Interactive Intelligence | Contact center                   | 8/31/2016      | 1,400                  | 3.4x       | 5.5x             |
| Avast                           | AVG                      | Security                         | 7/7/2016       | 1,300                  | 3.0x       | 3.7x             |
| EQT Partners                    | Sitecore A/S             | Content mgmt & Marketing         | 4/1/2016       | 1,131                  | 5.2x       | NA               |
| NICE Systems                    | inContact                | Contact center                   | 5/18/2016      | 1,037                  | 4.4x       | 5.7x             |

|                                |               |             |             |
|--------------------------------|---------------|-------------|-------------|
| <b>2016 Total Deal Value</b>   | <b>92,548</b> |             |             |
| <b>2016 Deal Average</b>       | <b>4,207</b>  | <b>5.1x</b> | <b>8.3x</b> |
| <b>Average of PE Deals</b>     | <b>2,601</b>  | <b>4.0x</b> | <b>9.2x</b> |
| <b>Average of Non-PE Deals</b> | <b>5,318</b>  | <b>5.9x</b> | <b>8.1x</b> |

Source: Company data, 451 Research, FactSet, and Jefferies Research



**Chart 59: Software M&A Deals Approximately \$1B or Greater, 1999-2017**

| <u>Year/Period</u>                | <u># of Deals<br/>~\$1B or Larger</u> | <u>PE vs<br/>Non-PE</u> | <u>% of Total<br/># of Deals</u> | <u>Enterprise<br/>Value (\$M)</u>         | <u>Average<br/>EV/LTM Rev</u> | <u>Average<br/>EV/LTM Mtn(Sub)</u> |
|-----------------------------------|---------------------------------------|-------------------------|----------------------------------|---|-------------------------------|------------------------------------|
| <b>2017</b>                       | <b>13</b>                             |                         |                                  | <b>Aggregate Large Deal Value</b>         | <b>18,846</b>                 |                                    |
|                                   |                                       |                         |                                  | <b>Overall Average of Large Deals</b>     | <b>1,450</b>                  | <b>6.4x</b>                        |
|                                   | <b>6</b>                              | <b>PE</b>               | <b>46%</b>                       | <b>Average of Large PE Deals</b>          | <b>1,264</b>                  | <b>4.7x</b>                        |
|                                   | <b>7</b>                              | <b>Non-PE</b>           | <b>54%</b>                       | <b>Average of Large Non-PE Deals</b>      | <b>1,609</b>                  | <b>7.2x</b>                        |
| <b>2016</b>                       | <b>22</b>                             |                         |                                  | <b>Aggregate Large Deal Value</b>         | <b>92,548</b>                 |                                    |
|                                   |                                       |                         |                                  | <b>Overall Average of Large Deals</b>     | <b>4,207</b>                  | <b>5.1x</b>                        |
|                                   | <b>9</b>                              | <b>PE</b>               | <b>41%</b>                       | <b>Average of Large PE Deals</b>          | <b>2,601</b>                  | <b>4.0x</b>                        |
|                                   | <b>13</b>                             | <b>Non-PE</b>           | <b>59%</b>                       | <b>Average of Large Non-PE Deals</b>      | <b>5,318</b>                  | <b>5.9x</b>                        |
| <b>2015</b>                       | <b>9</b>                              |                         |                                  | <b>Total Value of Large Deals</b>         | <b>29,918</b>                 |                                    |
|                                   |                                       |                         |                                  | <b>Overall Average of Large Deals</b>     | <b>3,324</b>                  | <b>4.4x</b>                        |
|                                   | <b>6</b>                              | <b>PE</b>               | <b>67%</b>                       | <b>Average of Large PE Deals</b>          | <b>3,816</b>                  | <b>4.4x</b>                        |
|                                   | <b>3</b>                              | <b>Non-PE</b>           | <b>33%</b>                       | <b>Average of Large Non-PE Deals (1)</b>  | <b>2,340</b>                  | <b>4.1x</b>                        |
| <b>2010-2014<br/>Average/Year</b> | <b>49</b>                             |                         |                                  | <b>Avg. Annual Large Deal Value</b>       | <b>24,293</b>                 |                                    |
|                                   | <b>9.8</b>                            |                         |                                  | <b>Overall Average of Large Deals (2)</b> | <b>2,479</b>                  | <b>6.0x</b>                        |
|                                   | <b>2.4</b>                            | <b>PE</b>               | <b>24%</b>                       | <b>Average of Large PE Deals</b>          | <b>2,120</b>                  | <b>3.1x</b>                        |
|                                   | <b>7.4</b>                            | <b>Non-PE</b>           | <b>76%</b>                       | <b>Average of Large Non-PE Deals (2)</b>  | <b>2,717</b>                  | <b>6.9x</b>                        |
| <b>1999-2009<br/>Average/Year</b> | <b>32</b>                             |                         |                                  | <b>Avg. Annual Large Deal Value</b>       | <b>8,507</b>                  |                                    |
|                                   | <b>2.9</b>                            |                         |                                  | <b>Overall Average of Large Deals</b>     | <b>2,924</b>                  | <b>4.2x</b>                        |
|                                   | <b>0.5</b>                            | <b>PE</b>               | <b>16%</b>                       | <b>Average of Large PE Deals</b>          | <b>1,963</b>                  | <b>2.7x</b>                        |
|                                   | <b>2.5</b>                            | <b>Non-PE</b>           | <b>84%</b>                       | <b>Average of Large Non-PE Deals</b>      | <b>3,103</b>                  | <b>4.5x</b>                        |

Notes:

(1) Non-PE revenue multiples for 2015 are not really meaningful given limited sample size

(2) Average multiples exclude outliers: Microsoft's 2012 acquisition of Yammer for \$1.2B, or 53.8x EV/2011 estimated revenue, VMware's 2012 acquisition of Nicira for \$1.26B, or about 120x EV/estimated LTM revenue, IBM's 2013 acquisition of Trusteer for \$900M, or 25.7x EV/estimated LTM revenue, and VMware's 2014 acquisition of AirWatch for \$1.5B, or 22.6x EV/estimated LTM revenue.

Source: Company data, 451 Research, FactSet, and Jefferies Research

**A Look Back at Recent Software M&A Buyer Trends**

Private equity buyouts of large Software companies only started to pick up in 2010, the year after the end of the recession, and soon after interest rates went to near zero. However, as the global economy slowly recovered, and with most developed economies still growing only modestly, most private equity participation (excluding venture capital) in Software prior to 2015 was in challenged companies trading at significant discounts to their expected future cash flows from their highly profitable, recurring revenue streams. While private equity funds continue to target these investments, their interest in and willingness to pay higher multiples for fundamentally sound, higher growth Software companies, seemed to have increased in 2015 and the trend continued in 2016.

In 2015, there was a step up in private takeouts of large public Software companies with solid fundamentals (e.g., Permira's takeout of Informatica for \$4.5B, or 10.3x EV/LTM recurring revenue, and Thoma Bravo/Silver Lake's takeout of SolarWinds for \$4.3B, or 14.3x EV/LTM recurring revenue), at high valuations (even despite the activist pressure in Informatica's case). Meanwhile, we believe that traditional strategic acquirers (e.g., Oracle and IBM) have generally shown more discipline (with exceptions such as Microsoft and salesforce.com at times), as they are cognizant of the M&A integration risks (and increased investor scrutiny of M&A rationale), and less willing to throw money at hyper growth assets that may not necessarily be a good fit. In 2015, there were only three large

enterprise software M&A deals by public companies, and none involving the usual suspects Oracle, SAP, and IBM, which accounted for nine out of the 13 large software M&A deals in 2013-2014.

In 2016, private equity continued to demonstrate willingness to pay up for reputable companies, such as Thoma Bravo's takeout of Qlik (\$2.6B EV, or 10.9x LTM recurring revenue) and Vista Equity Partners' takeout of Marketo (\$1.7B EV, or 8.5x LTM recurring revenue), both of which received interest from several parties including strategic players. But the biggest deals in 2016 were made by longstanding strategic acquirers, headlined by Microsoft's \$26B purchase of LinkedIn, at 8.1x LTM revenue. Other notable large deals included Oracle's \$9.3B acquisition of Netsuite for 13.9x LTM recurring revenue, Symantec's \$4.7B merger with Blue Coat for 10.7x LTM recurring revenue, and salesforce.com's \$2.8B acquisition of Demandware for 13.2x LTM subscription revenue.

## Considerations for Private Equity and Strategic Acquirers

### Why the Increased Private Equity Interest in Software?

We believe several factors have likely driven the increased private equity activity in software M&A transactions over the last few years, including:

**Historically Low Interest Rates.** Near zero interest rates for most of the last decade has lowered the cost of capital for private equity investors, enabling them to pay higher prices for assets than they could otherwise. See Chart 65 in the next section. Historically low interest rates enabled private equity acquirers to structure a deal in which they could lock in a very low cost of capital that could be paid back over time with the highly recurring, highly profitable maintenance or subscription renewals of software companies. Strategic acquirers also have a lower cost of capital in such an environment, but we believe private equity deals are more dependent on the structure of the deal (including the cost of capital), while strategic investors are more likely to use available capital on their balance sheets and are therefore less likely to benefit from lower interest rates on new capital.

**Increased Understanding of the Sustainability and Profit of Software Model.** More private equity investors had become more comfortable with these important characteristics of the software model, having observed them recently during the recession of 2008 and 2009, when most industries saw demand shortfalls result in both top and bottom line degradation. However, while the top lines faltered for software companies as license or new subscription suffered, profit was steady (if not increasing for some), since the overwhelming majority of the profit of a software company is generated by renewal revenue streams (which largely exclude sales cost – the largest expense of almost any software company). Given that most software companies cater to businesses, those renewal streams are highly sustainable even in recessionary times as long as the customer (or company) stays in business.

**More Private Equity Investment Increases Competition.** We believe that there has likely been an increase in the amount of money in private equity funds, which has led to more competition in potential transactions, likely raising prices.

**Public Company Investors' Desire for Growth Over Profit.** Public markets seem more amenable to organic growth than profit, so purchasing a relatively low growth company with meaningful margins may be less attractive to public companies if long-term stock price is one of, if not the primary driver of such a move.

### Valuations – Private Equity and Strategic Acquirers – Meeting in the Middle

As Private Equity investors have become willing to pay higher multiples, strategic acquirers have become more cautious over time (though Oracle and IBM have arguably

always been disciplined acquirers). This has increased competition in Software M&A, with both strategic and private equity acquirers “meeting in the middle” in recent years, pursuing software assets of reasonable growth at reasonable prices. This is different than the typical cellar dwelling assets traditionally acquired by private equity and the (assumed) hyper growth assets pursued by strategic players. The “middle” has traditionally been the domain of what we have viewed as perhaps the best acquirers in Software over the past 15 years, Oracle and IBM. These companies have largely acquired strategic assets with the associated risk accounted for in the price, i.e., at what we’d call “financial” acquisition prices (or not too far above the value of the highly recurring, highly profitable renewals streams of the acquired assets).

In essence, both private equity participants and strategic players have become better at buying software companies, as Private Equity companies have become more comfortable in paying higher multiples, while strategic acquirers have generally become more disciplined in the prices they’ll pay. As a result, we believe they are meeting more often in such situations and increasing the competitiveness of acquiring software assets.

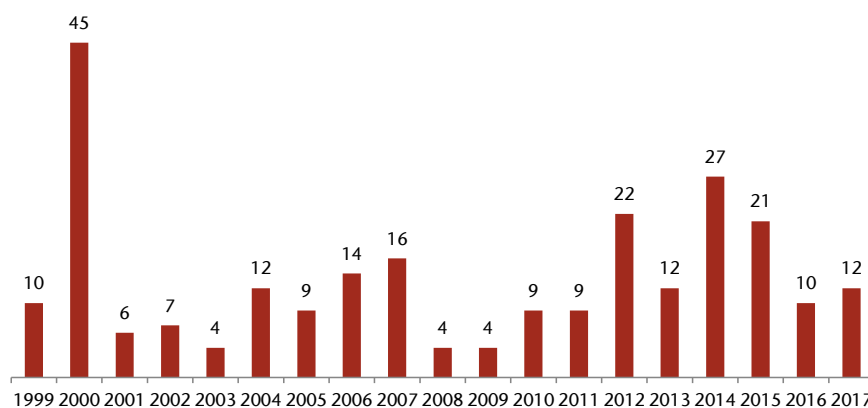
### What Happens in an Increasing Rate Environment?

The simple answer is that the cost of capital increases, which will have a deflationary effect on the prices private equity acquirers would likely be willing to pay, and perhaps curb their appetite for acquisitions. However, we believe Private Equity coffers remain high and they now have a greater appreciation for the very attractive characteristics of the software model as described above. Even after the three 25 basis point rate hikes in 2017 and three more planned for 2018, the federal funds rate would still be only approximately 2%, materially lower than in the past. We believe slightly higher rates are not likely to change private equity’s involvement in Software investments.

## 2017 Software IPOs

As shown in Chart 60 below, there were 12 US Software IPOs in 2017, versus 10 in 2016, still significantly below the IPOs in 2014 and 2015. We believe that current lofty market valuations provide a prime opportunity for private Software companies that are ready and looking to go public. See Chart 64.

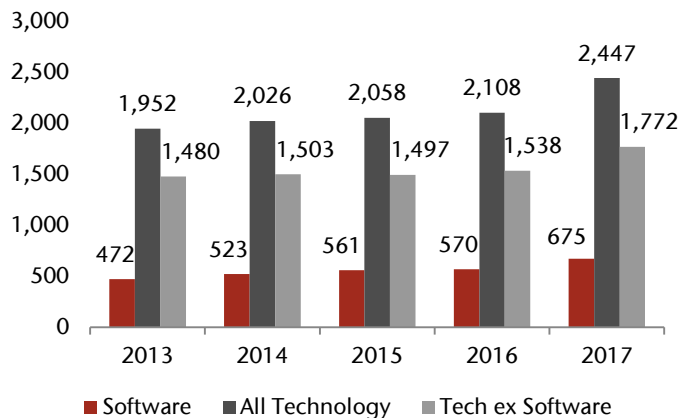
**Chart 60: Number of US Software IPOs, 1999-2017**



Source: Bloomberg and Jefferies Research

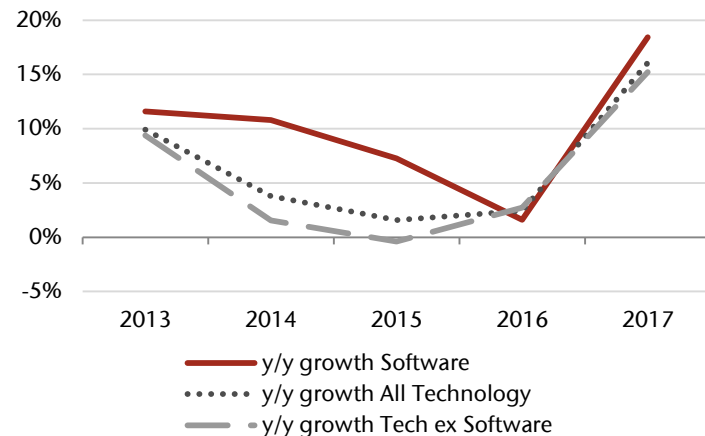
In Charts 61-64, we show the number of and year-over-year change in publicly traded Software and Technology companies both in the US and worldwide. Note that the number of public Software equities increased in 2017 after two years of declines.

**Chart 61: Number of Global Public Software Companies**



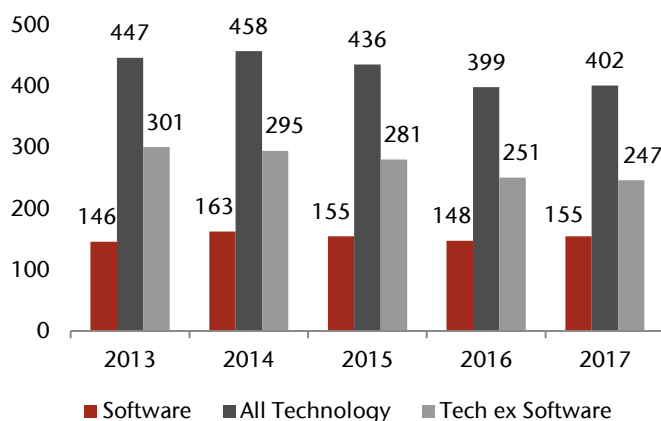
Source: Bloomberg and Jefferies Research  
 Note: Includes companies with a market cap ≥ \$100 million

**Chart 62: Growth in # of Global Public Software Companies**



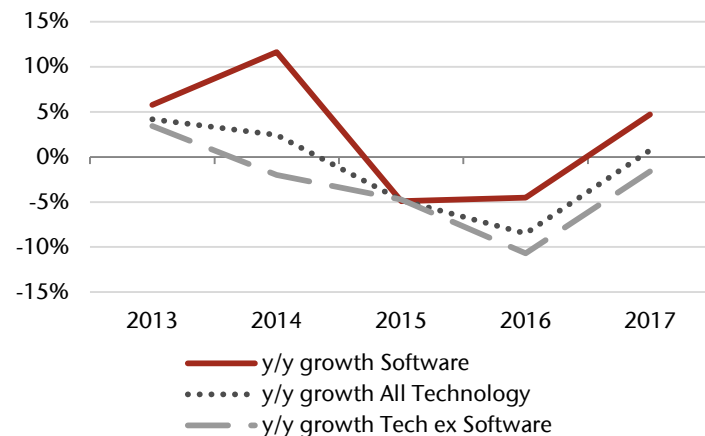
Source: Bloomberg and Jefferies Research  
 Note: Includes companies with a market cap ≥ \$100 million

**Chart 63: Number of US Public Tech Companies**



Source: Bloomberg and Jefferies Research  
 Note: Includes companies with a market cap ≥ \$100 million

**Chart 64: Growth in Number of US Public Tech Companies**



Source: Bloomberg and Jefferies Research  
 Note: Includes companies with a market cap ≥ \$100 million

## Interest Rates and Market Performance

### Rising Interest Rates – Markets Comfortable with This Rate Increase Cycle; Software Well Positioned

While we spend the majority of our time evaluating industry fundamentals and the companies we cover, we recognize that investors consider broader dynamics that influence the public markets, including economic growth and monetary policy. Therefore, we analyze how Software stocks may perform in the current rising interest rate environment.

The FOMC made three 25 basis point increases to the federal funds rate in 2017, and has indicated three more rate hikes to come in 2018. There will be a direct impact of higher

interest rates for some companies (i.e. increased interest income on cash reserves or increased cost of debt), while the impact on others may be market-driven by demand for the stocks (i.e. risk rotation). With approximately two years of FOMC rate increases behind us, we now can observe the market reaction to this cycle of rate increases. **What we observe over the last two years is that that while rates have increased about 135bps off unprecedented lows, the market has been quite robust over this period, returning about 14% annualized returns to the S&P 500.** Therefore, the market has indicated relative comfort with the current gradually increasing rate cycle.

Historically, the US equity market has performed robustly through increased rate cycles. However, these prior periods of increased short-term rates were a reaction to strong GDP growth. Given the Federal Reserve's current projection for GDP growth of 2.5% and 2.1% in 2018 and 2019, respectively, which is consistent with 2017's 2.5%, we believe this cycle has greater risk given the lack of a substantial growth tailwind. While the market may react positively to increasing rates due to historical precedent, this move may be unwarranted unless the economic environment accelerates, which would provide the foundation for sustainable market performance (and the likely real reason for market appreciation in prior periods of rate increases).

Regardless of our caution that historical precedent of rising rates may not provide the fundamental macroeconomic support for rising equities like it has in the past, we looked at more recent data of 10-year Treasury rate fluctuations and software stocks' reaction. We assume that the 10-year Treasury rate broadly moves in kind with speculation of changes to the Federal Funds Rate. We observed that technology, and more specifically software, has performed relatively well in the last four years during weeks of increased 10-year Treasury yields, while yield-oriented sectors like utilities, consumer staples, and telecommunications have displayed the worst performance. Furthermore, we find that within software, more value- and yield-oriented names have underperformed and growth-oriented names have outperformed during periods of rising rates. This analysis validates what we would expect to see in a rising rate environment.

However, even lacking an economic acceleration during a period of rising rates, we'd expect meaningfully increased interest income to benefit some names in our coverage universe (PAYC and CHKP). Others that have relatively high shareholder capital returns, including dividend yields (CA) would likely see pressure in such an environment. If the economy were to grow more meaningfully than expected, we'd expect growth stocks to continue benefiting more than value stocks. While the software sector is generally a growth sector with secular tailwinds, it is still affected by the macro-economic cycle. Value names within the sector are driven primarily by recurring revenue streams, with presumably little growth, while the potential of growth names lie in new business sales that originate new incremental recurring revenue. During times of economic acceleration, we would expect new business for growth names to benefit inordinately as compared to the stability of value names in good times and bad.

## Interest Rates and Market Performance

### Summary

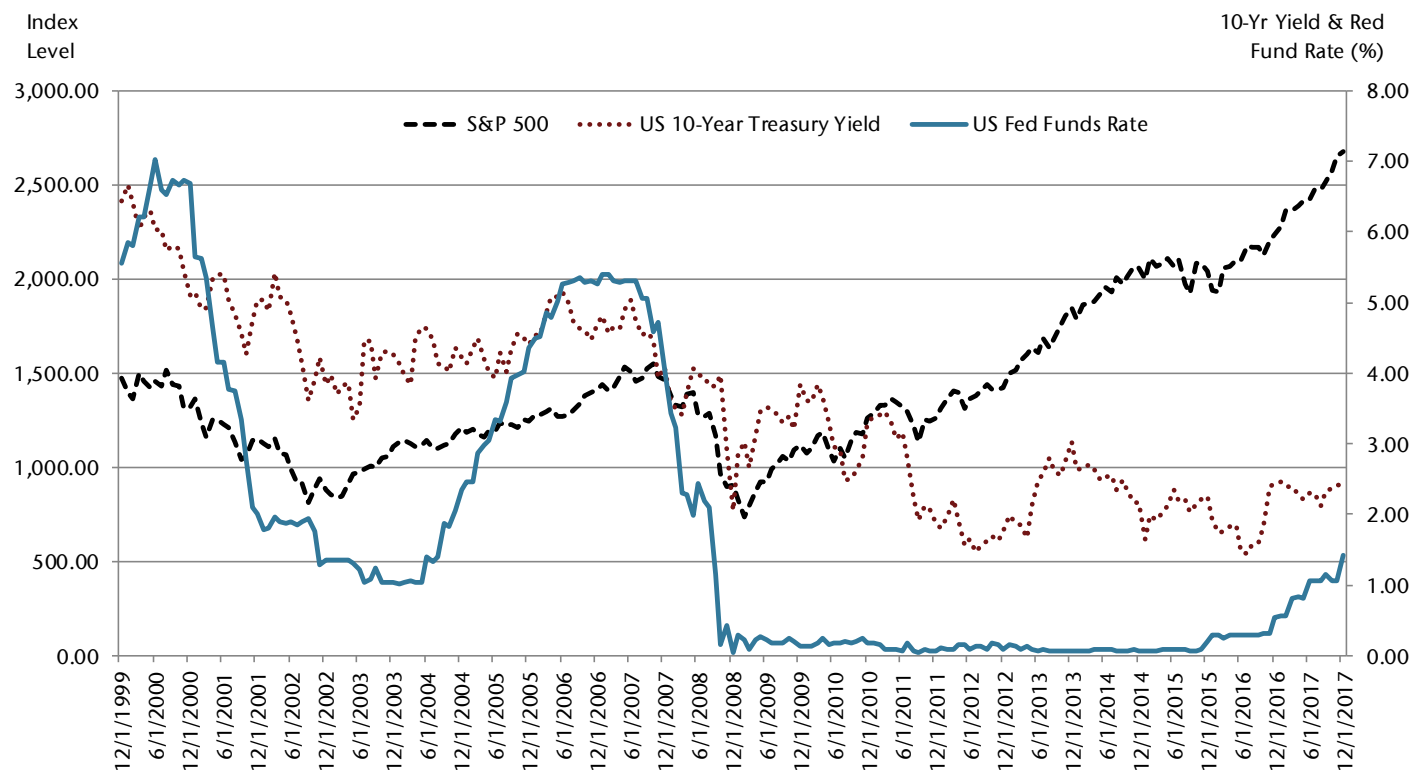
Whether looking back at the most recent trough to peak cycle for increased fed fund rates (2004 to 2007) or even further back to the 1950s, we observe a clear pattern that periods of increasing rates have been a reaction to accelerating growth as measured by US GDP growth. During these periods of rising rates, the S&P 500 has been robust, likely due to increased growth prospects overwhelming the headwind from increased rates. So far in this rising rate environment, since September 2015, we have observed only slight GDP growth acceleration, but a very robust equity market environment. This suggests that even if continued gradually increasing fed fund rates are not accompanied by accelerating GDP growth, the market response may continue to be robust.

**Recent History**

The FOMC began the process of increasing unprecedentedly low fed funds rates from a low of about 0.07% in September 2015. Over the last 2+ years of gradual rate increases, we have observed slightly accelerated US nominal GDP growth to about 3.5%, and a very robust market environment, with the S&P 500 delivering 14% annualized returns. While the prior period of low to near-zero interest rates for about nine years is unprecedented, the market performance during the last two years of rate increases should indicate a market which is comfortable with a gradually increasing rate environment.

We believe viewing just the last two years is myopic, and therefore we evaluate history for any insight into longer-term market reaction to an increase in the federal funds rate. The prior cycle of increases in the fed funds rates began in about June 2004, when rates were increased 35bps after bottoming in May. The S&P 500 was up about 2% in June 2004. Rates continued to increase through about January 2007, at which point they topped out at 5.41%. From this period that we identify as trough-to-peak fed fund rates, the S&P 500 increased 28%. See Chart 65. This historical scenario suggests the market responds well to increases in short-term rates. However, as we explore further below, these periods tend to be commensurate with accelerating GDP growth (and therefore accelerating revenue/earnings growth) which tends to overwhelm the headwind from increased rates.

We should be careful not to assign sweeping generalizations to historical patterns in such cases. We have seen examples in recent history when historical economic “trends” have been misleading, as the world changes. For instance, we believe European Government austerity programs had an outsized suppressive effect on IT spending in that region in 2011-2013 that would not have been anticipated with historical trends alone. Another example might be gleaned from further review of Chart 65. While an increase in the funds rate in 2004 may have coincided with an increase in the S&P, a low to near-zero percent U.S. Federal Funds rate has been the backdrop of the stock market climb since a bottom in 2009.

**Chart 65: Market Performance and Interest Rates since 2000**

Source: FactSet and Jefferies Research

### A Pattern Emerges

Since 1954, we identify 14 periods of rate cycles, either increases or decreases. See Chart 66. From this data, we evaluate the state of economic growth as well as the market performance during different interest rate cycles. During periods of increasing fed funds rates (trough to peak), annualized nominal GDP growth tends to be strong, averaging 7.5%. Alternatively, during periods of decreasing fed funds rates (peak to trough), annualized nominal GDP growth tends to be softer, averaging 3.2%. This again supports the notion that increased rates have been commensurate with a strong economy.

We then evaluate the market response to different rate cycles. The S&P 500 has tended to outperform in periods of rising rates, averaging +7.3% annualized return in the periods of trough to peak Fed Funds rates. In contrast, in periods of peak to trough Fed Funds rates, the S&P 500 has averaged a -0.4% return. We believe this strong market performance in rising rate cycles is due to strong economic conditions, which have positively overwhelmed any headwind from increasing rates.

We also evaluate the most recent period of trough (September 2015) to current (December 2017) of increasing rates. Over this period, the fed funds rate increased about 135bps off unprecedented lows. US GDP growth accelerated just slightly to about 3.5%, from the 2.9% in the prior period analyzed. Over this period, the S&P 500 returns were strong at 14% annualized. While we recognize this as an isolated period of time, this gives some indication that markets have gained comfort with the current gradually increasing rate cycle.

**Chart 66: Economic and Market Analysis During Interest Rate Cycles**

| Fed Funds Rate Cycle    | Start Date | End Date | Fed Funds Rate EoP | Increase (Decrease)<br>Fed Funds Rate | Annualized US GDP<br>Growth | Annualized S&P 500<br>Return |
|-------------------------|------------|----------|--------------------|---------------------------------------|-----------------------------|------------------------------|
| Trough to Peak          | Sep-1954   | Sep-1957 | 3.50%              | 2.06%                                 | 6.5%                        | 8.7%                         |
| Peak to Trough          | Sep-1957   | Mar-1958 | 0.50%              | -3.00%                                | -3.3%                       | -1.0%                        |
| Trough to Peak          | Mar-1958   | Mar-1960 | 4.00%              | 3.50%                                 | 7.2%                        | 10.6%                        |
| Peak to Trough          | Mar-1960   | Mar-1961 | 2.50%              | -1.50%                                | 0.4%                        | 13.8%                        |
| Trough to Peak          | Mar-1961   | Sep-1969 | 8.50%              | 6.00%                                 | 7.5%                        | 4.2%                         |
| Peak to Trough          | Sep-1969   | Dec-1971 | 3.00%              | -5.50%                                | 6.0%                        | 3.7%                         |
| Trough to Peak          | Dec-1971   | Jun-1974 | 13.31%             | 10.31%                                | 9.6%                        | -6.0%                        |
| Peak to Trough          | Jun-1974   | Dec-1974 | 3.87%              | -9.44%                                | 6.0%                        | -26.1%                       |
| Trough to Peak          | Dec-1974   | Dec-1980 | 22.00%             | 18.13%                                | 10.5%                       | 11.6%                        |
| Peak to Trough          | Dec-1980   | Dec-1992 | 3.06%              | -18.94%                               | 6.8%                        | 10.0%                        |
| Trough to Peak          | Dec-1992   | Sep-2000 | 6.72%              | 3.66%                                 | 5.6%                        | 16.1%                        |
| Peak to Trough          | Sep-2000   | Dec-2003 | 1.03%              | -5.69%                                | 3.8%                        | -7.1%                        |
| Trough to Peak          | Dec-2003   | Sep-2006 | 5.36%              | 4.38%                                 | 5.6%                        | 6.3%                         |
| Peak to Trough          | Sep-2006   | Sep-2015 | 0.07%              | -5.29%                                | 2.9%                        | 4.0%                         |
| Average, Trough to Peak |            |          |                    | 6.85%                                 | 7.50%                       | 7.35%                        |
| Average, Peak to Trough |            |          |                    | -7.05%                                | 3.23%                       | -0.38%                       |
| Trough to Current       | Sep-2015   | Dec-2017 | 1.42%              | 1.36%                                 | 3.5%                        | 14.2%                        |

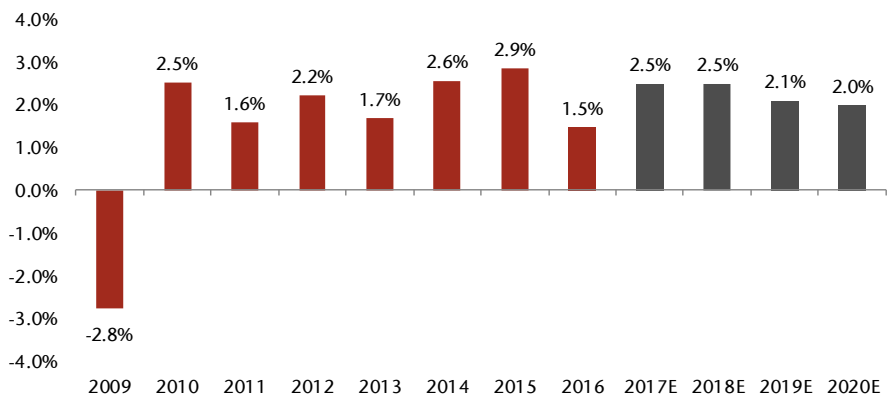
Source: FactSet and Jefferies Research

## Interest Rate Hikes Historically Follow GDP Growth

While we believe that history is the best starting point to gauge the future, we also recognize that differences between history and the present should be taken into account when forecasting the future. At the same time, we covered the software sector in 1999, so we're skeptical whenever we hear or start to think that it might be "different this time". But we do believe there are some differences this time that matter.

For instance, from the above observations of history, the market appreciates with increasing rates and vice versa. An important tenet of the historical correlation between rising interest rates and market appreciation has been an accelerating economic environment. However, this cycle of increasing rates is commensurate with a forecast for only moderate GDP growth. The Federal Reserve is forecasting real GDP growth of 2.5% and 2.1% in 2018 and 2019. These forecasts are about consistent with the 2.5% growth estimated in 2017, but an acceleration from the 1.5% growth in 2016. See Chart 67. While markets have historically performed well through rate increase cycles, they usually have the support of strong economic growth. It appears that while GDP growth is expected to remain solid, it may not have a significant offsetting tailwind from strong acceleration this time around.



**Chart 67: US Real GDP Growth**

Source: Federal Reserve

If the macroeconomy only improves modestly as rates gradually increase, the fundamental influences of increasing rates could have a suppressive effect on equities. These include:

- Higher rates equate to increased borrowing costs, which may suppress investment for growth.
- Higher rates make fixed income investments more attractive relative to equities, all else equal.
- Higher risk-free rates increase the discount rate derived from the CAPM model, reducing the calculated intrinsic value derived from a DCF calculation.

This doesn't mean that the market or specific stocks won't react positively with increasing rates. There are other influences that will likely weigh in, such as some of the positive secular factors we often talk about in regard to software. In addition, we may get a continued positive reaction regardless of any other factors simply because some market observers will note that the market typically increases with increasing rates. This alone may drive the market higher – for a while. However, this is something we'll monitor closely as macroeconomic fundamentals alone don't currently seem to support a significantly appreciating market.

## Software Fared Better Than Others in Recent Rising Treasury Rate Periods

Since the majority of our coverage universe did not exist during much of the historical period analyzed above (software was not even broadly analyzed as a sector until beginning in the 1990s), it's difficult to identify historical patterns of software equities specifically in periods of rising federal funds rates with confidence. In addition, coverage and understanding of the software sector has evolved from the nascent periods when there was overlap. However, we can consider more recent times when the market anticipates increasing federal funds rates as reflected in increasing Treasury yields. This analysis identifies something we anticipated all along – that as a growth sector with relatively high valuation multiples and lower dividend yields, software equities perform better in a rising rate environment than more yield-focused sectors. See Chart 68 for details.

While markets were rising through the most recent increase in the Fed Funds rate (in December 2017), we've seen market volatility driven by **speculation** of potentially

increasing rates over the last few years. We evaluate these periods by analyzing weeks in which the 10-year Treasury yield rose (rather than the federal funds rate). Since the beginning of 2014, a period which incorporates 209 weeks, the 10-year yield has risen in 96 weeks. Herein, we evaluate sector and stock performance during those 96 weeks of rising rates to parse out any themes.

### Software vs. Broad Market and Other Sectors

When evaluating weekly periods over the last three years, we identify 96 weeks (46% of 209 weeks total) in which the 10-year Treasury yield increased. Isolating these weeks, we evaluate how different sectors performed in periods of rising rates. See Chart 68.

We observe that of 96 rising yield weeks, the S&P 500 exhibited positive performance in 70% of these periods, with an average return of +0.7%. In comparison, the technology sector within the S&P 500 performed positively in 69% of rising rate periods, but outperformed the broad market with an average +0.9% return. The software sub-sector (within technology), using the IGV ETF as a proxy, performed positively in 68% of rising rate periods and delivered +0.9% average return over these periods.

In contrast, the worst-performing sectors (measured by average return) during periods of rising rates were utilities which averaged -0.3%, consumer staples which averaged +0.2%, and telecom which averaged +0.4%. These results are somewhat consistent with what many investors have come to understand: yield-oriented and lower-growth sectors like utilities, consumer staples, and telecom tend to underperform in periods of rising rates, while sectors with higher growth potential and lower yields, like software, tend to outperform during periods of rising rates. Understanding that this is a simplified exercise and there are many other market forces at play driving returns, **we conclude that in relation to other US equity sectors, software has had a relatively robust market reaction to recent increases in interest rates.** We believe this has more to do with software being considered a growth sector and the historical correlation between rising rates and economic acceleration discussed above.

### Chart 68: Sector Performance in Periods of Rising Rates

Weekly Periods, Since 1 Jan 2014; Sorted in ascending order by average return in rising rate periods

| Security   | Total # Periods | # Periods Pos 10Yr Chg | # Periods Pos 10Yr Chg + Pos Return | % Periods Pos Return | Avg Return During Pos 10Yr Chg | EV/Rev      | Div Yield   |
|--|-----------------|------------------------|-------------------------------------|----------------------|--------------------------------|-------------|-------------|
| S&P 500 Utilities                                  | 209             | 96                     | 47                                  | 49%                  | -0.3%                          | 3.7x        | 3.6%        |
| S&P 500 Consumer Staples                           | 209             | 96                     | 56                                  | 58%                  | 0.2%                           | 1.5x        | 2.7%        |
| S&P 500 Telecom                                    | 209             | 96                     | 53                                  | 55%                  | 0.4%                           | 2.4x        | 4.5%        |
| S&P 500 Healthcare                                 | 209             | 96                     | 61                                  | 64%                  | 0.5%                           | 2.5x        | 1.7%        |
| S&P 500 Industrials                                | 209             | 96                     | 68                                  | 71%                  | 0.6%                           | 2.3x        | 2.2%        |
| S&P 500 Energy                                     | 209             | 96                     | 55                                  | 57%                  | 0.7%                           | 2.1x        | 2.6%        |
| <b>S&amp;P 500</b>                                 | <b>209</b>      | <b>96</b>              | <b>67</b>                           | <b>70%</b>           | <b>0.7%</b>                    | <b>2.6x</b> | <b>2.2%</b> |
| S&P 500 Consumer Discretionary                     | 209             | 96                     | 66                                  | 69%                  | 0.7%                           | 2.1x        | 1.5%        |
| S&P 500 Materials                                  | 209             | 96                     | 71                                  | 74%                  | 0.8%                           | 2.7x        | 2.1%        |
| <b>S&amp;P North American Software Index (IGV)</b> | <b>209</b>      | <b>96</b>              | <b>65</b>                           | <b>68%</b>           | <b>0.9%</b>                    | <b>6.4x</b> | <b>0.2%</b> |
| S&P 500 Technology                                 | 209             | 96                     | 66                                  | 69%                  | 0.9%                           | 4.5x        | 1.3%        |
| S&P 500 Financials                                 | 209             | 96                     | 73                                  | 76%                  | 1.2%                           | 2.3x        | 1.7%        |

Source: FactSet and Jefferies Research

### Companies in Our Coverage Universe

Using the same methodology as discussed in the section above, we then drill down to evaluate how the companies within our coverage have reacted to periods of rising rates. Chart 69 sorts, from worst performer to best, by the average return in weeks of rising 10-year Treasury yields, over the last three years.

While we evaluate each individual company within our coverage, we recognize that there is much more than interest rates that has driven company performance throughout these periods. Therefore, we also aggregate our coverage into “Growth” and “Value” buckets using the same categorizations as defined earlier in this report. We find that in the 96 weeks of rising 10-year Treasury rates the “Value” bucket had positive performance in 89% of these periods, with an average return of +0.6%. The “Growth” bucket was positive in 81% of rising rate weeks, with an average return of +1.1%.

The results are somewhat muddled by the fact that “Growth” outperformed in fewer periods (81% versus “Value’s” 89%). Regardless, we observe thematically that value-oriented and dividend-focused names within Software have tended to underperform the sector in periods of rising rates, while growth-oriented names tended to outperform the sector in periods of rising rates. We note that even the lesser performing “Value” names performed about in-line with the broad market (S&P 500) during these rising rate periods.

### Chart 69: Software Stocks Performance in Periods of Rising Rates

Weekly Periods, Since 1 Jan 2014; Sorted in ascending order by average return in rising rate periods

| Security   | Total #<br>Periods | # Periods<br>Pos<br>10Yr<br>Chg | # Periods Pos<br>10Yr<br>Chg + Pos<br>Return | % Periods Pos<br>Return | Avg Return<br>During Pos 10Yr<br>Chg | EV/Rev       | Div Yield   |
|--|--------------------|---------------------------------|--|-------------------------|--------------------------------------|--------------|-------------|
| MULE   | 41                 | 19                              | 7  | 37%                     | -1.3%                                | 14.0x        | 0.0%        |
| NTNX   | 65                 | 33                              | 15   | 45%                     | -0.4%                                | 16.1x        | 0.0%        |
| ALRM   | 131                | 63                              | 33   | 52%                     | 0.1%                                 | 8.5x         | 0.0%        |
| CA   | 209                | 96                              | 45   | 47%                     | 0.1%                                 | 4.2x         | 3.5%        |
| APTI   | 66                 | 33                              | 17   | 52%                     | 0.2%                                 | 6.2x         | 0.0%        |
| SAIL   | 6                  | 3                               | 2  | 67%                     | 0.4%                                 | 19.3x        | 0.0%        |
| MIME   | 110                | 53                              | 28   | 53%                     | 0.4%                                 | 7.4x         | 0.0%        |
| ORCL   | 209                | 96                              | 53   | 55%                     | 0.5%                                 | 7.6x         | 1.6%        |
| CHKP   | 209                | 96                              | 55   | 57%                     | 0.5%                                 | 7.9x         | 0.0%        |
| CALD   | 209                | 96                              | 54   | 56%                     | 0.5%                                 | 8.9x         | 0.0%        |
| SYMC   | 209                | 96                              | 57   | 59%                     | 0.6%                                 | 5.6x         | 2.9%        |
| NICE   | 209                | 96                              | 58   | 60%                     | 0.6%                                 | 7.6x         | 0.0%        |
| <b>Value Software Coverage</b>                     | <b>209</b>         | <b>72</b>                       | <b>64</b>                                    | <b>89%</b>              | <b>0.6%</b>                          | <b>7.2x</b>  | <b>1.3%</b> |
| <b>S&amp;P 500</b>                                 | <b>209</b>         | <b>96</b>                       | <b>67</b>                                    | <b>70%</b>              | <b>0.7%</b>                          | <b>2.6x</b>  | <b>2.2%</b> |
| WDAY   | 209                | 96                              | 60   | 63%                     | 0.7%                                 | 13.1x        | 0.0%        |
| VRNS   | 200                | 94                              | 55   | 59%                     | 0.7%                                 | 15.6x        | 0.0%        |
| INST   | 111                | 53                              | 29   | 55%                     | 0.7%                                 | 7.4x         | 0.0%        |
| VMW  | 209                | 96                              | 59   | 61%                     | 0.8%                                 | 10.8x        | 1.3%        |
| CVLT   | 209                | 96                              | 58   | 60%                     | 0.8%                                 | 5.8x         | 0.0%        |
| <b>S&amp;P North American Software Index (IGV)</b> | <b>209</b>         | <b>96</b>                       | <b>65</b>                                    | <b>68%</b>              | <b>0.9%</b>                          | <b>6.4x</b>  | <b>0.2%</b> |
| CTXS   | 209                | 96                              | 59   | 61%                     | 0.9%                                 | 8.2x         | 0.0%        |
| SSNC   | 209                | 96                              | 59   | 61%                     | 0.9%                                 | 7.0x         | 0.7%        |
| BNFT   | 209                | 96                              | 53   | 55%                     | 0.9%                                 | 4.3x         | 0.0%        |
| TEAM   | 107                | 52                              | 28   | 54%                     | 1.0%                                 | 17.5x        | 0.0%        |
| MSFT   | 209                | 96                              | 64   | 67%                     | 1.1%                                 | N/A          | 2.6%        |
| <b>Growth Software Coverage</b>                    | <b>209</b>         | <b>72</b>                       | <b>58</b>                                    | <b>81%</b>              | <b>1.1%</b>                          | <b>11.7x</b> | <b>0.0%</b> |
| CRM  | 209                | 96                              | 65   | 68%                     | 1.3%                                 | 8.0x         | 0.0%        |
| RHT  | 209                | 96                              | 71   | 74%                     | 1.3%                                 | 8.4x         | 0.0%        |
| RNG  | 209                | 96                              | 59   | 61%                     | 1.4%                                 | 8.8x         | 0.0%        |
| PAYC   | 193                | 91                              | 58   | 64%                     | 1.5%                                 | 11.7x        | 0.0%        |
| SPLK   | 209                | 96                              | 63   | 66%                     | 1.7%                                 | 26.8x        | 0.0%        |
| DATA   | 209                | 96                              | 56   | 58%                     | 1.8%                                 | 10.0x        | 0.0%        |

Source: FactSet and Jefferies Research

## Best and Worst Fundamentally Positioned for Rising Rates

When simply considering fundamental logic, we believe some of the software stocks in our coverage universe will react to a rising rate environment. We consider rising rates in a relatively stagnant, slowly appreciating economic environment, versus the accelerating economy historically experienced when rates are rising. We also note that all equities may initially react positively (or likely already have) due to historical precedence (that may not really apply this time). Some names in our coverage universe will benefit from rising rates, while some will experience a net negative effect. Investors should also keep in mind that there are a multitude of other factors that will affect these stocks, some of which may overwhelm any effects from rising rates.

We note that the expected environment for rising rates is for a continued gradual increase. Furthermore, the impact is well-understood by investors and may already be priced into shares. Lastly, while we note potential benefits (headwinds) from a rising rate environment, each company has many fundamental and/or macro drivers which could overwhelm this impact. Below we note a number of companies in our coverage that we believe are best/worst positioned when isolating only for a rising rate environment.

### Best Positioned for Rising Rates

- **PAYC.** As part of its payroll and tax filing application, Paycom collects cash from clients and subsequently disburses these funds to the appropriate tax agencies and clients' employees. Between receipt and disbursement, Paycom invests these funds in money market funds and certificates of deposit, and earns interest income. Based on approximately \$800 million of funds held for clients as of 3Q17, every 25 basis point rate increase would yield about \$2 million of annual revenue, which flows straight through to income, equal to about \$0.03, or about 2% of our 2018 EPS estimate. Additionally, there has been a historical, positive correlation between interest rates and payroll growth, which drives Paycom's core payroll processing business.
- **CHKP.** The company holds about \$3.9 billion in net cash and equivalents as well as short- and long-term marketable securities. Equating to about 23% of its market cap, Check Point is poised to realize a financial benefit on interest income should rates rise meaningfully. A 25-basis point increase in rates would yield about a \$0.06 or 1% benefit to annual EPS in 2018.

### Cautious in a Rising Rate Environment

- **Relatively High Dividend Yield Stocks** will be less attractive as the difference between the dividend yield and risk-free yield will narrow:
  - **CA.** Current yield is about 3.1%.
  - **MSFT.** Current yield is about 2.0%.

## Software – Playing Offense and Defense

Despite pronounced volatility relative to the overall market in the last couple of years, primarily due to periods of macroeconomic concerns, we believe that Software fundamentals remain sound and the sector's unique business model characteristics provide resilience during uncertain times. Software is typically considered a growth-focused sector with "offensive" characteristics driven by disruptive secular themes and continued new business growth. However, Software also has substantial "defensive" characteristics as Maintenance and highly transparent subscription renewal streams

provide a defensive backstop in difficult times. Herein we discuss the unique fundamental characteristics of typical Software business models.

### Corporate Customer Base

The majority of Software companies cater (often exclusively) to corporate customers, resulting in greater customer stickiness and higher revenue retention rates. The consumer exposure of Software is concentrated largely with Microsoft, with Adobe, Intuit, and Symantec also having some exposure.

### Perpetual License Model

The “traditional” Software model (still employed by many) is to sell perpetual licenses that give the purchaser the right to use a certain capacity (often based on seats, users, or CPUs running the software for infrastructure) forever. An annual maintenance fee can be paid for continued support, product updates, and bug fixes. If the buyer does not pay the maintenance, it still has the right to use the software at the capacity purchased, but without the benefits associated with maintenance.

### Subscription Model

More and more companies recently have been employing or moving toward Software as a Service (SaaS) or other subscription models. Unlike the perpetual model, subscriptions give the buyer the right to use the software for the term in which subscription is paid (not perpetually). Contract terms can vary, but subscriptions are often paid for on either monthly or annual terms. There is typically no additional maintenance fees as updates and support are incorporated into the subscription. We term New Subscription ACV (Annual Contract Value) growth as the equivalent of License growth for a SaaS business – see our note dated May 20, 2015, [The Value of Growth](#), for more detail.

### Maintenance and Subscription Renewals

Enterprises generally pay the maintenance fee in order to ensure the software is up-to-date and fully functioning. Once a product is being utilized in a business, it is difficult to replace, assuming it is providing the functionality that it promised – the expression “If it ain’t broke, don’t fix it” tends to apply. Many software vendors boast greater than 90% maintenance renewal rates and most claim greater than 85%. Similar to maintenance renewals are subscription renewals, though the renewal rates of subscriptions are typically lower than that for maintenance due to either lower switching costs, a larger portion of SMB (small to medium business) customers, or other dynamics tied to the lack of control of the IP (intellectual property). However, even subscription renewals for most subscription based companies are typically 80% or better, and some boast renewals in the 90s%.

- **Renewals Provide the Majority of Profit for Enterprise Software Companies.** We believe that maintenance provides the overwhelming majority of profit for a software company, not license. Maintenance is very profitable for an enterprise software company, often providing 85% operating margins, in our estimation. We note this is not always true, especially for companies that provide a combination hardware/software solution. License has traditionally been the focus for software investors, as it indicates growth in new customers and capacity. Companies like Oracle have been preaching for years that the primary benefit of new software license revenue is that it results in incremental maintenance. We believe that for many software companies license sales alone are not profitable, or are only marginally profitable. We believe similar dynamics hold for a subscription-based software company as it relates to subscription renewals (relative to maintenance) and new subscriptions (relative to license), though subscription renewals may have a lower operating margin (than maintenance) of about 75% or so since subscription companies often have to run data centers to provide the service (in the case of SaaS companies).

- **Renewals Are Cumulative in Nature.** Given the high renewal rates of maintenance and subscription, they are largely cumulative, offering a high degree of transparency and less dependence on new customer growth. More mature software companies that have been in business longer often have a greater absolute amount of maintenance than license, and a greater percentage of maintenance relative to total revenue. For this reason, we estimate that maintenance accounts for substantially more (as a percentage) of total enterprise software revenue than it did a decade earlier. While most subscription based companies are relatively young (as compared to most traditional software companies), relatively high subscription renewals also provide the cumulative nature similar to maintenance renewals.

**Profitability Should Be Resilient in Difficult Times**

Because of the profitability and stickiness of maintenance and subscription renewals, as well as their greater percentage of total industry revenue, enterprise software companies should be able to maintain relative stability of their bottom lines even in a recessionary environment – at least better than most tech sectors. This assumes managements will adjust their expense structure accordingly when appropriate. We experienced this for the Software sector in the 2009 recessionary environment, when Software outperformed the S&P by about 2,400 basis points, and the NASDAQ by about 350 basis points.

**It All Comes Down to Valuation**

The characteristics of the software model and its very attractive maintenance (and subscription renewal) stream aside, investment decisions should also consider stock-specific valuation. Many names seem stretched to us at current levels, but we believe long opportunities exist within the sector regardless of where the environment takes us – bullish or bearish. We note that about 27% of software companies that we track are currently trading below what we calculate to be the value of their maintenance-like revenue (See Chart 13). We estimate the net present value of the future cash flow from \$1 of maintenance to be worth about \$5 – for more information, see our weekly piece published every Friday titled “The Right Price”.

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### (Article 3(1)e and Article 7 of MAR)

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- Callidus Software (CALD: \$29.75, BUY)
- CA Technologies (CA: \$34.47, BUY)
- Check Point Software Technologies Ltd. (CHKP: \$103.57, BUY)
- Citrix Systems, Inc. (CTXS: \$91.19, UNDERPERFORM)
- Commvault Systems (CVLT: \$52.65, BUY)
- Instructure, Inc. (INST: \$33.70, BUY)
- Microsoft Corporation (MSFT: \$90.14, UNDERPERFORM)
- Mimecast Limited (MIME: \$32.10, BUY)
- MuleSoft, Inc. (MULE: \$24.32, BUY)
- NICE Ltd. (NICE: \$92.63, BUY)
- Nutanix, Inc. (NTNX: \$36.73, BUY)
- Oracle Corporation (ORCL: \$50.27, BUY)
- Palo Alto Networks (PANW: \$154.23, BUY)
- Paycom Software Inc (PAYC: \$88.35, BUY)
- Red Hat (RHT: \$126.60, HOLD)
- RingCentral, Inc. (RNG: \$51.50, BUY)
- Sage (SGE LN: p801.60, BUY)
- SailPoint Technologies Holdings, Inc. (SAIL: \$16.10, BUY)
- Salesforce.com (CRM: \$110.04, HOLD)
- Sophos Ltd (SOPH LN: p642.00, BUY)
- Splunk (SPLK: \$90.57, BUY)
- SS&C Technologies, Inc. (SSNC: \$49.71, BUY)
- Symantec Corp. (SYMC: \$27.52, UNDERPERFORM)
- Tableau Software Inc (DATA: \$74.07, HOLD)
- Varonis Systems, Inc. (VRNS: \$52.90, BUY)
- VMware, Inc. (VMW: \$135.33, BUY)
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|--------------|-------|---------|-----------------------|---------|----------------------------|---------|
|              |       |         | Count                 | Percent | Count                      | Percent |
| BUY          | 1088  | 53.15%  | 339                   | 31.16%  | 66                         | 6.07%   |
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