

Industry Top Trends 2018

Technology



Authors

Andrew Chang
San Francisco
+1 415 371 5043
andrew.chang@spglobal.com

David Tsui
New York
+1 212 438 2138
david.tsui@spglobal.com

Raymond Hsu
Taipei
+886 2 8722 5827
taymond.hsu@spglobal.com

Thierry Guermann
Stockholm
+46 84405905
thierry.guermann@spglobal.com

Overview

- **Ratings Outlook:** The outlooks on our ratings of global technology companies remains mostly stable, reflecting the relatively solid overall underlying operating fundamentals, with a modest negative bias primarily due to operating weakness at certain legacy technology companies, especially in hardware, and because of higher financial leverage, mostly at sponsor-held companies, which leaves them with less room to accommodate operating headwinds.
- **Forecasts:** We expect hardware revenues to grow in the low-single digit percentages in 2018 as we anticipate improving sales in the smartphone, server and enterprise networking equipment markets. Partially offsetting this growth will be the challenging prospects in storage hardware, reflecting the ongoing migration of corporate IT workloads to the public cloud from on-premise environment, and another year of decline, albeit decelerating, in the telecom networking equipment market.
- **Assumptions:** Although we expect revenue in the semiconductor industry to grow nearly 20% in 2017, the industry remains inherently volatile. Nevertheless, we expect to see modest growth in 2018 due to growing diverse end markets, such as autos and industrials, as well as tight memory supply that is likely to persist through the first half of 2018. However, we remain cautious over the longer term because of heightened capital spending in the industry and growing investments in China which could result in oversupply.
- **Risks:** Repatriation of foreign earnings poses a potential credit risk to technology issuers if they were to become more aggressive in their shareholder returns than what we currently expect from their financial policies. We do not expect companies with large net cash positions to be negatively impacted by elevated shareholder returns. But if a borrower with a limited ratings cushion increases shareholder returns, thus raising leverage per our calculation, this may trigger a review of the company's credit ratings.
- **Industry Trends:** Software as a service (SaaS) is driving almost all of the growth in software applications with healthy double-digit growth rates. We expect this trend to continue over the next several years because of the benefits that accrue to both customers (lower upfront costs, easier implementations, better scalability, and budgetary flexibility) and providers (recurring revenue, larger addressable markets, and faster innovation). Oracle and Intuit are two companies that bear out the case for SaaS.

Ratings trends and outlook

Global Technology

Chart 1 – Ratings distribution

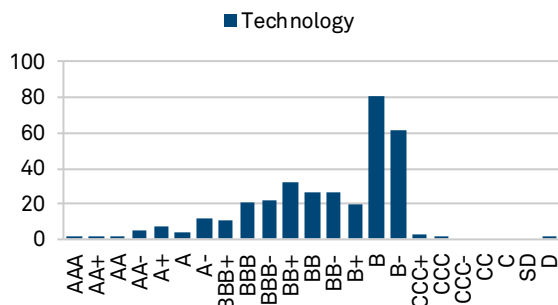


Chart 2 – Ratings distribution by region

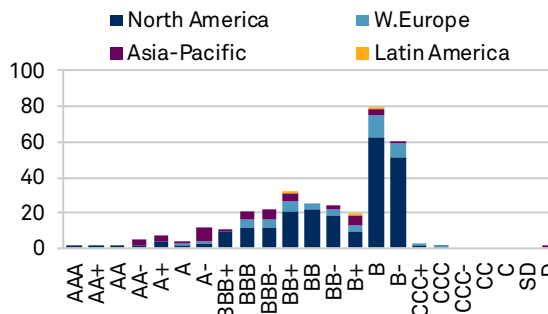


Chart 3 – Ratings Outlooks

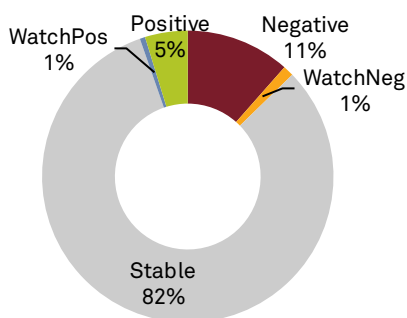


Chart 4 – Ratings Outlooks By Region

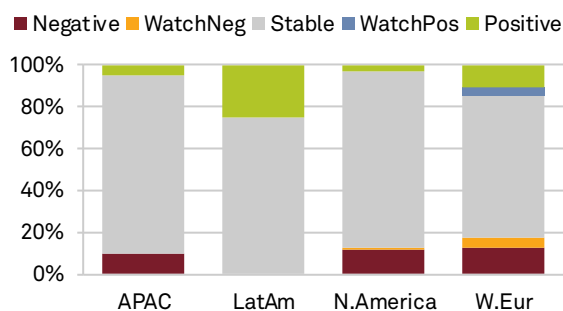


Chart 5 – Ratings Outlook Net Bias

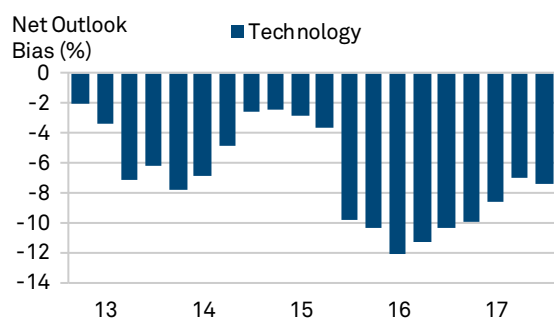
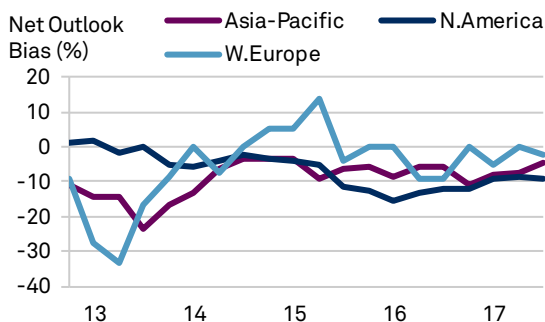


Chart 6 – Ratings Net Outlook Bias By Region



Source: S&P Global Ratings. Ratings data measured quarterly with last shown quarter ending September 30, 2017

Industry forecasts

Global Technology

Chart 7 – Revenue Growth (Local Currency)

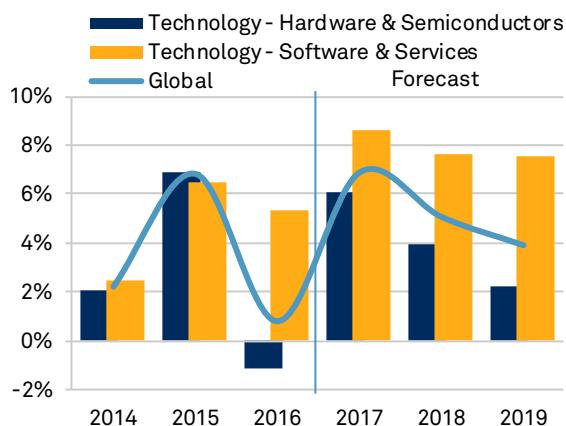


Chart 8 – EBITDA Margin (Adjusted)

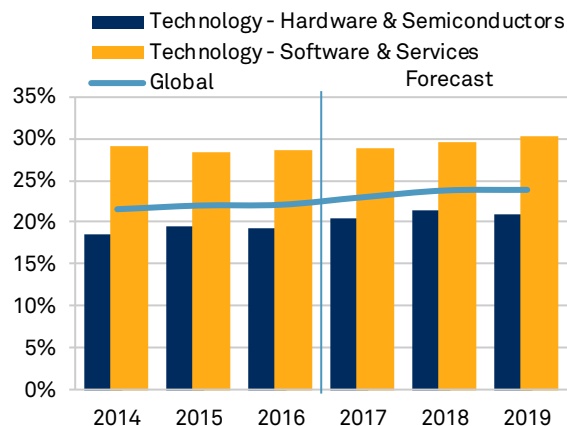


Chart 9 – Debt / EBITDA (Median, Adjusted)

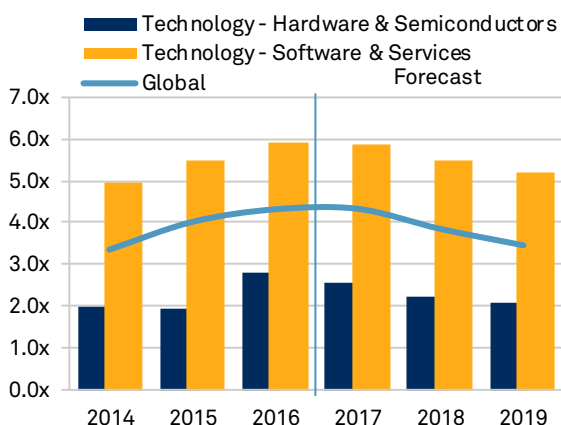
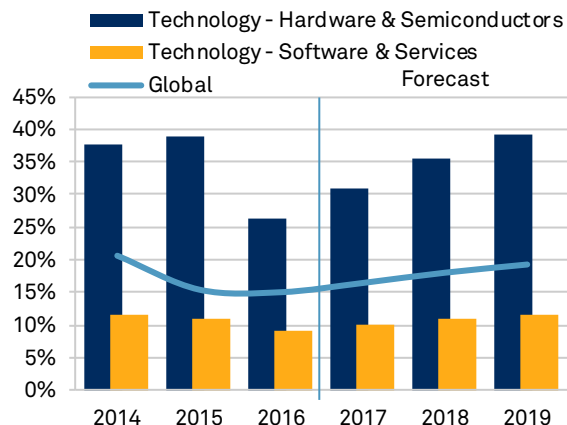


Chart 10 – FFO / Debt (Median, Adjusted)



Source: S&P Global Ratings. Revenue growth shows local currency growth weighted by prior-year common-currency revenue-share. All other figures are converted into U.S. Dollars using historic exchange rates. Forecasts are converted at the last financial year-end spot rate.

Key assumptions

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1	Muted hardware sector growth reflects migration to the cloud We expect overall revenue in the hardware sector to grow in the low-single-digit percentages in 2018, similar to our growth expectations for 2017. We anticipate improving sales in the smartphone, server and enterprise networking equipment markets in 2018, while the PC market remains roughly flat. Partially offsetting this growth, however, is the challenging prospects in storage hardware (HDD and external storage systems) as corporate IT workloads continue to migrate to the public cloud from on-premise environment. We also expect to see another year of declines in the telecom networking equipment market, albeit at a decelerating pace, owing to technology transition in wireless broadband.
2	Semiconductor sales to slow in 2018 after a strong 2017 We expect semiconductor industry revenue to grow nearly 20% in 2017 to over \$400 billion. This gain reflects supply shortages in memory as well as good growth in other segments such as analog and discrete offerings. The industry remains inherently volatile, but we still expect modest growth in 2018 because of diverse and growing end markets, such as auto and industrials, and tight memory supply that is likely to persist through the first half of the year. We remain cautious beyond 2018 given the current level of heightened capital spending as well as growing investments by China.
3	SaaS will drive software industry growth SaaS is driving almost all of the growth in software applications with healthy double-digit-percentage revenue growth. We expect this trend to continue over the next several years because of the benefits that accrue to both customers (lower costs, easier implementations, better scalability, and budgetary flexibility) and providers (recurring revenue, larger addressable markets, and faster innovation). Oracle and Intuit are two companies that bear out the case for SaaS.

Muted growth in the hardware sector reflects migration to the cloud

We expect the smartphone market in 2018 to grow in the low- to mid-single-digit percent area despite market saturation in developed countries. The market will likely receive a boost in late 2017 and into 2018 from Apple's new iPhone release. We expect that all models, but especially iPhone X, will be well-received and lead to higher sales and average selling prices because of new features such as faster chip processors, more durable glass displays, wireless charging, and better cameras. Samsung's release of its Galaxy S8 in the first half of 2017 was well received, and the company's performance in 2018 will depend on the timing of its next smartphone refresh. We expect smartphone sales in China from Huawei, OPPO and Vivo to continue their declining trend because of longer replacement cycles and increasing smartphone penetration in developing countries, especially India and Southeast Asia.

We expect the server market in 2018 to also grow in the low- to mid-single-digit percent area, just as it has in 2017. Increasing workload processing needs, whether in public cloud, enterprise, or in Internet of Things (IoT) deployments, will propel growth. The risk here, however, is the increased utilization rate due to the consolidation of workloads with server virtualization, or the faster pace of cloud migration (servers in the cloud environment tend to have higher utilization rates). Asian original design manufacturers (ODM) have gained share at the expense of branded original equipment manufacturers (OEM) as they are the preferred vendors of hyper scale cloud providers.

The PC market looks to be essentially flat in 2018, reflecting flat to modestly higher revenues in the notebook PC segment and continuing declines in desktop and workstation sales. We expect the three largest PC vendors—HP Inc., Dell Technologies Inc., and Lenovo—to outperform the market as they gain share from ODMs.

Networking equipment sales are also likely to be flattish in 2018, with enterprise product refreshes in Ethernet switches to 40G/100G, better network security features, and wireless local area networks (WLAN) offsetting declines in traditional router sales. The threat of software-defined networking is present, but the disruptive impact to the industry will be gradual. The telecom networking equipment market continues to experience declining demand from mobile telecom operators and price pressures from Asian competitors. Mobile operators' investments in GSM/EDGE (2G) and WCDMA/HSPA (3G) technologies are decreasing now that network coverage is essentially complete. Investments in LTE (4G wireless broadband technology) networks are also slowing now that network coverage has reached more than 55% of the global population. Although the expansion of IoT could support growth through the increasing use of smart devices over 4G networks and—eventually—5G technology (via 4.5G, an intermediate stage before 5G), we don't expect this to translate into significant revenues for equipment vendors until at least 2020.

We expect the hard-disk-drive (HDD) storage market to decline in the high-single-digits percentages in 2018, as the benefit from an elevated NAND (a HDD substitute) pricing environment in 2017 will be less of a tailwind for HDD over the next year. The external storage systems market is also expected to decline by low-single-digit percentages in 2018, primarily as workloads migrate to the cloud, where storage utilization tends to be more efficient. Hyper scale cloud providers prefer to design their own storage systems and purchase ODM equipment.

Because of market saturation, we believe that sales in the global TV market will rise, at best, by the low-single-digit percentages in 2018. However, we expect sales of premium televisions, such as those with ultra-high definition (UHD), to grow much faster. Samsung Electronics Co. Ltd. and LG Electronics Inc. are leading brands in the premium segment. We expect them to maintain their market positions and profitability, partly with the help of lower panel costs over the next few quarters, despite lower unit sales to emerging Chinese brands. We believe that display panel makers will not be able to sustain their strong profitability into 2018 because of significant capacity additions (notably in China) in the second half of 2017 and in 2018. This is likely to create an oversupply that will depress panel prices. More organic light emitting diode displays (OLED) in the premium smartphone market could also pressure companies that are unable to catch up with this technological shift over the next one to two years. We anticipate that Samsung will benefit most from the evolution because of its leading technology and scale.

Finally, we expect that shipments of printers in 2018 will be flat. Although sales are supported by a moderate recovery in the global economy, the decline in printer use is ongoing. We have seen growing competition and market saturation in recent years, and industry profitability has eroded. Companies now generate high margins on consumables such as ink and toner cartridges versus printers. Thus, we think that the lower-tier companies will face more challenges and we expect further industry consolidation.

Semiconductor growth slows in 2018

2017 has been a standout year for the semiconductor industry. Gartner, Inc. currently expects the industry to grow nearly 20% in 2017, exceeding \$400 billion in total revenues, with the memory segment growing over 50%. The primary reason for such strong memory growth is the current supply shortage and resulting higher average selling prices (ASP) as the industry rebounds from the recent PC-driven down cycle. Since the middle of 2016, we have seen memory producers, particularly in DRAM, report consecutive double-digit quarterly revenue gains, primarily from cloud providers. Despite supply constraints, NAND continues to take share from hard disk drives as a storage medium, particularly when performance and speed are deciding factors. However, the growth isn't isolated to just memory. Analog, discretes, and sensors are all expected to grow above their historical averages. In all, 2017 is likely to be the strongest yearly growth since the aftermath of the Great Recession in 2010.

Looking ahead, we see the overall semiconductor industry exhibiting more modest growth in 2018. We maintain our view that the industry remains inherently volatile, but it is no longer dependent on PC-driven cycles and now include stable and growing areas such as automobile and industrial markets. Although global auto sales are expected to be relatively flat in 2018, more and more

semiconductors are used in cars for driver assistance systems, entertainment, and of course in electric vehicles. Industrial users, from manufacturers to the healthcare industry, are also incorporating greater silicon content in devices they utilize, providing a boost for many semiconductor companies. Our expectation for Apple, Inc. to generate strong iPhone sales in 2018 should also contribute to the semiconductor industry's overall growth.

We continue to see favorable end-market demand for memory over the coming year, as most consumption needs have shifted to smartphones, data centers, autos, and IoT applications, and away from PCs. We expect DRAM unit demand to rise further, while ASPs will decline modestly and stabilize as the industry moves to more advanced technology nodes. We expect that NAND supply will remain tight into the first half of 2018 with some normalization in the second half amid the industry's costly and time-consuming migration to 3D NAND.

Over the long term, we expect the industry's revenues will generally track global GDP growth, so that strong growth years such as 2017 will be offset by periods of revenue declines. In particular, we maintain a conservative posture towards memory producers as current memory supply shortage is likely to be resolved through the completion of major technology migration and ongoing aggressive capital spending to ensure capacity gains, as indicated by even stronger growth from semiconductor equipment manufacturers such as Applied Materials and Lam Research. Moreover, China is making sizable investments to build out its local semiconductor industry, which could lead to an imbalance in supply and demand, and make it even more difficult to determine the size and scope of the next downturn.

SaaS will drive software industry growth

The SaaS delivery model is driving the majority of total software application revenue growth, and we expect that trend to continue over the next several years. International Data Corp. (IDC) expects the global application software market will have grown at a compound annual growth rate 5.5% between 2013 and the end of 2017, with SaaS applications having grown 23%, and traditional models having grown less than 1%, resulting in SaaS's share of the application software market increasing to 31% in 2017 from 17% in 2013. We expect these trends to persist over the next several years driven by benefits to both software purchasers and sellers, and because many of the companies we rate are still in the early stages of rolling out SaaS products.

SaaS offers a number of benefits to software users as well as software developers. Customers often find a lower total cost of ownership as the SaaS provider can more efficiently manage technology hardware and maintenance. Customers also find lower up-front costs and less complex implementations making it easier for new customer to purchase, they get better ability to scale applications across their enterprises, and they can make software expenditures more predictable and shift software spending from capital expenditure budgets to operating expense budgets. Software providers, for their part, can gain a more recurring and predictable revenue base, bring product innovations to market faster, and expand their addressable market since lower up-front costs can open up opportunities to gain less well-capitalized customers.

Two interesting examples are Oracle and Intuit. For several quarters, Oracle's total revenue had been falling because of declines in perpetual license sales, even as revenues from its small SaaS business were growing. In its most recent quarter ended August 2017, however, Oracle's revenue grew almost 4% pro forma for its acquisition of NetSuite, as SaaS revenue is now large enough to offset the decline in perpetual license sales. Intuit has been selling SaaS consumer tax and small business software products for several years with very good results. Revenue from the consumer tax business has grown in the high-single-digit percentages or more over the last several years as online offerings make it easy for consumers to use the software and it has enabled them to grow the do-it-yourself tax preparation category and their share within the category. On the small business side, the company's online offerings grew 30% in fiscal 2017 (ended in July) compared to 8% for its desktop offerings. Intuit does not promote online over desktop, so the difference clearly shows customer preference for SaaS.

Key risks and opportunities

Technology

1	<p>Tax reform and repatriation will test companies' financial policies</p> <p>The repatriation of foreign earnings—a major item in the prosed U.S. tax reform package before Congress—poses a potential credit risk to technology issuers if they were to become more aggressive in their shareholder returns than what we currently expect from their financial policies. We generally don't expect companies with large net cash positions to be negatively impacted by elevated shareholder returns. But if a borrower with limited ratings cushion increases shareholder returns, thus raising leverage per S&P calculation, this could trigger a review of our rating on the company.</p>
2	<p>LBO leverage remains high amid supportive market</p> <p>Supportive credit markets continue to enable high leverage in new leveraged buyouts (LBOs) transactions, with the median leverage remaining over 7x for the fourth consecutive year. Furthermore, an increasing share of weaker businesses pursuing leveraged loan financing has led to increase in 'B-' rated issuers.</p>
3	<p>Emerging technologies offer an upside</p> <p>Some key emerging trends will help overall IT growth in the medium to long term, but some segments of the industry, like those dealing with GPUs and advanced memory architecture, are already leading the way. The proliferation of digital commerce and internet-ready devices, coupled with the increasing need for real-time interactions, are generating an immense amount of data in the cloud. Analyzing and optimizing that data will lead to opportunities for corporate users to automate and streamline operations using advanced computing and artificial intelligence.</p>

Potential tax reform and repatriation will test companies' financial policies

Tax reform in the U.S. has the potential to meaningfully impact corporate cash flow. The proposed lowering of corporate tax rate from 35% to the 20% range would benefit all companies, but we note that most technology companies don't pay the maximum rate because of various deductions, so the actual cash benefit would vary. Proposals to reduce interest expense deduction would hurt all issuers, but specifically private-equity owned, highly-leveraged speculative-grade issuers. This in turn could lower purchase price multiples and potentially leverage applied to these transactions. At the very least, we believe it would create a pause in transactions as sponsors considered any new tax structure.

S&P Global Ratings views repatriation as a potential credit risk if issuers were to become more aggressive in their shareholder returns than what we assume in our forecasts and assessments of financial policy. The improved accessibility to offshore cash under the proposed tax reform could provide both economic incentives and pressure on management to revise its financial policies and capital allocation strategies. The depletion of surplus cash, if not accompanied by debt repayments, could raise adjusted leverage and pressure credit metrics as S&P nets surplus cash against debt when calculating leverage.

Specifically, we expect share repurchases will increase significantly, although this is likely to take place over multiple quarters if not years. Both one-time special dividends and dividend hikes are also likely to increase. As for debt, we believe that some companies (mostly large, cash-rich companies) would set aside cash to pay off debt or meet upcoming maturities. We believe borrowing among large technology companies will slow once cash is repatriated.

Overall, we see a decline in net cash balances and, with it, rising leverage for some and reduced cushion for others. Specifically, large cash holders could return a significant amount of repatriated

cash to shareholders, although we wouldn't expect this to lead to meaningful rating actions because these borrowers would mostly be reducing their cushion with respect to the ratings. On the other hand, borrowers who are cash neutral or in net debt positions despite having large cash balances will have to manage a delicate balance between equity holders and debtholders. If a borrower with limited ratings cushion opts to use repatriated cash for repurchases, thus raising leverage per our calculation, we may review the rating for a potential downgrade.

Technology LBO leverage remains high amid supportive market

Investor appetite for leveraged buyout loans has remained strong in 2017, and the technology sector continues to see strong interest from financial sponsors. Taken together, these two trends have contributed to significant leverage LBO targets in the technology sector, where leverage has remained over 7x for the past four consecutive years. We continue to see financial sponsors aggressively adjust EBITDA calculations to give advance credit for restructuring activities, expected margin expansion, and changes in deferred revenue, although we typically only see this adjustment made for rapidly growing software companies. Some recent transactions in which we have seen particularly aggressive accounting adjustments include Viewpoint, Ivanti Software (formerly LANdesk), and Procera LPI (Sandvine).

Furthermore, although median leverage levels have remained broadly consistent over the past three years, we have seen a broad decline in credit quality for new deals, largely due to increased LBO activity among weaker businesses. Since Jan. 1, 2017, nearly 50% of new LBO transactions have been rated 'B-' at launch, compared to approximately 40% in 2016 and only 15% in 2015. Although credit conditions appear to remain broadly sanguine in this sector of the market, we note that McAfee reducing its recent loan package could indicate reduced investor appetite for technology LBOs. Given extremely high leverage and weakening credit quality, we believe that many firms could face challenges refinancing or finding incremental funding for M&A and other strategic investments.

Emerging technologies offer long-term upside

Artificial intelligence (AI), a field consisting of subjects including machine learning and complex robotics, is garnering increasing attention. AI requires tremendous computing power to operate autonomously. We believe that over the next few years many industries are likely to incorporate AI to automate work and simplify operations. A major catalyst accelerating AI is the repurposing of GPUs to train large networks of computer models, so that machines can perceive and perform tasks the way humans do. Nvidia has clearly benefited from this. We recently upgraded the company two notches to BBB+ and maintain a positive outlook on the rating.

Blockchain is a single public ledger that uses heavy computing power to record any transaction on a decentralized basis. This platform can enable any exchange of goods or services digitally, coded by computers, in real time, without any intermediaries. The unique and encrypted computer network also ensures security and reduces human errors and fraud. While we see Blockchain as most disruptive to the financial industry, it will probably also create opportunities for technology enablers with scale.

Augmented reality and virtual reality have been identified by industry analysts as the next computing platform, succeeding smartphones. These technologies help bridge both real and virtual worlds so that physical and digital objects can co-exist and interact in real time. They create opportunities for major smartphone producers, such as Apple and Samsung, to market new hardware products as a way to protect their leadership positions. They also create a platform for others, like Facebook, Microsoft and Google, to gain entry into the next stage of computing with applications for advertising and ecommerce.

Lastly, we think that **autonomous vehicles** are slowly but surely to make their way into consumer homes. IHS Markit reported in 2016 that the ramp up will be slow initially and reach about 16% of new vehicle sales worldwide by 2035, with most sales in developed markets. Nvidia is a key competitor in this space as GPUs have been deployed as the "brains" of autonomous vehicles that can process information at billions of inputs per second. Intel is also participating in this emerging

technology with the acquisition of Mobileye this year, a company that essentially develops a nerve center for driverless cars.

All of these trends are interrelated in the future of our digital economy. They lead to tremendous growth in data creation and necessitate the speed of delivering data. Over the next few years, this dynamic will continue to prompt the industry to reassess data center architectures, optimize storage needs, and enhance software and service offerings to generate growth.

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Related research

- Hot Topics In Technology: Tax Reform, Cyber Security, The Cloud, Self-Driving Cars, And More, Oct 26, 2017
- Global Technology: Hot Topics and Emerging Trends, Sept. 28, 2017
- Can European Telecom Equipment Vendors Regain Investment-Grade Status?, Sept. 27, 2017
- Despite Credit Risks, More Software LBOs Are On The Horizon, Aug. 29, 2017
- The Technology Hardware Industry Reverts To Revenue Growth In 2017, But Will It Sustain?, July 31, 2017
- Protectionism And De-Globalization Flag Broken Links In The Technology Supply Chain, May 30, 2017
- U.S. Corporate Cash Reaches \$1.9 Trillion, But Rising Debt And Tax Reform Pose Risk, May 25, 2017
- Data Storage Needs Boost Demand For High-Capacity Hard Drives And Chip-Based Solutions; Long-Term Outlook Is Better For The Latter, April 12, 2017
- U.S. Technology Companies: As Industry Conditions Improve, M&A And Financial Policy Loom Large, Feb. 15, 2017
- What Impact Could Cash Repatriation Have On U.S. Corporate Credit Quality?, Feb. 13, 2017

Cash, debt and returns

Global Technology

Chart 11 – Cash flow and primary uses

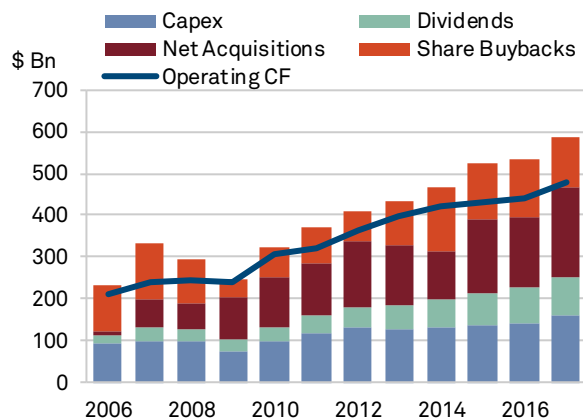


Chart 12 – Return on capital employed

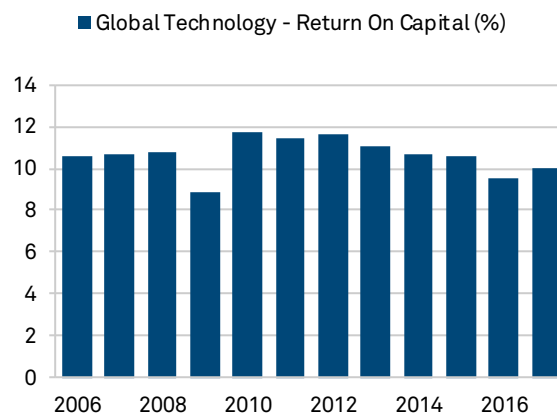


Chart 13 – Cash and equivalents / total assets

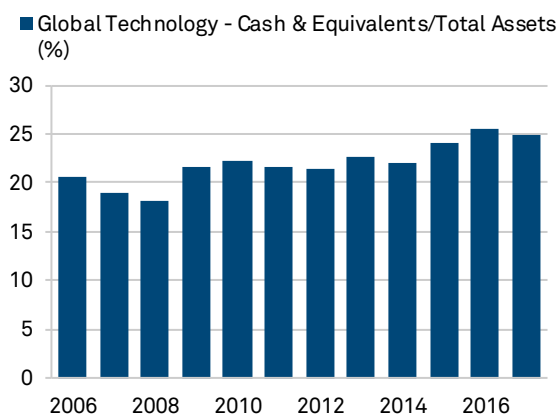


Chart 14 – Total debt / total assets

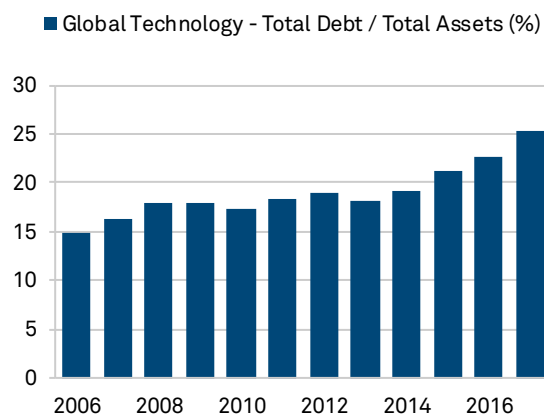


Chart 15 – Fixed versus variable rate exposure

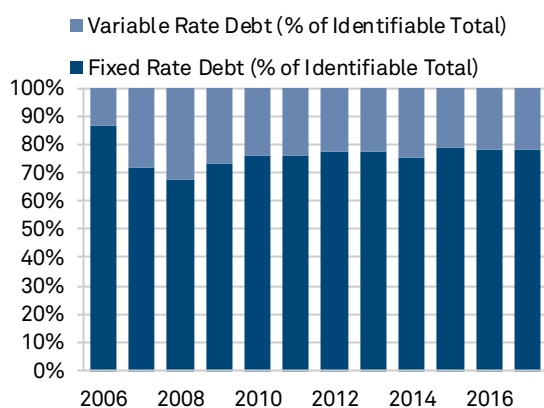
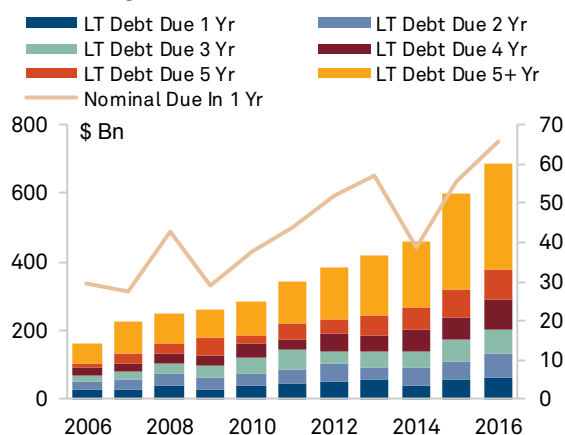


Chart 16 – Long term debt term structure



Source: S&P Global Market Intelligence, S&P Global Ratings calculations

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