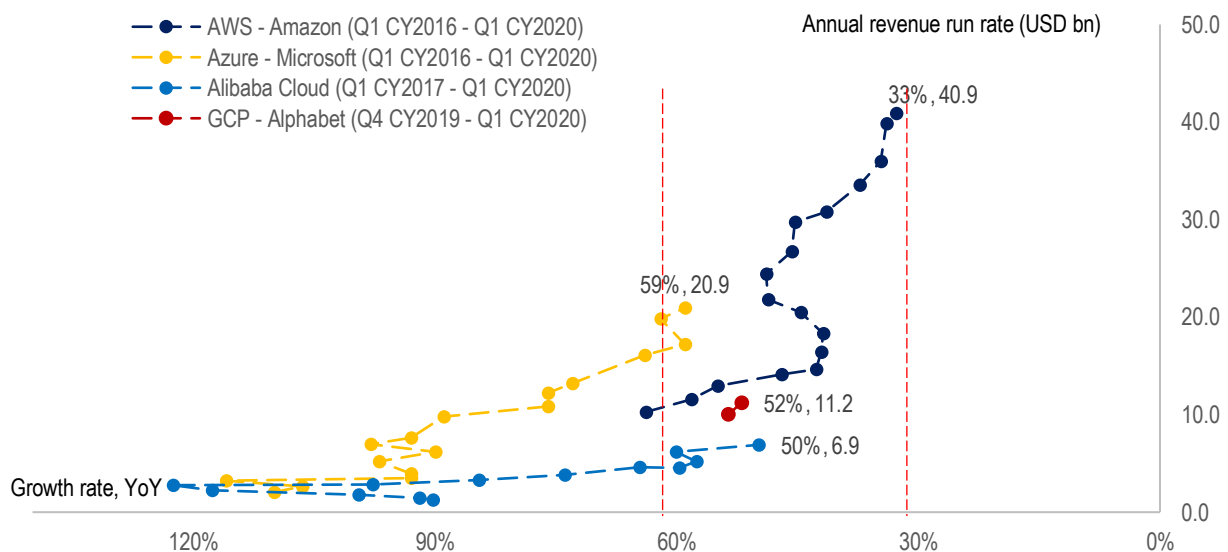




Cloud computing (IaaS) – growth, scale, and capex

Figure 1: annual revenue run rate vs growth rate, YoY



Source: Company data, AMTD Research estimates

AMTD views: the pandemic puts a spotlight on cloud computing. As COVID-19 have forced businesses to operate in distance and deploy their workforces and customers virtually, companies have to switch from legacy IT platform into cloud platform, which offers more agility and flexibility. This crisis will be a catalyst to accelerate the adoption of cloud computing, in our view. Major IaaS vendors have posted their Q1 results this year. AWS is still leading the competition with an annual revenue run rate of US\$40.9bn (growth rate of 33%, YoY), followed by Azure, GCP (incl. G Suite), and Alibaba Cloud at run rate of US\$20.9bn (+59%, YoY), US\$11.2bn (+52%, YoY), US\$6.9bn (+50%, YoY), respectively. In light of a huge surge in demand, capex will likely to be another important driver of their cloud business growth.

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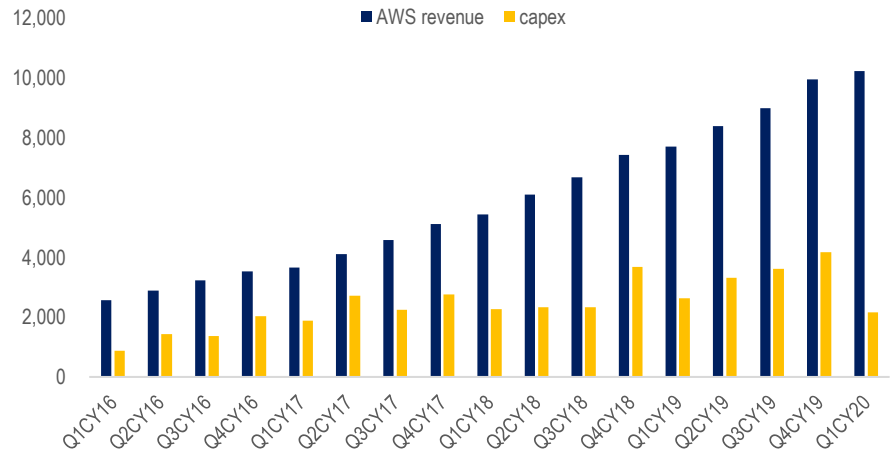
Cloud/laaS

AWS – Amazon

AWS – benefit from operating leverage

AWS reported strong revenue growth of 33% YoY in Q1CY20 on such a large base with a US\$41bn run rate. AWS is well-positioned in cloud business thanks to its breadth of customers from start-ups, enterprises to the public sector. In particular, video conferencing, gaming, remote learning, entertainment, etc., all are seeing much higher growth and usage amid the pandemic.

Figure 2: AWS's revenue and capex (US\$ mn)

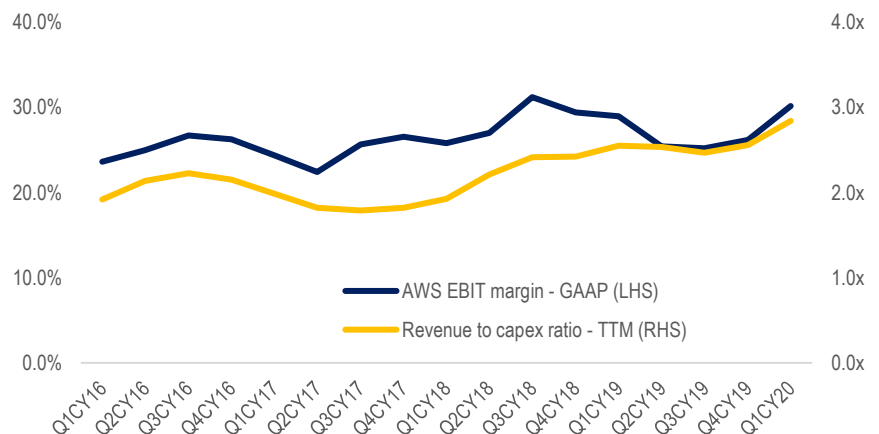


Source: Company data, AMTD Research estimates

Note: AWS capex is "property and equipment acquired under capital leases"

Capex is a good leading indicator of cloud (laaS), however, it cannot fully explain the growth of the AWS business, mainly because AWS has achieved a significant operating leverage, which has been reflected in both rising revenue to capex ratio and expanding EBIT margin. From revenue end, AWS can develop more and more products and services on its current platform to meet surging demand; from cost end, AWS has been able to extend useful life for server and infrastructure assets, which brought US\$800mn benefit in Q1CY20 for AWS. In Q1CY20, AWS's revenue to capex ratio in TTM rose to 2.8x (vs. 2.6x last quarter) and EBIT margin (GAAP) expanded to 30.1% from 26.1% last quarter.

Figure 3: AWS EBIT margin (GAAP) vs AWS's revenue to capex ratio



Source: Company data, AMTD Research estimates

Cloud/laaS

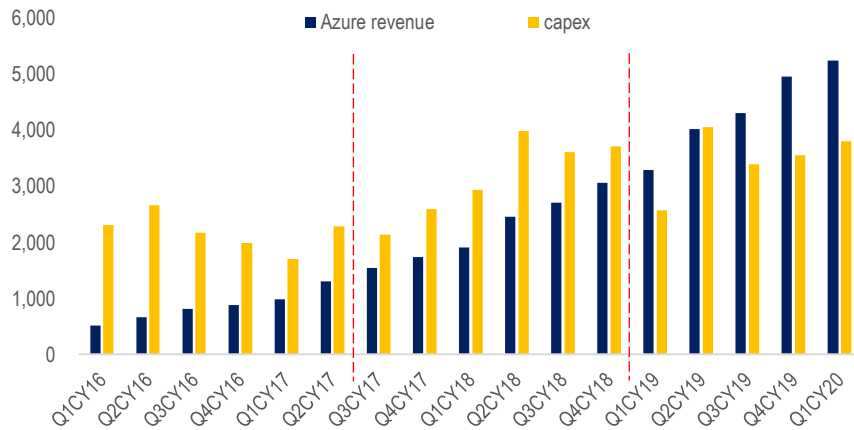
Azure – Microsoft

Azure – operating leverage on the horizon

Unlike Amazon’s AWS, which has been launched for 13 years, Azure has only been introduced for four years, during which we found the that the relationship between revenue and capex has undergone distinct changes: 1) initial heavy investment before Q2CY17; 2) revenue and capex grew at the same pace from Q2CY17 to Q1CY19; 3) revenue surpassed capex in dollars after Q1CY19.

In Q1CY20 (Q3FY20), capex including finance leases were US\$3.9bn (Cash paid for property and equipment was US\$3.8bn), up 15% YoY, but lower than expected, which was caused by COVID-19 related delays across the supply chain. At the same period, Azure revenue grew by 59% YoY, and based on our estimates, Azure’s revenue to capex ratio in TTM reached 1.0x. Following the growth path of AWS, capex will accelerate revenue growth, in our view.

Figure 4: Azure’s revenue and capex (US\$ mn)

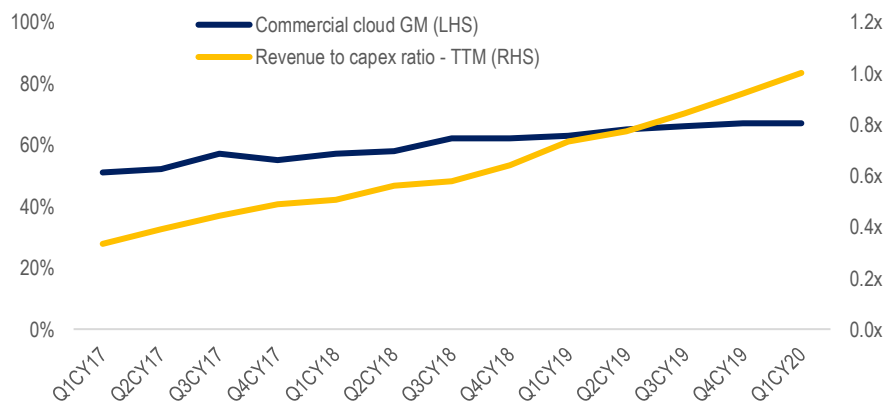


Source: Company data, AMTD Research estimates

Note: Most of Microsoft’s capex is for cloud infrastructure, thus we use “Cash paid for property and equipment” of its total capex as Azure’s capex here

On the other hand, although sales mix has shifted to lower margin Azure (based on our estimates, the proportion of Azure revenue to Commercial Cloud revenue rose to approximately 40% in Q1CY20 from 20% in Q1CY16), Commercial Cloud gross margin increased to 67% in Q1CY20 from 63% the same quarter last year, mainly driven by significant improvement in Azure gross margin. The operating leverage of Azure is on the horizon.

Figure 5: Microsoft commercial cloud gross margin vs Azure’s revenue to capex ratio



Source: Company data, AMTD Research estimates

Note: Commercial cloud includes Office365 Commercial, Dynamics 365, LinkedIn Commercial and Azure

News update

28 May 2020

Cloud/SaaS

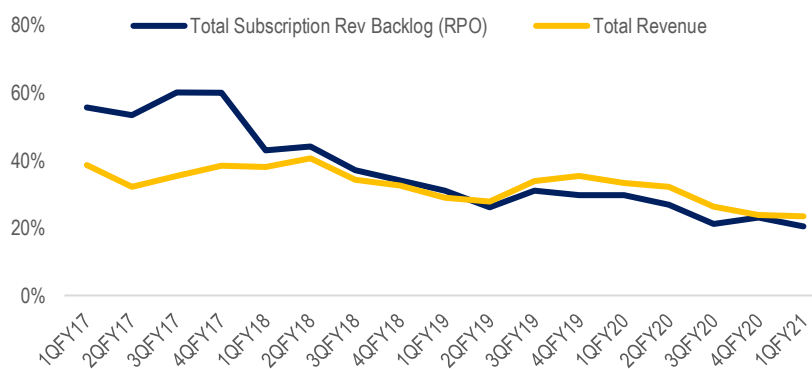
Workday

Strong Q1 results with conservative FY21 guidance

Workday reported strong Q1 results amid the COVID-19. Total revenue grew by 23.4% YoY to US\$1.02bn, with subscription revenue of US\$882mn, up 25.8% YoY, and professional services revenue of US\$136mn, up 10.0% YoY. Subscription revenue backlog grew by 20.4% YoY to US\$8.19bn, among which US\$5.52bn will be recognized within the next 24 months, up 21.1% YoY. Retention rates continued to be strong with gross retention over 95% and net retention over 100%. Non-GAAP operating margin continued to expand, reaching 12.8% (OM would have been 20.6% otherwise by excluding one-time bonus) in Q1 driven by lower travel expenses and more measured hiring. However, given the uncertain environment, the company revised down FY21 subscription revenue outlook to US\$3.670bn - US\$3.690bn, or 19% YoY growth. But non-GAAP operating margin was up from prior view of 14.5% to 16% for full year of FY21, reflecting expectation of lower operating expenses. (Source: [Workday](#))

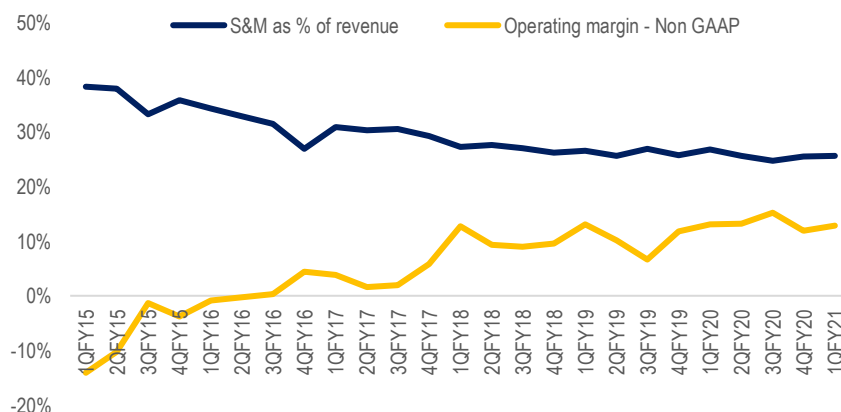
AMTD views: with a conservative full year guidance, Q2 and Q3 of FY21 are looking less optimal as the company saw customers were deferring decisions. However, we still see the tailwinds in longer term: 1) pipeline recovery in FY22 when budgets return; 2) very healthy back-to-base growth in Q1 (net new ACV growth of 50%); 3) acceleration of shifting to cloud-based solution post COVID-19.

Figure 6: Workday's backlog and revenue growth, YoY



Source: Company data, AMTD Research; Note: 1QFY21 ended 30 Apr 2020

Figure 7: Workday's S&M expenses as % of total revenue and operating margin (Non-GAAP)



Source: Company data, AMTD Research; Note: 1QFY21 ended 30 Apr 2020

28 May 2020

Cloud/SaaS

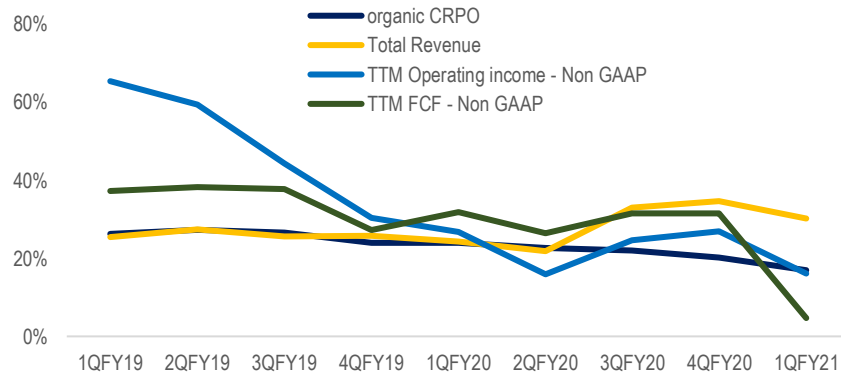
Salesforce

Strong Q1 results with downward FY21 guidance

Salesforce reported strong Q1 results. Current remaining performance obligations (CRPO) bookings was US\$14.5bn, up 23% YoY (organic +17% YoY). Total revenue came in at US\$4.87bn, up 30% YoY (organic +20% YoY). Non-GAAP operating margin was 13.1%, mainly due to one-time expenses totaling US\$250mn, including US\$140mn commission, US\$65mn events cancellation, US\$25mn lease impairment, and US\$20mn donations. Operating cash flow was down 5% YoY to US\$1.86bn, which was largely impacted by delayed payments from customers. For next quarter, CRPO growth was guided to 16-17% YoY and total revenue was expected to be US\$4.89bn - US\$4.90bn. Full year revenue and EPS guidance were trimmed down to US\$20bn and US\$2.93- US\$2.95 vs prior of US\$21.0bn-US\$21.1bn and US\$3.16-US\$3.18, respectively. (Source: [Salesforce](#))

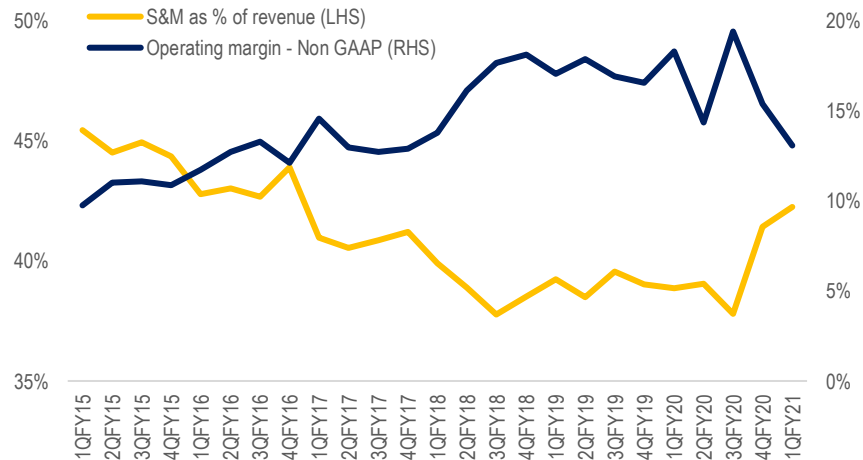
AMTD views: as expecting tougher Q2 caused by pandemic, the management revised down full year revenue guidance, however, as confidence is building up bit by bit, the company expected to get much better visibility for bookings into Q3 and Q4. In addition, in light of the uncertainty surrounding the COVID pandemic, the company is reassessing LT revenue target for FY24 and planning on giving an update during the Investor Day.

Figure 8: Salesforce's organic CRPO, total revenue, TTM operating income, and TTM FCF growth, YoY



Source: Company data, AMTD Research; Note: 1QFY21 ended 30 Apr 2020

Figure 9: Salesforce's expenses as % of total revenue and operating margin (Non-GAAP)



Source: Company data, AMTD Research; Note: 1QFY21 ended 30 Apr 2020

29 May 2020

Semiconductor

TSMC

TSMC plans to begin mass production of 5 nm+ process in 4Q20

TSMC is expected to kick-off volume production of its next-generation 5 nm+ manufacturing node, which is an enhancement of the 5 nm node, as soon as 4Q20. The rumored Apple A14X of 12.9" iPad Pro would be one of the first chips to benefit from the advanced technology. Meanwhile, Samsung plans to start the mass production of 5nm chips using the EUV process in 2Q20. (Source: [Techpowerup](#))

28 May 2020

Semiconductor

ASML

ASML shipped first-generation multibeam inspection system 'eScan1000'

ASML announced that it has completed system integration and testing of its first-generation HMI multibeam inspection (MBI) system for 5 nm nodes and beyond. The HMI eScan1000 demonstrated successful multibeam operation, simultaneously scanning nine beams on a number of test wafers. Thus, the eScan1000 will increase throughput up to 600% compared to single e-beam inspection tools for targeted in-line defect inspection applications. (Source: [ASML](#))

28 May 2020

Device

HP/Microsoft/Valve

HP's high-resolution Reverb G2 is a US\$599 headset for VR gaming

HP, Valve and Microsoft have announced a new version of their high-resolution Reverb VR headset for VR gaming. The Reverb G2 is slated to launch this fall at US\$599 (RMB4,200). It is an upgrade to the original HP Reverb, featuring more tracking cameras, a redesigned controller, and new lenses and speakers from VR pioneer Valve. Besides, it is designed to be compatible with both SteamVR and Window Mixed Reality. (Source: [VRTimes](#))

27 May 2020

Blockchain

Intel

Ant Group and Intel form partnership to make IT leasing more accessible

Ant Financial Services Group announced a cooperative effort with Intel to make it much easier and cost-effective for SMEs to lease IT equipment, leveraging the application of blockchain technology to strengthen transparency and build a system of trust. The partnership aims to empower the IT equipment leasing industry while accelerating the digital transformation of SMEs. (Source: [Businesswire](#))

27 May 2020

Semiconductor

OPPO

Oppo to hire more top experts and step up chip ambition

As part of its more aggressive chip strategy, Oppo has hired several top executives from its key chip supplier MediaTek, as well as many engineers from UNISOC, to create an experienced chip team in Shanghai. Recent hires include Jeffery Ju, MediaTek's former co-chief operating officer and a former executive with Chinese smartphone maker Xiaomi, who was already working with Oppo as a consultant. Another rising executive involved in MediaTek's 5G smartphone chip development will also join Oppo. (Source: [nikkei](#))

27 May 2020

Display

Samsung/LG

80% of iPhone 12 displays to be supplied by Samsung, LG to pick up the rest

Samsung has won the contract to supply 80% of Apple's iPhone 12 OLED displays (nearly 55mn units) while LG Displays obtained the remaining 20% (nearly 20mn units). BOE didn't win the orders. The 5.4-inch iPhone 12, 6.1-inch iPhone 12 Pro and 6.7-inch 12 Pro Max models are expected to be supplied by Samsung, while the non-Pro 6.1-inch model is expected to get an OLED panel from LG. (Source: [GizmoChina](#))

26 May 2020

Smartphone

Vivo

Vivo topped the Indonesian smartphone market in 1Q20

The Indonesian smartphone market shipped 7.5mn units, declining by 7.3% YoY in 1Q20, according to IDC. Vivo topped for the first time in Indonesia's smartphone market in 1Q20, by focusing on its market campaigns and various promotional campaigns for its low-end and midrange smartphones, with a market share of 27.4%. (Source: [IDC](#))

25 May 2020

Smartphone

Xiaomi/MediaTek

Redmi 10X series is launched with MediaTek Dimensity 820 5G

Xiaomi launched Redmi 10X series, priced at RMB 1,999. Redmi 10X is the first smartphone to ship with the MediaTek Dimensity 820 SoC based on 7 nm process. The chipset supports 5G+5G SIM dual standby along with SA and NSA dual mode 5G. Besides, by the end of last year, Xiaomi has largely cleared out its inventory of 4G phones and fully adopted 5G strategy. Xiaomi plans to launch at least 10 5G phones this year. (Source: [mi.com](#))

22 May 2020

PCB

PCB production in Japan increased by the most in recent years

Japan electronic circuit industry association (JPCA) reported that the output of Japan's printed circuit board (PCB) in March 2020 (including Rigid PCB, Flexible PCB and Module Substrates) declined by 5.4% YoY to 1.025 mn square meters, witnessing the 16th consecutive month of decline. Output rose 13.1% to 42.337 bn yen, the second month of growth and the biggest increase in recent years (at least since 2015). In Japan, PCB production from January to March fell 9.3% YoY to 2.959 mn square meters, while output grew by 7.2% to 116.882 bn yen. (Source: [JPCA](#))

22 May 2020

Software

Intel

Intel acquired Rivet Networks to boost Intel's Wi-Fi offerings for PC platforms

Intel announced the acquisition of Rivet Networks, a leader in software and cloud-based technologies for networking connectivity. Rivet Networks' key products, including its Killer brand, will integrate into Intel's broader PC Wi-Fi portfolio. With the addition of Rivet Networks' software, the company will license its software to customers and develop new solutions for broader PC connectivity enhancement. (Source: [Intel](#))

22 May 2020

Semiconductor

Samsung

Samsung to build new EUV foundry chip line for 5 nm chips

Samsung announced that the company has begun construction of a new contract chip-making line at its plant in Pyeongtaek, South Korea. The new line will use extreme ultraviolet (EUV) technology to make chips that are 5 nm or smaller. It will begin full operations in 2021 and make chips for use in 5G, high-performance computing, and artificial intelligence. (Source: [zdnet](#))

21 May 2020

Smartphone

Apple

Apple bounced back with 3.9mn iPhones sales in China in April

According to CINNO Research, Apple bounced back in April in China after a dull March due to the lockdowns, selling 3.9mn iPhones which is nearly 160% increase from 1.56mn in March, with the new iPhone SE's contribution able to account for 24%. (Source: [cnbc](#))

21 May 2020

Smartphone

Xiaomi

Xiaomi acquired 27.44% stake in Zimi for US\$103 mn

Xiaomi recently announced that it would acquire 27.44% shares of Zimi for US\$103 mn. On the completion of the transaction, Xiaomi Group will own 49.91% shares of Zimi. Zimi became a member of Xiaomi's industrial ecosystem chain in 2013, and it is responsible for research and development of Xiaomi mobile power bank and related accessories. (Source: [ChinaTechnews](#))

20 May 2020

IoT

Alibaba

Alibaba to invest US\$1.4 bn to boost smart speaker-centered AIoT ecosystem

Alibaba plans to invest RMB10bn (US\$1.41bn) this year to strengthen its AI and IoT ecosystem focusing on its smart speaker - Tmall Genie. The investment is aimed at expanding the AIoT ecosystem and boosting the Tmall Genie user experience by integrating more content and services from Alibaba's diverse ecosystem, ranging from entertainment to healthcare, education and online shopping. (Source: [yicaiglobal](#))

19 May 2020

E-commerce

Facebook

Facebook launched 'Shops' across all its platforms

Facebook launched Shops, a service that will allow businesses to display and sell products on its all social platforms. A checkout feature will enable in-app purchases, while a more deeply integrated messaging feature will allow customers to chat with businesses through WhatsApp, Messenger or Instagram Direct. (Source: [Facebook](#))

19 May 2020

Software

Microsoft

Microsoft acquired software robotic process automation platform 'Softomotive'

Microsoft announced the acquisition of Softomotive, a leading provider of robotic process automation (RPA) with over 15 years of experience and the creator of WinAutomation. By bringing Softomotive's desktop automation together with the existing Microsoft Power Automate capabilities, Microsoft is further democratizing RPA and enabling everyone to create bots to automate manual business processes. (Source: [Microsoft](#))

18 May 2020

Smartphone

OPPO/Vodafone

OPPO partnered with Vodafone for bigger European push

OPPO and Vodafone announced a comprehensive partnership agreement that will bring a broad range of OPPO's smartphones to Vodafone's European markets, including Germany, United Kingdom, Spain, Portugal, Romania, Turkey and the Netherlands, progressively rolling out across Vodafone channels, starting from May 2020. Partnership agreement will enable OPPO and Vodafone to accelerate 5G adoption and expand availability of OPPO products to more Vodafone markets and customers. (Source: [Vodafone](#))

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We, Brian Li and Halsey Wu, hereby certify that (i) all of the views expressed in this research report reflect accurately our personal views about the subject companies and their securities; and (ii) no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed by us in this research report, nor is it tied to any specific investment banking transactions performed by AMTD Global Markets Limited.

As of the date the report is published, Brian Li holds financial interest in the securities of Amazon mentioned in the report.

Firm Disclosure

AMTD Global Markets Limited has an investment banking relationship with Xiaomi Corporation and/or its affiliate(s) within the past 12 months.

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