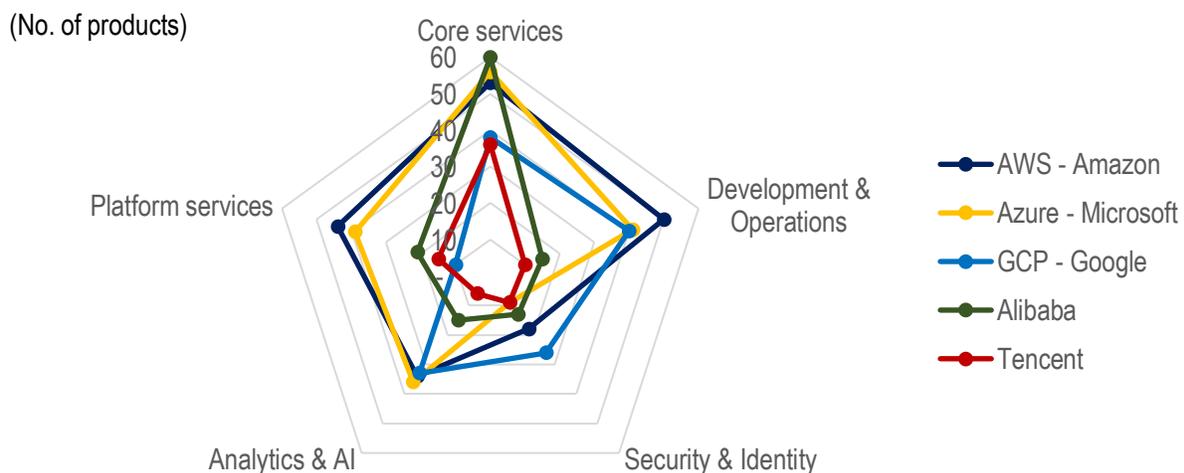




IaaS – product competitiveness of major vendors

Figure 1: Major cloud (IaaS) vendors' product competitiveness (as at the end of Aug 2020)



Source: aws.amazon.com, azure.microsoft.com, cloud.google.com, alibabacloud.com, intl.cloud.tencent.com, AMTD Research
 Note: Core Services include Compute, Storage, Database, Networking, etc.; Platform services include Mobile, Web, Gaming, Media, IoT, etc.

AMTD views: The most attractive feature of cloud computing business is the flexible online subscription model, which can not only generate recurring revenue, but also reach wider range of customers in a more economical way. Therefore, by comparing the priced products listed on their websites, we can derive the product competitiveness and revenue prospects of those IaaS vendors. Dividing the functions of IaaS into five sub-categories (as shown in Figure 1), as of August 2020, we find that AWS with nearly 200 products has the most well-balanced product portfolio; Azure is slightly behind AWS; and GCP has a comparative advantage Security and Development. Alibaba Cloud, the leader in the China market and offering more than 120 products, has caught up with the global leader in core services, but is still lagging in other areas.

AMTD Research
Brian Li
 +852 3163-3384
 brian.li@amtdgroup.com

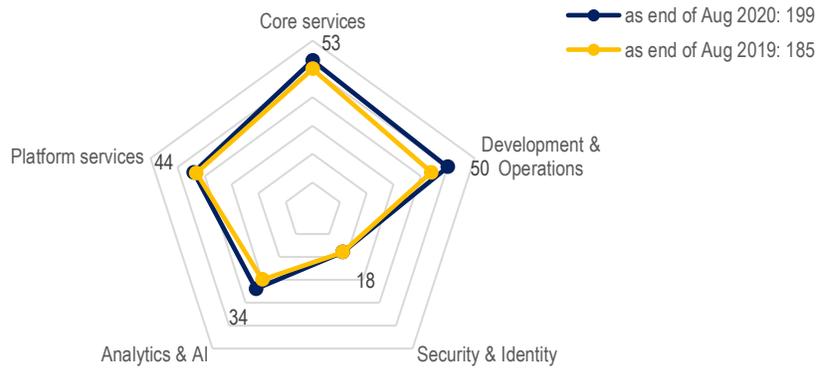
AMTD Research
Halsey Wu
 +852 3163-3220
 halsey.wu@amtdgroup.com

AMTD Research
Alyssa Han
 +852 3163 3231
 alyssa.han@amtdgroup.com

AWS Amazon – well balanced leader in IaaS

AWS is a well-balanced leader in IaaS in terms of number of products and revenue. As end of August 2020, AWS offered nearly 200 different types of products, an increase of 14 from the end of August last year. In re:Invent 2019, AWS unveiled new chips for cloud computing and several new features for machine learning (ML), hoping to strengthen its leading position by leveraging its balanced product mix. For example, in ML, AWS announced SageMaker Studio, which is first web-based integrated development environment (IDE) specifically for building machine learning model. It allows developers to build, train, tune, and deploy their models from a single interface. SageMaker Studio comprises several tools, including SageMaker Notebooks, SageMaker Experiments, SageMaker Debugger, SageMaker Model Monitor and SageMaker Autopilot.

Figure 2: AWS’s product portfolio at period end (No. of products)

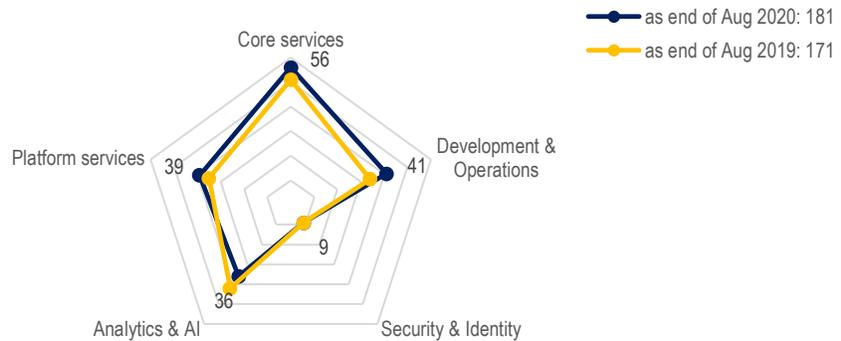


Source: aws.amazon.com, AMTD Research

Azure Microsoft – leading the competition in IoT and edge computing

Azure is continuing to strengthen its products in different areas. As end of August 2020, Azure offered more than 180 different types of products. In addition, over the last few years, Microsoft has been investing heavily in hybrid cloud, IoT and edge computing platforms. In Mar 2020, Microsoft announced Azure Edge Zones, an infrastructure service that combines the power of Azure, 5G, carriers, and technology partners. With the help of 5G network and intelligent cloud, Microsoft is building a comprehensive edge network and ahead of the competition in the industrial IoT and edge computing market.

Figure 3: Azure’s product portfolio at period end (No. of products)

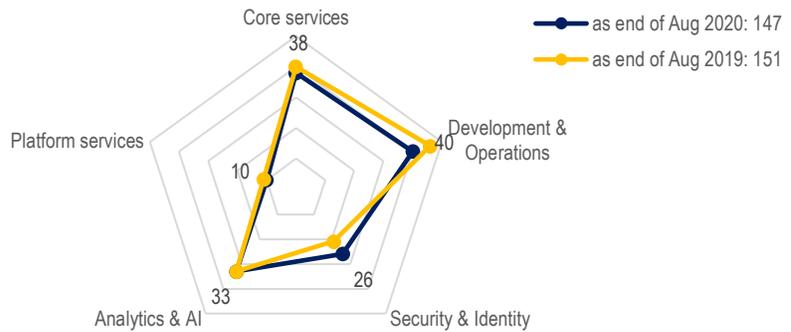


Source: azure.microsoft.com, AMTD Research

GCP Alphabet – with leading edge in Security and Development

Despite relatively small compared to AWS and Azure, GCP Google has advantages in security, development, and operations. Thanks to its engineering expertise, GCP has a comprehensive container-based model and is popular within innovative cloud native companies and has a strong position in the open source community. In hybrid and multi cloud field, GCP launched Anthos in 2019, which is rooted in container and Kubernetes technology, differentiating itself with Microsoft's Azure Stack and AWS's VMware combined with Outpost's hybrid cloud solution. In this August, GCP announced new features, including a new Identity Service, for Anthos, hoping to continue its leadership in Kubernetes and cloud native. As end of August 2020, GCP provided nearly 150 different products.

Figure 4: GCP's product portfolio at period end (No. of products)

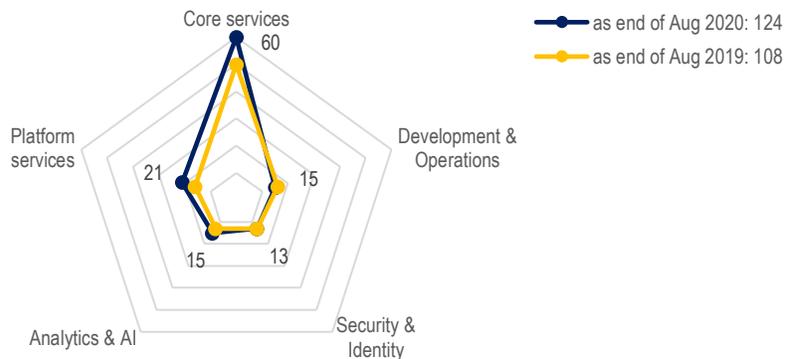


Source: cloud.google.com, AMTD Research

Alibaba Cloud – continuing to strengthen core services

Last July, on Alibaba Cloud Summit 2019, Alibaba launched All-in-Cloud solution, which includes Apsara Cloud Operating System, Apsara Big Data Platform, etc. Now, Alibaba has gradually commercialized these technologies and added them into the existing product portfolio. As end of August 2020, Alibaba Cloud listed 124 different products on its website, 16 more than the end of August last year. The increase mainly focused on the database products of core services. In addition, in annual event Apsara 2020, Alibaba announced Alibaba Cloud 2.0, an all-in-one platform augmented by its Apsara System and Digital Native Operating System, in hope of narrowing the gap with global leaders.

Figure 5: Alibaba Cloud's product portfolio at period end (No. of products)



Source: alibabacloud.com, AMTD Research

Tencent Cloud – leveraged by its unique social media platform

Although lagging behind other competitors, Tencent Cloud has huge growth potential in a fast-growing market given that Tencent is China's largest social platform. Tencent Cloud launched several media-related products this year, reflecting its competitive advantage in certain industry segments. In addition, Tencent Cloud is also a major player in financial industry and government segment in China.

Figure 6: Tencent Cloud's product portfolio at period end (No. of products)



Source: intl.cloud.tencent.com, AMTD Research

News update

16 Sep 2020

Cloud/SaaS

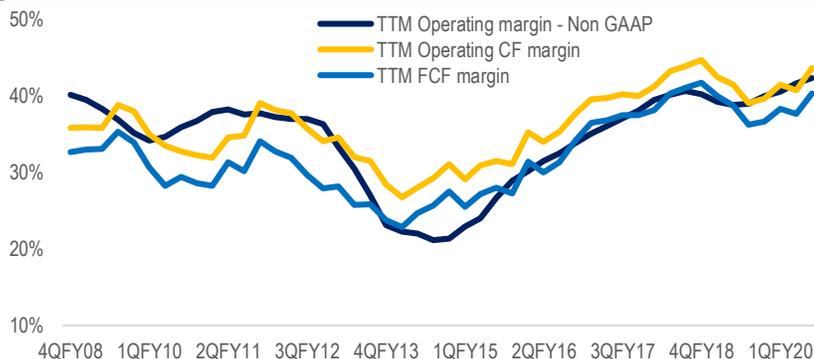
Adobe

Strong quarter with expanding margin amid headwinds

Adobe reported solid 3Q results. Total revenue grew by 13.8% YoY/3.1% QoQ to US\$3.23bn. In terms of segment: 1) Digital Media remained the main contributor and its revenue reached US\$2.34bn, up 19.1% YoY/4.7% QoQ; 2) Digital Experience reported revenue of US\$838mn, up 2.1% YoY/1.5% QoQ. Subscription revenue excluding Advertising Cloud grew 14% YoY. Operating margin continued to expand, reaching 43.5% this quarter compared to 42.7% last quarter, thanks to cost savings from T&E and shifting to virtual conference. Non-GAAP net income/EPS came in at US\$1.25bn/US\$2.57 this quarter, respectively. Adobe had a conservative 4Q guidance, as enterprises and smaller businesses continue to be impacted by the headwinds. Total revenue was guided to US\$3.35bn and Digital Media and Digital Experience revenues were expected to grow by 18% YoY and 1% YoY (12% YoY excl. Ad Cloud), respectively. (Source: [Adobe](#))

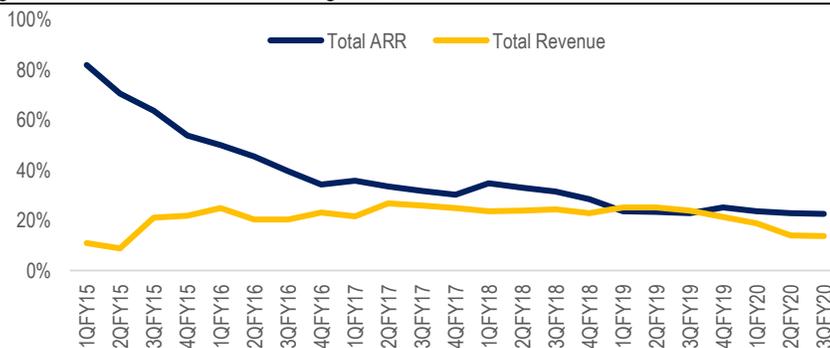
AMTD views: The company's RPO and ARR maintained a stable growth pace. RPO grew by 18% YoY to US\$10.34bn exiting Q3 and grew sequentially by 4% QoQ. Net new Digital Media ARR was US\$458mn and total Digital Media ARR grew to US\$9.63bn, driven by: 1) improvement in retention rate; 2) record traffic to Adobe.com; 3) benefits from remote work environment. In addition, given its strong cash flow, Adobe repurchased approximately 1.5m shares at a cost of US\$617mn in 3Q. Adobe's expanding margins and robust cash flow during the downturn proves the attractiveness of SaaS business model. (Please see our note: [AMTD Global Tech Biweekly vol.31](#) for more details on SaaS model).

Figure 7: Adobe's operating margin (Non-GAAP), TTM OCF margin, and TTM FCF margin



Source: Company data, AMTD Research; Note: 3QFY20 ended 28 Aug 2020

Figure 8: Adobe's total ARR and revenue growth, YoY



Source: Company data, AMTD Research; Note: 3QFY20 ended 28 Aug 2020

22 Sep 2020

Semiconductor

Qualcomm

Qualcomm announced Snapdragon 750G 5G mobile platform

Qualcomm expanded its 7-series mobile chipsets with a new 5G platform, the Snapdragon 750G. The new SoC boasts “truly global” 5G capabilities, HDR gaming and on-device AI feature. It supports both mmWave and Sub-6GHz 5G networks in SA and NSA modes, TDD, FDD and with Dynamic Spectrum Sharing (DSS). The company expects commercial devices based on the 750G to be available by the end of 2020. (Source: [Qualcomm](#))

18 Sep 2020

Display

Samsung

Samsung unveiled foldable OLED panel with world’s smallest curvature

Samsung announced a foldable display panel having a 1.4R rating for its curvature, representing the smallest degree of curving among commercialized foldable smartphones to date— an advancement first applied to the recently-released Galaxy Z Fold2 5G. Samsung Display’s cutting edge technology has now passed a folding test of 200,000 display panel folds. (Source: [Businesswire](#))

17 Sep 2020

Cloud

Accenture

Accenture Cloud First launched with US\$3 billion investment

Accenture announced the formation of Accenture Cloud First with a US\$3 billion investment over three years to help clients across all industries rapidly become “cloud first” businesses and accelerate their digital transformation. Accenture Cloud First is a new multi-service group of 70,000 cloud professionals. (Source: [Accenture](#))

17 Sep 2020

Cloud

Alibaba

Alibaba unveiled its first cloud computer – Wuying

Alibaba introduced the new cloud operating system - Alibaba Cloud 2.0 at Alibaba Cloud Apsara Conference 2020. Alibaba also announced the “first cloud computer,” a smartphone-sized device known as “Wuying.” Through connecting C-Key to any monitors, users can enter the dedicated cloud desktop and access various applications and files. In addition, it supports on-demand configuration, and the price is half the cost of a traditional PC with the same performance. (Source: [Myzaker](#))

17 Sep 2020

Cloud

WANdisco/AWS

UK’s WANdisco partnered with AWS to drive cloud migration projects

Cloud specialist WANdisco has partnered with AWS to launch a rapid self-service data migration tool. The “LiveData Migrator” lets companies move any size of on-premises data to AWS within minutes and without the need of engineers or specialists. (Source: [Cloudpro](#))

15 Sep 2020

Smartphone

Apple

Apple unveiled 5nm A14-powered new iPad Air and Apple One subscription

On Apple Event 2020, Apple introduced its new iPad Air, featuring an all-screen design with Apple’s most advanced chip, 5nm-based A14 Bionic. This device is available in Oct, priced at US\$599. Besides, Apple launched Apple One subscription, bringing together Apple’s disparate music, TV, news, games and storage services into one package, similar to Amazon’s Prime subscription, priced at US\$14.95, US\$19.95, US\$29.95 for three options. iOS 14, Watch OS 7 and TV OS 14 are also available at the same time. (Source: [Apple](#))

15 Sep 2020

Cloud

Microsoft

Microsoft launched xCloud game streaming for Xbox Game Pass Ultimate

Microsoft announced that its cloud gaming service will be available on Xbox Game Pass Ultimate (previously called xCloud) with more than 150 games. The service is now available across 22 different countries which has racked up over 10 million subscribers. The regular monthly subscription price is US\$14.99. (Source: [TheMotleyFool](#))

14 Sep 2020

Semiconductor

Samsung/Qualcomm

Samsung secured order to make all Qualcomm Snapdragon 875 chips

Samsung is reported to use its 5nm EUV process to manufacture all Snapdragon 875 chipsets. It is the first time Samsung has won all orders for Qualcomm's flagship processor model. Total contract size is said to be worth close to KRW 1 trillion (around US\$844 million). The Snapdragon 875 is expected to be unveiled in Dec 2020 and could appear in smartphones in the first quarter of 2021. (Source: [Sammobile](#))

13 Sep 2020

Semiconductor

NVIDIA/Arm

NVIDIA acquired Arm for US\$40 Billion

NVIDIA announced a definitive agreement under which NVIDIA would acquire Arm from SoftBank in a transaction valued at US\$40 billion. The combination brings together NVIDIA's leading AI computing platform with Arm's vast ecosystem to create the premier computing company for the age of artificial intelligence. NVIDIA will continue Arm's open-licensing model and customer neutrality and expand Arm's IP licensing portfolio with NVIDIA technology. NVIDIA will build on Arm's R&D presence in the U.K., establishing a new global center of excellence in AI research. (Source: [NVIDIA](#))

11 Sep 2020

Semiconductor

TSMC/MediaTek

TSMC, MediaTek posted record August revenue

TSMC reported that August revenue climbed to a record NT\$122.88 billion (US\$4.16 billion), increased 15.8% YoY and rose 16% month-on-month. MediaTek reported that August revenue soared about 42% YoY to NT\$32.72 billion. Revenue jumped 22.57% month-on-month from NT\$26.69 billion in July. These are attributed to robust demand for advanced chips used in 5G-related applications. Also, they benefited by receiving rush orders from Huawei, as Huawei stocks up on chip inventory. (Source: [TaipeiTimes](#))

11 Sep 2020

Smartphone/OS

Huawei

Harmony OS 2.0 announced: Will debut on smartphones in December

On Huawei Global Developer Conference, Huawei announced Harmony OS 2.0 and confirmed that a beta version of the Harmony OS 2.0 will be available from Sep 10 on smartwatches and cars. The firm added that a beta version of the developer tools will come to smartphones in Dec. Huawei smartphones will fully support Harmony OS in 2021. In addition, Huawei released the terminal operating system EMUI 11, which will be compatible with more than 50 Huawei smartphones. It is expected to install more than 200 million units, with a 90%t upgrade rate. Huawei officially announced HMS Core 5.0 to commercial use globally. HMS Core 5.0's open capabilities have reached 56 Kits, 12,981 APIs, 1.8 million registered developers, 96,000 global apps, and 700 million users worldwide. (Source: [36Kr](#))

10 Sep 2020

Cloud/SaaS

Tencent

Tencent Meeting users exceeded 100 million

Tencent Meeting announced that the number of users exceeded 100 million after 245 days of launch, thus Tencent Meeting has become a video conference product that tracked over 100 million users the fastest among its kind. Besides, Tencent released enterprise version, meeting connector and smart meeting solution "Tencent Meeting Rooms". Tencent Meeting released a payment version for corporate, supporting 2,000 people online concurrently at maximum. (Source: [Tencent](#))

10 Sep 2020

Smartphone/App

Tencent

WeChat mini program DAU exceeded 400mn

Since 2020, Tencent announced the daily active users of WeChat mini program have exceeded 400 million, covering more than 200 sub-industries and 5.36 million mini-program practitioners and mini programs have exceeded one million. In addition, two new capabilities were announced: 1) Open the ability to redirect: WeChat will gradually release restrictions on the ability to redirect to mini programs, APP redirects to mini programs, and H5 to redirect mini programs; 2) Open sharing capabilities: open mini programs to share to WeChat moments, currently this function is only available on android system. (Source: [Cnbeta](#))

9 Sep 2020

Smartphone/5G

Shipment

Canalys forecasted 5G smartphones to reach 278 million globally in 2020

Canalys projected global 5G smartphone shipments will reach 278 million units in 2020, with 62% of these in Greater China, followed by North America and EMEA. Overall smartphone shipment is projected to decline 10.7% in 2020 compared with 2019. According to CAICT, China smartphone shipment reached 202.3 million units over the past 8 months, down 19.5%YoY, and 5G smartphone shipment reached 93.7 million, accounting for 46.3% of total shipments. (Source: [Canalys](#))

9 Sep 2020

Semiconductor

Apple/TSMC

Apple to increase 5nm wafer starts at TSMC in 4Q20

Apple will kick off its 5nm wafer starts at TSMC for its new Apple Silicon processors starting the fourth quarter of 2020, with monthly output estimated at 5,000-6,000 wafers. (Source: [Digitimes](#))

8 Sep 2020

Semiconductor

MediaTek

MediaTek announced its newest 5G smartphone chip - the 7nm Dimensity 1000C

MediaTek recently announced its newest 5G smartphone chip, the Dimensity 1000C, which debuted first in the United States. The 7nm Dimensity 1000C features four Arm-Cortex-A77 CPU cores and four power-efficient Arm Cortex-A55 cores operating up to 2GHz, and it will power LG's newest 5G device, the LG VELVET. (Source: [Thefastmode](#))

8 Sep 2020

Smartphone/OS

Google

Google launched Android 11

Google launched Android 11, the latest version of its mobile OS, and pushed the source code to the Android Open Source Project (AOSP). Android 11 is not only arriving as an over-the-air update to Pixel phones first, but also on OnePlus, Xiaomi, OPPO, and Realme smartphones in the coming months. (Source: [Venturebeat](#))

7 Sep 2020

Cloud

Tencent

Tencent Cloud accelerated its western data center construction

Tencent Western Cloud Computing Data Center will invest more than RMB10 billion and is stepping up the second phase of construction. After the completion of the second phase of Tencent Western Cloud Computing Data Center, it can effectively drive Tencent Western Cloud Computing Data Center to form more than 200,000 server computing capabilities and become the largest single data center in Western China. (Source: [Jifang360](#))

7 Sep 2020

Semiconductor

AMD/MediaTek

AMD sought to enter the Wi-Fi chip market in partnership with MediaTek

AMD was seeking to work with MediaTek to enter Wi-Fi chips market. The collaboration will begin with custom Wi-Fi 6 chips for notebooks. (Source: [Kitguru](#))

7 Sep 2020

5G

Samsung

Samsung won US\$6.6 billion Verizon contract for 5G network

Samsung will develop 5G network infrastructure for Verizon Communications under a US\$6.65 billion deal. The contract runs through 2025. The deal marks one of Samsung's biggest 5G contracts since the company decided years ago to invest in networking and compete with global players like Nokia and Ericsson in providing telecom equipment. (Source: [bloomberg](#))

5 Sep 2020

5G

China

China built over 480,000 5G base stations with over 100m terminal connections

According to MIIT, the development of 5G network is accelerating. There are more than 480,000 5G base stations in the country, and the number of 5G terminal connections is increasing. At present, the number of 5G online terminal connections has exceeded 100 million, and the application of 5G has been continuously enriched, covering many fields such as industry, medical care, media, and transportation. China Mobile has built 300,000 5G base stations and more than 340 commercial cities. (Source: [Chinanews](#))

2 Sep 2020

Semiconductor

TSMC

TSMC 7nm process output to top 140,000 wafers monthly

TSMC has already scaled up its 7nm process output to 130,000 wafers monthly ahead of schedule, with the monthly production set to climb further to 140,000 wafers at the end of this year. (Source: [Digitimes](#))

IMPORTANT DISCLOSURES

Analyst Certification

We, Brian Li, Halsey Wu and Alyssa Han, 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.

AMTD Global Markets Limited

Address: 23/F - 25/F, Nexxus Building, 41 Connaught Road Central, Hong Kong

Tel: (852) 3163-3288 **Fax:** (852) 3163-3289

GENERAL DISCLOSURES

The research report is prepared by AMTD Global Markets Limited and is distributed to its selected clients.

This research report provides general information only and is not to be construed as an offer to sell or a solicitation of an offer to buy any security in any jurisdiction where such offer or solicitation would be illegal. It does not (i) constitute a personal advice or recommendation, including but not limited to accounting, legal or tax advice, or investment recommendations; or (ii) take into account any specific clients' particular needs, investment objectives and financial situation. AMTD does not act as an adviser and it accepts no fiduciary responsibility or liability for any financial or other consequences. This research report should not be taken in substitution for judgment to be exercised by clients. Clients should consider if any information, advice or recommendation in this research report is suitable for their particular circumstances and seek legal or professional advice, if appropriate.

This research report is based on information from sources that we considered reliable. We do not warrant its completeness or accuracy except with respect to any disclosures relative to AMTD and/or its affiliates. The value or price of investments referred to in this research report and the return from them may fluctuate. Past performance is not reliable indicator to future performance. Future returns are not guaranteed and a loss of original capital may occur.

The facts, estimates, opinions, forecasts and any other information contained in the research report are as of the date hereof and are subject to change without prior notification. AMTD has no obligation to update, modify or amend any part of this research report or to otherwise notify a recipient thereof in the event that any matter stated herein, or any opinion, projection, forecast or estimate set forth herein, changes or subsequently becomes inaccurate, or if research on the subject company is withdrawn. AMTD, its group companies, or any of its or their directors or employees ("AMTD Group") do not represent or warrant, expressly or impliedly, that the information contained in the research report is correct, accurate or complete and it should not be relied upon. AMTD Group will accept no responsibilities or liabilities whatsoever for any use of or reliance upon the research report and its contents.

This research report may contain information from third parties, such as credit ratings from credit ratings agencies. The reproduction and redistribution of the third party content in any form by any mean is forbidden except with prior written consent from the relevant third party. Third party content providers do not guarantee the timeliness, completeness, accuracy or availability of any information. They are not responsible for any errors or omissions, regardless of the cause, or for the results obtained from the use of such content. Third party content providers give no express or implied warranties, including, but not limited to, any warranties of merchantability of fitness for a particular purpose or use. Third party content providers shall not be liable for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including lost income or profits and opportunity costs) in connection with any use of their content. Credit ratings are statements of opinions and are not statements of fact or recommendations to purchase, hold or sell securities. They do not address the suitability of securities for investment purposes, and should not be relied on as investment advice.

To the extent allowed by relevant and applicable law and/or regulation: (i) AMTD, and/or its directors and employees may deal as principal or agent, or buy or sell, or have long or short positions in, the securities or other instruments based thereon, of issuers or securities mentioned herein; (ii) AMTD may take part or make investment in financing transactions with, or provide other services to or solicit business from issuer(s) of the securities mentioned in the research report; (iii) AMTD may make a market in the securities in respect of the issuer mentioned in the research report; (iv) AMTD may have served as manager or co-manager of a public offering of securities for, or currently may make a primary market in issues of, any or all of the entities mentioned in this research report or may be providing, or have provided within the previous 12 months, other investment banking services, or investment services in relation to the investment concerned or a related investment.

AMTD controls information flow and manages conflicts of interest through its compliance policies and procedures (such as, Chinese Wall maintenance and staff dealing monitoring).

The research report is strictly confidential to the recipient. No part of this research report may be reproduced or redistributed in any form by any mean to any other person without the prior written consent of AMTD Global Markets Limited.