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China Unicorns

Emerging from the stables

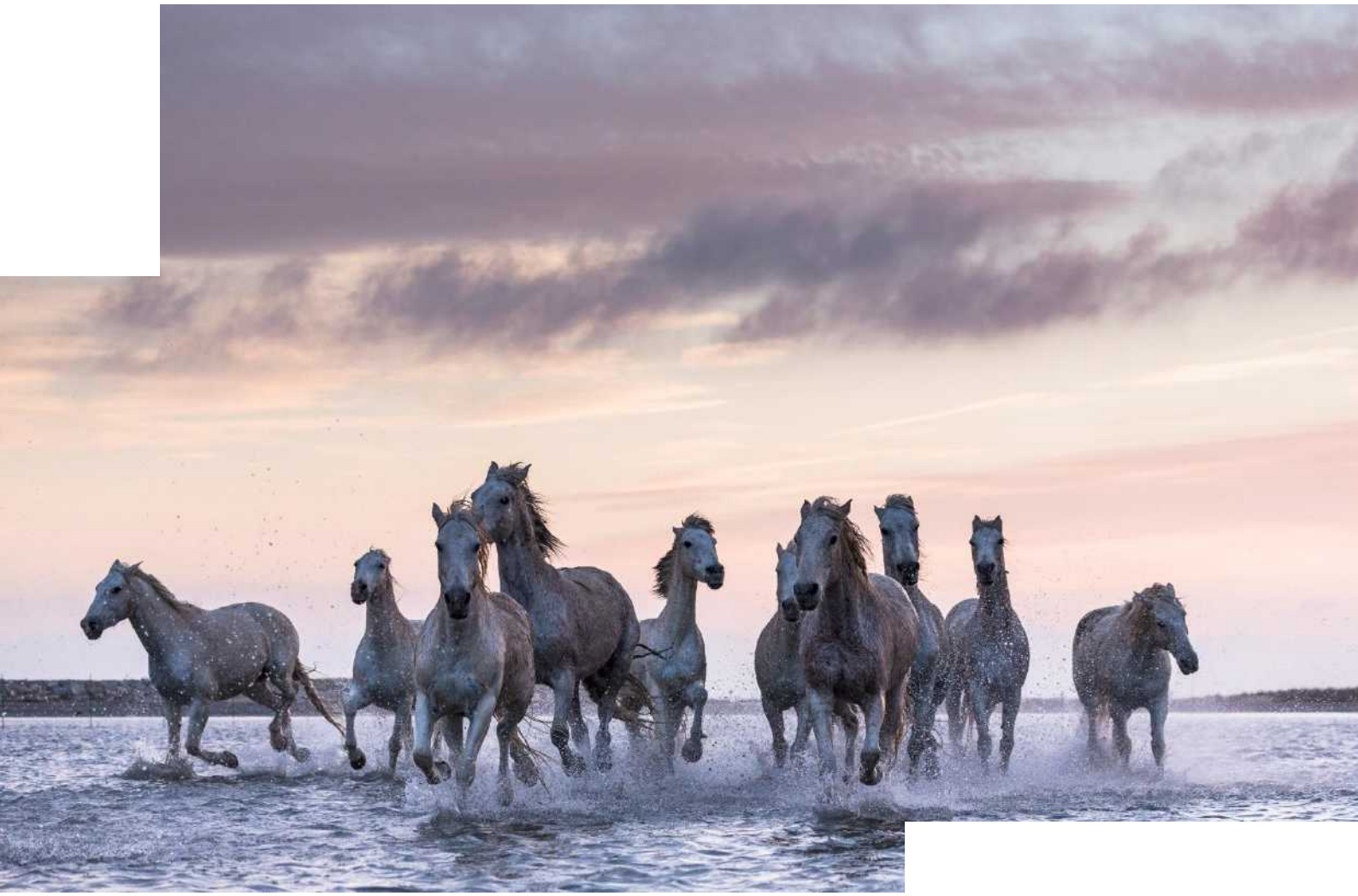

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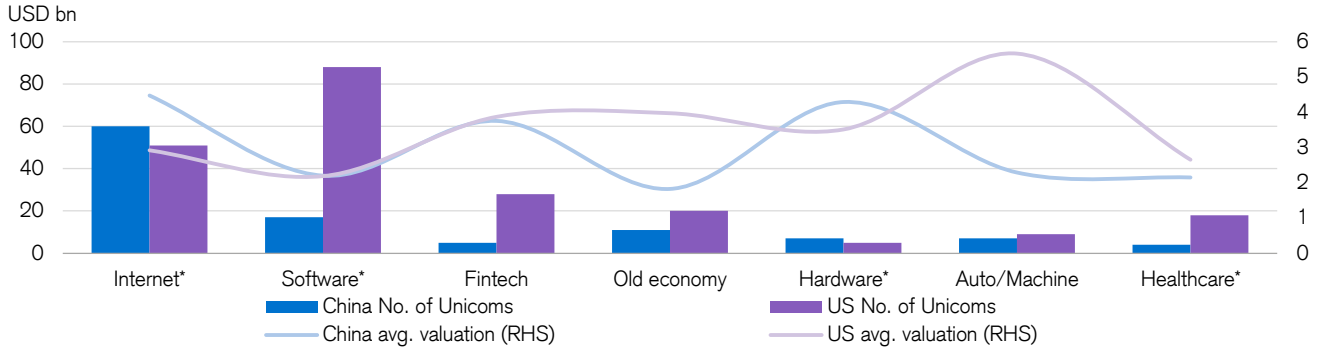
Figure 1: Where to find China's unicorns…



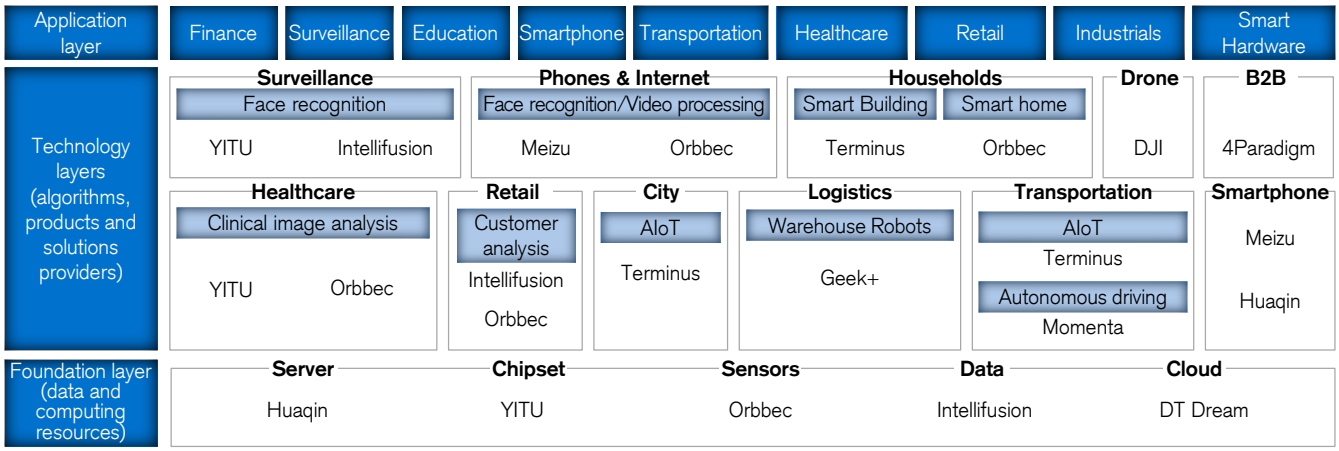
Note: * Internet also includes e-commerce/O2O/Games. Software also includes AI/Big Data/Robotics. Hardware also includes Semiconductors. Healthcare also includes Biotech. Old economy includes Property, Retailing, Construction, Logistic and Media; Source: CB Insights, Credit Suisse research

Figure 2: …in the internet sector

Total internet population (854 mn)							
(824.7 mn)	(685.9 mn)	(694.7 mn)	(758.8 mn)	(607.9 mn)	(638.8 mn)	(493.6 mn)	(418.2 mn)
IM/ Social Network	**News**	**Search**	**Video / livestreaming**	**Music**	**e-commerce**	**Online games**	**Vertical / services**
WeChat	Toutiao	Baidu	Douyin	QQ Music	Taobao	Tencent	Meituan
QQ	Tencent News	Sougou	Kuaishou	NetEase	Tmall	Game	Dianping
Weibo	Sina		iQiYi	Music	JD	NetEase	Eleme
Tantan	NetEase		Tencent Video	KuWo Music	PDD	Game	Ctrip
Momo	Qutoutiao		Youku	KuGou	Xiaohongshu		58 Home
			Bilibili	Music	Zhuan Zhuan		Dada
			Douyu		Xianyu		Cao Cao
					Womai		Didi
					Mia		Haluo
					Beibei		Ziroom
							Beike

Source: CNNIC, Credit Suisse research

Figure 3: Overall AI ecosystem companies in China



Source: Company data

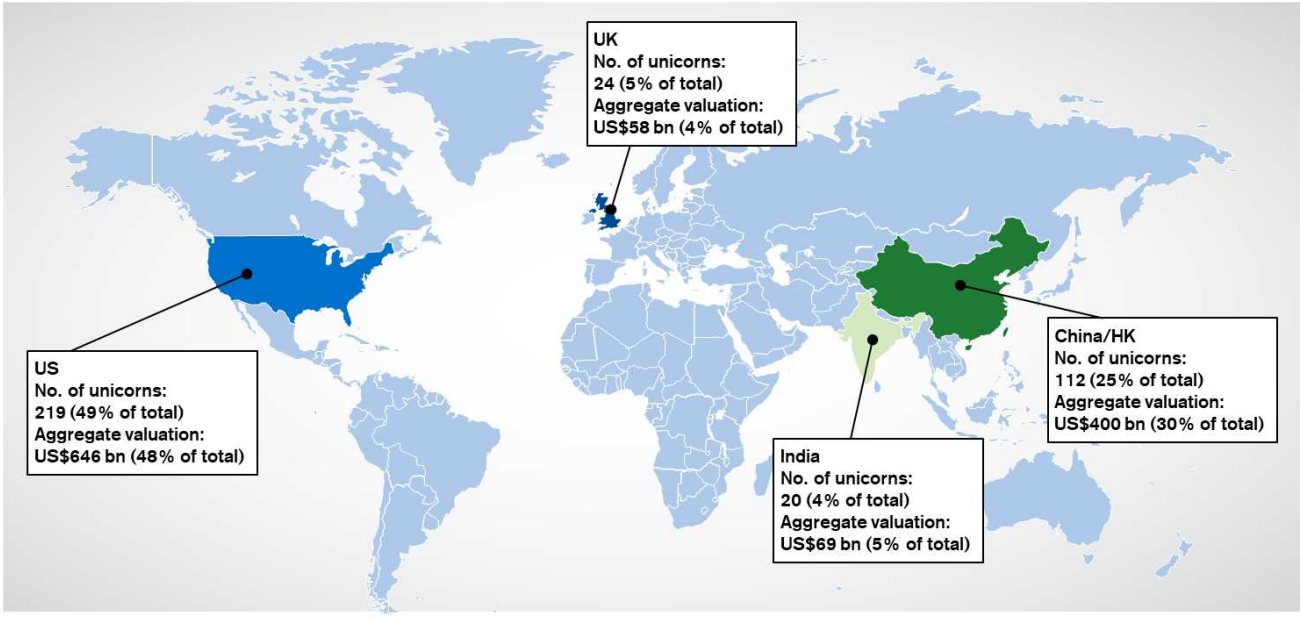
China Unicorns

China is the second-largest source of “unicorns” in the world. We expect most China unicorns to come from the internet, technology hardware, auto, healthcare and fintech sectors. New regimes introduced by HKEX and SSE have yielded positive results.

To date, China remains the second largest source of unicorns (commonly defined as start-up companies with valuation of >US$1 bn). The general trends and prospects of Chinese unicorns in different sectors are:

- **Trends in the past year:** China’s internet unicorns have seen robust growth with their share rising to 53.2%, along with AI/Big data/Robotics/Software and Auto. China unicorns have continued to ride the trend of the gigantic consumer market with innovative business models. Despite near-term challenges arising from the COVID-19 outbreak, they have managed to further gain market share from offline. The large gap in advanced technologies may need some time to close, but China has made good progress in areas requiring cutting-edge technology. Given consistently heavy R&D spending in the past few years, we expect to see more unicorns in sectors with sophisticated requirement of advanced technology, most notably, in biotech and AI/Big Data, thanks to large available data and a big market to explore.
- **Exchanges embracing the new economy:** Stock exchanges in China and Hong Kong have adapted to innovation and, in the last two years, are trying to attract new economy companies to get listed. STAR Board was launched in China in June 2019 as a testing field with a completely new design, introducing IPO registration system, new company thresholds, new financial tests, and welcoming weighted voting rights and red chips. Ninety four companies (mainly IT, Healthcare, Industrials and Materials) were received by the board and it raised a total of Rmb112 bn in the next nine months, at a higher-than-market average IPO valuation. Hong Kong Stock Exchange has also reformed its listing regime and embraced pre-revenue biotech companies and weighted voting right (WVR) internet companies, helping 17 companies successfully raise a total of HK$117.3 bn.
- **Key trends of major sectors:** Our sector analysts give an update on key trends of five major sectors: Internet, Technology Hardware, Auto, Healthcare, and FinTech.
- **Selected unicorns:** A two-page company profile for 66 companies which have reached the status of a ‘Unicorn’ is provided for investors' reference.

Figure 4: Unicorns by countries



Source: CB Insights

“China is now the second-largest source of unicorns thanks to the large, fast-growing consumer market.

Emerging from the stables

China is the second-largest source of "unicorns" in the world. We expect most China unicorns to come from the internet, technology hardware, auto, healthcare and fintech sectors. New regimes introduced by HKEX and SSE have yielded positive results.

China's unicorns: Trends in the past year

To date, China remains the second largest source of unicorns. According to CB Insights, by late March, China (Hong Kong included) was home to 112 unicorns with a total valuation of US$400 bn. China's unicorns represents 25% of the world's total. China's aggregate valuation stays at 30% of the world's total. The US is still leading, accounting for ~48% in terms of total number and valuation.

As the number grows, the industry distribution of Chinese unicorns will also change. In the past year, China's internet unicorns saw robust growth , with their share rising to 53.2%. The share in AI/Big data/Robotics/Software and Auto saw a rise too, reaching 15.3% and 6.3%, respectively. China unicorns are still riding the gigantic consumer market with business model innovations, and making progress in areas requiring more cutting-edge technologies. But the large gap with the US in advanced technologies may still need considerable time to close.

In the next few years, the internet sector may continue to dominate among Chinese unicorns. Despite some near-term headwinds in consumption growth due to the COVID-19 impact, these companies also get a chance to gain higher penetration. With higher R&D spending in the past few years, we expect to see more unicorns in the sectors with much bigger technology input, most notably, in biotech and AI/Big Data due to large available data and a big market to explore.

Exchanges embracing new economy

In the last two years, China and Hong Kong have adapted to companies with innovative businesses. In China, STAR Board was launched in June 2019 as a testing field with a completely new design. It introduced an IPO registration system, new company thresholds, new financial tests, and welcomes weighted voting rights and red chips. In the nine months post launch, 94 companies were received by the board and raised a total of Rmb112 bn. A large 96% of them are from IT, Healthcare, Industrials and Materials sectors. They bear the features of new economy companies—lighter assets, higher margin, and stronger growth momentum. The market recognised their value by giving them an average IPO P/E of 59x, much higher than industry average of 37x. In Hong Kong, after the listing regime reform which embraces pre-revenue biotech companies and WVR internet companies, the exchange has helped 17 companies raise a total of HK$117.3 bn in their IPOs.

Key trends of major sectors

Our sector analysts update key trends of five major sectors: Internet, Technology Hardware, Auto, Healthcare and FinTech.

In **Internet**, many unicorns flourish in the mobile age, but the competition is getting more intense, to fight for user engagement, time spent, and ultimately monetisation. We see tremendous growth potential in interest-based content, video streaming, and local services, as China netizens continue to spend nearly five hours on mobile internet every day.

In **Technology Hardware**, China's AI market is roughly 12% of the global market. China expects to become a leader by 2030, driven by three factors: (1) strong VC investment totalling US$2.6 bn annually; (2) largest smartphone user base of 730 mn, and (3) expanding talent pool. AI has four major development areas: machine learning, computer hardware and cloud platforms, availability of data and AIoT.

In the **Auto**, Tesla's success has reignited enthusiasm for start-ups trying to build smart new energy vehicles (NEVs) in recent years. We expect China's (NEV) sales to enjoy an 11-year CAGR of 23% from 2019-30E. Electrification, autonomous driving, and smart features remain the three mega-trends.

In **Healthcare**, the 'Big health' theme continues. Unicorns on the list mainly ride the "internet + healthcare" model. More biotech companies have successfully been listed in China and Hong Kong markets, thanks to the listing regime update.

In **Fintech**, investments contracted sharply from US$25.5 bn in 2018 to US$1.9 bn in 2019, mainly due to stricter regulations, but it bodes well for leaders. Technology advancements, including AI, blockchain, cloud computing, and big data are pillars of FinTech.

Selected unicorns

In this section, two-page company profiles for 66 companies which have reached the status of a 'unicorn' are provided for investors' reference.

#	Name	Classification	Valuation (US$ bn)	Business
1	17zuoye	Internet/e-commerce/O2O/Games	1.0	Online K12 education platform offering smart homework solutions
2	4Paradigm	AI/Big Data/Robotics/Software	1.2	AI technology and service provider focused on B2B area
3	58 Home	Internet/e-commerce/O2O/Games	1.0	Multi-category local services platform
4	Aihuishou	Internet/e-commerce/O2O/Games	2.5	C2B e-commerce platform that recycles and sells second-hand electronic items
5	AIWAYS	Auto	1.6	Intelligent new energy vehicle company
6	Apus Group	AI/Big Data/Robotics/Software	1.0	Technology company specialising in Android applications development and information services
7	Banma Network	Auto	1.0	Open platform for intelligent and connected vehicle based on AliOS
8	BeiBei	Internet/e-commerce/O2O/Games	1.0	Maternal and infant product e-commerce platform
9	Beike Zhaofang	Internet/e-commerce/O2O/Games	10.0	Real estate listing platform connecting real estate agents with users
10	ByteDance	Internet/e-commerce/O2O/Games	75.0	Operator of China's largest news aggregator and multiple hit video apps
11	Byton Auto	Auto	2.5	Intelligent electric-vehicle company
12	Cao Cao	Internet/e-commerce/O2O/Games	1.6	Ride-hailing start-up backed by automotive manufacturer Geely
13	Dada-JD Daojia	Internet/e-commerce/O2O/Games	1.0	Local logistics platform focussing on instant delivery services
14	Dadi Cinema	Internet/e-commerce/O2O/Games	2.3	Cinema investment and management company
15	Didi Chuxing	Internet/e-commerce/O2O/Games	56.0	Mobile transportation platform offering a full range of app-based ride services
16	Ding Xiang Yuan	Internet/e-commerce/O2O/Games	1.0	Forum for doctors to share experience and knowledge
17	DJI Innovations	Hardware/Semi	15.0	Global leader in civilian drones and aerial imaging technology
18	DT Dream	AI/Big Data/Robotics/Software	1.5	Solution provider for cloud computing and big data analysis
19	Gan & Lee Pharmaceuticals	Healthcare/Biotech	1.6	Leader in China diabetes drug market focusing on insulin
20	Geekplus Robotics	Logistics	1.0	Smart logistics solutions provider
21	Hosjoy	Internet/e-commerce/O2O/Games	1.0	Online platform for home decoration and furnishing services
22	Huaqin Telecom	Hardware/Semi	2.2	ODM for smartphone, tablet, notebook, wearables, server, automotive and IoT products
23	Huimin	Internet/e-commerce/O2O/Games	2.0	Community e-commerce O2O platform
24	Hujiang	Internet/e-commerce/O2O/Games	1.0	Comprehensive online education platform
25	iCarbonX	Healthcare/Biotech	1.0	Platform for people to monitor health status, predict trends and improve their life style
26	iHome	Internet/e-commerce/O2O/Games	1.0	Online home decoration platform connecting the vendors to customers
27	Intellifusion	AI/Big Data/Robotics/Software	1.0	AI company focusing on "non-cooperative" visual intelligence
28	Jiuxian	Internet/e-commerce/O2O/Games	1.1	Integrated online alcohol retailer
29	KK Group	Internet/e-commerce/O2O/Games	1.0	O2O e-commerce platform
30	Kuaishou	Internet/e-commerce/O2O/Games	18.0	Video-sharing platform
31	Kujiale	Internet/e-commerce/O2O/Games	1.0	Home decoration and furnishing online information and design platform
32	Leading Ideal	Auto	2.9	Electric vehicle start-up
36	Leap Motor	Auto	1.0	Manufacturer of intelligent electric sports cars and auto parts
33	Linklogis	Fintech	1.1	Platform providing micro and small-sized enterprises with supply chain financing
34	LinkSure Network	Internet/e-commerce/O2O/Games	1.0	Mobile internet company specialising in free internet access, content, and location-based services
35	Mafengwo	Internet/e-commerce/O2O/Games	2.0	Platform providing travel information and booking services
37	Maimai	Internet/e-commerce/O2O/Games	1.0	Real name based professional network
38	Manbang	Internet/e-commerce/O2O/Games	6.0	The largest truck-hailing service platform
39	Medlinker	Internet/e-commerce/O2O/Games	1.0	Mobile platform that allows physicians to social network and communicate with each other
40	Meicai.com	Internet/e-commerce/O2O/Games	2.8	Provider of one-stop all-category agricultural product procurement services
41	Meizu	Hardware/Semi	4.6	Consumer electronics manufacturer
42	Mia	Internet/e-commerce/O2O/Games	1.0	E-commerce platform selling mother and baby products
43	Miaoshou Doctor	Internet/e-commerce/O2O/Games	1.0	Pharmaceutical e-commerce company
44	Mofang Living	Property	1.0	Leading player in the rental apartment market
45	Momenta	AI/Big Data/Robotics/Software	1.0	Autonomous driving startup
46	Nxin	Internet/e-commerce/O2O/Games	1.0	Online agricultural platforms, providing data, commerce, and financial services for agricultural industry
47	Orbbec	Hardware/Semi	1.0	AI-driven 3D sensing company
48	Shansong Express	Logistics	1.0	Short-distance (usually same-city) delivery on-demand service provider
49	Terminus Technologies	Hardware/Semi	1.0	AI city solution provider
50	Tongdun Technology	AI/Big Data/Robotics/Software	2.0	Third-party intelligent risk management service provider
51	Trendy	Retail	2.0	International fashion entity with more than nine brands
52	Tujia	Internet/e-commerce/O2O/Games	1.5	Homestay booking platform

#	Name	Classification	Valuation (US$ bn)	Business
53	UCommune	Property	3.0	Shared office platform in Asia Pacific
54	United Imaging Healthcare	Healthcare/Biotech	5.0	Developer of Color Doppler ultrasound, MRI products and digital medical imaging tech
55	VIPKID	Internet/e-commerce/O2O/Games	4.5	Online education platform providing English training courses
56	Womai	Internet/e-commerce/O2O/Games	1.0	Domestic online food retailer
57	Xiaohongshu	Internet/e-commerce/O2O/Games	3.0	Social e-commerce app helping urban females discover, share and buy from overseas
58	Xiaozhu.com	Internet/e-commerce/O2O/Games	1.0	Online home sharing platform
59	Xinchao Media	Internet/e-commerce/O2O/Games	1.7	Elevator TV advertisement provider
60	YH Global	Logistics	1.0	Logistics company offering integrated supply chain management services
61	Yimidida	Logistics	1.2	Online less-than-container-load (LCL) logistics platform utilising crowd sourcing tools
62	YITU Technology	AI/Big Data/Robotics/Software	2.4	Integrating AI business applications for security, finance, transport and healthcare
63	YOUXIA Motors	Auto	3.4	Integrated smart electric vehicle manufacturer
64	Yuanfudao	Internet/e-commerce/O2O/Games	3.0	Online K12 tutoring
65	Zhuan Zhuan	Internet/e-commerce/O2O/Games	1.0	C2C online used goods trading platform
66	Ziroom	Internet/e-commerce/O2O/Games	4.5	China's largest co-living platform

Source: CB Insights, company data

“Unicorns are usually defined as private start-up companies with a valuation of over US$1 bn.

China's unicorns: Trends in the past year

The value of China's unicorns stands at 30% of the global total, despite a recent contraction in VC funding scale.

'Unicorns' are usually defined as private start-up companies with over a US$1 bn valuation. According to CB Insights, as of late March, the number of global unicorns rose to 452, a 39% increase over a year. The total valuation of the 452 companies is estimated to be US$1,347 bn, up 25% YoY.

Of the 452 unicorn companies globally, 219 have originated from the US, with total valuation of US$646 bn. The number and the aggregate valuation of US unicorns account for 48% of the global total. The US still is leading the game.

China/Hong Kong have 112 of these unicorns, with a total valuation of US$400 bn, accounting for 25% and 30% of global total, respectively. China/Hong Kong continue to be the second largest breeding ground for unicorns.

As compared to last year, the number of China unicorns increased by 18, they are mainly from Internet/e-commerce/O2O (10), AI/Big Data/Robotics/Software (4), Auto (4) and Hardware/Semi (3). In contrast, the Fintech/ Old economy number fell by 2/1. Internet/e-commerce/ O2O names still constitute the majority of China unicorns, making up 53.2% of all unicorns, slightly up from 52.7% last year. Auto and Hardware/Semi also took a bigger share, with Auto increasing from 3.2% to 6.3%, and Hardware/Semi increasing from 5.4% to 7.2%. Fintech, however, dropped from 7.5% to 4.5% due to the tightening of policies and accelerating transformation of the industry.

Chinese unicorns have continued to grow in the past year, despite the weaker support from VCs. By 2017, VC funding in Asia, mainly driven by China, was similar to that of North America but was way ahead of Europe. VC funding in North America surged almost 30% in 2018 and continued to expand to US$113 bn in 2019, while that in Asia went up moderately in 2018 and dropped by 22% in 2019. The gap between these two regions has thus widened again.

In China, the temporary difficulty in 2018-19 could mainly be attributed to the tighter environment triggered by a series of regulatory changes, including the introduction of new asset management rules. In the longer term, after the regulation consolidation in different segments of the financial industry, a more stable funding from banks and insurance will be able to provide lasting support to the VC/PE industry. Yet in the near term, the COVID-19 outbreak may bring more headwinds to the industry, as we see a record low in the number of new funds, and a suspension of fundraising activities. Limited resources are going to leading and well-established institutions.

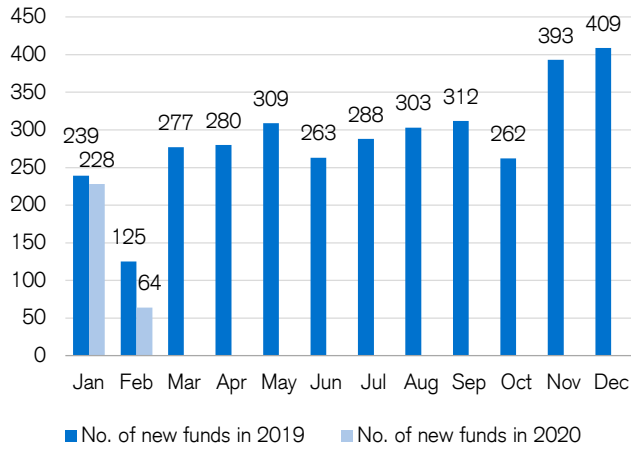
The average size of VC deals in Asia was much bigger during 2014-17, mainly due to the transactions of large internet platform companies that are usually much bigger than other types of start-ups. The number of large internet deals fell in Asia in 2018, replaced by those for more niche players, leading to a declining average deal size. At the same time, the average deal size in the US was rising and surpassed that of Asia in 2018. From 4Q16 onwards, of the 66 largest global companies, 23 (34%) originated from China. However, from 2H18 onwards, China has become less dominant in terms of the big deals.

Figure 5: Unicorns by country

	Number of unicorns		Aggregate Valuation	
As at 23-Mar-2020	**No.**	**%**	**US$ bn**	**%**
China/HK	112	25%	400	30%
US	219	49%	646	48%
UK	24	5%	58	4%
India	20	4%	69	5%
APAC X China X India	26	6%	83	6%
Europe x UK	32	7%	59	4%
Others	19	4%	32	2%
Total	**452**	**100%**	**1,347**	**100%**

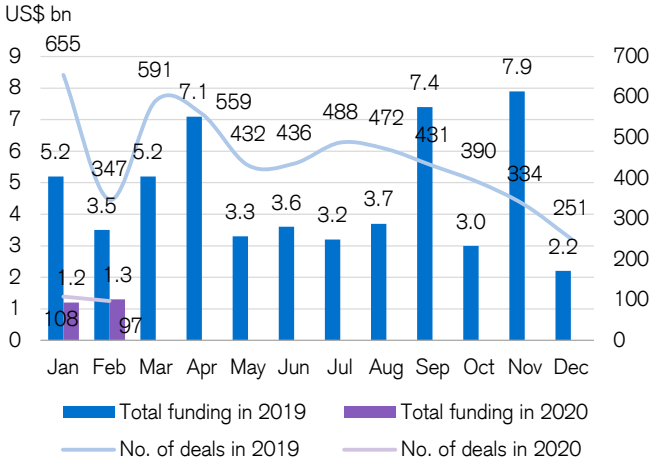
Source: CB Insights

Figure 6: No. of new funds in China dropped noticeably to a record low in February



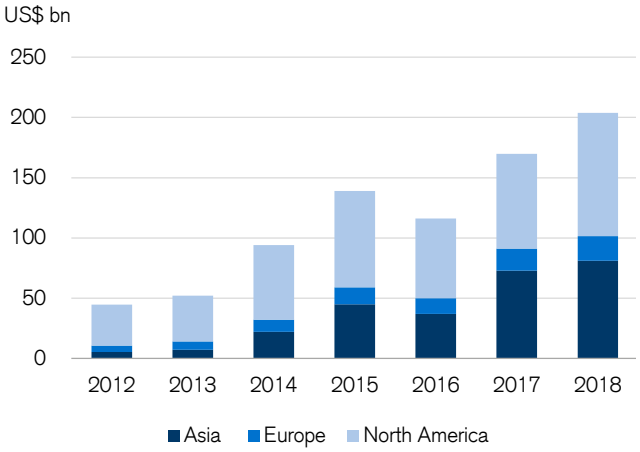
Source: PwC/CB Insights

Figure 7: China VC funding and deals have plunged in 2020



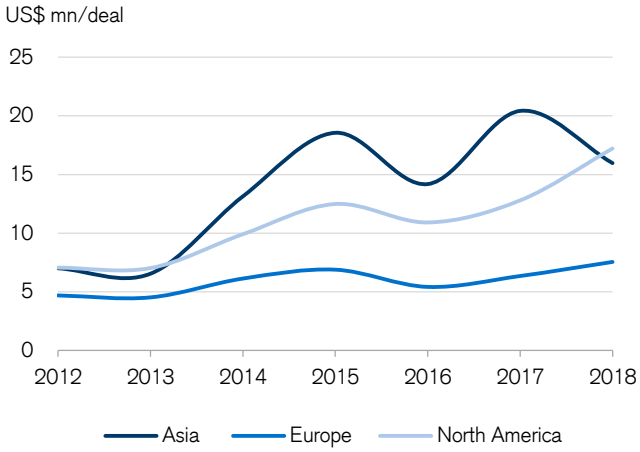
Source: PwC/CB Insights

Figure 8: Total size of VC funding by region



Source: PwC/CB Insights "Money Tree™ Report" 4Q18

Figure 9: Average deal size of VC funding by region



Source: PwC/CB Insights "Money Tree™ Report" 4Q18

Figure 10: Largest VC funding around the world (4Q16-4Q19)

4Q19			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
One97 Communication	Noida, India	Payments	1,000
Greensill	London, UK	Commercial	655
Bright Health	Minneapolis, USA	Healthcare plans	635
Chime	San Francisco, USA	Accounting & finance	500
ironSource	Tel Aviv, Israel	Application & data integration	430
3Q19			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
Beike Zhaofang	Beijing, China	Real estate	1,200
OpenAI	San Francisco, USA	IT services	1,000
Authentic Brands Group	New York, USA	Marketing & PR	880
Radiology Partners	El Segundo, USA	Medical practitioners	700
Didi Chuxing	Beijing, China	Travel (mobile)	600
2Q19			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
Cruise Automation	San Francisco, USA	Automobile Parts	1150
Rappi	Bogota, Colombia	Food & grocery	1000
Greensill	London, UK	Commercial	800
Face++	Beijing, China	Scientific, Engineering software	750
DoorDash	San Francisco, USA	Food & grocery	600

1Q19			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
Chehaoduo	Beijing, China	e-commerce	1500
Grab	Singapore	Mobile commerce	1460
OneWeb	London, UK	Telecom services	1250
Flexport	San Francisco, US	Supply chain & logistics	1000
WeWork	New York, US	Facilities	1000
4Q18			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
Coupang	Seoul, South Korea	Mobile commerce	2,000
Lu.com	Shanghai, China	Accounting & finance	1,330
Epic Games	Cary, United States	Gaming	1,250
View	Milpitas, United States	General building materials	1,100
Tokopedia	Jakarta, Indonesia	e-commerce	1,100
Swiggy	Bengaluru, India	Food & grocery	1,000
3Q18			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
Grab	Singapore	Mobile commerce	1,000
WeWork	NY, United States	Facilities	1,000
Lucid Motors	Newark, United States	Automobile manufacturing	1,000
Oyo Rooms	New Delhi, India	e-commerce	1,000
Xpeng Motors	Guangzhou, China	Automobile manufacturing	585
2Q18			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
Manbang Group	Guiyang, China	Internet software & services	1,900
Grab	Singapore	Mobile commerce	1,000
UBETECH Robotics	Shenzhen, China	Consumer electronics	820
Hellobike	Shanghai, China	Mobile commerce	700
SenseTime	Beijing, China	Scientific, Engineering software	620
1Q18			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
Easyhome	Beijing, China	Home furnishings & improvement	2,054
GO-JEK	Jakarta, Indonesia	Mobile software & services	1,500
Uber	CA, United States	Mobile commerce	1,250
Mobike	Shanghai, China	Mobile commerce	1,000
Chehaoduo	Beijing, China	e-commerce	818
4Q17			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
Didi Chuxing	Beijing, China	Mobile commerce	4,000
China Internet Plus	Beijing, China	e-commerce	4,000
Olacabs	Bengaluru, India	Mobile commerce	1,100
Ofo	Beijing, China	Mobile commerce	1,000
NIO	Shanghai, China	Automobile manufacturing	1,000
Lyft	San Francisco, United States	Mobile commerce	1,000
3Q17			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
Grab	Singapore	Mobile commerce	2,000
WeWork	NY, United States	Facilities	1,700
Flipkart	Bengaluru, India	e-commerce	1,400
Roivant Sciences	Basel, Switzerland	Biotechnology	1,100
Tokopedia	Jakarta, Indonesia	e-commerce	1,100
2Q17			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
Didi Chuxing	Beijing, China	Mobile commerce	5,500
One97 Communications	Noida, India	Mobile software & services	1,400
GO-JEK	Jakarta, Indonesia	Mobile software & services	1,200
ByteDance	Beijing, China	Mobile software & services	1,000
Ele.me	Shanghai, China	e-commerce	1,000

1Q17			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
Flipkart	Bengaluru, India	e-commerce	1,000
GRAIL	Menlo Park, United States	Disease diagnosis	900
NIO	Shanghai, China	Automobile manufacturing	600
Social Finance	San Francisco, United States	e-commerce	500
Uxin Pai	Beijing, China	e-commerce	500
4Q16			
Company	**Location**	**Industry**	**Funds raised (US$ mn)**
OneWeb	Virginia, United States	Telecom services	1,200
Yixia	Beijing, China	Mobile software & services	500
Careem Networks	Dubai, United Arab Emirates	Mobile commerce	350
Innovent Biologics	Suzhou, China	Drug manufacturing	385
WeWork	New York, United States	Facilities	260

Source: PwC/CB Insights "MoneyTreeTM Report"

Characteristics of China's unicorns

Despite China and the US being the two countries dominating the unicorn scene, the characteristics of their respective unicorns are quite varied. Chinese unicorns are mainly driven by business model innovation, which takes advantage of the large, fast growing but fragmented consumer market. In contrast, the percentage of high-tech companies among the US unicorns is higher. While this gap would remain in the mid-term, we notice some changes in this trend in the past year.

We break down the businesses of China and the US unicorns into seven categories: (1) Internet/e-commerce/ O2O/Games, usually companies focused on business model innovations and directly serving consumer demand; (2) AI/Big Data/Robotics/Software, mostly serve companies rather than consumers; (3) Fintech; (4) traditional Old Economy business; (5) Hardware/semi-conductor manufacturers, including final products for consumers or components; (6) Auto/Machinery; and (7) Healthcare/Biotech.

When the number of Chinese unicorns grows, their industry distribution also changes.

In the past year, the number of Chinese unicorns in the Internet/e-commerce/O2O/Games space grew from 49 to 59. The share of Chinese unicorns also has expanded to 53.2% from 52.7%. In contrast, the ratio among the US unicorns has declined from 29% to 23%. Internet platforms are becoming more dominant among China's unicorns, and China's competitive advantage in internet-based services is more obvious.

Speaking of the areas requiring cutting-edge technologies, the number of unicorn companies in AI/Big Data/Robotics /Software has also climbed from 13 to 17, pushing the percentage in this area from 14% to 15.3%. The improvement is encouraging, but still way below the 40% seen in the US. It demonstrates more companies are making an effort in these areas. In addition to facial recognition technologies, big data companies also have a noticeable presence here.

In Auto/Machine, the number of Chinese unicorns more than doubled from 3 to 7, with their share up from 3.2% to 6.3%, versus only 4.1% in the US. Most Chinese unicorn companies in this area concentrate on NEVs, probably due to the gigantic market in China and the policy stimulus. The US unicorns in this segment are more diversified and sophisticated in areas like space technology represented by Rocket Lab and SpaceX.

In Healthcare/Biotech, the number of Chinese unicorns was flat at 4, with its share down from 4.3% to 3.6%. In contrast, the US has 18 unicorns in this segment, accounting for 8.2% of total US unicorns. China still has a large gap to close.

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Figure 11: Comparing China and US unicorns

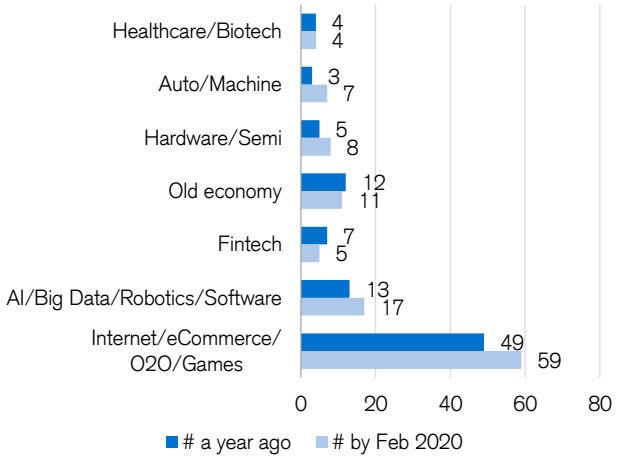
	China			The US		
	No. of unicorns	%	Avg. valuation (US$ bn)	No. of unicorns	%	Avg. valuation (US$ bn)
Internet/e-commerce/O2O/Games	59	53.2	4.5	51	23.3	2.9
AI/Big Data/Robotics/Software	17	15.3	2.2	88	40.2	2.2
Fintech	6	4.5	3.8	28	12.8	3.9
Old economy	11	9.9	1.8	20	9.1	4.0
Hardware/Semi	8	7.2	3.9	5	2.3	3.5
Auto/Machine	7	6.3	2.3	9	4.1	5.7
Healthcare/Biotech	4	3.6	2.2	18	8.2	2.7
Total	**112**	**100.0**	**3.5**	**219**	**100.0**	**3.6**

Source: CB Insights

The characteristics of Chinese unicorns reflect the country's stage of development as well as the absolute size of its economy.

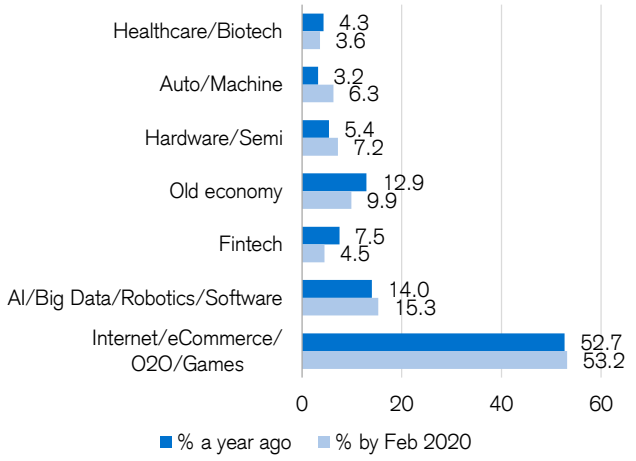
The reason for this divergence is that, compared to the US, the level of scientific research of other countries is still in the catch-up phase. China's investment in R&D was only 1.2% of GDP from 2000-09, way below that of the OECD (2.2%). China has realised the gap and is trying to close it. In 2010-17, China's investment in R&D grew to 2.0% of GDP. In 2019, national R&D expense amounted to Rmb2.17 tn, representing a YoY growth of 10.5% and 2.19% of GDP. The rapid growth in the past few years is partly due to the government's initiative to encourage more investment in R&D, and partly due to corporates' drive for better performance. In the past few years, the Chinese government has launched many favourable policies supportive of R&D. In October 2018, R&D expense incurred overseas was allowed for deduction in income tax, R&D expense deduction rate was raised to 175% until end 2020. In Oct-2019, China further encouraged the development of new-type R&D institutions. However, China's R&D as a percentage of GDP remains much lower than many other smaller economies, such as Japan, Korea, Taiwan, Sweden, Germany, Israel, Finland, etc., which have invested heavily in technology

Figure 12: Number of unicorns in different areas, now vs a year ago



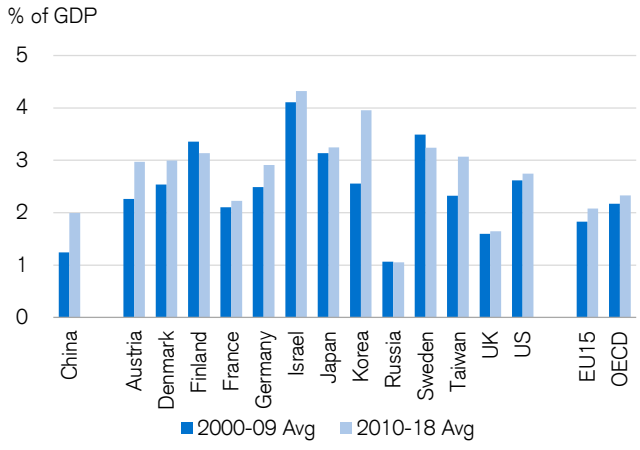
Source: CB Insights

Figure 13: % of unicorns in each area, now vs a year ago



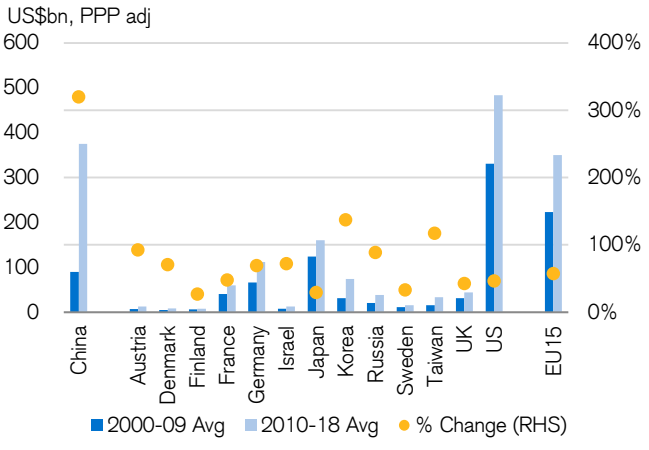
Source: CB Insights

Figure 14: R&D as a % of GDP



Source: OECD

Figure 15: Average R&D spend per annum



Source: OECD

In absolute terms, due to the large scale of the Chinese economy on a PPP basis, China's average R&D spending p.a. for 2010-18 was only smaller than that of the US and similar to the EU15 in total. The absolute level of China's R&D was much lower than that of US and Europe in 2000-09. China is still relatively 'new' in R&D and innovation. It does take time for R&D spending to translate into commercial products/services.

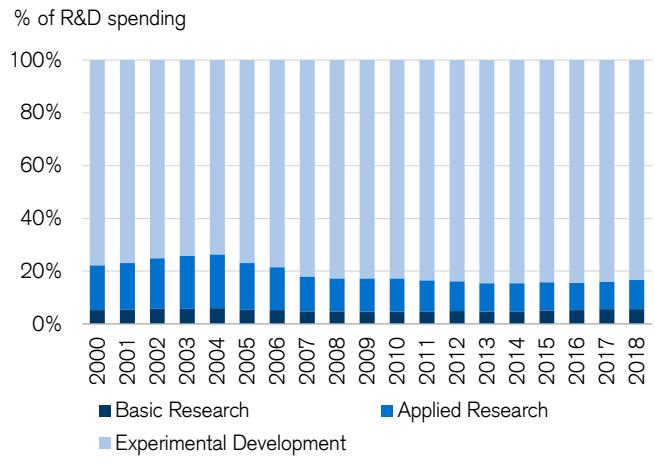
Another key characteristic of China's R&D is that its portion of basic research is very small, compared to other applied research (mid-stream) and experimental development (down-stream) spending. Even in recent years, only around 6% of total R&D spending is for basic research. As a percentage of GDP, China's basic research spending is way behind that of other countries, who spend heavily on R&D. China's absolute R&D spending (PPP adjusted) is still smaller than that of the US. In addition, the US spends almost 0.5% of its GDP on basic research, more than 5x that in China. Most of China's R&D spending is in experimental development, consistent with the fact that most of its unicorns are basically engaged in business model innovation businesses rather than new technology and products.

The low level of spending on basic research is partly due to most of China's R&D being undertaken by companies rather than universities or government research institutes. Even in China's universities and government research institutes, a significant part of scientific research work is in mid- to down-stream research rather than basic research. If China really wants to catch up on global innovation, it needs to spend much more on basic research, which is expensive and slow to yield results.

China's R&D investment has increased steadily. It is time to move the focus from quantity to quality. In our China Reinvented series: Learning to fly and China Reinvented series: SEMI-successful published last autumn, we took a close look at China's two key tech areas where it wants to achieve self-dependence: aero engine and semiconductor. Two industry experts shared their insights on the industry chain and development process. According to them, China still needs considerable time to achieve fundamental breakthroughs and catch up in major scientific fields.

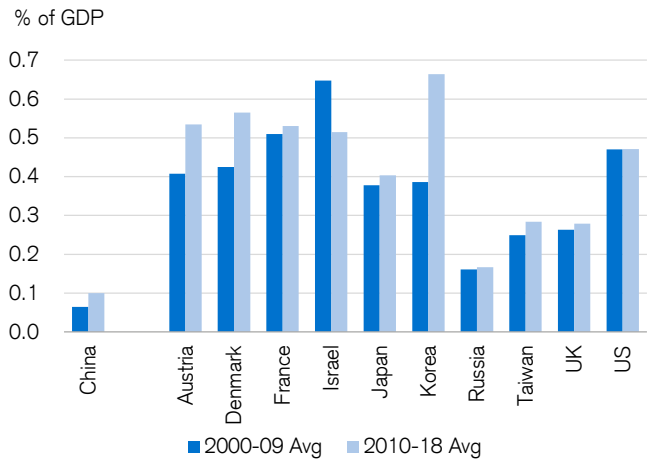
China has already grown to the stage which requires more sophisticated resource management. It needs to raise the profile of basic research, where more resources should be oriented. China may also have to strike a better balance between short-term and long-term results. Private sectors are also needed to more proactively participate to complement the SOE-dominant research system. It will introduce benign competition among participants of different backgrounds. We are confident of seeing more Chinese unicorns emerging with increasing technology leadership in the future.

Figure 16: China's R&D by research type



Source: CEIC

Figure 17: Basic research as a % of GDP



Source: OECD

China's large and fast-growing consumer market continues to breed new unicorns.

According to the IMF's World Economic Outlook Database, China's consumer market (including both private and government consumption) is already the second largest in the world, as of 2018. China's consumer market will continue to grow by 54% in USD terms between 2018 and 2023. China's consumer market growth is among the highest, compared to the major developed world economies with strong R&D (the list of countries below) and all other economies with population among the top 10 in the world, such as India and Brazil. This is a key reason why most of China's unicorns (all private sector start-ups) are targeting the consumer market.

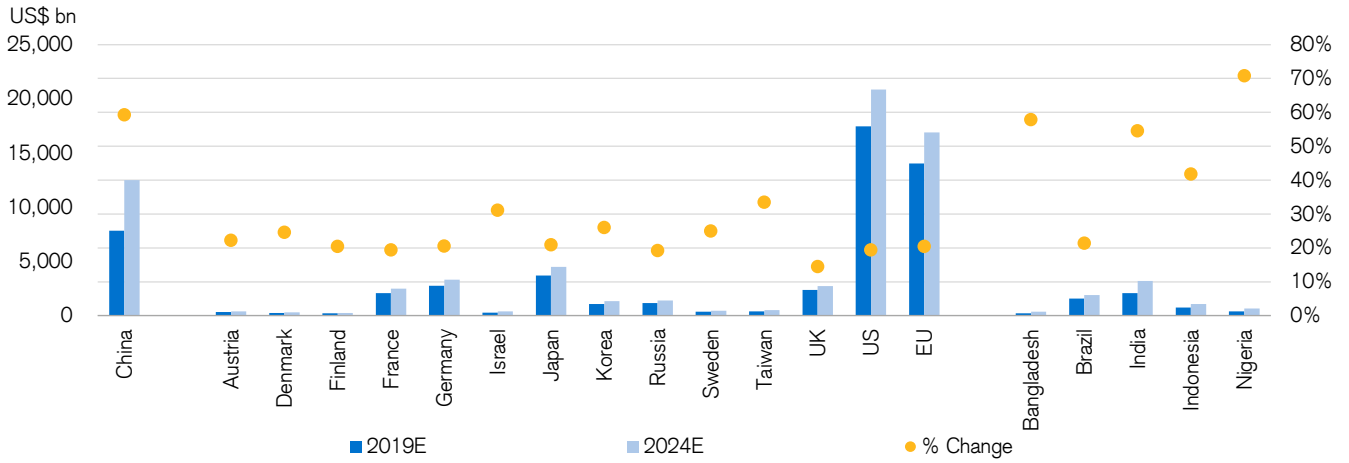
Despite some headwinds inn China's consumer market in 2020 due to the COVID-19 impact, two trends remain intact in the foreseeable future. The first being the Chinese government will work harder to unlock the potential in the 1.4 bn population consumer market, when investment growth momentum cannot be maintained at high levels. This will introduce huge opportunities for emerging companies to grow rapidly. The second is that the utilisation of mobile internet will continue penetrating into all consumption scenarios and bring opportunities to new kids on the block who can come up with new ideas and solutions.

While China's consumer market is large and fast-growing, its 'investment market' is extremely large but growth is slower given the high base. According to the IMF, total investment in China was US$6.0 tn in 2018, only 19% lower than the combined investment in the US (US$3.5 tn) and the EU (US$3.9 tn). Growth of China's investment market will be slower at only 37% between 2018 and 2024, slightly faster than most developed world economies', but slower than other populous emerging markets. Indeed, given the mega size of China's investment market, it should also offer enough room for unicorns to emerge. However, the reason why we have not seen many is probably due to the fact that investment spending in China usually comes from the government. Upstream/heavy industrial sectors are usually state-owned, which leaves less room for private sector companies to operate.

China's unicorns are mostly service sector companies (predominantly internet), despite its industrial sector (mining, manufacturing, utilities and construction) being significant. In 2017, China's industrial sector GDP was already larger than that of the US and the EU. Its growth momentum between 2010 and 2017, at 74%, was much faster than that of the US, the EU and other economies which invested heavily in R&D, as well as almost all the developing populous countries, with the exception of Bangladesh. This implies China's industrial sector is already rather developed, so with the exception of some new emerging sectors, such as AI/Robotics, it would be relatively difficult for new unicorns to emerge from the hardware sector.

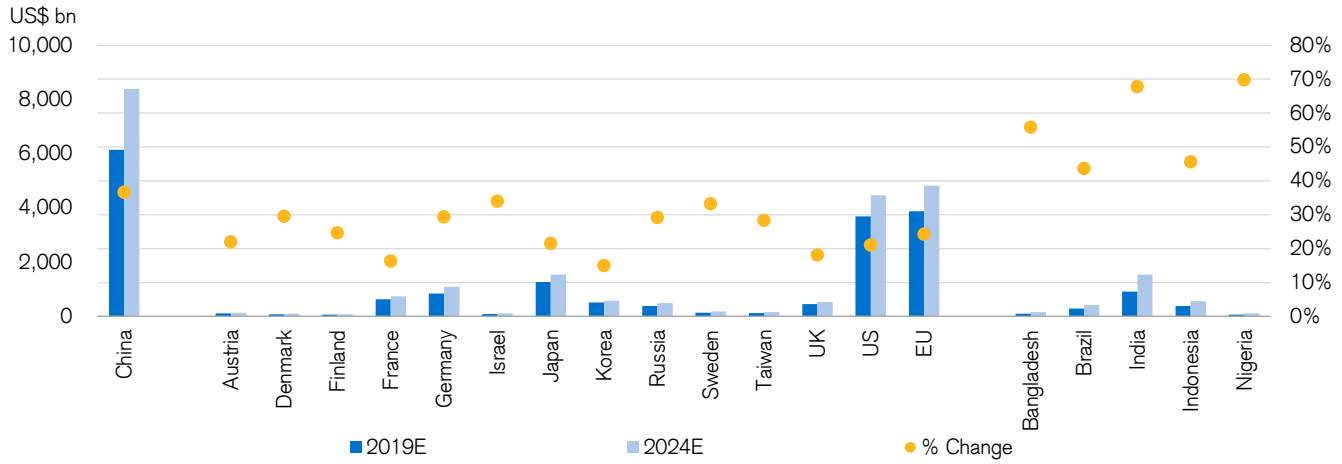
In contrast, China's service sector GDP is still very low. As of 2017, it was less than half that of the US and the EU, despite a larger population base. At the same time, between 2010 and 2017, it grew by 134%, well ahead of all the major economies. With the anticipated faster growth of consumption versus investment, it is expected that the services sector in China will maintain very high growth in the years ahead. Also, the domestic services sector is dominated by less nimble state-owned companies (particularly in consumer goods/services distribution), which allows the new technology-enhanced services sector to penetrate and grow very rapidly. These are the key factors behind the large number of unicorns that have emerged in the consumption/services sector, and this trend is unlikely to change in the near future.

Figure 18: China's consumer market compared to other major economies



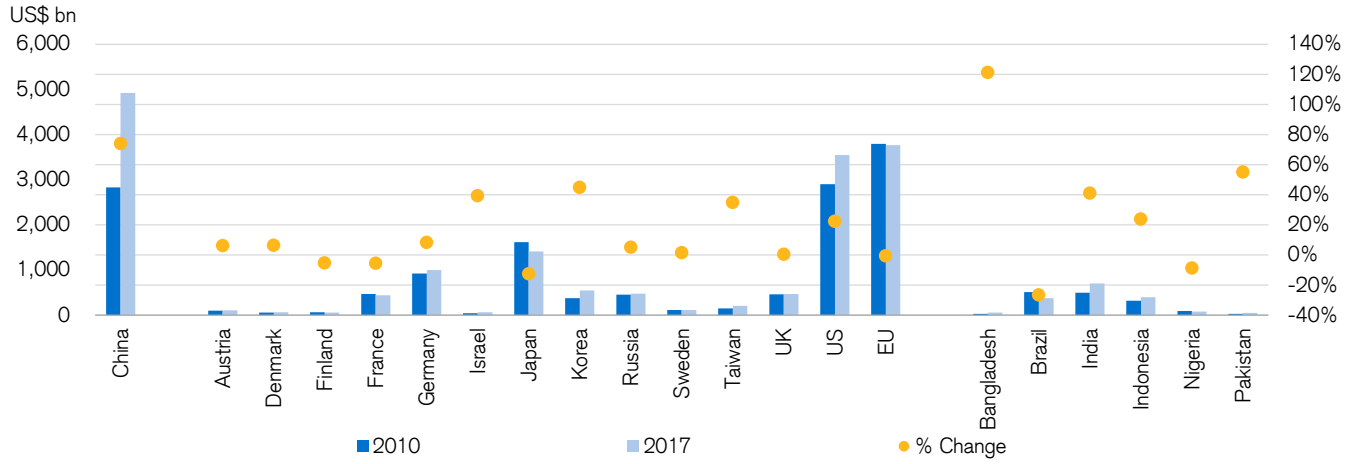
Source: IMF World Economic Outlook Database

Figure 19: China's investment market compared to other major economies



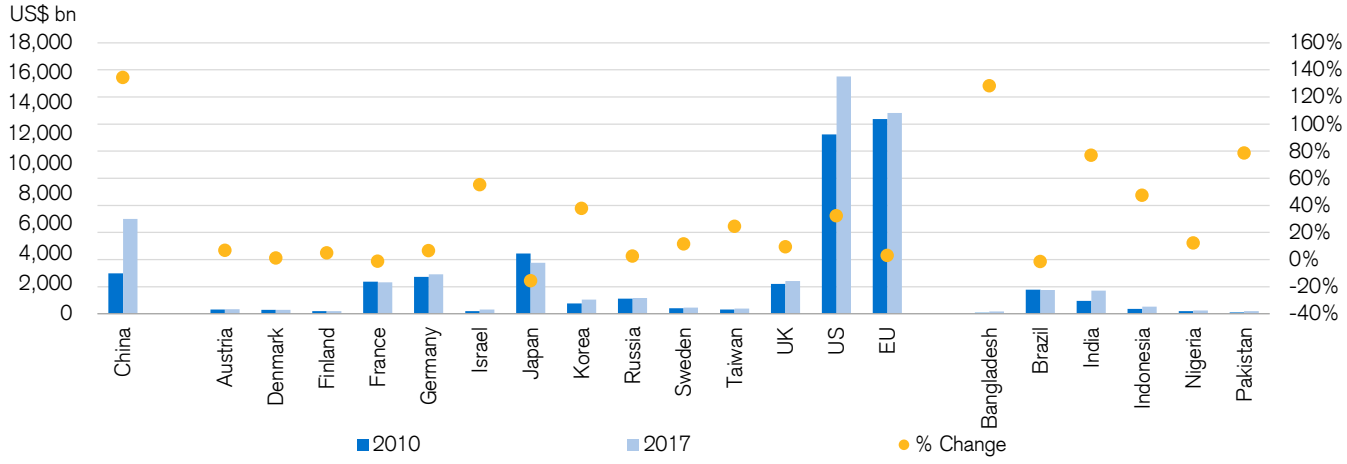
Source: IMF World Economic Outlook Database

Figure 20: China's industrial sector GDP compared to other major economies



Source: World Development Indicators (World Bank)

Figure 21: China's services sector GDP compared to other major economies



Source: World Development Indicators (World Bank)

Looking ahead

We maintain the view that in the next few years, the internet sector will still be dominant among Chinese unicorns, given the ample room for the Chinese consumer market to grow, and the inefficiency of traditional consumer services in the country.

As analysed above, the COVID-19 outbreak will hit China's consumption in 2020 as it hits most sectors globally. However, from another perspective, it is an opportunity for online businesses to grow. The most difficult period for China was early-to-mid February. According to CS' on-the-ground check at that time, when almost all offline activities were muted, online companies remained relatively intact or even received a boost, thanks to the greater demand shift from offline to online, as well as China's globally leading telecom infrastructure upgrade.

Examples are everywhere. E-commerce has further gained market share from offline when most families tried to avoid onsite shopping. Live streaming and on-line entertainment are gaining good momentum. Online education, such as K-12, has become a must when schools are closed. More people are trying online diagnosis to avoid hospital visits. The extended disruption has worked as a catalyst for changes in people's way of life and consumption behaviour, which provides centre stage for internet companies to play as long as they can better serve customer demand.

With increased R&D spending in the past few years, we should also see the emergence of some unicorns with stronger technology, rather than purely business model-driven ones. Most notably, two sectors: biotech and AI/Big Data, will likely stand out. Apart from a large amount of new research spending in these two sectors, China also has a big advantage in terms of the large available data, given the large amount of consumer activities online which help to generate a lot of data for analytical purposes. China's large population also provides a very wide gene pool for study.

In many business areas, Chinese companies are effectively using AI/big data to optimise their business layout or reduce business expenses. For example, China's banks are now assigning 3-4% of their annual revenue for R&D expenses every year. Their updated risk control systems, utilising big data and AI technology, can now effectively identify potential credit card fraud and turn down such requests. We expect more traditional industries to adopt such technologies in the future and such demand will enable more start-ups to grow and prosper.

Software companies will find new opportunities to emerge as well. Bringing everything online will be a long-lasting initiative to accelerate growth in China. On the one hand, many Chinese companies are transitioning to asset-light business models. They improve their efficiency by moving more business to mobile apps, and use offline resources for marketing, client acquisition and experience. This trend started years ago, when rising property prices pushed up outlet expenses and rising labour costs added pressure to staff costs, and will only intensify in the future. On the other hand, as we analysed in Work from home: A new secular trend; how to position, more companies saw the value and necessity of online collaborative working. In the near term, the sectors that could benefit immediately are software and IT consulting, IT hardware, and video conferencing. We expect more software companies to emerge and grow, riding this secular wave in the next two to three years.

“Both SSE and HKEX have undergone transformations to be better positioned to attract new economy companies.

Exchanges embracing the new economy

Both SSE and HKEx have shown positive results in attracting new economy companies, and have been making continuous adjustments to their listing regimes.

In the past two years, both SSE and HKEX have undergone transformations to embrace new economies and to compete with the NASDAQ. SSE established the STAR board in 2019 and HKEX introduced a new listing regime in 2018. Following those measures, we observe both exchanges have yielded positive results in attracting new economy companies and have made continuous adjustments and improvements as they accumulate practical knowledge over time.

China: STAR Board attracted 94 companies

In June 2019, China officially launched the STAR board to embrace emerging companies, turning a new page in the history of China's capital market. The new board is strict about companies' innovation capability and growth potential, but more tolerant on earnings track record. This is the first time in the A-share market that a Chinese stock exchange has accepted companies that are not yet profitable, and removed the cap of 23x P/E in IPO pricing for these new companies. Another big breakthrough is that the IPO approval system transitioned to a registration system, first on the STAR board and later on other existing boards with a revised Securities Law. In addition, red-chip companies and companies with WVR structure are also permitted to get listed on STAR board.

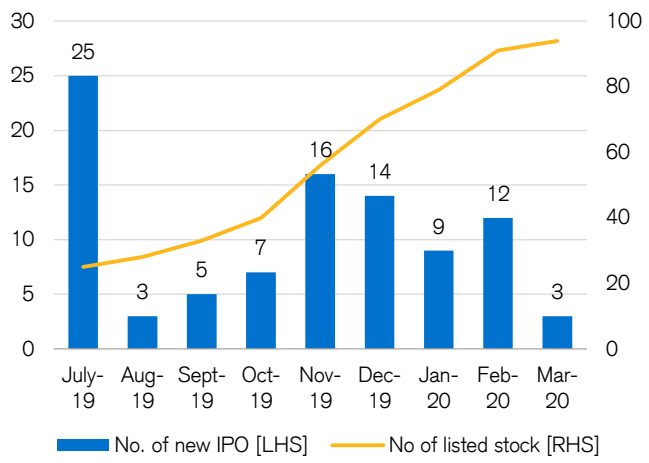
In the two months following the establishment of the STAR board, two batches of new companies were listed on the board. By the end of March 2020, the board was home to 94 companies including two red-chip companies.

Listing requirements crystallised over time

As stipulated in the 'Rule on establishment of STAR Board' issued by China Securities Regulatory Commission (CSRC) in Jan-2019, companies from six industries—IT, high-end equipment, new material, new energy, environmental protection and healthcare—will gain an edge in their listing applications. By the end of March 2020, companies listed on STAR are concentrated in five of those six industries, except new energy, where no company was successfully listed, despite a few having submitted their applications.

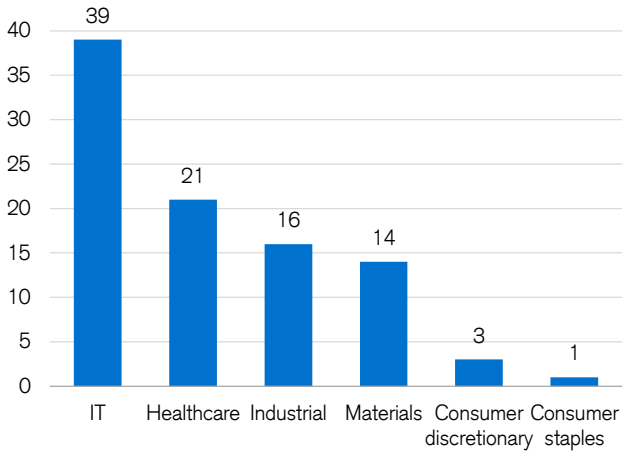
IT companies took the largest share, accounting for 41% of the companies listed on STAR board. They include 15 software providers, 14 hardware producers, and 10 semi-conductor manufacturers. Of the 16 successful industrial candidates, six are categorised as high-end equipment manufacturers and three as new material producers. Healthcare companies took 21 out of the 94 seats on the STAR Board, with 14 stocks being pharmaceutical or biotech companies, and seven being medical service providers.

Figure 22: STAR board is attracting more companies



Source: Wind

Figure 23: Industry distribution of STAR board IPOs



Source: Wind

It is worth noting that the criteria/category of eligible candidates was expanded by SSE in Aug-2019 to include players in traditional industries that integrate internet, cloud computing and AI with manufacturing, companies that could lead mid-to-high end consumption, and those that advance innovation in product quality and process efficiency. Though four of the listed companies are in consumer staple & discretionary, commonly classified as traditional industries, they were successfully listed on the STAR board because of leading technologies in their production processes/cycle. The broadened definition potentially qualifies more unicorns in the internet and e-commerce sector.

The key determinant of a company's suitability for STAR, in addition to the financial tests, is the company's level of adoption of science, technology and innovation. The judgement was earlier made on a qualitative basis by the Listing Committee. For instance, in 2019, Shanghai Titan Technologies was denied listing primarily due to its limited extent of being sci-tech innovative and the low GP margin of its core technological product. On 20 March 2020, CSRC took a step forward and issued a quantitative guidance to determine applicants' sci-tech innovativeness. A company can be deemed as being sci-tech innovative as long as it either meets all three ordinary criteria, or meets one of the five alternative criteria. The new guidance is clearer and easier to follow, for the issuers' self-assessment and assessment by the Listing Committee, and leaves enough flexibility to accommodate issuers that differ in their profitability and prospects.

Figure 24: Details of guidance/criteria issued by CSRC

Criterion 1	(a) R&D expenditure over 5% of turnover for the last three years, or
	(b) Cumulative R&D expenditure of over Rmb60 mn in the last three years.
Criterion 2	Over five patents that generate the turnover of the main business.
Criterion 3	(a) CAGR of turnover over the recent three years—over 20%, or
	(b) Turnover of the most recent year—over Rmb300 mn.
Alternative 1	Core technology deemed by government as globally advanced; or of strategic importance to the nation.
Alternative 2	Awarded with either National Prize for Progress in Science and Technology, National Natural Science Award, or National Science and Technology Invention Award, and applied relevant technologies into the main business.
Alternative 3	Lead or co-lead key in national scientific and technological projects relevant to the main business.
Alternative 4	Product formed out of the core technology is deemed as key product/part by the government and has replaced imported parts
Alternative 5	Number of patents used to generate turnover of main business is over 50.

Source: CSRC

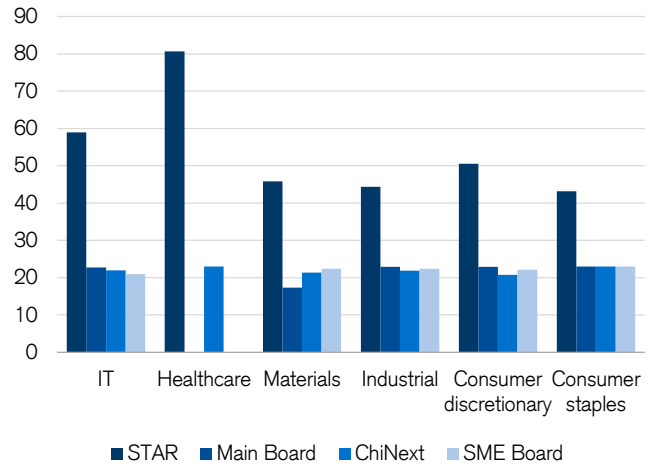
STAR stocks: What's new?

The STAR Board piloted a registration-based IPO system, where the implicit ceiling of 23x P/E is removed. As a consequence, companies listed on the STAR board have an average valuation 1.8 times higher than stocks on other boards, upon their IPOs. The P/E of IPOs of STAR companies from the IT/Healthcare industries reached 59x/81x respectively, and then stayed in a relatively stable range subsequent to the IPO.

Digging into the fundamentals of STAR companies, we notice that they have higher ROE and net profit margin than the A-share market average, and more robust earnings growth profiles. Company financials here refer to those of FY18, as a significant amount of companies have not announced their 2019 results at the time this report was being drafted. Higher ROE/net profit margin proves the selection criteria of STAR companies, which requires "key and core technologies" and capabilities formed thereof to build a competitive barrier and maintain robust growth.

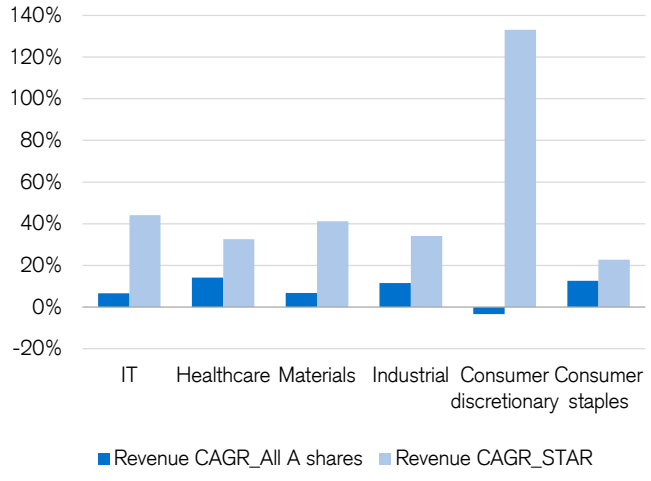
The aggregate market capitalisation of STAR stocks was recorded at ~1% of total market cap of the A-share market in July 2019, and has been expanding until the end of Feb-2020. During the COVID-19 outbreak, STAR stocks experienced a more severe downturn than the overall market, probably due to their higher valuation. By March, the total market cap of STAR stocks stood at Rmb1.2 tn.

Figure 25: P/Es at IPO during July 2019 to Mar 2020 for stock boards



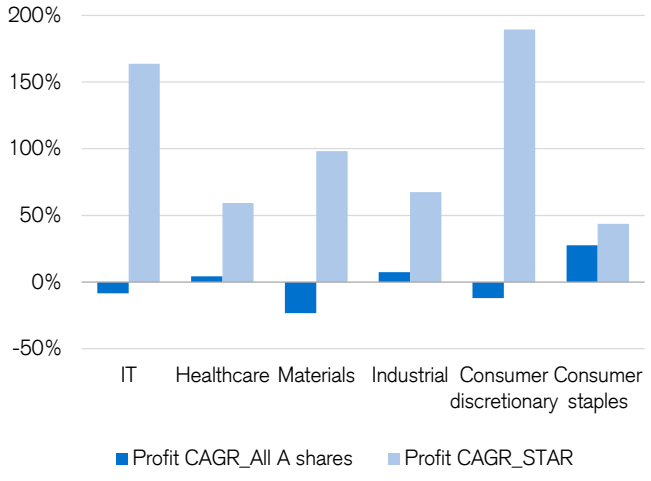
Source: Wind

Figure 26: Revenue CAGR of STAR average and A-share average



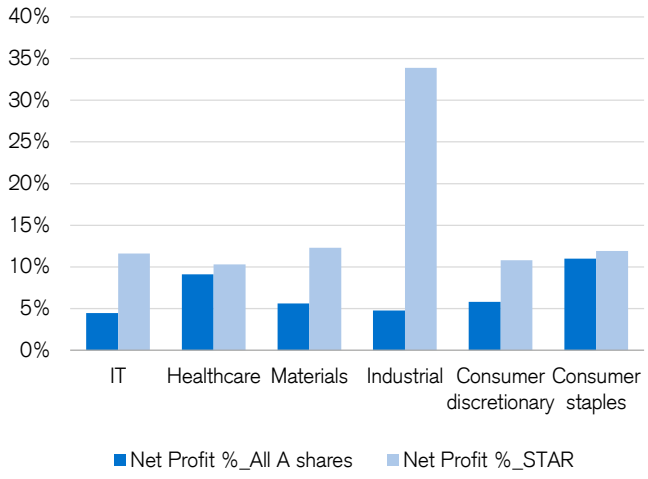
Source: Wind

Figure 27: Profit CAGR of STAR average and A-share average



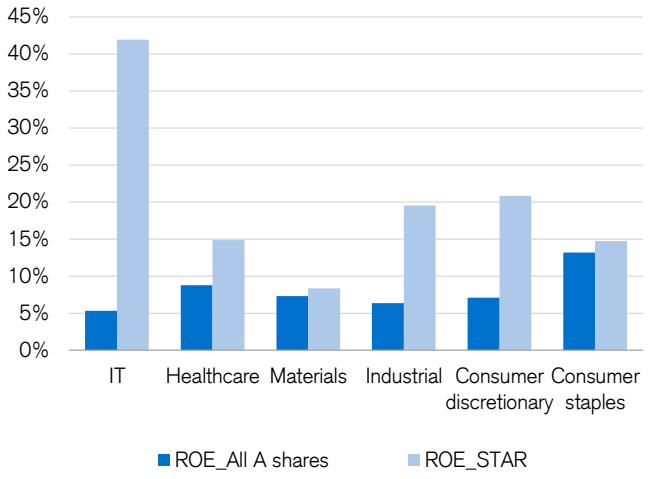
Source: Wind

Figure 28: Net profit margin of STAR average and A-share average



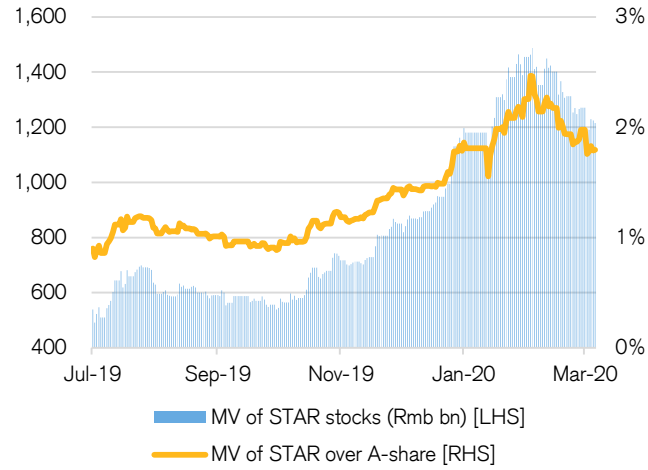
Source: Wind

Figure 29: ROE of STAR average and A-share average



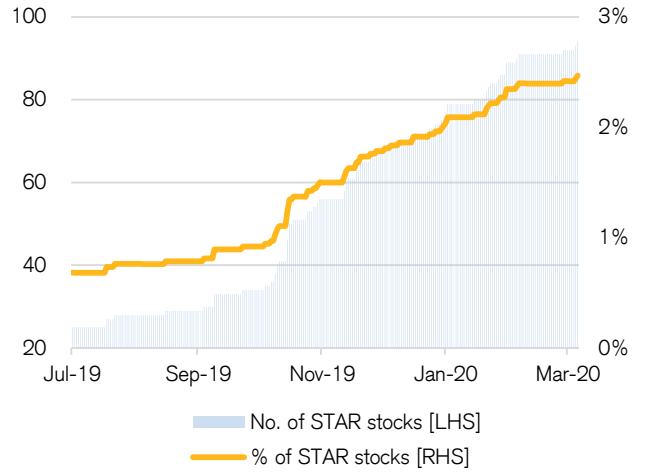
Source: Wind

Figure 30: Aggregated market cap of STAR stocks



Source: Wind

Figure 31: Number of STAR stocks



Source: Wind

The STAR Board accepts pre-profit, or even pre-revenue companies, but 87% of the companies still elected to be reviewed under Criterion 1 (Figure 24). This requires no less than Rmb50 mn of cumulative profit in the last two financial years and an estimated market value higher than Rmb1 bn. Compared to the other four criteria, it is less stringent about estimated market value while it sets a high threshold on profit than other criteria.

The profit/revenue requirement of Criterion 1 is also more stringent than the thresholds explicitly set in the Listing Rules of the Main Board and SME Board. Nevertheless, by examining companies' profit in FY2018, we found companies listed on STAR during Jun-2019 to Mar-2020 have average profit at the Rmb100 mn level, compared with Rmb346 mn of the Main Board, Rmb153 mn of the SME board, and Rmb99 mn of ChiNext. Main Board/SME Board candidates under the approval-based IPO system usually need to have significantly higher profit/revenue than what is required explicitly under listing rules to pass the financial tests, but this implicit requirement seems to be relaxed to some extent for the STAR board.

The new listing regime introduced by the STAR board also allowed listing of companies that had no access to public stock markets under the old regime, such as loss-making companies that could not pass financial tests under the old regime, companies with WVR, and red-chip companies.

In Jan-2020, the STAR Board had its first pre-profit company, Zelgen Biopharmaceutical, which develops and produces medicines for cancer and blood-diseases. Its FY19 revenue was reported as zero, with a net loss of Rmb462 mn, making it ineligible under Criteria 1-4. However, the estimated market value of Rmb8.1 bn enabled Zelgen to successfully pass Criterion 5, which requires an estimated market value no less than Rmb4 bn, and at least one core product approved for Phase II trials.

Ucloud Technology, a leading cloud services provider founded in 2012, become the first WVR company on STAR Board in Jan-2020, and is currently the only company in the A-share market with such a structure. Upon its IPO, the three founders (with 23.12% of total shares) will collectively enjoy 60.12% voting rights.

Before 2018, red-chip companies had to renounce their Variable Interest Entity (VIE) structure to issue shares in the A-share market. Despite a pilot CDR scheme launched in 2018, with Xiaomi as the first applicant, no red-chip company has ever successfully issued CDRs so far. The STAR Board introduced two rules for red-chip companies to issue shares or CDRs. In late February, China Resources Microelectronics, an integrated semi-conductor manufacturer incorporated overseas, elected Criterion 2 for red-chips and became the first red-chip IPO in the A-share market. It also was the first IPO in the Chinese market to introduce a green shoe option.

Figure 32: Financial tests for companies targeting Sci-Tech Innovation Board

Company types		Est. market cap after listing	Additional requirements
Non red-chip companies issuing shares	(1) A	≥ Rmb1 bn	Positive NP in last two years, accumulative NP ≥ Rmb50 mn
	(1) B		Positive NP in last year, revenue ≥ Rmb100 mn
	(2)	≥ Rmb1.5 bn	Revenue in last year ≥ Rmb200 mn, R&D investment ≥ 15% of cumulative revenues in last three years
	(3)	≥ Rmb2 bn	Revenue in last year ≥ Rmb300 mn, cumulative net cash flow from operation ≥ Rmb100 mn
	(4)	≥ Rmb3 bn	Revenue in last year ≥ Rmb300 mn
	(5)	≥ Rmb4 bn	Main business or products approved by government agencies, having a big potential market, and having initial achievements. For pharmaceutical businesses, at least one core product approved for Phase II trial. Other companies should have clear technology advantages and meet related requirements.
Red chips listed abroad	(1)	≥ Rmb200 bn	
	(2)	≥ Rmb20 bn	Revenue in last year ≥ Rmb3 bn
Unlisted red chips	(1)	≥ Rmb10 bn	
	(2)	≥ Rmb5 bn	Revenue in last one year ≥ Rmb500 mn The operating revenue is growing fast. With indigenous R&D capacity and world-leading technology, the issuer is well-placed in the market competition.
Issuer with WVR	(1)	≥ Rmb10 bn	
	(2)	≥ Rmb5 bn	Revenue in last year ≥ Rmb500 mn

Source: SSE

Hong Kong: listing regime change has yielded fruit

Hong Kong's listing regime was criticised for being conservative, especially when it lost the Alibaba deal in 2014. The regime was overhauled in April 2018 to embrace the new economy, with three main changes: inclusion of pre-revenue companies, acceptance of weighted voting rights (WVR), and more convenient secondary listing. After that, HKSE entered a new era.

By 2019, 17 companies had listed under the new listing regime, including two companies with WVR, 14 biotech companies and one with both WVR and concessionary secondary listing. Capital raised by WVR and biotech companies totalled HK$117.3 bn, representing ~38% of total equity funds raised through IPOs in 2019.

Biotech

In 2018, HKSE had set the goal of overtaking New York's NASDAQ exchange within five years, in terms of the number of listings of mainland Chinese biotechnology firms and their market capitalisation. In order to incorporate early-state biotech companies that did not meet any of the existing financial eligibility criteria, HKEX added a new chapter (Chapter 18A) to its listing rules in the new regime.

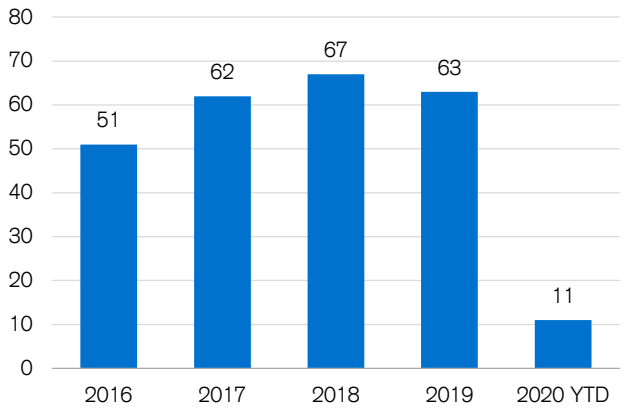
Globally, there have been a total of 254 biotech IPOs during 2016-20 YTD (source: Bloomberg). While the NASDAQ still dominates the market (with 135 companies), we notice HKEX catching up with a total of 14 biotech companies listed since 2016. All 14 biotech companies were listed under Chapter 18A.

It only took three months to see the first biotech company get listed after the new regime was announced. Ascletis Pharma, which develops and tests anti-virus drugs, was still making a loss when it was listed; nevertheless, it raised HK$3.1 bn and was more than nine times over-subscribed.

Among the 14 biotech companies, BeiGene raised over HK$7 bn through its IPO in Aug-2018. In Jul-2019, BeiGene's revenue enabled the company to pass the financial test under the old regime and become the first biotech company to remove the "B" marker placed at the end of its name which is used to signify biotech companies listed under Chapter 18A. This also made it eligible for HSI and Stock Connect inclusion.

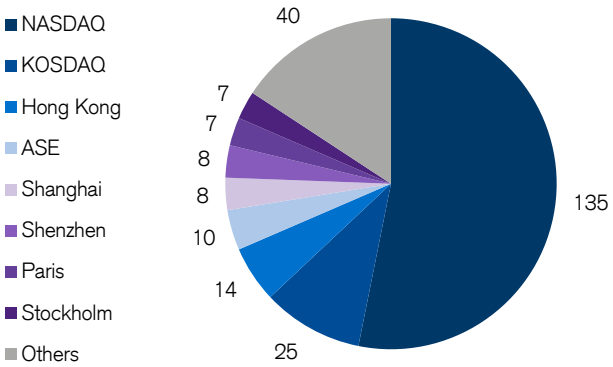
The performance of the 14 biotech companies varies, as share price is largely determined by the progress made by each company. While a successful trial could boost share performance significantly, a failed trial could also cause a drastic decline. This makes biotech a field that requires deep knowledge and expertise to invest in. This was also well considered by HKEX when it made the rules for Chapter 18A. It requires that an investment from sophisticated investors must be received by the issuers in the six months preceding the IPO.

Figure 33: Global biotech listings 2016-20 YTD



Source: Company data

Figure 34: Biotech listings in Nasdaq/other exchanges



Source: Company data

Figure 35: Biotech companies listed under Listing Rule Chapter 18A

Ticker	Name	IPO date	Funds raised (HK$ mn)	Price chg. (%) till end of 2019
9966.HK	Alphamab	12/12/2019	2,104	37
2500.HK	Venus Medtech	12/10/2019	2,980	14
3681.HK	SinoMab Bioscience Ltd	11/12/2019	1,384	-53
1875.HK	TOT BIOPHARM	11/8/2019	590	-33
6855.HK	Ascentage Pharma	10/28/2019	479	-12
2696.HK	Henlius	9/25/2019	3,425	-18
2181.HK	Mabpharm Ltd	5/31/2019	1,175	-23
6185.HK	CanSinoBIO	3/28/2019	1,357	168
2616.HK	Cstone	2/26/2019	2,572	-14
1877.HK	Shanghai Junshi Biosciences Co., Ltd	12/24/2018	3,542	38
1801.HK	Innovent	10/31/218	3,800	90
2552.HK	Hua Medicine	9/14/2018	892	-39
6160.HK	BeiGene	8/8/2018	7,085	-7
1672.HK	Ascletis Pharma	8/1/2018	3,138	-79

Source: Company data

Figure 36: Biotech companies listed under Listing Rule Chapter 18A

Principles underlying biotech issuer suitability	Product regulated by competent authority	■ US FDA, CFDA, EMA ■ Other authorities will be considered on a case-by-case basis
	Past concept stage	■ Completed Phase I and received no-objection to commence Phase II (or later) ■ Product subject to human testing
	Meaningful investment from at least one sophisticated investor	■ Obtained meaningful investment from at least one sophisticated biotech investor at least six months before the IPO
Additional listing requirements and shareholder protection	Market cap	■ >=HK$1.5 bn
	Track record	■ In its current line of business for at least two financial years ■ Substantially the same management
	Working capital	■ 125% of the group's costs for at least next 12 months (after taking into account the proceeds of the IPO) ■ Must substantially consist of (a) general, administrative and operating costs; and (b) R&D costs
	Restriction on cornerstones	■ Cornerstones will not count towards minimum initial public float requirement at listing or during six months lock-up ■ Existing pre-IPO investors can participate in IPO and only IPO shares subscribed for will not count towards minimum initial public float requirement
	Special measures to manage risks	■ Fundamental change of principal business will require consent from the exchange ■ Accelerated de-listing process (12 months to re-comply with requirements) ■ Stock marker "B"

Source: Wind, Credit Suisse research

Internet

For internet companies, the main issue solved was permitting WVR by introducing Listing Rule Chapter 8A. A different voting right structure, or the "AB share structure", is quite common among internet companies because their founders want to retain control over the companies after listing.

This change was well received by internet companies. Xiaomi became the first company to list in Hong Kong with WVR, raising a total of HK$42.6 bn in July 2019. This was followed by the Meituan Dianping IPO in the next month.

In Nov-2019, Alibaba raised HK$101 bn, accounting for 32% of the total IPO proceeds raised on HKEX in 2019. It also became the first company on HKEX with "SW" behind its name, for being listed under both Concessionary secondary listing and WVR.

Currently, the beneficiaries of WVR are limited to natural persons. However, innovative companies usually develop within what HKEX referred to as an "ecosystem", where companies collaborate by sharing intangible benefits, such as user data, which a single company is not able to gather on its own. Companies may become corporate shareholders of another company within the same ecosystem. Permitting only natural persons as beneficiaries will inevitably dilute corporate shareholders' control over the listed company. HKEX recently published a consultation paper in January 2020, on scoping in corporate shareholders as beneficiaries by amending the relevant requirements in Chapter 8A. A decision is likely to be made in the foreseeable future in this regard.

Figure 37: Companies with WVR listed under Listing Rule Chapter 8A

Ticker	Name	IPO date	Funds raised (HK$ mn)	Price chg. (%) till end of 2019
9988.HK	Alibaba	11/26/2019	101,200	18
3690.HK	Meituan Dianping	9/20/2018	33,139	48
1810.HK	Xiaomi	7/9/2018	42,611	-37

Source: Wind, Credit Suisse

Figure 38: Conditions for WVR structure in Chapter 8A

Eligibility & suitability requirement	**Companies**	■ New applicants only
		■ High market cap: (1) market cap >=HK$40 bn, or (2) market cap >=HK$10 bn with >=Hk$1 bn in revenue
		■ Innovative
		■ Successful: track record of high business growth
		■ External validation: meaning third-party investment
	Beneficiaries	■ Individuals only: materially responsible for growth of the business; separate consultation on corporate beneficiaries
		■ Directors only: at listing and afterwards
		■ Shareholding: >=10% and <=50% at listing (collectively)
		■ Transfers prohibited: event-defined sunset; allow trusts and legitimate tax planning
Additional listing requirements and shareholder protections		■ No increase in proportion of WVRs after listing
		■ Share-based WVR only with maximum 10x voting power vs ordinary shares
		■ Non-WVR shareholders must be entitled to cast at least 10% of the votes
		■ Fundamental matters voted on "One-Share, One-Vote" basis: changes to constitutional documents; INED appointment and removal; auditor appointment and removal; variation of rights attached to any class of shares; voluntary winding up of the listed issuer
		■ Enhanced disclosure: Warnings on listing documents and communications; Stock marker "W"
		■ Enhanced corporate governance: corporate governance committee to review, monitor and report on compliance with WVR safeguards; ongoing compliance adviser to provide advice to issuers on compliance with WVR safeguards and rules

Source: HKEX

Figure 39: Conditions for secondary listing under Chapter 19C

Listed on "Qualifying exchange"	NYSE, Nasdaq & LSE's main markets ("premium" only)
Good compliance record	At least two financial years on qualifying exchange
High market cap	(1) market cap >=HK$40 bn, or (2) market cap >=HK$10 bn with >=HK$1 bn in revenue
Greater China companies permitted to second list	

Source: HKEX

“We expect most of the future unicorns to come from internet, technology hardware, auto, healthcare and fintech sectors.

Key trends of major sectors

In this section, our sector analysts will focus their discussion on the key trends of five major sectors: internet, technology hardware, auto, healthcare and fintech. We expect most of the future China unicorns will come from these sectors.

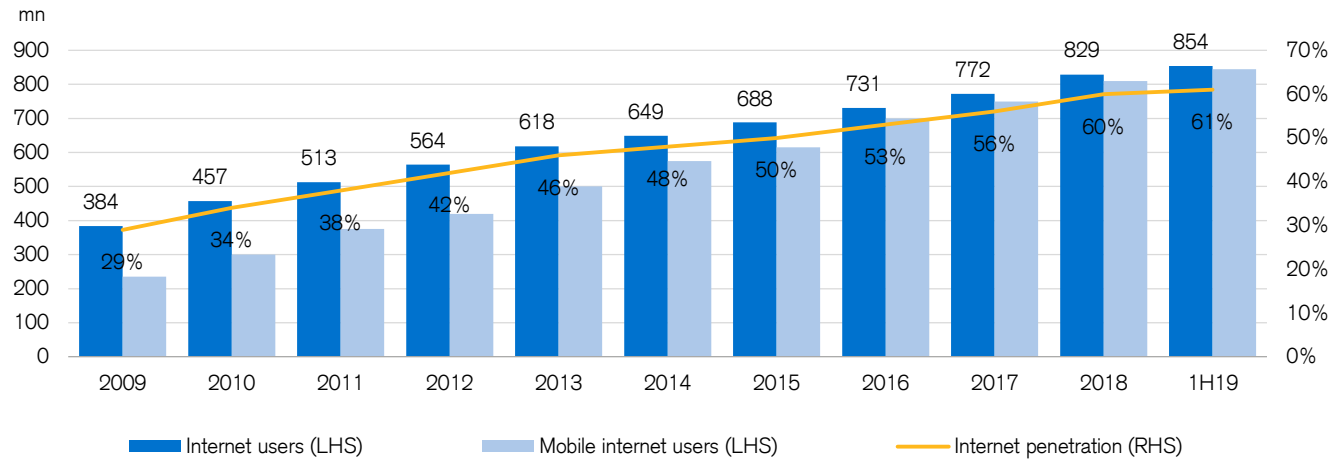
Internet

China's vast population and rapid economic development has empowered the country to become the largest market for internet consumption. The number of internet users in China has exploded from a mere 298 mn in 2008 to 854 mn as of 30 June 2019, or a CAGR of 11%. During the same period of time, mobile users grew twice as fast, at a CAGR of 21%, to reach 847 mn in 1H19, up from 118 mn. Compared to the US, China's internet economy is relatively concentrated on e-commerce and mobile payment, but we have seen tremendous growth potential in interest-based content, video streaming, and local services.

Many unicorns were born in the mobile age and flourished, driven by people's increased spending for better quality content and services. Meanwhile, as internet penetration exceeds 60% (or in fact around 80% if excluding senior and junior citizens), the battle for more user engagement, time spent, and ultimately, monetisation, intensifies. Two of the three largest unicorns we identified are entertainment and content-based—*Toutiao* and *Kuaishou*—as China's netizens continue to spend nearly five hours on their mobile internet every day.

In addition, internet technology has brought disruption and new growth ideas for certain traditional industries: property and rental platform, *Beike,* has tried to move the old-fashion property and rental transactions online and enable virtual sales; while e-commerce unicorns, *Xiaohongshu* and *Mia,* are growing into more specialised areas focusing on fashion shoppers and young females. Another pocket of unicorns worth highlighting is online education, such as *Yuanfudao* and *17zuoye*, which make offline after-school tutoring much more scalable in addition to satisfying the emerging needs for early-childhood education (especially English, math, music and coding).

Figure 40: China has the world's largest netizen population



Source: CNNIC Report, Aug-2019

Figure 41: Selected unicorns in China's internet ecosystem

Total internet population (854 mn)							
(824.7 mn)	(685.9 mn)	(694.7 mn)	(758.8 mn)	(607.9 mn)	(638.8 mn)	(493.6 mn)	(418.2 mn)
IM/ Social Network	News	Search	Video / livestreaming	Music	e-commerce	Online games	Vertical / services
WeChat	Toutiao	Baidu	Douyin	QQ Music	Taobao	Tencent	Meituan
QQ	Tencent News	Sougou	Kuaishou	NetEase	Tmall	Game	Dianping
Weibo	Sina		iQiYi	Music	JD	NetEase	Eleme
Tantan	NetEase		Tencent Video	KuWo Music	PDD	Game	Ctrip
Momo	Qutoutiao		Youku	KuGou	Xiaohongshu		58 Home
			Bilibili	Music	Zhuan Zhuan		Dada
			Douyu		Xianyu		Cao Cao
					Womai		Didi
					Mia		Haluo
					Beibei		Ziroom
							Beike

Source: CNNIC, Credit Suisse research

China internet: Rise of the next-generation giants

- **China's new unicorns: born in the mobile age.** Over the past decade, China's embracing of the dot-com era has created tremendous growth opportunities for tech start-ups, some of which seized the chance and have grown into the most dominant internet companies in the country, namely Baidu, Alibaba and Tencent (BAT). Founded in the late 1990s, the big three successfully built their empires in search engines, e-commerce and social networks, but are now expanding their footprint to payment, cloud computing, and digital entertainment. More importantly, they are seeing the burgeoning force of the unicorns born in the mobile age and riding the latest technology tide of big data, AI, and sharing economy. The new generation of unicorns, most less than a decade old, grew up together with post-1990s smartphone netizens and have significantly enriched the mobile users' experience by offering more comprehensive services.
- **Internet growth and mobile shipment slowing down.** China's total internet users numbered 854 mn by 1H19, with a growth rate of 3.0% from 829 mn in end-2018. Internet penetration reached 61.2% in China, higher than the global average. Mobile internet users reached 847 mn, suggesting that mobile internet penetration has increased to 99.2% in 1H19 from 98.6% in end-2018 (source: China Internet Network Information Centre). On the flip side, China's smartphone shipments saw YoY decline of 7.9% in 2019, the third consecutive year of slippage, according to IDC reports. The roll-out of 5G in 2020/21 could be a catalyst for smartphone upgrades, though it would not further lift mobile penetration much.
- **Solid growth in internet time spent and data usage.** Despite a high base of internet users in China, rural areas are creating incremental growth opportunities: it is worth noting that mobile payment penetration rose from 57.7% in 2015 to 73.4% in 1H19, with most new users coming from rural areas. Video is another notable trend: both video streaming and live streaming recorded significant growth, thanks to the wider adoption of 4G services and advanced data technology. Now the total time spent on mobile internet per user is around 5 hours a day, and people are spending more time on news apps and video, especially short-form videos.
- **Expanding boundaries.** Chinese internet giants are expanding into new business areas and the next-generation superstars are embracing all opportunities in the digital ecosystem. The online-to-offline (O2O) model is rapidly changing China's retail landscape; online capabilities empower offline consumption that enhances people's daily life. Moreover, actively leveraging on social elements and spreading services overseas are all ways to acquire new users and expand total addressable market.

Even though we have witnessed slower growth of internet users, China tech start-ups still benefit from the emerging rural population, as well as a dramatic increase in user time spent.

- First of all, China has recorded 854 mn internet users at the end of 1H19, with internet penetration of 61.2%, higher than the global average. China's mobile-centric model drives the surge in mobile data consumption in the country, notably attributable to the rural internet users who just began to embrace e-commerce, social media and a range of online entertainment options.
- Another notable trend is the rapid growth of time spent, especially entertainment time. Users daily time spent on mobile internet is close to 6.8 hours in February 2020, up 21% from the same period last year. Short-video is a key driving force. Users of *Douyin* and *Kuaishou* spent an average of ~80 minutes a day on these platforms. News and content aggregators, social media, and e-commerce also see strong performance and capture a greater portion of time spent.
- The proliferation of streaming services has significantly driven cellular internet data usage, thanks to the wider adoption of the 4G network in China.
- Finally, Chinese internet giants are trying to go beyond the boundaries, expanding their footprint from online to offline, or even globally. The new forms of e-commerce are proactively embracing social networking, making shopping more fun, while on-demand service is rapidly changing the retail landscape and offering a seamless experience to customers whenever and wherever they want to shop and consume. China's tech stars have been heavily investing in overseas markets, to capture the next growth engine/spurt.

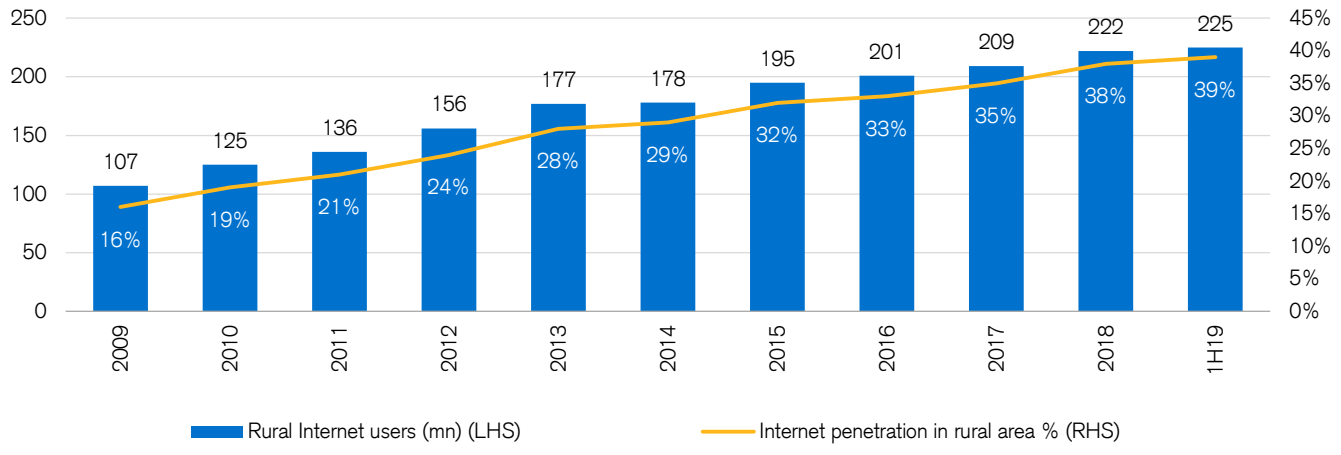
China internet unicorns

CB Insights included 112 Chinese private companies in its "global unicorn club" which comprises more than 450 unicorns around the world, as of March 2020. A vast majority of the listed names are tech companies. China is home to the world's top three most highly valued private non-US companies—*ByteDance* (US$75 bn), *Didi Chuxing* (US$56 bn), and *Kuaishou* (US$18.0 bn). It is worth highlighting that, while Didi's valuation is unchanged since our last published unicorn report, ByteDance's valuation has more than tripled, from US$20 bn, to US$75 bn for this edition.

While China's tech start-ups cover the full spectrum of the internet space, video/streaming, content/media and on-demand services are particularly under the spotlight. We think China unicorns are well-positioned for a promising future, considering: (1) growing disposable income further unleashes domestic consumption power; (2) people have increasing demand for quality content; and (3) technology and data analytics reshape user experience in all aspects.

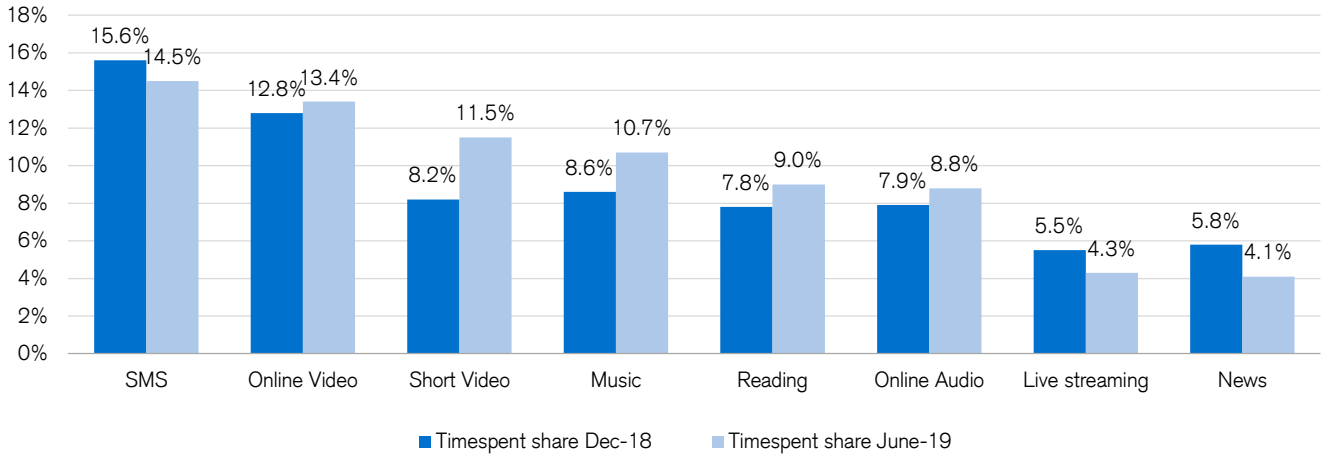
- **IPOs dried out in 2019:** 2018 marked a blockbuster year for Chinese tech unicorns as many of them made their public debut, raising billions of dollars from the capital market. It shows investors' strong appetite for high-growth, new economy companies amid a mild slowdown in China's GDP. Aside from the usual destination of a listing in US, the number and scale of Chinese tech IPOs may have set a record for the Hong Kong stock exchange, with some notable initial public offerings such as Meituan (3690.HK), Xiaomi (1810. HK), Ping An Good Doctor (1833.HK), China Literature (772.HK) and ZhongAn Insurance (6060.HK).

Figure 42: Rural internet users continue to drive China internet growth



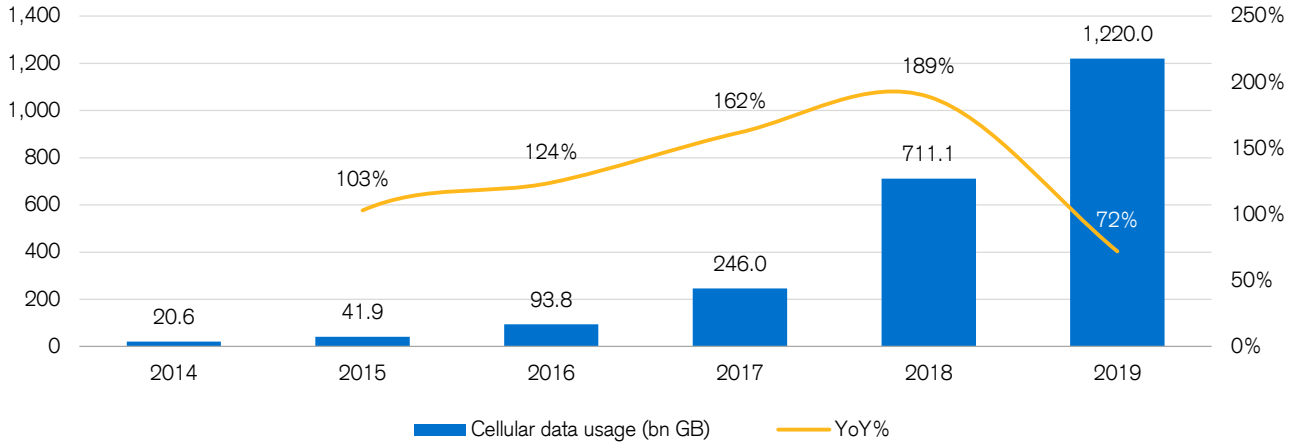
Source: CNNIC, Credit Suisse research

Figure 43: Short video platforms gaining share of users' time spent in 2019



Source: CNNIC, Credit Suisse research

Figure 44: China mobile data usage surges post 2015



Note: Cellular internet refers to 3G/4G network data.
Source: China Ministry of Industry and Information Technology

However, the tide reversed in 2019, which has been a much quieter year for tech IPOs, largely hurt by the US-China trade war and its ripple effect that lingered through most of the year. To make up for this, Alibaba's US$11 bn secondary-listing in Hong Kong on 26 November helped to push HKEx to the top of the global IPO league table in the year.

- **Unicorns get younger and younger:** We are observing another unprecedented phenomenon; China's internet industry is developing at a record-breaking speed to give birth to a billion-dollar baby. Chinese unicorns take, on average, a shorter time than American ones to reach the US$1 bn valuation. A Boston Consulting Group (BCG) report says it takes four years, on average, for Chinese unicorns to reach this status; while American ones normally take seven years. A significant 46% of the Chinese unicorns reached the US$1 bn valuation within two years, while that percentage for US unicorns was 9%. Examples of the fasting growing unicorns would be *NIO (a* three-year-old electric car maker), Didi's car service spin-off *Xiaoju Automobile Solutions,* and *Cambricon* (Chinese AI chip maker founded in 2016).
- **Cash burn no longer seen to be a solution:** After around five years of easy money from venture capital firms & PEs, that fuelled some of the biggest cash-burning battles, 2018 marked the end of the China tech start-up funding boom. 2019 was a year when many unicorns toppled, as the economy soured and there was a shortage of funding. What happened in the US to Uber and Lyft for their lacklustre debut, and more so a slash in valuation for WeWork, further weighed on sentiment. Based on ITjuzi, 336 Chinese start-ups shuttered in 2019 after raising US$2.5 bn from investors. Similarly, start-ups in China have raised less than US$40 bn via venture capital deals in 2019, vs US$112 bn in 2018, accordingly to consultancy firm Preqin. Pure cash burn to acquire traffic is no longer a solution; investors increasingly demand a road map to profitability. The new buzzwords to get funding are now profitability and sustainability.

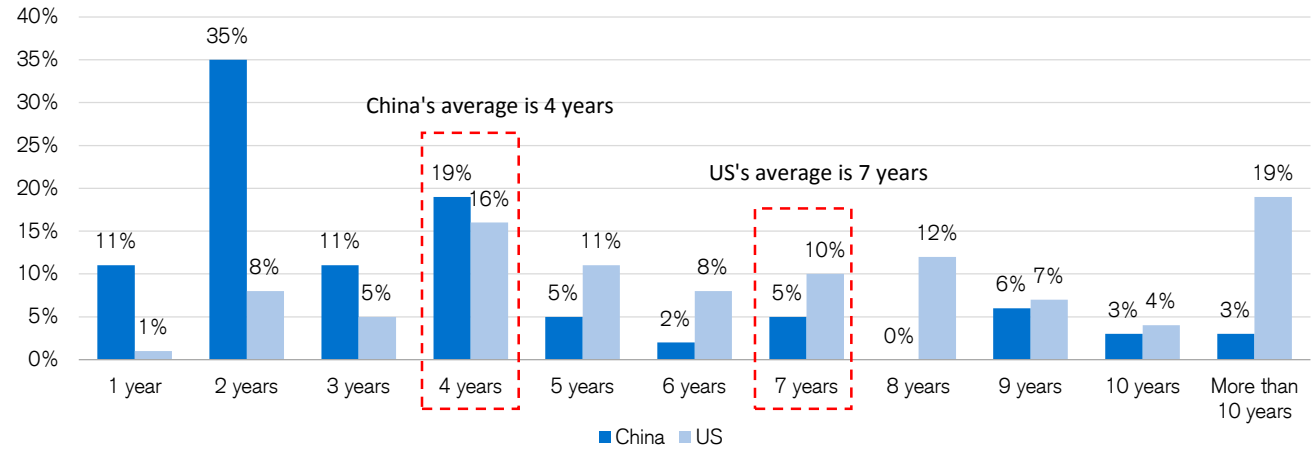
Hefty valuation is also hard to justify. The difficulties facing SoftBank, once the most generous investor, are also leading to it de-leveraging itself under pressure from its own investors. On 23 March 2020, SoftBank announced a plan to sell assets worth US$41 bn to buy back stocks and slash debt. This would lead to deflation in the valuation of new deals on the Street.

Figure 45: 2018 marks a blockbuster year for China tech IPOs

Company Name	Ticker	Listing Time	IPO Size (US$ mn)	Industry
Bilibili	BILI US	Mar-2018	483	Video streaming, Online game
iQIYI	IQ US	Mar-2018	2,250	Video streaming
Huya	HUYA US	May-2018	180	Live streaming
Ping An Good Doctor	1833.HK	May-2018	1,100	Medtech
Huifu	1806.HK	Jun-2018	200	Fintech
VCREDIT	2003.HK	Jun-2018	200	Fintech
Wise Talent	6100.HK	Jun-2018	370	Internet Service - HR
Xiaomi	1810.HK	Jul-2018	3,060	Hardware - Smart devices
Inke	3700.HK	Jul-2018	130	Live streaming
Qeeka Home	1739.HK	Jul-2018	280	e-commerce
Uxin	UXIN US	Jul-2018	225	Fintech
51 Credit Card	2051.HK	Jul-2018	130	Fintech
Aurora Mobile	JG US	Jul-2018	200	Big data
Cango	CANG US	Jul-2018	44	Fintech
Pinduoduo	PDD US	Jul-2018	1,870	e-commerce
Meituan Dianping	3690.HK	Sep-2018	3,800	O2O service
Qutoutiao	QTT US	Sep-2018	84	News, Info
111	YI US	Sep-2018	100	Medtech
CooTek	CTK US	Sep-2018	52	Utility App
LAIX Inc.	LAIX US	Sep-2018	72	Online Education
Tuanche	TC US	Nov-2018	20	Vertical – Auto
Tongcheng Elong	0780 HK	Nov-2018	18	OTA
BabyTree	1761 HK	Nov-2018	22	Vertical, e-commerce
TME	TME.N	Dec-2018	1,066	Online Entertainment
MOGU	MOGU US	Dec-2018	67	e-commerce

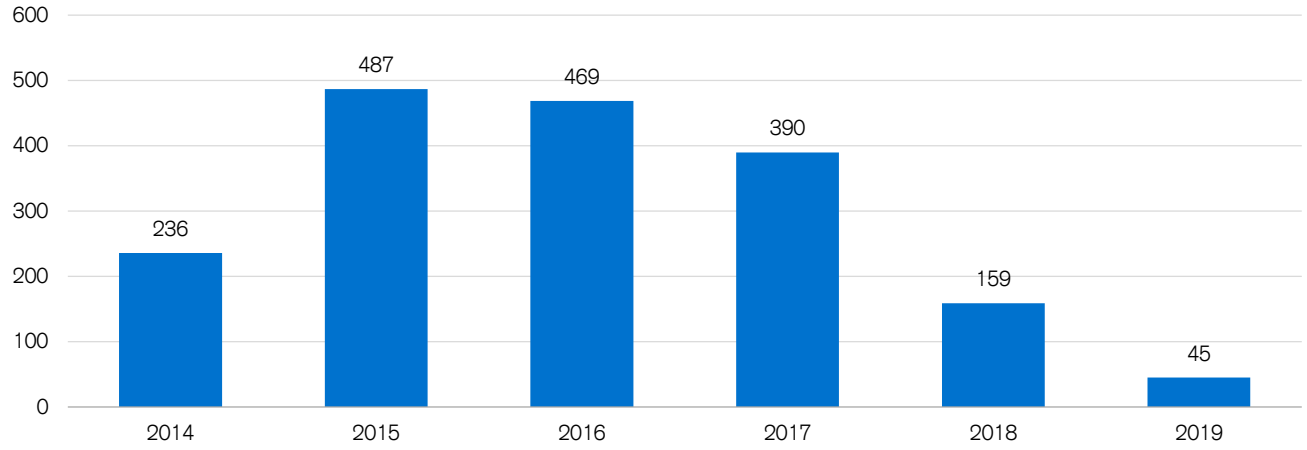
Source: Nasdaq, HKEx, company data, Credit Suisse research

Figure 46: China's unicorns take less time to reach US$1 bn valuation



Source: Boston Consulting Group

Figure 47: Only 45 Chinese-focused VCs have raised funds in 2019



Source: BLOOMBERG NEWS, Preqin, Credit Suisse research

Figure 48: List of top China internet unicorns

Company Name	Origination time	Est. Valuation (USD bn)	Industry	Major Investors
ByteDance	Jul-2012	$75.0	News feeds, Short video	Sequoia Capital China, SIG Asia Investments, General Atlantic
Didi Chuxing	Jul-2012	$56.0	O2O Service - Car Hailing	Matrix Partners, Tiger Global Management, Softbank
Kuaishou	Jan-2015	$18.0	Short Video, Livestreaming	Baidu, CMC Capital Partners, DCM Ventures, Huasheng Capital
Beike	Jul-2019	$10.0	e-commerce – Real Estate	China Renaissance, Country Garden, Gaw Capital, Haixia Capital, Hillhouse
Manbang Group	Apr-2018	$6.0	Logistics	ABCI, All Star Investments, Baillie Gifford, China Reform Fund, Eastern Bell
VIPKID	Aug-2017	$4.5	Online Education	Bryant Stibel, Coatue Management, Learn Capital, Matrix Partners China, Northern Light
Ziroom	Jan-2018	$4.5	e-commerce – Real Estate	China Renaissance, GA Capital, General Atlantic, H Capital, Haixia Capital
Yuanfudao	May-2017	$3.0	Online Education	CMC Capital Partners, IDG Capital, Matrix Partners China, New Horizon Capital, Tencent
Xiaohongshu	Mar-2016	$3.0	e-commerce	Alibaba, GGV Capital, GSR Ventures, Genesis Capital
Aihuishou	Jul-2018	$2.5	e-commerce – Second-hand goods	Cathay Capital, Fortune Capital, Fresh Capital, GenBridge Capital, Greenwoods
Huimin	Sep-2016	$2.0	e-commerce	CITIC Capital, China Innovation Investment, China Renaissance
CAOCAO	Jan-2018	$1.6	O2O Services – Car Hailing	People Electrical Appliance Group, Zhongrong International Trust
17zuoye	Mar-2018	$1.0	Online Education	ByteDance, CITIC PE, DST Global, H Capital, Shunwei Capital
Dada – JD Daojia	Dec-2015	$1.0	Logistics, Delivery	DST Global, Greenwoods, JD, Sequoia, Walmart
HuJiang	Oct-2015	$1.0	Online Education	Baidu, China Minsheng, Wanxin Media
FlashEx	Aug-2018	$1.0	Logistics, Delivery	BHG Long Hills Capital, Beijing Hualian, CDH Investments, Hearst Capital
KK Group	Oct-2019	$1.0	e-commerce, Retail	Black Algae Capital, Bright VC, Hongtai Capital, Matrix Partners China
Womai	Oct-2015	$1.0	e-commerce, Retail	Baidu, IDG Capital, SAIF Partners China
Zhuan Zhuan	Apr-2017	$1.0	e-commerce – Second-hand goods	58.com, Tencent
58 Daojia	Feb-2016	$1.0	O2O Services	Alibaba, KKR, Ping An Insurance
Beibei	Jan-2015	$1.0	e-commerce	Capital Today, Gaorong Capital, IDG Capital
Maimai	Nov-2017	$1.0	Social Network	DCM Ventures, DST Global, IDG Global, Morningside

Source: CB Insights, Credit Suisse research

Megatrend #1: AI-powered innovation

Technology enables a personalised experience

China's next-generation internet titans are born in the mobile age and fuelled by AI and data analytics. They are challenging the established superpowers, which mostly started as clones of US companies like Google, Facebook and eBay. Increasingly, these burgeoning start-ups are building their strength through innovation, by adopting cutting-edge technology and creating a better user experience. Competition in internet industry has levelled out, while Chinese consumers' demand for easy-

to-use products and interest-based content is not fulfilled. This creates opportunities for those who are equipped with machine-learning algorithms and data capabilities to make targeted advertisements and personalised recommendations.

Today, internet users have gradually migrated from searching for content to subscribing to content that fits their specific interest or is relevant to their needs. We have increasingly seen content curation by an algorithm based on user interest, and such trends can be found in China's most popular media/news aggregators, video and streaming sites, as well as e-commerce platforms.

- **Media/Entertainment: ByteDance & Kuaishou**

ByteDance is famous as an "application factory" as we mentioned above, for being a successful application incubator and operator. So far, it has developed newsfeed product Headline Today, short-video platforms Douyin and Tik Tok (overseas), and short-to-medium-length video platform Xigua and Huoshan video. We forecast the next step of its development strategy is a social media app, as it has already occupied users' time spent, but is yet to have the portrait of users' social relationships, which is of great value to deepen the monetisation level, including advertising and e-commerce. Though the trial for Duoshan (多闪) and Feiliao (飞聊) earlier in 2019 did not succeed, we expect it will bring more exciting products to the market in 2020 with the ambition to reshape the competition landscape of the social media space. We believe its AI technology plus data-driven operational method would still be the major approach for social media network development.

Different from ByteDance, Kuaishou has been executing a one-app strategy since inception. The only deviation is its early trial for small-game/casual-game Kuaishou Dianwan (快手电丸), which did not succeed. As Kuaishou further ramps up towards its user growth target of 300 mn DAUs, we believe it may relaunch its small-game/casual-game service within its core application, together with deepening its operation on live streaming. This echoes the company's user growth strategy with primary focus on identifying user interest and evolving further.

- **E-commerce/Shopping: Taobao/Pinduoduo**

China's e-commerce sites initially began as search engines. Through keywords, users can bridge to millions of products that fit their specific requirements. However, it becomes more and more important to know that customers today make purchases based on interest, recommendations or emotional factors; e-commerce sites need to transform themselves too, with an optimised personalisation strategy, introducing the algorithm-based recommendation mechanism that could potentially capture target users to make marketing efforts more effective. Alibaba's Taobao is one of the successful cases that leverages an improved algorithm for personalised recommendations. As a result, Alibaba said its recommendations did help Taobao merchants to sell more items as users find more they would like to purchase.

The e-commerce new force Pinduoduo also comes with an innovative algorithm to match merchants with buyers, and it is leveraging the social network effect and sharing to maximise the power of data analytics. By doing so, it creates exposure for its four million long tail merchants who previously had difficulty surviving on other platforms, such as Taobao.

Megatrend #2: Redefine transportation

On-demand transportation services have changed people's mobility behaviour and are making a positive impact on the economy, as it reduces fuel consumption and allows more flexible travel needs. Globally, the on-demand transportation market is expected to reach US$305.0 bn by 2025, at a CAGR of 19.8% during the forecast period, according to a study conducted by Grand View Research. Services such as e-hailing, car-sharing, car-rental, and station-based mobility are offering a productive space for the transport industry to thrive.

Substantial growth potential in China

With higher population density (largest population globally with more than 100 cities with population over 1mn residents), lower private-car ownership compared to developed countries, and increasing traffic congestion in mega cites, China is an ideal laboratory for on-demand transport and ride-sharing, including both cars and bikes.

Today, China's on-demand transportation giants are rapidly developing into a ride-sharing, artificial intelligence (AI) and autonomous driving conglomerates. Didi has been testing self-driving vehicles in four cities in China and the US; Chinese search engine Baidu is close to launching its first autonomous buses in China for commercial use and has planned to roll out 100 self-driving minibuses on the road. Both view that the new technology as a key to reduce cost, while improving transportation efficiency.

Comprehensive on-demand transportation solution provider

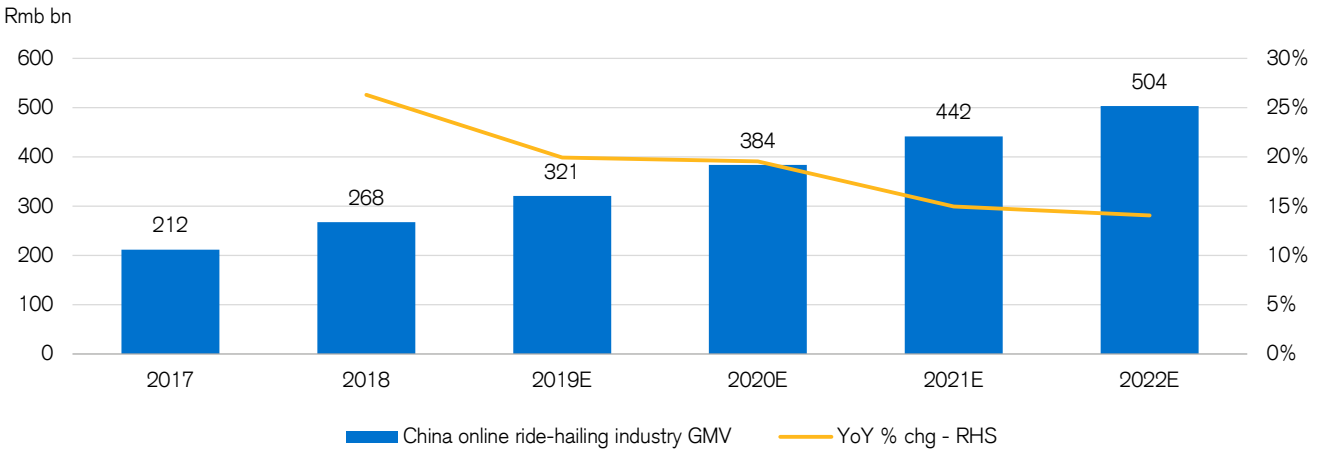
Didi Chuxing aims to become the world's largest transport platform. The Chinese ride-hailing giant was formed in 2015 through a merger of Tencent-backed Didi and Alibaba-backed Kuaidi. The combined giant continued to engage in a fierce subsidy battle with Uber until 2016, and later on won the China war. Didi Chuxing offers a diverse range of transportation services through its mobile app.

Didi Chuxing offers a full range of app-based transportation services to over 550 mn users across over 400 Chinese cities. It has been expanding its service scope to food delivery and hotel and travel areas, as the ride-hailing market has been consolidated. Outside China, Didi is eyeing the developing markets to form the backbone for the company's expansion strategy. It started services in Mexico, its first footprint in South America, amid a global expansion to Hong Kong, Japan and Taiwan.

Collaboration with automakers

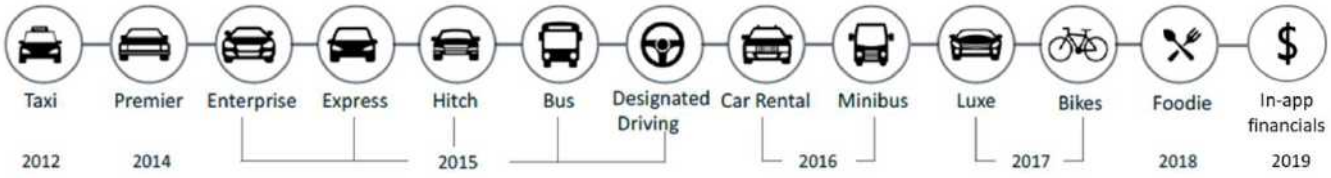
After consolidation of the car-hailing market, Didi is also actively seeking further cooperation with other participants along the value chain, especially upstream automakers. In June 2019, Didi announced a strategic agreement with GAC to deepen their collaborations on promotions and customisation of cars, as well as car-hailing and self-driving. In July, Didi partnered with Toyota to further expand their cooperation and formed a joined venture to provide vehicle-related services to ride-hailing drivers.

Figure 49: China online ride hailing industry GMV



Source: Qianzhan

Figure 50: Didi offers a comprehensive set of transportation services



Source: Company data, Credit Suisse research

Megatrend #3: Digitalise local services

The size of the local service consumption market in China is just as huge as what you could find in search, social and physical goods e-commerce. The past several years have seen fast online penetration of local consumer services such as food delivery. At the current level, we continue to see ample head room for the penetration to grow further. Yet, in the longer term, we see even bigger potential for digitalisation of the supply side and last-mile-delivery solution for the industry.

Supply-side digitalisation

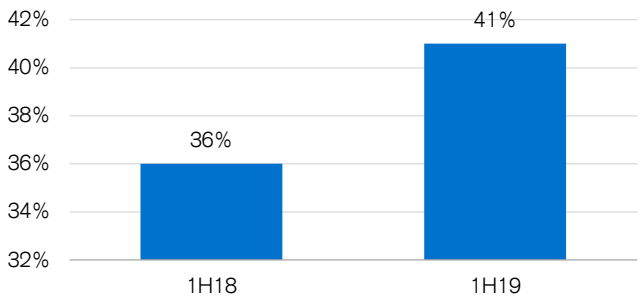
According to China Cuisine Association, there is a total of around 8 mn restaurants in China. The current penetration by food delivery platform on the supply side is only around 41%. Among different tiers, third-tier cities offer the most opportunity for further penetration, with only 31% of merchants signed up with the delivery platform.

On average, the average life span of a Chinese restaurant was only 508 days in 2018, according to the China Catering Report 2018. The most common challenges faced by them are raw material prices, rent, and customer acquisition based on the survey performed by Meituan. As China's food catering industry is getting more digitalised and leveraging mobile internet, we believe it is inevitable that more restaurants will embrace food-delivery apps as a way to expand business, acquire customers, and provide quantitative feedback to improve their business.

The key value proposition for Meituan is its vast range of data collected for customers covering their areas of interest (which ads they click on), what food reviews they read and write, their past consumption patterns (in-store or food delivery, cuisine, spending pattern and frequency), and which restaurants they go to. This is all valuable information for the merchants to market and acquire new customers. In fact, according to Aurora, more than 90% of the restaurants think that food-delivery apps have helped them to grow business.

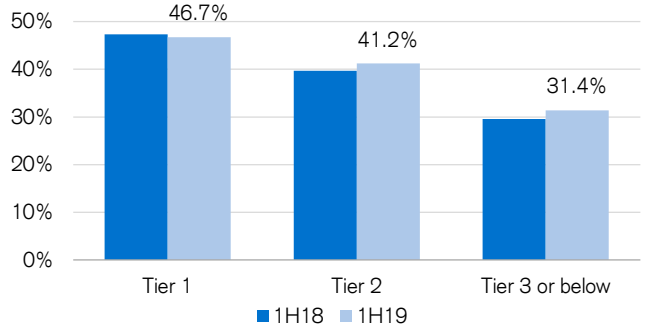
Over time, as the delivery platform gets more established and the ecosystem strengthens, restaurants are becoming more receptive and ready to incorporate food-delivery to drive incremental business, and as more food-delivery-only restaurants are coming up (currently only 10% of the Meituan merchants), we see significant upside on the supply side of restaurants.

Figure 51: China food delivery merchant penetration



Source: Trustdata

Figure 52: China food delivery merchant penetration by different city tier



Source: Trustdata

Figure 53: China food and beverage merchants' operating difficulties

Difficulties encountered	Percentage of merchants chosen the option
Increasing raw material costs	59%
High rent	52%
Incapability to acquire customers	44%
Staff recruitment, retention, and high staff cost	31%
Insufficient utilisation of Meituan or other delivery platform	29%
Insufficient marketing activities with universal marketing method	28%
Predicting clients demands and needs	24%
Insufficient operating capital	21%
Cuisine and menu design	14%
Insufficient space for future food chain	6%
Acquisition and utilisation of basic facilities	5%
Food safety	2%

Source: Company data, Credit Suisse research

Smart delivery solutions

Rider cost constitutes 75% of the cost of food-delivery segment, or 85% of the 1P food delivery. One of the key drivers of the improved profitability for the food delivery business has been the improvement in the unit delivery cost of ~5% YoY from around Rmb7.6 in 1H18 to Rmb7.2 in 1H19. Apart from efficiency gains from higher order density and better algorithms on route optimisation, there is also room for further digitalisation of the delivery process.

Currently, industry participants have estimated that the rider sometimes needs to wait 5-8 minutes at the delivery destination for the customer to pick up their order.

Considering the per-order delivery time is only 20-25 minutes, this is a significant wastage of resources. Currently, Meituan is testing robot-delivery to fulfill last-mile delivery within office buildings and campuses. According to Meituan's chief scientist, the company has plans to roll out this new technology more aggressively in the next 2-5 years. Although it is still a bit remote, we believe this technology would serve as a driver in the medium term to lower delivery cost further as rider efficiency gradually reaches an optimal level.

Figure 54: Robot for indoor and outdoor delivery

Source: Company data

Figure 55: Robot for in-building delivery

Source: Company data

Megatrend #4: Further monetisation of traffic

Besides the extraordinary growth in traffic/number of users/time spent and all sorts of operational metrics, we think the next critical topic for China unicorns would be how to monetise the enormous traffic pool, especially for the Top 2 giants: ByteDance and Kuaishou. We believe both the companies have already achieved significant revenue growth, and their revenue target for 2020 is more aggressive.

Driver #1: Online ads. Out of the incremental market size of around Rmb100 bn in 2019, ByteDance and Kuaishou combined have taken over half of it via advertising products across their news feeds, social feeds and video feeds. We expect this growth momentum trend to continue into 2020, as, based on our channel checks, deepening monetisation for the current traffic pool remains the key focus for the coming year, while advertising is still the primary tool.

Driver #2: Online game publishing. We expect the online game publishing market to get even more crowded as some traffic giants plan to participate in this lucrative business. Post monetisation approval suspension back to 2018, many independent game developers are eager to monetise their games in order to sustain their cash flow, and some of them have been using the traffic platform (formerly mainly cooperating as advertisers) for game publishing. Among them, ByteDance and Kuaishou are the two leading potential key competitors.

Douyin (or Tik Tok for overseas) and Kuaishou are short-video platforms. Originally, the target customers of their advertising business were online games business operators as short video ads demonstration is a highly effective means for game demo. Game developers are gradually recognising the value of these traffic platforms and accelerating cooperation with them.

ByteDance initiated its exploration for game publishing back in 2016-17 when the company was still small. Its game performance started to attract attention from that year since Virus War（消灭病毒）topped the iOS download rankings. The company has been implementing the strategy of omni-channel traffic acquisition, which enables it to deliver enough ad exposure of these casual games to the targeted user group.

ByteDance and Kuaishou both have the advantage of their robust traffic growth. We expect both platforms to squeeze market share from game publishers who formerly focused on casual/super-casual games, or more specifically genres including placement, matching puzzles, and casual competition.

Driver #3: Live streaming and its related revenue. We still believe live streaming is a business rather than monetisation function. Whichever platform has sizeable traffic can monetise and commercialise traffic via this function.

ByteDance has already built up its live-streaming product matrix: (1) traffic pool is originated in Headline Today, Douyin, Xigua and Huoshan short-video platforms as the entrance; (2) live-streaming products are rooted in short-video platforms, including Douyin, Xigua, and Huoshan; and (3) middle- and back-end desks are providing centralised support for these various apps. As of Feb-2020, Douyin had 552.1 mn MAUs with 309.3 mn DAUs, alongside Huoshan (123.4 mn MAUs/34.9 mn DAUs), and Xigua (219.9 mn MAUs/44.6 mn DAUs) had a relatively smaller size, based on recent data from Quest Mobile. Though the company has not disclosed its progress for live streaming, according to our estimate, ByteDance currently has ~200 mn MAUs/70-80 mn DAUs for live-streaming service, and can contribute ~Rmb25-30 bn annually.

Kuaishou has recently disclosed its 2019 live-streaming progress, which highlights that the DAU of its live-streaming services has already surpassed 100 mn. Among that DAU group, online-game live streaming has over 50 mn DAUs as of the latest data, which is higher than both Huya's and Douyu's. Though we understand that Kuaishou's content offerings are currently different from Huya's and Douyu's, with the latter two having an edge for professional e-sports content, we believe Kuaishou is also fairly interested in diversifying content offerings to close the gap with these two platforms.

Figure 56: ByteDance has 13 publishing games hit the Top 10 free game ranking in iOS 2019

Chinese Title	English title	Days in Top 10	Genre	Publishing mode
僵尸榨汁机	Zombie Catchers	6	Casual – Adventure	Exclusive
战争艺术	Art of War	22	RTS	Exclusive
我飞刀玩得贼6	Knife.io	48	Casual – .io	Exclusive
消灭病毒	Virus War	96	Casual – Shooting	Joint
猫千杯	Cats Cup	13	Casual	Exclusive
全民漂移	Drift Race 3d Sprint	115	Casual – Car Racing	Exclusive
炮打方块		15	Casual – Shooting	Exclusive
皮皮虾传奇		15	Casual - Simulation	Exclusive
早安我的少年	Make S	14	Casual – Romance	Joint
音跃球球	Hop 2	69	Casual – Music	Exclusive
我的小家	My home	90	Casual – Simulation	Joint
我功夫特牛	Combat of Hero	31	Casual – Action	Exclusive
游泳健身了解一下		15	Casual – Simulation	Exclusive

Source: Shouyounaxieshier (手游那些事儿), Credit Suisse research

Technology Hardware

China aims to lead AI market by 2030

Artificial intelligence (AI) is one of the major and fastest-growing technology trends in the 21st century, profoundly impacting most aspects of human life, work, and production. According to Statista estimates, the AI market is expected to grow from US$7.3 bn in 2018 to US$89 bn in 2025—a 45% CAGR. China's AI market is roughly 12% of the global market, as shown from a Statista report. China expects to become a leader by 2030, driven by three factors: (1) strong VC investment totalling US$2.6 bn annually; (2) largest smartphone user base of 730 mn; and (3) strong domestic and overseas returning talent pool.

China raises many unicorns in this space; we identify 11 companies which have potential in the rise of AI and AIoT industry. YITU, 4Paradigm, Intellifusion, and Momenta are AI algorithm providers—their solutions are adopted in many applications such as surveillance, mobile, retail, advertisement, autonomous driving, etc. DT Dream is a data-management and analysis solutions provider, leveraging big data. DJI, Meizu, Huaqin, Geek+, Orbbec, and Terminus are smart hardware companies which make devices for AIoT applications

AI has four major development areas: (1) Machine learning: enables machines the ability to "learn" from data, especially leveraging the neural networks and structures; it is applied in major areas of AI technology, especially voice and image recognition. (2) Compute hardware and cloud platforms: stronger computing power from GPU, ASIC & FPGA, and cloud resources facilitate faster algorithm iteration and testing. SaaS provided by technology giants such as Amazon Cloud, Google, Microsoft cloud and Ali Cloud, allow different industries to customise their own AI solutions. (3) Availability of data: we expect accumulated digital data will grow from 4.4 tn GB in 2015 to 44 tn GB in 2020 globally, enabling AI algorithms to learn and improve their performance. (4) Internet of Things: Allows data collection and AI applications in diverse scenarios to drive smart decision-making and provide more accurate predictions.

We see AI is applied in several applications such as healthcare, driverless vehicles, computer chips, financial, facial recognition, retail, robots, etc. Due to the broad applications of AI, different industries are enabled with different forms of AI, especially sensing intelligence and cognitive intelligence. Sensing intelligence tech has made significant progress, and incubated representative products such as smart speakers utilising voice and speech recognition and smart cameras/servers that can identify and match human faces from images and videos. Cognitive intelligence still remains a challenging area.

AI has been accorded an important role in China's 'Made in China 2025' blueprint. China aims to become a global leader in smart manufacturing by 2030 and AI is a key enabler. China will pursue leadership in the AI field through three steps. First, it must be able to keep pace with all leading AI technologies, and their applications in general, by 2020. Second, China has to make major breakthroughs by 2025, which is intended to lead to the third part of the plan—the establishment of China as the world leader in AI by 2030. Under the AI blueprint, China is incubating many potential tech companies.

In the AI value chain, there are three major layers. The technology layer, machine learning engine, and foundation layer. The foundation layer provides infrastructure such as server, chipset, sensors, data resources and cloud computing resources, etc. The machine learning engine is the platform that provides the deep learning process and makes computers learn from the data. The technology layer includes algorithm providers, products and solutions providers, etc. We expect some common players across different applications in the AI ecosystem to leverage their technology capability. Our identified eleven unicorn companies have been valued at over US$30 bn in total, which includes AI algorithm providers (YITU, 4Paradigm, Intellifusion, Momenta), big data solution provider (DT Dream) and hardware companies (DJI, Meizu, Huaqin, Geek+, Orbbec, Terminus). 4Paradigm is also listed in 2020 CBInsights' AI 100 list.

YITU Technology is an artificial intelligence research company that integrates advanced AI technology business applications to build a safer, faster and healthier world. It now engages in sectors such as security, finance, transportation and healthcare. YITU offers four major categories of products and services:

DJI is a global market share leader in civilian drones and aerial imaging technology. DJI's unmanned aerial vehicles (UAV), commonly known as drones, are used by individual consumers as well as professionals in filmmaking, agriculture, conservation, construction, search and rescue, energy infrastructure, and so on.

4Paradigm is an artificial intelligence technology and service provider focused on B2B area. The company developed a machine learning technology that can accurately predict and mine data to help enterprises improve efficiency, reduce risks, and achieve business value.

Geekplus Robotics provides smart logistics solutions through the use of robotics and AI. It offers flexible, reliable and highly efficient solutions for warehouse and supply chain management applications.

Huaqin is an ODM (original device manufacturer) for smartphone, tablet, notebook, wearables, server, automotive and IoT products. Meizu is a Chinese consumer electronic company based in Zhuhai. Meizu moved its focus to smartphones since 2008.

Intellifusion is an artificial intelligence company focusing on "non-cooperative" visual intelligence. There are four major business lines for the company: (1) public security; (2) city governance; (3) new retail; and (4) semiconductor.

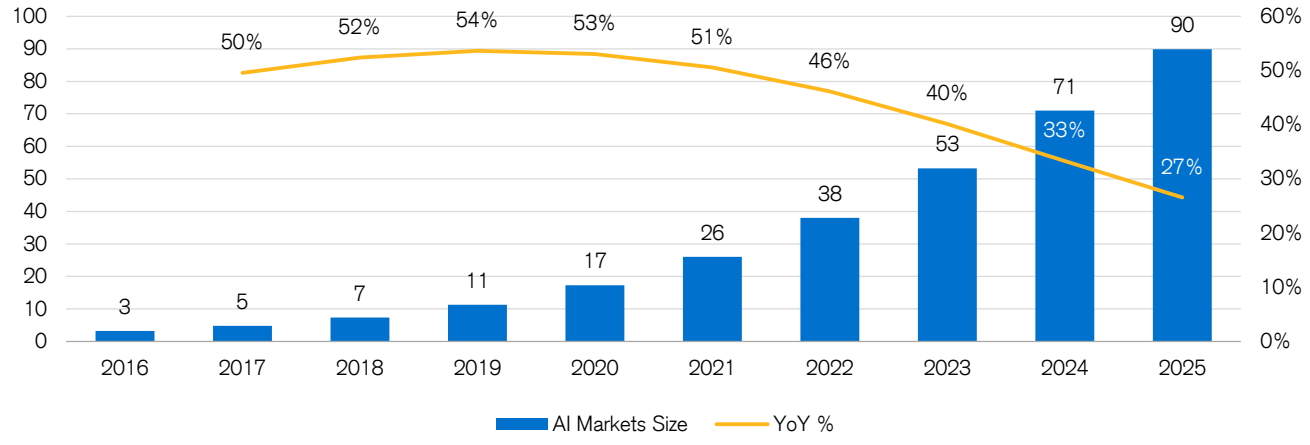
Momenta is an autonomous driving start-up aiming to build the 'Brains' for autonomous vehicles. Its deep-learning-based software in perception, HD semantic mapping, and data-driven path-planning enables full autonomous driving.

Orbbec is an AI-driven 3D-sensing company. It is one of the few global companies with mass production ability of 3D-cameras and also one of the very few offering a total 3D-sensing solution, including camera hardware and system design, semiconductor chip and algorithm.

Terminus focuses on artificial intelligence + IoT application technology, and operates as an AI city solution provider.

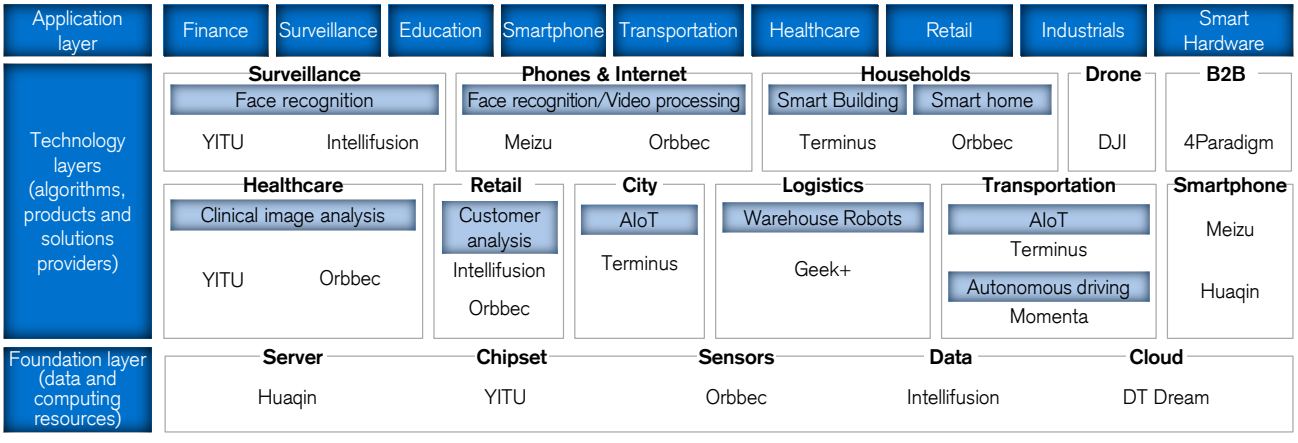
DT Dream as a solutions provider for cloud-computing and big data analysis. It has three major businesses — cloud-computing, big-data analysis, and cloud security.

Figure 57: Global AI market size and growth



Source: Statista report, Credit Suisse estimates

Figure 58: Selected unicorns in China AI ecosystem



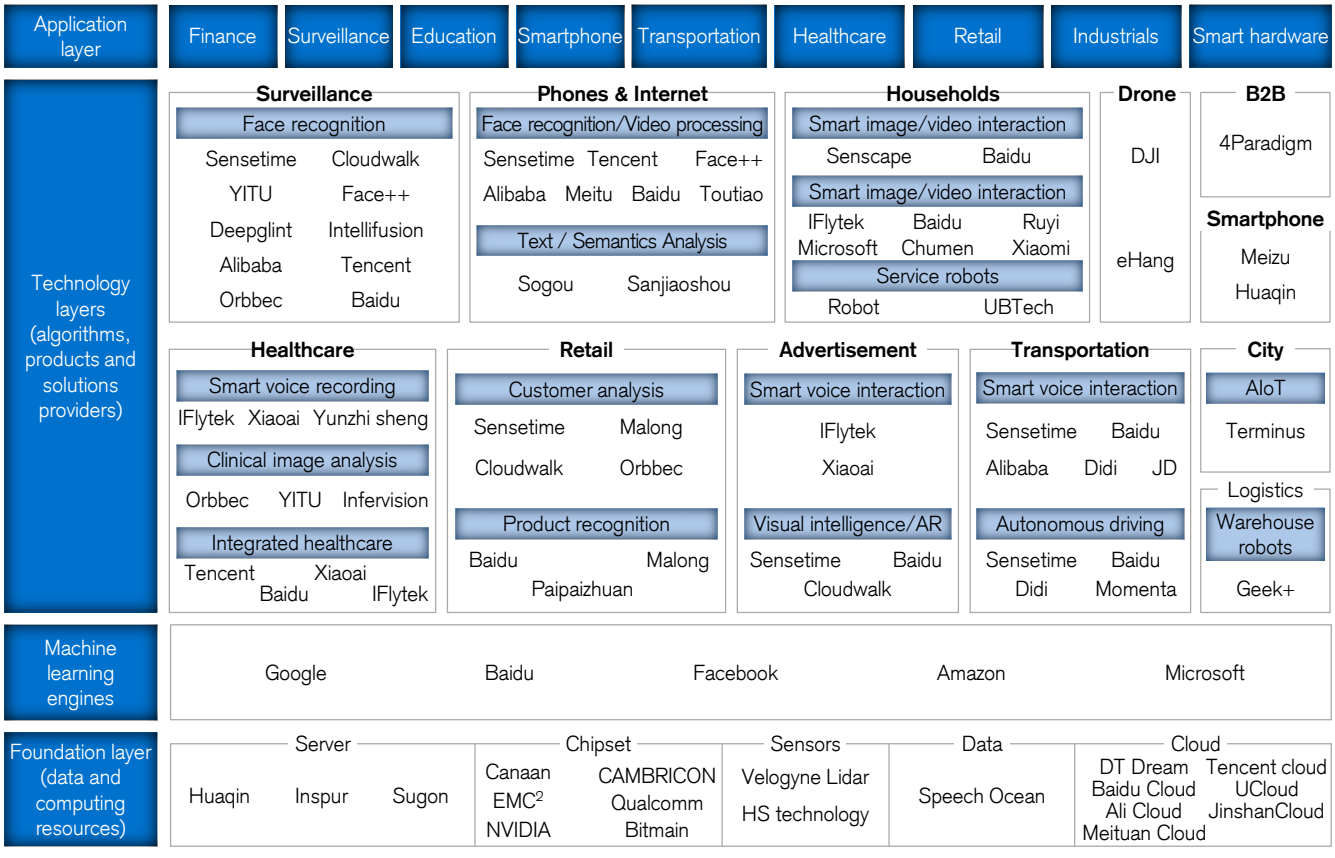
Source: Company data, Credit Suisse estimates

Figure 59: Selected tech unicorns in AI ecosystem

Unicorn	Valuation (US$bn)	Sector	Selected investors	Date joined	Total funding (US$mn)	Last funding
YITU	2.4	AI	Sequoia Capital China, Banyan Capital, China Industrial Asset Management, ICBC	8-Mar-2018	381.8	17-Jul-2018
4Paradigm	1.2	AI	Sequoia Capital China, China Construction Bank, Bank of China	19-Dec-2018	145	19-Dec-2018
Intellifusion	1.0	AI	BOC International, TopoScend Capital, Hongxiu VC	22-Mar-2019	29.7	22-Mar-2019
Momenta	1.0	AI	Sinovation Ventures, Tencent Holdings, Sequoia Capital China	17-Oct-2018	283	17-Oct-2018
DT Dream	1.5	Big data	Alibaba Group, China Everbright Investment Management, Yinxinggu Capital	8-Jun-2017	266.6	26-Sep-2019
DJI	15.0	Hardware	Accel Partners, Sequoia Capital	6-May-2015	1,135	5-Apr-2018
Meizu	4.6	Hardware	Telling Telecommunication Holding Co., Alibaba Group	23-Jul-2014	943.1	6-May-2019
Huaqin	2.2	Hardware	Zhangjiang Haocheng Venture Capital, Walden International, Intel Capital	8-Oct-2019	276.4	8-Oct-2019
Geek+	1.0	Hardware	Volcanics Ventures, Vertex Ventures China, Warburg Pincus	21-Nov-2018	383.6	10-Jul-2019
Orbbec	1.0	Hardware	R-Z Capital, Green Pine Capital Partners, SAIF Partners China	21-May-2018	200	21-May-2018
Terminus	1.0	Hardware	China Everbright Limited, IDG Capital, iFLYTEK	25-Oct-2018	629.6	12-Aug-2019

Source: CB Insights, Crunchbase, Credit Suisse research

Figure 60: Overall AI ecosystem companies in China



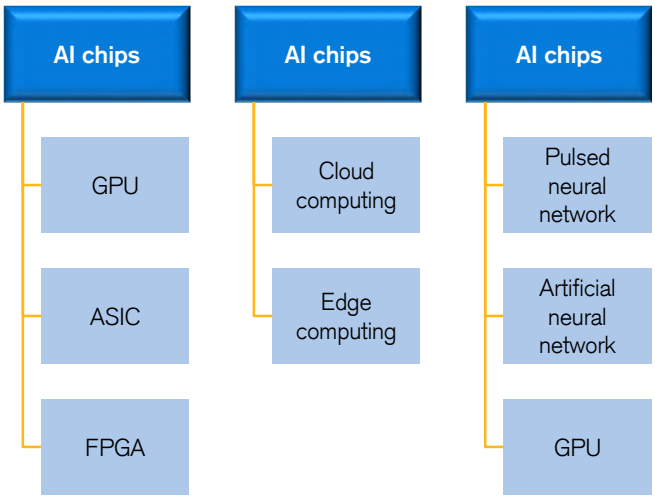
Source: iResearch, Credit Suisse research

AI chips

AI is a system with the ability to think for itself and embrace different types of machine-learning which requires minimal human intervention to learn from data to make accurate predictions. Deep-learning is a type of machine-learning that is capable of adapting itself to new data and training its systems to learn on its own and recognise patterns. The AI chip is designed to do particular AI tasks more efficiently to perform training and inference in the deep-learning process. An AI chip also uses "neurons" as a fundamental computing unit, unlike logic gates. The "neurons" in neural networks are simple computer processes. In other words, the AI chip is actually an accelerator to efficiently execute tasks in low power.

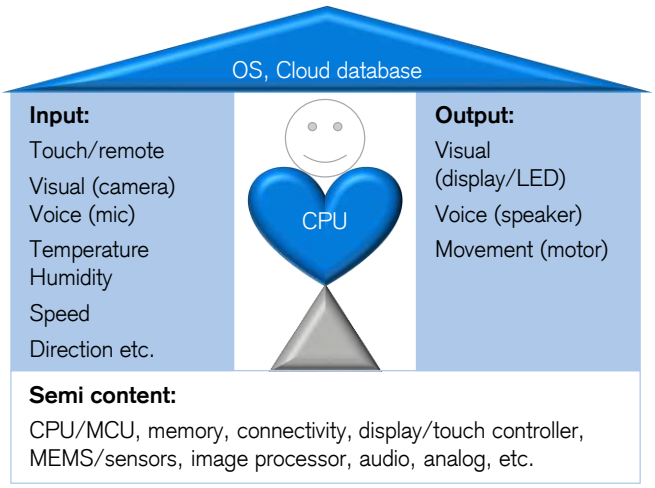
We see mainstream AI chips are GPU (graphics processing unit), ASIC (application-specific integrated circuits), and FPGA (field-programmable gate arrays) type. The primary developers in FPGA include Intel, Amazon, Baidu, MSFT, and Alibaba Cloud. Nvidia is the primary developer for GPU-type AI chips. Google's Tensor Processing Unit (TPU) is an ASIC chip for accelerating deep-learning. TPU gets installed on the AlphaGo system. In China, Cambricon, Bitmain, and Canaan also develop AI chips in ASIC, but Cambricon focuses on terminal computing AI chip, while Bitmain and Canaan focus on cloud-computing or a central-processing AI chip. Cambricon has successfully developed AI IP—Cambricon 1A—for the Huawei smartphone while Bitmain is a dominant ASIC developer for blockchain/bitcoin mining, but its AI is only in the development stage.

Figure 61: Different types of AI chips



Source: Credit Suisse research

Figure 62: AI in robotics



Source: Credit Suisse research

AI algorithm

Visual information takes 70% of all the information human beings process every day. Visual intelligence, with more dimension of information to analyse, requires more complex analysis and computing power to identify objects and "make sense" from the images and videos. Visual intelligence includes visual perception, visual cognition and image and video understanding. Visual intelligence is one of the applications that AI could apply effectively.

Facial recognition is only a part of visual intelligence, but it is the biggest part as it is the most mature, and can be quickly applied to different industries to meet rigid demands, e.g., public surveillance. Based on iResearch analysis, the market size of AI-enabled surveillance for To Government (ToG) and To Business (ToB) markets (excluding storage, switch, network, and implementation/maintenance, etc.) in China is expected to grow from Rmb4 bn in 2017 to Rmb71 bn in 2022, with a CAGR of over 78% (2017- 22). Visual intelligence, especially facial recognition, is applied across broad industries, including, video surveillance analysis, advertisements, smartphone and mobile internet, financial services and other new areas. Video surveillance takes 68% (the largest) market share. Due to the high technology entry barrier and R&D investment, this market is dominated by a few internet giants (BAT), major AI companies (Face++, SenseTime, YITU), and industry companies developing AI capabilities (Hikvision, Dahua, Huawei).

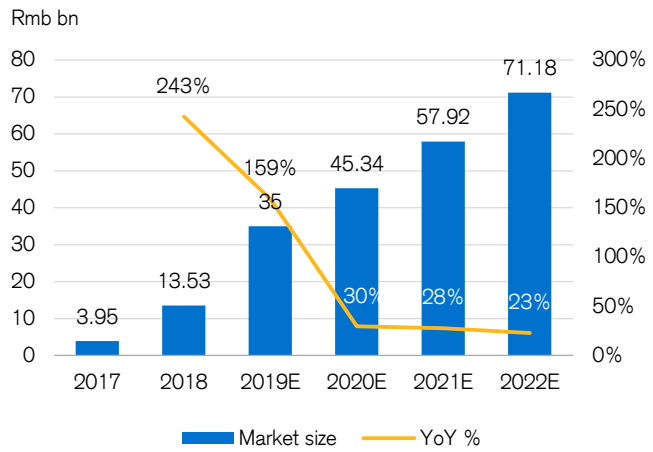
An AI-enabled video surveillance solution consists of front-end and back-end products. The smart cameras in the front-end and smart servers/storage in the back-end can be used independently. Smart cameras are network cameras added with chipset and AI solutions loaded. Smart servers are built from servers and storage items, together with AI solutions to extract facial features, recognise and match faces in the databases, and conduct image-searching services across multiple channels. The differences between single server solutions and platforms or supercomputing centres are mainly in: (1) image/video processing speed; (2) number of facial features recognised; (3) number of video channels that can be processed simultaneously; (4) ability to trace targets at real-time video-streaming; and (5) number of targets that can be focussed on at the same time. The server models used in this case are from Huawei, Sugon, Inspur, etc.

China AI algorithm providers SenseTime, Megvii (Face++), and YITU leverage their video intelligence capabilities across different industries. Besides video surveillance, we see them also providing solutions in facial recognition or video-processing in smartphones and internet, like fintech areas. Their solutions can also be used in smart city, smart healthcare, smart logistics, autonomous driving, retail customer analysis, etc.

AI hardware devices

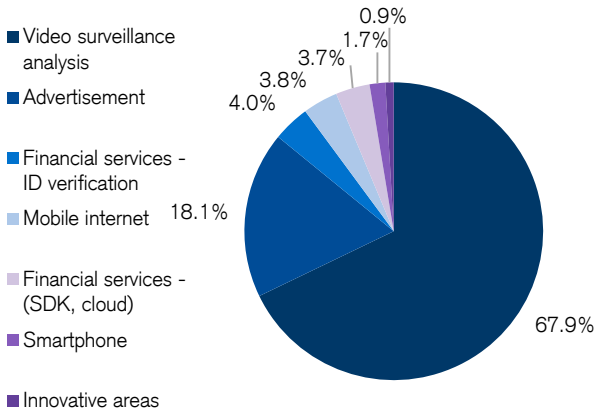
AI is moving towards edge devices from cloud/server. We see that increased computing power and sensor data along with improved AI algorithms are driving the trend towards machine-learning to be run on terminal devices, such as smartphones and automotive, rather than in the cloud.

Figure 63: China 2017-22 AI+ surveillance market size (excl. ToC segment)



Source: iResearch report, Credit Suisse research

Figure 64: China visual intelligence market share



Source: iResearch report, Credit Suisse research

AI robotics

AI is possibly the most exciting field in robotics. We see the increasing integration and connection between robotics and AI. Robots are programmable machines which are used to carry out a series of actions autonomously, or semi-autonomously. With embedded machine-learning capability, robots could perform complex tasks and interact with human beings.

We think the next generation of robots may use artificial intelligence (AI) to develop independent robots that can perform a variety of tasks without human supervision. The market is still in an early stage, and we believe today's AI robots are not "real" enough yet. The AI robot development is led by American and Japanese makers, but China aims to catch up.

The robotics market contains two major segments: industrial robots and service robots.

- **Industrial robotics** is a technology used to automate a variety of manufacturing processes across the Automotive, Electrical and Electronics, Food and Beverage, Semiconductors industries, etc. Industrial robots are programmed and automated with high precision and sustainability to control manufacturing processes. They help in enhancing manufacturing efficiency as well as improving the quality of products to a great extent by maintaining stability in performance. Moreover, they could offer low operational expenses that help vendors increase throughput and profitability when labour costs are sensitive.
- **Service robotics** is an intelligent machine technology that performs a variety of tasks that might be simple or complex, time-consuming, and repetitive. Service robots are classified into two wide divisions: professional robots and personal/domestic robots. Professional robots have the ability to work in challenging environments such as underwater, defence, and security and surveillance applications. Personal/domestic robots can perform household applications such as window and floor cleaning, grass mowing, vacuuming, personal transportation, home security and surveillance, and personal aid and assistance.

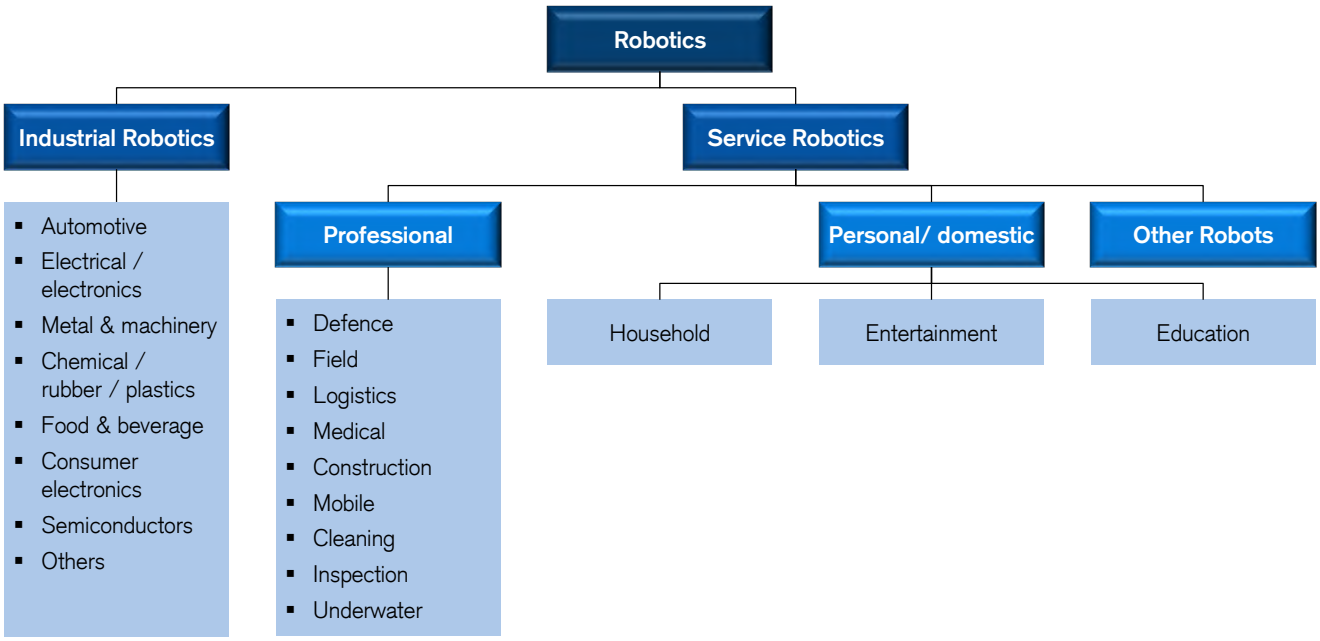
Enabled AI robotics could allow the machine to perform the specific tasks in an intelligent way without human supervision. It also allows the machine to improve its efficiency and accuracy through the deep-learning process. With computer vision and voice-recognition technologies, AI robots could interact with human beings effectively. Research And Market forecasts the AI robots market could grow by 29% CAGR during 2018-23 from US$3.49 bn in 2018 to US$12.36 bn in 2023.

Defence applications accounted for 19% of the total shipment of professional service robots in 2016 according to International Federation of Robotics (IFR). It expects its shipment growth to achieve 15% CAGR during 2017 to 2020. The majority of units sold were unmanned aerial vehicles (UAV). Other applications include unmanned ground base vehicles, demining, hazard disposal, firefighting, etc. These defence robots allow operators to monitor dangerous situations remotely. Also, they are developed to replace human beings to handle dangerous environments with manageable risks and costs. Apart from military use, UAV can be used in mass market for entertainment. We think Chinese players are leading in the affordable consumer UAV market. DJI has captured 70% or above market share in consumer UAV market in 2019 (source: Qianzhan Research). The ASP can be as low as a few thousands of renminbis for small vehicle. Industrial/commercial UAVs can sell at a few hundred thousand renminbis in China.

Enabled AI robotics could allow the machine to perform specific tasks in an intelligent way without human supervision. It also allows the machine to improve its efficiency and accuracy through the deep-learning process. With computer vision and voice recognition technologies, AI robots could interact with human beings effectively. Research And Market forecasts the AI robots market could grow by 29% CAGR during 2018-23 from US$3.49 bn in 2018 to US$12.36 bn in 2023.

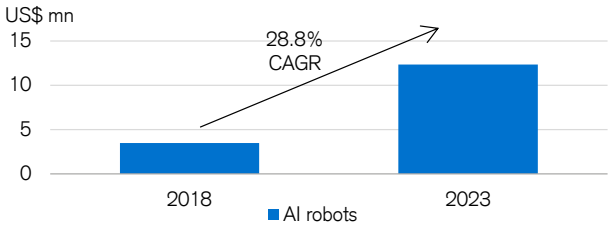
In personal or domestic robots, household, entertainment and education are major applications. IFR forecasts ~30-35% CAGR for household service robots shipment during 2018-20E, while entertainment and education service robots would be ~20-25% CAGR.

Figure 65: Robotic system categories



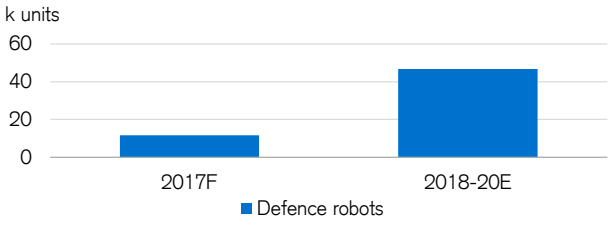
Source: Credit Suisse research

Figure 66: ~29% CAGR for AI robots market



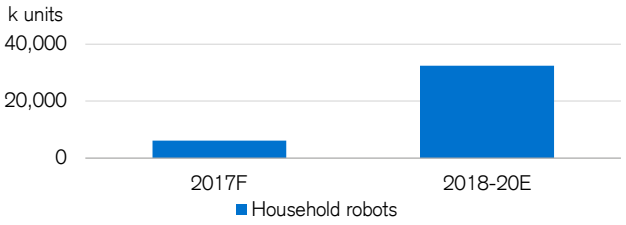
Source: Research And Market, Credit Suisse research

Figure 67: ~15% CAGR for defence service robots shipments in 2018-20E



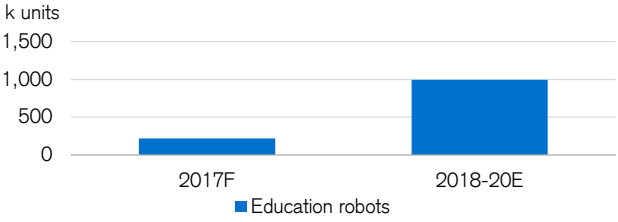
Source: IFR, Credit Suisse research

Figure 68: 30-35% CAGR for household service robots shipment in 2018-20E



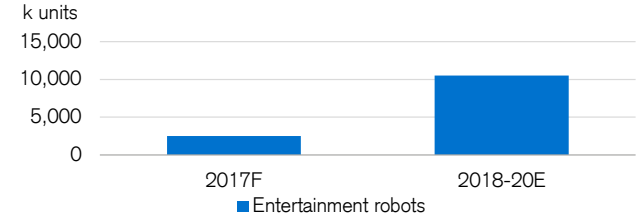
Source: IFR, Credit Suisse research

Figure 69: ~20-25% CAGR for education service robots shipment in 2018-20E



Source: IFR, Credit Suisse research

Figure 70: ~20-25% CAGR for entertainment service robots shipment in 2018-20E



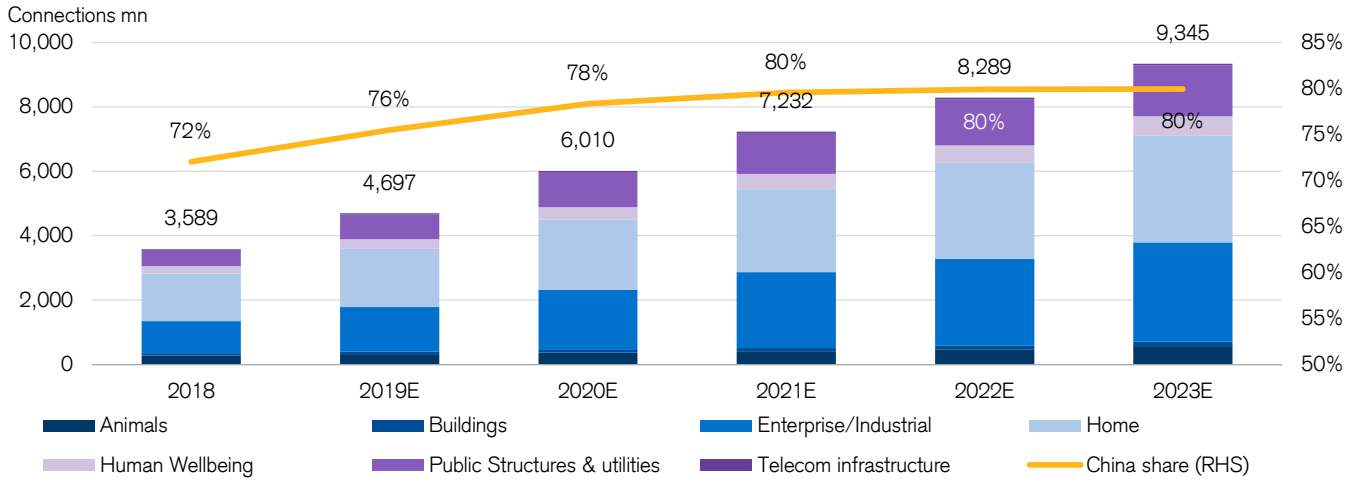
Source: IFR, Credit Suisse research

AIoT

AI is moving towards edge devices from cloud/server. When things such as smart devices, home appliance, sensors and other equipment are connected to the internet, they are called internet of things (IoT). When artificial intelligence is added to the IoT it means that these devices can analyse data and make decisions and act on the data without human involvement.

In China, the development of the 5G network and the adoption of big data and smart-city solutions were enabled by the massive adoption of IoT. IDC estimates that there were 3.6 bn IoT units connected in Asia ex-Japan at the end of 2018, and forecasts it will grow nearly three-fold (21% 2018-23E CAGR) to reach 9.3 bn connected units in 2023; China will continue to lead and account for 80% of the AxJ region's connections. The strong adoption growth will be primarily driven by the continuous capacity expansion of 4G LTE networks in China, as well as the introduction of 5G New Radio. 5G's ultra-low latency, enhanced mobile broadband capabilities will be a key enabler for enterprise/industrial and public sector applications, which IDC expects to grow fastest at 25% 2018-23E CAGR. We see a huge potential for the AIoT—first, connecting the IoT together and creating business opportunities by leveraging the data, and also offering smarter solutions.

Figure 71: Asia (ex-Japan) IoT connections by segment and China's market share



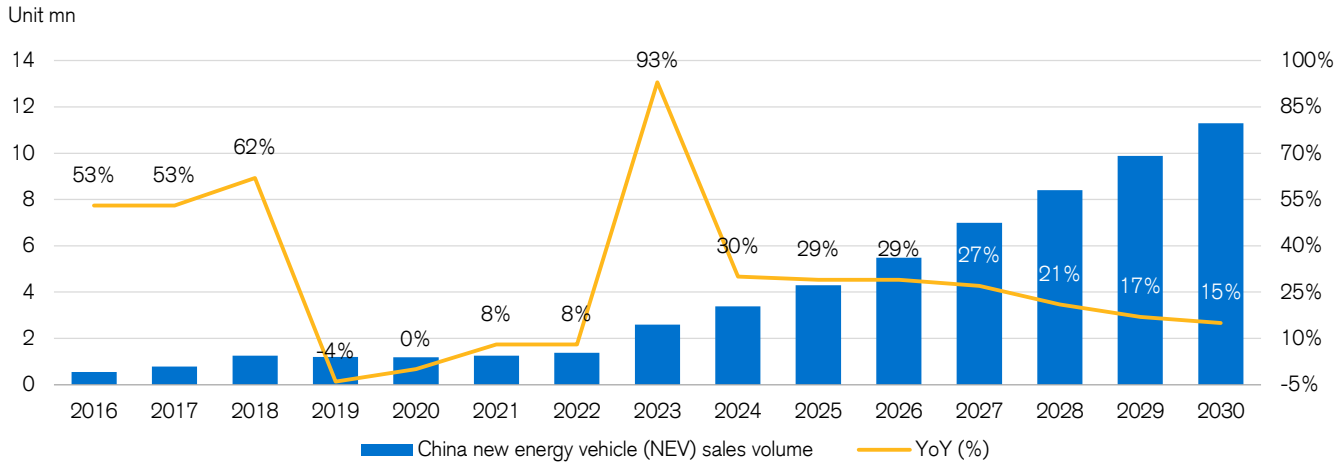
Source: IDC, Credit Suisse research

Auto

We identified three mega-trends in the smart electric vehicle (EV) industry—electrification, autonomous driving, and smart features. We think those successful new smart EV start-ups can innovatively and rapidly ride these mega trends to transform the entire automobile industry. We expect China NEV sales to enjoy a 23% 11-year CAGR from 2019 to 2030 when NEVs will achieve a penetration rate of 50% (NEV volume as % of overall). Specifically, we expect pure-electric vehicles' selling price to decline to a similar level as the ICE (internal combustion engine) vehicle in 2023, which is estimated to trigger a 93% YoY NEV volume jump in 2023. The China NEV market is driven by: (1) strong government support; (2) notable unserved demand due to car plate restrictions; (3) rapidly growing charging infrastructure and Chinese "NEV credits" regime; and (4) declining battery price and NEV ownership cost.

Six NEV makers are listed in the "2019 China unicorn companies' development" report. We believe these smart EV unicorns could succeed in the future auto industry, given: (1) they are fast-moving companies with high flexibility; (2) these companies are willing to take reasonable risks; and (3) they are all innovation-oriented with strong R&D capabilities.

Figure 72: China total new energy vehicle (NEV) sales outlook



Source: China Passenger Car Association, Credit Suisse estimates

Smart electric vehicle market: tremendous opportunity to build start-ups

- **Smart EV market: tremendous opportunities to build start-ups.** Tesla's success has reignited enthusiasm for start-ups trying to build smart electric cars in recent years. Currently, China is home to hundreds of start-ups betting on the smart electric car revolution because the country's commitment to lead the world in cars powered by electricity and smart features has enticed investors to pour billions of dollars into start-ups. More importantly, Tesla's story shows how, by going against the grain, new smart EV entrant can challenge incumbent industry leaders. This is because start-ups are inherently innovative, agile and adaptive, which gives them an advantage over more rigid structures prevalent in larger corporations. Also, successful new enterprises can challenge the accepted norms with new concepts, and in doing so, transform the entire industry.
- **China new energy vehicle ("NEV") market**—a strategically important, burgeoning market. The China NEV market is the largest market globally (54% market share in 2019). China NEV sales volume enjoyed an exponential growth of 84% nine-year CAGR, from only 4.9k units in 2010 to 1.2 mn units in 2019. We expect China NEV sales to enjoy 23% 11-year CAGR from 2019 to 2030, when NEV will achieve the penetration rate of 50% (NEV volume as a percentage of overall). The China NEV market is driven by: (1) strong government support owing to worsening air pollution and focus on the independence of petroleum resources; (2) notable unserved demand, due to car plate restrictions to combat severe traffic congestion; (3) rapidly growing charging infrastructure and Chinese 'NEV credits' regime to push more NEV supply and (4) declining battery price and NEV ownership cost.
- **Increasing penetration of autonomous driving functions.** We expect the China ADAS markets to see a fast growth of 24% CAGR over 2015-30. This is mainly due to: (1) falling components prices; (2) regulatory push for ADAS adoption via setting ADAS penetration target and inclusion of ADAS features in vehicle safety rating assessments; and (3) automakers adopting ADAS features to attract customers and increase volume.
- **Increasing use of smart features.** Similar to the trend of feature phones upgrading to smart phone, vehicles will also evolve into smart cars equipped with futuristic and practical features in the future. With smarter features, users could have cars with more comfort, entertainment, functionalities, and so on, than ever before.

Introduction

Tesla's success has reignited enthusiasm for start-ups trying to build smart electric cars in recent years. Currently, China is home to hundreds of start-ups betting on the smart electric car revolution because the country's commitment to lead the world in cars powered by electricity and smart features has enticed investors to pour billions of dollars into start-ups.

Meanwhile, Tesla's story shows how, by going against the grain, new smart EV entrants can challenge the incumbent industry leaders. This is because smart EV start-ups are inherently innovative, agile and adaptive, which gives them an advantage over more rigid structures prevalent in larger, traditional, incumbent automobile corporations.

Innovative: Smart EV start-ups might assess a problem from a fresh perspective, to create unique solutions. For example, Tesla first used Panasonic's 18650 batteries with its proprietary battery pack technology in 2009, to power the Roadster—the only highway-capable pure electric vehicle—which had never been done by other car makers before.

Agile and adaptive: Smart EV start-ups are generally small enough to act with freedom, thus can be more responsive. In contrast, larger enterprises generally have an established procedure and a system of hierarchies, which limit the incumbent industry leaders' new innovations; and moreover, shifting business focus is much harder, whereas smart EV start-ups can jump full throttle into new projects. For example, Tesla is able to sell vehicles directly, due to no legacy arrangements with a dealer network, NEV's low maintenance needs and the use of internet to handle most automotive transactions. Incumbent auto makers do not plan to give up their established offline dealer network for inventory adjustment purpose, which is good for traditional ICE vehicles (higher maintenance needs) but looks unnecessary for EVs.

We had identified three mega-trends in the smart EV industry: electrification, autonomous driving and smart features. We believe these successful, new and smart EV start-ups can innovatively and rapidly ride on these mega trends, to transform the entire automobile industry.

China smart electric vehicle unicorns

Six new energy vehicle (NEV) makers are listed in the '2019 China unicorn companies' development' report. We believe these smart EV unicorns could succeed in the future auto industry given: (1) they are fast-moving companies with high flexibility; (2) these companies are willing to take reasonable risks; and (3) they are all innovation-oriented, with strong R&D capabilities.

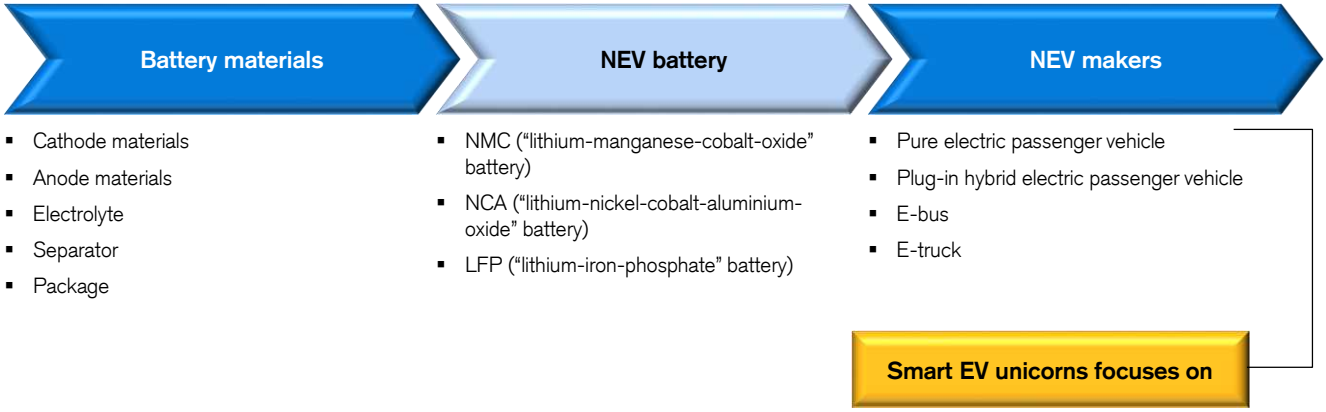
In the rapidly growing NEV market, companies that satisfy customers' needs faster could gain the first-mover advantage and build their brand image by providing appealing products. As these smart EV unicorns are full of young talent who know market trends very well, they could move much faster than the traditional automakers, in respect of customer satisfaction. The highly smart and electrified vehicle products would help them build up their brand image and deliver a strong financial performance.

Given the uncertainties of NEV development, many traditional automakers are very cautious on their investment in NEV R&D and supply chains. The reasons

are as follows: (1) traditional automakers have a strong presence in internal combustion engine (ICE) vehicles, so they are not very willing to shift their focus as they could still make tremendous profit from ICE vehicles; and (2) traditional automakers have established a series of strict protocols to follow, so they are less responsive to the market than new smart EV unicorns. On the contrary, these smart EV unicorns have no liabilities on traditional ICE vehicles and they could take reasonable risks to launch innovative products.

All of these smart EV unicorns have strong R&D capabilities as they know innovation is most important for a new economy such as the NEV industry. Thanks to their emphasis on R&D capability, the smart EV unicorns could develop products with a high integration of electrification, autonomous driving and smart features. The innovation-oriented strategy could help them succeed in the upcoming smart EV era.

Figure 73: China Smart EV unicorns' positioning in NEV sector value chain



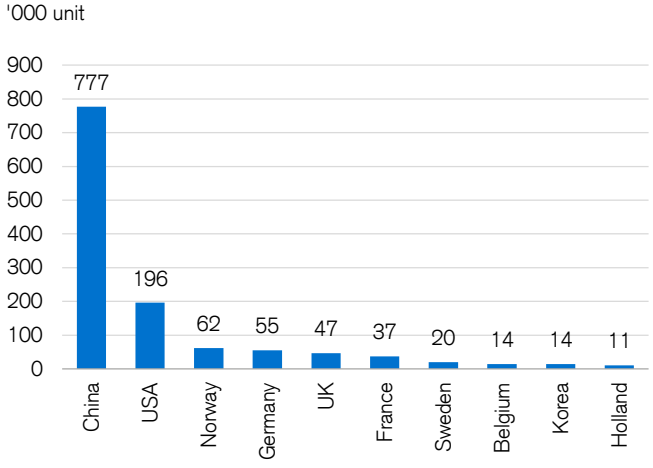
Source: Company data, Credit Suisse research

Figure 74: Smart EV unicorns listed in the "2019 China unicorn companies' development" report

Companies	Valuation (USD bn)	Year of establishment	Whether listed
AIWAYS	1.6	2011	No
Banma Network	1.0	2014	No
Byton Auto	2.5	2009	No
Leap Motor	1.0	2014	No
Leading Ideal	2.9	2009	No
Youxia Motors	3.4	2013	No

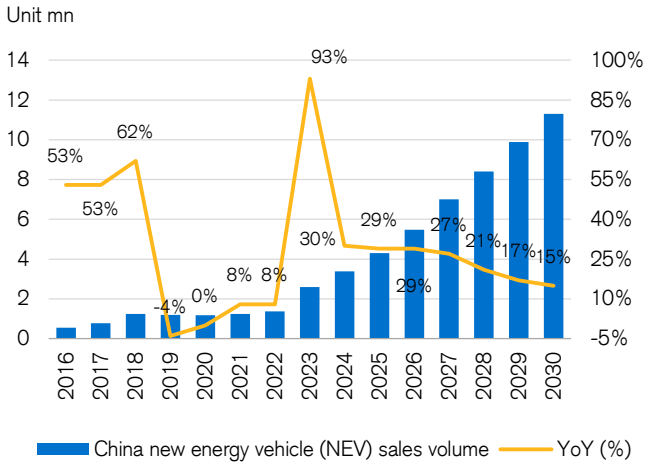
Source: Company data, Credit Suisse estimates

Figure 75: Global top 10 largest NEV markets in 2017



Source: European Automobile Manufacturers Association

Figure 76: China NEV passenger vehicle sales outlook



Source: China Passenger Car Association, Credit Suisse estimates

Megatrend #1: Electrification

China new energy passenger vehicle: A burgeoning market with huge potential

Benefitting from favourable Chinese government policies and strong support, China's new energy vehicle ("NEV") market has outperformed the global NEV market significantly. The China NEV market was the largest globally, with a dominant position at 54% market share in 2019. China NEV passenger vehicle sales enjoyed an exponential growth of 84% nine-year CAGR, from only 4.9k units in 2010 to 1.2 mn units in 2019. Looking ahead, we forecast China new energy PV sales to enjoy 23% 11-year CAGR from 2019 to 2030 (hitting 12 mn units), when NEVs are expected to achieve a notable penetration rate of 50% (NEV PV volume as a percentage of the overall PV).

The high 23% 11-year CAGR will be driven by:
(1) notable unserved demand due to car plate restrictions;
(2) improving infrastructure and strong regulatory push;
(3) declining battery price and NEV ownership cost;
(4) being more fun to drive, with better acceleration and handling than ICE.

- **NEV: A strategically important sector for technology and energy security**

The auto industry has been recognised as a strategically important industry for China. It is a significant contributor to China's GDP (>4%), employment (~4.7 mn workers), taxation (~4.5%) and national retail sales (~25%). In the traditional ICE auto market, Chinese players have lagged behind global leading peers in terms of technology, i.e., powertrain. The NEV market is expected to create a level playing field and allow Chinese NEV companies to play a greater role.

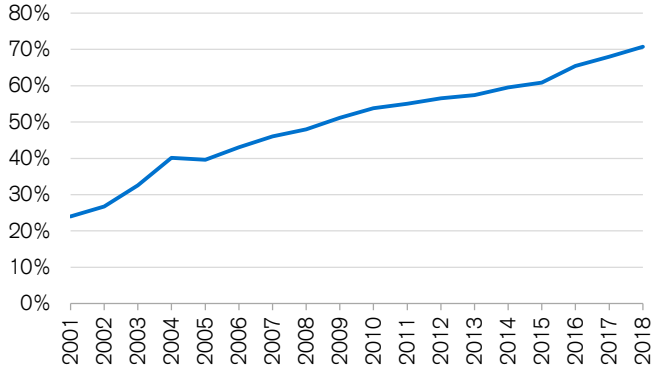
Meanwhile, the Chinese governments, both central and local, are pushing for the adoption of NEVs—with strong policy support, owing to worsening air pollution as well as focus on the independence of the petroleum resource.

- **Notable unserved demand due to car plate restrictions**

The strong regulatory requirements in China are one of the drivers for NEV penetration. Due to severe traffic congestion and air pollution, certain areas (including Beijing, Shanghai, Shenzhen, Hangzhou, Guangzhou, Tianjin and Hainan province) controlled the purchase of ICE vehicles by restricting annual car plate numbers.

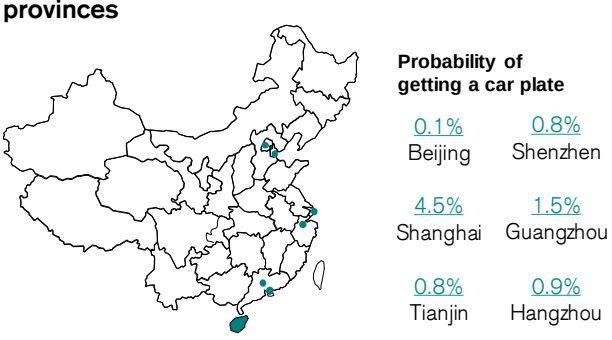
The probability of obtaining car plates in these areas is very low. The total number of car plate applicants from those areas reached around seven million by end-2019, representing a huge unmet demand for car ownership. These people could be prospective NEV buyers, given there is either no limitation on NEV plates, or a much higher probability of obtaining NEV plates.

Figure 77: Imported crude oil as % of total oil consumption



Source: National Bureau of statistics

Figure 78: Car plate restriction in various cities and provinces



Source: Company data, Credit Suisse estimates

■ Improving infrastructure and strong regulatory push

Rapidly growing charging infrastructure should pave the way for NEV development, as charging facilities are a major bottleneck for NEV demand currently. Thus, to attract prospective NEV purchases, building sufficient charging infrastructure and providing convenient charging services is critical. As a result, both public and private sectors (including state-owned electricity companies and automotive OEMs) are investing heavily in a nationwide charging network to alleviate potential customer concerns.

By end-2019, there were only 1,219,000 charging piles. And the number is estimated to rise to 1,743,000 units in 2020, 20 mn in 2025, and 80 mn units in 2030, according to Technology Roadmap for Energy-Saving and New Energy Vehicles from the Chinese Society of Automotive Engineers.

Meanwhile, the Chinese government introduced an 'NEV credits' regime in 2019 to push more NEV supply. This policy requires automakers to fulfil 10%/12% credits share target in 2019/2020. Failure to meet the NEV credits target will lead to the suspension of production for certain existing high-fuel-consumption models. As the conventional ICE car makers might face a deficit of NEV credits, trading of NEV credits is likely to be a new revenue and profit stream for NEV makers.

■ Declining battery price and NEV ownership cost

Improvements in battery technology, coupled with economies of scale, continue to reduce battery costs. Lithium-ion battery prices have fallen, from over Rmb2,800 per kWh in 2014 to Rmb723 per kWh today.

Cost is expected to further decrease to ~Rmb500 per kWh by 2023. The declining battery price could narrow the pricing/cost gap between NEV and ICE products, which could stimulate NEV demand.

From the perspective of the total cost of ownership, NEVs enjoy significant operational-cost advantages. Battery charging energy cost (~Rmb0.2/km) is approximately 75% lower than ICE cars' fuel cost (~Rmb0.8/km), and repair and maintenance costs are also significantly lower due to NEVs' simpler structure (no oil, belts, filters, etc., and brake life is much longer than ICEs) and lower maintenance frequency.

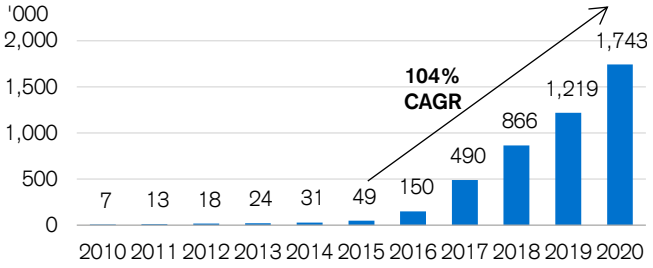
■ Better acceleration and handling: more fun to drive

Electric vehicles have better acceleration and handling as compared with ICE.

Better acceleration: Because of the way electric motors work, there is no torque curve. This means that the vehicle has full power instantly, unlike ICEs where the engine needs to rev to a certain level to get full power. It also means there is no need for transmission gearing in an EV.

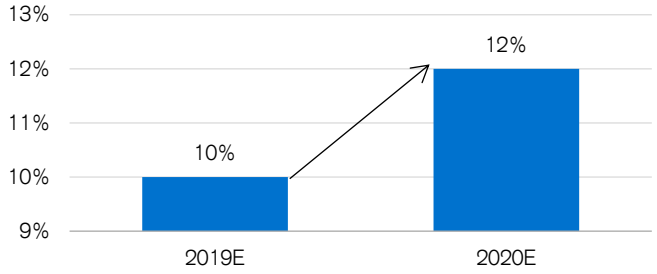
Better handling: If designed correctly, EVs can have a lower and more balanced centre of gravity. The battery can be flat and run along the bottom of the vehicle, compared to an ICE, where the engine's centre of mass sits higher and has to be at the front or back. Additionally, All-Wheel Drive, which improves handling and overall driving performance, is much easier and less costly. In an EV, one can just add a drive-unit at the front of the car. However, in an ICE, complicated mechanical components are required to transmit engine power to the rear wheel.

Figure 79: Nation-wide charging infrastructure (charging pile) outlook



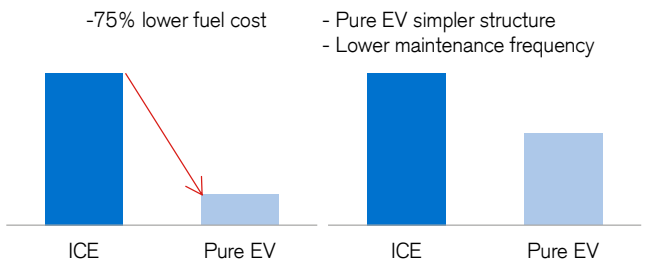
Source: Chinese Society of Automotive Engineers, Credit Suisse research

Figure 80: NEV credit ratio requirement from 2019



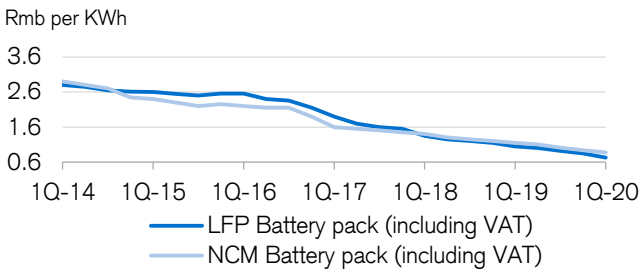
Source: Credit Suisse research

Figure 81: Significant advantage in fuel cost, repair and maintenance



Source: Credit Suisse research

Figure 82: Lithium-ion battery pack price outlook



Source: Credit Suisse research

Megatrend #2: Autonomous Driving

We expect the Chinese ADAS markets to see a 24% CAGR over 2015-30. Our confidence on the increasing penetration of ADAS features in vehicles is mainly due to: (1) falling prices of components (including sensors, semiconductors, etc.) because of mass production and intensifying competition; (2) regulatory requirements push on ADAS features via setting ADAS penetration targets and inclusion of ADAS features in vehicle safety rating assessments and (3) willingness of more OEMs (e.g., GM, PSA, Geely, Audi, Tesla, etc.) to incorporate appealing, high-tech ADAS features in the vehicles, to fight for volume given the increasing competition in the overall auto sector.

According to SAE (Society of Automotive Engineers) International, the classification system of autonomous driving has six different levels, from fully manual (L0) to fully automated systems (L5). In short, L1-L2 require a human driver to monitor the driving environment but the system could partially (L1) or fully (L2) participate in steering and acceleration/deceleration execution (to replace a human foot). Starting from L3, the automated driving system would be responsible for monitoring the driving environment (to replace the human eye) and to engage in dynamic driving (operational + tactical tasks) from L4. In L3-L4, autonomous driving could be realised in certain areas, and fully autonomous driving rolls out in L5.

ADAS-related component prices to further decline

As the industry is in the initial stage, with many new technologies and uncertainties on technology development roadmap, most companies are still in the heavy R&D stage without generating any profit. However, we expect ADAS-related component prices to reduce rapidly, thanks to the increasing market competition and mass production of new products. In other words, we believe component suppliers have the incentive to reduce the expensive pricing of certain products (i.e., Lidar, night vision) in order to gain more market share. We expect selling prices to reduce 10% each year from 2017 to 2030.

In addition to the fierce market competition that results in price cuts, mass production is another key factor to reduce component prices. Given that every new product needs large amounts of R&D and capital expenditure, the components suppliers could enjoy higher operating leverage with bigger production volume. Moreover, with experience gained from production, the product yield rate could also be sequentially increased, which would help cost efficiency.

Regulatory push for ADAS features

In China, the regulators are more aggressive. (1) They are setting specific localisation targets for certain ADAS systems; and (2) C-NCAP included ADAS functions in the latest auto safety ratings assessment in 2018.

For the specific localisation target setting, Action Plan for Developing Intelligent Connected Vehicles issued by Ministry of Industry and Information Technology specified that China aims to obtain key smart-car and ADAS technology, and to set up internet connectivity and smart-car R&D and manufacturing systems by 2020. By 2025, China plans to set up complete clusters of internet connectivity and smart-car R&D systems, manufacturing and related industry.

In March 2016, the China Association of Automobile Manufacturers issued 'the opinion on auto industry's development for 13th five-year plan.' In the document, the association set the ADAS penetration rate target for the overall China auto market. The association aims to achieve 50% penetration for L1 ADAS and 10% penetration for L2 ADAS by 2020, which is guided by the China strategic document. We see this ambitious target as being achievable, given: (1) Chinese local OEMs have the incentive to increase market penetration by adding more high-tech features in their products; (2) the sales portion of more ADAS-content-added luxury brands will rise to 11% by 2020, as per our estimate; and (3) the overall China auto products are less cost-sensitive with respect to adding L1 ADAS functions, as L1 ADAS would incur <Rmb3,000 of incremental costs by 2020.

On 3 April 2018, China's Ministry of Industrial and Information Technology (MIIT), Ministry of Public Security, and Ministry of Transport jointly announced the 'management regulation of smart and internet connectivity car road testing' policy. Based on the policy, many cities issued autonomous driving test licences to both traditional OEMs and leading technology companies. The Shanghai local government became the first one to issue the licences to SAIC and another internet-enabled connected new energy vehicle maker. Shortly after Shanghai's licences, Beijing, Pingtan city of Fujian province, Chongqing and Shenzhen issued licences to more than 10 companies and R&D centres.

To include ADAS features in the C-NCAP 2018 guidance, the China Automotive Technology and Research Centre (CATARC) issued a Chinese version of 2018 New Car Assessment Program management guidance, which specified that the active-safety-related ADAS functions are included in the rating guidance. The guidance assesses a vehicle's automatic emergency braking system and electronic stability control systems for the active safety part. The active safety portion as a percentage of the total score is 15%, and only vehicles with >90% score could get a 5+ star (highest) rating, which means vehicles without active-safety-related ADAS functions will not be rated as the highest safety product.

OEMs' motivation to add more ADAS features

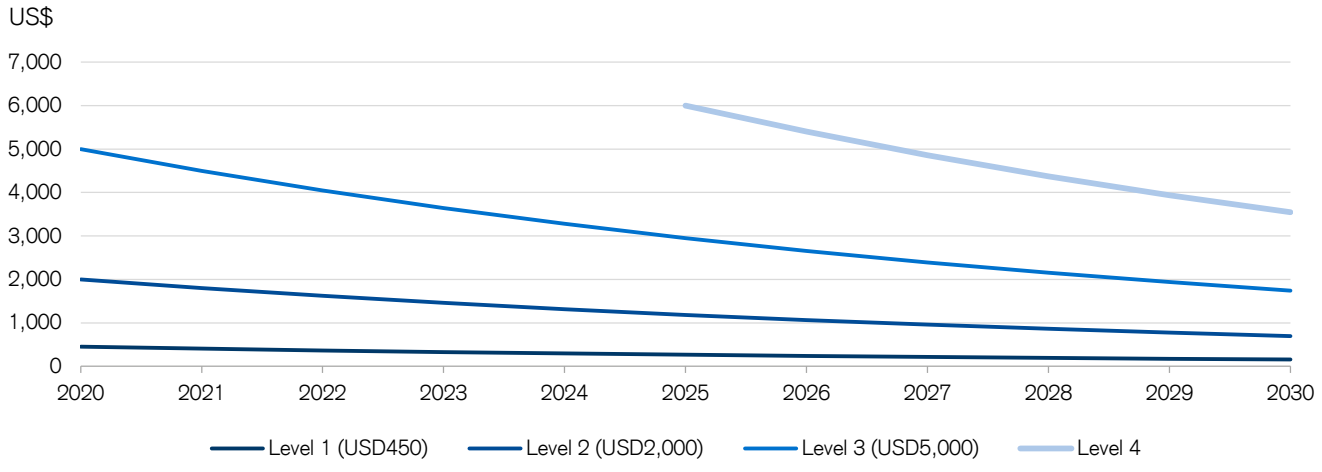
Though the overall auto sector experienced a slowdown, we have seen OEMs launching an increasing number of products with appealing ADAS features, e.g., Greatwall Haval new H6 SUV vs Geely Boyue SUV, to boost sales volume. Geely Boyue's 2018 Sports version is equipped with AEB and ACC functions, but the new H6 SUV, which is priced similar, does not have any ADAS function. As a result, H6 SUV sales volume declined from 60k units per month to ~12k units currently, but Geely Boyue sales jumped to >20k units per month. Thus, we believe

OEMs have the incentive to add more ADAS features as the high-tech features could attract more customers and boost sales volume meaningfully.

Every OEM has set up a timetable to achieve a certain level of ADAS, and we expect the ADAS market to significantly grow on the OEMs' determination on ADAS development, especially contribution from the Chinese local OEMs. We believe the current consensus estimate on global ADAS market size is low due to underestimation of the Chinese ADAS market.

To compete with the global OEMs, Chinese local OEM brands have put in a lot of effort in ADAS R&D. We believe the competition in ADAS technology is good for both global and Chinese local brands' OEMs. For example, Geely launched its ADAS roadmap, named G-PILOT, in May 2017. In 2018, Geely had started adding G-PILOT 2.0 system on its products to be launched. G-PILOT 2.0 is equivalent to L2 ADAS technology, which could realise adaptive cruise control (ACC), lane keeping assist (LKA), intelligent cruise control (ICC), etc. Geely aims to realise L3 ADAS by 2020 and will start using L4 autonomous driving technology internally in 2024.

Figure 83: Price drop of ADAS features on sequential sensors' ASP decline



Source: Credit Suisse estimates

Figure 84: China strategic document ADAS and autonomous driving penetration rate target

	China strategic document key smart car components localisation target
Auto optical systems	by 2020, >80% will be locally produced
Auto radar systems	by 2025, >40% will be locally produced
High Digital GPS system	by 2025, >60% will be locally produced
Integrated control system	by 2025, >50% of core control unit will be locally produced, and 30% of control unit chips will be locally made

Source: Credit Suisse estimates

Figure 85: Issue of autonomous driving test licences in China

Shanghai	SAIC/Internet NEV maker/BMW
Beijing	BAIC New Energy/Baidu/Daimler/Pony.ai/Internet NEV maker
Shenzhen	Tencent
Chongqing	FAW/Geely/GAC/Dongfeng/BAIC Foton/Baidu
Pingtan, Fujian	Baidu/King Long
Guangzhou	Autonomous driving road prepared and policy in place
Hangzhou, Zhejiang	Autonomous driving road prepared and policy in place
Jinan, Shandong	Autonomous driving road prepared and policy in place

Source: Credit Suisse research

Figure 86: C-NCAP auto safety ratings assessment guidance

Ratings		Minimum scores required by segment				
				Active safety		
		Passenger protection	Pedestrian protection	2018	2019	2020
5+	★★★★★☆	≥95%	≥75%	≥50%	≥55%	≥72%
5	★★★★★	≥85%	≥65%	≥26%	≥38%	≥55%
4	★★★★	≥85%	≥50%	≥26%	≥26%	≥26%
3	★★★	≥65%	≥40%	/	/	/
2	★★	≥55%	≥20%	/	/	/
1	★	<55%	<20%	/	/	/

Source: : CATARC

Megatrend #3: Smarter features

Similar to the trend of feature phones upgrading to smartphones, vehicles will also evolve into smart cars equipped with futuristic and practical features in the future. A full-function smart car system includes smart software and hardware, i.e., sensors, touch display, etc. With the smart car system, users could have more comfort, entertainment, functionalities, and so on, than ever before.

The smart car system is like a trusted friend to users. It could (1) recognise users through facial recognition; (2) listen to users' needs and respond to users through audio system; (3) adapt to users' habits, thanks to its memory functions. The smart car system could connect with all the users' devices to activate various functions, i.e., help users to track health status, communicate with friends, watch videos and listen to music, and post pictures to the social media, etc., while in the car.

Taking a real-life scenario as an example, when users approach the smart vehicle, the smart key could sense the distance between the user and the vehicle. The camera at the B-pillar of the vehicle will recognise users when they enter its functional range. After facial recognition identifies the user through the camera, the door will automatically open and the seat will adjust to the user's saved position. The in-car voice system could greet user by saying 'Hello Sir/Madam', etc. As the smart car system has memory functions, the entire car dashboard and interactive display in the middle of the vehicle could turn to the user's preferred topics and prioritise functions the user prefers. Moreover, a user could command the system by voice or gesture, to do something while driving, e.g., turn on the air-con or take a picture, etc. The smart navigation system with online and deep-learning functions could choose the most efficient route and adjust with changes in the traffic situation. Users could command the vehicle and inspect safety of the vehicle remotely, e.g., start the car or turn on the air-con in advance, etc., by using the phone app. To ensure the functionalities of a smart car system, high levels of integration and safety considerations are very necessary.

Given the smart car system is a combination of software and hardware, the way they could work could directly impact the user experience. The software needs to have machine-learning and cloud services so that it could learn a user's driving habits, memorise all the gestures and react to a user's command the next time. Moreover, a high quality of hardware is also required. The touchable display is going to be the most used for user-vehicle interactions. Camera at the B-pillar of the vehicle is also going to be frequently used every time drivers open the vehicle door.

Though a smart car system could improve user entertainment in the vehicle, safety is still the first priority. A smart car system has many functions to better protect users. For example, the heads-up display, user voice interface and enhanced gesture control are all designed to improve the safety of the vehicle. These functions could help drivers keep their eyes on the road and lower the accident rate. Moreover, given the vehicle will have more electronic functions, the over-the-air system updates could help vehicles fix the potential problems as soon as the system providers discover a bug. It is not necessary for vehicle users to drive to a shop for system updates any more.

Figure 87: Smart car system features and functions

Smart features	Functions
Facial recognition	(1) Unlock the door automatically (2) Adjust vehicle's settings to whoever is driving (3) Receive video feedback from the camera
Touch display	(1) Large screen to relieve visual fatigue (2) Easier to control with touchable screen
Enhanced gesture control	(1) Enable drivers to input characters just by finger (2) More comprehensive than pure voice control
Voice user interface	(1) Command the smart car system while driving (2) Recognise users' voice and provide tailor-made functions
Intelligent navigation	(1) Up-to-date HD maps (2) Adjust route based on real-time traffic (3) Memorise users' driving habits
App remote control	(1) Enable drivers to start the vehicle in advance (2) Inspect vehicle's safety remotely (3) Integrate key function into app
Head-up display	(1) Shorten distraction time while driving (2) Real time monitoring vehicle's condition
Over-the-air system update	(1) Ensure smart car system up-to-date (2) Save users' time to come to 4S shops (3) Back up vehicle's information
Connection with devices	(1) Check schedules on vehicles' screen (2) Control smartphone through voice commands; (3) Use smartphones from the vehicle's dashboard

Source: Company data, Credit Suisse estimates

Healthcare to 'Big health'

The China 'Big health; market reached Rmb4.9 tn in 2017, as per the government. The China pharmaceutical sector has delivered strong sales growth since 2010, which could be regarded as a strong indicator of the whole healthcare sector. Growth remains strong and the sector's overall pharmaceutical sales growth in 1H18 outperformed the past few years with a new drug included in the NDRL (National Drug Reimbursement List). Strong growth in the past ten years drives a lot of attention as well as capital to this market.

A few unicorns were born and grew up in 'Big health'. A combination of internet, technology, artificial intelligence and healthcare are the major areas of these companies. We identify five unicorns focusing on different parts of the value chain in the healthcare sector. They either focus on one part of the value chain or help connect entities in the chain.

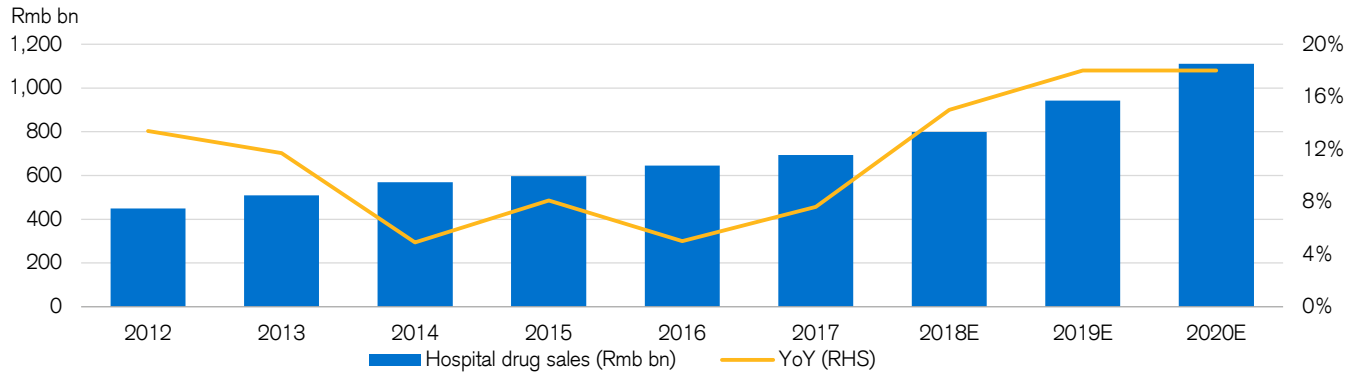
The China healthcare sector has been a focus area of investment in terms of all scale of investment, number of projects, number of investors and investment per project. The investment has stayed above US$4 bn every year since 2015. All private equity, M&As and IPO investments have been booming.

Overall, the investment focus is on pharmaceuticals as it dominates the China healthcare sector. Recently, investments started to surge on medical devices and biotech.

With intensive investment in the sector, a number of unicorns have been born and become leaders in their respective sectors. From 2007 to 2013, the investment focus was on pharmaceuticals and medical devices. Then, the investment focus shifted to hospitals, online medical and precision medicine. Recently, artificial intelligence and primary healthcare have been the most popular segments. Quite a few unicorns grew up during the tailwind period, with the highest focus on innovative drugs and internet + healthcare.

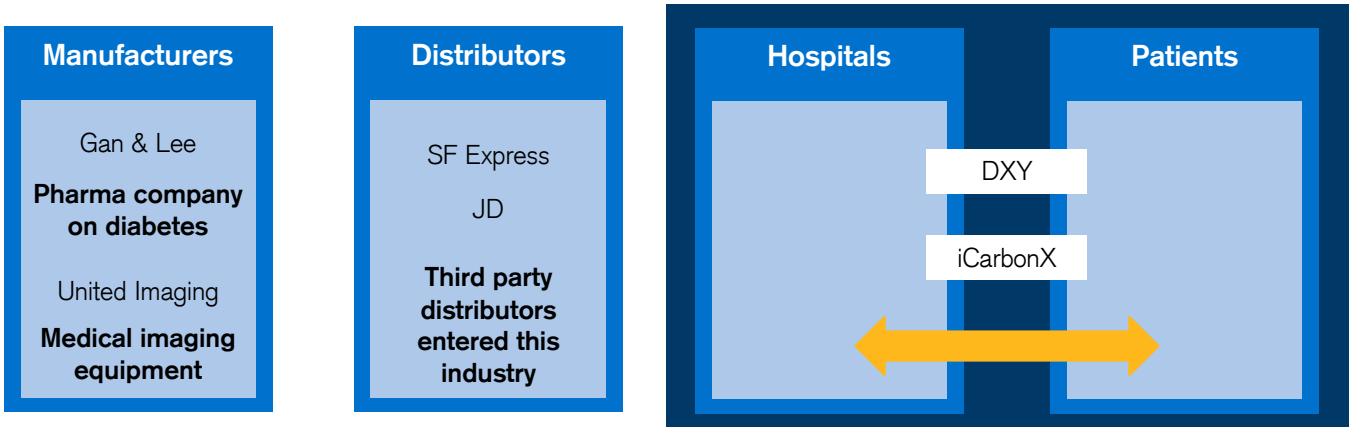
A few funds are quite active in investing in the healthcare sector, with SBCVC, Sequoia Capital and Matrix Partners investing in most unicorns. That also led to the variance of healthcare unicorns vs the traditional pharma companies. The unicorns are located in Beijing and Shanghai, closer to where the funds and capital are located, while the traditional pharma companies are located in Jiangsu, Zhejiang and Guangdong.

Figure 88: China hospital drug sales growth



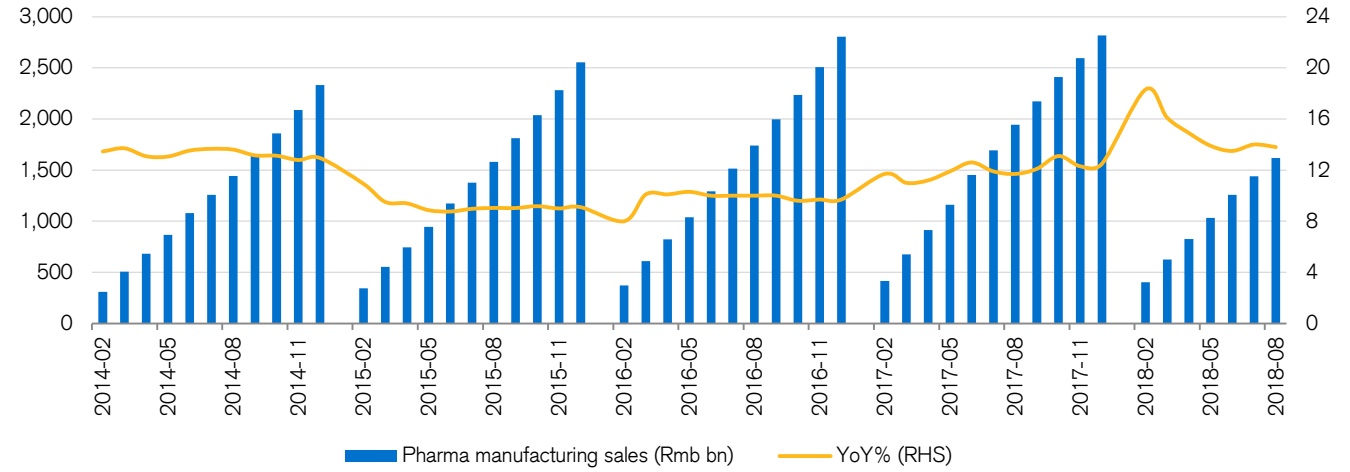
Source: IMS, Credit Suisse research

Figure 89: Unicorns in the 'Big health' value chain



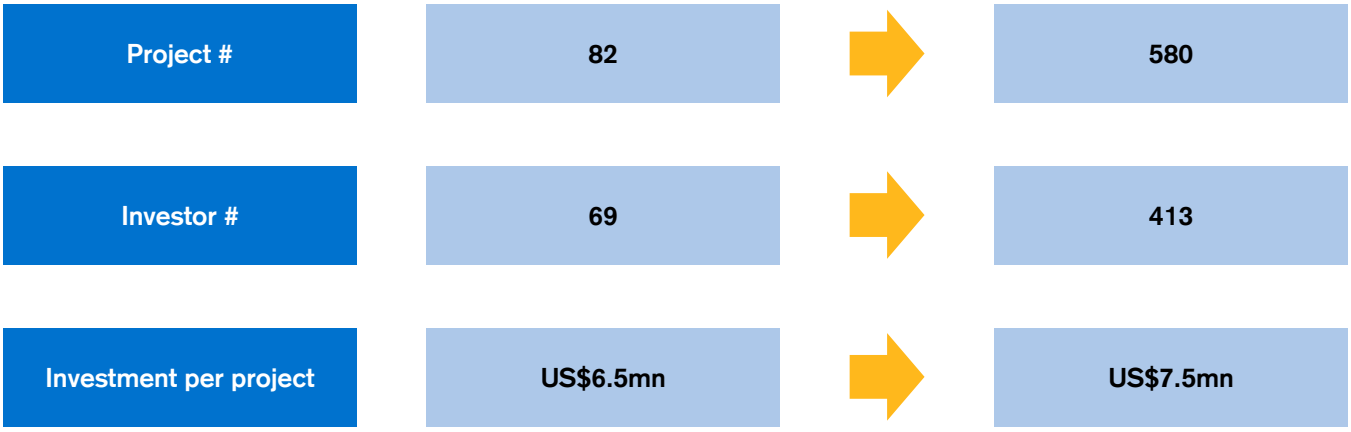
Source: Credit Suisse Research

Figure 90: China pharmaceutical sales YTD



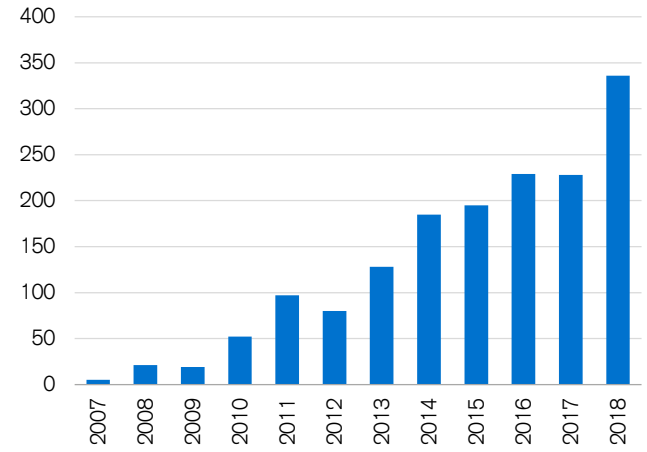
Source: Wind, Credit Suisse research

Figure 91: Healthcare investment 2007 vs 2018



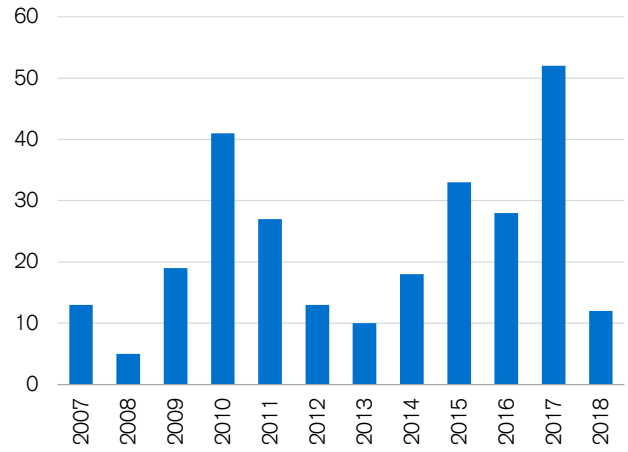
Source: Credit Suisse research

Figure 92: Scale of healthcare M&A (US$mn)



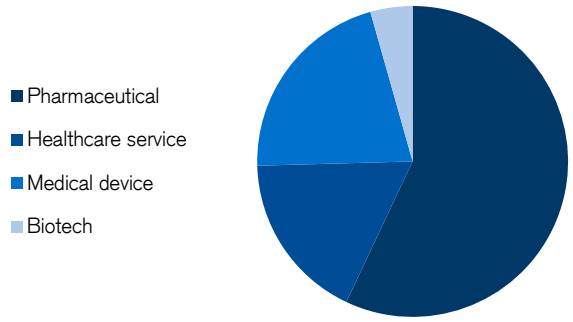
Source: Credit Suisse research

Figure 93: Number of healthcare IPO



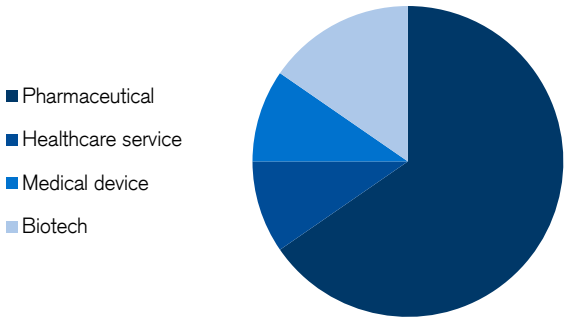
Source: Credit Suisse research

Figure 94: Investment segment of M&A



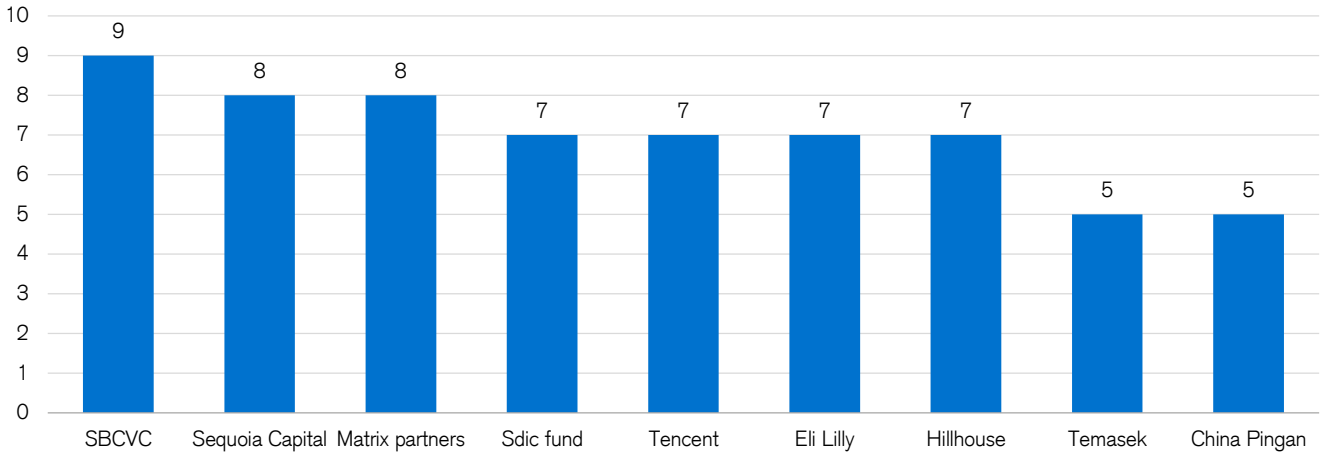
Source: Credit Suisse research

Figure 95: Investment segment of IPO



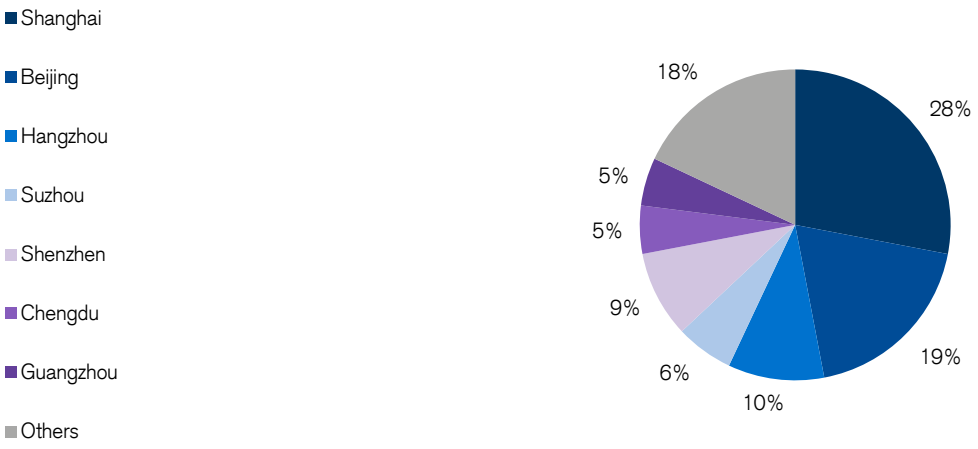
Source: Credit Suisse research

Figure 96: Most active funds in healthcare sector based on # of unicorns



Source: ITJuzi

Figure 97: Shanghai and Beijing have the most healthcare unicorns located



Source: ITJuzi, Company data

Internet + healthcare

Internet + healthcare is building a platform based on internet connecting doctors, patients, pharmacies, hospitals even distributors. Capital started to flow into this sector since 2011 and has steadily increased since then. In 2011, 315 investors invested US$2 bn in internet + healthcare while in 2014, 602 institutions invested US$7 bn in this sector per Askci Consulting.

BAT (Baidu, Alibaba and Tencent) have been actively involved in this sector. In 2014, Tencent invested US$70 mn into DXY. Gooddoctor listed in Hong Kong in 2018 as the first IPO of an online consultation company.

The market size of internet + healthcare kept increasing and reached Rmb49.1 bn in 2018. The user numbers are also increasing and reached 590 mn in April 2020. Online consultations are accelerating expansion off-line to monetise the network and registered accounts online.

Currently, Pingan Good Doctor, DXY, Chunyu Yisheng and Haodf are leaders in this industry. Pingan Good Doctor (1833 HK) listed in Hong Kong in May 2018 with an IPO market cap of HK$60 bn. The mentioned companies all act as a platform to connect institutions in internet + healthcare while they have different focuses. We give a brief on the three largest platforms—Pingan Good Doctor, and DXY—here.

Pingan Good Doctor (1833 HK)

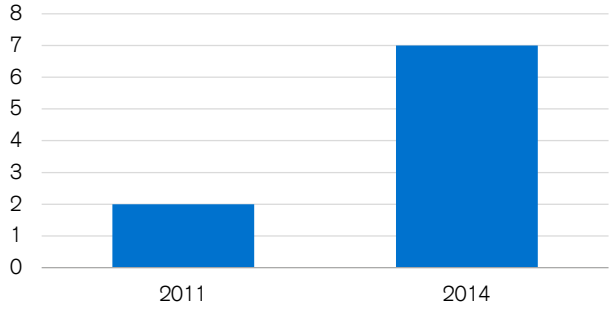
The company has established a platform offering online family doctor services, empowered by its AI assistant and in-house medical team, and offers a variety of offline services via its network of healthcare service providers. The company also collaborates with insurers in providing value-added services to policy-holders that enable the synergistic integration of insurance and healthcare based on its database. As of 31 December 2015, 2016 and 2017, the company had 30.3 mn, 131.5 mn and 192.8 mn registered users. In 2015, 2016 and 2017, average MAUs, calculated as the average of MAUs for each calendar month, reached 5.6 mn, 21.8 mn and 32.9 mn across its platform.

DXY

Founded in 2000, DXY started as a search engine for doctors to search for medical bibliographies and communicate with each other. It then developed into a discussion forum for doctors to share their experience and knowledge. It now has 5.5 mn professionals registered as members among which 2 mn are doctors. Its business could be categorised into channels for doctors, for patients, for medical institutions and commercial services. The company has already built four off-line clinics.

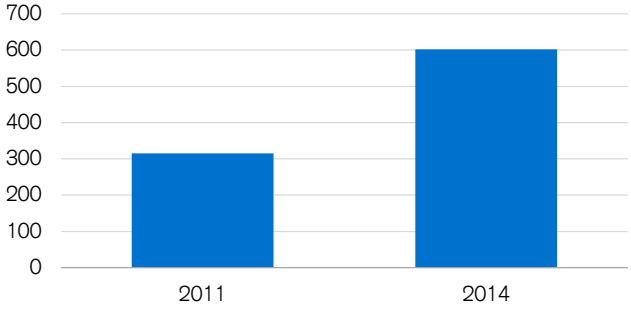
Compared to the other platforms, DXY's focus is on the doctor resources. DXY provides a channel for doctors from different regions to search for medical bibliography and communicate with each other. The company is also building a search engine that includes all the China approved prescription drug instructions to help doctors prescribe drugs. An app named "DXY Drugs Information" was designed for mobile phones.

Figure 98: Investment in Internet + healthcare (US$ bn) 2011 and 2014



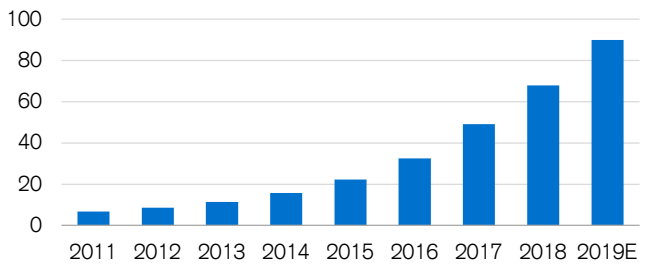
Source: Askci Consulting

Figure 99: No. of investors in Internet + healthcare 2011 and 2014



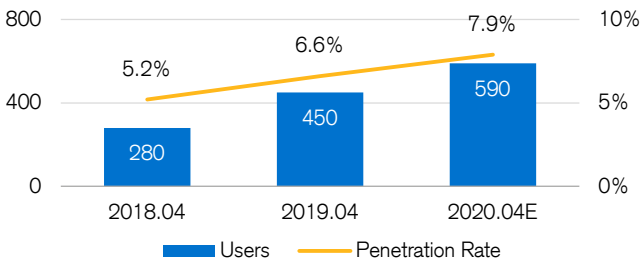
Source: Askci Consulting

Figure 100: Market size of internet + healthcare (Rmb bn)



Source: iResearch Global

Figure 101: Number of internet + healthcare users number (mn) and penetration rate



Source: Mob Research Institute, Credit Suisse Research

AI + healthcare

AI + healthcare is also applied in medical devices and platforms for digitising, analysing and understanding life. Medical imaging is an important sector for application of AI and healthcare. The healthcare resources focus on big cities and the rate of misdiagnosis is much higher in lower tier cities. China is facing a shortage of radiologists and pathologists with strong growth in radiology. The radiology market was delivering a 30% CAGR in the past three years while the growth rate of radiologists was only 4.1%. Training a pathologist takes around ten years including five years of basic clinical medical training and five years of resident standardisation training. The shortage is not likely to be fulfilled in the short run. Based on the data from the Chinese Medical Association, the misdiagnosis rate in China is around 27.8%.

AI application in medical imaging will help ease the situation of a shortage of pathologists. It could help reduce the misdiagnosis rate and at the same time help popularise new medical devices to lower tier hospitals which do not have experienced radiologists and pathologists. United Imaging Healthcare is the pioneer in China's medical imaging industry.

The company focuses on designing and manufacturing Color Doppler ultrasound and MRI (magnetic resonance imaging) and digital medical imaging technology. Traditionally, these markets are dominated by MNCs in China. The company is applying artificial intelligence into these areas. Its technology allows penetrating Color Doppler ultrasound and MRI to low-tier hospitals without specialists. AI would help improve the accuracy.

Its MRI product has received CE mark in 2011. The company received the first FDA 510 (K) clearance for iuStar300 and its international installation reached 1,000 units in 2016. UIH has more than 100 professional staff in its R&D team and an R&D centre was set up in California in 2012. In 2017, its products and services had entered into 700 hospitals in China.

Application in life style management

AI and healthcare could be applied in lifestyle management with the support of wearable devices. A full image of the body's data could be collected by wearable devices continuously. Data from millions of people could be collected and new signals about health could be found based on the data. Pre-signals could be found through continuously collecting data from the body and could help increase the early diagnosis rate. iCarbonX is a pioneer in this market.

iCarbonX is a company targeting to create a platform for digitising, analysing and understanding life. It combines data from new biological measures with experiential data from millions of people and uses advanced AI to search the data for new signals about health, disease and aging, thus allowing people easily understand and monitor their present health status, predict trends and improve lifestyle.

Other applications of AI + healthcare

The AI + healthcare is now applied in the drug discovery stage. The industry has already seen the benefits from applying machine learning to identify and screen potential drug candidates. The leading pharmaceutical companies are co-operating with AI-driven companies in developing a system with the hope of reducing R&D costs. For example, Pfizer is using IBM Watson, a system that uses machine learning to power its search for immune-oncology. The other important application of AI in healthcare is in surgeries. Most related applications fall into automation of suturing, machine learning for evaluation of surgical skills, machine learning for improving surgical robotic materials and machine learning for surgical workflow models.

Figure 102: Process of lifestyle management with AI

Source: Company data, Credit Suisse estimates

Fintech

Fintech investment in China to rebound after contraction

Investments in Chinese fintech firms amounted to US$1.9 bn in 2019, contracting sharply from a record shattering level of investments in 2018 (US$25.5 bn) during which Ant Financial, a fintech leader owned by Alibaba, completed a US$14 bn Series C funding round in 2018 with valuation reaching US$150 bn, exceeding many financial and internet giants. Some sub-segments of the broad fintech in China gradually matured after emerging from mega deals in the prior years. At the same time, despite a pause in investment, a number of less mature fintechs are growing rapidly, including microfinance and consumer finance. At a technology level, China is also seeing significant interest in AI, cloud-solutions, big data and blockchain. As these burgeoning areas of fintech evolve and gain more traction, fintech investment in China is expected to rebound.

We see three drivers for the rapid development of the fintech industry in China.

Firstly, the internet boom and technology advancements make fintech possible. The number of internet users in China grew by around 560 mn from 2008 to Jun-2019 and the mobile penetration ratio reached 98% as of Jun-2019 (vs. 39% as of 2008). Along with rising penetration of internet, people became more tech-savvy and open to online services, from e-commerce, online hotel/flight booking, to financial services.

Technology advancements, including AI, Blockchain, Cloud Computing and Big Data (or "ABCD" in an acronym) are pillars for fintech. These four are the mutual development of dialectical relations among themselves.

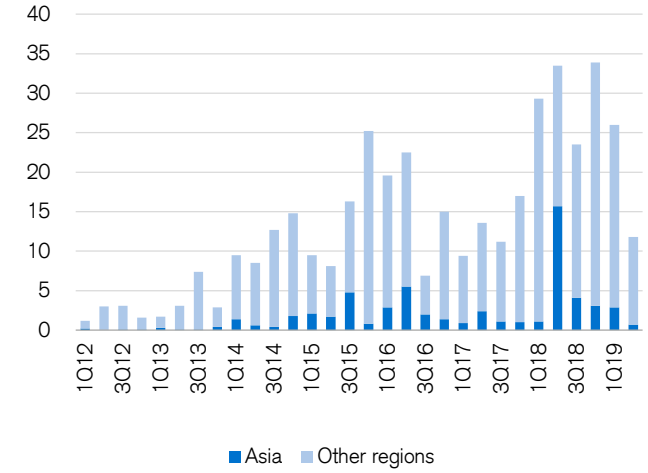
- First, cloud computing is the foundation for big data. Cloud computing has been developing rapidly since 2007 and its core model is about large-scale distributed computing in which it provides such resources as computing capacity, storage, and internet space in the form of services that can be used on demand. It lowers the cost and intensity of information technology; therefore, big data generally shows the following characteristics: large quantity, ubiquitousness, low cost and low value intensity.
- Secondly, big data and cloud computing together drive the development of AI. The research progress of AI is seen mainly in machine learning in recent years, where machines learn rules and patterns from historical data via algorithms and then use such rules and patterns to recognise new samples or predict the future in an intelligent way.
- Blockchain, compared to the other three concepts, is at an earlier stage and Chinese companies are still looking for applications for this technology. The intelligence contracts could be used to prevent risk of system breakdown and enhance data security.
- The underserved demand for financial services of mass market individuals and small- and micro-enterprises makes fintech desirable. Take online lending as an example: traditional financial institutions used to focus on corporate loans for SOEs and mortgages for individuals. As of 2018, credit cards per person in China were only 0.49, far below 0.9 in the UK, 2 in Korea and 2.6 in HK. Besides, Oliver Wyman estimates that the financing gap of SME (i.e. unmet financing demand) will grow at 14% CAGR in 2017-22E. Fintech companies, leveraging on advanced technologies, could extend the reach of financial services.

Key trends in the sector:

- *More integrated business model:* FinTech start-ups usually focus on a single underserved financial product initially but they gradually move from mono-product to multi-product to expand customers' digital footprint.
- *More aggressive incumbents:* The incumbents either actively invest in fintech startups or allocate more resources to develop in-house fintech capabilities. Competition between fintech companies and incumbents inevitably intensifies in some areas but more partnership opportunities have been emerging as well.
- *Tightened regulations:* in the past two years, regulators supervised this industry more closely and tried to eliminate various loopholes to better protect fintech customers. This trend is likely to continue, which lifts entry barriers for the industry, pushes consolidation and supports long-term healthy development.
- *From fintech to techfin:* Many industry players regard technology services to financial institutions as their new growth driver and strategic focus.

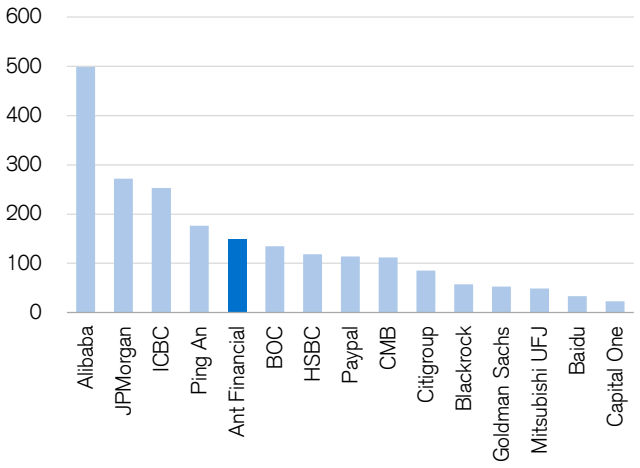
Go global: there is great potential in the overseas market and many players have been expanding to reach a broader user base and explore local applications of their successful experiences in China.

Figure 103: Investment activity (VC, PE and M&A) in fintech companies (US$ bn)



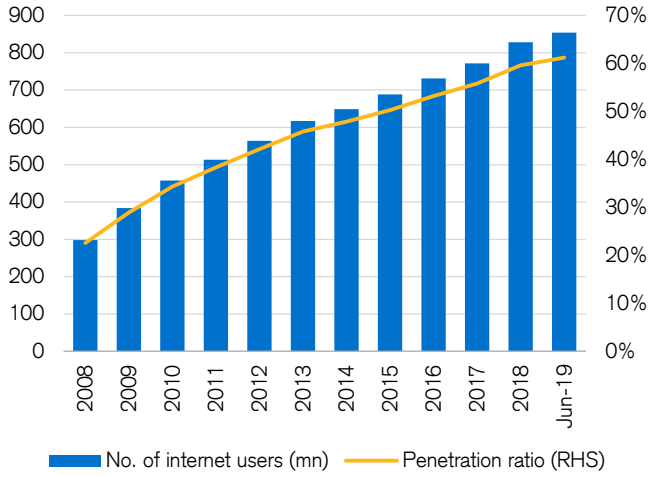
Source: KPMG, Credit Suisse research

Figure 104: Valuation comparison between Ant and financial and internet companies (US$ bn)



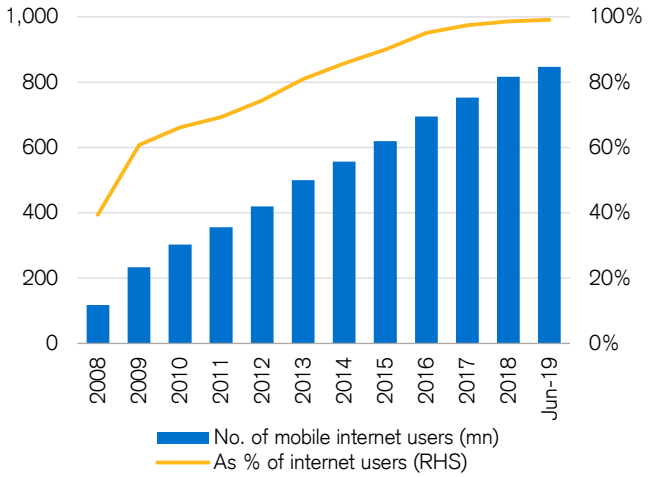
Source: Company data, Credit Suisse research

Figure 105: The number of internet users in China grew by ~560 mn from 2008 to Jun-2019



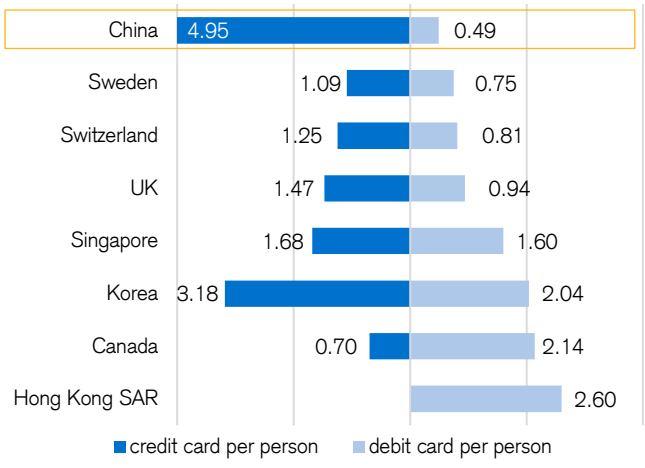
Source: CNNIC, Credit Suisse research

Figure 106: The number of mobile internet users grew by 730 mn from 2008 to Jun-2019



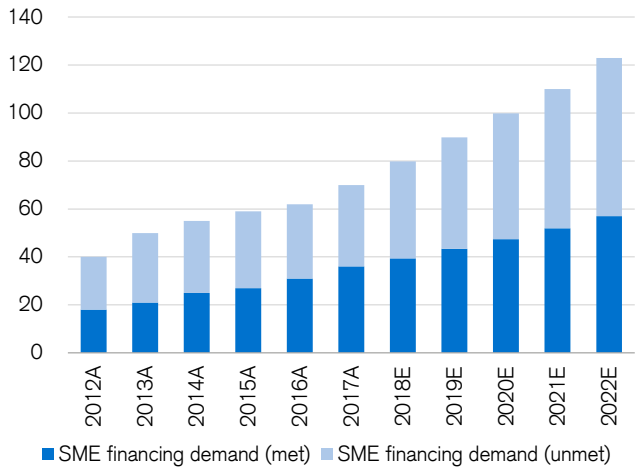
Source: CNNIC, Credit Suisse research

Figure 107: Worldwide bank card penetration as of 2018



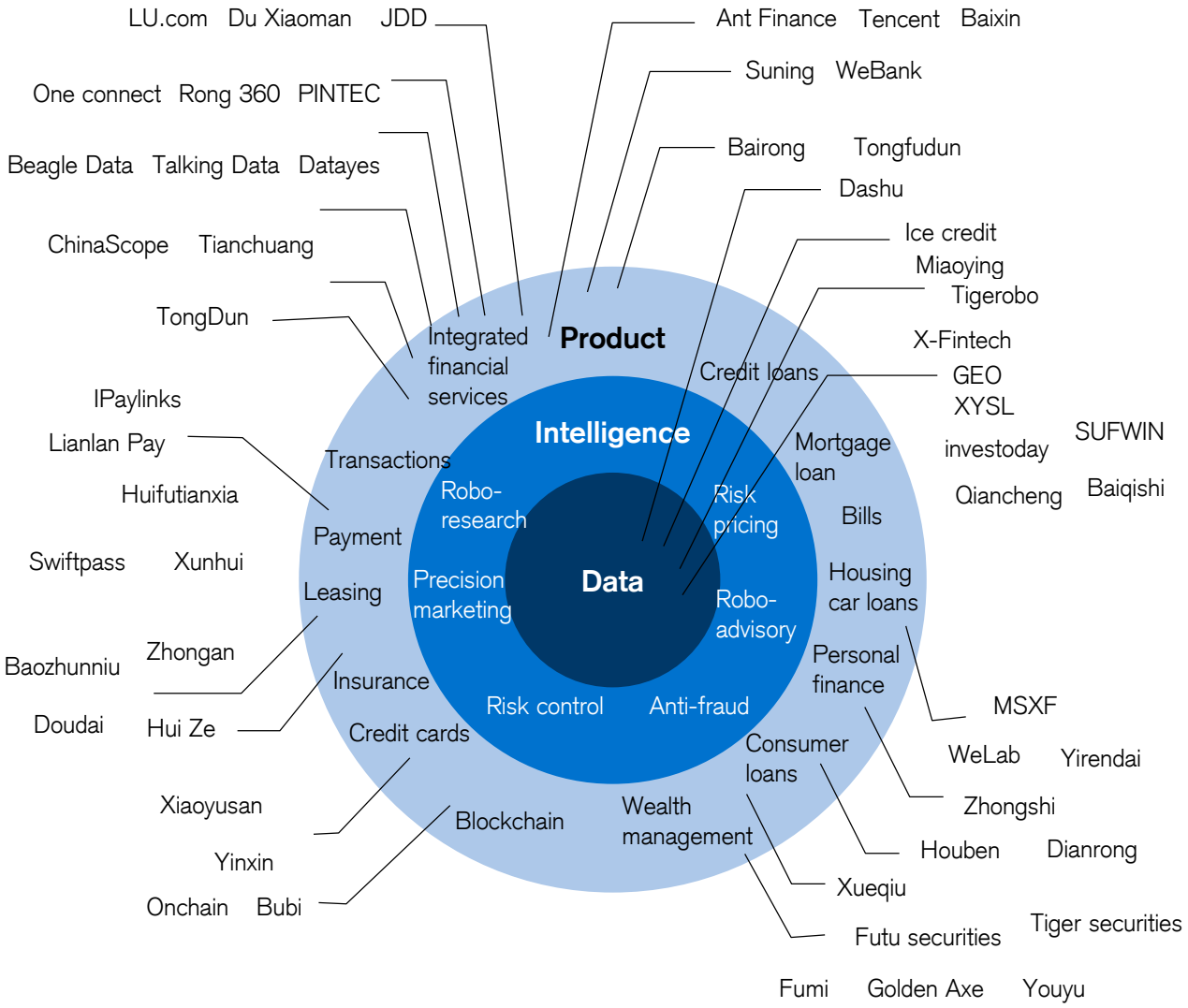
Source: BIS, Credit Suisse research

Figure 108: SME financing gap is expected to grow at 14% CAGR in 2017-22E (Rmb tn)



Source: Oliver Wyman, Credit Suisse research

Figure 109: Classification of KPMG 2018 China Leading FinTech 50 companies in terms of business model



Source: KPMG

“Chinese unicorns are driven more by business model innovation targeting the large consumer market in China

Selected unicorns

In this section, there will be a two-page write-up for 66 companies which have reached the status of a "unicorn", i.e., private companies but valued over US$1 bn according to CB Insights. A summary of the sector and valuation of these companies is shown in the figure below.

Figure 110: Structure and data flow of Prophet, 4Paradigm's core product

#	Name	Classification	Valuation (US$ bn)	#	Name	Classification	Valuation (US$ bn)
1	17zuoye	Internet/e-commerce/O2O/Games	1.0	34	Linklogis	Fintech	1.1
2	4Paradigm	AI/Big Data/Robotics/Software	1.2	35	LinkSure Network	Internet/e-commerce/O2O/Games	1.0
3	58 Home	Internet/e-commerce/O2O/Games	1.0	36	Mafengwo	Internet/e-commerce/O2O/Games	2.0
4	Aihuishou	Internet/e-commerce/O2O/Games	2.5	37	Maimai	Internet/e-commerce/O2O/Games	1.0
5	AIWAYS	Auto	1.6	38	Manbang	Internet/e-commerce/O2O/Games	6.0
6	Apus Group	AI/Big Data/Robotics/Software	1.0	39	Medlinker	Internet/e-commerce/O2O/Games	1.0
7	Banma Network	Auto	1.0	40	Meicai.com	Internet/e-commerce/O2O/Games	2.8
8	BeiBei	Internet/e-commerce/O2O/Games	1.0	41	Meizu	Hardware/Semi	4.6
9	Beike Zhaofang	Internet/e-commerce/O2O/Games	10.0	42	Mia	Internet/e-commerce/O2O/Games	1.0
10	ByteDance	Internet/e-commerce/O2O/Games	75.0	43	Miaoshou Doctor	Internet/e-commerce/O2O/Games	1.0
11	Byton Auto	Auto	2.5	44	Mofang Living	Property	1.0
12	Cao Cao	Internet/e-commerce/O2O/Games	1.6	45	Momenta	AI/Big Data/Robotics/Software	1.0
13	Dada-JD Daojia	Internet/e-commerce/O2O/Games	1.0	46	Nxin	Internet/e-commerce/O2O/Games	1.0
14	Dadi Cinema	Internet/e-commerce/O2O/Games	2.3	47	Orbbec	Hardware/Semi	1.0
15	Didi Chuxing	Internet/e-commerce/O2O/Games	56.0	48	Shansong Express	Logistics	1.0
16	Ding Xiang Yuan	Internet/e-commerce/O2O/Games	1.0	49	Terminus Technologies	Hardware/Semi	1.0
17	DJI Innovations	Hardware/Semi	15.0	50	Tongdun Technology	AI/Big Data/Robotics/Software	2.0
18	DT Dream	AI/Big Data/Robotics/Software	1.5	51	Trendy	Retail	2.0
19	Gan & Lee Pharmaceuticals	Healthcare/Biotech	1.6	52	Tujia	Internet/e-commerce/O2O/Games	1.5
20	Geekplus Robotics	Logistics	1.0	53	UCommune	Property	3.0
21	Hosjoy	Internet/e-commerce/O2O/Games	1.0	54	United Imaging Healthcare	Healthcare/Biotech	5.0
22	Huaqin Telecom	Hardware/Semi	2.2	55	VIPKID	Internet/e-commerce/O2O/Games	4.5
23	Huimin	Internet/e-commerce/O2O/Games	2.0	56	Womai	Internet/e-commerce/O2O/Games	1.0
24	Hujiang	Internet/e-commerce/O2O/Games	1.0	57	Xiaohongshu	Internet/e-commerce/O2O/Games	3.0
25	iCarbonX	Healthcare/Biotech	1.0	58	Xiaozhu.com	Internet/e-commerce/O2O/Games	1.0
26	iHome	Internet/e-commerce/O2O/Games	1.0	59	Xinchao Media	Internet/e-commerce/O2O/Games	1.7
27	Intellifusion	AI/Big Data/Robotics/Software	1.0	60	YH Global	Logistics	1.0
28	Jiuxian	Internet/e-commerce/O2O/Games	1.1	61	Yimidida	Logistics	1.2
29	KK Group	Internet/e-commerce/O2O/Games	1.0	62	YITU Technology	AI/Big Data/Robotics/Software	2.4
30	Kuaishou	Internet/e-commerce/O2O/Games	18.0	63	YOUXIA Motors	Auto	3.4
31	Kujiale	Internet/e-commerce/O2O/Games	1.0	64	Yuanfudao	Internet/e-commerce/O2O/Games	3.0
32	Leading Ideal	Auto	2.9	65	Zhuan Zhuan	Internet/e-commerce/O2O/Games	1.0
33	Leap Motor	Auto	1.0	66	Ziroom	Internet/e-commerce/O2O/Games	4.5

Source: Company data

17zuoye

Tina Long, Alex Xie

Company profile

17zuoye is a leading online K12 education platform that offers smart homework solutions to teachers and students in public schools. On a class basis, 17zuoye allows teachers to generate customised homework from a large quiz bank of over 20 mn questions and to grade homework online.

17zuoye announced its Series E financing of US$250 mn, led by Temasek, in March 2018. Other key shareholders included ZhenFund, Shunwei Capital, Tiger Global, and H Capital. Qiang Wang, partner of ZhenFund, serves as the chairman of 17zuoye.

17zuoye has entered 374 cities and 120k schools. There are 53 mn registered students, 2.7 mn registered teachers, and 27.4 mn registered parents on the platform. The company's MAUs exceeded 12 mn by Jan-2020. 17zuoye leverages its strong offline sales team of around 1,000 to penetrate into a large number of schools with free-to-use products and achieves high retention rate through continuous improvement of products and user experience with advanced technology.

17zuoye has two business models to monetise its large user base and vast amount of teaching and studying data.

- **Online tutoring class:** The company launched its online live-streaming tutoring course '17xue'. 17xue online tutoring classes now cover mathematics, Chinese, and English for primary-school students, based on its strong operating system and data analytical capacity. It also tried low-price promotion courses and worked to improve conversion to normal-price enrolment.
- **Premium-content package:** 17zuoye offers paid education content on the platform. It makes personalised recommendations to students to help them achieve higher education efficiency through appropriate study materials and exercises.

Key management personnel

Chang Liu (CEO): Mr Liu has 13 years of experience in education and management. He served as the assistant VP and head of Shenyang Campus of New Oriental. Mr. Liu was a vocabulary education expert and founded the Changchun Campus of New Oriental and led a team of 800 members.

Dun Xiao (President): Mr Xiao is an experienced start-up entrepreneur and has founded edutech companies in both China and the UK. Before joining the online education industry, he served in Bank of China and UBS in London. Mr Xiao graduated from Cambridge and MIT.

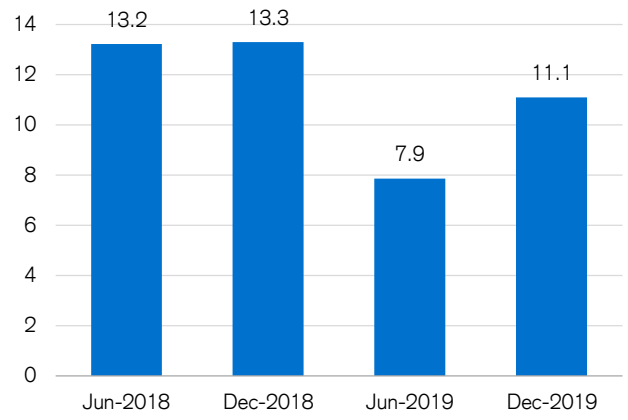
Kuanghao Zhang (VP of Livestreaming): Mr Zhang is a renowned expert in education and a pioneer in online education. Before joining 17zuoye, he was responsible for the online products of TAL. Mr Zhang joined TAL in 2008 and was one of its top teachers in the primary school area.

Qin Wen (VP of Operations): Mr Wen has extensive experience in the operation of online-to-offline products that involve both business clients and consumers. He worked in Meituan for seven years before joining 17zuoye where he served as the general manager of the retail business group and CFO of the in-store restaurant group.

Industry

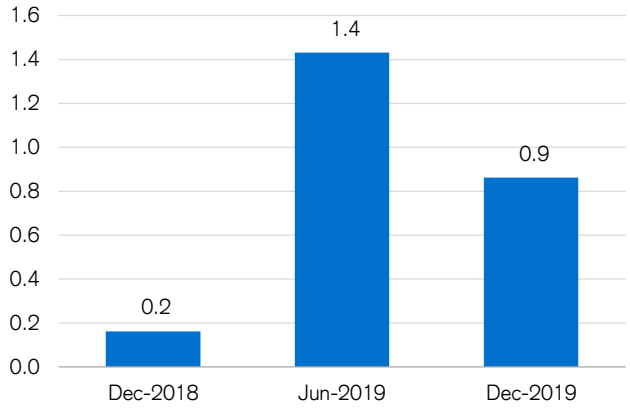
Internet/e-commerce/O2O/Games

Figure 111: MAU of Yiqizuoye Primary School app (mn)



Source: QuestMobile

Figure 112: MAU of Yiqixue app (mn)



Source: QuestMobile

4Paradigm

Kyna Wong, Chaolien Tseng, Stephen Yin

Company profile

Founded in 2014, 4Paradigm is an artificial intelligence technology and service provider focused on the B2B area. The company developed a machine-learning technology that can accurately predict and mine data to help enterprises improve efficiency, reduce risks, and achieve business value. 4Paragidm maintains the world's leading edge in the field of migration-learning, which was considered by some industry practitioners as "the next generation of artificial intelligence technology".

The company's core product is Prophet—a one-stop AI SaaS platform covering different life stages of AI applications of its clients. The AI SaaS platform currently supports its banking clients on risk control and anti-fraud initiatives, and internet clients on intelligent pricing, marketing, and recommendations leveraging big data. As a B2B business, 4Paradigm has over 1,000 customers across different industries, with its major client groups being the banking and internet sectors. The company claims that the total assets of 4Paradigm's banking clients exceed Rmb50 tn. The company also collaborated with Shanghai Ruijin Hospital to conduct research on virtual metabolic human database and chronicle disease management.

In December 2018, 4Paradigm received over Rmb1 bn Series-C funding and was valued at over US$1.2 bn. Its investors include the Top 5 Chinese state-owned banks: Sequoia Capital, Sinovation Ventures, Guoxin Capital, China Reform TUS Funds, and CITIC Securities.

In August 2018 and March 2019, 4Paradigm signed cooperation agreements with ICBC and China Merchants Banks (CMB) to co-build a corporate-level AI platform using its own Prophet System to support the fintech development of these banks. In February 2020, 4Paradigm, and Cambricon jointly launched the new SageOne AI computing platform, using Cambricon's chipset and OS and 4Paradigm's corporate-level AI platform Sage to unleash computing power from both sides. 4Paradigm's Sage platform is also the first AI platform to get the EU's GDPR certification. During the coronavirus epidemic, the company also developed precise AI solutions to track and prevent the spread of coronavirus utilising its big-data analysis, and applied this solution to help locate high-infection-risk groups and potential cases.

Key management personnel

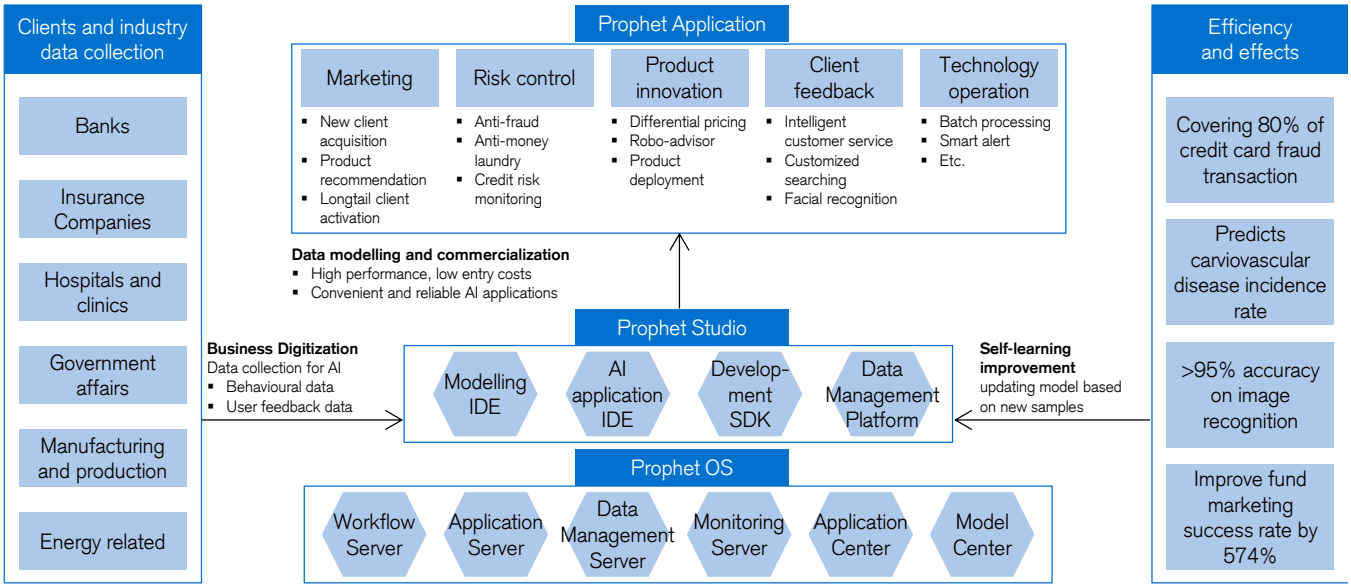
Wenyuan Dai (Founder & CEO) was the chief scientist of Huawei Noah's Ark Lab. He has directed Baidu Fengchao online marketing system, Baidu brain, and other heavyweight core products, driving Baidu's liquidity capacity to increase by eight times in four years. Mr Dai received the first prize of the "6th Wu Wenjun Artificial Intelligence Science and Technology Award" Innovation Award. He was among Fortune's list of China's 40 business elites under 40 years old in 2017, and was selected as an MIT Technology Review 35 outstanding technology innovation elite under 35 years old.

Qiang Yang (Co-founder & Chief Scientist), head of the computer science department of HKUST and editor-in-chief of the IEEE Big Data Journal. Mr Yang is the first Chinese researcher of the International Association of Artificial Intelligence (AAAI) and an outstanding scientist of ACM. He is the chairman of the International Artificial Intelligence Association (IJCAI) since 2017. In 2012, he was the founding director of Huawei's Noah's Ark Lab and has also had an important influence on the business community. Mr Yang also serves as an independent director of WeBank.

Industry

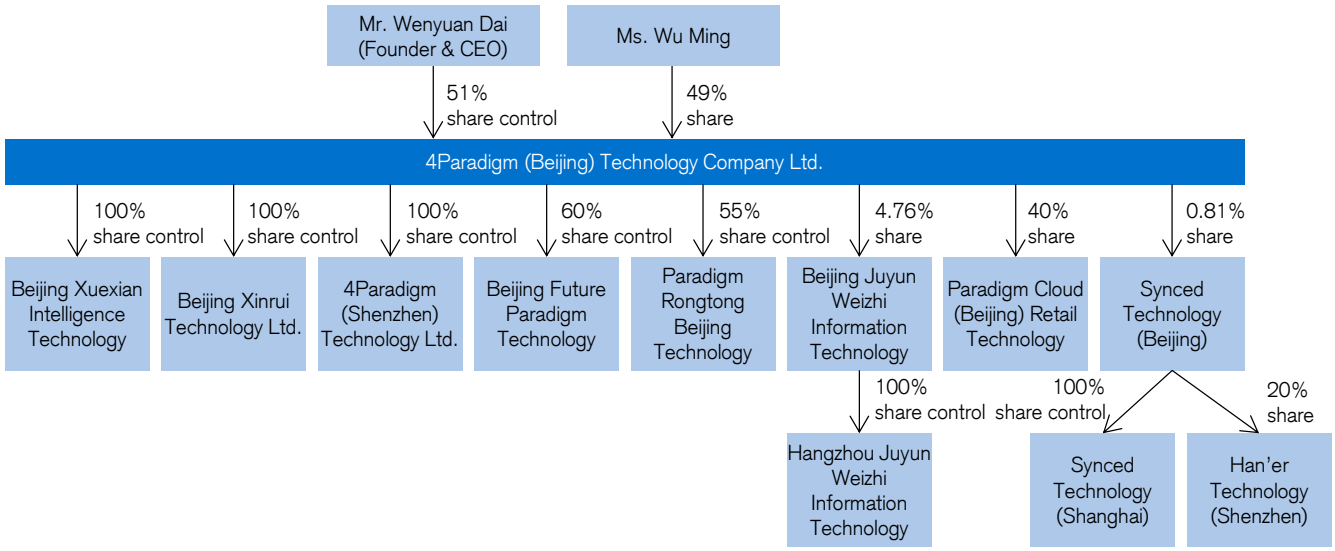
AI/Big Data/Robotics/Software

Figure 113: Structure and data flow of Prophet, 4Paradigm's core product



Source: Company data

Figure 114: Shareholding structure of 4Paradigm and its related companies



Source: Qichacha

58 Home

Tina Long, Ashley Xu

Company profile

58 Home is a multi-category local-service platform, providing information on and access to high-quality offline services such as cleaning, moving/cargo, babysitting, beauty care, and many other categories in approximately 30 cities in China. Leveraging its location-based system technology, it can efficiently connect customers to the nearest independent service providers in a timely manner.

With diverse business lines, 58 Home is facing intense competition from various vertical players, such as, housekeeping platform eJiajie (e家洁), Ayibang (阿姨帮), manicure service Helijia (河狸家), car washing platform Chediandian (车点点), and intra-city moving/cargo service provider Lalamove (货拉拉). The firm reaffirmed its strategy to continue to invest in new start-ups riding on China's fast developing home service market.

- **Focus on high frequency services:** 58 Home is enjoying a leading position in housekeeping and manicure services. Such high-frequency services can drive repeat purchase and increase user stickiness to the platform.
- **Strategic synergies with 58.com:** As China's largest online classified site, 58.com can provide a broad user base with better insights of their potential needs. 58 Home can benefit from both financial support and strategic resources from 58.com.
- **Enhancing service standards and quality:** 58 Home introduced service standards and a customer review system to improve customer trust by providing training to babysitters. It also helps the truck drivers to streamline the home page in order to gain greater exposure.

Business update

The platform model relies on qualified service providers and their consistency in providing quality service, and to facilitate services to a diversified user group is challenging. 58 Home also strives to capture opportunities by: (1) expanding the offline network and directing users to the right outlet; (2) deepening data analysis for user behaviour to better understand their service needs; (3) further digitalising the offline data base in local service markets and promoting industry standardisation to enhance the operational efficiency and brand awareness of 58 Home's platform.

In Aug-2017, 58 Home's freight division, 58 Freight, merged with Hong Kong-based startup GoGoVan, helping to extend the business to more target markets. It wishes to build the company as a leading on-demand logistics company, covering multiple geographic markets, including mainland China, Hong Kong, Taiwan, Singapore, South Korea, and India.

In 2018, 58 Home pushed the majority of its business into two subsidiaries—58 Freight and 58 Daojia. 58 Freight (name changed to 快狗打车 in Aug-2018) focuses on cargo and freight logistics and delivery services, and 58 Daojia focuses on home services. 58 Freight received equity financing from outside investors subsequently and Alibaba exchanged certain equity interest in 58 Home for that in 58 Freight. Currently, 58 Home has largely become a holding company of the two subsidiaries and holds 57% in 58 Freight. 58.com holds 68.8% equity interest in 58 Home, but has not consolidated the entity as other shareholders are believed to have substantive participating rights.

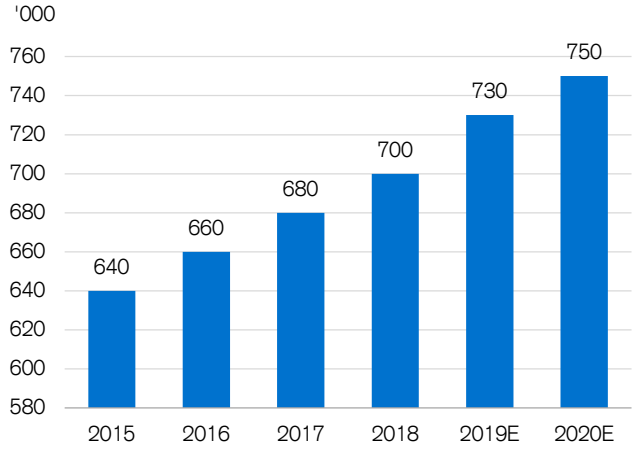
Key management personnel

Xiaohua Chen (CEO): Mr Chen is the founder of 58 Home and 58 Suyun. Also, he served as CSO and SVP at 58.com before separately establishing the O2O business in 2014. Prior to 58.com, Mr Chen started at Ganji.com, a leading online classified site before merging with 58.com, focussing on search optimisation. He graduated from Xiangtan University.

Industry

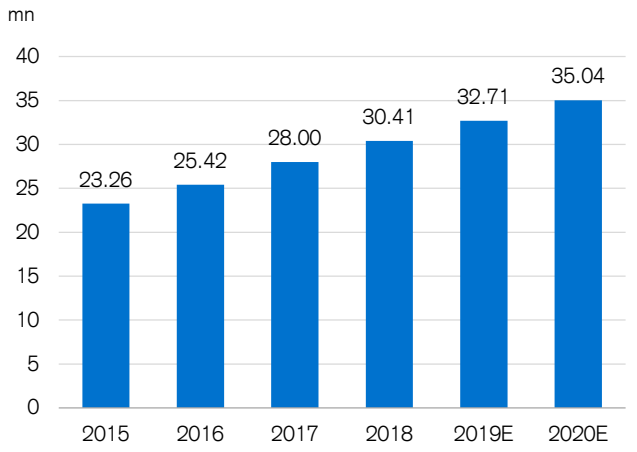
Internet/e-commerce/O2O/Games

Figure 115: Number of home service companies in China



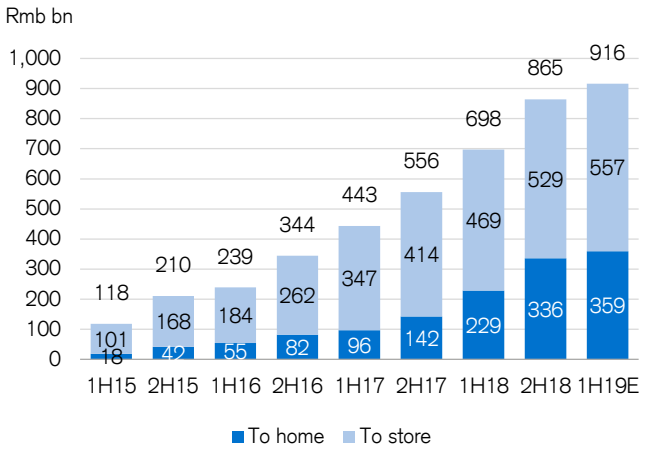
Source: Company data, Credit Suisse research

Figure 116: Number of home service workers in China



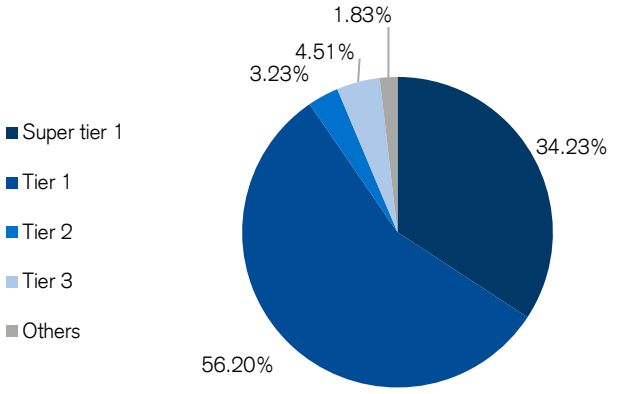
Source: Company data, Credit Suisse research

Figure 117: Market size of China's O2O local services



Source: Analysys, Credit Suisse research

Figure 118: Most demand comes from tier 1 cities and above



Source: Analysys, Credit Suisse research

Aihuishou

Tina Long, Ivy Liu

Company profile

Founded in 2011, Aihuishou.com is a C2B e-commerce platform that recycles and sells second-hand electronic items including mobile phones, laptops, and cameras. Through four professional inspection centres, Aihuishou standardises the recycling process and structures an efficient pricing scheme. Smartphone remains the single-largest category on the platform, contributing ~60% of total GMV. In 2018, Aihuishou achieved a total GMV of Rmb7 bn and has handled 10 mn cell phones. JD.com, Aihuishou's largest shareholder, has merged its second-hand platform Paipai into Aihuishou, in order to improve recycling efficiency and expand categories.

- China's second-hand goods market size is expected to reach Rmb1,040 bn, with a three-year CAGR of 12%. The number of scrapped smartphones will reach 499 mn in 2019, though now only less than 5% of them are being recycled. With 5G rollout in the next two years, consumers will upgrade to new handsets, escalating the demand to recycle and resell. Major competitors include JD–Paipai, BABA–Idle Fish, and 58.com–Zhuan Zhuan, and Huishoubao.
- **To C—multiple purchase channels:** To tap China's vast, fragmented second-hand dealing market, Aihuishou has established multiple channels to directly acquire goods from consumers. By now, users can turn in second-hand electronics through offline stores, self-service machines and mail orders. Aihuishou also partnered with e-commerce partners, such as JD and GOME to direct traffic and acquire users when they purchase the new handsets. Aihuishou has established 400 offline stores, and tens of thousands of handsets are being recycled by the self-service machines.
- **To B—standardised process and efficient pricing:** Leveraging its expertise in 3C products, Aihuishou standardises the recycling process with faster services. Aihuishou established four inspection centres that inspect and assess the quality and condition of the products, and sort them into different categories. Using a bidding system, Aihuishou then prices and sells the parts with a guaranteed margin. The major B customers of Aihuishou include JD Youpin, Koudai Youpin and other electronics recyclers and wholesalers.
- **Synergies with JD-Paipai:** Paipai is JD's C2C second-hand, all-category platform. The merger with Paipai will help both platforms to solidify the moat. Aihuishou will enjoy more efficient traffic acquisition on JD's platform, especially targeted 3C users; while Paipai could further standardise the recycling process for all category products, including apparels, appliances, and books, leveraging Aihuishou's expertise in inspection.

Key management personnel

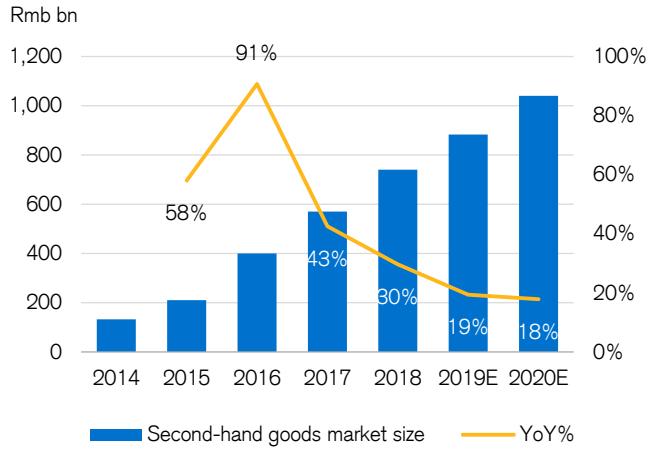
Xuefeng Chen (Founder and CEO): Xuefeng Chen co-founded Aihuishou with Wenjun Sun in 2011 when Chen was pursuing a master's degree in computer science at Fudan University. He received a bachelor's degree in computer science from Tongji Unviersity. Before Aihuishou, Chen and Sun founded a C2C second-hand-goods website in 2008.

Wenjun Sun (Founder and CEO): Wenjun Sun co-founded Aihuishou when he was a lecturer of computer science at Fudan University.

Industry

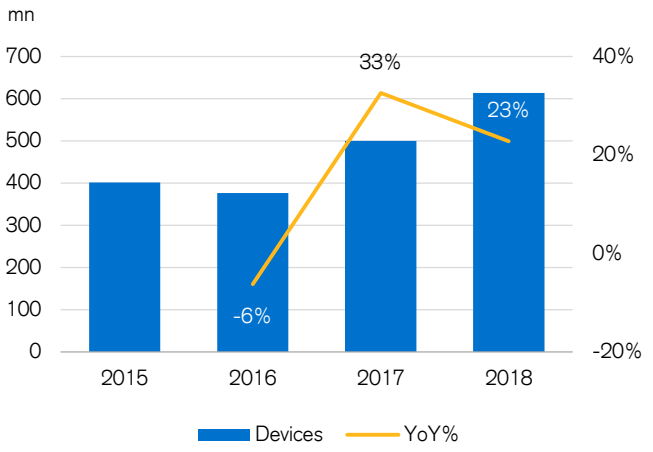
Internet/e-commerce/O2O/Games

Figure 119: Market size of second-hand goods 2014-20E



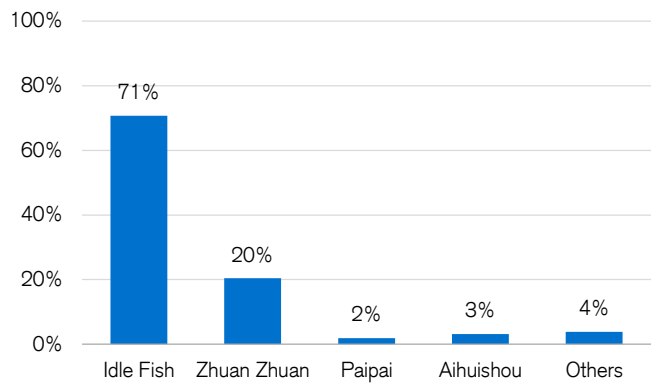
Source: Qianzhan Industry Research

Figure 120: Number of scrapped electronic devices in China, 2015-18



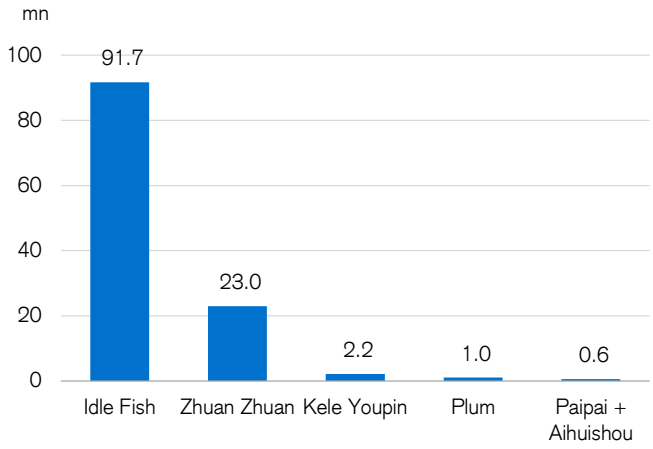
Source: Qianzhan Industry Research

Figure 121: Penetration of second-hand goods transaction platforms in 2018 (%)



Note: Penetration among users that use second-hand good transaction platforms.
Source: Qianzhan Industry Research, Credit Suisse research

Figure 122: MAU of major second-hand platforms (mn)



Note: as of Jan-2020.
Source: QuestMobile

AIWAYS

Bin Wang, Nick Li, Carrie Jiang

Company profile

AIWAYS is an intelligent-new-energy-vehicle company, established in 2017, with footprints in China, the US, and Germany. Its headquarters and R&D centre are located in Shanghai, China. Its main production base is in Shangrao (Jiangxi Province, China) and it also has an office in Beijing. It has subsidiaries in Germany and an advanced-technology laboratory in the US.

AIWAYS's main products include:

- **AIWAYS U5.** AIWAYS U5 is an electric, five-seater smart-SUV. In addition to a stylish design, it is equipped with an immersive-AI smart-cabin which has a 12.3'' information centre, AI-ID face-recognition function, and a TRI-fold display-screen in front of the driver. Meanwhile, AIWAYS U5 has an advance Interactive Defence & Attack System (IDAS), with functions of automatic queuing during traffic jams, automated highway driving assistance, and all-situations autonomous parking. Moreover, its fully charged master battery pack has a range of more than 460 km under comprehensive conditions.
- **RG Nathalie.** RG Nathalie is an electric sports car—a combination of a sports car's aerodynamic design and pure electric drive dynamics. RG Nathalie not only has a 1,200 km range, but also the attributes of Internet of Vehicle, including lap speed settings, racing music packages, and other racing settings. AIWAYS U5 and RG Nathalie are based respectively on two platforms: MAS and GES.

AIWAYS's key technologies include:

- **More Adaptable Structure (MAS).** MAS is a modular-based platform designed for smart-EV, supporting multi-profile spectrum development with the same architecture. The wheelbase can be flexibly adjusted to meet horizontal and vertical auto body modification.
- **Integrated Electric Drive System (IEDS).** The IEDS is a highly integrated motor, reducer, and electronic control system.
- **IBOOSTER System.** A new-generation of ESP9.3 IBOOSTER System supports L4 level autopilot with full model brake pedal sense adjustment.

Management profiles

Fu Qiang (CEO, Co-founder): Fu Qiang is the CEO and co-founder of AIWAYS. He received a master's degree in engineering in automotive from Jilin University of Technology. Mr Fu entered the auto industry in 1989 and has worked for FAW-VW, SAIC-VW, BAIC-Benz, and Volvo as head of marketing, head of Skoda business division, executive vice president of sales and marketing, and COO successively.

Gu Feng (CEO, CFO, Co-founder): Gu Feng is the CEO, CFO and co-founder of AIWAYS. He received a doctoral degree in management from the Shanghai University of Finance and Economics. He is a CPA, ACCA and the vice president of Shanghai Services Federation. Mr Gu is the former CFO of the SAIC Group.

Roland Gumpert (CPO): Roland Gumpert is the chief product officer of AIWAYS and CEO of AIWAYS' German subsidiary. Mr Gumpert was a former engineer at Audi.

Wang Dongchen (CTO): Wang Dongchen is the Chief Technology Officer of AIWAYS. Mr Wang was previously Minister of FAW Technology Centre.

QIU Xiaochuan: Qiu Xiaochuan is responsible for the Shangrao production base operations for AIWAYS. Mr Qiu was the former vice president of BAIC Foton and has worked in SAIC-Volkswagen.

Industry

Auto

Figure 123: Company milestones

Time	Events
2019	■ **14 Apr:** AIWAYS launched its new model U7 ION during the Shanghai Auto Show..
2018	■ **10 Feb:** AIWAYS and DeepBlue Technology achieve a strategic cooperation.
2017	■ **10 Jan:** Former SAIC Group CFO, GU Feng, joins AIWAYS as co-founder, CEO and CFO. ■ **28 Mar:** Groundwork initiation of AIWAYS's Shangrao base construction. ■ **7 Jul:** Support university students project with the name of AIWAYS Unmanned Formula Competition. ■ **1 Aug:** Roland Gumpert, Father of Audi Quattro, joins AIWAYS as the first product officer. ■ **7 Sep:** AIWAYS and NavInfo achieve a strategic cooperation. ■ **30 Nov:** AIWAYS and Bosch (China) achieve a strategic cooperation. ■ **20 Dec:** AIWAYS and Siemens (China) achieve a "strategic cooperation".
2016	■ AIWAYS team formation

Source: Company data

Apus Group

Colin McCallum, Billy Lee

Company profile

Founded in June 2014, APUS is a Chinese technology company specialising in Android applications development and information services. The company's main product is the APUS User System (also known as APUS Launcher), along with other APUS series products (including the APUS User System, APUS Booster+, APUS Browser, APUS Message Center, APUS Flashlight). These products cover 1.2 bn global users across 200+ countries and regions, 69% of which are within the 65 “Belt and Road” countries. A key feature of the APUS System is its ability to automatically sort apps on the home-screen by category, in order to quickly and conveniently find apps for users.

In August 2015, APUS was enrolled in the ‘$1 Billion Dollar Club’ of venture companies listed by the Wall Street Journal, becoming the world's youngest unicorn company. Starting 2016, APU has been listed as a “China Unicorn Company” for two consecutive years.

Key management personnel

Tao Li (founder and executive director): Before founding APUS Group in June 2014, Mr Li served as senior vice president of Qihoo 360 (QIHU NYSE), one of the major Internet company players in China known for its antivirus software. Prior to that, he was involved with several companies, including Datang Telecom. Mr Li is also an active venture capitalist who has invested in start-up companies from media and VR technology to video advertising, both domestically and abroad. He received a Bachelor of Engineering degree from Zhengzhou University in 1998. Currently, Mr Li is a finance EMBA student in Tsinghua University.

Industry

AI/Big Data/Robotics/Software

Figure 124: Key features of APUS System

App Drawer	APUS Know	Free Swipe
Find all of your apps listed in alphabetical order in one convenient folder	Just like a wind chime, APUS Know on home screen reminds you of important calendar events and trending news	Swipe to open Free Swipe to quickly access a menu of recently-used apps & your device's system settings
APUS News	**APUS Market**	**APUS Toolkit**
Also the APUS Headlines. Search the web and read popular news simply by swiping right on the home screen	Browse the App Market effortlessly with a simpler app store layout. Searching for the apps you want is fast and easy	APUS' digital toolbox is filled with an assortment of useful widgets: booster flashlight, calculator, notepad and more.

Source: Company data

Banma Network

Bin Wang, Nick Li, Carrie Jiang

Company profile

Banma Network Technology is an independent start-up invested in by Intelligent and Connected Vehicle Fund, initiated by Alibaba Group and SAIC Motor in 2015. Banma is an open platform for Intelligent and Connected Vehicle based on AliOS, providing Intelligent and Connected Vehicle total solutions to the whole automotive industry currently. Intelligent and Connected Vehicle is a smart-car running on the internet. It has realised not only physical connection but also data flow and calculation (Alicloud), providing a smart mobility experience that connects car with cloud: the operating system AliOS developed for cars makes 'service seeking for people' experience a reality, directly targeting payment (Alipay) with scenes uninterrupted.

Currently, Banma provides services to dozens of models for ten auto brands. As of now, millions of cars have installed Banma System solutions. 30% of Banma's application services come from Alibaba-related service providers.

Wide range of solutions

All-weather map & intelligence map engine. This gives a dynamic view of the weather on the desktop with real-time data. It has a more intelligent perception of weather conditions, which gives a more immersive experience. It has a brand-new visual interaction, new 3D real scene navigation, road restrictions function, real-time information on traffic incidents, dynamic route recommendation.

In-car AI & in-car assistance. Voice personification expresses the emotions of the data intelligence behind the human-vehicle interaction. It connects the ecological services for mobility to avoid the awkwardness of switching between apps. The car can predict driver's needs, realising "service seeking for you".

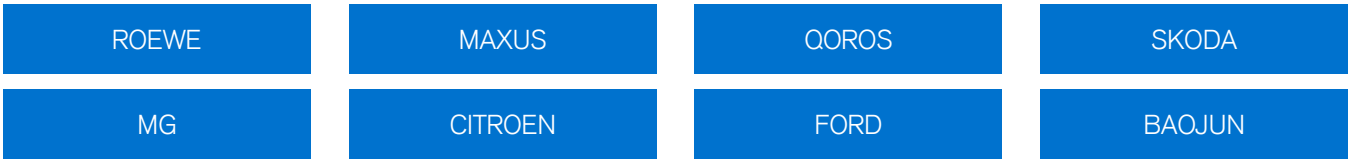
Three-dimensional real scene navigation. A variety of magnified vector maps and grid maps are provided, while the 3D real scene navigation will be switched on at complex intersections. With the navigation being more immersive and the guidance more clear, complex intersections can be easily handled.

3D maps. These provide a universal and immersive 3D rendering in some cities (Shanghai, Beijing), high-precision 3D real scene rendering of urban roads and bridges, etc.

Simple touch control centre and rich custom settings. Common applications can be selected to be placed on the first screen to facilitate personalised choice.

Other in-vehicle new experience solutions. *Personal super ID:* entertainment accounts exchangeable between devices; *Banma WeChat mini-programme:* enables universal cross-end grouping; *CarChat Circle:* an online mobile chat room with 100 people; online short video; karaoke entertainment system; personal map, etc.

Figure 125: Auto brands that Banma provides solutions to



Source: Company data

Management profile

HAO Fei (Co-CEO): Mr Hao is responsible for sales & marketing for Banma Network. He has a master's degree in automatic control from Jilin University of Technology and an Executive Master of Business Administration degree from China Europe International Business School.

ZHANG Chunhui (Co-CEO): Mr Zhang is responsible for technology, product, and operations at Banma Network. Before joining Banma Network, Mr. Zhang served as the director of E.T. logistics laboratory at Cainiao Smart Logistics Network.

Industry

Auto

Figure 126: Company milestones

Time	Events
2019	■ **12-Mar:** Banma Network × SAIC Skoda, the first launched car was Octavia. ■ **5-Jul:** Banma Smart Food Ordering was launched. ■ **27-Dec:** Alibaba has reached a strategic partnership with Faw to build intelligent and connected vehicles.
2018	■ **18-Mar:** Banma Network signed a strategic cooperation agreement with Bosch to jointly create smart mobility solutions. ■ **6-Jul:** AR-Driving was officially released at the first Banma Exploration Conference. ■ **13-Sep:** The signing ceremony for the first round of financing of Banma Network was held. ■ **12-Nov:** "Banma Mobility Service Month", the first automobile online operation activity, was successfully held.
2017	■ **4-Mar:** The 1st MG Internet Car—MGZS—was launched. ■ **13-Oct:** Banma Network and DPCA signed a strategic cooperation agreement to create the first JV-branded Internet Car. ■ **28-Dec:** The largest OTA upgrade in the global automotive field was kicked off (Banma 2.0 then covered 400,000+ Internet vehicles).
2016	■ **6-Jul:** Roewe RX5, the world's first Internet Car with an embedded AliOS-based Banma System, was launched.
2015	■ **12-Mar:** Alibaba Group and SAIC Motor invested Rmb1 bn to establish Banma Network.
2014	■ **23-Jul:** Alibaba Group and SAIC Motor signed a strategic cooperation agreement to carry out the project cooperation of "Internet Car".

Source: Company data

Beibei

Tina Long, Ivy Liu

Company profile

China's Beibei.com is a maternal and infant product e-commerce platform that offers children's clothes, shoes, toys and other supplies. It offers a special section just for imported products, along with a handful of daily deal flash sales. It was established in April 2014; it focuses on children's apparel to differentiate itself, when other baby product platforms mostly offer low-margin milk powder and diapers.

- The industry size of maternity and baby products in China is expected to exceed Rmb3 tn in 2020, registering a 6% CAGR over 2018-20E. Online retail size in mother and baby products will surpass Rmb619 bn in 2020E, representing a growing online penetration of 20.5%.
- **Two-child policy to stimulate demand:** Looking ahead, the industry is expecting to post a consumption growth of 9.4% in 2020E, primarily driven by the two-child policy and consumption upgrade. According to estimates by China's National Health and Family Planning Commission, every year there are about 90 mn couples of childbearing age that are expected to add 2.5 mn newborns, buffering the decline in fertility rate. Other stimulus policies such as subsidies and paternity leave, are expected to curb the continuous drop in fertility rate.
- **Consumption upgrade in maternity and baby industry:** Riding on a nationwide consumption upgrade trend, Chinese parents today focus more on product quality, safety, brand reputation as well as personalised choices. Parents are increasingly willing to pay a higher premium for high-quality and high-value-added baby products, thereby driving up the average annual spending on each infant.
- **Expertise in product curation**: As a leading player in the mother and baby vertical, Beibei forms industry-wide relationships with offline retailers, leveraging its expertise in product selection and curation. Beibei's strategic focus on children's apparel differentiates it from others. The company believes a vertical platform is less competitive against online retailer giants on standardised items like diapers, but for apparel and shoes, price becomes less important and merchandising capability is key. Beibei has an independent buyer team that selects and curates the right mix of SKUs, leveraging its customers' insights. Beibei also incubates a product-matrix to better retain a growing user base, including tools in parenting, early education, and consumer finance.

Business update

Beibei's CEO disclosed some of the company's key operational metrics in the latest round of financing. Beibei has 5,000 brands, 10 mn registered users, generates Rmb200 mn of monthly sales, and 100,000 items are sold each day. 70% of the orders are placed through mobile devices. More than 80% of Beibei's customers are urban young mothers aged between 25 and 35.'

In Nov-2018, a major maternity and baby content platform Babytree (one of Beibei's key competitors) was listed in HKEX.

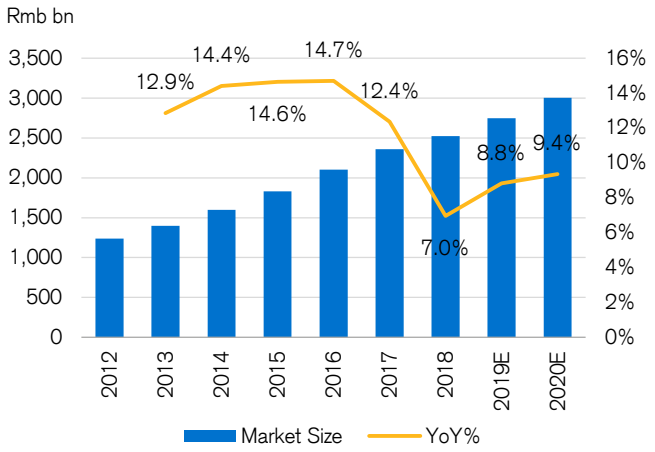
Key management personnel

Lianglun Zhang (CEO and founder): Mr Zhang founded Beibei.com in April 2014. Previously he had worked in the business-to-business sector of Alibaba Group for two years. Mr Zhang holds an undergraduate degree from Jilin University and a master's degree from the Huazhong University of Science and Technology.

Industry

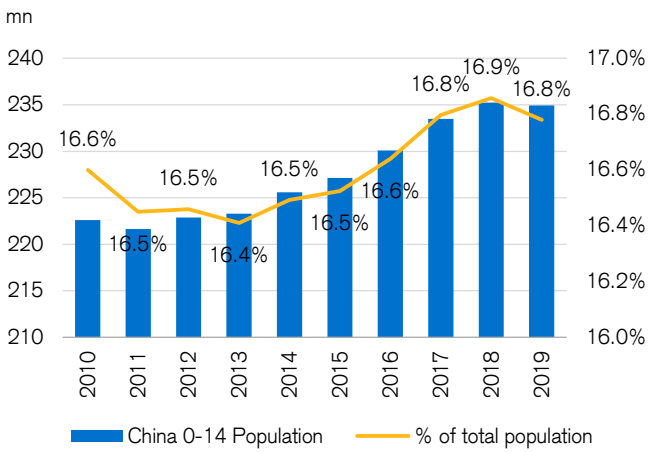
Internet/e-commerce/O2O/Games

Figure 127: Market size of mother & baby products



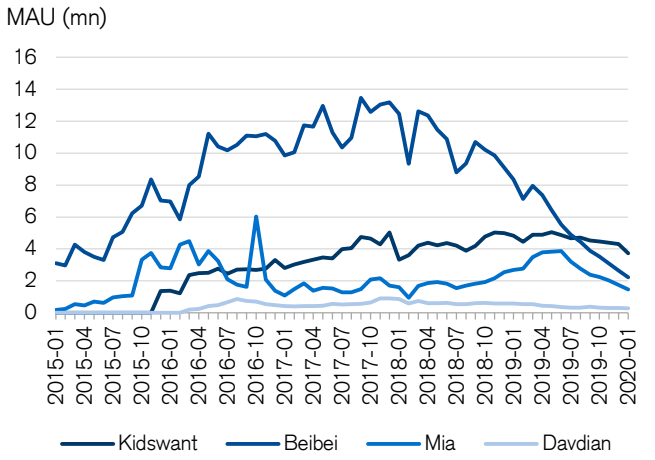
Source: iResearch

Figure 128: 0-14 age group population % is increasing



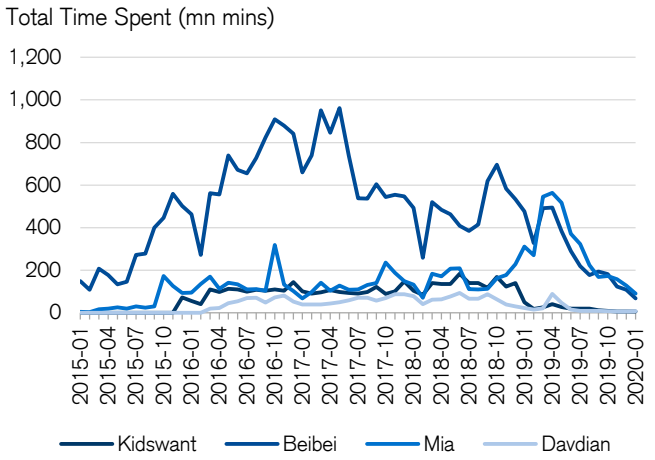
Source: National Bureau of Statistics

Figure 129: MAU of major mother & baby e-commerce apps



Source: Questmobile

Figure 130: Beibei and Mia leading in total time spent



Source: Questmobile

Beike Zhaofang

Tina Long, Ashley Xu

Company profile

Beike Zhaofang is a leading real estate listing platform in China, connecting real estate agents with users that have rental or real estate purchase needs. Beike was founded by one of China's largest real estate agencies, Lianjia, in Apr 2018, as a platform to expand the network by integrating mid-small agencies. Beike not only brings brand value to mid-small agencies, but also sends experienced agents to help agencies implement better management systems and provide training to staff, improving their efficiency and service quality. Additionally, Lianjia and all onboarded agencies would share data on properties in their network, work together to accomplish deals with customers, and share profit under a pre-specified scheme. Beike is set to reform the real estate agency market:

- **Authentic property information (真房源)**: China's real estate market has been beset with fake property information for years, as real estate agencies post fake information in order to attract customers and at the same time prevent competitors from poaching the same property. Beike's brand authenticates property information and its parent company, Lianjia, has been taking the lead by building up a database, named property dictionary (楼盘字典), with authentic property information since 2008. So far the property dictionary has registered more than 200 mn properties, including information like historical transaction data, price range, property structure, etc. Beike also launched an authentication system based on data from the property dictionary and massive interaction data between property owners, clients and agencies. It also sets related KPIs to encourage agencies to ensure information is authentic and updated.
- **ACN (Agent Cooperation Network)**: Beike formulates ACN to encourage agents coordinate with each other—all agents need to share information on properties in their network, and coordinate with each other to complete a transaction. Under this arrangement, each broker could take a role in a transaction, by being the property input broker (房源录入人), property information maintenance broker（房源维护人), client introduction broker (客源转介绍), and transaction broker (客源成交人), etc. All brokers participating in the transaction would be able to share commissions. This model reduces duplicated work, allows better information flow, and improves market efficiency. It also helps avoid vicious competition among brokers and de-incentivises them from posting fake property information.

Business update

In Apr-2019, Beike announced that 60 brands have onboarded, with 21,000 stores and 210,000 agents. In the same month, it also onboarded Century 21 Real Estate, another leading real estate agency in China, marking the first national agency network joining the platform. Last November, Beike received US$1.5 bn in funds from investors including SoftBank, Hillhouse, Tencent, and Sequoia Capital, at a valuation of over US$14 bn, according to Wall Street Journal.

Key management personnel

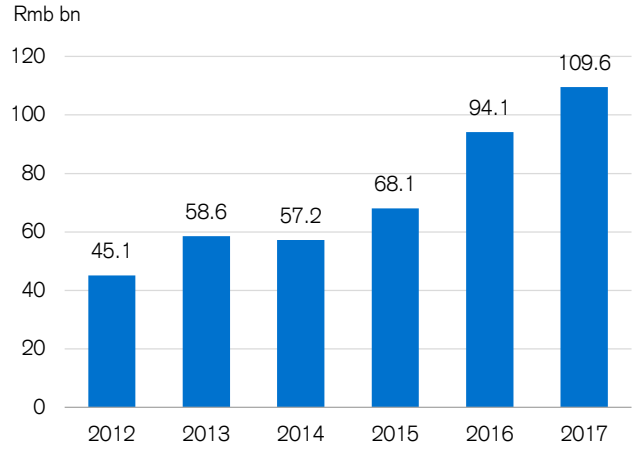
Zuo Hui (Founder and Chairman): Mr Zuo Hui founded Lianjia Group in 2001 and Ziroom in 2011, and remains the chairman of both companies. He has a deep experience in the real estate industry and plays key roles in a number of associations in the following capacities: the vice-chairman of CIREA (China Institute of Real Estate Appraisers and Agents), vice-chairman of CRECC (China Real Estate Chamber of Commerce), and vice-president of Beijing Real Estate Agent Association.

Peng Yongdong (CEO): Mr Peng Yongdong has been the CEO of Lianjia Group since 2014 and CEO of Beike since 2018. Prior to that, he had been a VP at Lianjia since 2010. During 2006-10, Mr Peng Yongdong was a senior consultant in IBM.

Industry

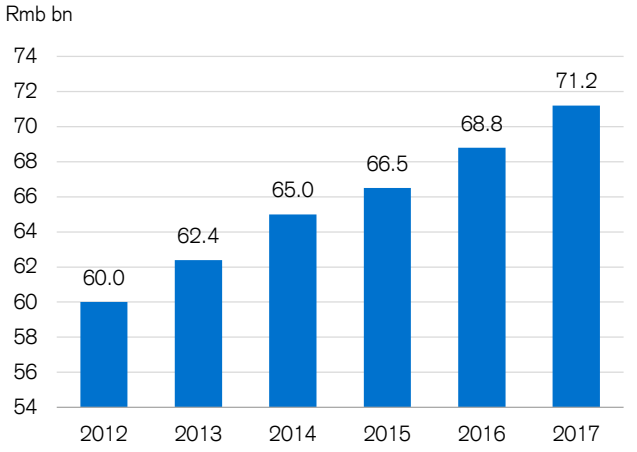
Internet/e-commerce/O2O/Games

Figure 131: Agent service market size for primary housing



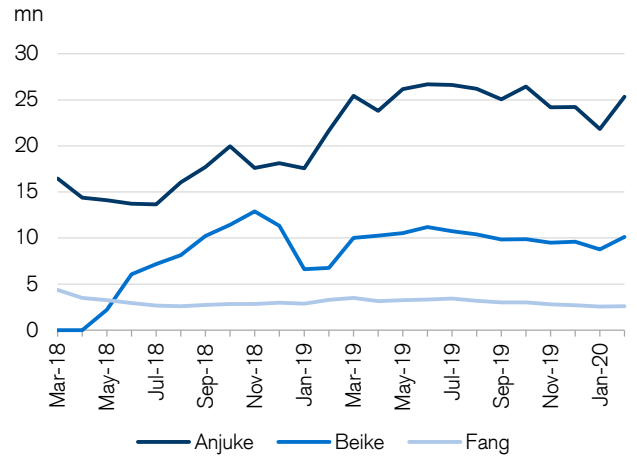
Source: Zhiyan consulting group, Credit Suisse research

Figure 132: Agent service market size for secondary housing



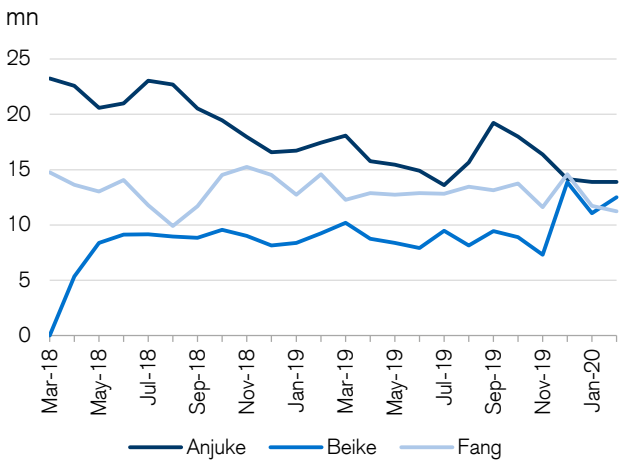
Source: Zhiyan consulting group, Credit Suisse research

Figure 133: MAU of top real estate listing platforms



Source: QuestMobile, Credit Suisse research

Figure 134: Time spent per user per day



Source: QuestMobile, Credit Suisse research

ByteDance

Kenneth Fong, Ribery Gu

Company profile

ByteDance is the holding company behind China's largest news aggregator Jinri Toutiao and the largest video-based entertainment apps portfolio, including Douyin (known as Tik Tok outside China), Douyin Huoshan (or Vigo Video in English), and Xigua (or Watermelon Video in English). It is actively expanding overseas, from launching its first international product topBuzz in 2015, followed by a series of acquisitions such as Musical.ly (now merged with Tik Tok) and Flipagram.

ByteDance is rising among media and entertainment platforms, as well as pushing forward its edge in different areas including social media-based SAAS (Feishu or Lark in English). As we mentioned before, ByteDance is utilising its cutting-edge AI-powered content distribution and personalisation that pushes addictive newsfeed/videofeeds to around 1.1 bn users every day (on an aggregate, according to QM) with ever-growing time spent. The company has been monetising the huge traffic pool with systematic online advertising sales distribution network.

- **The flagship media and entertainment platform:** Toutiao (or Headline today in English) is equipped with a powerful and decentralised recommendation algorithm, on top of a massive and continuous stream of PGC (professionally generated content) and UGC (user generated content). The mechanism has turned out to be extremely effective in capturing user eyeballs and spare time. The media titan functions very well as an advertising platform for long-tail content creators to find audience. ByteDance is also the undoubted leader of short video platforms globally as its leading products Douyin, Huoshan and Xigua have achieved a remarkable surge in the past few years, successfully defending attacks from various China internet giants including Tencent and Baidu.
- **"Make company like make product":** This is the business development logic of Mr Yiming Zhang, founder and CEO of ByteDance global. Utilising this strategy, ByteDance further expands its coverage to various verticals including automobile (Dongchedi or The guy knows auto in English), real estate (Dongfangdi or The guy knows real estate in English), online games (various casual/super-casual games), online education and social media apps (focusing on both 2B and 2C). The self-replicating machine is expanding its user reach and service offerings while simultaneously making a foray into more diversified business areas. During the outbreak of the coronavirus epidemic, hundreds of millions of employees have been required to work from home. Feishu (or Lark in English), the internal communication and co-work social media app, also got introduced in the general market. Its efficiency-oriented and teamwork-friendly functions helped the product gain strong popularity in this critical time.
- **Aggressive overseas expansion:** Different from other internet companies, overseas expansion has been on Mr Yiming Zhang's priority list from day one since ByteDance was established. With meaningful M&As (including Musical.ly and Fllipagram) plus endless efforts at localisation, ByteDance has now grown into a global company, covering 1.5 bn users across 150 countries (and regions). However, it is worth noting that recently ByteDance's overseas expansion has encountered regulatory pressures, especially in the US.

Business update

According to Questmobile, ByteDance's core product Jinri Toutiao App has ~330 mn MAUs and ~140 mn DAUs. More notably, according to the same data source, Douyin has approached ~550 mn MAUs with ~310 mn DAUs only in the China domestic market, while we expect the overseas number to reasonably approach 300 mn globally. Multiple media reports indicated that ByteDance has become the largest online advertising company in 2019, with its advertising revenue/gross billings surpassing Tencent's and Baidu's. At the same time, ByteDance has also been diversifying its revenue-mix with more contribution from live streaming, e-commerce, and game publishing.

Key management personnel

Zhang Yiming (CEO and Founder): Mr Zhang is a serial entrepreneur who either established or worked for internet companies such as Kuxun, 99Fang.com. He founded Toutiao in 2012. He studied software engineering at Nankai University.

Industry

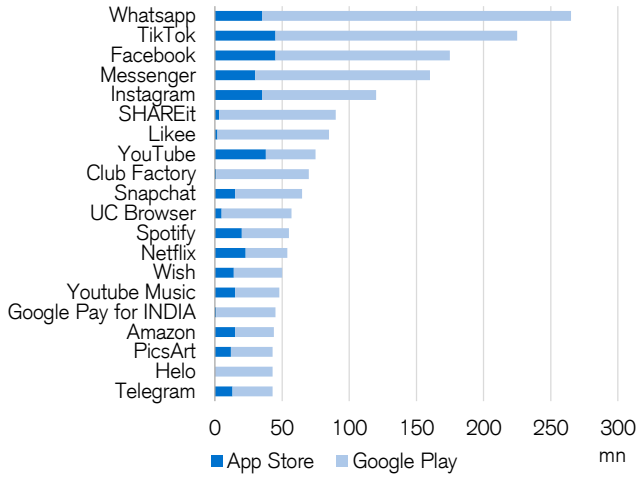
Internet/e-commerce/O2O/Games

Figure 135: QuestMobile's Jan-2020 updated data for the China Online Entertainment space

	MAU (mn)					DAU (mn)					Time spent (mn mins)				
	Dec-19	Jan-20	Feb-20	MoM	YoY	Dec-19	Jan-20	Feb-20	MoM	YoY	Dec-19	Jan-20	Feb-20	MoM	YoY
Douyin	489	551	552	0%	23%	271	292	309	6%	37%	639,645	795,881	873,480	10%	108%
Kuaishou	379	493	457	-7%	41%	184	206	219	7%	33%	387,081	453,354	507,493	12%	134%
Bilibili	106	122	134	9%	42%	27	30	34	12%	41%	71,673	93,796	112,987	20%	73%
Douyu	50	48	53	11%	15%	13	13	15	17%	6%	22,734	21,328	25,973	22%	32%
Huya	31	33	35	8%	11%	10	10	12	17%	11%	22,409	26,011	33,106	27%	99%
YY	23	22	27	23%	8%	4	4	5	28%	2%	5,789	4,763	6,679	40%	21%

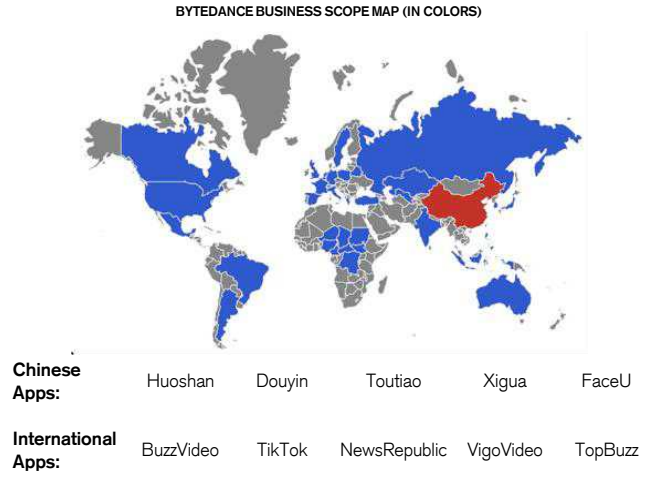
Source: QuestMobile, Credit Suisse research

Figure 136: 4Q19 worldwide app download ranking



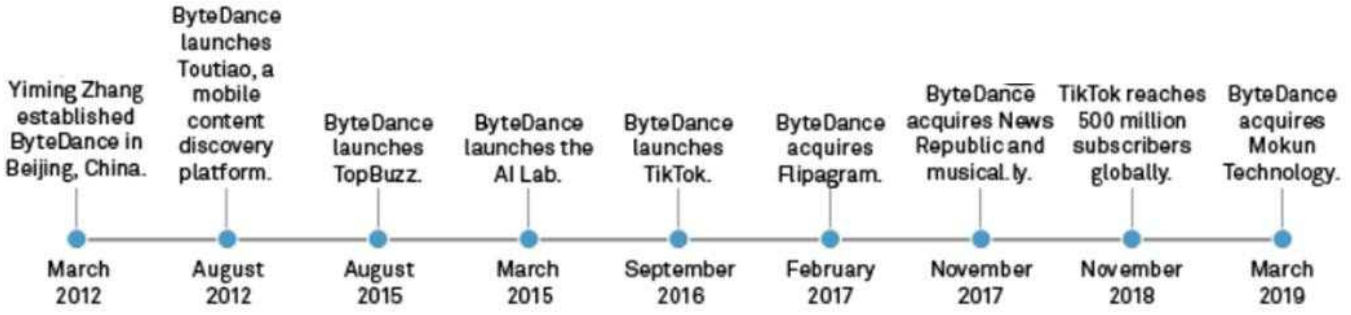
Source: Sensor Tower, Credit Suisse research

Figure 137: ByteDance business scope map globally



Source: Analysys, Credit Suisse research

Figure 138: ByteDance milestones



Source: Company data

Byton Auto

Bin Wang, Nick Li, Carrie Jiang

Company profile

Byton Auto is a Chinese new-energy vehicle brand established in 2017. Byton means wheels on the byte, which was first introduced by Future Mobility Corporation in September 2017. The brand aims to become the next-generation smart device with appealing appearance and autonomous driving technologies.

The company, Future Mobility Corporation (FMC), was founded by Tencent, Foxconn, and Harmony New Energy Auto in 2016. Carsten Breitfeld, the former vice president of BMW, together with Daniel Kirchert, an auto veteran who could speak fluent Mandarin, became the key management members of FMC. The company is headquartered in Nanjing City, Jiangsu Province, China.

Byton Auto's philosophy is to provide better in-car experience by differentiation. It believes the time spent in the car will become a richer experience for passengers now and for drivers in the full autonomous driving era. To enrich this experience, Byton Auto has installed more screens in the car, e.g., a 48-inch-wide horizontal display at the front and a display on top of the steering wheel. The company also provides an option to add more display at the back of the car.

Byton Auto unveiled its first concept car "Byton M-Byte Concept" at CES Las Vegas in January 2018 and received positive feedback from the public. The concept car is a pure-electric SUV with an extraordinary interior design. The concept car featured a 48-inch-wide horizontal resolution display and will feature an in-car gesture-control technology. The company already announced that the 48-inch LCD display will be in the production car, which is likely to attract more potential customers.

In December 2016, several industry investors and FMC's management team finished their series Pre-A funding. After the funding, management's interest is more in line with the shareholders. In July 2017, FMC received US$200 mn series-A investment from several Nanjing local companies. More importantly, in June 2018, Chinese state-owned automaker FAW Group became the major investor in Byton Auto's series-B funding. The series-B funding amount is US$500 mn. With more famous investors joining, including China's leading battery maker CATL, Byton Auto's valuation is close to US$2 bn after series-B funding. In January 2020, its series-C funding almost finished with a more diversified investor structure. The series-C funding is jointly invested in by Japan's Marubeni Corporation, an investment fund under the Nanjing government, and Korea's Myoung Shin Co.

Thanks to FAW Groups' help, Byton Auto acquired FAW's subsidiary, Huali, with only Rmb1 consideration to become one of the few new NEV makers who have a production licence in China. Moreover, the company showcased its second concept car "Byton K-Byte" in June 2018. The company has built its own plants for production and R&D in Nanjing with a total investment of Rmb11 bn and 300k-units annual capacity.

Byton Auto aims to mass-produce its first product M-Byte in mid-2020. The second product, K-Byte, is targeted to be officially launched in 2021. The third product is planned to be launched in 2023.

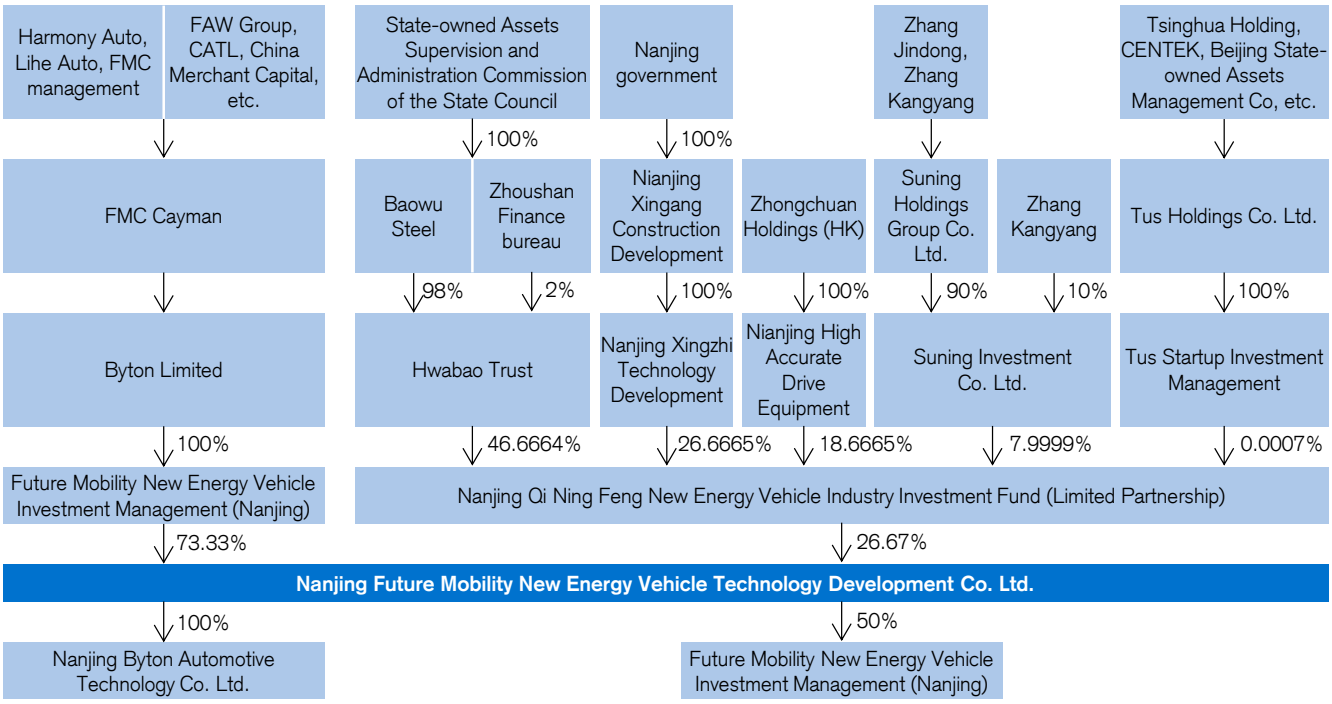
Management profile

Dr Daniel Kirchert. Dr Daniel Kirchert is one of the founders of Byton Auto. Before founding Byton Auto, Dr Kirchert held senior executive positions, including managing director at Infiniti China, president at Dongfeng Infiniti, and senior vice-president of sales and marketing at BMW Brilliance.

Industry

Auto

Figure 139: Byton Auto's shareholder structure before series-C funding



Source: Company data, Credit Suisse research

Cao Cao

Kenneth Fong, Ivy Ji, Lok Kan Chan, Rebecca Law

Company profile

Founded in November 2015, Cao Cao is a ride-hailing start-up backed by the largest Chinese private automotive manufacturer, Geely. In February 2017, Cao Cao received a licence for its B2C platform to provide ride-hailing services in China. With a presence in 51 Chinese cities, Cao Cao has 33 mn registered users and ranks third among Chinese ride-hailing apps, at around 3% market share (market-leader Didi has 90%).

Cao Cao analyses the cloud-data of vehicles to continuously improve customer experience and facilitate better communication between users and drivers. With data algorithms, it shortens the response time of the orders to within 4-7 minutes.

Ride-hailing has been constantly gaining popularity in both China and over the globe. According to CNNIC, China internet ride-hailing users have reached 337mn people as of 1H19, penetrating 39% of the online population. Meanwhile, Qianzhan expects industry gross merchandise value (GMV) to grow at a 16% three-year CAGR, reaching Rmb50 bn in 2022.

In January 2018, Cao Cao completed its Rmb1 bn series-A round funding at a valuation of US$1.6 bn.

Key business spotlights as below:

First new-energy ride-hailing service in China: Cao Cao provides its users primarily with Geely new-energy vehicles, which is the first platform to offer hail-rides, mainly with alternative-energy vehicles in China.

Rapid local and overseas expansion: Cao Cao has been proactively expanding its network since 2015. The company is now operating in 51 cities in China, vis-à-vis only 41 cities in 3Q19. Cao Cao has recently expanded to its first overseas city, Paris, in Jan-2020.

High-quality services: The company owns all the vehicles in service and recruits its drivers after training. All drivers are required to possess at least three years of driving experience with background checks on criminal records and body health. It has also established 'Cao Cao Schools' to guarantee service standards for its customers.

Future business collaborations: Cao Cao is planning to work with the Swedish manufacturer Volvo (which has been acquired by Geely) on driver-assistance systems and autonomous vehicle technology. The company also plans to collaborate with the US-based start-up, Terrafugia (also acquired by Geely in Nov-2017), in its flying car technology.

Key management personnel

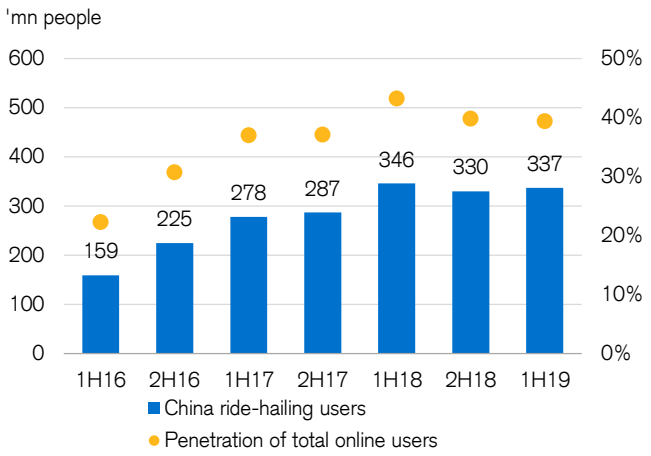
Mr Jinliang Liu Jinliang (CEO): Before joining Cao Cao, Mr Jinliang Liu served as the vice president of Geely, responsible for marketing and the new-energy car segment.

Mr Kainan Dong (General Manager): Before joining Cao Cao, Mr Kainan Dong served as the head of the customer service department in Geely.

Industry

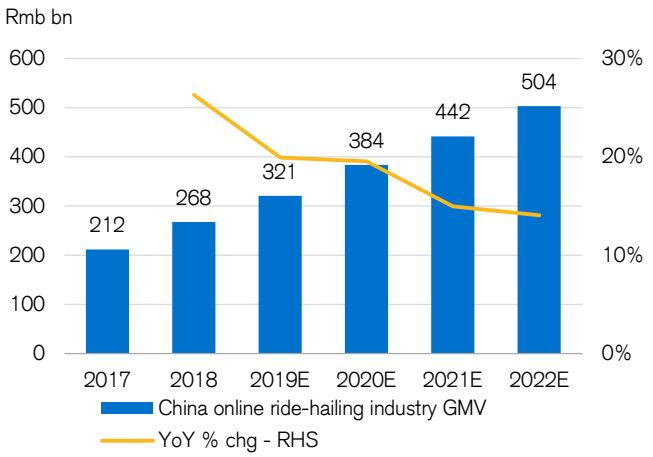
Internet/e-commerce/O2O/Games

Figure 140: China online ride-hailing users



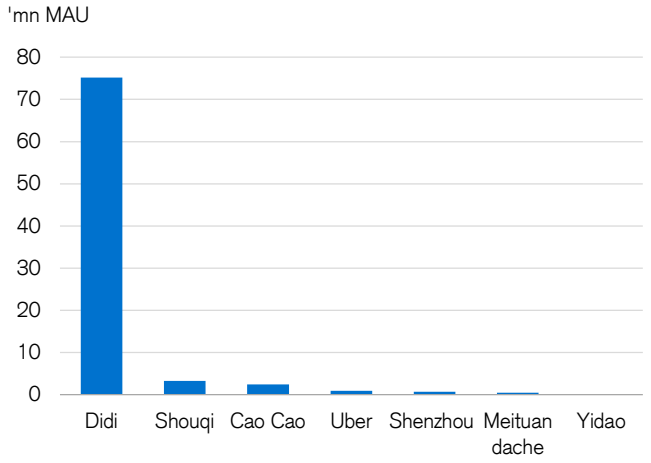
Source: CNNIC

Figure 141: China online ride hailing industry GMV



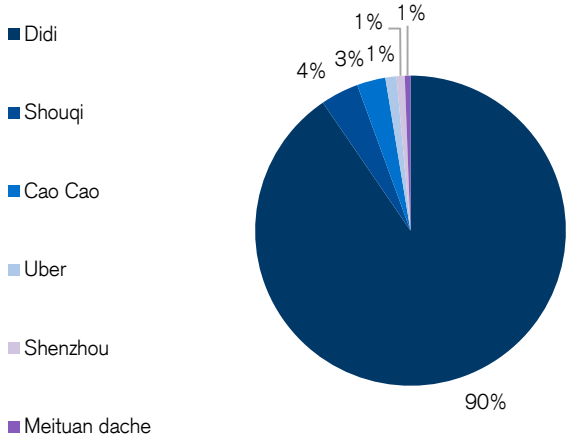
Source: Qianzhan

Figure 142: China ride-hailing platform operators MAU as of May 2019



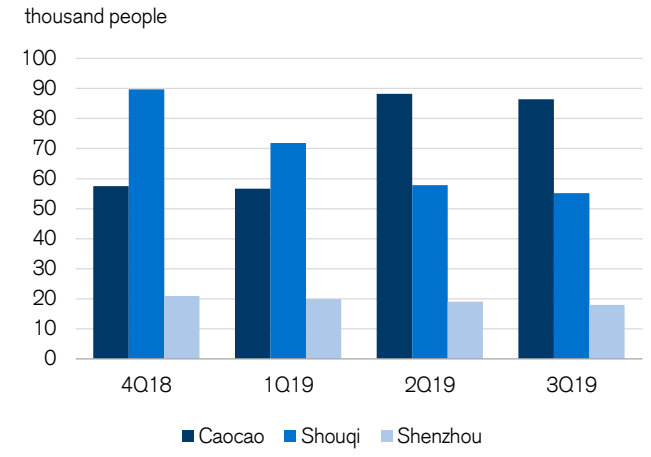
Source: Analysys

Figure 143: China ride-hailing platform operators market share as of 3Q18



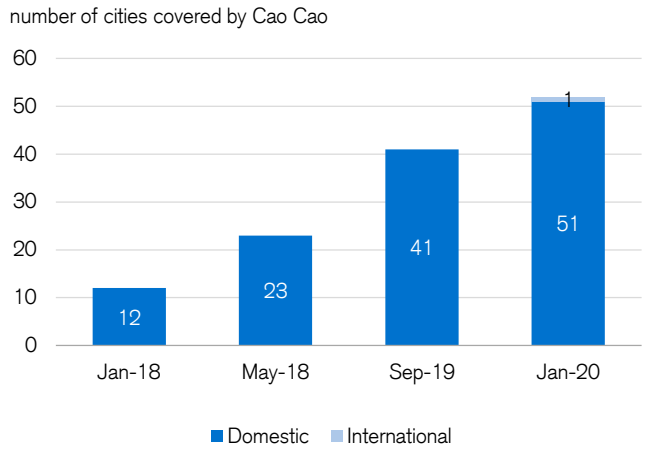
Source: Analysys

Figure 144: Cao Cao's new daily registered users exceed competitors in 2Q-3Q19



Source: Company data, Credit Suisse research

Figure 145: Number of cities covered by Cao Cao



Source: Company data, Credit Suisse research

Dada-JD Daojia

Kenneth Fong, Ivy Ji, Lok Kan Chan, Rebecca Law

Company profile

Dada-JD Daojia was founded in 2016 after the merger of two platforms: Dada (founded in 2014) and JD Daojia (founded in 2015), respectively. Dada is a local logistics platform that focuses on instant delivery services (usually within the same city) in more than 2,400 Chinese cities, with a peak daily volume of 10 mn orders. According to BigData, Dada is the second-largest local logistics platform with a 27% market share and 1.85 mn monthly active users (MAU).

In addition, JD Daojia is an online-to-offline retail e-commerce platform. This mainly covers supermarket daily necessities, fresh fruits and vegetables, a pharmacy, flowers, a bakery and fashion goods. Since its foundation in 2015, it has accumulated almost 100k retail partners, with Dada-JD Daojia now serving more than 74 mn registered users or 30 mn MAU. According to Fastdata, Dada-JD Daojia is the market leader of China's fresh fruit and vegetable online deliveries, with a 14% market share. According to iResearch, China's instant delivery market is estimated to have reached a gross merchandise value (GMV) of Rmb131 bn from 18.5 bn orders in 2019. According to Bigdata, these local logistics orders mainly comprise meals (52%), retail convenience goods (22%), fresh fruits and vegetables (15%), and flowers and cakes (6%).

Dada-JD Daojia raised US$500 mn in its last funding round in August 2018, co-led by Walmart and JD.com, reaching a valuation of US$1 bn. JD.com is one of the biggest investors in Dada-JD Daojia with about a 47.5% equity interest in Dada on a fully diluted basis as of 2018.

Key business spotlights:

Delivery within one hour 24/7: Dada has over 400 mn delivery personnel across China enabling door-to-door pick-ups and deliveries locally (3 km) within one hour at any time of any day.

JD Daojia strong front-end and back-end partnership: (1) Retail partnerships. It offers a wide range of quality products from renowned and leading supermarket brands, such as Walmart, Vanguard and Centurymart. (2) Sales channel partnerships. JD.com, with more than 362 mn annual active users, has JD Daojia's application as a short cut on JD's mobile app main page. (3) Its delivery partnership with Dada enables JD-Daojia to deliver its products within one hour, 24 hours a day, seven days a week.

JD Daojia's product recommendations and management through AI and big data: (1) Dada-JD Daojia analyses user preferences based on their searches and past purchases to provide the best-fitting product recommendation. (2) Real-time monitoring of retail partner inventories to help with replenishment and decrease the chance of products selling out. (3) Elimination of unpopular products to provide a better range of products matching user preferences.

Key management

Philip Kuai (Co-founder and CEO): Mr Kuai founded Dada in 2014. Prior to Dada, he served in management roles with AdChina and Anjuke.com.

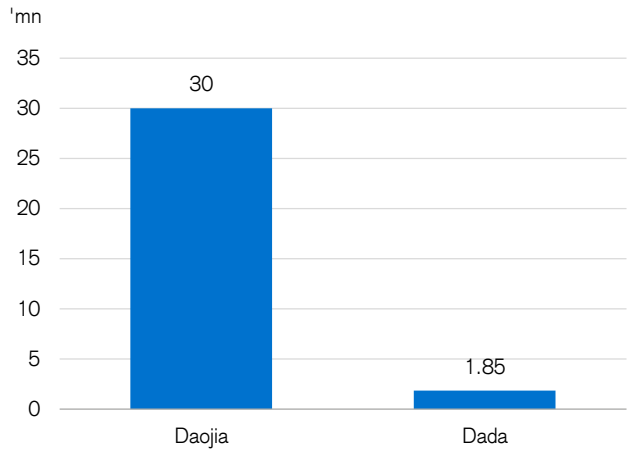
Jun Yang (Co-founder and CTO): Prior to joining Dada, Mr Yang worked at Facebook and Google for almost seven years. During his time with Facebook, he led a research and development team focusing on big data analysis.

Beck Chen (CFO): Mr Chen joined Dada as CFO in December 2018 after serving with Baozun as a CFO for almost six years. He is also a CICPA and CFA charter holder.

Industry

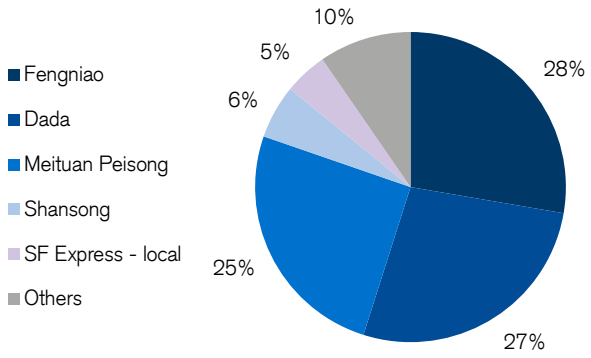
Internet/e-commerce/O2O/Games

Figure 146: Dada and JD Daojia's MAU



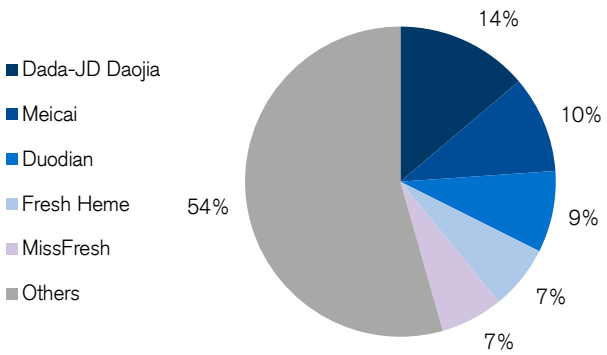
Source: Sequoia, Bigdata

Figure 147: Dada's market share as of 3Q19



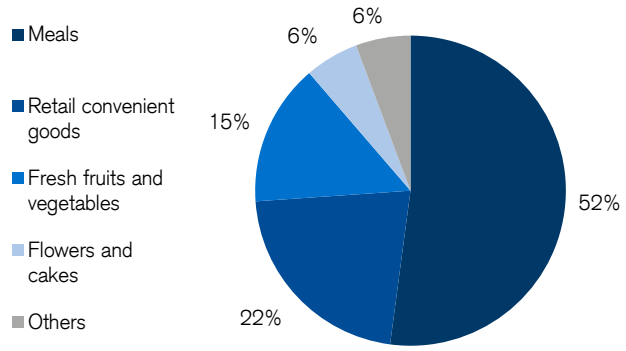
Source: Bigdata

Figure 148: JD Daojia's market share in the fresh fruit and vegetable online market as of 1H19



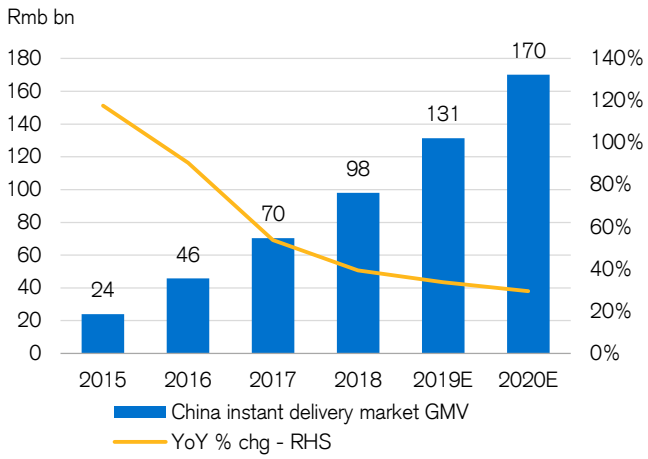
Source: iResearch

Figure 149: China's local logistic online order volume by product



Source: Bigdata

Figure 150: China's instant delivery market GMV



Source: iResearch

Figure 151: China's instant delivery market order volume

Source: iResearch

Dadi Cinema

Kenneth Fong, Ivy Ji, Lok Kan Chan, Rebecca Law

Company profile

Dadi Cinema was founded in 2008 in Guangdong with a lower tier cities' focus and has quickly become one of the biggest cinema chains in China. In July 2017, Dadi's parent company, Nan Hai Corporation Limited (0680.HK), fully acquired the tier 1 and 2 cities' based Orange Sky Golden Harvest to further help the expansion of Dadi Cinema. As of the end of 2019, Dadi is operating in 471 cities with a total of 1,174 cinemas and more than 7,000 screens. With over 174 mn visitors, the 2019 box office reached Rmb5,800 mn.

According to Endata, as of 1H19, Dadi is the largest cinema player in terms of number of cinemas, with a 9.9% share (Wanda ranks second with a 5.6% share). Meanwhile, in terms of box office, Dadi comes second, with a 9.8% share, after Wanda with a 14.2% share, due to Dadi's lower tier cities focus). In China, the average ticket price of a movie is Rmb39 (down Rmb3 YoY) with a seat occupancy rate of 10.6% (down 2.8 pp YoY) in 1H19.

Key business spotlights:

Second- or lower-tier focus: Dadi operates more than 80% of its cinemas in non-tier-1 cities due to a saturated market with intense competition. According to the Nielsen Consumer Trend Index that measures one's willingness to spend and spending power, the tier 3 cities' score was up 10 pp YoY to 121, tier 2 up 9 pp to 119, and tier 1 up least by 7 pp YoY to 114 in 3Q19. This implies non-tier-1 cities should experience higher growth in terms of consumption than in tier 1 cities. With a non-tier 1 city focus, Dadi is well-positioned for future growth.

Self-produced and co-produced animation content: Dadi provides comics and animation content through its wholly-owned subsidiary, Wow Dadi, targeting both children and the two-dimensional market in China. In 2019, its major series MiniForce ranked first in both the iQiyi and Tencent Video VIP paid channels, and had more than 300 mn views on Tencent Video.

Key management

Bin Fang (CEO): Mr Fang joined Dadi Cinema in 2008. He is a highly regarded industry expert as well as the vice chairman of China Film Organisation, a society co-founded by the National Radio and Television Administration and Ministry of Civil Affairs.

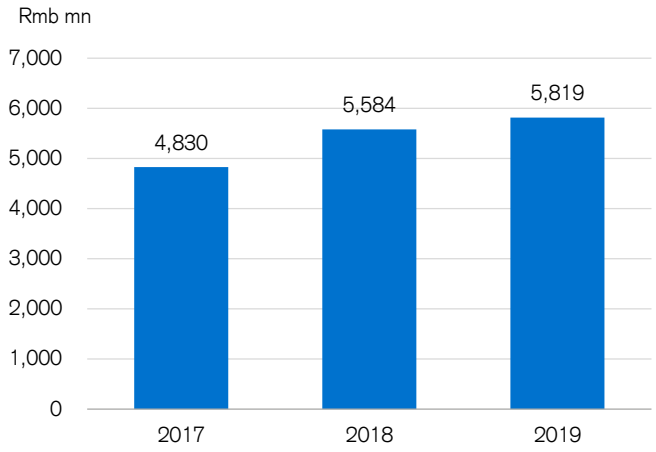
Ms. Yu Yan (General manager): Ms. Yu joined the cinematic industry with Zhongying Cinema in 2002 and joined Dadi Cinema in 2016. She is experienced in film investment and cinema operations. In addition, she is also the vice president of the Beijing Film Society.

Jiaqing Feng (Vice general manager): Mr Feng joined Dadi Cinema in 2010 and his main duties include sales and marketing, expansion and management, and the day-to-day operations of the group.

Industry

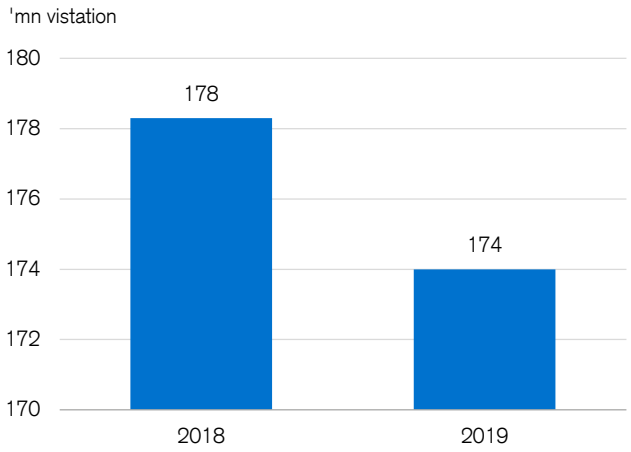
Internet/e-commerce/O2O/Games

Figure 152: Dadi Cinema's annual box office receipts



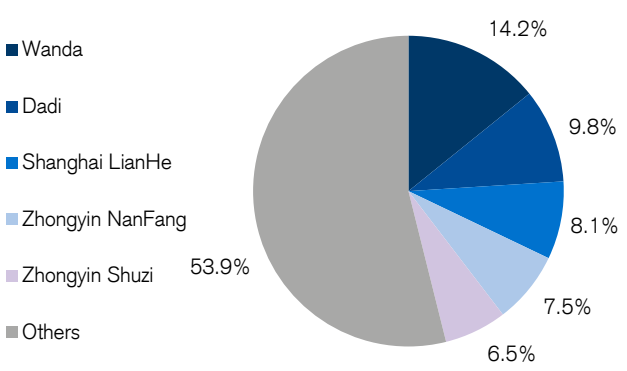
Source: Company data

Figure 153: Dadi Cinema's annual box office visitors



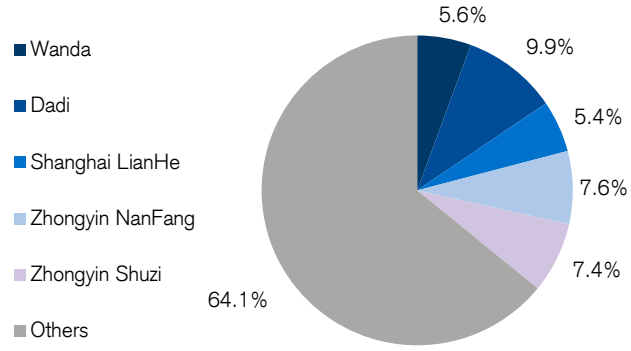
Source: Company data

Figure 154: 1H19 market share in terms of box office receipts



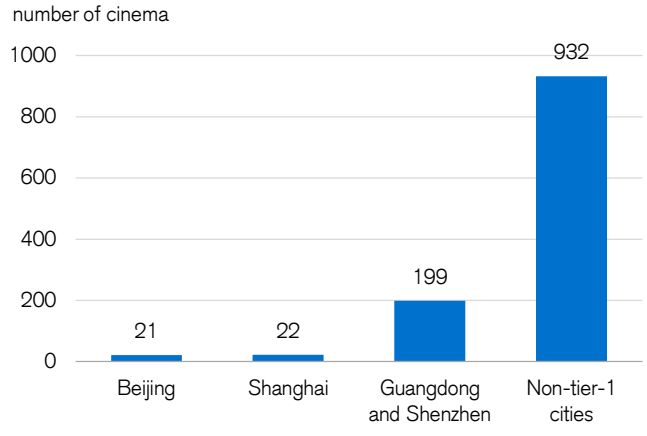
Source: Endata

Figure 155: 1H19 market share by number of cinemas



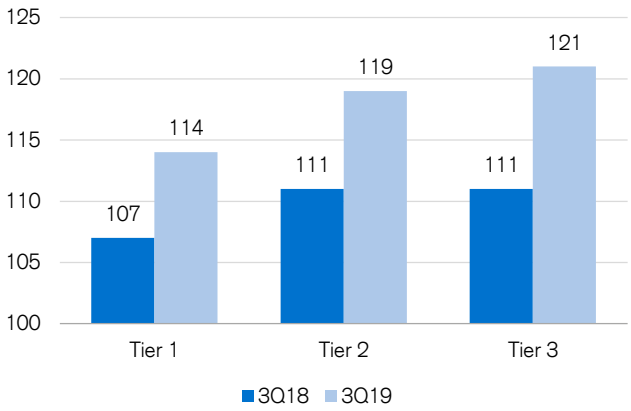
Source: Endata

Figure 156: Number of Dadi cinemas by location



Source: Company data

Figure 157: Nielsen Consumer Trend Index by city tiers



Note: Higher score reflects higher willingness in spending.
Source: Nielsen

Didi Chuxing

Kenneth Fong, Ivy Ji, Lok Kan Chan, Rebecca Law

Company profile

Didi is a global market leader in mobile transportation platforms. It has more than a 90% market share in China, 75 mn monthly active users (MAU) and delivers over 10 bn passenger trips for more than 550 mn registered users across the world. It mainly focuses on its mobile-app-based taxi-hailing service in China which was founded in 2012. It has developed a full range of mobility products (such as bike-sharing, designated driving and food delivery services) and expanded its footprint to more than 400 cities spanning seven countries. According to CNNIC, China's internet ride-hailing users reached 337 mn people as of 1H19, penetrating 39% of the online population. Meanwhile, Qianzhan expects industry GMV to experience a 16% three-year CAGR, reaching Rmb500 bn in 2022.

Followed by strategic investments from Tencent and Alibaba in 2013, Didi merged with another key market player, Kuaidi Dache, in February 2015 and acquired Uber's China unit in August 2016. After the latest funding round of US$600 mn in July 2019 from Toyota Motor, Didi has become the second most valuable start-up company with a valuation of more than US$56 bn.

Key business spotlights:

Market leading hailing platform: (1) Didi's mobile app was launched in June 2012 providing online taxi-hailing services, disrupting the traditional roadside taxi hailing by utilising big data to better match passengers with drivers. (2) Didi Premier was launched in August 2014 being its first non-taxi offering for better product diversification. It offers passengers a superior mobility experience with higher-end vehicles and quality services. (3) Didi Hitch is a carpooling service platform launched in 2015 that matches private car owners with users at cheaper prices than a regular taxi ride. (4) Didi Express allows users to share cars with a fare discount.

Successful global expansion: Didi has entered six other countries outside of China for its ride-hailing service and successfully gained meaningful market shares in Brazil and Mexico. Its food delivery service is another growing focus, with a presence in Brazil, Mexico, Chile and Colombia. In 2020, it targets accelerating its expansion in Japan and entering Russia. Moreover, it has also invested in Grab, Lyft, Ola, Uber, and 99 to expand its global network.

Thoughtful and innovative product offerings: On top of taxi-hailing, Didi also offers: (1) Didi Enterprise Solutions provides corporate ride services and management solutions that enable trip and fare control in the backend system. (2) Didi Bus offers bus transfer plans and customised bus lines to costumers. (3) Didi Designated Driving offers car owners convenient and reliable driving services. (4) Didi Luxe aims to target customers who prefer a high-end experience with customised offerings such as auto brand, model, music and available refreshments. (5) Didi Bike has launched its own bike-sharing platform, which integrated companies Ofo, Bluegogo and Didi-branded bikes from January 2018. (6) Didi English offers instant text message translation targeting non-Chinese speakers to facilitate rider-driver communication.

Key management

Will Cheng (Co-Founder & CEO): Prior to launching Didi Chuxing in 2012, Mr Cheng founded Beijing Orange Technology and had over eight years in Alibaba Group in an operational role.

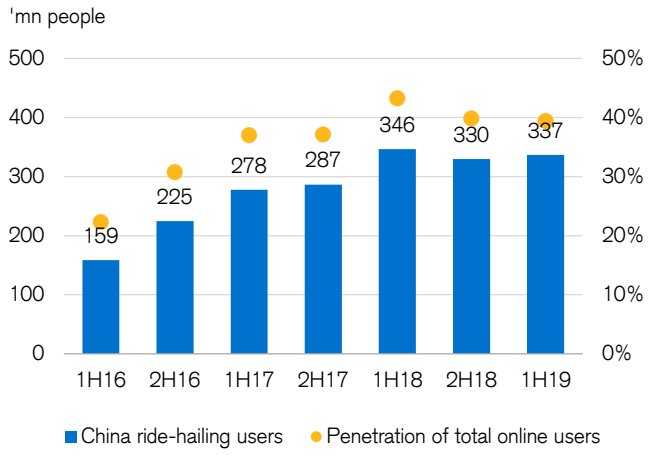
Ms. Jean Liu (President): Ms. Liu joined Didi in July 2014 from her previous position as a managing director at Goldman Sachs.

Bo Zhang (Co-Founder & CTO): Before Mr Zhang co-founded Didi, he served as a tech manager in Baidu Inc for more than three years.

Industry

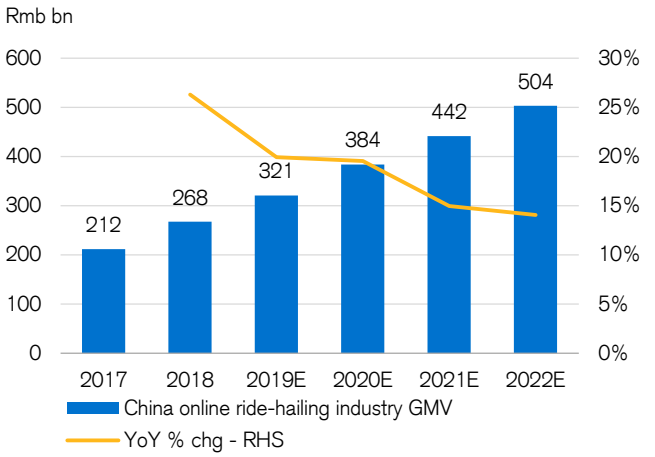
Internet/e-commerce/O2O/Games

Figure 158: China's online ride-hailing users



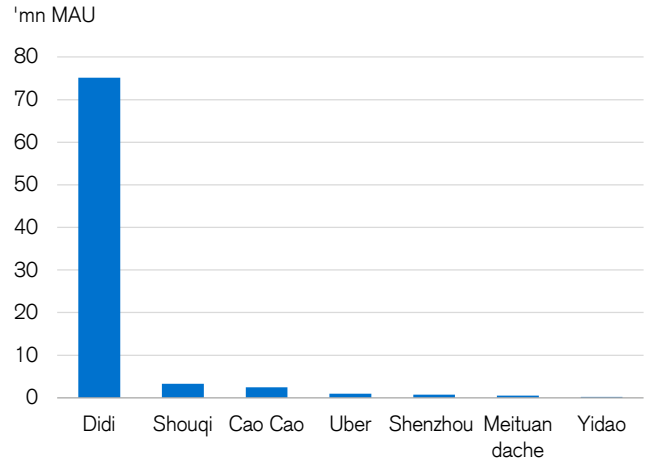
Source: CNNIC

Figure 159: China's online ride hailing industry GMV



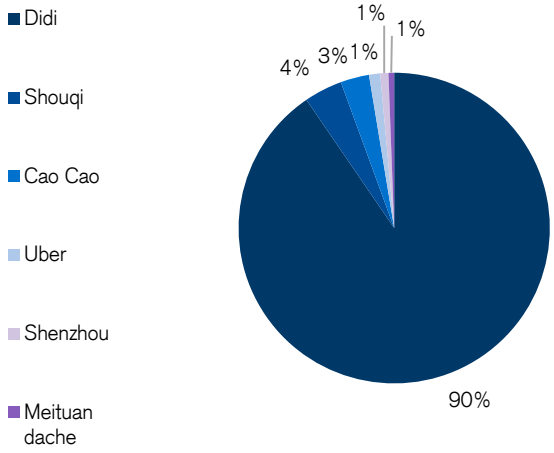
Source: Qianzhan

Figure 160: China's ride-hailing platform operator MAUs



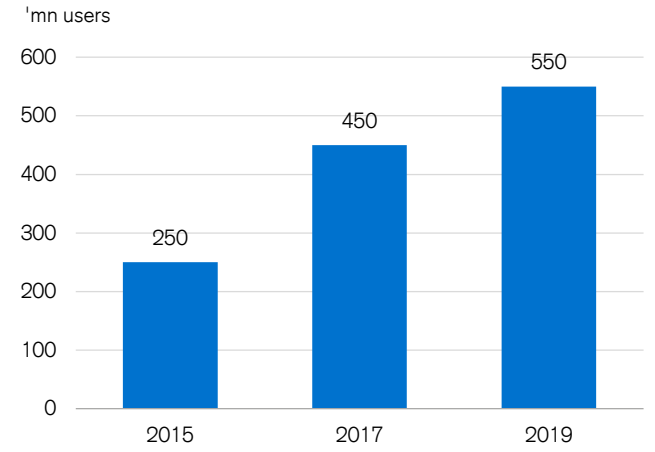
Source: Analysys; Note: as of May 2019

Figure 161: China's ride-hailing platform operator market shares



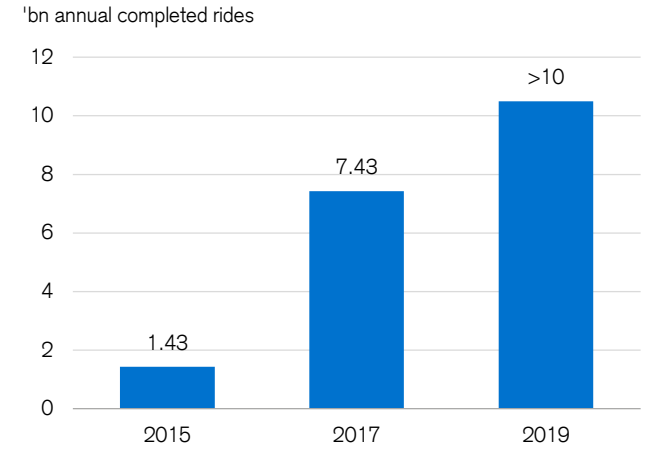
Source: Analysys; Note: as of 3Q18

Figure 162: Didi's registered users



Source: Company data

Figure 163: Didi's annual completed rides



Source: Company data

Ding Xiang Yuan (DXY)

Fei Zheng, Jason Liu

Company profile

Founded in 2000, DXY was launched as an online forum for doctors to search for medical bibliographies, and share experience and knowledge. It has 5.5 mn professional registered members of which more than 2 mn are doctors, according to its company website. Its business can be categorised as providing channels for doctors, patients, medical institutions and commercial services. The company has already built four off-line clinics.

- **Doctors:** DXY provides a channel for doctors from different regions to search for medical bibliographies and communicate with each other. The company has also built a search engine including all the China-approved drug prescription instructions to help doctors prescribe drugs. An app named "DXY Drugs Information" was designed for mobiles.
- **Patients:** The platform provides a channel for patients to talk to other patients with the same diseases. DXY popularises basic medical knowledge to the public including diet and exercises among other things. Besides, doctors can give advice (but not prescriptions) to patients especially on chronic disease management. A DXY ranking of hospitals for different departments is provided for patients' reference.
- **Medical institutions:** With more than 2 mn doctors registered on the platform, DXY serves medical institutions as a platform to post job advertisements and hire doctors to join them.
- **Commercial services:** Pharmaceutical and medical device companies are able to market their new products on the DXY website. Detailed data such as time spent on reading the instructions of specific products or videos can be monitored through the website. Now revenue from commercial services accounts for around 50% of its total revenue.
- **Off-line clinics:** The company started to build off-line clinics in 2017 providing general practice. Patients registered with DXY online can be shifted to off-line and generate revenue.

Key management

Li Tiantian (founder and chairman): Li holds a master's of oncology, dropping out of his PhD of bioinformatics from Harbin Medical University. He started the company 18 years ago.

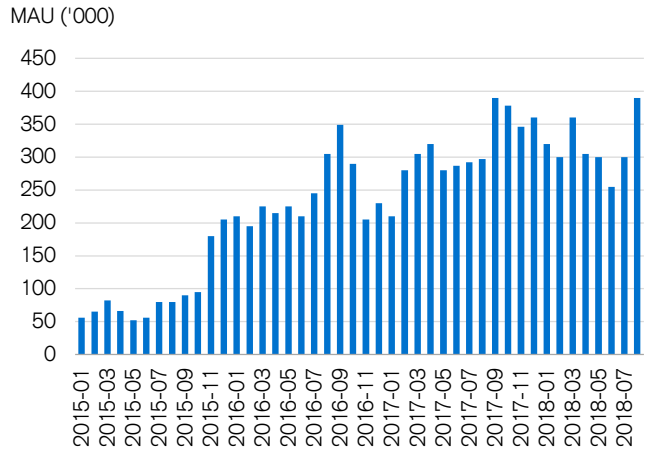
Zhang Jin (CEO): Zhang holds a PhD from Central South University and has practised as a specialist at the Second affiliated Hospital of Zhejiang University Medical School. He joined the company in 2008.

Zhou Shuzhong (founder): Mr Zhou co-founded the company with Mr Li.

Industry

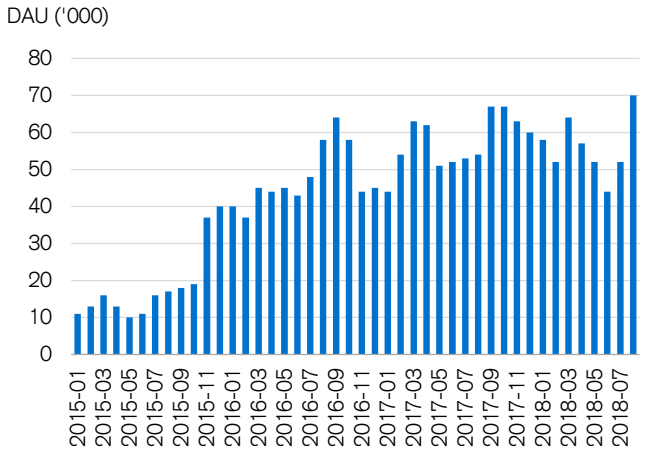
Internet/e-commerce/O2O/Games

Figure 164: App MAUs have kept increasing



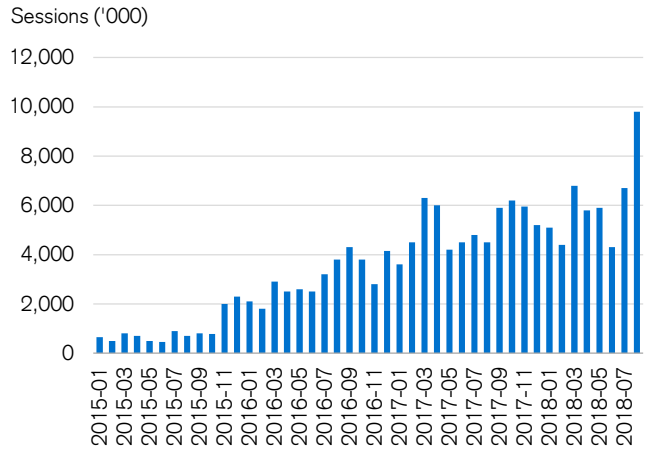
Source: QuestMobile

Figure 165: App DAUs have kept increasing



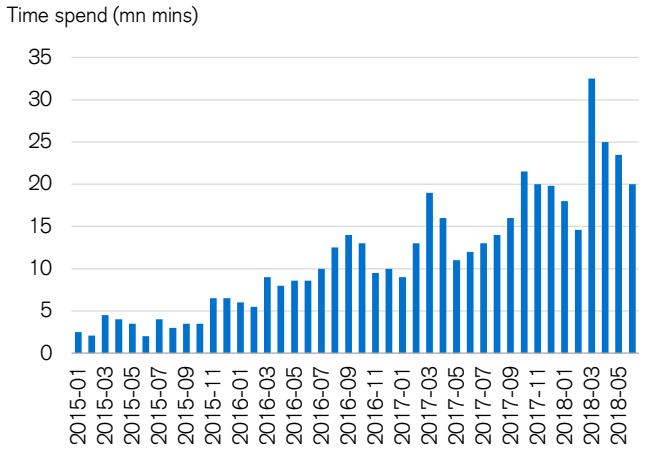
Source: QuestMobile

Figure 166: Session usage of the app



Source: QuestMobile

Figure 167: Time spent on the app



Source: QuestMobile

Figure 168: Time spent per MAU per month

Date	2010	2012	2014	2018
Round	A	B	C	D
Investor	DCM	Shunwei, DCM	Tencent	Trustbridge Partners
Investment (US$mn)	2 mn	15 mn	70 mn	100 mn

Source: QuestMobile

DJI Innovations

Kyna Wong, Chaolien Tseng, Stephen Yin

Company profile

Founded in 2006, DJI is a global leader by market share in civilian drones and aerial imaging technology. DJI's unmanned aerial vehicles (UAV), commonly known as drones, are used by individual consumers as well as professionals in filmmaking, agriculture, conservation, construction, search and rescue, energy infrastructure, and so on. DJI has facilities in the US, Germany, the Netherlands, Japan, South Korea, and China. DJI's manufacturing facility is in Shenzhen.

DJI generated revenue of Rmb18 bn in 2017, with 80% year-over-year growth. DJI has ~70%share in the global consumer drone market in 2017, according to a report by Chinadaily. DJI has expanded its expertise and innovative technology to enterprises, government agencies and different industries around the world. It has expanded its enterprise solutions to include aerial platforms, payloads and analytic tools that can be deployed for businesses across the agriculture, construction, infrastructure, energy, public safety sectors, and more. UAV-powered solutions enable operators to streamline workflows, empower staff, digitise operations and make daily processes less time consuming and more cost effective, preparing businesses to meet the needs of tomorrow's workplace. Roger Luo, DJI's President, said in early 2018 that DJI will further increase its industrial drone business (currently 15% of total revenue). In May 2018, DJI and Microsoft formed a strategic partnership to help enterprises harness commercial drone technology and edge cloud computing, with DJI's drones and Microsoft's AI and machine learning capabilities.

Key management

Wang Tao, Frank Wang (Founder and CEO): Mr. Wang founded DJI in 2006 while pursuing his master's degree at Hong Kong University of Science & Technology. Forbes estimates that Wang owns about 45% of DJI.

Roger Luo (President): Mr Luo joined DJI in 2015 as Operation Vice President and was named as DJI's President in 2017. Previously, he has served in many hardware and software companies, including Apple, Foxconn Tech, Siemens, Innolux, etc.

Industry

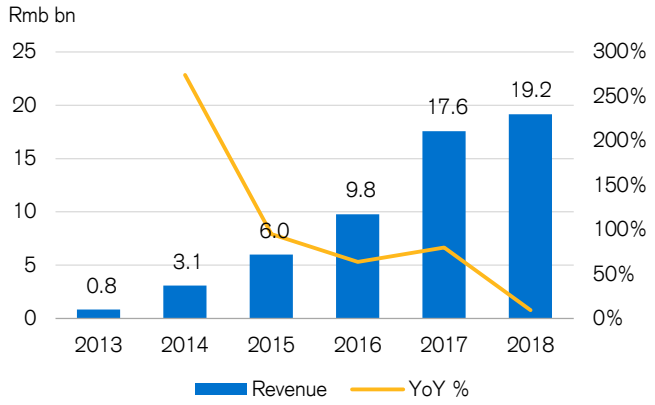
Hardware/Semi

Figure 169: DJI raised over US$1 bn funds in the past

Round	US$ mn	Date of funding
Series C	1,030	5-Apr-2018
Series B	75	6-May-2015
Series A	30	24-Nov-2014

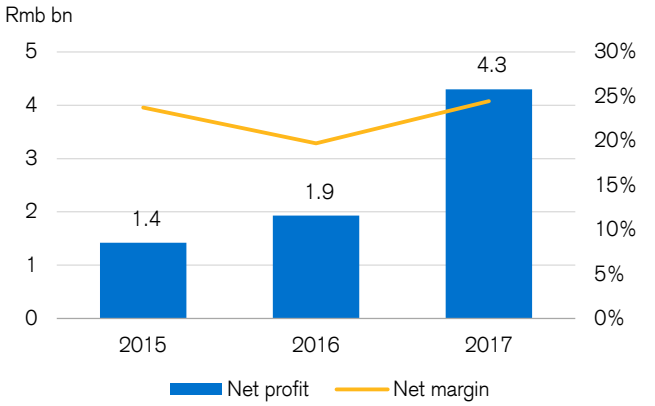
Source: CBInsights, company data, Credit Suisse research

Figure 170: DJI revenue and annual growth rate



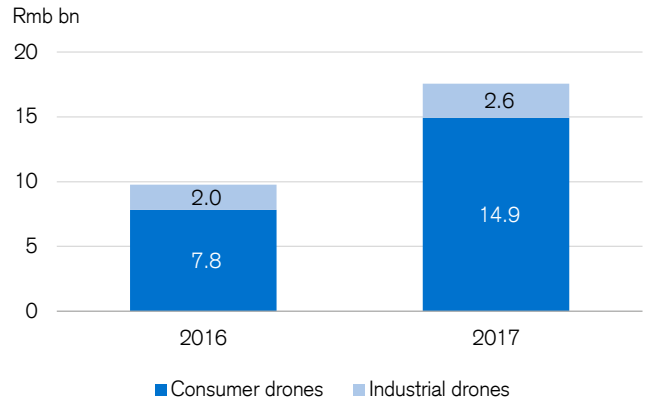
Source: Sohu, company data, Credit Suisse research

Figure 171: DJI net profit and net margin



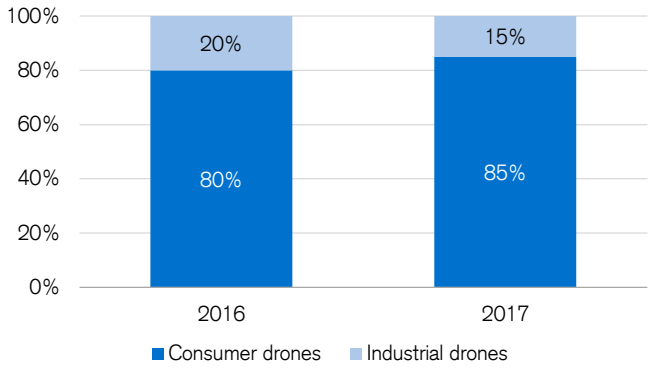
Source: Sohu, Credit Suisse research

Figure 172: DJI revenue by types of drones



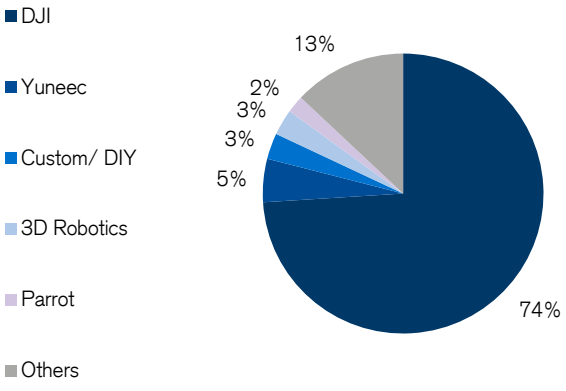
Source: Sohu, Credit Suisse research

Figure 173: DJI revenue by types of drones



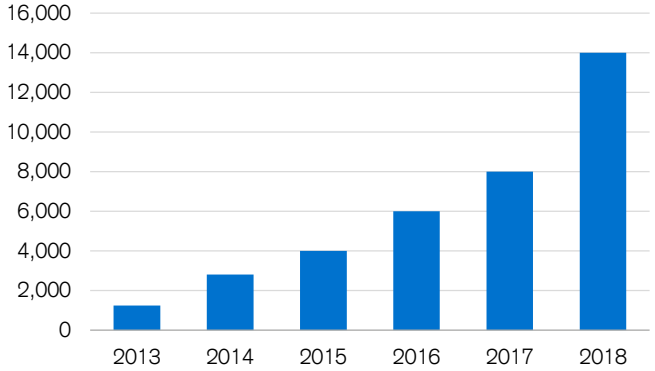
Source: Sohu, Credit Suisse research

Figure 174: DJI dominated market share in 2018



Source: Company data, Credit Suisse research

Figure 175: DJI had dominant market share in 2018



Source: Company data, Credit Suisse research

DT Dream

Kyna Wong, Chaolien Tseng, Stephen Yin

Company profile

DT Dream was established in March 2015 in Hangzhou, as a solution provider for cloud computing and big data analysis. The company has set up 31 branches in China and innovation centres in multiple cities. It has three major businesses—cloud computing, big data analysis, and cloud security:

Cloud computing: The business includes private cloud, hybrid cloud, and other products such as cloud database and middleware. Its private cloud CDU is based on Ali-cloud IaaS, integrating compute, storage and network resources to provide a distributed framework for different scenarios for its clients. Current users of its private cloud include Zhejiang, Jiangsu and Guangdong provincial governments. Its hybrid cloud DTCube spans across infrastructure, data service and application layers to provide users with an All-in-one solution, and mature products with full stack capabilities. Cloud database is highly scalable and available while its middleware provides core support to Taobao, Tmall and Juhuasuan business of Alibaba.

Big data analysis: Its solutions provide API/SDK for multiple use cases including public security, economic forecast, driving, and smart transportation, etc. It connects to a data sharing platform and has calculation engines to process massive amounts of data for real-time analysis. Its solutions provide datamining for finance, public security, transportation, electricity and IoT industries.

Cloud security: This is based on Alicloud's security platform, and provides DDoS protection, with separation among tenants to ensure security of main servers. The solution has a centralised security management centre to manage the whole system. The cloud security solution provides protection for different levels across platform, servers, data, applications business, among others.

DT Dream mainly covers two client segments: governments and corporates, targeting to provide IaaS, PaaS and DaaS private platform for governments, with cloud migration and optimisation services. For its corporate clients, the company provides full stack services including operation, maintenance, design and consulting across industries. Its clients include Geely, China Mobile, Didi, CCTV and Haier. In Jun-2017, DT Dream completed Series A funding and was valued at over US$1 bn. In Sep-2019, DT Dream completed Series B funding of Rmb600 mn, and was valued at US$1.5 bn. Its biggest shareholder, Alibaba, holds a 22.5% share.

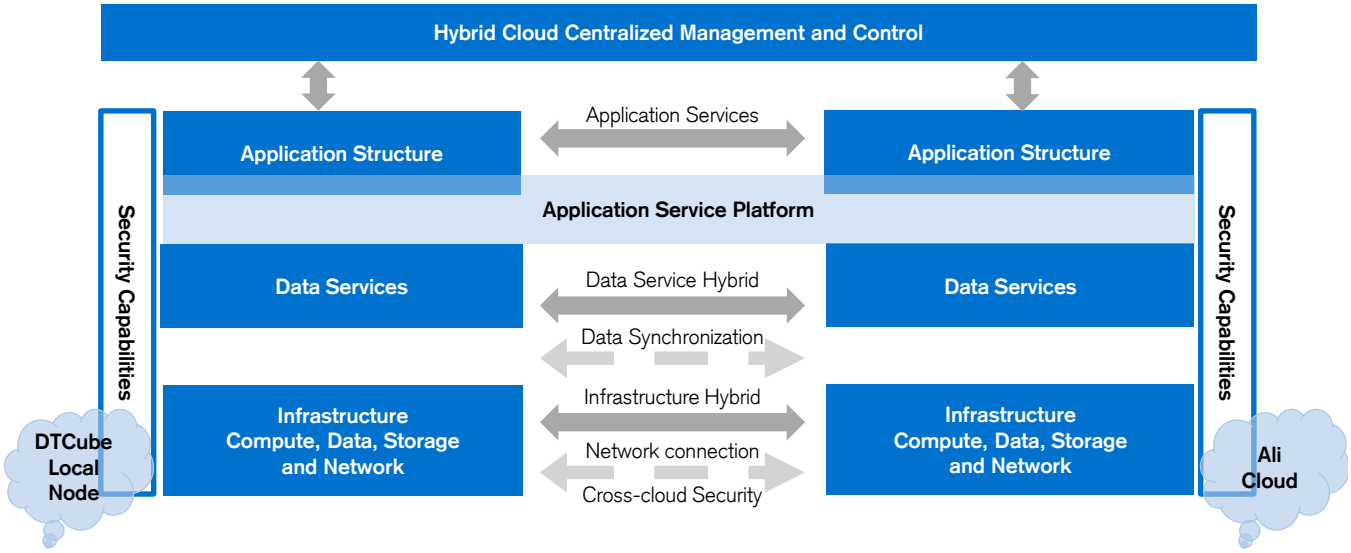
Key management

Ms. Wu Jingchuan (Chairwoman & CEO): Ms. Wu joined DT Dream in 2016. Before joining DT Dream, she had multiple years' experience in H3C, and held management roles such as head of global sales, chairwoman and CEO. Before H3C, Ms Wu also worked in Huawei for seven years, as vice president for China marketing, head of data communication sales, head of broadband product sales etc., and led Huawei's data communication products to grow by 200% during her time. She also worked in the R&D space for CATV, HFC when she first joined Huawei. She graduated from UESTC in Sichuan, China.

Industry

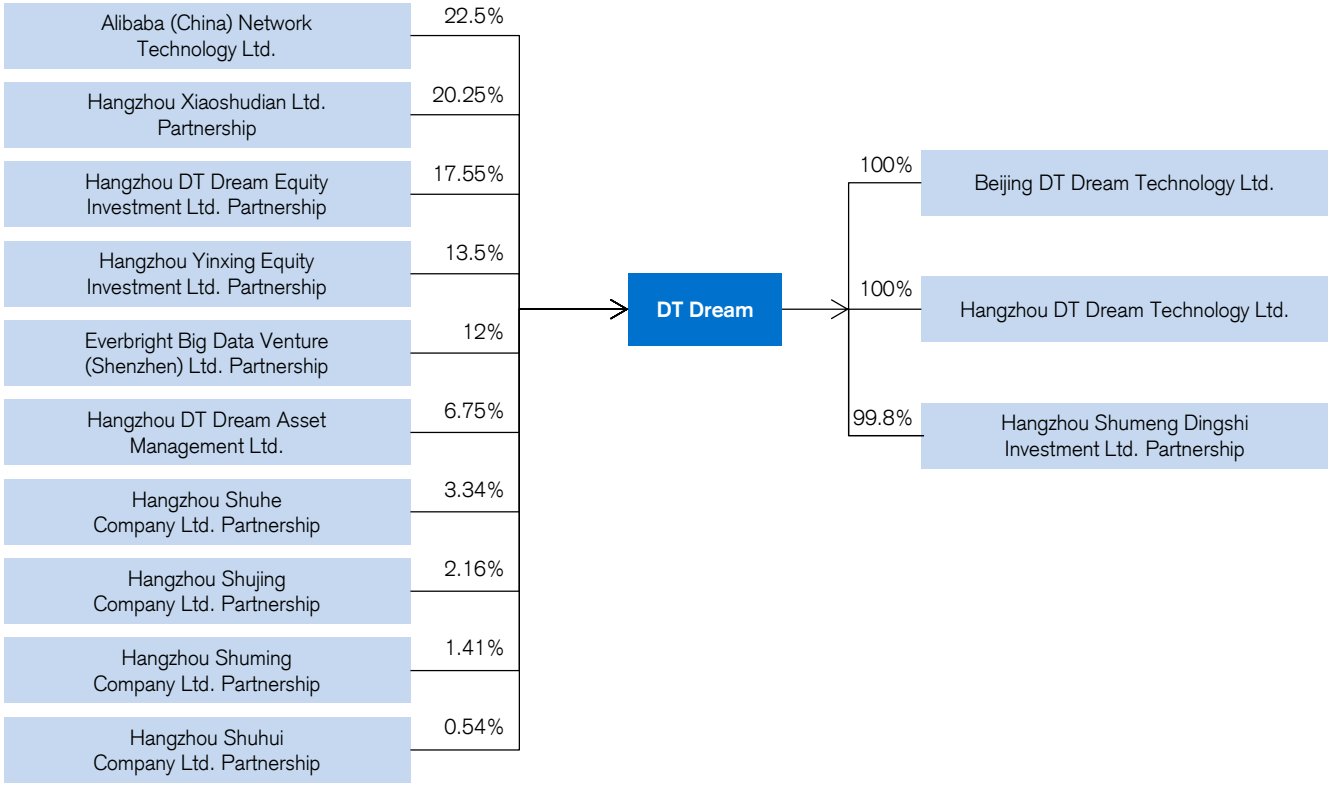
AI/Big Data/Robotics/Software

Figure 176: DT Dream's hybrid cloud structure



Source: Company website

Figure 177: Shareholders and subsidiaries structure of DT Dream



Source: Qichacha

Gan & Lee Pharmaceuticals

Fei Zheng, Jason Liu

Company profile

Founded in 1998, Gan & Lee now is the leader in China's diabetes drug market focusing on insulin. It launched the first insulin analog by a Chinese company in 2005 and the first quick insulin analog by a Chinese company in 2006. It also expanded its business to other emerging markets including ASEAN, Egypt, Pakistan and Latin America. Except the launched products, the company has a rich pipeline focusing on diabetes drugs. It now has 2.65% of China's diabetes drug market share.

- **Leader in China's diabetes market:** The company's market share in China's diabetes market increased from 1% in 2011 to 2.7% in 2015. It kept gaining market share from MNCs and had the first approved insulin analog by a Chinese company approved in China.
- **Launched product:** The company's major products include insulin glargine (Basalin), recombinant lispro insulin injection (Prandilin) and mixed protamine zinc recombinant human insulin lispro injection (Prandilin 25R). Prandilin delivered Rmb1.63 bn sales in 2016 with 44% sales CAGR in the past three years.
- **R&D capacity and pipeline products:** Its pipeline also focuses on the diabetes drug market. The company has filed insulin aspart drug application and is waiting for approval. Besides, it is preparing to start insulin glargine's clinical trial Phase III in the US.
- The company's total revenue reached Rmb1.8 bn in 2016 with insulin-related products contributing 98% of total sales. Net profit also reached Rmb770 mn in 2016.

Key management

Gan Zhongru (Chairman and CEO): Mr Gan is the founder of the company. He graduated from University of Michigan with a PhD. Mr. Gan worked in Merck for eight years after that.

Ms. Wang Damei (Director and VP): Ms Wang graduated from Peking University with a master's degree in pharmaceuticals. She joined Tonghua Antaike in 1995 and joined Gan & Lee, where she has been working since 2002.

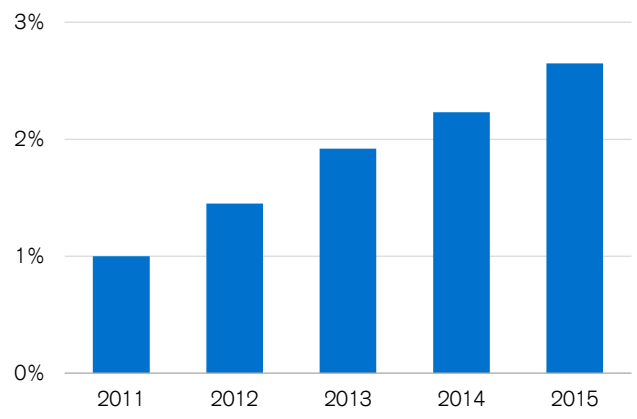
Ms. Zhang Ying (Director and VP): Ms Zhang joined the company in 2005 and is responsible for its financial management.

Song Weiqiang (Director and VP): Mr Song graduated from Renmin University. He joined the company in 2005 and has served in multiple roles in the company.

Industry

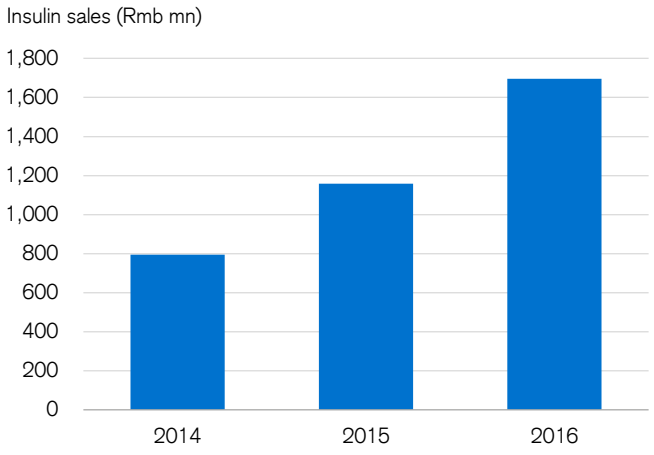
Healthcare/Biotech

Figure 178: Gan & Lee market share in diabetes



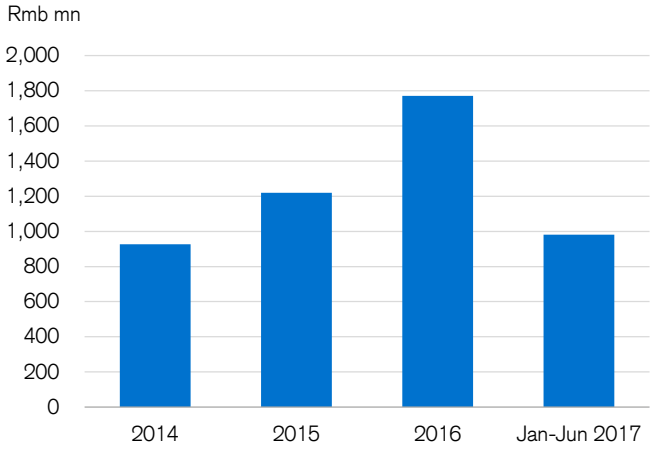
Source: Company data

Figure 179: Basalin delivered 44% sales CAGR



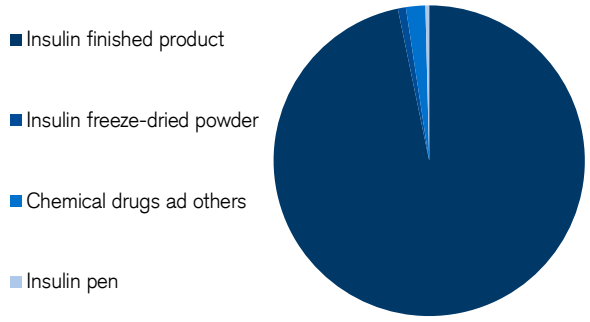
Source: Company data

Figure 180: Revenue 2014-1H17



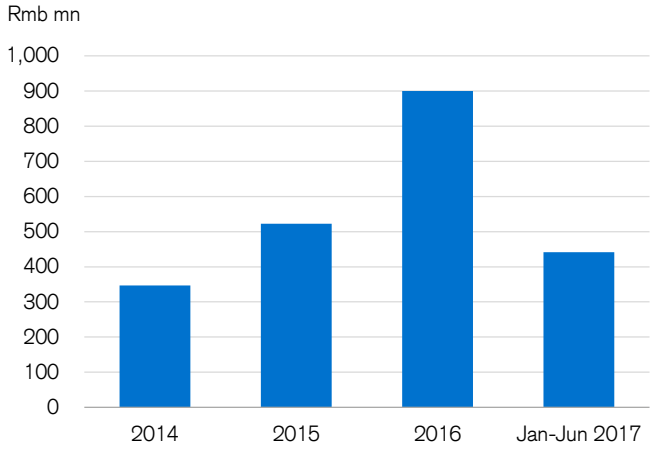
Source: Company data

Figure 181: Sales segment in 1H17



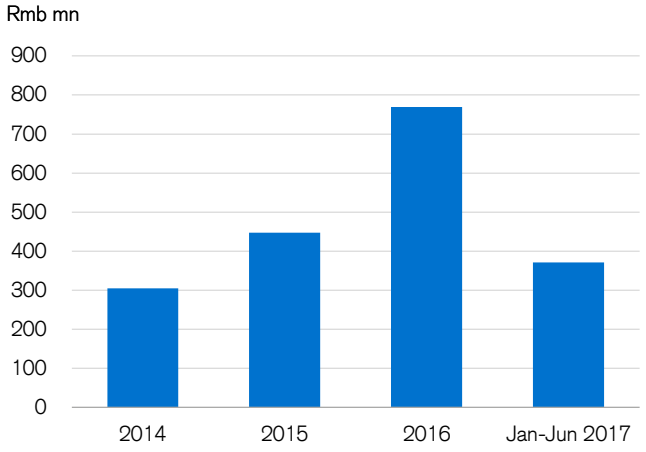
Source: Company data

Figure 182: Operating profit 2014-1H17



Source: Company data

Figure 183: Net profit 2014-1H17



Source: Company data

Geekplus Robotics

Kyna Wong, Chaolien Tseng, Stephen Yin

Company profile

Geekplus Robotics (Geek+) was founded in 2005 and is a technology company engaged in smart logistics solutions with the use of robotics and artificial intelligence technologies to provide flexible, reliable and highly-efficient solutions for warehouse and supply chain management applications. The company provides leading, reliable, and a one-stop enterprise-level service with strong strength in technology, precise customer understanding, thorough after-sales service, and ISO 9001: 2008 quality system. Geek+ has successfully completed over 200 projects across four continents, deploying more than 7,000 robots. The company has over 700 employees and is headquartered in Beijing, with offices in Hong Kong, Japan and Germany.

The company's R&D team brings together robotics, computer science, and AI engineers, with industrial engineers, who have an understanding and proven experience in supply chain management, enabling Geek+ to offer truly comprehensive intelligent logistics solutions to its customers. The company develops tailored solutions for a broad range of industries globally, including e-commerce, apparel, retail, logistics, 3PL, pharmaceutical, and manufacturing.

The company's R&D team is made up of employees with PhDs and master's degrees from universities of high repute, including Tsinghua, PKU, CAS, BEIHANG, USTB, among others. The team has solid research and practical experience in the fields of robotics, embedded software development and programming, and artificial intelligence engineering. Most of them have also competed in, and won, various domestic or international robotic contests. All products are developed independently and possess core patents, and are equipped for world-class level performance.

Key management

Yong Zheng (Chairman, Founder & Chief Executive Officer): Yong Zheng is the CEO and founder of Geek+, with expertise in supply chain management and robotics. He has worked previously as a senior manager in ABB and Saint-Gobain, and has a master's degree in industrial engineering from Tsinghua University and also RWTH Aachen University.

Dr Hongbo Li (Co-Founder & Chief Technology Officer): Dr Hongbo Li, Co-founder and CTO of Geek+, has a PhD in computer science from Tsinghua University and is an expert in the field of intelligent robots and multi-agents. He has more than ten years of experience in robotic R&D management. After the establishment of Jizhijia, Dr Li has been committed to achieving highly flexible and intelligent logistics solutions through artificial intelligence technology.

Lit Fung (Managing Director): Lit Fung is the Managing Director of Geek+. Prior to Geek+, he was the general manager of IT & Automation at BPS Global Group. He is responsible for logistic consultation, automation integration, and warehouse solution design and system integration.

Industry

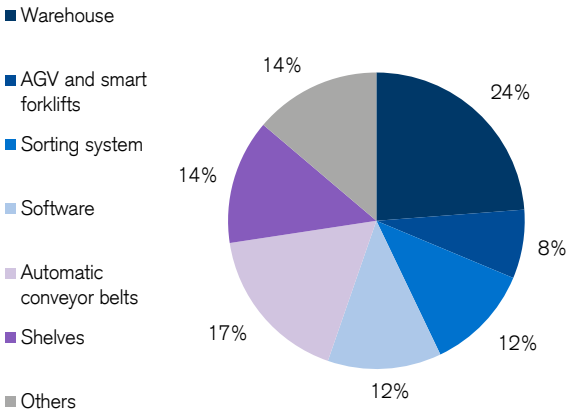
Logistics

Figure 184: Geek+ product suite

Picking System	Moving System	Sorting System	Storage Retrieval System
Moves shelves to achieve "goods to person" for goods picking	Move shelves and pallets, achieving automatic point to point moving	Uses visual navigation to achieve automatic sorting	Automated storage and retrieval in the warehouse and the factory

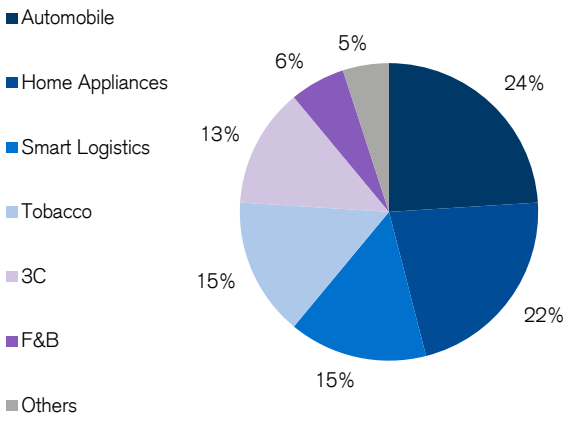
Source: Company data

Figure 185: Smart warehouse automation cost breakdown



Source: CHYXX

Figure 186: AGV applications breakdown



Source: CHYXX

Hosjoy

Jianping Chen, Summer Wang

Company profile

Hosjoy, founded in 2009, is one of the leading platforms on energy consumption and smart system services. The company offers air-conditioning and heating, ventilation, water purification, and smart home control systems. Hosjoy targets satisfying the upgrade of consumption demand for a more comfortable living environment via its one-stop and IoT smart home solution through its app and website.

- **Development:** Before 2014, Hosjoy mainly operated its company-owned product and service stores in the East China region. To focus on service platform development, Hosjoy commenced its strategy transition in 2014 and integrated other third-party product and service stores in other regions and built a comprehensive product and service platform. Under the 'S2B2C' model, Hosjoy provides all-dimensional support to local product and service stores, including finance, internet operation tools, supply-chain management, technical services and store operation services, to strengthen its competitive edge and brand impact by offering standardised service and a high-quality product. Currently, its service network covers over 100 cities in 16 provinces, including over 1,500 service stores, and has serviced over 200,000 customers till date.
- **Fund raising:** Hosjoy has completed four rounds of financing and has obtained Rmb1.25 bn from DT Capital, Founder H Fund, Richland Equities, Charisma Partner, the US-China Green Fund (Rmb0.8 bn) and others. The valuation of the company exceeded US$1 bn upon the completion of the fourth round of financing in October 2018.
- **Key competitors:** Major competitors are traditional local product and service stores in the sector, and other smart home market players, including Haier, Orvibo and Uiot.

Key management

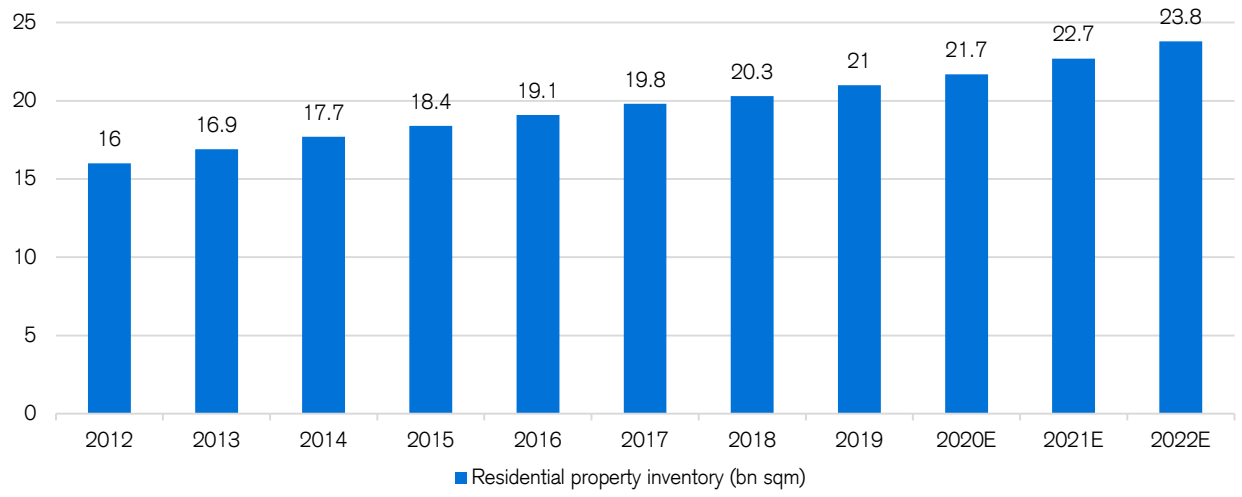
Jianguo Wang (Chairman): Mr Wang is the Chairman and founder of Hosjoy, Haiziwang (chain stores for selling baby and children products and relevant services), Huitongda (O2O platform focused on rural areas) and Five Star Holdings.

Hao Wang (CEO): Mr Wang has been the CEO of Hosjoy since 2018. Prior to that, he was the investment and financing manager of Five Star Holdings. Mr Wang graduated from the Case Western Reserve University.

Industry

Internet/e-commerce/O2O/Games

Figure 187: The residential property inventory in China



Source: CEIC, Credit Suisse research

Figure 188: Major milestones of Hosjoy

Year	Event
2019	■ Launched the 4.0 smart experience centre and smart home IOT system.
2018	■ Hosjoy completed the C+ round financing with a valuation of US$1 bn.
2017	■ Completed C round financing of Rmb800 mn from the US-China Green Fund.
2016	■ Completed B round financing of Rmb120 mn from Founder H Fund, Richland Equities and Charisma Partner.
2016	■ Completed the shareholding reform and signed a strategic cooperation agreement with Nanjing Wulian.
2015	■ Completed A round financing of Rmb30 mn from DT Capital.
2014	■ Hosjoy established its online business and launched its e-commerce platform.
2013	■ It was listed as one of the intelligent projects under the key support of the local government.
2010	■ Opened one of the largest experience stores for indoor comfortable systems in Nanjing.
2009	■ Hosjoy was founded in Nanjing and opened its first experience store for indoor comfortable systems.

Source: Company data, CTSBW.com, Credit Suisse research

Huaqin Telecom

Kyna Wong, Chaolien Tseng, Stephen Yin

Company profile

Founded in 2005, Huaqin Telecom is an ODM (original device manufacturer) for smartphones, tablets, notebooks, wearables, servers, automotive and IoT products. Headquartered in Shanghai, Huaqin has R&D centres in Shanghai, Wuxi, Xi'an, Dongguan and Nanchang. Its production sites are in Nanchang, Dongguan and Indonesia. It has over 26,000 employees, including 60% R&D personnel. Huaqin completed the first round fundraising of US$130 mn in 2017 and B round of funding of US$147 mn in December 2019. The B round investors include some high-profit names like Qualcomm, Intel, and SummitView Capital, among others.

According to the company, Huaqin's revenue reached Rmb30.8 bn in 2018, with 106 mn device shipments of all product categories. The company estimated its notebook business to more than double in 2019, wearables to grow 200%+, and it to ship a total of 120 mn devices of all categories in 2019, leading to Rmb36 bn revenue.

In the handset market, Huaqin is the second-largest ODM, after Wingtech. According to IHS Markit, Huaqin shipped 85 mn handsets in 2018, while Wingtech shipped 90 mn handsets. Huaqin's customers include Huawei, Xiaomi, LG, and Lenovo, among others. More recently, Huaqin has become one of the ODMs for Alipay's new Dragonfly facial recognition device.

Key management

Mr Qiu Wenshen (Founder): Mr Qiu founded Huaqin Telecom in 2005 and serves as the Chairman and CEO. Prior to founding Huaqin, he worked with ZTE between 1998 and 2005. Mr Qiu graduated from Tsinghua University and completed his master's degree from Zhejiang University.

Industry

Hardware/Semi

Figure 189: Huaqin's key milestones and major customer recognition

Year	Milestone & major customer recognition
2011	■ Smartphone went into production in Huabel. ■ Xi'an R&D Centre was founded.
2013	■ Accumulated shipments reached 100 mn. ■ Tablets started to ship globally.
2014	■ Received "MBG Outstanding Serviceability" award by Lenovo.
2015	■ Received "The Core Partner" award by Huawei.
2016	■ Received "Outstanding Serviceability" award by Lenovo. ■ Received "The Core Partner" award by Huawei.
2017	■ Developed server solution. ■ Received "Best Quality Partner" by Huawei. ■ Received "Perfect Quality Award" by Lenovo. ■ Received "Breakthrough Award" by Intel.
2018	■ Received "Exellent Quality Award" by Huawei. ■ Received "Best ODM Partner Award" by LG. ■ Received "Perfect Quality" by Lenovo. ■ Received "CCG Innovation Award" by Intel. ■ Received "Best Delivery Award" by Xiaomi.
2019	■ Started 5G projects. ■ Received 'Best Quality' supplier award from Xiaomi. ■ Received "Microsoft ODM Partner & Million Units Device Shipment" by Microsoft. ■ Received "Outstanding Serviceability" at 2019 Lenovo Supplier Conference.

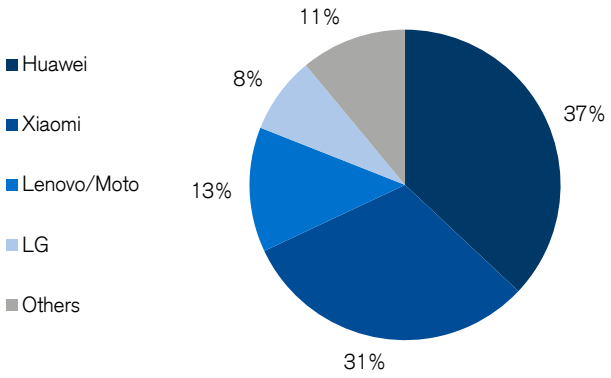
Source: Company data, Credit Suisse research

Figure 190: Top 10 smartphone ODM shipments in 2017-18

ODM smartphone shipments (mn)	2017	2018	YoY growth (%)
Wingtech	83.7	90.2	8%
Huaqin	79.1	85.0	7%
Longcheer	34.2	57.8	69%
Chino/OnTim	5.9	17.8	202%
TINNO	15.4	11.5	-25%
Wind	17.3	5.0	-71%
Arima	2.7	1.2	-56%
CCI	2.6	1.0	-62%
Ragentek	8.1	-	-100%
CK	4.8	-	-100%

Source: IHS Markit

Figure 191: Huaqin 2018 smartphone shipment mix by customer



Source: IHS Markit

Huimin

Tina Long, Michael Wang

Company profile

China Business Huimin is the leading B2B e-commerce platform in China. It aims to build a community e-commerce service platform, a micro-logistics platform for urban areas, and a comprehensive and convenient community service platform. The innovative development model has largely enhanced the competitiveness and service capabilities of the community supermarkets (convenience stores).

Huimin started business in May 2013. After seven years of development, its business now covers 23 provinces or cities in China, serving nearly 600,000 community merchants, enterprises and institutions. In the upstream, it also has maintained good relationship with brands including Nescafe, Tsingtao Brewery, Want Want, Panpan Foods, Uni-President, Yili, etc. It has built around 30 modern logistics distribution bases with nearly 1,000 delivery vehicles.

Key business is as follows:

- **Huipeitong:** An ordering terminal designed for business managers of community convenience stores. It aims to solve the problem of 'difficult and expensive procurement' and 'fake goods'. The platform enables the direct factory-store and agriculture-store connection. On the one hand, the model greatly improves the efficiency of the supply chain by offering unified and centralised distribution solutions. On the other hand, the system offers professional guidance and support for community store sales and inventory management.
- **Huigou GO:** A community group purchase product launched in 2018. Supported by the strong supply chain of Huimin and the ability to offer high-quality low-priced products, Huigou GO provides one-stop FMCG group purchase services to enterprises and institutions at the core of business community.
- **Hijia Convenience:** A franchise brand positioned to run modern convenience store professionally. The company also provides operation guidance and logistics support to traditional convenience stores that have upgraded to 'Hijia Convenience'.
- On 9 September 2018, the company completed a fund raising of Rmb1.6 bn, hitting a record in terms of financing size in the B2B e-commerce sector. The investment was led by Jinan Industrial Development Group, and followed by institutions like Fosun and China Renaissance. Huimin intends to use the fund to expand the Hijia Convenience network as well as function as a consolidator in the sector. So far, the company is valued at over US$2 bn.

Key management

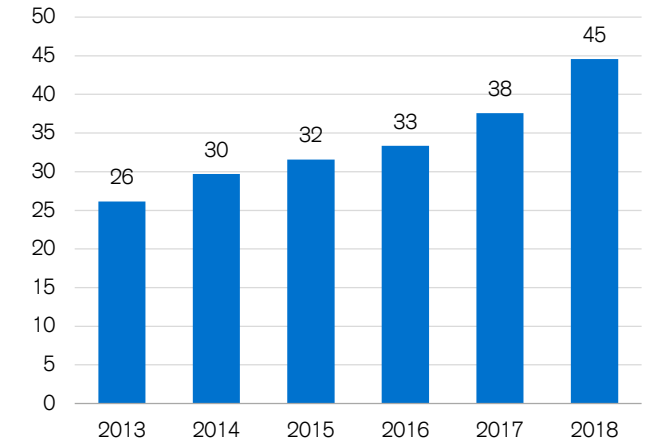
Yichun ZHANG (Founder and Chairman): Before founding the China business Huimin, Mr Zhang worked in the telecommunication industry. He considers himself a grassroots entrepreneur and has mentioned that his childhood experience in the grocery store inspired him to upgrade those convenience stores with the help of internet.

Dong ZHANG (CEO): He worked in the IT industry for several years, and was responsible for the development and operation of value-added services at China Netcom Corporation.

Industry

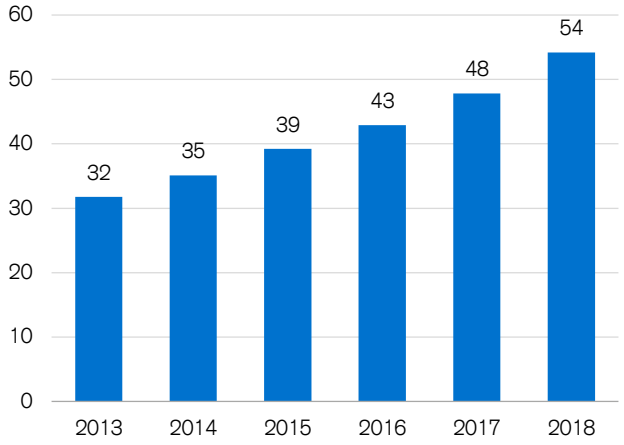
Internet/e-commerce/O2O/Games

Figure 192: Procurement expenditure of convenience stores in China (Rmb bn)



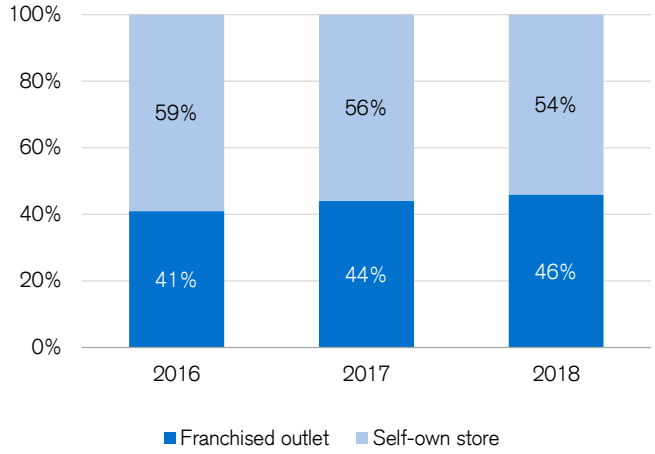
Source: CEIC

Figure 193: Revenue of convenience stores in China (Rmb bn)



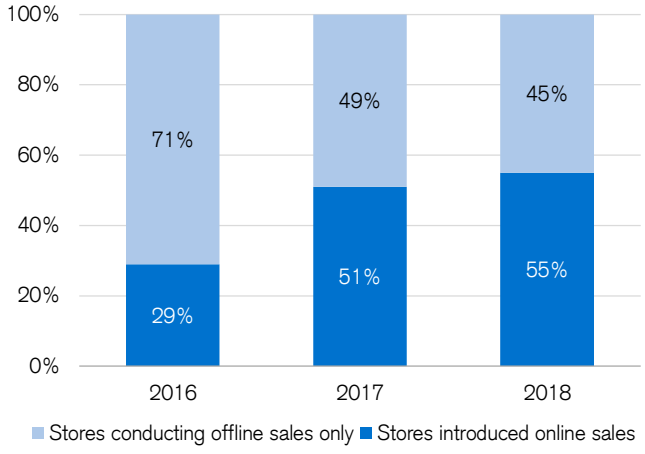
Source: CEIC

Figure 194: Breakdown of convenience stores by operating mode



Source: China Chain Store & Franchise Association

Figure 195: More convenience stores are embracing online sales



Source: China Chain Store & Franchise Association

Hujiang

Tina Long, Alex Xie

Company profile

Hujiang is a leading online education company in China. It operates a comprehensive online education platform to provide users with a broad range of offerings:

- **Proprietary courses:** Hujiang offers nearly 2,000 proprietary courses under the Hujiang brand, covering education and training needs of K12 students, undergraduate and graduate students and up to working professionals. Its flagship courses include: Overseas Study Qualification Exam courses, Master's Degree Entrance Exam courses, Japanese courses, and Hitalk English courses. Hujiang has a team of 200 in-house staff that focuses on course development, innovation and updates. The number of student enrolments of its formal proprietary courses increased from 232,583 in 2016 to 293,557 in 2017. The average spend per student was Rmb3,170 in 2017. Net billing from the proprietary courses segment increased by 45% from Rmb506 mn in 2016 to Rmb735mn in 2017.
- **CCtalk platform:** Hujiang launched its CCtalk platform in October 2016 as another major initiative to monetise its platform and vast user base. In this segment, Hujiang derives revenue from providing internet technology services to various education industry participants, including teachers, corporate customers, education institutions and government agencies, who either list their own courses on the platform for sale or leverage the technology to improve their teaching and training programmes. For 2017, the net billing of courses listed on CCtalk amounted to Rmb236 mn and the average MAUs reached 2.3 mn. The number of paying users reached 255,298. Around 2,187 third-party merchants and 41,534 self-employed teachers registered on the platform and listed 73,795 courses by the end of 2017.

Key management

Cairui Fu (CEO): Mr Fu is the Founder of the company. He has been leading the company and has served for over 16 years in the online education industry in China. Mr Fu launched Hujiang Yulin, the predecessor of Hujiang in May 2001 when he was a junior in college. He graduated from the University of Shanghai for Science and Technology with a bachelor's degree in English. He also received his master's degree in foreign linguistics and applied linguistics from the same university in 2005.

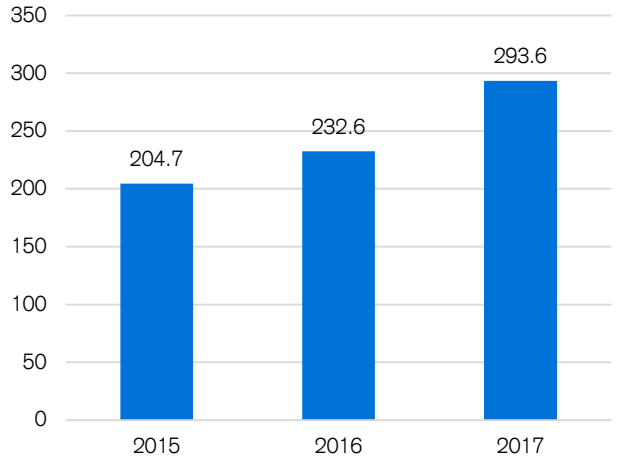
Jun Li (Chief Operating Officer): Mr Li joined the company in December 2014 and served as Vice President in charge of technology. He was appointed the COO in December 2016. Mr Li served as a venture partner in Shanghai Shanda Capital Equity Investment from 2012 to 2013. Prior to that, he served as a senior architect for Shengle Information Technology from 2010 to 2012. He graduated from the Shanghai Jiaotong University in June 1997 with a bachelor's degree in communication engineering.

Xiaobin Zhang (Chief Financial Officer): Mr Zhang joined the company as the Chief Financial Officer in February 2018. Mr Zhang has over 24 years of experience in financial management. Before joining the company, he served in various positions in the Shanghai Branch of Bank of China and the Bank of Jiangsu and Shanghai Huarui Bank. He obtained a master's degree in business management from the Shanghai University of Finance and Economics in January 2002.

Industry

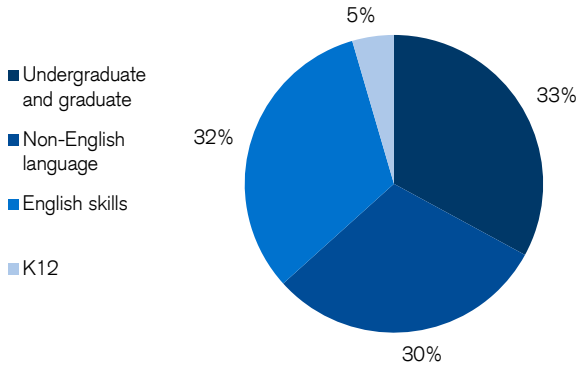
Internet/e-commerce/O2O/Games

Figure 196: The number of student enrolments in formal proprietary courses ('000)



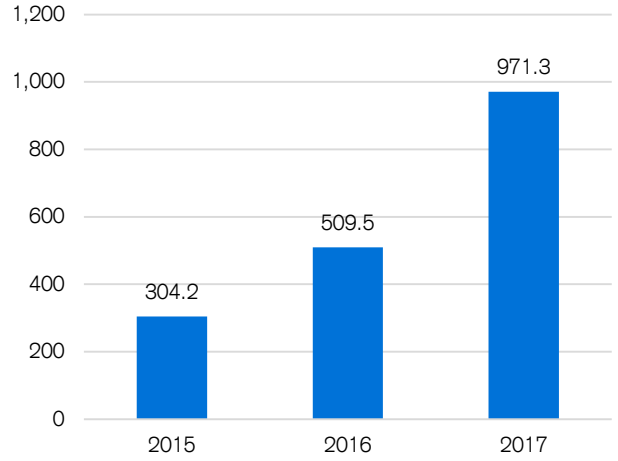
Source: Company data

Figure 197: Mix of four major categories in proprietary courses based on net billing in 2017



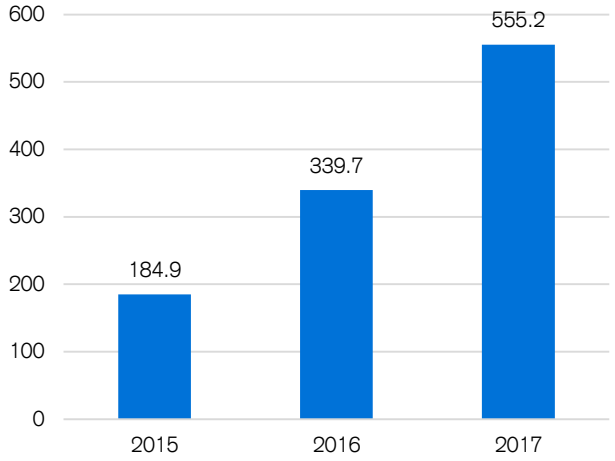
Source: Company data

Figure 198: Total net billing of Hujiang (Rmb mn)



Source: Company data

Figure 199: Revenue of Hujiang (Rmb mn)



Source: Company data

iCarbonX

Fei Zheng, Jason Liu

Company profile

iCarbonX is a company that targets creating a platform for digitising, analysing and understanding life. It combines data from new biological measures with experiential data from millions of people and uses advanced AI to search the data for new signals about health, disease and ageing, thus allowing people to easily understand and monitor their present health status, predict trends, and improve their lifestyle.

The company designed a platform named Meum as a digital health management platform that helps people easily create digital profiles of their lives. Meum gives people access to a range of nutrition, fitness and skincare applications including Fit Force, MeumSpring, Precision Nutrition.

Applications on the Meum platform can also help individuals monitor, record, and manage their health status, including diet, exercise, sleep, and emotional state. For example, individuals can record voice memos or photos of what they have eaten, and Meum will automatically analyse their nutrition intake, measure nutrition levels, and provide proactive advice when nutrition and other factors are out of balance.

Besides, the company also serves as a data provider to partners with profiling capacities such as providing data and platform access to app developers.

Key management

Dr Wang Jun (founder and CEO): Dr Wang earned his bachelor's degree in artificial intelligence and a PhD in bioinformatics from Peking University. Dr Wang co-founded the Beijing Genomics Institute (BGI) in 1999. As the CEO, he built BGI into a premier global genome sequencing centre. He is a significant contributor to the Human Genome Project and to the rice genome sequencing initiative. He founded the company in 2015.

Li Yingrui (co-founder and Chief Scientist): Mr Li enrolled in the Biology Department at Peking University; two years later, he interned at BGI Tech and started his career in genome science. In 2012, he was named as the CEO of BGI Tech, then in 2014, the chief scientist of BGI. Mr Li has published more than a hundred papers in reputable scientific journals such as Science, Nature and Genome Research, and has been recognised on the 'Forbes 30 under 30 Asia' list.

Hao Li (co-founder and CIO): With 15 years of work experience in the telecommunications field, Mr Li served as the Director of the Business Planning Division of Market China Netcom and the team leader of global IPO business group, China Netcom. He was the Deputy Commander of the Olympic Marketing Headquarters during the 2008 Beijing Olympic Games. He joined Beijing Genomics Institute (BGI) in early 2014. Before joining iCarbonX, he was the CIO of BGI, overseeing BGI information construction and big data operation management.

Industry

Healthcare/Biotech

Figure 200: Milestone of the company

Time	Milestones
2018	■ German Chancellor Angela Merkel visited iCarbonX.
2017	■ Jun Wang and Yingrui Li named on the 2017 Highly Cited Researchers list by Clarivate Analytics. ■ Jun Wang named in Fast Company's "100 Most Creative People of 2017" list. ■ Jun Wang presents his vision for digitising life to the global audience at TED2017. ■ iCarbonX named in Fortune's magazine's list of 50 companies leading the AI revolution. ■ iCarbonX ranked one of Fast Company's 2017 Top 10 most innovative in China. ■ Meum™, the digital health management platform built by iCarbonX and its digital life ecosystem partners, is introduced to the public. ■ iCarbonX announces that seven companies have joined its Digital Life Alliance as part of a nearly US$400 mn investment, including: SomaLogic, HealthTell, PatientsLikeMe, AOBiome, GALT, Imagu and Robustnique.
2016	■ iCarbonX acquires Imagu Vision Technologies and establishes the iCarbonX-Israel R&D centre. ■ iCarbonX completes an investment of Rmb30 mn in Shenzhen Prajnasys Corp. Ltd ., extending its network to big data insurance. ■ iCarbonX completes its Series A financing led by Tencent. The post investment value of iCarbonX reaches US$1 bn. ■ iCarbonX (Malta) Limited is formally established. ■ iCarbonX International Limited is formally established in Hong Kong.
2015	■ iCarbonX founded.

Source: Company data

iHOME

Jianping Chen, Summer Wang

Company profile

Founded in 2015, iHOME is an online home decoration platform connecting vendors to the customers. It provides integration of services of interior design and construction. The company's business focus is on the new home market and it obtains access to customers by leveraging its partnership with developers. It has established strategic cooperation with several developers, including Central China, CIFI, Modern Land, etc. By end of September 2019, the company had established a footprint in 250 cities across 24 provinces. GMV was likely at Rmb30 bn in 2018 vs Rmb1.76 bn in 2016 and Rmb10.4 bn in 2017 (source: 36kr). The major services provided by iHome are listed below.

- **Interior design services:** iHOME attracts interior designers to offer design services on the platform via its innovative design copyright paying mode. The individual designers can list their design plans on the platform and get payment based on the number of purchasing customers. With a largely similar layout for the individuals, this offers some economies of scale to designers. The customers are also willing to pay some premium for better quality services. Meanwhile, iHOME has established its AI designing platform—Dramatic Reality—to facilitate the interaction between design vendors and customers. On the platform, designers are able to provide customised design work to clients and clients can also modify the design plan based on their preference.
- **Better quality control:** iHOME has introduced a series of measures to guarantee quality of decoration work, such as real-time monitoring system via iHOME APP and carrying out of site supervision work by the project manager. This can effectively relieve customers from the on-site supervision work. Meanwhile, customers can evaluate the performance of project managers after the construction work has been completed, and the evaluation affects the income and future orders of the project manager. On construction work, iHOME guarantees the quality and lowers the decoration cost by directly cooperating with factories manufacturing decoration materials.
- **Furnishing service:** iHOME provides a wide range of furnishing services to clients, including furniture, house ornaments, household appliances and other household items. Thus, customers can move into the house directly. Moreover, iHOME reduces the cost via its cooperation with furniture factories and household appliances companies.
- The company was jointly founded by Jiangsu Yide Group and Central China. In August 2018, iHOME completed B round financing and raised Rmb1 bn from Tiantu Capital. The implied valuation is at US$1 bn. Its major competitors include Golden Mantis, Dongyi Risheng, Jia.com, and Tubatu.

Key management

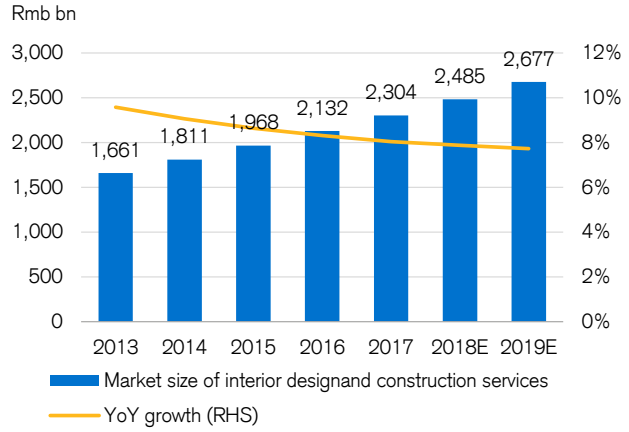
Jun Chen (Chairman): Mr Chen founded iHOME in 2015 and also serves as the Chairman of the Eastide Group (the local developer in Jiangsu Province, established in 1993) and partner of IDG Capital.

Dingguo Pan (CEO): Mr Pan is the co-founder and the CEO of iHOME. He is also the founder of Wuge Huozhan (one Wechat mini programme).

Industry

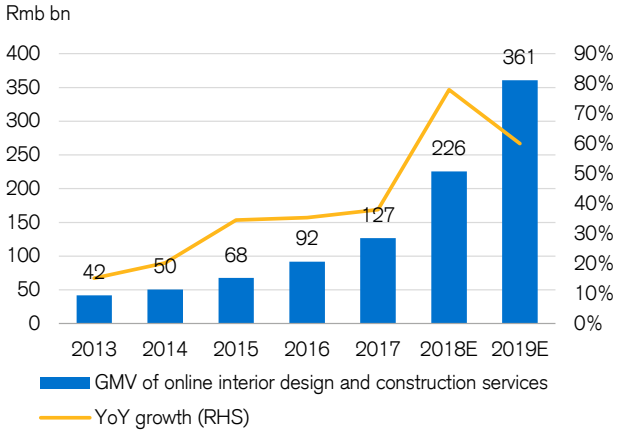
Internet/e-commerce/O2O/Games

Figure 201: Market size of interior design and construction services industry in China



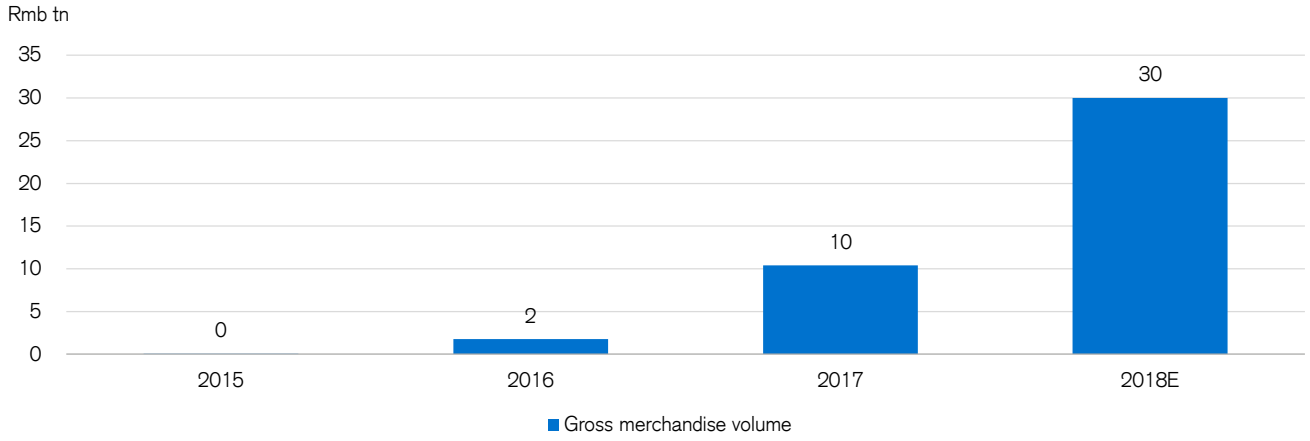
Source: Frost & Sullivan Report, Credit Suisse research

Figure 202: GMV of online interior and construction services industry in China



Source: Frost & Sullivan Report, Credit Suisse research

Figure 203: iHOME's GMV trend



Source: 36kr, Credit Suisse research

Intellifusion

Kyna Wong, Chaolien Tseng, Stephen Yin

Company profile

Founded in 2014 in Shenzhen, Intellifusion is an artificial intelligence company focusing on 'non-cooperative' visual intelligence. There are four major business lines of the company: (1) public security; (2) city governance; (3) new retail; and (4) semiconductor.

- **Public security:** Started in Shenzhen, the company's artificial intelligence solutions have already been used in over 100 cities in mainland China and ASEAN countries. Intellifusion provides hardware equipment (both front end and back end), semiconductor, data, algorithm and services in their solutions. The company has already over 30,000 networked front-end cameras deployed in over 20 cities, and has assisted in solving over 10,000 cases involving missing elderly and children. Most notably, the company's products are used in the jaywalking regulation system for Shenzhen Traffic Police and face recognition system for intelligent customs escorts HK-Zhuhai-Macao Bridge. Currently, public security is the most important source of revenue for the company.
- **City governance:** This segment covers smart buildings, communities, campuses, transportation, and hospitals, etc. Functionalities include entry controls with face recognition, centralised equipment management, car plate recognition, and centralised management system using IoT and biometrics technology, to increase level of security and reduce costs.
- **Commerce:** This is a relatively new business for Intellifusion. Its solution is now being used in some shopping malls in Shenzhen. Camera images of customers in the shopping mall are collected for analysis (like age, gender, education and income level, taste, etc.) to provide more tailor-made advertisements to the customer. Also, it is used to monitor the performance of sales employees as well as for theft prevention.
- **Semiconductor:** Intellifusion designs semiconductors, such as chipset modules, cameras, and edge computing for its own devices as well as to sell them to other AI equipment manufacturers. Its self-developed second generation DeepEye 1000 chipset taped-out in 2018, and the product realised mass production and commercialisation in the first half of 2019.

The company received series B funding in March 2019 from investors including BOC International, China CITIC Bank, among other investors.

Key management

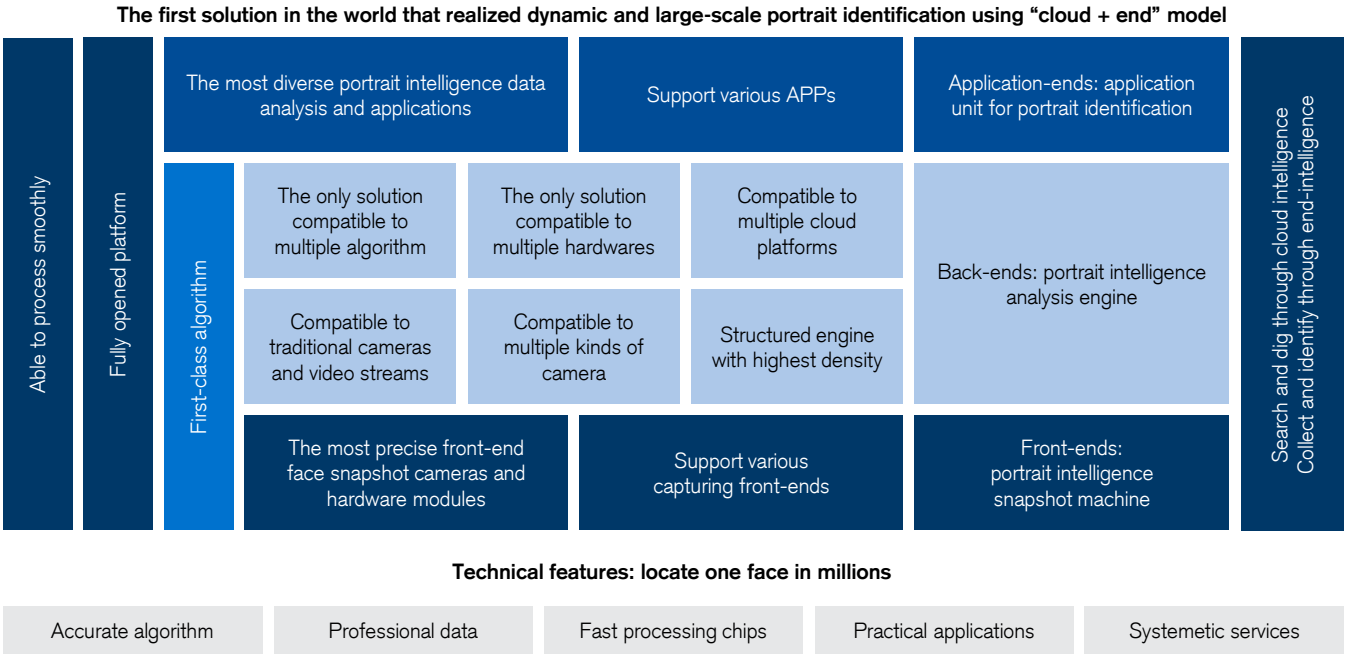
Dr Chen Ning (Founder, Chairman and CEO): Dr Chen earned a PhD in electrical engineering from the Georgia Institute of Technology. He designed and created the order set for the first vector processors, which has achieved the best single-core processing power globally, and provides exclusive commercial chip solution for unmanned aerial vehicle HD video transmission based on 4G-LTE technology. He was the IC director of ZTE Corporation and has extensive experience in ICT product design and R&D in the US. In 2014, he led a team of PhD returnees from the US to start Intellifusion.

Dr Wang Xiaoyu (Co-founder and Chief Scientist): Dr Wang obtained his bachelor's degree from the University of Science and Technology of China, and his PhD and MS in electrical and computer engineering and statistics from the University of Missouri. He is a renowned specialist in facial recognition, business intelligence, advertisement analysis, user profile, and other related areas. He was a founding member of the Snap AI Lab and served as the chair of Computer Vision. Prior to joining Snapchat, he was a research staff member at the NEC Labs America.

Industry

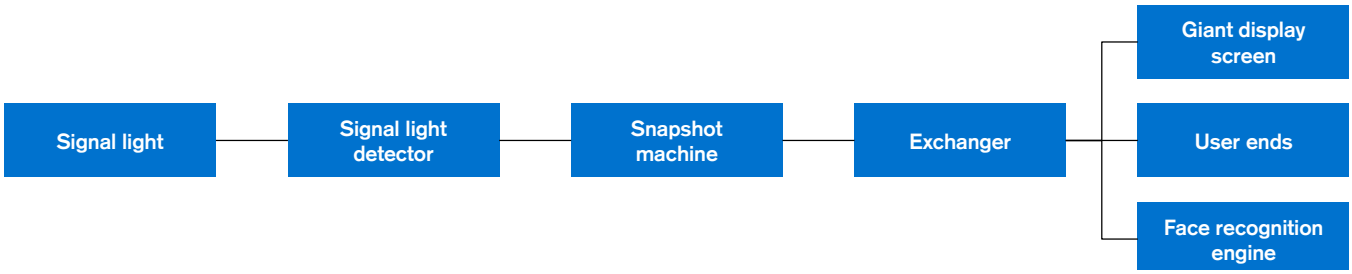
AI/Big Data/Robotics/Software

Figure 204: Intellifusion's DeepEye public security face recognition image solution



Source: Intellifusion website

Figure 205: System architecture of jaywalking regulation system for Shenzhen Traffic Police provided by Intellifusion



Source: Intellifusion website

Jiuxian

Tony Wang, Tina Long, Harriet Liu, Michael Wang

Company profile

Jiuxian.com (Jiuxian), established in Sep-2009, is now one of the largest liquor e-commerce comprehensive service companies in China. It mainly provides online sales services on imported and China-made wine and liquors. It conducts business through three business models: (1) B2C: Jiuxian.com and mobile apps as the main sales platform; flagship stores on leading e-commerce platforms including Tmall and JD; (2) B2B: Cooperates with cigarette and wine shops, KTVs, supermarkets and convenience stores; (3) O2O: Developed the Jiukuaidao business, helping customers to find the nearest registered offline liquor stores online.

Funding and valuation: In 2011, Jiuxian obtained round A financing of Rmb15 mn from Guangdong Yueqiang Group. Besides, a total of seven rounds of financing, amounting to Rmb1.43 bn have been completed from Sequoia, Oriental Fortune, China Renaissance, etc. Jiuxian was listed on the New Third Board in 2015. However, two years later, it terminated the listing when its market value reached Rmb20 bn and it realised profitability.

Supply chain integration: The company has established in-depth cooperative relationships with more than 500 domestic liquor companies, and over 80% of the country's large-scale liquor companies. Such B2B integration of vertical supply chains enables it massive procurement from upstream wine companies with an attractive price discount, reduces the purchase cost and increases circulation. At present, in addition to cooperating with major liquor companies, Jiuxian.com also has acquired wineries. In 2018, Jiuxian acquired Chateau Madran in Bordeaux after a series of wine brand acquisitions.

E-commerce platform cooperation: In May 2010, Jiuxian re-hired a technical team to rebuild the website and establish its own ERP system, exploring the 'shop-in-shop' strategy through realising in-depth cooperation with more than ten domestic e-commerce platforms, including Tmall, JD.com, Suning Tesco, etc. At that time, the sales revenue from cooperative platforms accounted for 40% of Jiuxian's sales. In 2011, by collaboration with Taobao.com, its sales exceeded Rmb10 mn in the Double Eleven event that year, which was an important turning point for Jiuxian. During the 2019 double-11 shopping festival, Jiuxian announced it had sold out 5.89 mn bottles of wine and liquor, up 82.5% on a YoY basis, ranking top among other wine and liquor focused e-commerce companies.

New retail strategy: In July 2017, Jiuxian opened its first offline store, City of International Famous Liquor, and it focused on ten core regions (including Hebei, Henan, Shandong, Jiangsu, Anhui, Hunan, Hubei, Tianjin, Beijing, and Sichuan) to deploy stores nationwide. Currently, Jiuxian has formed a new retail strategic layout with 1,000 offline terminals by either opening self-operated stores or in cooperation with traditional local terminals. In tier 3-5 cities, Jiuxian adopts a large store model of 60-200 sq m by cooperating with big local businessmen, while in tier 1 and 2 cities, it adopts a small store model of 30-50 sq m, mainly in cooperation with prefecture-level agents.

Key management

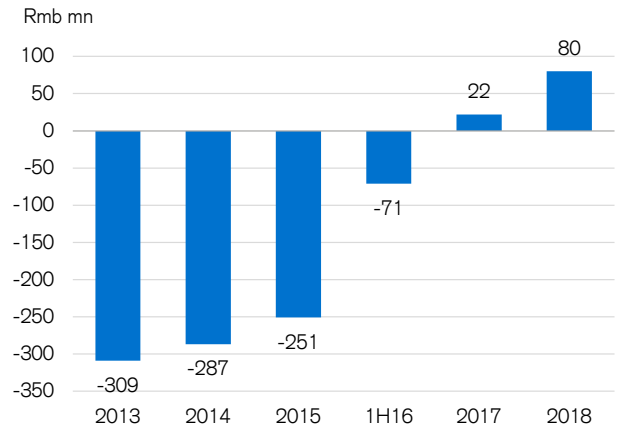
Hongfeng HAO (CEO): Mr Hao is the largest shareholder of Jiuxian (36.7%). He graduated from Tsinghua University in China with a degree in Master of Economics and Management. He once worked with a liquor distribution company named Baishi Hengji Economic and Trade Co. Ltd. in Shanxi Province, China.

Ms. Wenjie FENG (CFO and Director): Ms. Feng has a long track record and proven experience in corporate finance. She used to work in the finance department in Shanxi North Junwei Industrial Group and Baishi Hengji Economic and Trade Co. Ltd.

Industry

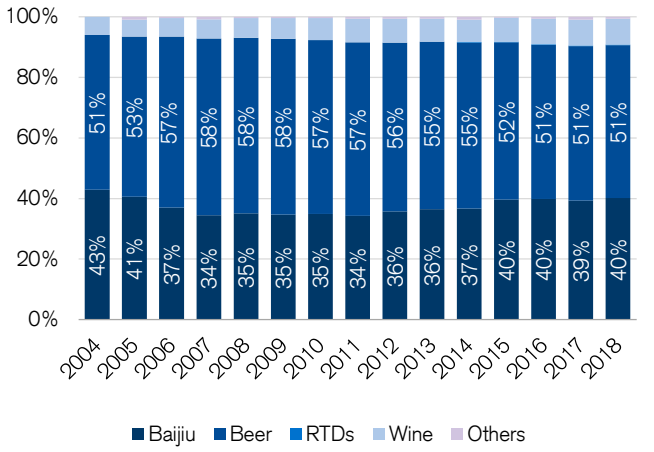
Internet/e-commerce/O2O/Games

Figure 206: Jiuxian.com net profit



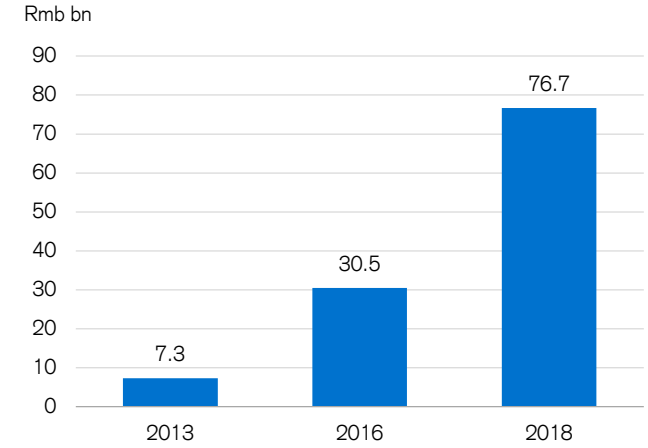
Source: Company data

Figure 207: China liquor sales volume contribution by category



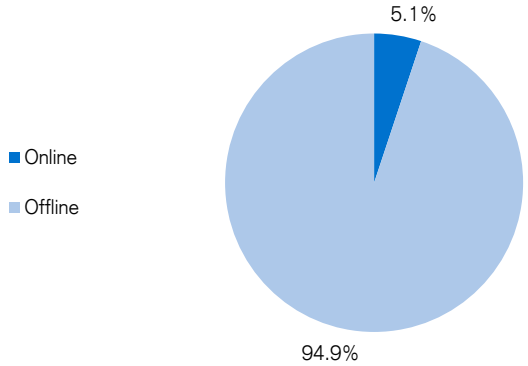
Source: Euromonitor

Figure 208: Online liquor market size in China



Source: Consumption Daily

Figure 209: China liquor channel contribution (2018)



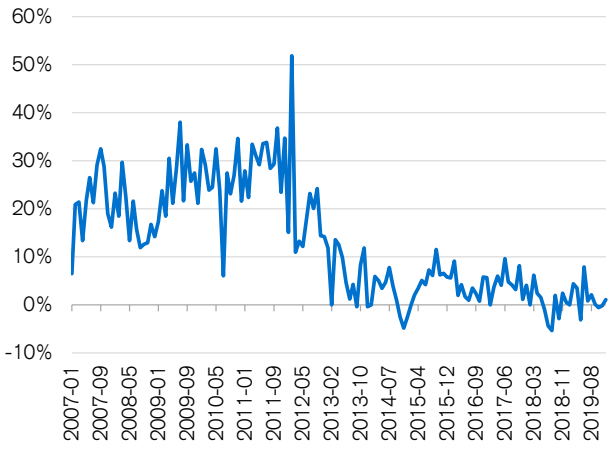
Source: Consumption Daily

Figure 210: Jiuxian's funding history

Date	Funding round	Investors	Money raised
Apr-2011	Series A	Guangdong Yueqiang Group	Rmb15 mn
Nov-2011	Series B	Sequoia Capital, Oriental Fortune Capital	Rmb80 mn
Aug-2012	Series C	China Renaissance, Richland Capital	Rmb110 mn
Nov-2013	Series D	Richland Capital, Oriental Fortune Capital	Rmb165 mn
Apr-2014	Series E	Sequoia Capital and others	Rmb260 mn
Aug-2014	Series F	CDB Capital and others	Rmb300 mn
Aug-2014	Debt Financing	China Merchants Bank, China Minshen Bank, Shanghai Pudong Development Bank	Rmb700 mn
Jul-2015	Series G	Mingxiang Wealth Management and others	Rmb500 mn

Source: Company data

Figure 211: China baijiu monthly production growth YoY



Source: Wind, NBS

KK Group

Tina Long, Ivy Liu

Company profile

Founded in 2014, KK Group operates chain stores that offer a variety of imported consumer goods, including snacks, cosmetics, personal care products, and household goods. The company owns three brands: KK Guan, KKV, and the Colorist. The company also operates an online e-commerce platform.

To better compete in the slowly growing offline retail market, KK Group focuses on multi-brand strategy, targeting young customers aged 14-35. On the store front, each brand operates standardised stores with well-designed space and shelves. On product procurement, the buyer team directly sources products and self-manages inventory. The company digitises the process from product selection, inventory management, to store display and management.

The Group now operates hundreds of brick-and-mortar stores in over 70 cities in China, and targets expanding to 400 stores. In recent years, small-goods collection stores have emerged as the new form of offline retail, and major competitors in the space include MUJI, Miniso, Yanxuan (NetEase) and Watson.

- **Lifestyle stores at prime locations:** Chinese customers' behaviour is quickly evolving, and shopping malls have emerged as the destination for shopping, socialising and offline entertainment. KK Group focuses on store expansion in shopping malls at prime locations in tier 1 to tier 3 cities, targeting young customers aged 14-35. Its chain stores are well adapted to customers' needs for lifestyle upgrade, with well-designed store formats and shelves. Its online e-commerce platform, KK Guan, helps direct traffic with similar user groups to its offline stores.
- **The multi-brand strategy:** The Group operates three major brands: KK Guan operates standardised convenient stores for imported goods; KKV owns flagship stores with broader categories and better shopping experience; The Colorist offers quality, value-for-money cosmetics. Each brand serves different customer groups with diversified shopping scenarios.
- **Direct Sourcing:** KK Group focuses on its supply chain capability to remain competitive on pricing. The company manages its inventory and directly sources merchandise from manufacturers or distributors. The buyer team selects best-selling imported SKUs in various categories, including personal care, cosmetics, household goods, office supplies, and snacks. The SKU pool is well managed and updated on a monthly basis, leveraging its customer data analytics.

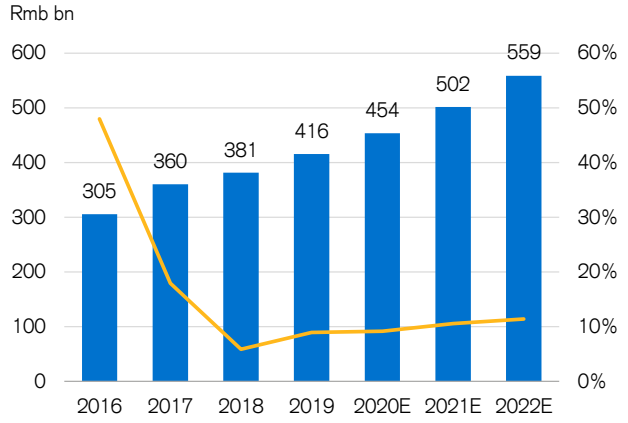
Key management

Yuening Wu (Founder and CEO): Yuening Wu founded KK Guan in 2014. Wu is a serial entrepreneur who founded Yide Technology and an online game website Dingke. He received a bachelor's degree from the Dongguan University of Technology.

Industry

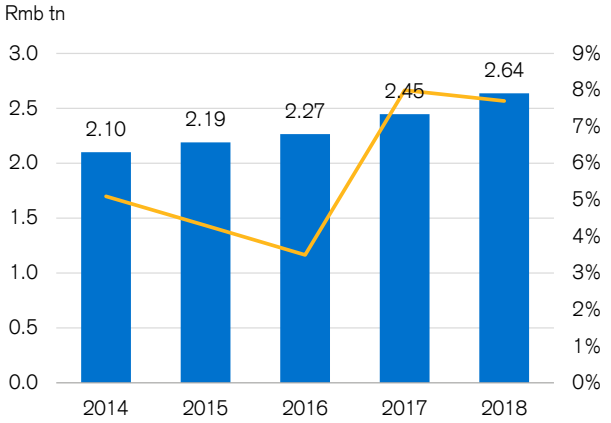
Internet/e-commerce/O2O/Games

Figure 212: China cross-border e-commerce market size in 2016-22E



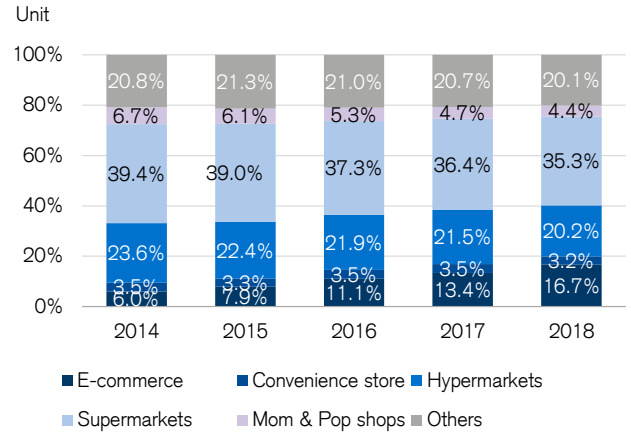
Source: Analysys

Figure 213: Retail size of Top 100 offline chain stores in 2014-18



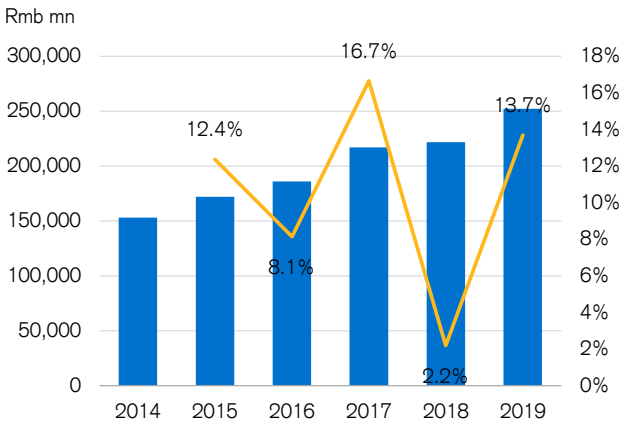
Source: Ministry of Commerce

Figure 214: China retail channel breakdown 2014-18



Source: KWP & Bain

Figure 215: China retail sales for skincare & cosmetics, 2014-19



Source: NBS

Kuaishou

Kenneth Fong, Ribery Gu

Company profile

This Beijing-based short video streaming platform was founded in 2011 as a photo app, and soon gained popularity among Chinese youth living in small towns. Many consider Kuaishou as the lens to a different China, showing the real lives of ordinary people across the nation. Most distinctively, Kuaishou opts to decentralise traffic and support original, user-created content. Meanwhile, it does not actively push content based on a creator's popularity or viewership; it encourages interaction between creators and viewers, to establish social connections and a broad sense of community. It provides a channel for millions of individuals to express themselves.

The brand image of Kuaishou was mixed: on the one hand, the App has a simple design, making it easy for those who are not very internet savvy to use; on the flip side, the mainstream media commonly depicted Kuaishou as vulgar and lowbrow, which reflects the real life of internet users in lower-tier cities. We have already seen Kuaishou's efforts to diversify its content offering mix, as live broadcasting is becoming increasingly important for the platform.

- **Short video content continues to evolve:** Kuaishou is famous for its unique content offerings, as the platform has deeply penetrated into lower-tier cities while the content distribution hierarchy is flatter. Unlike other social media rivals, Kuaishou does not use KOLs (key opinion leaders) or celebrities to attract users. The company does not employ a human team, but only relies on algorithms to make personalised recommendations. Normally, the more 'likes' a video receives, the bigger the chance it will be chosen by the algorithm. Kuaishou initiated a plan to achieve 300 mn DAUs in mid-2019, and the company has achieved this target at the beginning of 2020.
- **Rising giant for the live broadcasting industry:** Kuaishou is a latecomer to the live broadcasting industry. It started to trial its live broadcasting business only in 2017, when the market was already crowded. However, since live broadcasting is more a monetisation function rather than a content product, Kuaishou has very quickly accumulated market share from leveraging its large traffic generated by the short video platform. According to Kuaishou's own updates, its live streaming DAUs have already surpassed 100 mn, while online game live broadcasting DAUs have reached 51 mn.
- **From tipping to e-commerce:** Along with the development of live streaming, e-commerce live streaming also gains momentum driven by the structural changes between the relationship of KOL, brands, supply chains and platform. Top e-commerce-related live streamer, Xinba, has been reported to bring in over Rmb10 bn GMV for the Kuaishou platform.

Business update

According to Questmobile, Kuaishou's MAUs have already surpassed 450 mn and it has over 210 mn DAUs. It mainly relies on revenue sharing from live streaming services based on its largest live streaming DAUs among the whole industry. To improve the social experience, Kuaishou introduced mini-games and is focusing on overseas expansion. Its overseas product, Kwai, has been gaining traction in Russia, South Korea, and Taiwan, among other countries. Meanwhile, it acquired animation and video site, AcFun, in June 2018 to extend its user base. To sustain high growth, Kuaishou increased spending on branding by sponsoring several hit variety shows and investing in user acquisition starting from Feb-2019, and we have already seen a variety of content flowing to the platform.

Key management

Hua Su (CEO and Founder): Mr Su is a top algorithm engineer and serial entrepreneur. He began teaching himself how to code at the age of 12, graduated from School of Software of Tsinghua University and has worked as a programmer at Google and Baidu.

Industry

Internet/e-commerce/O2O/Games

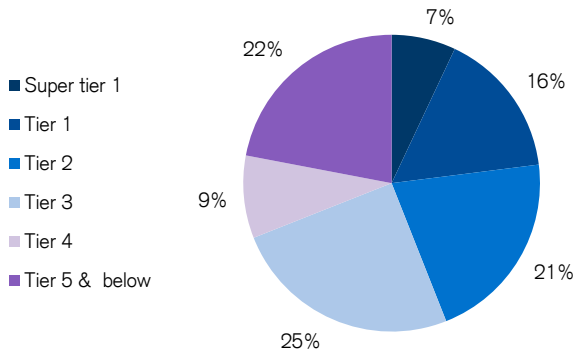
Figure 216: QuestMobile's Jan-2020 updated data for the China Online Entertainment space

	MAU(mn)					DAU(mn)					Time spent (mn mins)				
App	Dec-19	Jan-20	Feb-20	MoM	YoY	Dec-19	Jan-20	Feb-20	MoM	YoY	Dec-19	Jan-20	Feb-20	MoM	YoY
Douyin	489	551	552	0%	23%	271	292	309	6%	37%	639,645	795,881	873480	10%	108%
Kuaishou	379	493	457	-7%	41%	184	206	219	7%	33%	387,081	453,354	507493	12%	134%
Bilibili	106	122	134	9%	42%	27	30	34	12%	41%	71,673	93,796	112987	20%	73%
Douyu	50	48	53	11%	15%	13	13	15	17%	6%	22,734	21,328	25973	22%	32%
Huya	31	33	35	8%	11%	10	10	12	17%	11%	22,409	26,011	33106	27%	99%
YY	23	22	27	23%	8%	4	4	5	28%	2%	5,789	4,763	6679	40%	21%

Source: Company data, Credit Suisse research

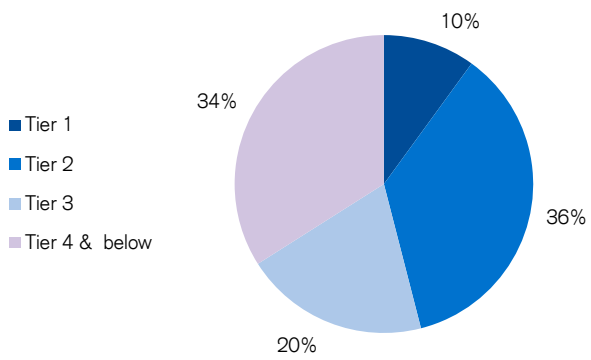
Figure 217: Douyin vs Kuaishou—tier-wise difference in user mix

Douyin



Source: Company data

Kuaishou



Source: Company data

Kujiale

Jianping Chen, Summer Wang

Company profile

Kujiale, founded in 2011, is an online home design and information platform, which focuses on providing one-stop solutions for digital upgrading of home design, decoration and furnishing business. Based on the home design service and solutions, Kujiale offers comprehensive solutions and services to furniture companies, including design, marketing, production, operation and supply chain management. The company targets realising the vision of 'what you see is what you can get'.

- **Eco-system in online home decoration industry.** Kujiale established the cloud-based 3D designing platform using artificial intelligence and virtual reality to facilitate users to create 3D renderings in a simpler and faster way. Based on its very large database of 3D floor plans (covering about 90% of 3D floor plans nationwide) and furniture models (connecting to the physical furniture various brands), Kujiale's platform can generate home design plans within five minutes and home decoration renderings under ten seconds. Currently, there are over 25 mn registered users and the platform has generated over 200 mn decoration plans and can create over 1 mn renderings per day. Besides, Kujiale launched its international design platform, 'Coohom', and has entered into over 130 countries via cooperation with some overseas home furnishing companies.
- **Monetisation.** Most of Kujiale's revenue is from the subscription of the SaaS premium products. Customers can use basic design service for free, but need to subscribe to premium features for advanced design services. Besides, the company makes money from brand promotion and advertising, such as displaying a furniture company's product at the top of the list of materials. Key competitors include 3vjia, Shejijia and Autodesk.
- **Fund raising.** Kujiale has completed five rounds of financing in the past few years. The major investors include GGV Capital, Shunwei Capital, Hearst Ventures, Yunqi Capital and IDG Capital. The valuation of the company exceeded US$1 bn upon the completion of D+ round in 2019.

Key management

Xiaohuang Huang (Chairman): Mr Huang is the Chairman and Founder of Kujiale. He previously worked at NVIDIA as a software engineer. Mr Huang holds a bachelor's degree from Zhejiang University and a master's degree from University of Illinois.

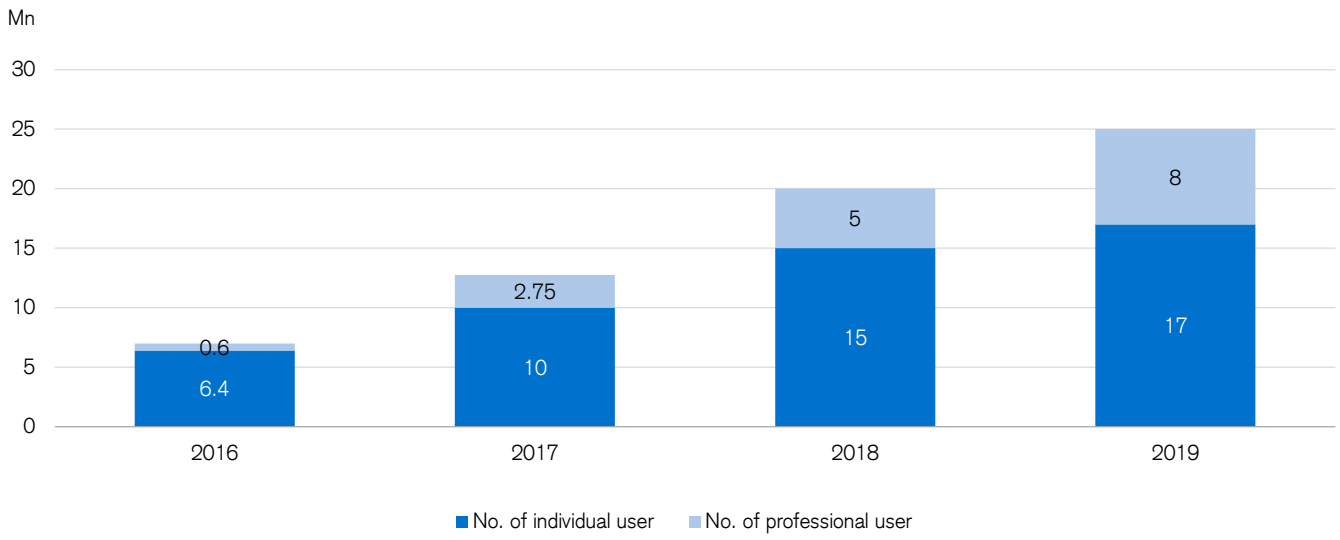
Hang Chen (CEO): Mr Chen is the Founder and CEO. Prior to this position, he worked at NCSA, Google and Microsoft. Mr Chen graduated from Zhejiang University and University of Illinois.

Hao Zhu (CTO): Mr Zhu is the Founder and CTO. Previously he worked at Microsoft and Amazon. Mr Zhu graduated from Tsinghua University and University of Illinois.

Industry

Internet/e-commerce/O2O/Games

Figure 218: Number of registered users of Kujiale



Source: Company data, Credit Suisse research

Figure 219: Milestones of Kujiale

Year	Event
2019	■ Completed D+ round financing of US$100 mn and its valuation reached US$1 bn.
2018	■ Completed D round financing of US$100 mn from Shunwei Capital, Pavilion Capital, GGV, IDG, Linear Venture, Yunqi Partners and Hearst Ventures and its valuation reached US$600 mn.
2017	■ The number of staff rose to over 500.
2016	■ Completed C round financing from GGV, IDG, Linear Venture, Yunqi Partners, Matrix Partners China and Hearst Ventures and its valuation reached US$300 mn.
2015	■ SaaS product sales surged and the company set up offices in Guangzhou and Shanghai.
2014	■ Completed B round financing of US$10 mn from GGV, IDG, Linear Venture, Yunqi Partners, Matrix Partners China and Hearst Ventures.
2013	■ Version 1.0 of Kujiale website was officially launched.
2013	■ Completed A round financing of US$2 mn from IDG Capital.
2012	■ The product prototype was completed.
2011	■ Kujiale was founded.

Source: 36kr, company data, Credit Suisse research

Leading Ideal

Bin Wang, Nick Li, Carrie Jiang

Company profile

Leading Ideal, formerly known as CHJ Automotive and founded in 2015, is a Beijing-based electric vehicle start-up that plans to disrupt the transportation and auto industries. Leading Ideal started building its own manufacturing plant with a capacity of 100,000 vehicles annually in Changzhou city, Jiangsu province, with a total investment of Rmb5.0 bn. By purchasing Lifan Motors for Rmb650 mn in Dec-2018, Leading Ideal acquired the New Energy Vehicle Production Qualification, which legally allowed it to produce and sell new energy vehicles. Leading Ideal unveiled its first product—"Leading Ideal ONE" high-end luxury SUV—in October 2018, which started delivery in Dec-2019. Unlike other start-ups' pure electric vehicle products, Leading Ideal ONE can travel 180 km on pure electric, but with a range-extender's assistance, the car could travel more than 700 km.

Business update

Previously, Leading Ideal finished series A, B and B+ funding rounds with total funding exceeding US$1.57 mn, enabling its market value to reach US$2.93 bn. In May 2015, Leading Ideal completed the series A funding of Rmb780 mn. Three years later, Leading Ideal finished the total Rmb3.0 bn series B funding in March 2018, led by Matrix Partners China and ShouGang Fund. In August 2019, Leading Ideal completed its US$530 mn series C round of funding, propelling its valuation to US$2.93 bn. The deal was led by US$300 mn from Wang Xing (王兴), founder and CEO of O2O lifestyle service platform Meituan-Dianping, US$30 mn from ByteDance, Matrix Partners China, Bluerun Ventures, Future Capital, etc.

Leading Ideal is building a variable interest entity (VIE) structure for the purpose of going public in an overseas stock market, according to documents submitted by Leading Ideal second-largest shareholder, LEO Group (002131 CH). All shareholders would indirectly hold Leading Ideal's equity through possessing shares of Leading Ideal Inc. that is registered in Cayman. Like most US-listed Chinese companies, the actual to-be-listed company of Lixiang is a Cayman Island corporation.

Management profile

Li Xiang (CEO, founder of Chehejia): Mr Li was the angel investor of the company. He started his entrepreneurship since 2000. He founded Paopao Information Technology and Autohome. He was both founder and president of Autohome. Li started his third business and founded Chehejia in July 2015. Now he is both the founder and CEO of Leading Ideal.

Shen Yanan (President, co-founder): Mr Shen was previously the Vice President of Lenovo and Chairman of Motorola (China). He is very experienced in global supply chain management and overseas market development. He is currently responsible for production & manufacturing, global supply chain and overseas market development of Leading Ideal.

Ma Donghui (Chief engineer, co-founder): Mr Ma has 20 years' experience in auto R&D. He has worked in Jasmin International Auto R&D, IAT Automobile Technology and SANY Heavy Industry. He is currently responsible for battery, electric motor, electric control system, engineering, design, reagent, experiment and other R&D on Leading Ideal's products.

Li Tie (CFO, co-founder): Former CFO of Autohome. He has worked in PricewaterhouseCoopers and Paopao Information Technology.

Chen Bing (General Manager of Leading Ideal mobility department): Ms Chen has a master's degree in business administration from Rotterdam School of Management, Erasmus University and a bachelor's degree in international finance from Renmin University in China. She was former CEO of Daimler Car2Share. She has worked in Motorola (US), McKinsey Consulting as a project manager and AES (China) as M&A director.

Industry

Auto

Figure 220: Company milestones

Time	Events
2019	■ **Aug:** Leading Ideal completed its US$530 mn series C round of funding, propelling its valuation to US$2.93 bn. The deal was led by US$300 mn from Wang Xing (王兴), founder and CEO of O2O lifestyle service platform Meituan-Dianping, US$30 mn from ByteDance, Matrix Partners China, Bluerun Ventures, Future Capital, etc. So far, Leading Ideal has raised more than US$1.57 bn in total financing after the series C round, boosting its valuation to US$2.93 bn. ■ **Oct:** Leading Ideal started mass-producing Leading Ideal ONE SUV and began delivery in November.
2017	■ **Sep:** Chezhiyi Battery factory in Changzhou started battery cell production. Total investment was Rmb5 bn; Signed strategic cooperative contract with Brilliance Auto in terms of EV R&D, supply chain, and manufacturing. Finished new round of finance of Rmb620 mn.
2016	■ **May:** Leading Ideal completed the series A funding of Rmb780 mn, from eight investors including Leo Group, Ningbo Yuanjie Venture Capital, Shanghai Huasheng Lingfei Equity Investment, Shenzhen Chenhongyi Asset Management, Changzhou Wunan New Energy Car Investment, Jiaxing Zizhiyihao private equity, Ningbo Meihuamingshi Investment, and ZHANG Xuesong. ■ **Aug:** Changzhou factory started operation with 300k units design capacity
2015	■ **Aug:** Leading Ideal's first manufacturing factory started construction.

Source: Company

Leap Motor

Bin Wang, Nick Li, Carrie Jiang

Company profile

Leap Motor is an innovative intelligent pure electric vehicle company founded in 2015, which was co-founded with video surveillance equipment maker, Zhejiang Dahua Technology (002236 CH). Leveraging Dahua's strong financial strength and mature experience in technology research and development, process system and quality management, Leap Motor emphasises the culture of engineers and is the ultimate pursuit of technological innovation, industrial design, and process quality. Leap Motor has built an intelligent production base in Jinhua city's Economic and Technological Development Zone, Zhejiang province, with initial capacity/designed capacity of 50,000/250,000 units. Currently, the Jinhua plant has three factories: stamping, welding, and painting shops. Then the auto body will be shipped to Hangzhou Changjiang auto's assembling shop for completion, because Leap Motor needs to use Changjiang Auto's auto manufacturing licence. Leap Motor differentiated itself from other EV start-ups with its first vehicle as a relatively affordable electric coupe, S01, which was launched on 3-Jan-2019 and priced at Rmb119,900 to Rmb159,900; targeting the mid-range and lower-end mass market.

Business update

In June 2018, Leap Motor announced that the first domestically made artificial intelligence (AI) chip, dubbed "Lingxin 01", had entered the phase of integration verification. The AI chip, co-developed by Leap Motor and Zhejiang Dahua Technology Co., Ltd, was tested on vehicles in 2Q19. The Lingxin 01, which is designed for autonomous vehicles, features the capability of deep learning and leading computing power.

Leap Motor's advanced power train is called "Heracles" which combines the drive-motor, the motor control modules, and the speed reducer as "Three-in-one" setup. "Heracles" is 30% lighter and 40% smaller than a traditional set-up. In particular, its motor control modules further combined five other components: DC-DC (direct current-to-direct current converter), MCU (motor controller unit), PDU (power distribution unit), VCU (vehicle control unit) and OBC (on-board charger). Leap Motor had designed three product platforms: "S platform" for electric sedan, "C platform" for electric SUV and "T platform" for small-size family car. After the S01 electric coupe—the first product from "S platform"—launched in early 2019, Leap Motor plans to launch its second product, T03 small-size electric car (from T platform) in 1H 2020, followed by S02 electric sedan in 2H 2020. The company's fourth and fifth products will come from its "C platform", including an SUV (named "C-more") and a sedan, both of which will be available in 2021.

Management profile

Zhu Jiangming (Founder and Chairman): Mr Zhu is the co-founder of Zhejiang Dahua Technology in 1993, as the CTO. Zhu helped Dahua Technology become the second-largest surveillance equipment provider globally. Since the establishment of Leap Motor in 2015, Mr Zhu has been its Chairman.

Zhao Gang (Vice president): Mr Zhao started his career at Huawei and worked there for 18 years, going from a product manager to the head of Honor brand (a smart phone brand by Huawei)'s overseas operations. Mr Zhao joined Leap Motor in 2017 as vice president of marketing and sales.

Industry

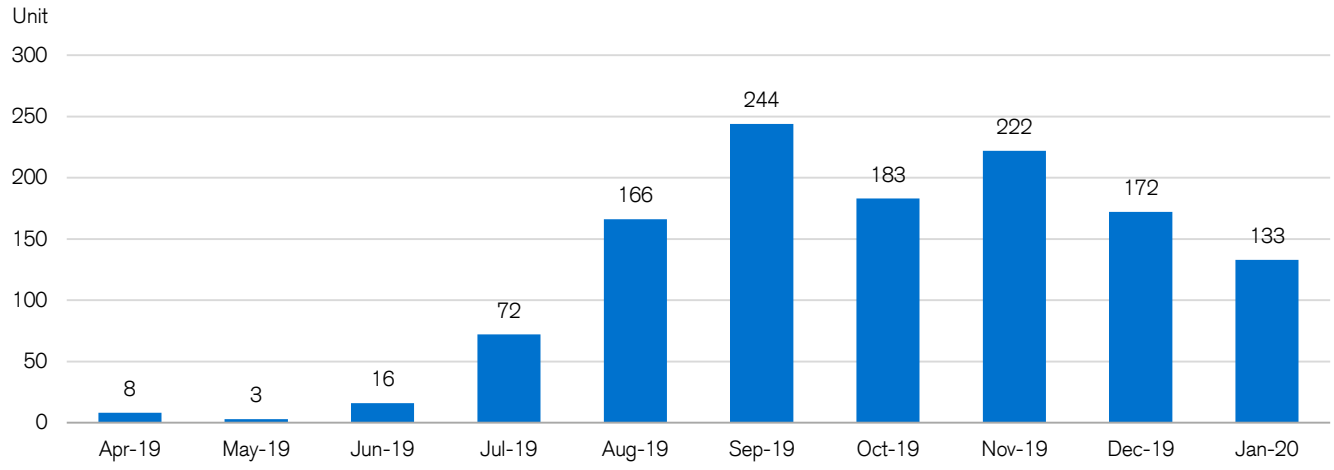
Auto

Figure 221: Company milestones

Time	Events
2019	■ **Jan:** Leap Motor launched its first vehicle as a relatively affordable electric coupe: "S01". ■ **Apr:** Leap Motor showcased its second product—"C-more" electric SUV—in the Shanghai auto show, which enabled L3 autonomous drive. ■ **Aug:** Leap Motor raised Rmb360 mn in a series A+ round of financing from new energy-focused investment firm Jinhua Zhongche Fund, which picked up 5.06% shares, enabling its market value to reach US$1.03 bn or Rmb7.115 bn. Dahua's stake fell from 16.32% to 15.5% after the series A+ round. ■ **Nov:** Leap Motor showcased its third product, "T03", a small-size electric car.
2018	■ **Jan:** Leap Motor raised about Rmb400 mn from Sequoia Capital's Chinese division in the pre-A round financing. ■ **Nov:** Leap Motor raised Rmb2.5 bn in a series A round led by Shanghai Electric Group Corp with participation from Sequoia Capital, Gopher Asset Management and Industrial Securities.
2017	■ **Nov:** Leap Motor introduced its first EV model "S01"electric coupe.
2016	■ **Dec:** Leap Motor was founded in Hangzhou city, Zhejiang province.

Source: Company

Figure 222: Leap Motor's monthly sales volume



Source: Company data

Linklogis

Charles Zhou, Yiran Zhong, Richie Jiang

Company profile

Founded in 2016, Shenzhen-based Linklogis specialises in supply chain finance, focusing on four dimensions including core enterprise+, SMEs+, cross-border trade+ and Fintech+ to help SMEs in the ecosystem gain access to timely and low-cost funding. It leverages technologies like big data, artificial intelligence (AI), blockchain, cloud computing and big data, to help solve financing difficulties for core enterprises and their related enterprises.

China's over 100 mn SMEs together contribute 50% of total tax revenue, 60% of GDP and 80% of urban employment. However, many face difficulties securing financing from banks and via other means. The number of SMEs with valid SME loans is only 1.35 m—or 16 mn if personal operational loans are included, according to a speech by Yi Gang, China's PBoC Governor. Chinese SMEs often rely on high-interest private loans, which increase their operational costs and make them less competitive. As of December 2019, Linklogis has helped arrange more than Rmb10 bn to more than 10,000 SMEs.

At the same time, Linklogis has entered the blockchain space via collaboration with Tencent's fintech team to jointly launch a financial blockchain platform named TrustSQL in April 2017, which provides enterprise-class blockchain infrastructure, industry solutions and blockchain cloud services.

Linklogis received nearly Rmb100 mn in a series A round of funding in August 2016 from Tencent, CITIC Capital and Loyal Valley Capital. In August 2017, Linklogis secured roughly Rmb200 mn through a series B round of financing from Tencent, China Merchants Innovation Investment Management, Bertelsmann Asia Investments as well as the company's shareholders CITIC Capital and Loyal Valley Capital. In October 2018, Linklogis completed round C financing exceeding US$220 mn, with Singapore government investment corporation (GIC) taking the lead. In January 2020, Standard Chartered purchased an undisclosed equity stake in Linklogis. This follows the banks' signing of a memorandum of understanding in February 2019 to jointly develop and deliver a supply chain financing proposition, and the completion of several joint deep-tier supply chain financing transactions.

Key management

Qun Song (Founder and CEO): Mr Song previously served as a finance strategy advisor for Tencent Technology (Shenzhen) Company Limited, and the vice-chairman of Lefu Payment Company Limited. Mr Song obtained a master's degree in Business Administration from University of Melbourne and a bachelor's degree in engineering from Huazhong University of Science and Technology of the PRC. He was formerly the president and chief executive officer of China Resources Bank of Zhuhai, and prior to that the global head of Trust and Agency Services at HSBC. His working experience also includes holding senior management positions in JP Morgan Chase and ANZ Bank.

Industry

Fintech

LinkSure Network

Colin McCallum, Billy Lee

Company profile

Founded in 2013, LinkSure Network is a global mobile internet company specialising in free internet access, content, and location-based services. It is the operator of Wi-Fi Master Key, a mobile peer-to-peer Wi-Fi sharing app that leverages the sharing economy, cloud computing, and big data in an attempt to provide users with safe and free Wi-Fi internet connections around the world.

According to Techcrunch, its Wi-Fi connectivity service helped LinkSure secure US$52 mn from a series A financing round back in 2015, valuing the parent company at US$1 bn only two years after launch. LinkSure has not announced further funding rounds since then, and has kept a relatively low profile.

The app is free and depends on advertising for monetisation. It claims 800 mn MAUs in China and another 100 mn around the world. According to App Annie, it ranked fifth in terms of MAUs in China, just after WeChat and Alipay, which have around 1 bn MAUs each worldwide. In addition, LinkSure has also joined hands with two major Chinese telecommunication companies to offer separate broadband cards with appealing data plans.

Key management

Chen Danian (Founder and Chairman of LinkSure Network): Mr Chen was awarded the accolade of "China's Top 50 Most Influential Business Leaders" in 2017 by Fortune magazine. He is the cofounder of SNDA, the first Chinese online games company to be listed on the NASDAQ in the United States in 2004, and also the founder of Zenmen Group.

Industry

Internet/e-commerce/O2O/Games

Figure 223: Wi-Fi Master Key ranked fifth in terms of China MAU

China by Monthly Active Users top apps of 2018— China combined iPhone and Android phone (Monthly Active Users)

Rank	App	Company
1	Wechat	Tencent
2	QQ	Tencent
3	Alipay	Ant Financial Services Group
4	Taobao	Alibaba Group
5	WiFi Master Key	Linksure
6	Baidu	Baidu
7	Tencent Video	Tencent
8	iQIYI	Baidu
9	Amap	Alibaba Group
10	QQ Browser	Tencent

Source: The State of Mobile 2019, App Annie

Figure 224: User interface of Wi-Fi Master Key app

Source: The State of Mobile 2019, App Annie

Figure 225: Chen Danian (CEO)'s career history

Year	Milestone
1998	■ He developed China's first acclaimed internet bill tracker software named ENCounter, and became among the first leading wave of remarkable programmers in China.
1999	■ At the age of 21, Chen Danian co-founded SNDA with his brother Chen Tianquao. He is the second-largest shareholder of the company, and China's first wave of internet company leaders to start a new era of online gaming in China's internet industry.
2004	■ SNDA became the first Chinese online games company to be listed on the Nasdaq (NASDAQ: SNDA) in the United States.
2008	■ He founded Shanda Institute for Innovation and Technology. The research direction, leadership and technical advice he provided during his tenure has successfully incubated several start-ups, including UCloud and QiNiu, to become unicorn companies within ten years.
2012	■ Chen Danian independently founded Zenmen Group and expanded his endeavour into emerging fields such as sharing economy, internet finance, Internet of Things (IoT), and space technology.
2013	■ Chen Danian founded LinkSure Network, the operating company of WiFi Master, bringing universal internet access using Sharing Economy.

Source: Company data

Mafengwo

Kenneth Fong, Ivy Ji, Lok Kan Chan, Rebecca Law

Company profile

Mafengwo is a travel website with both social networking and e-commerce features. It focuses on user-generated content (UGC) to share travel strategy or experience and allows user interaction. Meanwhile, it also provides in-house strategy, booking services for hotels, package tours, and transportation tickets. Founded in 2006, it currently covers content and booking services for over 60,000 destinations. Mafengwo has accumulated over 130 mn registered users in 2017 and achieved over 100% growth in gross merchandise volume (GMV) for four consecutive years till 2018.

According to iResearch, the online travel industry GMV is expected to continue its strong growth at 14% YoY reaching Rmb2,046 bn in 2020. Major competitors are other major online travel agencies (OTAs) such as Ctrip and Tuniu. After its latest funding round of Rmb250 mn in May 2019, led by Tencent, Mafengwo's valuation is estimated to be at US$2 bn.

Key business spotlights as below:

Holistic product offerings complemented by content: Mafengwo offers a wide range of travel products from transportation and hotels, to visa services. It differentiates itself from other e-commerce platforms by having a large UGC base that allows online communication and feedback which enhances user confidence on its product offerings.

Artificial intelligence (AI) and big data adoption: Mafengwo also uses AI and big data to understand user preference based on users' search history and interactions in order to provide best-suited updates and products to various destinations.

Stay up-to-date with market trends: With the rising trend of short video in recent years, Mafengwo was one of the first travel websites to launch its in-site short video platform in 2018 and carried on further promotion in 2019. Management stated that with the increasing UGC, user behaviour shifted from searching to "shopping" for product ideas; short video could provide users with efficient information to grasp their attention. In 3Q19, short video users grew by over 300% QoQ for Mafengwo (compared to a 12% growth in China overall).

In-house research on travel trends: Compared to its peers, Mafengwo spent extra resources on in-house research development towards travel trends and analysis. Its research reports cover a wide range of topics such as analysis on extreme travel, road trip, and on the overall travel sector. With such analysis, Mafengwo could better understand market needs and future trends, thus better positioning itself for long-term business development.

Key management

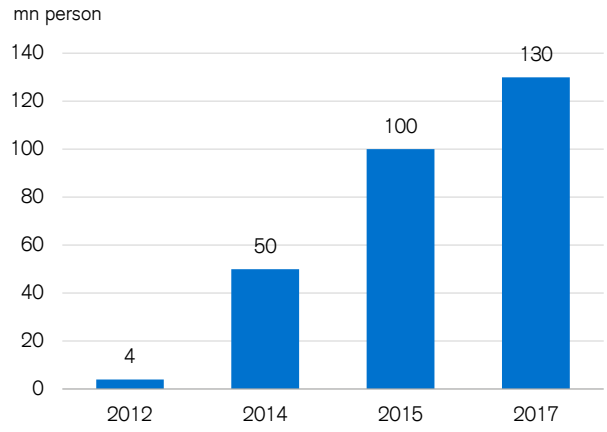
Gang Chen (Co-founder and CEO): Mr Chen co-founded Mafengwo in 2006 with Mr Lv as a part-time hobby for recording travel journeys, along with a full-time job at Sina. In 2010, Chen left Sina and began operating Mafengwo as a full-time business.

Gang Lv (Co-founder and COO): Mr Lv co-founded Mafengwo in 2006 with Chen, and left his full time job at Sina in 2010 as well. He is responsible for the integration of Mafengwo's social travel data and business operations.

Industry

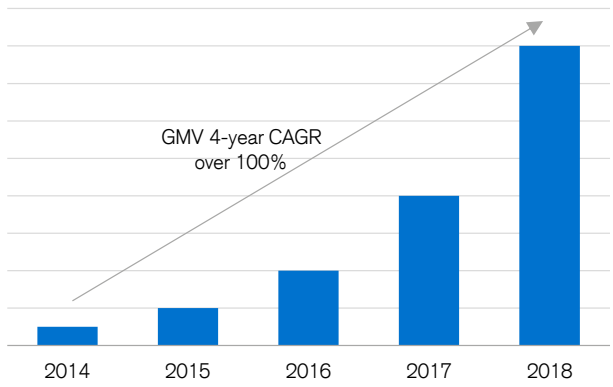
Internet/e-commerce/O2O/Games

Figure 226: Mafengwo registered users over past years



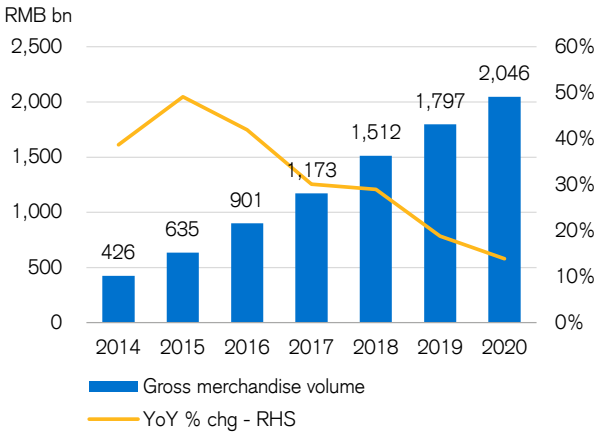
Source: Baidu Baike

Figure 227: Mafengwo GMV four-year CAGR over 100%



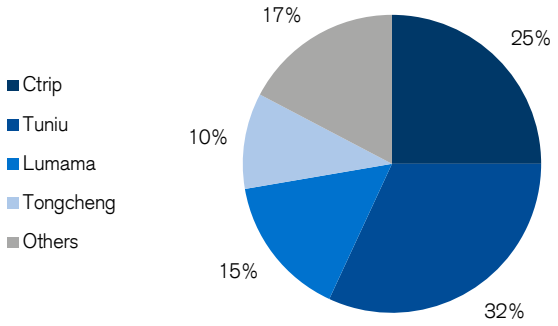
Source: Company data

Figure 228: China online travel gross transaction volume



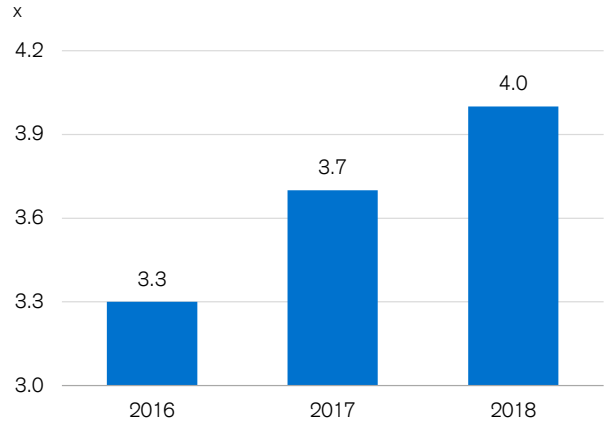
Source: Credit Suisse research

Figure 229: Current market share of China OTA



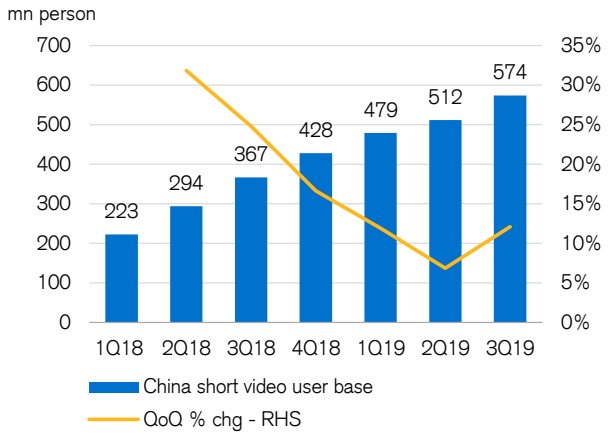
Source: Credit Suisse research

Figure 230: Average number of times Chinese travel in a year



Source: Company data

Figure 231: MFW short video user QoQ growth



Source: Bigdata

Maimai

Tina Long, Ashley Xu

Company profile

Launched in Oct-2013, Maimai is a real name-based professional network. Similar to LinkedIn, users could connect with their professional network, share thoughts and look for jobs on the platform. According to NBS, China had an employed population of 770 mn in 2018. Of these, only 160 mn were using work-related mobile apps according to Analysys, implying just 20% penetration; thus, the company has ample room to grow. Maimai has developed into China's largest professional network, with 7.4 mn MAUs in Jun-2019, compared to LinkedIn China's 0.88 mn, according to Analysys. We attribute Maimai's success to a few factors:

- **Clear market positioning:** Maimai is positioned differently from other social networks; it focuses on professional networking since day one of its launch. Thus, the platform has been able to build up a differentiated brand.
- **Networking effect:** Compared to most online hiring platforms, Maimai has gone one step further by building up a network among users, strengthening user acquisition and retention.
- **Content community:** Maimai also features abundant content. Maimai has developed the largest community for sharing professional experiences. Users could find topics they are interested in, via the recommendation feed, or search by hashtag. Additionally, professional generated content starts to play a role: "Mai Class" (脉课堂) was on-boarded in Jan-2018, aiming to help users improve working efficiency or develop professional skills.
- **Effective monetisation:** Maimai launched paying memberships in Aug-2016, which became the core revenue contributor. The platform also provides branding ads to business clients.

Business update

LinkedIn entered the China market since 2014. However, the app is not customised for the China market. Its professional network platform targeting the China market, Chitu (赤兔), stopped operations in 2018. Maimai has grown much larger than LinkedIn China. In Aug-2018, Maimai received US$200 mn in funding. As of Apr-2019, registered users on Maimai exceeded 80 mn.

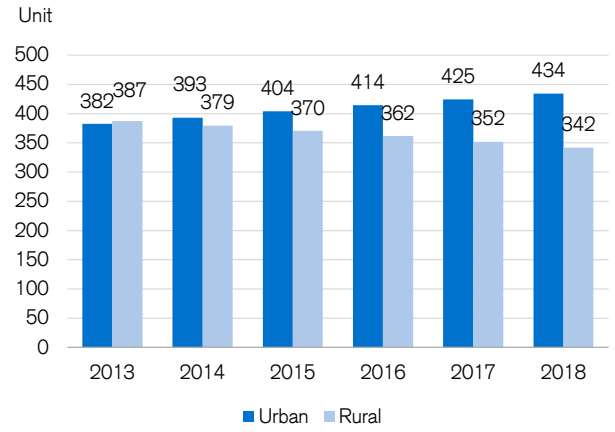
Key management

Lin Fan (Founder and CEO): Mr Lin graduated from Tsinghua University. He joined Sogo in 2003, and participated in the development of Sogo input and Sogo browser. He founded Maimai in Jan-2012 and has been the CEO of Maimai since then.

Industry

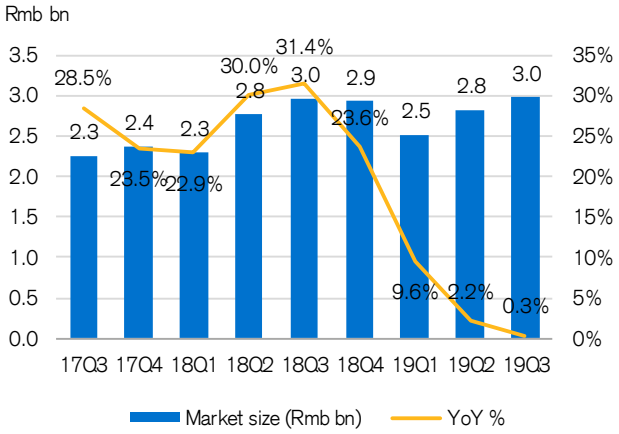
Internet/e-commerce/O2O/Games

Figure 232: China employed population



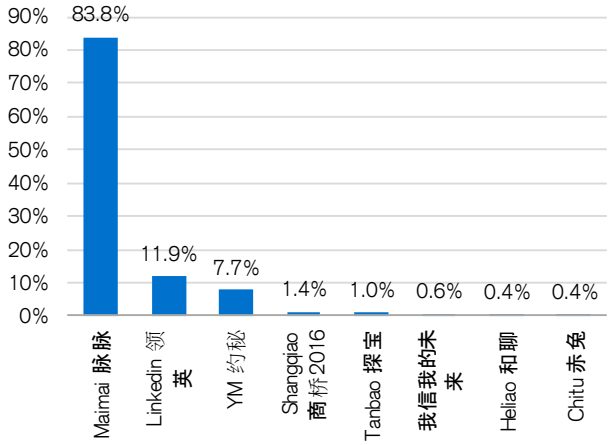
Source: NBS, Credit Suisse research

Figure 233: User penetration of professional network apps



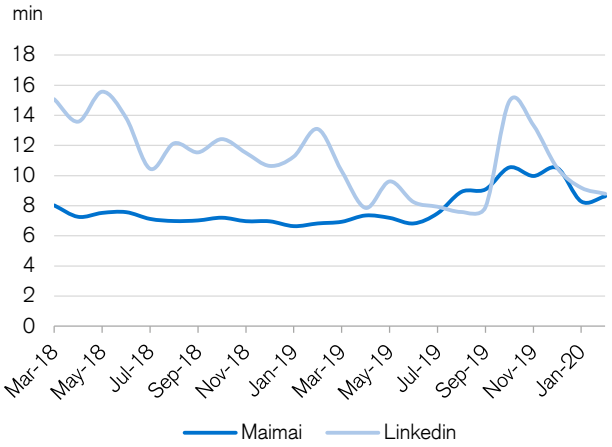
Source: Analysys, Credit Suisse research

Figure 234: User penetration of professional network apps



Note: Above number reflects penetration among users that use professional networking apps.
Source: Analysys, Credit Suisse research;

Figure 235: Time spent per user per day



Source: QuestMobile, Credit Suisse research

Manbang

Kenneth Fong, Ivy Ji, Lok Kan Chan, Rebecca Law

Company profile

Manbang (formally known as Full Truck Alliance Group) is the largest truck hailing service platform in China, providing an online-to-offline truck logistics platform, and it has started overseas expansion. In November 2017, Manbang was formed by the merger of two Chinese truck logistics tech giants, Huochebang and Yunmanman. The company has about 7 mn truck drivers and 2.3 mn shippers. With a strong user base growth of 32% YoY in 2019 reaching over 9 mn users (drivers + shippers), Manbang reached a monthly GMV of Rmb3 bn or 800k monthly tickets in 2019.

In April 2018, Manbang raised US$1.9 bn from investors, including Japan's SoftBank Vision Fund and China Reform Fund, at a valuation of US$6 bn.

Key business spotlights as below:

China's biggest online-to-offline truck logistics platform: In China, more than 41bn tonnes of goods were distributed through road transport in 2019. However, the industry is fragmented, without efficient communication between shippers and truck drivers. Manbang allows shippers to connect with truck drivers via an app, tapping into demand for goods transport in one of the world's busiest markets. It effectively shortens the time required to match a deal, from 3-5 days to 0.5-1 day. As of 2018, 6.5 mn of China's ~8.2 mn trucks have registered on the platform.

Value-added service: Manbang has further developed value-added services such as fleet management, financing, insurance and electronic toll collection (ETC). Its ETC platform is partnering with 12 provinces in China and continuously expanding; with over 2 mn ETC users, it has become the biggest truck ETC platform in China in 2019.

Advanced technology to boost efficiency: Manbang has stepped up its investment in artificial intelligence and set up an AI laboratory in Silicon Valley. This will help the company improve its operational efficiency matching empty trucks with loads with the new AI technology.

Key management

Mr Gang Wang (CEO): Mr Wang is an angel investor who has invested in start-ups such as Didi. He has over ten years' experience in Alibaba, overseeing B2B for Beijing District, and group strategy and development.

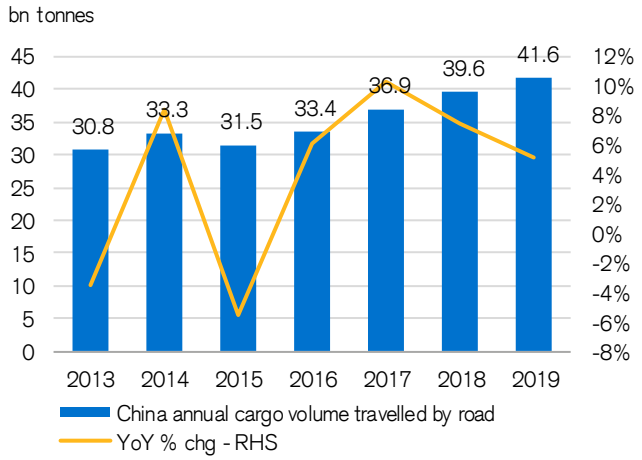
Mr Peng Luo (Co-President): Mr Luo previously served as CEO in Huochebang. Before joining Huochebang, he served as president and CEO for Yudie Group and president for Colorful GuiZhou Culture & Art Co., Ltd. He also worked as executive vice president for Maipu, overseeing marketing and operations.

Mr Hui Zhang (Co-President): Zhang previously served as founder and CEO in Yunmanman. Before launching Yunmanman in 2013, he had over nine years' experience in Alibaba, overseeing the B2B sales project and worked as general manager of the Shanghai and Guangdong district.

Industry

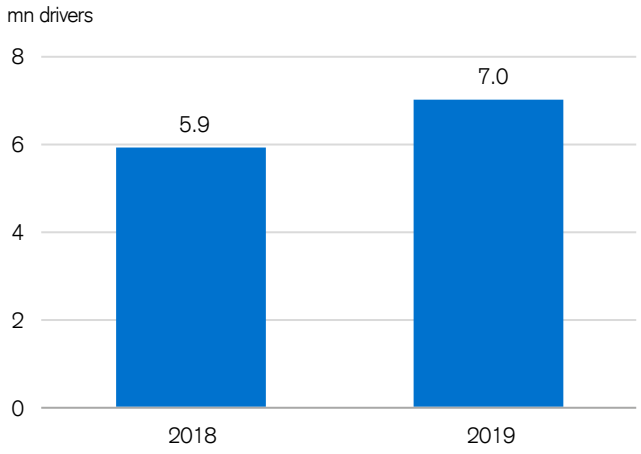
Internet/e-commerce/O2O/Games

Figure 236: China annual cargo volume travelled by road



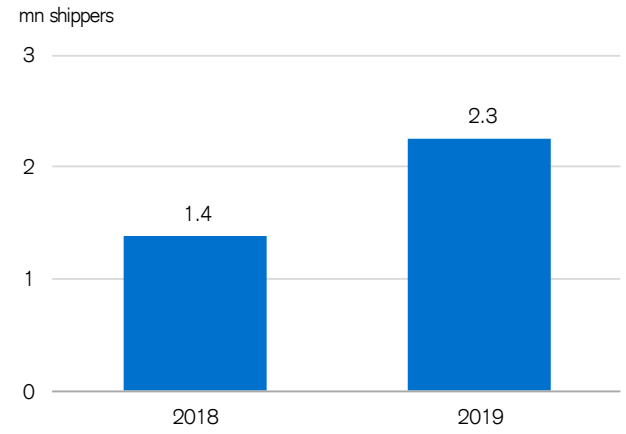
Source: Wind, China Ministry of Transportation

Figure 237: Manbang—number of truck drivers



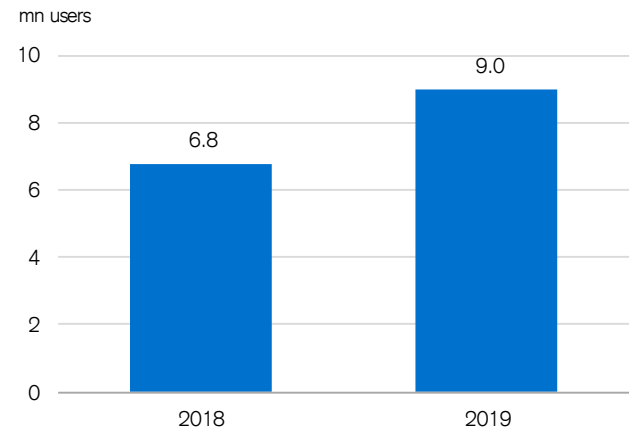
Source: CNNIC

Figure 238: Manbang number of shippers



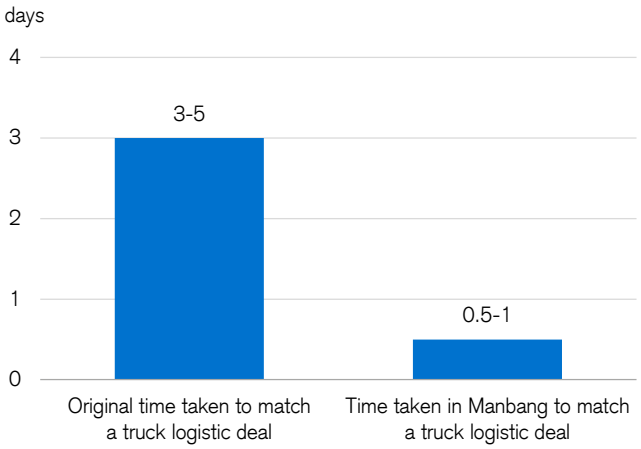
Source: CNNIC

Figure 239: Manbang number of registered users



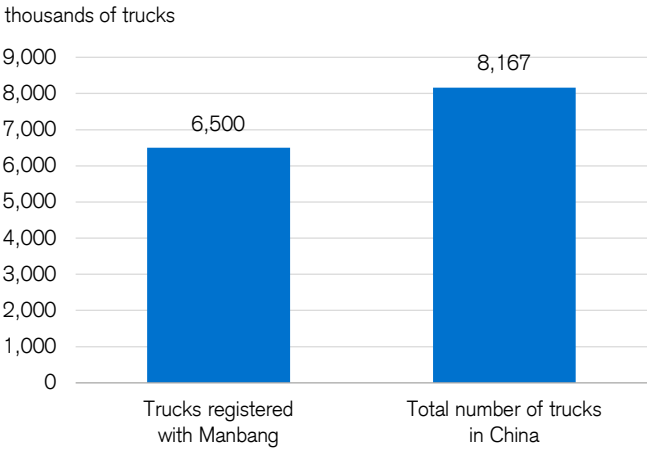
Source: CNNIC

Figure 240: Time saved in deal matching from Manbang



Source: Company data

Figure 241: No. of trucks registered with Manbang vs. China



Source: Company data, CEIC

Medlinker

Fei Zheng, Jason Liu

Company profile

Medlinker started as a social networking platform specially designed for doctors. Users are certified doctors working in the Medical Alliance and Medlinker verifies that all users are practicing doctors. On medlinker.com and via its mobile app, doctors can share their expertise, experiences and insights with other users in the industry, thus providing the community with a continuous source of quality content. The platform also provides unique resources such as medical knowledge tests, case mapping services, and various social circles for doctors to connect.

The company was founded in 2014 and boasts over 700,000+ certified doctors on its platform. The platform has regional coverage of all provinces in China, medical coverage of 48 specialties, and its services are applied in more than 25,000 hospitals. The company has collected over 130,000 case histories from its partner hospitals and institutions.

Medlinker launched consultation service in 2015, and developed AI consultation to enhance operational efficiency. Its consultation service currently covers 12 kinds of chronic disease, ranging from diabetes, HIV, asthma and etc., and has provided medical consultation to over 3.5 million patients.

While Medlinker initially focused on building out its social platform, the company found it possible to connect hospitals through the social network it had already built. Medlinker then transitioned to serve not only hospitals and patients, but also insurers. The company currently conducts Chronic Disease Management (CDM) including management of HBV, AIDS, chronic kidney disease, medical insurance management and patient/doctor management through the technology of internet and big data.

Key management

Wang Shirui (Founder and CEO): Mr Wang Shirui is the founder and CEO of Medlinker and the CEO of Doctorwork Group. He completed his bachelor's, master's, and PhD studies at Sichuan University West China School/Hospital of Stomatology and was a research scholar at Harvard University. In 2014, Mr Wang founded Medlinker.

Industry

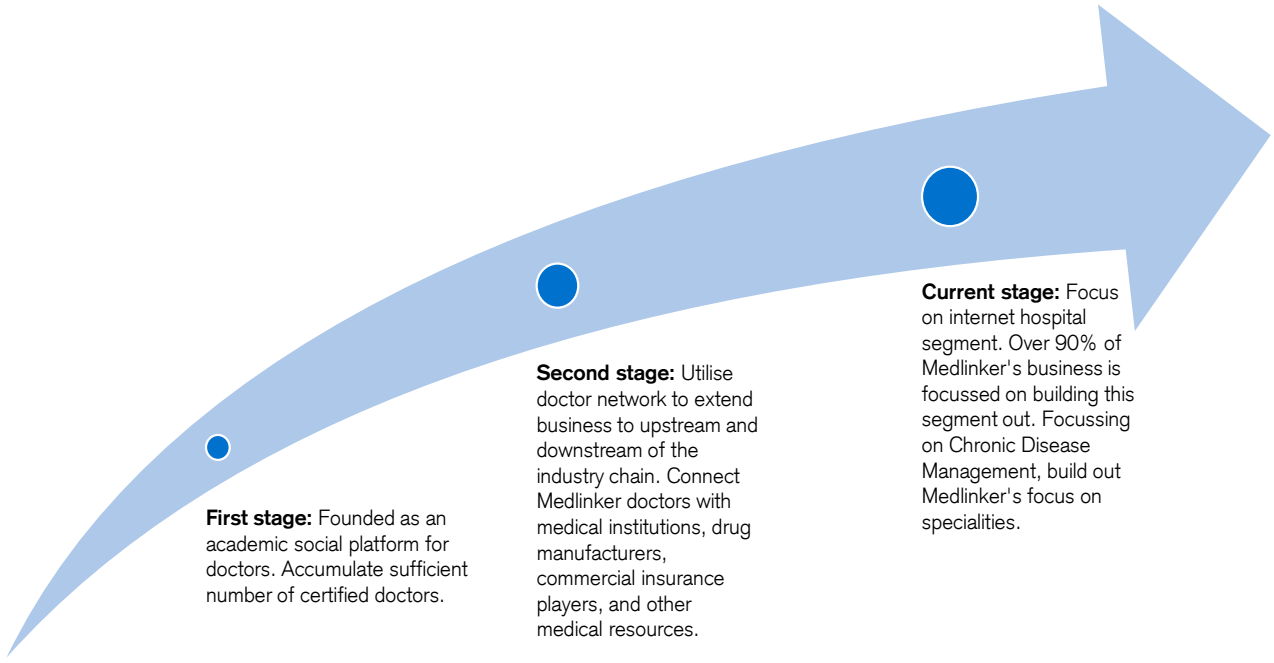
Internet/e-commerce/O2O/Games

Figure 242: Key milestones in the company's development

Time	Event
2014	■ Company was founded.
Nov-2014	■ Launched Medlinker app focused on connecting physicians.
2015	■ Amassed more than 100,000 certified doctors as users.
Sep-2015	■ Launched Medlinker Consultation business segment.
2016	■ Amassed more than 400,000 certified doctors as users.
2018	■ Partnered with medical institutions, starting with liver cancer hospital to conduct Chronic Disease Management.
2020	■ Amassed more than 700,000 certified doctors as users.

Source: Company data

Figure 243: Company development



Source: Company data, Credit Suisse research

Figure 244: Fundraising history

Round (date)	Amount raised (US$ mn)	Investors
Series D (Jun-2018)	146.8	China Capital Zhongcai Fund Sequoia Capital China China Health Industry Investment Fund China Renaissance
Series C (Dec-2017)	60	China Electronics Corporation Data China Renaissance Sequoia Capital China Tencent Holdings
Series B (Sep-2015)	40	Tencent Holdings Yunfeng Capital
Series A (Feb-2015)	1	Sequoia Capital China

Source: FactSet as of 19-Feb-2020

Meicai.com

Tony Wang, Harriet Liu

Company profile

Meicai.com (Meicai) is an online catering supply chain platform, which was established in May 2014 and has been committed to changing agriculture, rural areas and farmers nationwide, through the internet. The unique "F2B model" is to upgrade the agricultural product supply chain through self-built warehousing, logistics and distribution, cutting out the intermediate links, linking the fields to city restaurants directly through self-operation and partnership business models. Meicai provides one-stop and all-category agricultural product procurement services. It not only adopts big data systems to deliver accurate market demand to farmers, but also provides farmers with sufficient distribution channels. It sets stringent production standards at the source, ensuring the quality and safety of the upstream agricultural products. Meicai has covered about 220 cities across the country (as of December 2018), with 44 storage centres, 4,000 employees, and a total of over 3 mn farmers. As at Sep-2018, Meicai's daily sales value exceeded Rmb130 mn.

Funding and valuation. Meicai has raised over US$7 bn through eight rounds of funding from Zhen Fund, Blue Lake Capital, Shunwei Capital, H Capital, Meituan, etc. and the company's valuation exceeded US$7 bn when it raised US$800 mn (E+ round of financing) from Tiger Global Management and Hillhouse in Sep-2018.

Digitalisation. Meicai has cooperated with Kraft Heinz to create a new model for online food sourcing, and introduced point of purchase system, which equips the company for both self-operation and platformisation.

Partnership in the product sourcing areas. Meicai's supporting partners at the origin/source act as leaders in the production and collection of local agricultural products. Partners can concentrate on mobilising more farmers to participate in production and sales. Meicai helps them build logistics and transportation infrastructure, as well as provides data support to sell agricultural products. The company has now developed over 5,000 partners who help to achieve more than 50% of direct procurement from source fields.

Self-construction of storage and logistics. Unlike regional online players, Meicai positions itself as a national player equipped with nationwide self-built storage and cold-chain logistics. In 2018, it built another 100,000 sq m of cold storage and increased the capacity of its cold chain transportation. Meicai currently has 44 warehouses covering more than 220 cities (out of 334 prefecture level cities in China), and over 8,000 trucks delivering 2.5 mn parcels each day, which serves as a key advantage for its further expansion in this industry.

Key competitors

Major competitors are traditional farmer's markets, supermarkets and hypermarkets, such as Yonghui, Sunart, Wumart (物美) and Carrefour, as well as other e-platforms such as Baocailang, SF Dadangjia, Caibei, Miss Fresh, Taobao (Taoxianda), and Hema.

Key management

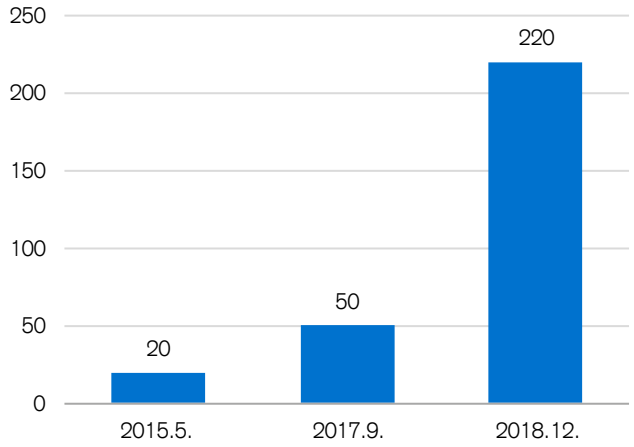
Chuanjun Liu (CEO, Co-founder): Mr Liu holds a Master of Space Physics from Chinese Academy of Sciences. He studied Mars for two years and the moon for one year, by participating in the study of Shenzhou 6, No. 7 spacecraft, Chang'e (嫦娥) 3 satellite and Firefly No. 1 satellite. Mr. Liu is also the founder of the Wowo Group (窝窝团), which is an e-commerce platform similar to Taobao.

Xueyin Xu (CTO): Mr Xu was admitted to the Junior College of the University of Science and Technology of China at the age of 13, and graduated at the age of 19. He has worked in the core R&D team of eBay, a US e-commerce company.

Industry

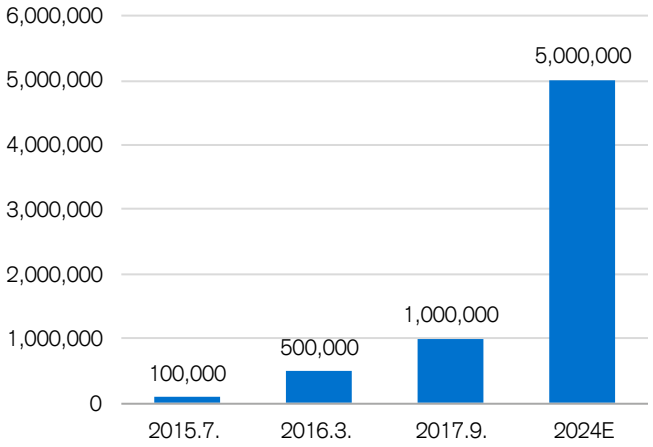
Internet/e-commerce/O2O/Games

Figure 245: Number of cities covered



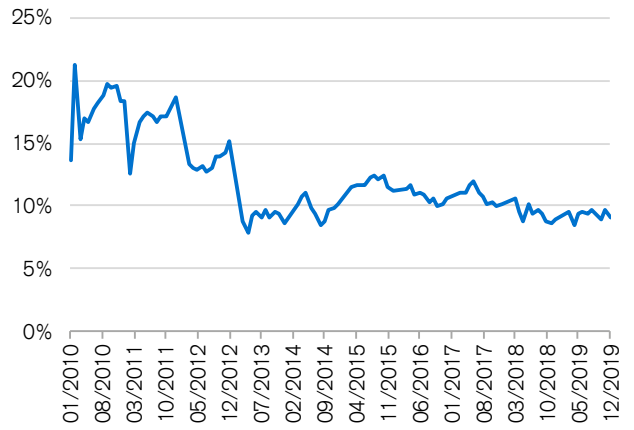
Source: Company data

Figure 246: Number of merchants served



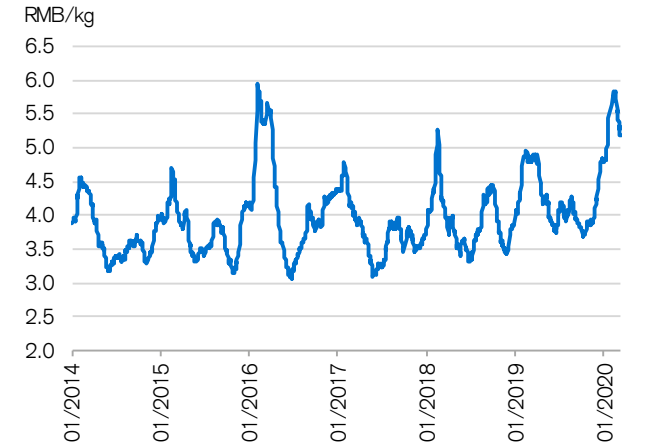
Source: Company data

Figure 247: China catering retail sales growth YoY



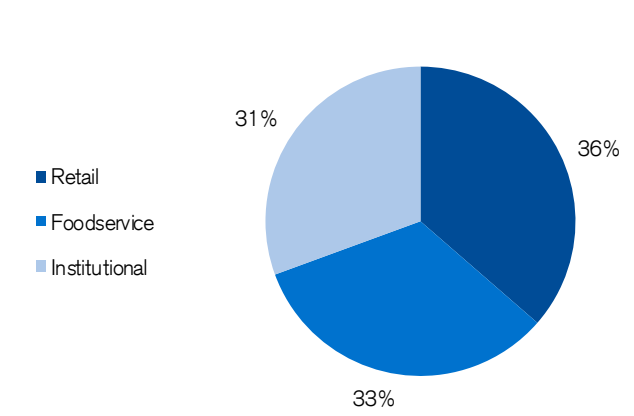
Source: NBS

Figure 248: China vegetable price



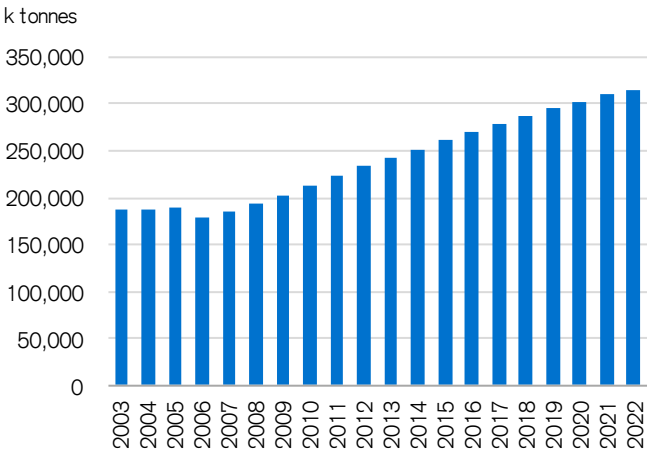
Source: CEIC, Ministry of Agriculture and Rural Affairs

Figure 249: Vegetable distribution channel breakdown in China as of 2017



Source: Euromonitor

Figure 250: Market size of vegetable sales in China



Source: Euromonitor

Meizu

Kyna Wong, Chaolien Tseng, Stephen Yin

Company profile

Founded in 2003, Meizu is a Chinese consumer electronics company based in Zhuhai. Meizu began as a manufacturer of MP3 players and later MP4 players. In 2008, Meizu moved its focus to smartphones. Since then, it remains focused on developing innovative and user-friendly smartphones for consumers. It has over 800 employees and 600 retail stores, and presence throughout many overseas markets. Its revenue reached Rmb16.8 bn in 2015, from Rmb2.8 bn in 2013.

Meizu developed an aftermarket firmware named Flyme, which is based on the Android operating system. Some of its key features include complete redesign of apps, one-handed usability and performance optimisations. The current version of Flyme features distinguished flat design and various optimisations for performance.

Meizu initially focused on the domestic market, with over 90% local shipments during 2014-17, but expanded to overseas markets from 2018 with over 25% of shipments to international markets. Its China market share increased from 1.2% in 2014 to 4.7% in 2015, and then declined to 4.0%/4.4% in 2016/17, but fell to 1% or below in 2018-19, according to IDC.

In February 2015, Alibaba invested US$590 mn in Meizu, acquiring an undisclosed minority stake. Besides Alibaba, other investors include Indiegogo, Telling Telecommunication (in 2016) and Zhuhai Honghua Fund (in 2019).

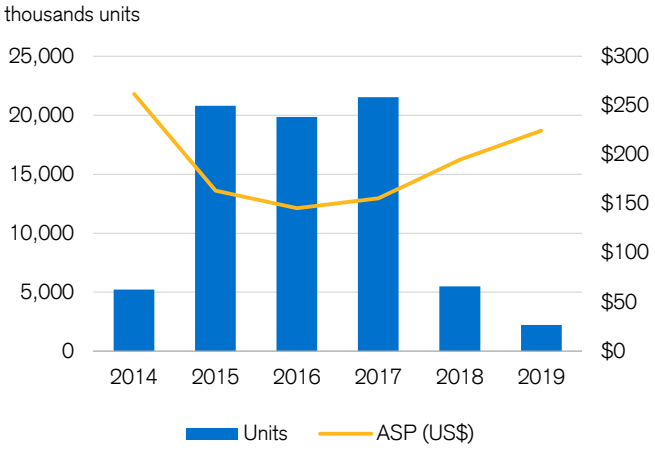
Key management

Jack Wong (Founder, CEO and Chairman): Mr Wong is a Chinese entrepreneur and founded Meizu in 2003. Previously he worked at a Singaporean joint venture company called “Aegean” as a general manager.

Industry

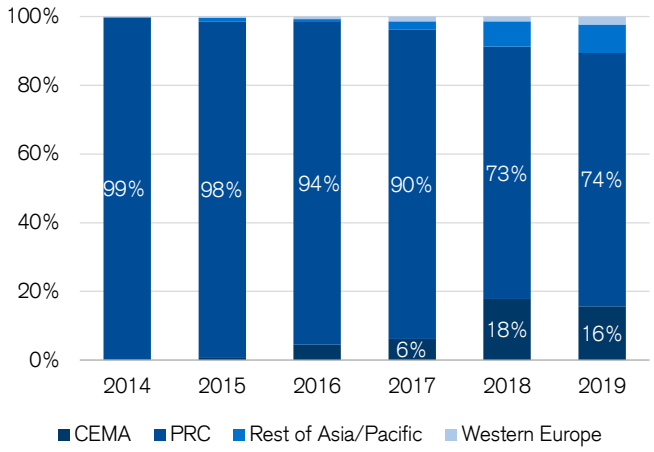
Hardware/Semi

Figure 251: Meizu sold c.20mn smartphones a year during 2015-17, but dropped significantly from 2018



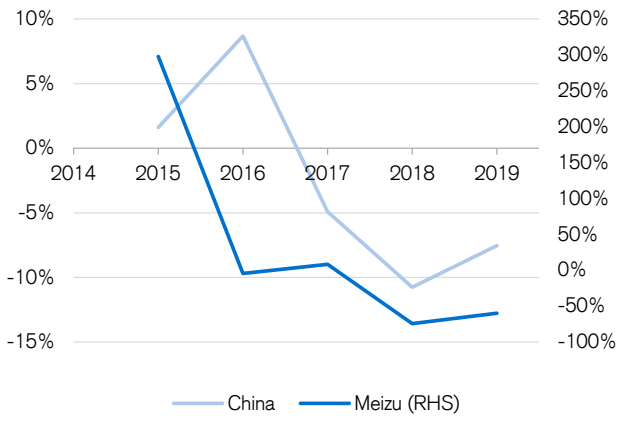
Source: IDC, Credit Suisse research

Figure 252: Majority of shipment to China market. Overseas shipment increased from 2018



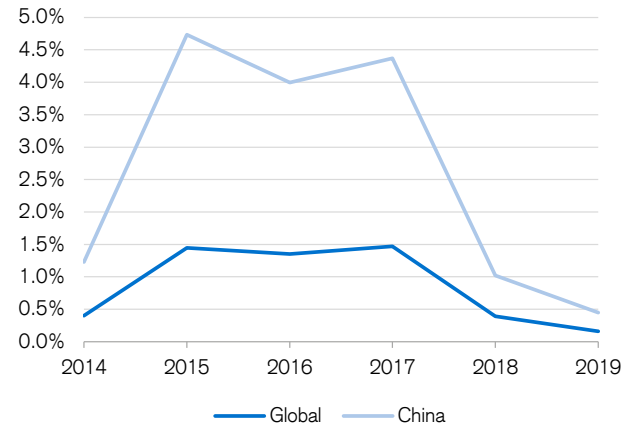
Source: IDC, Credit Suisse research

Figure 253: Shipment growth declined along with China market contraction and also increasing competition from HOVX



Source: IDC, Credit Suisse research

Figure 254: Market share dropped from 4% to <1% in 2018-19



Source: IDC, Credit Suisse research

Mia

Tina Long, Ivy Liu

Company profile

Mia.com is a dedicated e-commerce platform selling maternal and infant products, ranging from infant formulas and baby care to apparel and toys. It was founded in 2011 by a full-time mother, Liu Nan, who started her e-commerce career with a Taobao shop. Her original mission was to help Chinese mothers to find overseas products that are trustworthy, safe and of good quality.

By now, Mia has evolved into a comprehensive cross-border online shop with greater variety in products. Most of its users are from higher-tier cities, and are willing to pay a premium for quality products and services.

- **Direct sourcing:** Several food safety scandals involving Chinese domestic brands have triggered the increasing demand for imported goods. Mia has developed a global supply chain by cutting out the middle layers and directly sourcing from brands at lower prices. By now, multiple major baby food labels—including Nestle, Danone, Mead Jonson, Wyeth, Pampers—have partnered with Mia. The overseas products can be shipped to domestic bonded warehouses in bulk, and then shipped to end customers (when ordered), shortening the delivery time compared with traditional trade purchase.
- **Promotion and marketing:** Apart from selling products, one important feature is the content community–a group of young mothers share their experience, opinions and reviews on products. Through the recommendation content and feeds, sales accelerated rapidly. Meanwhile, to gain traffic and grow user base, Mia sponsored TV shows and encouraged sharing via other social media networks to accelerate user expansion.
- **Vertical expansion:** To solidify the moat, Mia has upgraded from a pure e-commerce site to a content community and integrated platform for related services such as maternity health, early education, etc. It collaborated with Amcare—a leading offline maternity care service provider, inviting top experts to create special content; it also cooperated with ~~offline~~ kindergartens and child day-care. Through such investments into related industries, Mia has helped to extend users' long-term loyalty, and directing more traffic to its site from more offline presence.

Business update

The e-commerce site covers 13 categories and offers over 30k SKUs. A huge 80% of orders are placed through mobile. Over 85% of the sales are generated from a direct-sales model, while baby apparel and home goods are mainly offered through marketplace (POP). According to QuestMobile, Mia's app has MAUs of 1.5 mn as of Jan-2020.

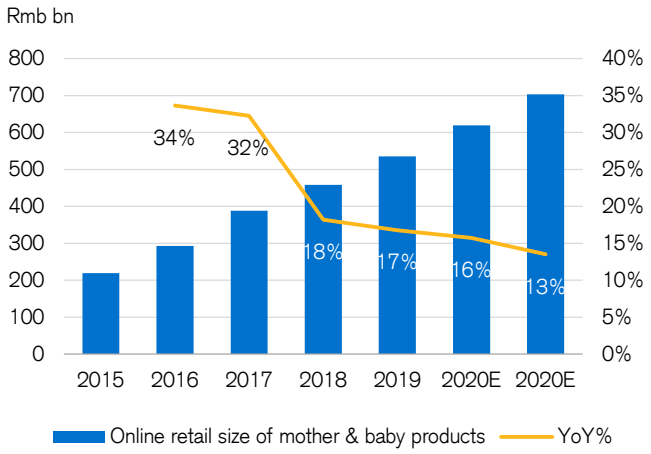
Key management

Nan Liu (Founder and CEO): Ms. Liu founded mia.com in 2011 when she was a full-time mother. She graduated from Peking University and joined Dow Chemical Company after graduation. When she was expecting in 2011, she actively explored maternal and baby products from overseas and gradually became a shopping KOL (key opinion leader) in the community. She then started her e-commerce career running a Taobao shop that offered Kao's diapers, which recorded over Rmb30 mn in sales.

Industry

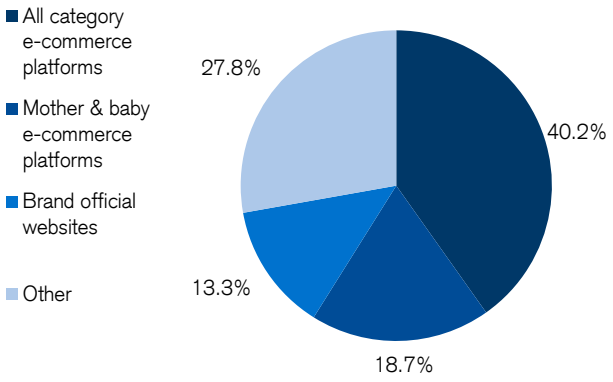
Internet/e-commerce/O2O/Games

Figure 255: Online retail size of mother & baby products



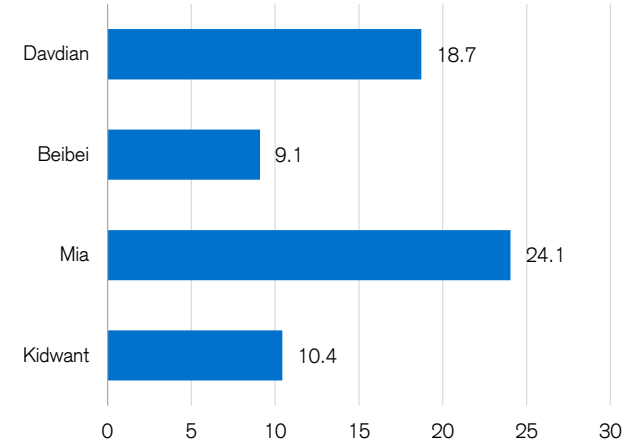
Source: Analysys

Figure 256: Mother & baby products e-commerce channel breakdown in 1Q19



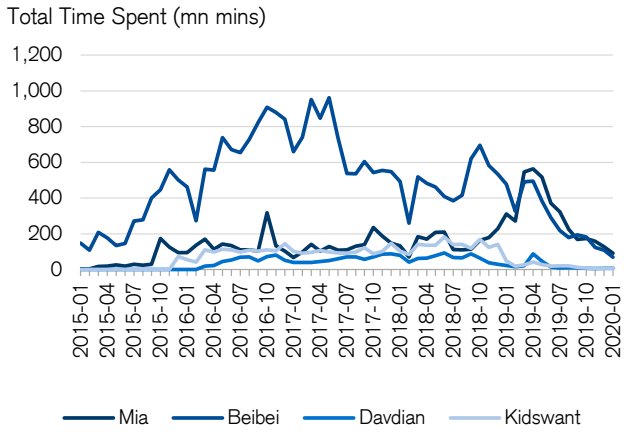
Source: Big Data research

Figure 257: Monthly user frequency for top maternal and baby apps



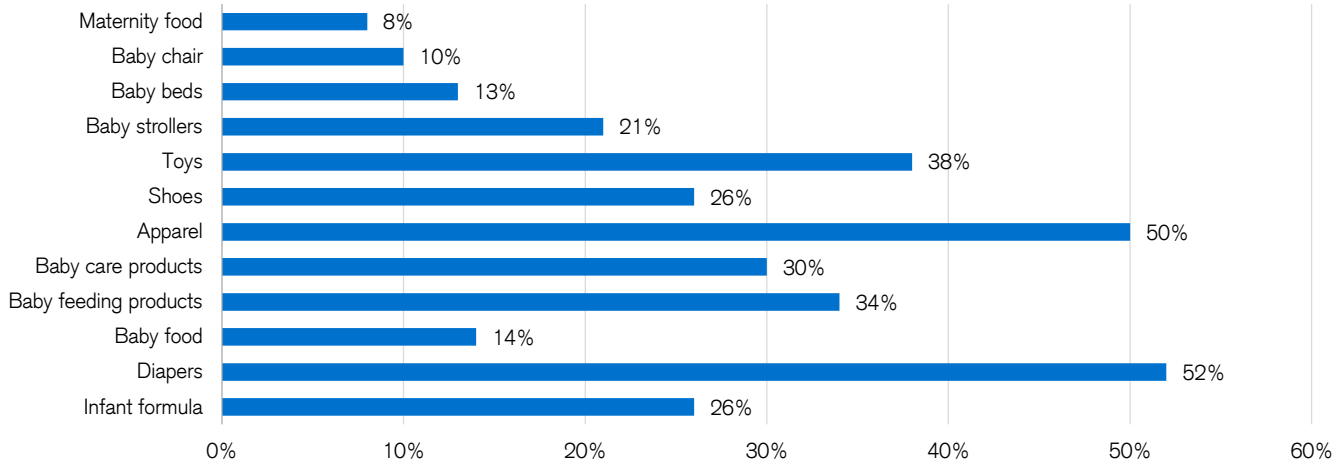
Source: QuestMobile

Figure 258: Beibei and Mia leading the time spent among peers



Source: QuestMobile

Figure 259: Online retail penetration for mother & baby related products



Source: Nielsen data

Miaoshou Doctor

Fei Zheng, Jason Liu

Company profile

Miaoshou Doctor is a telemedicine healthcare services platform that was initially founded to serve as an online communication services platform between patients and doctors. Since its founding in 2015, the company has expanded into five business units: Miaoshou Doctor Online Hospital, Yuanxin Chain Pharmacy, Miaoshou Doctor App, Miaoshou B2C Mall, and Miaoshou online community for hospitals to share prescriptions. It has established an online diagnosis platform for follow-up patients and a nationwide drug delivery network. Its main business centres on 'internet+ diagnosis+ drug'.

- **Yuanxin pharmacy:** The Yuanxin pharmacy chain includes over 200 DTP (direct to patient) pharmacies in 66 cities of 23 provinces and covers over 260 Class 3 cancer hospitals.
- **Miaoshou Doctor app:** While the compensation and welfare differ due to regional economic levels, doctors could benefit from providing online clinical services. In Miaoshou Doctor app, doctors' hourly consultation price may be as low as free and as high as CNY399. The number of active customers has reached 1.9 mn and the number of participating doctors has reached 20,000.
- **Miaoshou Mall:** Miaoshou has built a strategic partnership with over 1,000 pharmaceutical companies both domestic and foreign which allows it to sell medicine to patients directly in Miaoshou Mall, employing a B2C model. It currently sells over 26,000 types of drugs, including over 300 innovative or targeted drugs.
- **Miaoshou prescription sharing platform:** Miaoshou's prescription sharing platform is set up in cooperation with Chinese tier 3 hospitals and is used to further improve the management and performance of its online hospital.

Key management

He Tao (founder and CEO): Mr He graduated from Central University of Finance and Economics and worked as CEO of China Resource J1 before starting up Miaoshou Doctor.

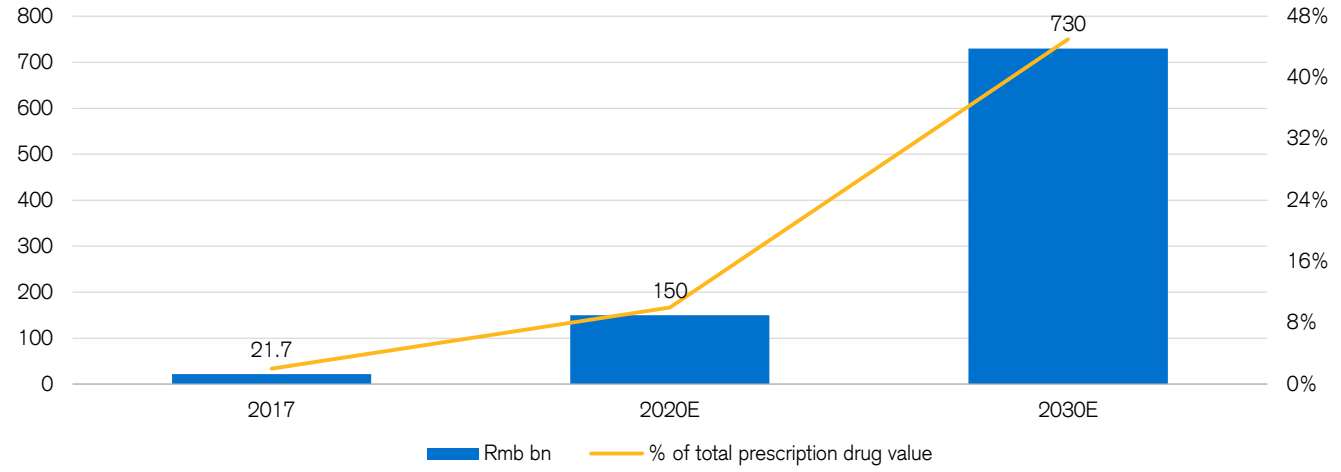
Han Daoliang (founder and CTO): Mr Han worked with ShanDa Innovations and Sohu before starting up Miaoshou Doctor.

He Ziliang (COO): Mr He worked with 120ask before joining Miaoshou Doctor.

Industry

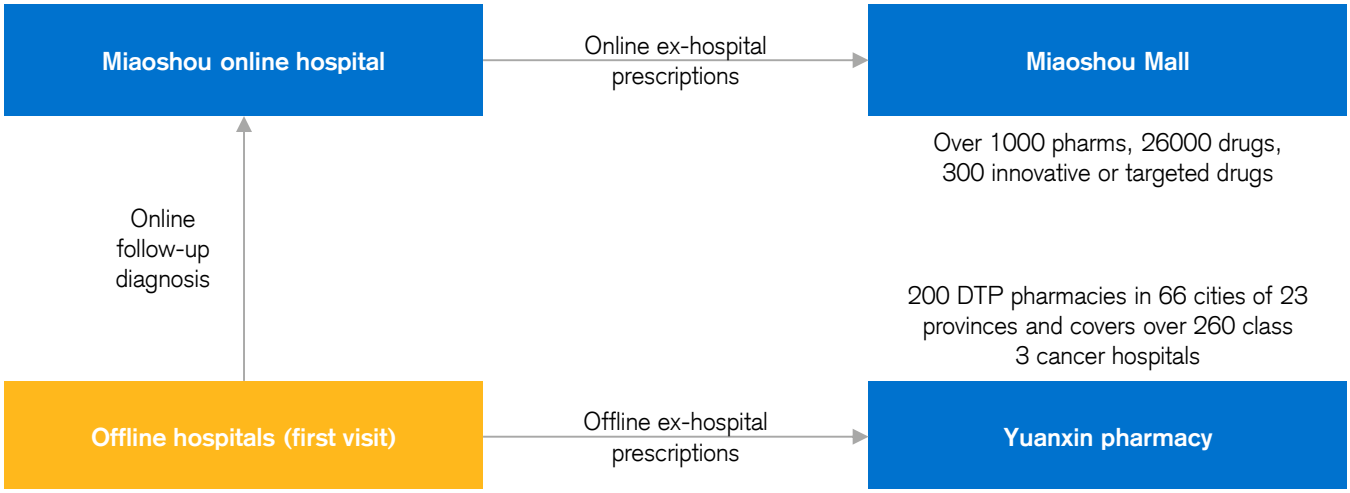
Internet/e-commerce/O2O/Games

Figure 260: Fast growing ex-hospital prescription drug market (Rmb bn)



Source: Analysys

Figure 261: Main business model for Miaoshou Doctor



Source: Company data, Credit Suisse research

Mofang Living

Tina Long, Ashley Xu

Company profile

Mofang Living, China's earliest centralised apartment operator, was founded in 2009. Mofang currently operates centralised apartments in more than 20 cities in China, providing serviced apartments for white collar residents. According to CRIC, Mofang has 48,452 apartment units under management at the end of 2019. With an efficient operation, Mofang's apartments could reach 90-95% utilisation in 3-6 months after the launch.

Since 2016, Mofang has been expanding its brand lines—it launched 'Jiuhaolou' targeting blue collar residents and 'More' targeting mid-to-high end residents. In 2019, Jiuhaolou's rooms under operation exceeded 10,000.

Due to heavy offline execution, the apartment operating market is highly fragmented with a number of small local players. However, property developers have established an edge with much better access to land, properties and professional property management teams. They operate under both heavy asset (self-owned properties) and light asset model (leased properties). Vanke has been leading with 100k rooms open and another 130k rooms in the pipeline, totaling 230k under operation, followed by Longfor and Cifi.

Mofang also competes with co-living platforms that operate apartments scattered among neighbourhoods—leading players being Ziroom (1 mn rooms), Danke (407k rooms) and Qingke (100k rooms). Such players are of much larger scale and provide more flexibility in the selection of the location and apartment structure. However, it is more difficult to maintain a consistent service quality as apartments are widely spread out in different locations.

Business update

Warburg Pincus invested US$60 mn in Mofang Living in 2013, as round B financing, followed by another US$140 mn in 2015. Round C financing of US$300 mn was invested by AVIC Trust, at post money valuation of US$1 bn. In March 2019, Mofang Living announced D-round financing of US$150 mn, invested by CDPQ.

Key management

Zheng Nanyan (Chairman): Mr Zheng became the chairman of Mofang Living in June 2018. He has rich experience in hotel operations and investment. In 2013, he founded Plateno Group, a multi-brand hotel operator, together with other partners. In 2016, Mr Zheng founded Ocean Link, a PE fund focusing on the travel industry, together with Liang Jiangzhang and Zhang Chi.

Liu Jia (CEO): Liu Jia joined Mofang in 2014. Before that, she had years of experience in the hotel operating industry. Ms. Liu joined Ctrip in 2001 and participated in the establishment of Home Inn.

Industry

Property

Figure 262: Top centralised apartments by property developers in China

Operator	Chinese name	Rooms open	Rooms under operation
Vanke Boyu	万科泊寓	100,000	230,000
Longfor Goyoo	龙湖冠寓	80,000	110,000
Cifi Lingyu	旭辉领寓	26,500	68,367
Langshiyu	朗诗寓	18,385	45,000
Zhaoshang apartment	招商公寓	16,701	24,670

Note: As of Dec-2019. Source: CRIC

Figure 263: Other centralised apartment operators in China

Operator	Chinese name	Rooms under operation
Lefull	乐乎	51,337
Mofang	魔方	48,452
Vlinker	V领地	33,490
Homeplus	世联红璞	31,975
WOWQU	窝趣	21,000

Note: As of Dec-2019. Source: CRIC

Momenta

Kyna Wong, Chaolien Tseng, Stephen Yin

Company profile

Founded in September 2016, Momenta is an autonomous driving start-up operating out of Beijing, aiming to build the 'Brains' for autonomous vehicles. Its deep-learning based software in perception, HD semantic mapping and data-driven path planning enables full autonomous driving. Momenta provides customers with L3 to L4 autopilot solutions, as well as big data services, including real-time road edge and driving area detection, 3D vehicle detection and human feature detection via various types of software development kits.

During the past two years, the company has completed three phases of development. The first phase is the construction of the underlying computing infrastructure. The second phase is to establish awareness of surroundings, high-precision maps and positioning, driving decision planning based on a series of software algorithms. The third phase is to form autonomous parking under different scenarios and levels of autonomous driving solutions for highways and urban roads. The company has three key foundations to develop its technology—AI, Big Data and closed loop. By cooperating with tier 1 suppliers and OEMs of automobiles, the firm can gain access to more data to train and improve its algorithms.

In 2018, Momenta partnered with the Suzhou city government to test self-driving cars in a designated special area. They will jointly launch an industry fund to invest in upstream and downstream start-ups in autonomous driving. Momenta hopes that its autonomous driving technology can lower the traffic accident rate by 20%-40% in the next five to ten years. In the 54th International CES in Jan-2020, Momenta showcased its new Front Camera Perception Product based on TI's Jacinto TDA4x platform, which can detect distant objects under complex scenarios, meeting the EU's 2022/2024 safety requirements in new vehicles.

Momenta has a relatively flat team structure and a flexible work environment. The company is currently one of the most valued unicorns in autonomous driving with a valuation of over US$1 bn after the latest round funding of US$200 mn, with investors including Tencent, China Merchants Group, CCBI, NIO Capital and Pagoda Investment.

Key Management

Xudong Cao (Founder & CEO): Mr Cao is a former scientist at Microsoft Research and former executive director of R&D at Chinese face recognition start-up SenseTime. He was a runner-up in the US National Data Science Bowl. Mr Cao holds a bachelor of science degree from Tsinghua University.

Shaoqing Ren (Co-founder, R&D Director): Mr Ren is a PhD in computer vision from a joint PhD programme between University of Science and Technology of China and Microsoft Research Asia. He was a recipient of CVPR (Computer Vision event) 2016 Best Paper Award. He's also the author of Fast-RCNN & ResNet, and the winner of ImageNet 2015 and MS COCO Challenge 2015.

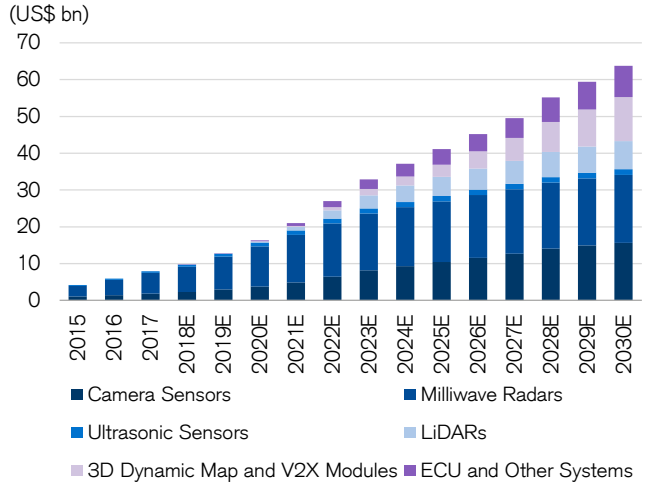
Ms. Yan Xia (Co-founder): Ms. Xia is the head of R&D at Momenta. Prior to joining Momenta, Ms. Xia developed technologies at Microsoft Research which were used in products such as Bing. She holds a PhD in computer vision from University of Science and Technology of China and Microsoft Research.

Gang Sun (R&D Director): Mr Sun is an expert in advanced parallelised computer systems. He is a former researcher at Baidu IDL (Institute of Deep Learning). He was also the winner of ImageNet 2017 Image Classification, and the runner-up of ImageNet 2016 Scene Classification.

Industry

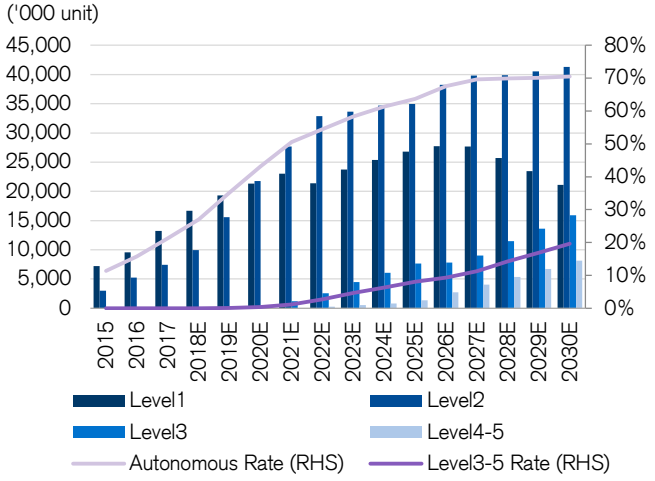
AI/Big Data/Robotics/Software

Figure 264: Market for components in autonomous driving cars to exceed US$60bn in 2030



Source: YRI, Credit Suisse research

Figure 265: Forecasting 85mn autonomous vehicles by 2030, 15% CAGR (2015-30)



Source: YRI, Credit Suisse research

Figure 266: Two years since launch, Momenta received five rounds of financing, making the company one of China's highest valued start-ups in the autonomous driving space

2016	2017	2018
■ Momenta was founded, receiving US$5 mn funding from Blue Lake Capital, Sinovation Ventures and Zhen Fund.	■ Early in the year, Momenta received Series A funding from Shunwei Capital. ■ Received Series B1 funding of US$46 mn from Nio Capital, Daimler Group, Shunwei Capital, Sinovation Ventures and Unity Ventures. ■ Received Series B2 funding from Cathay Capital and GGV Capital China.	■ Momenta completed a new round of financing mainly from industry-leading strategic investors and investors with state-owned background. Strategic investors included Tencent and some other institutions. Investors with state-owned backgrounds included China Merchants Venture Capital, Guoxin Capital, Suzhou Yuanhe Yuandian Venture Capital and CCB International, and existing shareholders Neo Capital and Pagoda Investment. ■ Overall, the firm received >US$200 mn investment, with a latest valuation of >US$1bn.

Source: Company data, 36Kr, Zhihu

Nxin

Tina Long, Michael Wang

Company profile

Founded in 2015, Beijing Nxin Technology operates an online agricultural platform, providing data, commerce and financial services for the agricultural industry. It leverages on the power of the internet, IoT and AI to transform and upgrade the China agriculture industry. It has established an agricultural big data sharing platform, agricultural products distribution platform, agricultural loans, and more.

Major products include 'Internet of pig', 'Internet of feed', 'Internet of agrifood', 'Internet of egg', 'Internet of fish', etc. These products can help corporates to do live supervision on the breeding base and improve operational efficiency by providing intelligent and comprehensive data reports. Supply chain management, e-commerce distribution channel and financing services are also included in these systems. It currently has 21 regional divisions nationwide, serving over 30,000 corporate clients and 230,000 individual clients.

The core advantages of Nxin's services are as follow:

- **Closed-loop services** throughout the agricultural and animal husbandry industry chain. Its business covers three aspects—management, trading and finance. The network penetrates into all the upstream and downstream sectors, including feed production, hog (or poultry) breeding to slaughtering and processing. By integrating the source along the industry chain, it has built a comprehensive service platform and formed an agriculture ecosystem with breeding as the centre. Within the ecosystem, the e-commerce platform and financing services are also included to provide the most convenience to the agriculture firms.
- **Intelligent and digitalised services** favouring the operating efficiency improvement. By connecting the devices to the internet of things, the production process can be automated. Besides, with the introduction of digitalised enterprise management, the production and operation data can be visualised. Favoured by the data integration and circulation at the enterprise level, decision-making can be more intelligent and efficient.

Its 'Internet of pig' could be the platform that manages the largest number of sows in China. The application of IoT devices such as intelligent environmental control, video surveillance and wireless B-ultrasound into hog breeding has caused heated discussions. In 2018, the "IoP" had served over 50 mn heads of pigs with a total transaction value (GMV) of Rmb50 bn. In Dec-2019, Nxin was awarded the title of 'Intelligent pig breeding service provider of the year' during 2019 China Pig Industry Reproduction Conference. In Sep-2018, Nxin completed the series-B finance of Rmb364 mn, leading the total valuation to Rmb7.4 bn.

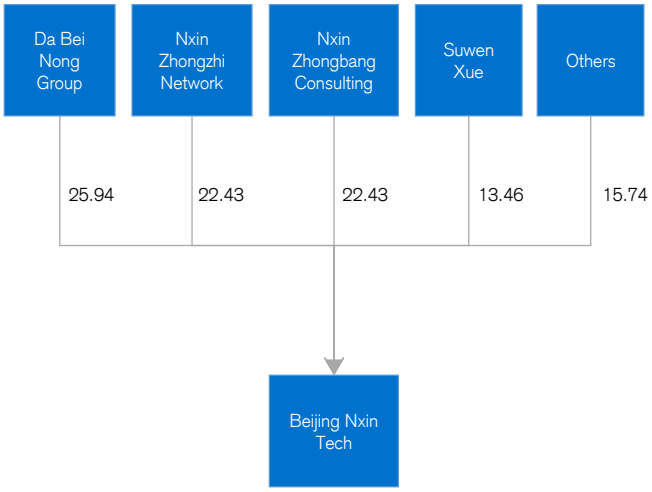
Key management

Suwen XUE (CEO): Mr Xue joined the Da Bei Nong Group in 1996 and successively served there as CFO, CIO, executive vice president and director. He then quit the company in March 2018. He was once named as the China Top 10 CFO of 2010, China Outstanding CFO of 2013, and Top 10 Economic Figures of Animal Husbandry Industry in 2014. He has been serving as CEO of Nxin since Feb-2015.

Industry

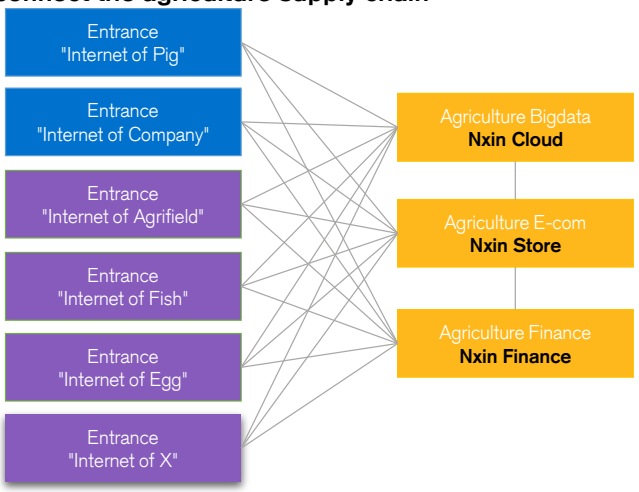
Internet/e-commerce/O2O/Games

Figure 267: Overview of Nxin's share structure



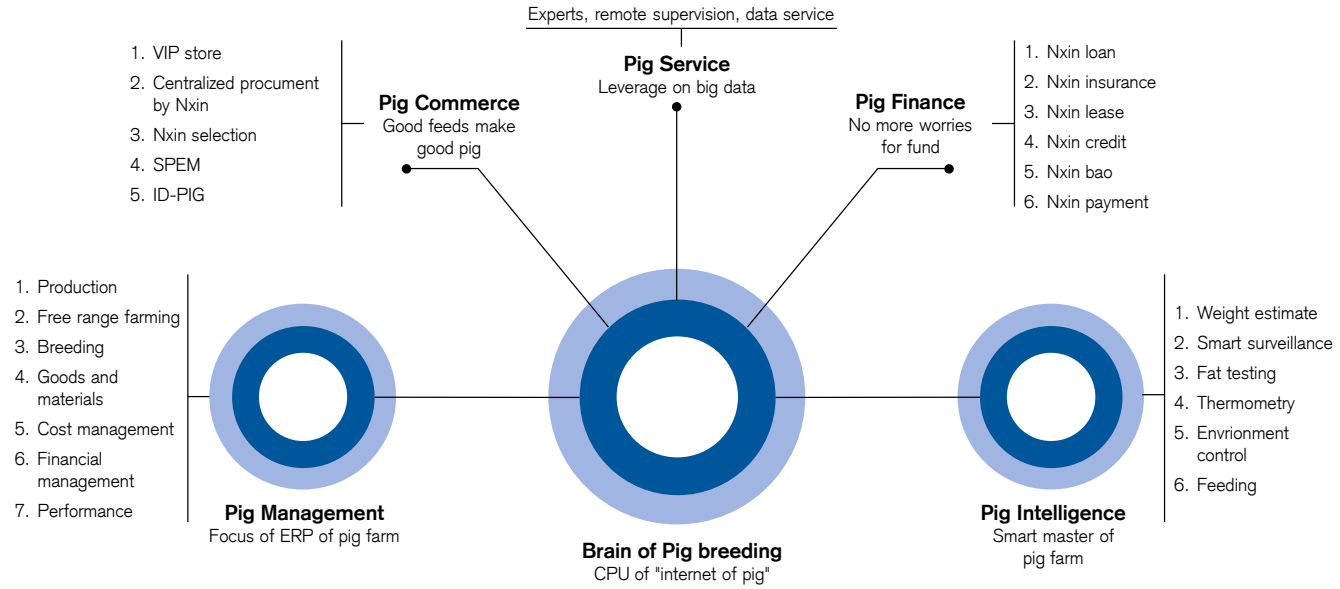
Source: TianYanCha; Notes: Suwen Xue also holds stakes in Nxin Zhongzhi Network and Nxin Zhongbang Consulting, but no available data. He is the actual controller of Beijing Nxin Tech according to an announcement made by Da Bei Nong Group.

Figure 268: An ecosystem leveraging on internet to connect the agriculture supply chain



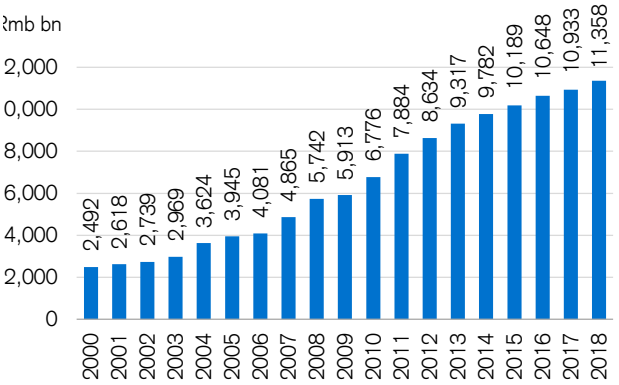
Source: Company data

Figure 269: An introduction to its "Internet of pig"



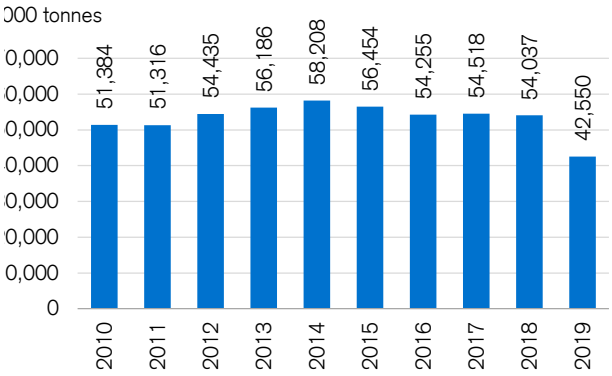
Source: Company data

Figure 270: Agricultural, fishery and forestry production value registered a 2000-18 CAGR of 8.8%



Source: NBS, CEIC

Figure 271: Production volume of pork in 2019 impacted by the African swine fever



Source: NBS, CEIC

Orbbec

Kyna Wong, Chaolien Tseng, Stephen Yin

Company profile

Founded in 2013, Orbbec is an AI-driven 3D sensing company. It is one of the few global companies with mass production ability of 3D cameras and also one of the very few companies offering a total 3D sensing solution, including camera hardware and system design, semiconductor chip and algorithm. Its 3D camera solutions are used in a wide range of applications, including smartphone, robotics, retail, gaming, smart home, surveillance, healthcare and so on. Its 3D sensing solutions are used by more than 2,000 companies globally, including OPPO, HP, Ant Financial and China Mobile.

In May 2018, Orbbec raised US$200 mn in a series D funding round, led by Ant Financial. The Hurun Global Unicorn List 2019 lists Orbbec as one of the top unicorns with a valuation of Rmb7 bn.

In 2018, its founder Dr Huang indicated in a media interview that the company's revenue had reached several hundreds of millions RMB. Orbbec has more than 700 employees, with more than 70%of its headcount in R&D. According to Orbbec, it has applied nearly 600 patents and is the global number three companies in terms of patents in 3D sensing, after Apple and Microsoft. Orbbec has production facilities in Zhejiang and Shenzhen.

Key management

Dr Huang Yuanhao (Founder & CEO): Dr Huang graduated from Peking University and earned his master's degree from the Singapore University and PhD from the City University of Hong Kong. Dr Huang conducted various 3D sensing research projects in Singapore, Hong Kong, Canada and the US. He founded Orbbec in 2013 with a group of scientists and engineers from MIT, Apple, AMD and so on.

Industry

Hardware/Semi

Figure 272: Orbbec key milestones

Year	Milestone
2013	■ Company was founded in Shenzhen.
2015	■ Developed first 3D sensing ASIC chip, MX400. ■ Began to mass produce Astra and Astra Mini 3D cameras.
2016	■ Astra 3D cameras adopted by TV, robot and PC customers. ■ Launched the Persee, the world's first 3D camera computer. ■ Partnered with HP to build the next generation 3D scanner. ■ Received strategic investment from MediaTek.
2017	■ Developed second-generation 3D chip MX6000, using TSMC's 40nm LP technology. ■ Completed the C+ round of financing.
2018	■ Partnered with OPPO to add a mobile 3D camera to OPPO Find X. ■ Taped-out third-generation 3D chip MX6300, using TSMC's 28nm HPC+ technology.
2019	■ Partnered with Baidu Brain on 3D facial recognition.

Source: Company data

Shansong Express

Kenneth Fong, Ivy Ji, Lok Kan Chan, Rebecca Law

Company profile

Launched in 2014 in Beijing, Shansong Express, also known as FlashEx, is a logistics company that mainly provides short-distance (usually within the same city) delivery services. It guarantees one-hour or less delivery time to destinations within five kilometres of the collection point. As of May 2019, Shansong serves over 139 mn registered users in 222 cities across China, with the number of Flash Riders reaching 636,000. The company achieved financial breakeven in 2016.

According to iResearch, the China instant delivery market is estimated to reach gross merchandise value (GMV) of Rmb131 bn from Rmb18.5 bn orders in 2019. According to Bigdata, these local logistics orders are mainly contributed by meals (52%), retail convenience goods (22%), fresh fruits and vegetables (15%), and flower and cakes (6%). After completing a series D funding round in August 2018 for US$60 mn, Shansong Express reached a valuation of US$1 bn.

Key business spotlights are as follows:

Convenience: Orders can be placed through Shansong's app, website and online social platform, WeChat, without appointments in advance. Moreover, unlike traditional logistics systems, Shansong's services are available 24 hours a day and 7 days a week.

Quick responses: Shansong has differentiated itself by having quick processes, such as responding in one minute, initial pick-up within 10 minutes, and same-city delivery within 60 minutes. According to the company, the average delivery time for orders within 5 km and 10 km can be 23 and 33 minutes, respectively, and only 1% of parcels are later than promised.

Focus on delivery safety: Different from the traditional logistics services which deliver packages from station to station, Shansong assigns a particular Flash Rider to a single parcel throughout the delivery process. Shansong uses a credit screening procedure to select the Flash Rider with high trustworthiness. Combined with other measures, such as face recognition and real-time monitoring, it significantly improves the safety of delivery and customer confidentiality.

A wide variety of services: Shansong provides various kinds of 'purchase and delivery' services for customers, with the delivery items ranging from documents, flowers, food and gadgets to groceries, among others. Apart from individual customers, Shansong also expanded its business relationship with corporate customers such as jeweller retailer Chow Tai Fook and department store SPK, among others.

Key management Peng Xue (Co-Founder and CEO): Mr Peng Xue founded Shansong Express in 2014; he had previously founded an online ordering platform integrating all express delivery companies.

Ms. Wei Song (CFO): Before joining Shansong, Ms. Song worked in the finance industry overseas.

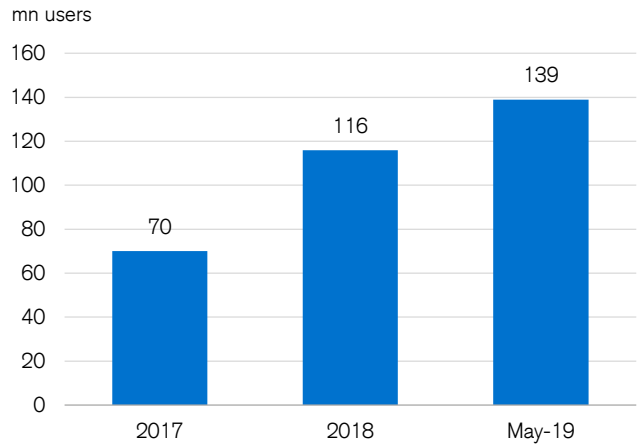
Hongjian Yu (Co-Founder and CTO): He co-founded Shansong Express with Mr Peng Xue.

Haibo Ru (Co-Founder): Before joining Shansong, Mr Ru had over 15 years of experience in various companies. He held the position of venture partner at Matrix Partners, and project manager at China Mobile.

Industry

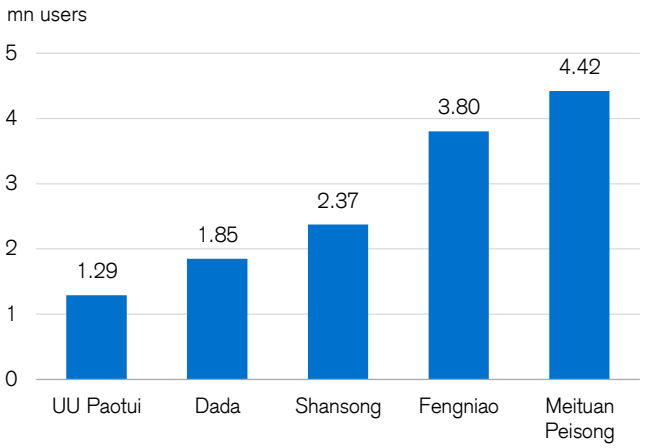
Logistics

Figure 273: Shansong's registered users



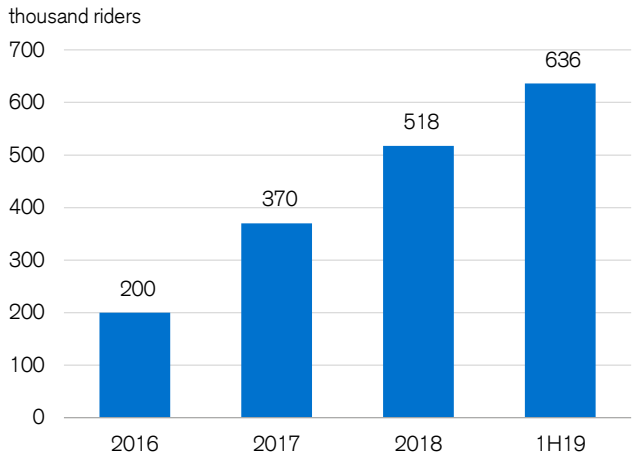
Source: Company data, 36kr

Figure 274: Shansong's MAU as of 1H19



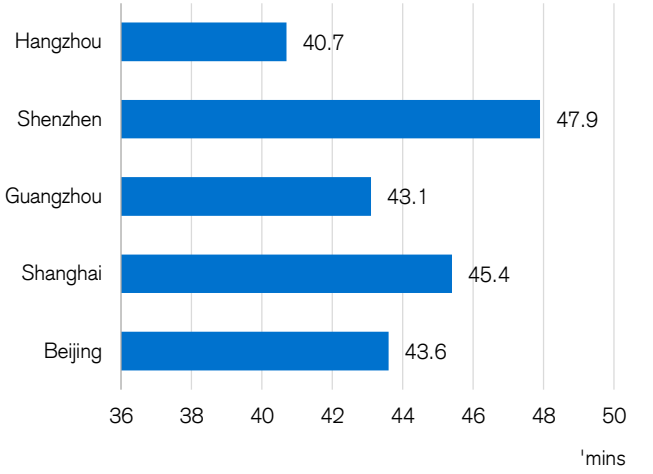
Source: Fastdata

Figure 275: Shansong's number of riders



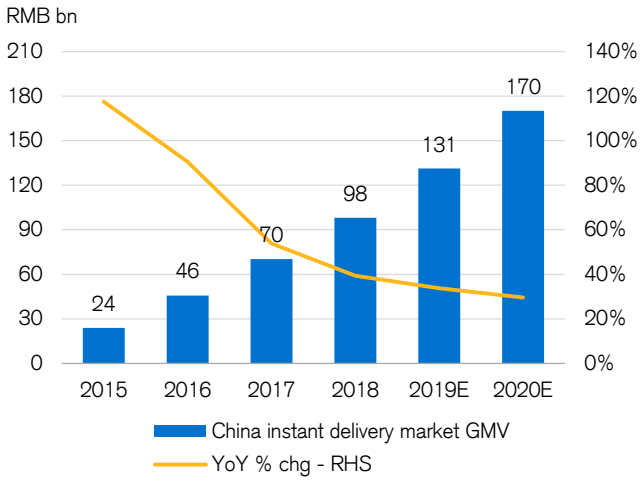
Source: Company data, Fastdata

Figure 276: Shansong's average delivery time



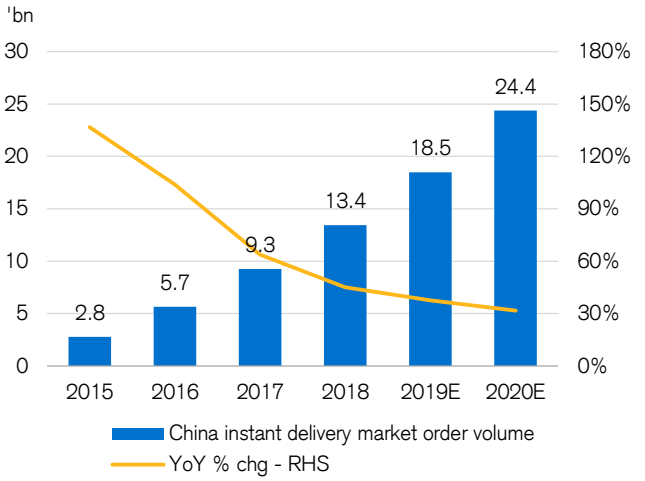
Source: Company data

Figure 277: China local logistics online market GMV



Source: iResearch

Figure 278: China local logistics online market order volume



Source: iResearch

Terminus Technologies

Kyna Wong, Chaolien Tseng, Stephen Yin

Company profile

Terminus Technologies is a high-tech innovative enterprise incubated by Everbright Holdings. It focuses on artificial intelligence + IoT application technology, and operates as an AI city solution provider. The company is committed to becoming China's largest urban-level intelligent IoT platform to provide urban management, population management and construction for governments and enterprises. It provides a one-stop solution for applications, including energy management, public safety management, environmental and infrastructure operations management. The company's R&D centres are located across the country in Beijing, Shanghai, Chongqing, Wuhan, Shenzhen and others, with more than 8,400 projects domestically.

Through AIOT platforms, edge computing and smart devices, the company provides a wide range of subsystems for smart communities, including device perception, fire perception, face perception, traffic perception, and more. It currently counts blue chip corporates, as well as multiple provincial governments as its customers, including Beijing, Shanghai, Tianjin, Chongqing, Chengdu, Wuhan, Nanjing and Zunyi.

Key Management

Ai Yu (CEO): Ai Yu, CEO of Terminus Technologies, is also a managing director at China Everbright Limited, which is Terminus' incubator. Mr Ai has over ten years' experience in investment banking and private equity investment, and has led 50 investment projects, totalling more than US$7.3 bn (Rmb100 bn) in both RMB and USD denominated funds. Mr Ai is a founding member and managing partner of Everbright-IDG Industrial Fund and Everbright-Zhongying Capital. He also sits on the investment committee of two TMT-focused PE funds under CITIC Securities and HUATAI Securities. Mr Ai has rich investment experience in the sectors of FinTech, pan-entertainment, high-technology, new consumption, etc.

Industry

Hardware/Semi

Figure 279: Terminus Technologies' product suits

AIoT platform	Edge computing	Smart devices
■ Smart community ■ Protection smart firefighting ■ Smart building energy	■ Edge computing module ■ Edge gateway ■ Edge computing server	■ Service robots ■ AI control ■ Smart locks / doors

Source: Company data, Credit Suisse research

Figure 280: Terminus Technologies' clients

iFlytek	Sensetime	Huawei	HIKVISION	VIMICRO	intel	CAS	Everbright	Greenland
Poly	FSPM	OCT	T11 Food Market	Sunshine 100	Hema Xiansheng	Miss Fresh	SII	Originwater
SINOGRAIN	KONKA	State Grid	MCC	CHINACCTC	ENJOYOR	INESA	SINCERE	NetPosa
W+	**Beijing Government**	**Shanghai Governement**	**Tianjin Government**	**Chongqing Government**	**Chengdu Government**	**Wuhan Government**	**Nanjing Government**	**Zunyi Government**

Source: Company data

Tongdun Technology

Charles Zhou, Yiran Zhong, Richie Jiang

Company profile

Founded in 2013, Tongdun Technology is a professional third-party intelligent risk management service provider headquartered in Hangzhou, Zhejiang. Since its inception, Tongdun has been serving its clients under a risk control concept that centralises on an "intelligent integrity network". By integrating artificial intelligence into business scenarios, Tongdun Technology offers solutions in intelligent user analysis, intelligent risk management, intelligent antifraud and intelligent operation to various businesses including non-bank microfinance, funds, auto finance, banking, insurance, logistics, healthcare, retail, smart cities and government bodies. The products and services include anti-fraud services, credit risk management services and core risk management tools. It has been growing rapidly. To date, it has reached business cooperation with over 10,000 corporate clients.

As a leader in intelligent risk management, Tongdun constantly enhances its service reliability through product and technology innovation and taps on technologies such as artificial intelligence and blockchain to provide intelligent risk control and anti-fraud services to financial institutions and internet firms. The core technologies it uses include:

- **Device fingerprint**, which creates a global unique ID for each device, and then, in combination with its powerful rule engine, analyses the operation of all users on one device accurately, finds the association of multiple users and depicts a device-based user portrait.
- **Cheating tools identification**, which can identify the common cheating tools used by fraudsters, with over 98% coverage. For example, Tongdun can identify whether the device is in the root/jailbreak status, and whether cydia framework, xposed framework, Android simulator, machine modification tool, proxy software, virtual positioning and other cheating tools are installed.
- **Real time gang detection**, which can identify fraud gangs in real time. It establishes the relationship network based on Tongdun's big data, then analyses communities with the dynamic algorithm for community detection, and filters with rules and strategies in the meantime, thus returning hit gang details and gang distribution map to identify fraud gangs, helping users find fraud gangs in advance and take preventive measures.

Key management

Tao Jiang (Founder): Mr Jiang obtained his master's degree from Fudan University. He worked in Alibaba between 2009 and 2013, specialising in anti-fraud. He established Tongdun Technology in 2013.

Junqu Ma (Co-founder): Mr Ma obtained his bachelor's degree from the University of Hong Kong and has over-20 years experiences in IT development. In 2012, he joined ThreatMetrix as the vice president of Asia Pacific and became a co-founder of Tongdun in 2014.

Linhuan Dong (Co-founder): Mr Dong holds a PhD in statistics from Nankai University and joined the Chinese Academy of Sciences after graduation. Prior to joining Tongdun in 2015, he served in FICO and SAS, focusing on anti-fraud in the financial industry.

Industry

AI/Big Data/Robotics/Software

Trendy

Tony Wang, Harriet Liu

Company profile

Established in 1999, Trendy International Group Limited (Trendy) is an international fashion entity with more than nine brands and registered capital of Rmb720 mn. L Capital Asia, a private equity fund of LVMH (the largest luxury goods group in the world), spent US$200 mn in 2012 to acquire a 10% stake in Trendy. It was the largest foreign investment in China when the company was valued at US$2 bn at that time. Channel wise, there were over 3,000 offline stores covering more than 290 cities worldwide, as well as homepage and third-party platforms for online sales. More than 8,000 employees serve the group. Trendy's multi-brands include not only its self-designed core brands Orchirly (1999), Five Plus (2009), TRENDIANO (2010), COVEN GARDEN (2014), but also brands acquired through M&A or joint ventures, such as Miss Sixty (2012), Superdry (2015) and DENHAM (2017). Its business covers fashion, leisure, urban, denim, and luxury, which mainly cover mid-to-high-end women's wear (only TRENDIANO covers the menswear market). The company can maintain a high gross profit margin and more prominent profitability due to its high barriers in terms of brand, product development, supply chain management and channel marketing.

Multi-fashion lifestyle. In 2013, it joined forces with Milan's brand, The 10 Temple Corso Como, creating a trendy life experience in China Pavilion (however, Corso Como suffered losses and stepped out of China in 2019); in 2015, it entered into a joint venture with Supergroup Plc Group of the UK to introduce Superdry, a popular urban fashion brand in China. In 2017, DENHAM, the Netherlands high-end jeans brand, was brought to China by Trendy, and further acquired by Trendy in 2019. In order to strengthen the differentiated characteristics of each brand and avoid style similarity of various brands, Trendy established independent product development teams for separate brands. The brand portfolio has a gradient in style and age, which can accompany the growth of consumers' age and consumption trends, in order to meet their consumption needs at different stages of their growth.

IPO application cessation. Trendy (China) Group Ltd, the subsidiary of Trendy International, had submitted the latest version of its prospectus in Jun-2018 to Shanghai Stock Exchange, but ceased the IPO review process in Feb-2019. The group originally aimed to publicly issue no more than 127 million shares, accounting for no more than 15% and no less than 10% of the company's total share capital after the issuance, A total of Rmb3.2 bn was expected to be raised for Marketing Network Construction (Rmb1.84 bn), Supply Chain and Logistics Centre Construction (Rmb0.54 bn), Information System Construction (Rmb0.35 bn), as well as Supplementary Liquidity (Rmb0.5 bn).

Challenges. As a typical apparel entity, Trendy's inventory level has continued to grow during recent years, which requires a more effective method to clear abundant inventory. Management also expressed its ambition to cover a larger menswear market as currently only one brand sells menswear under the whole group. Besides that, the company's marketing network terminals need to be further expanded for larger areas and the level of both software and hardware has to be upgraded, such as the warehousing logistics system and the management information system.

Major competitors

Major competitors of Trendy could be Gelisi (歌力思,1996), Vignas (维格娜丝, 2003), The Peace Bird (太平鸟, 2001), Anzheng Fashion (安正时尚, 2008), Ribo Fashion (日播时尚, 2002), which are all well-known apparel companies in China.

Management

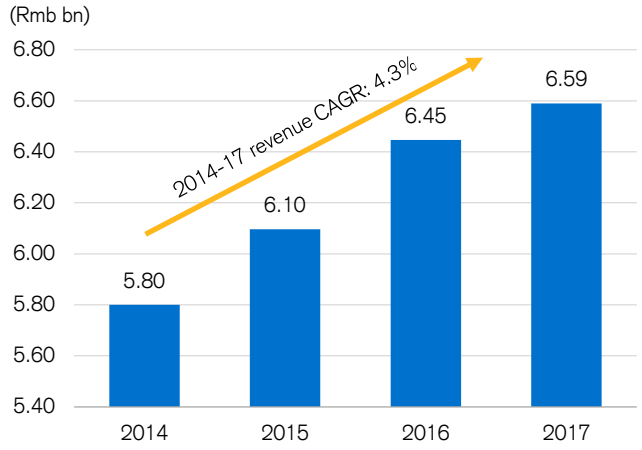
Jacky, Yu Xu (Founder, Chairman and General Manager): In 1999, Mr Xu founded Ochirly, the core brand of Trendy. He studied at the Cheung Kong Graduate School of Business for Executive Master of Business Administration (EMBA) from 2006 to 2009 and obtained his PhD in business administration (DBA) from Cheung Kong Graduate School of Business in 2014.

Ivan, Cheng Xu (Director, Deputy General Manager and President of Five Plus brand): Ivan Xu is the brother of Jacky, who works in the management team as well.

Industry

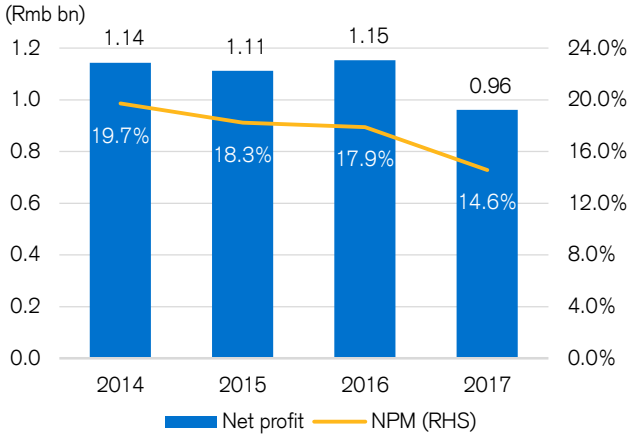
Retail

Figure 281: Trendy's revenue growth YoY



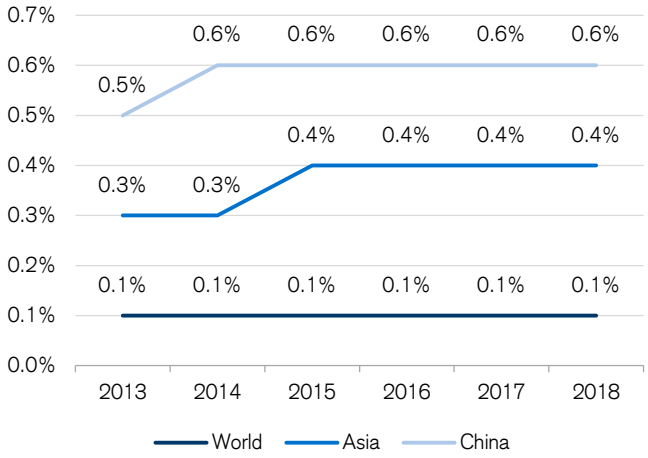
Source: Company data

Figure 282: Trendy's net profit and net profit margin



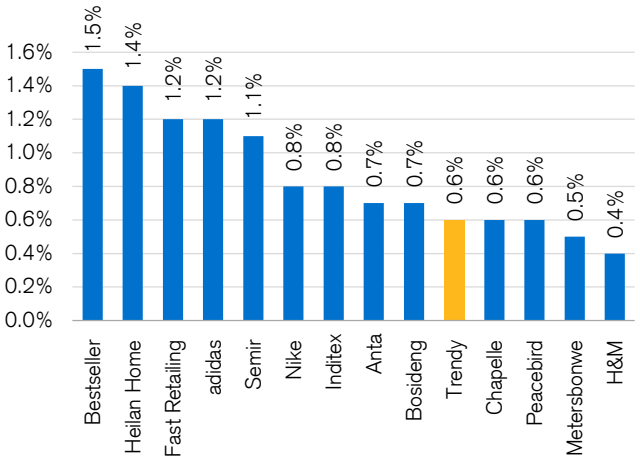
Source: Company data

Figure 283: Trendy's stable market share in China's apparel industry



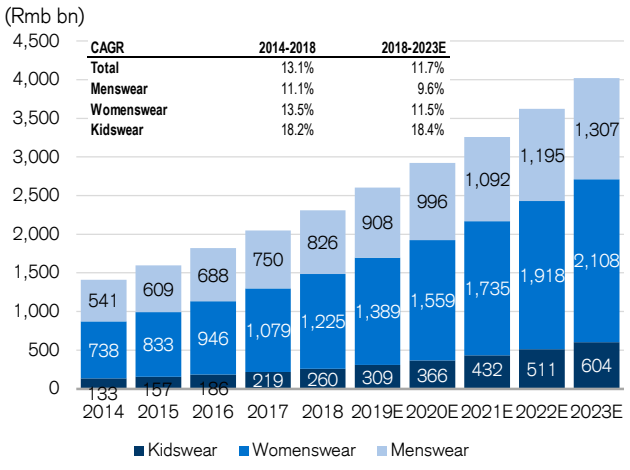
Source: Euromonitor

Figure 284: Trendy's market share ranked top 10 by apparel sales in China (2018)



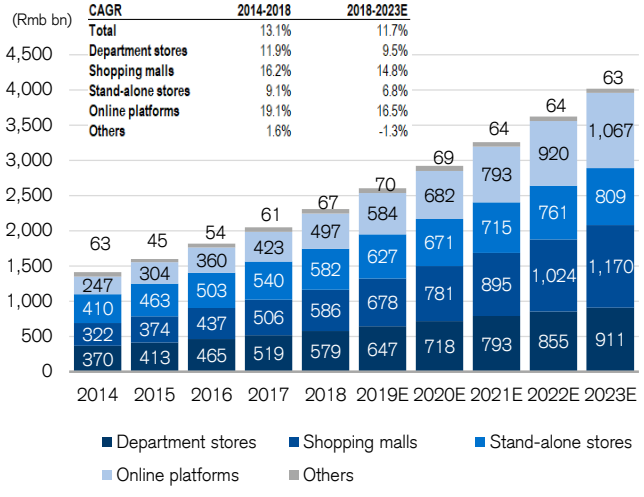
Source: Euromonitor

Figure 285: Womenswear dominates over menswear and kidswear in China



Source: CIC

Figure 286: Online channel outgrowing other segments in the Chinese apparel market



Source: CIC

Tujia

Kenneth Fong, Ivy Ji, Lok Kan Chan, Rebecca Law

Company profile

Founded in December 2011, Tujia is one of the largest homestay booking platforms in China. Ctrip, the largest online travel agency (OTA) in China, is one of Tujia's largest shareholders and strategic partners since its early days. Over the years, Tujia has grown into a global platform covering over 400 domestic and 1,037 international destinations with over 2.3 mn residential houses on its platform, including guesthouse, apartments and villas. According to State Information Centre, China's online homestay industry GMV grew 36% YoY reaching Rmb22.5 bn with 83 mn users, equivalent to 9.7% of the total internet population. After the latest round of e-financing of US$300 mn in October 2017, Tujia was valued at over US$1.5 bn.

Key business spotlights as below:

A complete supply chain layout. Tujia differentiates itself from peers by having a diversified accommodation property inventory, thanks to the relatively complete supply chain it has built over the years. Tujia's sources of inventories mainly include: (1) new residential properties from direct developers; (2) guesthouse/apartments signed up by individual owners; and (3) local governments, especially in popular tourist destinations.

Tujia also provides innovative inventory management models including those run by owners (RBO), run by agency (RBA) and self-operated (managed by Tujia). This platform, plus the self-operation model, allows Tujia to strike a balance between scale and quality. This, in our view, is particularly important given the nascent nature of the market and customers' concerns about quality and trust.

Well-balanced growth strategy. Tujia has expanded through both organic growth and M&As. The company started to consolidate domestic rental resources in 2016 by: (1) acquiring Mayi.com, a leading short-term rental platform, in June and (2) acquiring the homestay business of Ctrip and Qunar through a stock swap in October.

Tujia also started to expand overseas in 2017, with an initial focus on North and Southeast Asian markets. In January 2018, Tujia announced its first overseas deal by acquiring Fishtrip, an alternative accommodation booking platform based in Taiwan and with a meaningful presence in the ASEAN markets. According to the company, the addition of Fishtrip to Tujia's portfolio could bring at least 300k quality inventories to its platform and significantly strengthen its position in the Asian markets.

Key management

Changle Yang (CEO): Mr Yang had been Tujia's COO since 2016, prior to becoming CEO in February 2019. Before Tujia, he was at Qunar, overlooking the accommodation segment.

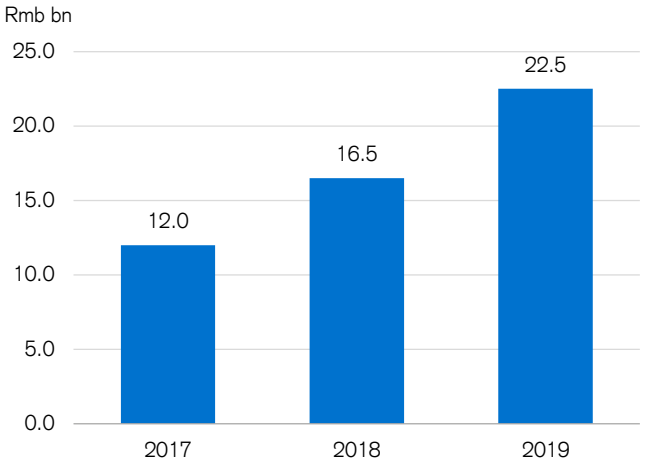
Qiang Yu (CTO): Prior to joining Tujia in 2016, Mr Yu worked with Mr Changle Yang in Qunar, overlooking the travel segment.

Warren Wang (CFO): Before he joined Tujia, Mr Wang served as CFO in iPinYou and HOGS.US for about ten years.

Industry

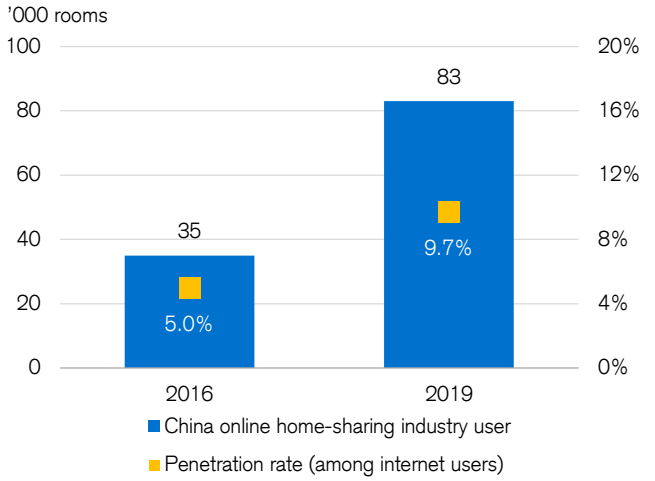
Internet/e-commerce/O2O/Games

Figure 287: China online home-sharing industry GMV



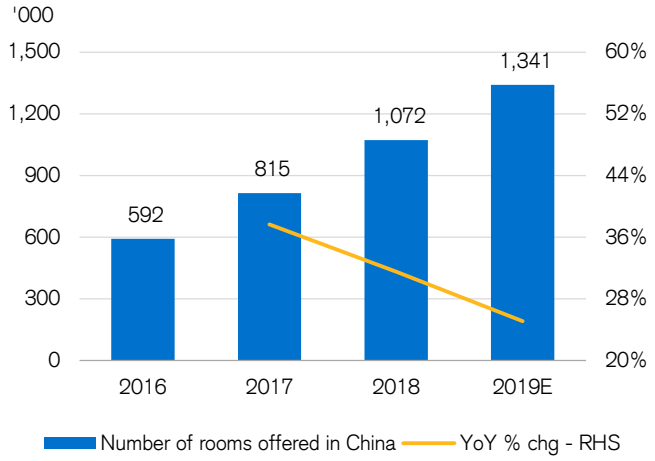
Source: State Information Centre of China

Figure 288: China online homestay industry user base and penetration rate



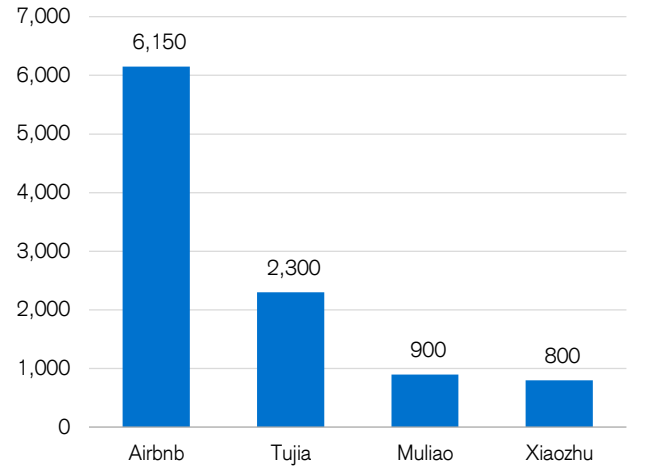
Source: State Information Centre of China

Figure 289: Rooms offered from homestay in China ('000)



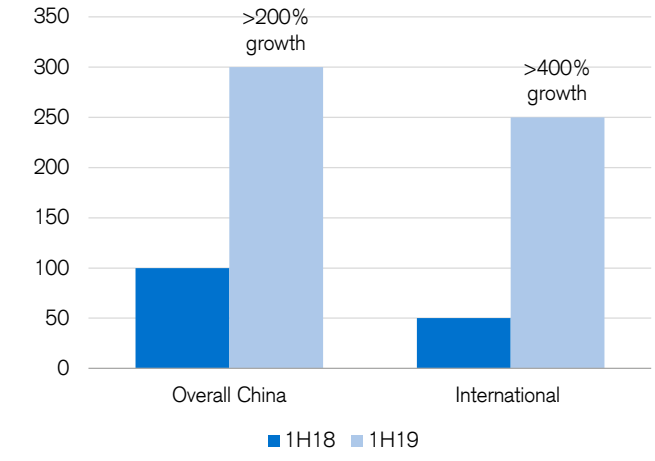
Source: Trustdata

Figure 290: Total rooms available by platform by 1H19 ('000)



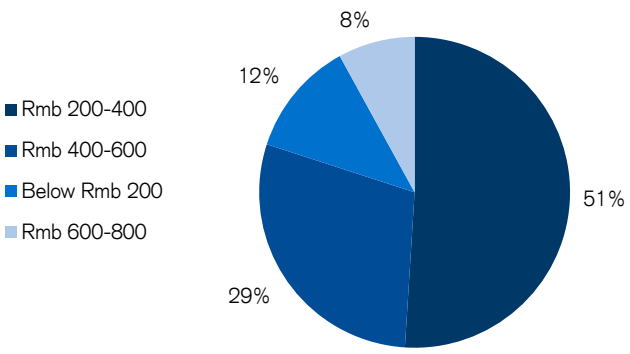
Source: Trustdata

Figure 291: Tujia order volume growth as of 1H19



Source: Trustdata

Figure 292: Average spending per night over total booking



Note: as of 1H 2018.
Source: Trustdata

UCommune

Jianping Chen, Summer Wang

Company profile

UCommune, founded in 2015, is the leading co-working community operator. Its scale in China is the largest in terms of the number of co-working spaces, aggregated managed area and number of cities covered in China as at end of Sep-2019, according to Frost & Sullivan.

- **Workstation services:** As of Sep-2019, the company had 197 co-working spaces across 41 cities in Greater China and Singapore. Meanwhile, it had 171 spaces in operation with 72,700 workstations and 26 spaces under construction or planning. The number of UCommune's members reached 609,600, including about 584,600 individuals and 25,000 enterprises as of Sep-2019. The net revenue from the workspace membership in 2017-9M19 was Rmb154 mn, Rmb394mn and Rmb420 mn, respectively. The occupancy was 68%, 60% and 79% in 2017-9M19, respectively.
- **Operation model of workstation services:** UCommune operates the office space under two modes: (1) self-operated model. Under this model, there are three categories, including **U Space** (lease office area with GFA over 200 sq m; design and build the space using its proprietary SOP), **U Studio** (lease office area with GFA below 200 sq m; design and build the space using its proprietary SOP) and **U Design** (offers one-stop customised services from location selection to daily operation services); (2) asset-light model. The company provides design, construction and management services to landlords for developing co-working spaces. The model has two categories: **U Brand** (charges landlords with management fees for branding, operating and consulting services) and **U Partner** (shares revenue with landlords).
- **Other services:** UCommune provides comprehensive **U Plus** services to the large base of members. U Plus' services include individual services, general corporate services, advertising and branding services, etc. Besides, the company has developed a smart and integrated platform connecting online and office services via technology innovation.
- **Key competitors:** Traditional office landlords, People Square, Nash Work, My Dream Plus, SOHO 3Q and other co-workstation companies in China.

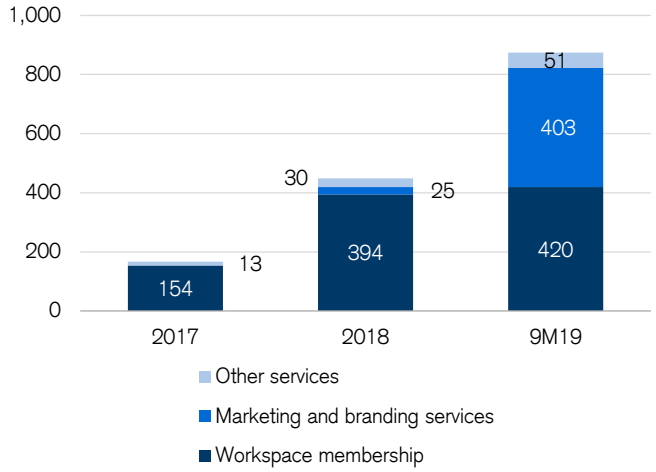
Key management

Daqing Mao (Chairman and CEO): Mr Mao is the founder, chairman and CEO of UCommune. Previously, he worked at Vanke as the executive vice president from 2009 to 2015 and served as general manager of Bohai-Rim region of CapitaLand China during 1996-2009.

Industry

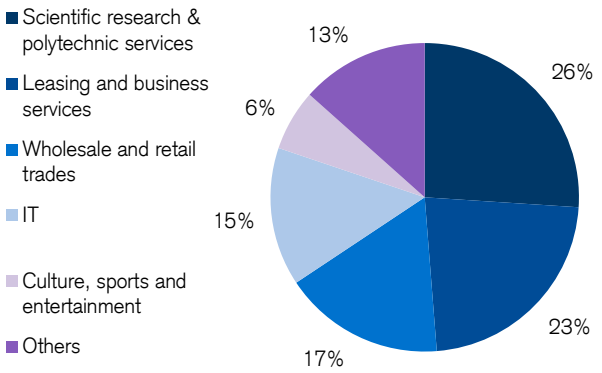
Property

Figure 293: Revenue breakdown (Rmb mn)



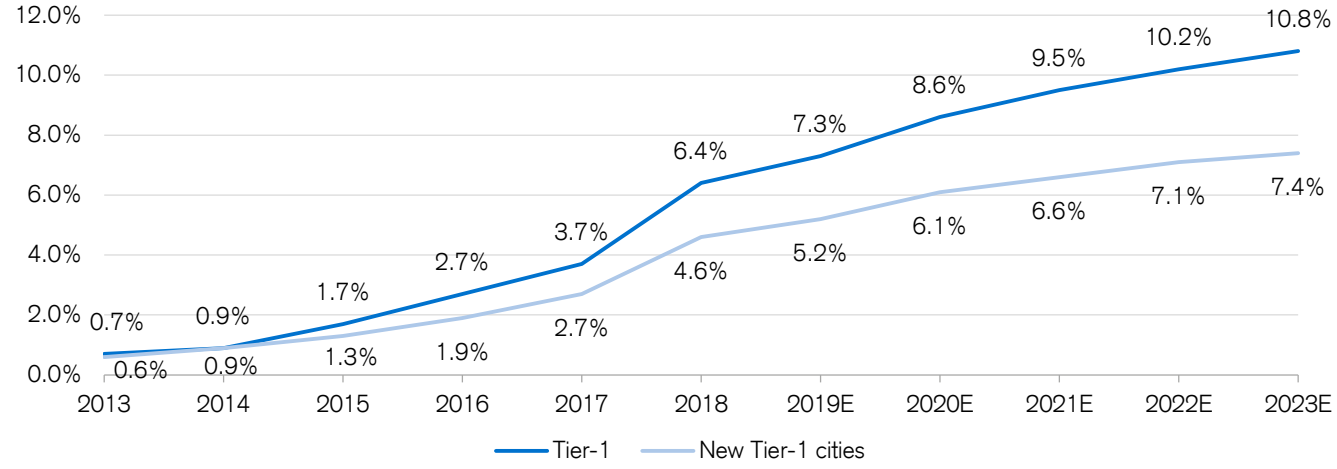
Source: Company data, Credit Suisse research

Figure 294: Tenant mix as at end of Sep-2019



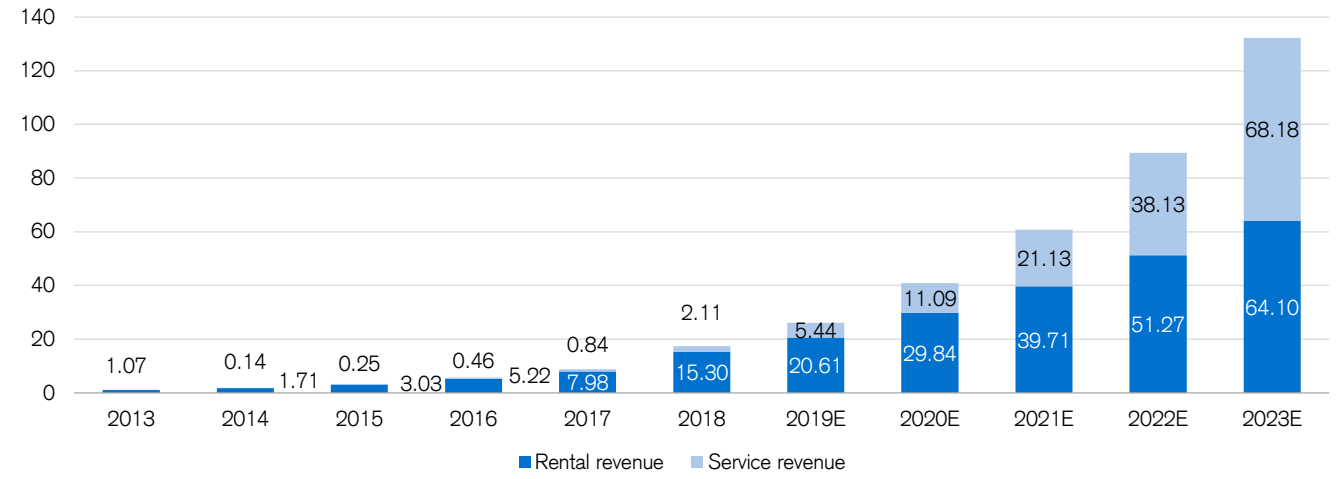
Source: Company data, Credit Suisse research

Figure 295: Co-working spaces as a percentage of total office buildings



Source: Frost & Sullivan, Credit Suisse research

Figure 296: Market size of co-working space industry in China by revenue (Rmb bn)



Source: Frost & Sullivan, Credit Suisse research

United Imaging Healthcare

Fei Zheng, Jason Liu

Company profile

Established in 2007 and headquartered in Beijing, United Imaging Healthcare (UIH) focuses on designing and manufacturing Colour Doppler ultrasound and MRI (magnetic resonance imaging), and digital medical imaging technology. Traditionally, these markets are dominated by MNCs in China. The company is applying artificial intelligence in these areas. Its technology allows penetrating Color Doppler ultrasound and MRI to the low tier hospitals without specialists. AI should help improve the accuracy.

Its MRI product had received the CE mark in 2011. The company received the first FDA 510 (K) clearance for iuStar300 and its international installations reached 1,000 units in 2016. UIH has more than 100 professional staff in its R&D team and an R&D centre was set up in California in 2012. In 2017, the company's products and services entered 700 hospitals in China.

- **MRI:** An MRI scan is a common procedure around the world. It uses a strong magnetic field and radio waves to create detailed images of the organs and tissues within the body. The company has Talent 0.4 Tesla, imStar E 3000 and Novitas 460 approved.
- **Color Doppler ultrasound:** A Doppler ultrasound is a non-invasive test that can be used to estimate the blood flow through the patient's blood vessels by bouncing high-frequency sound waves off circulating red blood cells. The company has six approved colour doppler ultrasound products
- **OEM/ODM:** The company also serves as Original Equipment Manufacturer (OEM) and Original Design Manufacturer (ODM) to some other large medical device manufacturers in China.
- **Overseas market:** The company's overseas market includes the Middle-East, ASEAN, Africa and the United States. Currently, overseas sales account for 60% of its total sales.

Key management

UIH has a management team with rich R&D experience.

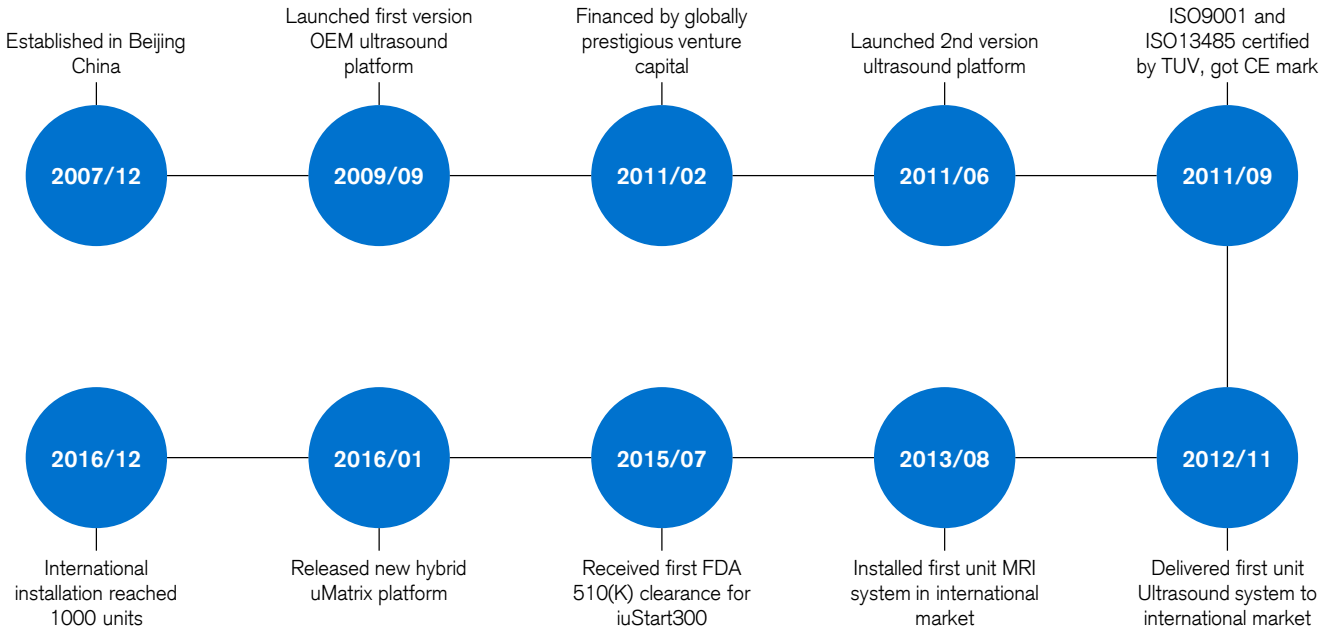
Cai Xiangfei (Founder and CEO): Mr Cai holds a PhD degree from University of Amsterdam in radiology. He has worked with Stanford University Oncology Centre, Netherlands Cancer Institute and Catholic University of Leuven.

Xing Lei (CTO): Mr Xing is the director of Medical Physics division of Stanford University and a Jacob Haimson Professor. He has focussed on medical imaging R&D for more than 20 years with over 250 refereed publications. Mr Xing joined the company in 2017.

Industry

Healthcare/Biotech

Figure 297: Milestones of the company



Source: Company data

VIPKID

Tina Long, Alex Xie

Company profile

VIPKID is a leading online education platform that focuses on providing English training courses to students aged 4-12 globally. VIPKID has set up nine offices around the world and signed over 60,000 North-American teachers. The number of paying students exceeded 500k with overseas students from 63 countries. The total number of daily lessons taken exceeded 180k with total average time of 4.5 mn minutes. Gross billings for VIPKID were estimated by its CEO to be above US$750 mn.

In June 2018, VIPKID announced series D+ financing of US$500 mn led by Coatue, Tencent, Sequoia and Yunfeng. Other key shareholders of VIPKID include the Matrix Partners China, Sinovation Ventures, ZhenFund and Bryant Stibel Foundation.

According to Chinese Academy of Sciences, VIPKID has 55% of market share in the online junior English training market. 51Talk and VIPJr together take another 25% of the market. 74% of students in the sector are between 6 and10 years old.

VIPKID has established a high-quality teacher team. All teachers have bachelor or above degrees and have an average teaching experience of 7.5 years.

VIPKID also has an international education content development team of over 400 employees. The team has an average experience of eight years and 15% of team members are foreign nationals. Chinese product specialists work closely with foreign experts to produce localised content that is suitable for Chinese students.

- **VIPKID 1v1 live class:** 1v1 live class is VIPKID's flagship product line. Students watch a preview video of 3-8 minutes before a 25-minute online live class with teachers from North America. Then teachers will give homework of 5-25 minutes to students to help students review what they have learned.
- **Dami Online Tutoring:** Dami Online Tutoring is the large-class tutoring business line of VIPKID. The segment announced the first round of independent external financing in Jan-2020 and got US$80mn from Tencent and Sequoia Capital. A significant 80% of its existing large-class students came from the 1v1 live business.
- **Follow Bear to Learn English:** This product line focuses on students 3-6 years old. The annual course package includes 148 online video lessons and 12 offline courseware boxes. The price is Rmb2,180. The product line has established thousands of WeChat groups and served over 3 mn users in the community.
- **Lingobus:** Lingobus was launched in August 2017. It is an online education platform for students who are learning Chinese. Lingobus has over 10,000 registered users from various countries.

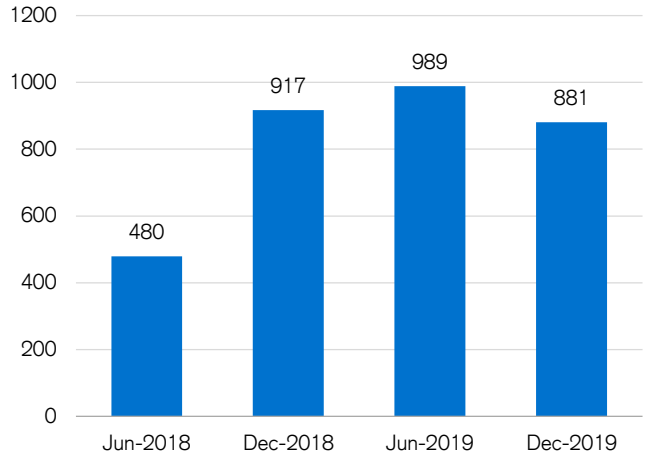
Key management

Ms. Wenjuan Mi (CEO): Ms. Mi has over 18 years of experience in the junior English training market. She founded an offline English institution with her uncle in 2000 when she was 17. The institution had over 20k students in five cities in 2009. Ms. Mi founded VIPKID in 2013. She obtained her MBA degree from Cheung Kong Graduate School of Business.

Industry

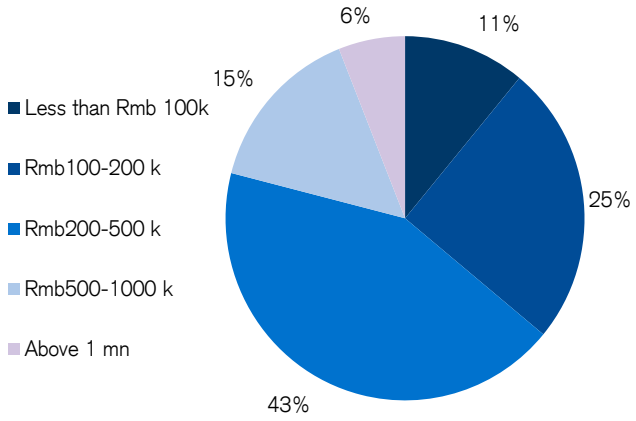
Internet/e-commerce/O2O/Games

Figure 298: MAUs of VIPKID app ('000)



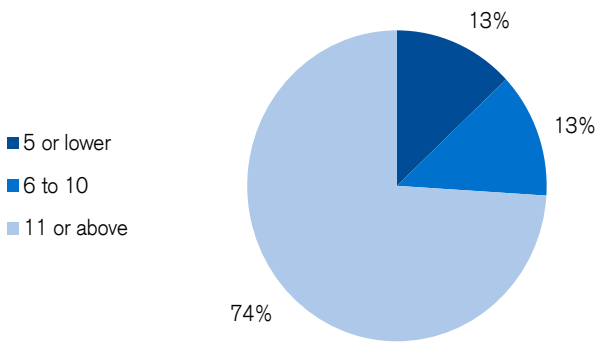
Source: QuestMobile

Figure 299: Household income of online junior English training students



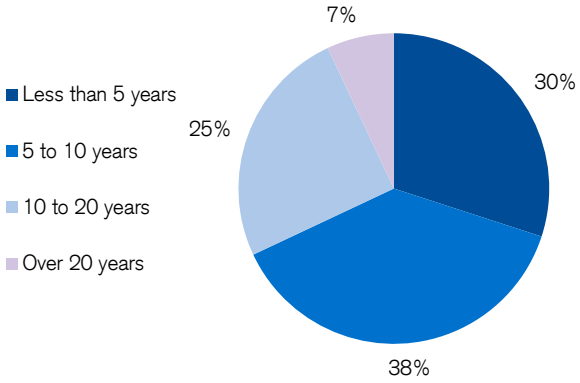
Source: Chinese Academy of Sciences

Figure 300: Age mix of online junior English training students



Source: Chinese Academy of Sciences

Figure 301: Teaching experience of VIPKID teachers



Source: Chinese Academy of Sciences, VIPKID

Womai

Tina Long, Michael Wang

Company profile

Womai.com is a large domestic online food retailer, founded in 2009 and owned by COFCO Group. Womai has sold over 25,000 SKUs in 21 categories, including fresh fruits and vegetables, grain and oil, snacks, beverage, imported foods, and private-label products on the platform. Noticeably, a group of private-label product brands now have become widely recognised ones, including SUNSIDES, Smart Time, You Cai, and CHUCUI. The offering of these private brands also differentiate it from other e-commerce players, and help improve the brand recognition. Besides, it also has third-party online marketplace stores on Taobao, JD, etc.

Being a member of the COFCO family also enables it to have access to rich supply chain resources. Besides, the company has established six warehousing logistics centres and a nationwide distribution network. The “mobile vegetable market”, a fresh & frozen-commodities delivery network, now covers over 300 cities in China. With the help of the well-established cold-chain logistics system, the company effectively solves the “last mile” delivery distribution problem. It also allows customers to choose a convenient time for delivery.

Since 2017, the company has deployed a number of overseas companies to expand the sales channel and create an integrated sales platform for imported food. The flat channel that delivers products straight from overseas origins to consumers in China is in tandem with the growing demand of local customers on imported goods.

As it grows, Womai has received investment from institutions including IDG, Baidu, SAIF Partners and Taikang Life Insurance. According to the Hurun Global Unicorn list 2019, Womai is valued at Rmb7-10 bn, ranking No.264 in the list. On 4 March 2020, COFCO Coca-Cola, a joint venture between Coca-Cola and COFCO, announced that it would set up its own flagship store on Womai.com, becoming the first independent brand to settle and operate in Womai.com.

Key management

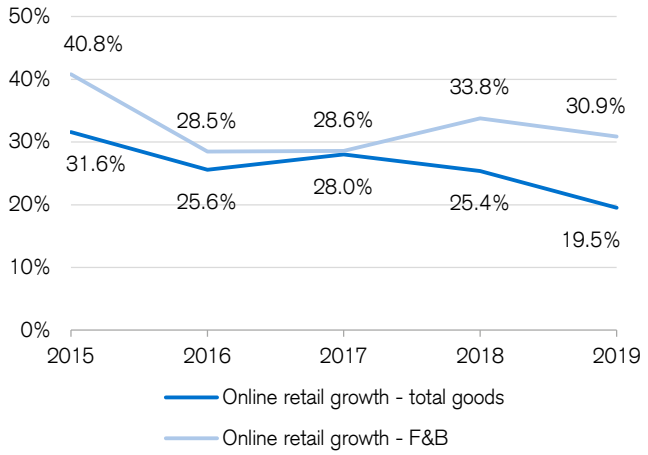
Pingyuan ZHAO (CEO): Mr Zhao served as the national sales director of Fulingmen during 1998-2006. After that, he took a position in the innovation business department of COFCO. In late-2008, he offered the idea to establish an e-commerce platform within the group. In August 2009, Womai.com was launched and Mr Zhao has been its CEO since then.

Dongfeng ZHANG (Executive vice chairmen): Mr Zhang is also the legal representative of COFCO and the assistant to the president of COFCO Group.

Industry

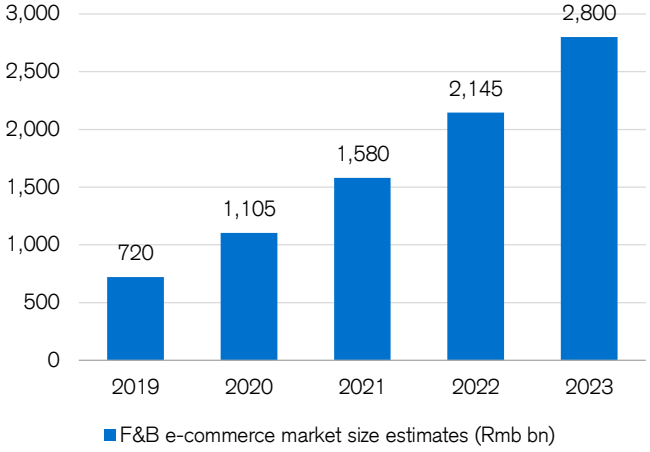
Internet/e-commerce/O2O/Games

Figure 302: F&B e-commerce outgrew the whole sector



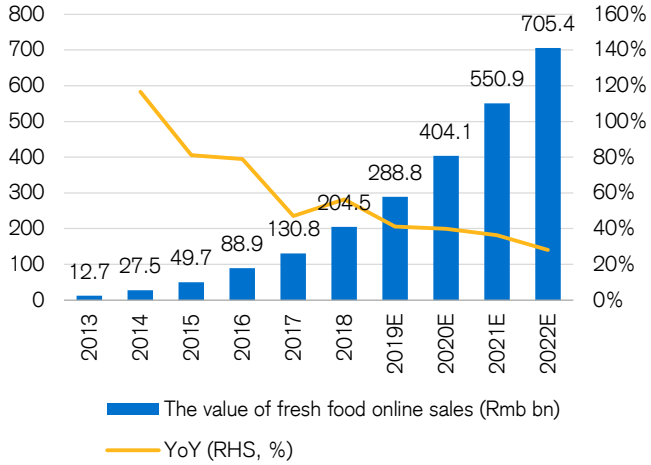
Source: NBS, CEIC

Figure 303: F&B e-commerce market is expected to deliver rapid growth in coming years



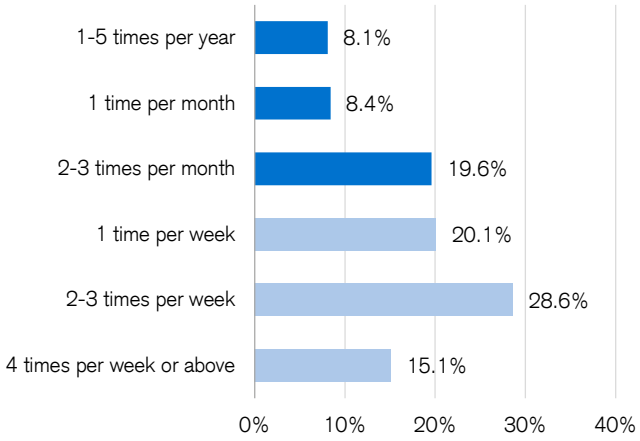
Source: China Industrial Information

Figure 304: Fresh food e-commerce is expected to grow at 2018-22 CAGR of 36.3%



Source: iResearch

Figure 305: The frequency distribution of online fresh food purchase



Source: iResearch

Xiaohongshu

Tina Long, Ashley Xu

Company profile

Xiaohongshu is a fast growing social e-commerce app. It targets 18- to 35-year-old Chinese urban females, helping them to discover, share and buy luxury, fashion and beauty products from overseas. It started as a UGC (user generated content) fashion community that encouraged shoppers to share content, ideas and shopping tips. Over time content has expanded to every aspect of life including sports, travel, hotels, restaurants, among others. Xiaohongshu is growing to be an alternative valuable social media platform for branding and customer awareness enhancement, thanks to its targeted customer strategy. It also offers a cross-border e-commerce business to ensure better shopping experience.

- **Female economy:** Xiaohongshu meets Chinese females' increasing demand for diversification and upgrade. Unlike past generation, young females are more interested to share and explore. They spend a long time not only browsing shopping tips but also extending interest to lifestyle, fitness, leisure, pets, etc.
- **Content community:** User generated content (UGC) is one of the core assets of Xiaohongshu, contributing to 70% of traffic. To create a balance between content and engagement, Xiaohongshu is gradually shifting to a personalised algorithm system that maximises the exposure and commercial value to its target users. It also enhances commercial co-operation with brands and creates differentiated content that blends well with user generated content.

Business update

Xiaohongshu has been exploring monetisation through various approaches including cross-border e-commerce and advertising, but the way to profitability has been bumpy. In 2014, Xiaohongshu started its cross-border e-commerce business, and launched a bonded warehouse in Zhengzhou and Shenzhen in 2015. However, the cross-border e-commerce experience faced a headwind with tightened regulation and a market structural change. Xiaohongshu also sees issues in logistics, post purchase service, product authentication, etc.

At end-2017, Xiaohongshu decided to shift its focus back to community and content development. Advertisements became a more natural way for monetisation. Xiaohongshu devoted resources to cultivate multichannel network (MCN) and professional generated content to build up ad inventory. In 2018, it on-boarded more celebrities to enhance the key opinion leader (KOL) effect and expand users—during 1H18, DAUs increased from 3 mn to 8.4 mn, according to QuestMobile.

Xiaohongshu has been taking action to develop MCN, KOL ecosystem. In May 2019, Xiaohongshu further strengthened supervision on content creators—lifting barriers of becoming a brand co-operation partner to those with a >5,000 fan base and 10,000 exposure volume in the past month. Unqualified content creators are not allowed to implant ads in their content. Such stringent rules are being taken as a sign that Xiaohongshu may be preparing to monetise through a charged commission. In Dec-2019, Xiaohongshu launched the live streaming function for content creators to diversify their content format. And the platform set a target to cultivate 100k content creators with over 10k fans.

In May 2018, Xiaohongshu received US$300 mn funding at a US$3 bn valuation. Investors include Alibaba, Tencent, GSR capital etc.

Key management

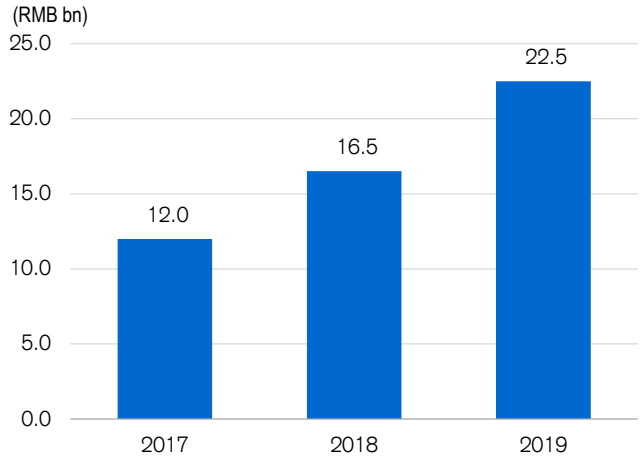
Charlwin Mao (Founder and CEO): Mr Mao founded Xiaohongshu in 2013. Previously he worked at Bain Capital and Bain Consulting for six years before pursuing his MBA degree at Stanford. He received a bachelor's degree in mechanical engineering from Shanghai Jiaotong University.

Ms. Miranda Qu (Co-Founder): Ms. Qu was a former executive with media enterprise Bertelsmann. She founded Xiaohongshu together with Charlwin and is in charge of product operations. Miranda graduated from Beijing Foreign Studies University with a degree in journalism.

Industry

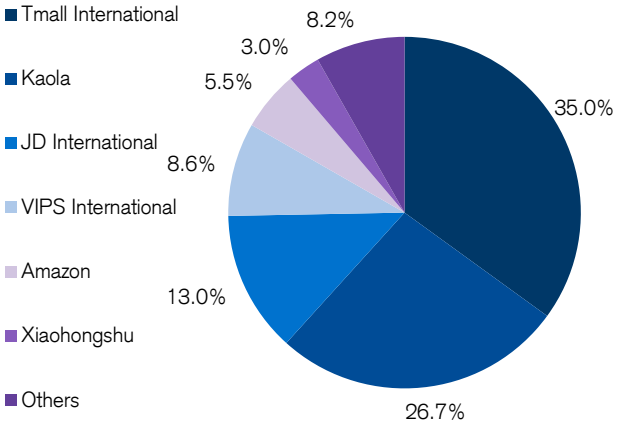
Internet/e-commerce/O2O/Games

Figure 306: Cross border e-commerce booming



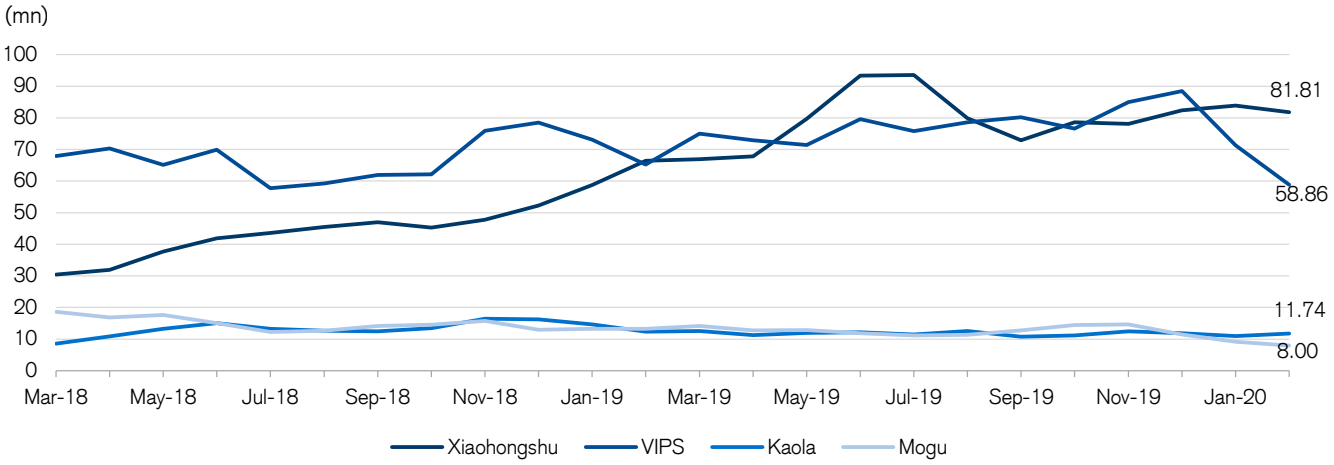
Source: Analysys, Credit Suisse research

Figure 307: Market share of cross border e-commerce platforms (2019)



Source: Analysys, Credit Suisse research

Figure 308: Questmobile MAU trend—rising active users for Xiaohongshu



Source: QuestMobile, Credit Suisse research

Xiaozhu.com

Kenneth Fong, Ivy Ji, Lok Kan Chan, Rebecca Law

Company profile

Founded in 2012, Xiaozhu.com (Xiaozhu) is a Beijing-based online homestay platform in China connecting travellers and individual home owners. Xiaozhu mainly operates through its self-operated mobile app. As of May 2019, Xiaozhu covered housing in over 400 Chinese cities and 252 overseas destinations, serving 50 mn active users.

According to State Information Centre, China online home-sharing industry GMV grew 36% YoY reaching Rmb22.5 bn with 83 mn users, equivalent to 9.7% of total internet population.

Xiaozhu's latest round of funding was completed in October 2018, reaching a US$1 bn valuation.

Key business spotlights as below:

A comprehensive service platform. Homestay was new to the China market when Xiaozhu started. Thus, Xiaozhu has been building an infrastructure service platform from scratch in order to facilitate growth of the market. This new infrastructure platform provides a variety of value-added services to property owners ranging from décor design to security, including installation of smart locks with face recognition and housekeeping. As of 2018, Xiaozhu had over 6,000 housekeepers and over 1,000 part-time photographers on its platform while the coverage of smart locks exceeded 100 cities in China. These value-added services have been instrumental in improving the quality of the properties, fostering trust between property owners and travellers and therefore facilitating transactions on the platform.

Penetration into lower-tier cities. The sharing economy started in tier 1 cities, where resources are more crowded, and has been gradually penetrating into lower-tier cities and even the countryside. Xiaozhu has seen this trend gathering momentum: in 2017, tier 2 cities, such as Tianjian and Chongqing, were the fastest growing markets, yet in 1H18 they were overtaken by tier 3 and 4 cities. In April 2018, Xiaozhu set up its second headquarters in Chengdu, the capital city of Sichuan province, in order to better facilitate the shift to lower-tier cities.

A young platform. By advocating personalised accommodation and encouraging landlords to share their own experience, Xiaozhu has proved appealing to China's young generation. As of May 2019, 40% of travellers who make bookings on the Xiaozhu platform were born after 1995 while the average age of property owners was 36, five years older than it was in 2015.

Key management

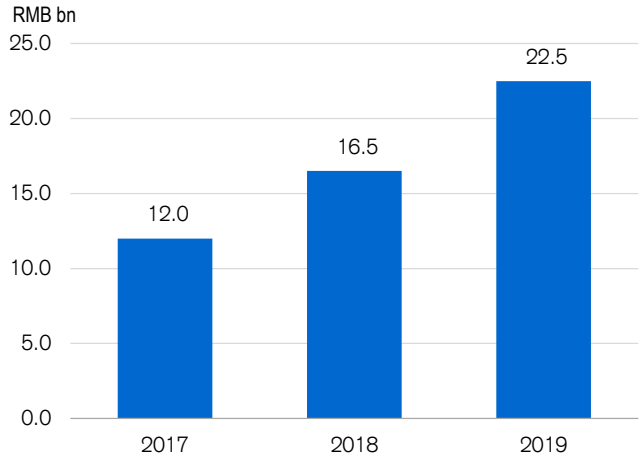
Kelvin Chen Chi (Co-founder and CEO): Prior to the co-founding of Xiaozhu in 2012, Mr Chi served as vice president of Ganji.com. He also served as vice president of Kuxun.cn from 2009-11, overseeing the ticket and hotel booking business. Before that, he was regional director for southwest China, then director of Qihoo 360, responsible for setting the strategic direction and delivering business growth.

Tarry Liantao Wang (Co-founder and COO): Prior to the co-founding of Xiaozhu with Mr Chi, Mr Wang served as vice president of Ganji.com since 2010. He also served as vice president of Madhouse, China's leading and most established mobile advertising company, where he was responsible for business development and marketing outreach.

Industry

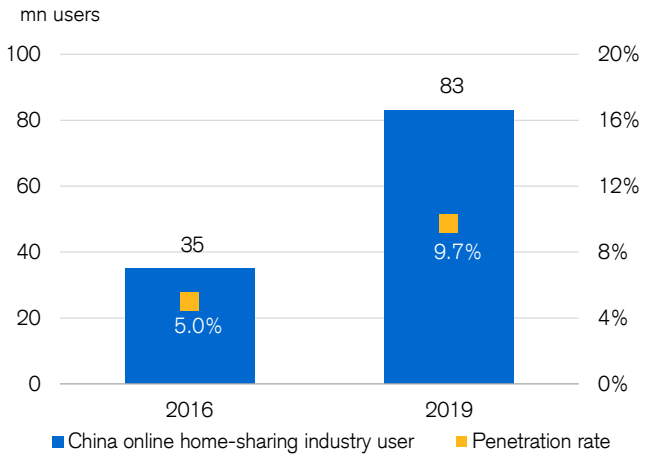
Internet/e-commerce/O2O/Games

Figure 309: China online homestay industry GMV



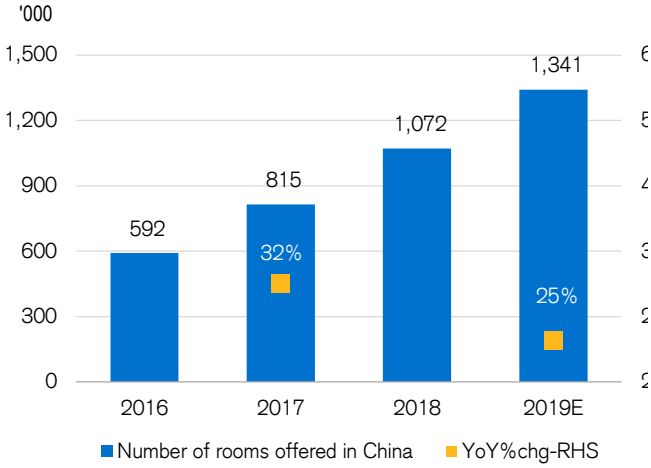
Source: State Information Centre of China

Figure 310: China online homestay industry user base and penetration rate



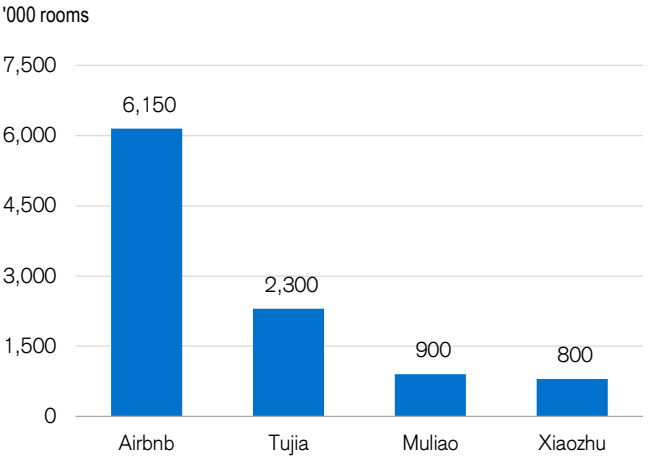
Source: State Information Centre of China

Figure 311: Number of rooms offered from homestay in China



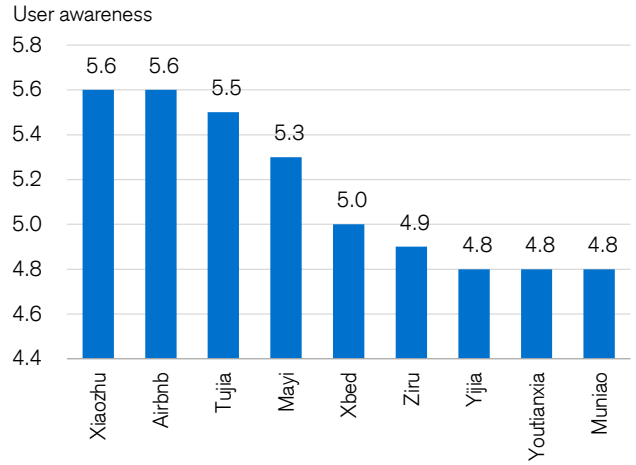
Source: Trustdata

Figure 312: Total rooms available by platform by 1H19 ('000)



Source: Trustdata

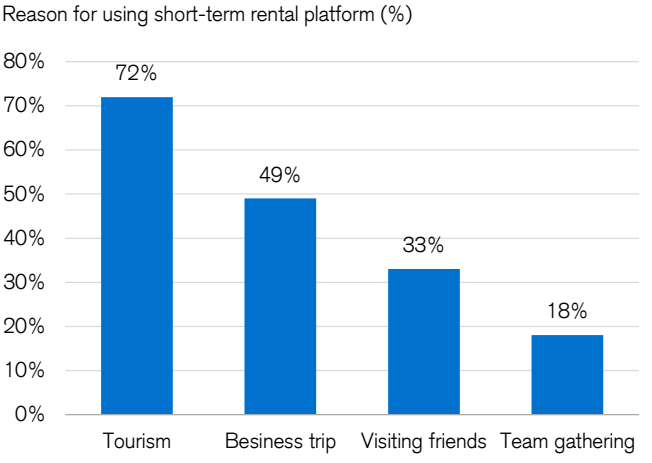
Figure 313: User awareness of short-term rental platform



Note: A higher score means higher user awareness.

Source: iiMedia

Figure 314: Reason for using short-term rental platform



Source: iiMedia

Xinchao Media

Kenneth Fong, Ivy Ji, Lok Kan Chan, Rebecca Law

Company profile

Xinchao Media, founded in 2013, is an innovative technology company that provides elevator TV advertisement. With over 700k smart TV screens installed, over 23k corporate clients place advertisements on its channel, reaching 200 mn elevator users per day. Xinchao has a five-year plan of investing Rmb10 bn to install 2 mn smart TV screens and reaching 300-500 mn middle-class elevator users per day.

Followed by the latest Rmb1 bn funding round led by JD in August 2019 and a previous round of Rmb2.1 bn with Baidu in November 2018, Xinchao reaches a valuation of US$1.7 bn.

Key business spotlights as below:

Enhance elevator advertisement efficiency and human safety via technology: Xinchao Media has developed its own AI and big data system named BITS that enables (1) calculation and analysis of elevator users' preference from different neighbourhoods to provide it with a series of best-suited advertisement, thus increasing the probability of generating revenue for its corporate clients. (2) Real time updates on natural disasters. For instance, when there is an earthquake, Xinchao would immediately end the advertisement to provide warnings more than ten seconds before the disaster so that users could have more time to seek shelter and minimise casualties.

First 5G elevator platform: With the partnership with China Unicom and Baidu, Xinchao is currently developing China's first 5G elevator platform to further enhance user experience. In the future, elevator media might be able to offer both augmented reality (AR) and virtual reality (VR) products.

Key management

Zhang Jixue (Co-founder and CEO): Mr Zhang is an entrepreneur with a media focus since 1996. His earliest start-ups include advertising firms for TV channels, lifestyle magazines, and internet media.

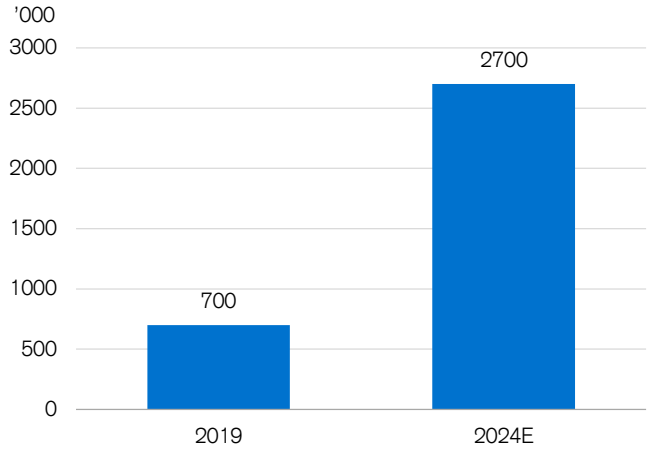
Shendong Peng (Co-founder): Mr Peng is an entrepreneur with a focus on internet technologies. He founded 2345.com, a direct-industry web guide company, in 2005.

Yi Shu (Co-founder): Mr Shu is an entrepreneur who founded Limei advertisement in 2010. He is also an angel investor with an internet focus.

Industry

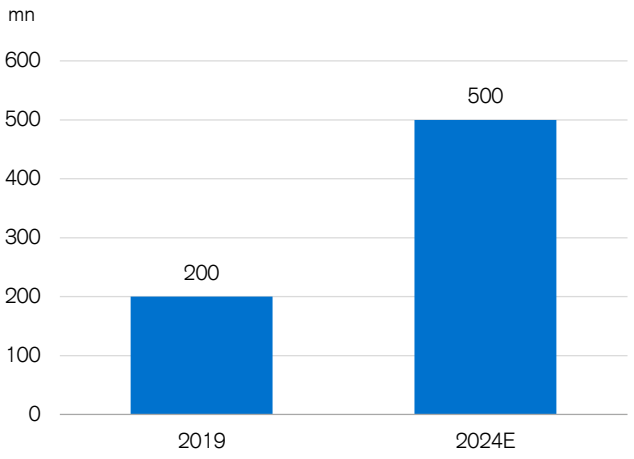
Internet/e-commerce/O2O/Games

Figure 315: Xinchao—number of elevator TV screens vs 5Y target ('000)



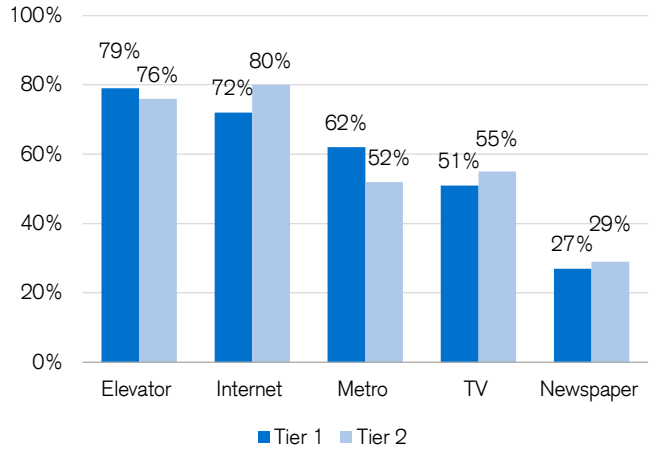
Source: Company data

Figure 316: Xinchao—number of elevator TV users vs 5Y target



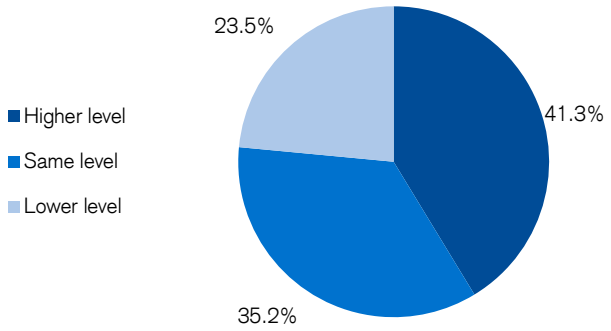
Source: Company data

Figure 317: Media conversion rate into successful purchase in middle-class segment in tier 1-2 cities



Source: iiMedia

Figure 318: Level of attention generated in elevator media comparing to other online media channels



Source: iiMedia

YH Global

Kenneth Fong, Ivy Ji, Lok Kan Chan, Rebecca Law

Company profile

YH Global is a logistic company founded in March 2012 in Qianhai. In China, YH Global has over 330 mn sq m bonded warehouse with eight major hubs, 32 second-tier hubs, and 82 third-tier hubs. Outside of China, it has been gradually building strategic partnership with other one-belt-one-road related countries such as Malaysia, Thailand, Philippines, Vietnam, and Europe. YH Global has a large base of corporate clients such as Philips, Samsung, Huawei, Nike, etc. For the Double 11 shopping festival in 2018, YH Global handled over 33 mn orders, +50% YoY.

After the completion of series A Round financing in September 2017, YH Global has reached a valuation of US$1 bn.

Key business spotlights as below:

Supply-side reform: Yuehai innovated the "integrated supply chain" model. In 2016, it created C2B + DIY Circulation manufacturing model (defined by the Ministry of Commerce) to innovate the demand-driven supply chain, which helped the industry transform and upgrade to the industrial 4.0 era.

Financing service: Yuehai has reduced distributors' financing and inventory pressure by providing financing and logistics services simultaneously, which enhances supply chain efficiency. Specifically, Yuehai pays for the goods transported to the manufacturers upon receiving service fee from distributors. The goods naturally become the collateral for Yuehai's financing services, which will be released to distributors in batches based on cash received from them.

Integrated supply chain: Yuehai's creative integrated supply chain management mode provides well-known MNCs with B2B + B2C + Supply chain synergy services.

Intelligent production line: Yuehai's business model efficiently transforms itself from labour intensive to automation mode. The production processes are highly automated thanks to the high-speed cross-belt sorter, robotic arm, automatic labelling, weighting, photographing, barcode recognition, automatically generated parcels, and automatic distribution, etc.

Import and export agent: Yuehai docks with the customs system to provide one-stop customs clearance, warehousing and logistics standardisation services for cross-border import and export e-commerce platforms.

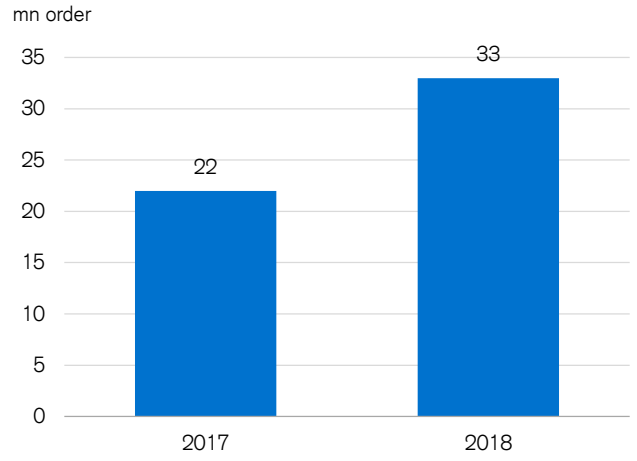
Key management

Zhang Quan (chairman of the board, general manager): Mr Zhang was Shenzhen People's Congress representative, and once selected as 2008 Person of the Year by Cheung Kong Graduate School of Business.

Industry

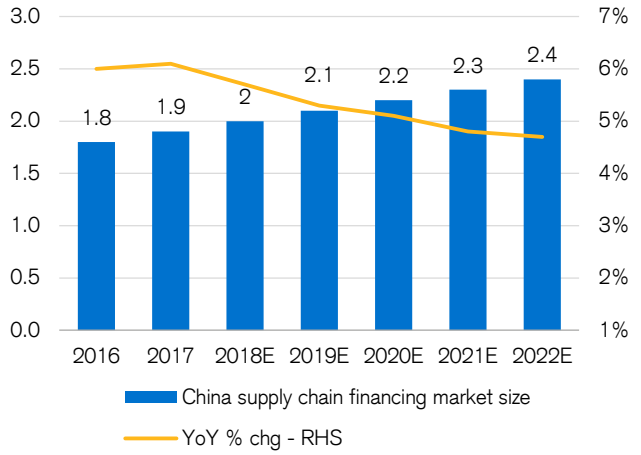
Logistics

Figure 319: YH Global order volume during Double 11 festival



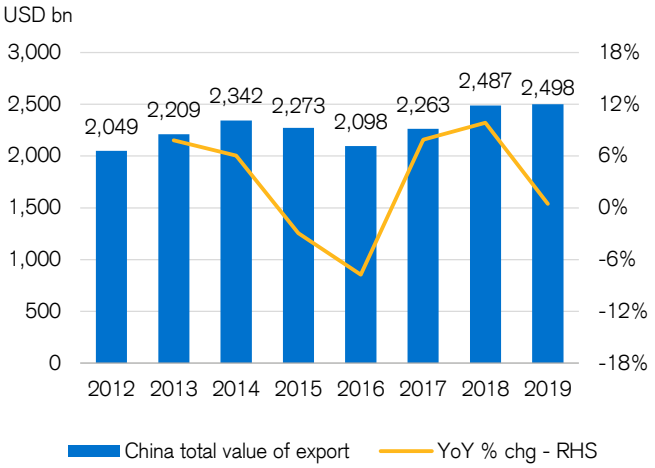
Source: Company data

Figure 320: China supply chain financing market size



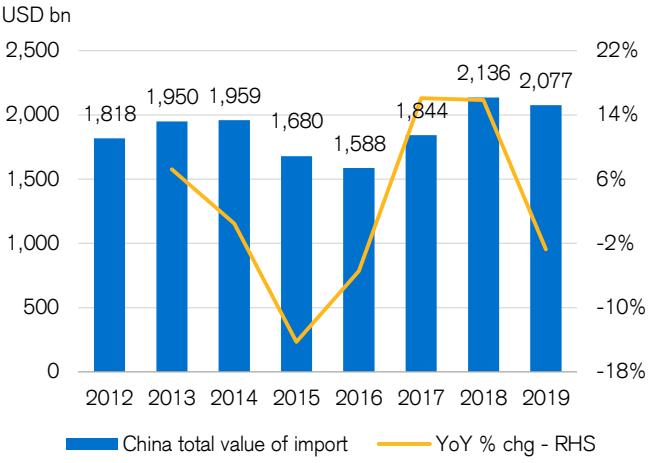
Source: iResearch

Figure 321: China's total value of exports



Source: Wind

Figure 322: China's total value of imports



Source: Wind

Yimidida

Kenneth Fong, Ivy Ji, Lok Kan Chan, Rebecca Law

Company profile

Yimidida is a logistics company that provides same-city and inter-city delivery for less-than-container load (LCL) size goods in China. It was formed in 2015 from the consolidation of six provincial logistics companies in order to provide a more cost-efficient platform with better connection between cities. As of July 2019, Yimidida operates in over 33 provinces with over 13k product drop-off points, 200 distribution centres, 1,600 key operation routes, and 2,500 container trucks.

According to China Ministry of Transportation, the annual cargo volume travelled by road reached 42 bn tonnes in 2019. Meanwhile, Jinglue Consulting estimates the LCL market to reach Rmb1,760 bn in 2019.

In February 2020, Yimidida has completed its series D funding round for Rmb1 bn, reaching a valuation of US$1.2 bn.

Key business spotlights as below:

Ability to handle delivery over a wide range of sizes: Yimidida's core products include (1) Yimi Mini that delivers products between 5 kg and 70 kg and guarantees to-door delivery. Mini product deliveries are also prioritised over other sizes. (2) Dida To-door that targets delivery between 70 kg and 150 kg at a minimum charge of Rmb16/order. (3) Yimi Heavy Goods that targets delivery for products over 500 kg or 2.4m^3 at almost 50% discount from peers. (3) Yimidida Overnight that enables urgent delivery to arrive before 10 am next day.

Value-added products: Yimidida complements its delivery products by providing payment collection, transportation insurance, return receipts to shippers, and packing services.

Specialisation in provinces: Unlike most of its peers that started from one destination and developed to overall China, Yimidida was formed from a consolidation of provincial logistics companies in Shandong, Sichuan, Hubei, and Shanxi. Some of those companies have been operating since the 1990s, and the specialisation on a provincial level could help Yimidida leverage its operational efficiency on a national level.

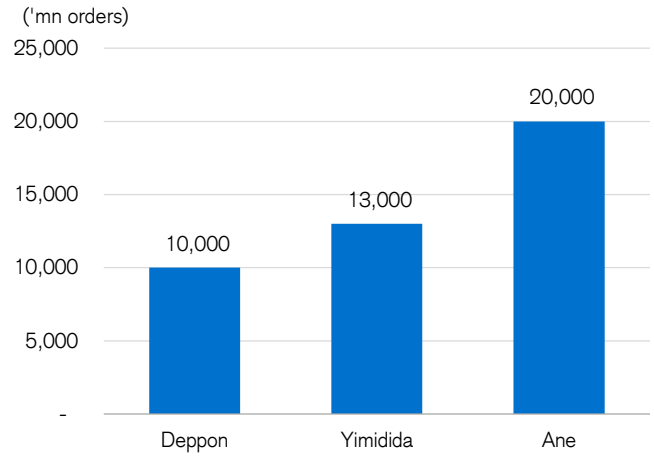
Key management

Yang Xingyun (Founder and CEO): Mr Yang first founded this logistics company in Shanxi with only one container truck and 15 staff back in 2006. He also led the provincial consolidation process.

Industry

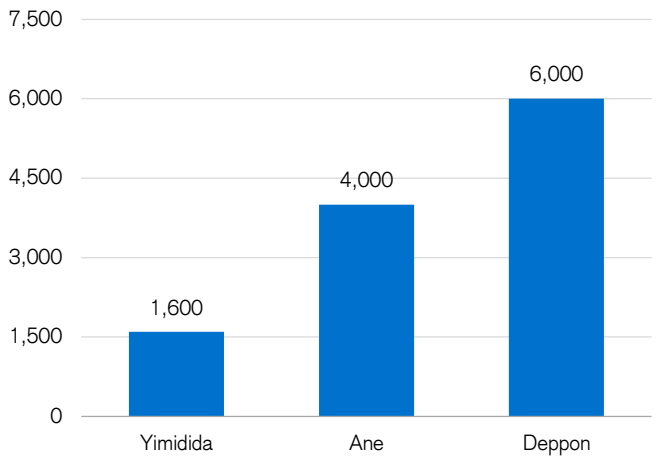
Logistics

Figure 323: Yimidida—number of product drop-off points vs peers



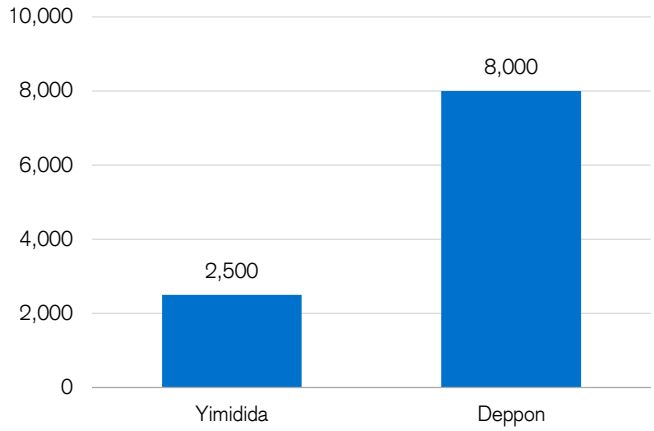
Source: Company data, Baidu Baike

Figure 324: Yimidida—number of key operation routes vs peers



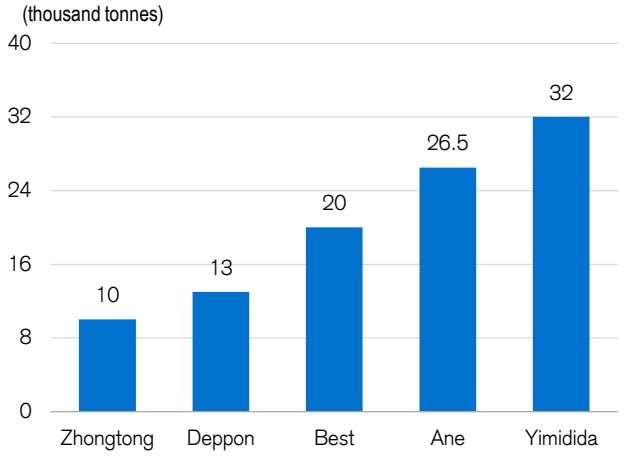
Source: Company data

Figure 325: Yimidida—number of container trucks vs peers



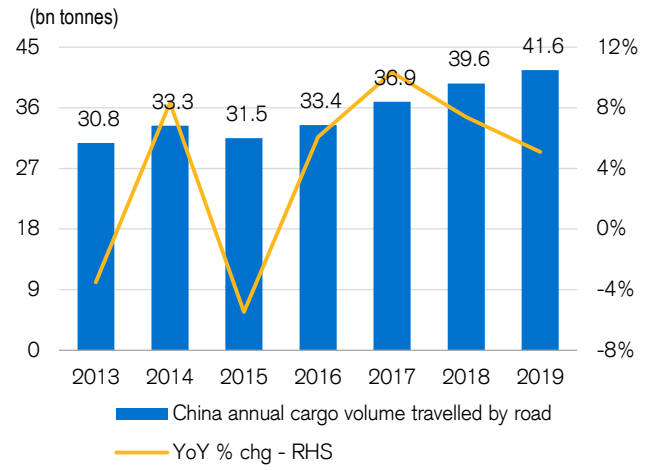
Source: Company data

Figure 326: Yimidida—daily LCL delivery volume vs peers



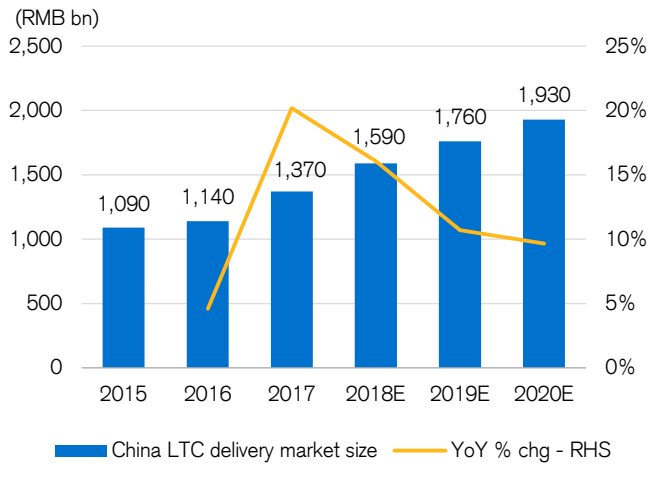
Source: Company data

Figure 327: China annual cargo volume travelled by road



Source: Wind, China Ministry of Transportation

Figure 328: China LTC goods delivery market size



Source: Jinglue consulting

YITU Technology

Kyna Wong, Chaolien Tseng, Stephen Yin

Company profile

Founded in 2012, YITU technology is a leading artificial intelligence research company that integrates advanced AI technology business applications to build a safer, faster and healthier world.

YITU now engages in sectors such as security, finance, transportation and healthcare. It offers four major categories of products and services:

- **Intelligent security platform:** YITU's intelligent security technologies include artificial intelligence algorithms, high performance computing, distributed computing and storage and large-scale operation and maintenance. Among these features visual intelligence algorithm covers facial recognition, vehicle identification, text recognition, target tracking and feature-based image retrieval.
- **Smart city:** Leveraging rich experience in computer vision and deep insights into urban transportation systems, YITU Tech has worked on the application of the City Data Hub. Based on models built upon massive traffic data and urban transportation analysis, it manages to improve road utility and efficiency and help optimise urban traffic management in multiple levels and dimensions.
- **YITU healthcare:** YITU seeks breakthroughs in healthcare using AI technologies and promotes the sharing of theories and practices with leading deep learning technologies. It is finding ways to allow doctors to give increasingly accurate diagnoses, stipulate suitable treatment plans, and improve overall patient experience.
- **Intelligent hardware equipment:** By means of machine vision, listening and other friendly human-machine interactions, YITU enables intelligent hardware to listen, see and understand the world thus creating a more diverse user experience.

Key management

Long Zhu (Co-Founder): Mr Zhu received his PhD in statistics from the University of California, Los Angeles (UCLA). Mr Zhu is a student of Professor Alan Yuille, who is a disciple of Stephen William Hawking. Mr Zhu specialises in statistical modelling of computer vision and artificial intelligence.

He is also a postdoctoral Fellow at MIT AI Laboratory studying brain science and computational photography and a Research Fellow in the Courant Mathematics Research Institute run by Yann Lecun, the founder of deep learning, at New York University.

Chenxi Lin (Co-founder, CEO): A former senior expert at Aliyun computing, Mr Lin led a team of more than one hundred senior engineers and set up the Apsara distributed cloud computing operating system, the largest of its kind with independent intellectual property rights in China.

Before joining Alibaba Group, Lin worked with Microsoft Research Asia (MSRA) in the field of machine learning, computer vision, information retrieval and distributed systems.

Lin received his master's degree from Shanghai Jiao Tong University in 2005. In 2002, Lin was selected as a member of the ACM-ICPC team of Shanghai Jiao Tong University.

Industry

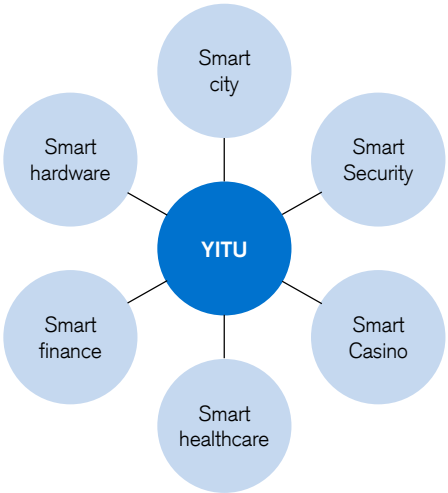
AI/Big Data/Robotics/Software

Figure 329: A brief history and milestones of YITU Technology

Year	Milestone
2020	■ YITU launched its AI image evaluation system for Chest CT scanning to detect COVID-19, and the system has been adopted by multiple hospitals in China.
2019	■ YITU launched a cloud AI SoC chipset questcore in Shanghai in May, based on its own chip architecture, applicable for multiple tasks e.g. face recognition, video structure analysis, and pedestrian recognition. ■ YITU received Series D funding from SIG, New Alliance Capital and Gaorong VC. ■ YITU and Guiyang government signed a strategic cooperation agreement in Shanghai to promote and build the AI industry ecosystem in Guiyang. ■ YITU was one among six Chinese AI companies which entered CB Insight's 2019 AI 100 list.
2018	■ YITU launched its first international office in Singapore.
2017	■ Received US$55mn in Round C funding from Hillhouse Capital and other investors. ■ Ranked first in the Face Recognition Vendor Test and winner of the Face Recognition Prize Challenge. ■ Strategic collaboration with Microsoft to integrate YITU's AI solutions into Microsoft's AZURE Cloud Computing platform for Smart City applications. ■ Announced plans to establish an R&D Hub in Singapore.
2016	■ Received round B funding from Yunfeng Capital. ■ YITU's facial recognition platform provided security support at G20 Summit and Boao Forum for Asia. ■ YITU's intelligent diagnosis assistance products for chest CT scans launched in a range of 3A hospitals in China.
2015	■ YITU's facial recognition platform was awarded the Science and Technology Progress Award by China's Ministry of Public Security. ■ YITU's facial recognition technology was rolled out across 1,500 China Merchants Bank branches in China. ■ Shanghai Pudong Development Bank deployed YITU's facial recognition platform for video teller machines (VTM) and mobile banking face authentication.
2014	■ Received round A funding from Sequoia Capital and Banyan Capital.
2013	■ Received angel round funding from ZhenFund.
2012	■ YITU Technology was founded.

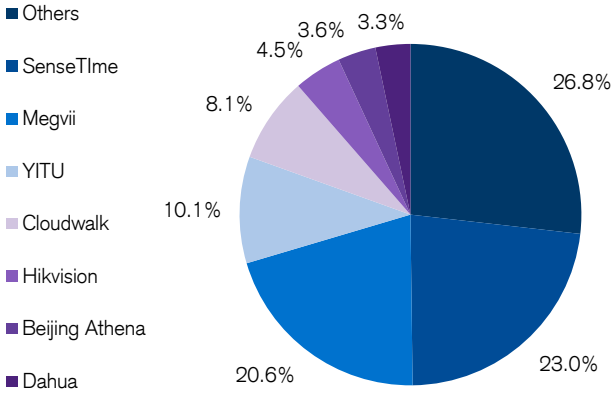
Source: Company data, Credit Suisse research

Figure 330: YITU's AI solutions



Source: Company data, Credit Suisse research

Figure 331: China AI computer vision applications market share in 2H18



Source: IDC

YOUXIA Motors

Bin Wang, Nick Li, Carrie Jiang

Company profile

YOUXIA Motors is one of the earliest companies of China's 2014 electric vehicles start-up boom. The company released its first product, "YOUXIA X", pure electric sedan in July 2015. With an amazing acceleration performance, YOUXIA X is equipped with a 270 kW peak motor, instantly producing 440Nm of torque. The car only takes 5.6 seconds to accelerate from 0 to 100 km/h.

Several months later, YOUXIA Motors was acquired by Beijing-based industrial electric power manufacturer Ceetop Inc (西拓工业), whose chairman Wei Jun has since been the chairman of YOUXIA Motors. YOUXIA Motors had secured support from the Wuxing district government of Huzhou city, Zhejiang province in April 2017, striking a deal with local authorities to build an EV factory there, whose construction began in 2018 with an annual capacity of 200,000 units.

Business update

After showcasing the "YOUXIA X" pure electric sedan in July 2015, YOUXIA Motors announced its plan to develop a luxury pure electric SUV the "YOUXIA Y" in 2018, followed by a family usage MPV and small electric sedan. However, it seems there was not much progress after that before the news arrived about Huzhou Municipal Government intending to take over YOUXIA Motors' plant at end-2019. In Dec-2019, the Huzhou city local government-owned Wuxing district Urban Investment Group's planned to acquire YOUXIA Motors' plant land and take over its unfinished construction project. After the proposed plant takeover, Huzhou government will own the related land and plant, which will be rented to YOUXIA Motors for upcoming vehicle manufacture. This move is the company's latest effort to relieve its tight cash flow. YOUXIA Motors had earlier finished series A, B and B+ funding rounds with total funding exceeding US$1.25 mn, enabling its market value to reach US$3.35 bn.

Key management

WEI Jun (Chairman): Mr Wei graduated from Nankai University and started his career in Tsinghua Uni group in 2009 as a high-end intelligent chip sales person. In 2011, Mr Wei established Ceetop industry Inc focusing on bio-energy and electricity. After Ceetop took over motors in December 2015, Mr Wei has since been the chairman of YOUXIA Motors.

Qin Yifei (Co-Chairman): Mr Qin received his PhD degree from the London School of Economics and Political Sciences. He was a former director at DTZ (Debenham Thouard Zadelhoff), and became the chief economist and CEO of Solomon Capital China. After that, Mr Qin joined Gezhi Asset Management as the CEO. After Gezhi's investment in YOUXIA Motors' B+ round funding, he become its global co-chairman and co-founder.

Huang Xiuyuan (CEO): Mr Huang graduated from Communication University of China in 2019 and started his career in the design department of Douban, a vertical internet company. After that, he initiated a wave of new start-ups, such as "Fandongxi" shopping website, mobile internet browser, mobile phone service fee recharging, etc. Mr Huang started his electric vehicle start-up in 2014 in Shanghai. After Ceetop took over YOUXIA Motors in December 2015, he became the CEO of YOUXIA Motors.

Industry

Auto

Company milestone

Time	Events
2018	■ **Aug:** YOUXIA Motors announced the completion of US$350 mn series B+ funding round, which was totally invested by Gezhi Capital. In the meantime, Gezhi Capital also became the second-largest shareholder of YOUXIA Motors. The company declared that this round values the company at US$3.35 bn ■ **Mar:** YOUXIA Motors announced its completion of Rmb5.0 bn worth of Series B round financing. This round of funding was co-invested by twelve institutions including China Environmental Protection Industry Corporation, Qianhai Wutong Mergers and Acquisition Funds, China Fortune Ocean Fund and other unnamed investors.
2017	■ **Oct:** YOUXIA Motors completed a Rmb1.22 bn worth of series A round financing; launched its Youxia factory construction in Wuxing district, and hosted its first global partnership conference with over 300 suppliers like Bosch and Tommykaira. ■ **Jun:** YOUXIA X small-batch trial car passed core tests. ■ **Apr:** Signing for YOUXIA smart factory project (annual capacity 200,000 units) with Wuxing district, Huzhou City, Zhejiang province with total investment of Rmb11.5 bn.
2015	■ **Jul:** Debut of YOUXIA X concept car in Beijing, China.
2014	■ **May:** YOUXIA Motors was founded in Shanghai.

Yuanfudao

Tina Long, Alex Xie

Company profile

Yuanfudao is a leading online K12 tutoring company. It has over 1 mn customers, according to 36Kr.

In June 2017, Yuanfudao announced series E financing of US$120 mn by Warburg Pincus and Tencent. Other key shareholders include IDG, Matrix Partners China, China Media Capital, and New Horizon Capital.

In December 2018, Yuanfudao announced another round of financing of US$300 mn that was led by Tencent at the valuation of over US$3 bn.

Yuanfudao has three main platforms.

- **Yuanfudao:** Yuanfudao provides live small class tutoring for all school subjects of K12 education. Yuanfudao was first launched in June 2015 with an open platform model where all teachers were able to join the platform. However, the company found it difficult to control education quality under the open platform model. Therefore, it shifted to a proprietary model in 1H16. In 2016, Yuanfudao served 200k paying users. Only one-fourth of these paying users had experience of offline tutoring classes. Its retention rate is the KPI of Yuanfudao. The company has improved its retention rate close to the level of offline institutions. Teachers of Yuanfudao should have teaching experience of at least three years. New teachers must receive 12 weeks of professional training and 200 hours of trial classes before delivering formal classes.
- **Zebra AI Class:** Zebra AI Class provides AI-based online interactive courses with services from teachers for students aged 2-8 years. Students can get daily content and study tasks in the interactive platform while online teachers will answer questions from parents and students in the online community. The price of the annual package for each subject is only Rmb2,800.
- **Xiaoyuansouti:** Xiaoyuansouti is a leading test question search tool in China. It was launched in November 2014. The MAUs of Xiaoyuansouti exceeded 25 mn by December 2019.
- **Yuantiku:** Yuantiku is an adaptive learning and testing platform that offers a test question bank of top schools of different regions in China. Yuanfudao launched a high school test bank in Sep-2013 and middle school test bank in Aug-2014. Yuantiku has accumulated quiz data of more than 3.6 bn items by 2016. The MAU of Yuantiku was about 6 mn in Feb-2020.

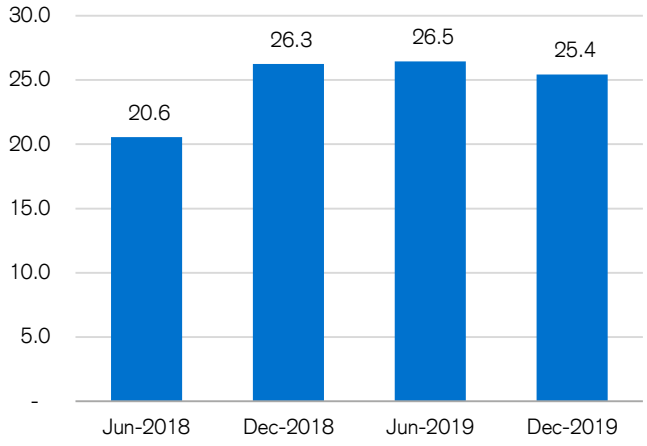
Key management

Yong Li (CEO): Mr Li graduated from Renmin University in 1996. He served as executive editor, executive chief editor and general manager of Global Entrepreneur from 2001-05. Mr Li served as the chief editor and vice-president and the president of NetEase Portal Business Unit in NetEase from 2005 to 2012.

Industry

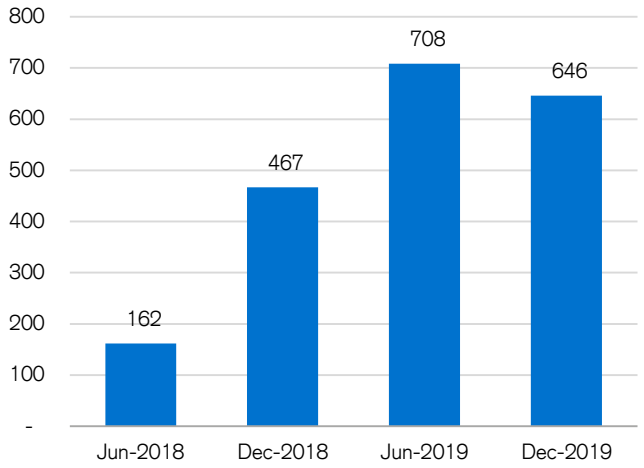
Internet/e-commerce/O2O/Games

Figure 332: MAU of Xiaoyuansouti app (mn)



Source: QuestMobile

Figure 333: MAU of Yuanfudao app ('000)



Source: QuestMobile

Zhuan Zhuan

Tina Long, Ashley Xu

Company profile

Zhuan Zhuan was launched by 58.com in 2015 to target the C2C used goods transaction market. It has developed into a leading online used goods trading platform. The C2C payment solution for Zhuan Zhuan is a WeChat payment-based escrow payment process co-developed by 58 and Tencent. Under this process, funds transferred through online payment will not be released to the sellers until the buyers confirm receipt. Users can opt to transact offline face-to-face as well as using Zhuan Zhuan to arrange logistic service providers to come to sellers' place to pick up the goods and track shipment status through intuitive user interface.

For some specific product categories, such as mobile phones, Zhuan Zhuan provides further value-added services like authentication, maintenance and price range recommendation. Zhuan Zhuan charges fees upon authentication services provided to buyers as well as online marketplace services provided to sellers especially business sellers.

Business update

Zhuan Zhuan has experienced rapid growth in user traffic since its launch in 2015. It has covered more than 200 mn users, including users through app activation and WeChat registration.

In April 2017, Tencent invested US$200 mn in cash and additional business resources in Zhuan Zhuan in exchange for a minority equity ownership. Zhuan Zhuan launched its first WeChat mini-programme in 2017 which serves as a new access point. Based on a business co-operation agreement between Zhuan Zhuan and Tencent, the Zhuan Zhuan mini-programmes can also be accessed through the "Used goods" shortcut on WeChat Pay index page.

As of Dec-2018, 58.com owned a 72.2% equity stake in Zhuan Zhuan on an 'as-converted basis' and continues to consolidate the company. In Sep-2019, Zhuan Zhuan completed round B financing, receiving US$300 mn from investors including Tencent and 58.com.

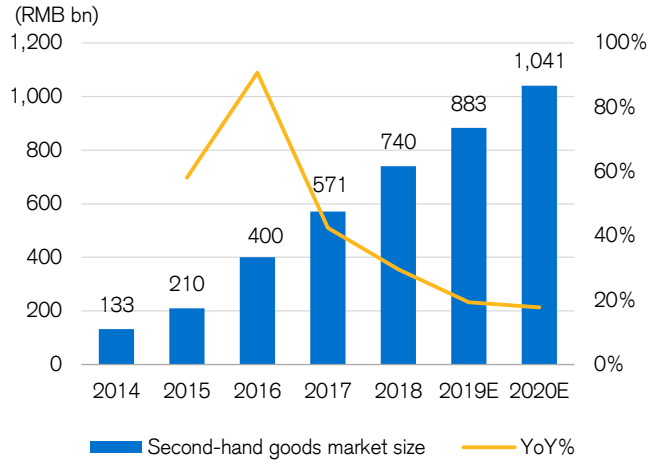
Key management

Wei Huang (CEO): Mr Huang graduated from Tsinghua University. During 2007-12, he worked in Baidu, responsible for Baidu news and formulated a team for Baidu Map since 2008. He joined 58.com in 2013, and became CEO of Zhuan Zhuan in Nov 2015.

Industry

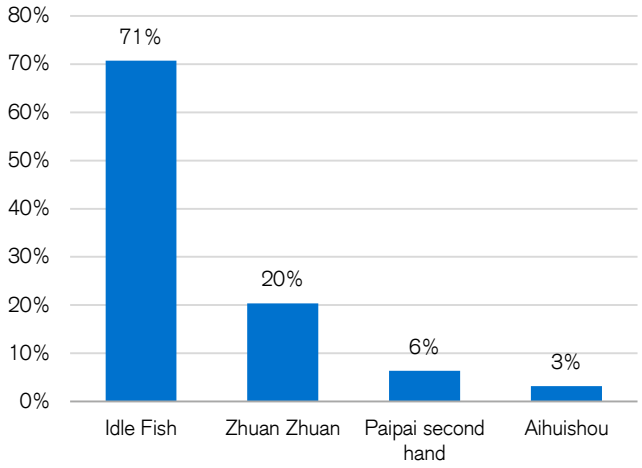
Internet/e-commerce/O2O/Games

Figure 334: Market size of second-hand goods



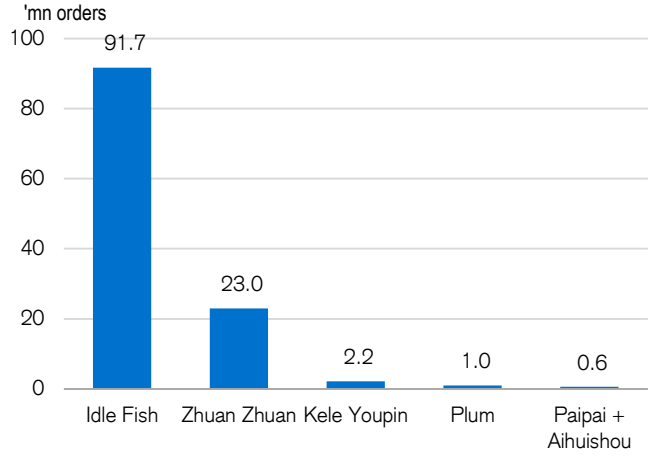
Source: Qianzhan Industry Research, Credit Suisse research

Figure 335: Penetration of second-hand goods transaction platforms in 2018



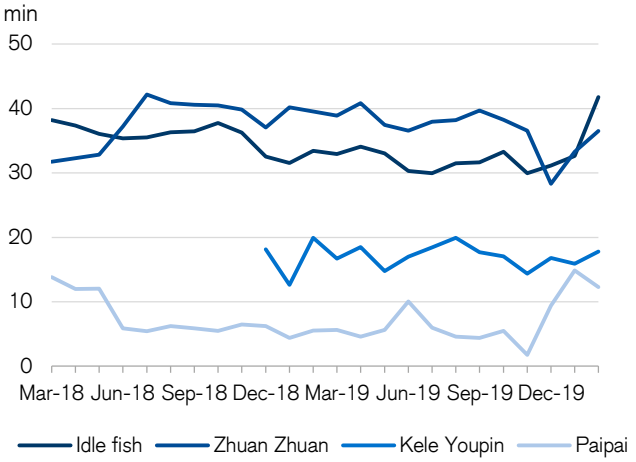
Note: Penetration among users that use second-hand good transaction platforms. Source: Qianzhan Industry Research, Credit Suisse research

Figure 336: MAUs of major second-hand platforms



Source: QuestMobile, Credit Suisse research

Figure 337: Time spent per user per day



Source: QuestMobile, Credit Suisse research

Ziroom

Tina Long, Ashley Xu

Company profile

Ziroom is China's largest co-living platform, founded in 2011 by Lianjia, one of the largest real estate agents in the country. Similar to Danke, Ziroom focuses on apartments sourced from individual property owners, scattered across neighbourhoods. Centralised apartments called "Ziroom Department" are operated in Beijing and Shanghai, but revenue contribution remains minimal. We see Ziroom enjoys advantages compared to competitors:

- **Support from Lianjia:** Lianjia has established an extensive agency network in top tier cities and built a database for over 200 mn properties. The group has also developed online real estate service platforms Beike and Lianjia with 9.6 mn, 5.4 mn MAUs in December 2019, respectively, according to QuestMobile. We believe Ziroom will benefit from its parent's support in traffic generation, business development, salesforce, etc.
- **Large scale with longer track record:** Scale and business development stages are key determinants of profitability, and Ziroom has already stepped into a more favourable position than peers. After eight years of operation, a number of properties have entered into the second or even third round of renewal with property owners, which would not incur further renovation cost. The large scale also means deep penetration in key cities and better economies of scale. It is reported that Ziroom is already profit making in Beijing.
- **Lower reliance on rental financing:** Rental financing penetration is below 30% on Ziroom. And different from most peers, residents would bear the interest expense. Low reliance on rental financing reduces the pressure on cash flow when tenants choose to terminate the contract early.

Business update

In Nov-2019, Ziroom announced that apartment units under operation exceeded 1 mn, covering nine cities including Beijing, Shanghai, Shenzhen, Hangzhou, Nanjing, Chengdu, Wuhan, Guangzhou, and Tianjin. In the same month, SoftBank's Vision Fund put US$500 mn directly into Ziroom and bought an additional US$500 mn of shares from its founders in a deal that values the company at US$6.6 bn, according to Wall Street Journal.

Key management

Zuo Hui (Founder and Chairman): Zuo Hui founded Lianjia Group in 2001 and Ziroom in 2011 and remains the chairman of both companies. Zuo Hui has deep experience in the real estate industry and plays a key role in a number of associations by being the Vice-Chairman of CIREA (China Institute of Real Estate Appraisers and Agents), the Vice-Chairman of CRECC (China Real Estate Chamber of Commerce) and Vice-President of Beijing Real Estate Agent Association.

Xiong Lin (CEO): Xiong Lin joined Lianjia in 2010 and has been the CEO of Ziroom since Oct-2011, when Ziroom was founded. Before that, he was a consultant in IBM since 2005, and an ERP consultant in Shenzhou Digital since 2001.

Industry

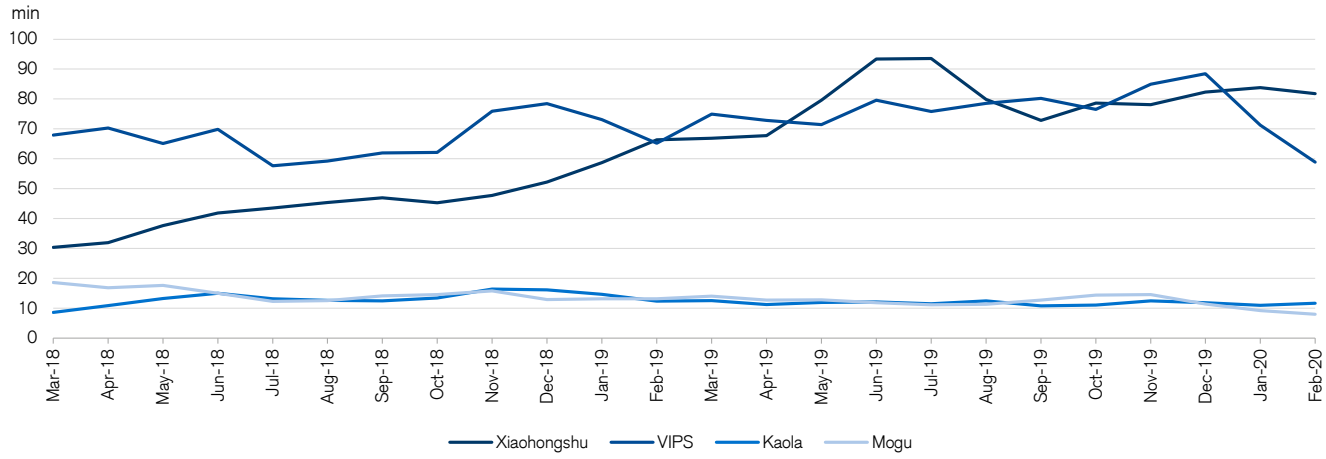
Internet/e-commerce/O2O/Games

Figure 338: Top co-living platforms in China

Name	Ziroom	Danke	Qingke
Year founded	2011	2015	2012
Units under operation[1]	1,000,000	406,746	99,656
Cities covered	9	13	6

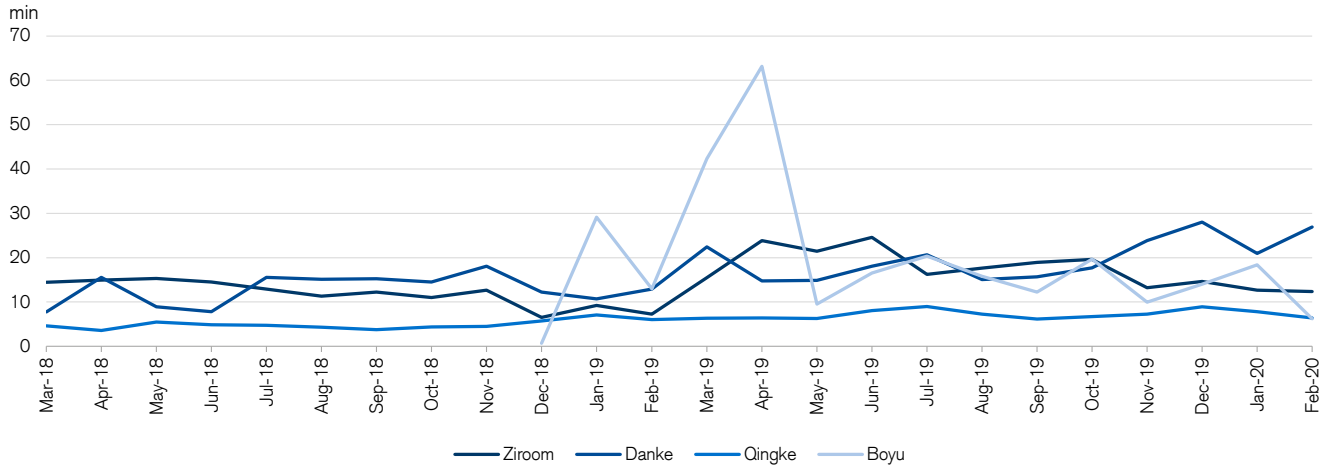
Note 1: As of Sep-2019 for Danke, Qingke; As of Nov-2019 for Ziroom. Source: Company data

Figure 339: MAUs of top co-living platforms



Source: QuestMobile, Credit Suisse research

Figure 340: MAUs of top co-living platforms



Source: QuestMobile, Credit Suisse research

Companies Mentioned *(Price as of 04-May-2020)*

111 (YI.OQ, $7.23)
360 (601360.SS, Rmb18.66)
51 Credit Card (2051.HK, HK$0.51)
58.com Inc. (WUBA.N, $51.13)
ANZ Banking Group (ANZ.AX, A$16.15)
AbbVie Inc. (ABBV.N, $82.84)
Alibaba Group Holding Limited (9988.HK, HK$189.7)
Alibaba Group Holding Limited (BABA.N, $194.48)
Alphabet (GOOGL.OQ, $1317.32)
Alphamab (9966.HK, HK$17.0)
Amazon com Inc. (AMZN.OQ, $2286.04)
Anzheng Fashion (603839.SS, Rmb12.07)
Apple Inc (AAPL.OQ, $289.07)
Ascentage Pharma (6855.HK, HK$31.5)
Ascletis Pharma (1672.HK, HK$2.69)
Audi (NSUG.F, €980.0)
Aurora Mobile (JG.OQ, $2.3)
BMW (BMWG.DE, €54.05)
BabyTree Group (1761.HK, HK$0.94)
Baic Bluepark New Energy Technology Co.,Ltd (600733.SS, Rmb5.48)
Baidu (BIDU.OQ, $96.02)
Bank of China Ltd (3988.HK, HK$2.87)
Bank of China Ltd (601988.SS, Rmb3.48)
Bank of Jiangsu (600919.SS, Rmb6.04)
BeiGene (6160.HK, HK$83.7)
BeiGene (BGNE.OQ, $140.21)
Bilibili (BILI.OQ, $25.14)
BlackRock (BLK.N, $484.16)
CIFI Holdings (0884.HK, HK$5.52)
CITIC (0267.HK, HK$7.31)
COFCO Meat Hldg (1610.HK, HK$2.64)
CStone (2616.HK, HK$7.53)
CanSinoBIO (6185.HK, HK$154.0)
Cango (CANG.N, $5.0)
Cann Grp (CAN.AX, A$0.88)
Capital One Financial Corp. (COF.N, $61.58)
China Literature Limited (0772.HK, HK$32.0)
China Merchants Bank Co Ltd (3968.HK, HK$35.1)
China Merchants Bank Co Ltd (600036.SS, Rmb35.09)
China Mobile Limited (0941.HK, HK$60.1)
China Vanke H (2202.HK, HK$24.75)
ChinaRenaissance (1911.HK, HK$10.42)
Chow Tai Fook Jewellery Group Limited (1929.HK, HK$6.34)
Citigroup Inc. (C.N, $45.52)
CooTek (Cayman) (CTK.N, $7.15)
Dahua (002236.SZ, Rmb16.87)
Daimler (DAIGn.DE, €31.535)
Datang Telecom (600198.SS, Rmb8.93)
Dongfeng Motor Group Company Limited (0489.HK, HK$4.92)
Ellassay (603808.SS, Rmb11.15)
Facebook Inc. (FB.OQ, $202.27)
Financial Street Holding (000402.SZ, Rmb6.94)
Fosun International Ltd (0656.HK, HK$9.32)
Foxconn Industrial Internet (601138.SS, Rmb14.69)
Geely Automobile Holdings Ltd (0175.HK, HK$11.54)
General Motors Company (GM.N, $20.9)
Goldman Sachs Group, Inc. (GS.N, $177.1)
Great Wall Motor (2333.HK, HK$5.12)
Great Wall Motor (601633.SS, Rmb8.06)
Greenland HK (0337.HK, HK$2.73)
Guangzhou Automobile Group (2238.HK, HK$6.47)
Guangzhou Automobile Group (601238.SS, Rmb9.8)
HSBC Hldg (0005.HK, HK$38.6)
HUYA Inc. (HUYA.N, $15.11)
Haier Electronics Grp (1169.HK, HK$21.55)
Henlius (2696.HK, HK$44.2)
Hikvision (002415.SZ, Rmb32.06)
Hua Medicine (2552.HK, HK$2.89)
Huatai Securities (6886.HK, HK$11.96)
Huatai Securities (601688.SS, Rmb18.14)
Huifu (1806.HK, HK$2.1)
Industrial & Commercial Bank of China (1398.HK, HK$5.06)
Industrial & Commercial Bank of China (601398.SS, Rmb5.17)
Inke (3700.HK, HK$1.05)
Inner Mongolia Yili Industrial Group (600887.SS, Rmb29.24)
Innolux Corporation (3481.TW, NT$6.27)
Innovent (1801.HK, HK$36.95)
Inspur Software (600756.SS, Rmb18.02)
International Business Machines (IBM.N, $121.87)
JD.com (JD.OQ, $41.38)
JPMorgan Chase & Co. (JPM.N, $93.25)
Laix (LAIX.N, $3.39)
Leo GROUP (002131.SZ, Rmb3.8)
Lianhua (0980.HK, HK$1.46)
Longfor Group Holdings Limited (0960.HK, HK$37.0)
Lyft (LYFT.OQ, $29.61)
Meituan Dianping (3690.HK, HK$100.7)
Merck & Co., Inc. (MRK.N, $77.67)
Microsoft (MSFT.OQ, $174.57)
Mitsubishi UFJ Financial Group (8306.T, ¥415)
Motorola Solutions (MSI.N, $138.83)
NetEase.com (NTES.OQ, $325.34)
Nio Inc (NIO.N, $3.18)

Panasonic (6752.T, ¥789)
PayPal (PYPL.OQ, $120.61)
Peacebird (603877.SS, Rmb14.28)
Pfizer (PFE.N, $37.64)
Phoenix Tree Holdings Limited (DNK.N, $6.5)
Pinduoduo Inc (PDD.OQ, $45.43)
Ping An (601318.SS, Rmb74.46)
Ping An (2318.HK, HK$78.0)
Poly Property Development Co., LTD (6049.HK, HK$78.1)
Qeeka Home (1739.HK, HK$2.5)
Qutoutiao (QTT.OQ, $2.34)
Ribo Fashion (603196.SS, Rmb7.95)
S F Holding (002352.SZ, Rmb46.79)
SAIC Motor Corp Ltd (600104.SS, Rmb18.9)
SGOCO (SGOC.OQ, $0.966)
Shanghai Junshi Biosciences Co., Ltd (1877.HK, HK$40.6)
Siemens (SIEGn.DE, €84.68)
Sina (SINA.OQ, $32.82)
SoftBank Group (9984.T, ¥4,608)
Sugon (603019.SS, Rmb48.32)
Sun Art Retail Group (6808.HK, HK$12.52)
Suning Commerce Group Co., Ltd. (002024.SZ, Rmb8.42)
TOT BIOPHARM (1875.HK, HK$3.86)
Tencent Holdings (0700.HK, HK$400.0)
Tencent Music Entertainment (TME.N, $10.72)
Tesla Inc (TSLA.OQ, $701.32)
Tongcheng-Elong (0780.HK, HK$12.3)
Tractor Supply Company (TSCO.OQ, $102.09)
Tsingtao Brewery (0168.HK, HK$48.15)
Tsingtao Brewery (600600.SS, Rmb52.75)
UCloud (688158.SS, Rmb60.1)
Uber (UBER.N, $28.39)
United Guardian (UG.OQ, $14.01)
Uxin (UXIN.OQ, $1.44)
VCREDIT Holdings Limited (2003.HK, HK$5.85)
Venus Medtech (2500.HK, HK$51.9)
Vipshop Holdings Limited (VIPS.N, $15.2)
Want Want China Holdings Ltd. (0151.HK, HK$5.31)
Weibo Corporation (WB.OQ, $34.98)
Wise Talent Info (6100.HK, HK$16.7)
Xiaomi (1810.HK, HK$10.0)
Yonghui Superstores (601933.SS, Rmb10.16)
ZTE (0763.HK, HK$22.1)
ZTE (000063.SZ, Rmb41.09)
ZhongAn Online P&C Insurance Co., Ltd. (6060.HK, HK$24.95)
ctrip.com Intl (CTRP.W, $45.83)
eBay Inc. (EBAY.OQ, $39.25)
iQIYI Inc. (IQ.OQ, $16.36)

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This research report is authored by:

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