



DIGITAL ECONOMY COMPASS 2019

Digital technologies are disrupting the economy and our daily lives with relentless stride. As much as the ever-increasing amount of data is helping us, it also leads to risks and challenges. One way to deal with the incredible amount of data is the use of Artificial Intelligence – a buzz word that nobody can escape at the moment. But what is really happening in this field and who is using this technology? Another topic that is gaining relevance is the next economic recession. Despite all the talk about growth and innovations, there is the rising fear of an overheating market and the emergence of another bubble that is about to burst.

These are the topics that we are tackling in this third edition of the Digital Economy Compass. We have compiled the most relevant and recent data and found some answers and new questions along the way.

Similar to the prior editions, the Digital Economy Compass 2019 is divided into two parts. The first one covers today's most exciting and important trends. It starts with the data explosion and how the growing amount of data will change the world. In the chapter about Artificial Intelligence, we analyze how smart machines influence our daily lives, how they are used, and what they can do. The chapter about the current funding and investment market looks at the big players, the newcomers, and the unicorns in the tech market. Additionally, we have analyzed the current economic situation, different developments, and the potential impact on start-ups and the digital economy.

In the second part, we show all the relevant data and insights regarding the biggest eight digital markets. This includes market sizing and forecasts for future developments as well as an overview of current trends that are relevant to the respective markets.

Apart from external data, this year's Digital Economy Compass includes more of Statista's exclusive data than ever. Our own research and market analyses have increasingly become the founding stone of our analyses and insights. Our Global Consumer Survey is giving insights into the minds of more than 400,000 consumers in 46 countries. You can find and analyze more than 5,000 brands in the survey. Our Consumer and Digital Market Outlooks are available for 150 countries, covering all relevant markets worldwide. All this information and more can be found on [statista.com](https://www.statista.com). The [ecommerceDB.com](https://www.ecommerceDB.com) gives insights into more than 10,000 online stores. You can find more information about our products on pp. 225 – 228.

Our research has resulted in more than 200 slides on the global digital economy. We are convinced that you will enjoy reading our new Digital Economy Compass.



A handwritten signature in black ink, which appears to read "Dr. Schwandt". The signature is stylized and fluid.

Dr. Friedrich Schwandt (CEO)

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Statista Digital Market Outlook

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Data explosion – data is everywhere

Today's world and its future are built on data.

Users and companies are more and more interconnected. Additionally, there is a shift from being offline to always online. Both developments have led to the creation of an incredible amount of data that is growing exponentially.

While many companies already try to make use of their customers' data or data extracted from production processes, the implications of using Big Data cannot yet be fully assessed. Companies that are able to put their data to use, will have more business opportunities and improve current production and distribution models.

A data-driven world is based on aggregating and working with all the collected input. Thus, it is all about tracking, monitoring, listening, watching, and observing. The more advanced the data-processing systems become, the better their output will be. When used properly, large data sets can improve decision-making and business processes, help with innovations, and lead to personalization in sectors like entertainment, healthcare, or financial services.

Data storage

One of the main challenges regarding the use of large data sets is finding ways to store and later analyze them. The total amount of data generated in 2018 was 33 zettabytes (330 million times the capacity of the currently largest hard drive) and it will grow exponentially to more than 2,100 zettabytes in 2035.

Since traditional storage solutions are incapable of handling the incoming stream of data, new solutions such as Cloud storage and Blockchain technologies are gaining traction. Cloud storage will overtake device storage in 2019. The shift towards Cloud solutions is especially visible in the enterprise storage market and will become even more apparent in the future. In this market, Cloud services will replace traditional storage as the primary storage solution in 2020 and will make up 92% of revenues in 2026.

The Cloud market is highly dominated by Amazon, which owns one third of storage capacities. However, while Amazon's share is stable, the rest of the market is slowly divided between Google, Microsoft, and IBM, which all invest heavily in Cloud technologies.

Data security

With the growing amount of data, the need for security measures and safe data storage increases as well. Besides Cloud storage, Blockchain establishes itself as a storage solution to safely handle large data sets. As many investors started to realize its potential, the investment sum for Blockchain start-ups increased by almost 300% from 2017 to 2018.

Although Blockchain and Cloud storage are able to increase the safety of data sets, there is still a large threat of data breaches and malicious usage of data. Such data breaches are not uncommon and extremely expensive for the companies affected. The more personal and sensitive the data, the higher the costs for companies to retrieve the data and repair the damage to their public image. The growing importance of data and the public discussion about data security and fraud are making many internet users increasingly aware of how their data is collected, stored, and used by companies.

Value of data

Many private companies are collecting extensive amounts of data about their customers. Facebook or Google are able to track and analyze most of their customers' behavior. This gives them enormous power in the advertising market as they can provide companies with the best-fitting target groups through their advertising and targeting services.

However, it remains unclear to consumers what the companies are using their data for and what the value of personal information is. It may come as a surprise that information regarding demographics or occupation is not nearly as valuable to companies as one might think. Instead, information on family planning, medical conditions, or the ownership of certain assets comes at a much higher price. This is due to the private and sensitive nature of these issues and because they might entail

certain purchase intentions which companies can serve.

Data usage

In addition to the aforementioned threats, extensive data collection also has some pleasant consequences for consumers. These include personalized purchase recommendations or content that is created especially for certain target groups. Both are highly valued by customers as they improve the shopping experience or the satisfaction with entertainment services. Many consumers are actually willing to share their data if they receive better-fitting ads in return.

The overall trend towards personalized content and individualized consumption can also be seen when looking at programmatic advertising shares. They dominate the advertising landscape in many countries.

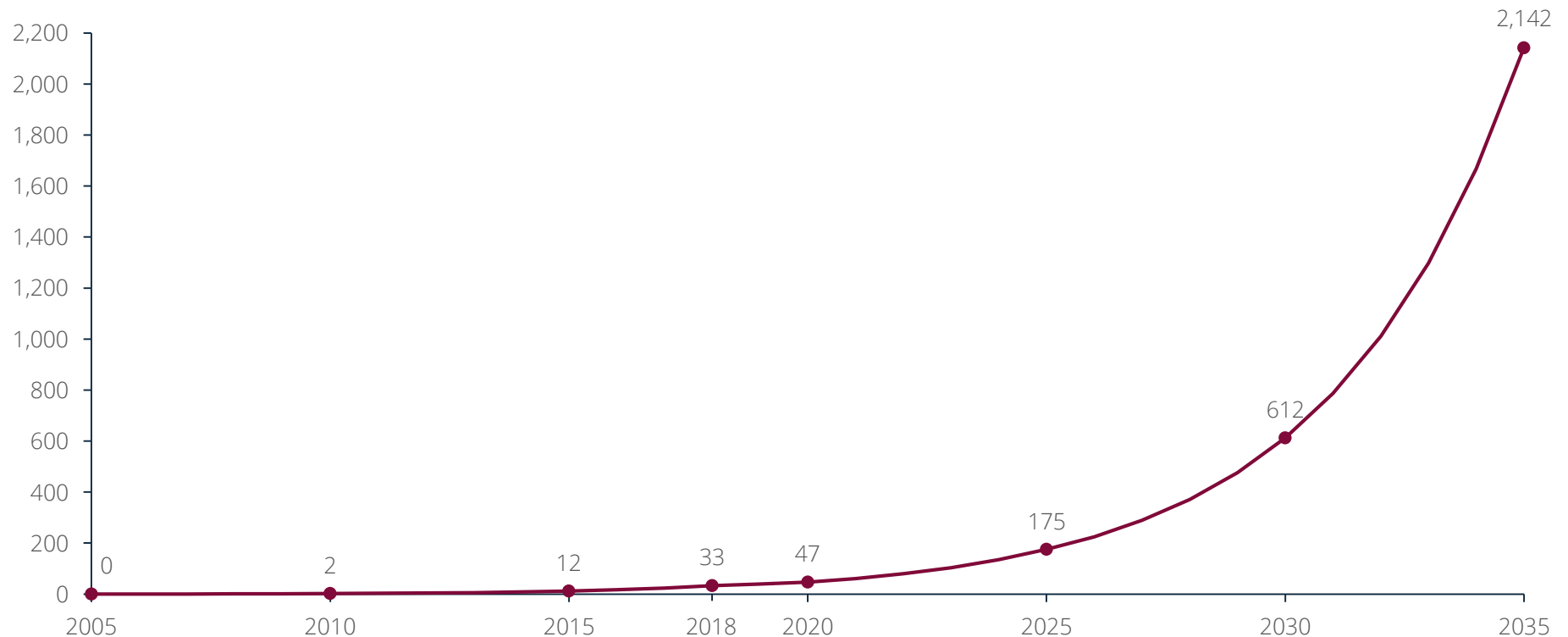
Data collection can also be brought to a new level: China's social credit systems are an example of this. So far, these systems are only tested in 70 pilot projects in different regions, but by 2020, the Chinese government wants to extend them to cover the complete population.

While economic credit systems are common for many countries, the Chinese social credit systems go a step further. They evaluate not only a citizen's economic behavior but also their entire online and offline behavior and aggregate it into a personal score. This score is publicly available and updated on a regular basis. The individual's score then determines their ability to get a promotion, travel by plane, or send their children to college.

While this might sound restrictive and invasive to many Western societies, these systems are very established and valued in China. 80% of the Chinese online population approve of social credit systems and only 16% state that they do not take part in social credit systems.

The amount of data created is growing exponentially and calls for more and better data storage solutions

Worldwide amount of data created per year in zettabytes¹



To save all the data created in 2018, 660 billion Blu-ray discs would be needed

The amount of data created in 2018 (33 zettabytes) equals to ...



the storage of a standard Blu-ray disc (50 gigabytes)



the capacity of the world's currently¹ largest hard drive (100 terabytes)



the internet's size in 1997 (88 terabytes)



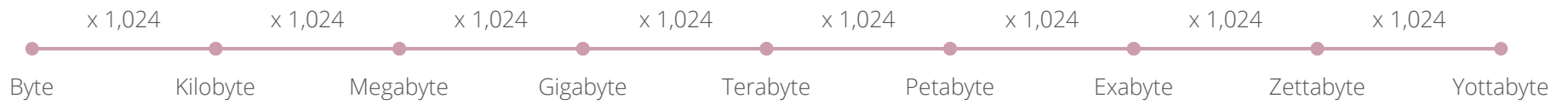
the storage of a human brain (1 petabyte)²



the currently³ fastest supercomputer's storage (250 petabytes)



the capacity of one gram of DNA (455 exabytes)

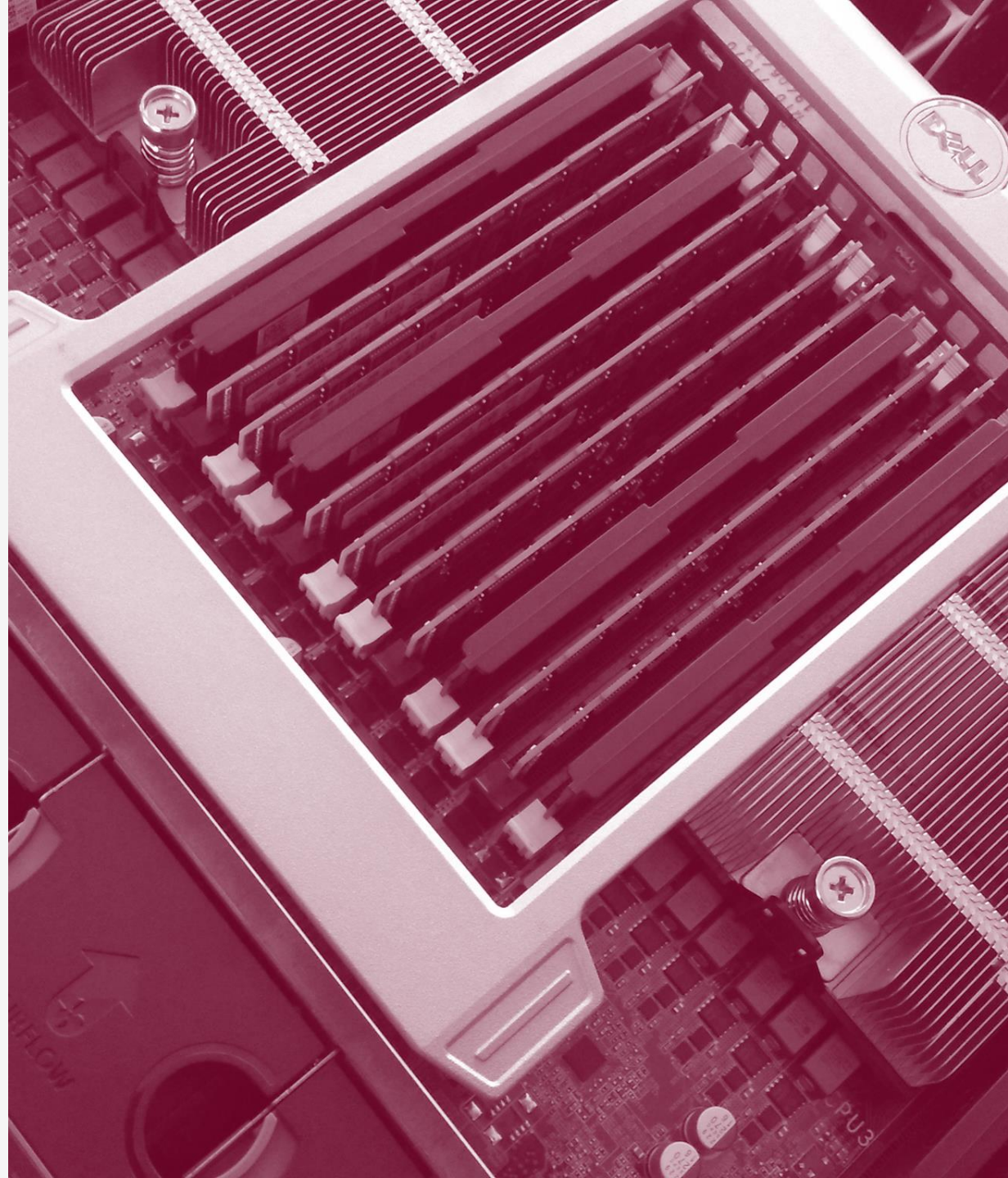


Data storage

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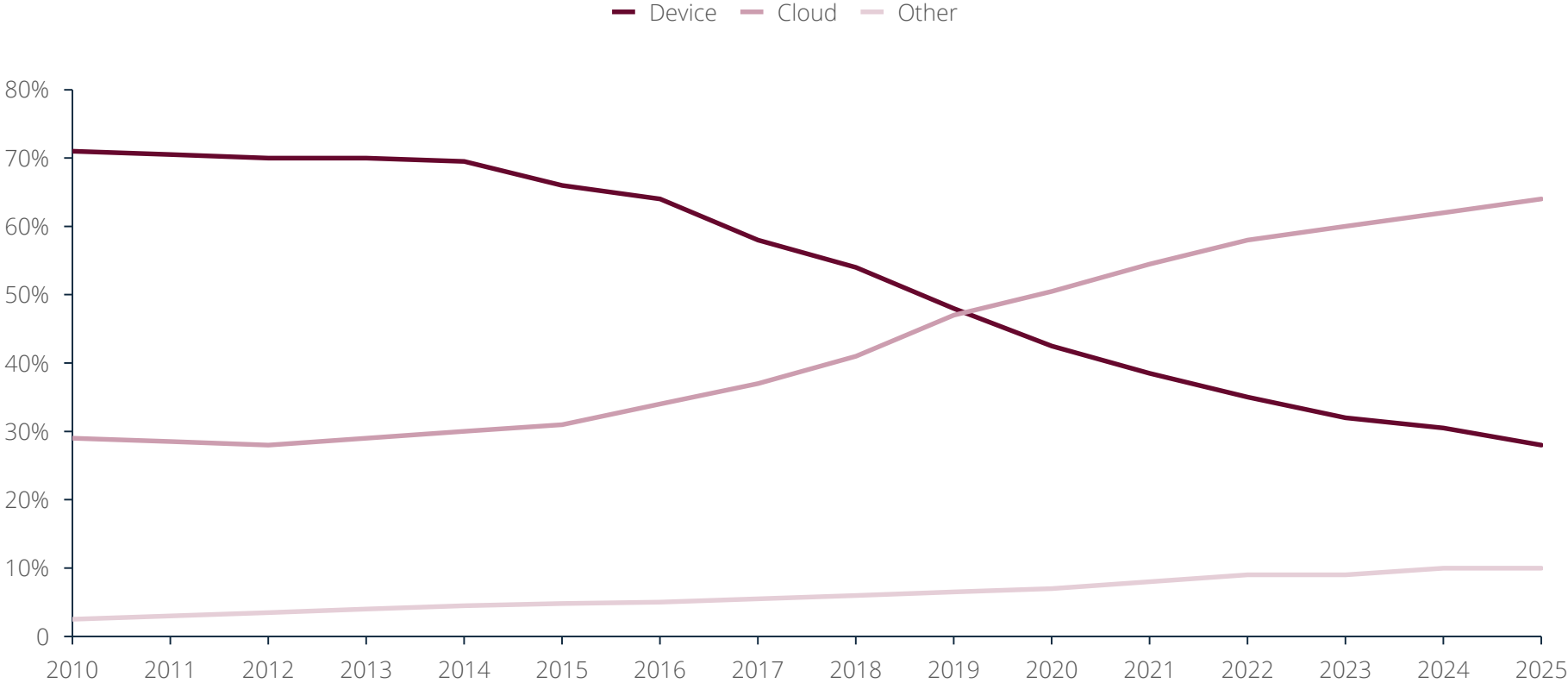
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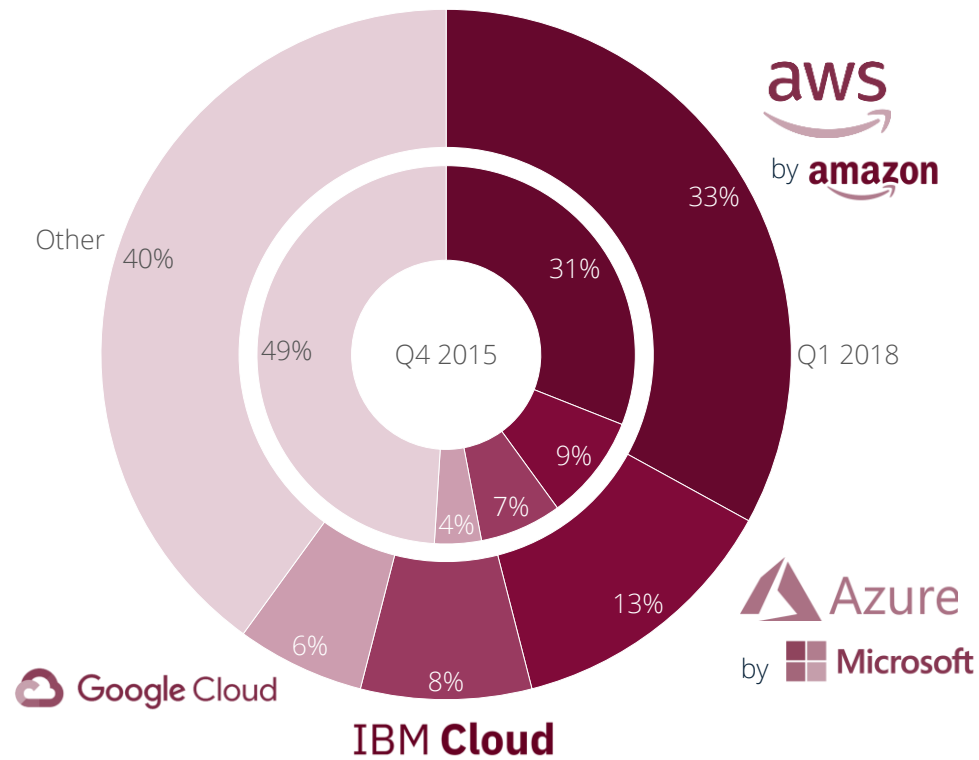
Cloud solutions are the answer to the data storage problem

Share of data storage solutions



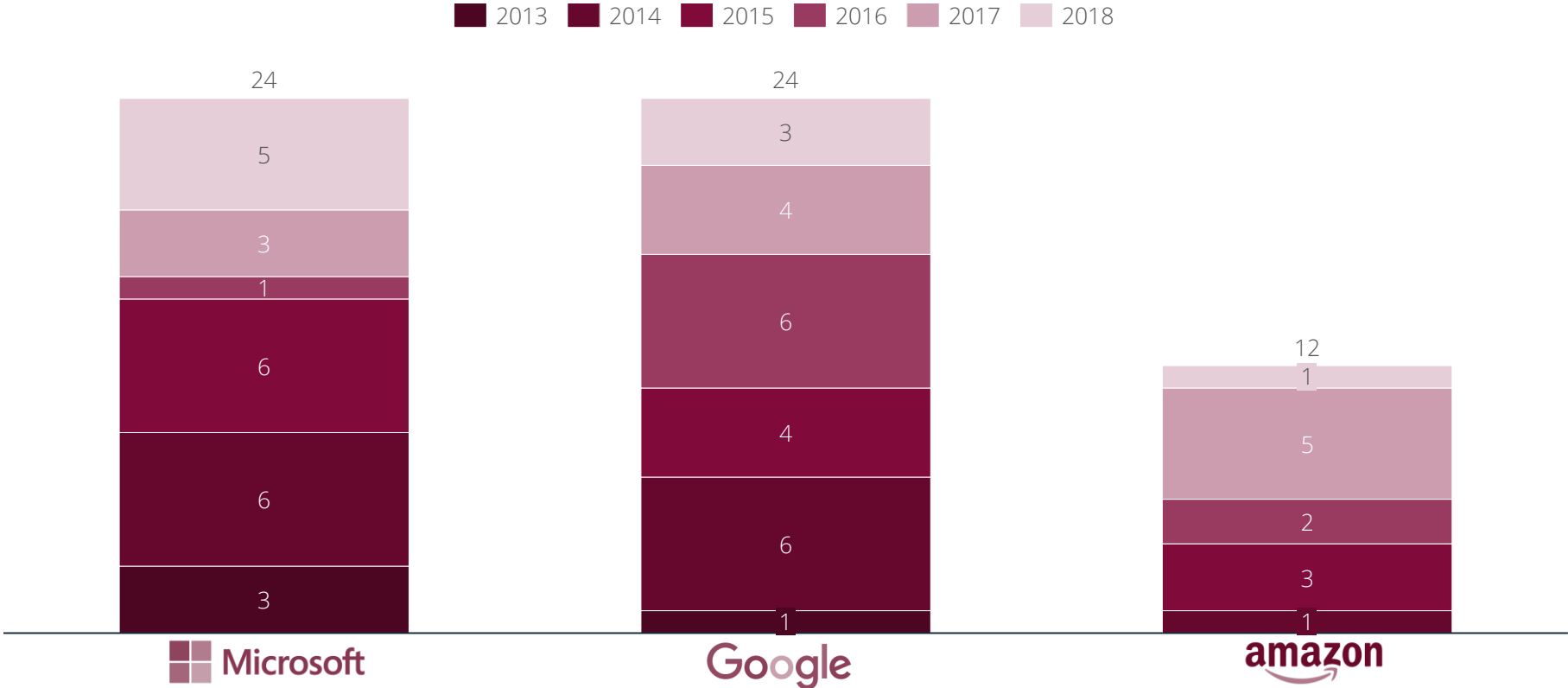
Amazon dominates the Cloud market with a market share of 33%

Worldwide market share of Cloud services¹ in Q4 2015 and Q1 2018



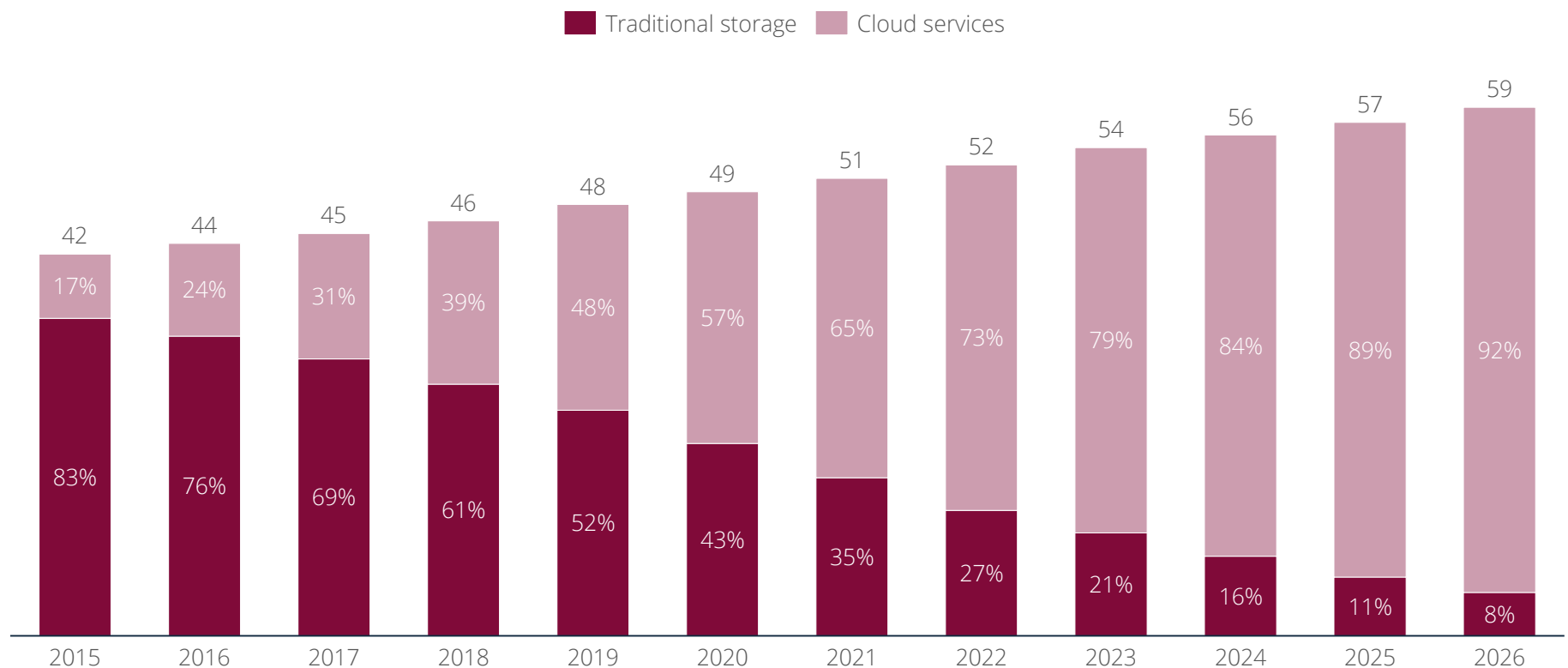
Microsoft and Google are threatening Amazon by massively acquiring companies from the Cloud sector

Number of acquisitions of companies with a focus on Cloud technology



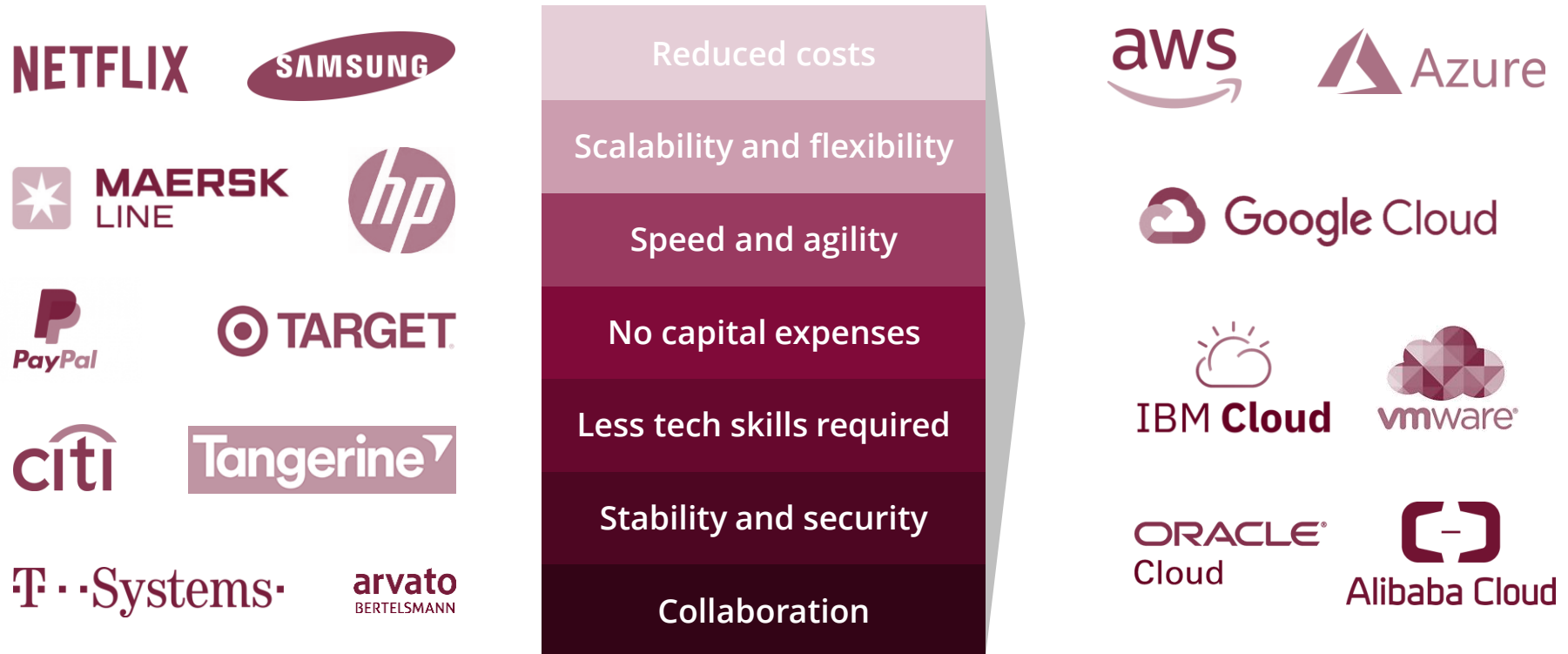
Traditional enterprise storage will soon become obsolete

Worldwide revenues from enterprise storage in billion US\$



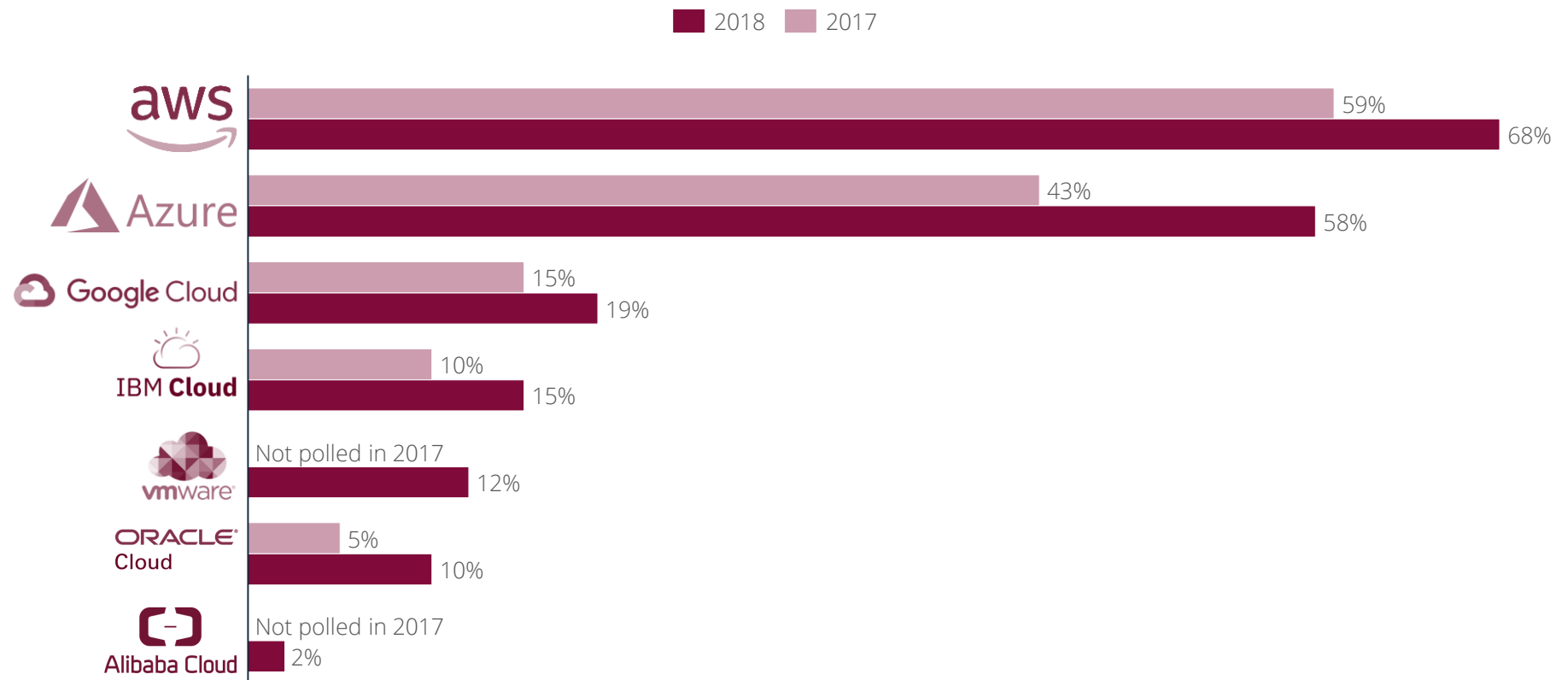
Cloud services offer a wide variety of benefits for companies, from reducing costs to improving agility

Selected reasons for companies to use Cloud services



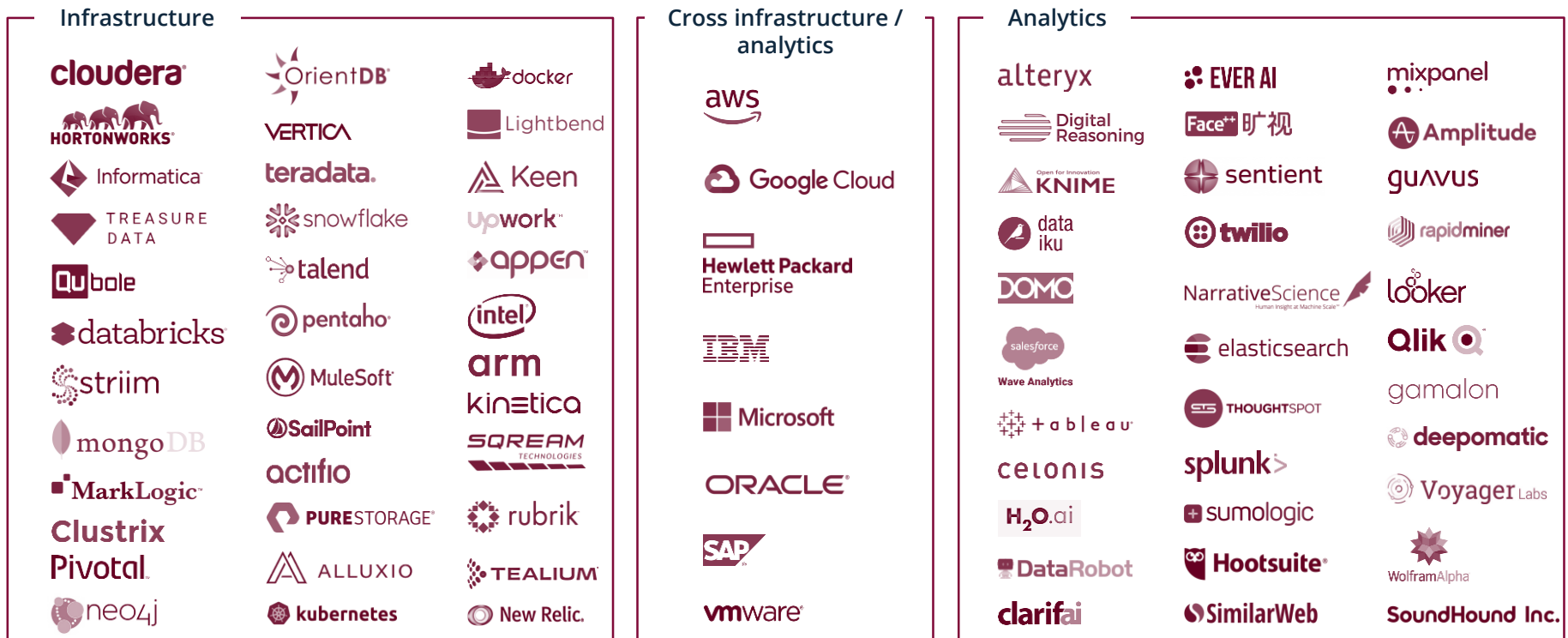
Amazon also dominates the enterprise Cloud market, but Microsoft is gaining ground

Adoption rates of Cloud services among enterprises



Apart from the big players, there are many smaller companies in the Cloud ecosystem

Selected companies in the storage & analytics landscape in 2018



Data security

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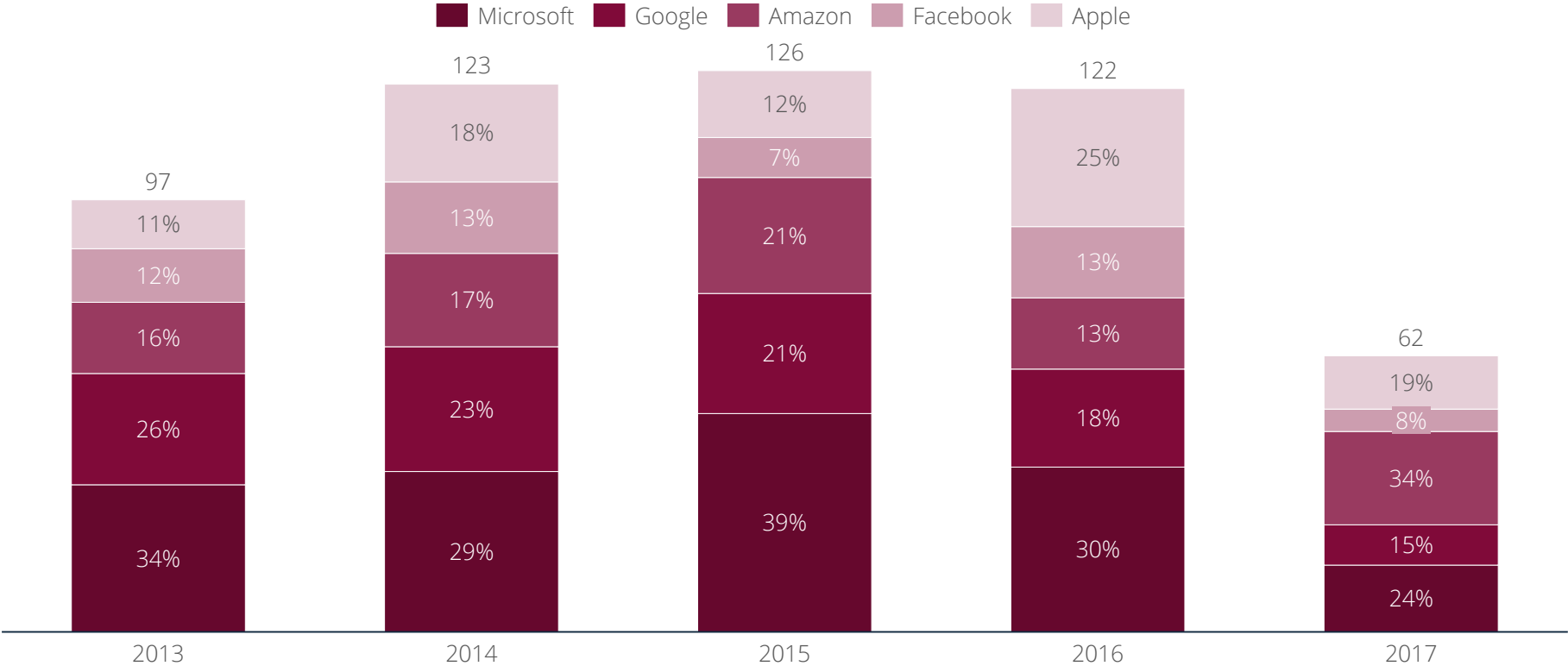
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The growing importance of data and the public discussion about data security and fraud are making many internet users increasingly aware of how their data is collected, stored, and used by companies.



Storage is not everything – tech giants are also investing heavily in data security

Selected companies' patent applications for data security



Blockchain technology allows the secure and transparent allocation of data and property

The concept behind Blockchain

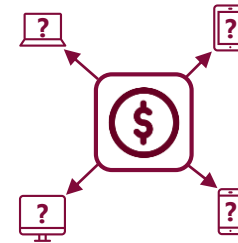
A digital value – in this case money – is sent from A to B. Information like origin, date, and recipient are attached.



The money transaction is represented as a single "block". It contains all attached information and a unique hash code.



The block is shared with all nodes in the network. Its details are checked for validity. For approval, the block needs ...



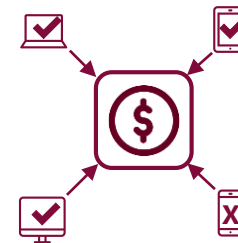
As the previous ownership by A has been validated, B is now authorized to become the new owner of the money sent.



Now, the Blockchain provides a transparent history of all conducted transactions related to the money sent.

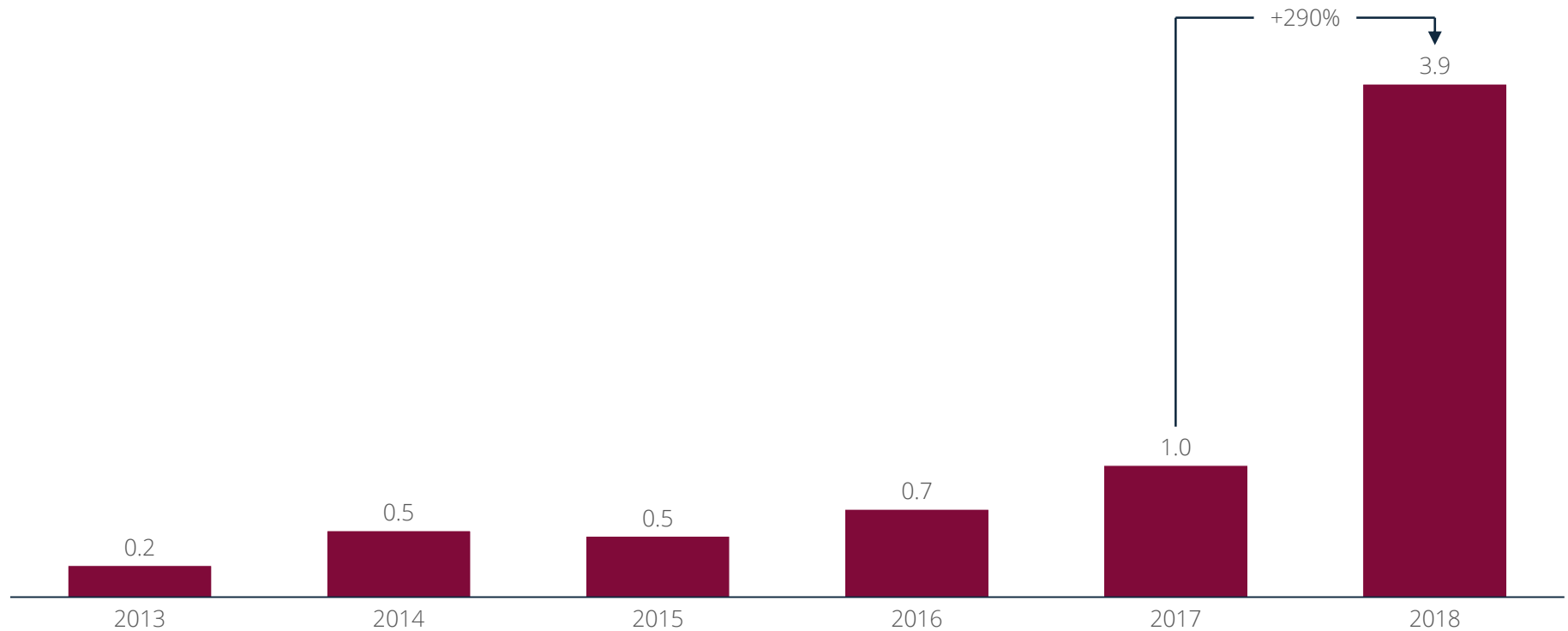


... the consensus of the majority of nodes. If this is the case, the block's information is considered valid and added to the chain.



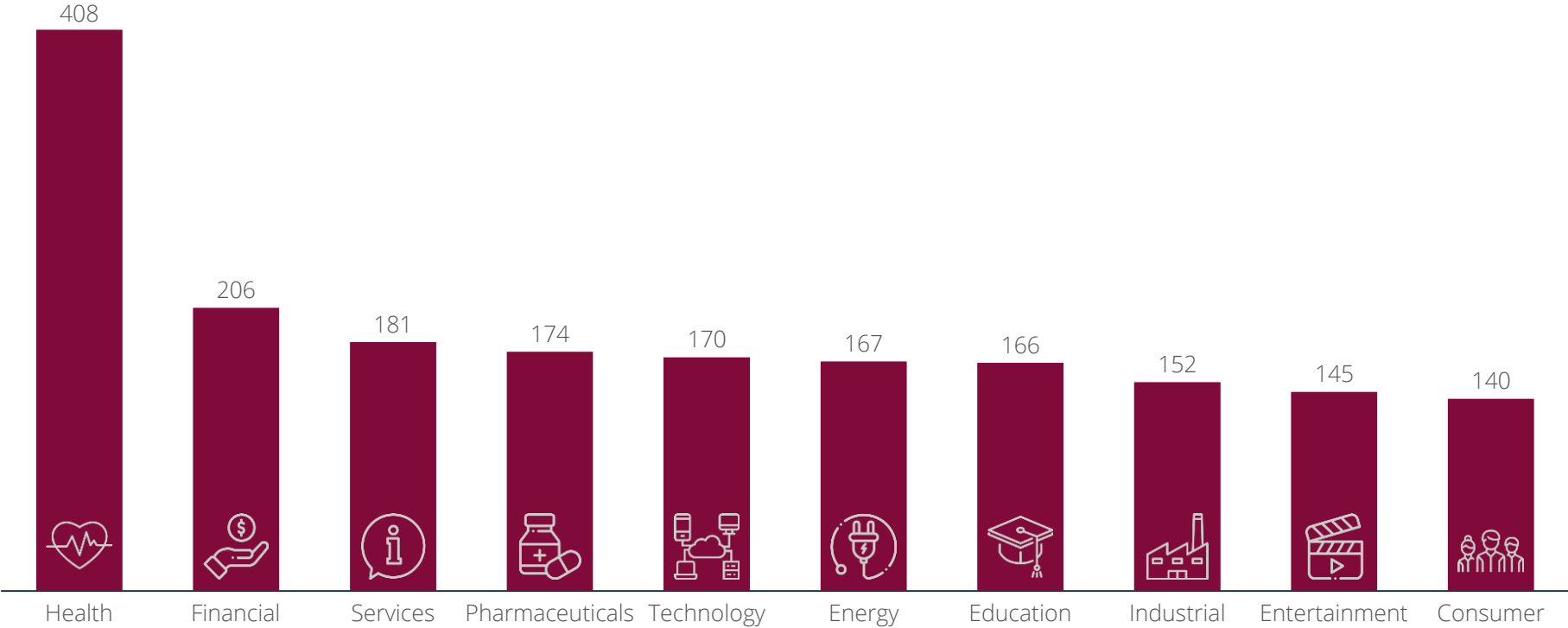
From 2017 to 2018, investments in Blockchain companies grew by 290% to reach US\$4bn

Total worldwide venture capital invested in Blockchain companies in billion US\$



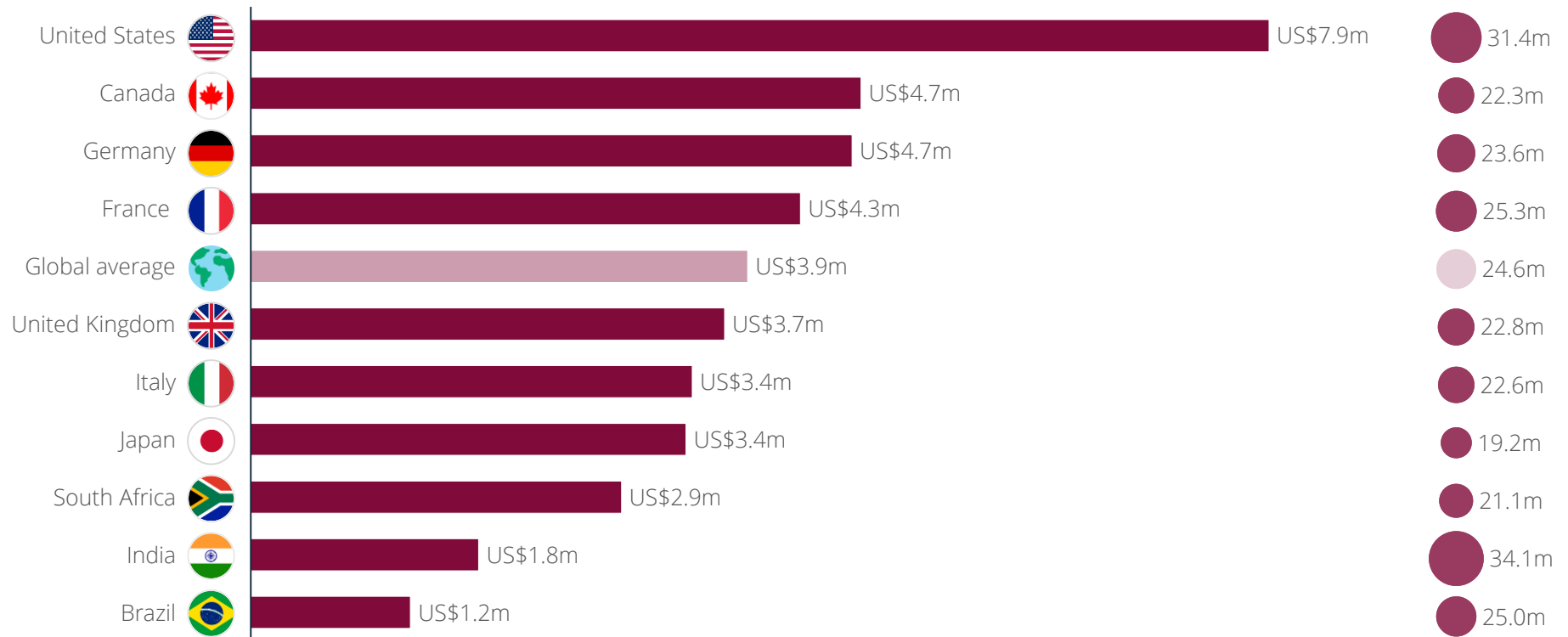
Data breaches are expensive: the more sensitive and private the information, the higher the costs

Average cost per capita of a data breach in selected industries in US\$



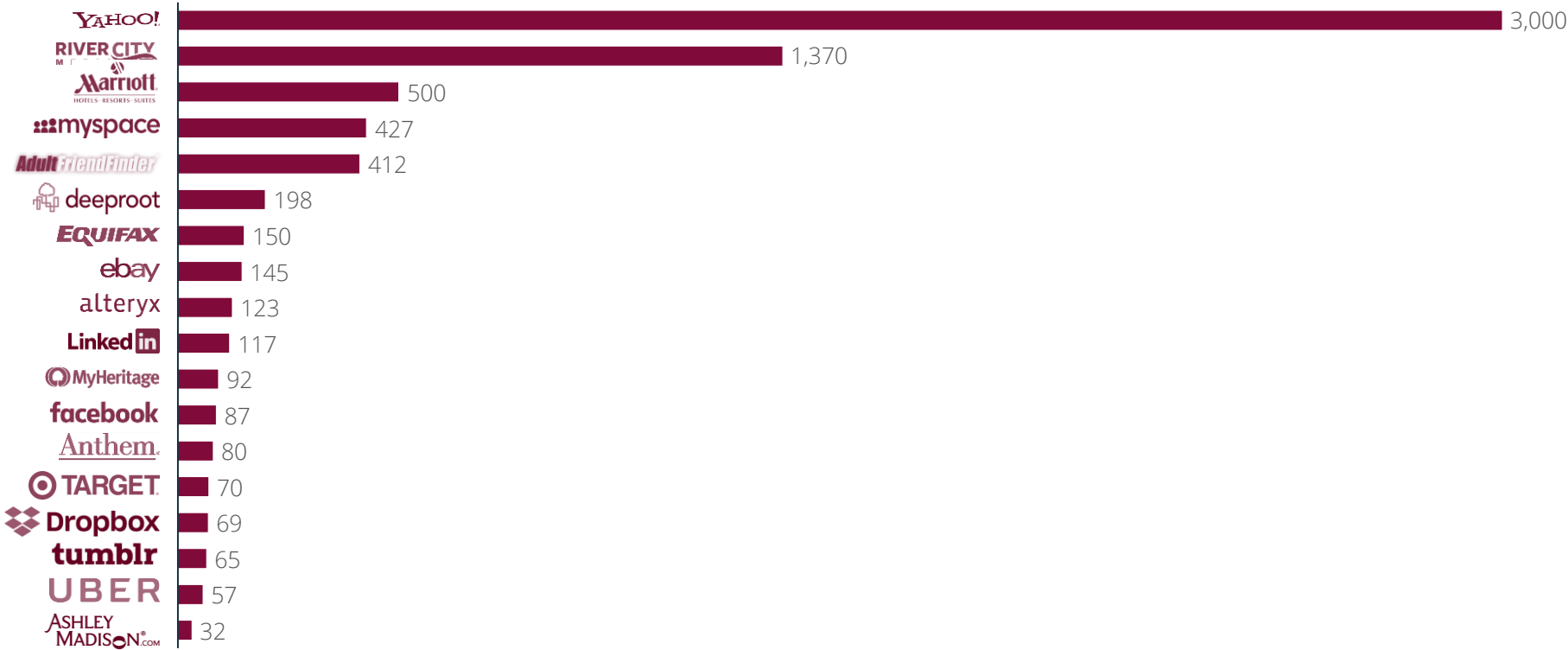
With US\$8 million, the cost of lost data was highest in the U.S.

Cost of data breach and average number of breached records in selected countries in 2018



With 3 billion stolen data records, Yahoo has experienced the largest data breach so far

Selected breaches by number of compromised data records in millions since 2013



Data breaches are not the only threat: the Cambridge Analytica scandal shows the problem of data misuse

Users whose data may have been shared with Cambridge Analytica¹ in millions as at April 2018

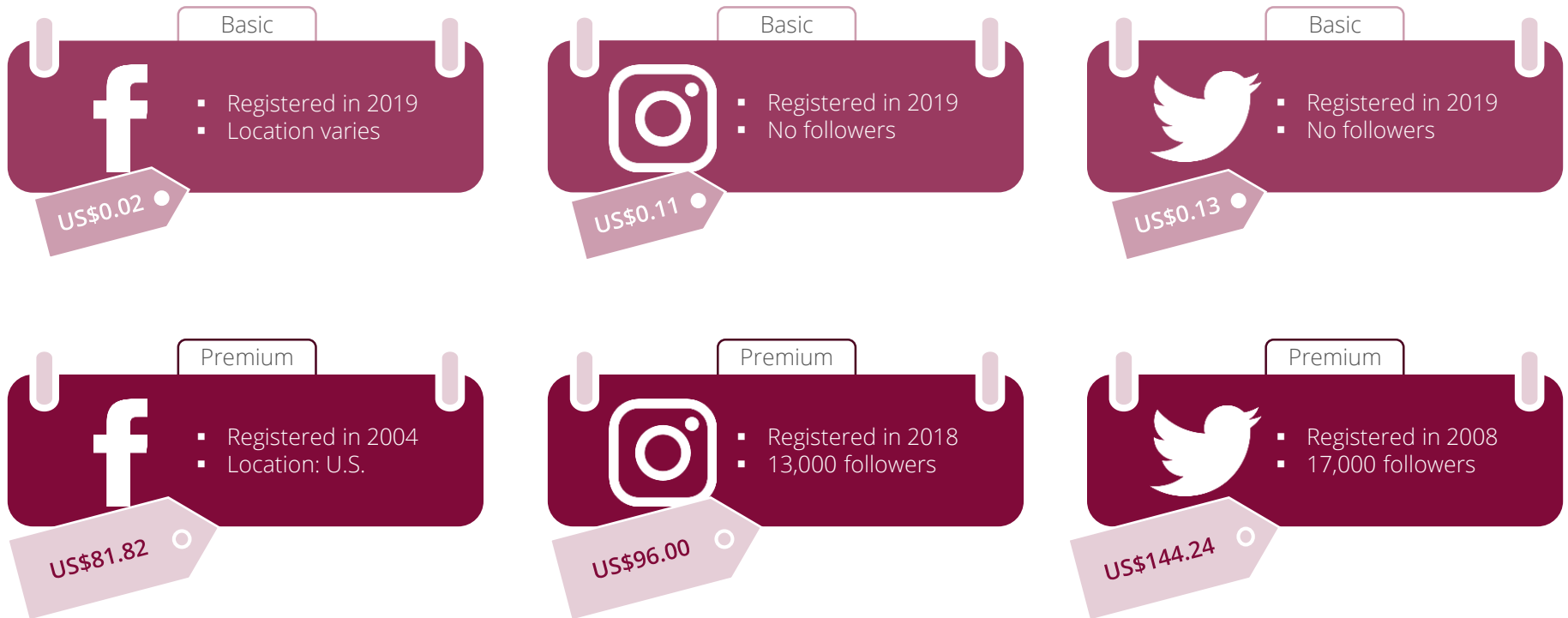


1: Facebook doesn't know precisely what data was shared or how many people were impacted. The figures presented here are the social network's best estimates

Source: Facebook

Fake profiles are another example of data misuse

Prices of purchasable single social network accounts



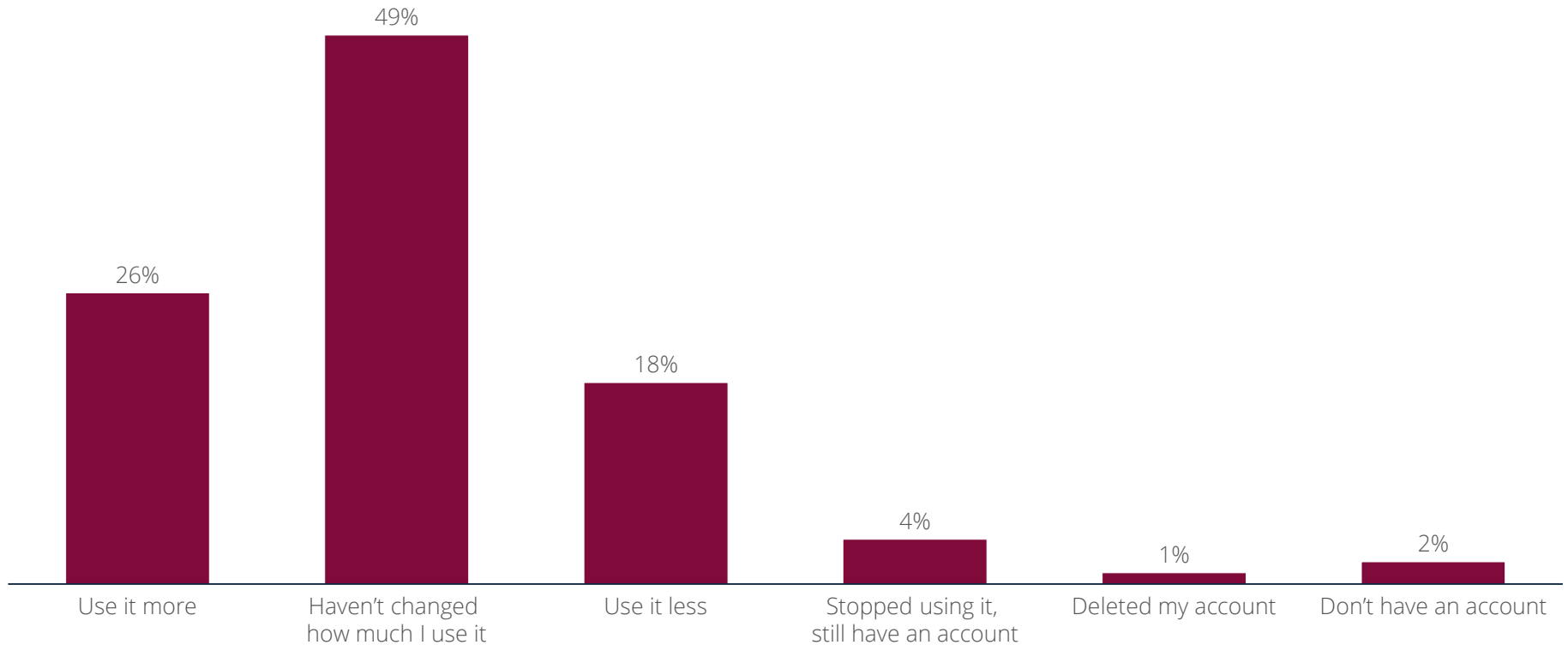
Facebook has lost the public's trust more than any other company

Companies people trust least with their personal information as at December 2018



Loss of trust does not necessarily mean less usage

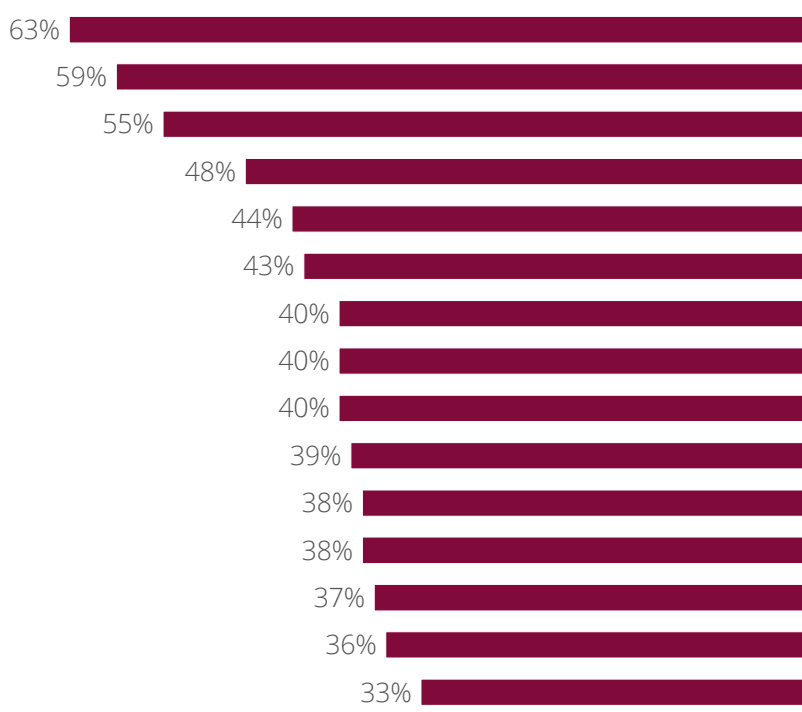
Usage behavior of U.S. Facebook users after the Cambridge Analytica scandal



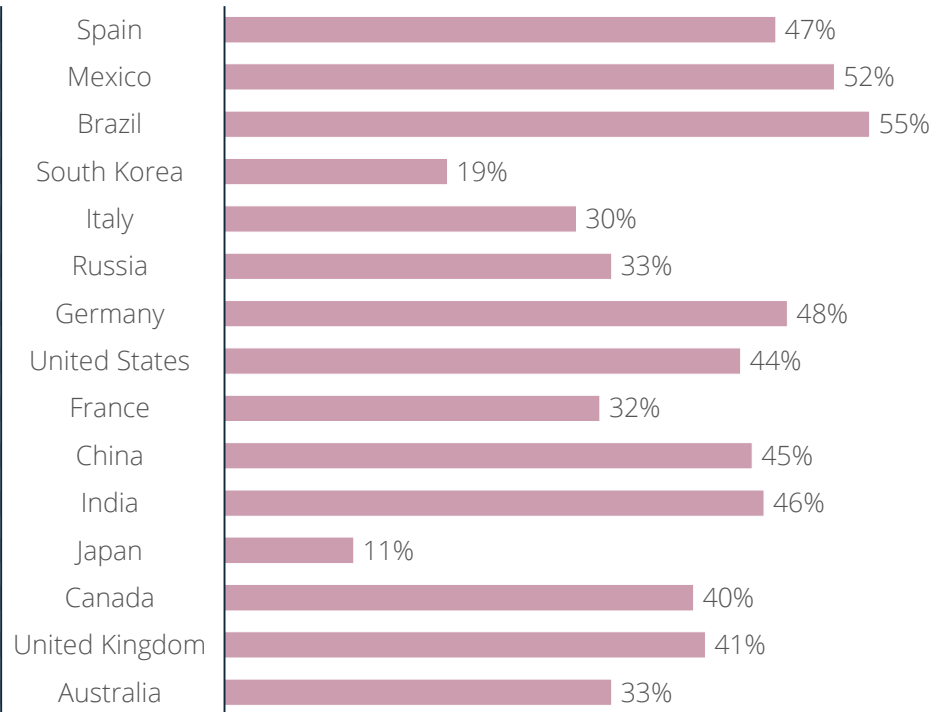
Many internet users are concerned about data misuse, but not all of them take active measures



Share of respondents that are concerned about data misuse on the internet



Share of respondents that take active measures to protect their data



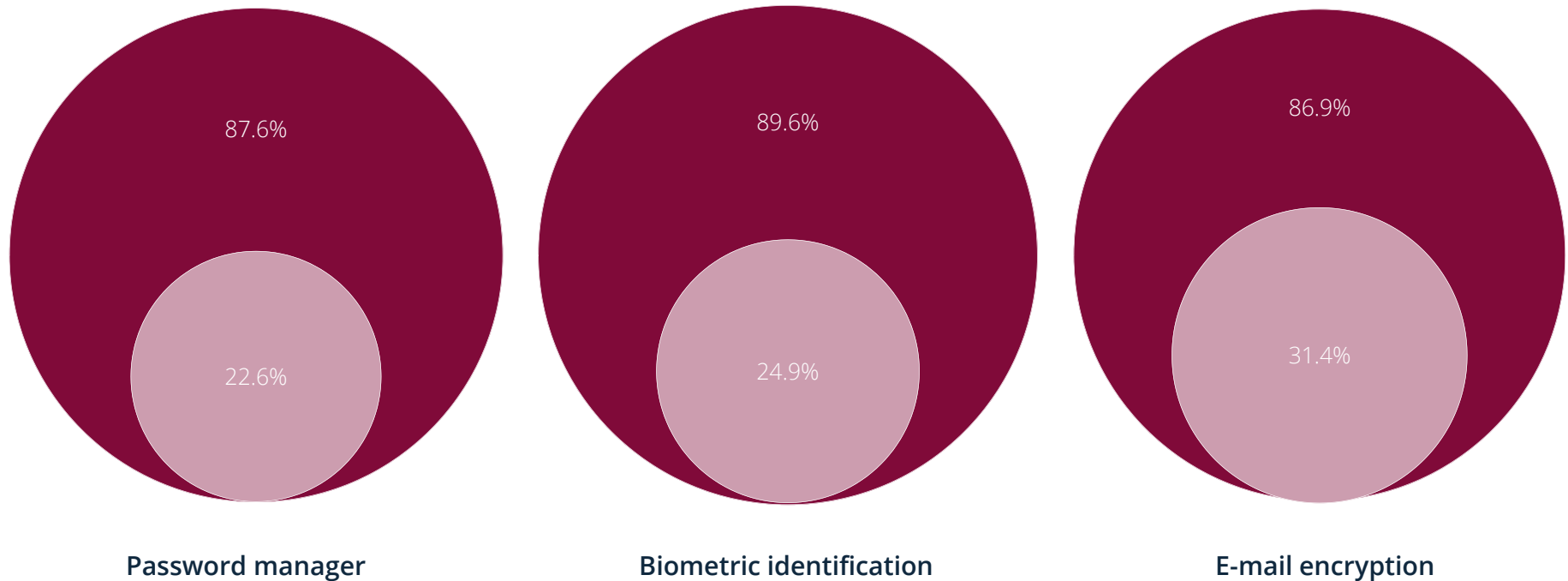
"I'm concerned that my data are being misused on the internet"; "I actively do something for the protection of my data", Multi Pick; n=25,749 respondents

Source: [Statista Global Consumer Survey](#), as at February 2019

Many safety measures to protect personal data are well known but rarely used

Share of respondents who know and use security measures online

● Known ● Used



Value of data

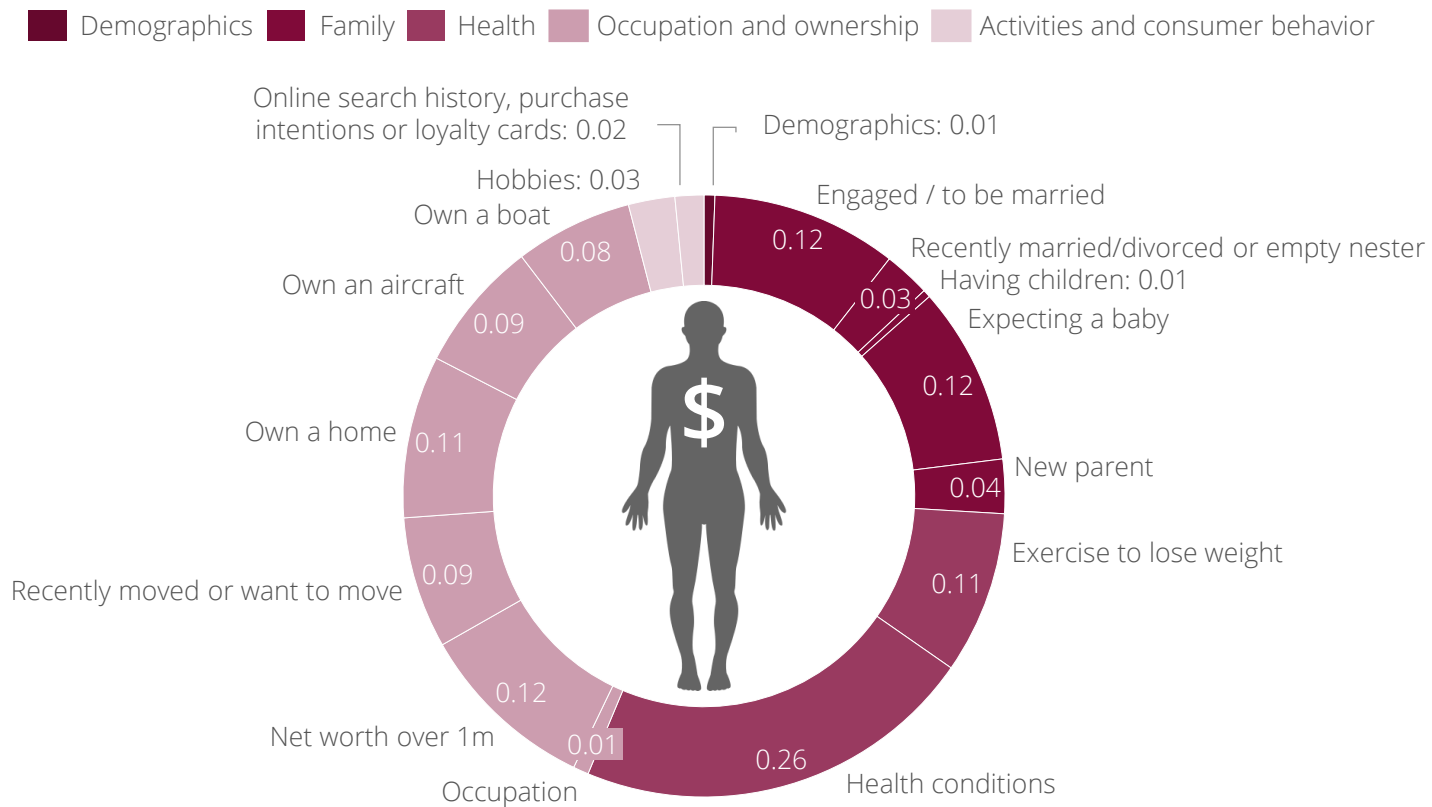
Many private companies are collecting extensive amounts of data about their customers. Facebook or Google are able to track and analyze most of their customers' behavior. This gives them enormous power in the advertising market as they can provide companies with the best-fitting target groups through their advertising and targeting services.

However, it remains unclear to customers what the companies are using their data for and what the value of personal information is. It may come as a surprise that information regarding demographics or occupation is not nearly as valuable to companies as one might think. Instead, information on family planning, medical conditions, or the ownership of certain assets comes at a much higher price. This is due to the private and sensitive nature of these issues and because they might entail certain purchase intentions which companies can serve.



Data on health conditions fetches the highest price

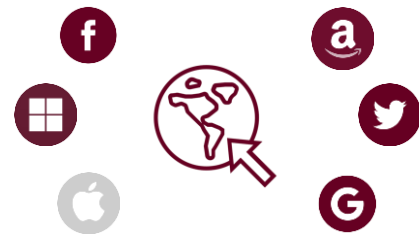
Average price per data point for consumers in US\$ in 2017



Major tech companies collect sensitive user data

Data that major tech companies officially admit to collecting

● Company collects data ● Company does not collect data



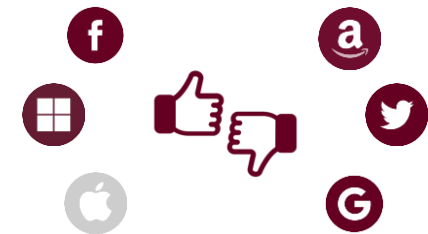
Web activities

Search history and websites visited
Uploads and consumption



Biometrics

Facial recognition data
Voice data



Attitudes

(Dis)Likes on social media
Religious and political views



Living situation

Education
Relationship status



Health/fitness

Sports activities incl. location
Health information

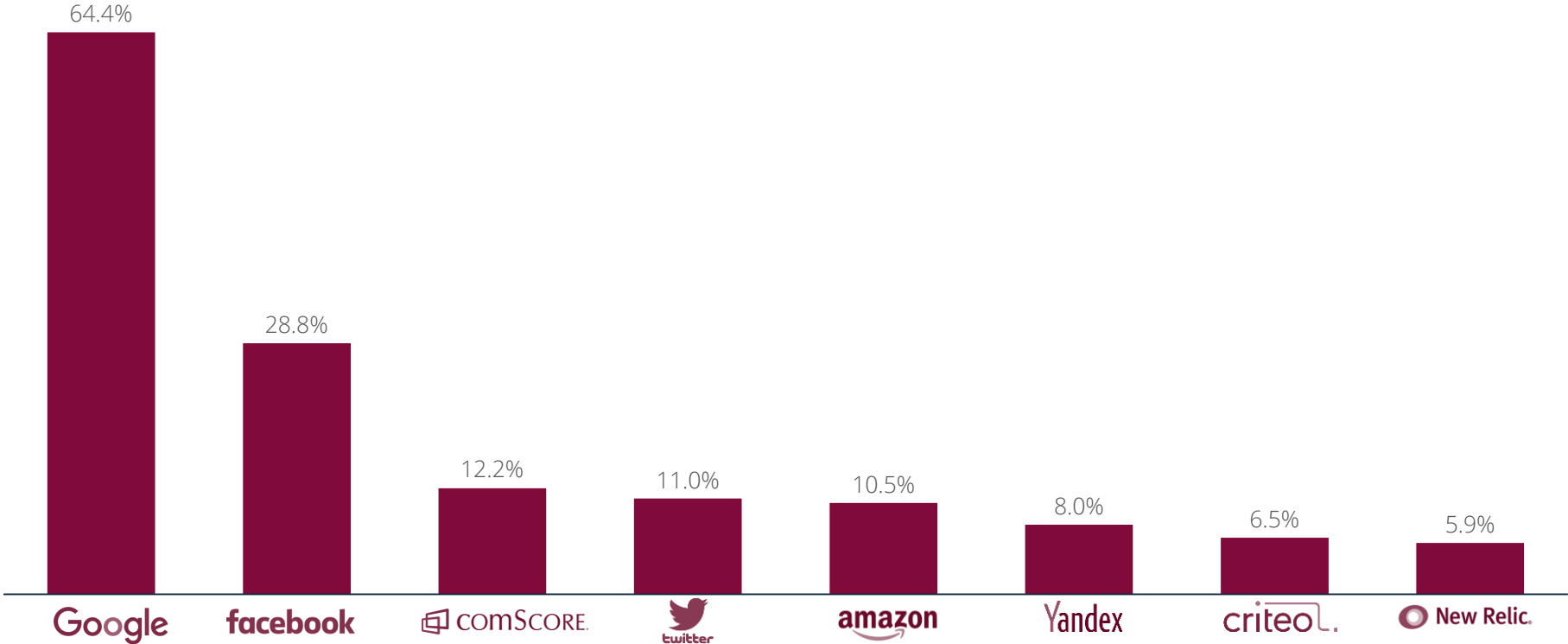


Financial situation

Income level
Purchase history

Google is in the best position to collect data

Share of tracked websites



32 Note: based on the analysis of 144 million websites loaded by 850,000 Ghostery users from more than 20 countries
Source: Ghostery, Cliqz

Google is able to track most of its users' life and activities via its many different platforms and services

Google services, apps or products used for data collection



Data usage

In addition to the aforementioned threats, extensive data collection also has some pleasant consequences for consumers. These include personalized purchase recommendations or content that is created especially for certain target groups. Both are highly valued by customers as they improve the shopping experience or the satisfaction with entertainment services. Many consumers are actually willing to share their data if they receive better-fitting ads in return.

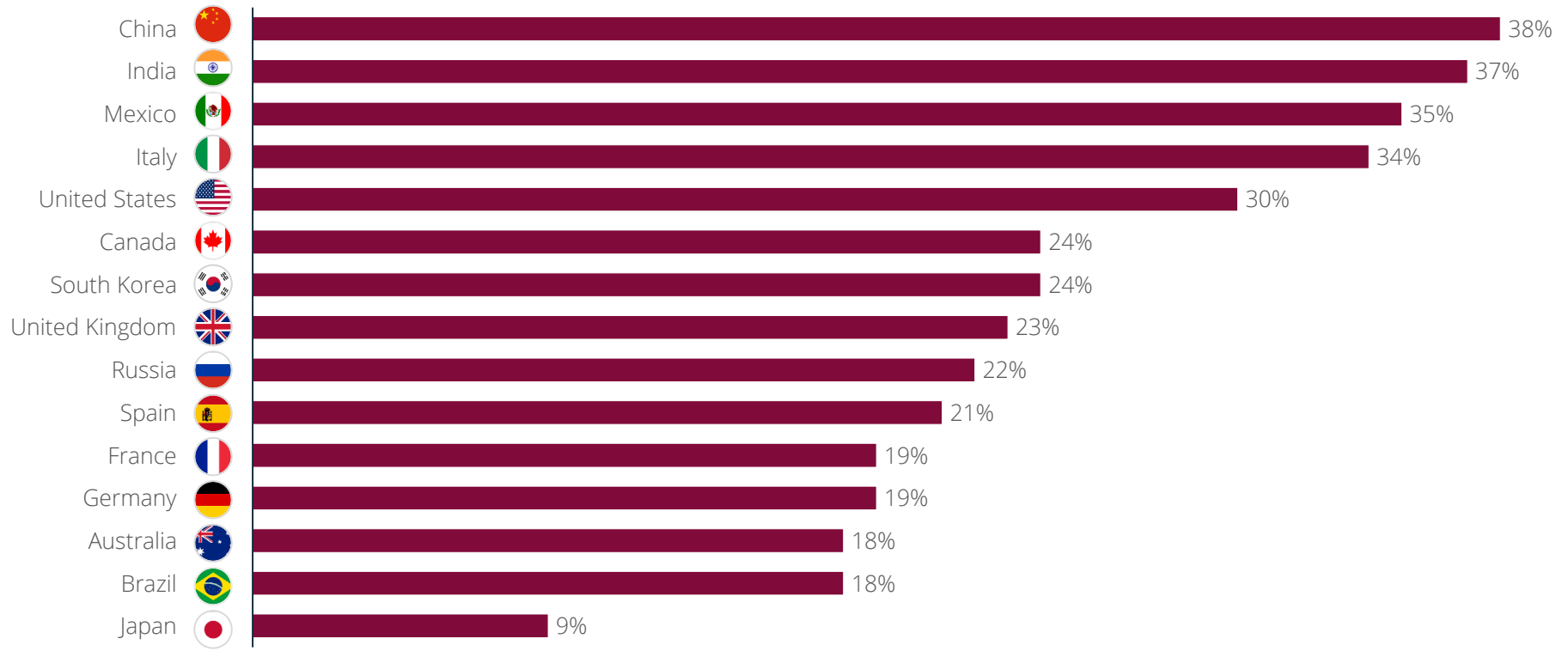
Data collection can also be brought to a new level: China's social credit systems are an example of this. The Chinese social credit systems go a step further than the usual economic credit systems. They evaluate not only a citizen's economic behavior but also their entire online and offline behavior and aggregate it into a personal score. While this might sound restrictive and invasive to many Western societies, these systems are very established and valued in China.



Many customers are willing to share personal data in order to receive better-fitting ads

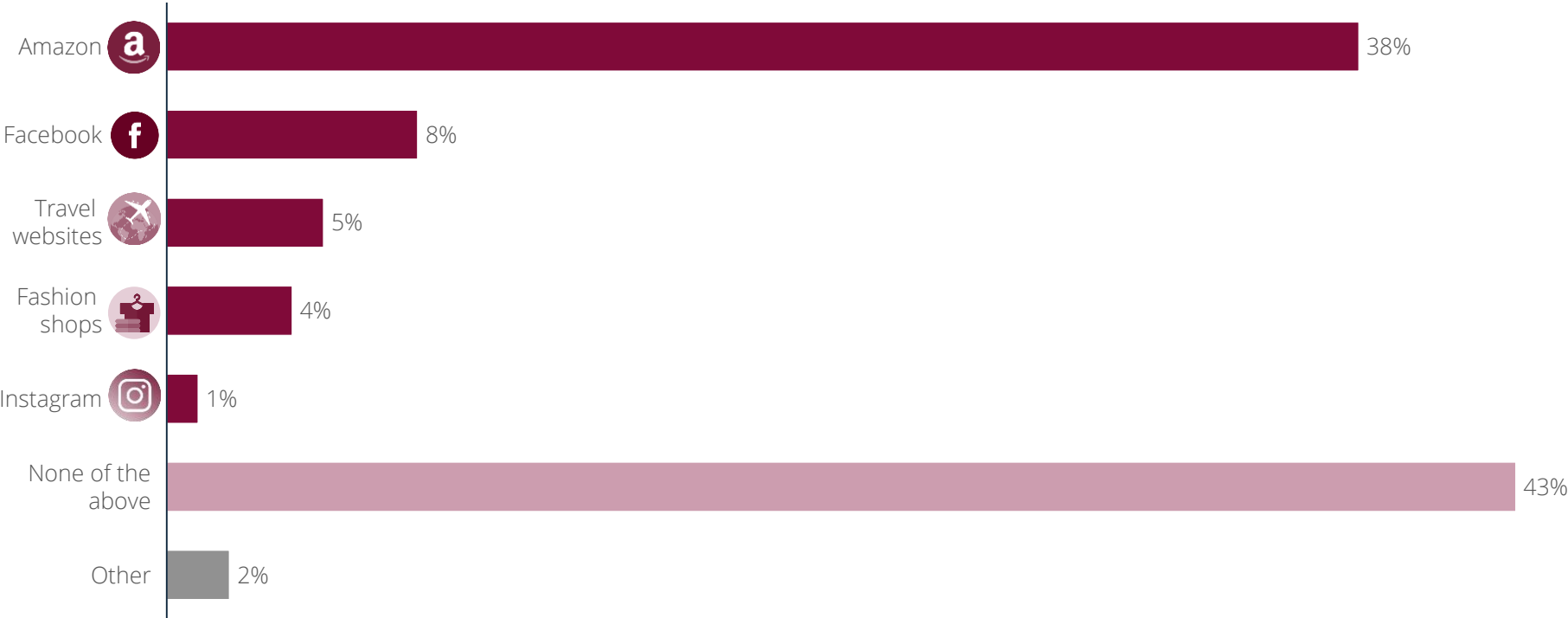


Agreement to the use of personal data in order to get ads that relate better to the person's interests



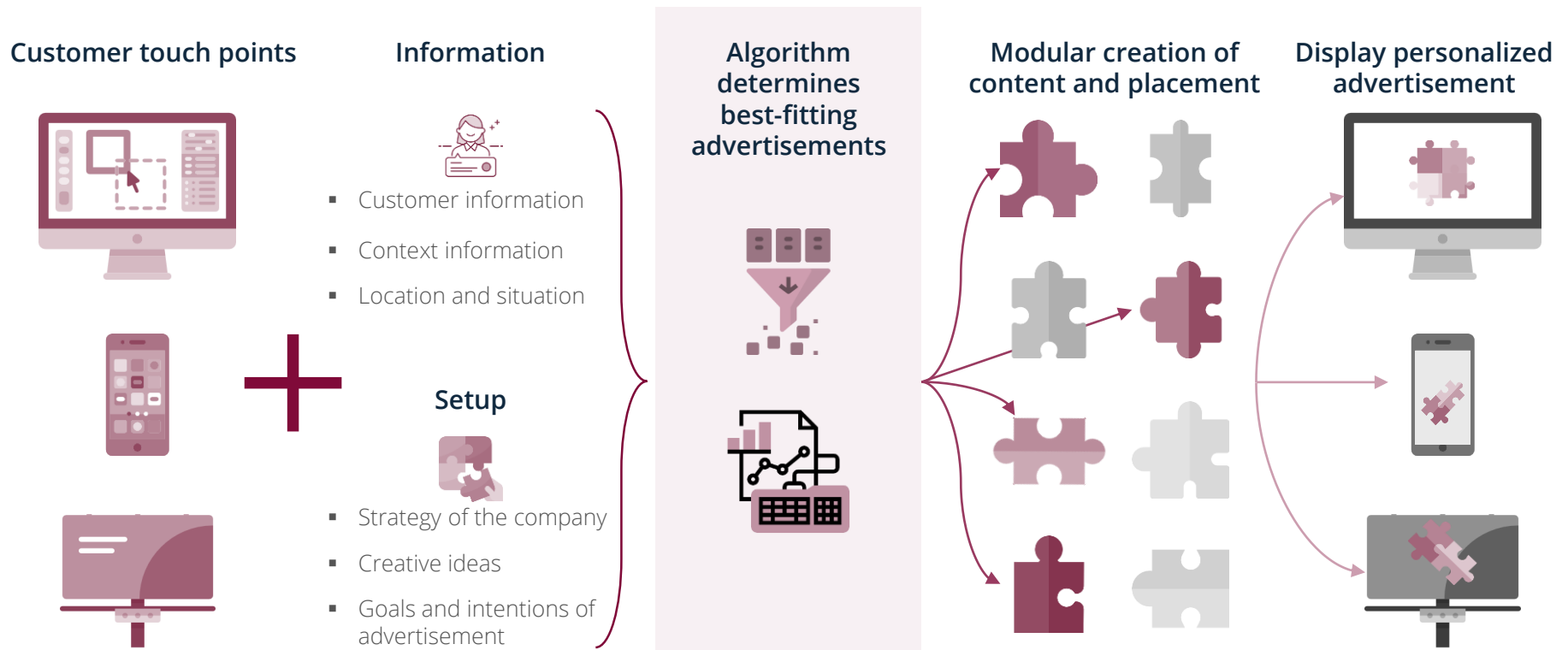
Customers particularly value eCommerce purchase recommendations

Approval of personalized offers and recommendations on selected platforms



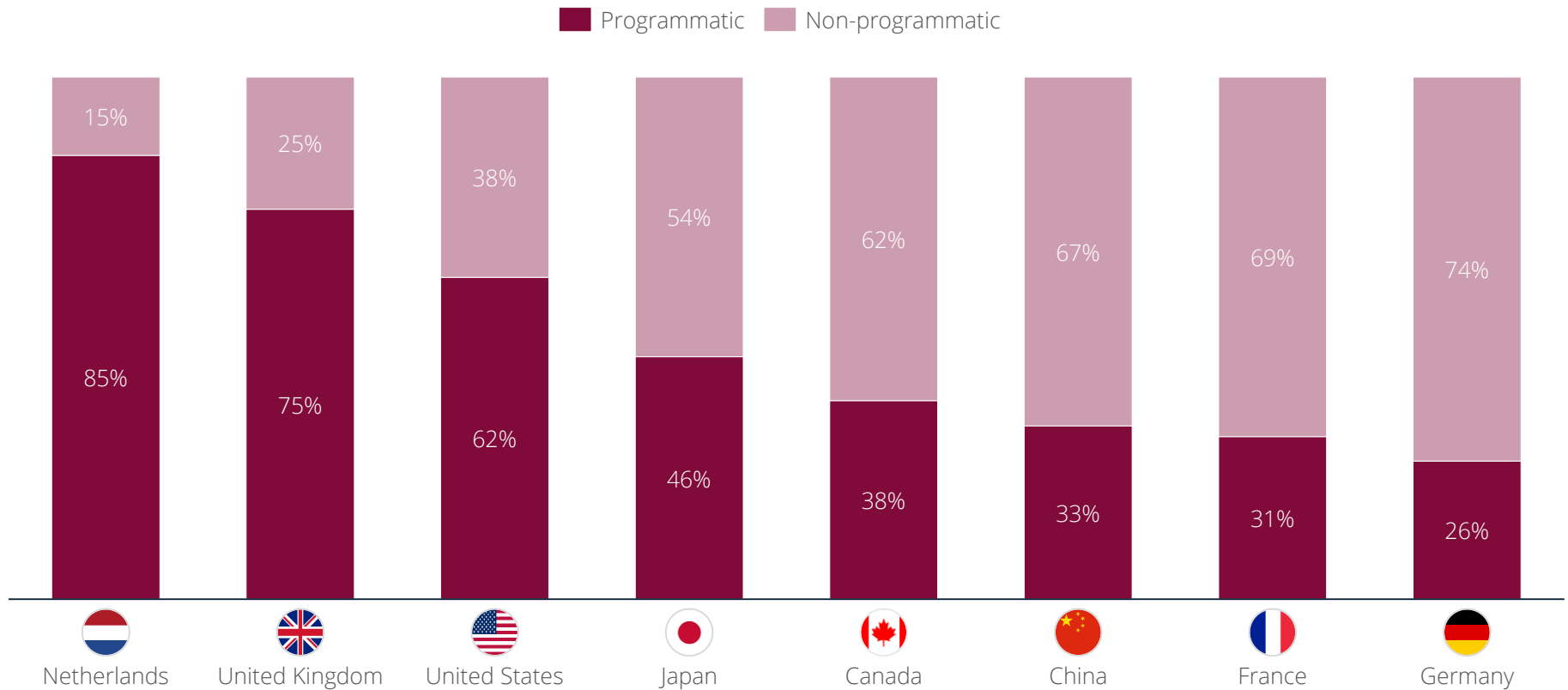
Personalized, algorithm-based advertisements can produce a better fit to each customer's preferences

Advertising's programmatic way of working



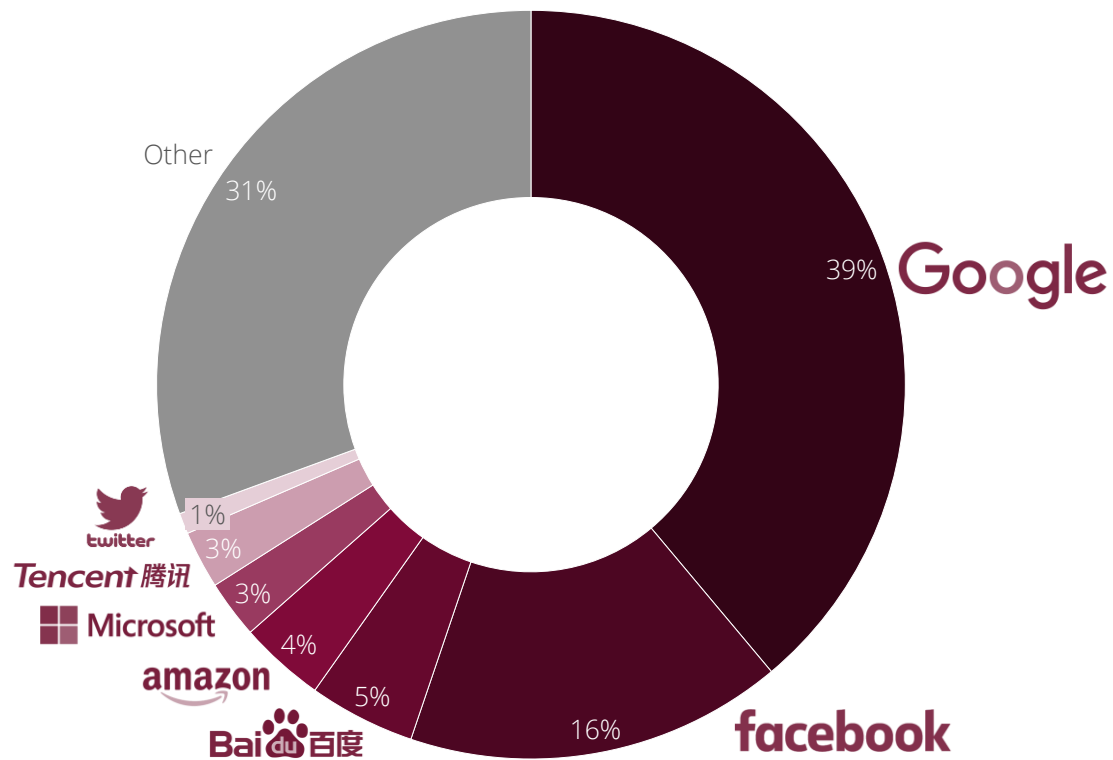
While programmatic advertising is especially popular in the Netherlands and the UK, Germany is far behind

Ad spending shares in 2017



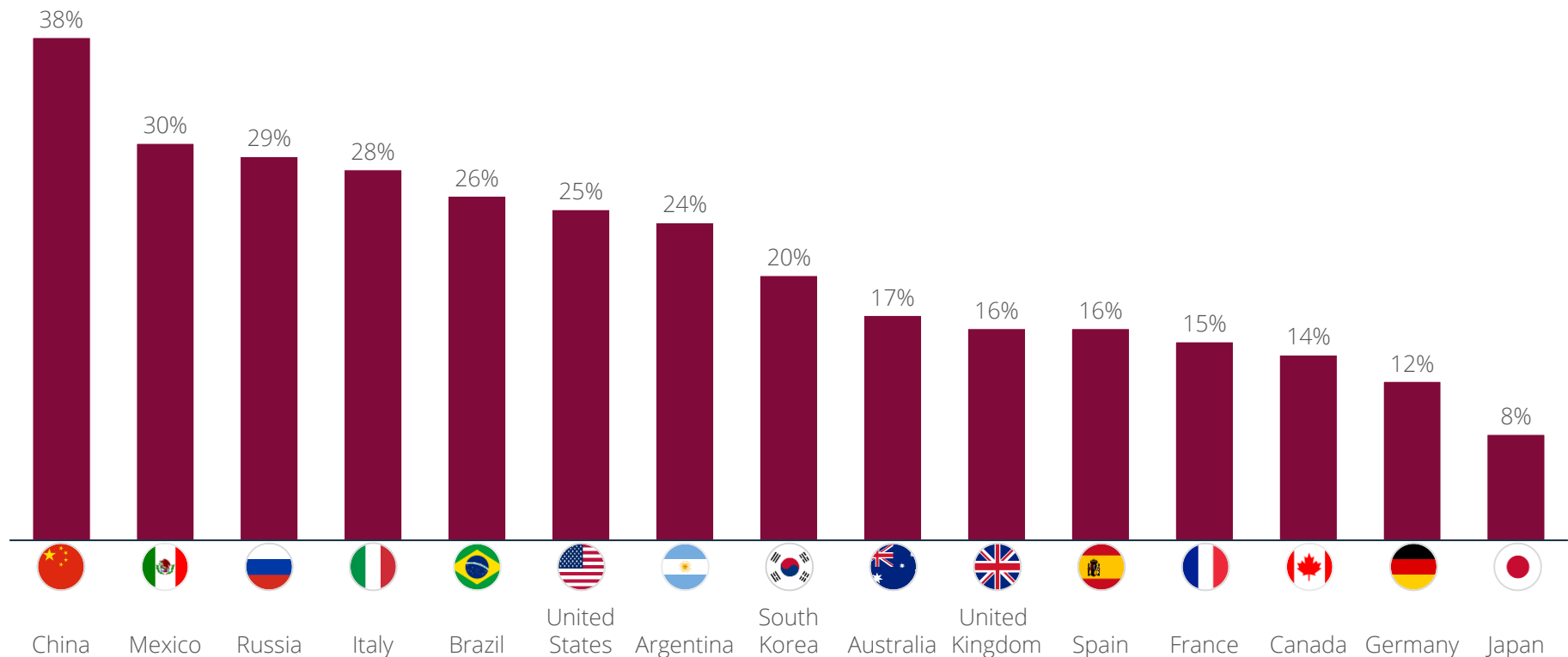
The global digital advertising market is heavily dominated by Google

Digital advertising market shares in 2017



Chinese consumers are particularly willing to share their data in order to receive benefits or rewards

Willingness to share personal data in exchange for benefits or rewards



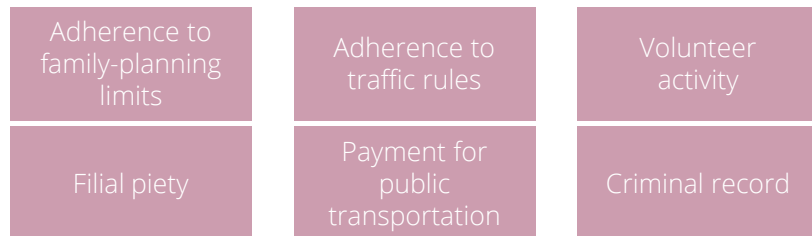
China's social credit systems compile data from different sources to create a score for every person

Input and consequences of the social score

Traditional input



Social input



Online input



Benefits

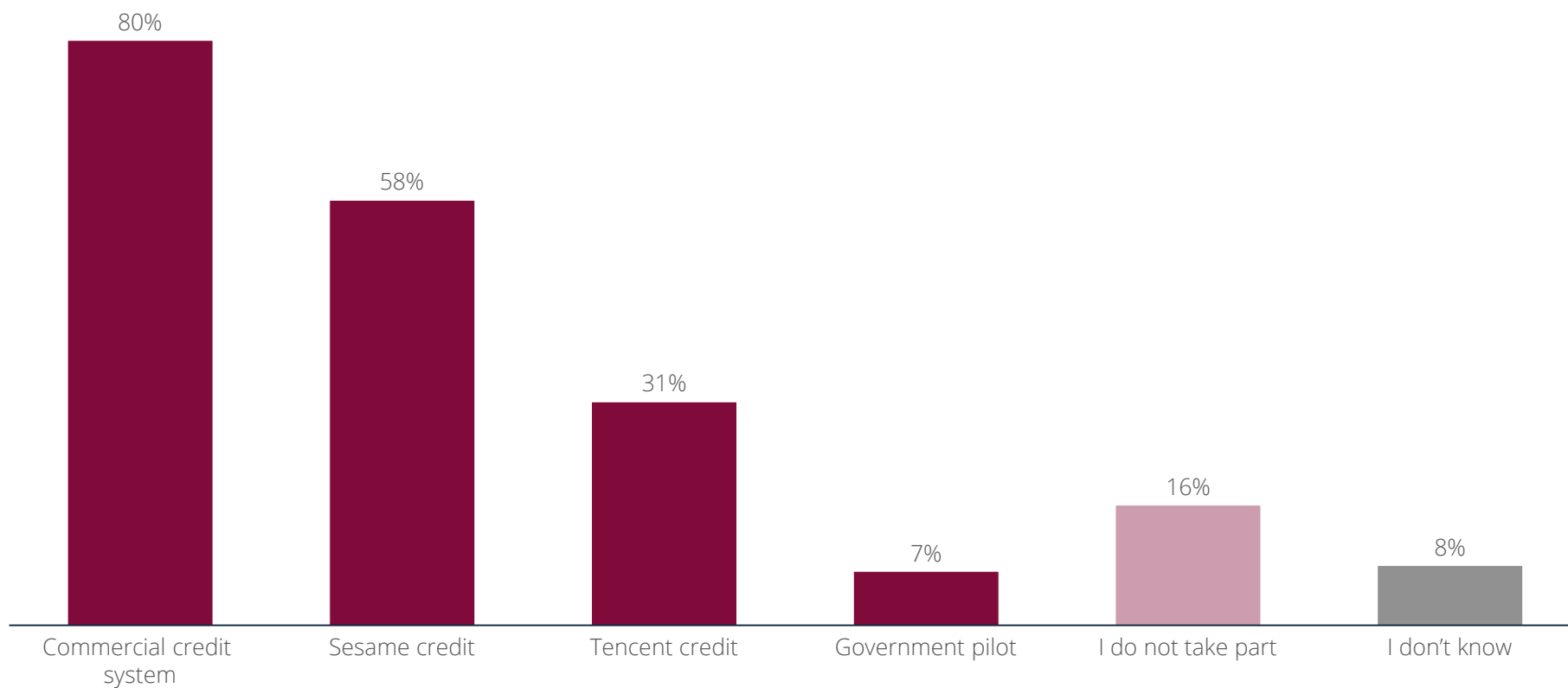
- Priority for school admissions and employment
- Easier access to loans and credits, as well as tax breaks
- Cheaper public transport
- Shorter waiting times in hospitals
- Fast-track promotion at work

Punishments

- Denial of licenses, permits and access to social services
- Exclusion from booking flights and high speed train tickets
- Ineligibility for government jobs
- No access to private schools
- Public shaming online or on TV screens in public places

Social credit systems are highly popular in China

Participation in social credit systems in China

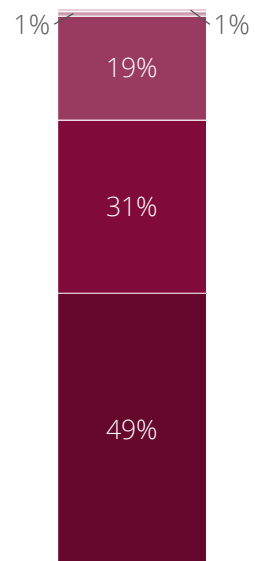


The majority of the Chinese population approves of social credit systems

Approval of social credit systems in China

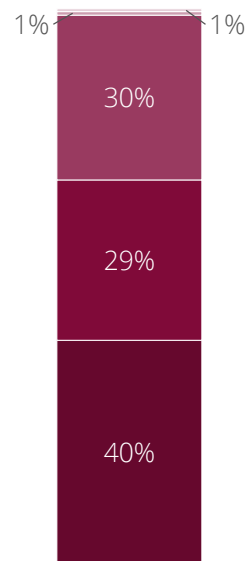
■ strongly approve
 ■ somewhat approve
 ■ neither nor
 ■ somewhat disapprove
 ■ strongly disapprove

Overall

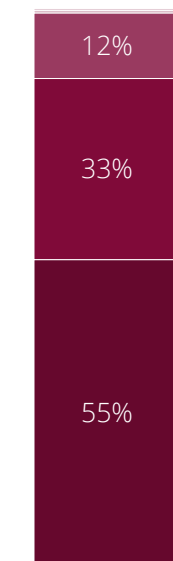


All

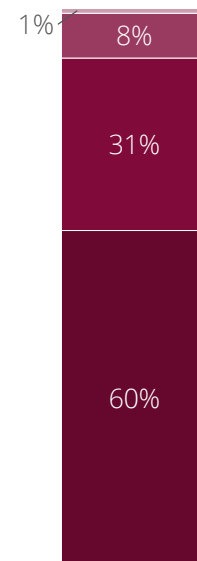
By income



low income

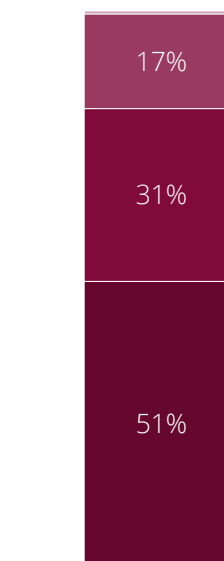


medium income

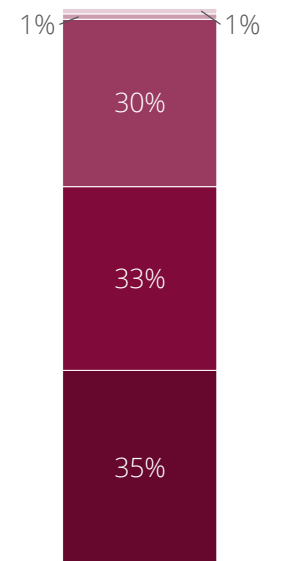


high income

By confidence in government



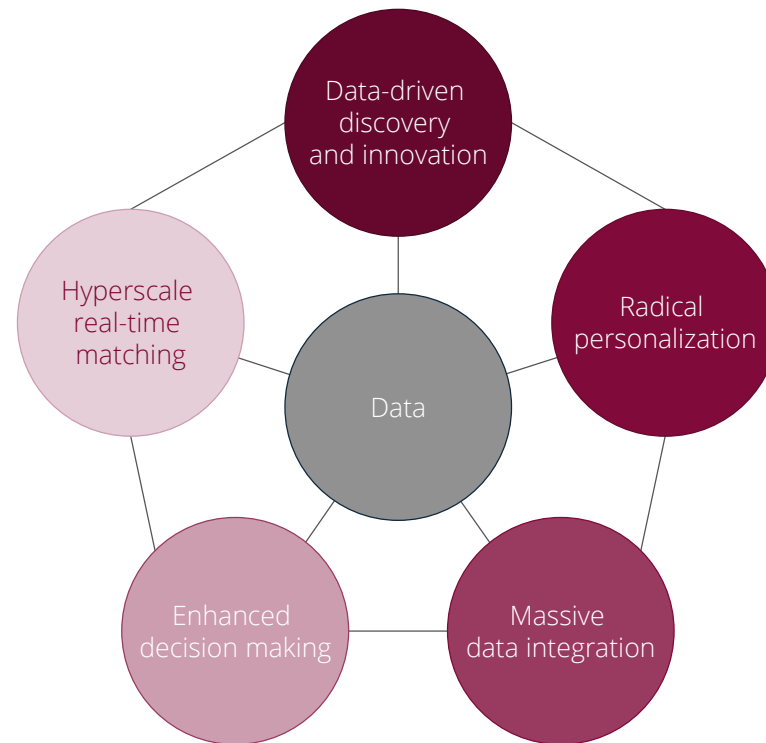
confidence in government



no confidence in government

The unprecedented amount of data can be used for multiple purposes and most of them are AI

Possible applications for Big Data and AI



Artificial Intelligence

One of the buzzwords that you cannot seem to get around lately is “Artificial Intelligence”. It seems like every company and every influencer in the tech sphere is talking about its potential and what it will do for us in the future. But what exactly is Artificial Intelligence? What is it used for? Who invests in it? This chapter will answer these questions.

The term “Artificial Intelligence” (AI) is not new. It was already established in the 1950s and describes machine intelligence that is able to process, analyze, and react to input and changing situations by itself. While simple robotic process automations only deliver a fixed set of actions, advanced AI is able to learn from humans and past behavior and makes decisions on its own. All AI systems are composed of sensing and processing components, while advanced AI also contains learning components. These components are running in a never-ending cycle, leading to better decisions for the next situation.

Today, machines are already partially aware, which means they are able to improve learned actions by themselves, but they still need human interaction and teaching in order to learn something new. The next and final step of AI development will be fully aware machines, which can

teach themselves without any prior information. But this step has not been reached yet. Scientists disagree about the potential implications of fully aware machines as it is impossible to predict what these machines will be able to do and how this will affect humanity. Some consider them a great threat because they will be considerably more intelligent than humans and will be capable of teaching themselves.

AI use cases

Although the concept of AI sounds futuristic, it is already used by many companies. Examples are image recognition, language processing, data analysis, or the planning and optimization of processes. Many start-ups and established companies are working on bringing AI applications to the market or use it for their own products and processes. Interestingly, the travel industry will most likely experience the highest impact of AI applications: AI could increase the travel industry's revenue by more than 11% by 2025. At the same time, it is the sector with the least adoption of AI technologies. In the technology sector, on the other hand, 32% of companies were already using AI technologies in 2017.

Well-known examples of companies that are already using AI for their products are Amazon with Alexa's language processing or Tesla with its autonomous driving features.

An everyday object that can also be equipped with AI is the smartphone keyboard. The company SwiftKey developed an AI technology that is able to understand the context of a message and makes suggestions for the next word based on this context.

The Chinese news and information content platform Toutiao by Bytedance uses AI for their automated journalism concept. This company is still rather unknown in the United States and Europe. Toutiao creates and fills users' news timeline based on demographics and their previous and current usage behavior. The AI is managing 90% of the content on the newsfeed. Additionally, it creates and writes content all by itself.

Impact of AI

The increasing application of AI technologies will lead to a huge rise in global revenues made with AI applications, from only US\$7 billion in 2018 to US\$90 billion in 2025. The majority (45%) will be made in North America, followed by Asia and Europe with almost one quarter each.

Asia in general and China in particular are already very established in the AI market and will continue to grow in the future. The Chinese government revealed its plans to become an AI-first economy and the world leader concerning AI application and implementation by 2030. With an additional US\$7 trillion in GDP by 2030, China will most likely also be the biggest winner of AI implementation in terms of economic gains, followed by North America with only US\$3.7 trillion. Europe and the rest of the world are lagging even further behind.

This is also evident in the share of AI patent applications, which are highest in the United States and China with a share of more than 20%

each. IBM and Microsoft are dominating the AI knowledge landscape regarding the number of patent applications.

Investments in AI

Investing in AI becomes increasingly relevant with global enterprise investments rising from US\$12 billion in 2018 to US\$232 billion in 2025. While the overall AI market is of great interest to companies and investors, machine learning has been the most prominent application of AI so far. It attracted 62% of the overall AI investments in 2017, and the vast majority of AI start-ups are focusing on machine learning.

Global funding for AI companies made a huge leap in 2017, reaching US\$15 billion. While companies from the United States received most of the deals in the past, their share is continuously decreasing and stood at only 39% of all global deals in 2018. The top 3 highest-funded start-ups are from China.

But not only investors are betting on AI: Many large tech companies are developing AI applications themselves or acquire start-ups active in the AI field. When comparing the acquisitions of Apple, Google, Facebook, Microsoft, and Amazon, it becomes clear that their hunger for AI start-ups has grown immensely. While all five companies have bought start-ups with a focus on AI in the past 18 years, Apple and Google have acquired by far the largest number of AI start-ups with 16 and 15 each.

All this shows that large tech players and investors are considering AI to be an important technology for the future.

Everyone is talking about AI – and here is why

Global AI impact and use

**72% of
business
leaders**



say AI will bring about a business advantage

**US\$15.7
trillion
in value**



will be added to the economy by 2030 from AI productivity and personalization

**2.3 million
jobs**



will be created in companies thanks to AI technologies by 2020

**4 billion
devices with
voice skills**



are currently in use

**1 billion
video
cameras**



will be connected to AI by 2020

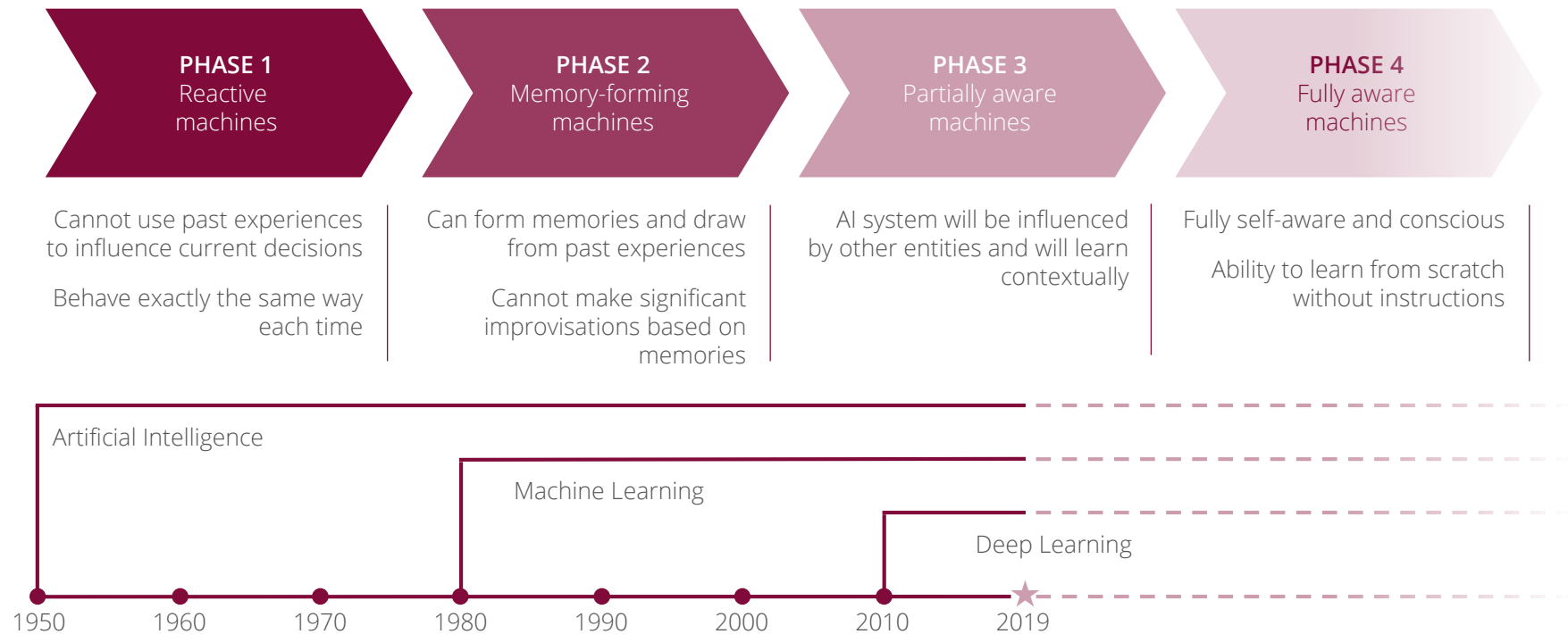
**75% of
customer
interactions**



will be managed by AI by 2020

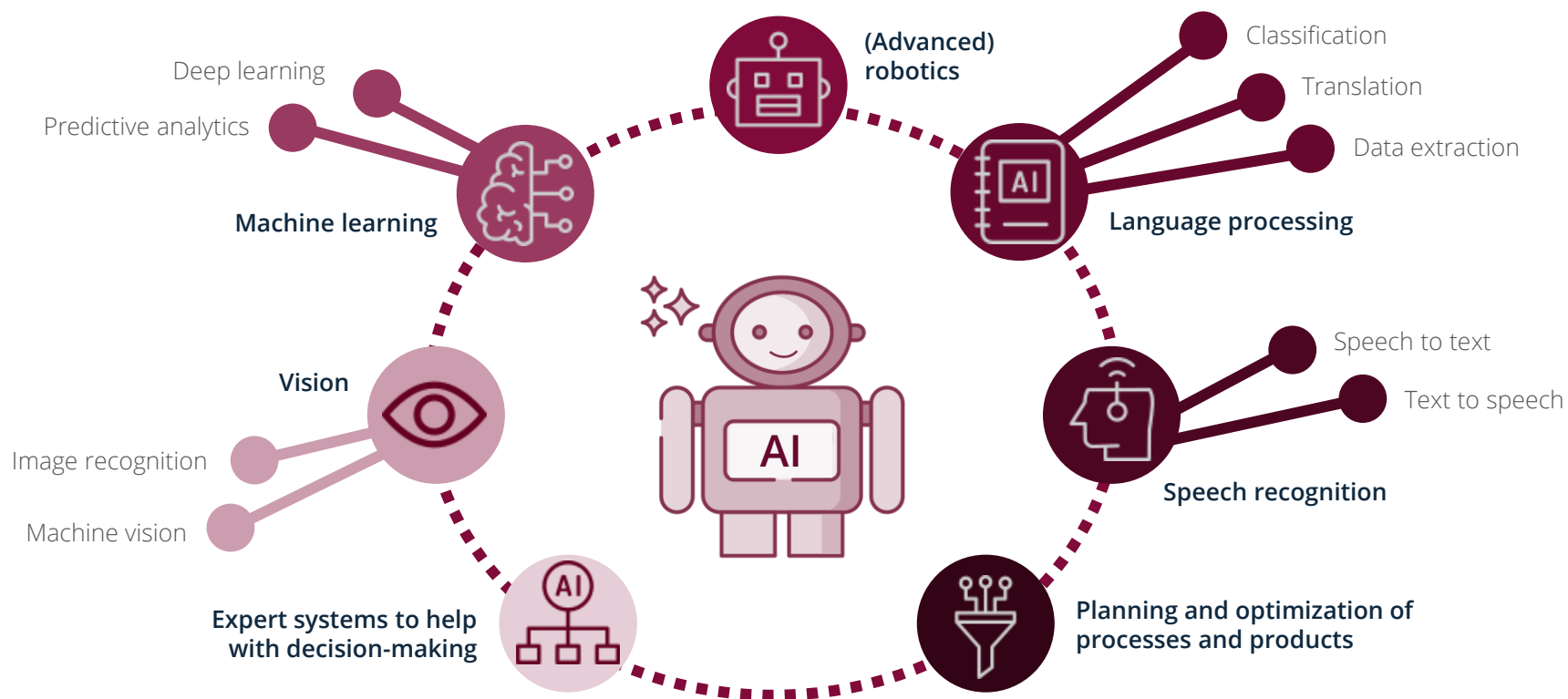
Artificial Intelligence is not a new thing: It started in the early 50s

The evolution of Artificial Intelligence



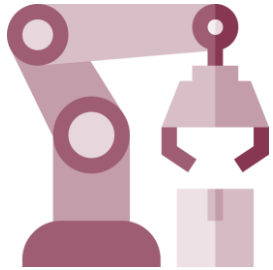
Artificial Intelligence is more than machine learning

Artificial Intelligence technology and its applications



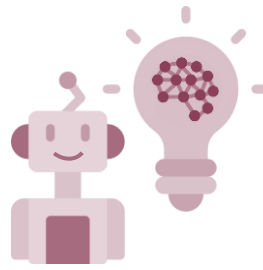
Early AI agents combined with modern machine learning lead to buzzwords everyone is talking about

Intelligent Automation is based on Robotic Process Automation and Machine Learning



Robotic Process Automation

- React on input data
- Act in predefined ways
- Usually only do simple tasks



Intelligent Automation

-  ▪ Autonomous vehicles
-  ▪ Prescribing treatment plans
-  ▪ Smart security systems
-  ▪ Smart warehouse management
-  ▪ Airborne drone technology

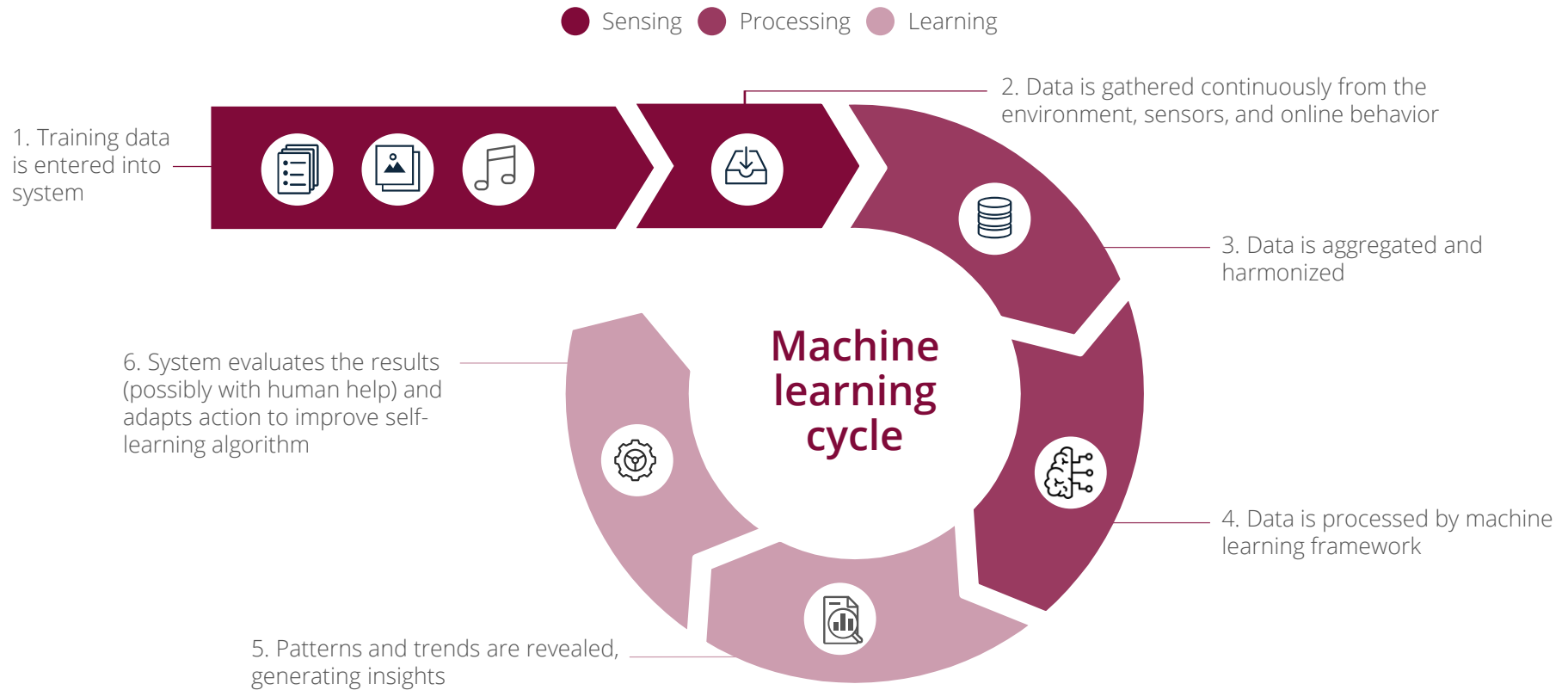


Machine Learning

- Improve based on input
- Can react to unknown situations
- Can handle complex tasks

Machine learning consists of sensing, processing, and learning components

The typical machine learning cycle



AI use cases

Although the concept of AI sounds futuristic, it is actually used by many companies already. Many start-ups and established companies are working on bringing AI applications to the market or use it for their own products and processes.
















In the technology sector, 32% of companies were already using AI technologies in 2017. While the use of AI is already high in technology-dependent sectors, it will most likely have the highest impact in the travel industry, where AI could increase the industry's revenue by up to 11% by 2025.

Well-known examples of companies already using AI for their products are Amazon with Alexa's language processing or Tesla with its autonomous driving features. The Chinese news and information content platform Toutiao by Bytedance uses AI to create and determine users' news timeline based on previous and current usage behavior and is also providing content created only by AI.



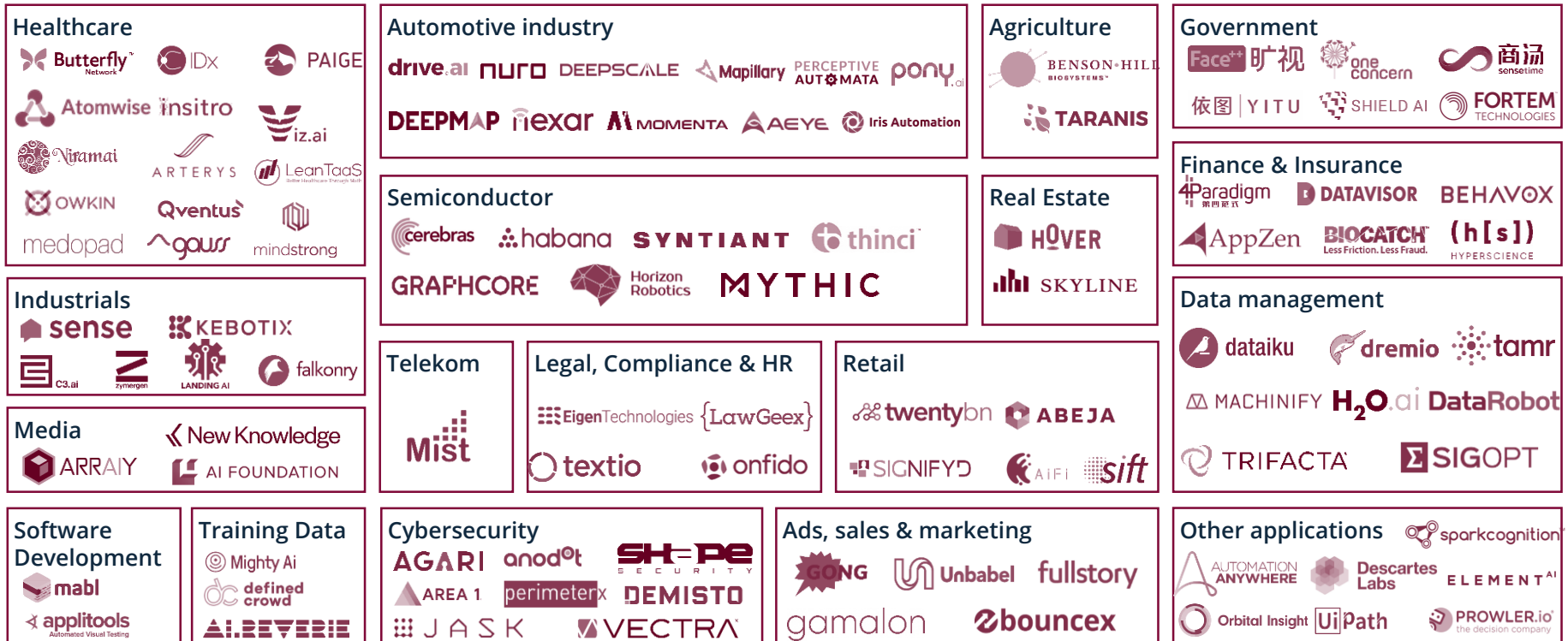
AI has applications in all industries

Examples of AI technology applications in different industries

Agriculture	Smart sensors 	Mixed-reality applications 	Precision agriculture 
Banking	Virtual assistants 	Robo-advisors 	Fraud protection 
Automobiles	Navigation systems 	Lane detection systems 	Self-driving vehicles 
Healthcare	Health monitors 	Cancer diagnostics 	Custom treatment plans 
Manufacturing	Industrial robots 	Predictive maintenance 	Self-correcting systems 

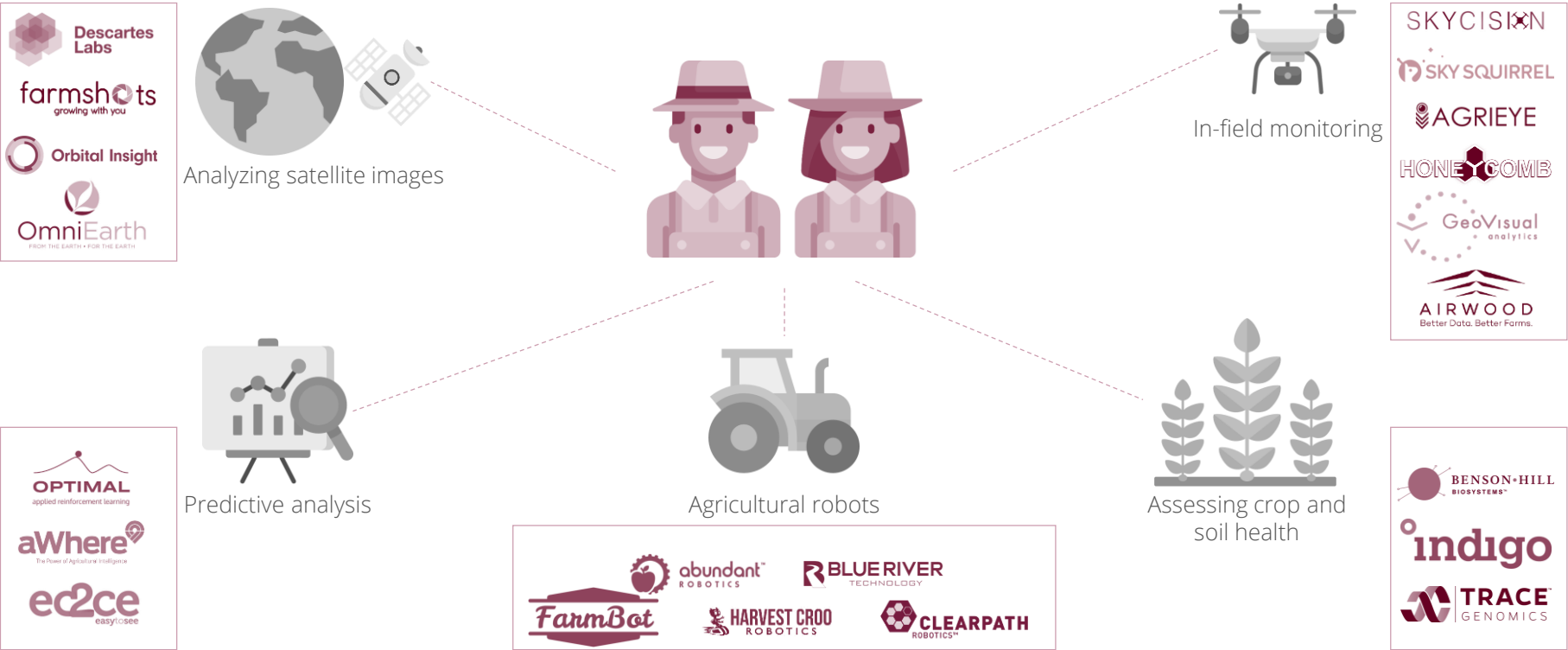
Many AI start-ups are specializing in a particular industry

Top 100 AI start-ups in 2019



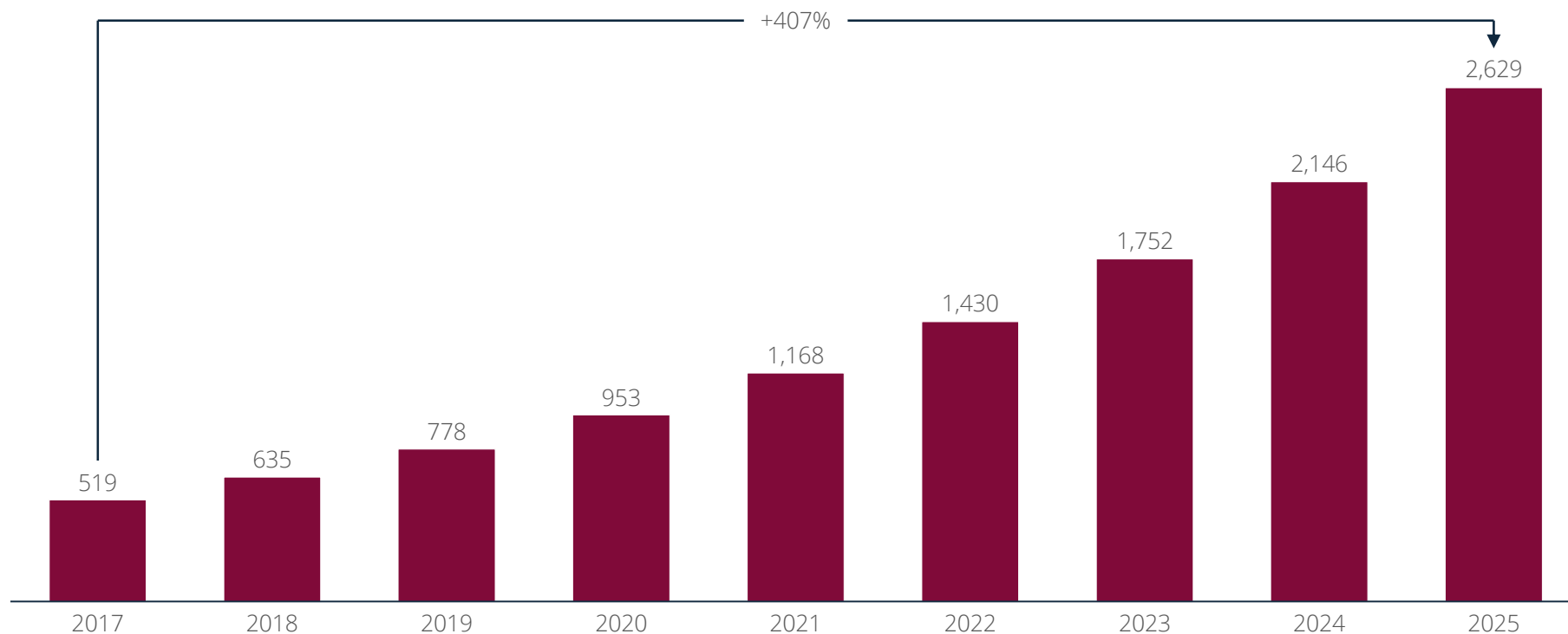
Farming and agriculture are good examples of specialized AI applications

Use cases for AI and robotics in agriculture



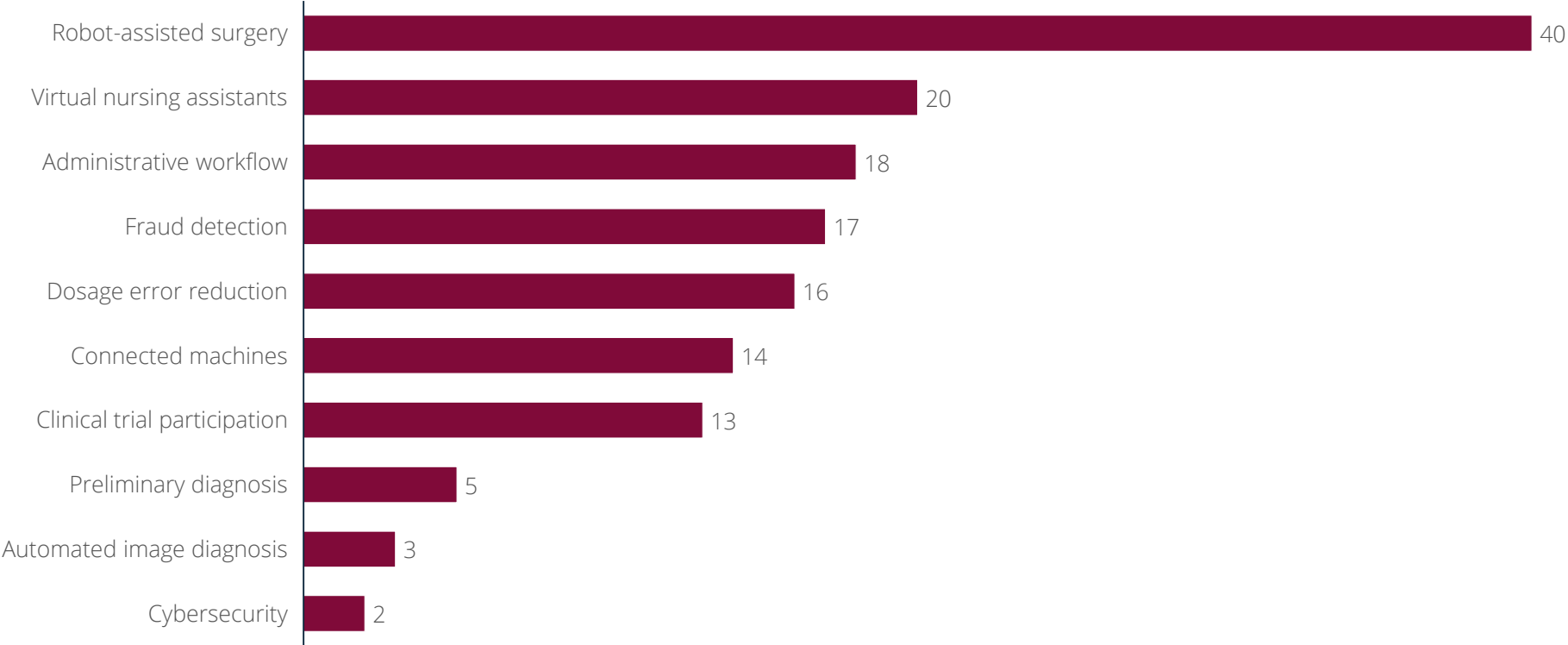
The value of AI in agriculture will quadruple by 2025

Value of AI in agriculture in million US\$



In medicine, the most promising applications of AI are robot-assisted surgeries

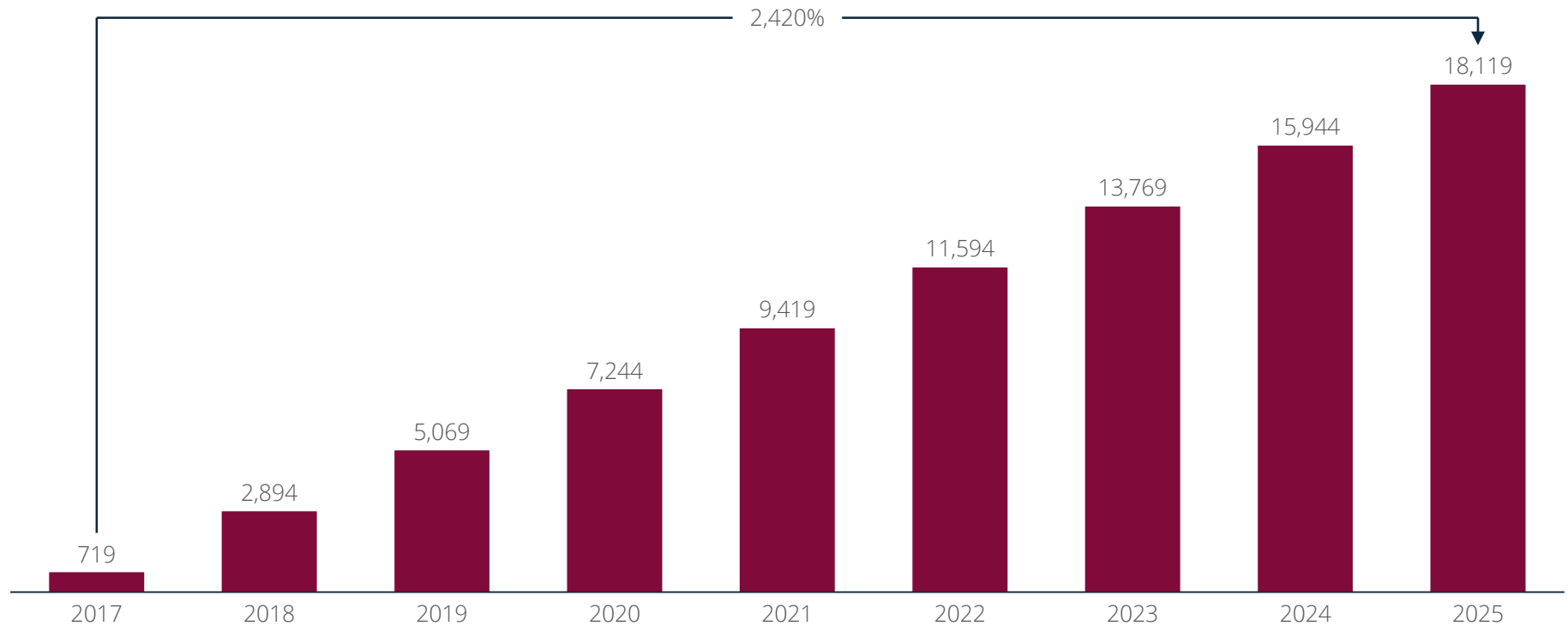
Potential annual value¹ of selected AI applications in billion US\$ by 2026



57 1: "value" refers to the estimated potential benefit of each application
Source: Accenture, hbr.org

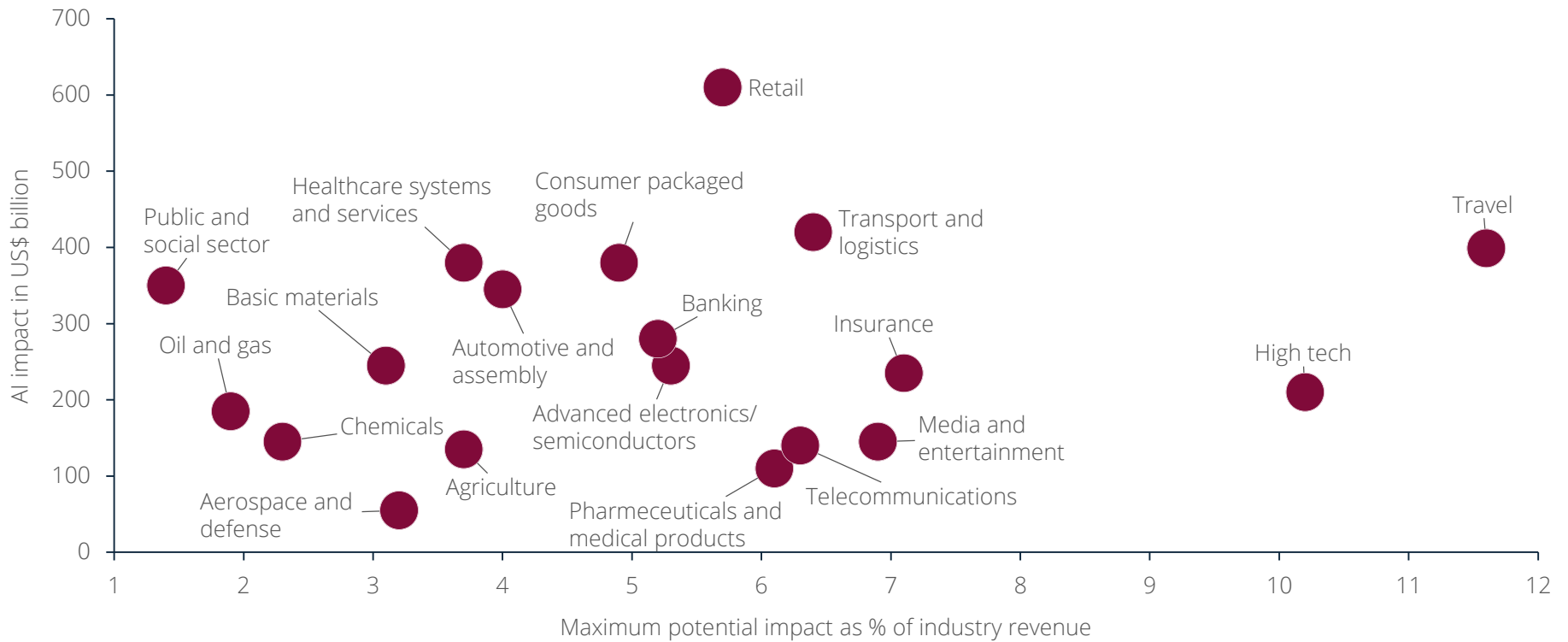
The value of AI in medicine will grow by 2400% by 2025

Value of AI in medicine in million US\$



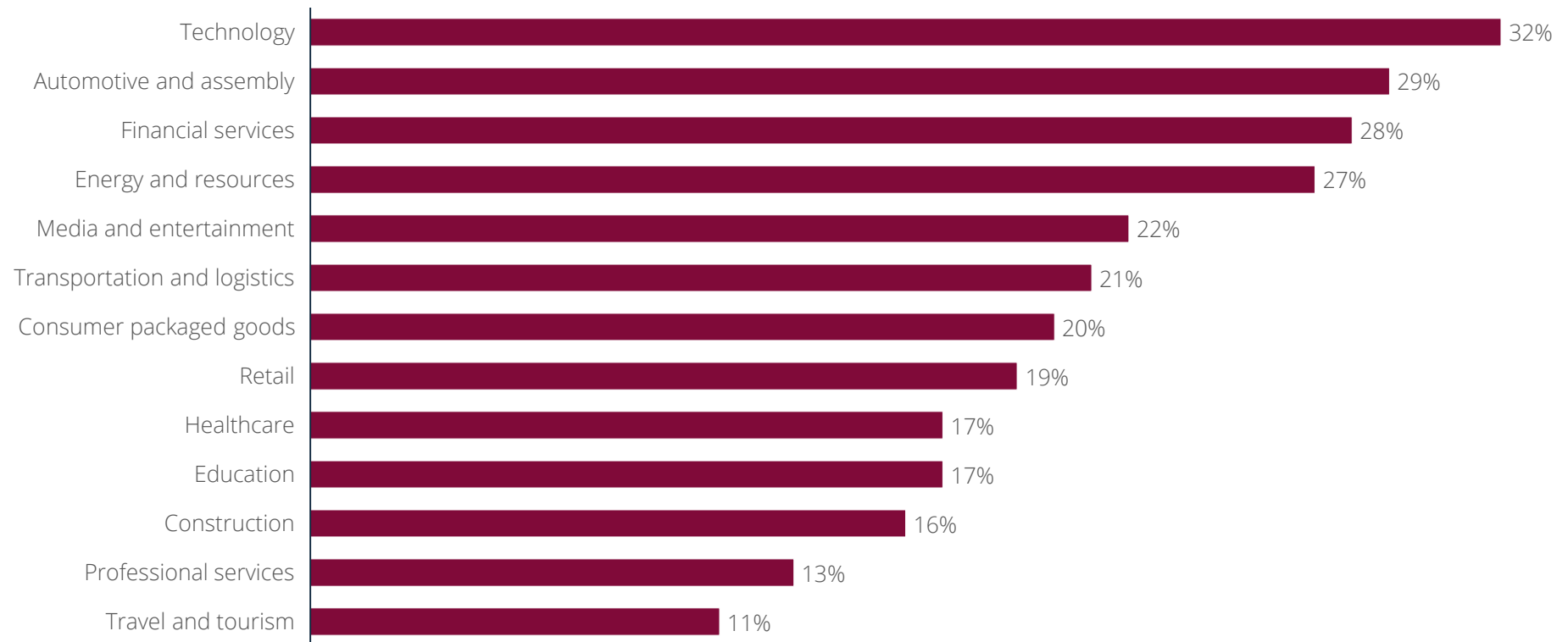
Overall, the travel and high-tech industries will benefit most from AI

Potential annual impact of AI technologies in global industries by 2025



Despite having the highest potential, travel and tourism companies are slow in adopting AI

Share of companies that adopted AI technologies in 2017



AI is not only about industrial usage, it is also a part of our daily life

Examples of consumer-focused AI applications

amazon



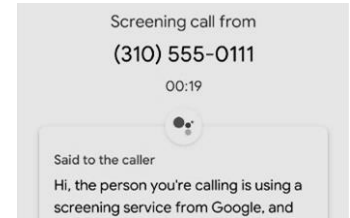
Amazon's Alexa makes use of natural language processing (NLP) technology to understand human speech and give responses based on the conversation's context.

Microsoft



For a seamless integration of virtual objects into reality, Microsoft HoloLens applies object recognition, vision processing, and deep neural networks technology.

Google



Like Amazon, Google's screen calling feature uses NLP to transcribe incoming calls and automatically identify unwanted calls based on the call's context.

facebook



Deep learning technology is supposed to help Facebook to automatically detect fake news in users' newsfeeds. In addition to texts, images and videos are also analyzed.

Apple



By using deep learning methods and vision processing methods, Apple's Face ID feature is capable of distinguishing human faces at an error rate of only 1:1,000,000.

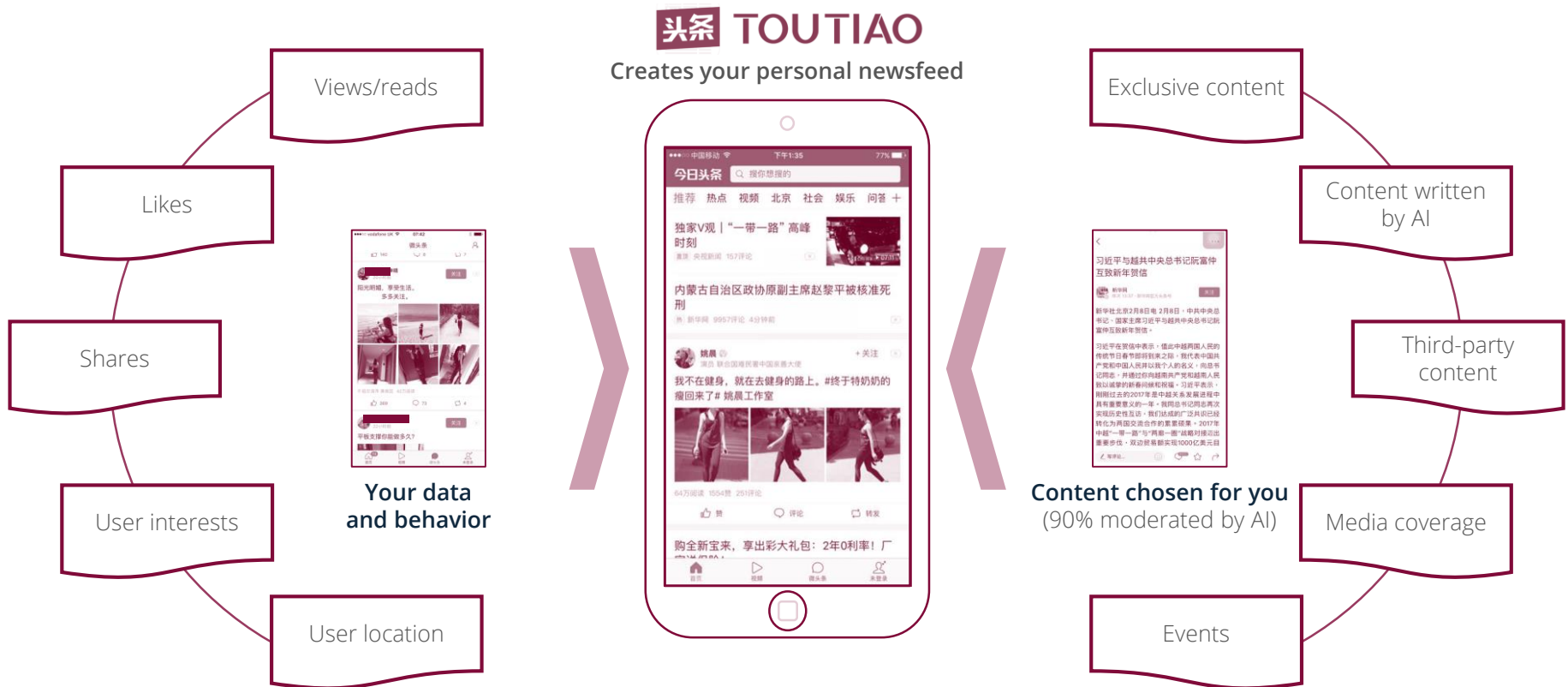
TESLA



Tesla's Autopilot combines a wide set of AI technologies like deep learning, predictive analysis, object recognition, and machine vision to enable fully autonomous driving.

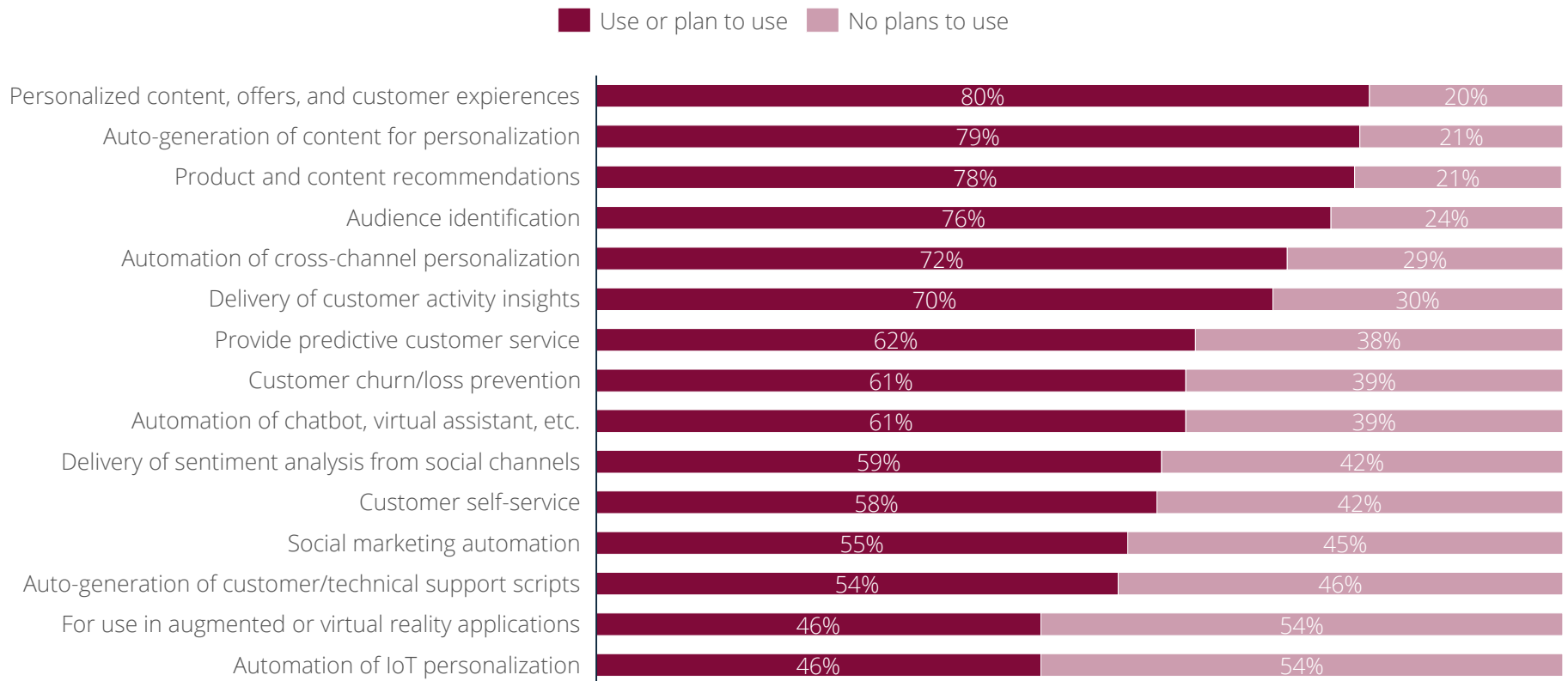
Toutiao uses AI to generate and aggregate content based on user behavior

Illustration of Toutiao's automated journalism concept



In marketing, the personalization of content is the most frequently used AI application

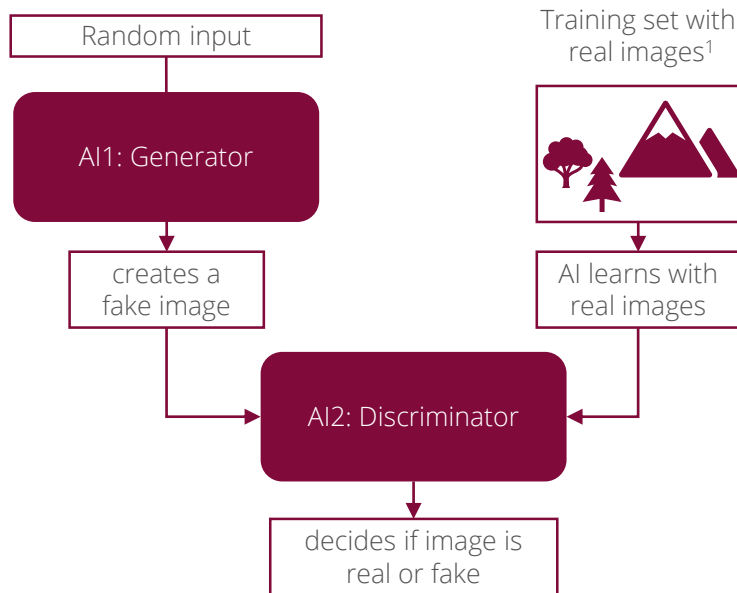
Worldwide adoption of AI in marketing personalization according to industry professionals in 2018



NVIDIA's AI software GauGAN is able to create photorealistic pictures from rough drawings

How generative adversarial networks work

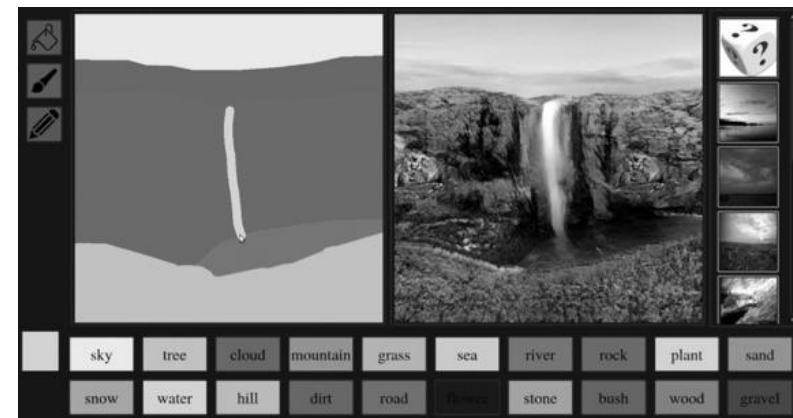
GANs¹ are the product of two networks: a generator and a discriminator. The two go head-to-head on millions of images, with the generator presenting images to the discriminator, which is then trained to distinguish real from fake images using real samples to provide pixel-by-pixel feedback, continuously improving on details.



NVIDIA's GauGAN

With this software, users can create simple pictures with the help of a paint bucket, pen, and pencil. A series of objects can also be put into the frame. If a user selects the cloud button and draws a line, the software will produce a wisp of photorealistic clouds. The neural network has been trained to create realistic landscape images. If the user changes the setting from cloud to snow, GauGAN1 will reconfigure the scene to reflect a winter setting. The result is always a unique, synthesized image. GauGAN is multimodal: If two users create the same sketch, the software creates different results.

Simple input and photorealistic output:

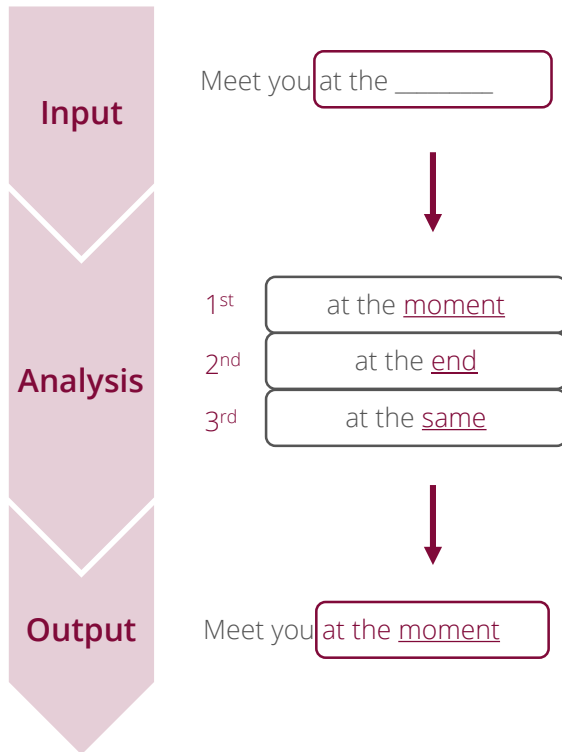


Note: Gau = named after the postimpressionist painter Paul Gauguin; GAN = Generative adversarial networks; for GauGAN, NVIDIA turned to 1 million images on Flickr to train the neural network
Source: Company information, techcrunch, towardsdatascience.com

SwiftKey's AI keyboard predicts what users will type



Before 2016: prediction model¹

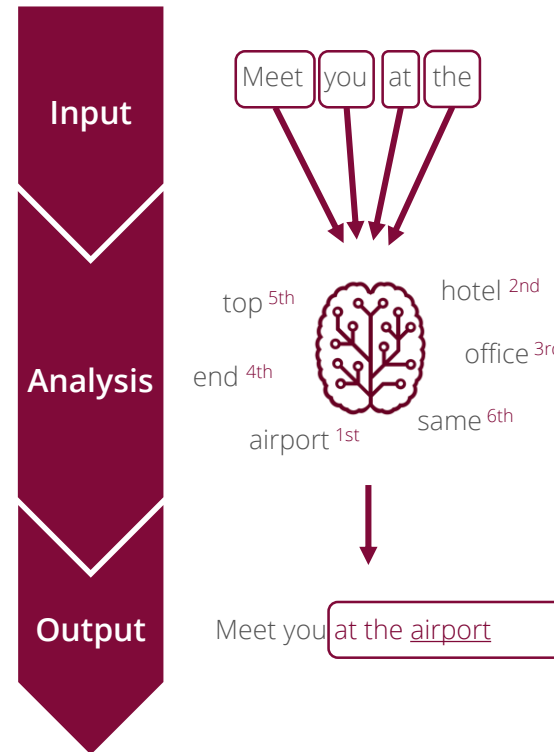


The last words in a sentence constitute the input for the prediction model.

The model ranks the most common next words and offers these as predictions.

These word combinations might be the most common ones but are not necessarily relevant to the context.

After 2016: neural network model



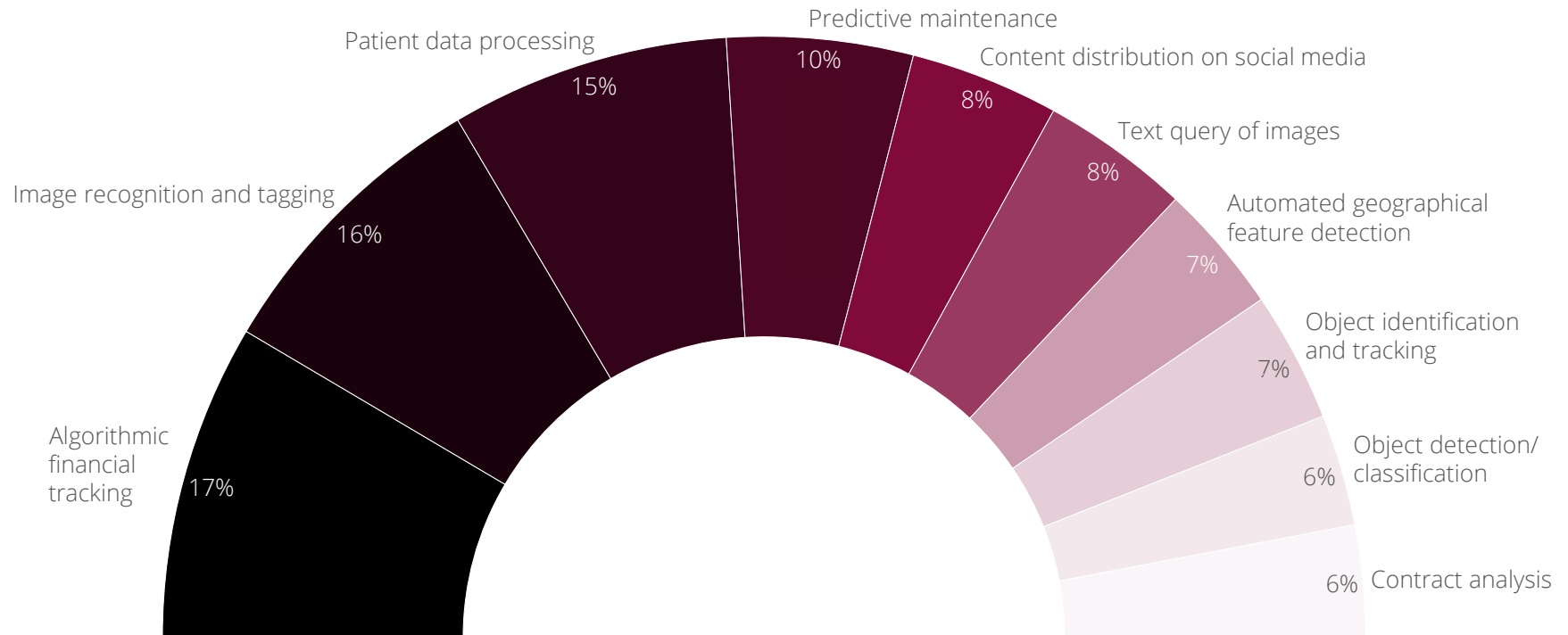
The neural network model uses all words of the sentence as input.

It is trained to recognize statistical regularities and patterns. It tries to identify a cluster that captures the meaning of the sentence.

It then offers the most fitting word as a prediction and can even predict phrases it has not seen before.

By 2025, almost every fifth dollar spent globally on AI will be related to algorithmic financial trading

Estimated global shares of spending on AI applications in 2025



Impact of AI

The increasing application of AI technologies will lead to a huge rise in global revenues made with AI applications from only US\$7 billion in 2018 to US\$90 billion in 2025. The majority (45%) will be made in North America, followed by Asia and Europe with almost one quarter each.

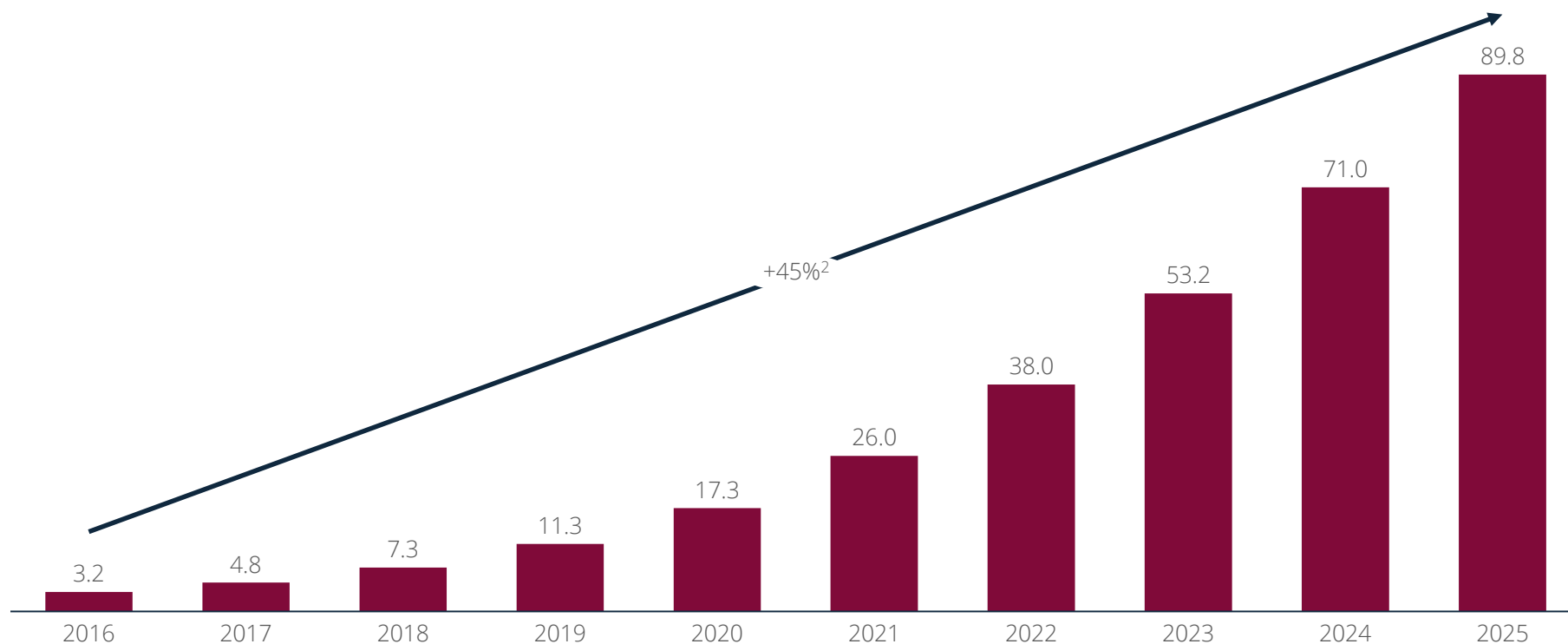
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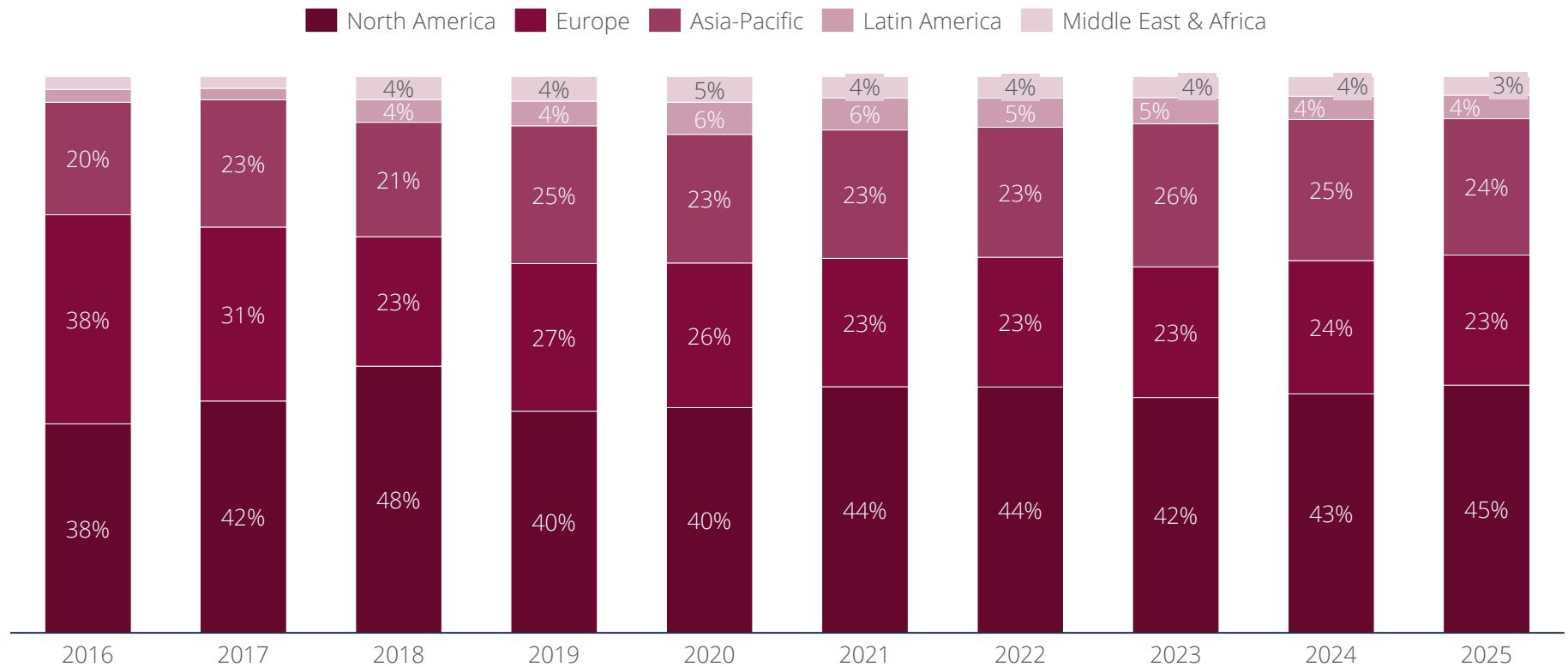
AI will be a US\$90 billion market by 2025

Estimated worldwide revenues¹ from the AI market in billion US\$



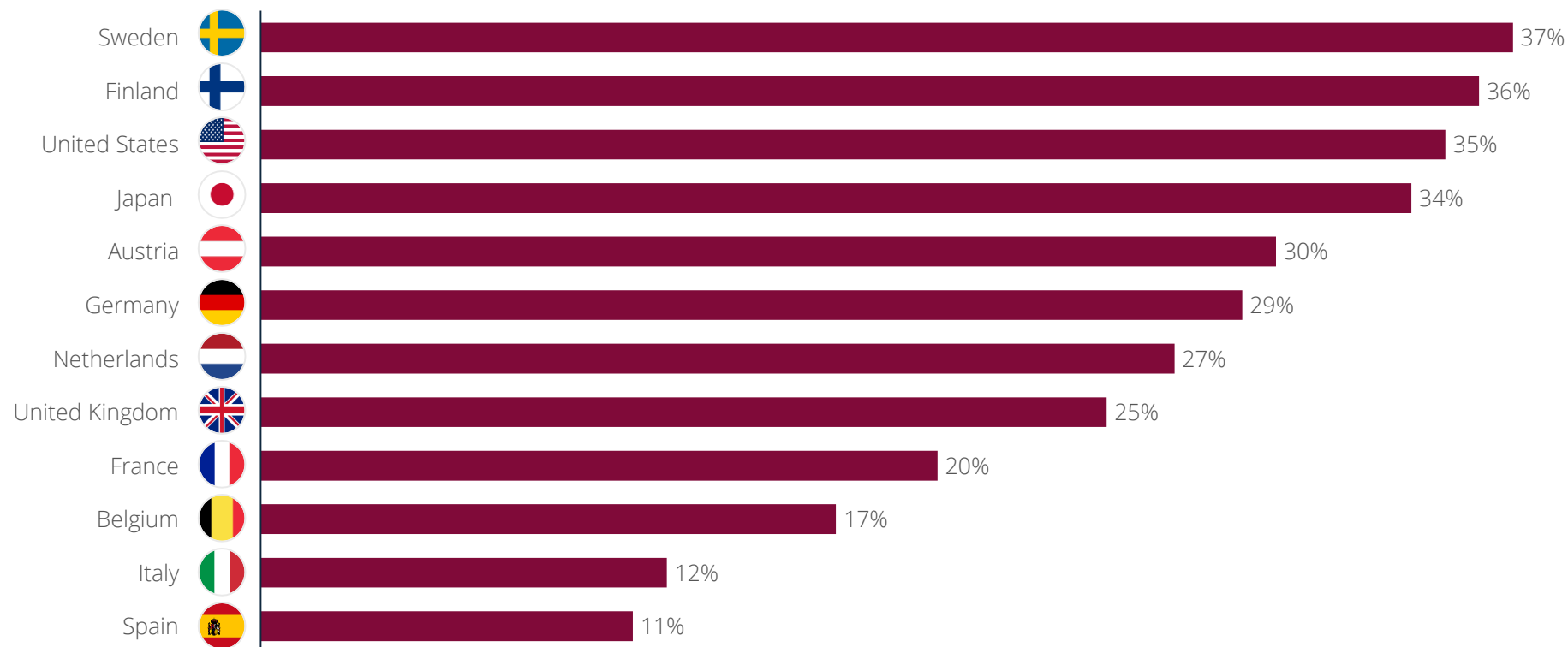
North America remains the biggest market for AI

Estimated regional share of AI applications



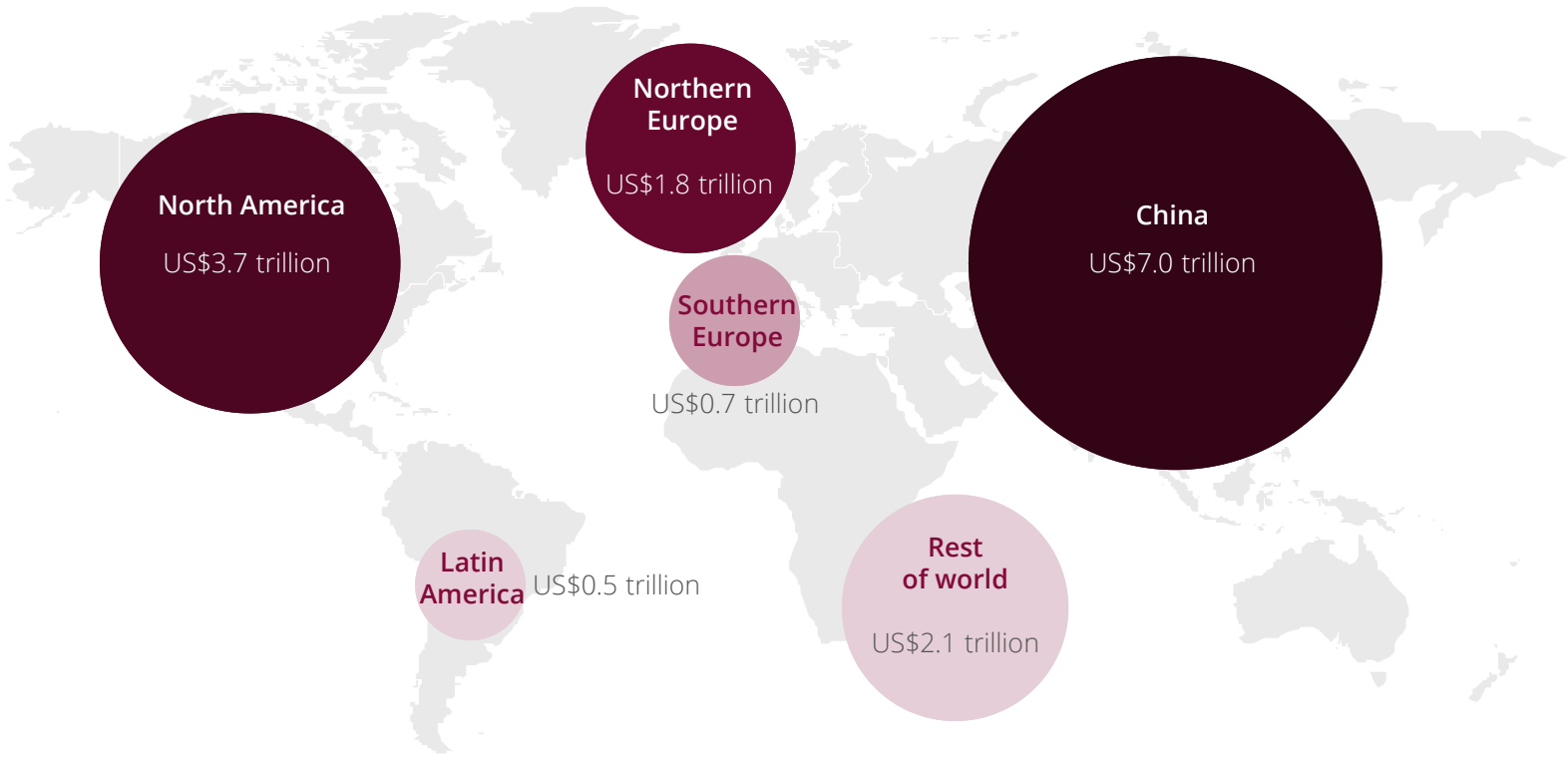
AI has the potential to increase labor productivity

Impact of AI on labor productivity in developed countries in 2035



China gains the most from implementing AI

Regional gains in GDP from implementing AI by 2030



The Chinese government wants to become the AI leader and is currently focusing on computer vision

China's AI plans

China's State Council released a roadmap in 2017 to create a domestic US\$148 billion AI industry and become the global leader in AI by 2030:

- Keeping pace with leading AI technologies around the world by 2020
- Major breakthroughs by 2025
- World leader by 2030

Planned and launched in 2018:

- AI industrial park in Beijing
- 5-year AI talent training program (5,000 students, 500 teachers)

China's tech giants and AI



- Facial recognition technology
- Voice assistants
- Open mobile AI platform with Huawei
- Autonomous driving

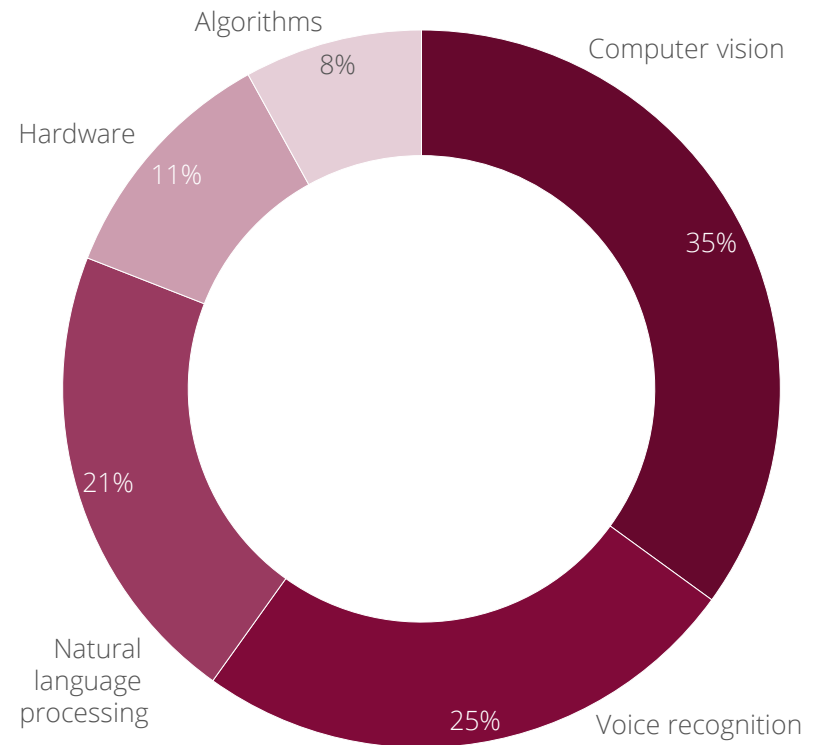


- 7 AI-related research labs
- Voice assistant
- Industrial design
- Intelligent manufacturing
- Robotics



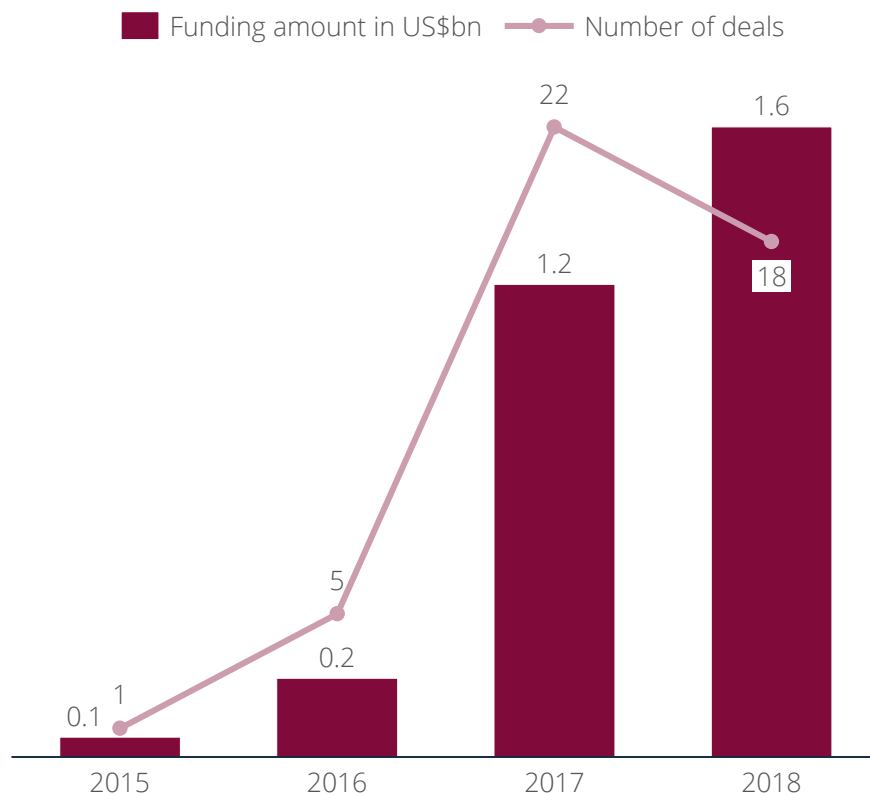
- Slogan: "AI in all"
- AI lab in Shenzhen
- Developed an open AI platform
- Leading technologies in image, face and audio analysis

Focus of AI companies in China in 2017



AI-enhanced facial recognition is rolled out across China

Deals for facial recognition technology in China



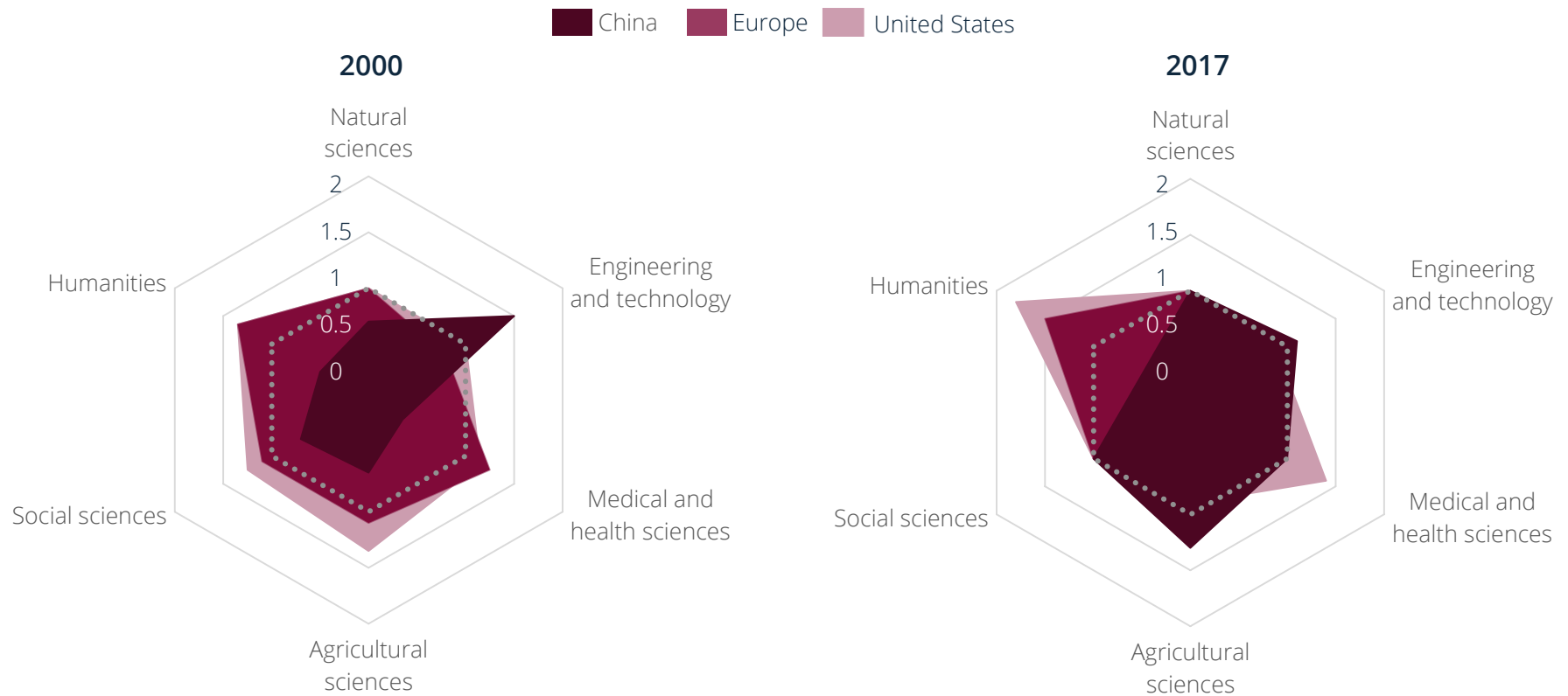
Ways facial recognition AIs are used in China

China plans to introduce a system that will identify any of its 1.3 billion citizens in seconds with a centralized identity database. At the moment, error rates of the technology can be as low as 0.8%.

- **Intellifusion** (AI unicorn) works with the **local police** in Shenzhen to display the faces of jaywalkers on LED screens at intersections. They also cooperate with local mobile phone carriers and WeChat so that jaywalkers will receive a text message on their phone.
- The **Beijing Subway** plans to introduce “bio-identification” technology that includes facial recognition and palm scanning systems to increase efficiency by eliminating the need for tickets.
- The **railway police** in Zhengzhou became the first in China to use facial recognition eyewear created by **Xloong** to screen passengers (verifying identities, spotting impostors, and flagging suspected criminals).
- **Alibaba** partnered with an **agricultural company** to raise pigs using AI, allowing farmers in Sichuan province to keep an eye on their hogs. The facial recognition technology keeps tabs on each pig’s activities and helps to record its vital signs and other statistics.

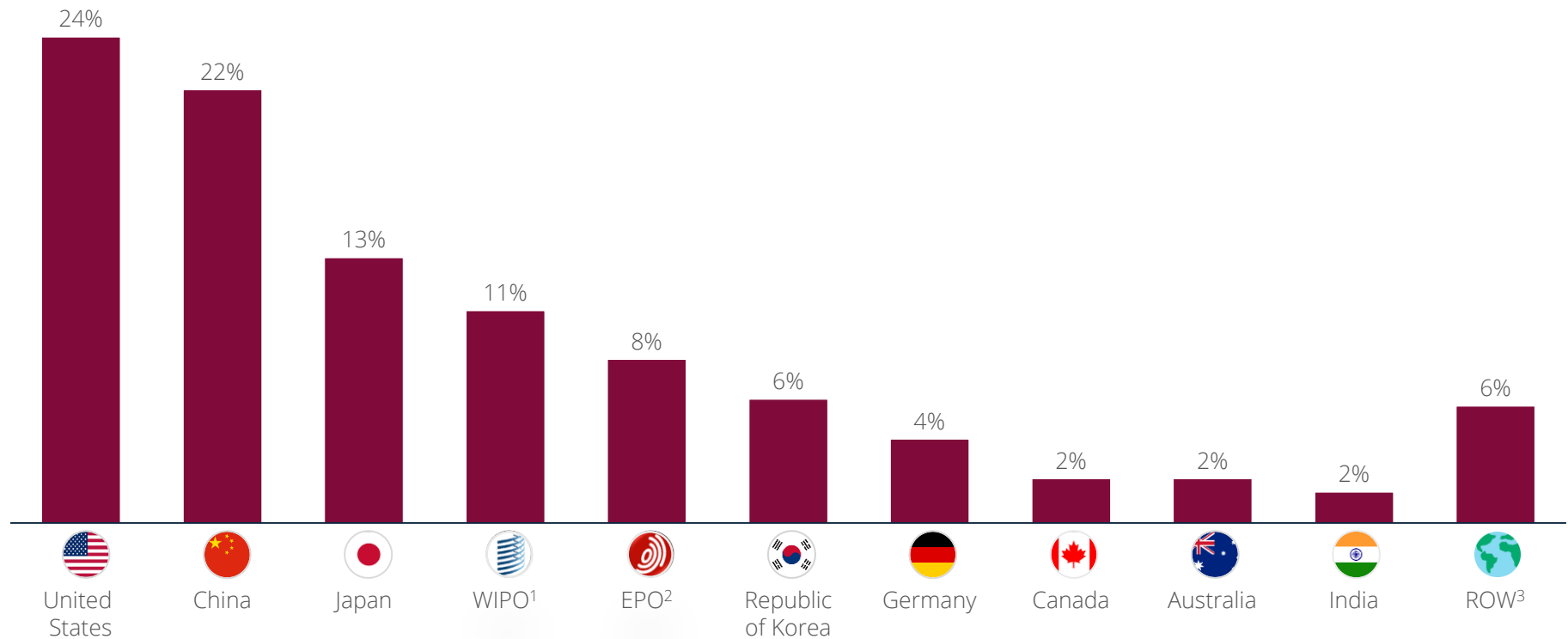
In AI research, China focuses on agriculture, while Europe and the U.S. are prioritizing humanities

Index of AI-related research publishing



Most AI patent filings are made in the U.S. and China











Share of worldwide AI patent applications in 2017



IBM and Microsoft are dominating the AI knowledge landscape

Technology leaders by number of AI patent applications

Most patents for this segment
 2nd most patents for this segment

	Total patents	 IBM	 Microsoft	 SAMSUNG	 Alphabet	 SIEMENS	 HITACHI	 TOYOTA	 SONY	 国家电网公司 STATE GRID CORPORATION OF CHINA	 Panasonic
Personal devices²	5,840	1,050	1,438	922	709	268	306	169	495	160	323
Transportation	5,590	424	278	538	333	415	735	1,987	209	184	487
Telecommunications	5,261	759	754	755	593	458	338	198	538	374	494
Life and medical sciences	4,200	553	319	595	119	1,127	447	188	372	158	322
Document management³	3,897	1,223	944	265	521	170	270	14	196	43	251
Business	3,118	935	780	183	463	60	168	26	194	194	115
Security	3,079	486	377	446	206	293	297	92	299	322	261
Industry and manufacturing	2,091	546	192	131	61	266	199	36	46	518	96
Physical sciences and engineering	1,553	112	155	165	53	323	256	267	85	36	101
Energy management	1,478	43	22	140	18	164	141	173	34	646	97
Other	6,091	1,020	1,242	532	925	248	322	215	874	338	375
Total patents		7,151	6,501	4,672	4,001	3,792	3,479	3,365	3,342	2,973	2,922

Investments in AI

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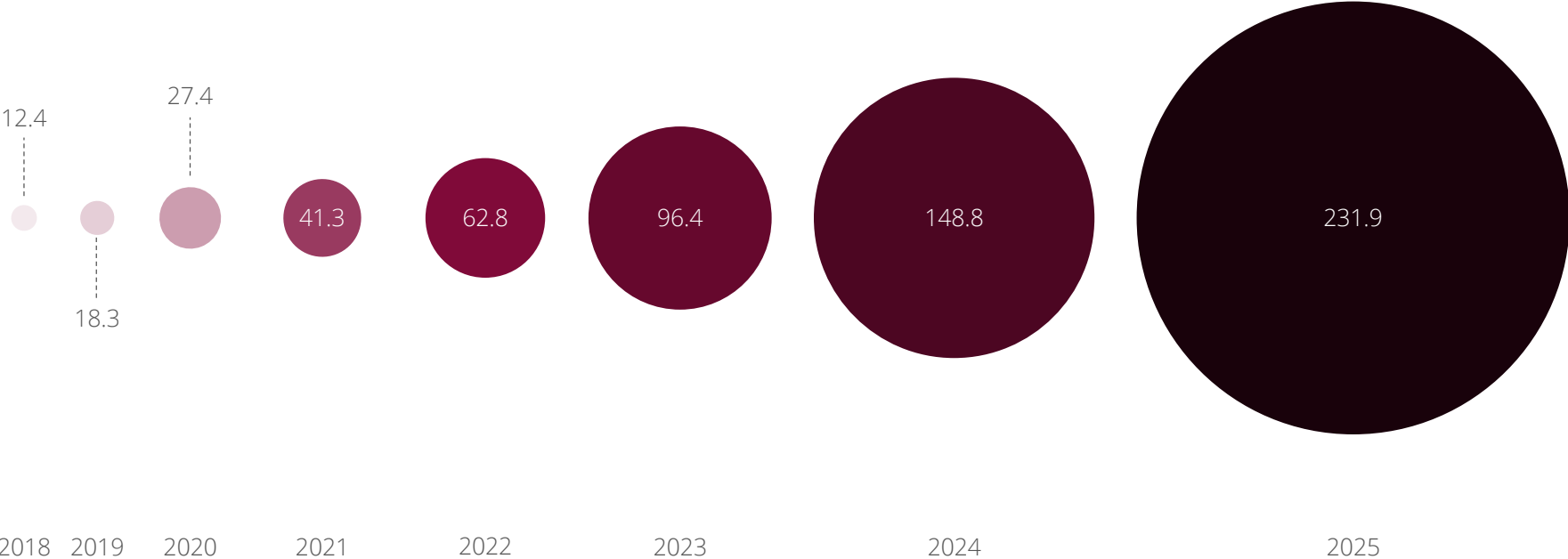
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Investing in AI becomes increasingly relevant

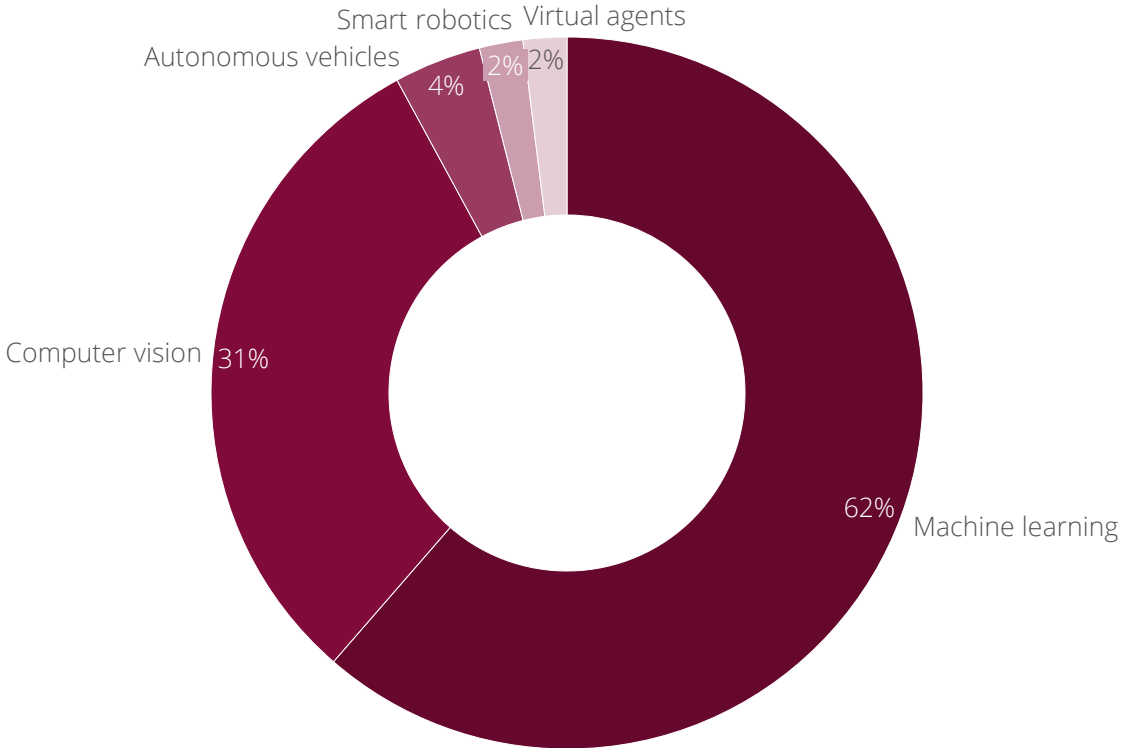
Global enterprise investment in the AI market in billion US\$



Note: The diameter refers to the market size; Artificial Intelligence (AI) includes Intelligent Automation (IA), Machine Learning (ML), and Robotic Process Automation (RPA)
Source: KPMG

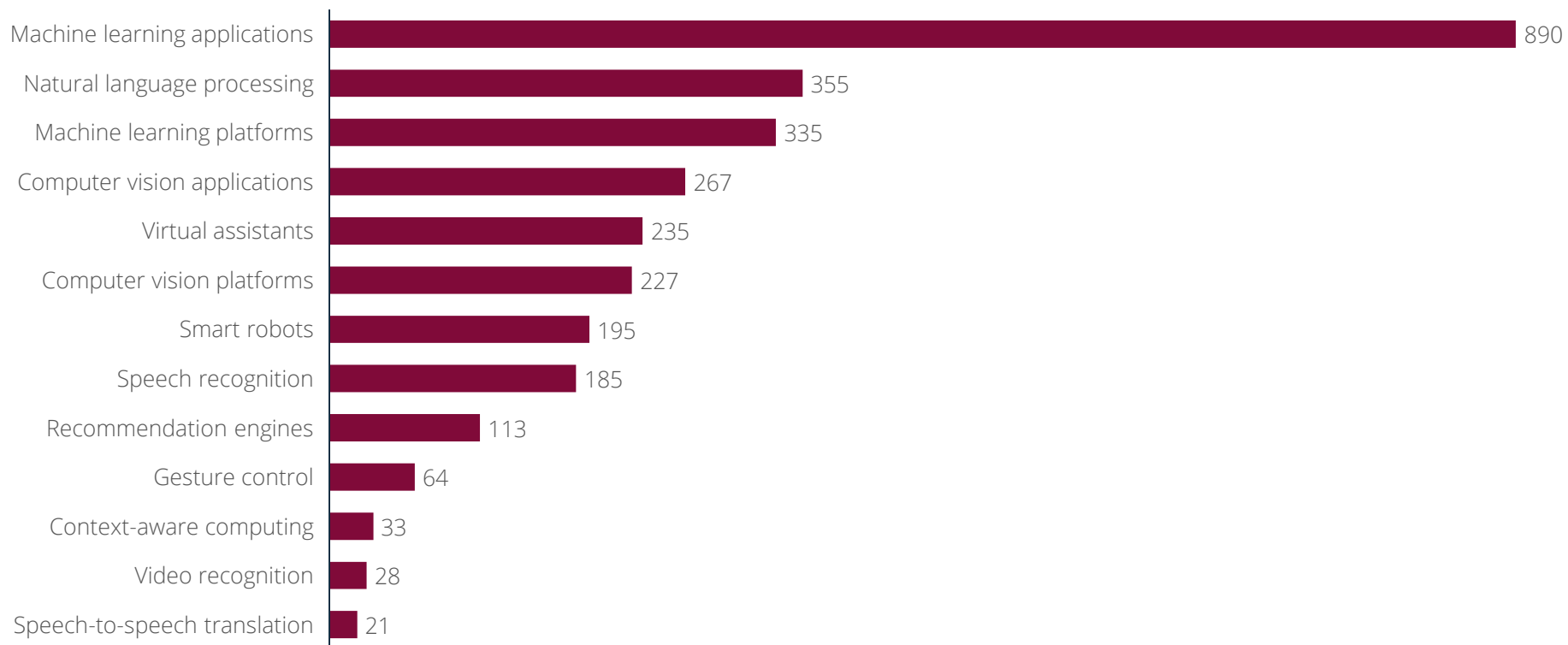
Machine learning attracts almost two thirds of all investments in AI

Global breakdown of investments in AI applications in 2017



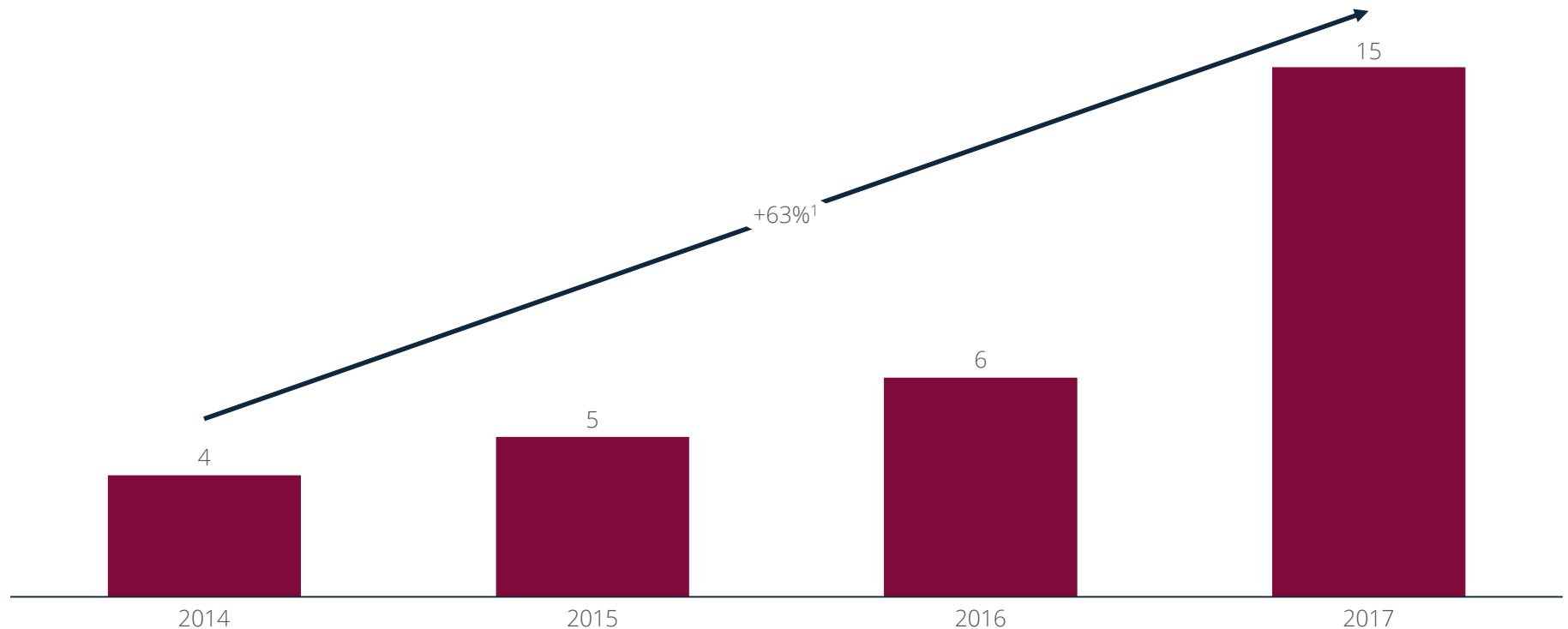
The vast majority of AI start-ups are focusing on machine learning

Number of AI start-ups in 2018¹



With the emergence of more and more AI start-ups, global AI-related funding is skyrocketing

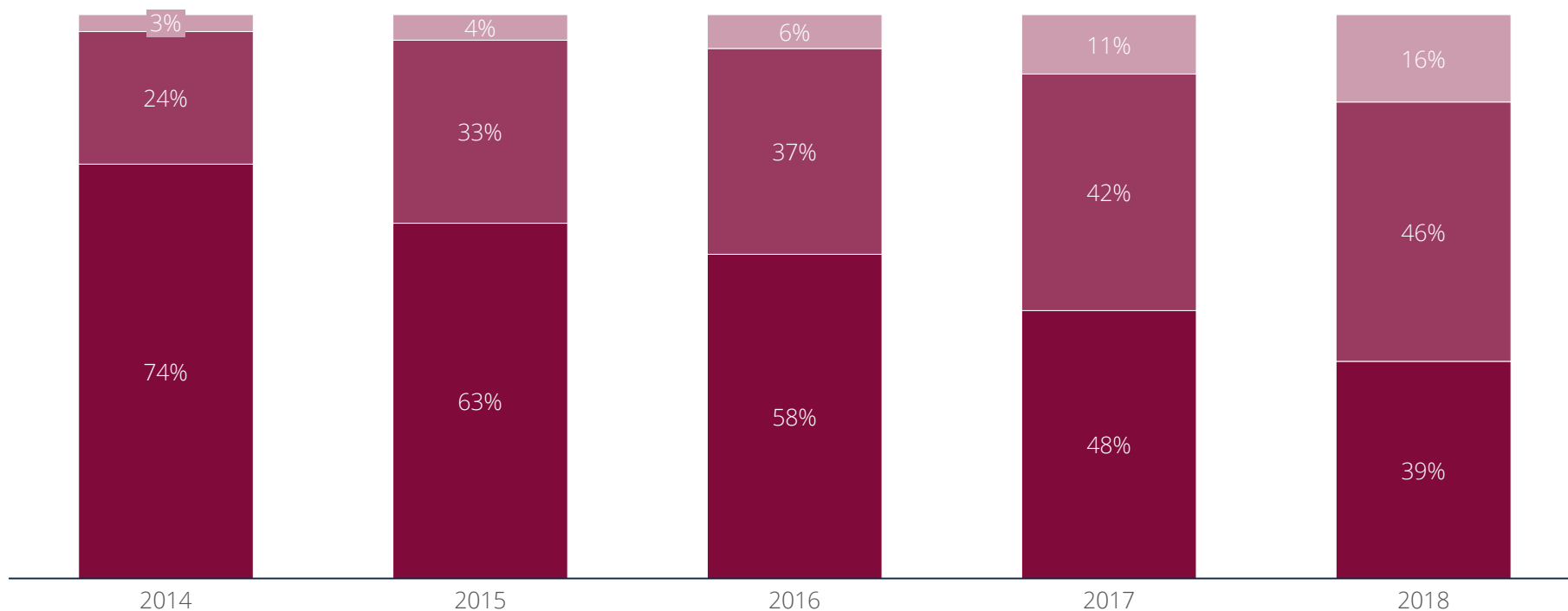
Annual global AI-related funding in billion US\$



The U.S. is losing the AI funding battle

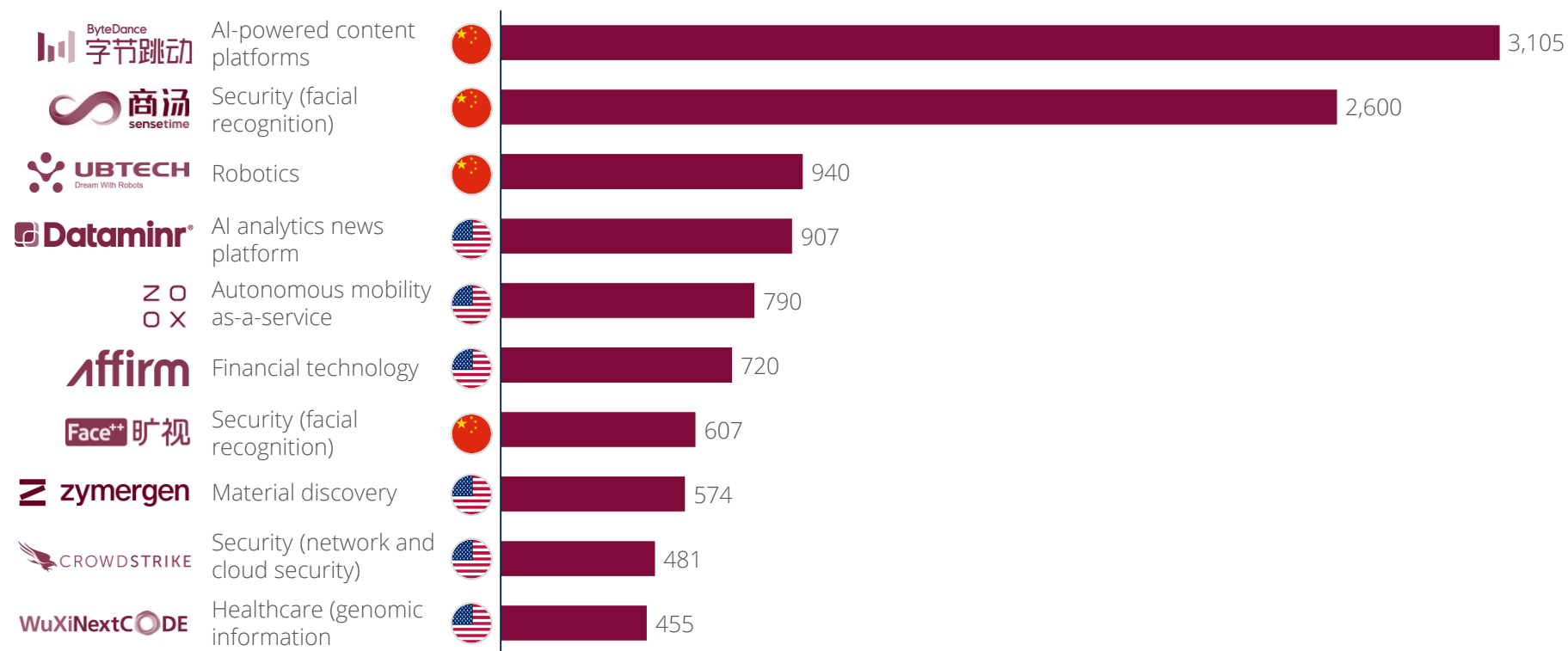
Global AI-related equity deals

■ U.S. deal share ■ Other countries' deal share ■ China's deal share



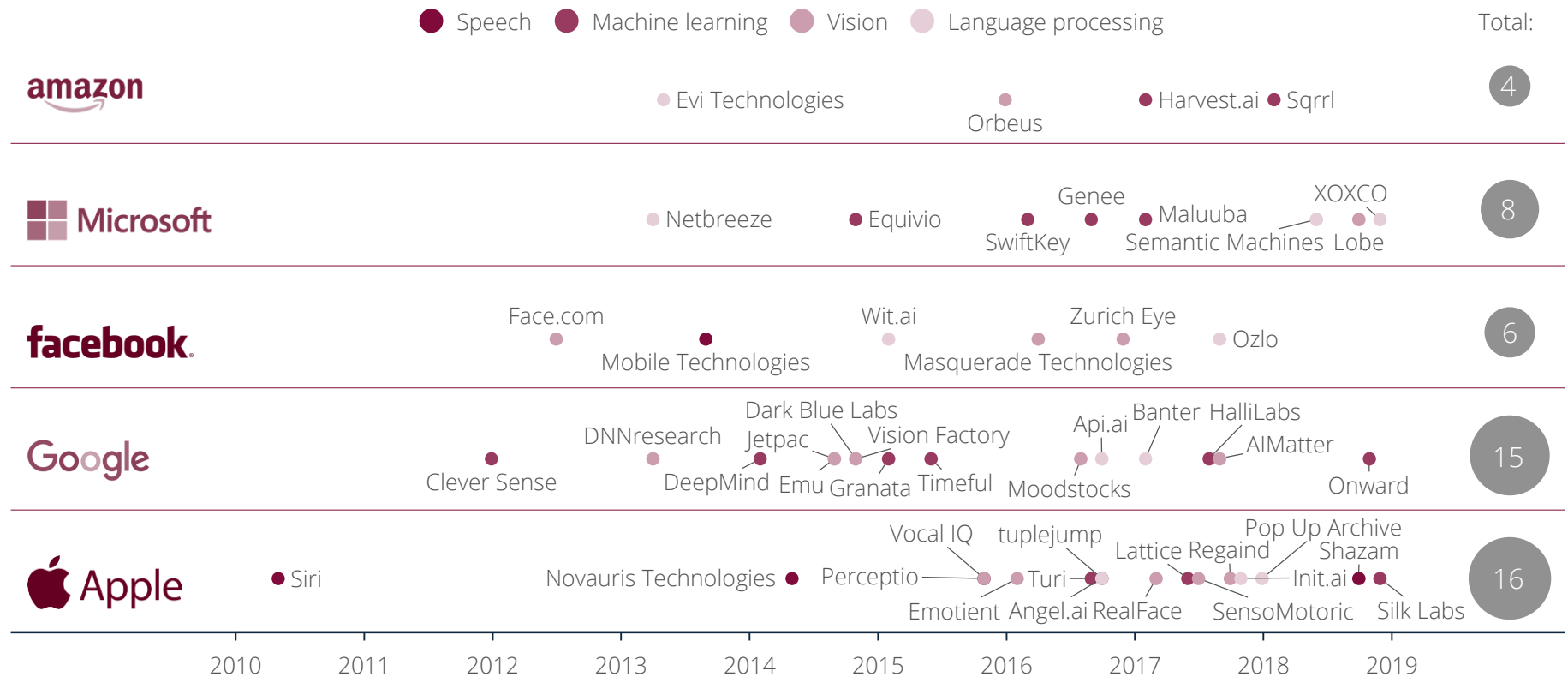
The top 3 highest-funded AI start-ups are from China

AI start-ups ranked by funding in million US\$¹



Apple and Google are on a major shopping spree for AI start-ups

Number of AI start-up acquisitions by major U.S. tech companies



Funding & investment

Digital products and services have been driving the economy forward for the last two decades, and investors are still optimistic about the industry's future.

The Americas captured most of VC funding, but Asia is close. At the same time, supergiant VC rounds of US\$100 million and more in funding are becoming more common and are changing the investment landscape. Software companies are getting almost 40% of venture capital investments, making Software the industry which attracts by far the most investments.

The Americas have historically captured most volume of the global VC funding and remained #1 in 2018, but Asian start-ups have been catching up for the past 5 years. Europe, however, is lagging behind – and the gap is growing: Only 10% of global VC investment still finds its way into Europe, and UK companies get the lion's share.

The American seed accelerator Y Combinator was the most active investor in 2018 with 141 funding rounds in total, followed by Sequoia Capital China with only 69 funding rounds.

However, in terms of capital invested the Japanese SoftBank Vision Fund remains untouched. It is by far the largest pool of private capital ever raised and invests heavily into tech start-ups.

Softbank – the unicorn hunter

The Japanese Softbank Group co-financed many of the largest global VC deals last year, focusing on Asian and U.S. tech companies. It is involved in start-ups spread all over the globe, ranging from the United States to China, Europe and Southeast Asia.

The five largest unicorn investments made by Softbank are AI company ByteDance, ride-hailing providers Uber and Didi Chuxing, office provider WeWork and ride-hailing and delivery company Grab. Its biggest unicorn investment is ByteDance, which is valued at US\$75 billion, closely followed by Uber with US\$72 billion.

The global unicorn club

What do Uber, SpaceX and Airbnb have in common? They all are so-called unicorns, i.e. private companies with a valuation of over one billion US\$. Theoretically, any company can reach the unicorn club, but most of the unicorns actually share some common traits: Many develop internet software services and were founded – and funded – in the U.S. and China. Out of the top 15 unicorns, three are from China, one each from the UK and Indonesia, and the remaining 10 are from the U.S. Currently, there are 334 unicorns worldwide and the most valuable unicorn is the Chinese AI company ByteDance.

Becoming a unicorn is not easy as it requires a killer business model and multiple successful funding rounds. In the end, only about 1% of the companies that acquire seed funding are able to reach that status. Nevertheless, the U.S. still saw a record number of newly-born unicorns at the end of 2018.

Market valuations are on the rise

It looks as if there is only one way for tech stocks: up. Market valuations of internet and tech companies wiped banks and oil companies off the list of the world's most valuable companies in 2017 and continued their growth in 2018. The race between the highest valued companies is also a race between two countries: The U.S. have six out of the world's 10 biggest tech companies, while China has the remaining four.

As tech giants grow and actively reshape the world we live in, no investor wants to be late for the party this time. Everyone knows that investing in some Apple stock 15 years ago would have made you rich by now. So hopes for the future of Amazon and Netflix are high – and their market caps have grown fivefold in less than five years.

Is the market overvalued?

The high valuation of companies on the stock market leads to the question whether we are moving towards the next bubble and the next recession. The U.S. stock market reached a record-high level of over 1.5 times the country's GDP in 2018. At the same time, market valuations and the average investment sum per deal were higher than during the dot-com bubble. When looking at unicorns or newly-traded companies and their valuations, it becomes clear the latter are hard to justify with the companies' revenues, especially if you compare them to those of traditional players. Netflix's market valuation is almost as high as Comcast's, but it only generates a fraction of the latter's revenue. The craziest valuation, however, has WeWork, with 18.8 times its revenue as a market cap.

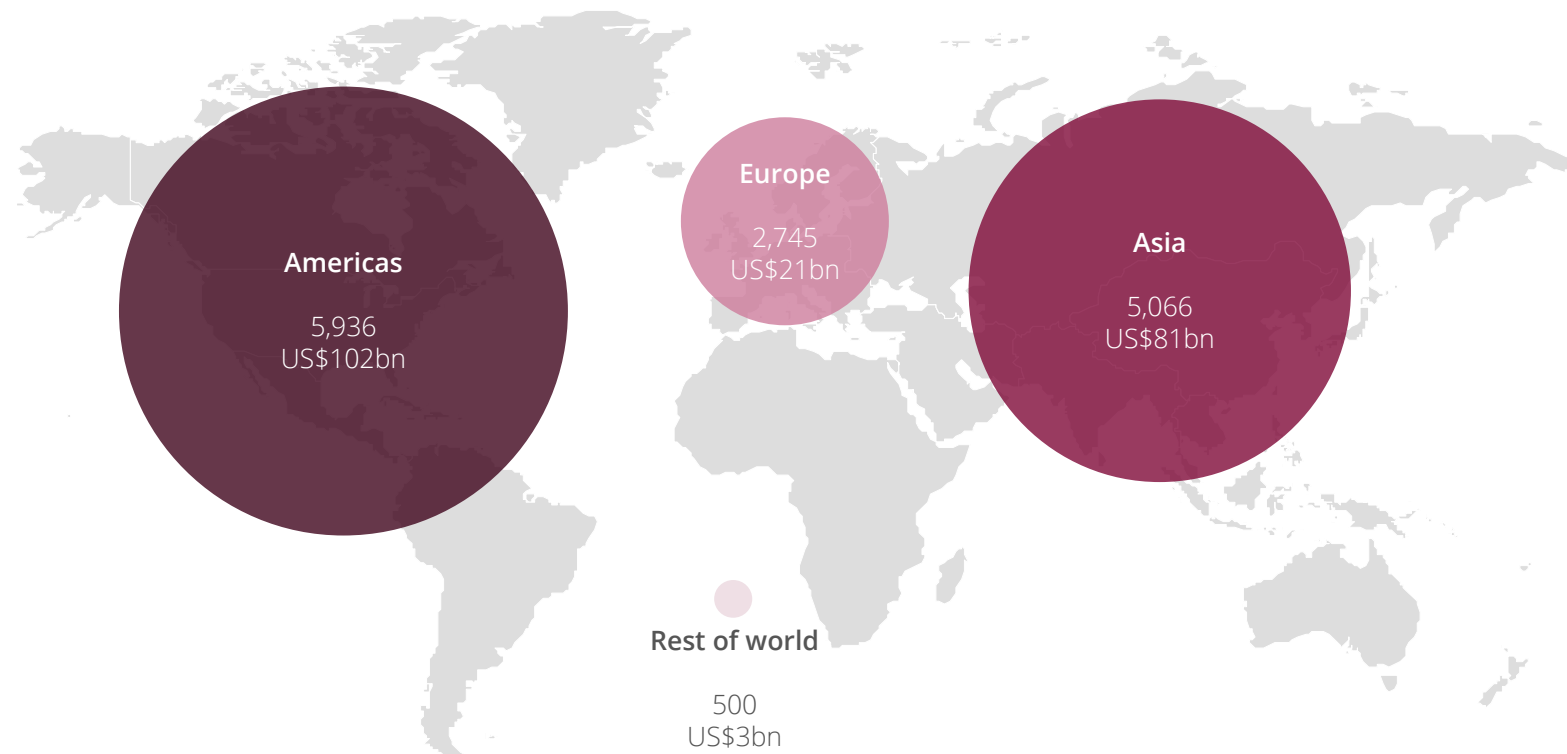
The high stock market values and the high unicorn valuations are fueling the rumors that the market is overheating. Looking at tech giants' balance sheets, you can see that they massively increased their investments in 2018. They built networks and data centers, getting ready for further growth. But the investments in hard assets might also be a way to prepare for rough times on the market.

Recession in tech

The economy runs in cycles, and after ten years of steady growth, many market players expect it to slow down in 2019, possibly even going into decline. So when the day comes and the broad economy plunges, what will it be like for the digital economy? Recessions heavily influence funding, cutting down the market valuations of publicly traded companies and making it much harder for start-ups to attract investment. But we are not there yet. The so-called "Fall of the FAANG!" at the end of 2018 was interpreted as a possible start of a recession, but stock prices bounced back in 2019.

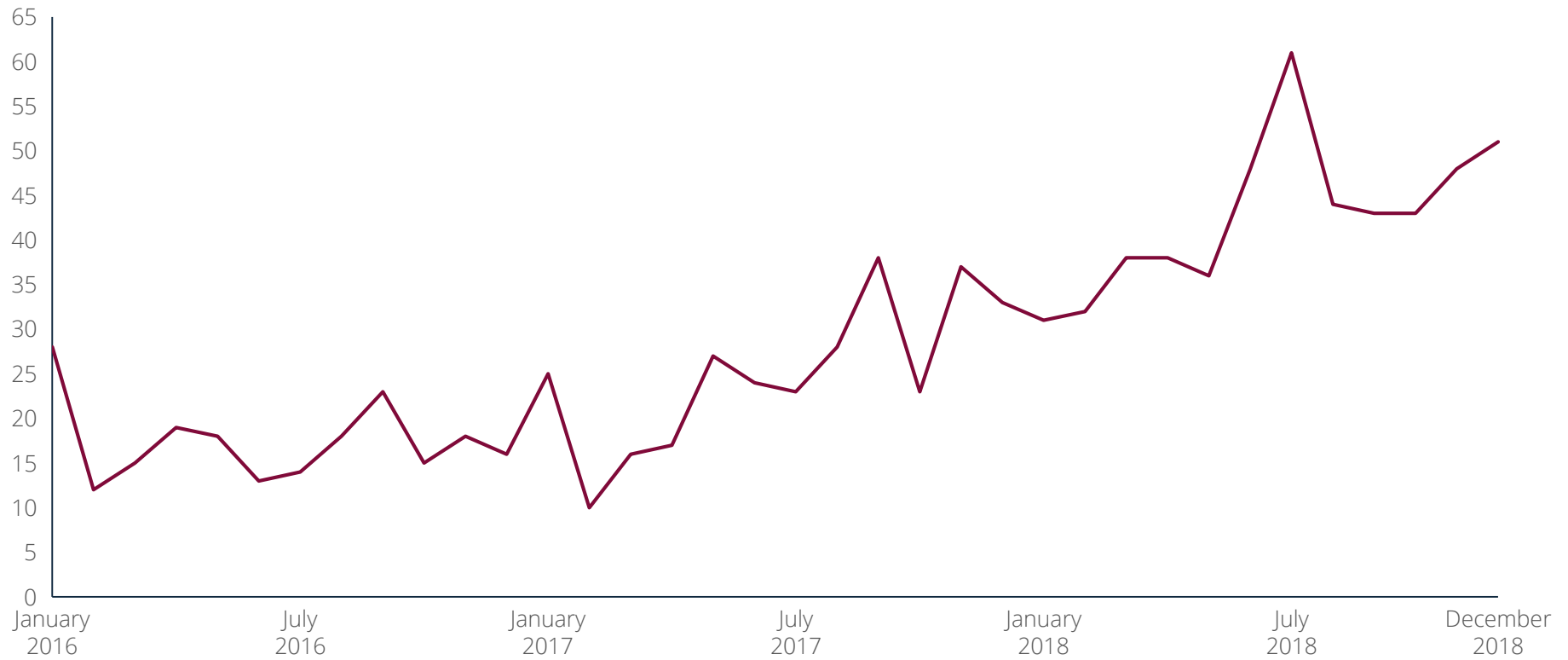
The Americas capture most of VC funding, but Asia is close

Regional comparison of the number of financing deals and total investments in 2018



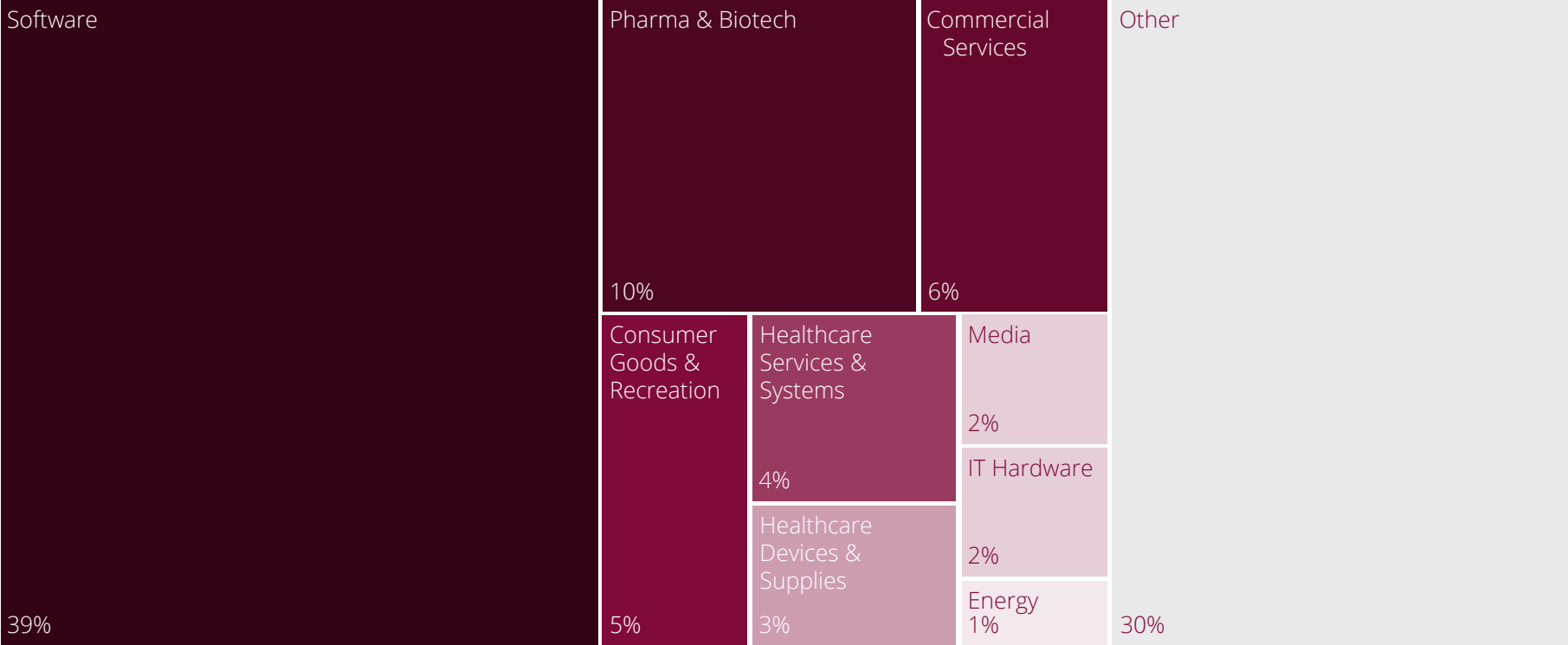
Huge VC funding rounds are becoming more common

Number of VC rounds totaling more than US\$100 million



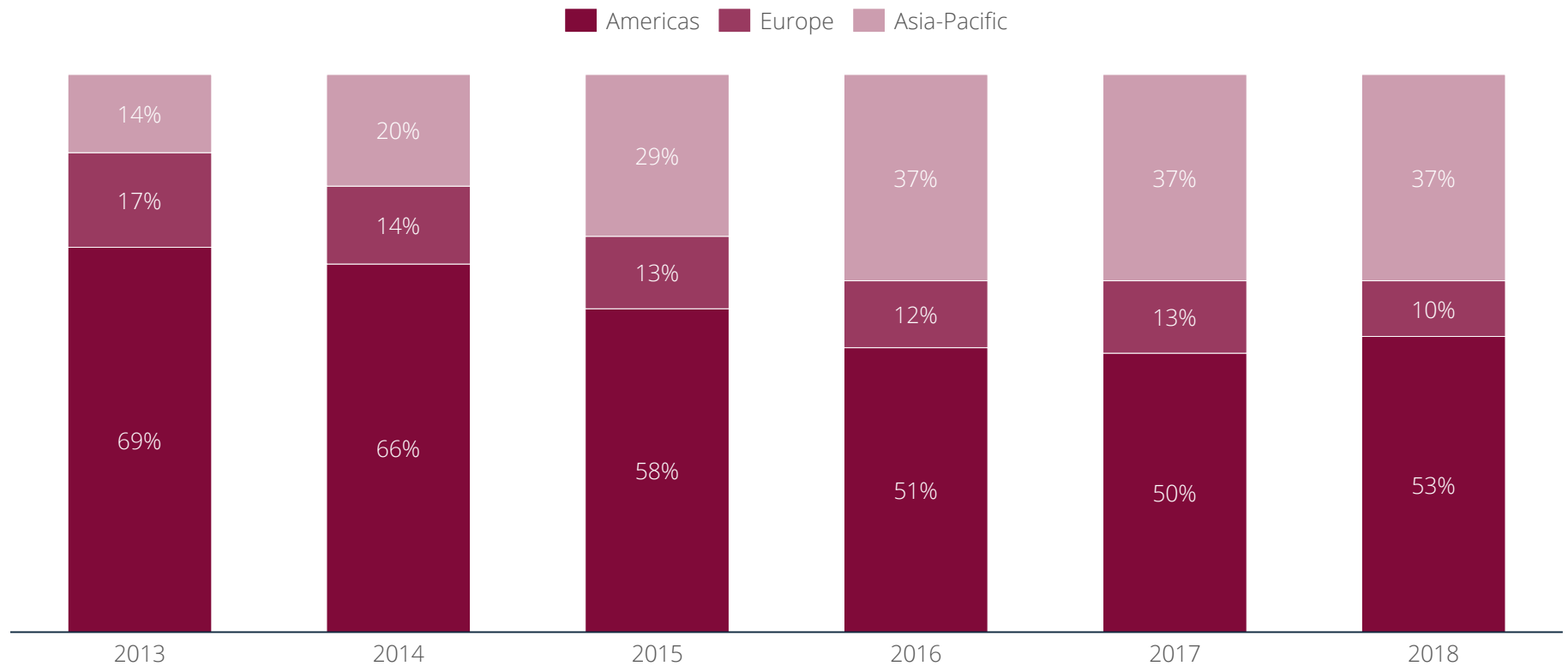
Software dominates VC funding deals worldwide

VC investments in 2018



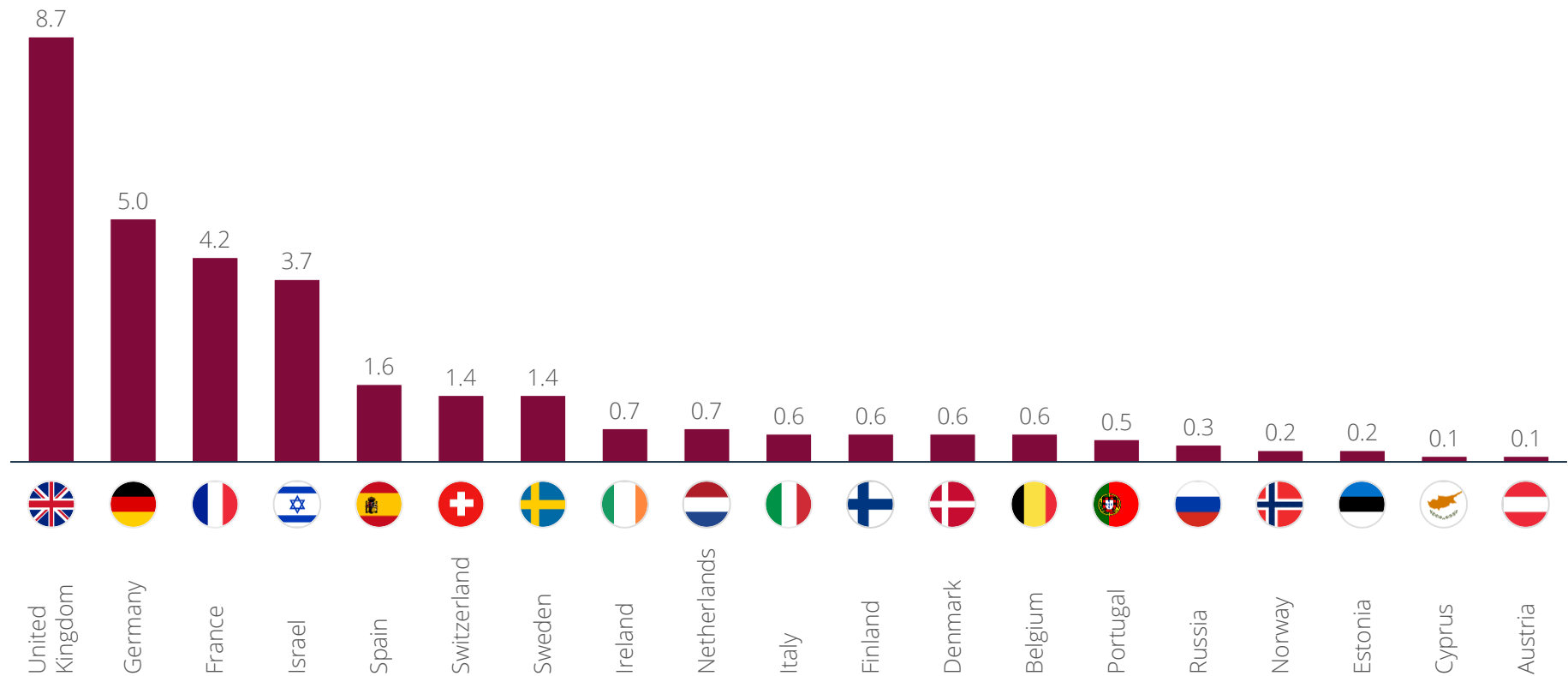
Asia-Pacific is now a major recipient of VC funding

VC investments



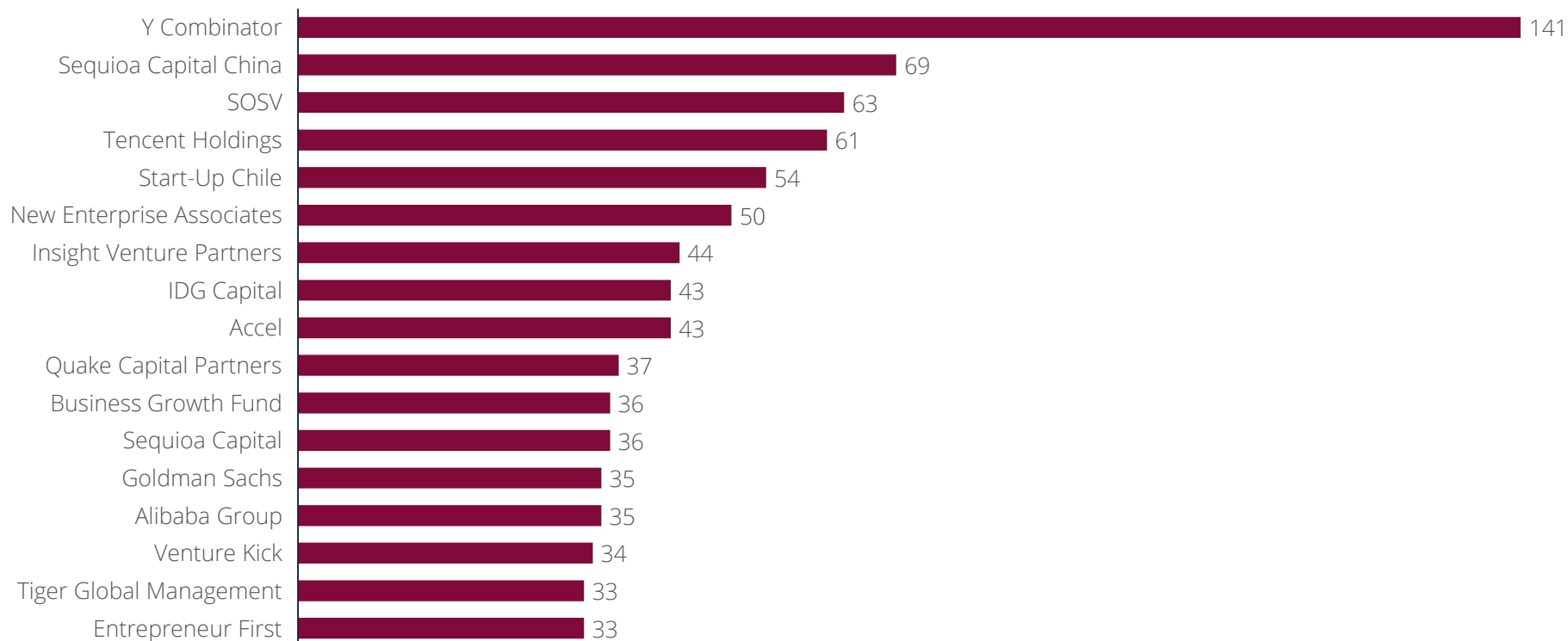
Most VC investments in Europe go to the UK

VC investments in Europe in billion US\$¹



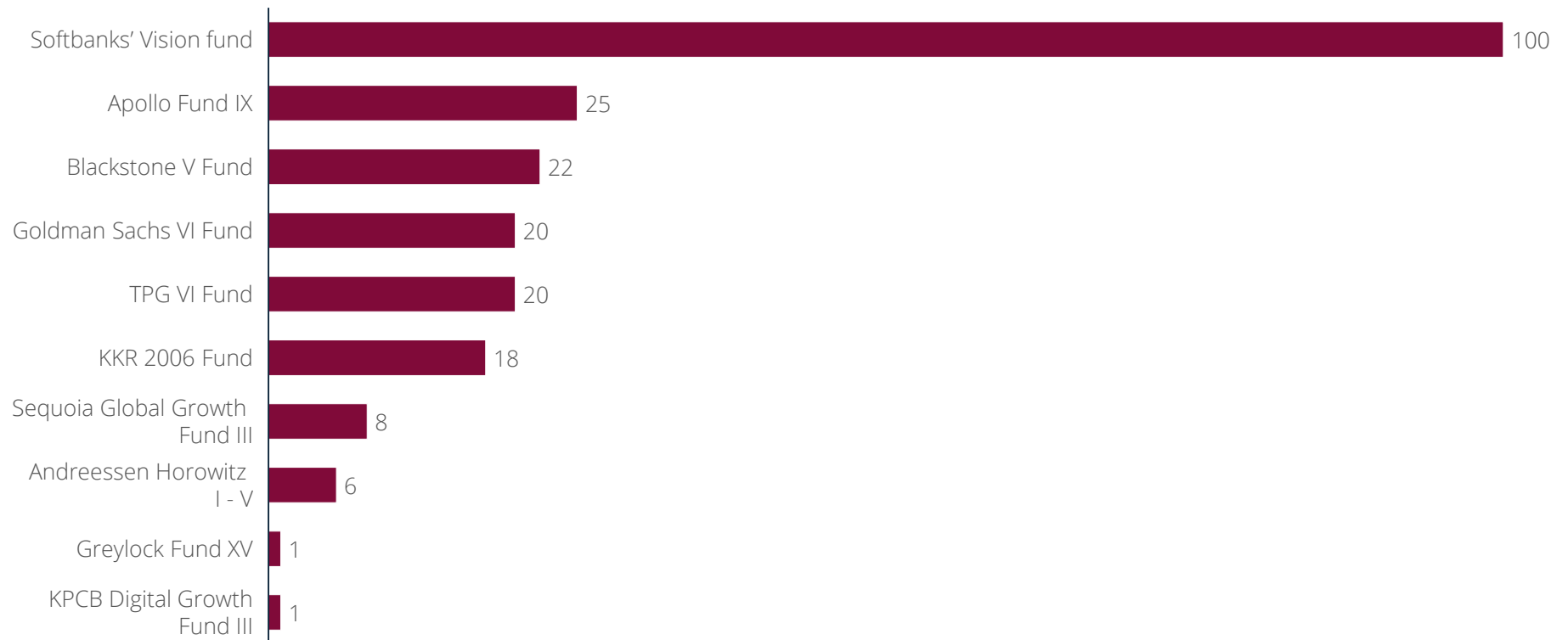
Y Combinator was the most active investor in 2018

Most active lead investors by number of rounds in 2018



Although not the most active one, SoftBank's Vision Fund is the largest pool of private capital ever raised

Approximate size of top VC funds in 2018



Softbank – the unicorn hunter

The Japanese Softbank Group co-financed many of the largest global VC deals last year, focusing on Asian and U.S. tech companies. It is involved in start-ups spread all over the globe, ranging from the United States to China, Europe and Southeast Asia.

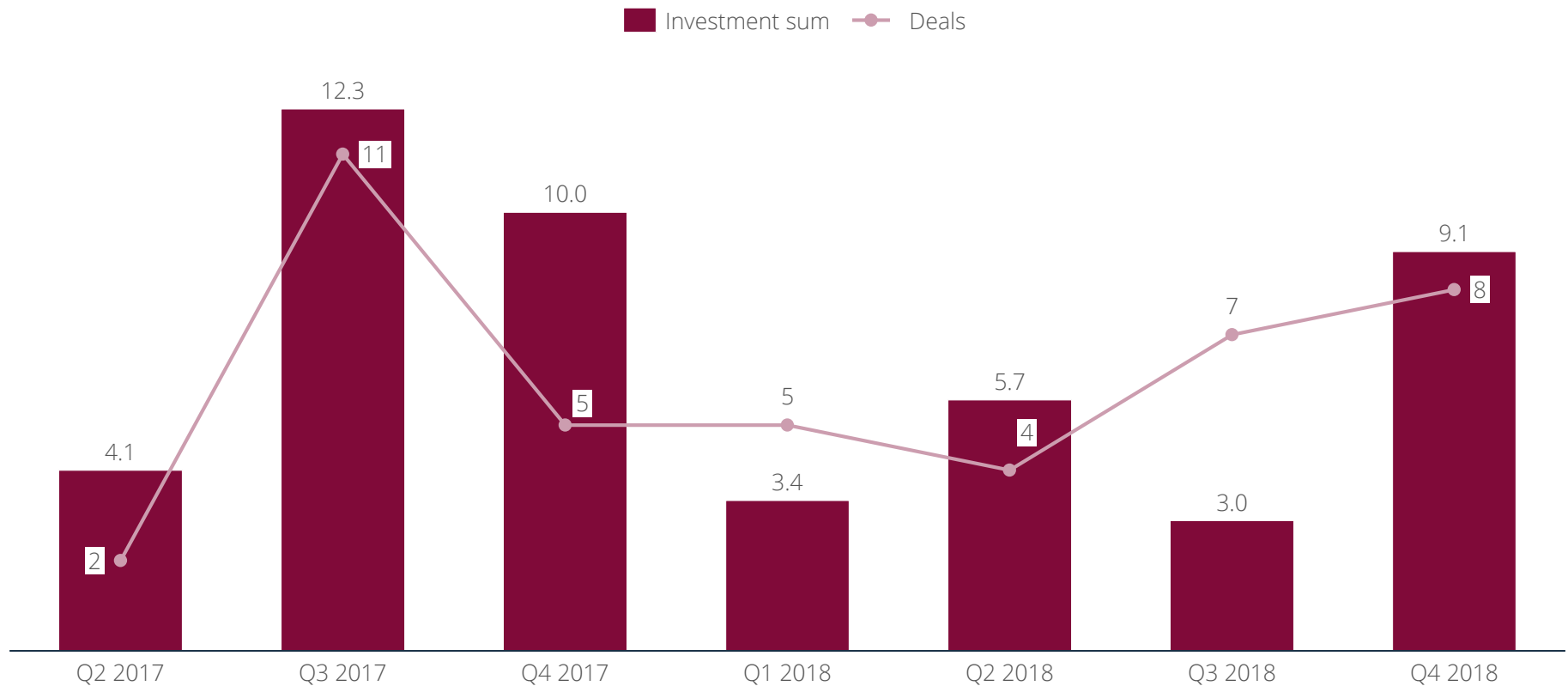
The five largest unicorn investments made by Softbank are AI company ByteDance, ride-hailing providers Uber and Didi Chuxing, office provider WeWork and ride-hailing and delivery company Grab. Its biggest unicorn investment, which is also the highest valued unicorn so far, is ByteDance, which is valued at US\$75 billion, closely followed by Uber with US\$72 billion.



SoftBank

SoftBank's Vision Fund invests more per quarter than the size of some of the biggest funds

SoftBank's Vision Fund's investments in billion US\$ and number of deals



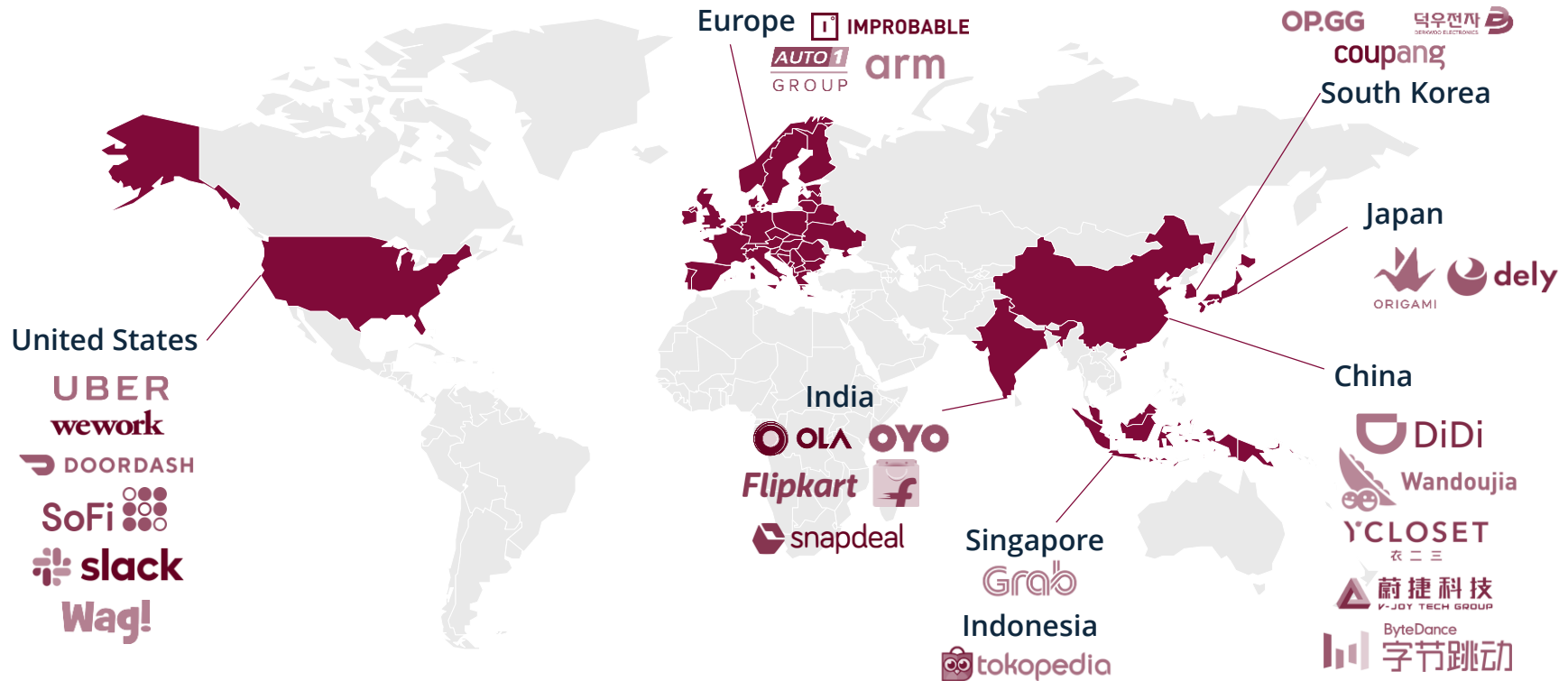
The Softbank Group was part of many of the largest global VC deals in 2018

Largest global VC deals in 2018

Company	Location	Sector	Industry	Deal value	Investors
 coupang	South Korea	Mobile & Telecommunications	Mobile Commerce	US\$2.0bn	SoftBank Group
 满帮集团 Manbang Group	China	Internet	Internet Software & Services	US\$1.9bn	SoftBank Group , Sequoia Capital China, Lightspeed China Partners
 LU.com 陆金所 中国平安集团成员	China	Internet	Accounting & Finance	US\$1.33bn	All-Stars Investment, Goldman Sachs, LionRock Capital
 EPIC GAMES	United States	Software	Gaming	US\$1.25bn	ICONIQ Capital KPCB, KKR & Co.
 view	United States	Industrial	General Building Materials	US\$1.1bn	SoftBank Group
 tokopedia	Indonesia	Internet	eCommerce	US\$1.1bn	SoftBank Group , Alibaba Group, Sequoia Capital India
 wework	United States	Business Products & Services	Facilities	US\$1.0bn	SoftBank Group
 OYO	India	Internet	eCommerce	US\$1.0bn	SoftBank Group , Greenoaks Capital, Lightspeed India, Sequoia Capital India
 SWIGGY	India	Mobile & Telecommunications	Food & Grocery	US\$1.0bn	Coatue Management, Tencent Holdings, Naspers

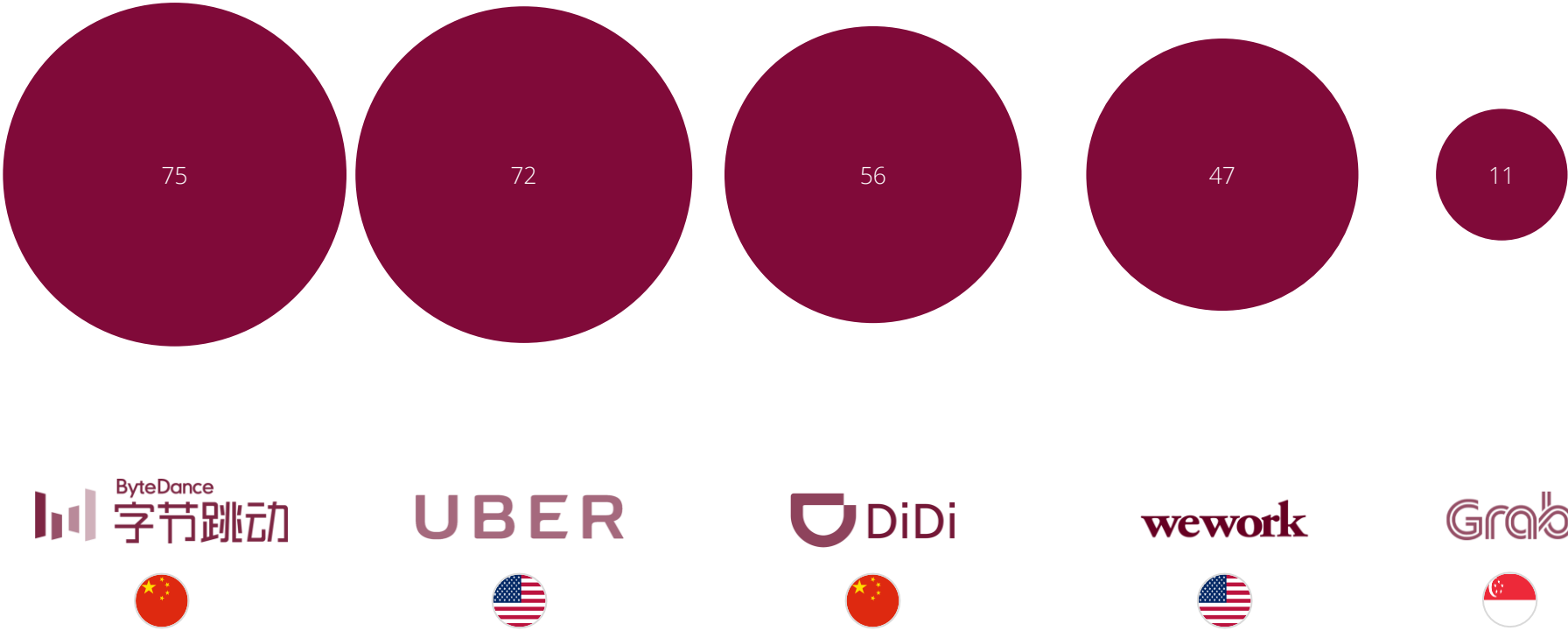
SoftBank has a diversified portfolio of investments all over the world

Selected investments of the SoftBank Group



Softbank's five biggest unicorn investments exceed US\$260 billion in total valuation

Company valuations of Softbank's five biggest unicorn investments in billion US\$ in 2018



The global unicorn club

What do Uber, SpaceX and Airbnb have in common? They all are so-called unicorns, i.e. private companies with a valuation of over one billion US\$.

Theoretically, any company can reach the unicorn club, but most of the unicorns actually share some common traits: Many develop internet software services and were founded – and funded – in the U.S. and China.

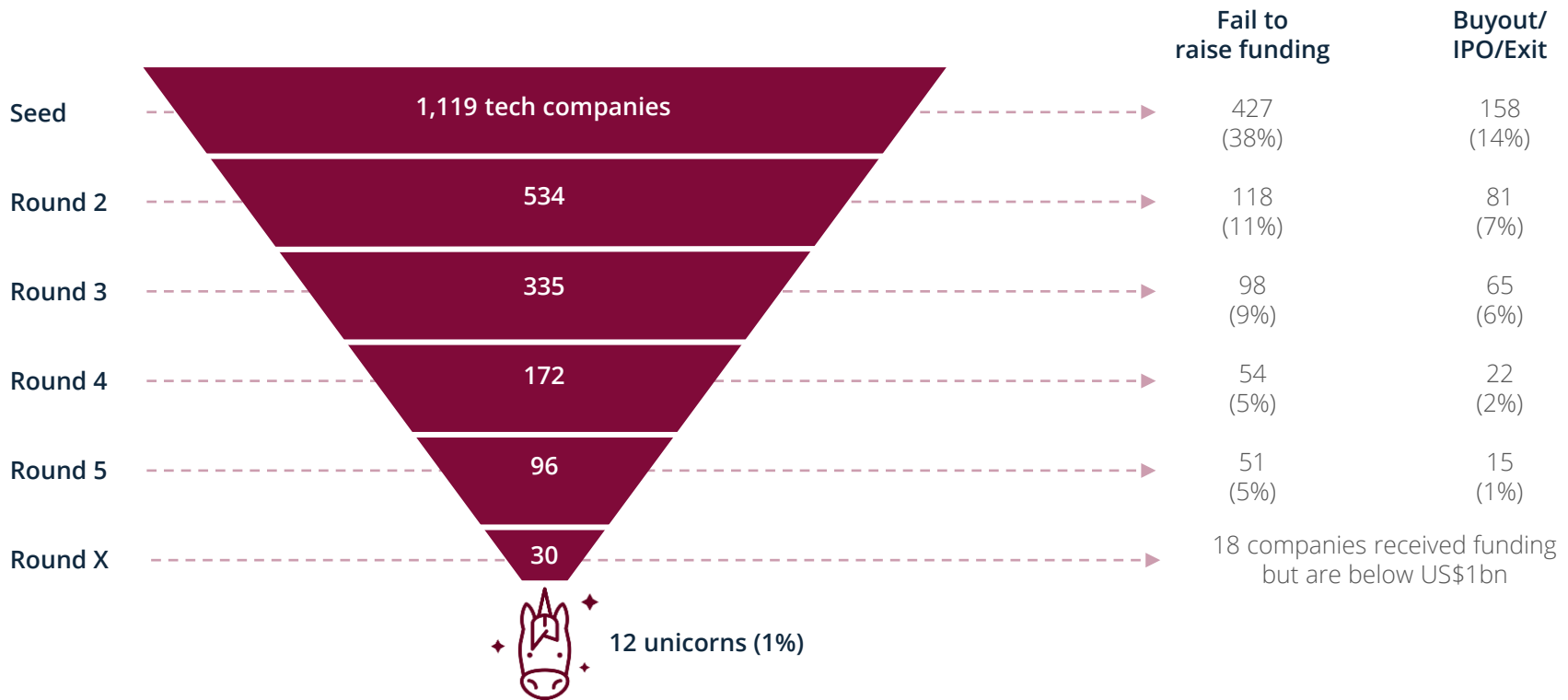
Becoming a unicorn is not easy as it requires a killer business model and multiple successful funding rounds. In the end, only about 1% of the companies that acquire seed funding are able to reach that status. Nevertheless, the U.S. still saw a record number of newly-born unicorns at the end of 2018.

Out of the top 15 unicorns, three are from China, one each from the UK and Indonesia, and the remaining 10 are from the U.S. Currently, the most valuable unicorn is the Chinese company ByteDance.



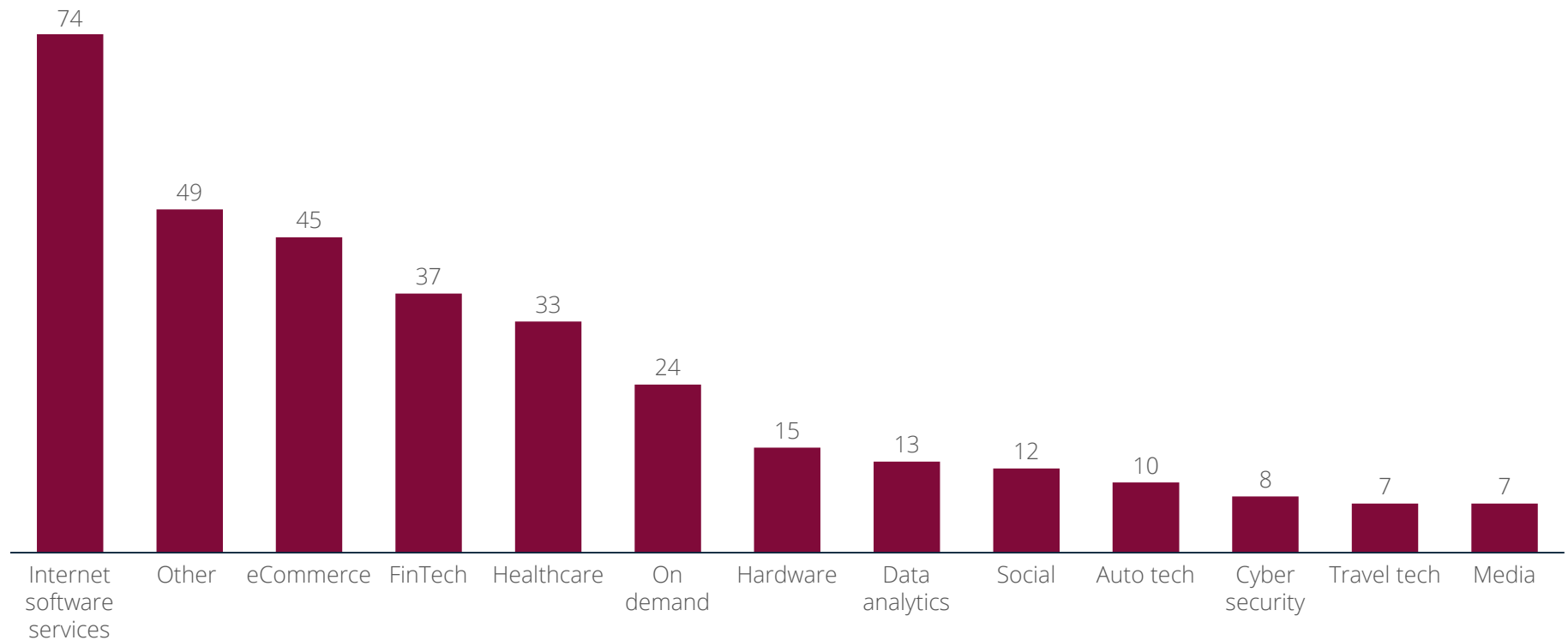
Only 1% of seed-funded companies become unicorns

Venture capital funnel for a group of tech companies headquartered in the U.S. from 2008 to 2017



The largest share of unicorns are developing internet software services

Number of unicorns in 2019



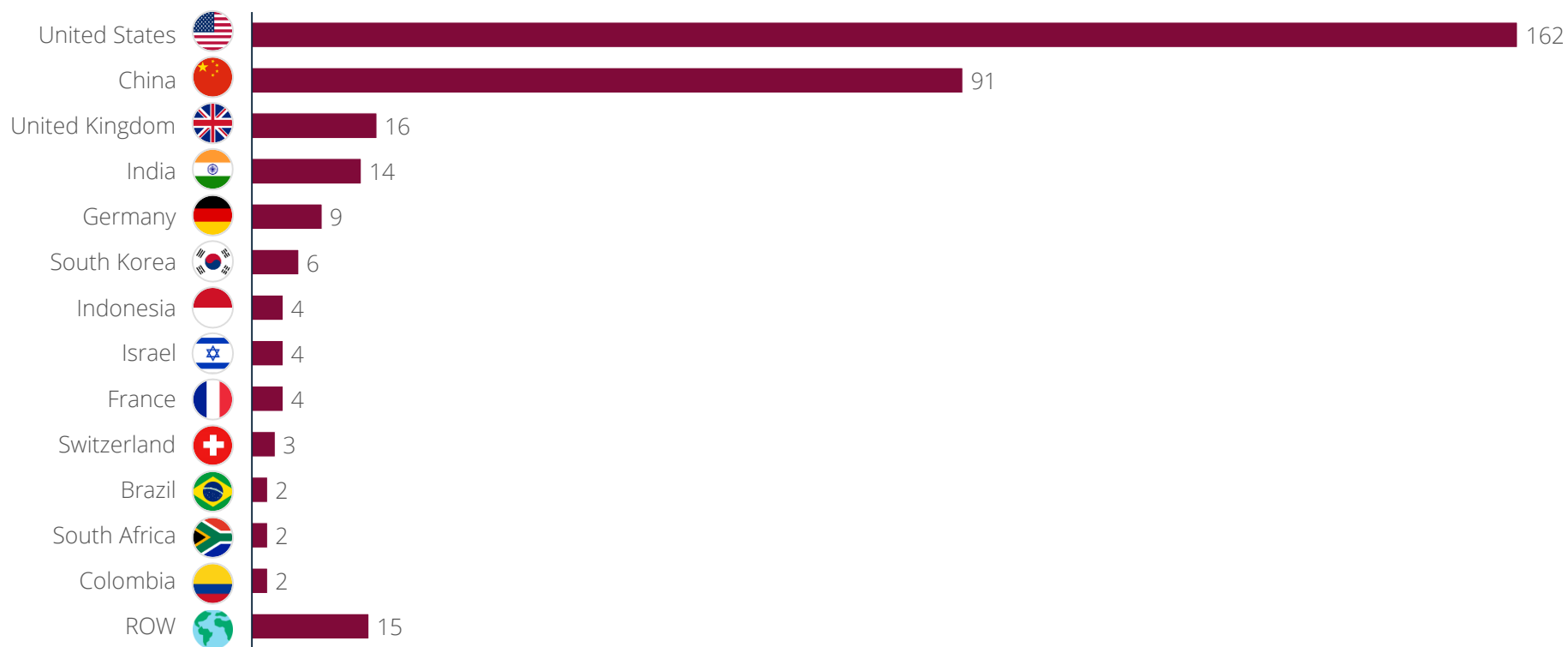
Uber, SpaceX and Airbnb are all members of the global unicorn club

Selected companies belonging to the global unicorn club



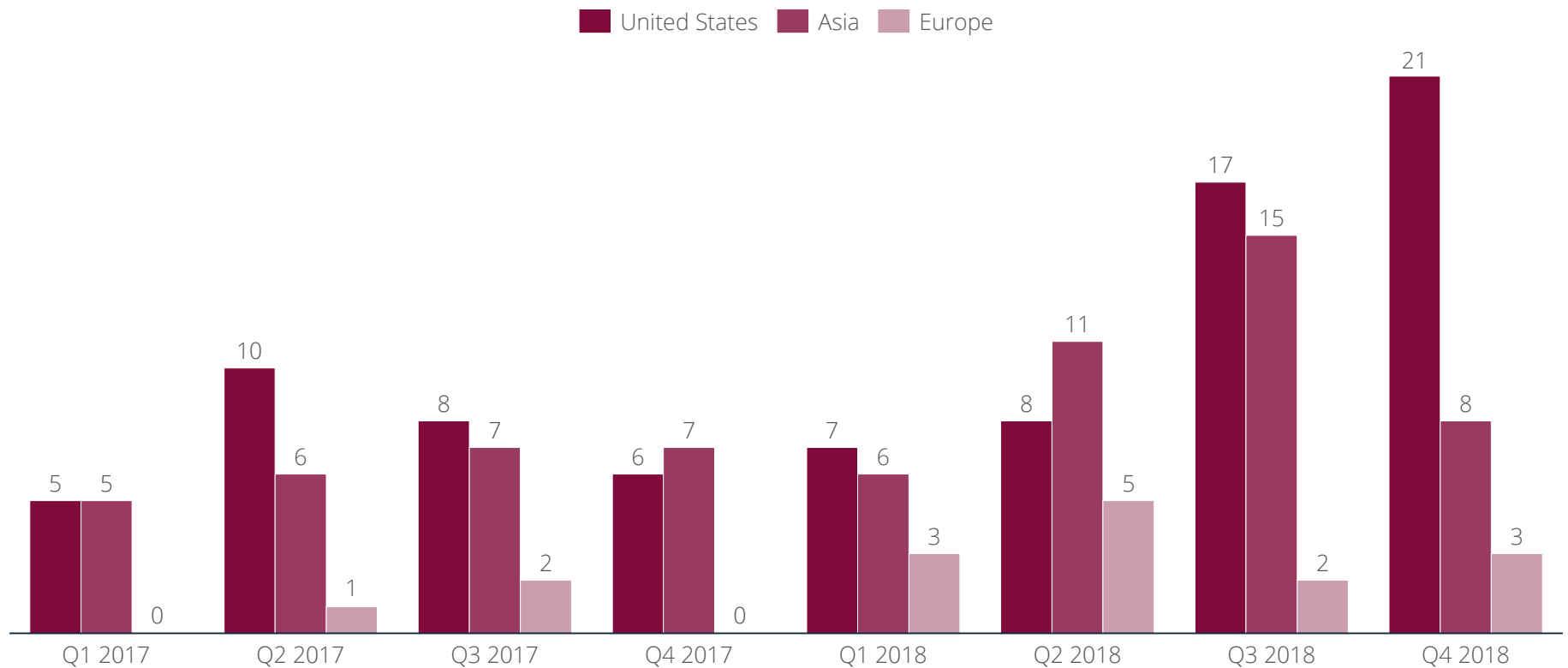
The majority of unicorns are based in the U.S.

Number of unicorns in 2019



The U.S. saw a record number of newly-born unicorns in late 2018

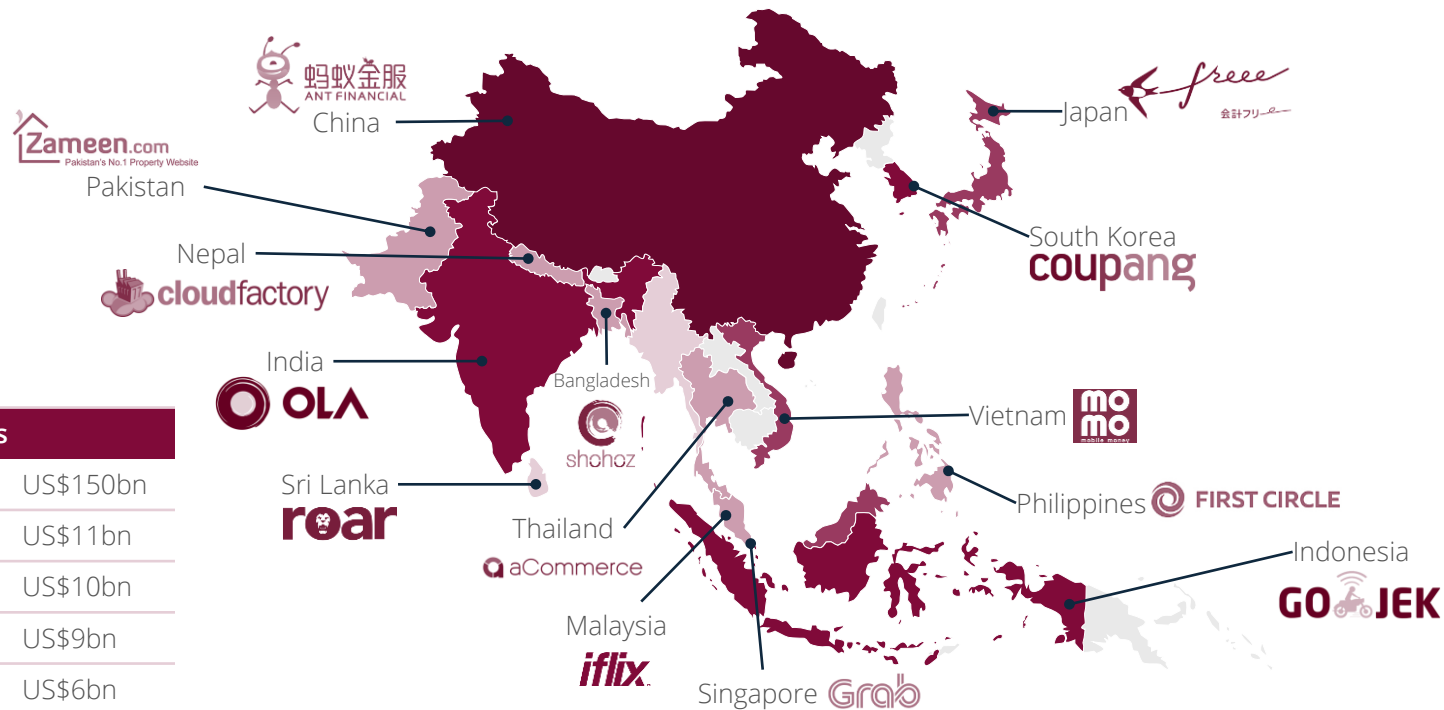
Number of new unicorns



Southeast Asian tech-start-ups are getting ready for the global unicorn race

Total founding amount per country/territory and highest funded VC backed tech companies

US\$1m >US\$10,000m <US\$1m

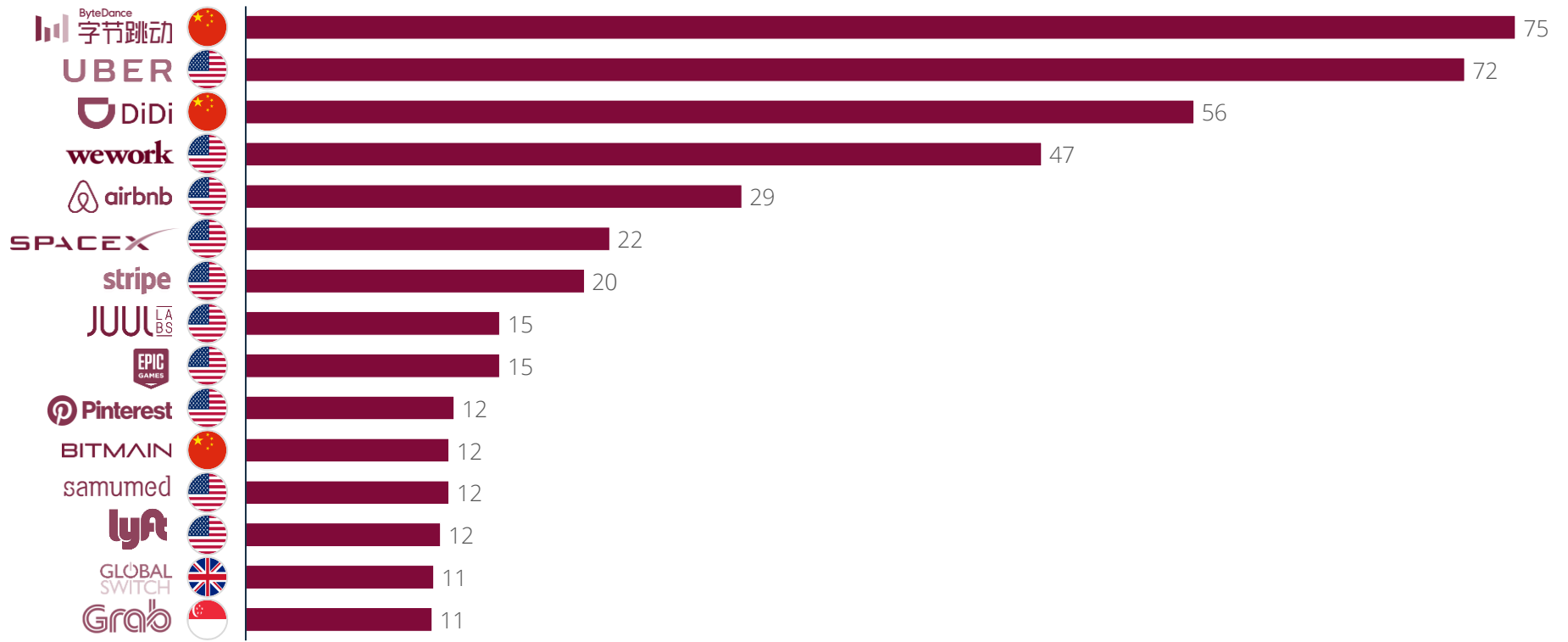


Top 5 valuations	
1. Ant Financial	US\$150bn
2. Grab	US\$11bn
3. GO-JEK	US\$10bn
4. Coupang	US\$9bn
5. Olacabs	US\$6bn

Note: only tech companies with new funding since 2014; excludes countries whose highest funded start-ups have not raised more than US\$200,000; data as at March 2019
Source: CB Insights

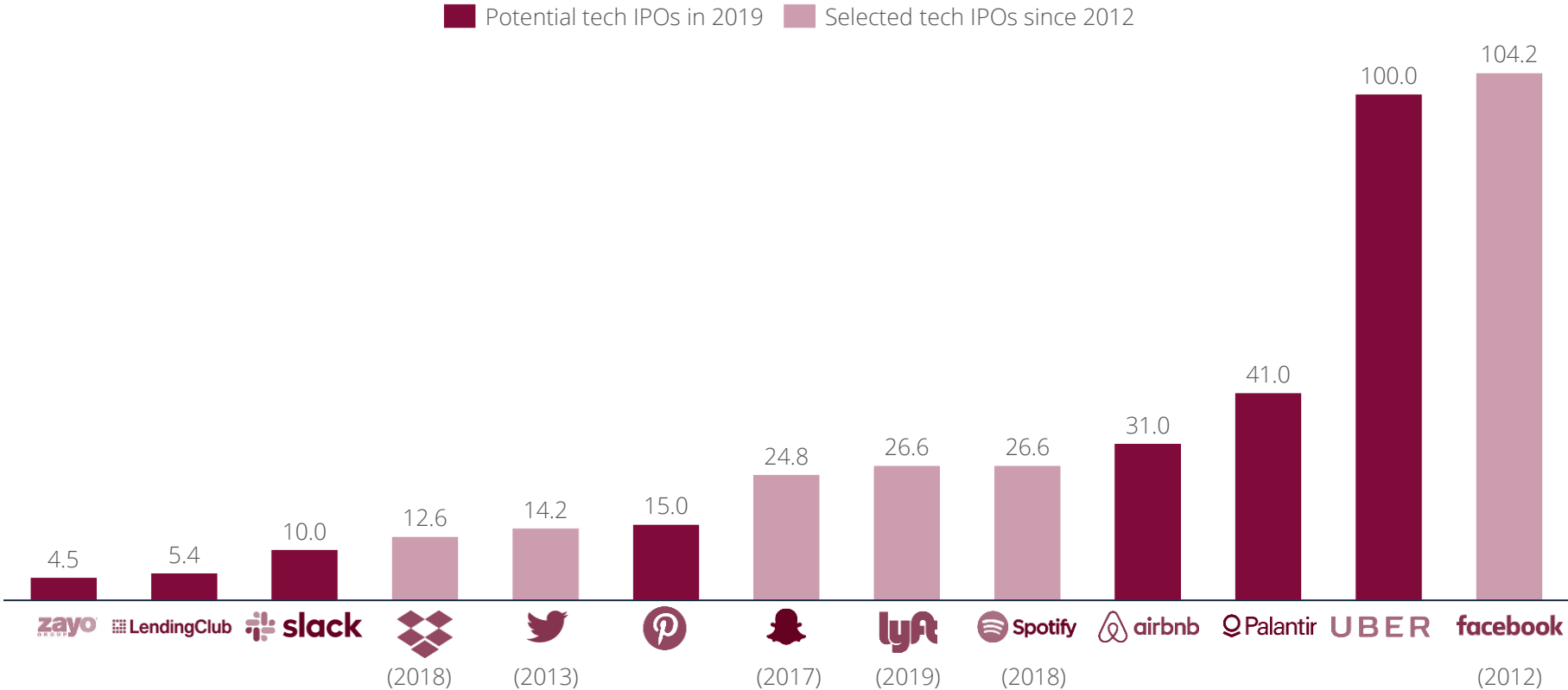
Chinese AI company ByteDance is the top unicorn

Unicorn valuation in billion US\$



Uber is expected to become the second largest tech IPO

Comparison of (potential) IPOs in billion US\$



Market valuations are on the rise

It looks as if there is only one way for tech stocks: up. Market valuations of internet and tech companies wiped banks and oil companies off the list of the world's most valuable companies in 2017 and continued their growth in 2018.

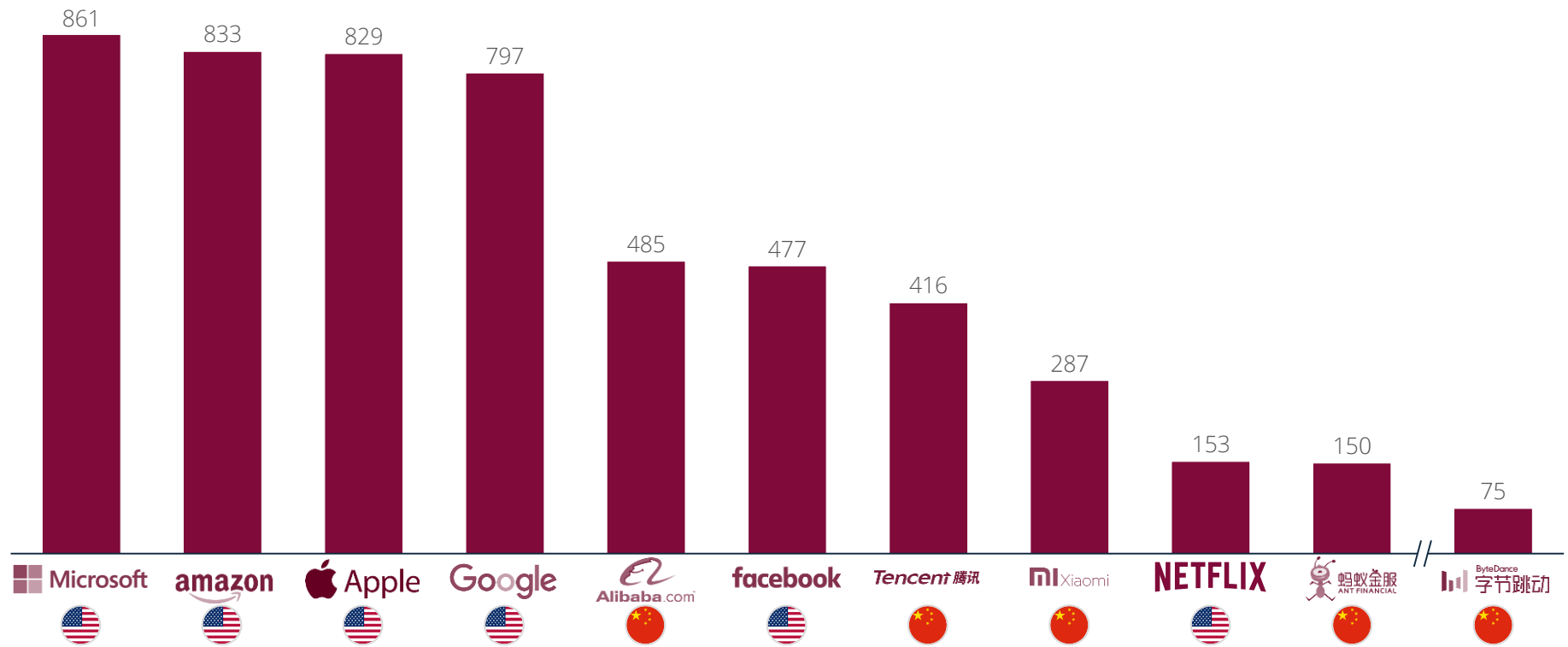
The race between the highest valued companies is also a race between two countries: The U.S. have six out of the world's 10 biggest tech companies, while China has the remaining four.

As tech giants grow and actively reshape the world we live in, no investor wants to be late for the party this time. Everyone knows that investing in some Apple stock 15 years ago would have made you rich by now. So hopes for the future of Amazon and Netflix are high – and their market caps have grown fivefold in less than five years.



Top unicorn Bytedance is not even worth one tenth of Microsoft

Internet companies ranked by valuation in billion US\$ in 2019



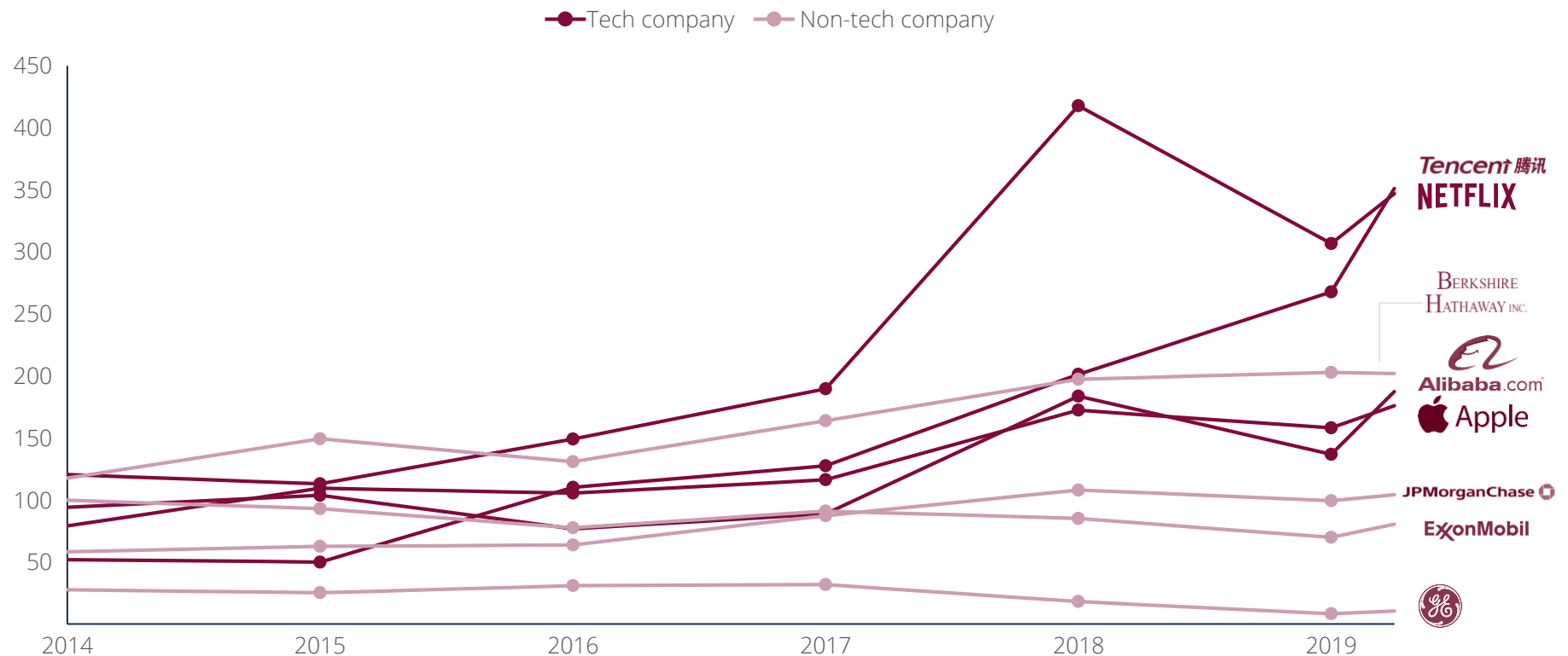
Facebook lost the race for the top 5 companies

Most valuable companies by market cap in billion US\$



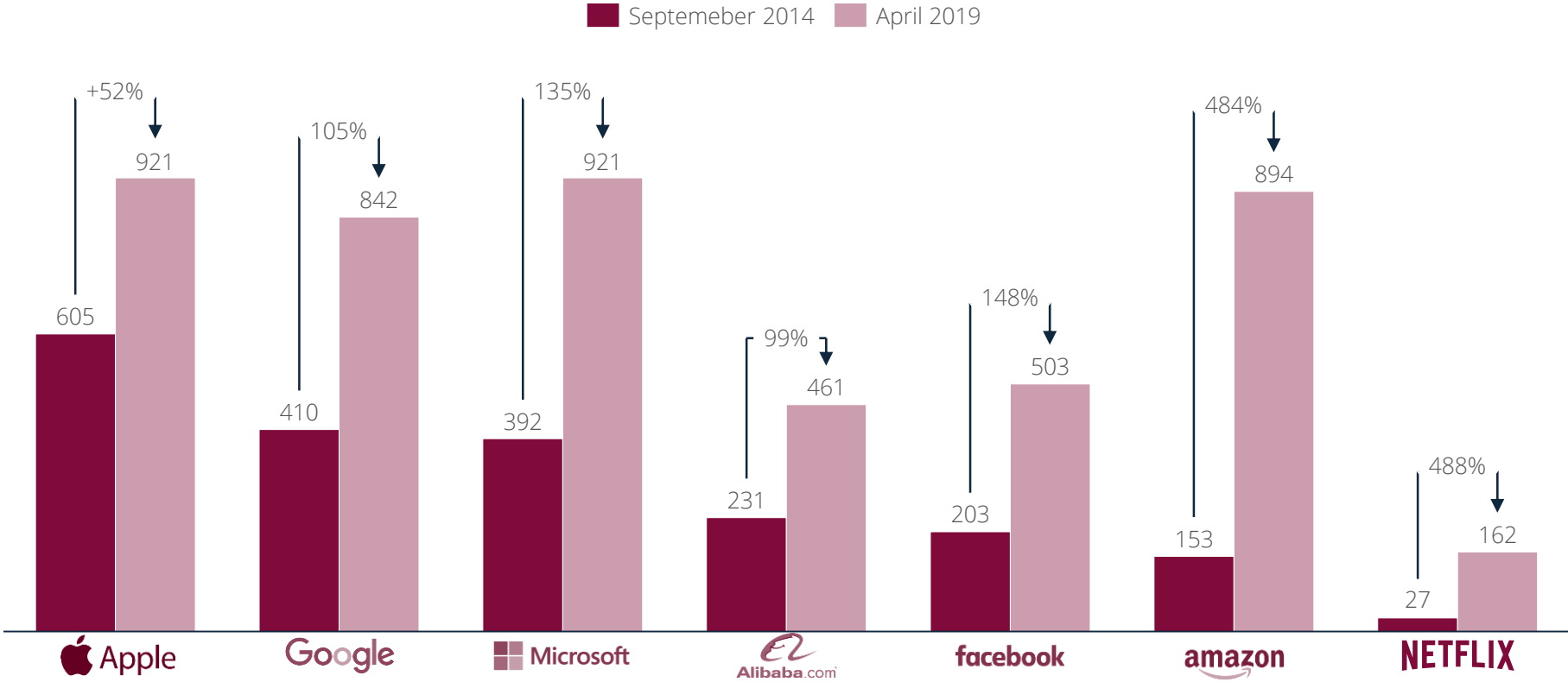
While traditional companies are stagnating, the valuation of tech companies is rising

Closing stock prices of selected companies in US\$



In the past five years, most top tech players have at least doubled their valuation

Market cap of top tech companies in billion US\$



Is the market overvalued?

The high valuation of companies on the stock market leads to the question whether we are moving towards the next bubble and the next recession. The U.S. stock market reached a record-high level of over 1.5 times the country's GDP in 2018. At the same time, market valuations and the average investment sum per deal were higher than during the dot-com bubble.

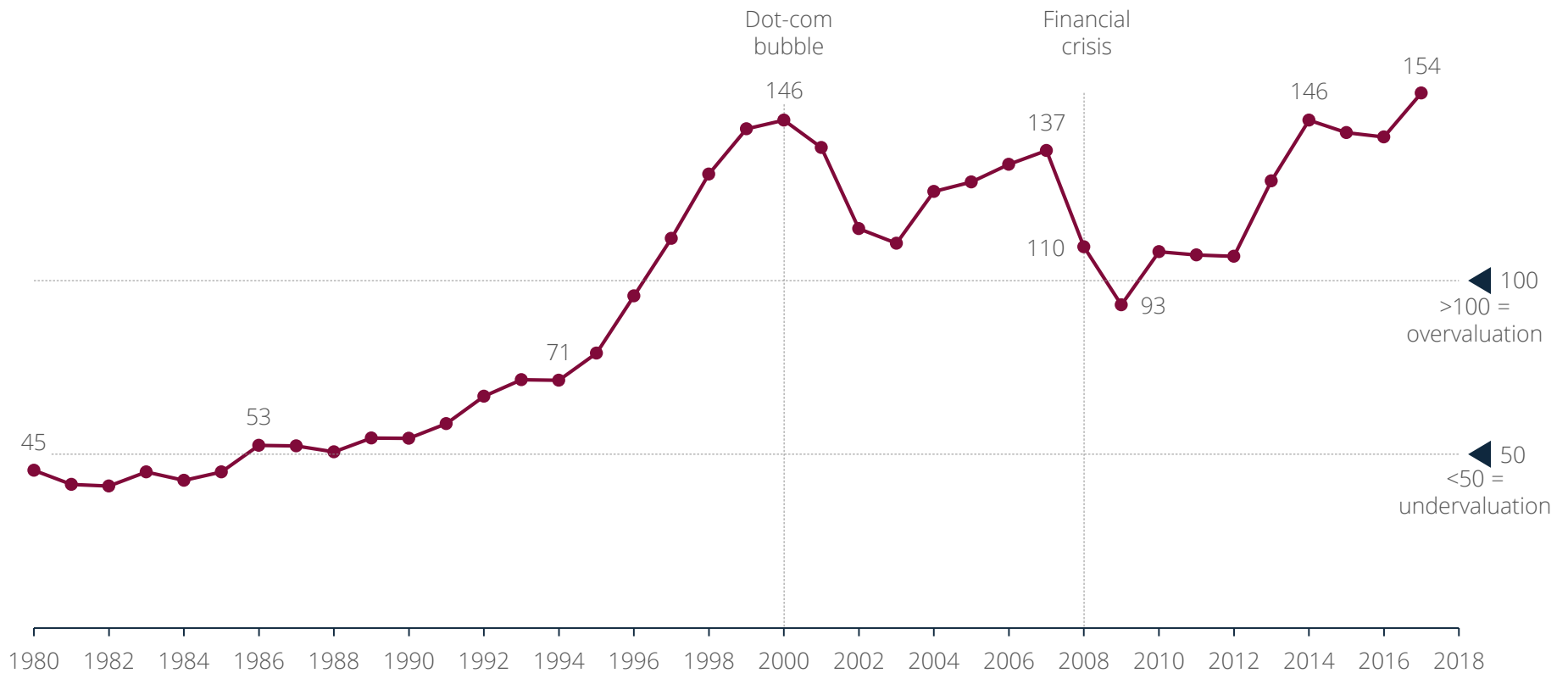
When looking at unicorns or newly-traded companies and their valuations, it becomes clear the latter are hard to justify with the companies' revenues, especially if you compare them to those of traditional players. Netflix's market valuation is almost as high as Comcast's, but it only generates a fraction of the latter's revenue. The craziest valuation, however, has WeWork, with 18.8 times its revenue as a market cap.

The high stock market values and the high unicorn valuations are fueling the rumors that the market is overheating.



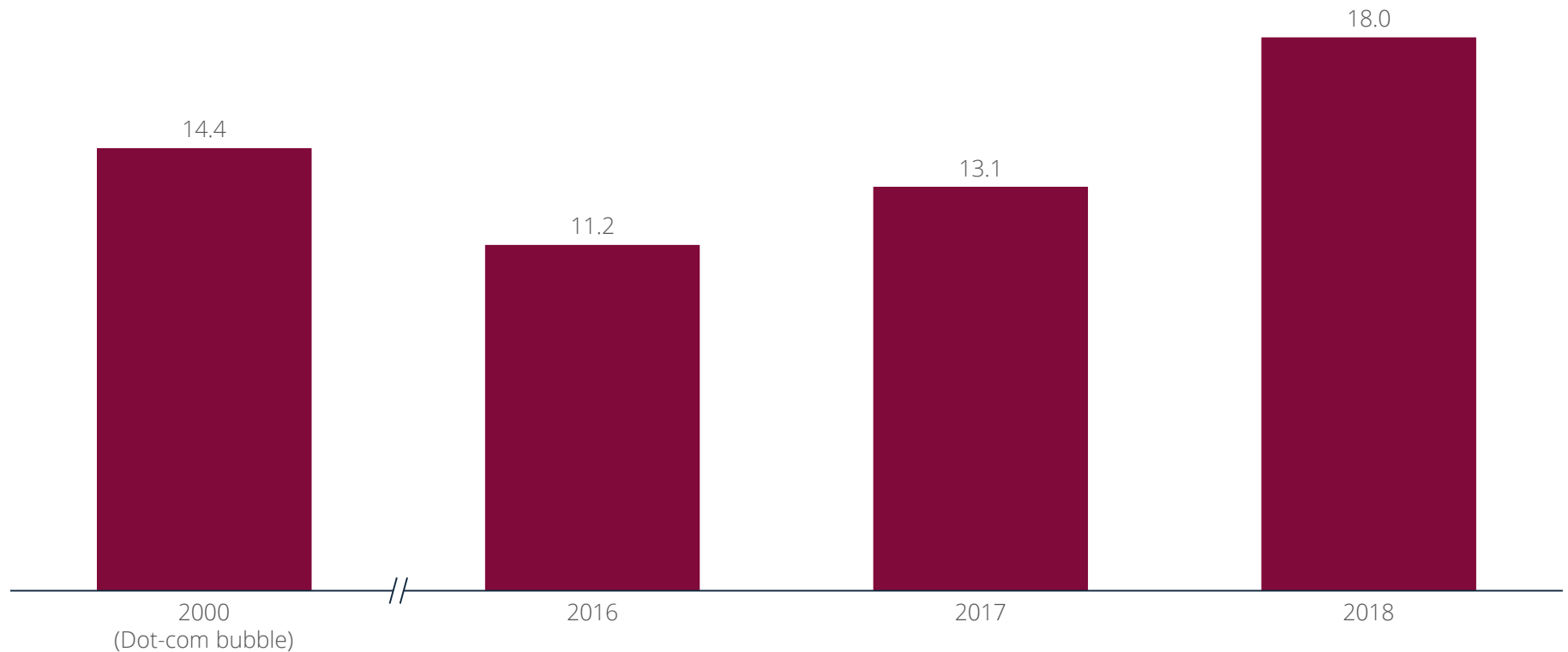
Is the next bubble about to burst?

Total value of all listed shares in the U.S. stock market as % of GDP



The average investment sum per deal is already higher than during the dot-com bubble

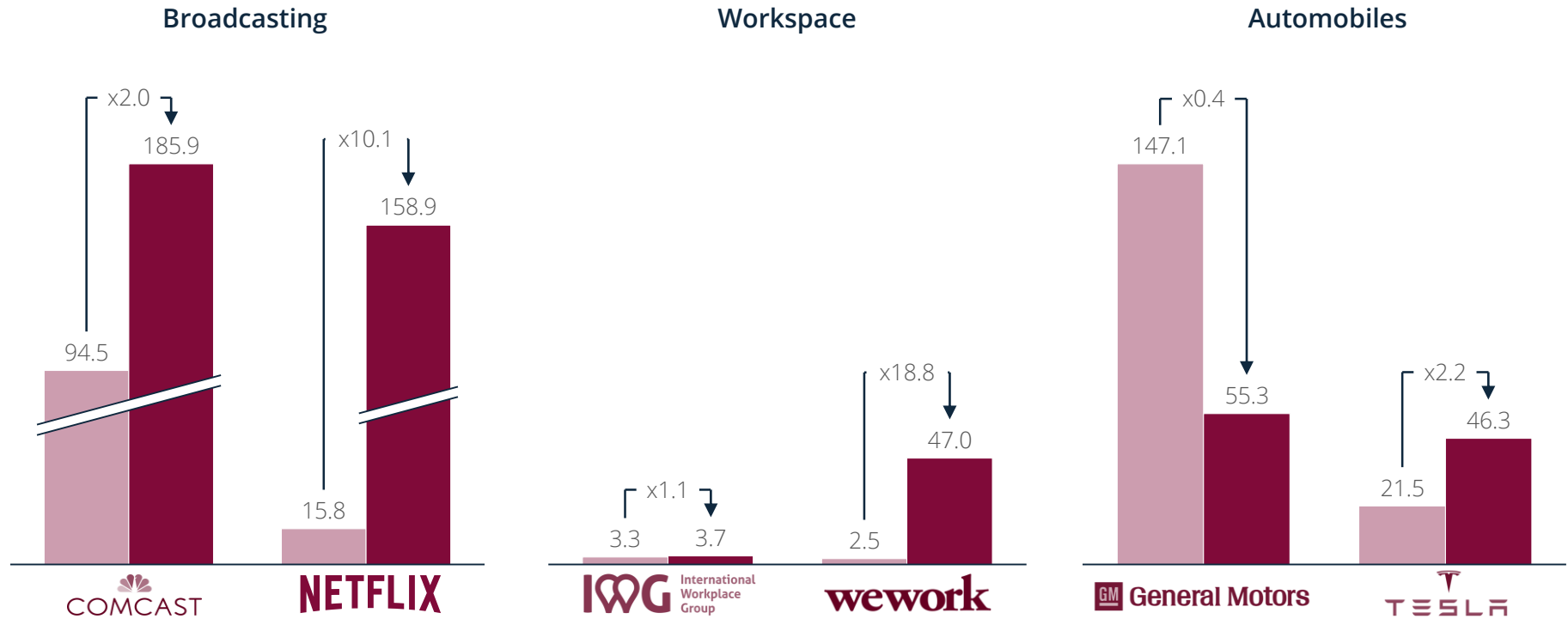
Average VC investment sum per deal in the United States in million US\$



Comparing market valuation and revenue reveals the high overvaluation of Tesla, Netflix, and WeWork

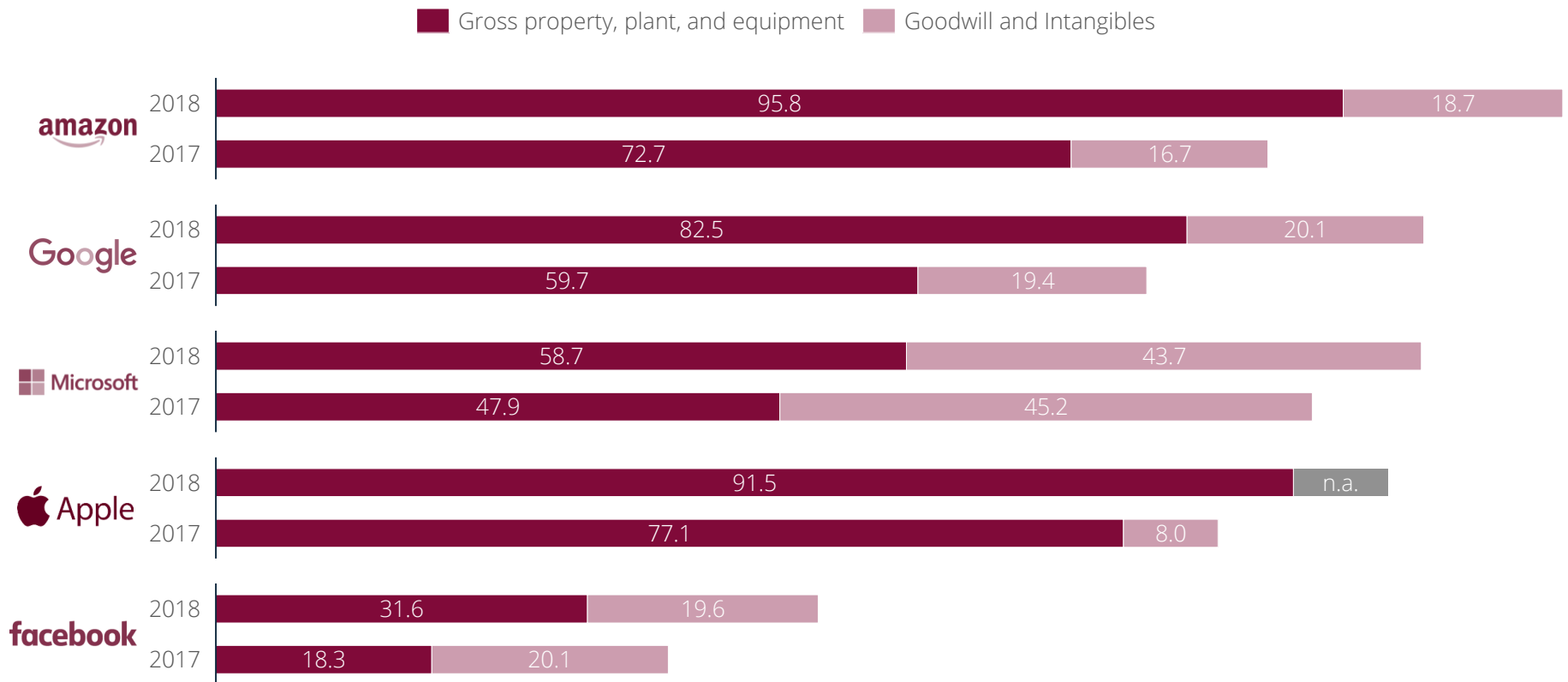
Market cap, company revenue, and their ratio in billion US\$ in 2018

Revenue Market cap



But U.S. tech giants are increasing their investments into hard assets

Development of property, plant, and equipment value vs. goodwill and intangibles in billion US\$



Recession in tech

The economy runs in cycles, and after ten years of steady growth, many market players expect it to slow down in 2019, possibly even going into decline.

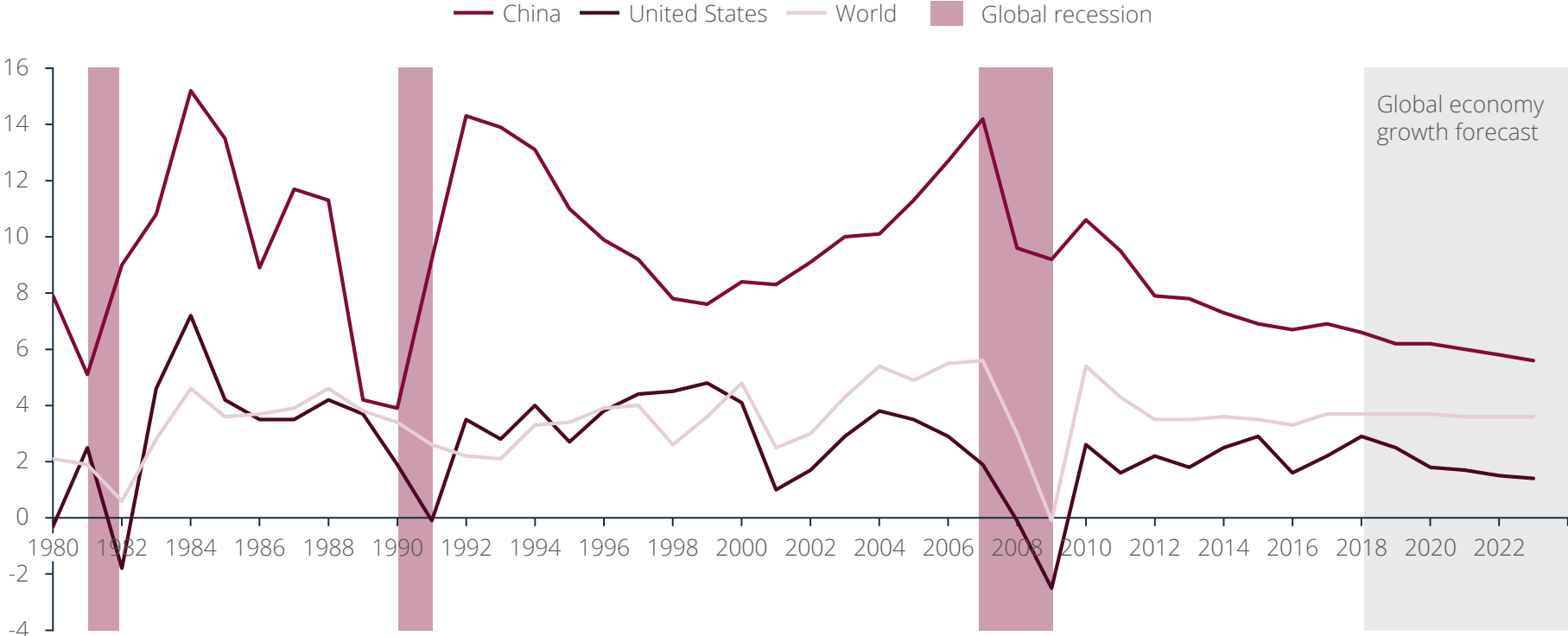
The current trend towards very high valuations and the possible overvaluation of the market can be interpreted as a sign of the next economic bubble that is about to burst. Recessions heavily influence funding, cutting down the market valuations of publicly traded companies and making it much harder for start-ups to attract investment.

But we are not there yet. The so-called “Fall of the FAANG¹” at the end of 2018 was interpreted as a possible start of a recession, but stock prices bounced back in 2019.



Global growth is expected to slow in 2019 – is the next recession around the corner?

Real GDP growth in annual percent change



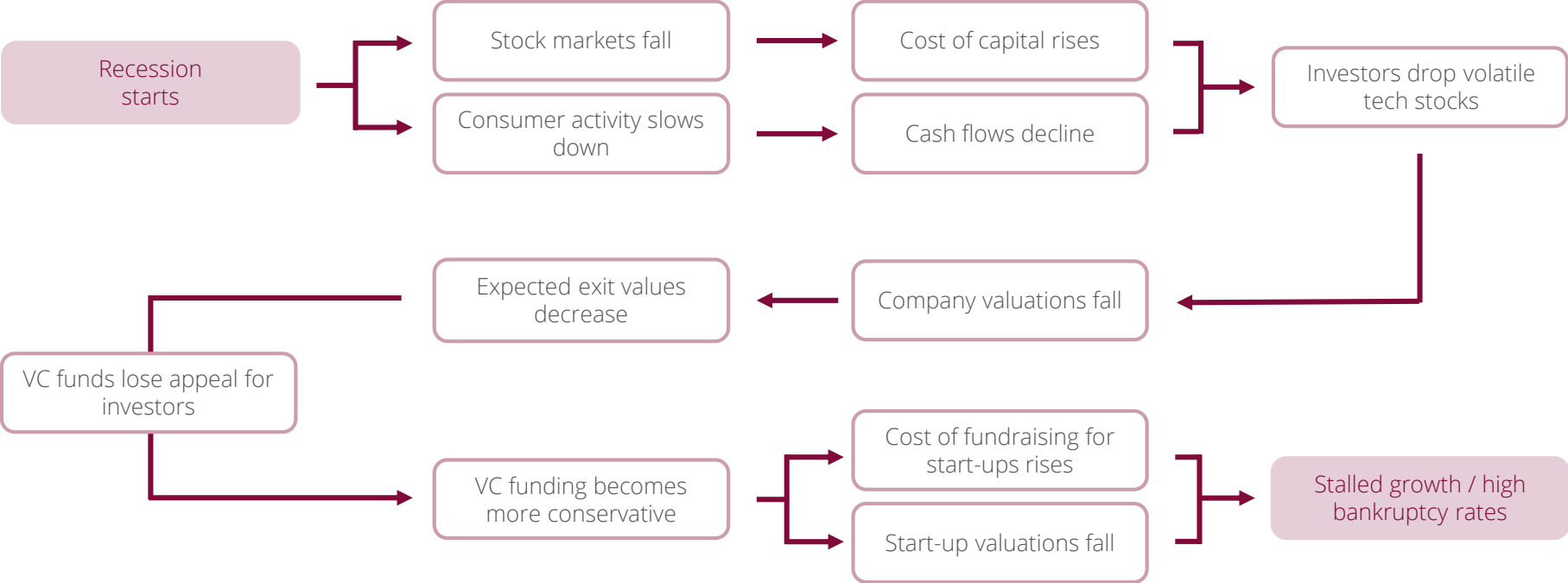
Economy dips lead to funding gaps in VC financing

Value of venture capital investment and real GDP growth in the U.S.



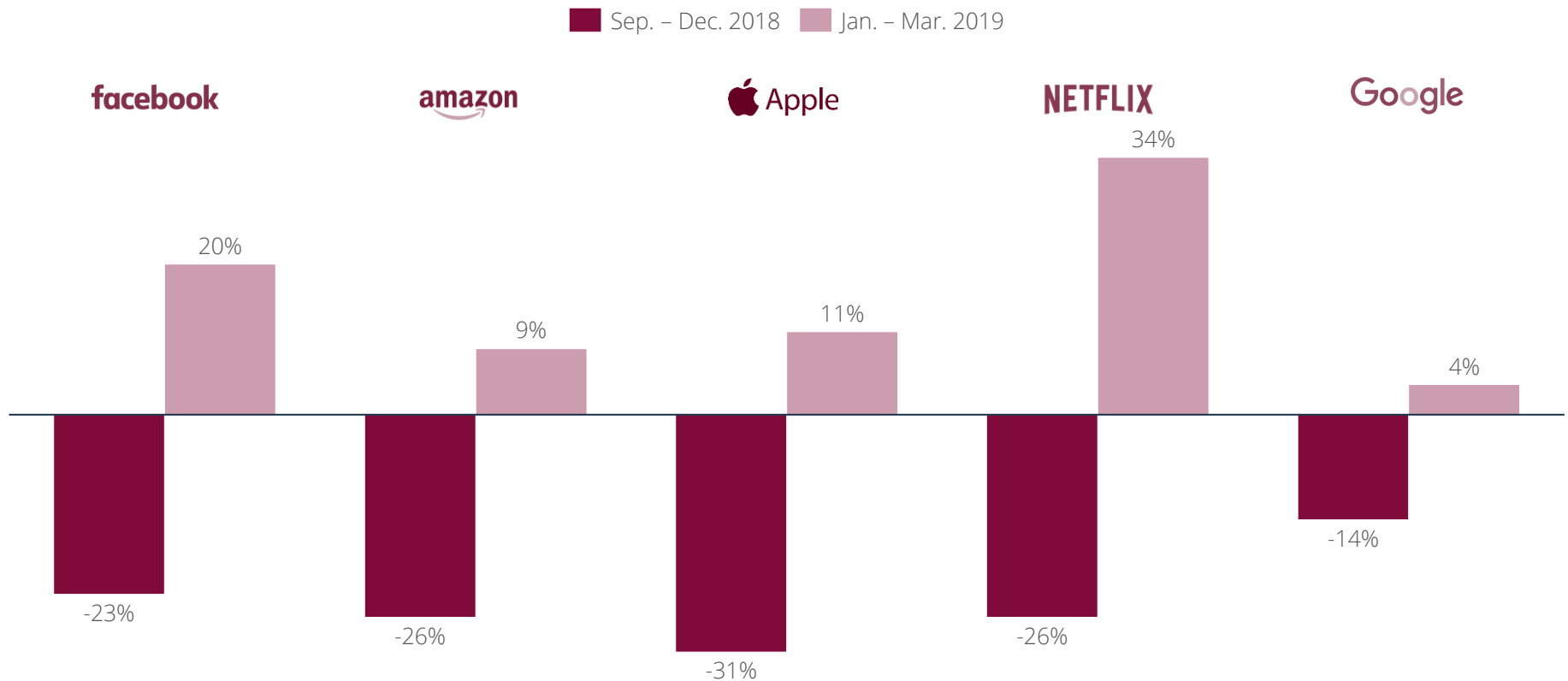
Recessions make it harder and more expensive for start-ups to raise venture capital

What happens to venture capital start-up funding in the next recession?



The so-called “Fall of the FAANG” was interpreted as a possible start of a recession, but they all recovered

Change in closing stock prices for FAANG¹ in % from September 2018 to March 2019



Statista Digital Market Outlook

Digital markets play a crucial role in the world economy but there are vast differences in the maturity and extent of digital services available in each region and even more each country.

The European and North American countries are often highly digitalized, but many of the Asian countries are currently catching up with impressive speed. The fast adoption of digital media and digital payments in these countries leads to a different usage behavior, as interacting online and being online gains an unprecedented “normality”. This in turn leads to different market structures, which have large impacts on the size and development of the digital markets.

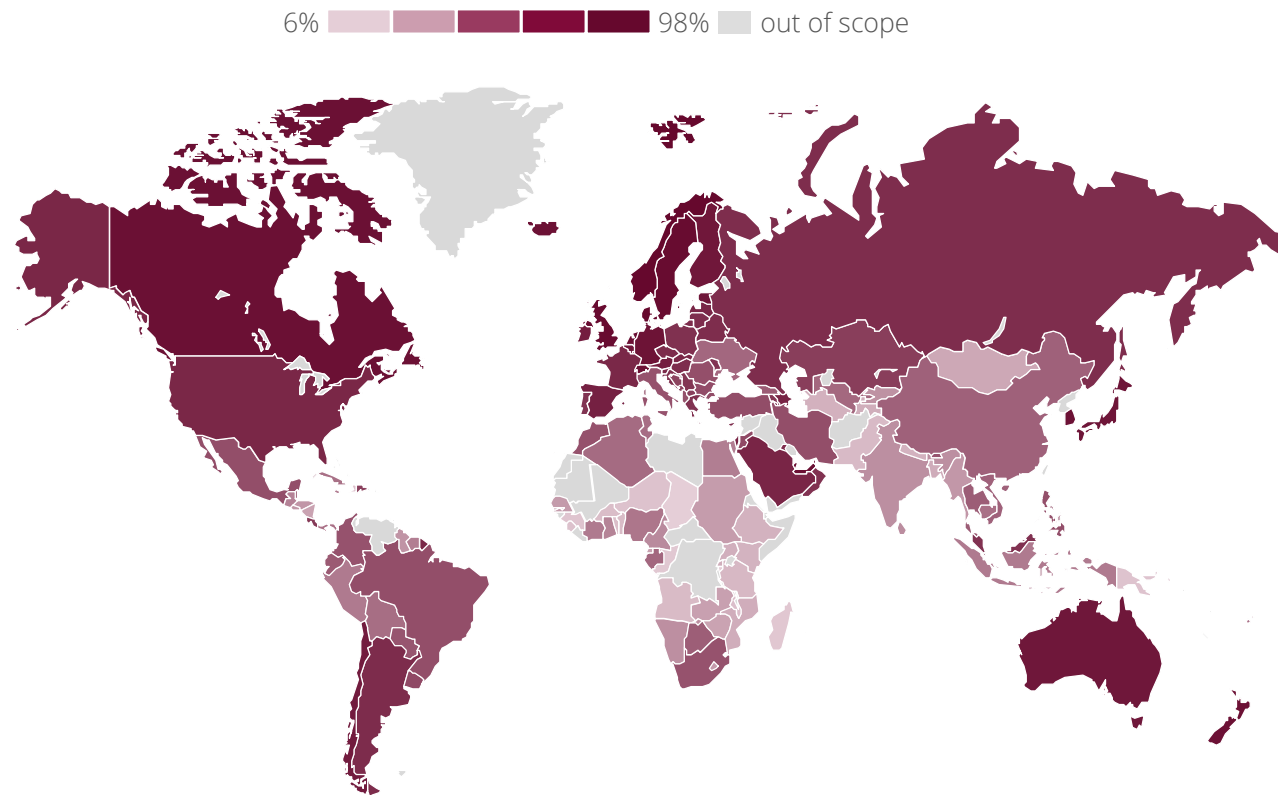
But the preconditions available for successful digitalization of markets are differing heavily between countries. While European and North American countries have internet penetration rates of up to 94%, Asia and Africa lag far behind. Another aspect that influences the degree of

digitalization is the availability and price of internet. While the broadband subscriptions per capita and the average connection speed are rising constantly, a lot of people still lack access to internet or web-enabled devices.

The next chapter contains an overview over Statista’s eight digital markets, including market revenue sizes, user developments and current trends. The information provided is part of the exclusive research of the Digital Market Outlook, backed up with data from Statista’s Global Consumer Survey, Statista’s eCommerce Database and third party sources. Combined they provide an insight into the complex market structures and deliver nuanced information on specific segments and current changes in each market.

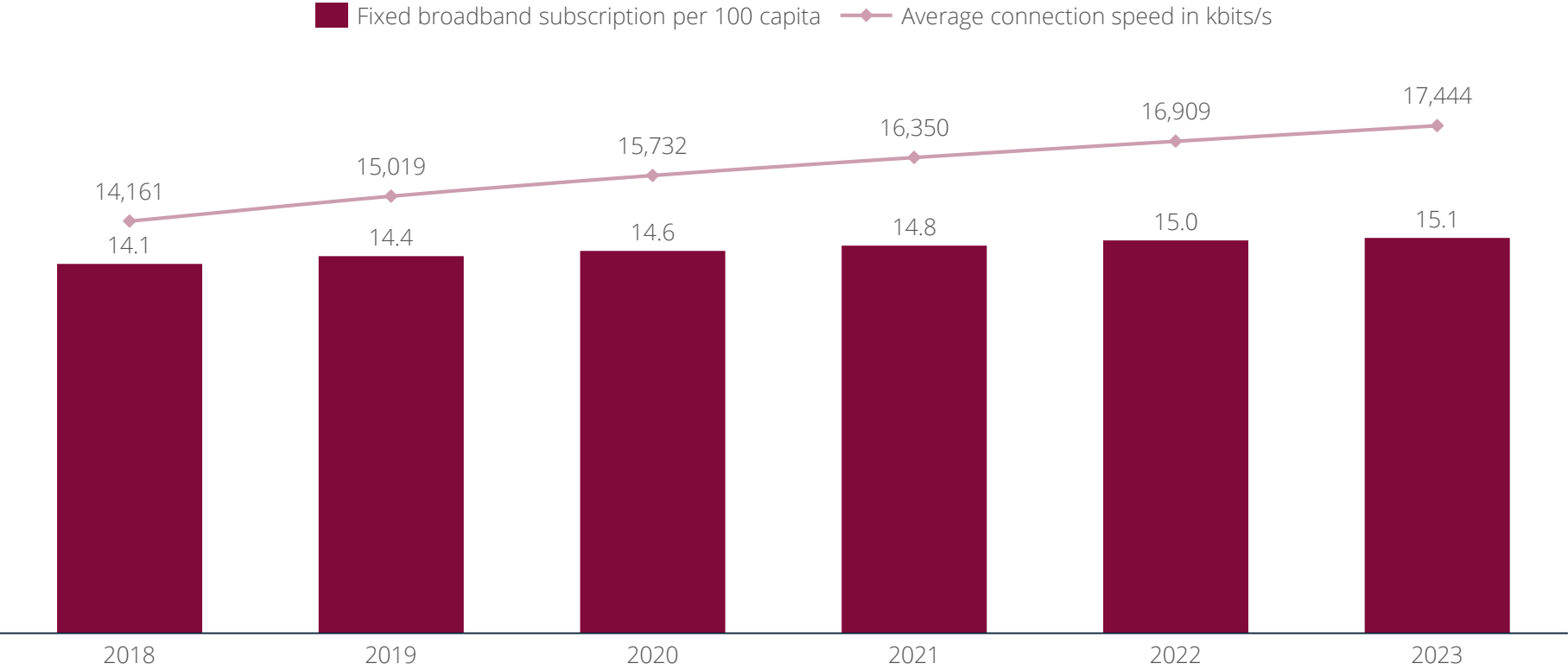
The availability of internet access differs massively across the world

Internet penetration in 2018



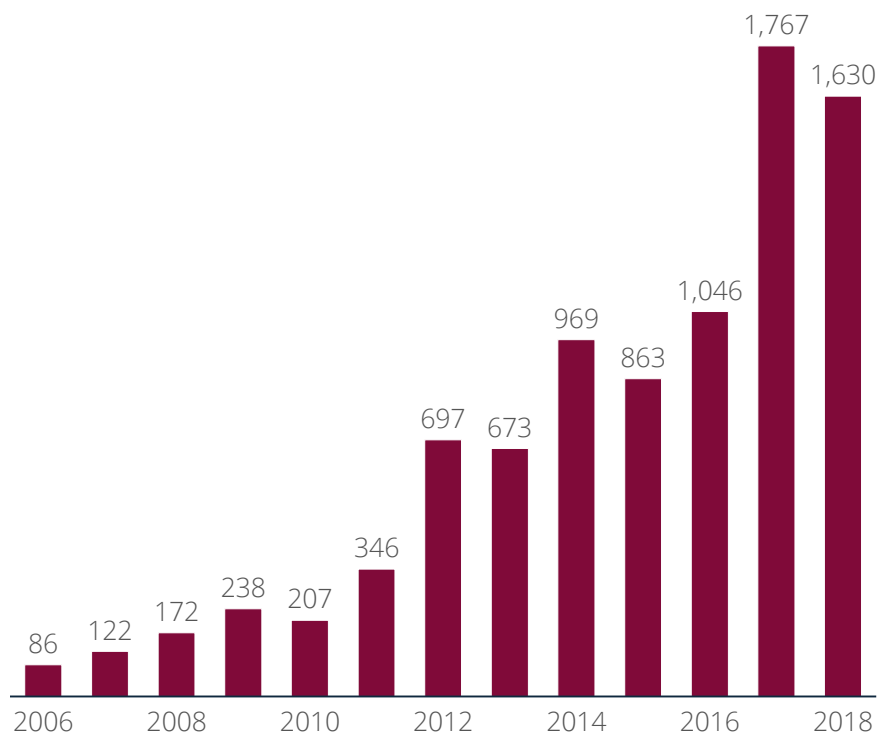
Broadband subscriptions and connection speed are continuously rising

Global fixed broadband subscriptions and average connection speed

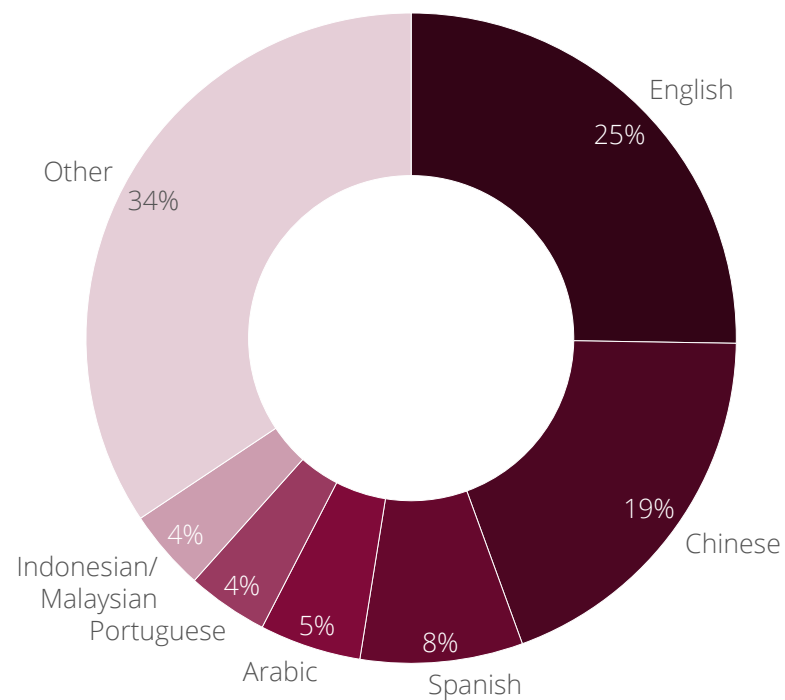


A quarter of the internet's 1.6bn websites is in English

Number of websites in millions

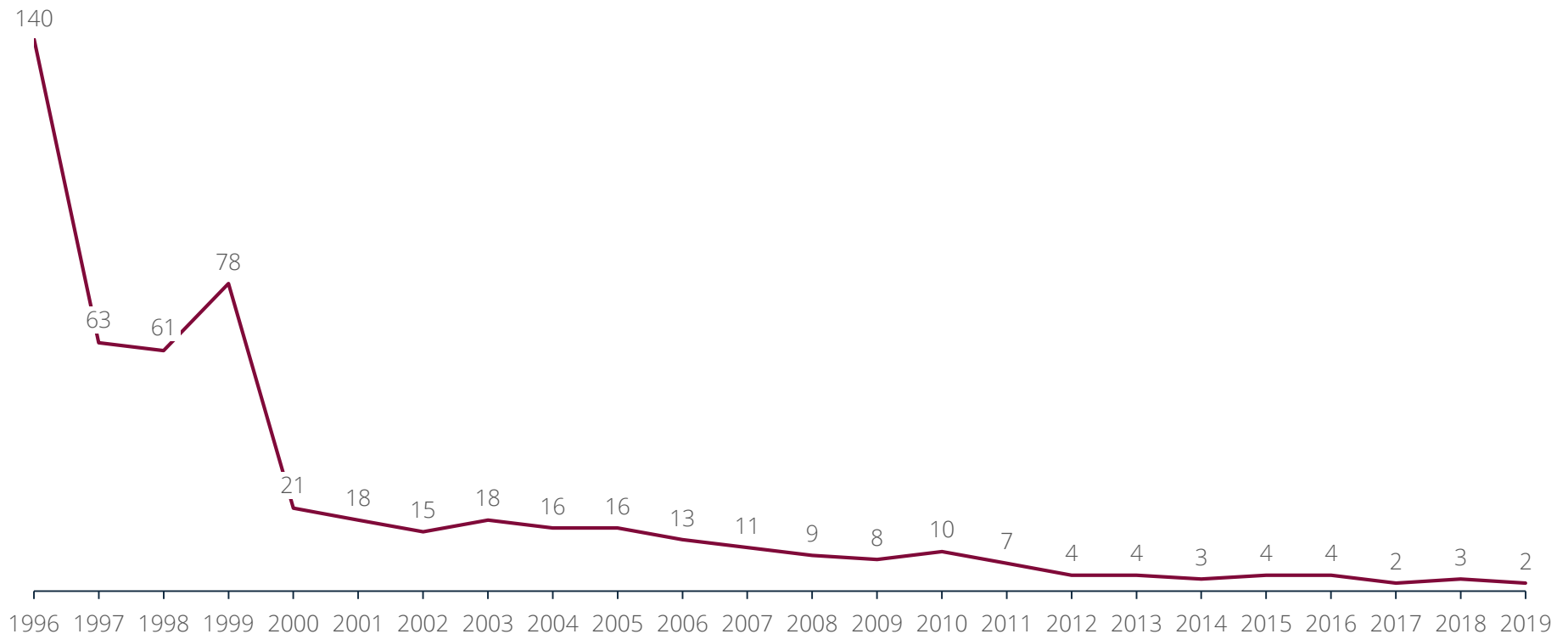


Share of languages on the internet



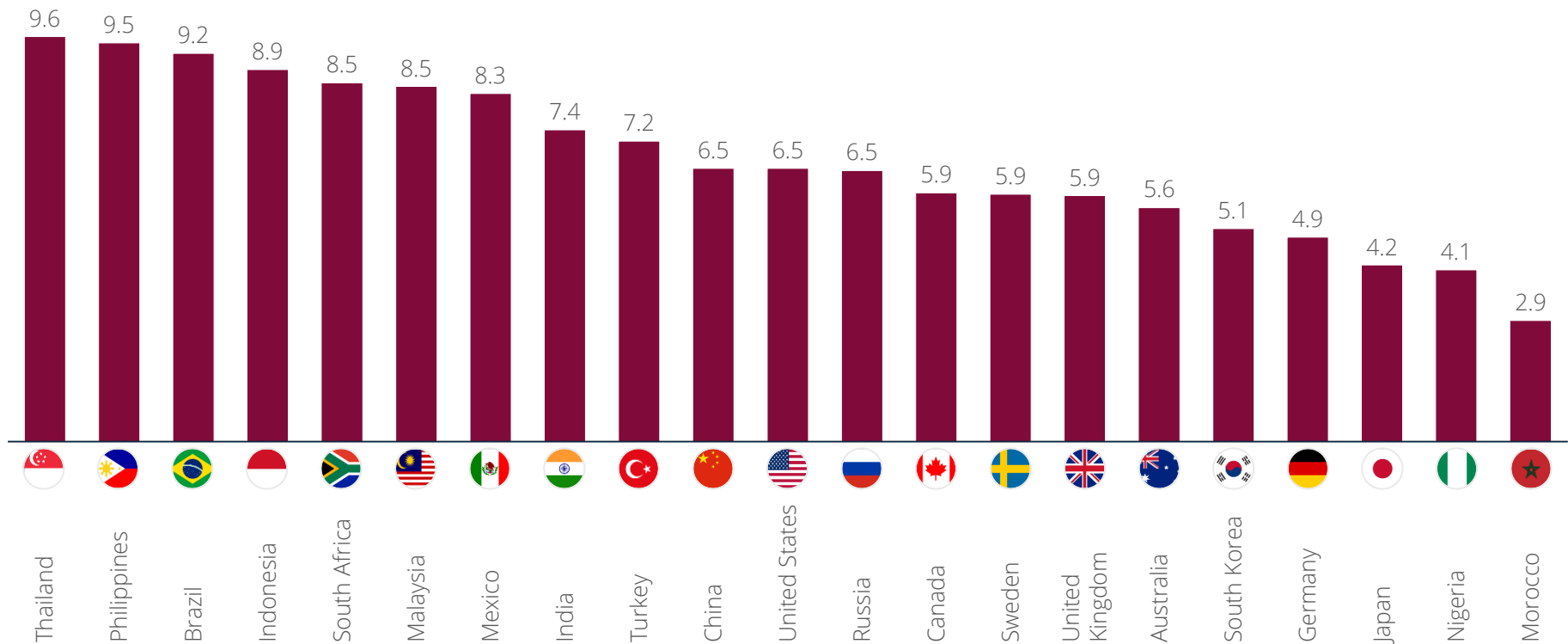
With rapidly rising number of websites, the number of users per website is decreasing heavily

Number of internet users per website



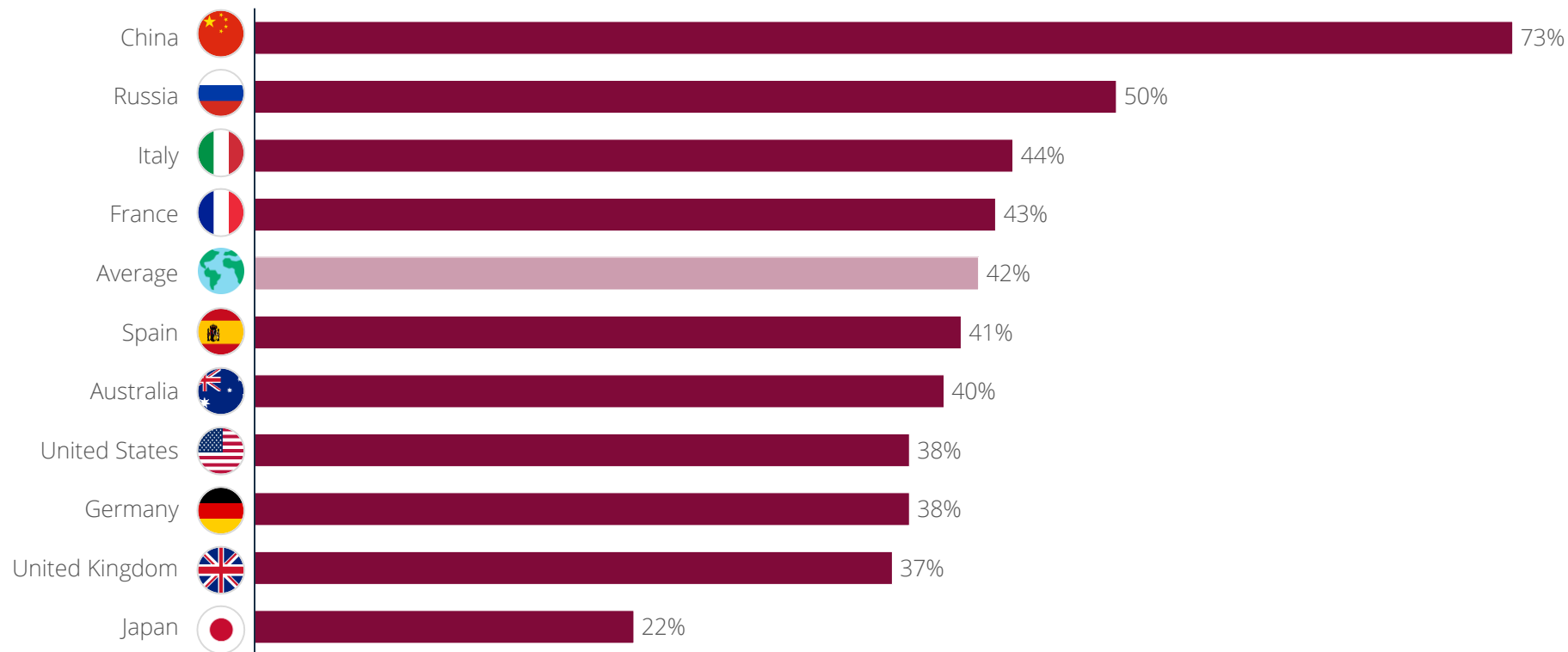
Asian consumers spent far more time online than European consumers

Time spent on the internet per day in hours in selected countries in 2017



Chinese customers are most confident that technologies can tackle the world's problems

Share of respondents from selected countries who think that digital technology will improve the world





eCommerce

In the last decade, the eCommerce market has evolved from a simple counterpart of brick and mortar retail to a shopping ecosystem that involves multiple devices and store concepts. Many players from both online and offline retail are moving to multi-channel strategies and are continuously reinventing the way we shop online. Expectations are growing rapidly as customers discover more convenience on all levels – be it product customization, mobile-optimized search, quick checkout processes, or hassle-free delivery.

The Statista Digital Market Outlook divides the eCommerce market into five product segments: Fashion, Electronics & Media, Toys, Hobby & DIY, Food & Personal Care, and Furniture & Appliances.

In 2018, the global eCommerce market was worth US\$1.8 trillion. China was the biggest eCommerce market worldwide, generating revenues of US\$630 billion. China's eCommerce market has a high growth rate, which

is fueled by both the increasing purchasing power of the local population and cross-border eCommerce. With revenues of US\$501 billion in 2018, the U.S. constitutes the second biggest eCommerce market, followed by the UK with US\$86 billion. Amazon, Walmart and Apple are the three biggest players in the United States. Amazon also dominates the most relevant European eCommerce markets.

Chinese key market players like Alibaba Group, JD and Tencent together add to a comprehensive eCommerce ecosystem in China – and increasingly penetrate other promising Asian markets like Indonesia and India. The Chinese population is tech savvy and mobile-first, and Chinese eCommerce giants are therefore constantly pushing technology forward. They have diversified into literally every sphere that comes in touch with online retail, from payments to logistics. Current developments in China will – to a large extent – define the next decade's global eCommerce.

The growth of cross-border eCommerce is a hot topic in the Western markets, especially within the EU free trade zone. Geographic proximity and logistics make it possible for sellers to offer attractive shipping times and convenient returns to not only local buyers but to the whole EU population. Cross-border eCommerce is also an opportunity for players from the mature UK, French or German markets to expand their businesses to all corners of Europe.

We are witnessing two more major trends: mobile commerce and the almighty marketplaces. Marketplaces like eBay or Amazon have a firm grip on the market as they have long become primary product search engines. They enjoy a significant amount of recurring customers, who come back for best prices, transparent quality, and easy returns.

We expect marketplaces to become the primary shopping destination for almost all product categories. The exception will be context-rich categories like luxury goods, interior design, and fashion, where stand-alone shops will always have their share of the market.

Mobile eCommerce is now the fastest-growing segment as customers enjoy shopping on-the-go and increasingly browse the shops and place orders on their smartphones or tablets. Its scope is not limited to

creating mobile-friendly shop interfaces or separate shopping apps. Its major potential lies in AI applications, augmented reality, voice eCommerce, and customer profiling.

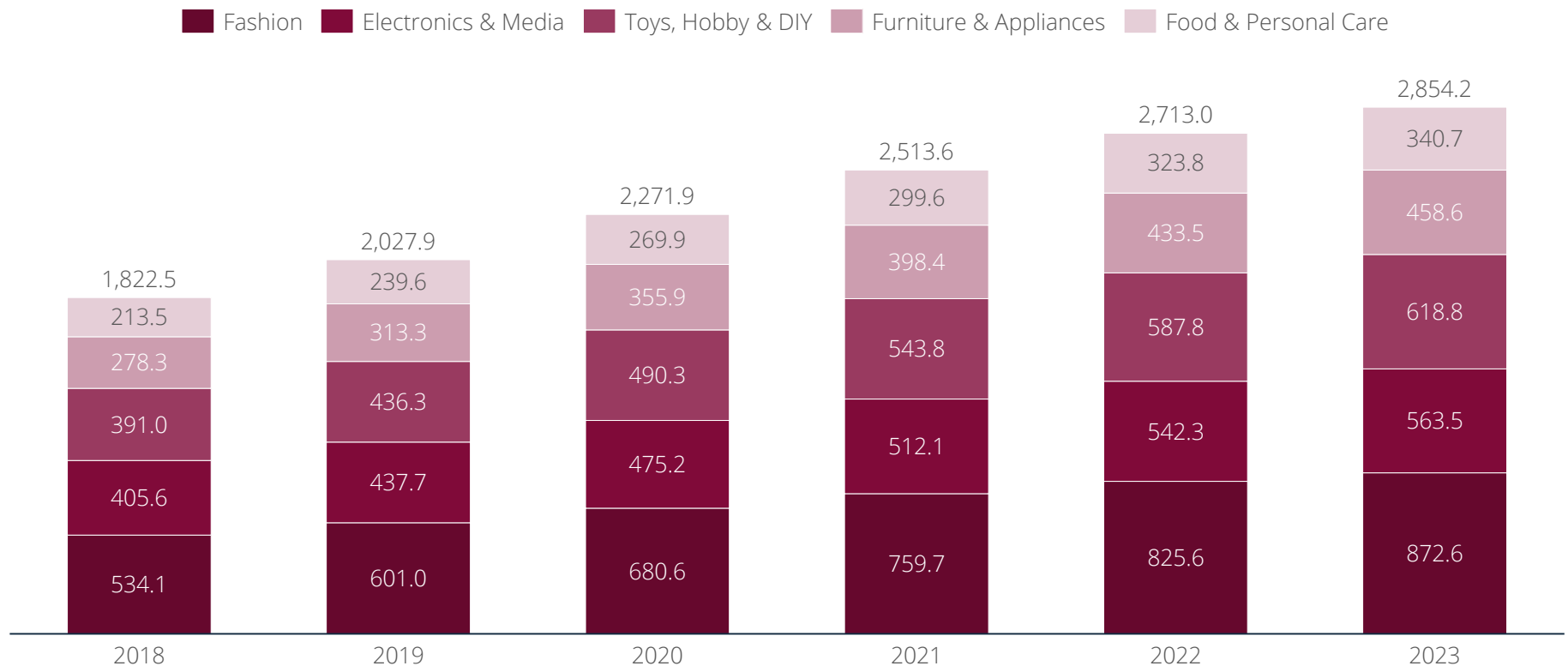
Both online-only players and traditional retailers are developing various multi-/cross-channel strategies to reduce inconvenience and increase customer satisfaction throughout the customer journey. Parcel delivery boxes and exact delivery times for working people, drone deliveries of time-sensitive products like medicines as well as same-day-delivery services are only a few of many ambitious innovations and optimizations in the area of product or service delivery.

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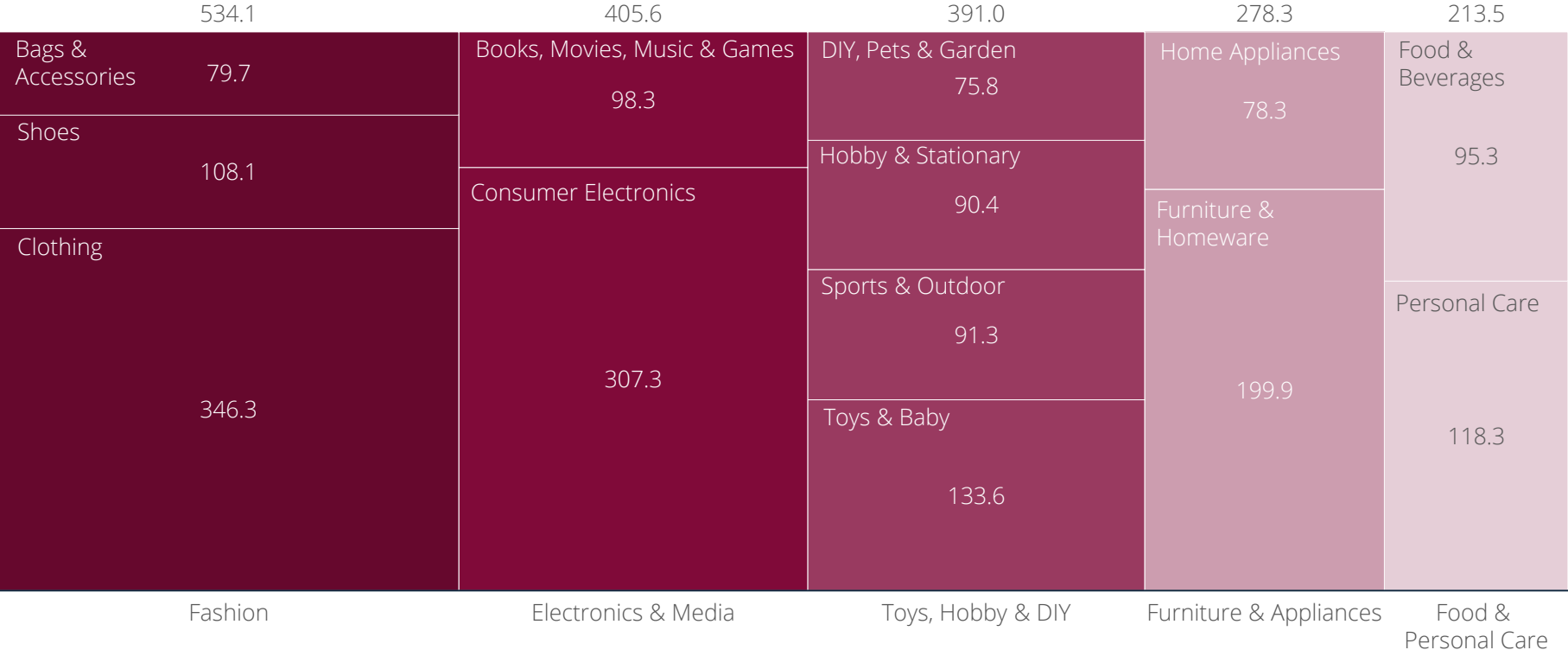
The global eCommerce market is expected to reach US\$2.7 trillion in revenues by 2023

Global eCommerce revenue forecast in billion US\$



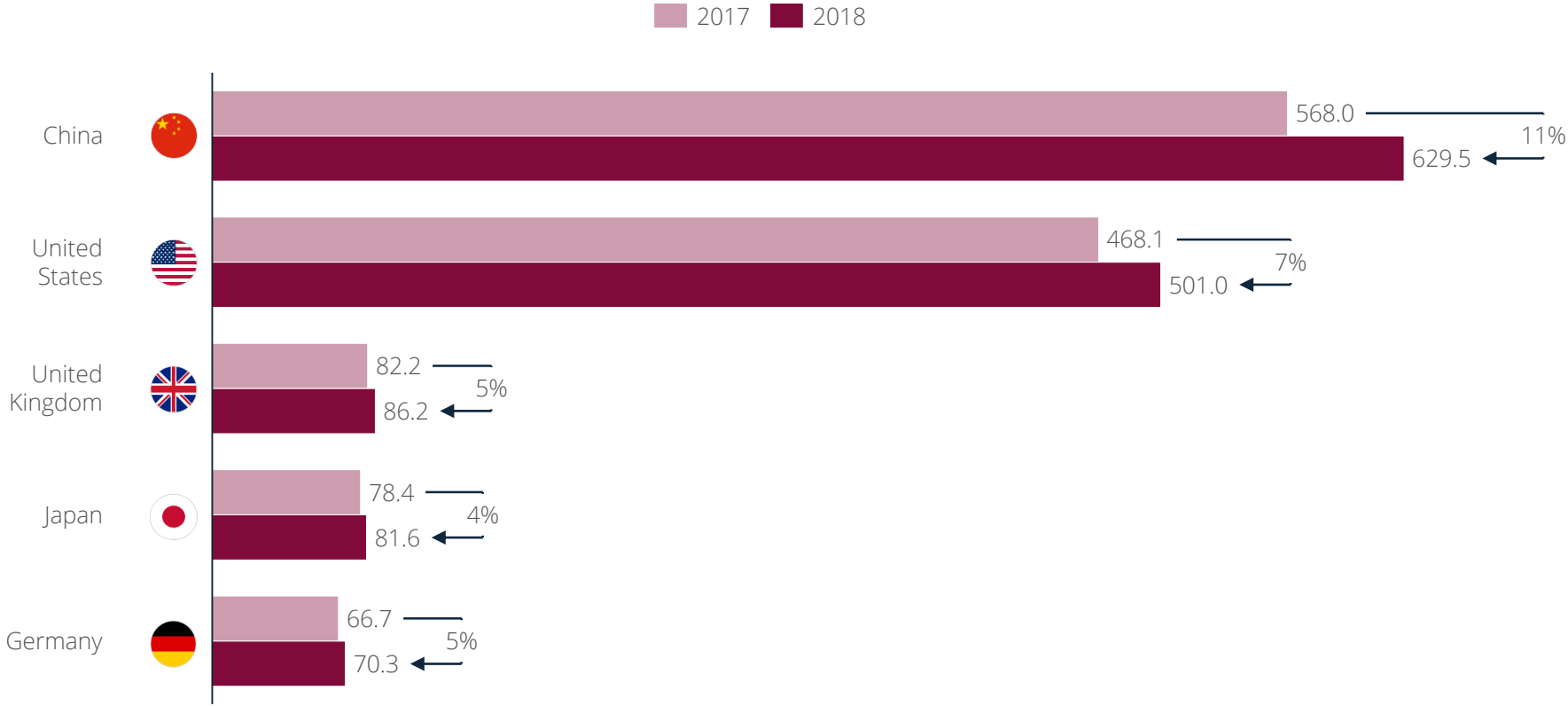
Clothing and Consumer Electronics are the biggest categories within eCommerce

Global eCommerce revenue in billion US\$ in 2018



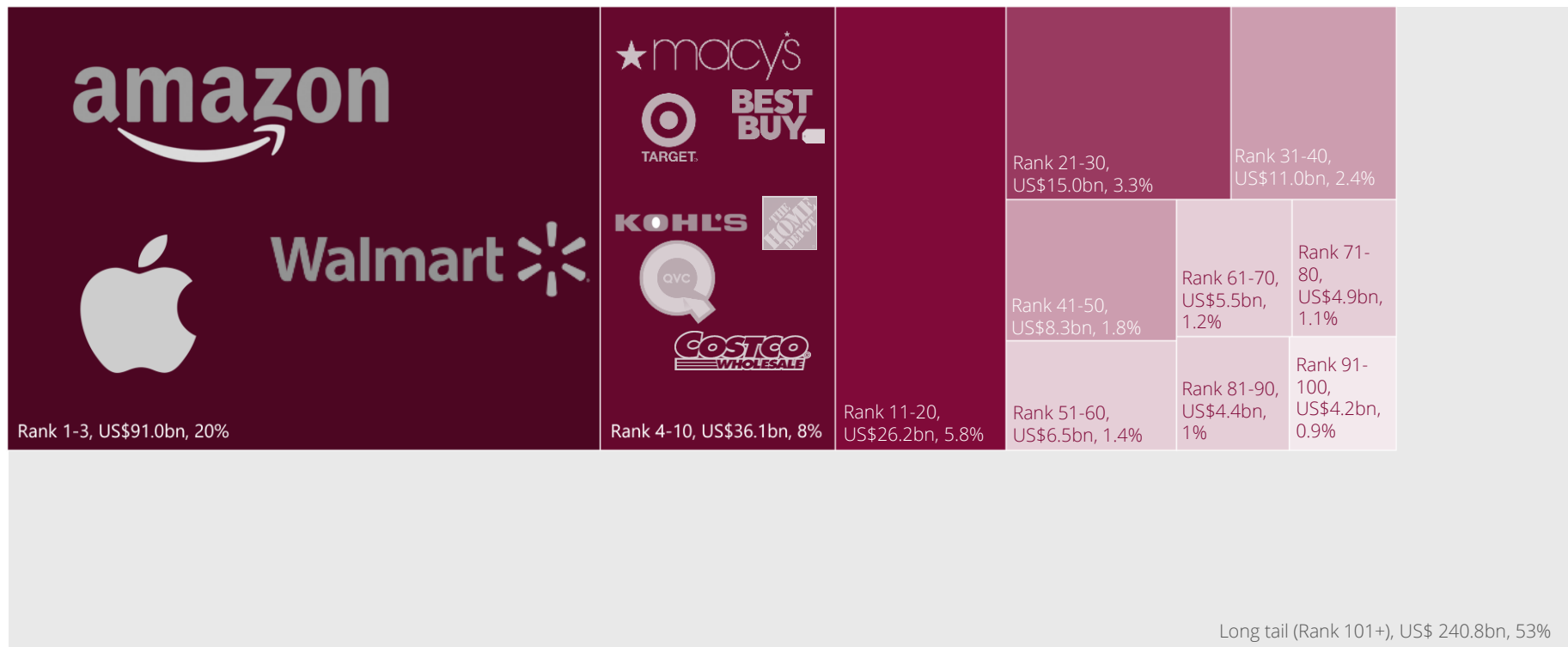
China remains #1 in eCommerce and grew over 10% in 2018

Top 5 eCommerce countries by market revenue in billion US\$



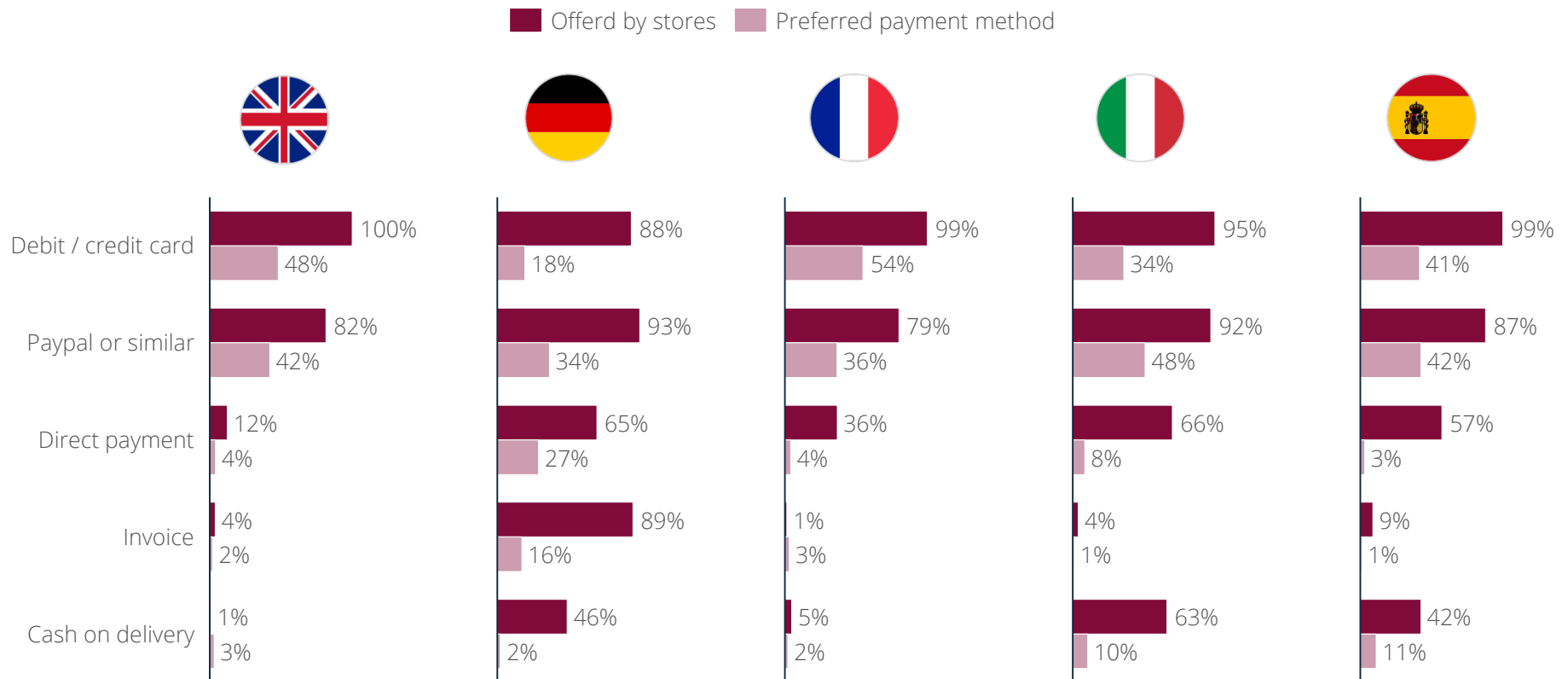
The U.S. eCommerce market is highly concentrated – 3 largest stores account for 20% of net sales

U.S. eCommerce net sales and market shares in 2018



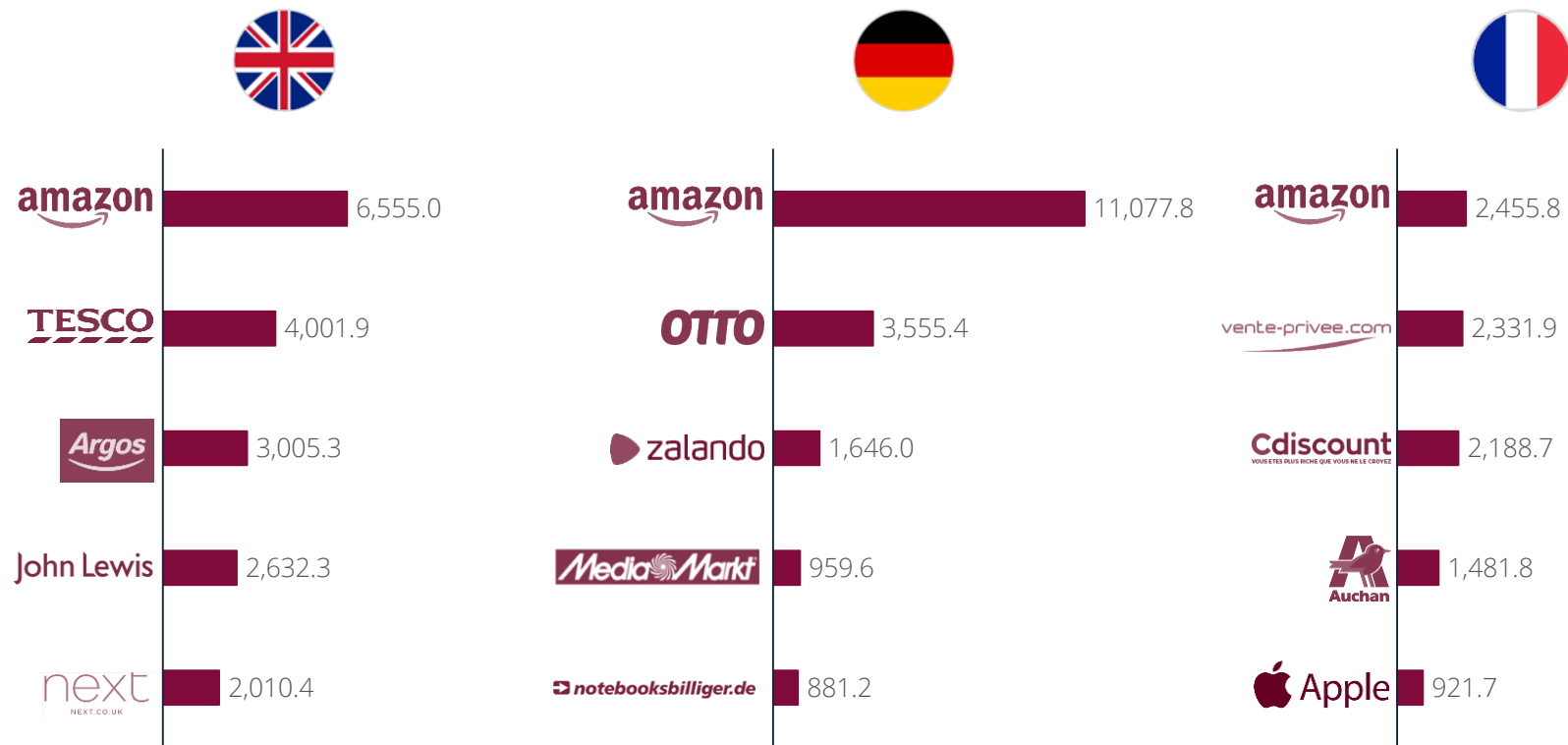
The payment methods offered by European online stores mostly meet customer needs

Payment methods offered by online stores and preferred payment methods of online shoppers¹



Amazon is the #1 online shop in the most relevant European eCommerce markets

Top 5 online shops by revenue in million US\$ in 2018



Next to large all-encompassing platforms, there are many product-specific eCommerce players

Selected key players in the eCommerce market

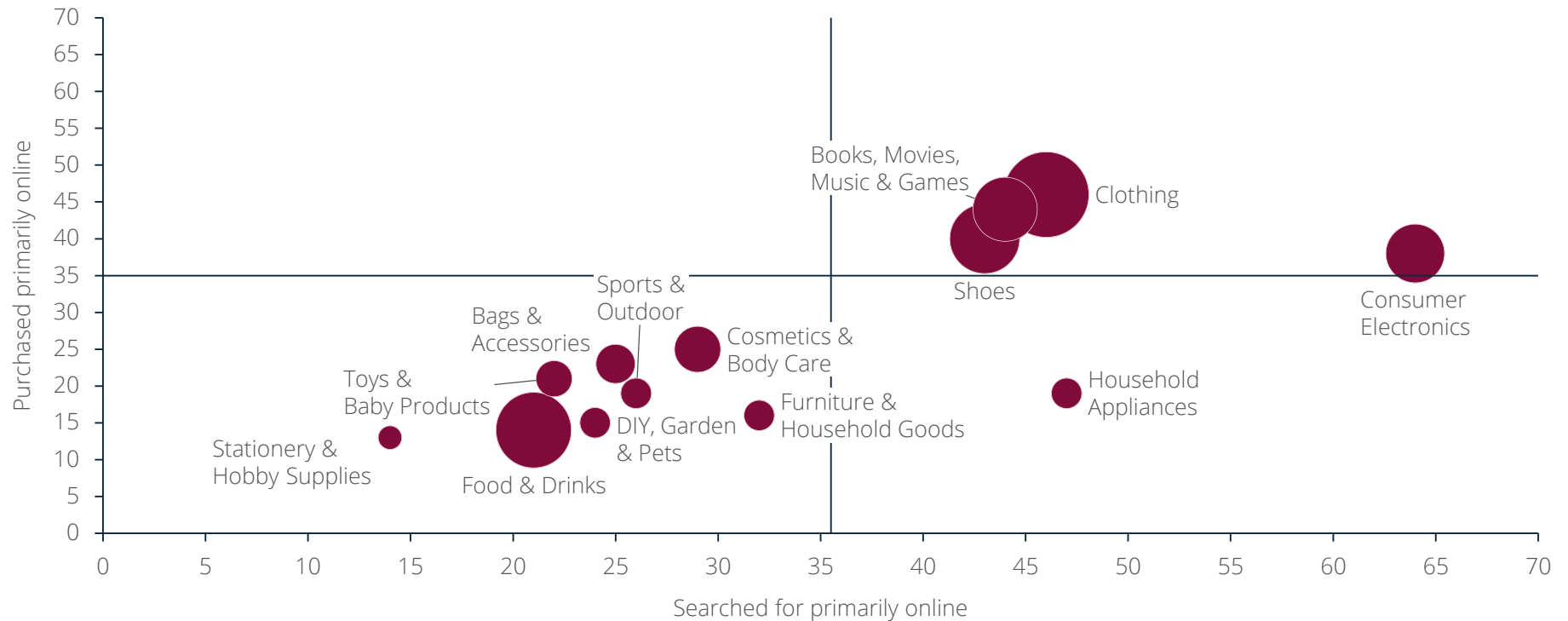
	Marketplaces	Online retailers	Direct sellers
United States 	   	        	       POTTERY BARN  VICTORIA'S SECRET
China 	    	    	     
Europe 	  	         	     

Consumer Electronics, clothing, shoes and media products are mainly searched for and bought online



Share of U.S. consumers who primarily search for / purchase a product online in %

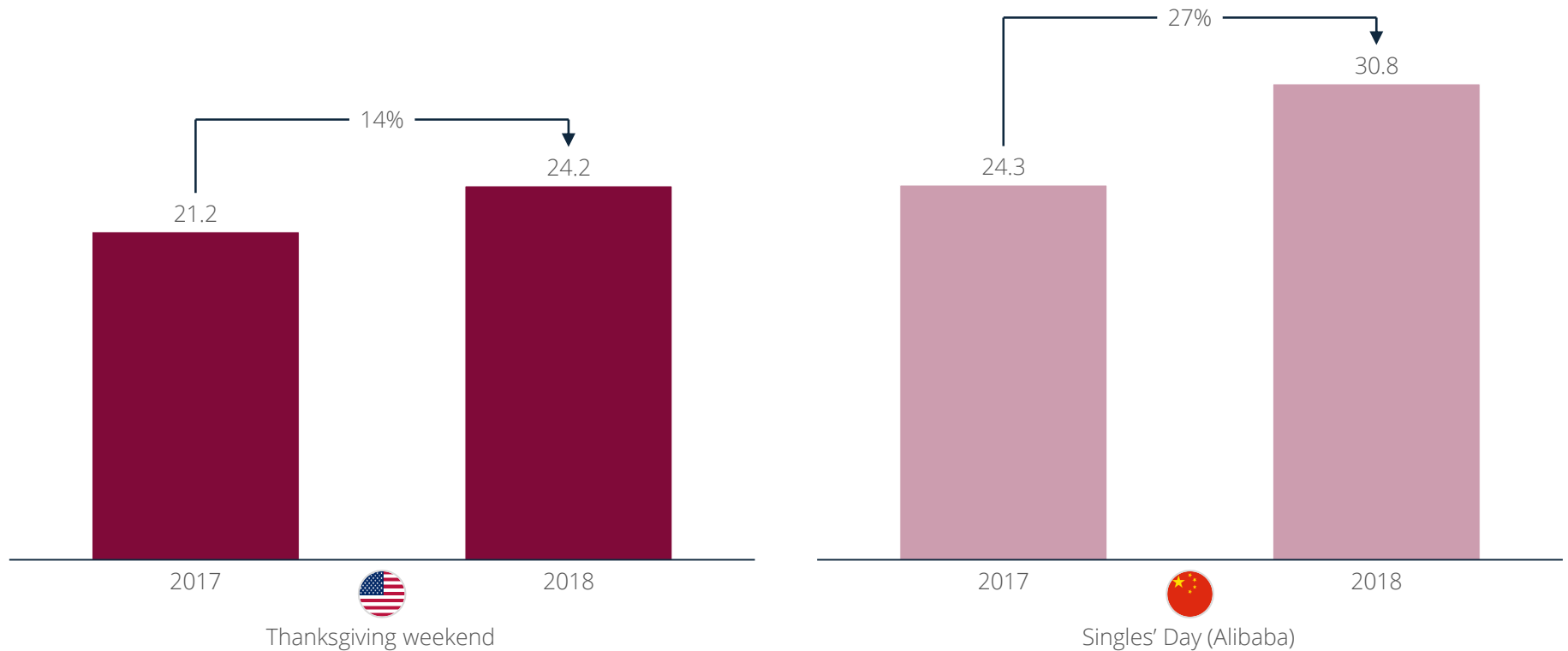
● Share of U.S. consumers who ordered these items online in the past 12 months



"For which of these products do you mostly look for information online?"; "Which of these products do you mostly buy / order online?"; "Which of these items have you bought online in the past 12 months?"; Multi pick; n=4,044
 Source: [Statista Global Consumer Survey](#), as at February 2019

Alibaba's sales on Singles' Day easily beat Thanksgiving weekend record sales

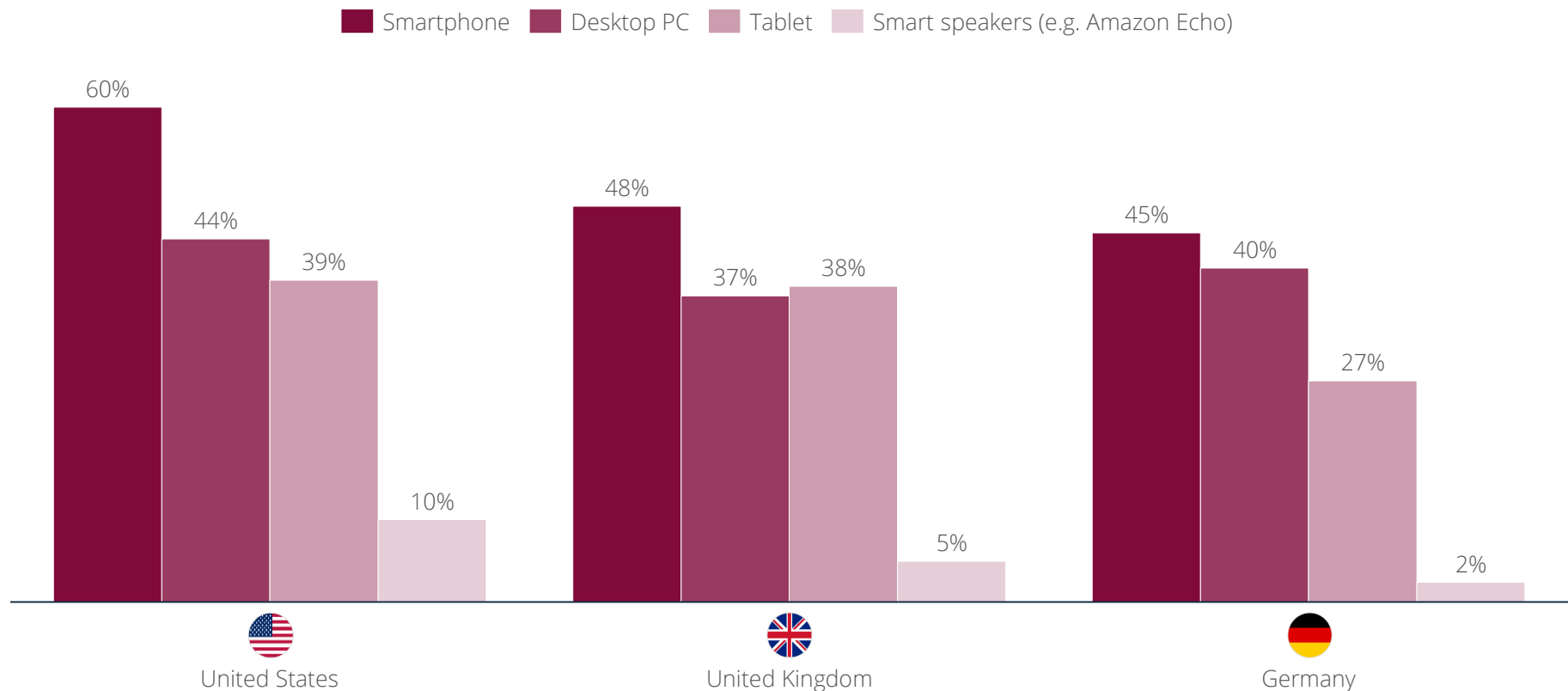
U.S. online retail sales on Thanksgiving weekend and Alibaba's GMV¹ on Singles' Day in billion US\$



The U.S. has the highest mobile and voice shopping rates



Devices used for online shopping in 2018

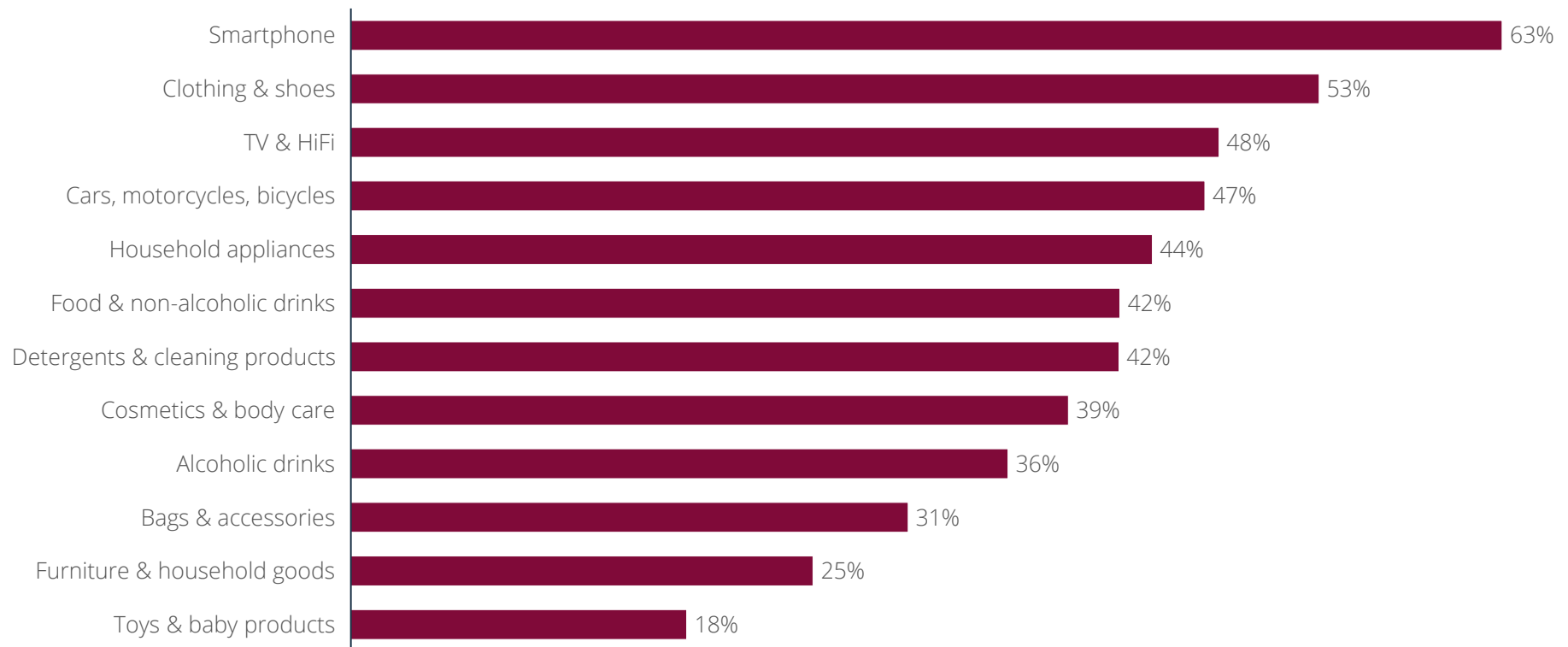


"Which of the following devices have you used for online shopping in the past 12 months?"; Multi pick; U.S.: n=4,044, UK: n= 2,011, DE: n=2,062
Source: [Statista Global Consumer Survey](#), as at February 2019

To U.S. consumers, brands matter most when it comes to smartphones



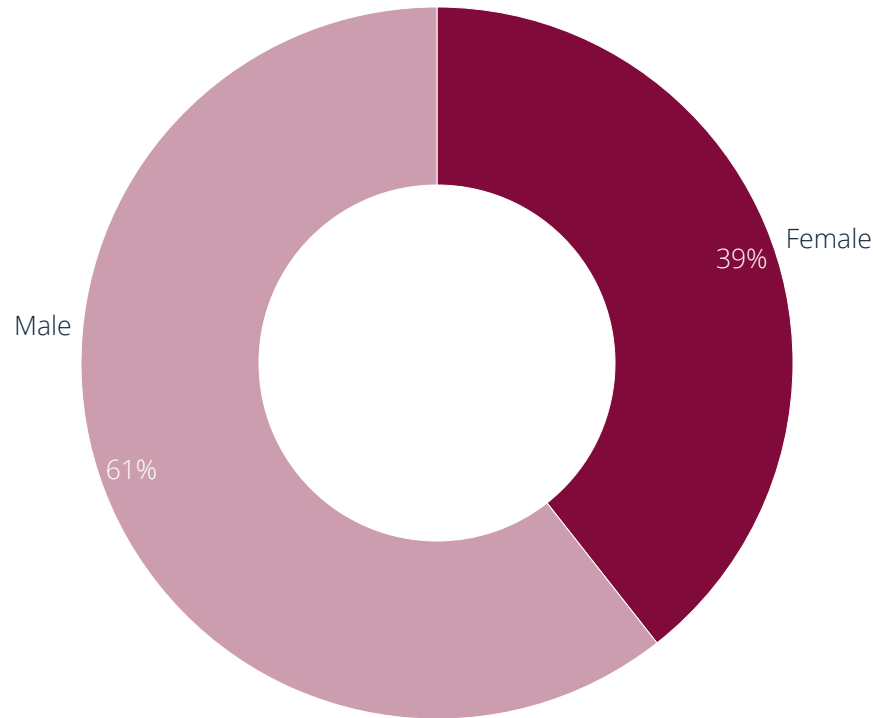
Brand awareness in the U.S.



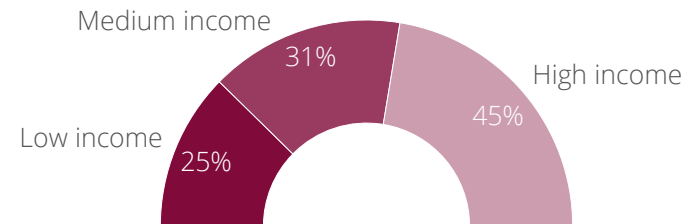
Over one third of Chinese online shoppers buying consumer electronics are aged between 25 and 34



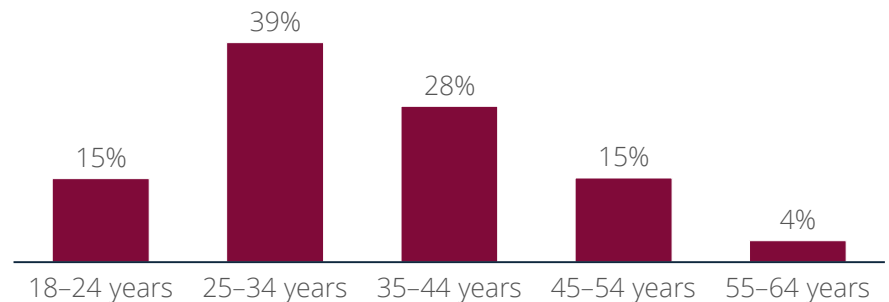
Demographics of users buying consumer electronics online in China



Income



Age



eServices

The ubiquitous use of the internet and mobile phones has triggered a flourishing eServices business, which is still on the rise.

Since Pizza Hut launched the first-ever pizza online ordering service back in 1994, online food delivery has become a billion-dollar business. Food delivery platforms have aggregated menus of hundreds of thousands of restaurants in easy-to-access apps in nearly every city across the world.

Recently, the incorporation of ride-sharing companies has pushed the market to even bigger growth. In the U.S., UberEATS is the fastest-growing meal delivery service, catching up with industry leader GrubHub. New concepts are emerging everywhere, like Deliveroo's container kitchens or UberEATS virtual restaurants. Those concepts are combined with new delivery methods like self-driving cars, drones, and robots.

Nevertheless, the market is witnessing fierce competition. A large number of start-ups have already gone bankrupt. Many acquisitions have

taken place to bundle strength. Even established players have to face this: German Delivery Hero, for example, was recently bought by Dutch Takeaway.com.

The eServices market is divided into four segments: Online Food Delivery, Event Tickets, Fitness, and Dating Services. The eServices market reached a revenue of US\$168 billion in 2018, with Online Food Delivery being the biggest segment. Even though the U.S. was still the biggest market in 2018 with US\$51 billion, China will take the lead in revenue by 2023 with US\$77 billion. With a revenue of US\$34 billion in 2018, the eServices market in Europe was smaller compared to China and the U.S. The leading country in Europe with respect to revenue is the United Kingdom.

Event Tickets are the second largest eServices segment. Owing to issues with widespread fake and duplicate tickets, high prices and fees, the industry has fallen into disrepute. But driven by rapid advancements in technology, the industry is undergoing a fast transformation that is benefitting customers.

Start-ups like GUTS or Aventus, for example, have been involved in a number of new solutions connected to Blockchain technology, which will lead the way with new protocols for smart ticketing. The UEFA has already used a new ticketing system based on Blockchain technology for UEFA Super Cup matches. The use of smart algorithms such as machine-learning tools can help these services to become more individualized. One main trend are wearables with smart assistants, which offer a high level of AI and are able to learn certain patterns and preferences of their users.

As for the Fitness segment, in the future apps and trackers will be able to make recommendations regarding the user's health and predict health conditions. This might open up possibilities for new business models in several areas, such as the insurance sector. The future of wearable devices will see many connections between apparel and technology, resulting in more sophisticated gadgets. Solid data networks and 5G

implementation will enable more interactions between wearables and other smart devices.

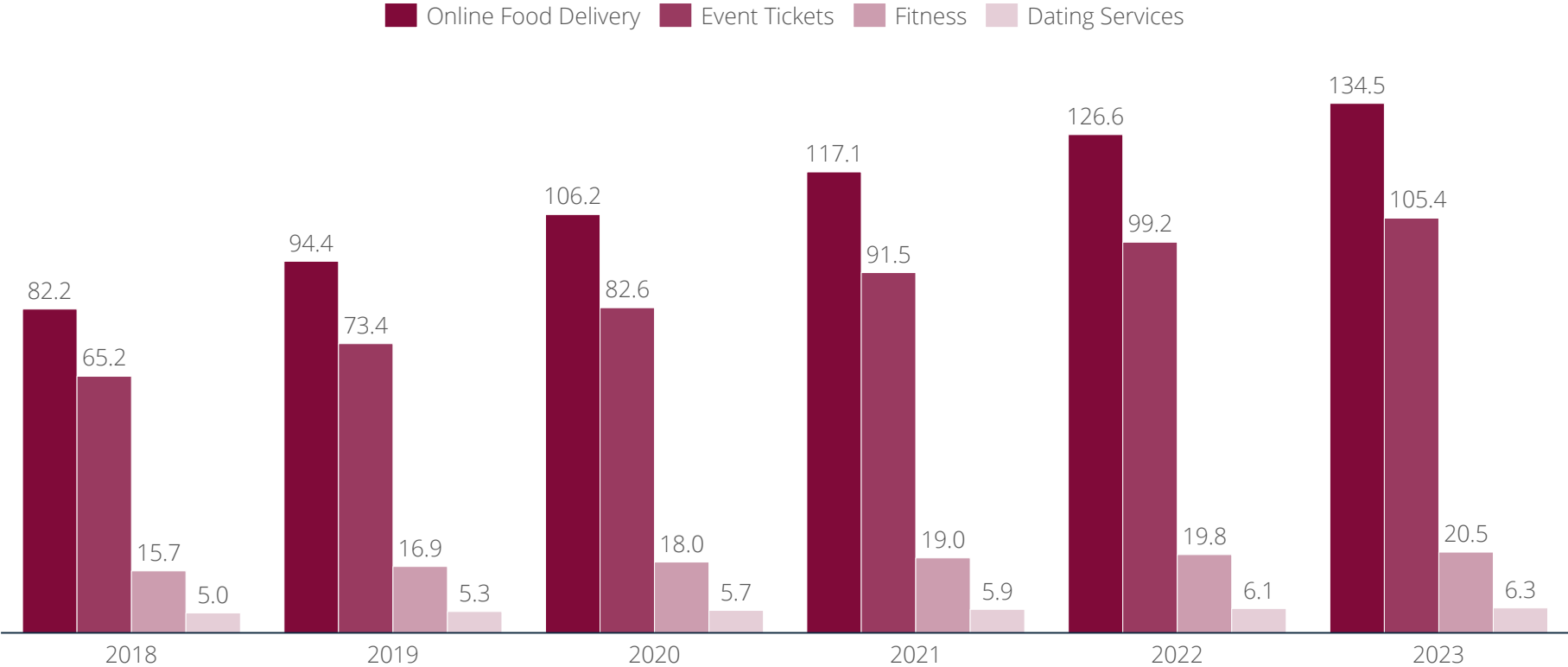
Dating Service will see a more widespread application of Artificial Intelligence. Whilst the majority of current AI technology focuses on the initial matching stage, AI could in the future help to support relationships in a far more therapeutic context. Amazon's Alexa and Google Home could be able to diagnose relationships by taking into account vocal patterns. AI coaching could extend from profile recommendations to relationship and life coaching. Moreover, home devices could build perfect dating profiles, e.g. by scanning and adding fitness tracking data, knowing that users who work out regularly tend to receive more messages.

C. Blumtritt

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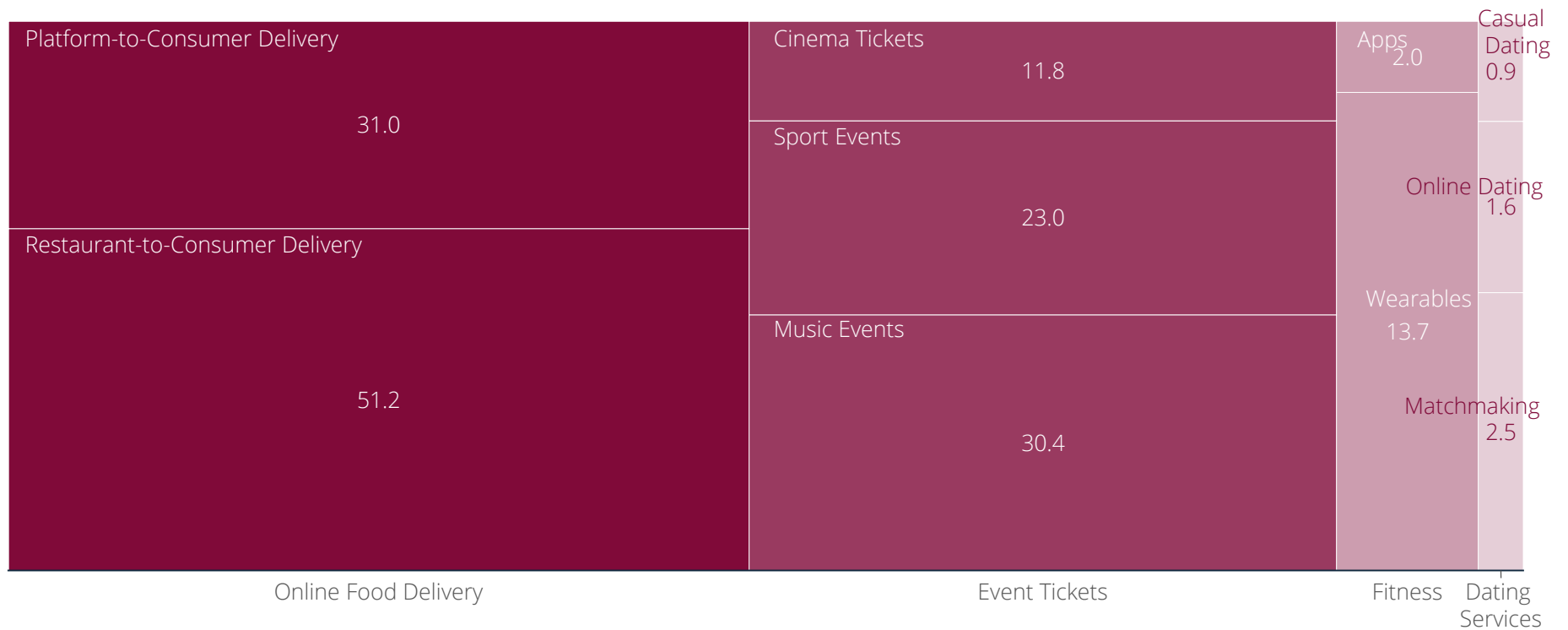
Online Food Delivery is the most important segment in eServices

Global eServices revenue forecast in billion US\$



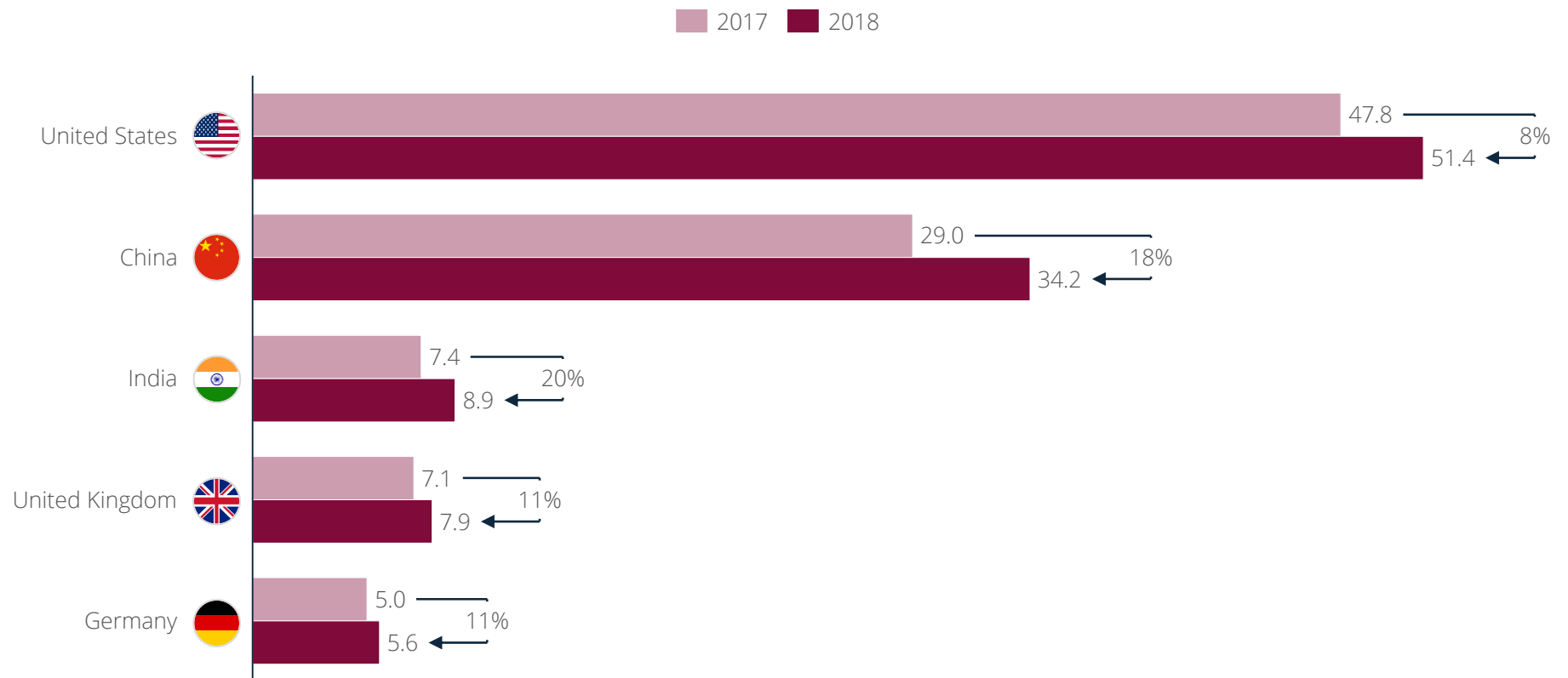
The Restaurant-to-Consumer segment dominates the global eServices market in terms of revenue

Global eServices revenue in billion US\$ in 2018







The eServices market grew in all top 5 countries by more than 8%

Top 5 eServices countries by market revenue in billion US\$



In all eServices segments, the variety of different service and business models is high and changing fast

Selected key players in the eServices market

	Event Tickets	Fitness	Dating Services	Food Delivery
Start-ups ¹	       	        	          	       
Established players	        	       	        	      

Most Online Food Delivery players had more than 5 funding rounds









Overview of selected online food delivery players

Company	Segment	Headquarter	Mainly covered regions	Funding in billion US\$	Funding rounds	Revenue in billion US\$ 2017
Deliveroo	Platform-to-Consumer	United Kingdom	Europe	0.86	9	0.36
Delivery Hero¹	Restaurant-to-Consumer	Germany	Europe	2.58	15	0.60 ²
Domino's Pizza	Restaurant-to-Consumer	United States	United States, Europe, China	-	-	2.79
Ele.me³	Platform-to-Consumer	China	China	3.34	8	-
Postmates	Platform-to-Consumer	United States	United States	0.68	11	0.25 ⁴
Zume Pizza	Restaurant-to-Consumer	United States	United States	0.42	7	-
GrubHub	Restaurant-to-Consumer	United States	United States, Europe	0.28	7	0.68
Just Eat	Restaurant-to-Consumer	United Kingdom	Europe	0.07	4	0.73 ⁵
Takeaway.com	Restaurant-to-Consumer	Netherlands	Europe	0.77	3	0.16
UberEats	Platform-to-Consumer	United States	United States, Europe	24.20 ⁶	22	-
Glovo	Platform-to-Consumer	Spain	Europe	0.17	6	-

1: German operations bought by Takeaway.com in 2018 2: EUR/USD (2017) = 0.90554 3: Ele.me was bought by Alibaba in 2018 4: Estimated
 5: GBP/USD (2017) = 0.75014 6: Total funding amount of Uber
 Source: Company information, Crunchbase

The Fitness market is shaped by start-ups as well as multinational apparel and tech companies

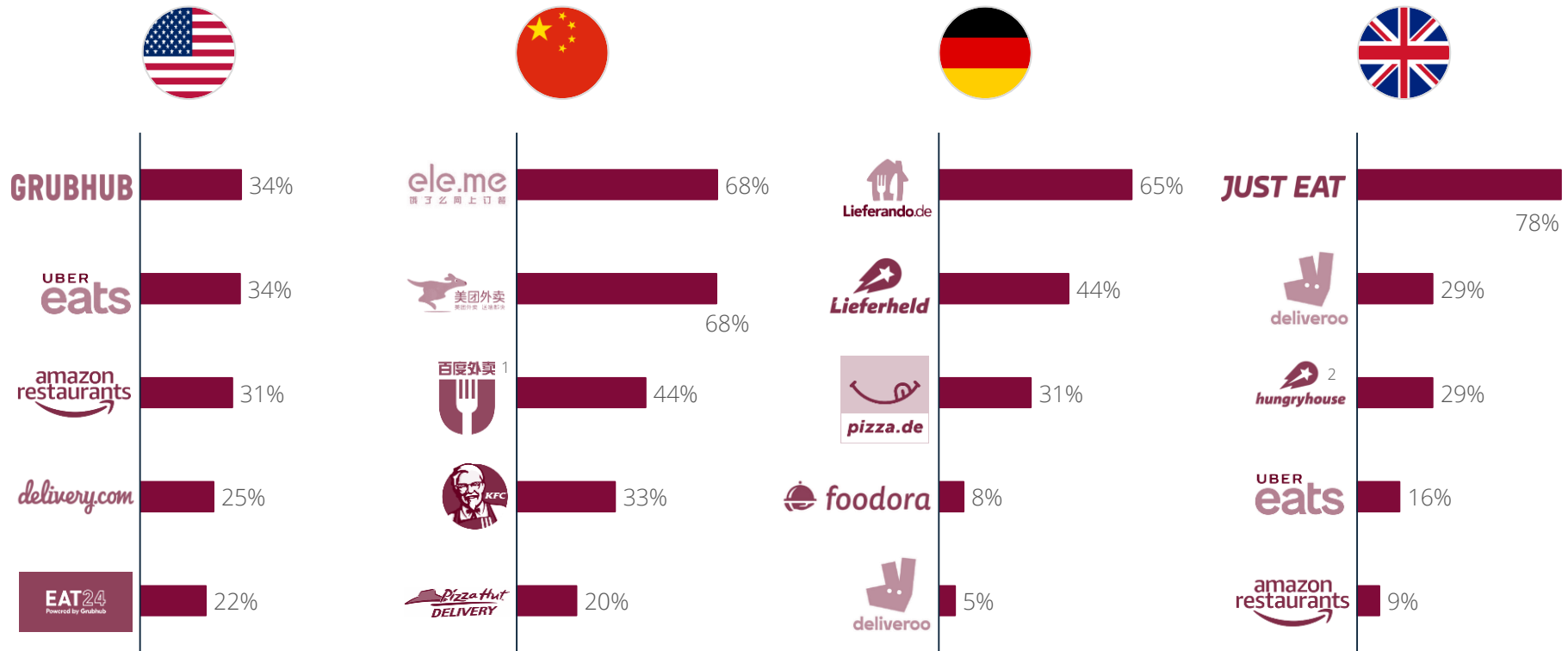
Revenue of selected key players in fitness apps and wearables

Company	Products	Headquarter	Revenue 2016 in billion US\$	Revenue 2017 in billion US\$
 Adidas	miCoach FIT SMART, Heart Rate Monitor, Runtastic	Europe	23.1	23.4 ¹
 Fitbit	Fitbit Zip, Fitbit One, Fitbit Flex, Fitbit Charge, Fitbit Alta, Fitbit Charge HR	United States	2.2	1.6
 Garmin	Garmin Vivofit 3, Garmin Vivoactive, Garmin Vivosmart, Garmin Forerunner	Europe	3.0	3.1
 Huawei	TalkBand B3, TalkBand B3 Lite, Band 2, Color Band A2, Fit, Watch 2	China	75.1	92.5
 Misfit Wearables ²	Misfit Ray, Misfit Shine 2, Misfit Flash, Misfit Speedo Shine	United States	3.0 ²	2.8 ³
 Moov TM	Moov, Moov Now	United States	-	-
 Nike	Nike+ FuelBand, Nike+ FuelBand SE, Nike+ Running App	United States	32.4	34.4
 Under Armour	Under Armour Band, MapMyFitness, MyFitnessPal, Endomondo	United States	4.8	5.0
 Xiaomi	Mi Band, Mi Band Pulse, Mi Fit	China	-	18.0

While the UK has a clear market leader with JUST EAT, competition in other countries is more diverse



Online purchase of food delivery products by provider in the past 12 months



1: Baidu delivery is now a subbrand of Ele.me 2: In February 2018, hungryhouse became part of Just Eat

"Which of these online providers of food delivery have you used in the past 12 months?" Multi Pick; U.S.: n=1,461; China: n=1,458; UK: n=766;

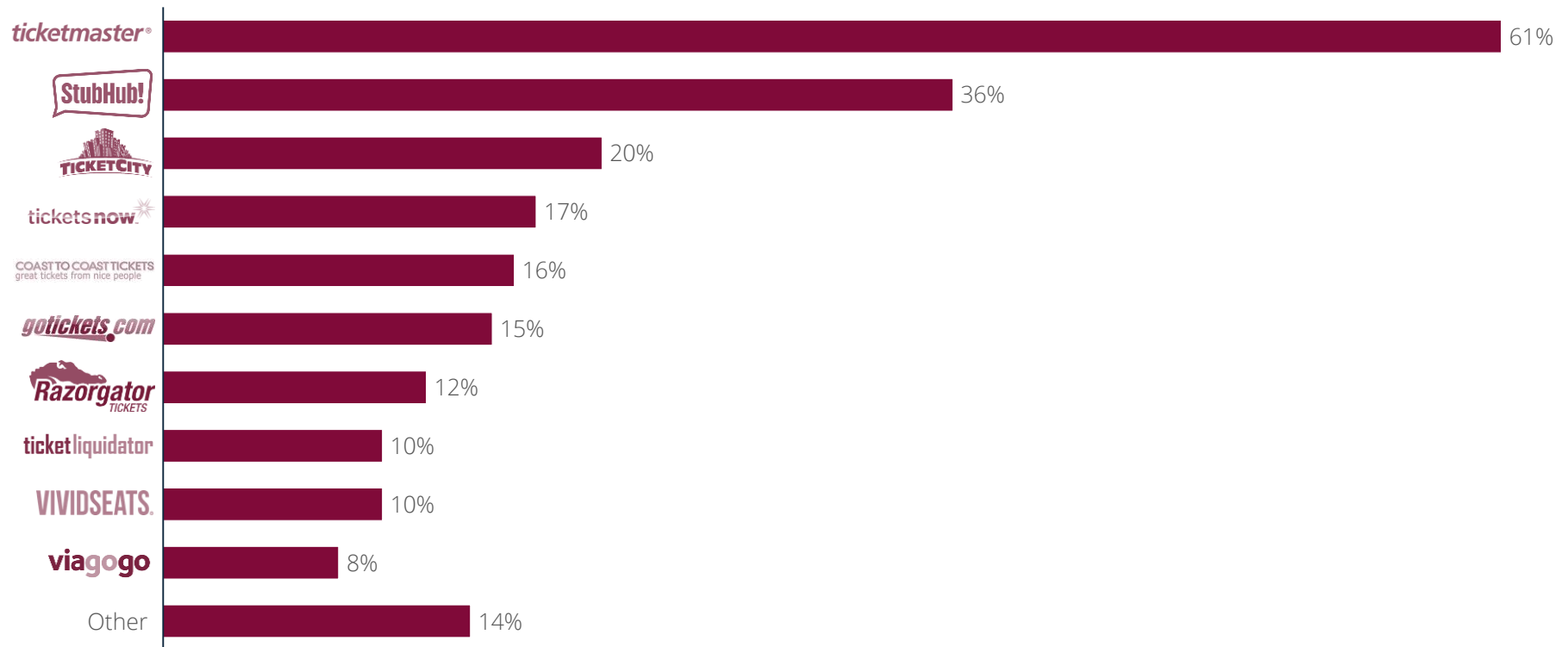
Germany: n=750 respondents who used meal orders online in the past 12 months

Source: [Statista Global Consumer Survey](#), as at February 2019

Ticketmaster is the market leader in online ticketing in the U.S.



Websites and apps used to purchase event tickets in the U.S.

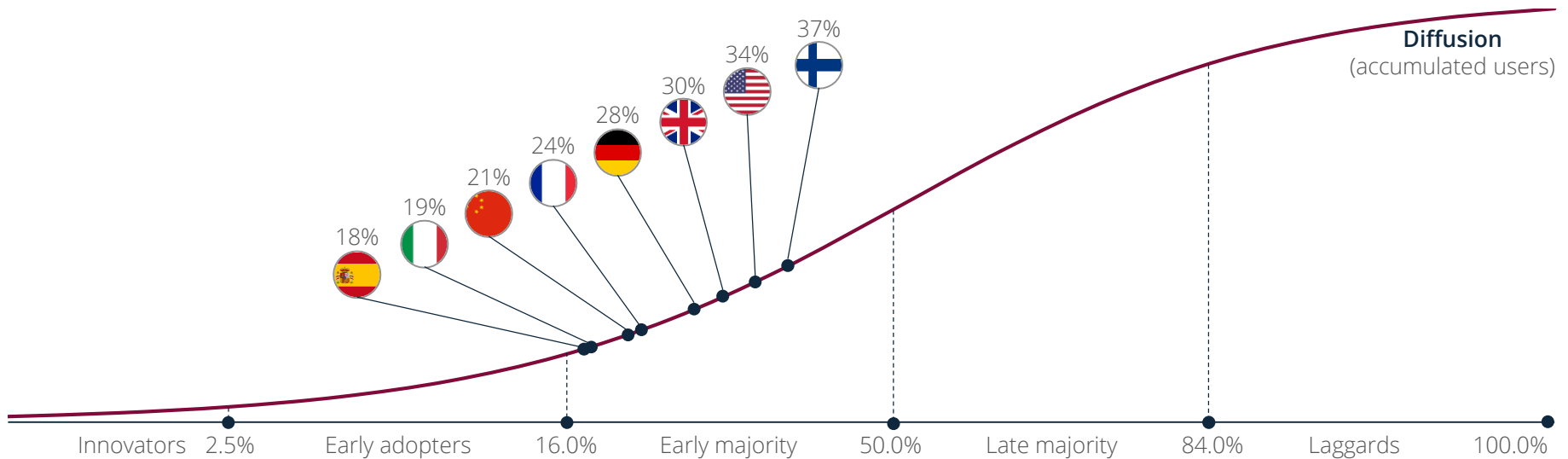


*"Which of these online providers have you bought event tickets from (website or app) in the past 12 months?"; Multi pick; n=871 respondents who bought event tickets online

Source: [Statista Global Consumer Survey](#), as at February 2019

Finnish consumers have the widest adoption of online event ticket purchasing with 37% penetration rate

Innovation diffusion curve for online event ticket services in 2018

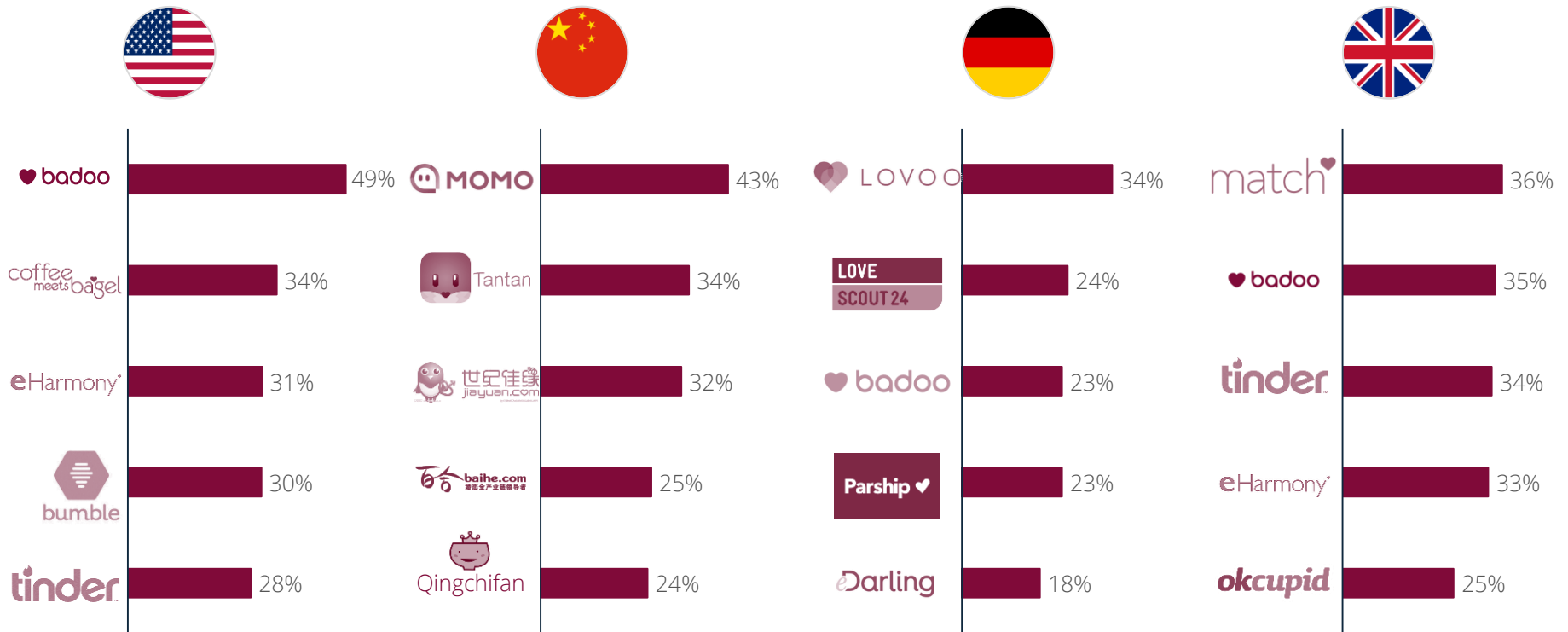


The diffusion of innovations graph shows successive groups of consumers adopting Event Tickets (for this the graph above shows the penetration rate of selected countries). Innovations in general are not adopted by all individuals at the same time. Instead, they tend to adopt in a time sequence, and can be classified into adopter categories based on how long it takes until they begin using the service. Diffusion is considered to be the rate and volume at which innovations spread among their users (an adoption rate of 100% is theoretically possible but not realistic). Considering the high adoption rates, the Event Tickets segment is likely to grow slower in the next years, especially in the UK and the U.S. China's big market still holds great potential.

Nearly 50% of paying Online Dating users in the U.S. use Badoo



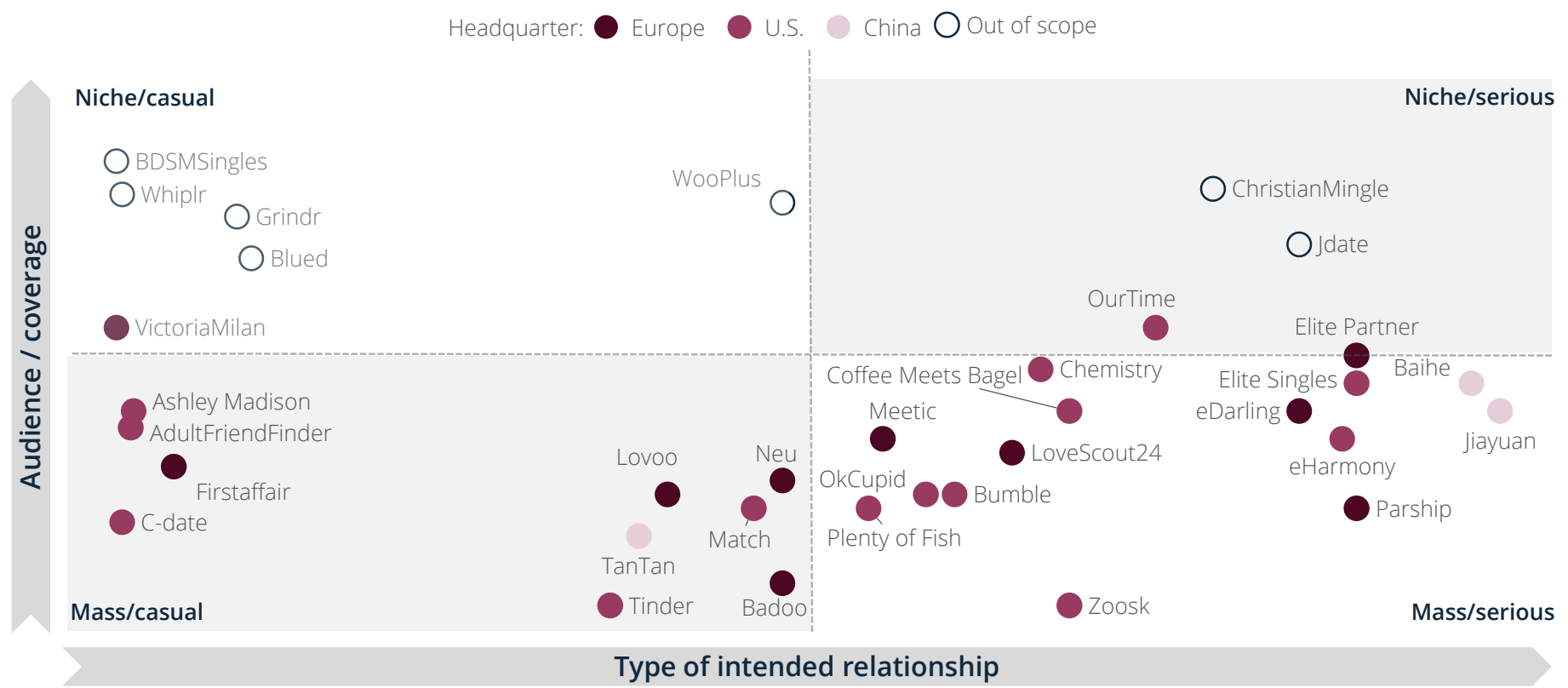
Usage of Online Dating by provider (paying customer) in the past 12 months



*Which of these online dating providers (website or app) have you used as a paying customer in the past 12 months?" Multi Pick; U.S.: n=580; China: n=350; UK: n=127; Germany: n=79 respondents who used and spend money on online dating in the past 12 months
Source: [Statista Global Consumer Survey](#), as at February 2019

AshleyMadison, C-Date and Firststaffair are typical Casual Dating portals for a broader audience

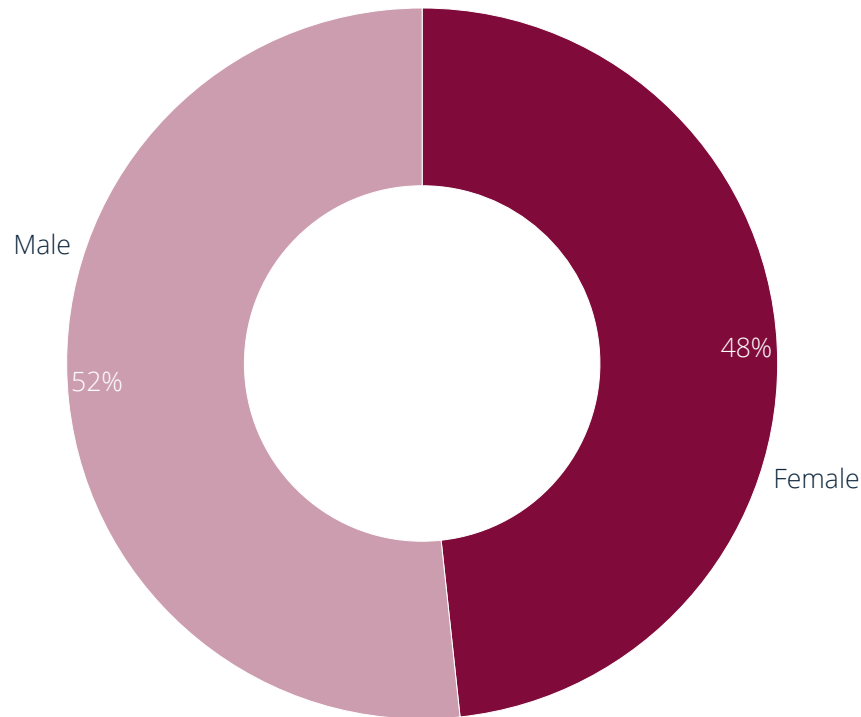
Dating Portals and Apps segmentation



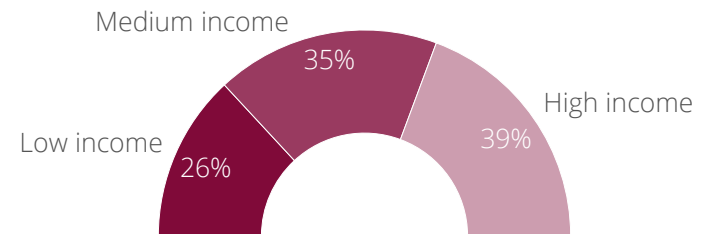
Online food delivery users in India are mostly young males



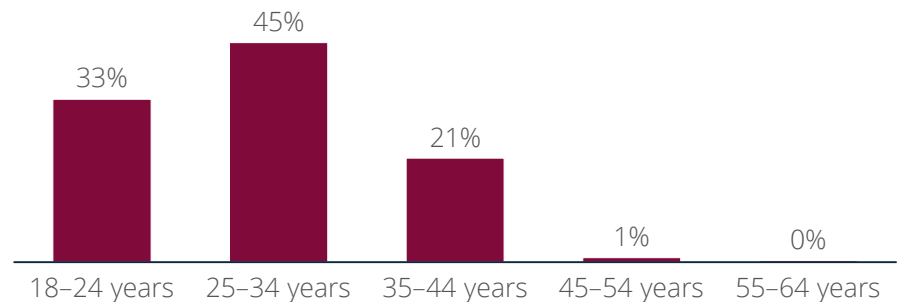
Demographics of people using online food delivery in India



Income



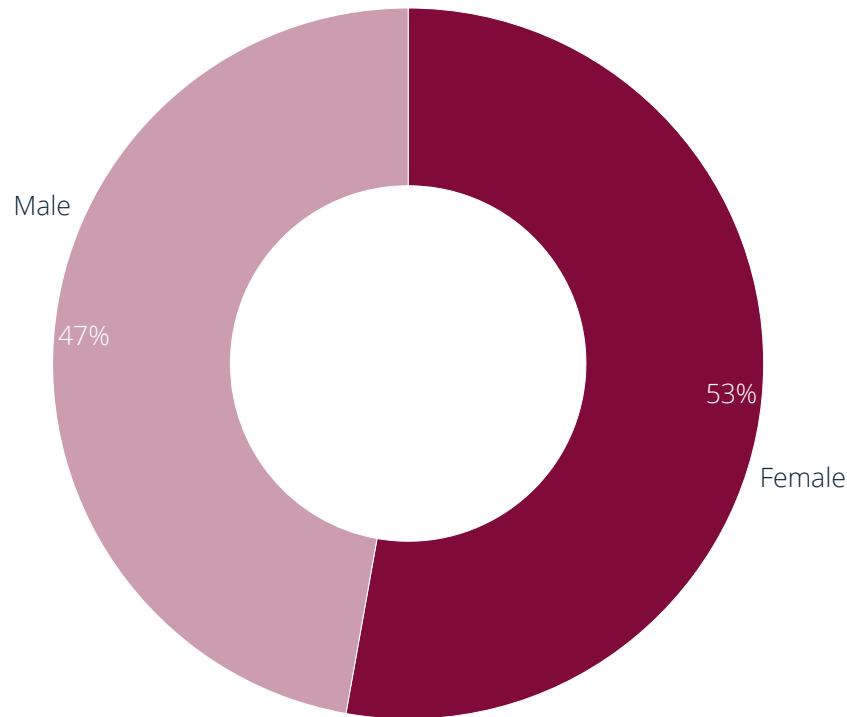
Age



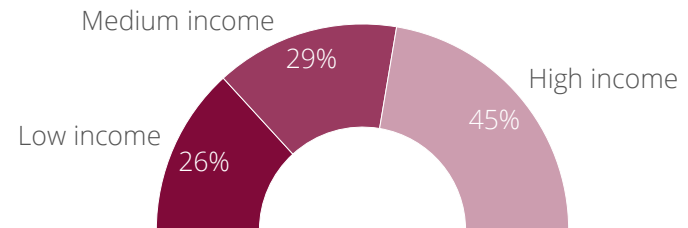
Event ticket users in Finland are predominantly females aged between 25 and 44 with high income



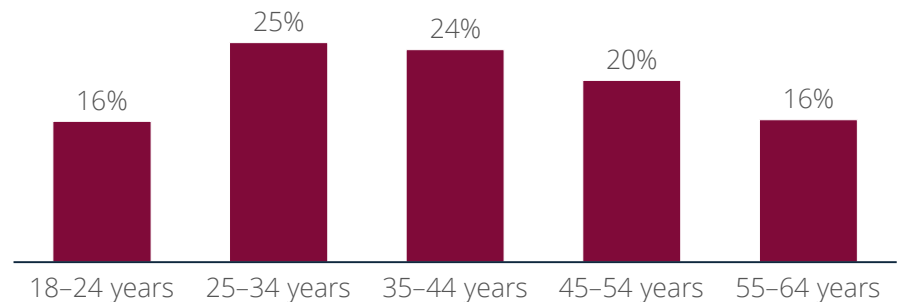
Demographics of people booking event tickets online in Finland



Income



Age



eTravel

The mobility and travel markets have been heavily disrupted by digital business models. And this trend is far from over: Changed travel behavior, autonomous cars and similar developments interfere with processes both in commercial and personal transportation.

In the Statista Digital Market Outlook, the eTravel market consists of two segments: Online Mobility Services and Online Travel Booking. With revenues of US\$217 billion in 2018, the United States took the leading role within the eTravel market. Although the Chinese market is smaller, with revenues of US\$157 billion, it is the fastest-growing region and we expect it to overtake Europe in some segments by 2023.

The shared mobility concept of ride hailing is a much-discussed topic at the moment because of its possible implications for the traditional taxi business and because of past security scandals. This type of mobility service is growing significantly. It probably constitutes the most lucrative

field of application for self-driving cars, which are a highly promising means of transportation themselves. In the future, the cost of travel per mile will probably be lower in a driverless car than in a private car, even for long trips in rural areas. We also expect self-driving cars to increase road safety, reduce traffic accidents, free up space in cities and reduce traffic congestion.

Many large automakers are investing in a vast number of mobility start-ups in different fields. Mercedes-Benz, for example, has invested in car sharing (Car2go), ride hailing (myTaxi), and multi-modal platforms (moovel). Not surprisingly, many automakers like General Motors, Ford, Volvo, Mercedes-Benz and Tesla are also developing driverless cars and cooperate with ride-hailing companies to test them.

Another hot trend is the growth of the travel market in developing countries such as India and China. With more people becoming affluent

enough to travel, a new generation of local start-ups are entering the market, threatening established players. Examples are mobility service provider Grab in South East Asia or MakeMyTrip in India.

One major trend within online travel bookings is the shift towards mobile booking and mobile devices: The overall amount of mobile searches and bookings is increasing at a fast pace. In particular, last-minute and same-day bookings are often made on mobile devices. Hence, hotels and online travel agencies are investing heavily in mobile technologies to expand their services and products within this area. While Europe is lagging behind in mobile bookings, American and especially Asian customers are booking via mobile devices much more frequently. The showpiece of this trend is Hotel Tonight, a smartphone-only same-day hotel booking app.

Another major development in travel bookings is the growing influence of personalization. Many customers feel overwhelmed by the sheer amount of travel destinations and packages to choose from. Travel companies are able to counteract this situation by analyzing the customers' previous journeys and overall travel behavior and presenting personalized travel recommendations that meet the customers' needs. While segmentation is already existent in the travel industry,

personalization is the next step to stay close to customers and motivate them to stay with the company.

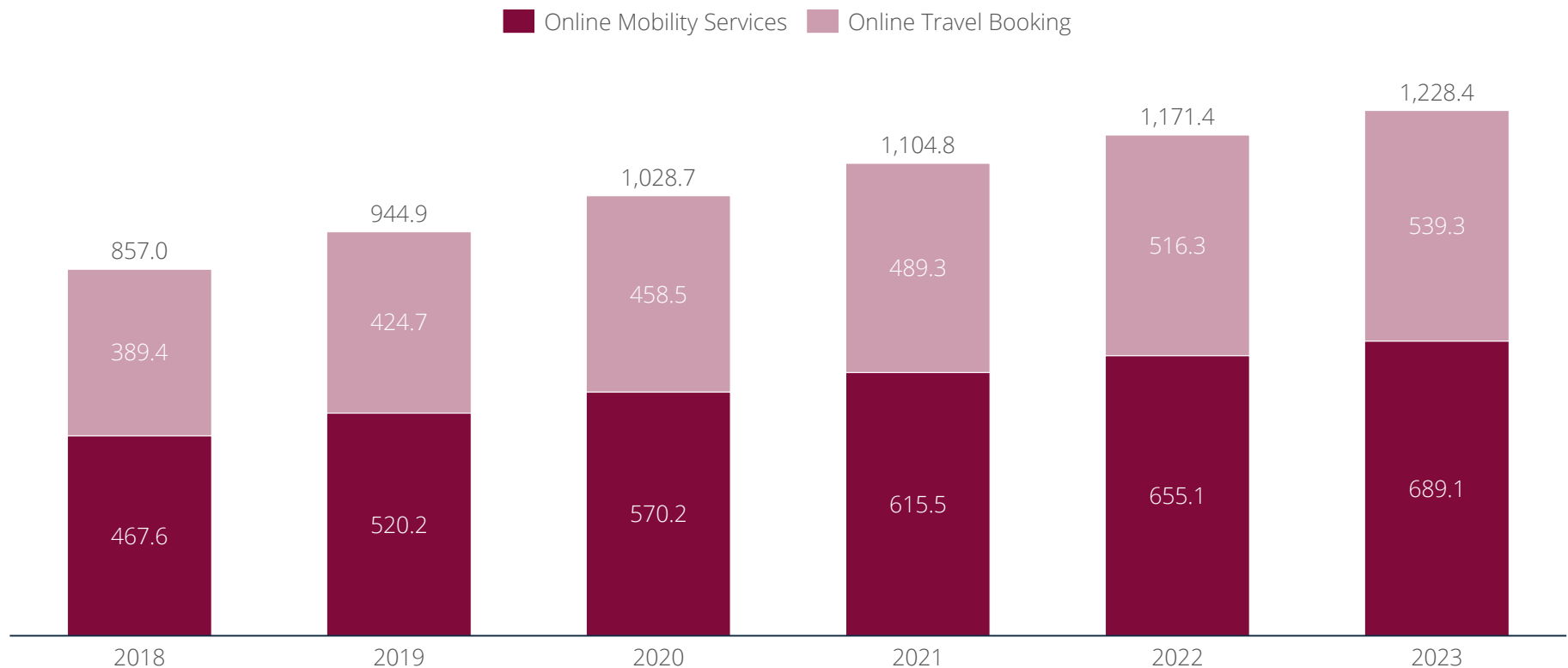
We expect eTravel booking websites and apps to implement AI in order to aid customers before, during, and after the booking process, for example via chatbots and virtual assistants. Chatbots can provide automated customer service on a travel website or operate through a messaging platform to converse with travelers and assist with the booking. Users tell the bot about their travel plans, the bot asks questions and eventually presents five suitable hotel options. At the same time, AI can present travel suggestions based on previous travel decisions, thus making it easier for customers to find a fitting travel package.



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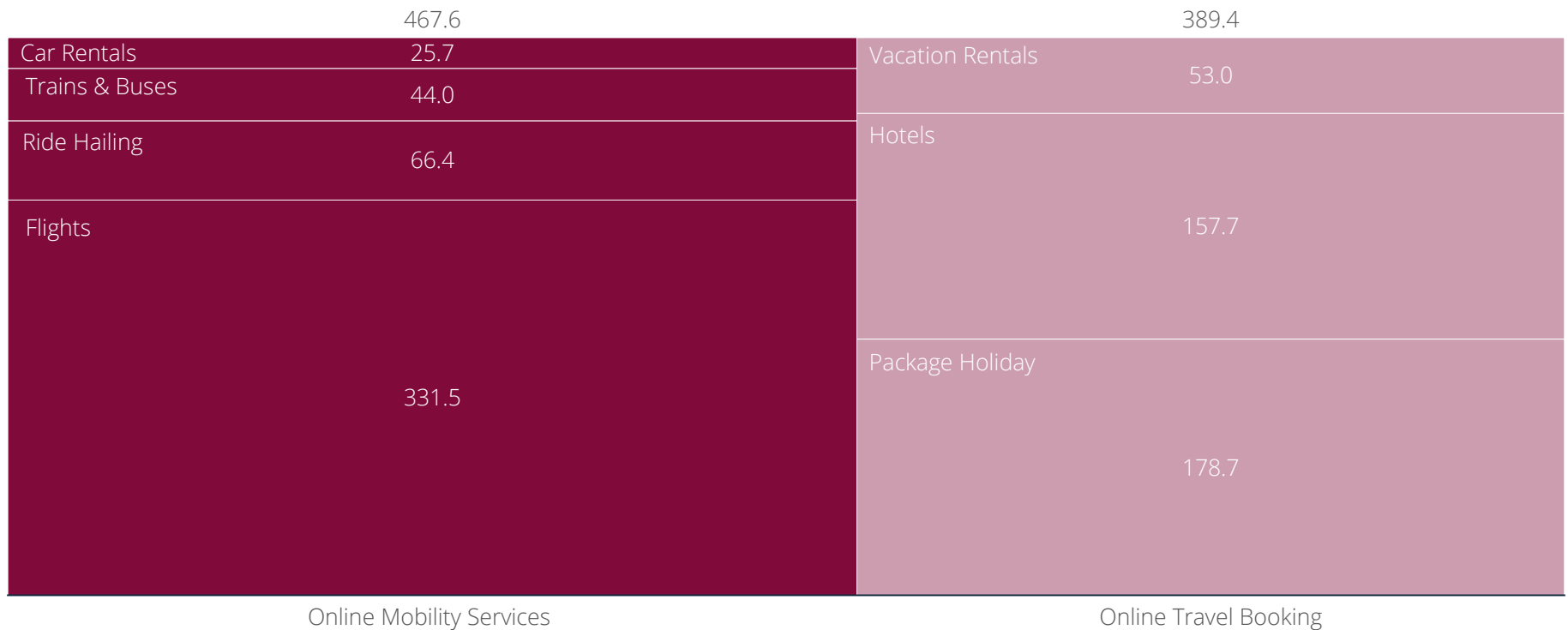
The global eTravel revenue is expected to grow to over US\$1.23 trillion by 2023

Global eTravel revenue forecast in billion US\$



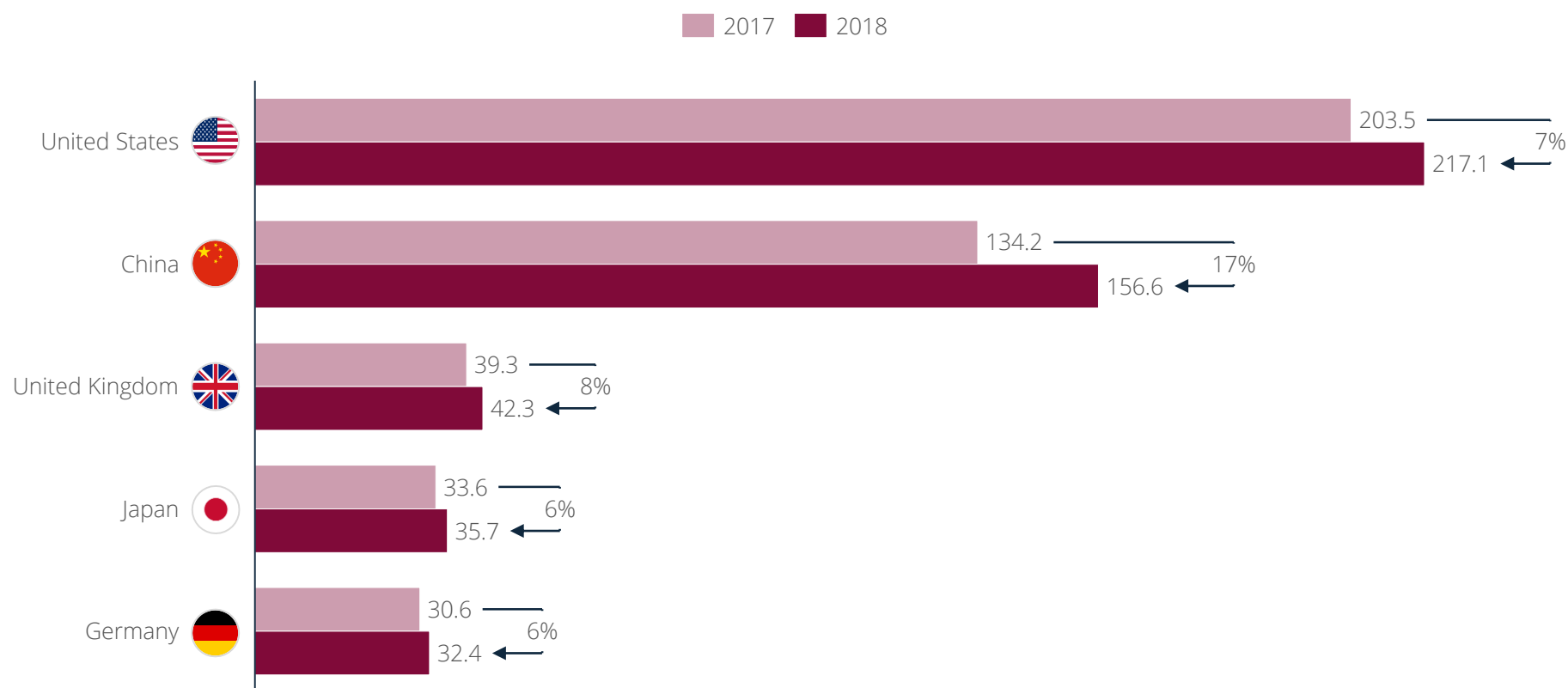
Online flight bookings is by far the largest segment in the global eTravel market

Global eTravel revenue in billion US\$ in 2018



The Chinese eTravel market grew by 17%

Top 5 eTravel countries by market revenue in billion US\$



The eTravel market experienced major shifts because of start-ups such as Airbnb or Uber

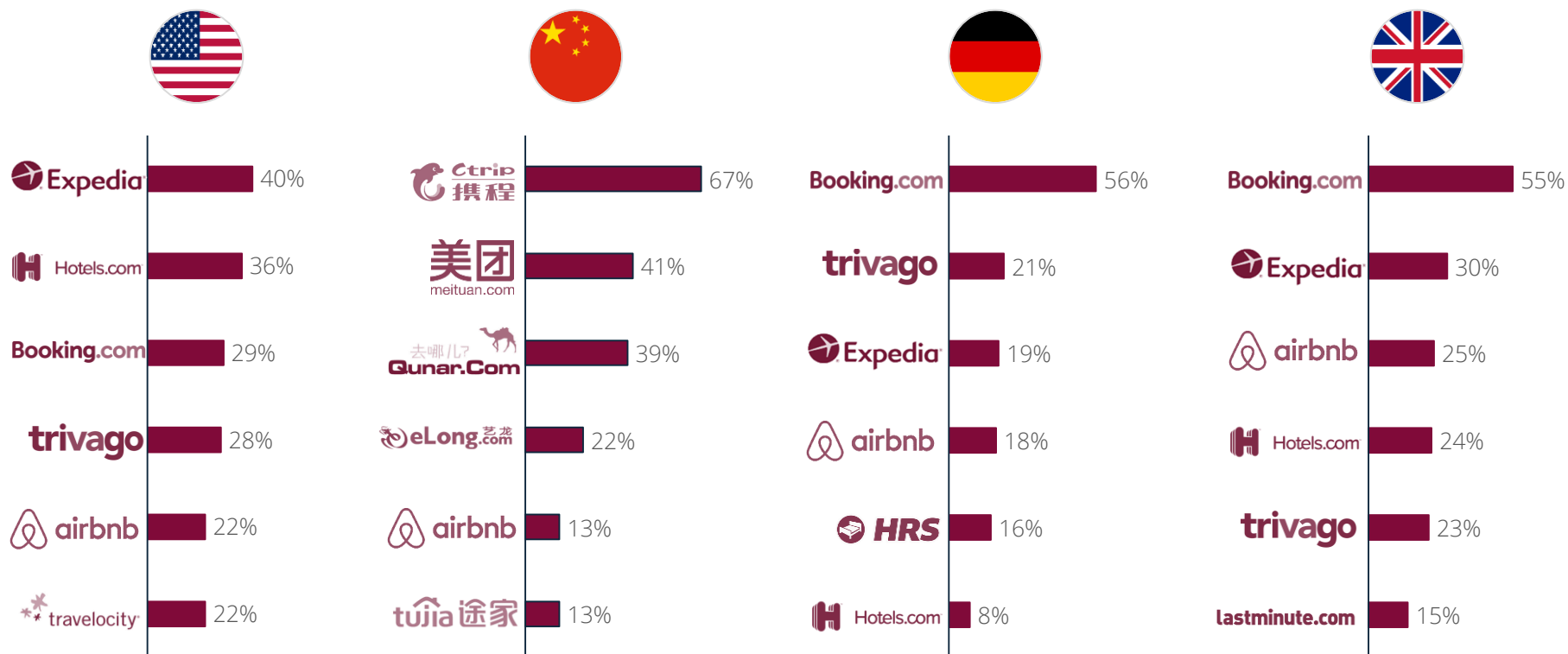
Selected key players in the eTravel market

	Online Travel Booking	Online Mobility Services
Start-ups ¹		
Established players		

Airbnb is the only top western eTravel player in China



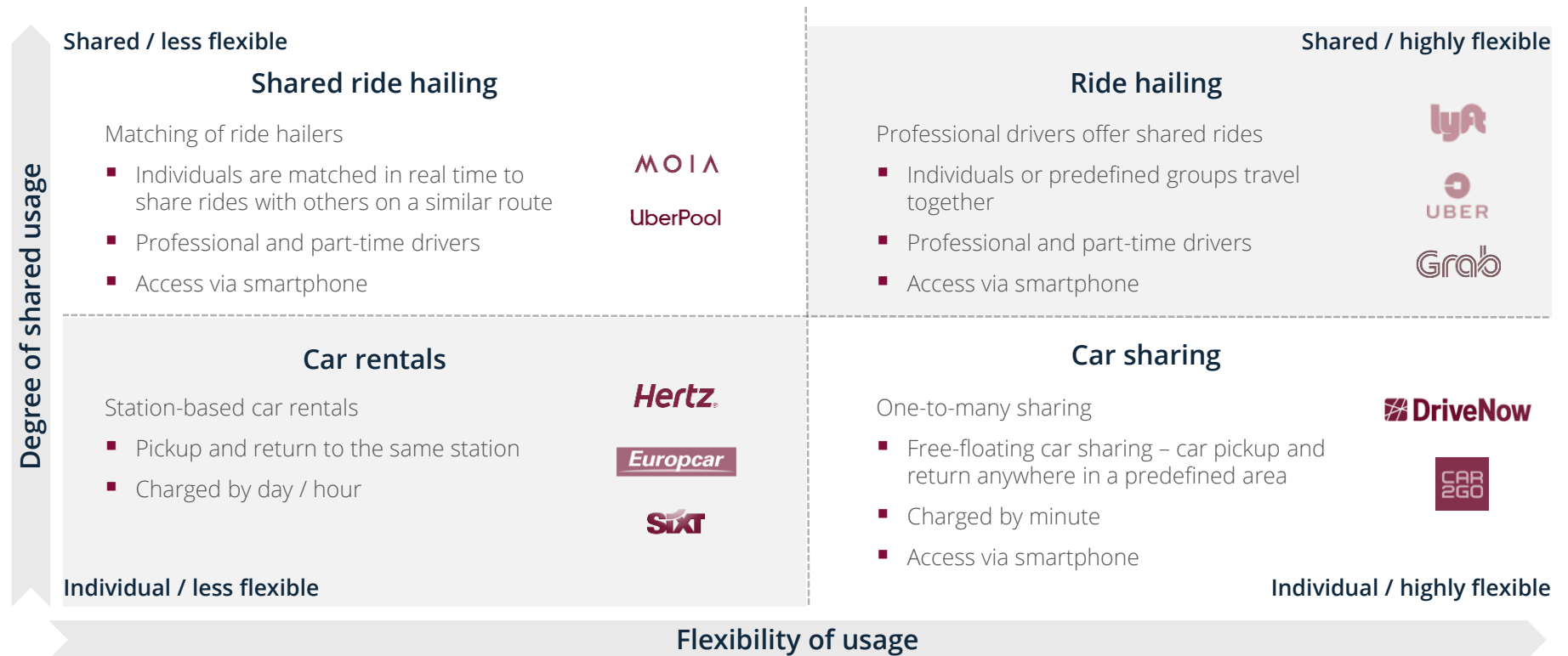
Top 6 online providers to book accommodations with in 2018



"From which of these online providers have you booked an accommodation - hotel or private accommodation - in the past 12 months (website or app)?"; Multi Pick; n=10,000 respondents who booked hotels, vacation apartments or houses online in the past 12 months
 Source: [Statista Global Consumer Survey](#), as at February 2019

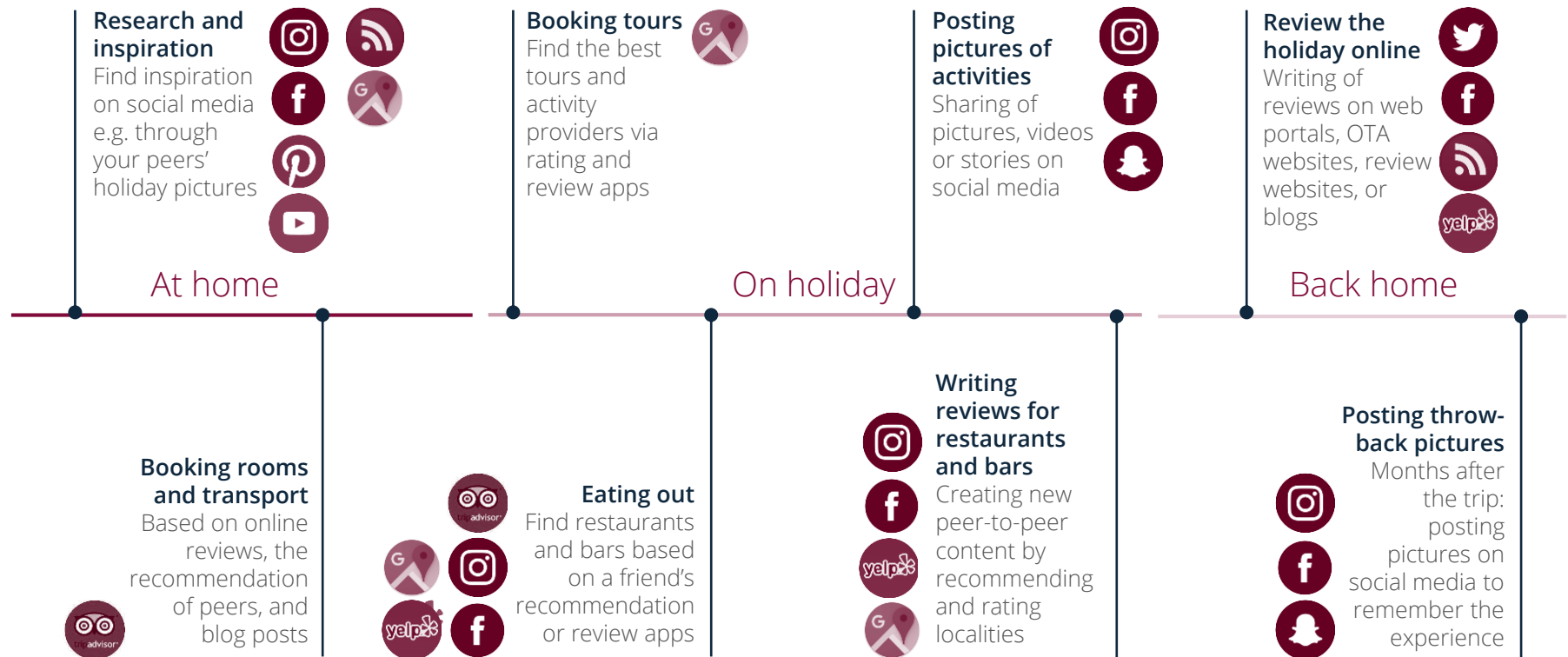
Shared mobility options range from rentals to shared ride hailing

Distribution of mobility services by shared usage and flexibility



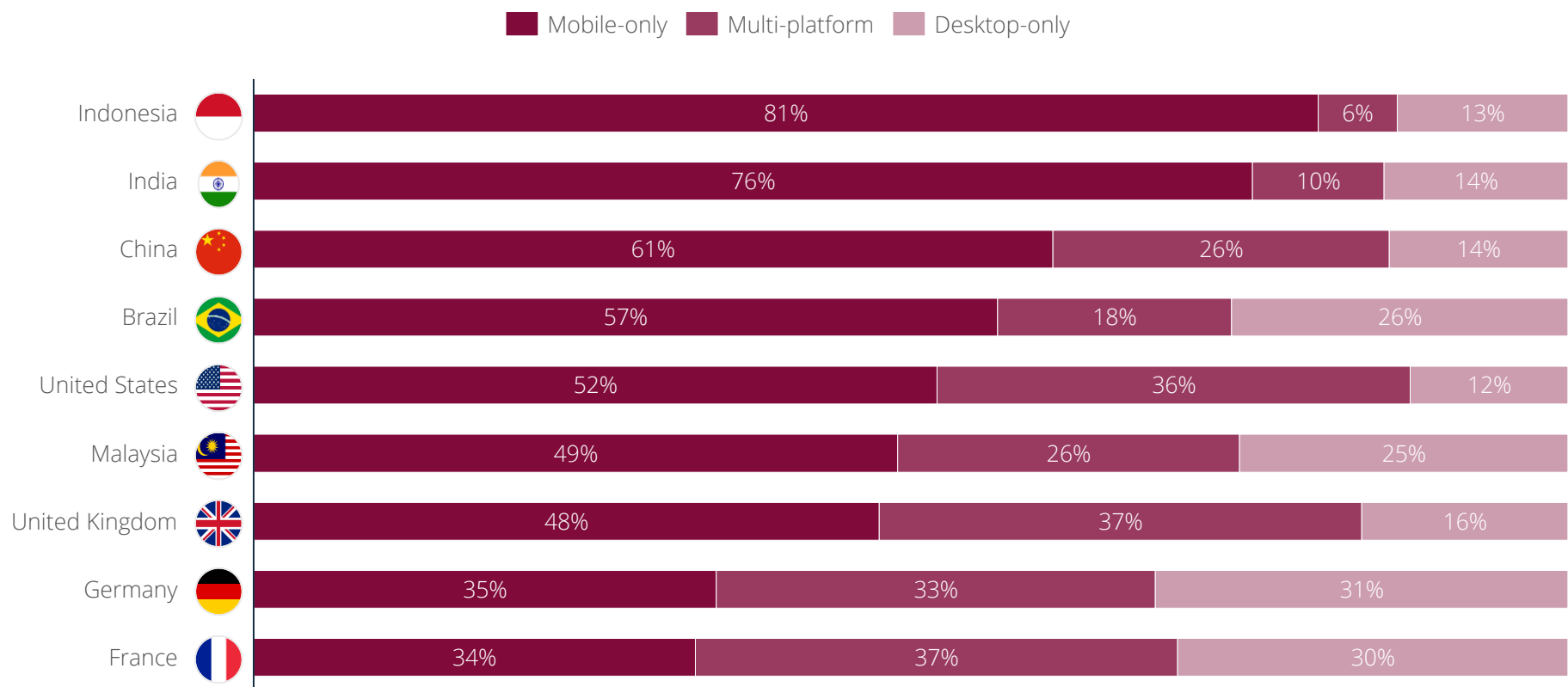
Social media channels are used in many instances throughout the trip, both for research and sharing

Usage of social media throughout a holiday



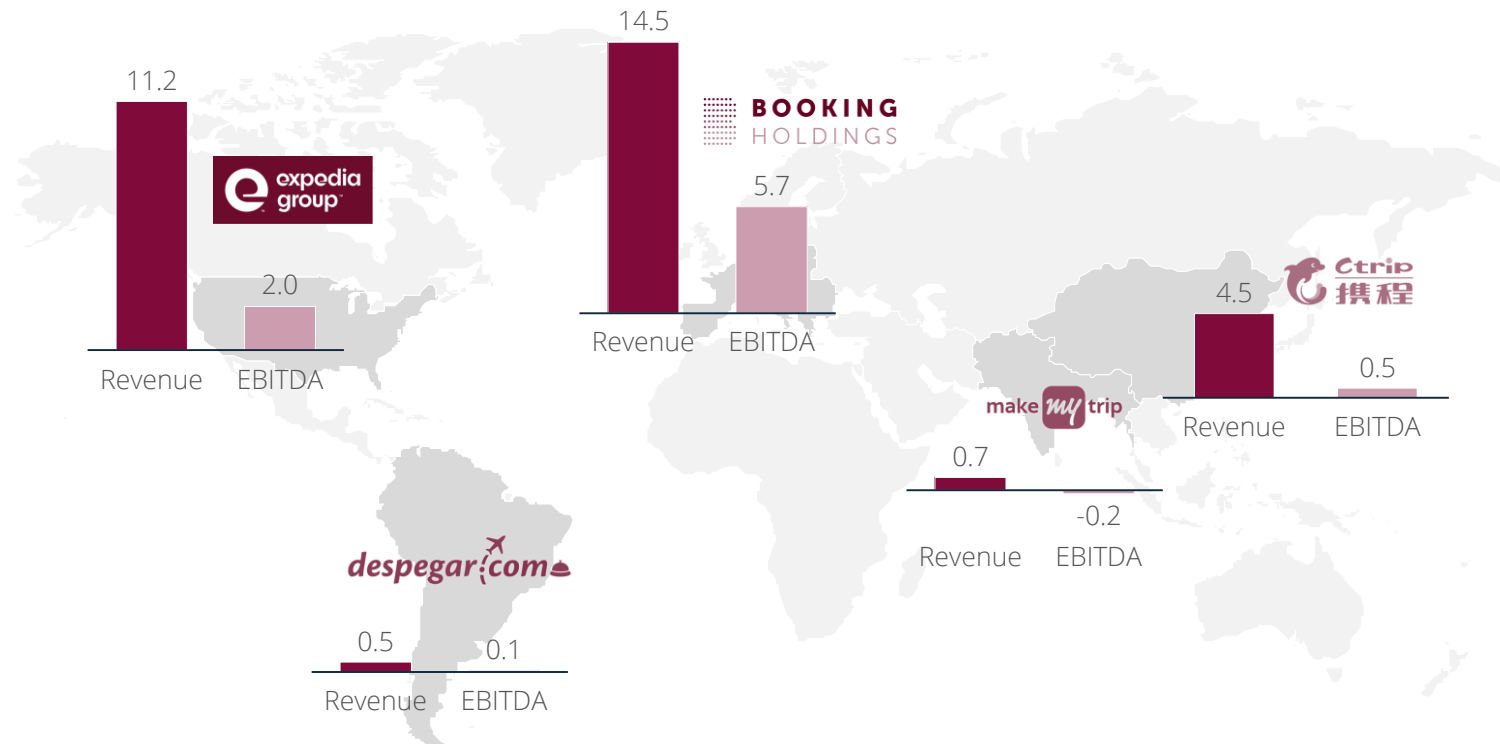
Asian consumers are mobile-first, while many European consumers still use their desktops

Device usage to access travel sites in selected countries



Expedia Group and Booking Holdings dominate the global Online Travel Booking market

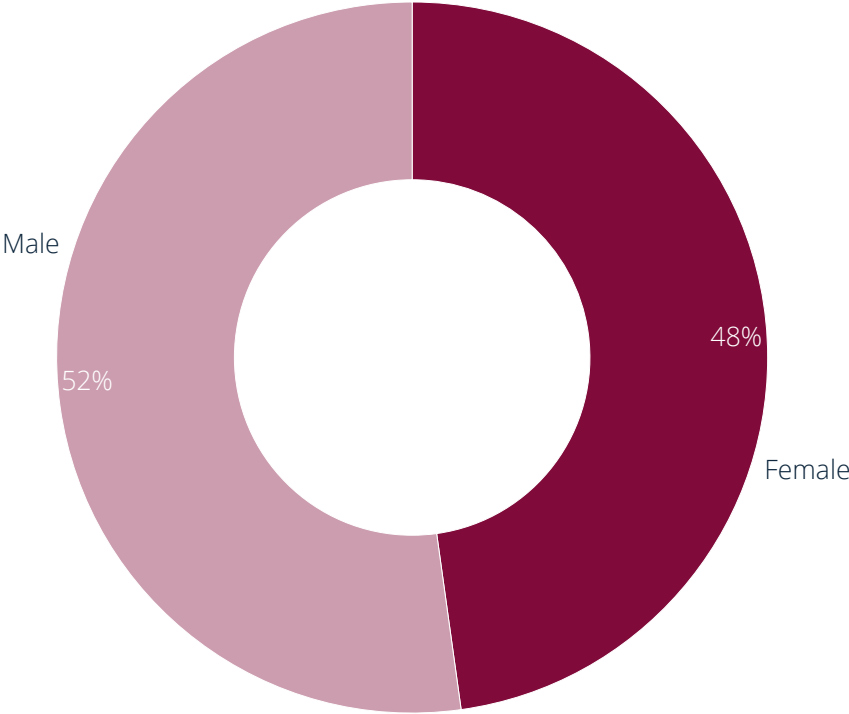
Revenue and EBITDA for selected regional players in billion US\$ in 2018



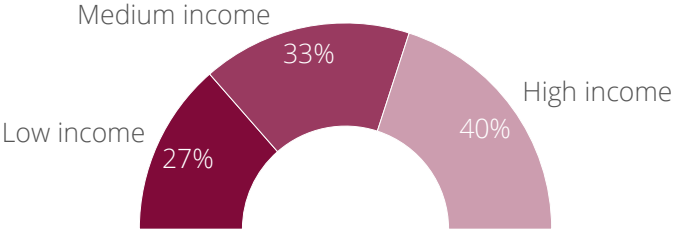
Ride-sharing users in India are very young but still have a medium to high income



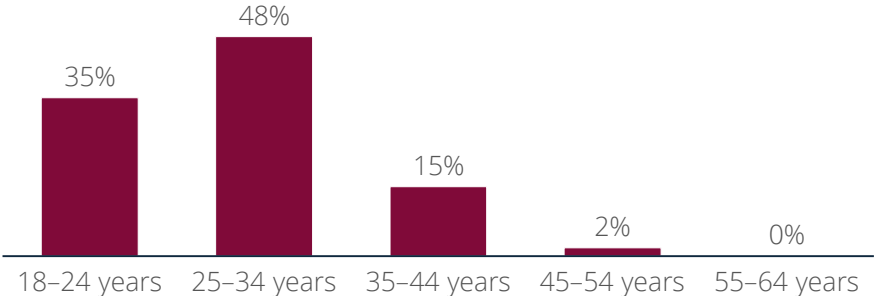
Demographics of people using ride-hailing services in India



Income



Age



Digital Media

The emergence of MP3 players and online file-sharing services like Napster has not only caused a big disruption of the music industry's whole business concept. It has also fundamentally changed the way in which music is sold, distributed, and consumed nowadays. While Napster is just an exemplary starting point for the music industry's transition, developments like eReaders, smartphones, and tablets are further symbols of the digital revolution of traditional media.

The Digital Media market in the Statista Digital Market Outlook is segmented into Video Games, Video-on-Demand, ePublishing, and Digital Music. Video Games were by far the biggest market in 2018 with a global revenue of US\$77 billion, which represents a share of 55% of the whole Digital Media market. The Video Games market benefits highly from a shift from desktop computers to mobile devices: Every third US dollar in Digital Media is generated by Mobile Games. Video-on-Demand is the second biggest digital market with a global revenue of US\$31

billion in 2018. The continuing popularity of subscription-based services will lead to a steady growth up to 2023, whereas the growth of Pay-per-View and Video Download services will decrease massively in the next couple of years.

The next smaller segment is ePublishing, which is expected to grow to US\$28 billion by 2023. This growth is mainly driven by emerging markets like China, where eBook prices are substantially lower.

Digital Music was the smallest segment in 2018 with a revenue of US\$13 billion. The market is utterly dependent on Music Streaming. This is due to the fact that Music Downloads are one of the very few shrinking markets in the digital economy, which underlines how mature the entire Digital Media market has become.

The media business had to endure difficult times when illegal distribution and downloads of digital content became common among users. This development particularly threatened the music and video business and caused sales to decline. Faced with changing customer behavior and their evolving demands, companies thus had to find new ways of monetizing their content.

Customer requirements have become clear over time: easy access to a wide range of media content at any time, in any place, and at a good price. This need triggered the birth of online streaming and lending, a trend which can especially be observed in the rising popularity of music and video streaming as well as mobile gaming. Companies such as Amazon, Apple, Netflix or Spotify have successfully responded to these needs and provide huge content libraries and convenient purchasing models for their customers.

Competition remains fierce in the Digital Media market and companies have to constantly reassess their business strategy to be ahead of their competitors. Netflix and Amazon, for example, are increasingly investing in the production of their own exclusive content to decrease their dependency on production companies and to increase their competitive advantage. This strategy seems to pay off: Although Netflix has recently

increased prices again, it announced another big boost in streaming subscribers at the beginning of 2019. In the gaming business, big companies such as Nintendo participate in the huge and fast-growing field of Mobile Games by releasing their own games on third-party platforms or by cooperating with franchise partners.

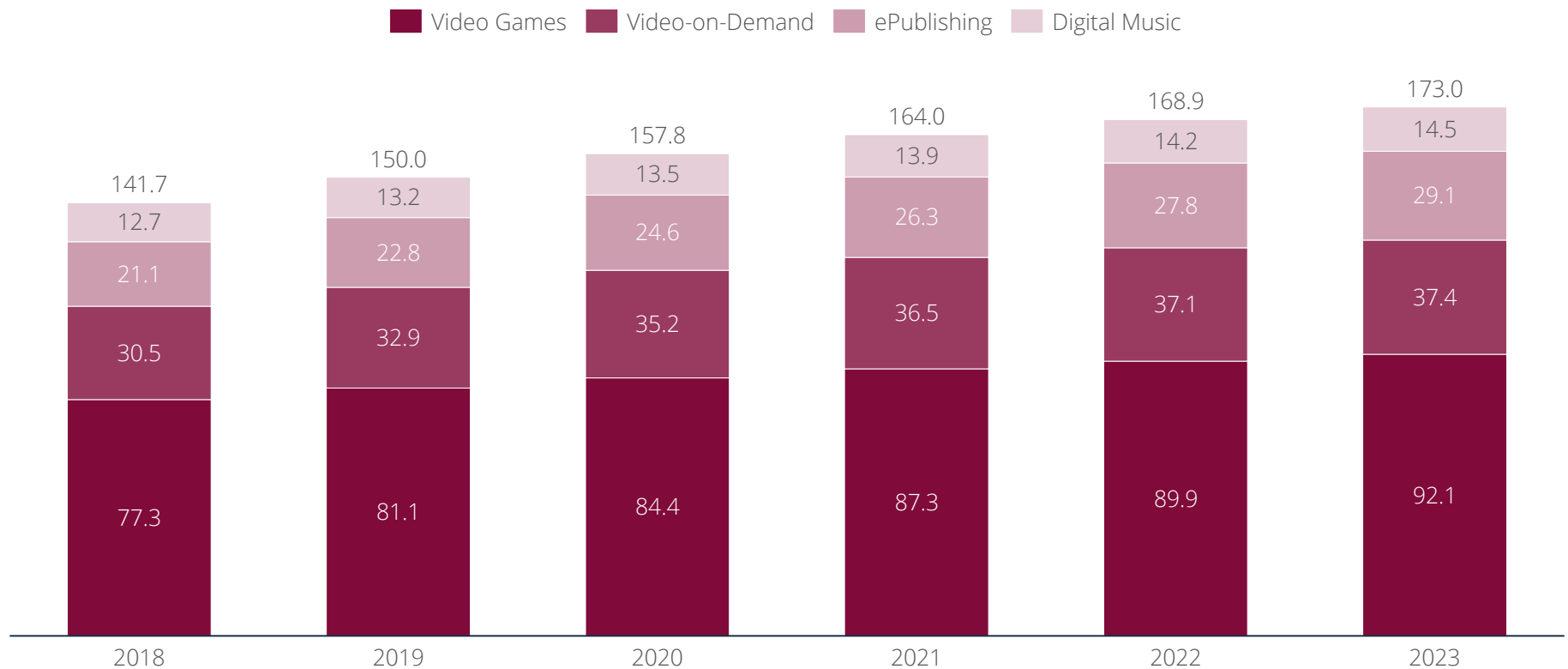
Another trend is live content. Periscope, Facebook Live, Instagram Live, live.ly, Snapchat Live Stories, YouTube Live, Alibaba Tmall, Sina Weibo Miaopai, Yizhibo – nearly every social media network offers the possibility to stream live videos in real time. Besides the benefit for consumers to share moments in life with friends and family, live streaming also opens up new commercial scenarios for manufacturers to advertise their products.



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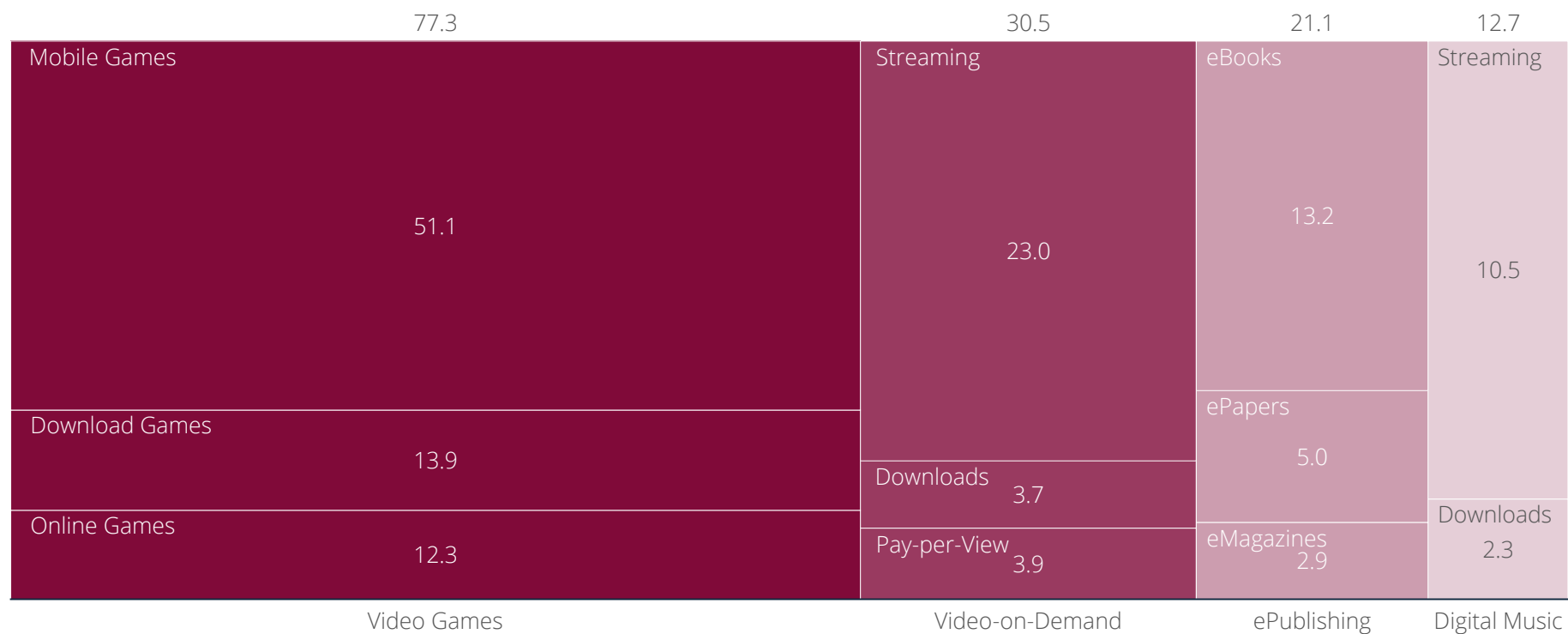
The global Digital Media market is expected to reach a value of US\$157 billion by 2023

Global Digital Media revenue forecast in billion US\$



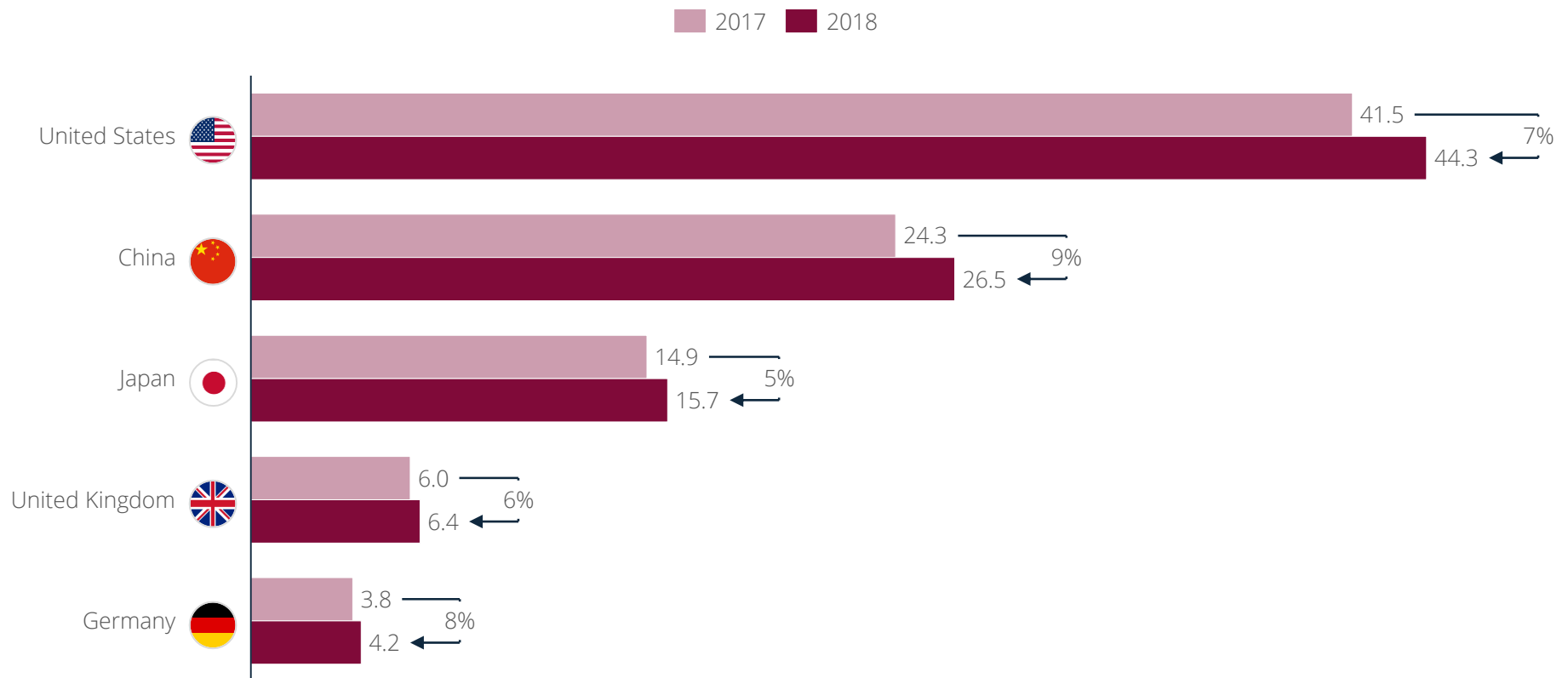
The Mobile Games segment leads Digital Media sales

Global Digital Media revenue in billion US\$ in 2018



China and Germany show the highest growth in Digital Media revenues

Top 5 Digital Media countries by market revenue in billion US\$



The Digital Media landscape is split into content specialists and those with a diversified portfolio

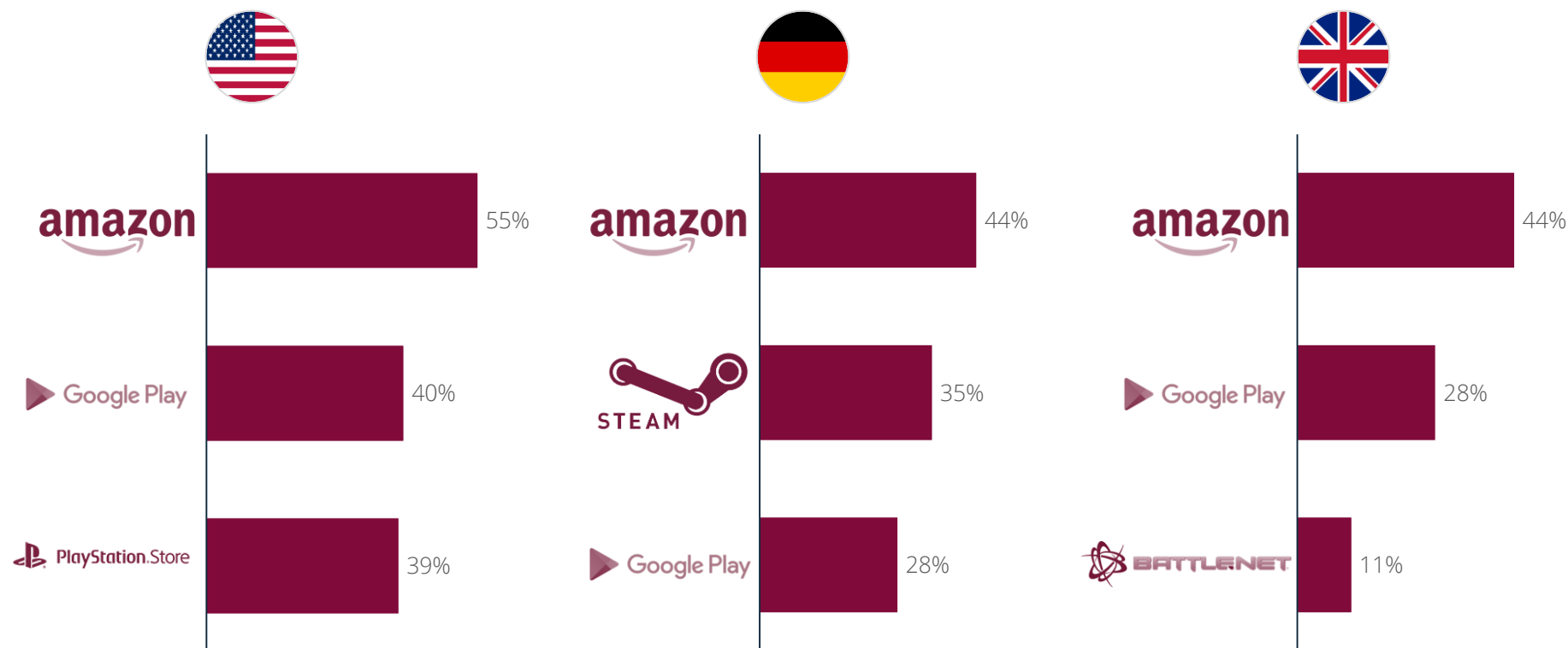
Selected key players in the Digital Media market

	Video Games	Video-on-Demand	ePublishing	Digital Music
Pure Players				
Diversified Players				

Amazon is the preferred online video games provider

Statista
Global
Consumer
Survey

Share of respondents who purchased online video games of selected providers



"Where have you spent money on online video games in the past 12 months (downloads, in-app purchases, subscriptions)?"; Multi Pick; U.S.: n=1,814; Germany: n=453; UK: n=600 respondents who play video games regularly and spent money on downloads, in-app purchases and subscriptions in the past 12 months
Source: [Statista Global Consumer Survey](#), as at February 2019

All Video-on-Demand services still lack customers over 49, while they are popular among young people

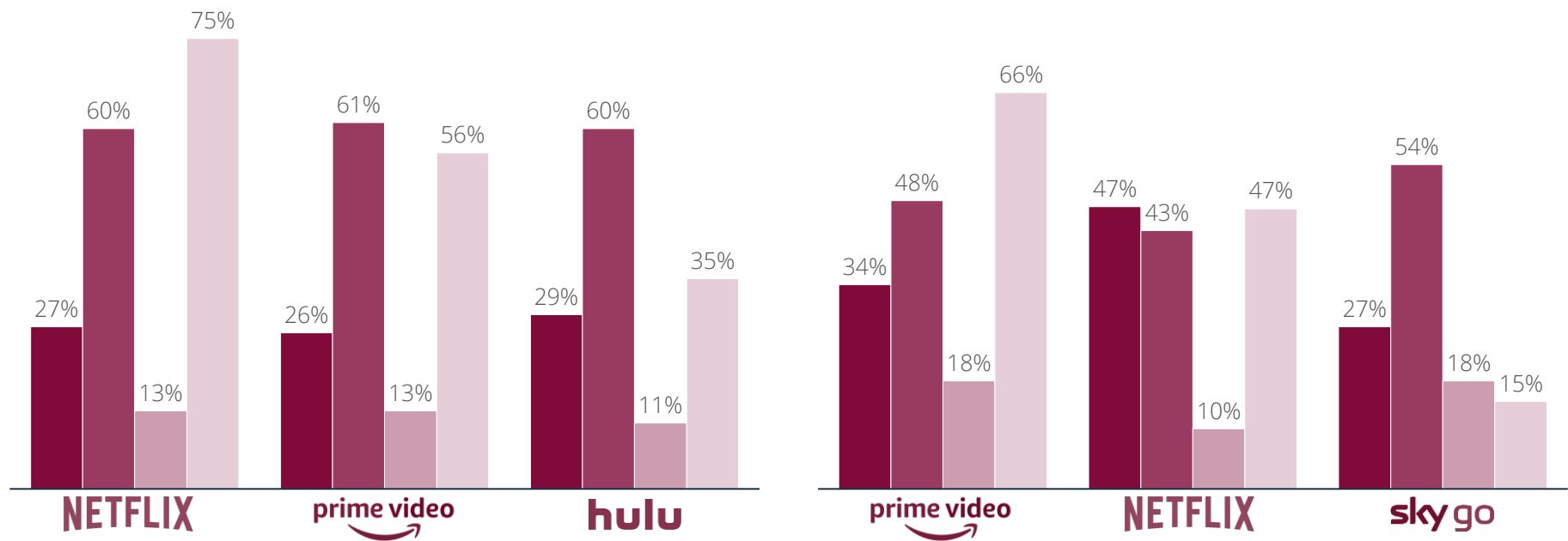


Share of respondents who purchased video-on-demand services of selected providers by age

18-29 years 30-49 years 50-64 years All

United States 

Germany 

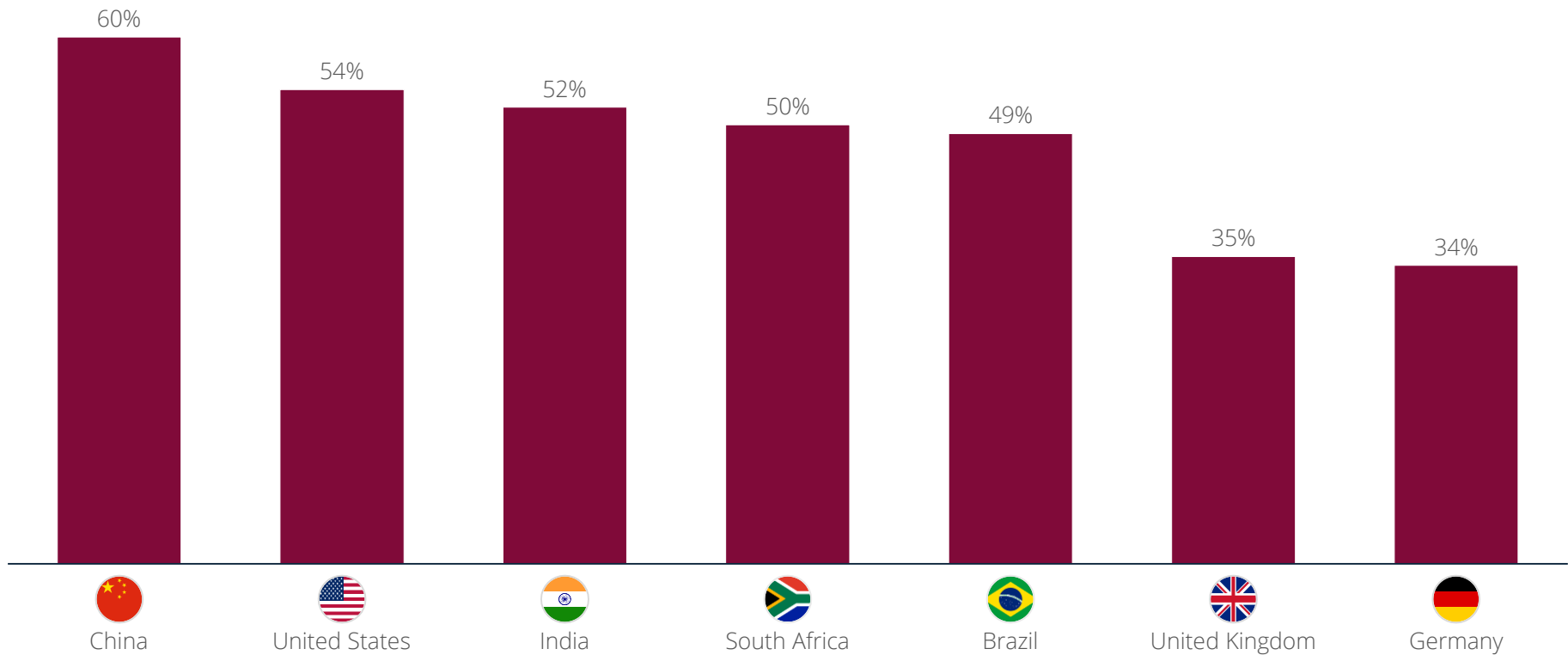


"Which of these video on demand providers have you used in the past 12 months as a paying customer?"; Multi Pick; U.S.: n=2,222; Germany: n=708 respondents who spent money on digital video content in the past 12 months
Source: [Statista Global Consumer Survey](#), as at February 2019

The willingness to pay for content is highest in China, Brazil, and India, with Germany and UK lagging behind



Share of respondents who purchase video-on-demand products



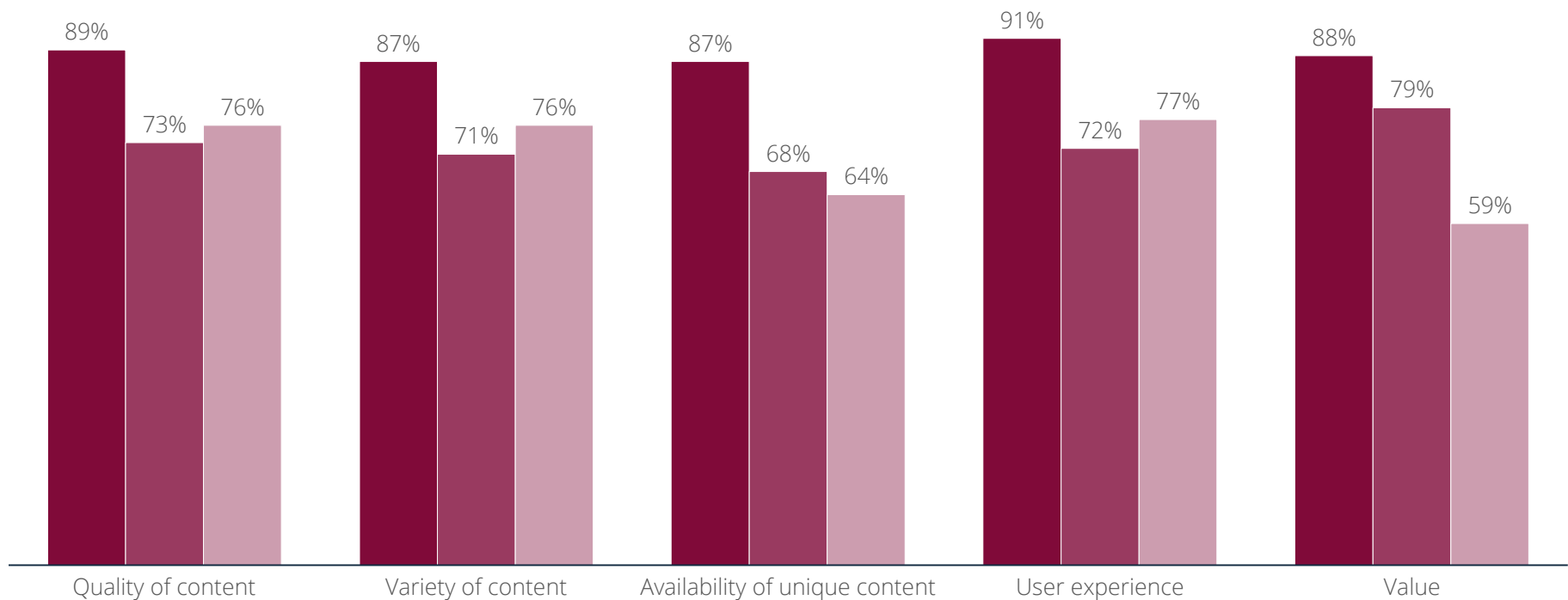
Note: contains downloads and subscriptions; "Have you spent money on digital video content in the past 12 months?"; Multi pick; n=13,406 respondents

Source: [Statista Global Consumer Survey](#), as at February 2019

Streaming services beat (paid) TV in customer satisfaction

Share of viewers who rate the service as excellent/good in terms of ...

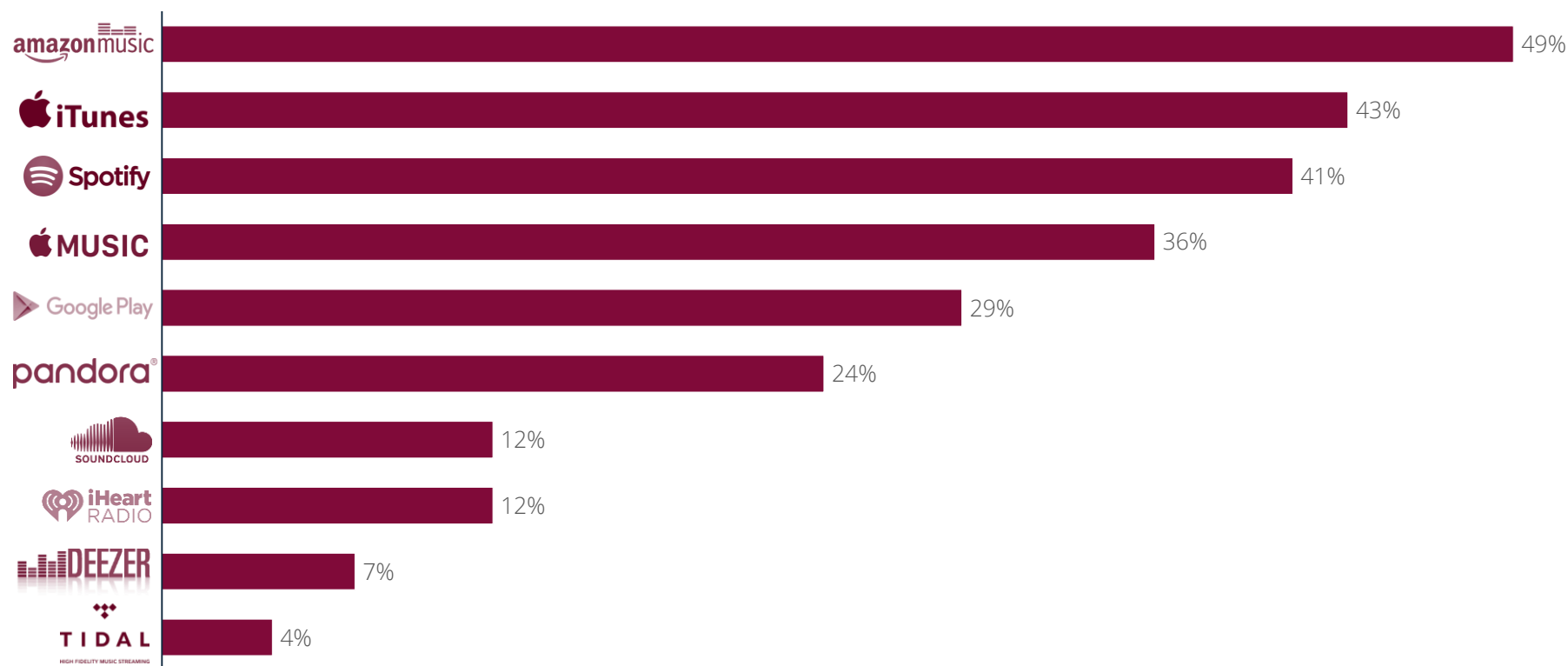
Ad-free streaming subscription services Network TV Cable / Satellite / Telco TV



Amazon tops the list of digital music services

Statista
Global
Consumer
Survey

Share of U.S. respondents who use digital music services of selected providers

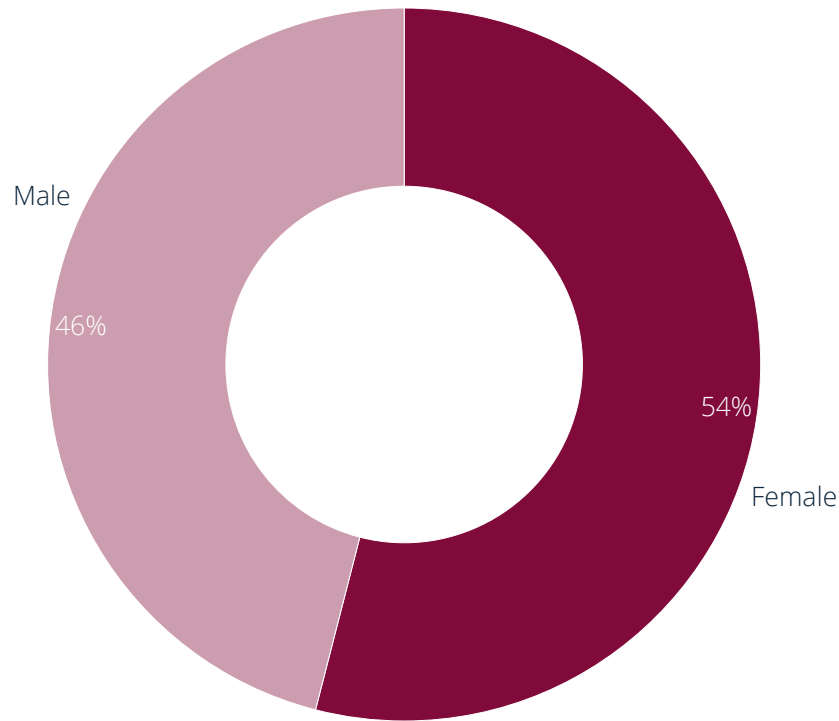


"Which of these providers have you bought music downloads or streaming services from in the past 12 months?"; Multi Pick; U.S.: n=2,328 respondents who spent money on digital music content in the past 12 months
Source: [Statista Global Consumer Survey](#), as at February 2019

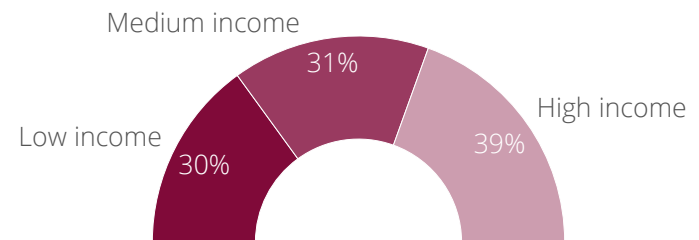
In Spotify's home country, Sweden, women are more likely to spend money on digital music



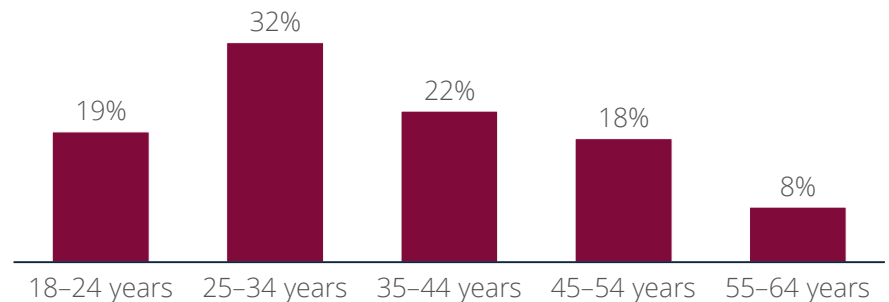
Demographics of people paying for digital music in Sweden



Income



Age



FinTech

FinTech, a combination of financial services and technology, has been rapidly evolving in the last decade and has already to some extent reinvented the financial services landscape and the way people spend, invest, and lend money. With more than 50% of the global adult population using the internet to pay bills or shop online, FinTech is not an emerging market anymore but an established industry with huge potential yet to be unlocked. The most important driving forces for the adoption of any FinTech innovation are minimal entrance barriers for both consumers and providers, comprehensive information, and intuitive handling. Intuitive handling is especially important for people who are not tech savvy. Last but not least, favorable regulation and legislation are also important drivers.

The FinTech market in the Statista Digital Market Outlook includes Digital Payments, Personal Finance services, such as Robo-Advisors and cross-border P2P money transfer, financing platforms for small businesses

(Alternative Financing), as well as Alternative Lending for private business purposes. Digital Payments are by far the largest segment in the consumer-oriented FinTech space. The global Digital Payments transaction value was US\$3.6 trillion in 2018 and is expected to reach US\$6.7 trillion by 2023, following a projected annual growth rate of 13%. While China and the U.S. clearly lead the market with transaction values of US\$1.3 trillion and US\$878 billion in 2018 respectively, Europe is struggling to catch up.

There is an evolving payments landscape in Europe, but market dynamics and the penetration of digital payments are not comparable to China or the U.S. Different cultural mindsets and the overall state of an economy also play a significant role in the speed of innovation: While cash is still king in Germany, mobile payments in China (e.g. Alipay and WeChatPay) have already practically replaced cash as the most frequently used way of payment in everyday life.

Personal Finance, is currently the second biggest FinTech segment and accounted for US\$632 billion in transactions in 2018. Traditional banks' wealth management services often fail to keep up with middle-class consumers' expectations in terms of both performance and technological fanciness. This has led to the emergence of a broad spectrum of digital investment services in North America and Europe. The current value of assets under management of those services is estimated at US\$543 billion in 2018.

Alternative Lending has not lived up to the industry's expectations and has suffered some reputational damage. Nevertheless, this segment still accounted for US\$198 billion in global transaction value in 2018. Borrowing money from an online community instead of turning to family or friends is an attractive option in growing economies, where traditional bank loans are less accessible. The alternative lending sector in China has grown exponentially in the past several years, but has later received some scrutiny from Chinese authorities because of several major fraud incidents.

Last but not the least, Alternative Financing is currently the smallest segment with a global transaction value of US\$9 billion in 2018, but it shows a promising growth up to 2023 as many entrepreneurs and small

business owners are starting to recognize its benefits.

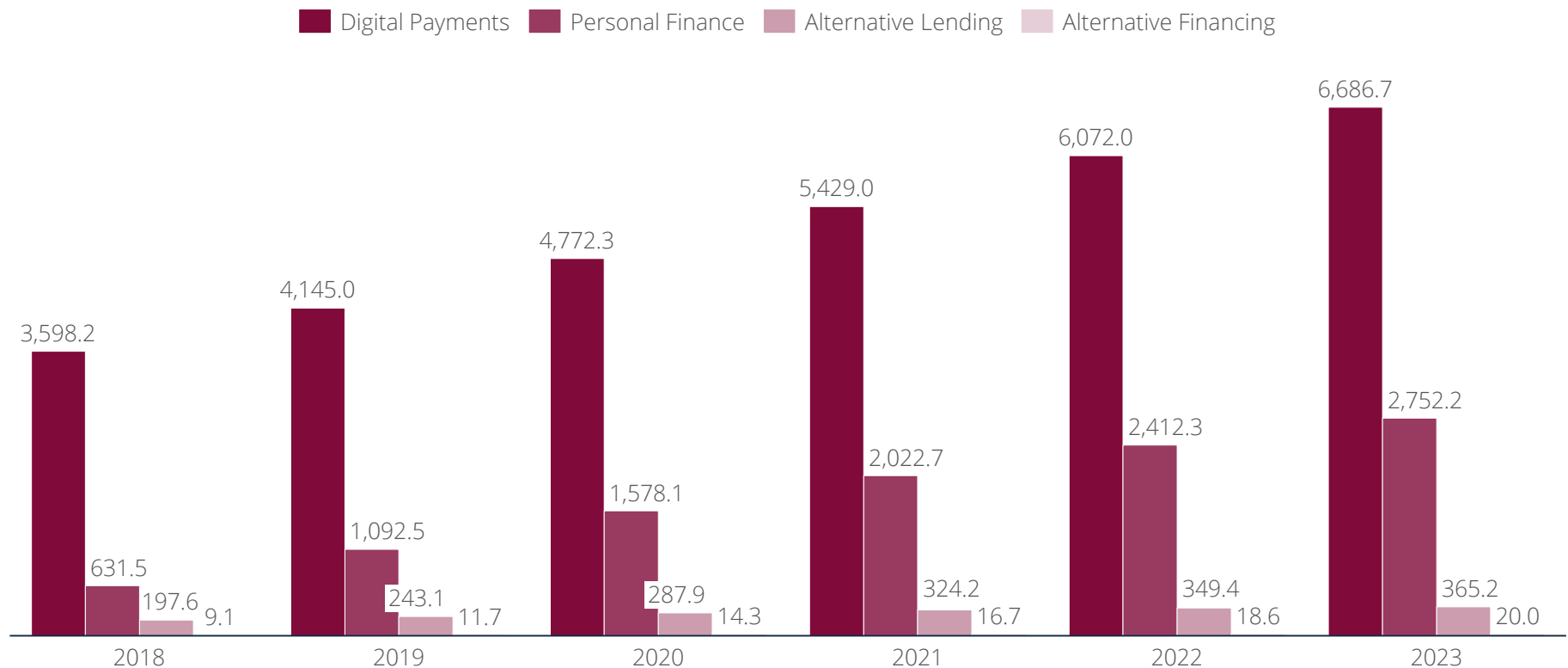
The most frequently used buzzword within FinTech is probably Blockchain. Blockchain is a distributed ledger technology that autonomously records peer-to-peer transactions across decentralized computers without a central authority. Information is written in blocks that are visible to everyone. The Blockchain grows with the number of transactions and information stored in it. Blockchain participants, also called "miners", provide computing power to append new blocks and get an incentive for their work referring to a public Blockchain. This makes fraudulent activities almost impossible, because of the immense number of equivalent replications.

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The global Digital Payments market volume will grow to over US\$6.7 trillion by 2023

Forecast of global FinTech transaction value in billion US\$



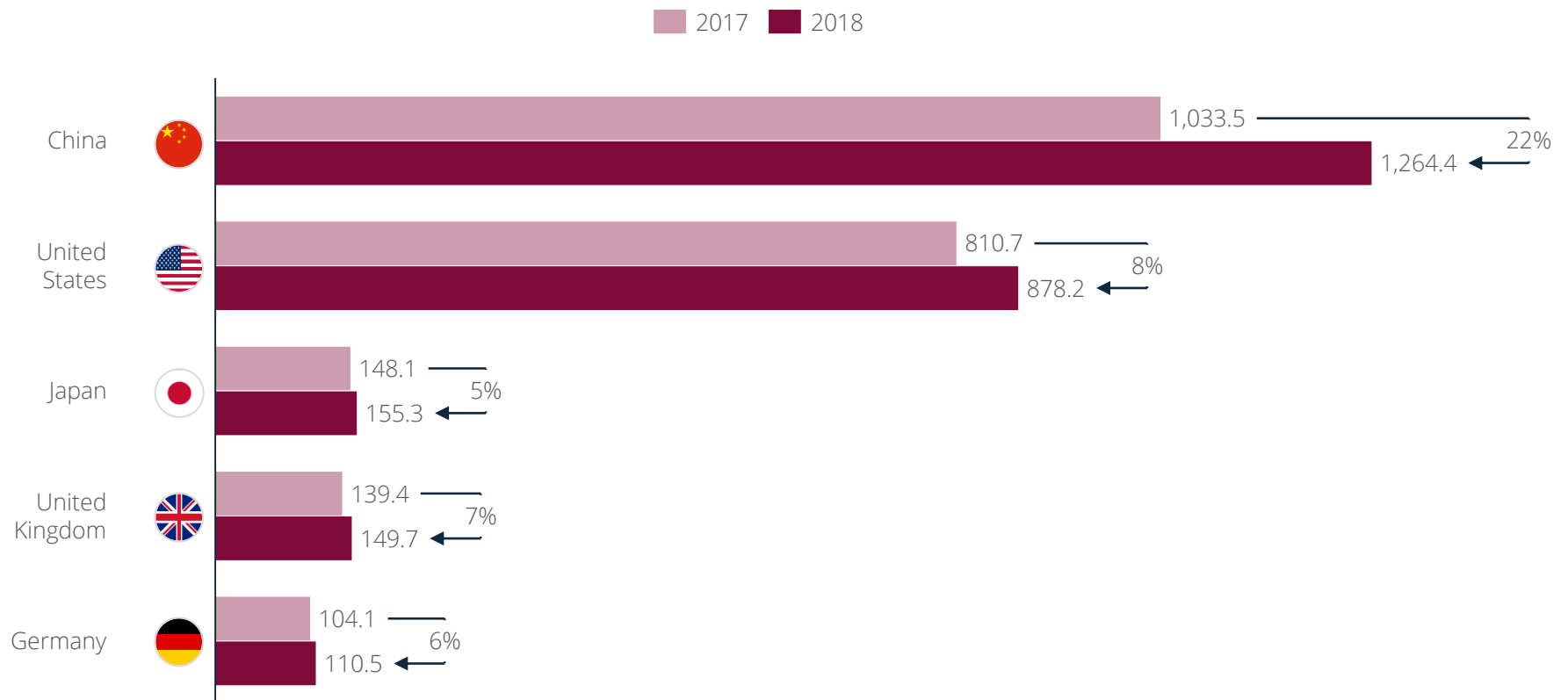
Digital Commerce dominates the FinTech market

Global FinTech transaction value in billion US\$ in 2018



Digital Payments in China grew by 22% in one year from 2017 to 2018

Top 5 FinTech countries by Digital Payments transaction value in billion US\$



The FinTech landscape is highly competitive with a lot of different players

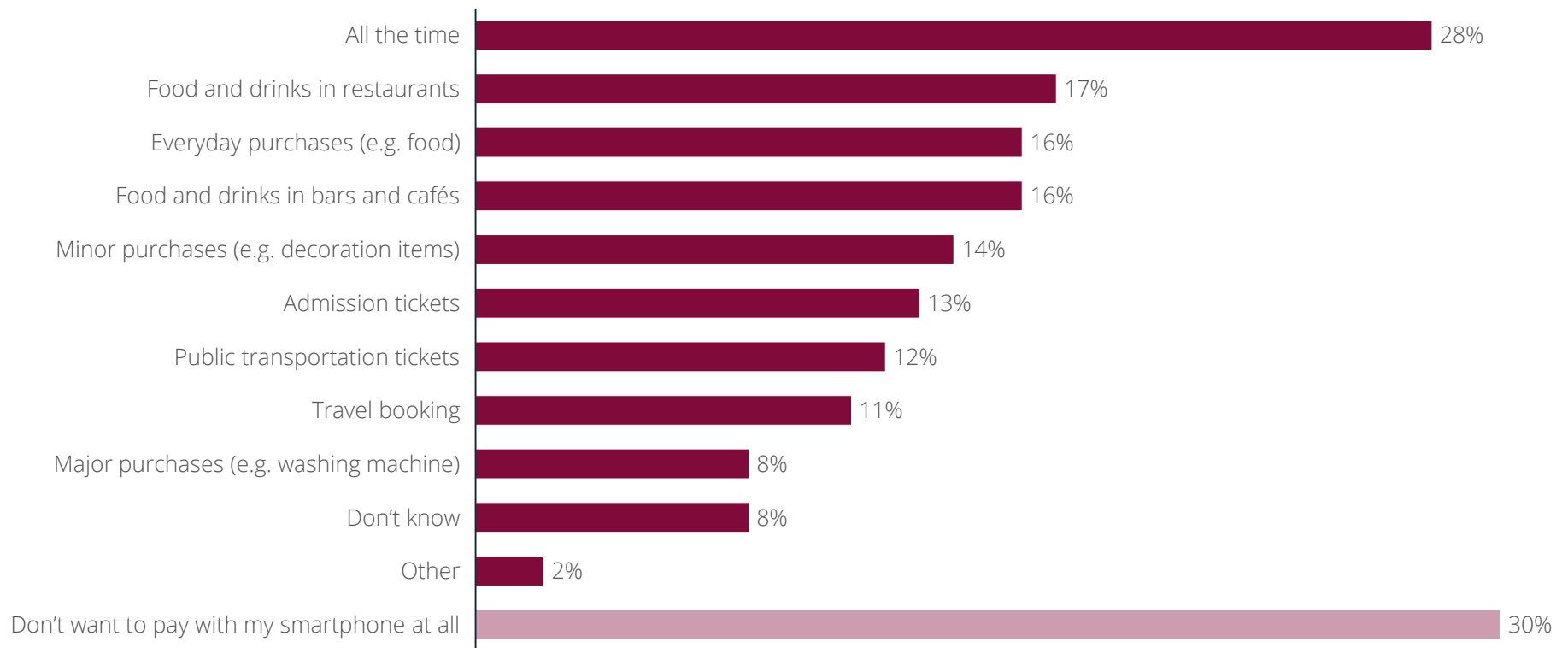
Selected key players in the FinTech market

Digital Payment	Personal Finance	Alternative Lending	Alternative Financing
Digital Commerce 	Robo-Advisors 	CrowdLending 	CrowdFunding
Mobile POS Payments 	P2P Moneytransfers 	P2P Marketplace Lending 	CrowdInvesting

28% of U.S. consumers would like to pay via mobile at all times



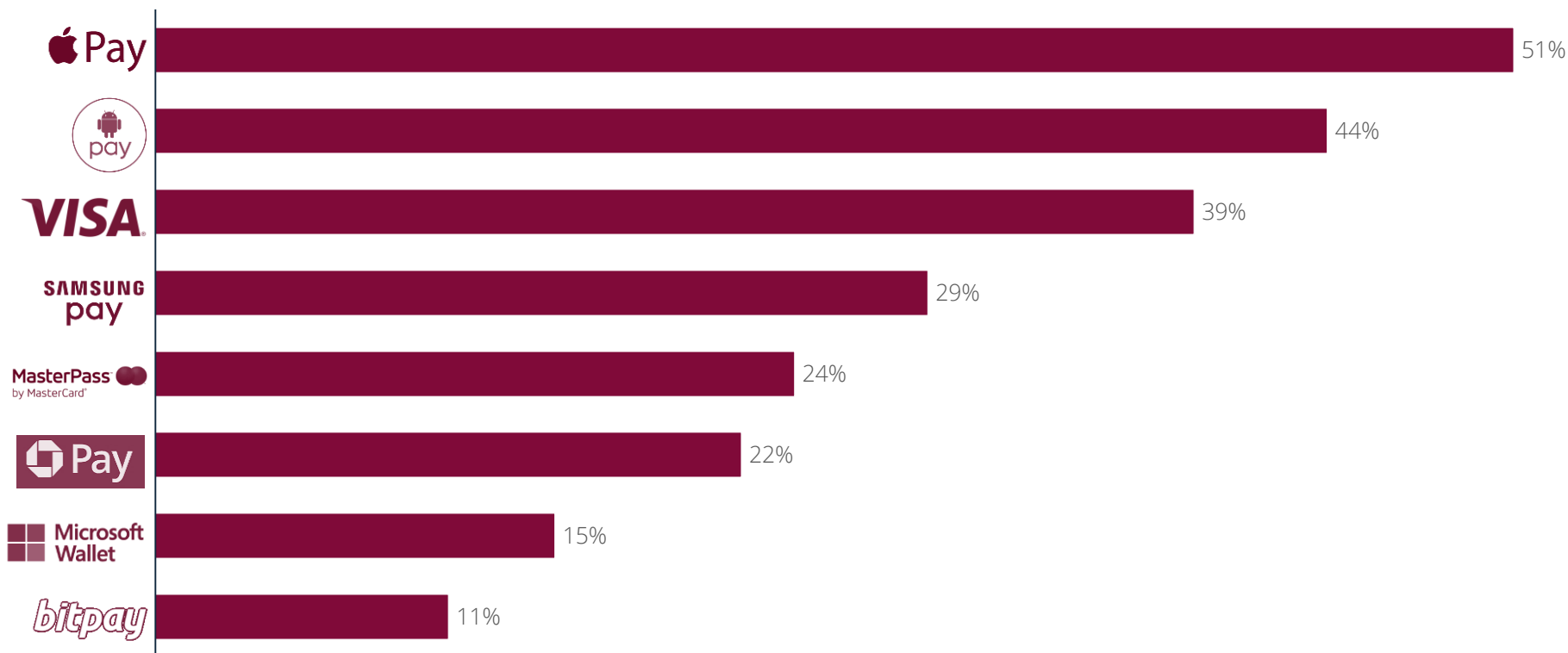
Relevance of mobile payment methods in the U.S.



Apple Pay is the most popular mobile payment method in the U.S., followed by Android Pay



Share of respondents who use selected mobile payment methods in the U.S.

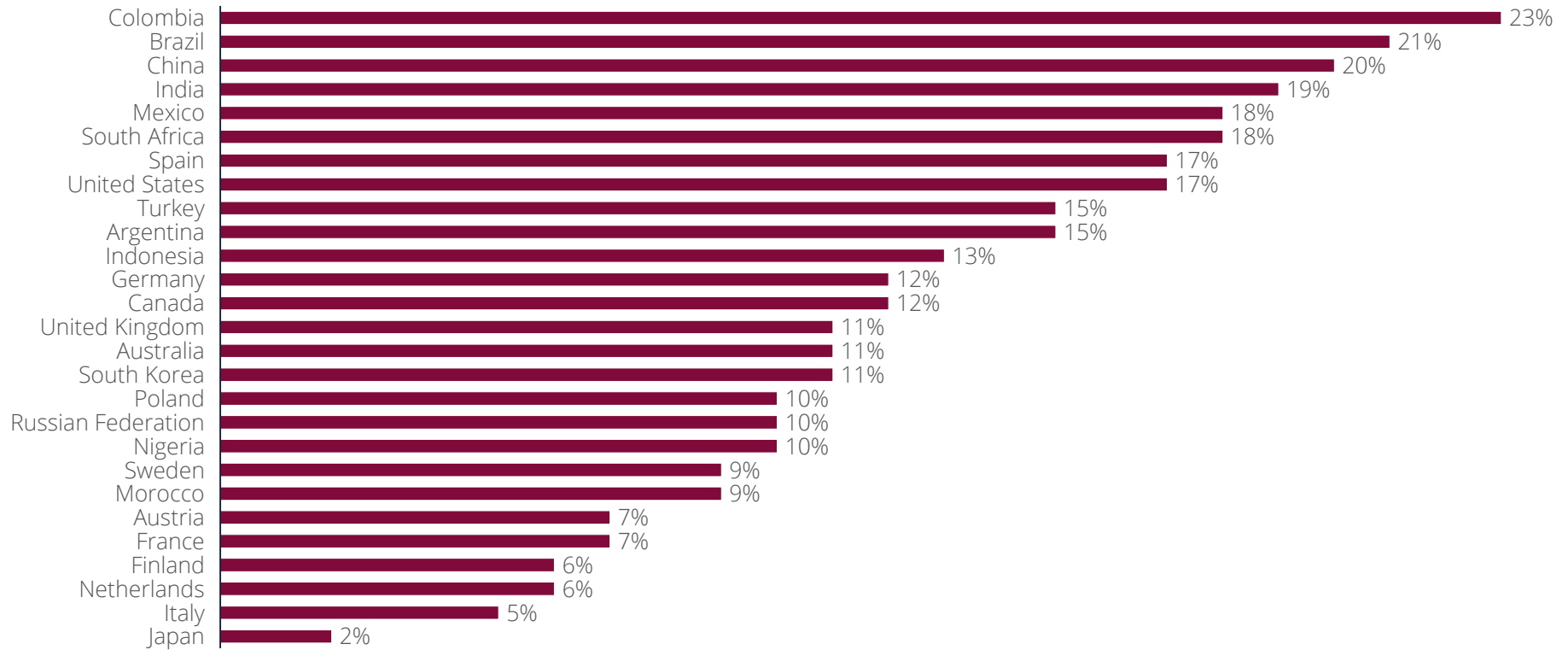


"Which of these services have you used in the past 12 months to pay in stores, restaurants or other points of sale with your smartphone?"; Multi pick; Base: respondents who used mobile payment in restaurants, stores and other points of sale in the past 12 months, n=818 respondents
Source: [Statista Global Consumer Survey](#), as at February 2019

Interest in Robo-Advisors is highest in Colombia, Brazil and China



Respondents who could imagine consulting a digital program (RoboAdvisor) for personal finance advice

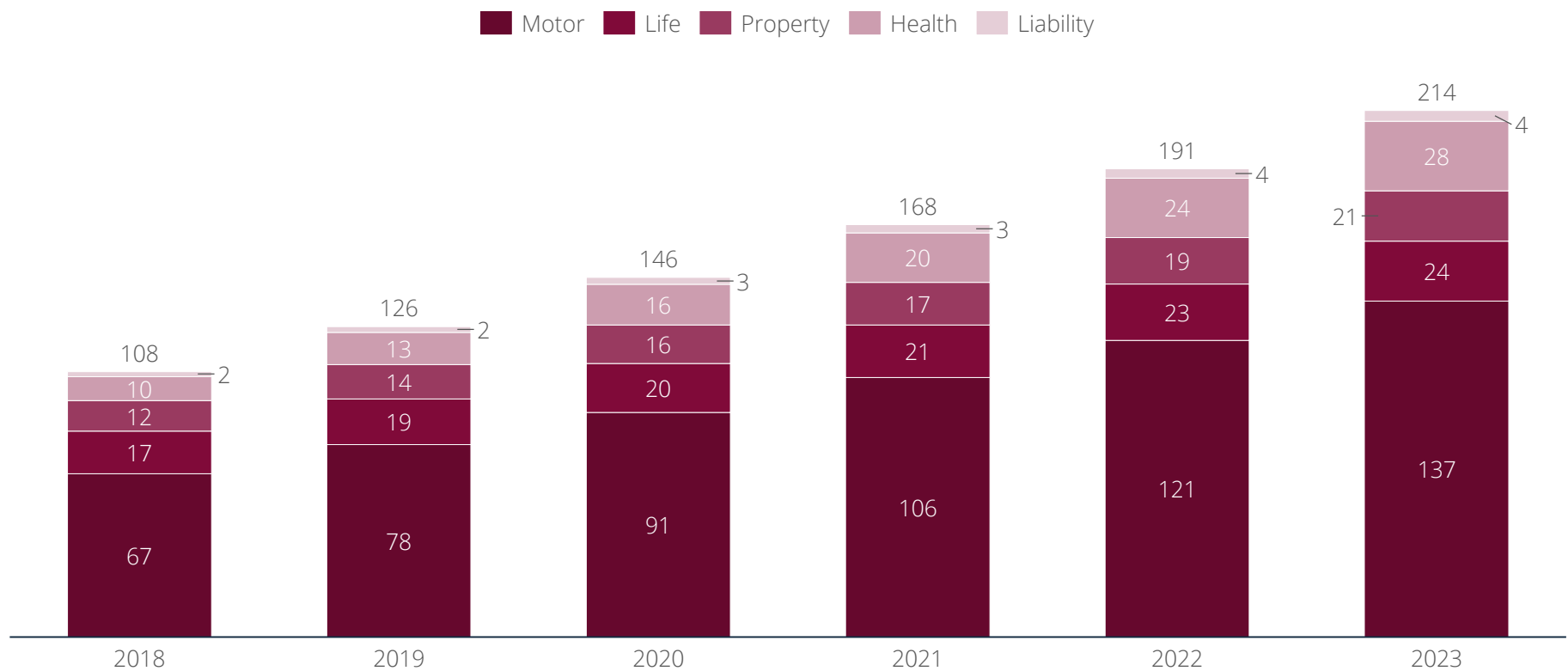


"Which of these statements apply to you? / I could imagine consulting a digital program (RoboAdvisor) for advice on finance issues"; Multi pick; n=40,600

Source: [Statista Global Consumer Survey](#), as at February 2019

InsurTech: Motor insurance is the main driver for growth in the online insurance sector in the U.S.

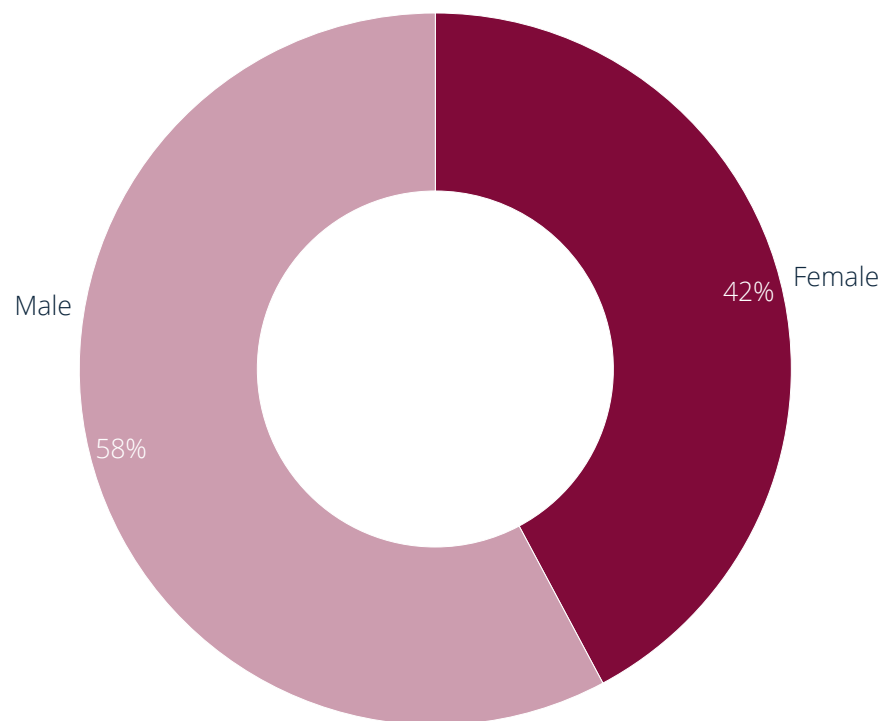
Number of policies sold online in the U.S. in millions per year



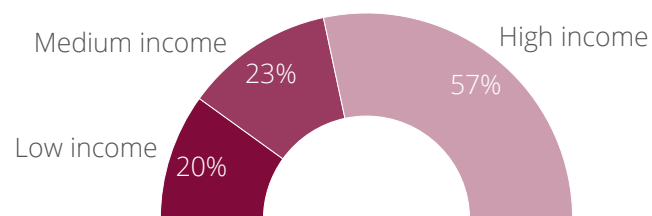
In the UK, a higher share of people with high income use mobile POS payments



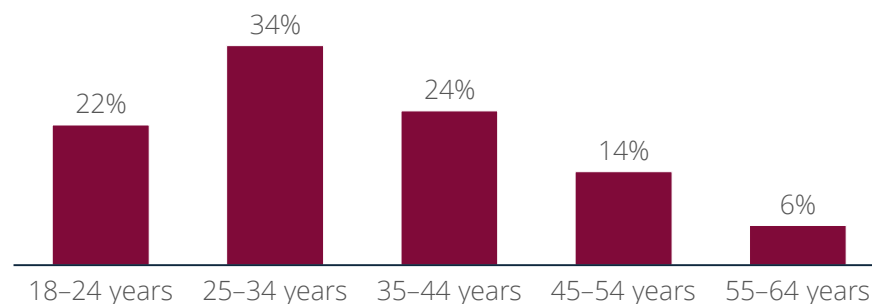
Demographics of people using mobile POS in the UK



Income



Age



Digital Advertising

Worldwide spending on digital advertising outreached TV ad spending for the first time in 2017. Considering how great a role television used to play for generations of media consumers, this is quite a revolutionary development. This shows how important digital advertising has become.

The Statista Digital Market Outlook segments the Digital Advertising market according to the environment where the ads are played. In-page ads are categorized as Banner Ads, while in-stream ads – be it videos or text overlays – are considered Video Advertising. Together with Social Media Advertising, Search Advertising, and Online Classifieds, they constitute the five segments of the Digital Advertising market.

The dominating segment is Search Advertising with a global market volume of US\$105 billion in 2018, making up a market share of 37%. Having keywords as its underlying basis, Search Advertising enables marketers to reach a relevant target group in a very simple and precise way. These keywords can be complemented with a range of options, like

location-based factors, website and audience types, or remarketing based on user behavior.

Social networks usually work with newsfeeds, where user-specific content and shared information are shown. This presents an ideal advertising environment that offers numerous opportunities for personalized user targeting. But it also makes advertisers vulnerable to changes in algorithms, as can now be seen in Facebook's shrinking traffic after its recent update. The global Social Media Advertising market size was about US\$75 billion in 2018.

Although we can observe an advancement in the field of targeting solutions, Banner and Video Advertising still face the challenge of reaching the right audiences. They have a much more random advertising environment than social networks or search engines.

This difficulty is reflected in the market size of both Banner and Video Advertising: With a volume of US\$58 billion, Banner Advertising has a share of only 20% of the total Digital Advertising market. As video players have much more limited advertising space than banners, Video Advertising has an even smaller share of 12%, corresponding to a market volume of US\$35 billion.

Nevertheless, we believe that the development of targeting solutions is still at an early stage. Once it is in full swing, it will have noticeable effects on the advertising market in general and the Digital Advertising market in particular.

Furthermore, in the field of Banner Advertising, we are observing the positive impact of native ads, which match the environment in which they appear in terms of form and function. In other words, these native ads appear as paragraphs within articles in a form and style which is similar to the content provided by the actual platform's editorial staff. This format works very well on smaller displays and is ideal for advertisements on mobile devices. The proximity to editorial contributions increases consumer engagement and the acceptance of the ads.

Online Classifieds make the smallest contribution to overall market revenues. In 2018, the segment generated a global revenue of US\$23 billion, with revenues being more or less equally distributed across categories like motor, jobs, or real estate.

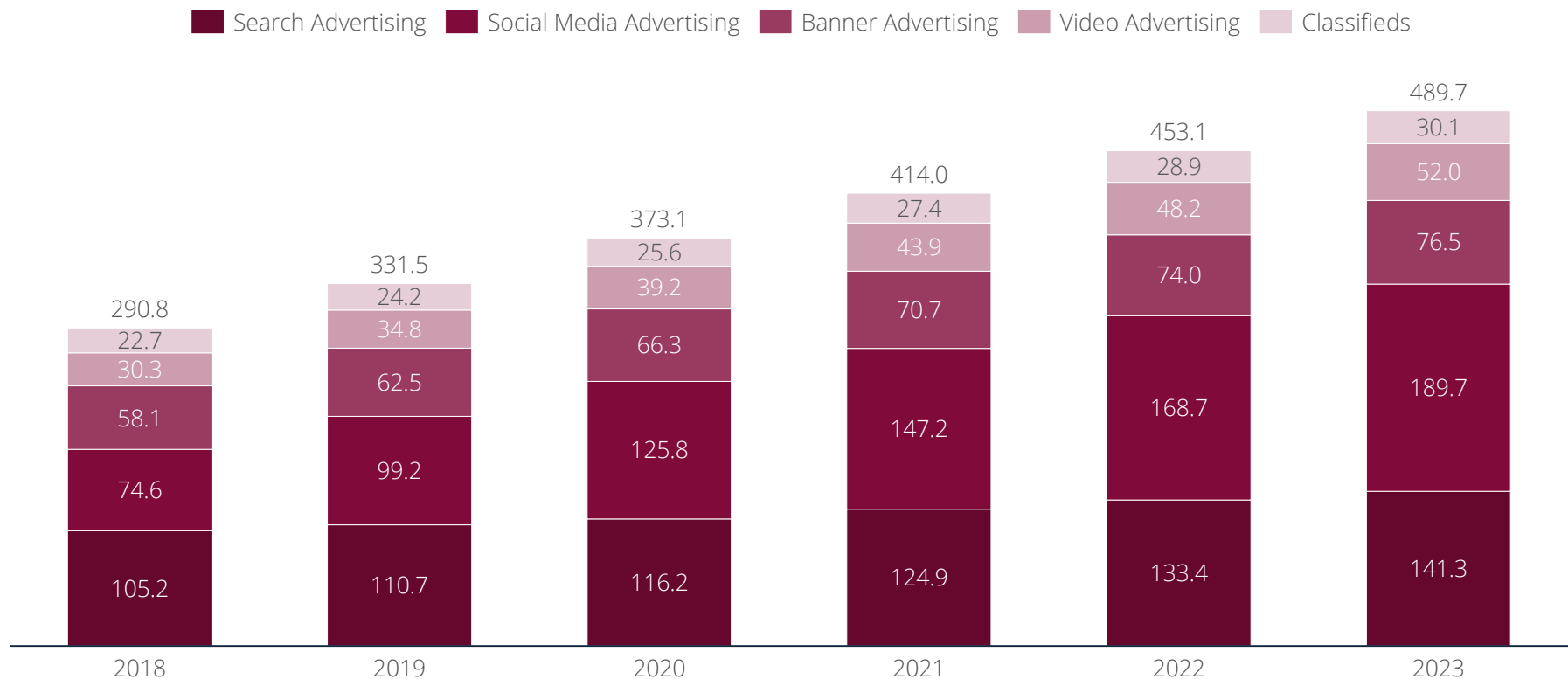
One major trend that has been discussed lately is programmatic advertising including (re-)targeting and real-time bidding. Nevertheless, we believe that this development is still at its beginning and will have noticeable effects on the advertising market in general and the Digital Advertising market in particular. Programmatic advertising describes the software-based buying of advertising space based on audience data to target certain potential customers. The recipient of the ad is known before the ad is sold. Therefore, the ad can be even more personalized. This process takes place within a split second. We expect this targeting to become increasingly precise and the average revenue per user will increase accordingly.



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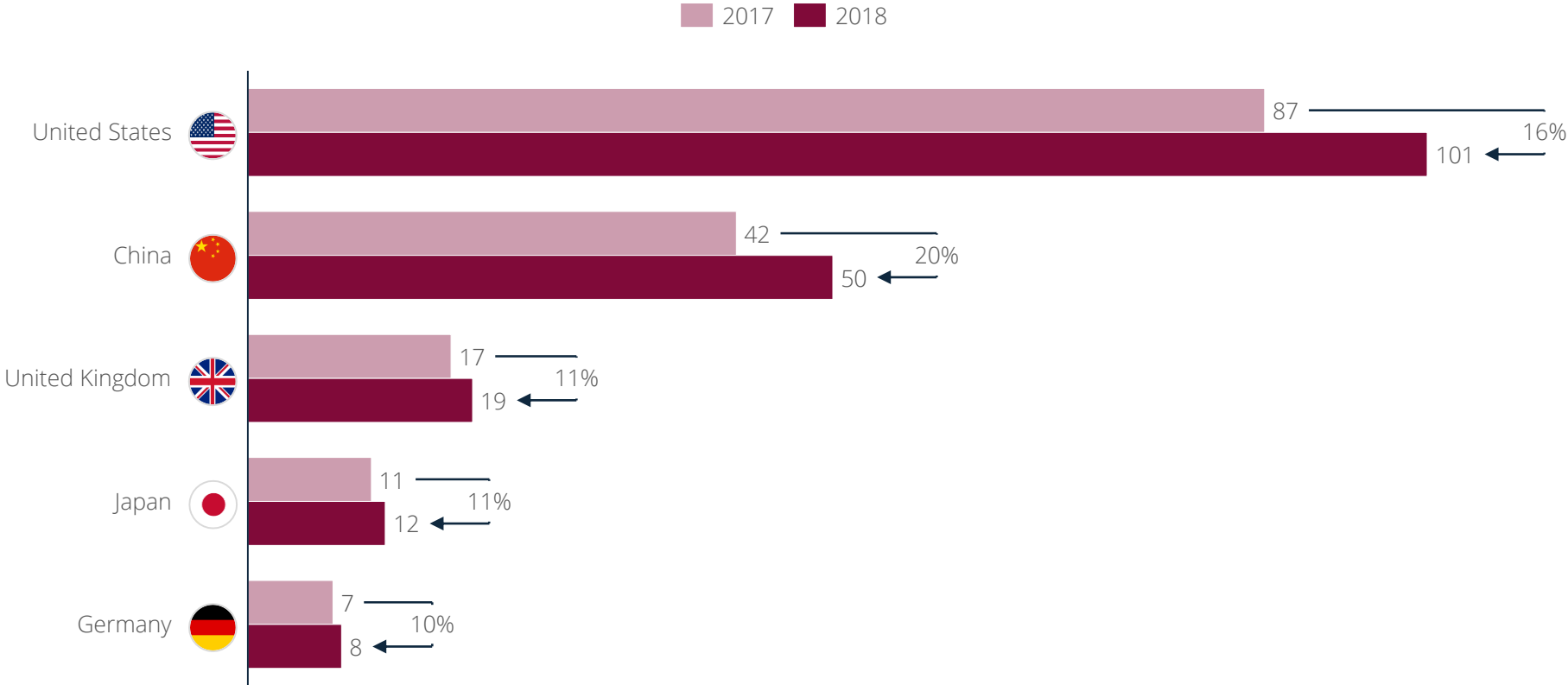
The global Digital Advertising market is expected to grow to more than US\$490 billion by 2023

Global Digital Advertising revenue forecast in billion US\$



Chinese Digital Advertising revenues increased by almost 20% from 2017 to 2018

Top 5 Digital Advertising countries by market revenue in billion US\$



Digital Advertising is still a complex business with many players

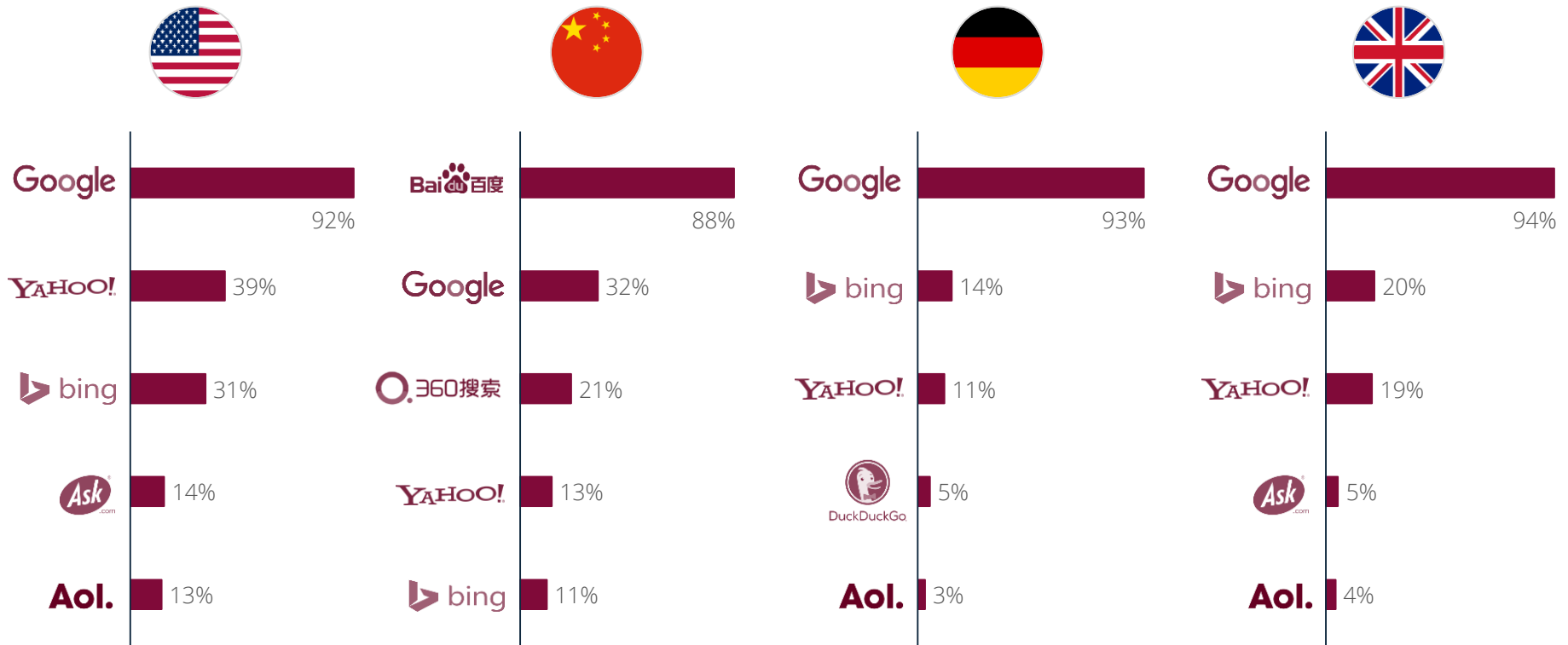
Selected key players in the Digital Advertising market

Agencies and Trading Desks	Demand Side Platforms (DSPs)	Ad Networks / Ad Exchanges	Supply Side Platforms (SSPs)	Publishers

Except in China, Google ranks among the most used search engines

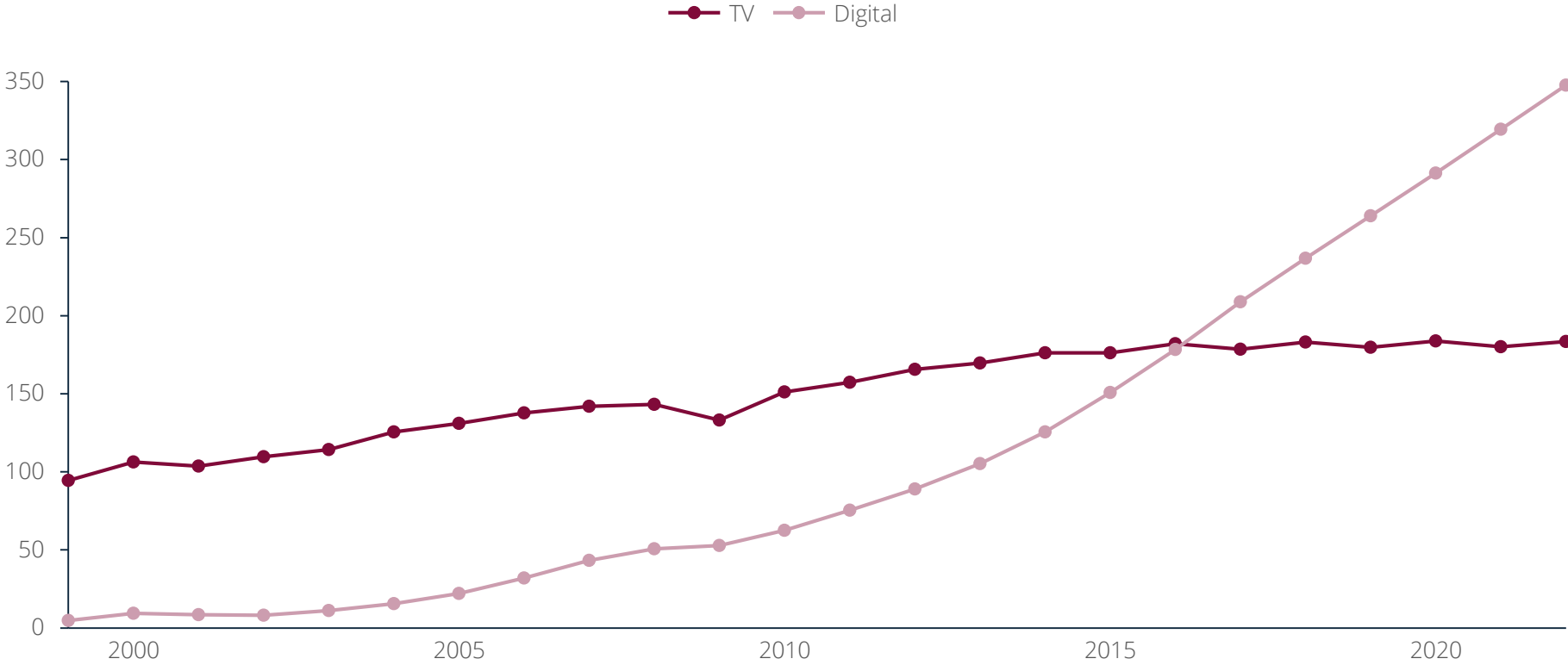


Usage of search engines in 2018



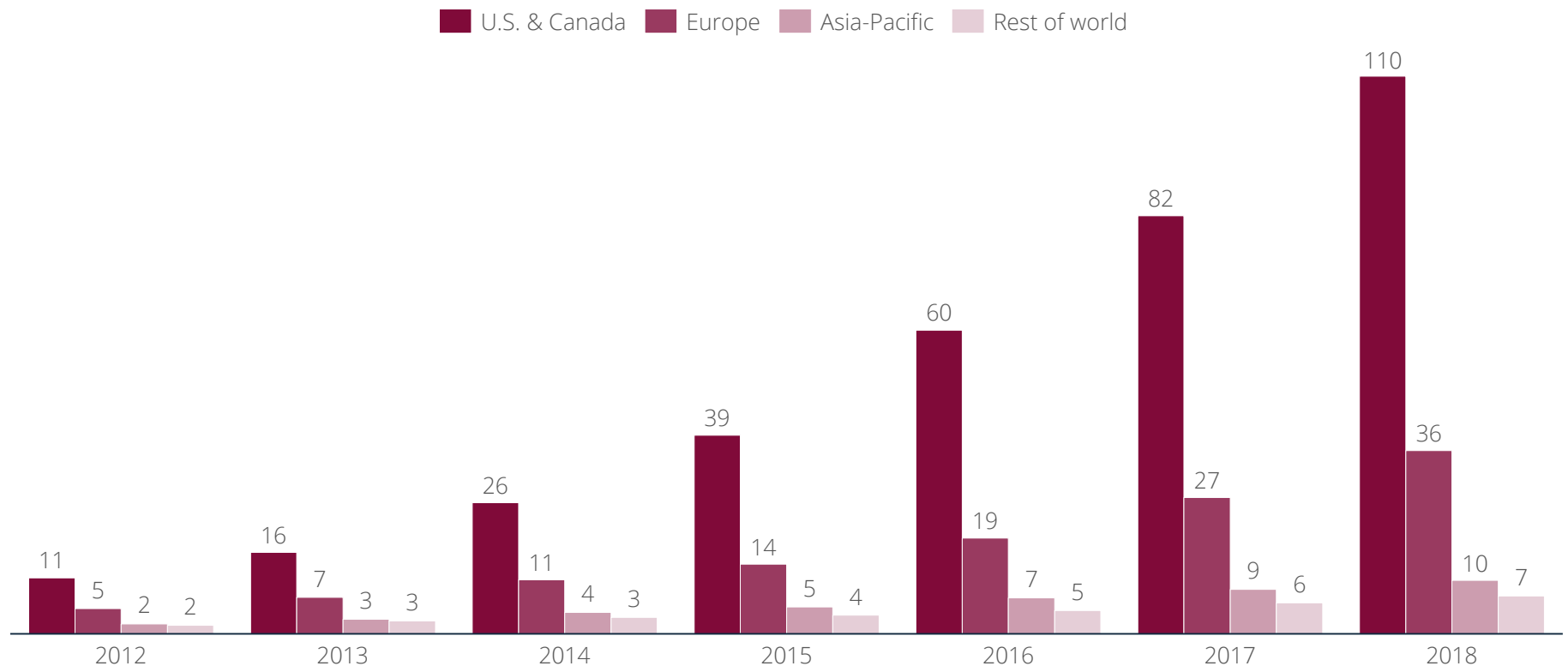
In 2017, spending on digital advertising has already outpaced TV-ad spending

Ad spending in billion US\$



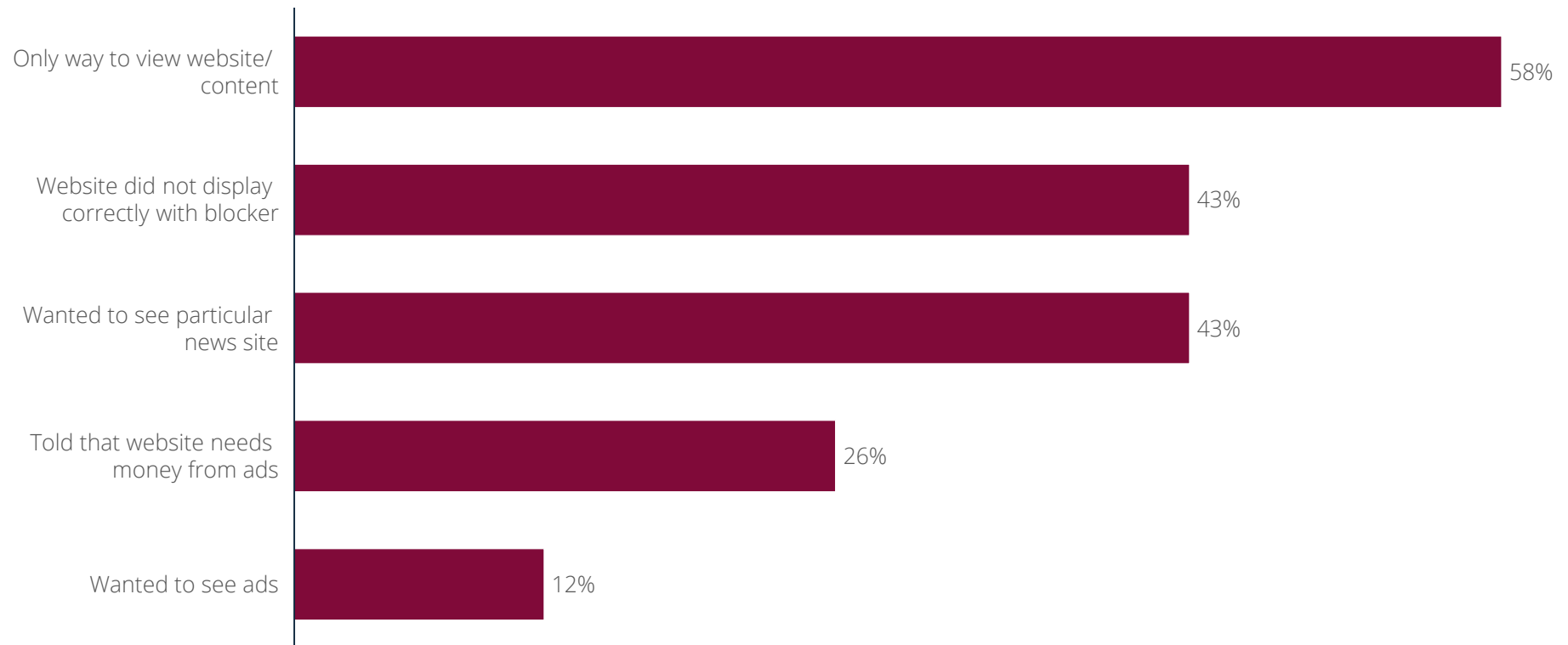
Facebook's advertisement business relies heavily on the advertising revenue from its North American users

Facebook's average advertising revenue per user in US\$



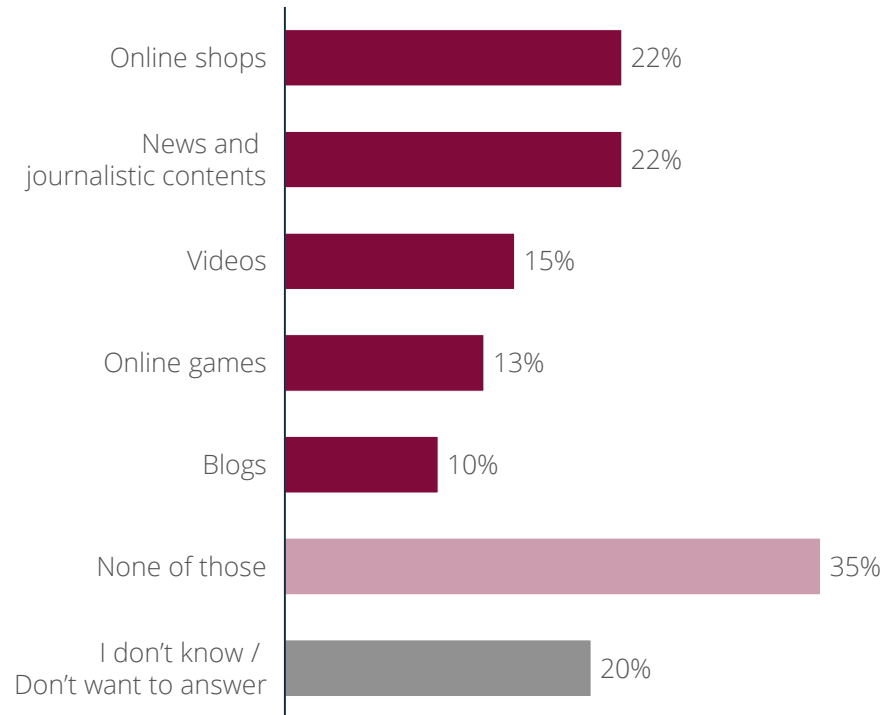
Almost 60% of respondents would disable an ad blocker if it is the only way to see a website correctly

Reasons for users to temporarily turn off their ad blockers

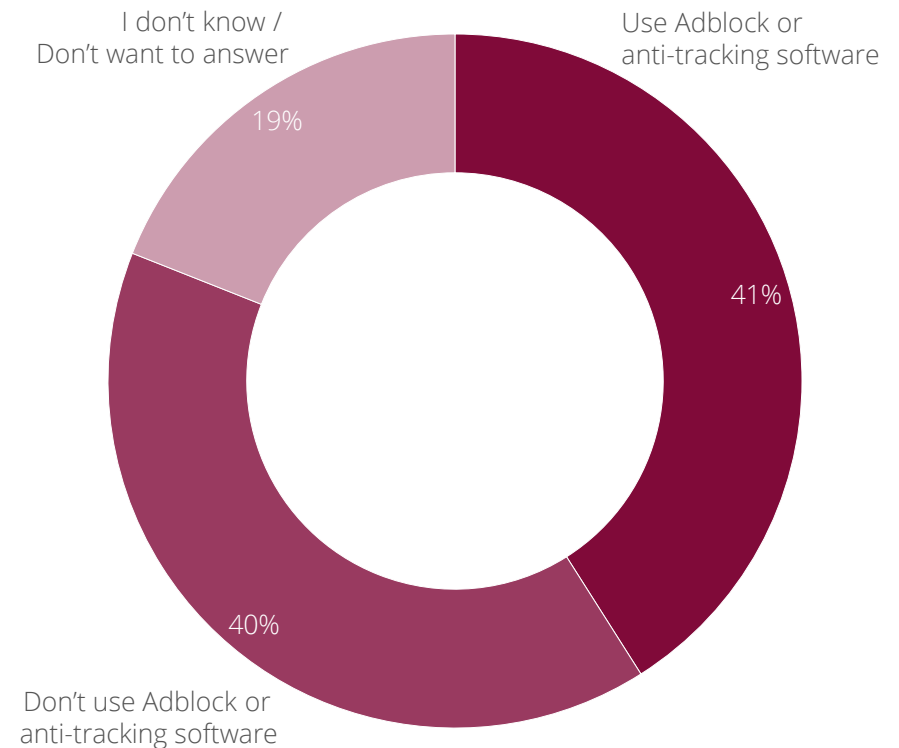


Germans disable their ad blocker for online shops and news – but only 41% use an ad blocker at all

Share of respondents who would disable their ad blocker for the following content



Share of respondents who use an ad blocker in Germany



Smart Home

Smart homes and the Internet of Things (IoT) are irrevocably entwined, and the IoT is one of the most disruptive trends at the moment, affecting a large number of traditional industries. IoT initiatives by Google, Apple, Amazon, or Alibaba have already noticeably changed the smart home landscape. They provide opportunities for all kinds of companies, but they have also forced market consolidation. The big tech players are rapidly expanding their product portfolios in the smart home field with huge investments. One example is Amazon, which acquired Ring in 2018 for US\$1 billion.

Nevertheless, several market segments still have no clear market leader. Manufacturers, telcos, energy suppliers, medium-sized companies or start-ups still have chances in the future, when practically every product in the average home will be connected to the internet.

In the Statista Digital Market Outlook, we divide the Smart Home market

into the segments Control and Connectivity, Comfort and Lighting, Security, Home Entertainment, Energy Management, and Smart Appliances. With revenues of US\$24 billion, the U.S. was the biggest Smart Home market in 2018. Although the prospects are positive, the U.S. grew at an annual rate of 33% from 2017 to 2018, which is significantly lower than the Chinese CAGR¹ of 69%. However, the Chinese market is still comparatively small with revenues of US\$7 billion in 2018.

The market got a tremendous boost from smart speakers in 2018. The adoption rate for smart speakers in the U.S. nearly doubled, which can be attributed to growth in both Alexa and Google Home devices. Apple's HomePod, on the other hand, only played a minor role. Moreover, there was an influx of smart displays, such as Echo Show, the Lenovo Smart Display, or Facebook Portal. These devices have laid the groundwork for more advanced human interface capabilities.

No matter how many sensors or connected appliances consumers install, they often still have to manually control things, whether through an app or a voice assistant. Voice assistants can set up routines, i.e. multiple smart devices can be controlled at a specific time or with one command, but it is still rare for a smart home to automatically react to situations.

Many competing smart home standards like Bluetooth, Zigbee, Z-Wave or Wi-Fi even make interoperability between devices complicated by having separate apps and logins. However, devices in a smart home are seldom used separately. Customers don't want to switch devices and technologies when controlling their home entertainment or security systems, for example. The future of the smart home will be an integrated platform solution with a universal communication standard interlinking all smart devices. It will gather data with the help of AI-based solutions to automate routines and individualize the device functions at home.

The connection of every device, more sophisticated AI-driven services and the gathering of a gigantic amount of data will present a big challenge for data transfer solutions. In this respect, the implementation of 5G is vital. Sharing the data of homeowners with businesses will probably foster the growth of new individualized technologies and

services in the market. Data that is shared with smart devices will therefore be of great interest to companies.

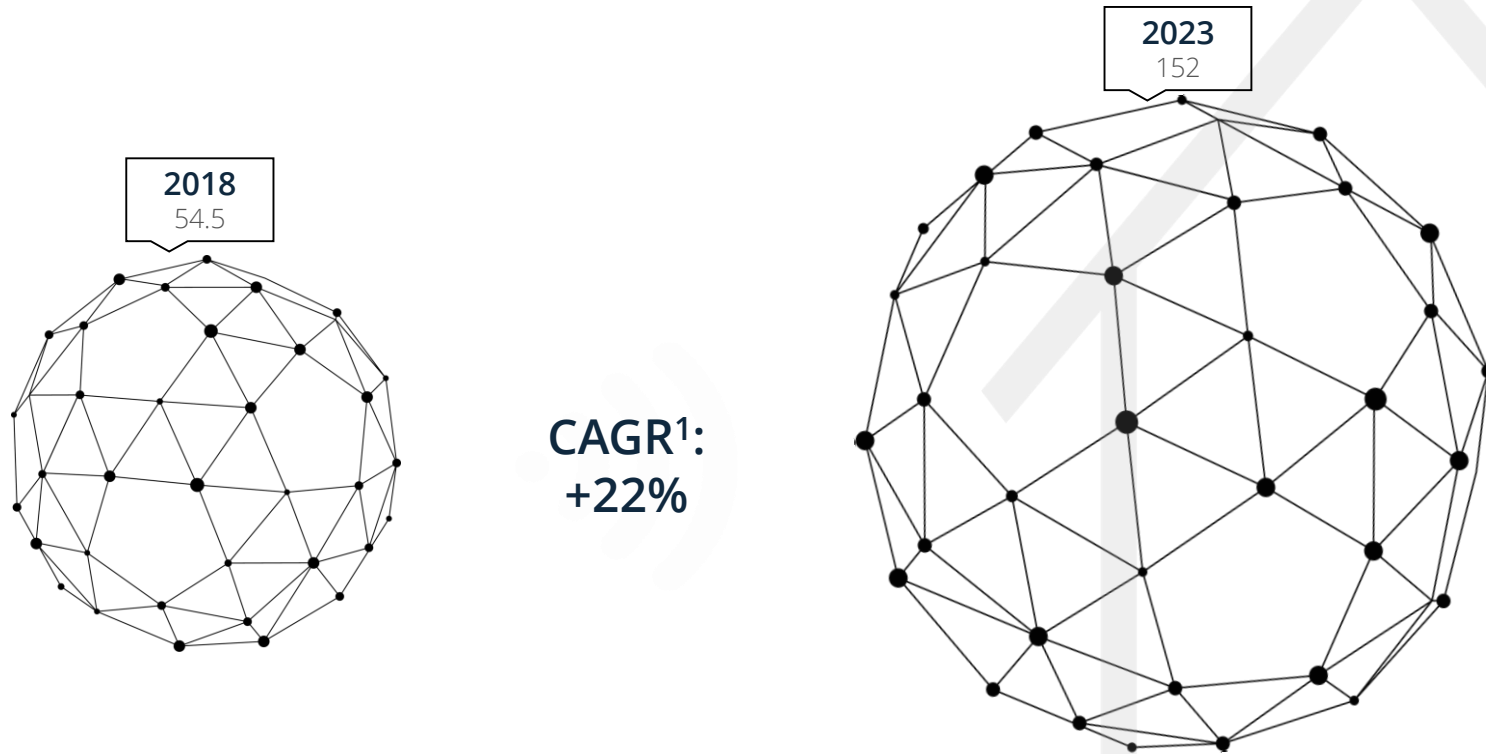
Considering the handling of all this data, security concerns will become even more relevant. Due to the fact that there are currently no minimum requirements, there is no standard for implementing cybersecurity into smart devices. Consumers are already worried about data security breaches in the context of smart homes, and providers have to respond to these concerns.

C. Blumtritt

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The market for Smart Home products is expected to grow by 22% annually between 2018 and 2023

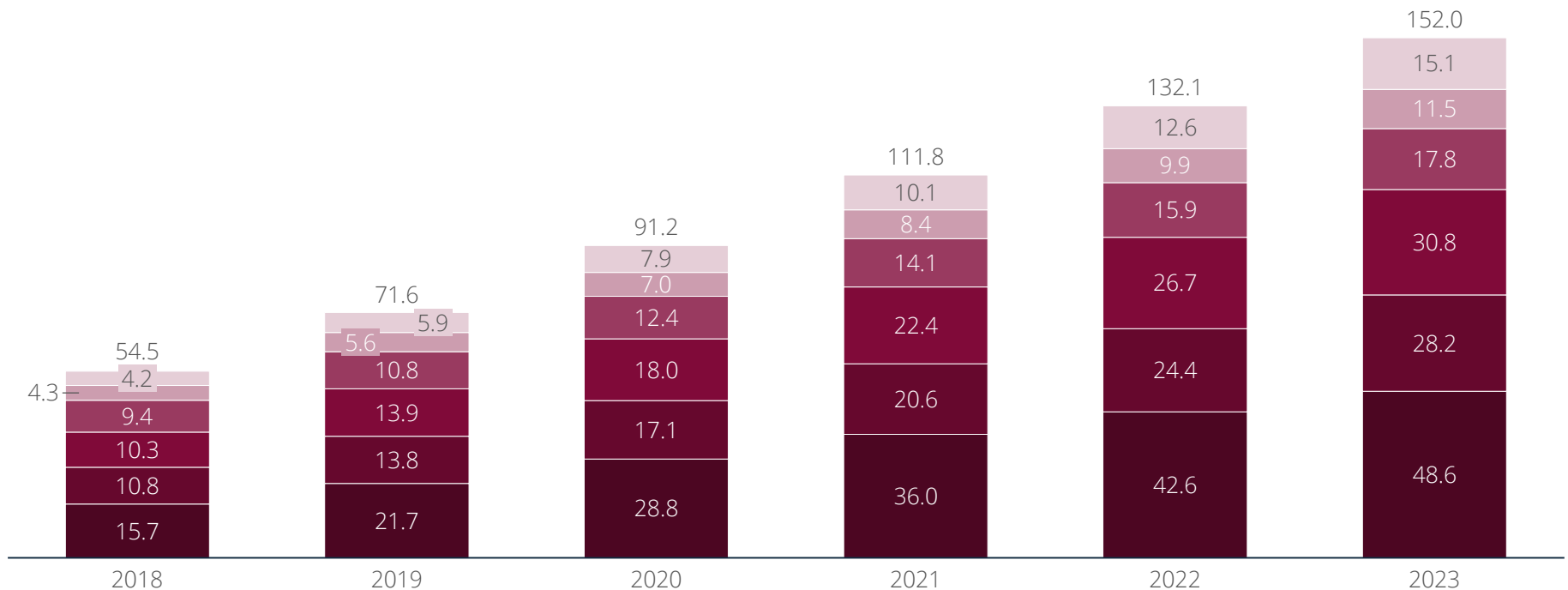
Estimated revenue for Smart Home products worldwide in billion US\$



The global Smart Home market is worth US\$55 billion in 2018 and is expected to grow even bigger

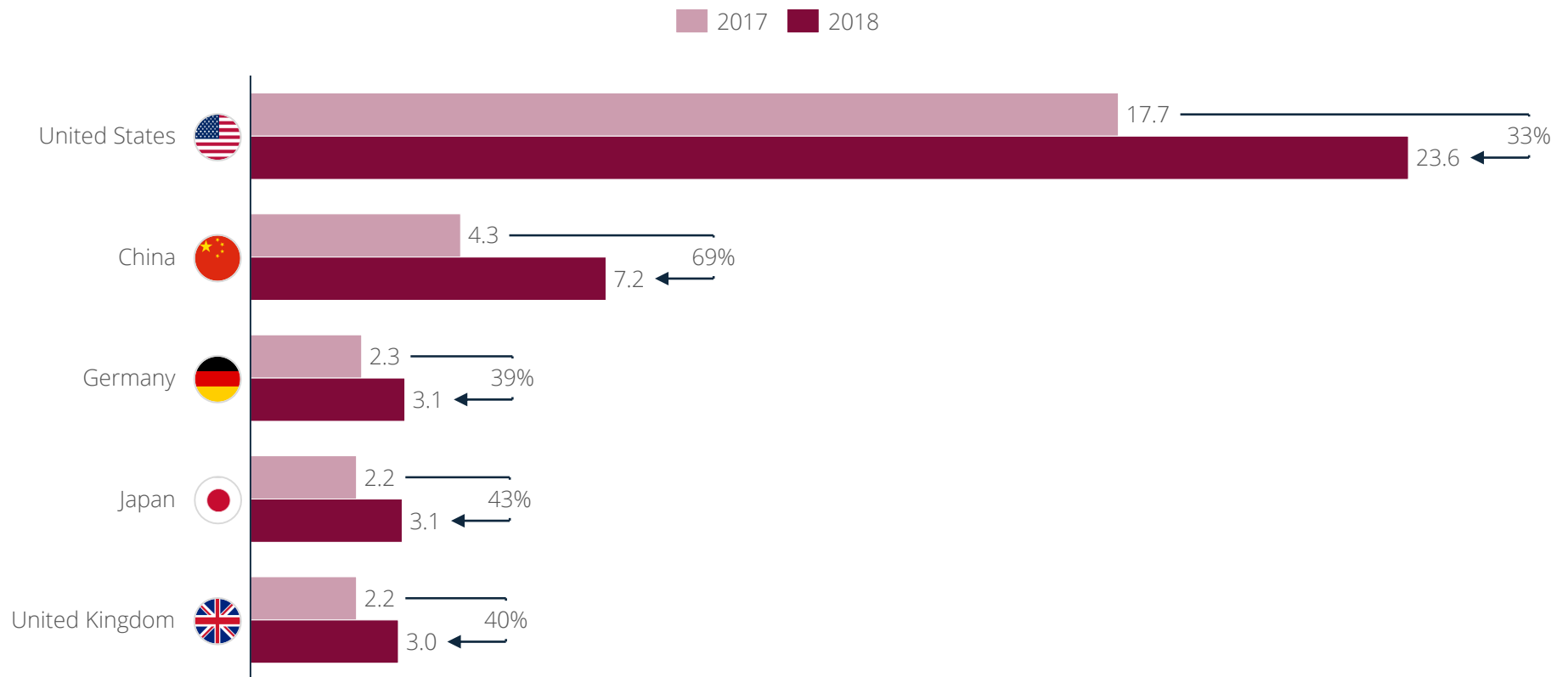
Global Smart Home revenue forecast in billion US\$

■ Smart Appliances
 ■ Security
 ■ Control and Connectivity
 ■ Home Entertainment
 ■ Energy Management
 ■ Comfort and Lighting



The Smart Home market is surging in all top 5 countries, with China showing the highest rate of 69%

Top 5 Smart Home countries by market revenue in billion US\$



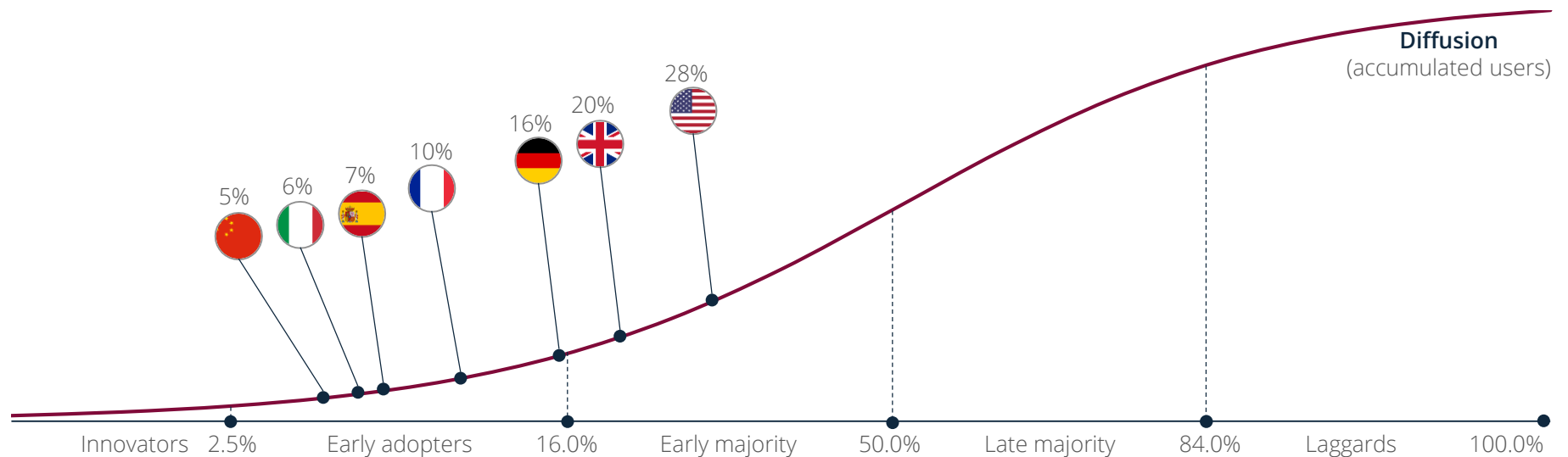
More and more players with different backgrounds are entering the Smart Home market

Selected key players in the Smart Home market

	Control and Connectivity	Comfort and Lighting	Security	Home Entertainment	Energy Management	Smart Appliances
Dedicated Smart Home companies	 	 	 	 	 	
Players entering the market from other industries	 	 	 	 	 	

The Smart Home market is starting to move past the early-adopter stage

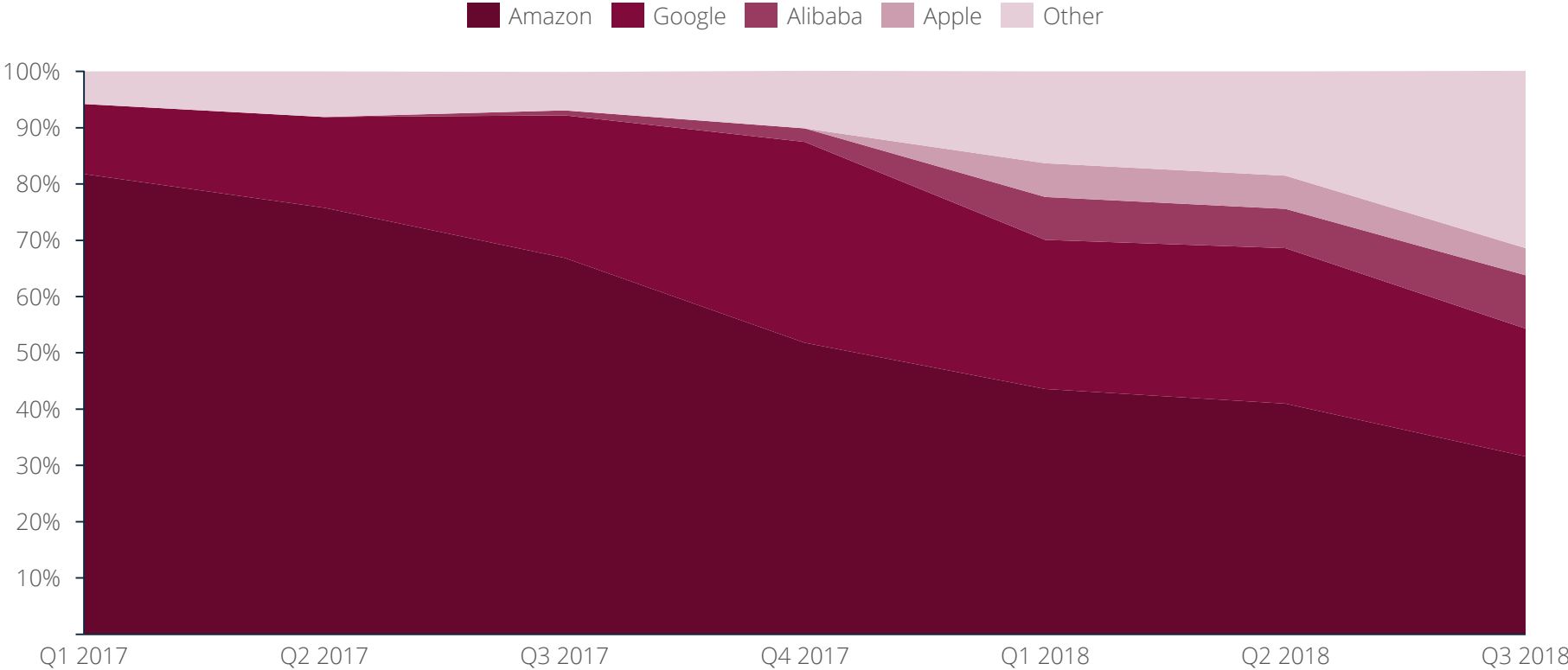
Innovation diffusion curve for Smart Home adoption in 2018



The diffusion of innovations graph shows successive groups of consumers adopting devices from the Smart Home market (the graph above shows the household penetration rate of selected countries). Innovations in general are not adopted by all individuals at the same time. Instead, they tend to adopt in a time sequence, and can be classified into adopter categories based on how long it takes until they begin using the service. Diffusion is considered to be the rate at which innovations spread among users (an adoption rate of 100% is theoretically possible but not realistic). Considering the moderate penetration, replacement cycles and that more and more devices will be connected, adoption will steadily grow in the next years.

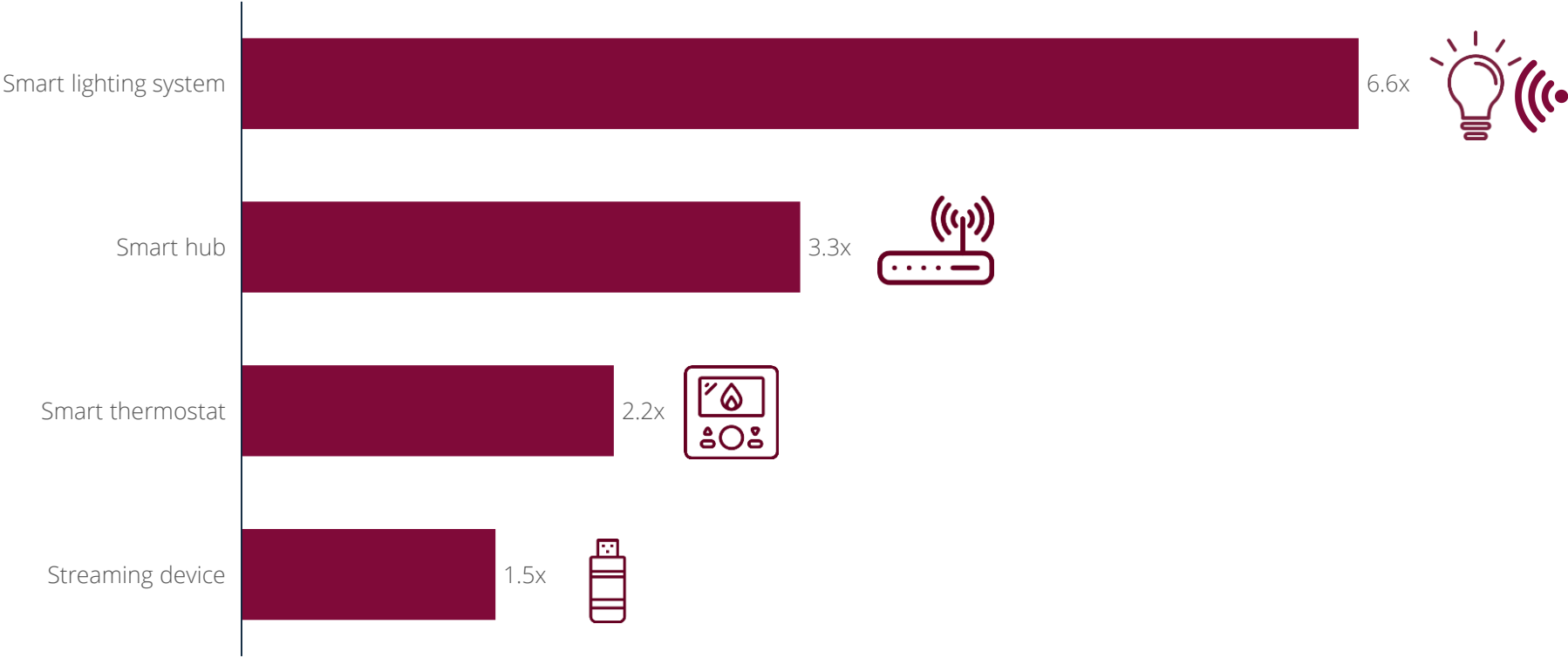
Competition is eating away at Amazon's smart speaker market share

Estimated share of global smart speakers sales



U.S. smart speaker households are 6.6 times more likely to also own a smart lighting system

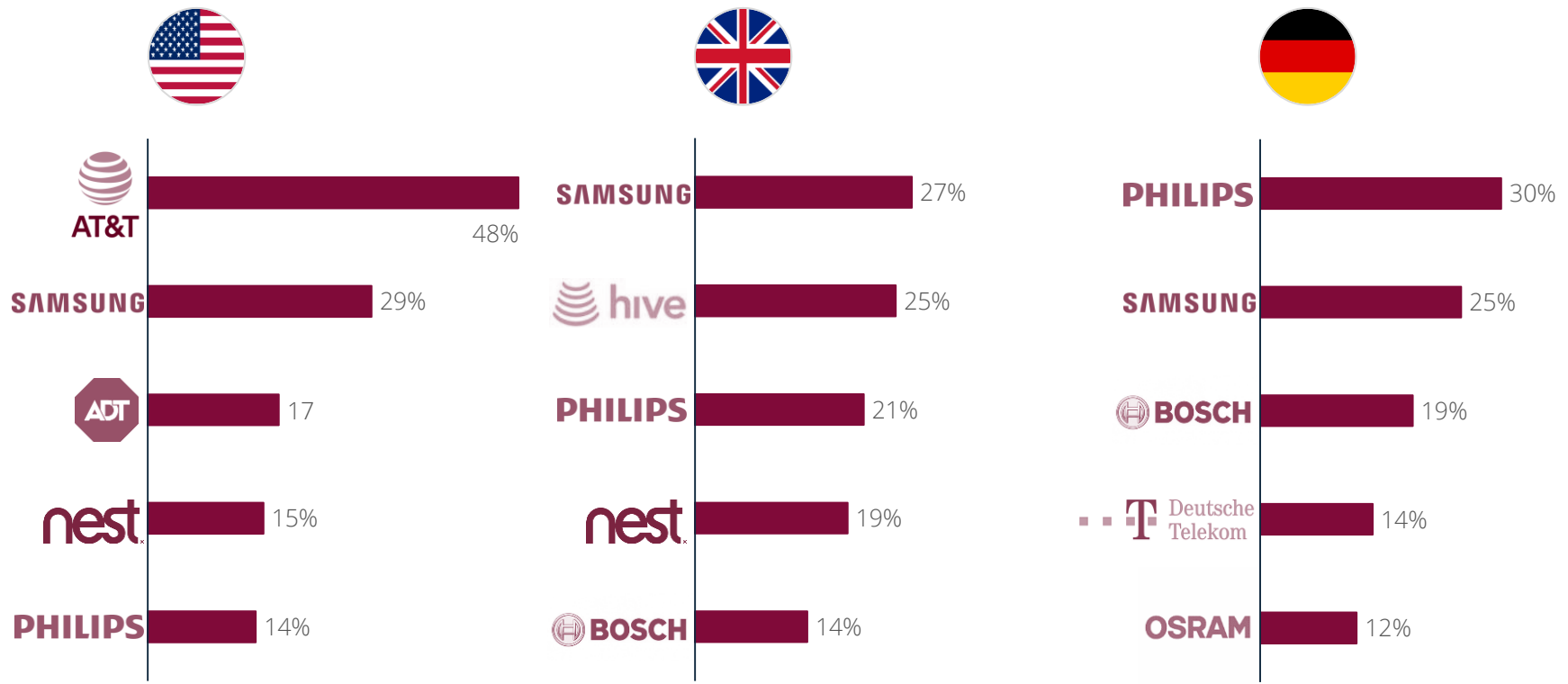
Likelihood of U.S. smart speaker households using other connected devices vs. non-smart speaker households



The top smart home product brand is AT&T in the U.S., Samsung in UK and Philips in Germany



Ownership of smart home automation devices

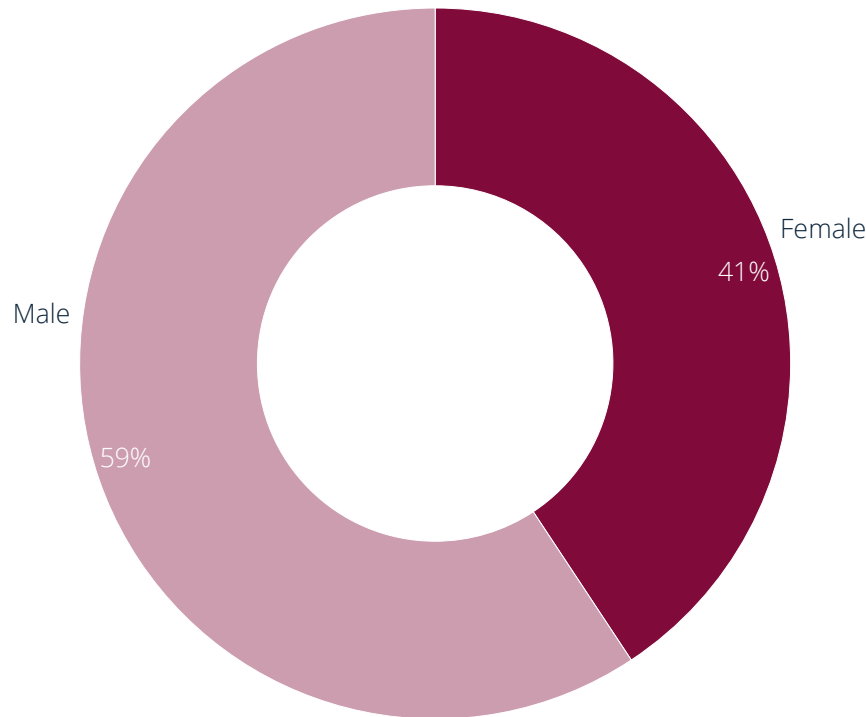


"Which of these providers do you own Smart Home devices from?" Multi Pick; U.S.: n=1,211; UK: n=355; Germany: n=270 respondents who own Smart Home devices for Comfort and lighting, building safety/security or energy management
 Source: [Statista Global Consumer Survey](#), as at February 2019

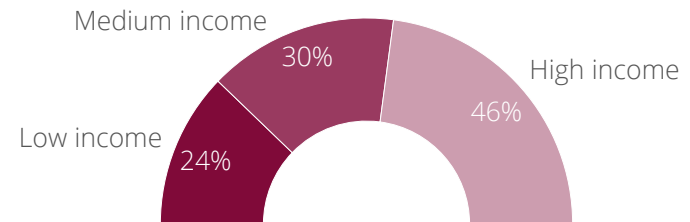
South Korean smart home device users are mostly male and between 45–54 years old



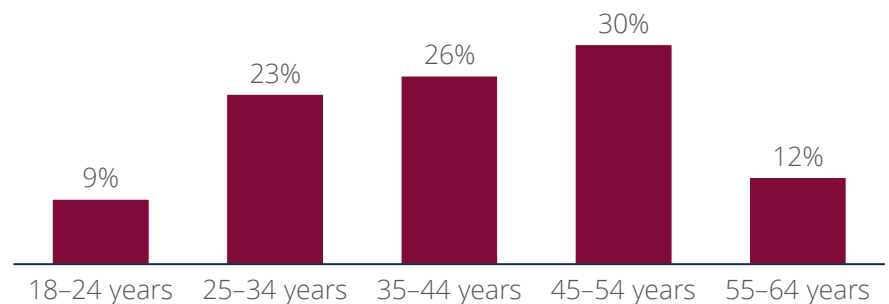
Demographics of people using smart home devices in South Korea



Income



Age



Connected Car

Connectivity is a major trend changing our everyday lives – the way we work, communicate, and spend our free time. Naturally, this trend is also dominating when it comes to mobility and, more precisely, to the automotive market. Original Equipment Manufacturers (OEMs) increasingly connect their vehicles to the internet and offer a wide range of digital services. Examples are navigation relying on real-time traffic information (RTTI), automated emergency calls, or services that let you locate and access your car remotely.

From our point of view, a car is considered connected as soon as it is equipped with hardware which enables internet connection. This creates the basis for the communication of the vehicle with other connected cars, smartphones, and the environment. The hardware ranges from simple telematics for gathering, sending, and receiving limited amounts of data to products that enable the extended use of internet connectivity and infotainment offers.

The individual services are divided into vehicle-related services such as maintenance and diagnostics as well as infotainment services such as navigation services. In 2018, more than 31 million connected cars were newly registered, which added to a total of 119 million vehicles on the roads worldwide. Together they generated an overall revenue of over US\$19 billion.

These services are meaningful for customer experience and therefore meaningful for brand value and customer bonding. However, the direct monetary benefit from these services is only one of the goals pursued by OEMs. Increasing connectivity opens up a broad set of possibilities which are likely to affect the way we drive as well as many different parts of our daily routines. Connectivity has the high potential to disrupt the traditional automotive market by enabling new business models and therefore offering chances for many other market participants.

For example, as virtual assistants like Amazon's Alexa enter the car, online shopping and the integration of the smart home create new possibilities for tech companies and eCommerce retailers alike.

Car-related data has different sources. The car itself and its sensors generate the so-called "operating data". These are distinguished from information brought into the car by drivers or passengers. Owing to the trend towards vehicle connectivity, the number of connected working parts and, consequently, the amount of data are continuously increasing.

Large-scale car data are valuable to their owners. Once privacy concerns and third-party utilization have been sorted out, OEMs' revenue sources are almost infinite. Many players are able to generate revenues from vehicle data. Insurance companies can offer customized policies, repair shops can get early information on customers requiring their services, gas stations that know a car nearby needs fuel can offer promotions, just to name a few of them. OEMs can generally make a profit from the data in two ways, either by selling data packages or by getting a share of data-driven turnover.

Another promising use for vehicle connectivity is autonomous driving, which is already being tested by various OEMs and tech companies.

Since drivers will no longer need to pay attention to traffic, the car will turn into a third space that allows for various other activities like leisure, work, or shopping.

In the future, technologically advanced cars are expected to be equipped with nearly 200 connected sensors. Combined with the inevitably growing number of connected cars on the roads, the inter-connection of components will not only take place inside cars but also between cars and their environment. This is the so-called Vehicle-to-everything communication (V2X-communication). Connected cars will share data with each other and with the traffic infrastructure. Hence, urban traffic management will be optimized, and driving a car will be much safer. Automotive connectivity is thus paving the way for the future of mobility.

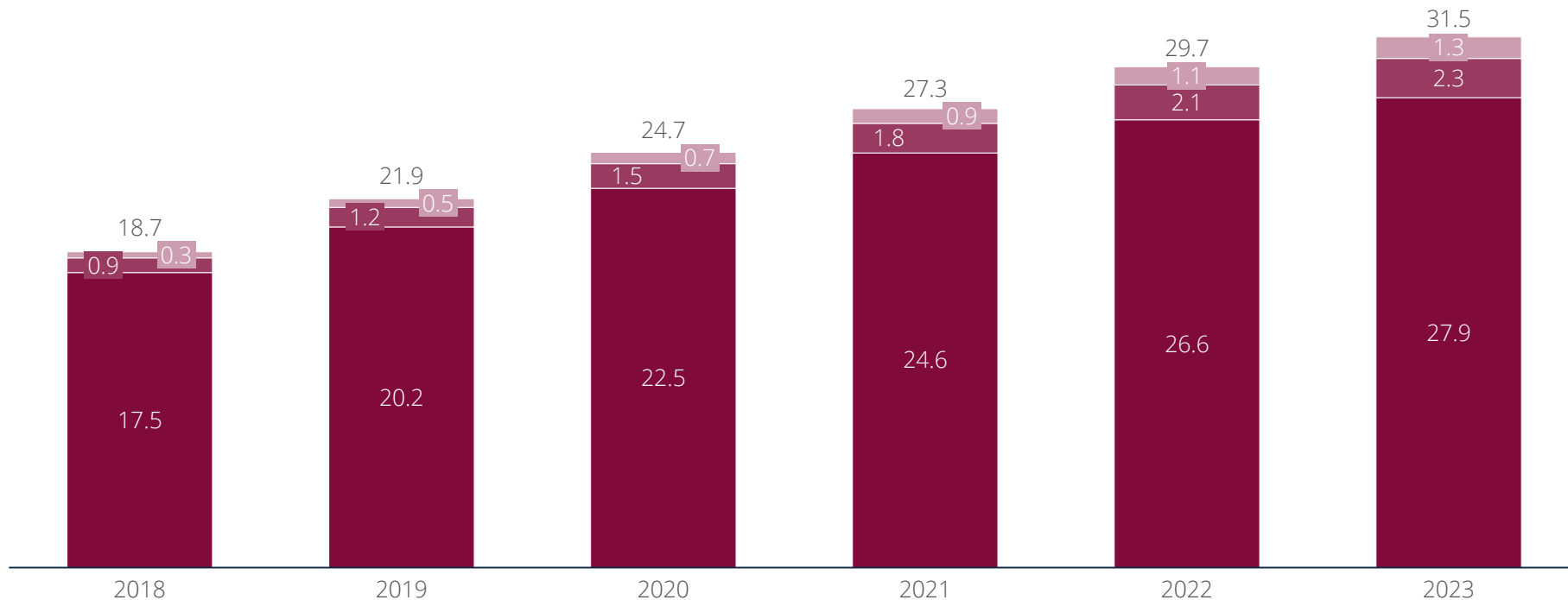
Dennis Becker

d.becker@statista.com

The global Connected Car market is expected to grow to around US\$30 bn by 2023

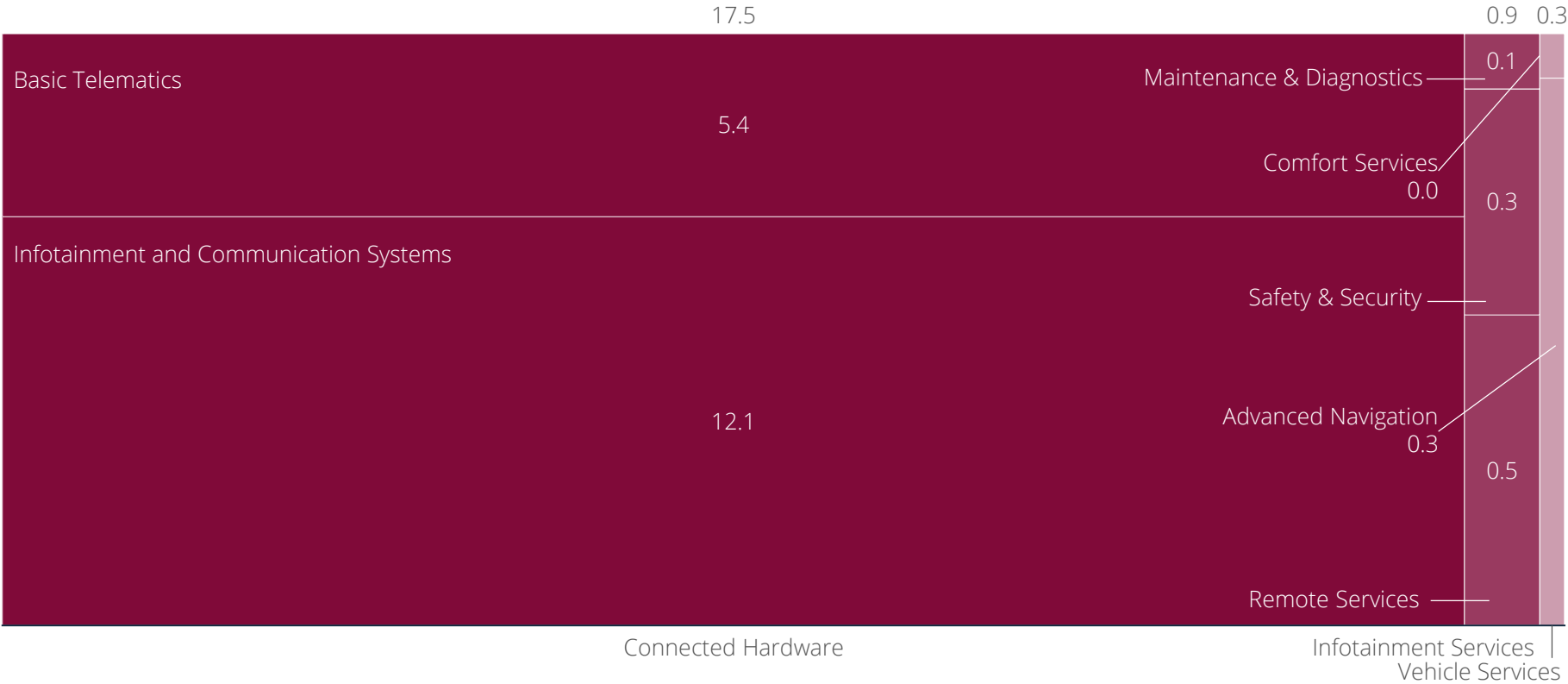
Estimated global Connected Car revenue in billion US\$

Connected Hardware Vehicle Services Infotainment Services



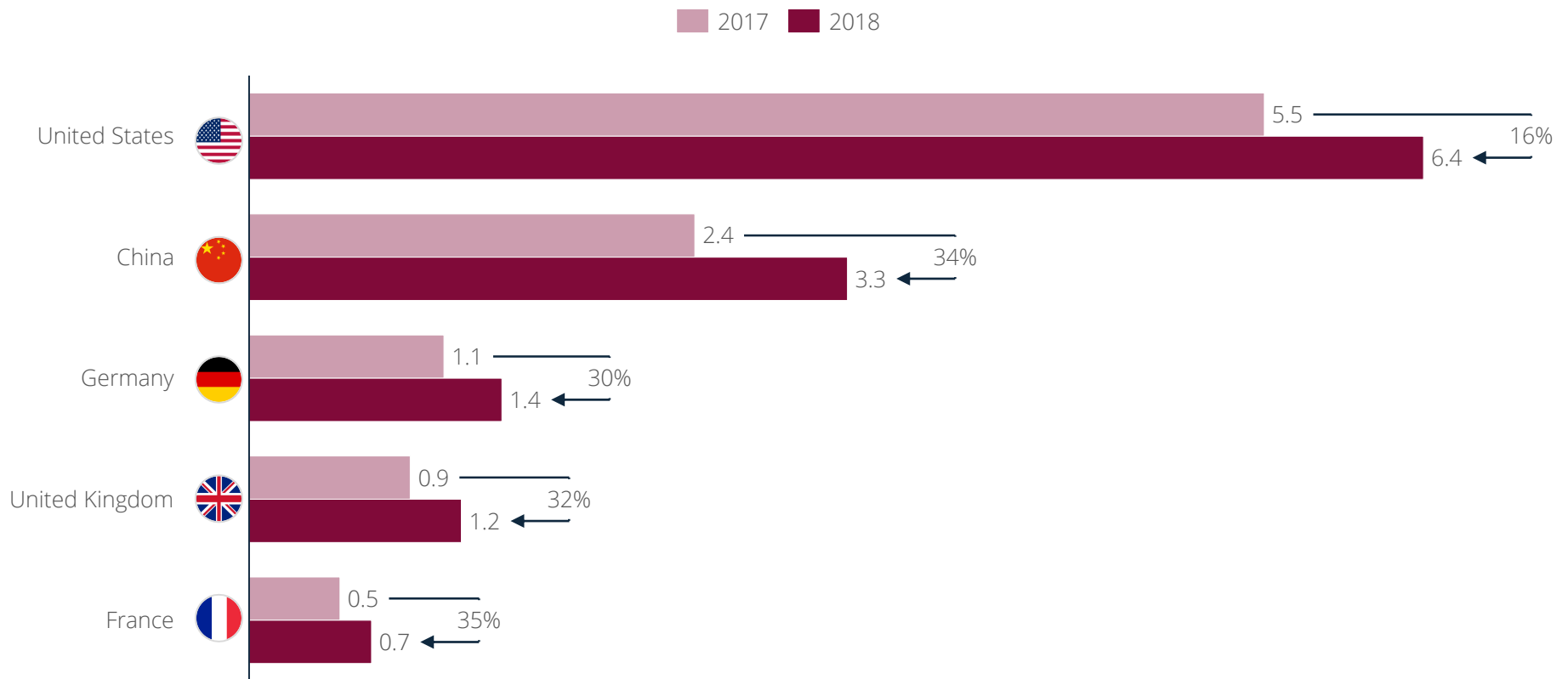
Infotainment and Communication Systems build the biggest segment in the global Connected Car market

Global Connected Car revenue in billion US\$ in 2018



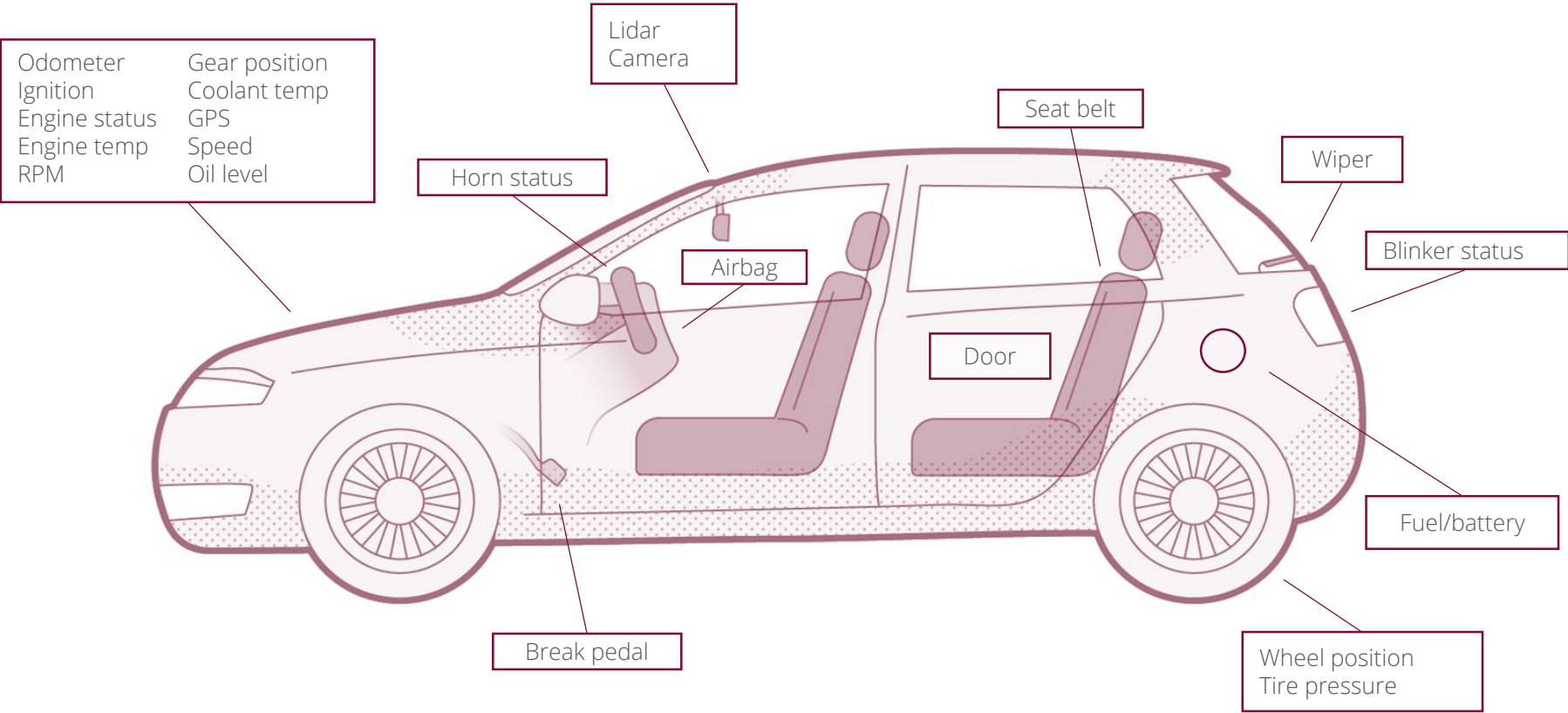
EU Countries show substantial growth due to recent legislation making eCall a mandatory feature

Top 5 Connected Car countries by market revenue in billion US\$



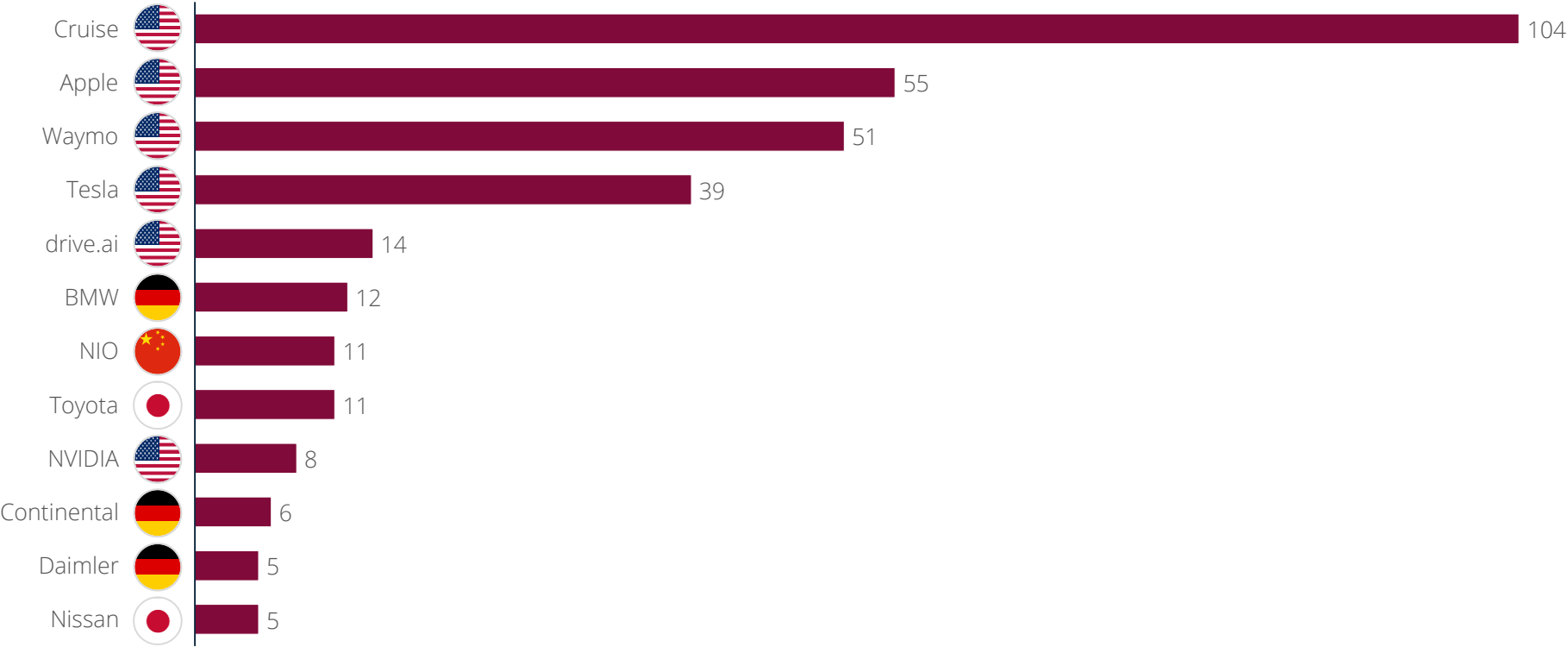
OEMs can collect vehicle-related data from various potential sources

Potential sources of vehicle-related data



GM's subsidiary Cruise has over 100 autonomous cars registered for test driving in tech hot spot, California

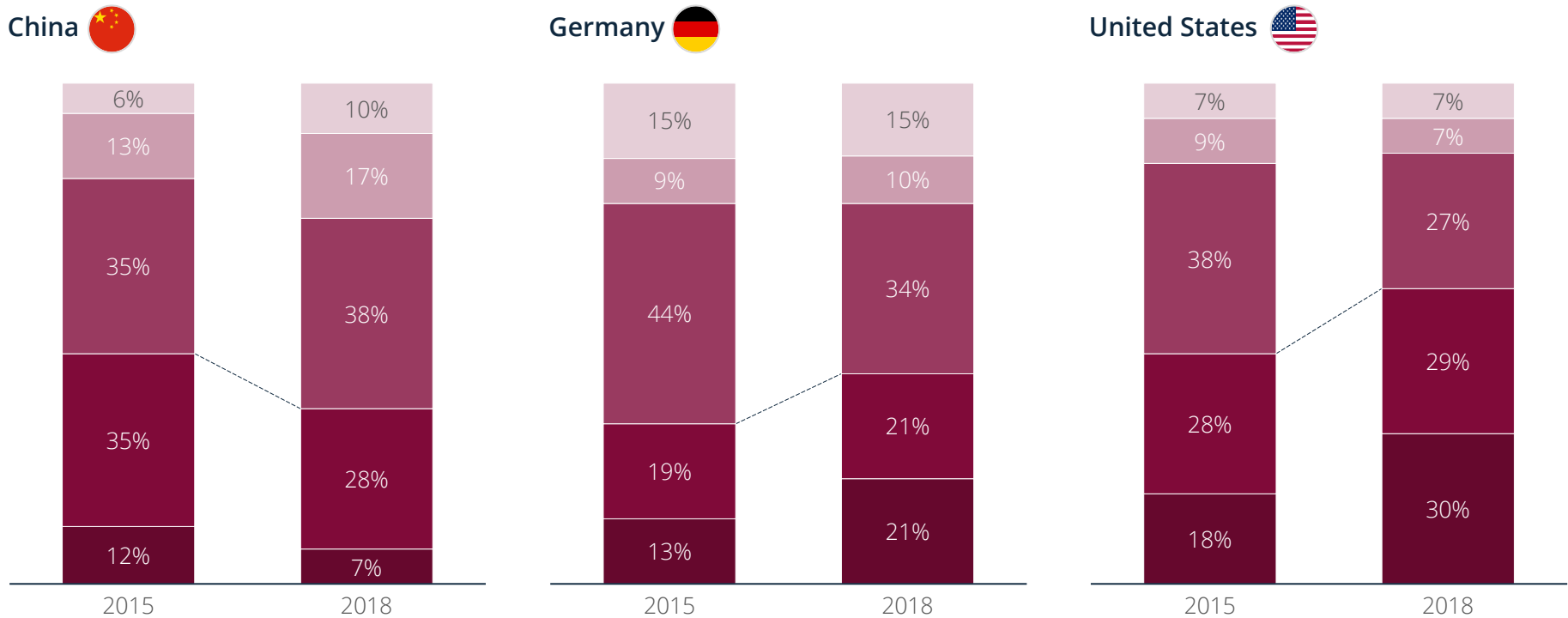
Number of autonomous vehicles registered to be tested on public roads in California in 2018



Concerns about the security of personal data have risen in Germany and the U.S., but fallen in China

Concerns about the security of personal and private data with regard to autonomous driving

It's a showstopper No issue at all

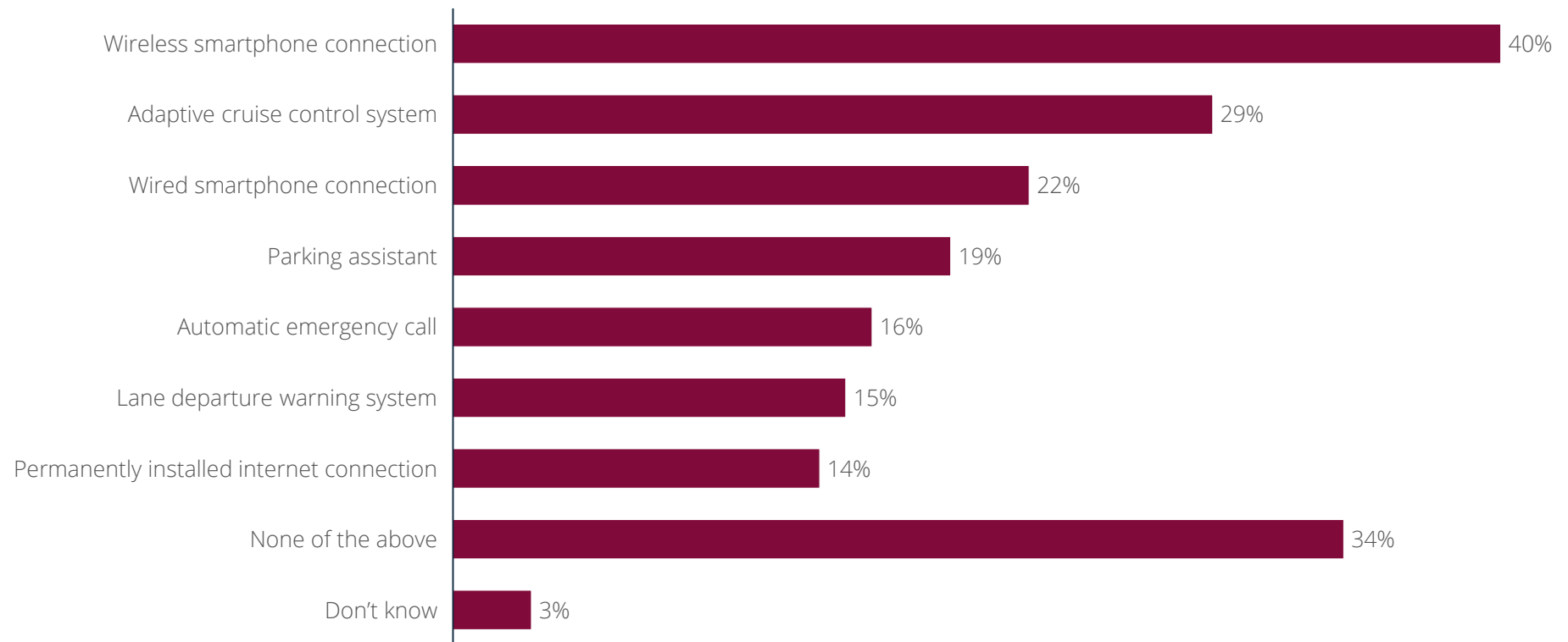


"How concerned are you about the security of your personal and private data with regard to autonomous driving?"; n= 2,960 driver's license holders
Source: adlittle.com 2018

40% of American drivers already connect their smartphone to their car



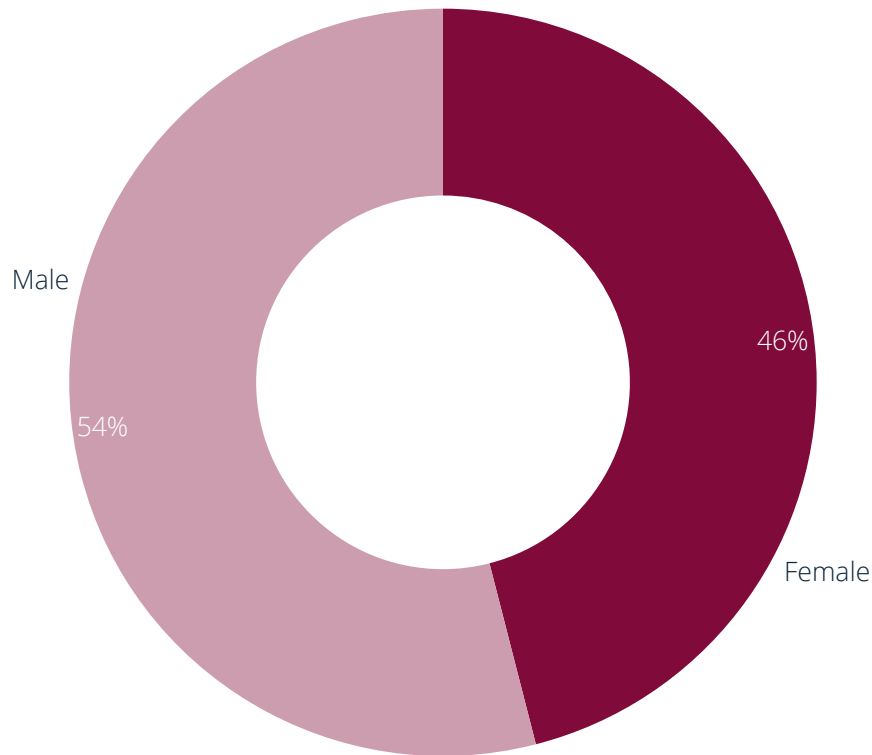
Usage of connected services by American drivers



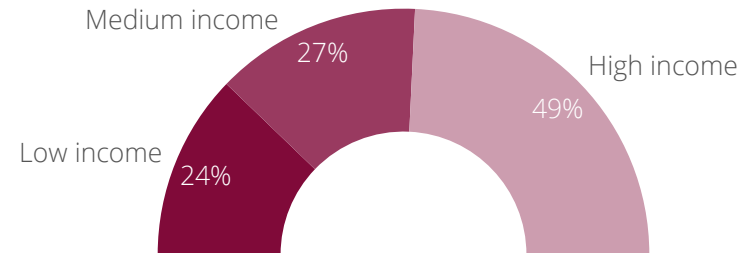
Almost 40% of Chinese connected car users are between 25 and 35 years old



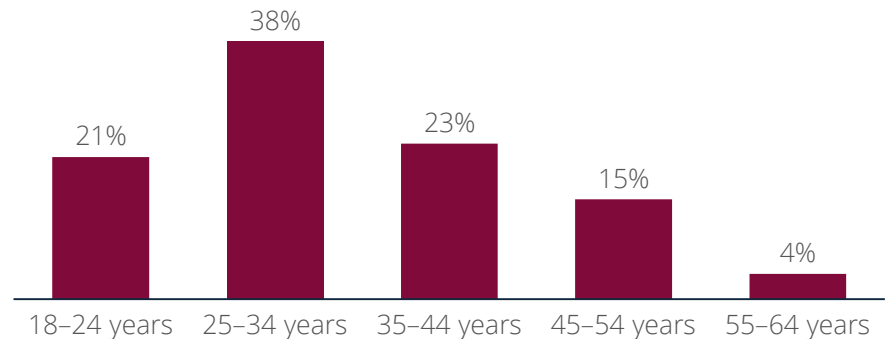
Demographics of people using connected cars in China



Income



Age



Our products



About the Statista Global Consumer Survey



50+

topics & industries

46

countries

5,000+

int. brands

400,000+

consumers

The **Statista Global Consumer Survey** offers a global perspective on consumption and media usage, covering the offline and online world of the consumer. It is designed to help marketers, planners and product managers understand consumer behavior and consumer interactions with brands.

- Cross-tabulation
- Customized target groups
- Trend and regional comparisons
- Export in Excel (CSV) or PowerPoint format

 Marketing & social media

 Finance & insurance

 eCommerce & retail

 Health

 Food & nutrition

 Housing & household equipment


 Internet & devices

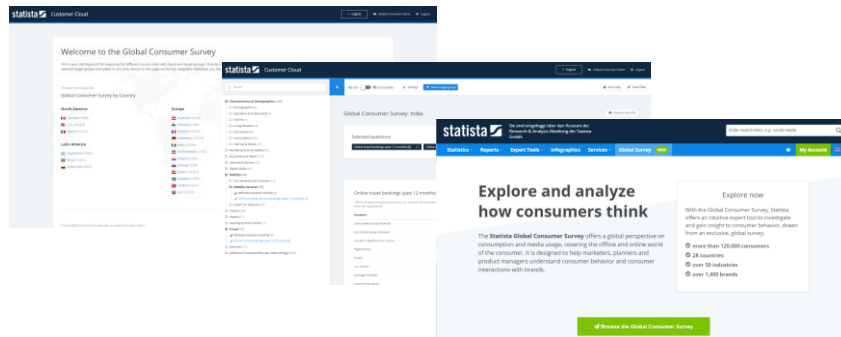
 Travel

 Media & digital media

 Services & eServices

 Mobility

 Characteristics & demographics



Find out more on www.statista.com/customercloud/global-consumer-survey

About the Statista Digital Market Outlook

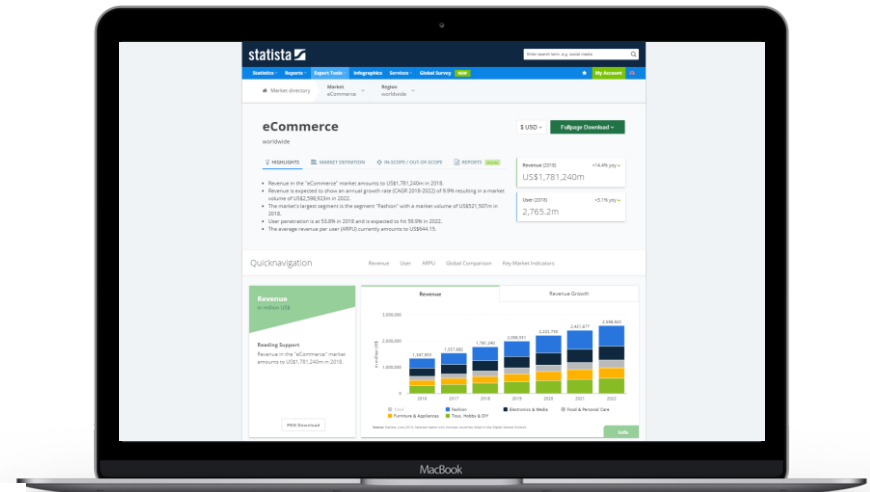


90+ markets
150+ countries
7 years (2017-2023)
30,000+ interactive statistics

The **Digital Market Outlook** presents up-to-date figures on markets of the digital economy. The comparable key figures are based on extensive analyses of relevant indicators from the areas of society, economy, and technology.

What is the size of the eCommerce fashion market in Spain?
How many connected cars are already on the road in China?

The answers to these and many more questions can be found in Statista's Digital Market Outlook. It provides forecasts, detailed market insights, and key indicators for the digital economy.



Nine digital verticals: eCommerce, Smart Home, eTravel, Digital Media, eServices, FinTech, Digital Advertising, Connected Car, eHealth



Direct access & downloads, fully integrated into the Statista database



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Outlook **reports** with **segment-specific topics** (top companies, trends, deep dives)



Find out more on www.statista.com/outlook/digital-markets

About the ecommerceDB.com

The toolbox for all eCommerce relevant questions

ecommerceDB.com offers direct access to URL related revenue information together with forecasts, customizable top, country and category rankings, KPI analysis and extensive eCommerce relevant contact information to over 10,000 online stores.



In depth analysis for over 10,000 online store URLs



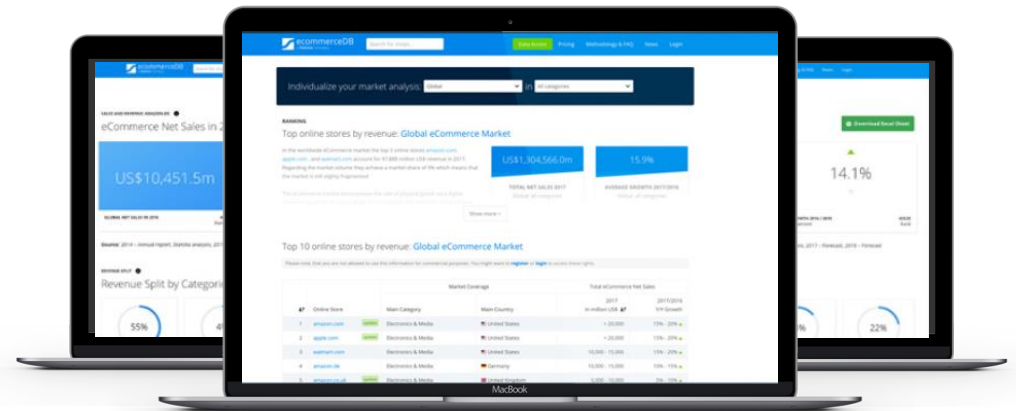
Adjustable top, category & country rankings



Download shop profiles for seamless processing



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