Internet Trends 2018

Mary Meeker

May 30 @ Code 2018

INTERNET TRENDS 2018

Mary Meeker

May 30 @ Code 2018

KLEINER PERKINS

Thanks

Kleiner Perkins Partners

Ansel Parikh & Michael Brogan helped steer ideas and did a lot of heavy lifting. Other contributors include: Daegwon Chae, Mood Rowghani, Eric Feng (E-Commerce) & Noah Knauf (Healthcare). In addition, Bing Gordon, Ted Schlein, Ilya Fushman, Mamoon Hamid, Juliet deBaubigny, John Doerr, Bucky Moore, Josh Coyne, Lucas Swisher, Everett Randle & Amanda Duckworth were more than on call with help.

Hillhouse Capital

Liang Wu & colleagues' contribution of the China section provides an overview of the world's largest market of Internet users.

Participants in Evolution of Internet Connectivity

From creators to consumers who keep us on our toes 24x7 + the people who directly help us prepare the report. And, Kara & team, thanks for continuing to do what you do so well.

Context

We use data to tell stories of business-related trends we focus on. We hope others take the ideas, build on them & make them better.

At 3.6B, the number of Internet users has surpassed half the world's population. When markets reach mainstream, new growth gets harder to find - evinced by 0% new smartphone unit shipment growth in 2017.

Internet usage growth is solid while many believe it's higher than it should be. Reality is the dynamics of global innovation & competition are driving product improvements, which, in turn, are driving usage & monetization. Many usability improvements are based on data - collected during the taps / clicks / movements of mobile device users. This creates a privacy paradox...

Internet Companies continue to make low-priced services better, in part, from user data. Internet Users continue to increase time spent on Internet services based on perceived value. Regulators want to ensure user data is not used 'improperly.'

Scrutiny is rising on all sides - users / businesses / regulators. Technology-driven trends are changing so rapidly that it's rare when one side fully understands the other...setting the stage for reactions that can have unintended consequences. And, not all countries & actors look at the issues through the same lens.

We focus on trends around data + personalization; high relative levels of tech company R&D + Capex Spending; E-Commerce innovation + revenue acceleration; ways in which the Internet is helping consumers contain expenses + drive income (via on-demand work) + find learning opportunities. We review the consumerization of enterprise software and, lastly, we focus on China's rising intensity & leadership in Internet-related markets.

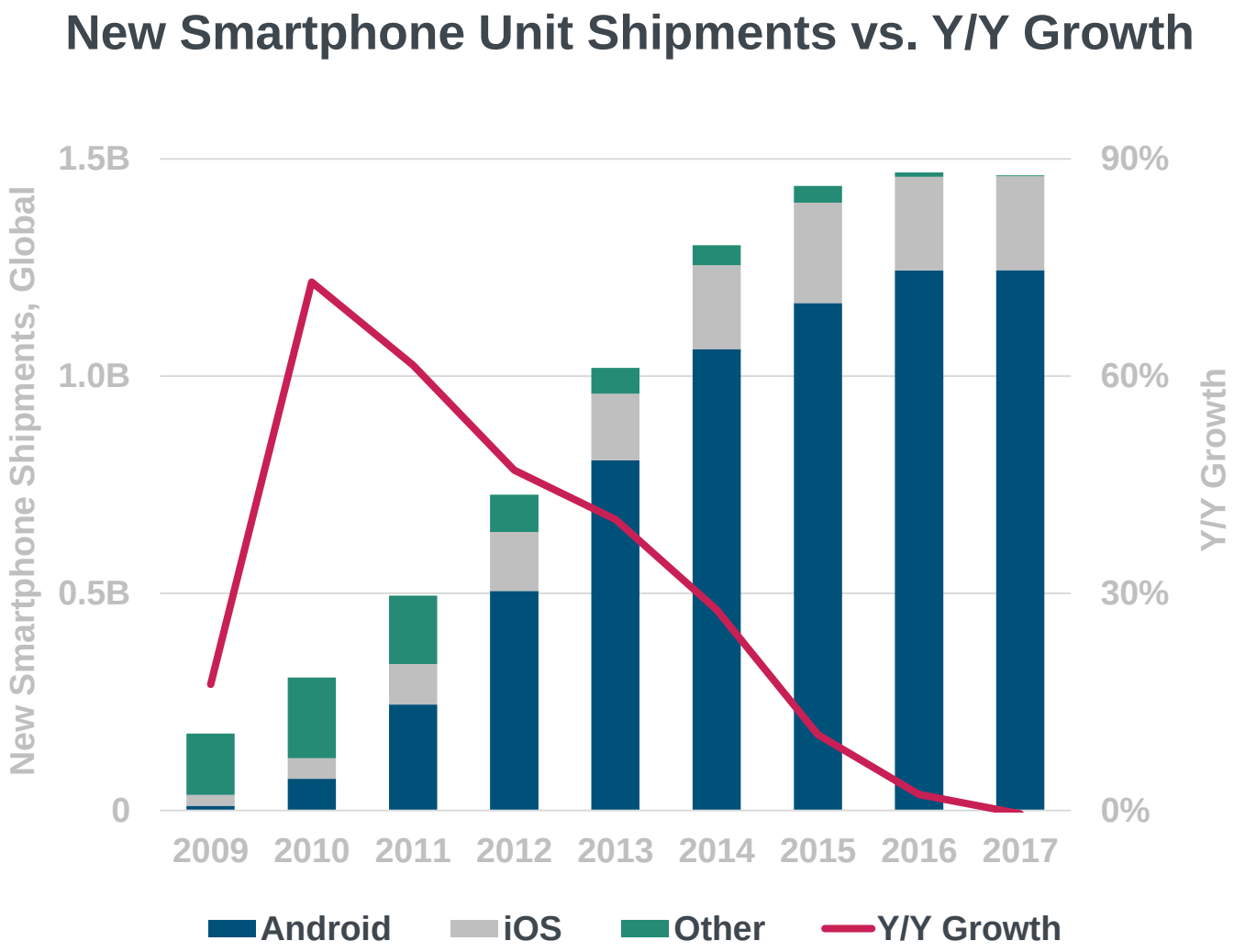
Internet Trends 2018

1) **Users** 5-9
2) **Usage** 10-12
3) **Innovation + Competition + Scrutiny** 13-43
4) **E-Commerce** 44-94
5) **Advertising** 95-99
6) **Consumer Spending** 100-140
7) **Work** 141-175
8) **Data Gathering + Optimization** 176-229
9) **Economic Growth Drivers** 230-237
10) **China** (Provided by Hillhouse Capital) 237-261
11) **Enterprise Software** 262-277
12) **USA Inc. + Immigration** 278-291

INTERNET DEVICES + USERS =

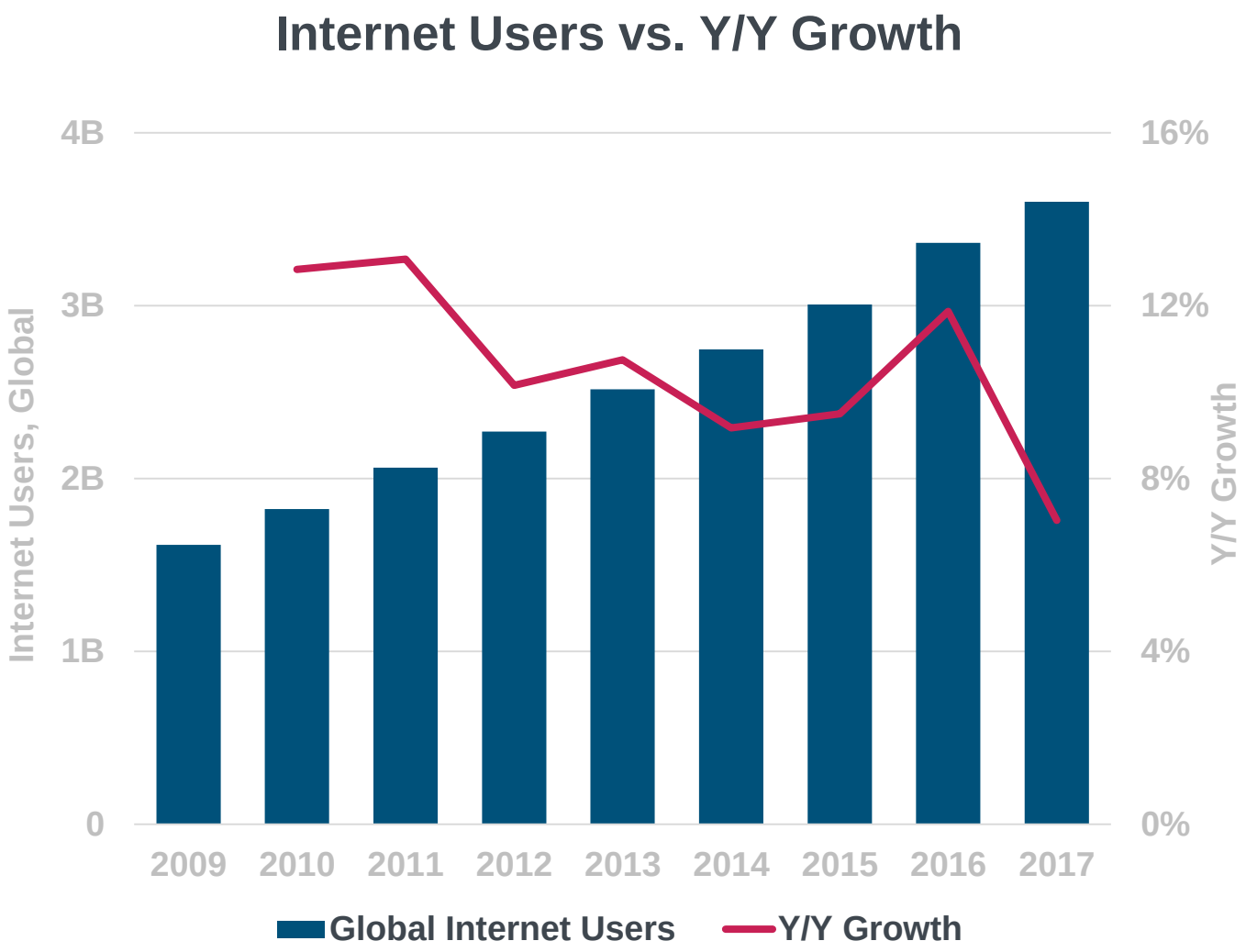
GROWTH CONTINUES TO SLOW

Global New Smartphone Unit Shipments = No Growth @ 0% vs. +2% Y/Y



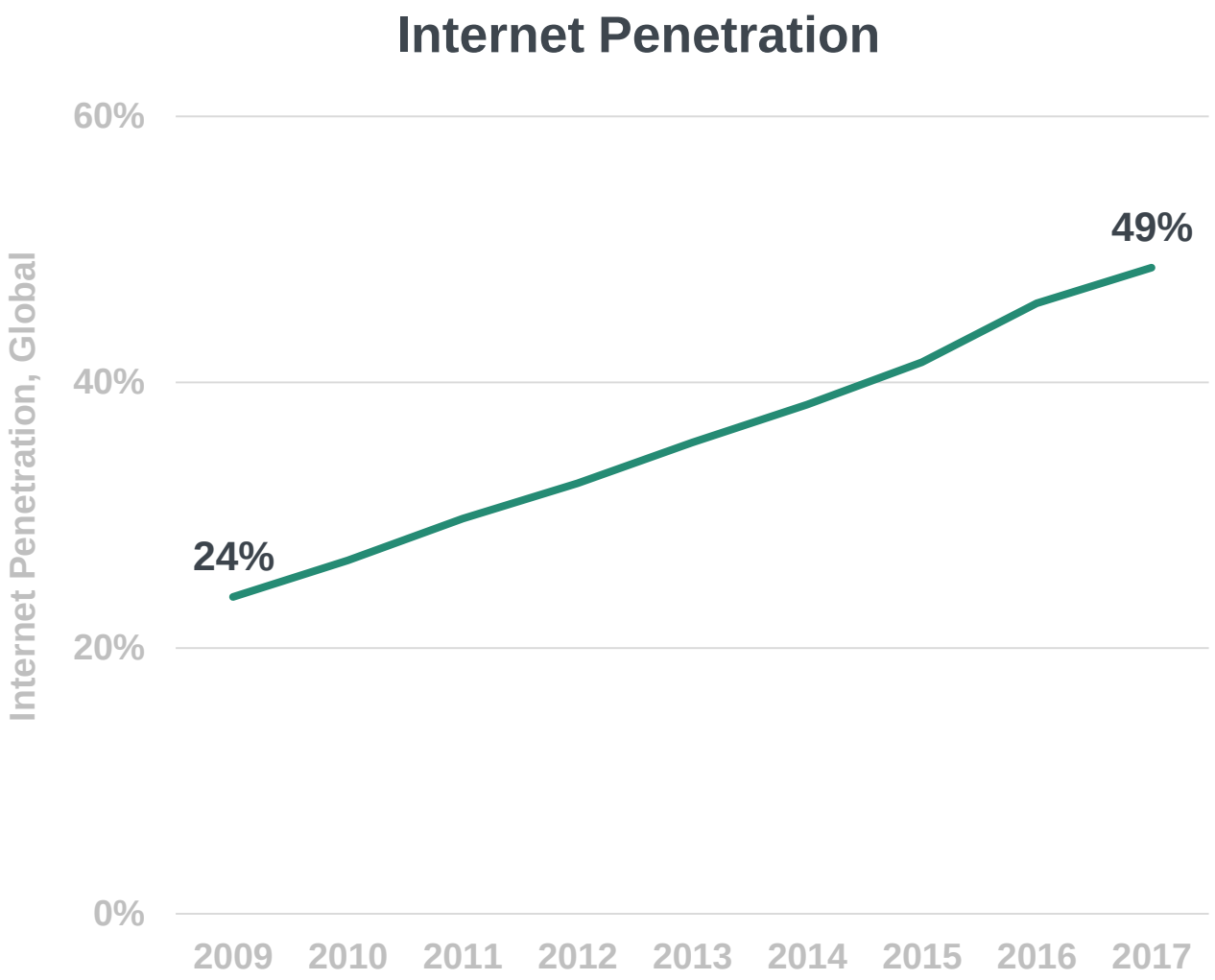
Source: Katy Huberty @ Morgan Stanley (3/18), IDC.

Global Internet Users = Slowing Growth @ +7% vs. +12% Y/Y



Source: United Nations / International Telecommunications Union, USA Census Bureau. Internet user data is as of mid-year. Internet user data: Pew Research (USA), China Internet Network Information Center (China), Islamic Republic News Agency / InternetWorldStats / KP estimates (Iran), KP estimates based on IAMAI data (India), & APJII (Indonesia). Note: Historical data (particularly in Sub-Saharan Africa) revised by ITU in 2017 to better account for dual-SIM subscriptions (i.e. two Internet subscriptions per single smartphone user).

Global Internet Users =
3.6B @ >50% of Population (2018)



Source: CIA World Factbook, United Nations / International Telecommunications Union, USA Census Bureau. Internet user data is as of mid-year. Internet user data: Pew Research (USA), China Internet Network Information Center (China), Islamic Republic News Agency / InternetWorldStats / KP estimates (Iran), KP estimates based on IAMAI data (India), & APJII (Indonesia). Note: Historical data (particularly in Sub-Saharan Africa) revised by ITU in 2017 to better account for dual-SIM subscriptions (i.e. two Internet subscriptions per single smartphone user).

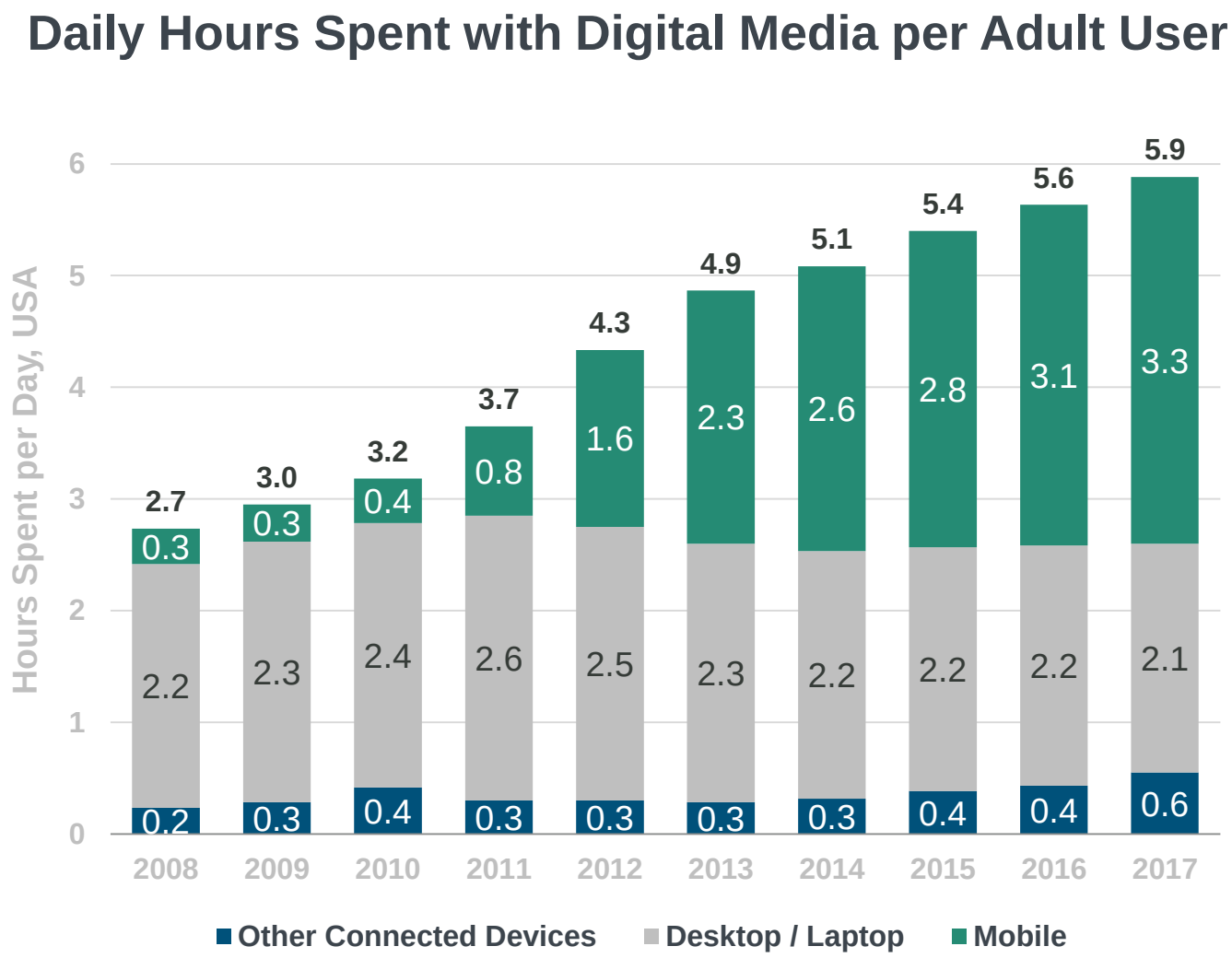
Internet Users…

Growth Harder to Find After Hitting 50% Market Penetration

INTERNET USAGE =

GROWTH REMAINS SOLID

Digital Media Usage @ +4% Growth...
5.9 Hours per Day (Not Deduped)



Source: eMarketer 9/14 (2008-2010), eMarketer 4/15 (2011-2013), eMarketer 4/17 (2014-2016), eMarketer 10/17 (2017). Note: Other connected devices include OTT and game consoles. Mobile includes smartphone and tablet. Usage includes both home and work for consumers 18+. Non deduped defined as time spent with each medium individually, regardless of multitasking.

Internet Usage…

How Much = Too Much?
Depends How Time is Spent

INNOVATION + COMPETITION =

DRIVING PRODUCT IMPROVEMENTS / USEFULNESS / USAGE +

SCRUTINY

Innovation + Competition =
Driving Product Improvements / Usefulness / Usage

Devices

Access

Simplicity

Payments

Local

Messaging

Video

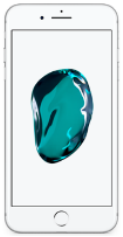
Voice

Personalization

Devices =
Better / Faster / Cheaper

Apple iPhone

2016



‘Portrait’ Photos
Water Resistant

2017

Face Tracking
Full Device Display
Wireless Charging

Google Android

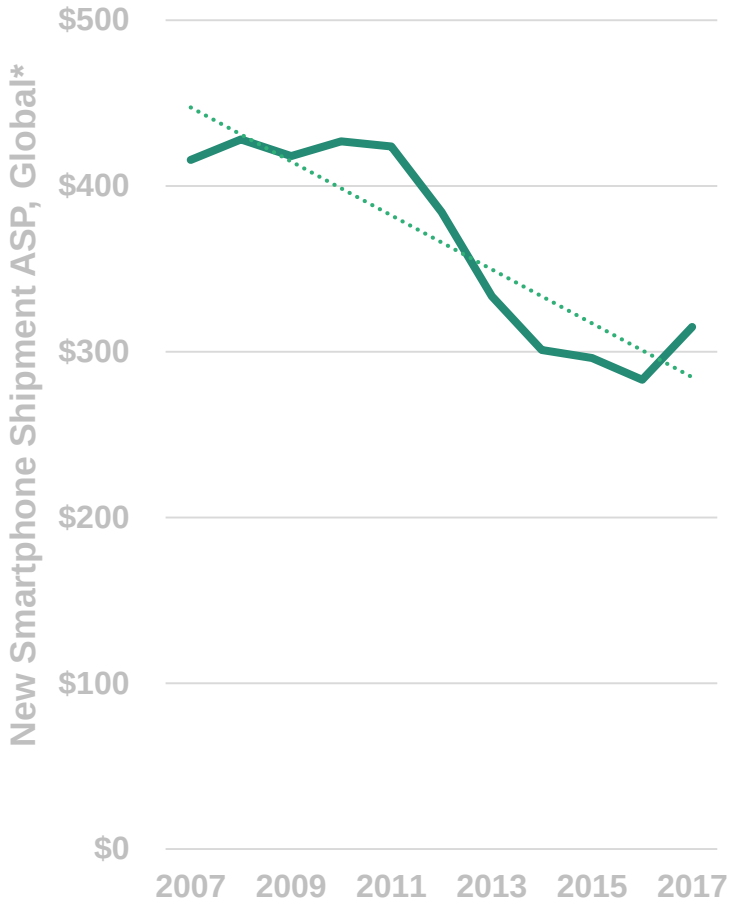
2016

Google Assistant
‘AI-Assisted’
Photo Editing

2017

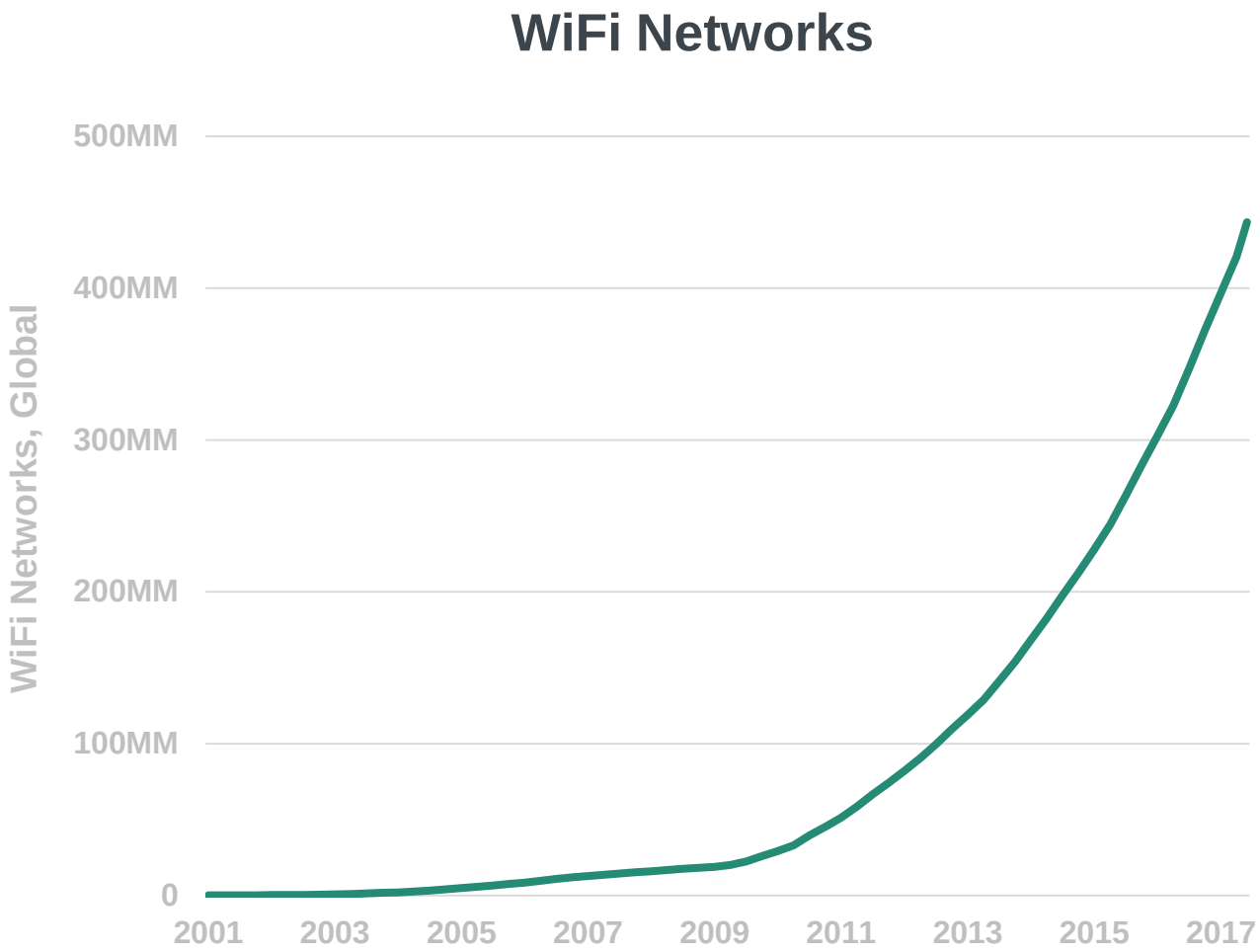
‘Lens’ Smart
Image Recognition
Always-On Display

New Smartphone Shipments – ASP



Source: Apple, Google, Katy Huberty @ Morgan Stanley, IDC. *ASP Based on Morgan Stanley’s new smartphone shipment breakdown by taking the midpoint of each $50 price band & assuming a $1,250 ASP for smartphones over $1,000. Note: Deloitte estimates that 120MM used smartphones were traded in 2016 and 80MM in 2015 which may further reduce smartphone costs to consumers as the ratio of used to new devices rises. Apple 2016 = iPhone 7 Plus, 2017 = iPhone X. Google 2016 = Pixel, 2017 = Pixel 2.

Access =
WiFi Adoption Rising

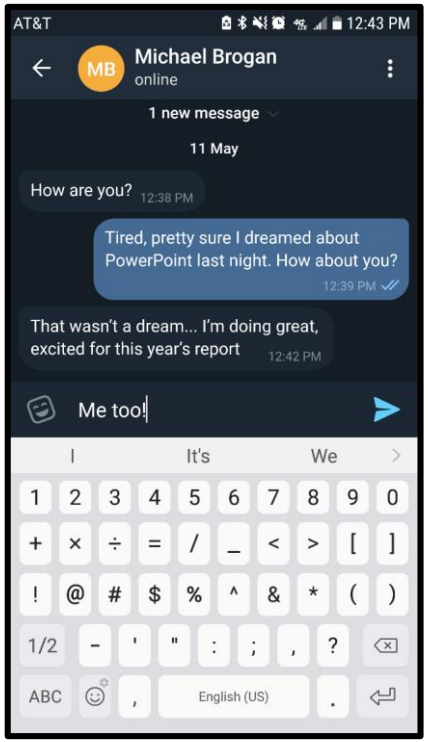


Source: WiGLE.net as of 5/29/18. Note: WiGLE.net is a submission-based catalog of wireless networks that has collected >6B data points since launch in 2001. Submissions are not paired with actual people, rather name / password identities which people use to associate their data.

Simplicity =
Easy-to-Use Products Becoming Pervasive

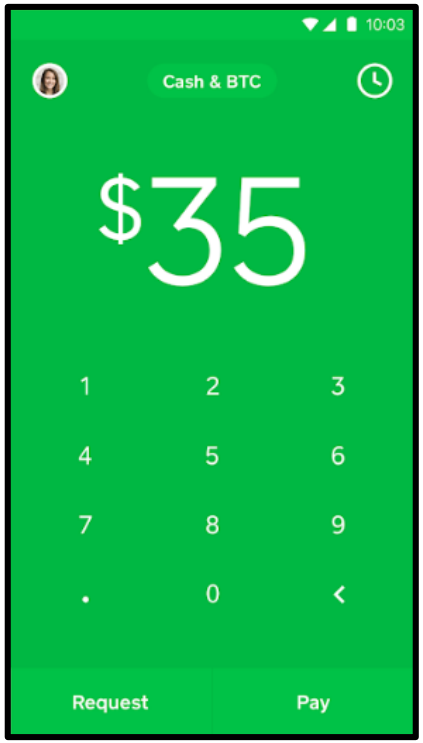
Messaging

Telegram



Commerce

Square Cash



Media

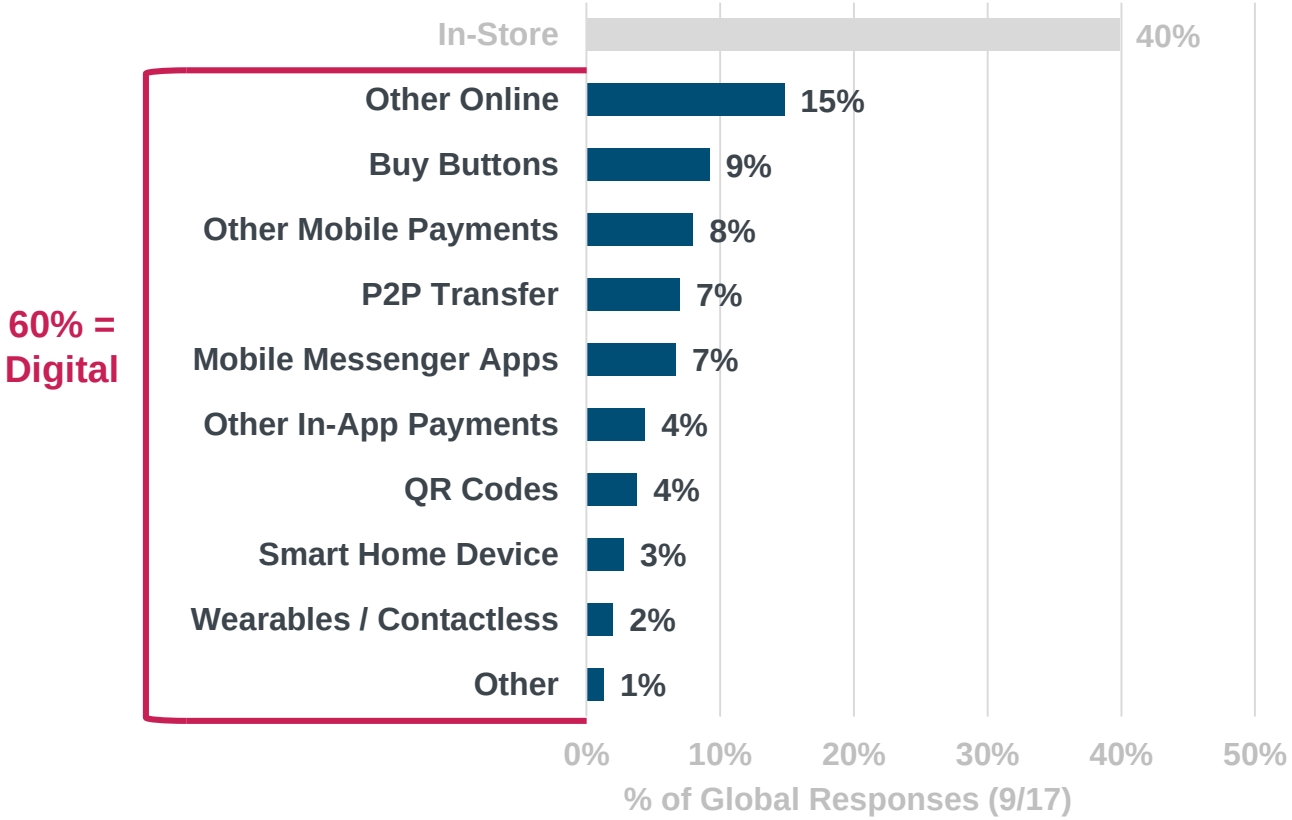
Spotify

Source: Telegram (5/18), Square (5/18), Spotify (5/18).

Payments =
Digital Reach Expanding…

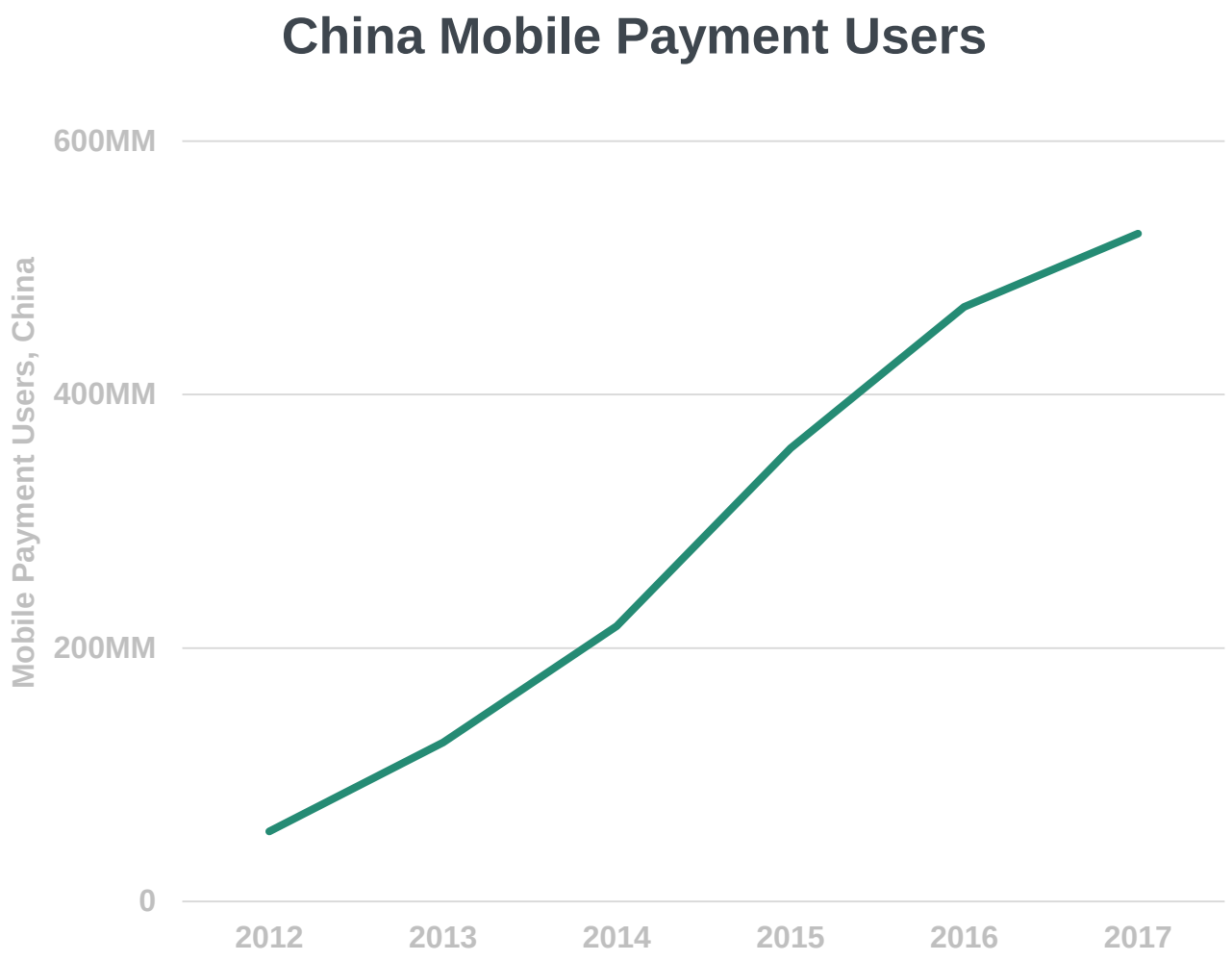
Transactions by Payment Channel

Thinking of your past 10 everyday transactions, how many were made in each of the following ways?



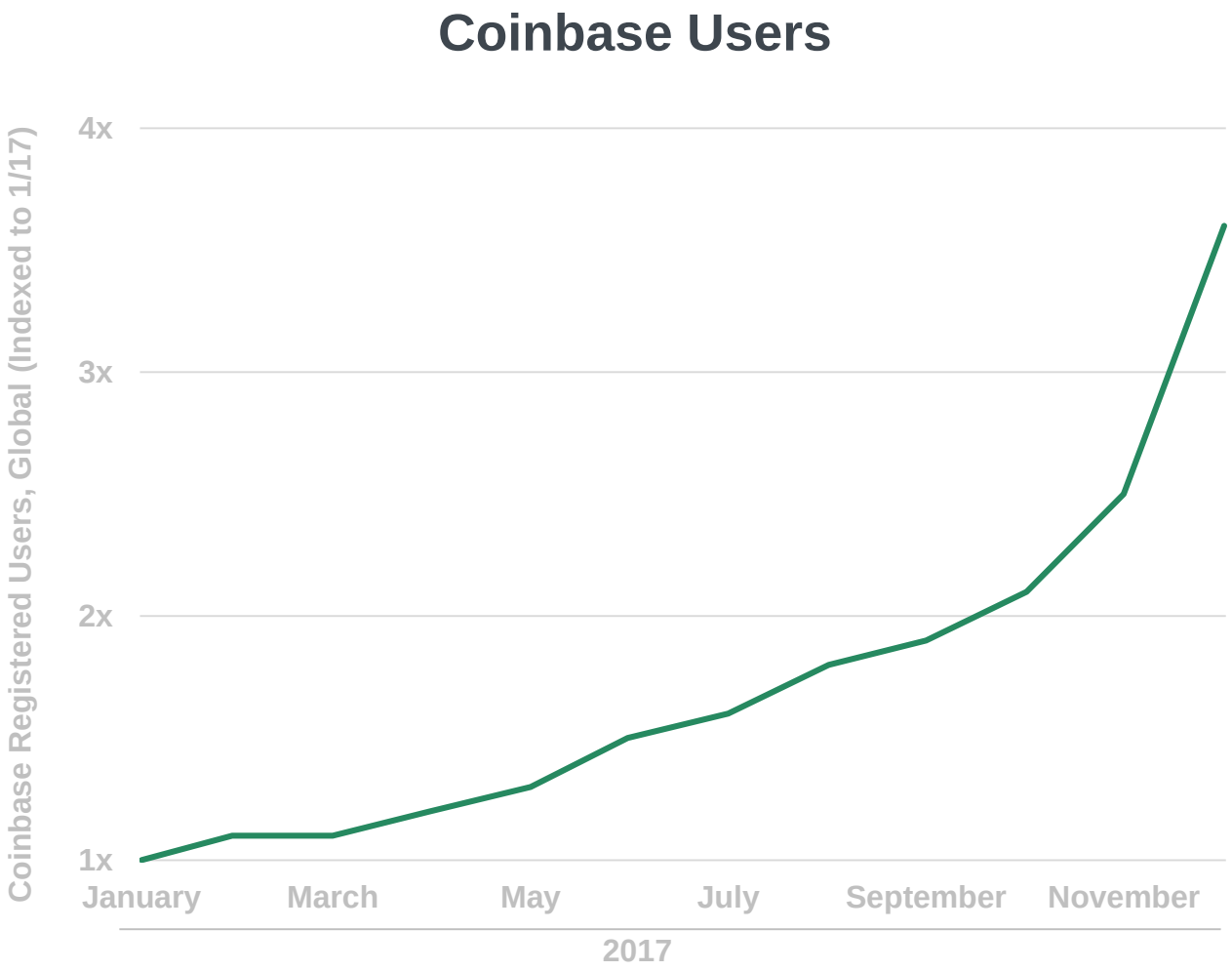
Source: Visa *Innovations in a Cashless World 2017.* Note: Full question was 'Please think about the payments you make for everyday transactions (excluding rent, mortgage, or other larger, infrequent payments). Thinking of your past 10 everyday transactions, how many were made in each of the following ways?', GfK Research conducted the survey with n = 9,200 across 16 countries (USA, Canada, UK, France, Poland, Germany, Mexico, Brazil, Argentina, Australia, China, India, Japan, South Korea, Russia, UAE), between 7/27/17 – 9/5/17. All respondents do not work in Financial Services, Marketing, Marketing Research, Advertising, or Public Relations, own and currently use a smartphone, have a savings or checking account; own/use a computer or tablet, and own a credit or debit card.

…Payments = Friction Declining...



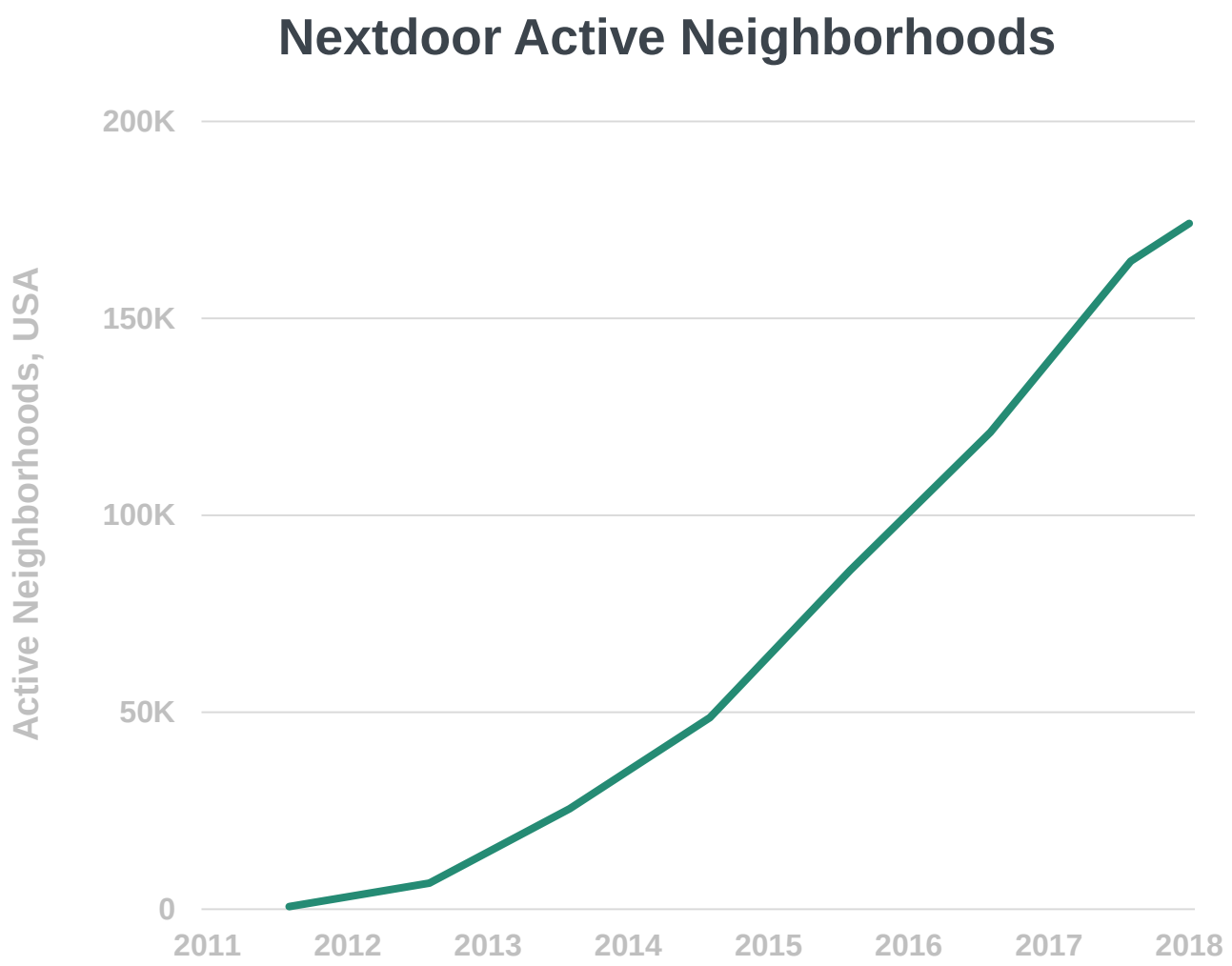
Source: China Internet Network Information Center (CNNIC). Note: User defined as active user of mobile-passed payment technology for everyday transactions, as well as more complex transactions, such as bill paying in the relevant period. Includes all forms of transactions on mobile (e.g., QR codes, P2P, etc.)

…Payments =
Digital Currencies Emerging



Source: Coinbase. Note: Registered users defined as users that have an account on Coinbase.

Local =
Offline Connections Driven by Online Network Effects



Source: Nextdoor (5/18). Note: There are ~130MM households in USA. Nextdoor estimates that there are ~650 households per average neighborhood (~200K USA neighborhoods).

Messaging = Extensibility Expanding

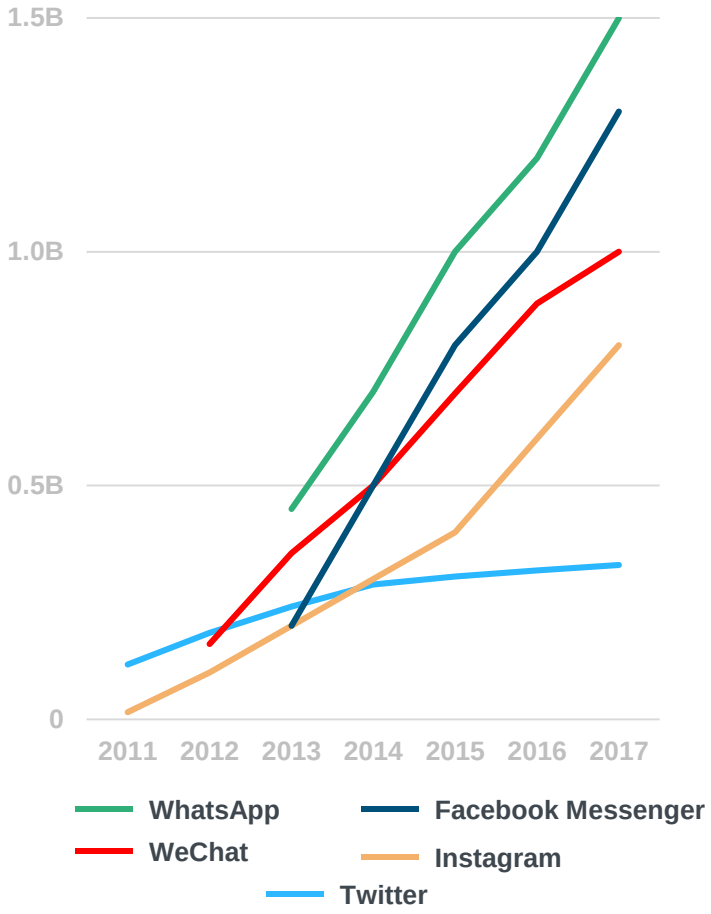
Messaging

Tencent (2000 → 2018)

QQ

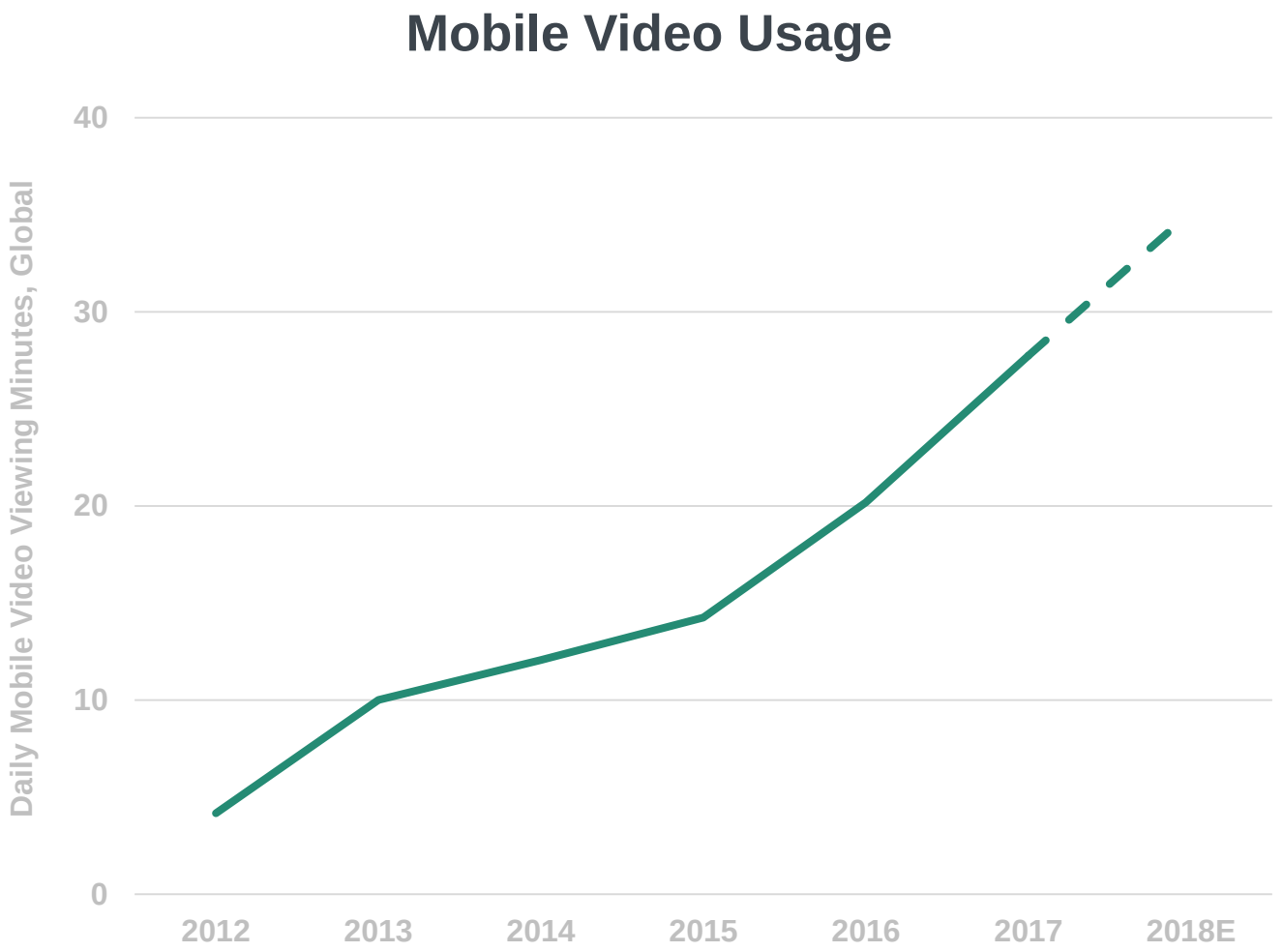
WeChat

Messenger MAUs



Source: Facebook, WhatsApp, Tencent, Instagram, Twitter, Morgan Stanley Research. Note: 2013 data for Instagram & Facebook Messenger are approximated from statements made in early 2014. Twitter users excludes SMS fast followers. MAUs (Monthly Active Users) are defined as users who log into a messenger on the web or through an application.

Video =
Mobile Adoption Climbing...

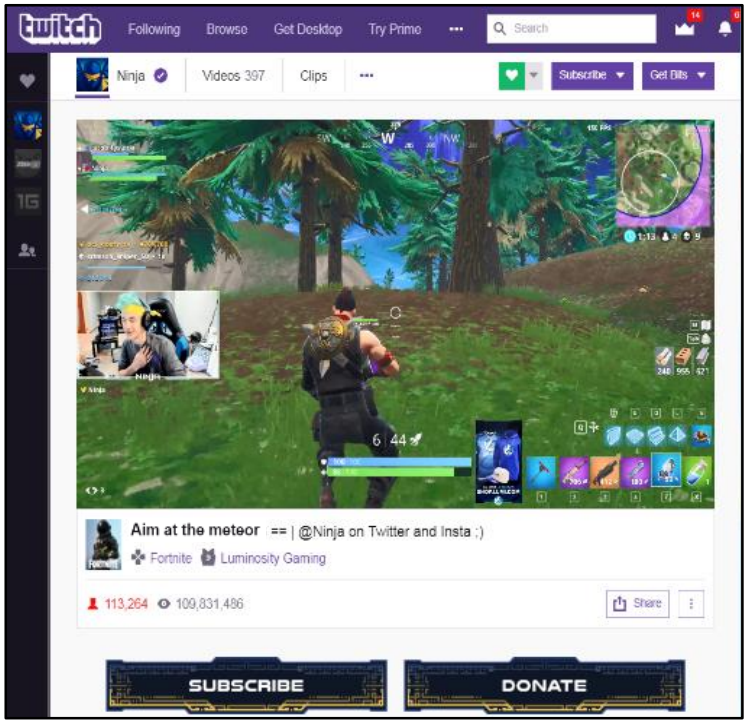


Source: Zenith Online Video Forecasts 2017 (7/17). Note: Based on a study across 63 countries. The historical figures are taken from the most reliable third-party sources in each market including Nielsen and comScore. The forecasts are provided by local experts, based on the historical trends, comparisons with the adoption of previous technologies, and their judgement.

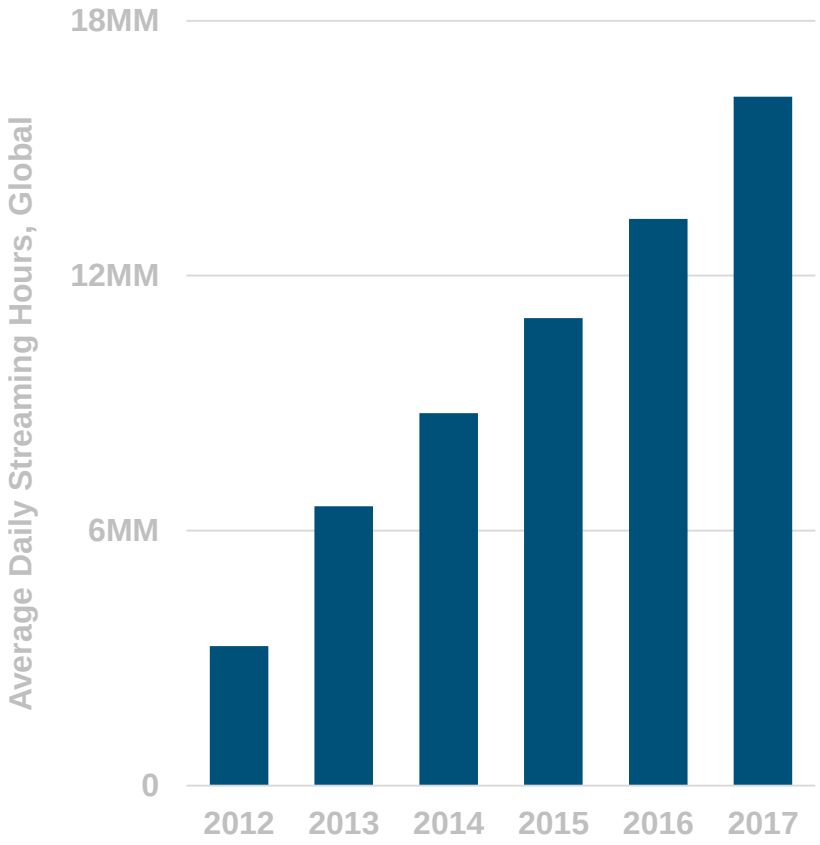
…Video =
New Content Types Emerging

Fortnite Battle Royale

Most Watched Game on Twitch

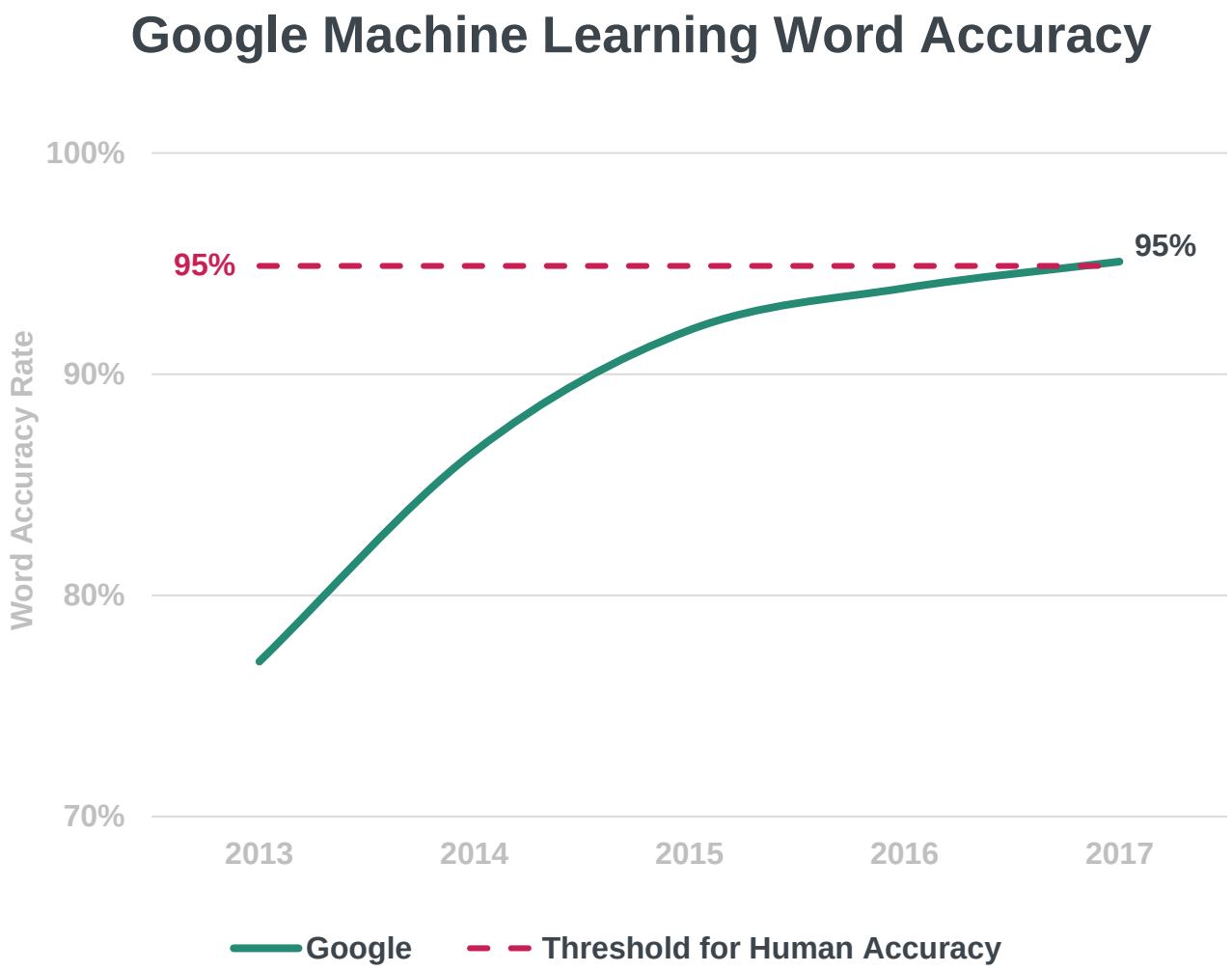


Twitch Streaming Hours



Source: Twitch (3/18). Note: Tyler "Ninja" Blevins Twitch stream has 7MM+ followers (#1 ranked) as of 5/29/18 based on Social Blade data.

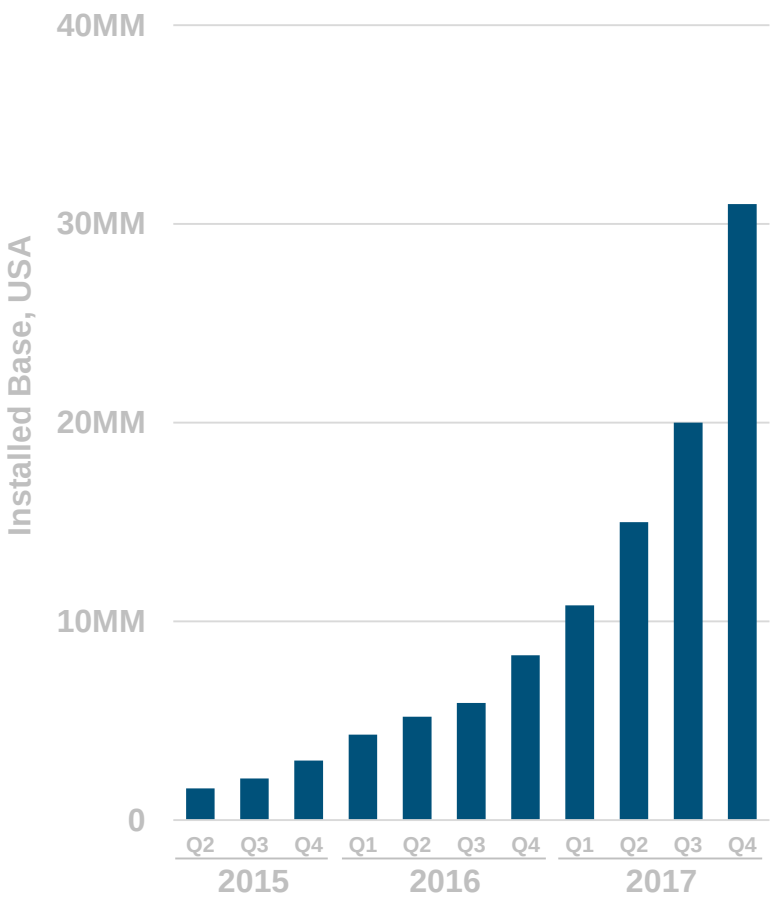
Voice =
Technology Lift Off…



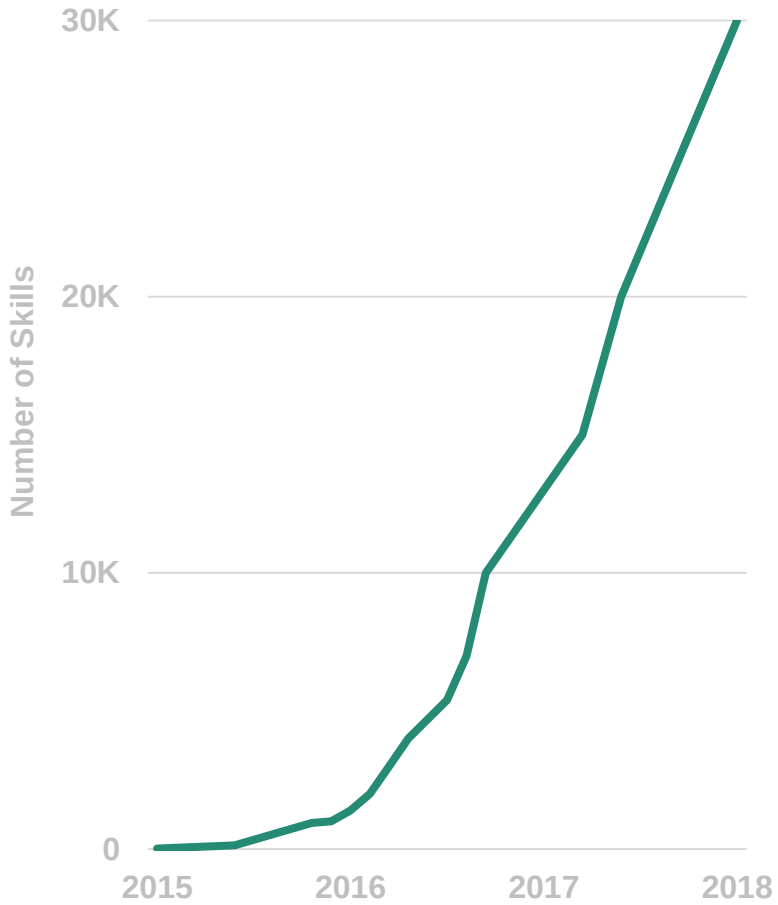
Source: Google (5/17). Note: Data as of 5/17/17 & refers to recognition accuracy for English language. Word error rate is evaluated using real world search data which is extremely diverse & more error prone than typical human dialogue.

…Voice = Product Lift Off

Amazon Echo Installed Base



Amazon Echo Skills



Source: Consumer Intelligence Research Partners LLC (Echo install base, 2/18), Various media outlets including Geekwire, TechCrunch, and Wired (Echo skills, 3/18)

Innovation + Competition =
Driving Product Improvements / Usefulness / Usage

Devices

Access

Simplicity

Payments

Local

Messaging

Video

Voice

Personalization

Personalization =

Data Improves
Engagement + Experiences…

Drives Growth + Scrutiny

Personal + Collective Data = Provide Better Experiences for Consumers…

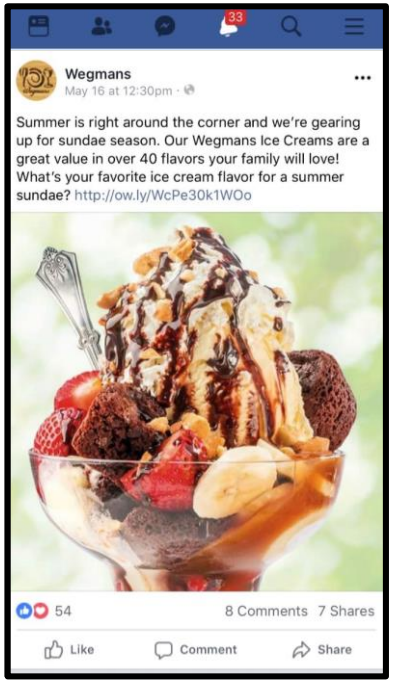
2.2B Facebooks

200MM Pinterests

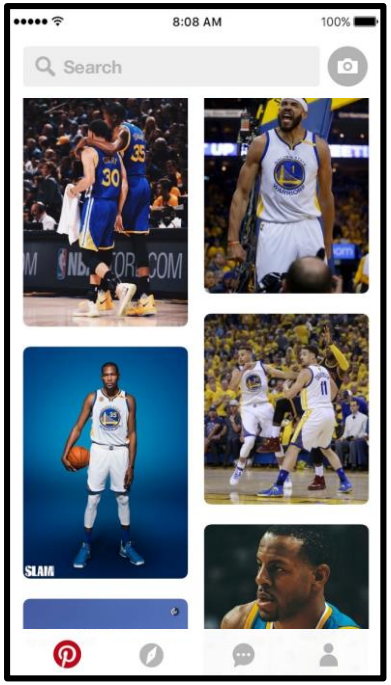
170MM Spotifys

125MM Netflixes

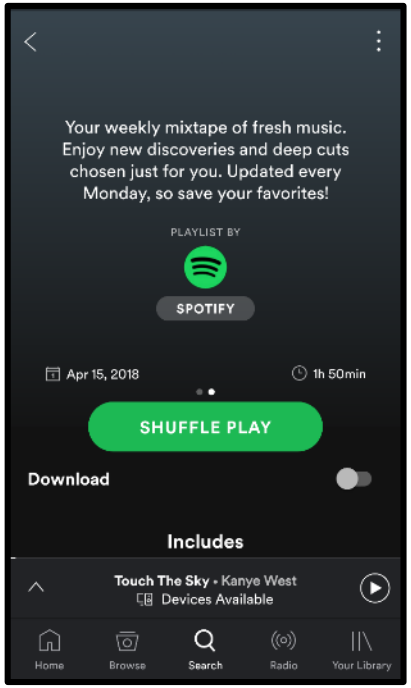
Newsfeed



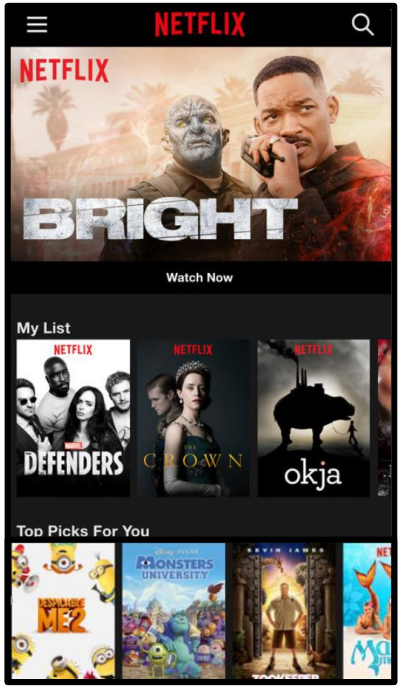
Discovery



Music



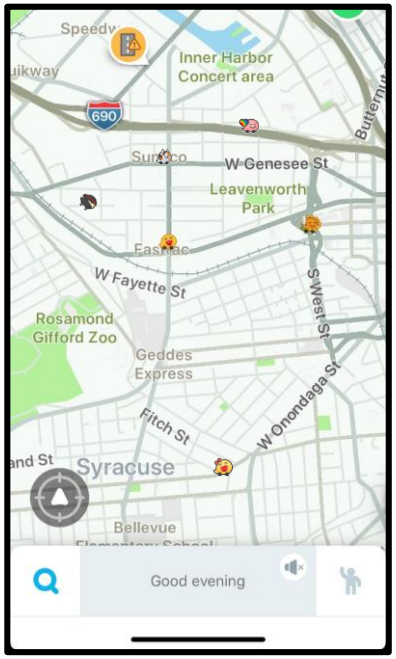
Video

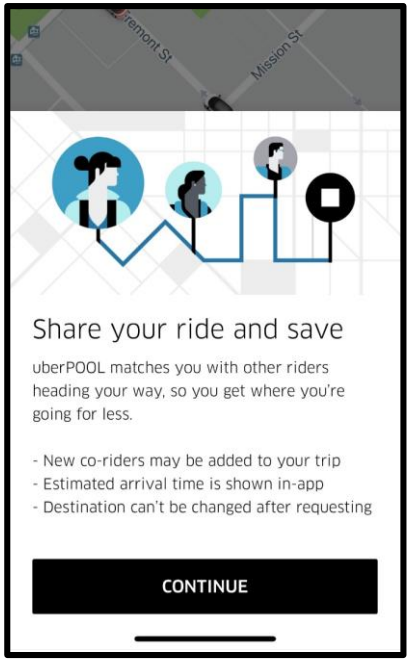


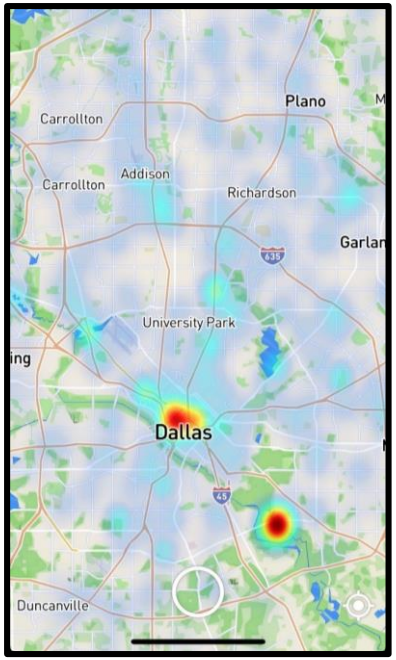
Source: Facebook (5/18), Pinterest (5/18), Spotify (5/18), Netflix (5/18).
Note: Facebook Q1:18 MAU (4/18), Pinterest MAU (9/17), Spotify Q1:18 MAU (5/18), Netflix Q1:18 global streaming memberships (4/18).

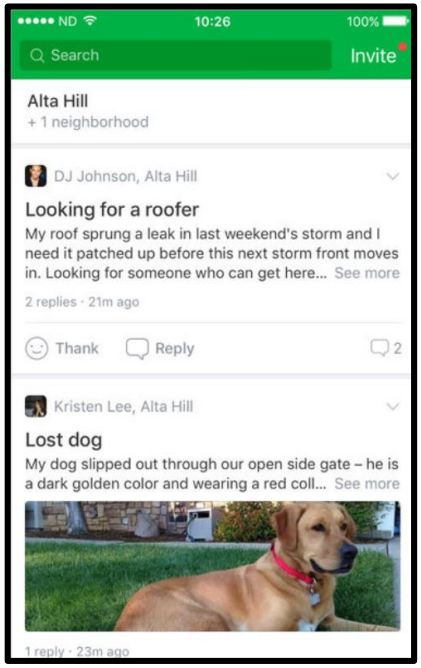
...Personal + *Collective* Data = Provide Better Experiences for Consumers

100MM+ Waze Drivers	**20%** UberPOOL Share of All Rides, Where Available*	**100MM+** Snap Map MAUs	**17MM**** Nextdoor Recommendations
Real-Time Navigation	*Real-Time Transportation*	*Real-Time Social Stories*	*Often Real-Time Local News*









Source: Facebook (5/18), Waze (2/18), Snap (5/18), Nextdoor (5/18) *Active Markets = Atlanta, Austin, Boston, Chicago, Denver, Las Vegas, Los Angeles, Miami, Nashville, New Jersey, New York City, Philadelphia, Portland, San Diego, San Francisco, Seattle, Washington D.C., Toronto, Rio de Janeiro, Sao Paulo, Bogota, Guadalajara, Mexico City, Monterrey, Lima, Paris, London, Ahmedabad, Bangalore, Chandigarh, Chennai, New Delhi, Guwahati, Hyderabad, Jaipur, Kochi, Kolkata, Mumbai, Pune, & Sydney. **Refers to cumulative recommendations as of 11/17.

Privacy Paradox

Internet Companies

Making Low-Priced Services Better, in Part, from User Data

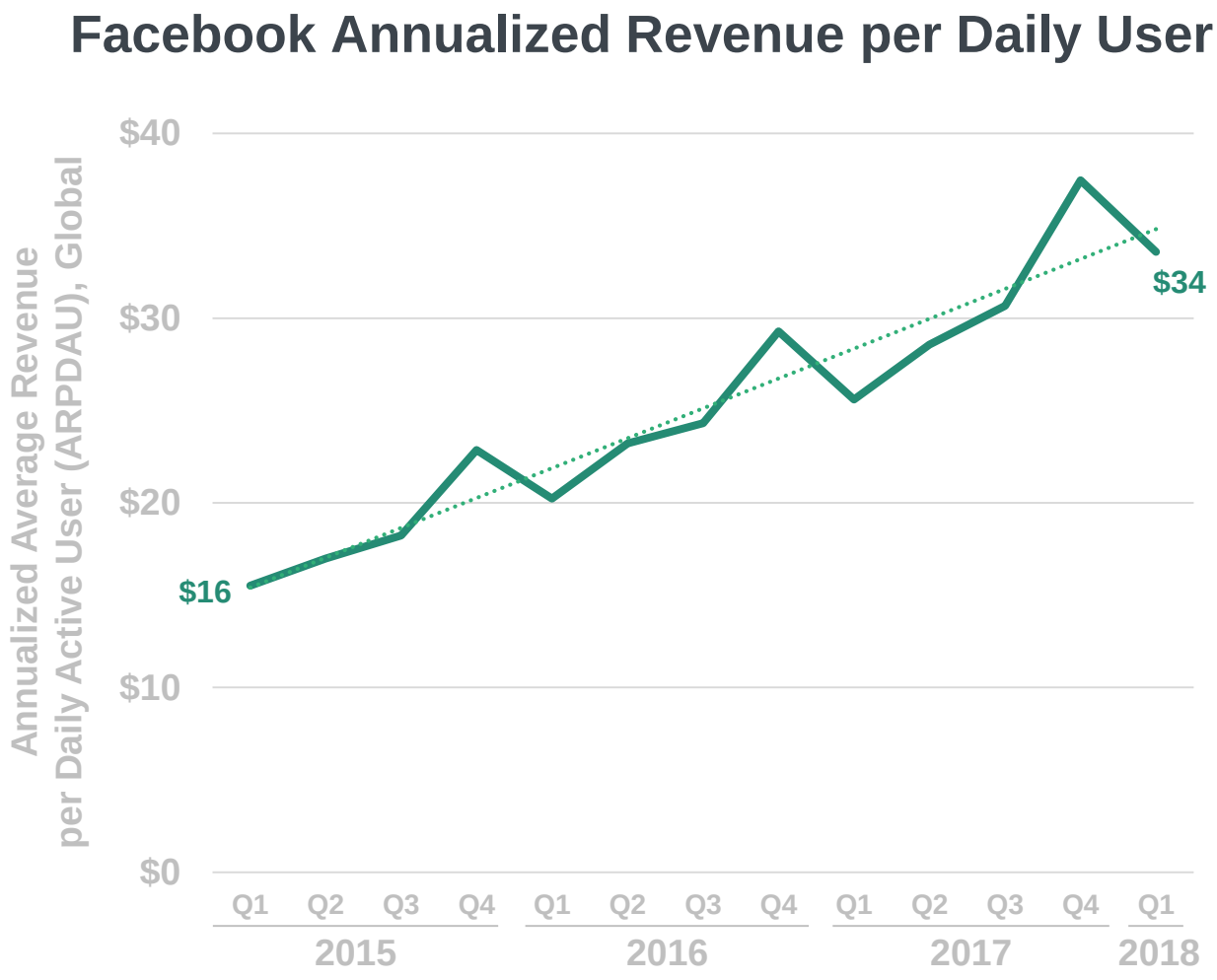
Internet Users

Increasing Time on Internet Services Based on Perceived Value

Regulators

Want to Ensure User Data is Not Used 'Improperly'

Rising User Engagement = Drives Monetization + Investment in Product Improvements...



Source: Facebook (4/18). Note: Facebook Daily Active Users (DAU) defined as a registered Facebook user who logged in and visited Facebook on desktop or mobile device, or took action to share content or activity with his or her Facebook friends or connections via a third-party website that is integrated with Facebook, on a given day. ARPDAU calculated by dividing annualized total revenue by average DAU in the quarter.

...Rising Monetization + Data Collection = Drives Regulatory Scrutiny

Data / Privacy

The European Data Protection Regulation will be applicable as of May 25th, 2018 in all member states to harmonize data privacy laws across Europe.

- European Union, 5/18

Facebook's collection & use of data from third-party sources is abusive.

- German Federal Cartel Office, 12/17

Competition

Commission fines Google €2.42 billion for abusing dominance as search engine by giving illegal advantage to its own comparison shopping service.

- European Commission, 6/17

Commission approves acquisition of LinkedIn by Microsoft, subject to conditions.

- European Commission, 12/16

Safety / Content

The Germany Network Enforcement Act will require for-profit social networks with >2MM registered users in Germany to remove unlawful content within 24 hours of receiving a complaint.

- German Federal Ministry of Justice & Consumer Protection, 10/17

Taxes

Commission finds Luxembourg gave illegal tax benefits to Amazon worth around €250 million.

- European Commission, 10/17

Source: European Union (5/18), European Commission (6/17, 10/17, 12/16), Bundeskartellmt (German Competition Authority (12/17). German Federal Ministry of Justice and Consumer Protection (10/17).

Internet Companies = Key to Understand Unintended Consequences of Products...

We're an idealistic & optimistic company.
For the first decade, we really focused on all the good that connecting people brings.
But it's clear now that we [Facebook] didn't do enough.

We didn't focus enough on preventing abuse & thinking through how people could use these tools to do harm as well.

- **Mark Zuckerberg, Facebook CEO, 4/18**

Source: Facebook (4/18).

…Regulators = Key to Understand Unintended Consequences of Regulation

This month, the European Union will embark on an expansive effort to give people more control over their data online...

As it comes into force, Europe should be mindful of unintended consequences & open to change when things go wrong.

- **Bloomberg Opinion Editorial, 5/8/18**

Source: Bloomberg (5/18).

It's Crucial To Manage For Unintended Consequences…

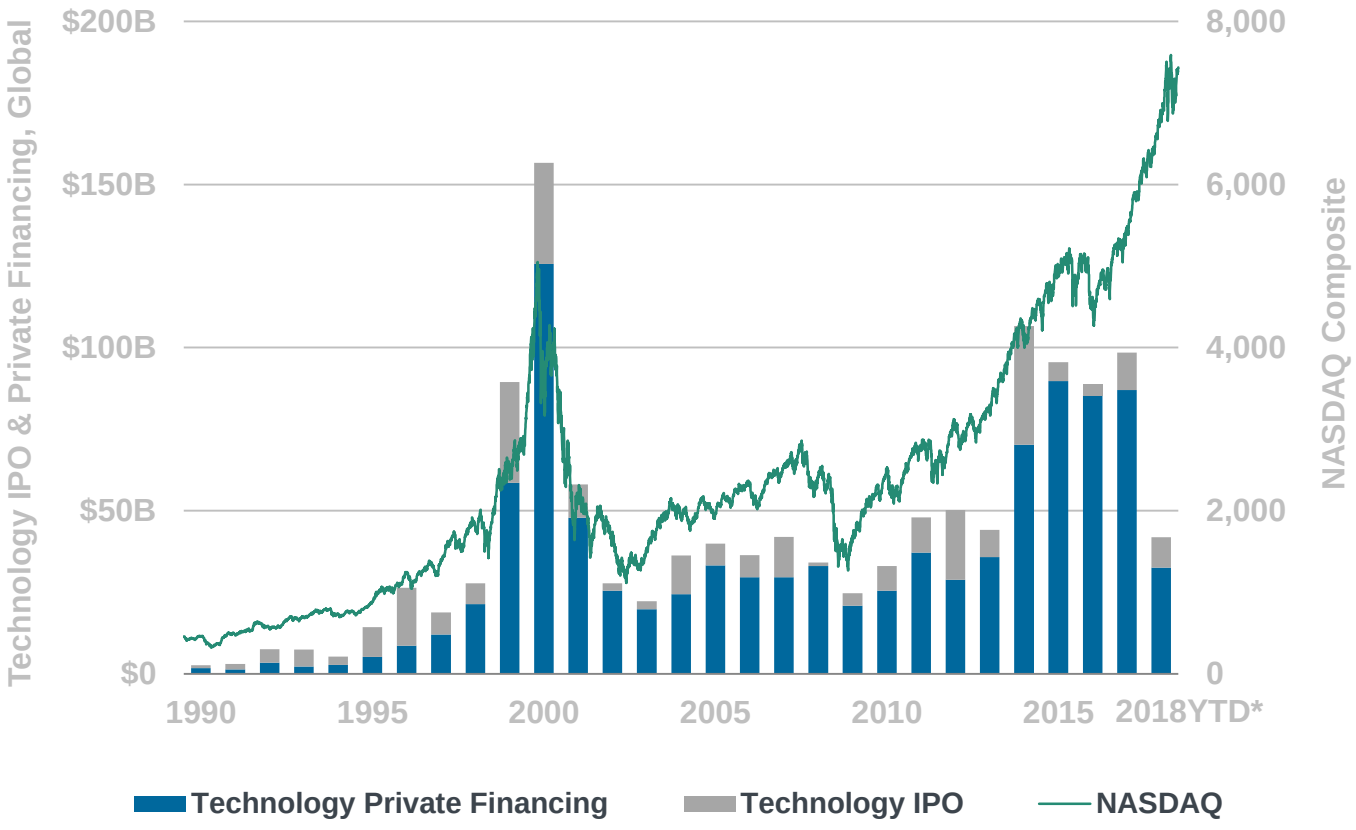
But It's Irresponsible to Stop Innovation + Progress

USA Internet Leaders =

Aggressive + Forward-Thinking Investors for Years

Investment (Public + Private) Into Technology Companies = High for Two Decades

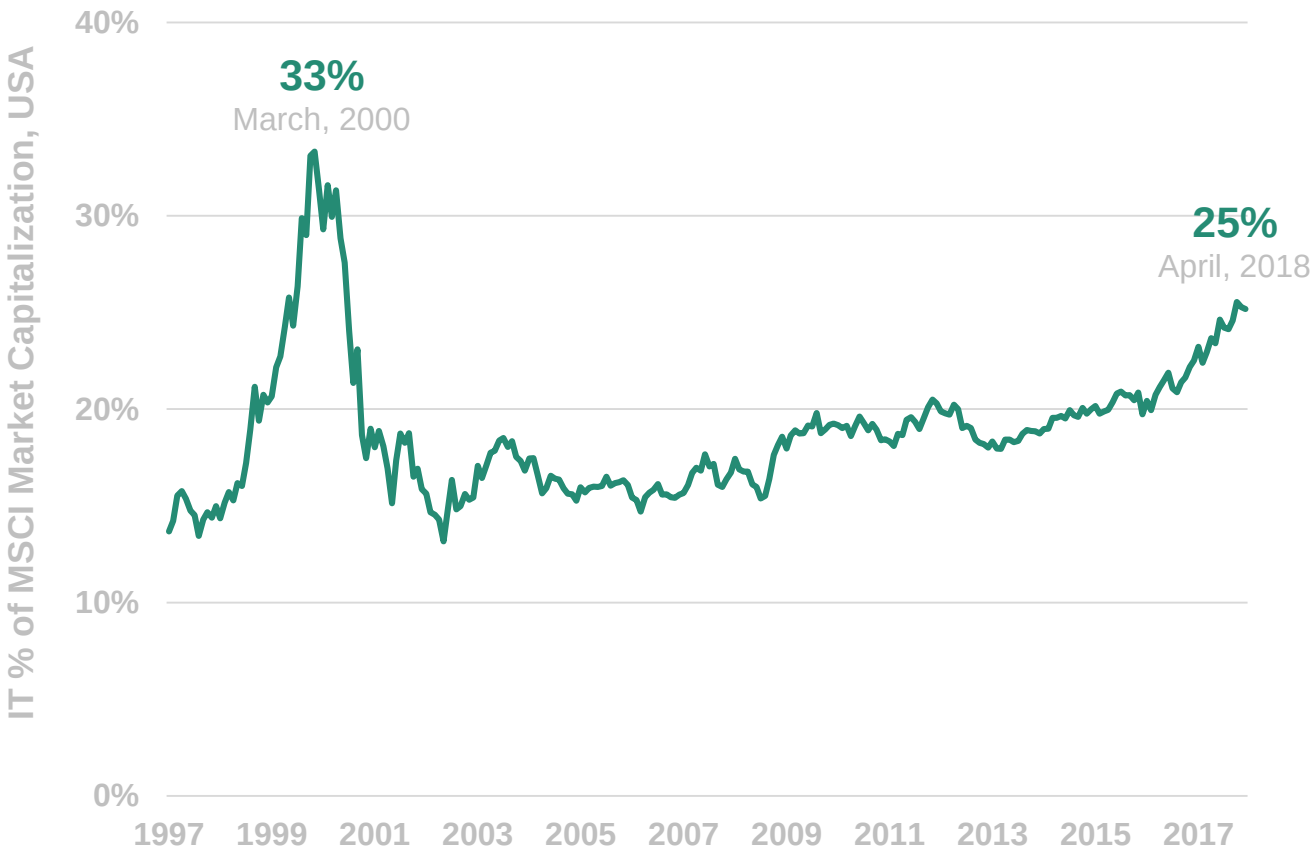
Global USA-Listed Technology IPO Issuance & Global Technology Venture Capital Financing



Source: Morgan Stanley Equity Capital Markets, *2018YTD figure as of 5/25/18, Thomson ONE. All global USA-listed technology IPOs over $30MM, data per Dealogic, Bloomberg, & Capital IQ. 2012: Facebook ($16B IPO) = 75% of 2012 IPO $ value. 2014: Alibaba ($25B IPO) = 69% of 2014 IPO $ value. 2017: Snap ($4B IPO) = 34% of 2017 $ value.

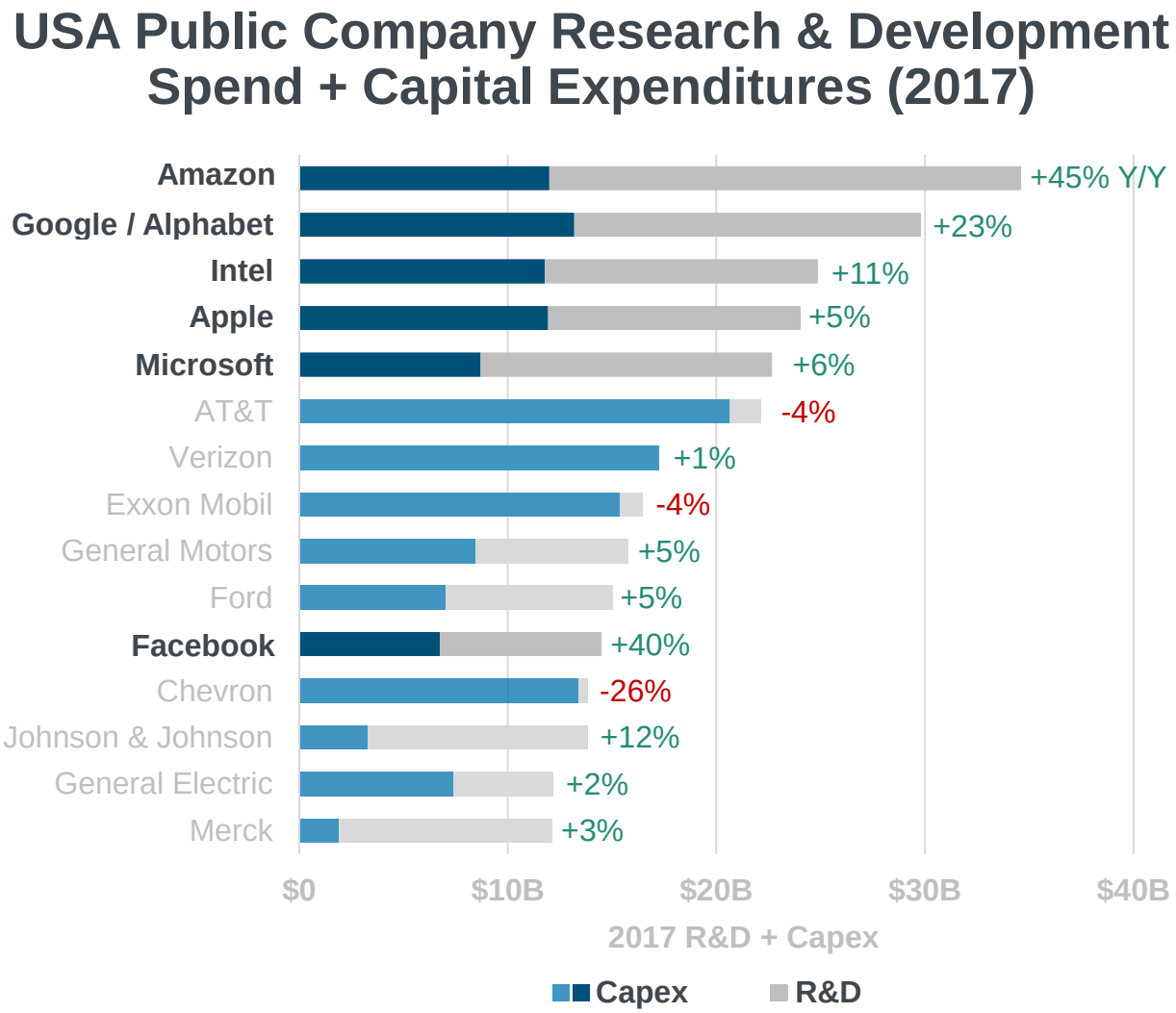
Technology Companies = 25% & Rising % of Market Cap, USA

USA Information Technology % of MSCI Market Capitalization



Source: FactSet, Katy Huberty @ Morgan Stanley. MSCI, Formerly Morgan Stanley Capital International = American provider of equity, fixed income, hedge fund stock market indexes, and equity portfolio analysis tools. Data refers to MSCI's index of USA publicly traded companies.

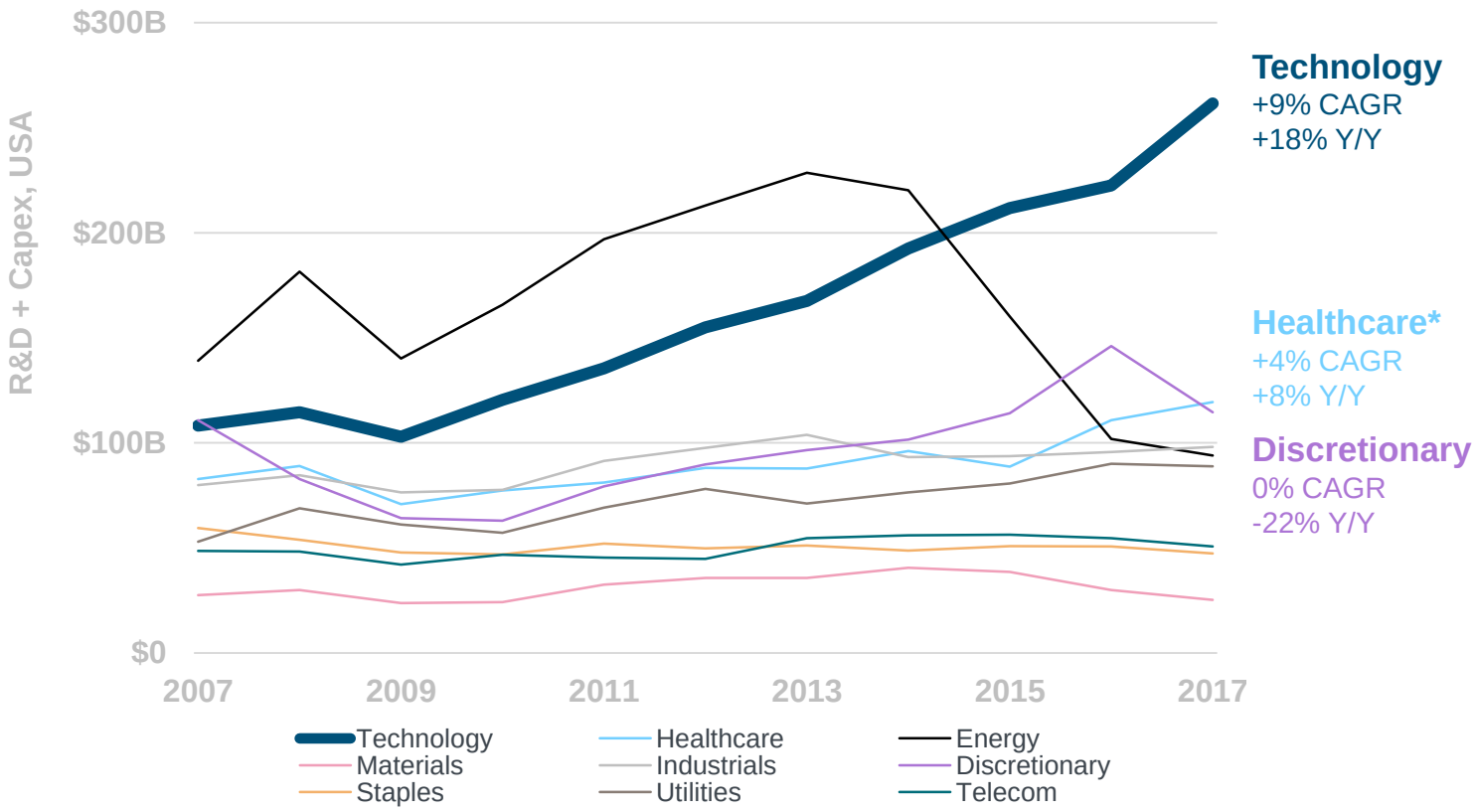
Technology Companies = 6 of Top 15 R&D + Capex Spenders, USA



Source: SEC Edgar, Katy Huberty @ Morgan Stanley. Note: All figures are calendar year 2017. Amazon R&D = Tech & Content spend. General Motors does not include purchases of leased vehicles. AT&T capex does not include interest during construction, just purchases of property, plant, & equipment. Verizon capitalizes R&D expense (i.e. reported as capex). General Electric R&D = GE funded, not government or customer. Bold indicates tech companies.

Technology Companies = Largest + Fastest Growing R&D + Capex Spenders, USA

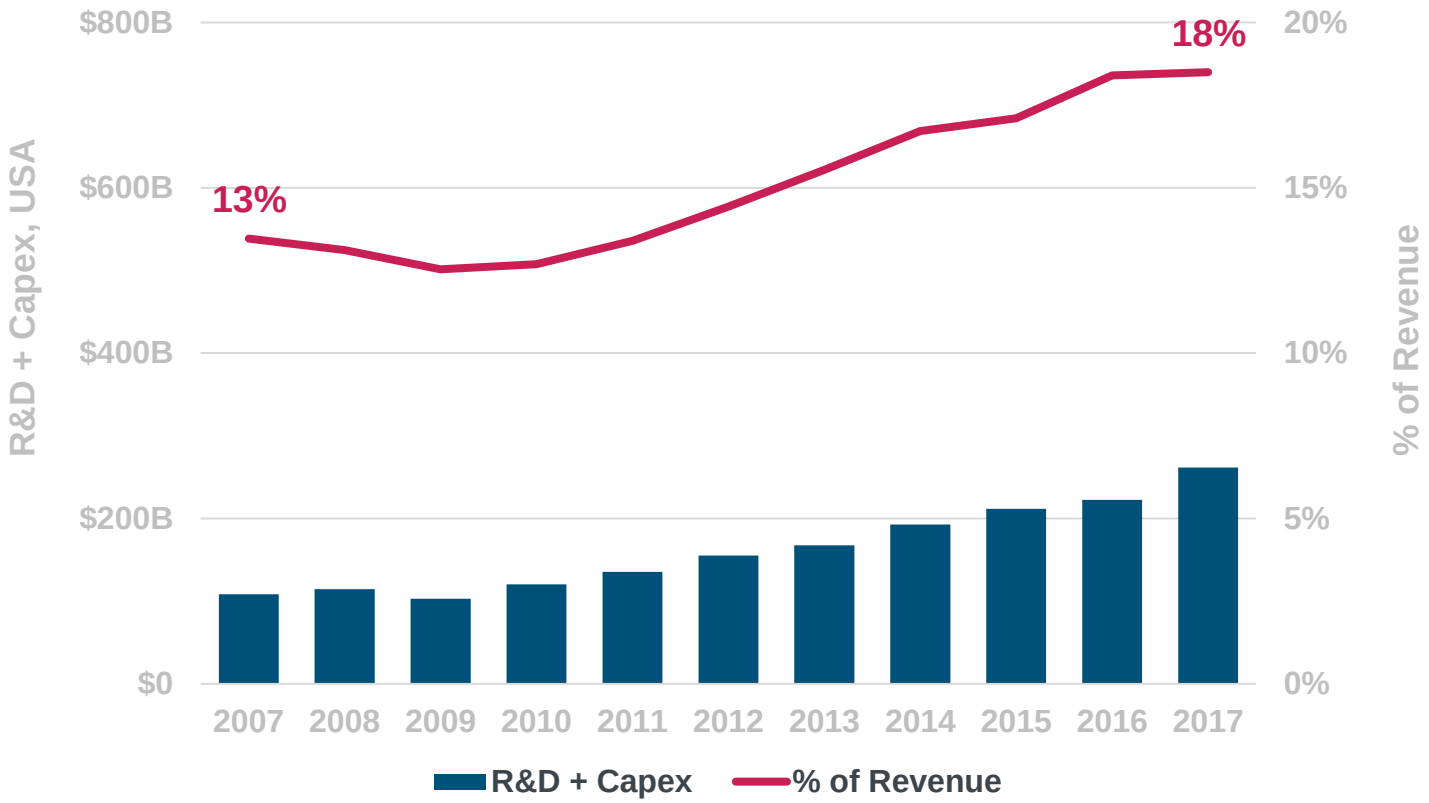
Research & Development Spend + Capital Expenditures – Select USA GICS Sectors



Source: ClariFi, Katy Huberty @ Morgan Stanley. GICS = Global Industry Classification Standard, an industry taxonomy developed in 1999 by MSCI and Standard & Poor's (S&P) for use by the global financial community. CAGR = Compounded annual growth rate from 2007-2017. Note: Amazon, Netflix and Expedia removed from Discretionary Sector & added to Technology. Discretionary includes companies that sell goods & services that are considered non-essential by consumers such as Starbucks (restaurants) & Nike (apparel). See appendix for detailed GICs definition. ClariFi does not have R&D or Capex data from Financial Services. *Healthcare Includes pharmaceutical companies.

Technology Companies = Rising R&D + Capex as % of Revenue…18% vs. 13% (2007)

USA Technology Company Research & Development Spend + Capital Expenditures vs. % of Revenue



Source: ClariFi, Katy Huberty @ Morgan Stanley. GICS = Global Industry Classification Standard, an industry taxonomy developed in 1999 by MSCI and Standard & Poor's (S&P) for use by the global financial community. Note: Amazon, Netflix and Expedia removed from Discretionary Sector & added to Technology. Discretionary includes companies that sell goods & services that are considered non-essential by consumers such as Starbucks (restaurants) & Nike (apparel). See appendix for detailed GICs definition.

USA Tech Companies…

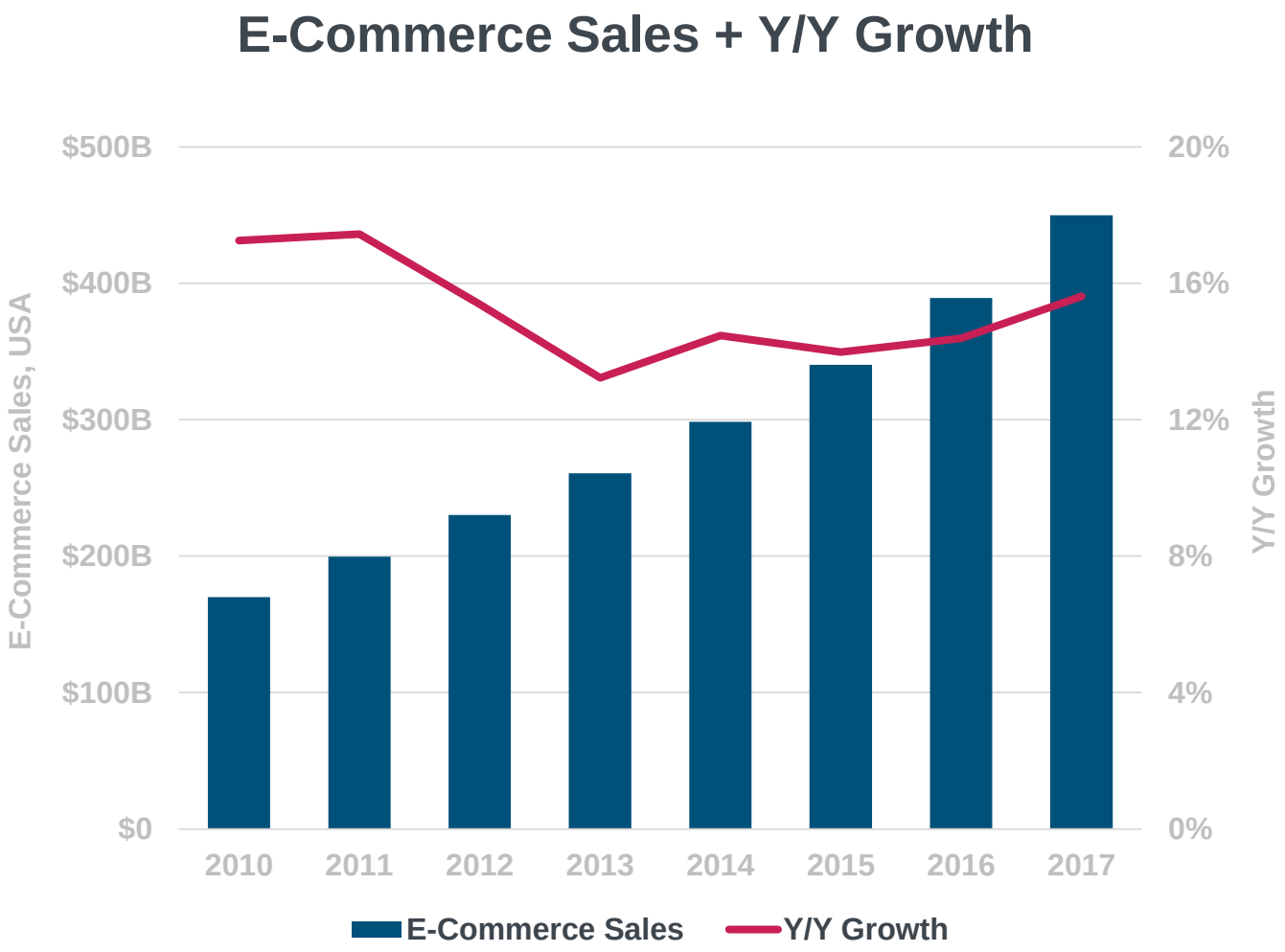
Aggressive Competition +
Spending on R&D + Capex =

Driving Innovation + Growth

E-COMMERCE =

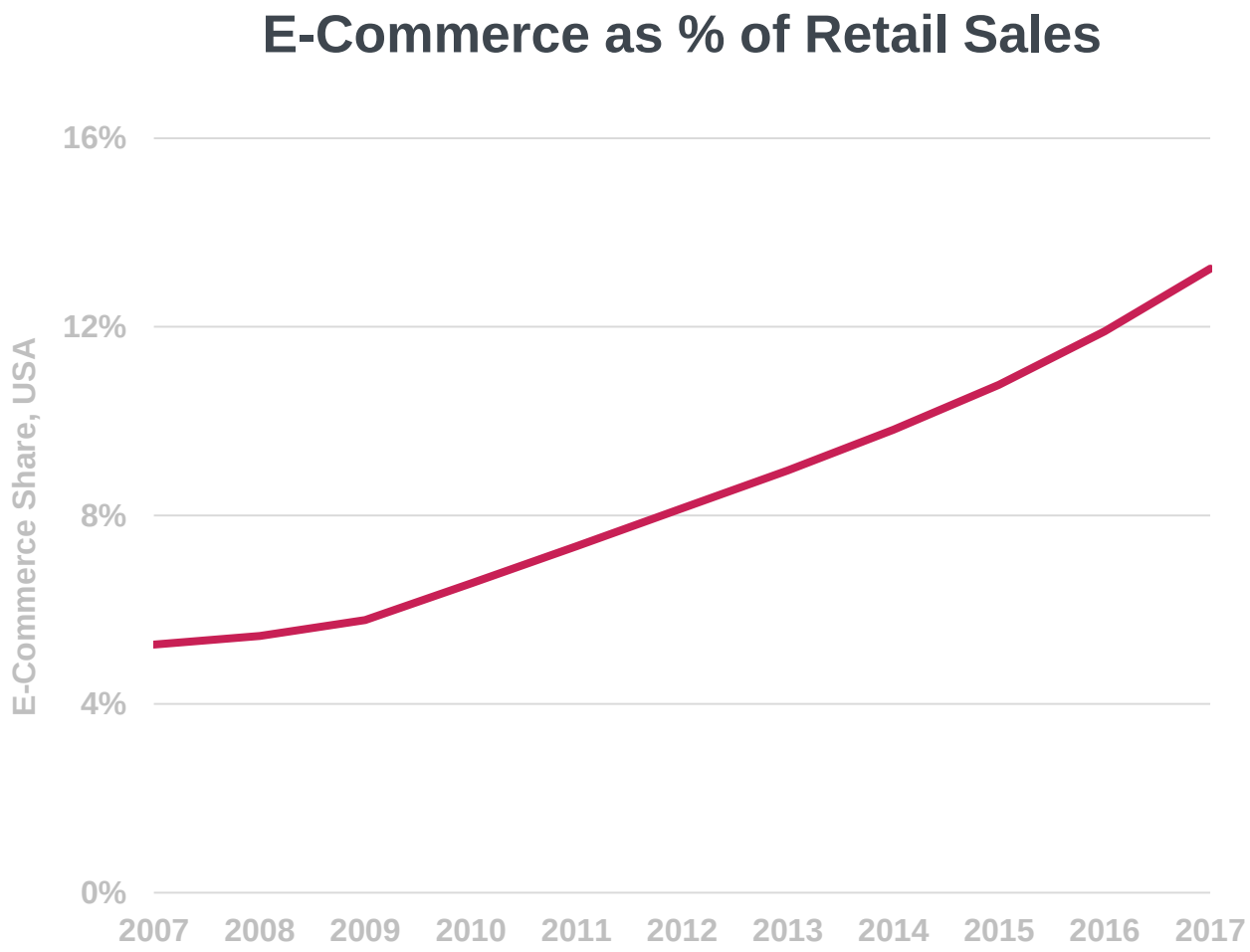
TRANSFORMATION ACCELERATING

E-Commerce =
Acceleration Continues @ +16% vs. +14% Y/Y, USA



Source: St. Louis Federal Reserve FRED database. Note: Historic data (Pre-2016) adjusted / back-casted in 2017 by USA Census Bureau to better align with Annual Retail Trade + Monthly Retail Trade Survey data.

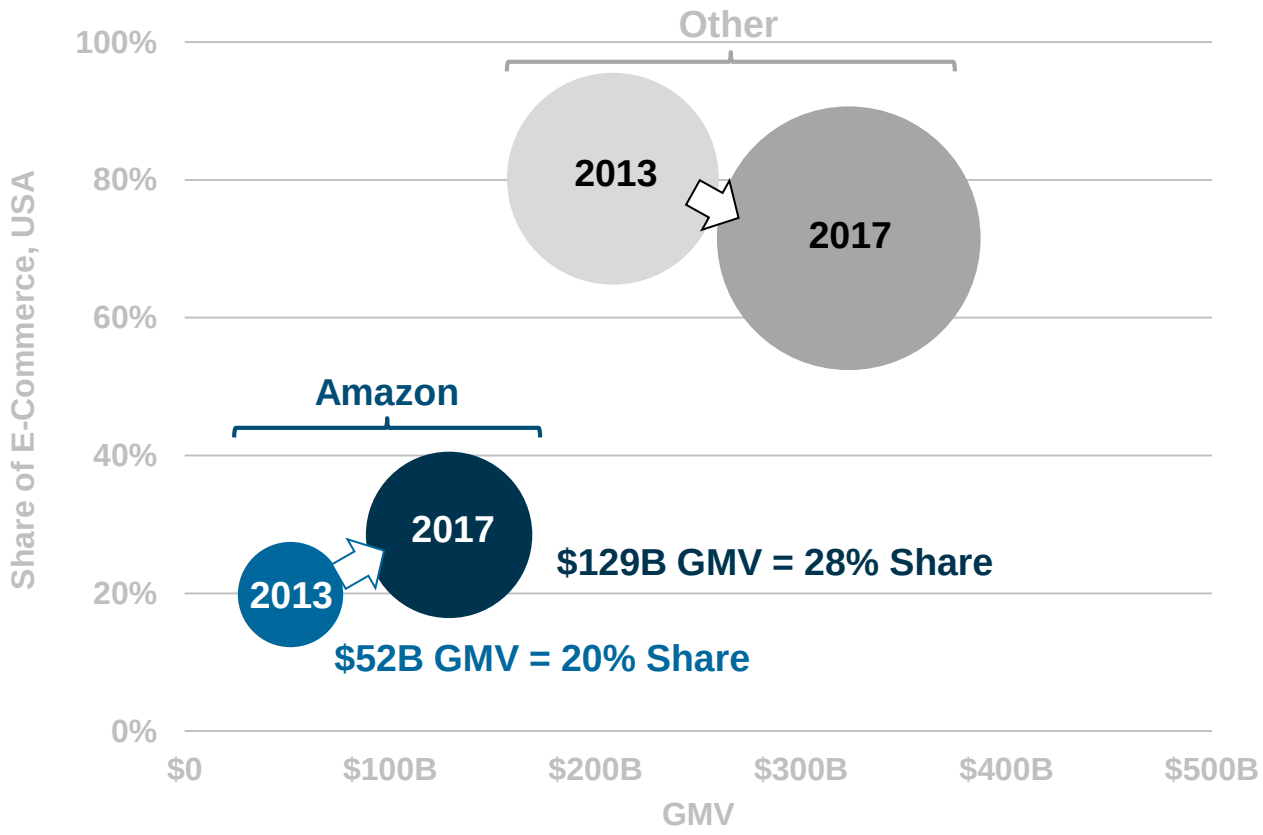
E-Commerce vs. Physical Retail = Share Gains Continue @ 13% of Retail



Source: USA Census Bureau, St. Louis Federal Reserve FRED database.
Note: 13% = Annualized share. Penetration calculated by dividing E-Commerce sales by "Core" Retail Sales (excluding food services, motor vehicles / auto parts, gas stations & fuel). All figures are seasonally adjusted.

Amazon =
E-Commerce Share Gains Continue @ 28% vs. 20% in 2013

E-Commerce Gross Merchandise Value (GMV) – Amazon vs. Other



Source: St. Louis Federal Reserve FRED database, Brian Nowak @ Morgan Stanley (5/18). Morgan Stanley Amazon USA GMV estimates exclude in-store GMV and assume 90% of North American GMV is USA. Market share calculated using FRED E-Commerce sales data.

E-Commerce =

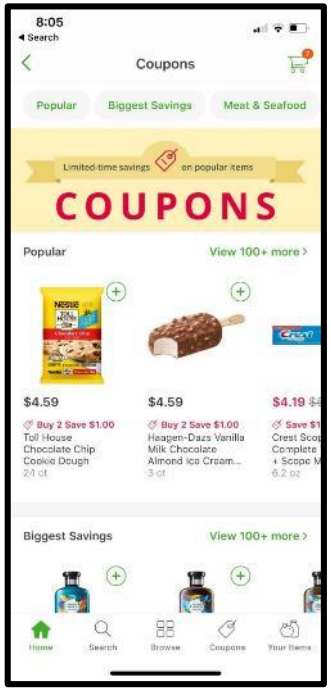
Evolving + Scaling

E-Commerce =
Mobile / Interactive / Personalized / In-Feed + Inbox / Front-Doored

Instacart

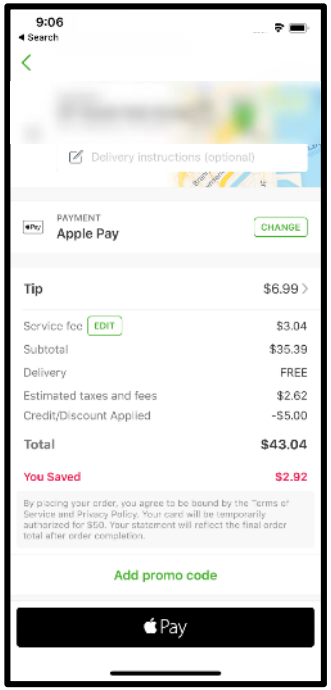
Find Local Store

Explore Custom Savings

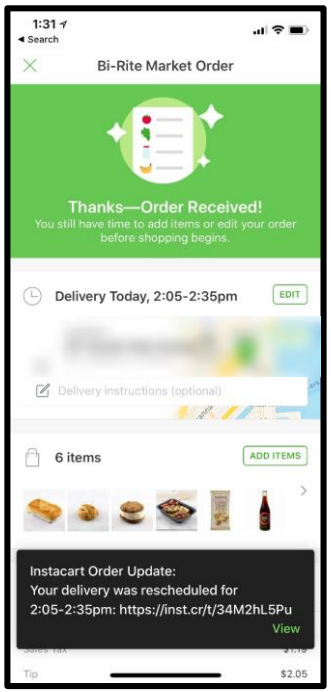


View + Share Recommendations

Pay Seamlessly



Update



Source: Instacart (5/18)

E-Commerce =
A Look @ Tools + Numbers…

Payment

Online Store

Online Payment

Fraud Prevention

Purchase Financing

Customer Support

Finding Customers

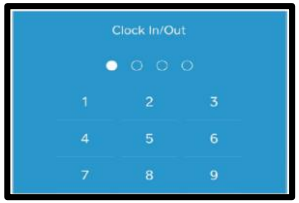
Delivering Product

Offline Merchants = Set Up Payment System…

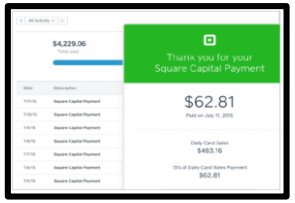
Square
Points of Sale (POS)

Software Services

Payroll

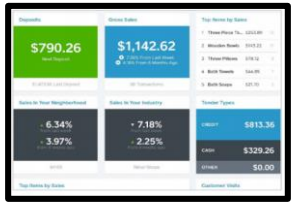


Loans

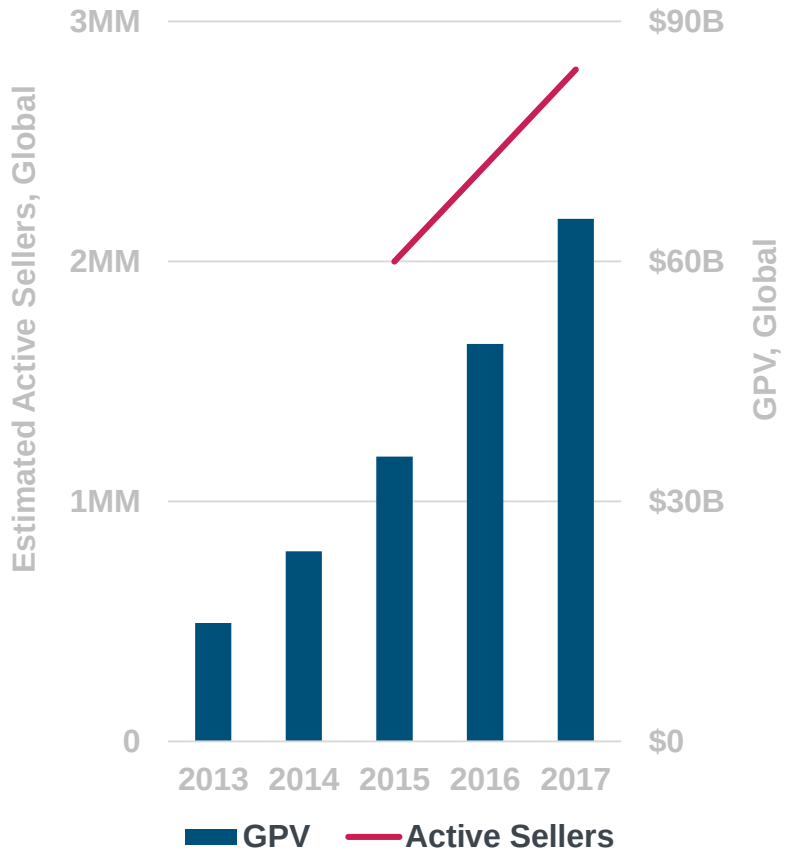


Invoices

Analytics



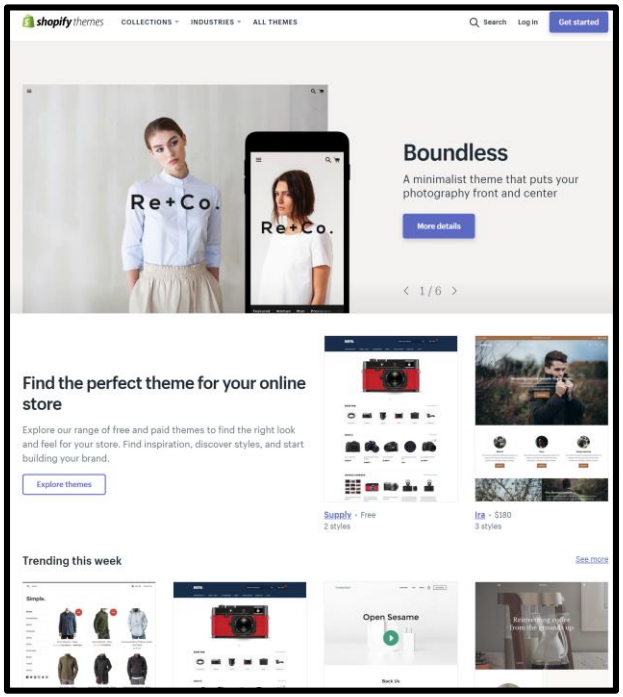
Estimated Active Sellers & Gross Payment Volume (GPV)



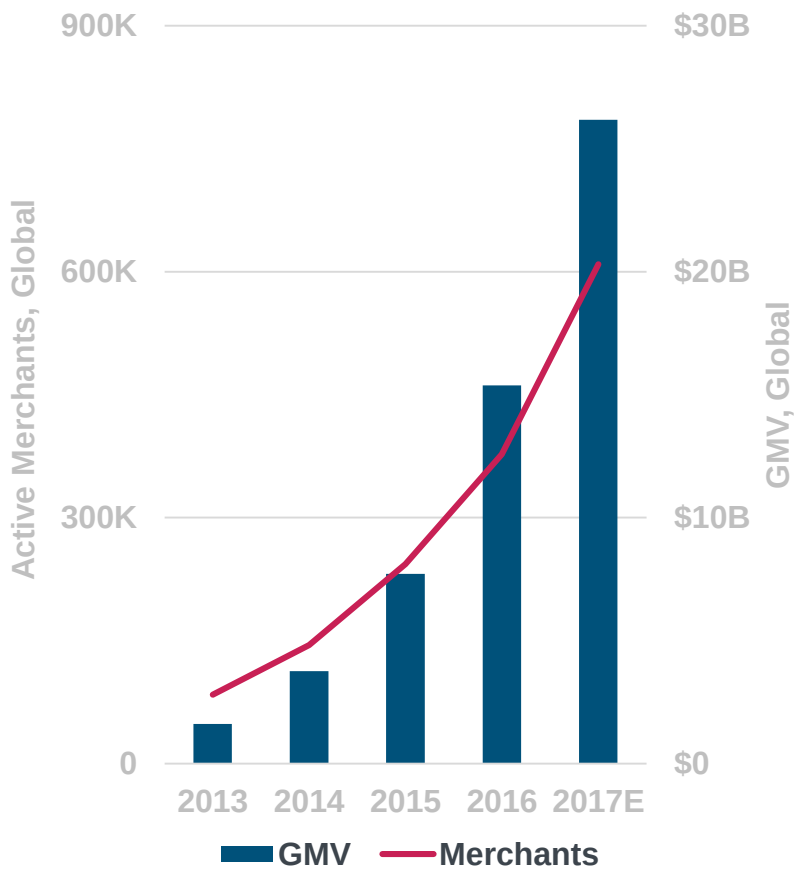
Source: Square (5/18). Note: Active Sellers have accepted five or more payments using Square in the last 12 months. In 11/15 Square disclosed it had 2MM users and in 3/16 disclosed it was adding 100K sellers per quarter – assuming seller trends remained constant, Square had approximately 2.8MM active sellers at the end of 2017. (~2.8MM = 2017E)

...Build Online Store…

Shopify
Online Stores



Active Merchants & Gross Merchandise Volume (GMV)

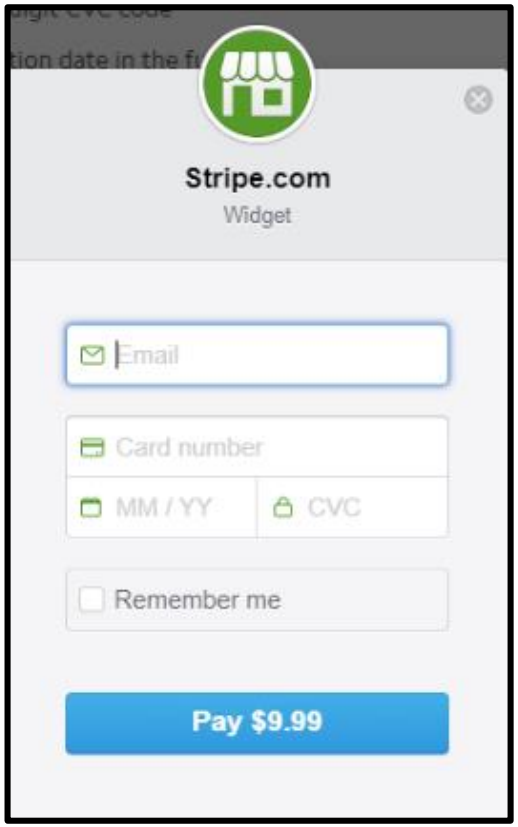


Source: Shopify, Brian Essex @ Morgan Stanley. Note: Active Merchants refers to merchants with an active Shopify subscription at the end of the relevant period. 2017 Active merchants and GMV are estimates based on periodic disclosures. (609K = 2017E)

…Integrate Online Payment System…

Stripe
Payment API Implementation

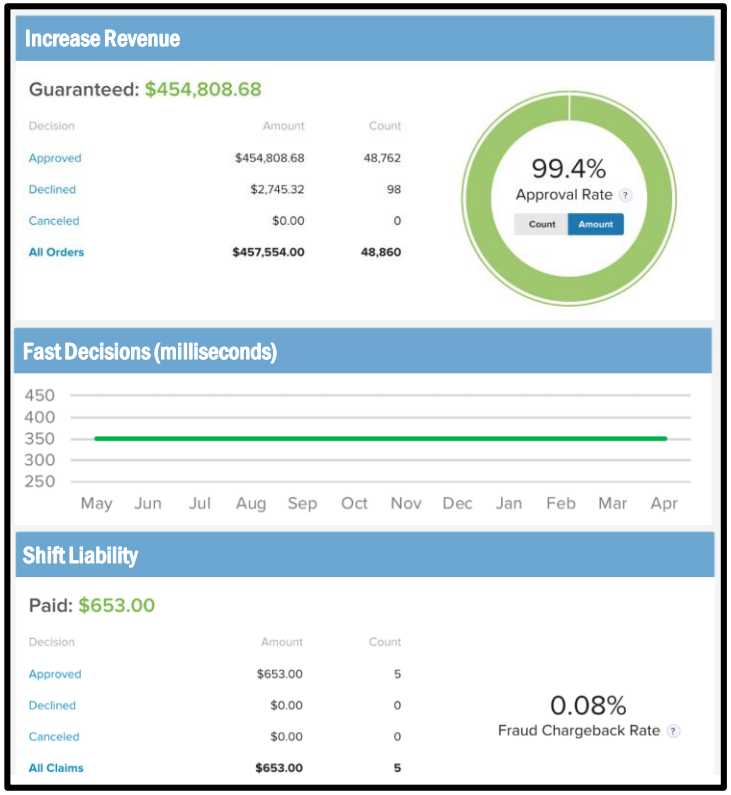
```
<form action="your-server-side-code" method="POST">
  <script
    src="https://checkout.stripe.com/checkout.js" class="stripe-button"
    data-key="pk_test_6pRNASCoBOKtIshFeQd4XMUh"
    data-amount="999"
    data-name="Stripe.com"
    data-description= "Example charge"
    data-image= "https://stripe.com/img/documentation/checkout/marketplace.png"
    data-locale="auto"
    data-zip-code="true">
  </script>
</form>
```



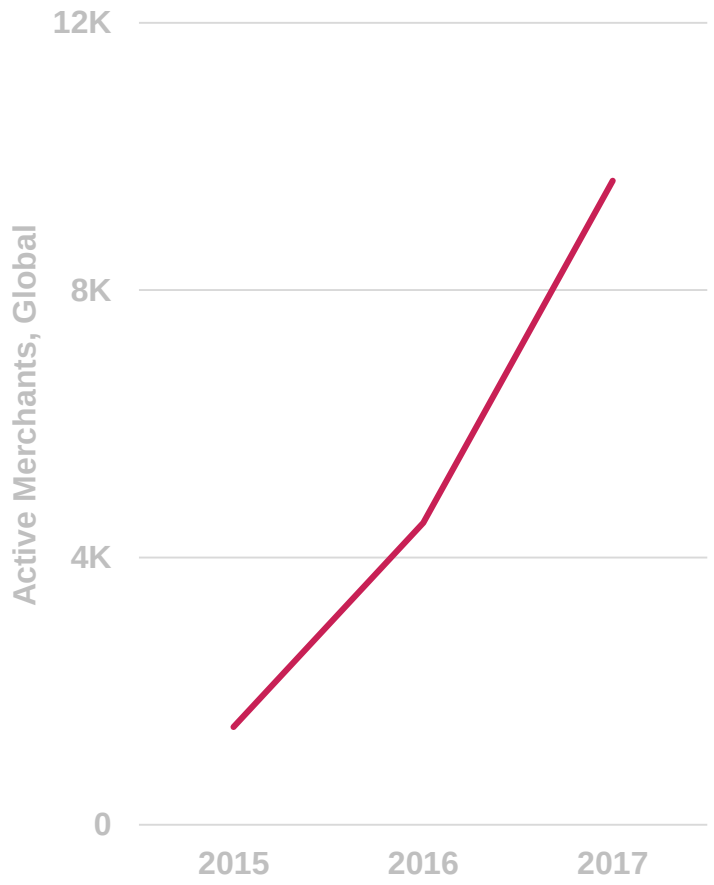
Source: Stripe (5/18).

...Integrate Fraud Prevention…

Signifyd
Fraud Prevention



Merchants

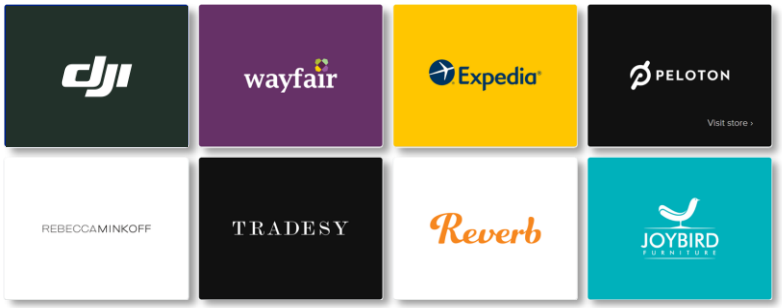


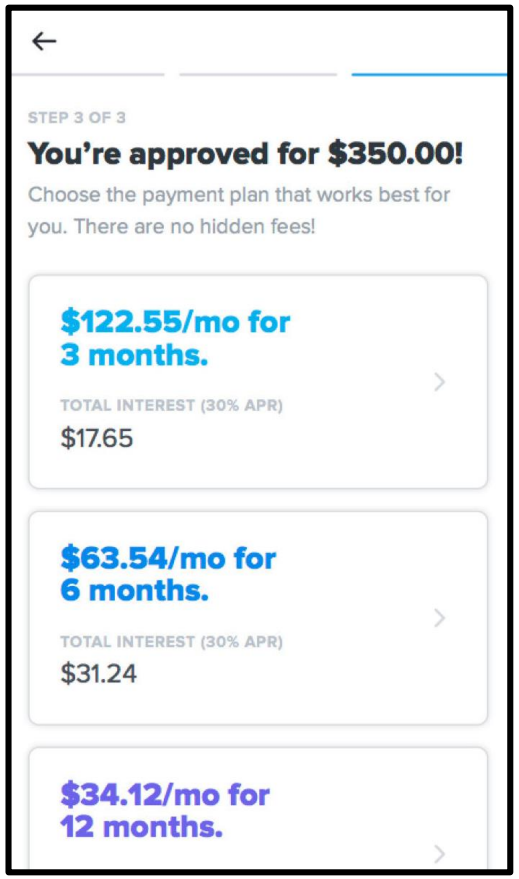
Source: Signifyd (5/18). Note: Merchants refers to retailers using Signifyd services to monitor for fraud @ period end. (10K = 2017)

…Integrate Purchase Financing…

Affirm
Financing

1,200+ = Merchants

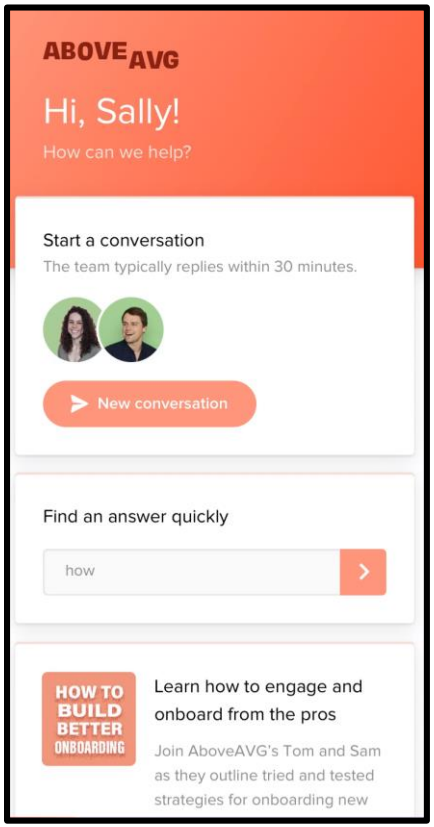




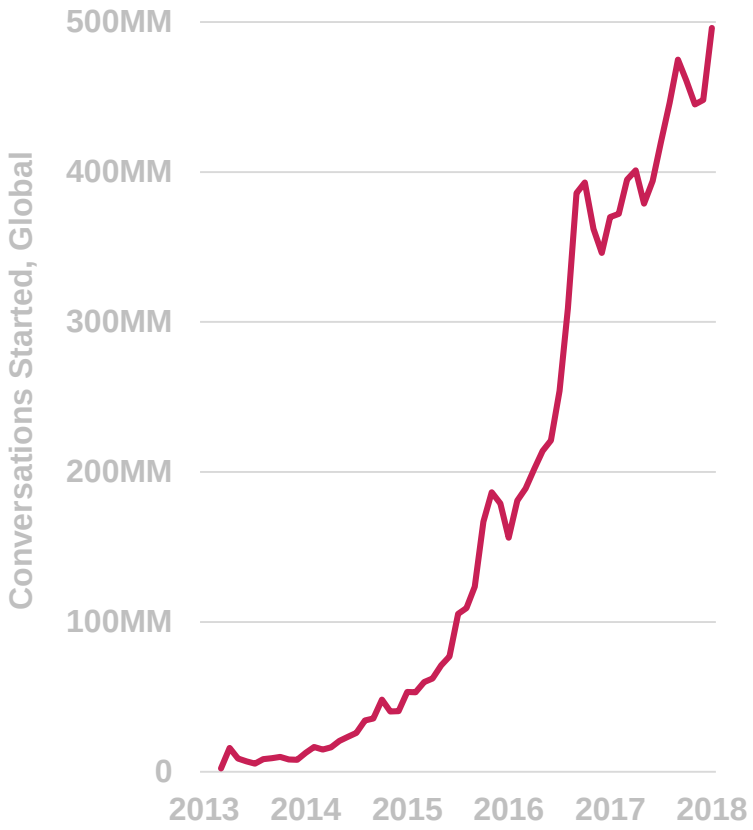
Source: Affirm (5/18).

…Integrate Customer Support…

Intercom
Real-Time Support



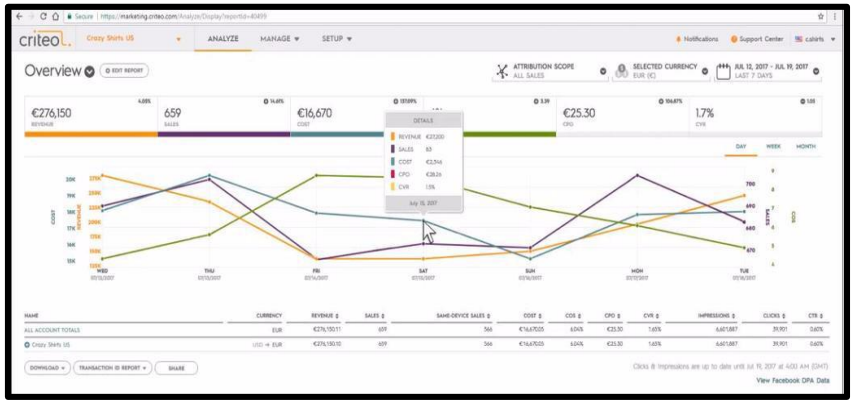
Customer Conversations



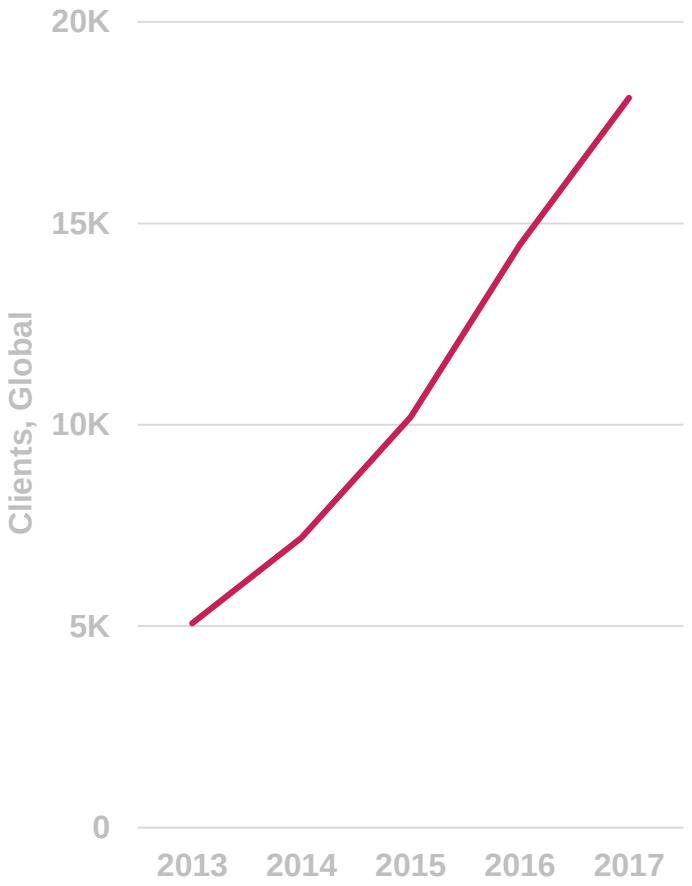
Source: Intercom (5/18). Note: Conversations started include messages initiated by business & customers. (500MM = 2018)

…Find Customers…

Criteo
Customer Targeting



Marketing Clients



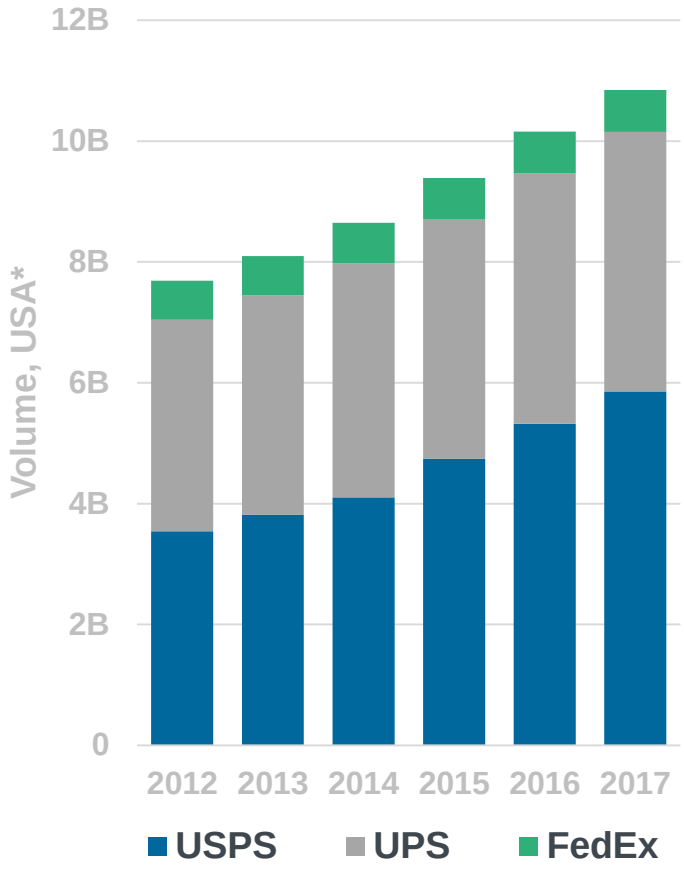
Source: Criteo (5/18). Note: Clients defined as active clients @ relevant period end. (18K = 2017)

…Deliver Products to Customers

Product Delivery

Parcel Volume

UPS + FedEx + USPS*



Source: UPS, FedEx, USPS, Caviar. *Combines USPS's domestic shipping & package services volumes, FedEx's domestic package volumes, and UPS's domestic package volumes. All figures are calendar year end except FedEx which includes LTM figures ending November 30 due to offset fiscal year.

…E-Commerce =
A Look @ Tools + Numbers

Payment

Online Store

Online Payment

Fraud Prevention

Purchase Financing

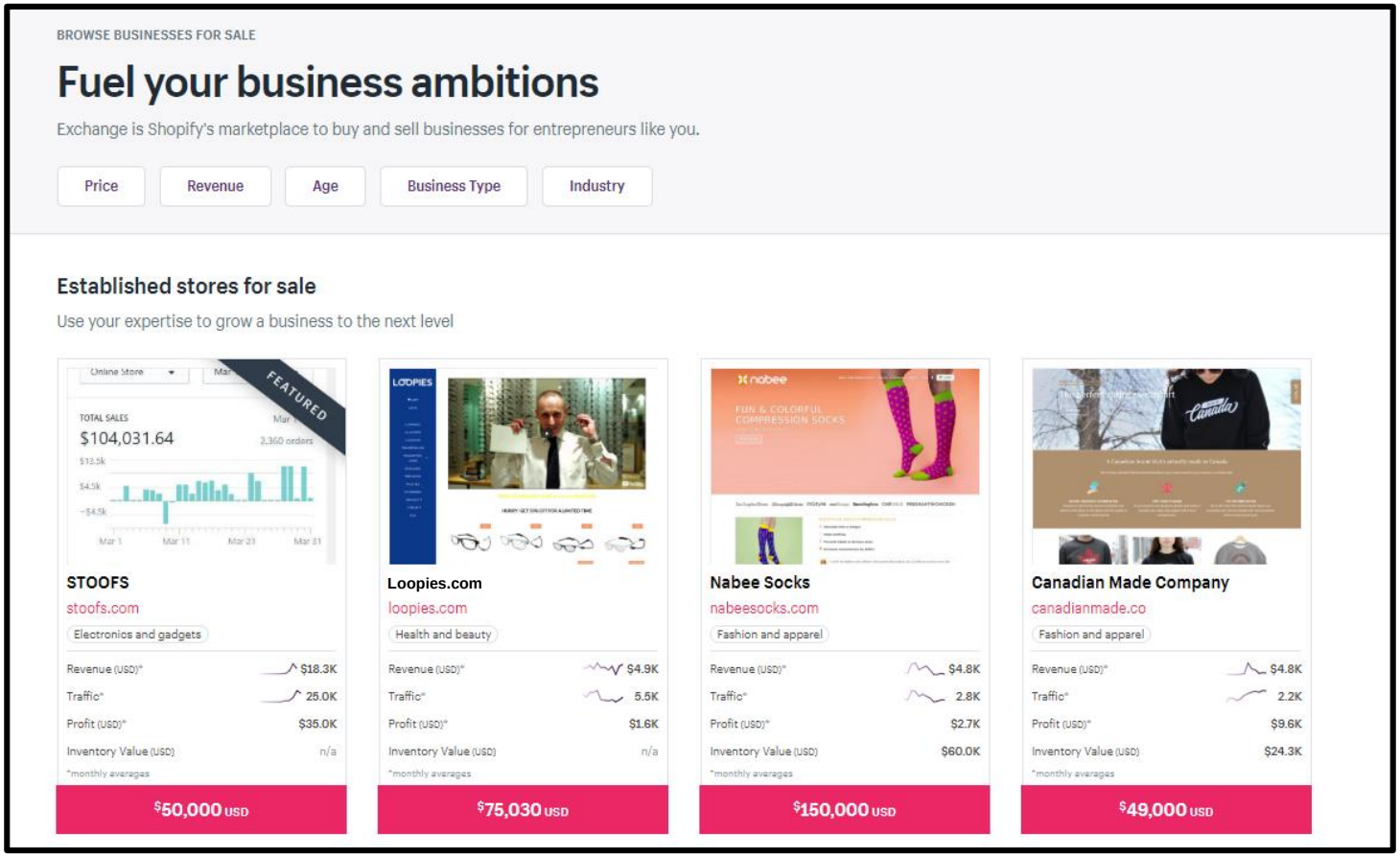
Customer Support

Finding Customers

Delivering Product

Building / Deploying Online Stores = Trend Evinced by Shopify Storefront Exchange

Shopify Storefront Exchange (Launched 6/17)



Source: Shopify (5/18)

Online Product Finding Evolution =

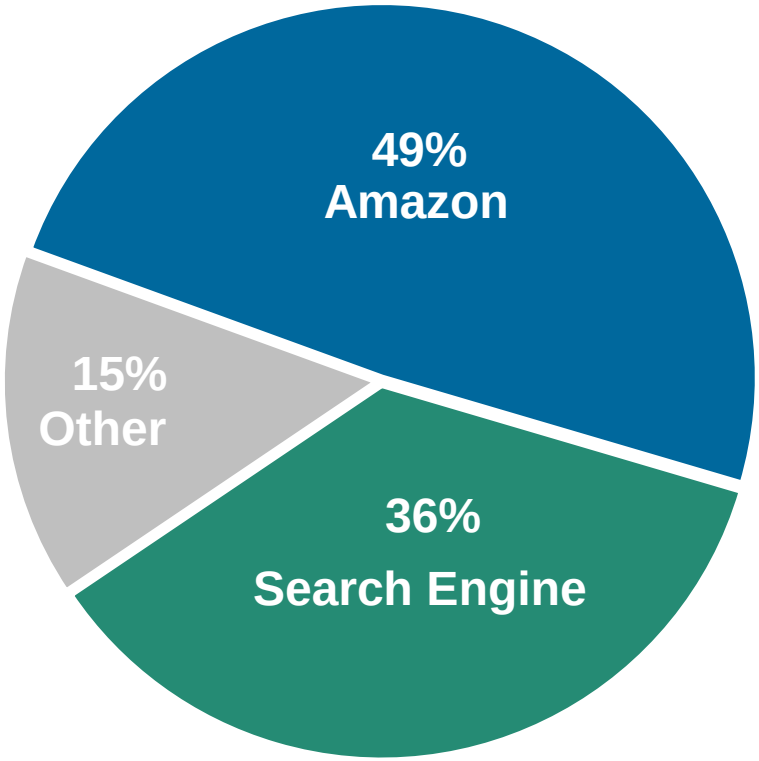
Search Leads…

Discovery Emerging

Getting More...
Data Driven / Personalized / Competitive

Product Finding =
Often Starts @ Search (Amazon + Google...)

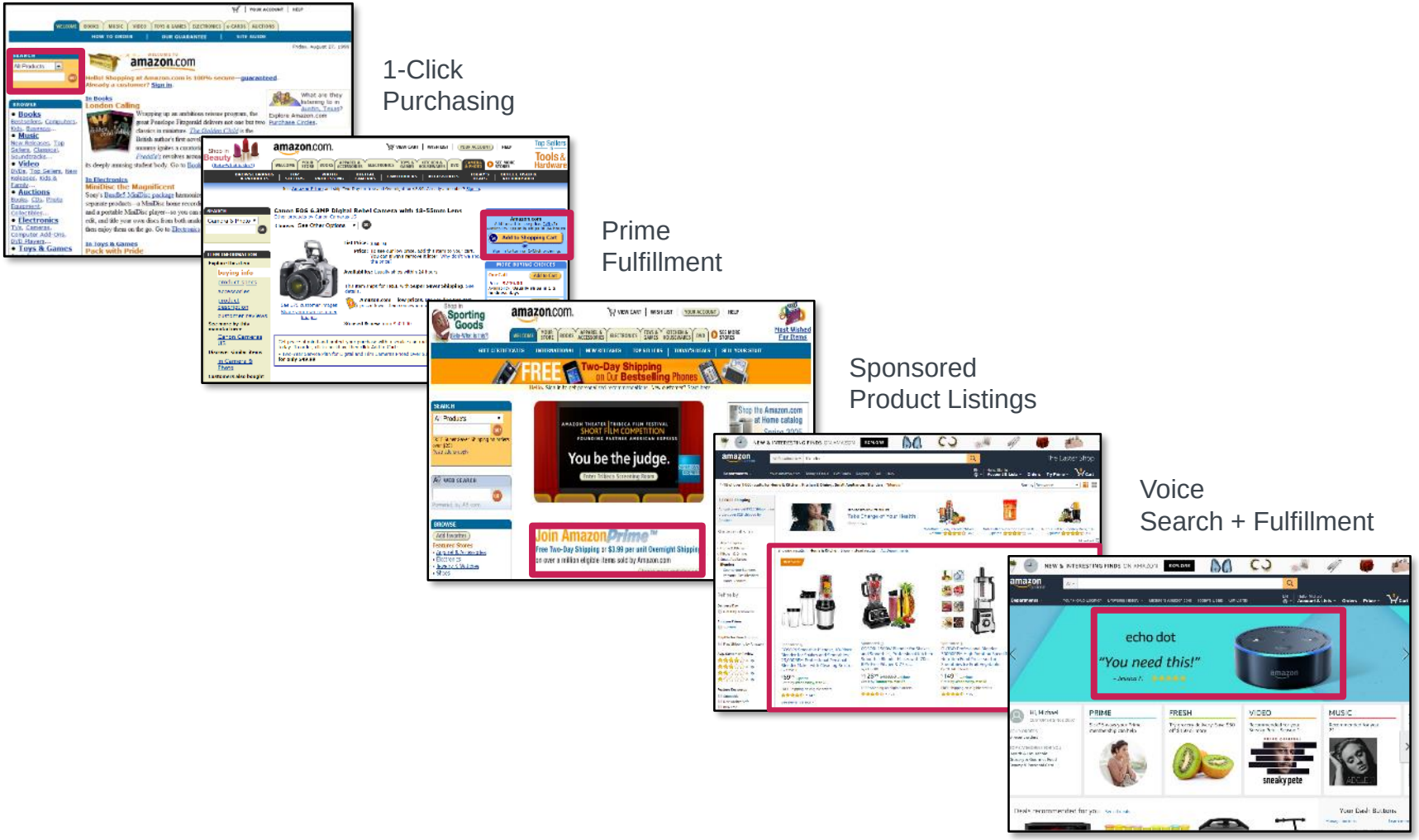
Where Do You Begin Your Product Search?



Source: Survata (9/17). Note: n = 2,000 USA customers.

Product Finding (Amazon) = Started @ Search...Fulfilled by Amazon

Product Search

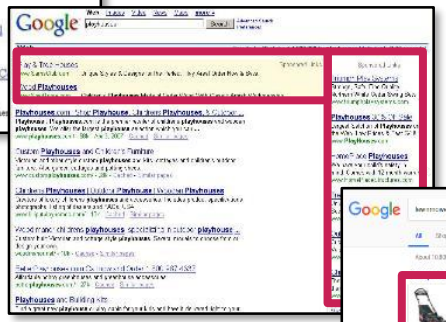


Source: The Internet Archive, Amazon.

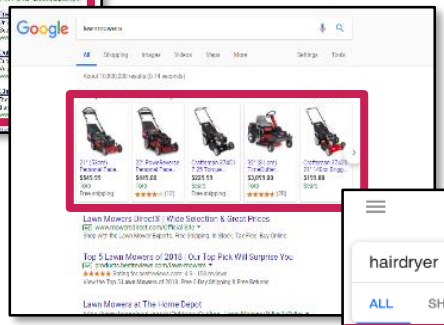
Product Finding (Google) = Started @ Search...Fulfilled by Others

Organic Search

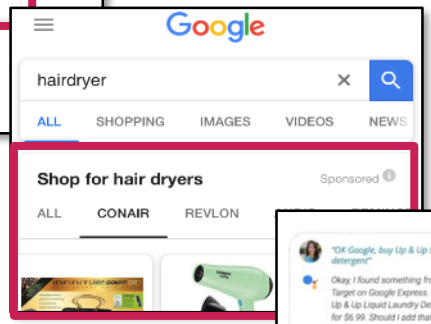
Paid Search



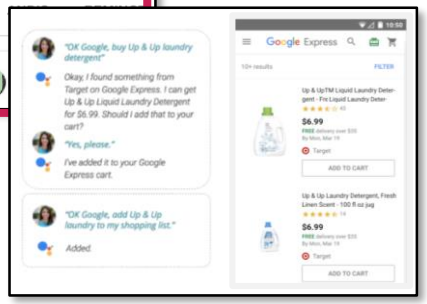
Google Shopping



Product Listing Ads



Shopping Actions



Source: The Internet Archive, Google.

Online Product Finding Evolution =

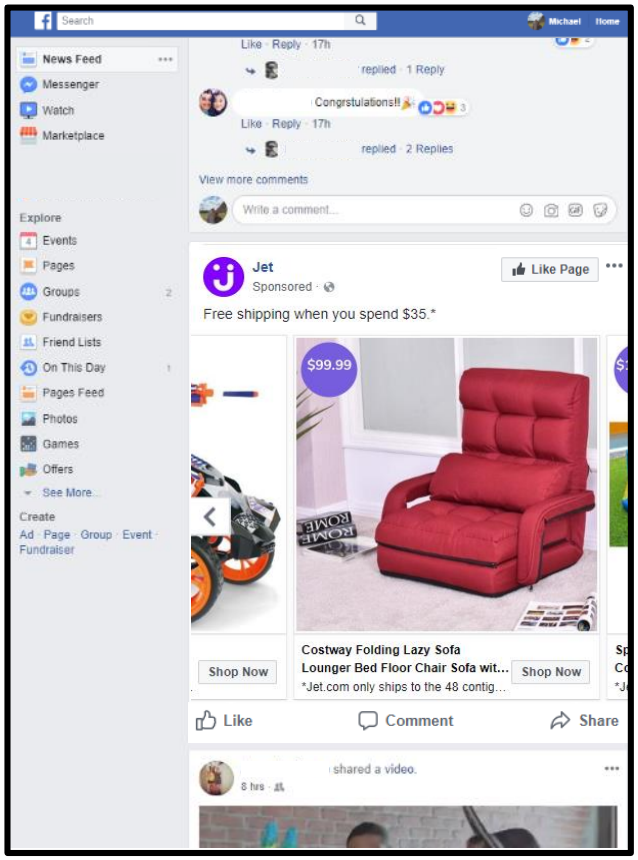
Search Leads…

Discovery Emerging

Getting More...
Data Driven / Personalized / Competitive

Product Finding (Facebook / Instagram) = Started @ Personalized Discovery in Feed

Facebook



Instagram

Source: Facebook (5/18), Instagram (5/18).

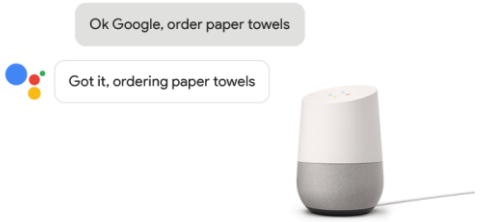
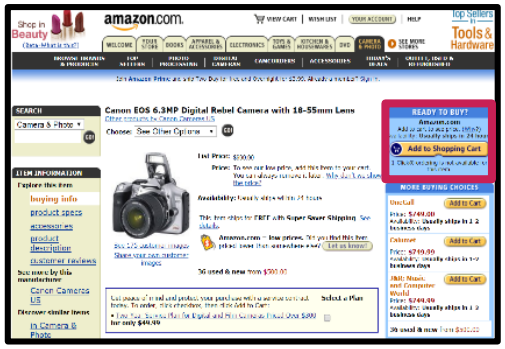
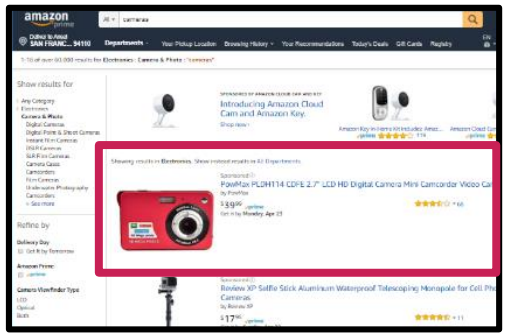
Online Product Finding Evolution =

Search Leads…

Discovery Emerging

Getting More...
Data Driven / Personalized / Competitive

Google = Ad Platform to a Commerce Platform...
Amazon = Commerce Platform to an Ad Platform

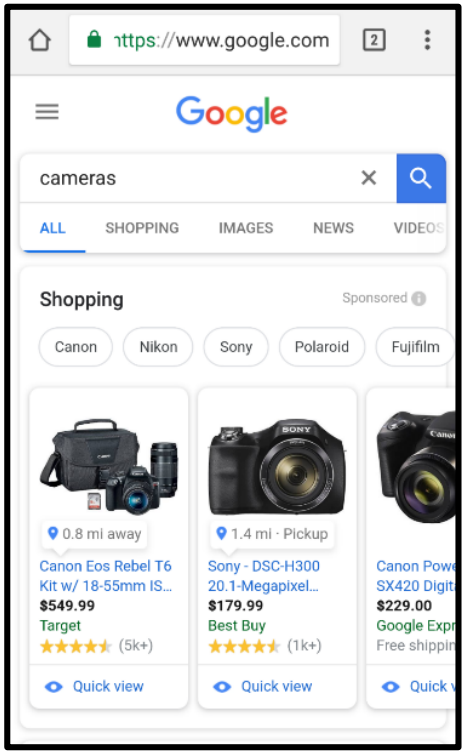
	1997…2000	2018
Google	*AdWords*	*Google Home Ordering*
		
Amazon	*1-Click Checkout*	*Sponsored Products*
		

Source: Advia (Google 2000 image), TechCrunch (2/17), Amazon (5/18).

E-Commerce-Related Advertising Revenue = Rising @ Google + Amazon + Facebook

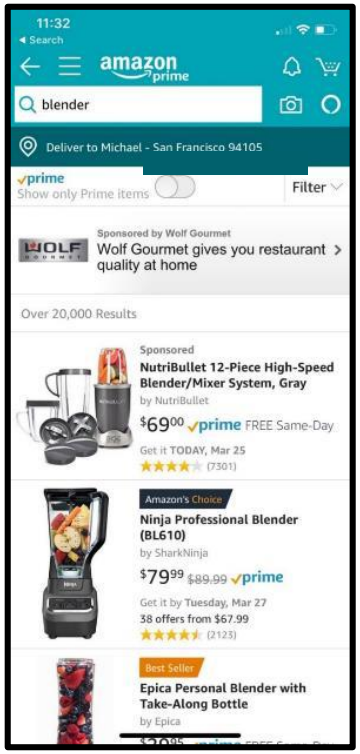
Google

3x = Engagement Increase
For Top Mobile Product Listing Ad*



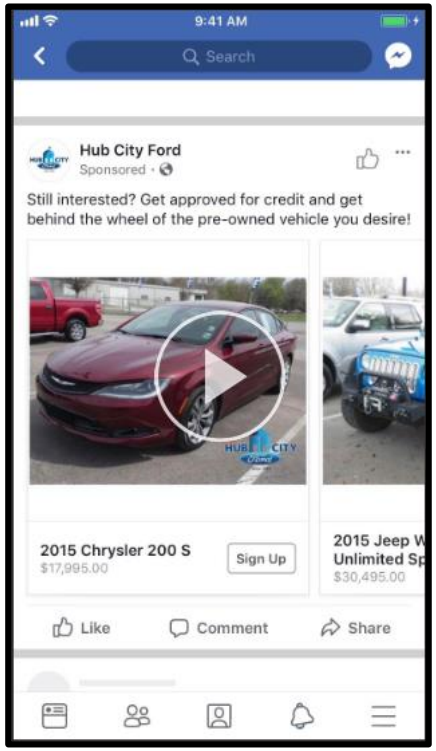
Amazon

$4B +42% Y/Y =
Ad Revenue



Facebook

>80MM +23% Y/Y =
SMBs with Pages



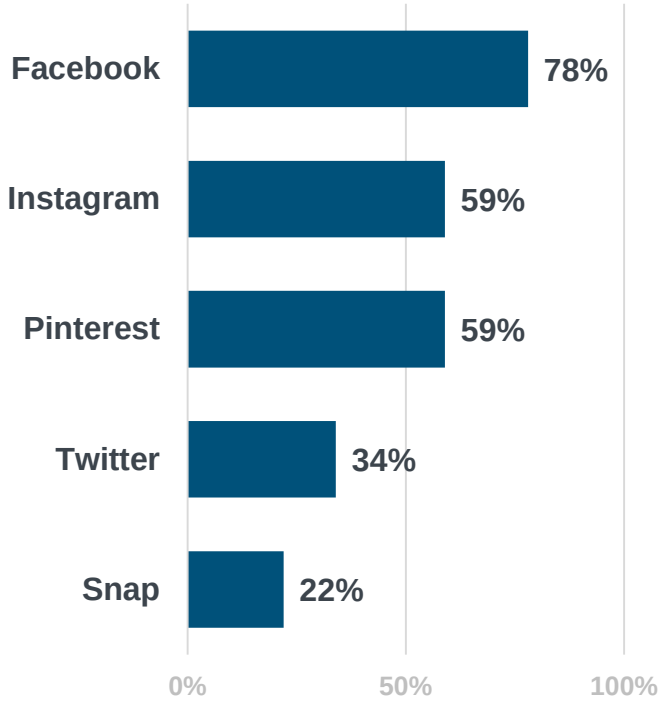
Source: Google (7/17), Brian Nowak @ Morgan Stanley (Amazon Ad revenue estimate, 5/18), Facebook (4/18).
*Google disclosed that the leftmost listing in a mobile product listing ad experiences 3x engagement.

Social Media =

Enabling More Efficient
Product Discovery / Commerce

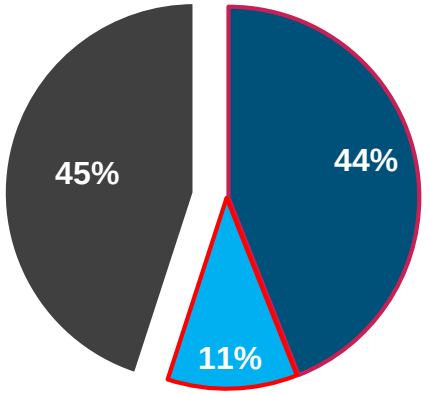
Social Media = Driving Product Discovery + Purchases

Social Media Driving Product Discovery…



% of Respondents that Have Discovered Products on Platform, USA (18-34 Years Old)

…Social Media Discovery Driving Purchases



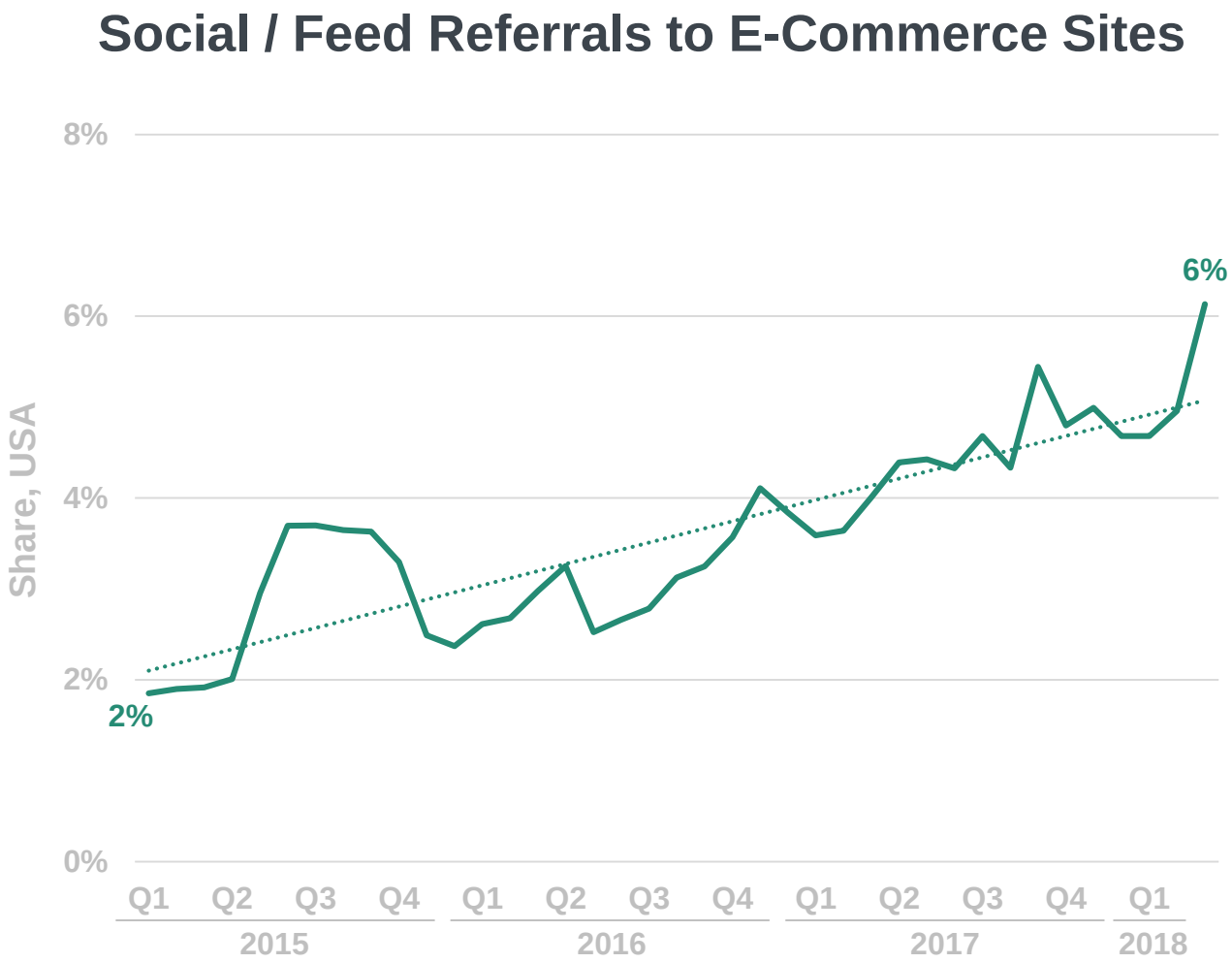
55% = Bought Product Online After Social Media Discovery

- Bought Online Later
- Bought Online Immediately
- Never Bought / Other

% of Respondents, USA (18-65 Years Old)

Source: Curalate Consumer Survey 2017 (8/17). Note: n = 1,000 USA consumers ages 18-65. Left chart question: 'In the last 3 months, have you discovered any retail products that you were interested in buying on any of the following social media channels?' Right chart question: 'What action did you take after discovering a product in a brand's social media post?' Never Bought / Other includes offline purchases made later.

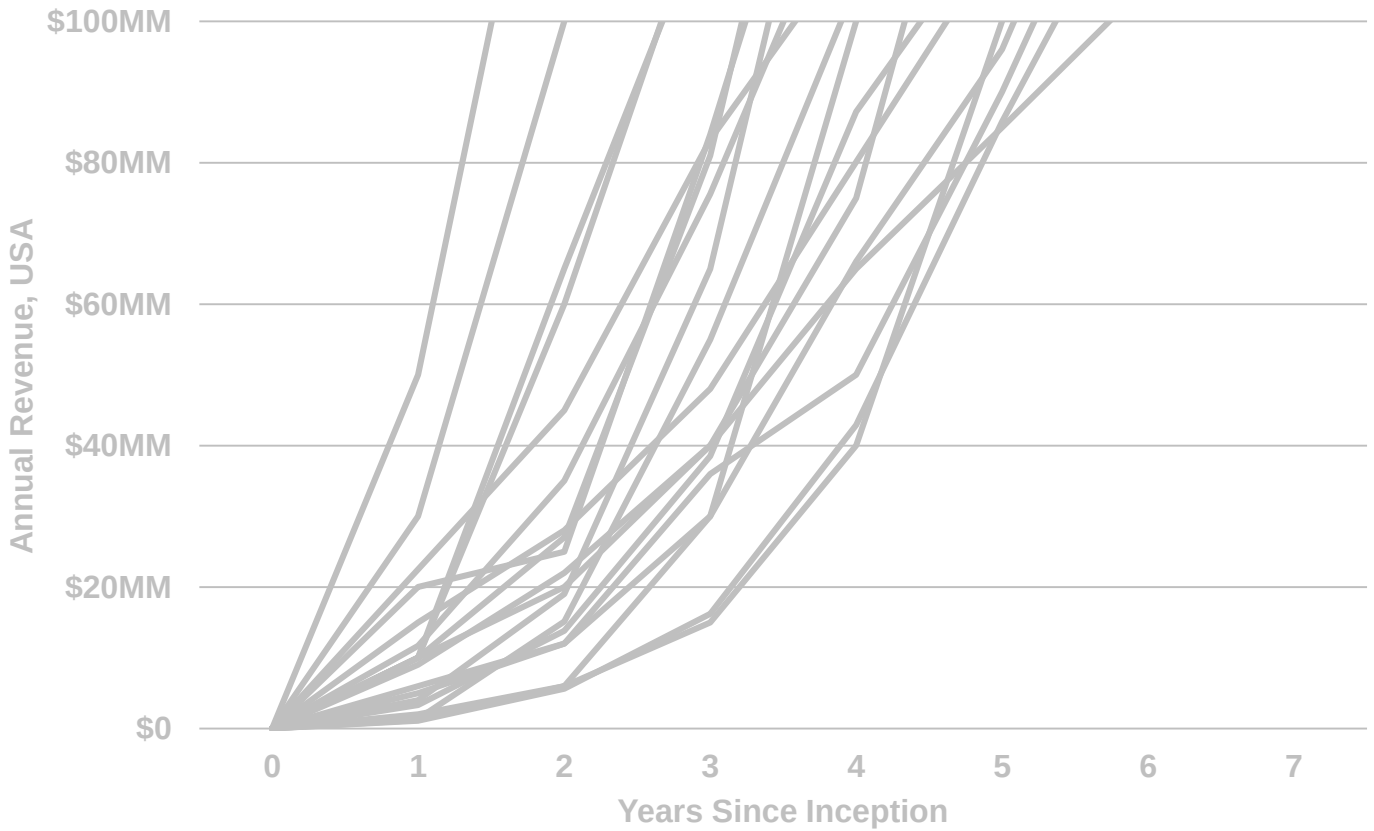
Social Media =
Share of E-Commerce Referrals Rising @ 6% vs. 2% (2015)



Source: Adobe Digital Insights (5/18). Note: Adobe Digital Insights based on 50B+ online USA page visits since 2015. Data is collected on a per-visit basis across all internet connected devices and then aggregated by Adobe. Data reflects 5/1/18 measurements.

Social Media =
Helping Drive Growth for Emerging DTC Retailers / Brands

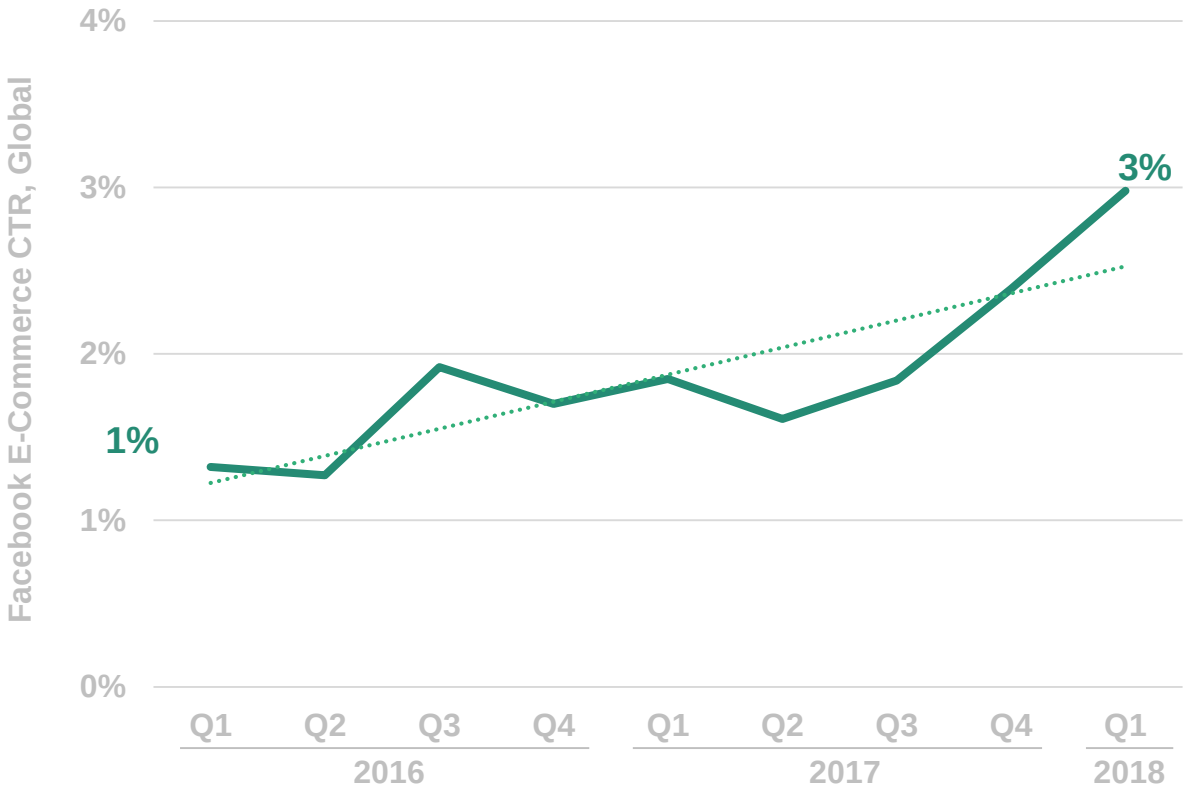
Select USA Direct-to-Consumer (DTC) Brands – Revenue Ramp to $100MM Since Inception*



Source: Internet Retailer *2017 Top 1,000 Guide*. *Data only for E-Commerce sales and shown in 2017 dollars. Chart includes pure-play E-Commerce retailers and evolved pure-play retailers. The Top 1,000 Guide uses a combination of internal research staff and well-known e-commerce market measurement firms such as Compete, Compuware APM, comScore, ForeSee, Experian Marketing Services, StellaService and ROI Revolution to collect and verify information.

Social Media =
Ad Engagement Rising…Facebook E-Commerce CTRs Rising

Facebook E-Commerce CTRs (Click-Through Rates)



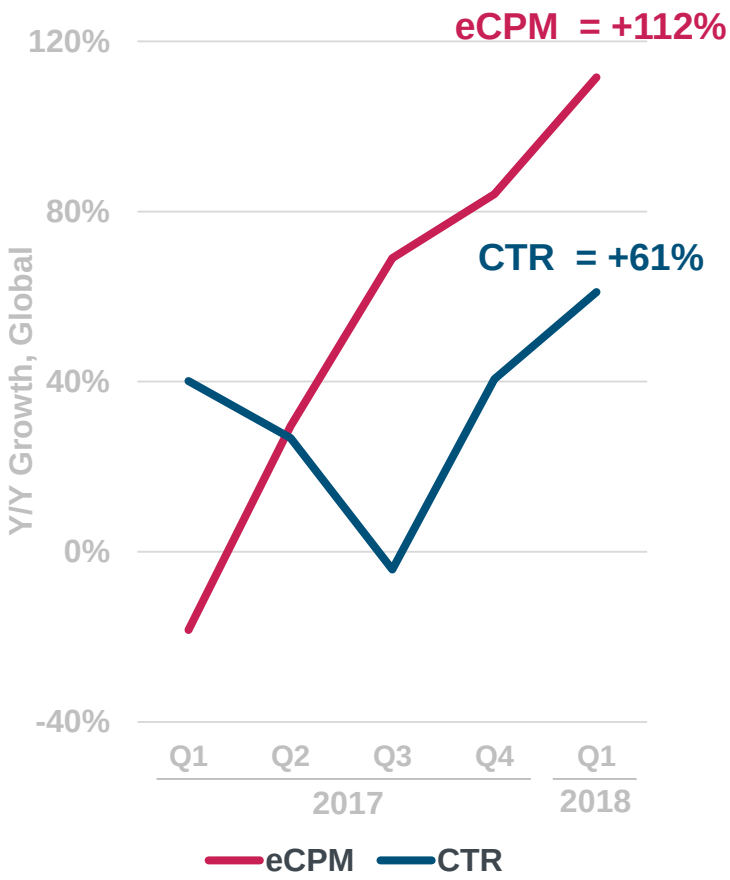
Source: Facebook, Nanigans Quarterly Facebook Benchmarking Data. Note: Click-Through Rate is defined as the percentage of people visiting a web page who access a hyperlink text from a particular advertisement. CTR figures based on $600MM+ of ad spend through Nannigan's platform.

Return on Ad Spend = Cost Rising @ Faster Rate than Reach

In performance-based [digital advertising] channels, ***competition for top placement has reduced ROIs over the years & been a source of margin pressure…***

- Glenn D. Fogel, CEO & President, Booking Holdings
Q3:17 Earnings Call, (11/17)

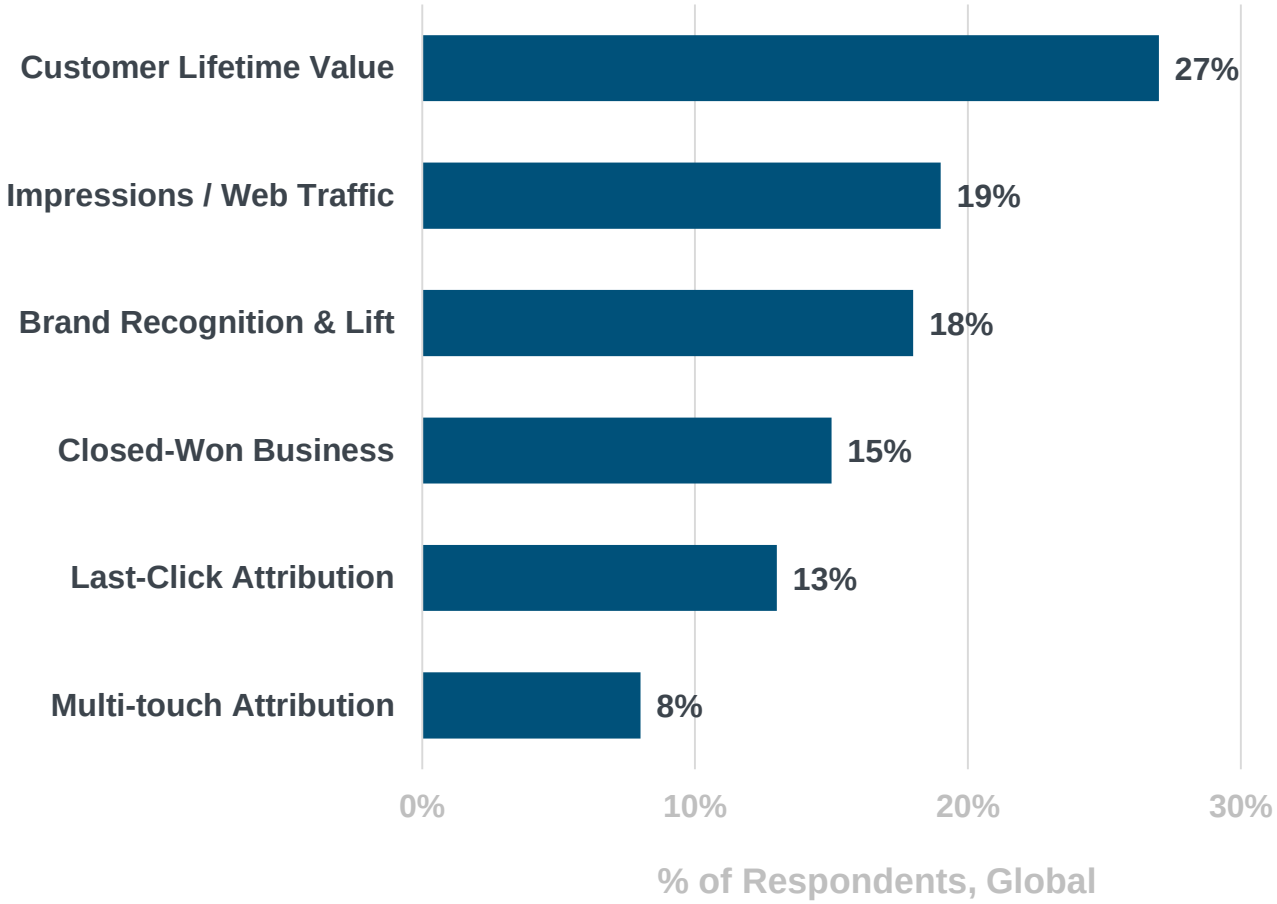
Facebook E-Commerce
eCPM vs. CTR Y/Y Growth



Source: Booking Holdings Inc. (11/17), Nanigans Quarterly Facebook Benchmarking Data. Note: eCPMs are defined as the effective (blended across ad formats) cost per thousand ad impressions. Click-Through Rate is defined as the percentage of people visiting a web page who access a hyperlink text from a particular advertisement. CTR figures based on $600MM+ of ad spend through Nanigan's platform. In 2017, Booking Holdings spent $4.1B on online performance advertising which is primarily focused on search engine marketing (SEM) channels. The quote on the left relates to historical long-term ad ROI trends as competition across performance channels intensified.

Customer Lifetime Value (LTV) = Importance Rising as... Customer Acquisition Cost (CAC) Increases

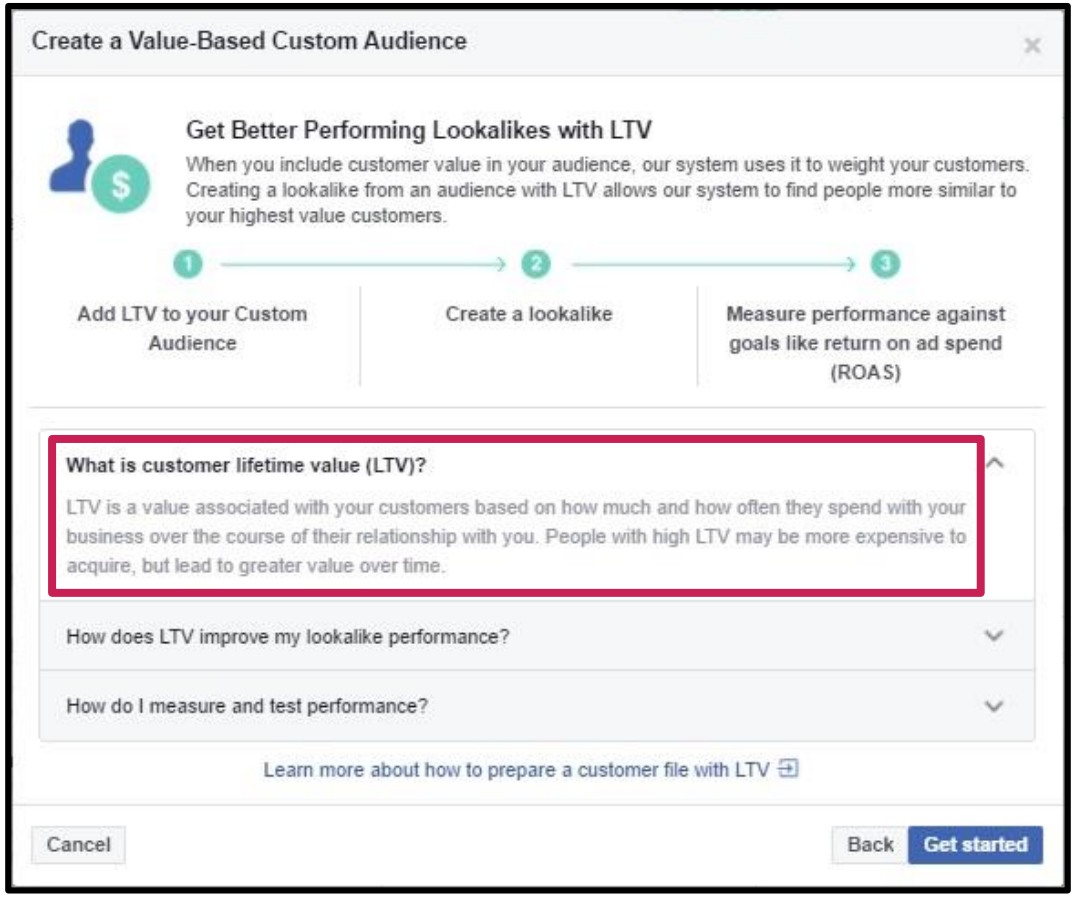
What Do You Consider To Be Important Ad Spending Optimization Metrics?



Source: Salesforce Digital Advertising 2020 Report (1/18). Note: n = 900 full-time advertisers, media buyers, and marketers with the title of manager and above. Respondents are from companies in North America (USA, Canada), Europe (France, Germany, Netherlands, UK, Ireland) and Asia Pacific (Japan, Australia, New Zealand) with each region having 300 participants. The survey was done online via FocusVision in 11/17.

Lifetime Value / Customer Acquisition Cost (LTV / CAC) = Increasingly Important Metric for Retailers / Brands

Facebook Ad Analytics Tools LTV Integration

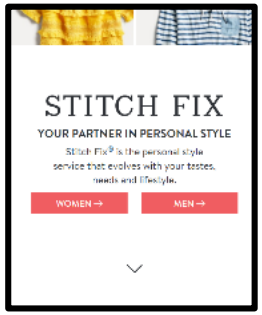


Source: Facebook (3/17).

Data-Driven Personalization / Recommendations =

Early Innings @ Scale

Evolution of Commerce Drivers (1890s -> 2010s) = Demographic -> Brand -> Utility -> Data



1890s - 1940s	1940s - 1990s	1990s - 2010s	2010s - …
Demographic	**Brand**	**Utility**	**Data**
Catalogs	**Department Stores / Malls**	**E-Commerce – Transactional**	**E-Commerce – Personalized**
Limited product selection + shopping moments	Rising product selection + shopping moments	Massive product selection + 24x7 shopping moments	Curated product discovery + 24x7 recommendations
• Sears Roebuck • Montgomery Ward	• Macy's • GAP • Nike	• Amazon • eBay	• Amazon • Facebook • Stitch Fix

Source: Eric Feng @ Kleiner Perkins
Wikimedia, eBay, Stitch Fix.

Product Purchases =

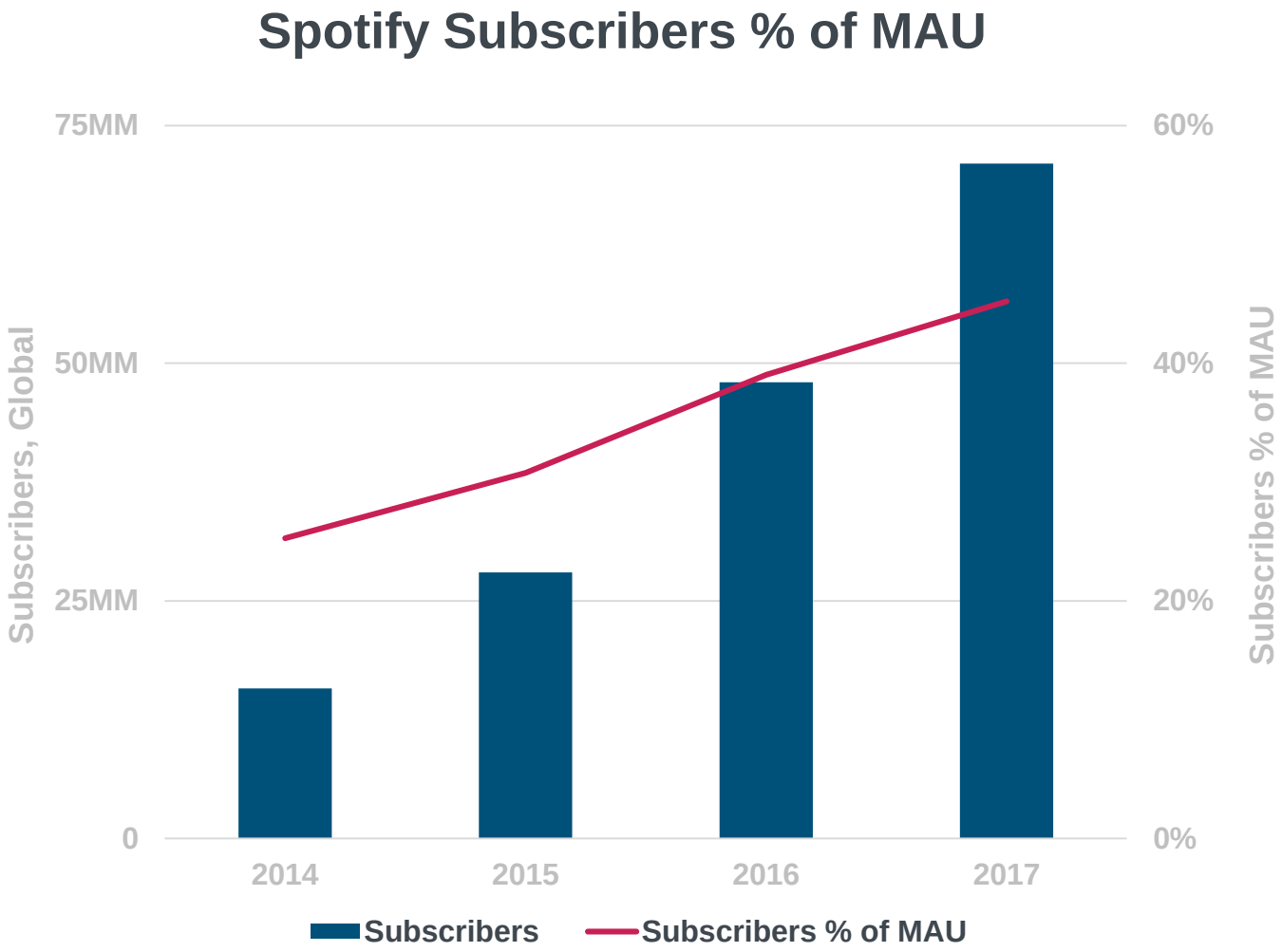
Many Evolving from Buying to Subscribing

Subscription Service Growth = Driven by...
Access / Selection / Price / Experience / Personalization

Online Subscription Services Representative Companies		Subscribers 2017	Growth Y/Y
Netflix	Video	118MM	+25%
Amazon	Commerce / Media	100MM	--
Spotify	Music / Audio	71MM	+48%
Sony PlayStation Plus	Gaming	34MM	+30%
Dropbox	File Storage	11MM	+25%
The New York Times	News / Media	3MM	+43%
Stitch Fix	Fashion / Clothing	3MM	+31%
LegalZoom	Legal Services	550K	+16%
Peloton	Fitness	172K	+173%

Source: Netflix, Amazon, Spotify, Sony, Dropbox, The New York Times, Stitch Fix, LegalZoom, Peloton.
Note: Netflix = global streaming memberships. The New York Times = digital subscribers. Sony PlayStation Plus figures reflect FY, which ends March 31. Stitch Fix figures reflect FY, which ends January 31.

Free-to-Paid Conversion = Driven by User Experience... Spotify Subscribers @ 45% of MAUs vs. 0% @ 2008 Launch

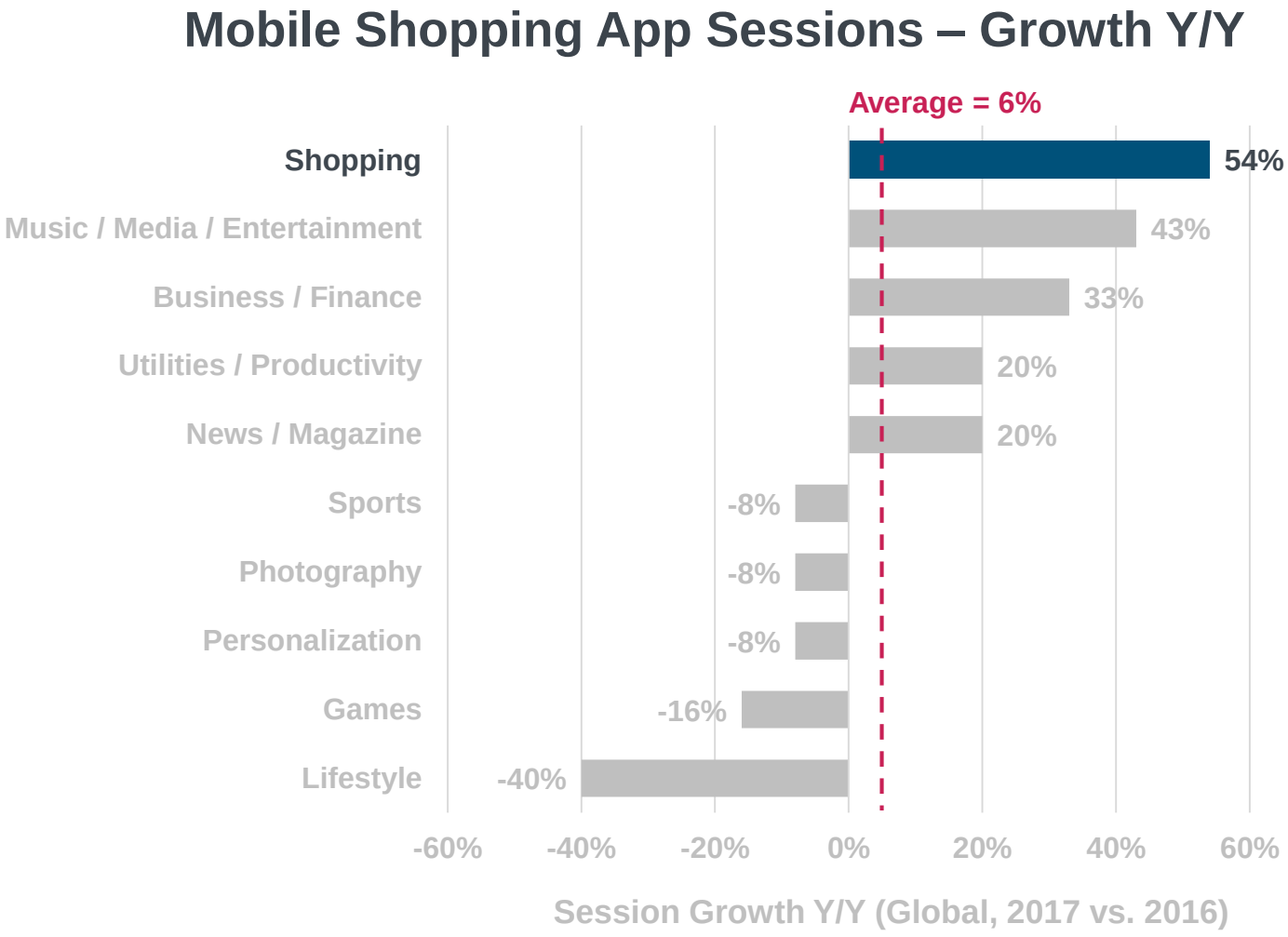


Source: Spotify (5/18). Note: MAU = Monthly Active Users.

Shopping =

Entertainment…

Mobile Shopping Usage = Sessions Growing Fast

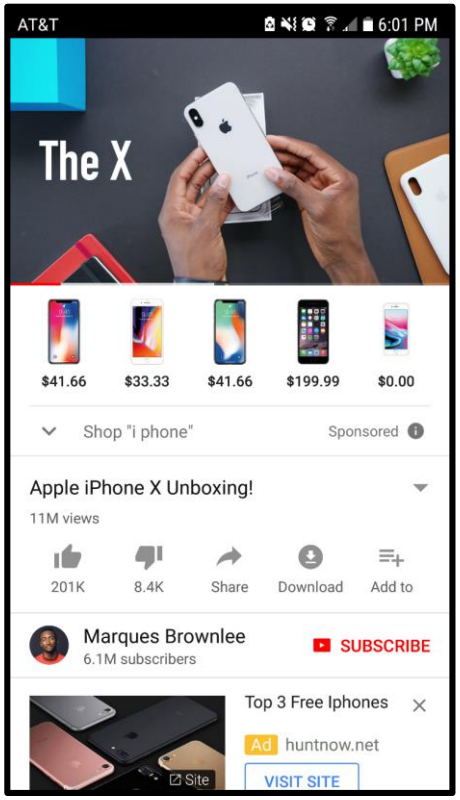


Source: Flurry Analytics State of Mobile 2017 (1/18). Note: n = 1MM applications across 2.6B devices globally. Sessions defined as when a user opens an app.

Product + Price Discovery = Often Video-Enabled…

YouTube

Many USA Consumers View YouTube Before Purchasing Products



Taobao

1.5MM+ Active Content Creators

Source: YouTube (3/16, 5/18), Alibaba (3/18), Right image: South China Morning Post (2/18). Note: Many USA customers refers to data in a report published by Google, based on Google / Ipsos Connect, YouTubeSports Viewers Study conducted on n = 1,500 18-54 year old consumers in the USA in 3/16.

…Product + Price Discovery = Often Social + Gamified

Wish

Hourly Deals
300MM+ Users

Pinduoduo

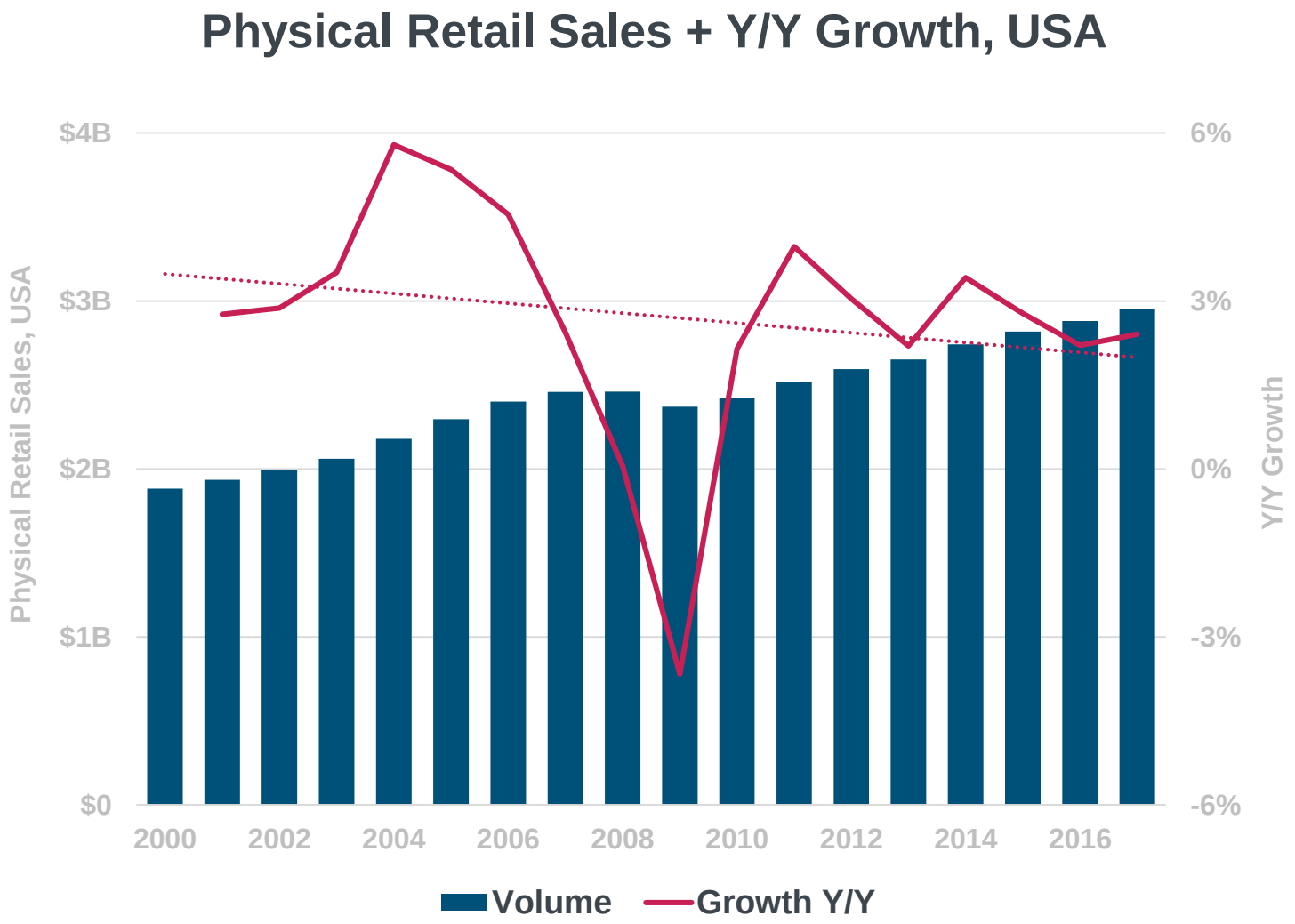
Refer Friends to Reduce Price

Source: Wish (5/18), Pinduoduo (1/18), Right image: Walkthechat (1/18).
Note: Wish user figures are cumulative users, not MAU.

Physical Retail Trending =

Long-Term Growth Deceleration

Physical Retail =
Long-Term Sales Growth Deceleration Trend



Source: St. Louis Federal Reserve FRED Database. Note: Physical Retail includes all retail sales excluding food services, motor vehicles / auto parts & fuel.

'New Retail' =

Alibaba View from China

Alibaba =
Building E-Commerce Ecosystem Born in China

Source: Alibaba Investor Day (6/17).

Alibaba & Amazon = Similar Focus Areas…
Alibaba = Higher GMV…Amazon = Higher Revenue (2017)

Alibaba		Amazon
$509B = Market Capitalization $701B = GMV(E) +29% Y/Y $34B = Revenue +31% Y/Y 60% = Gross Margin $14B = Free Cash Flow 8% = Non-China Revenue as % of Total**		$783B = Market Capitalization $225B = GMV(E) +25% Y/Y $178B = Revenue +31% Y/Y 37% = Gross Margin $4B = Free Cash Flow 31% = Non-USA Revenue as % of Total**
Tmall / Taobao / AliExpress / Lazada / Alibaba.com / 1688.com / Juhuasuan / Daraz	**Online Marketplace**	Amazon.com
Intime / Suning* / Hema	**Physical Retail**	Whole Foods / Amazon Go / Amazonbooks
Ant Financial* / Paytm*	**Payments**	Amazon Payments
Youku / UCWeb / Alisports / Alibaba Music / Damai / Alibaba Pictures*	**Digital Entertainment**	Amazon Video / Amazon Music / Twitch / Amazon Game Studios / Audible
Ele.Me (Local) / Koubei (Local) / Alimama / (Marketing) / Cainiao (Logistics) / Autonavi (Mapping) / Tmall Genie (IoT)	**Other**	Alexa (IoT) / Ring (IoT) / Kindle + Fire Devices (Hardware)
Alibaba Cloud	**Cloud Platform**	Amazon Web Services (AWS)

Source: Grace Chen (Alibaba) + Brian Nowak (Amazon) @ Morgan Stanley. *Alibaba has invested but does not have a majority ownership. **Alibaba Non-China revenue = Alibaba International Commerce revenue (AliExpress, Lazada, & Alibaba.com). Amazon Non-USA revenue = Retail sales of consumer products & subscriptions through internationally-focused websites outside of North America. Note: All figures reflect calendar year 2017. Alibaba GMV includes Non-China GMV estimates, Y/Y Growth is FX adjusted using 6.76 RMB / USD average exchange rate for 2017. All figures refer to calendar year. Market cap as of 5/29/18. Amazon GMV includes in-store GMV. FCF = Cash flow from operations - stock-based compensation - capital expenditures.

Alibaba =
'New Retail' Vision Starts in China…

…through technology & consumer insights,
we [Alibaba] put the right products in front of right customers at the right time…
our 'New Retail' initiatives are substantially growing Alibaba's total addressable market in commerce…
in this process of digitizing the entire retail operation,
we are driving a massive transformation of the traditional retail industry.

It is fair to say that our e-commerce platform is fast becoming the leading retail infrastructure of China.

Since Jack Ma coined the term 'New Retail' in 2016,
the term has been widely adopted in China by traditional retailers & Internet companies alike.
New Retail has become the most talked about concept in business…

Alibaba has three unique success factors that are enabling us to realize the New Retail vision.

Alibaba CQ1:18 & CQ4:17 Earnings Calls, 5/4/18, 1/24/18

…Alibaba =
'New Retail' Vision Starts in China

…Alibaba's
marketplace platforms handle billions of transactions each month
in shopping, daily services & payments.
These transactions provide us with the
best insights into consumer behavior
& shifting consumption trends. This puts us in the best position to enable our retail partners to grow their business.

…Alibaba is a ***deep technology*** *company.*
We contribute expertise in cloud, artificial intelligence, mobile transactions & enterprise systems to help our retail partners improve their businesses through digitization & operating efficiency.

…Alibaba has the most
comprehensive ecosystem of commerce platforms, logistics & payments
to support the digital transformation of the retail sector.

Alibaba CQ1:18 & CQ4:17 Earnings Calls, 5/4/18, 1/24/18.

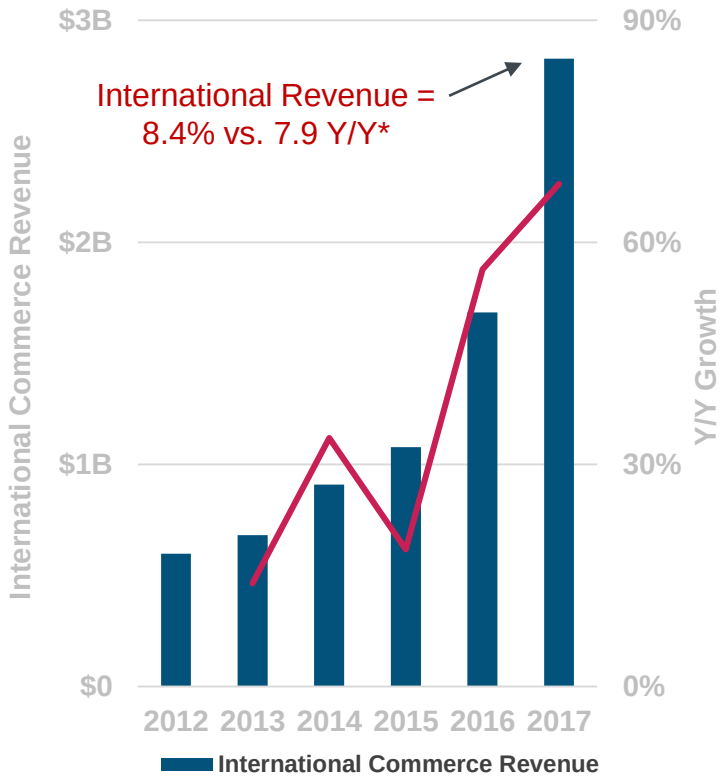
…Alibaba = Extending Platform Beyond China

Alibaba Non-China E-Commerce Highlights

Selected Investment

Company	Country	Category	Type	Date
Daraz.pk	Pakistan	Marketplace	M&A	5/18
Tokopedia	Indonesia	Marketplace	Equity	8/17
Paytm	India	Payments	Equity	4/17
Lazada	Singapore	Marketplace	M&A	4/16

Revenue

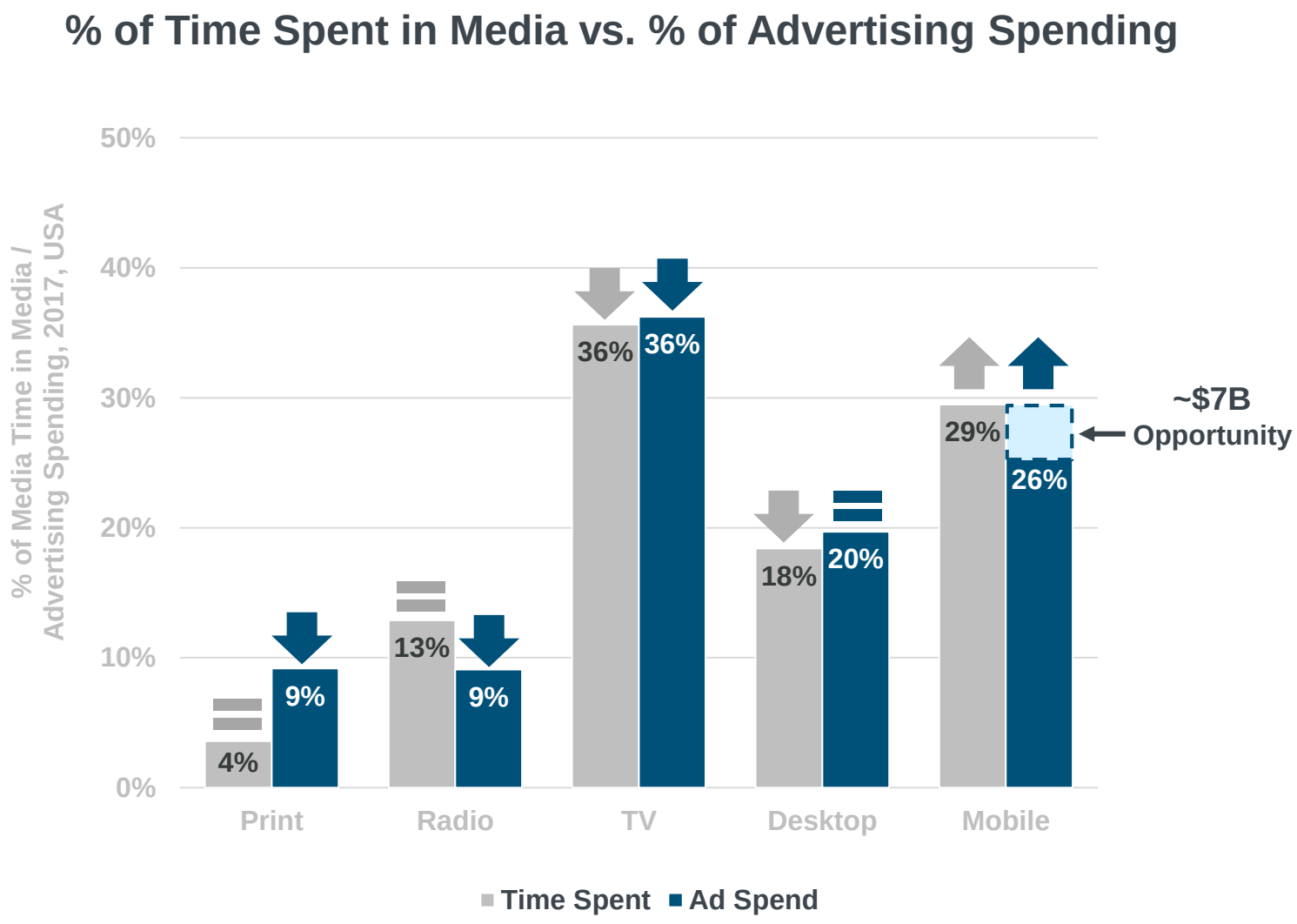


Source: Alibaba, Pitchbook. *Percentages represent international commerce revenue proportion of total revenue. Note: All figures are calendar year. Revenue figures translated using the USD / CNY = 6.76, the average rate for 2017. Grey indicates a majority control stake, all others are minority investments. Country based on headquarters, not countries of operation. Alibaba International Commerce revenue includes revenue generated from AliExpress, Lazada, and Alibaba.com.

INTERNET ADVERTISING =

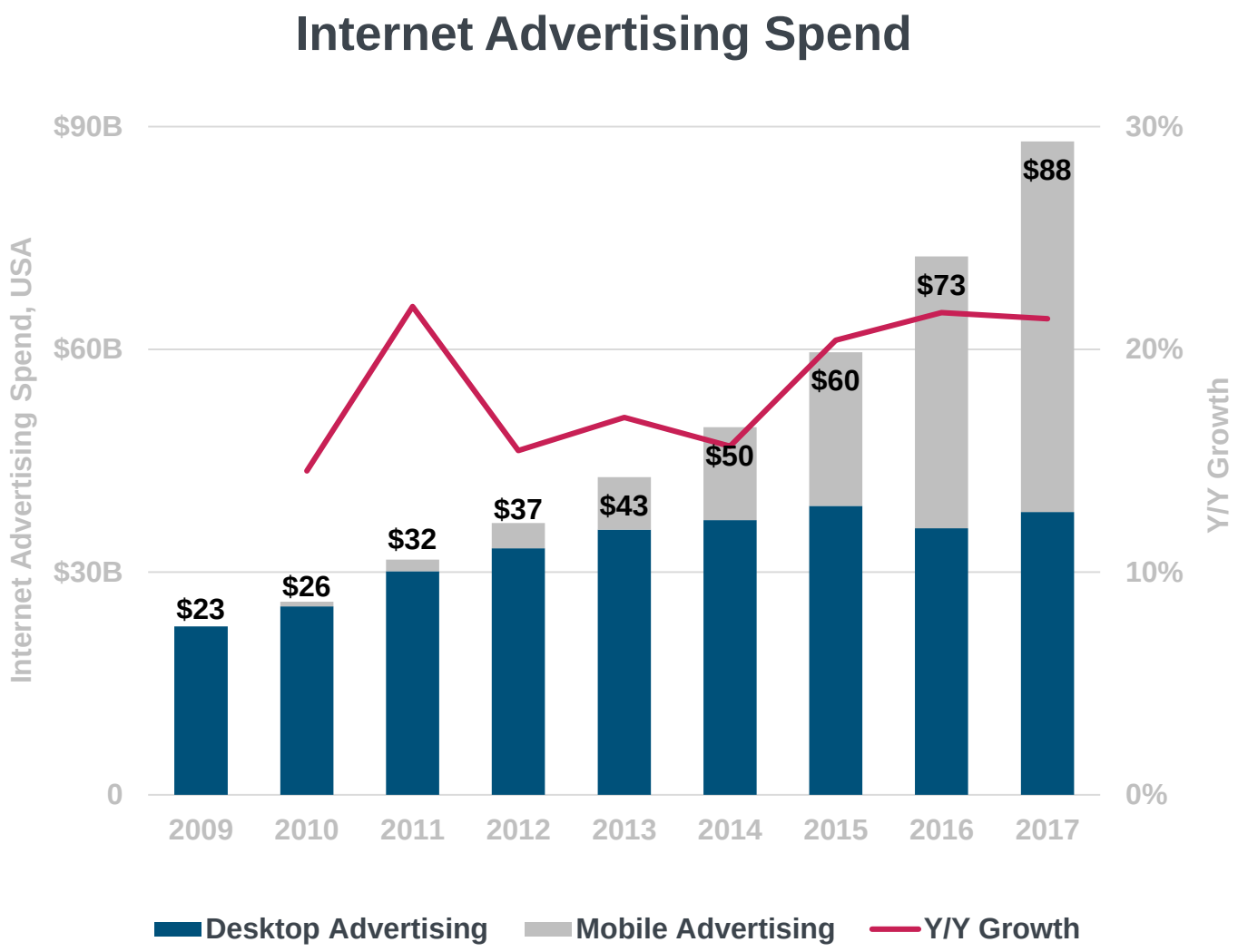
GROWTH CONTINUING...
ACCOUNTABILITY RISING

Advertising $ =
Shift to Usage (Mobile) Continues



Source: Internet and Mobile advertising spend based on IAB and PwC data for full year 2017. Print advertising spend based on Magna Global estimates for full year 2017. Print includes newspaper and magazine. ~$7B opportunity calculated assuming Mobile (IAB) ad spend share equal its respective time spent share. Time spent share data based on eMarketer (9/17). Arrows denote Y/Y shift in percent share. Excludes out-of-home, video game & cinema advertising.

Internet Advertising = +21% vs. +22% Y/Y



Source: IAB / PWC Internet Advertising Report (5/18).

Advertisers / Users vs. Content Platforms = Accountability Rising...

Many Americans Believe Fake News Is Sowing Confusion

Pew Research Center, December 2016

Procter & Gamble Cut Up to $140 Million in Digital Ad Spending Because of Brand Safety Concerns

Adweek, July 2017

Unilever Threatens to Reduce Ad Spending on Tech Platforms That Don't Combat Divisive Content

The Wall Street Journal, February 2018

...Advertisers / Users vs. Content Platforms = Accountability Rising

Content Initiatives

Google / YouTube

8MM = Videos Removed (Q4:17)…
81% Flagged by Algorithms…
75% Removed Before First View

2MM = Videos De-Monetized For Misleading Content Tagging (2017)

10K = Content Moderators (2018 Goal)

Facebook (Q1:18)

583MM = Fake Accounts Removed…
99% Flagged Prior To User Reporting

21MM = Pieces of Lewd Content Removed…
96% Flagged by Algorithms

3.5MM = Pieces of Violent Content Removed…
86% Flagged by Algorithms

2.5MM = Pieces of Hate Speech Removed…
38% Flagged by Algorithms

+7,500 = Content Moderators…
3,000 Hired (5/17–2/18)

Source: YouTube (5/18, 12/17), Facebook (Transparency Report: 5/18, 5/17, 2/18). Note: All Google content moderators represent full-time hires but Facebook content moderators are not all full-time.

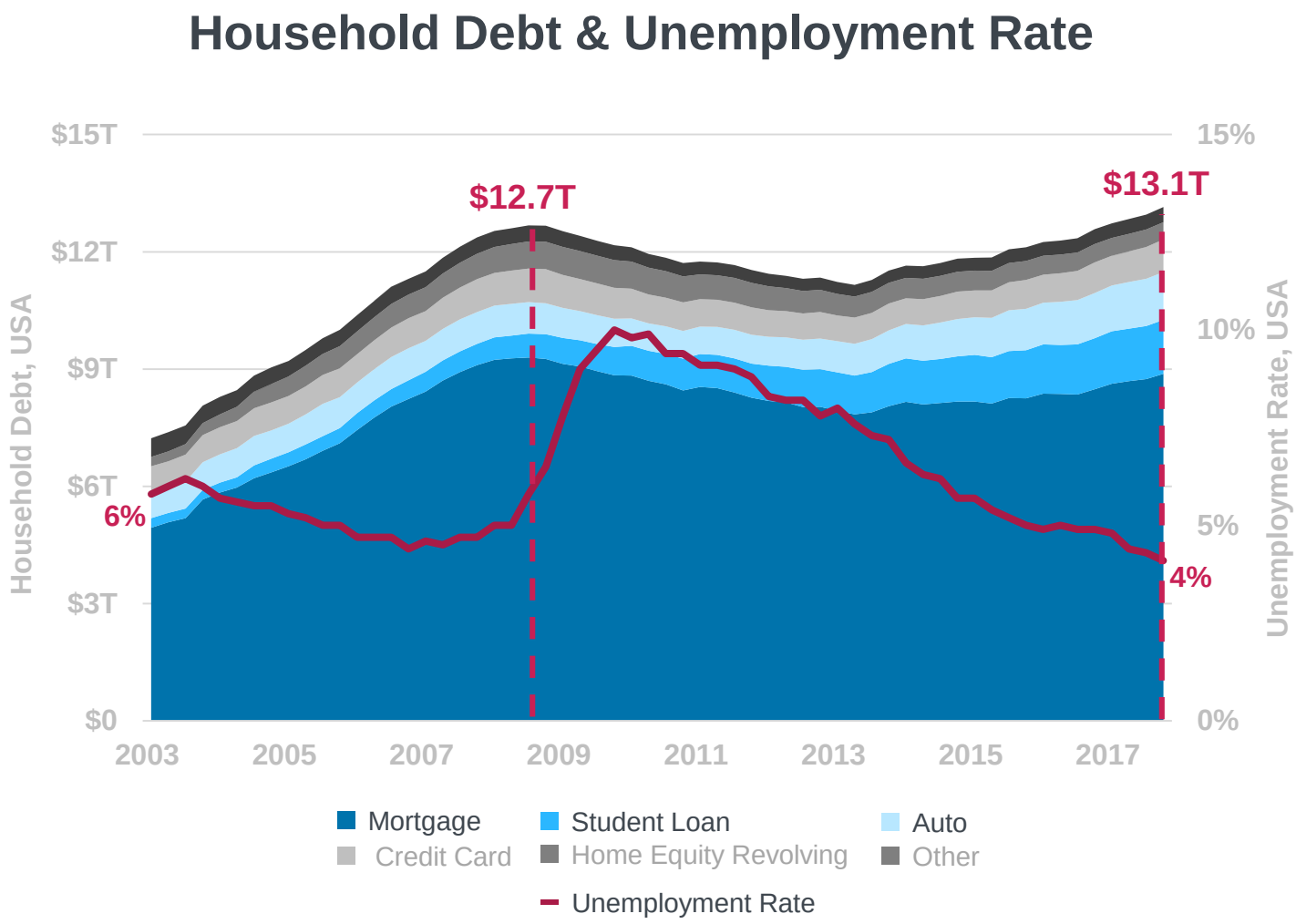
CONSUMER SPENDING =

DYNAMICS EVOLVING…
INTERNET CREATING OPPORTUNITIES

Consumers…

Making Ends Meet = Difficult

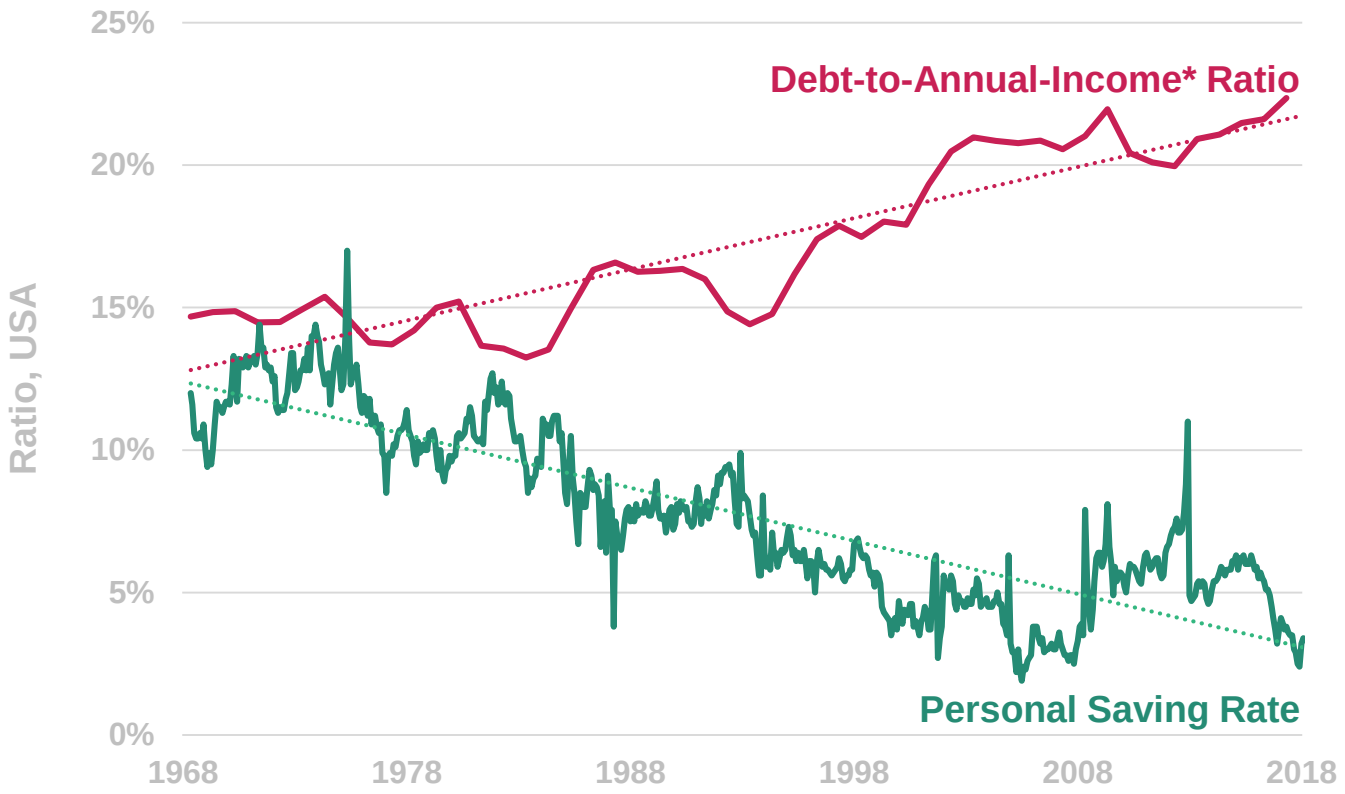
Household Debt = Highest Level Ever & Rising…
Change vs. Q3:08 = Student +126%...Auto +51%...Mortgage -4%



Source: Federal Reserve Bank of New York Consumer Credit Panel / Equifax, Quarterly Household Debt and Credit Report, Q4:17; St. Louis Federal Reserve FRED Database.

Personal Saving Rate = Falling @ 3% vs. 12% Fifty Years Ago… Debt-to-Annual-Income Ratio = Rising @ 22% vs. 15%

Personal Saving Rate & Debt-to-Annual-Income* Ratio

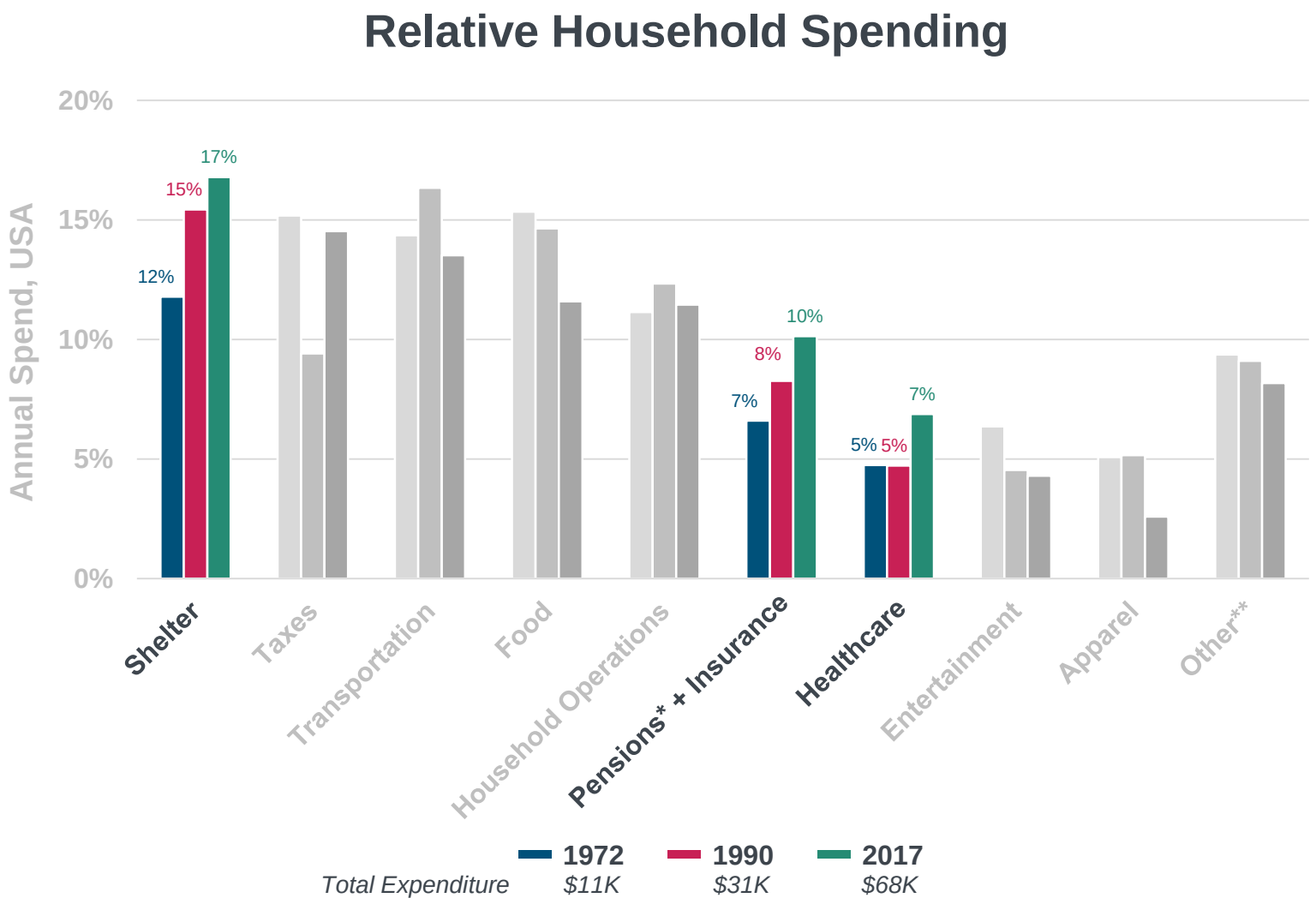


Source: St. Louis Federal Reserve FRED Database, USA Federal Reserve Bank. *Consumer debt-to-annual-income ratio reflects outstanding credit extended to individuals for household, family, and other personal expenditures, excluding loans secured by real estate vs. average annual personal income. Personal saving rate is shown as a percentage of disposable personal income (DPI), frequently referred to as "the personal saving rate." (i.e. the annual share of disposable income dedicated to saving)

Relative Household Spending =

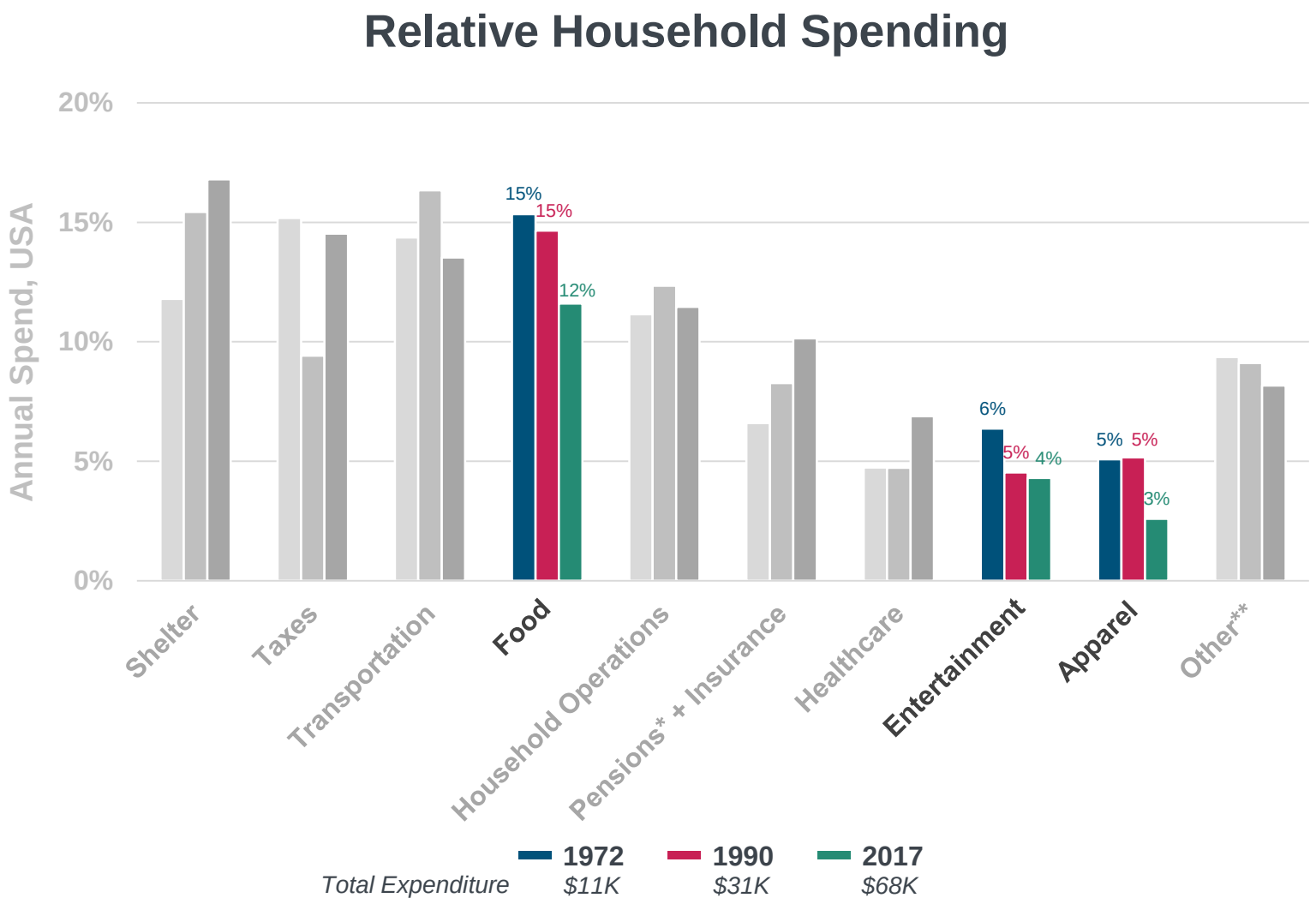
Shifting Over Past Half-Century

Relative Household Spending *Rising* Over Time = Shelter + Pensions / Insurance + Healthcare…



Source: USA Bureau of Labor Statistics (BLS), Consumer Expenditure Survey. *Pensions + Insurance includes deductions for private retirement accounts, social security, and life insurance. **Other Includes education and miscellaneous other expenses. Note: Results based on Surveys of American Urban & Rural Households (Families & Single Consumers). 1972 data reflects non-annual survey conducted by BLS + Census Bureau to adjust CPI. 1990 and 2017 Data Based on Annual Survey performed by BLS + Census Bureau. Healthcare costs include insurance, drugs, out-of-pocket medical expenses, etc. 2017 = mid-year figures.

…Relative Household Spending *Falling* Over Time = Food + Entertainment + Apparel



Source: USA Bureau of Labor Statistics (BLS), Consumer Expenditure Survey. *Pensions + Insurance includes deductions for private retirement accounts, social security, and life insurance. **Other Includes education and miscellaneous other expenses. Note: Results based on Surveys of American Urban & Rural Households (Families & Single Consumers). 1972 data reflects non-annual survey conducted by BLS + Census Bureau to adjust CPI. 1990 and 2017 Data Based on Annual Survey performed by BLS + Census Bureau. Healthcare costs include insurance, drugs, out-of-pocket medical expenses, etc. 2017 = mid-year figures.

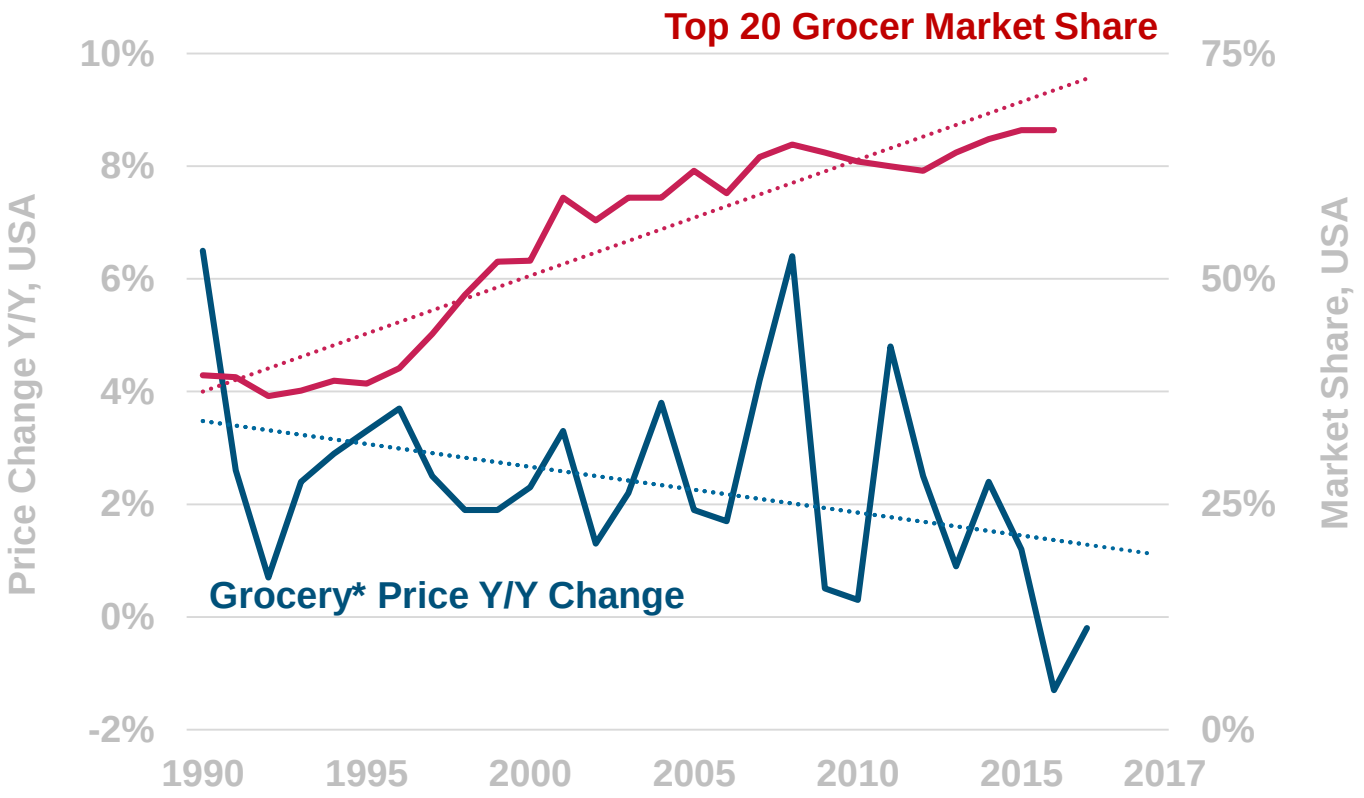
Food =

12% vs. 15% of

Household Spending 28 Years Ago...

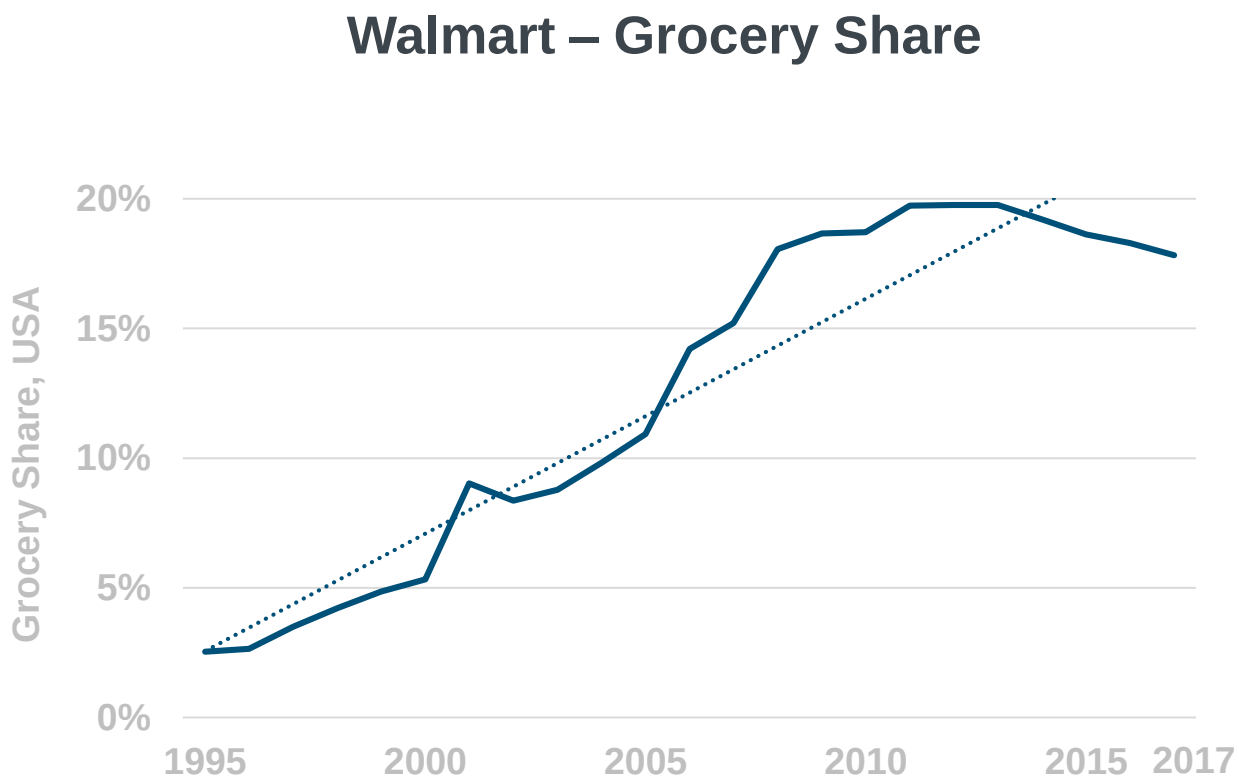
Grocery Price Growth = Declining Trend…
Owing To Grocery Competition

Grocery Price Change Y/Y & Market Share of Top 20 Grocers



Source: USDA Research Services, using data from the USA Census Bureau's Annual Retail Trade Survey + Company Reports, USA Bureau of Labor Statistics (BLS). *Grocery Price growth refers to the growth in prices for "Food at Home" as reported by the USA Census Bureau. Note: Includes all food purchases in CPI, other than meals purchased away from home (e.g., Restaurants). Grocery @ 56% of Food Spend in 2017 vs. 58% in 1990 per BLS.

Walmart = Helped Reduce Grocery Prices via Technology + Scale... per Greg Melich @ MoffettNathanson



By using technology to reduce inventory, expenses & shrinkage, we can create lower prices for our customers.

- Walmart 1999 Annual Report

Source: Greg Melich @ MoffettNathanson
Note: Share reflects retail value of food for off-site consumption sold across all Walmart properties.

E-Commerce =

Helping Reduce Prices for Consumers

E-Commerce sales have
risen rapidly over the past decade.

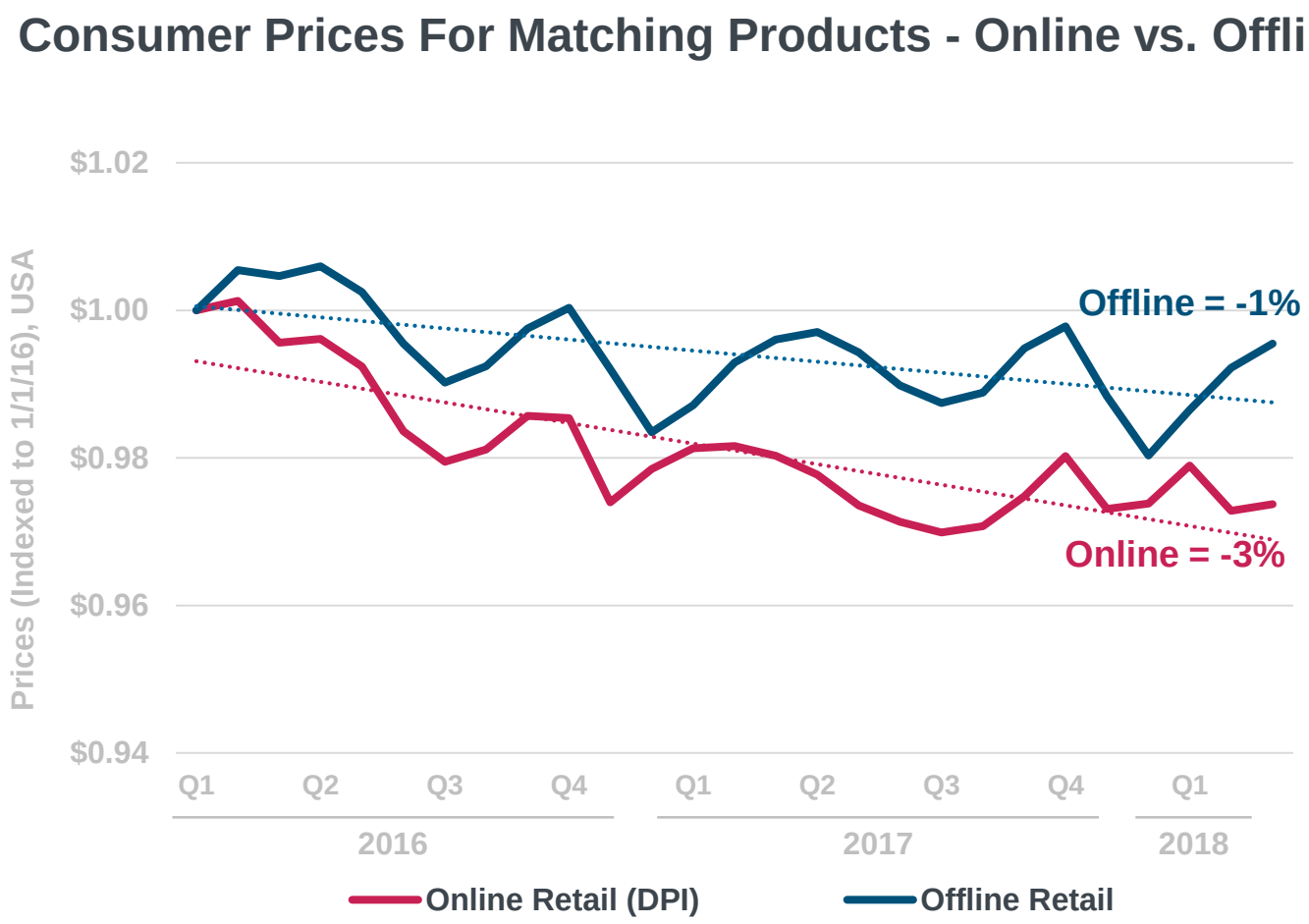
Online prices are falling – absolutely & relative to – traditional inflation measures like the CPI.

Inflation online is, literally, 200 basis points
lower per year than what the CPI has been showing.

To better understand the economy going forward,
we will need to find better ways to measure prices & inflation.

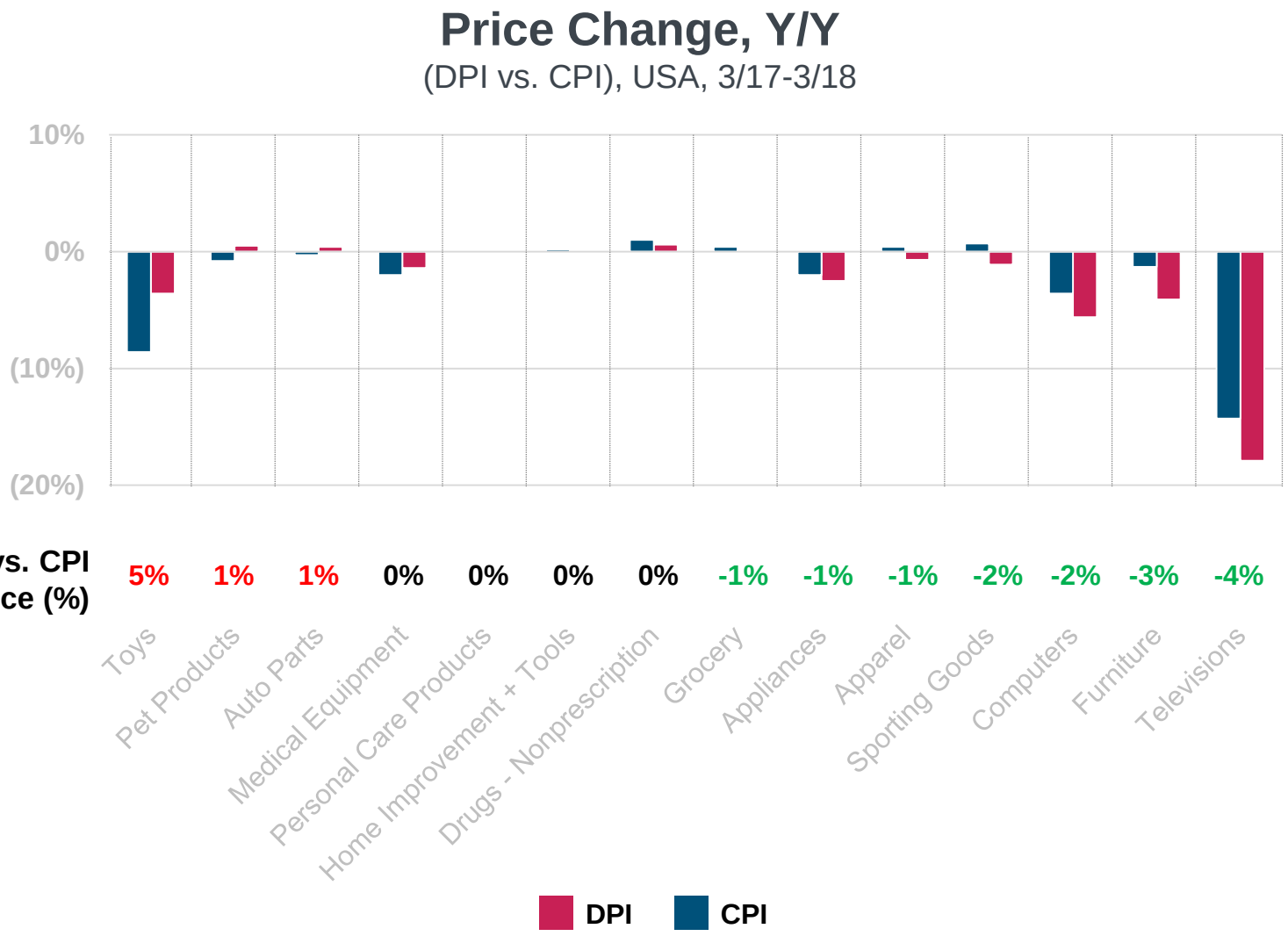
- Austan Goolsbee,
Professor of Economics, University of Chicago Booth School of Business, 5/18

Consumer Goods Prices = Have Fallen…
-3% Online & -1% Offline Over 2 1/4 Years per Adobe DPI…



Source: Adobe Digital Economy Project Note: Adobe Digital Economy Project measures prices and sales volume for 80% of online transactions at top 100 USA retailers (15B site visits & 2.2MM products) then calculates a Digital Price Index (DPI) using a Fisher Ideal model. CPI calculates USA prices using a basket of 83K goods, tracked monthly, & applied to a Laspeyeres model. DPI Excludes Apparel. Austan Goolsbee serves as strategic advisor to Adobe DPI project.

…Online vs. Offline Price Decline Leaders = TVs / Furniture / Computers / Sporting Goods per Adobe DPI



Source: Adobe Digital Economy Project Note: Adobe Digital Economy Project measures prices and sales volume for 80% of online transactions at top 100 USA retailers (15B site visits & 2.2MM products) then calculates a Digital Price Index (DPI) using a Fisher Ideal model. CPI calculates USA prices using a basket of 83K goods, tracked monthly, & applied to a Laspeyeres model. DPI Excludes Apparel. Austan Goolsbee serves as strategic advisor to Adobe DPI project.

We've seen how technology can make online shopping more efficient, with lower prices, more selection & increased convenience.

We are about to see the same thing happen to offline shopping.

- Hal Varian, Chief Economist @ Google, 5/18

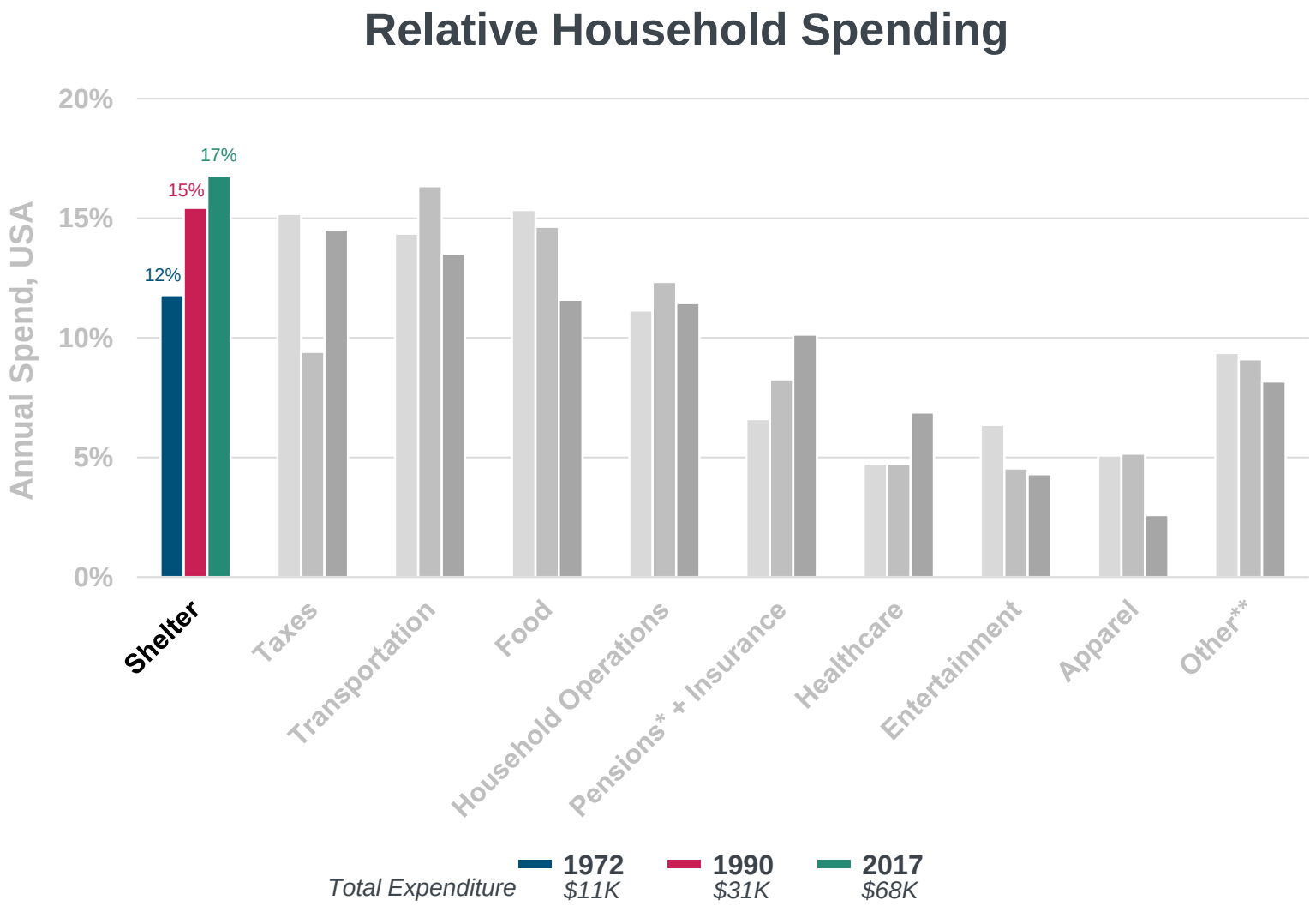
Relative Household Spending = How Might it Evolve?

Shelter Spend = Rising

Transportation Spend = Flat

Healthcare Spend = Rising

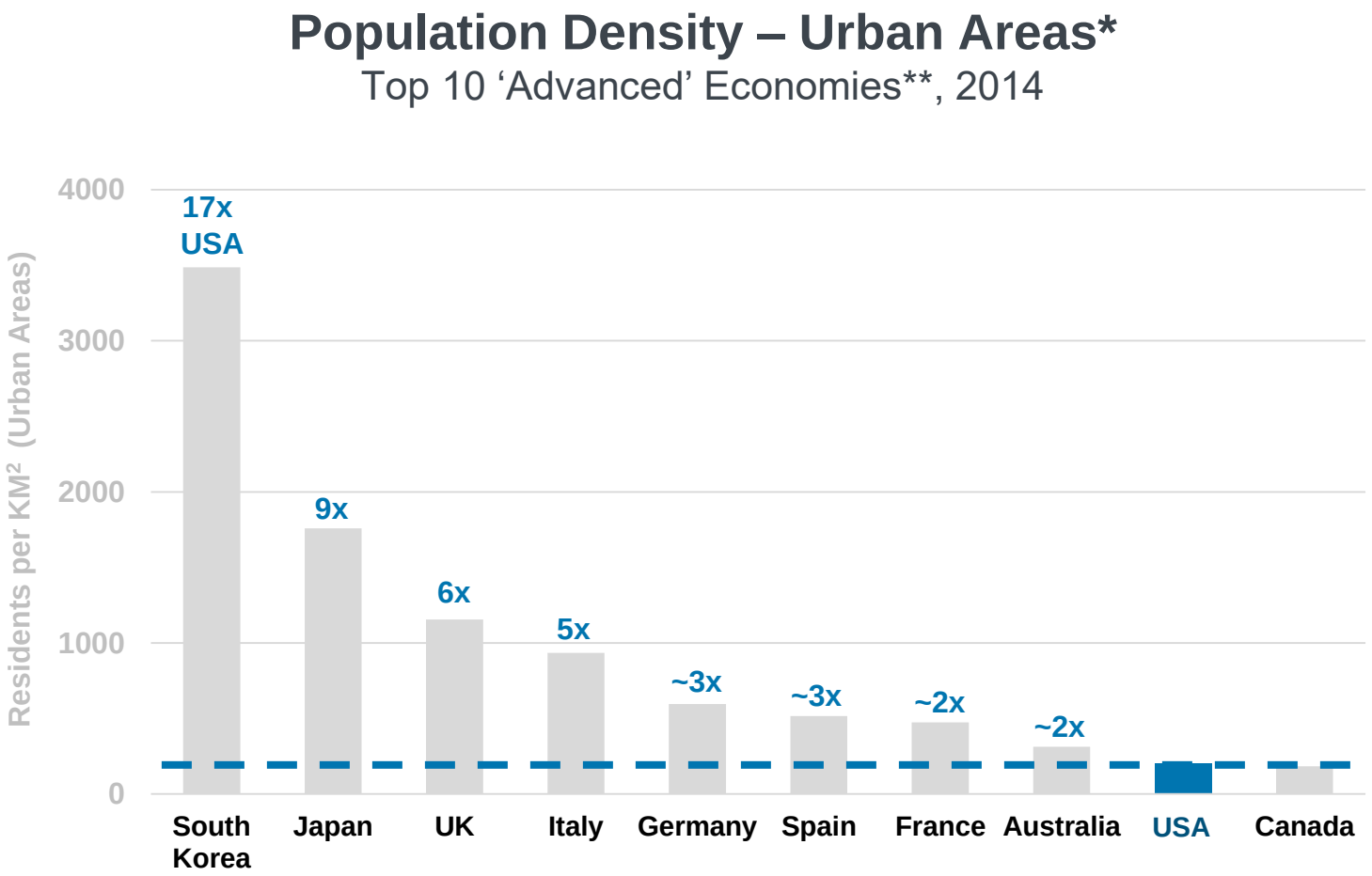
Shelter as % of Household Spending = 17% vs. 12% (1972)... Largest Segment in % + $ Growth



Source: USA Bureau of Labor Statistics (BLS), Consumer Expenditure Survey. *Pensions + Insurance includes deductions for private retirement accounts, social security, and life insurance. **Other Includes education and miscellaneous other expenses. Note: Results based on Surveys of American Urban & Rural Households (Families & Single Consumers). 1972 data reflects non-annual survey conducted by BLS + Census Bureau to adjust CPI. 1990 and 2017 Data Based on Annual Survey performed by BLS + Census Bureau. Healthcare costs include insurance, drugs, out-of-pocket medical expenses, etc.. 2017 = mid-year figures.

Shelter…

USA Cities =
Less Densely Populated vs. Developed World



Source: OECD, International Monetary Fund (IMF). *Urban areas defined as "Functional Urban Areas' per OECD/EU with greater than 500K residents. **IMF determines 'Advanced Economies' designation using a combination of GDP per Capita, Export Diversity, and integration into the global financial system.

USA Homes = Bigger vs. Developed World…

Average Home Size* (Square Feet) – Select Countries

USA
~1,500

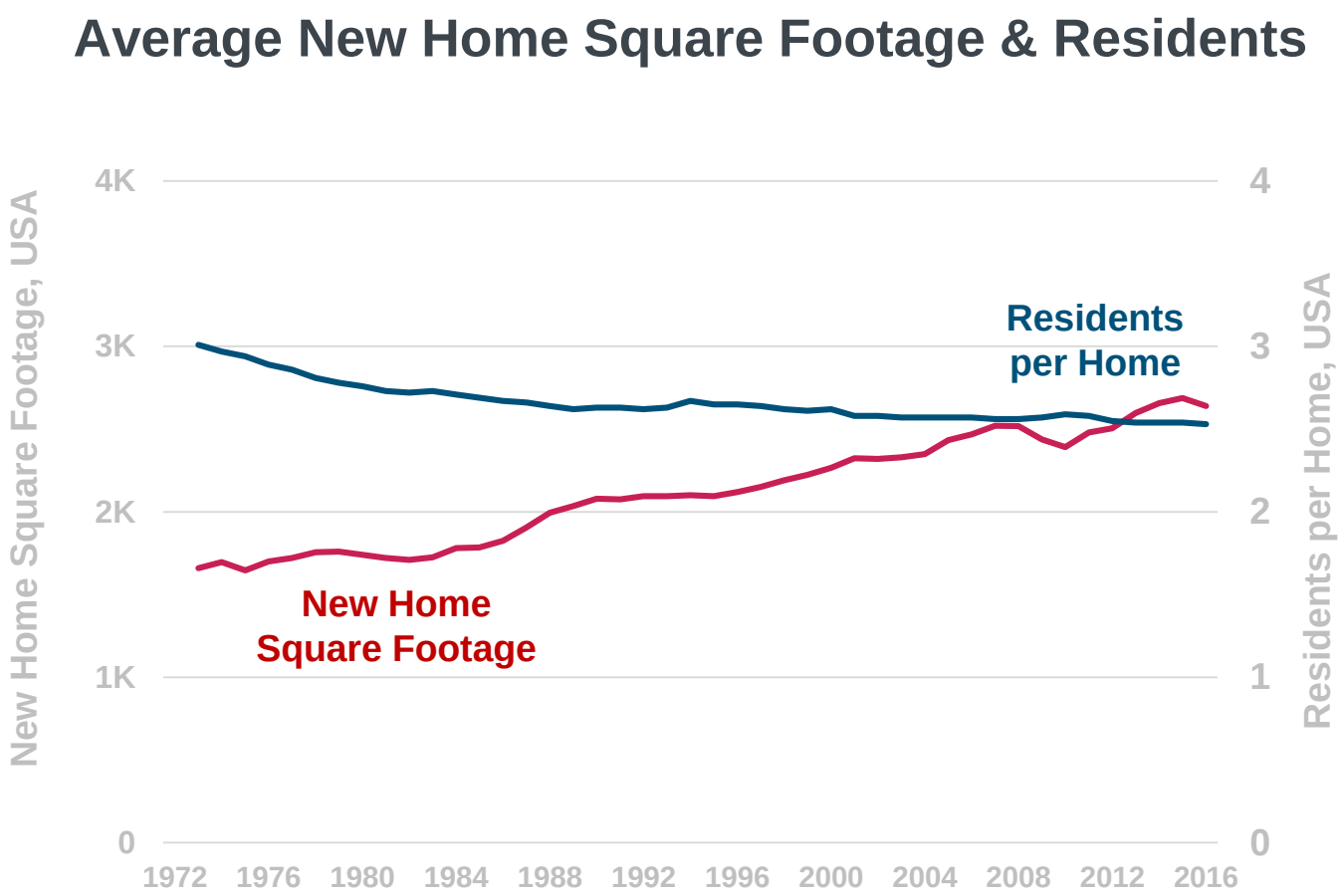
Japan
~1,015

UK
~990

South Korea
~725

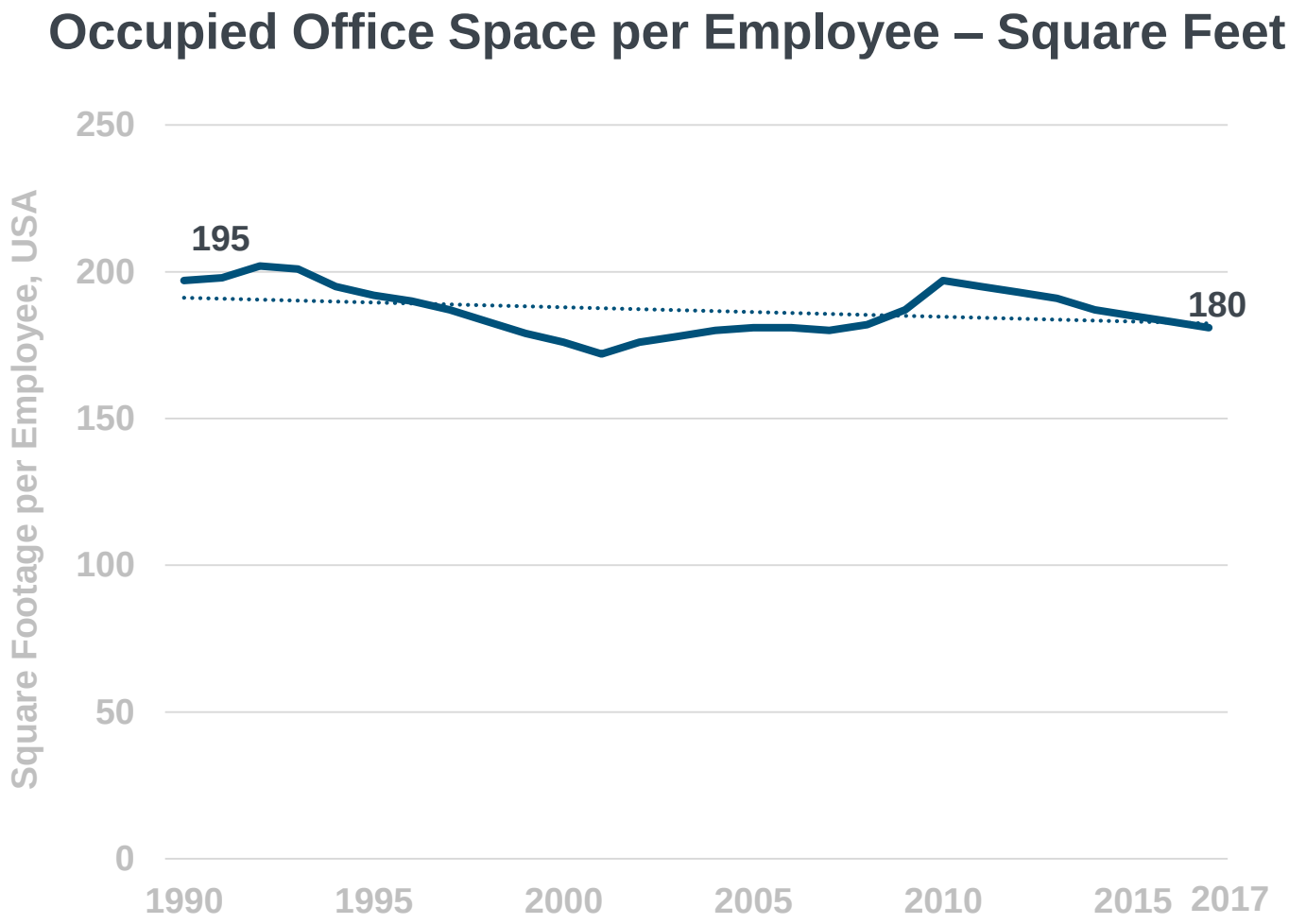
Source: Wikimedia, Japan Ministry of Internal Affairs, US Census Bureau, UK Office for National Statistics, Asian Development Bank Institute. *USA + Japan + UK = 2013. Korea = 2010, owing to lag in publication of government measured data. Note: Data reflects average occupied dwelling size across each nation.

…USA Homes =
Getting Bigger...Residents Falling @ 2.5 vs. 3.0 (1972)



Source: USA Census Bureau (6/17). Note: Data reflects newly built housing stock. Single Family homes includes newly built single family homes. Similar growth trends are seen across all housing units, as single-family homes are the majority of new USA housing stock. Average size of multifamily new dwelling in USA = 1,095 square feet in 1999 (earliest data available), 1,207 square feet in 2016. Residents per household based on all households.

USA Office Space =
Steadily Getting Denser / More Efficient



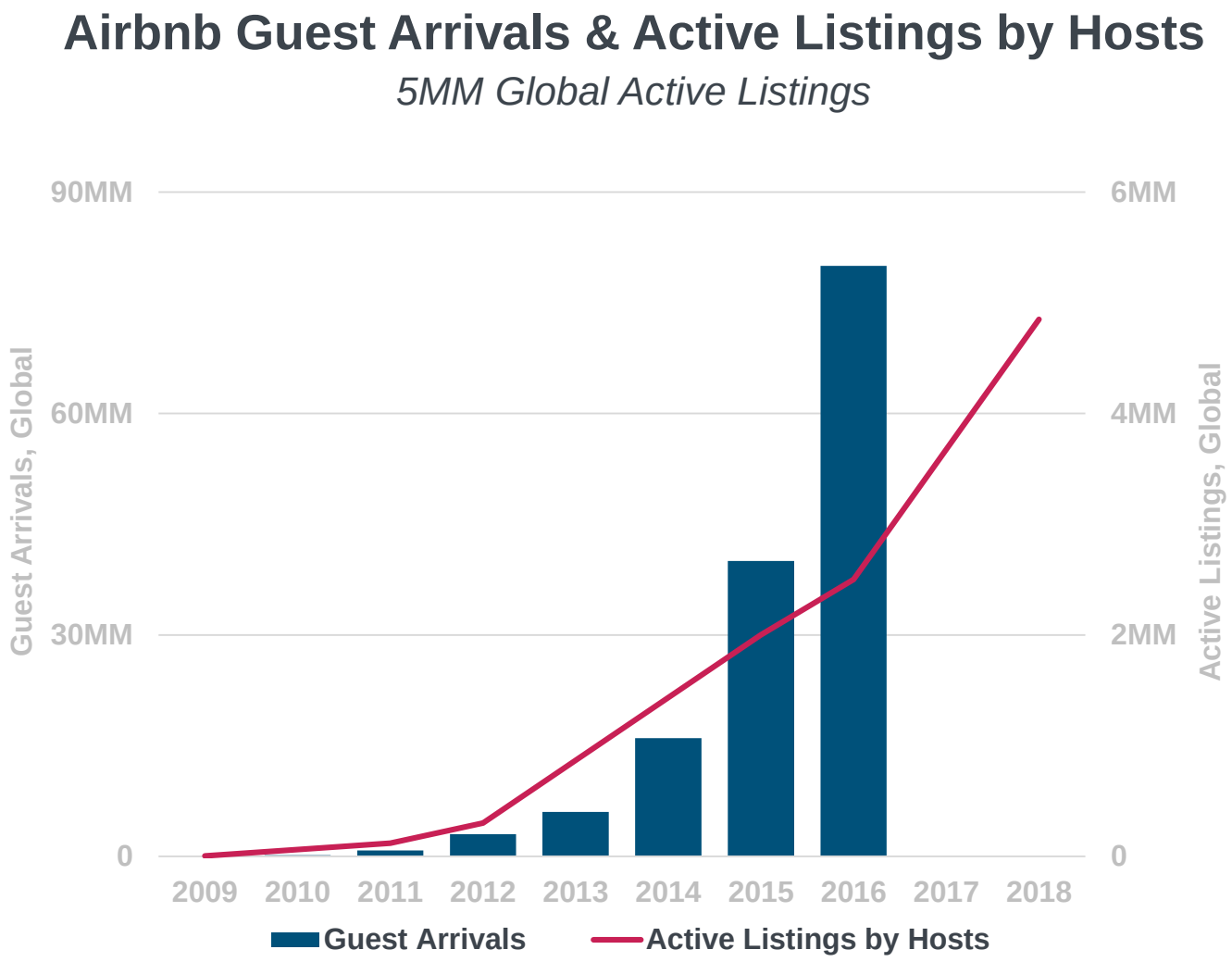
Source: CoStart Portfolio strategy Analysis of USA Leased office space & USA Employment Figures (2017).

…Shelter...

To Contain Spending…

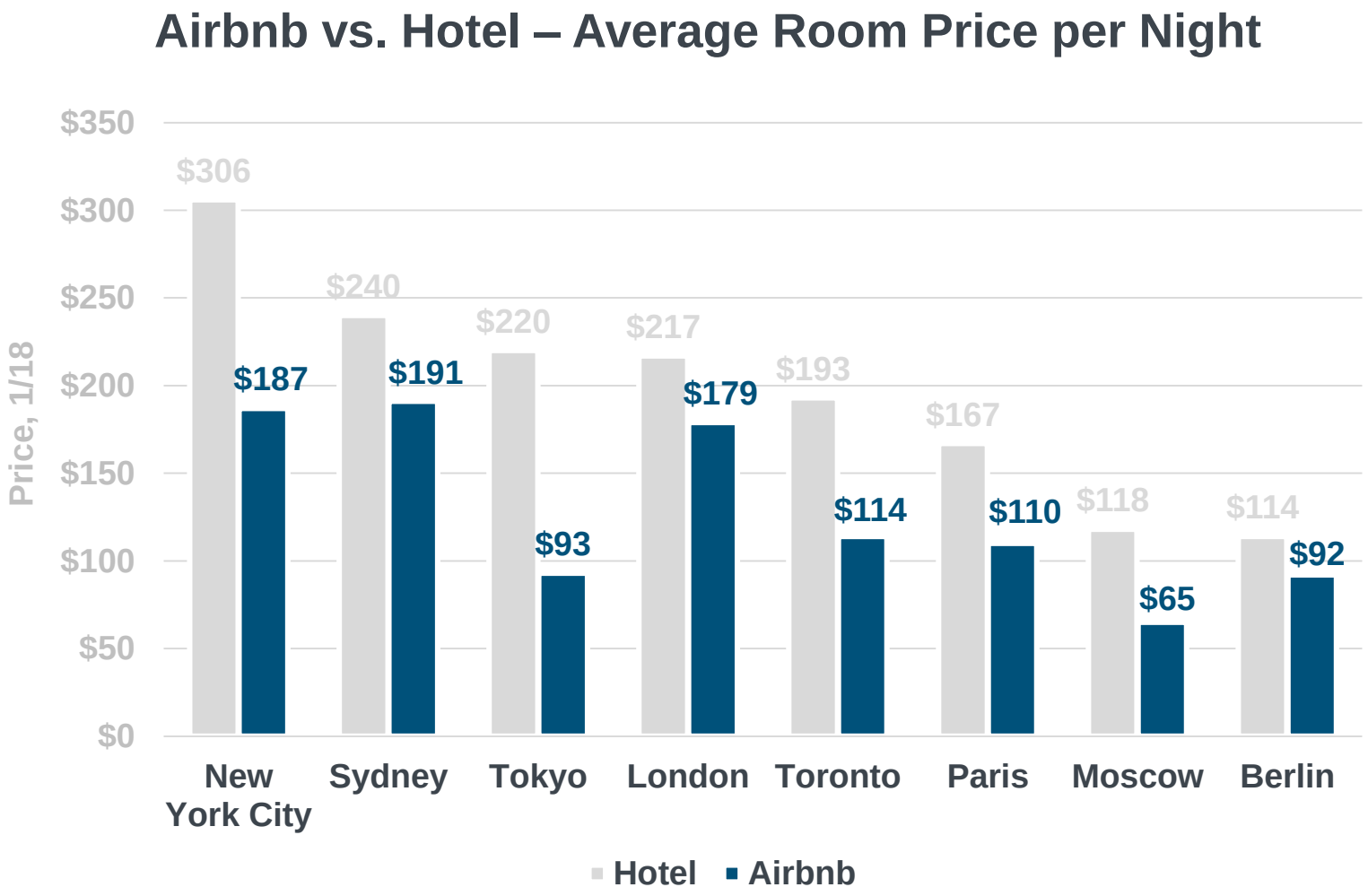
Consumers May Aim to Increase Utility of Space

Airbnb =
Provides Income Opportunities for Hosts…



Source: Airbnb, TechCrunch. Note: Airbnb disclosed in 2017 ~660K listings were in USA. A 2017 CBRE study of ~256K USA Airbnb listings + ~177K Airbnb hosts in Austin, Boston, Chicago, LA, Miami, Nashville, New Orleans, New York City, Oahu, Portland, San Francisco, Seattle, & Washington D.C. found that 83% of listings are made by single-listing hosts, or are listings for spaces within otherwise occupied dwellings. This implies that there >500K individuals listing spaces on Airbnb in USA as of 2018.

…Airbnb Consumer Benefits = Can Offer Lower Prices for Overnight Accommodations



Source: AirDNA, HRS, Originally Compiled by Statista. Note: Hotel data based on HRS's inventory of hotels. Euro prices converted to USD on 1/22/18.

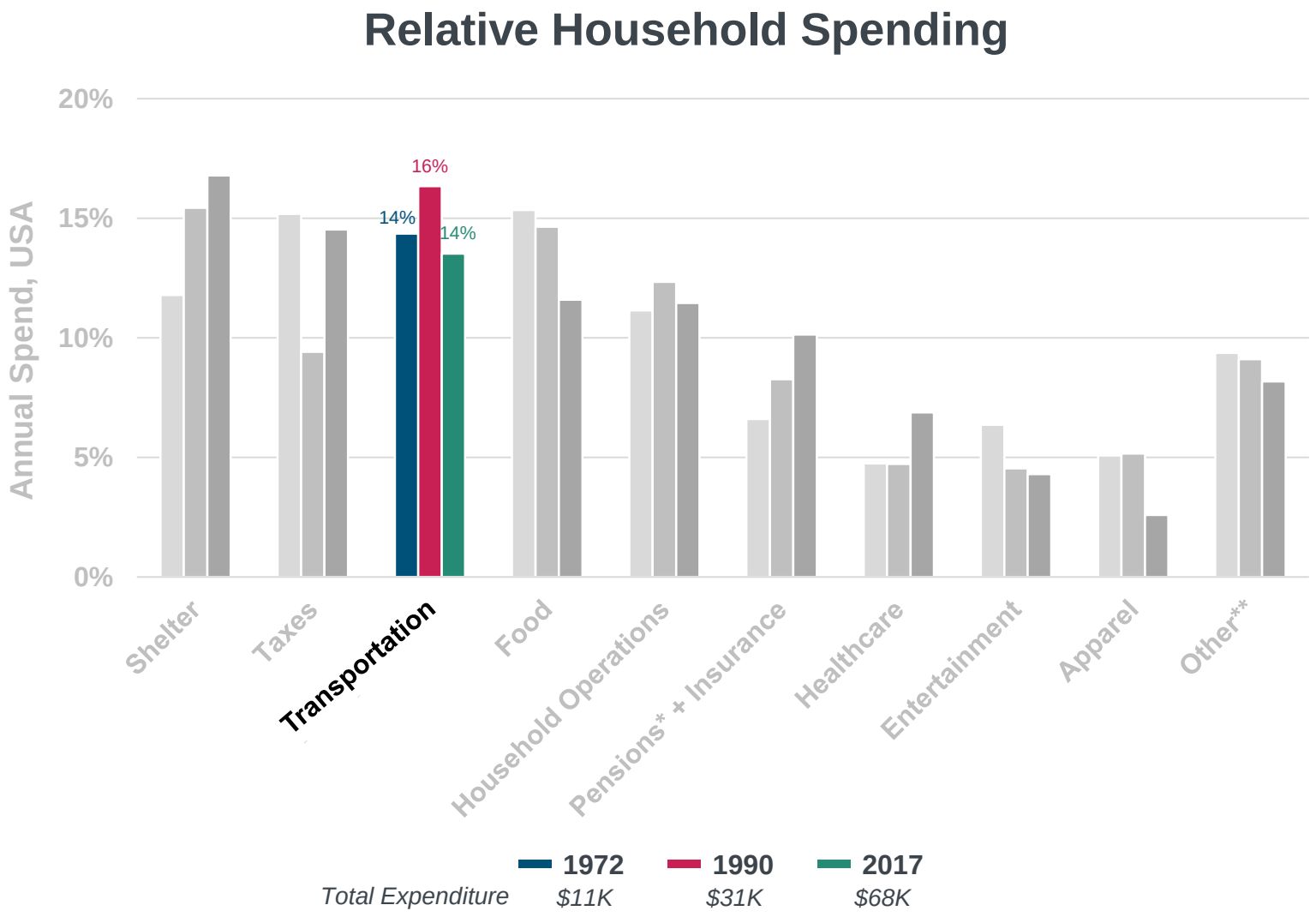
Relative Household Spending = How Might it Evolve?

Shelter Spend = Rising

Transportation Spend = Flat

Healthcare Spend = Rising

Transportation as % of Household Spending = 14% vs. 14% (1972)... #3 Segment of $ Spending Behind Shelter + Taxes



Source: USA Bureau of Labor Statistics (BLS), Consumer Expenditure Survey. *Pensions + Insurance includes deductions for private retirement accounts, social security, and life insurance. **Other Includes education and miscellaneous other expenses. Note: Results based on Surveys of American Urban & Rural Households (Families & Single Consumers). 1972 data reflects non-annual survey conducted by BLS + Census Bureau to adjust CPI. 1990 and 2017 Data Based on Annual Survey performed by BLS + Census Bureau. Healthcare costs include insurance, drugs, out-of-pocket medical expenses, etc.. 2017 = mid-year figures.

Transportation…

To Contain Spending…

Consumers Reducing Relative Spend on Vehicles + Increasing Utility of Vehicles

Transportation as % of Household Spending = Vehicle Purchase % Declining…Other Transportation % Rising

Relative Transportation Spending =

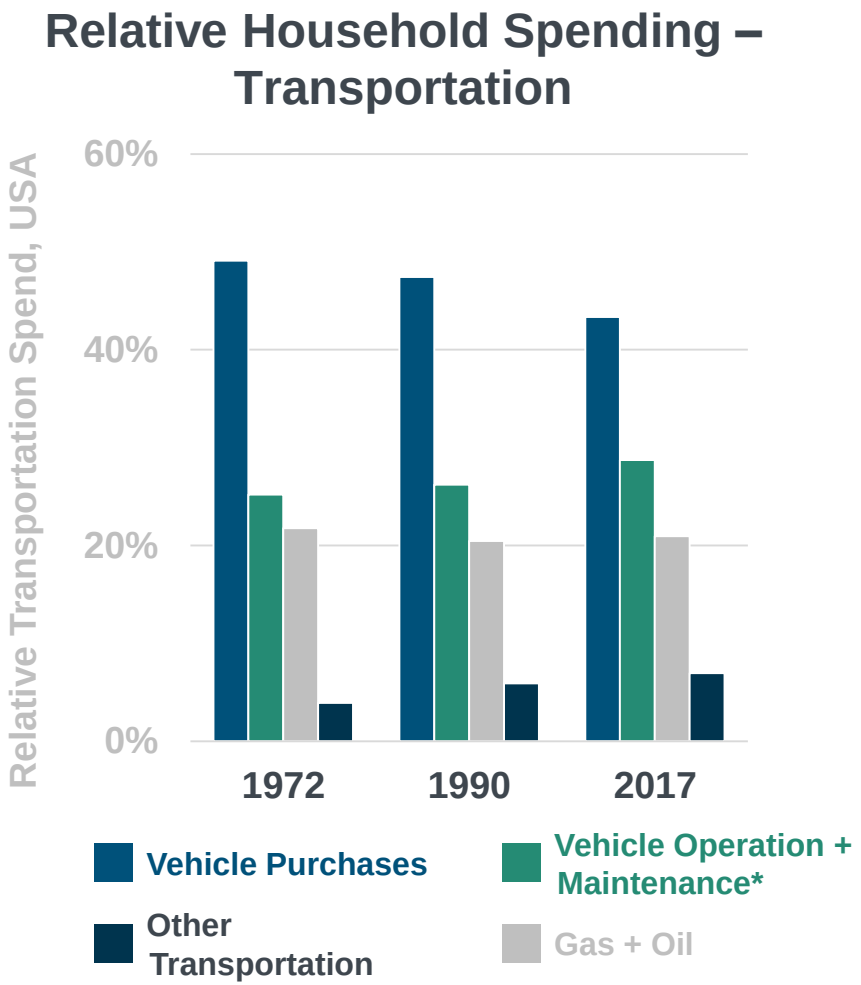
Vehicles Stay On Road Longer...

@ 12 vs. 8 Years (1995)
Average Car Lifespan

…Other Transportation Rising

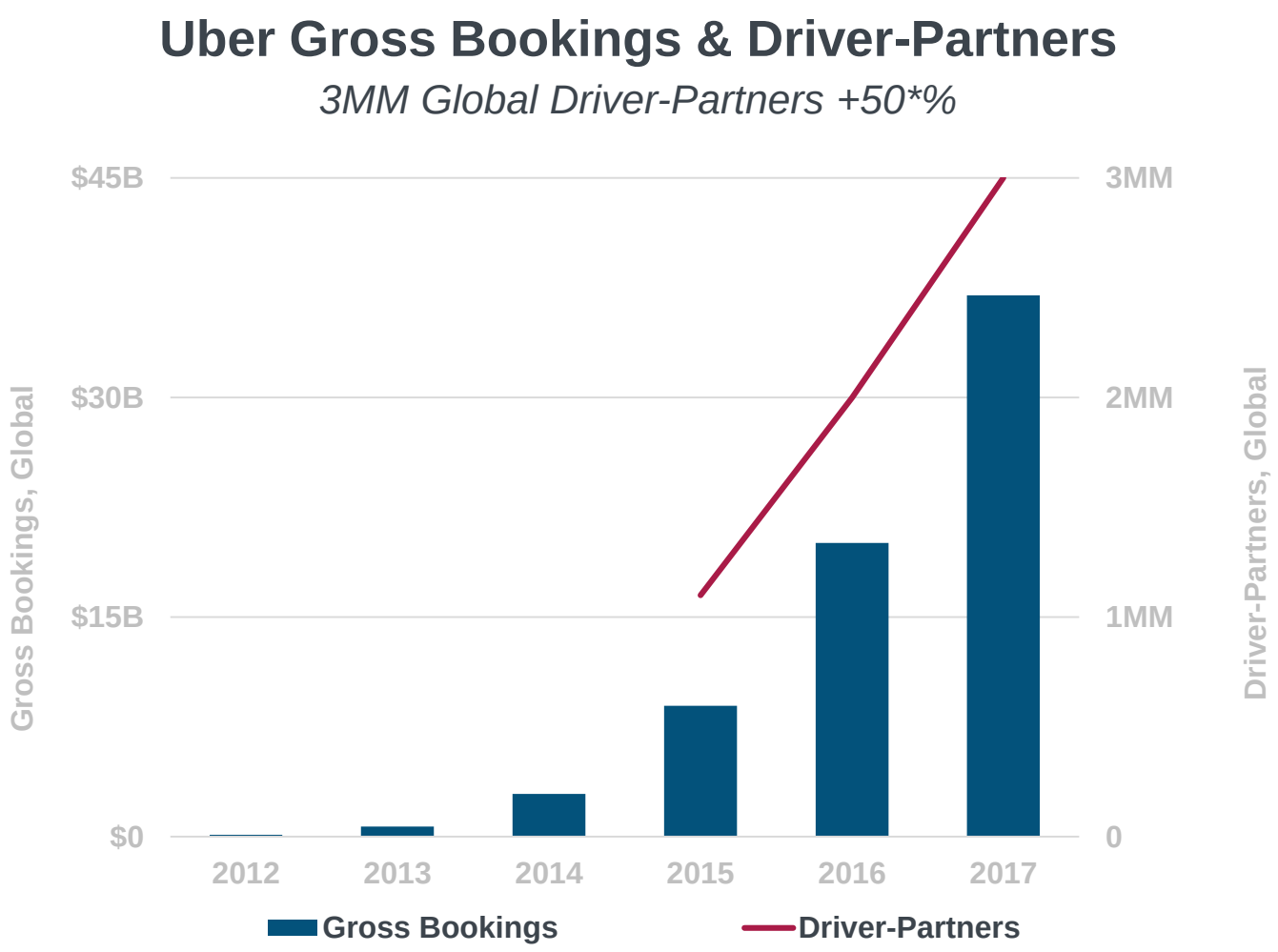
+30% vs. 1995
Public Transit Usage

~2x Y/Y (2017)
Ride-Share Rides



Source: USA BLS Consumer Expenditure Survey. Vehicle Age = Bureau of Transportation Statistics + I.H.S. Public Transit Trips = American Public Transit Association Note: *Vehicle Operation + Maintenance includes Insurance, Repairs, Parking, and Other expenses. Other transportation includes all transportation outside of personal vehicles, including rise-sharing.. Results based on Surveys of American Urban and Rural Households (Families and Single Consumers). 1972 data reflects non-annual survey conducted by BLS + Census Bureau to adjust CPI. 1990 and 2017 Data Based on Annual Survey performed by BLS + Census Bureau. Cars refers to all light vehicles (i.e. passenger cars + light trucks). Includes all actively driven cars. Public transit trips reflect unlinked rides (i.e. one full journey). Note: Ride Share Statistics based on Q1:16 and Q1:17 Estimates from Hillhouse Capital.

Uber =
Can Provide Work Opportunities for Driver-Partners…

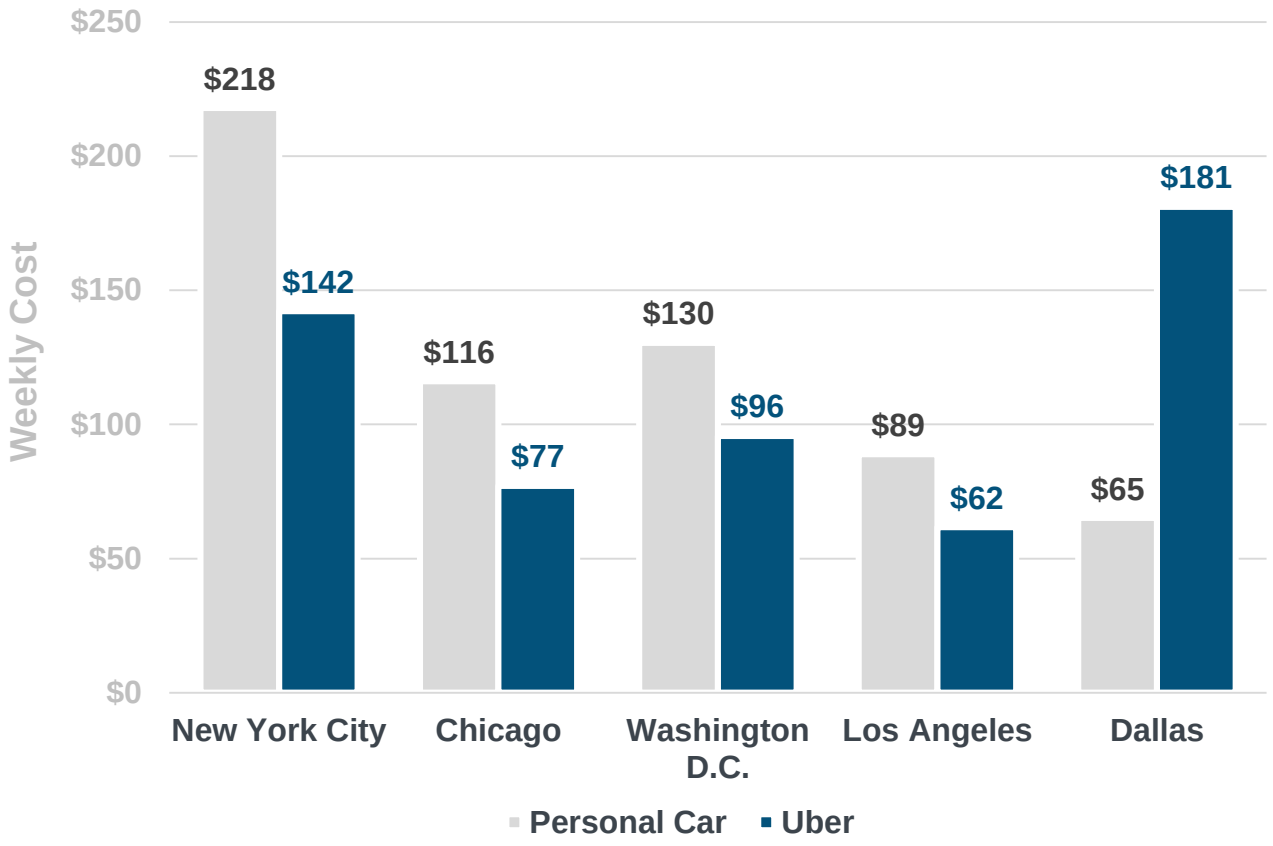


Source: Uber. *Approximately +50% Y/Y. Note: ~900K USA Driver-Partners. Note: As of Jan 2015, ~85% of Uber driver-partners drove for UberX – based on historical growth rates, it is estimated that >90% of USA Uber driver-partners drive for UberX.

…Uber Consumer Benefits = Lower Commute Cost vs. Personal Cars – 4 of 5 Largest USA Cities

UberX / POOL vs. Personal Car* – Weekly Commute Costs

5 Largest USA Cities, 2017



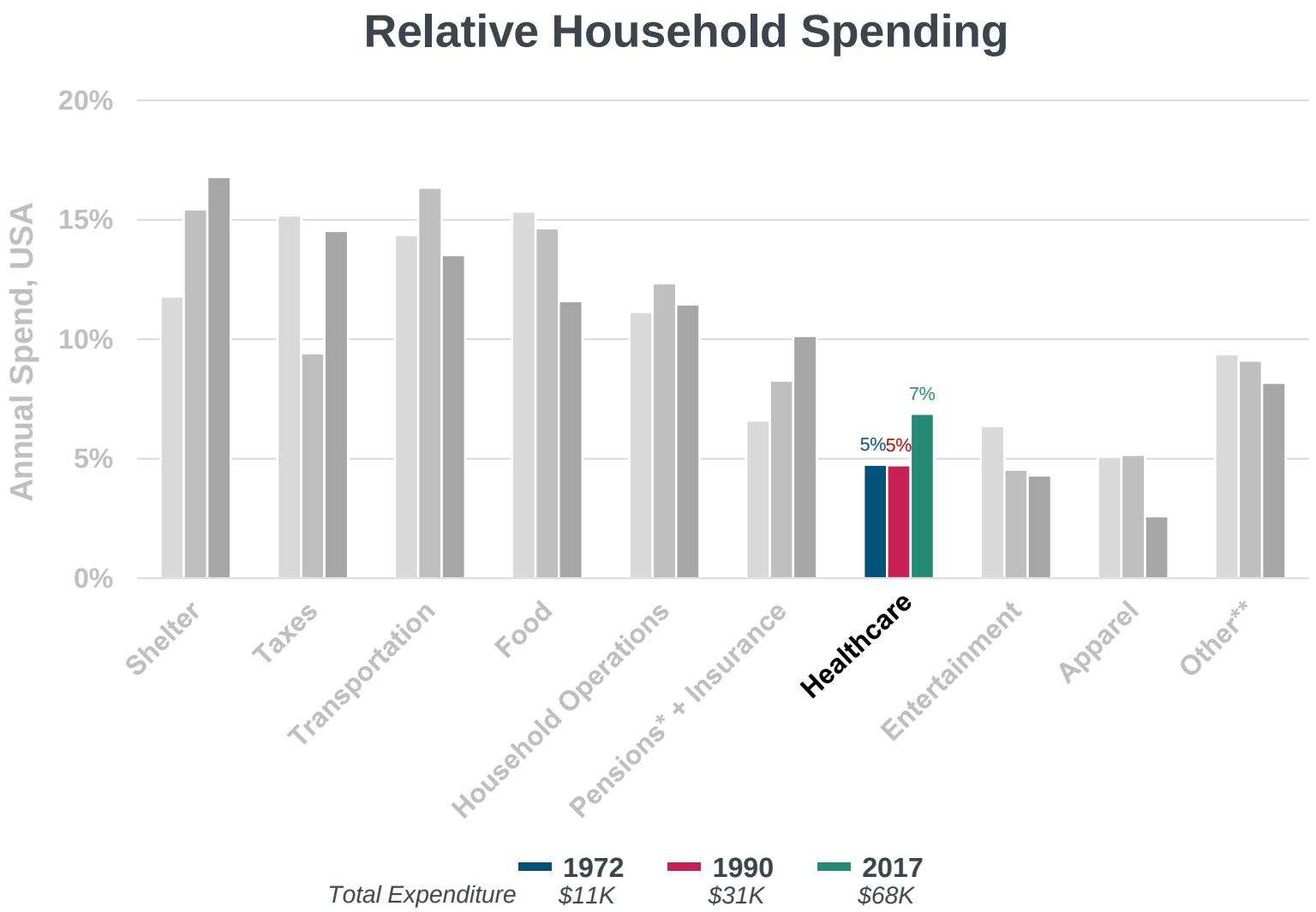
Source: Nerdwallet Study, March 2017. Washington D.C. included in Top 5 due to including of Baltimore MSA population. *Car commute costs include Gas (OPIS), Maintenance (Edmunds.com), Insurance (NerdWallet), & Parking (parkme.com). Note: Commute distances are from 2015 Brookings analysis. Uber data is based on a suburbs-to-city-center trip mirroring average commute distance for a metro. Data collected at peak commute times in February 2017. Cheapest Option (UberX, UberPOOL, etc.) selected for Uber costs.

Relative Household Spending = How Might it Evolve?

Shelter Spend = Rising
Transportation Spend = Flat
Healthcare Spend = Rising

CREATED BY NOAH KNAUF @ KLEINER PERKINS

Healthcare as % of Household Spending = 7% vs. 5% (1972)... Fastest Relative % Grower



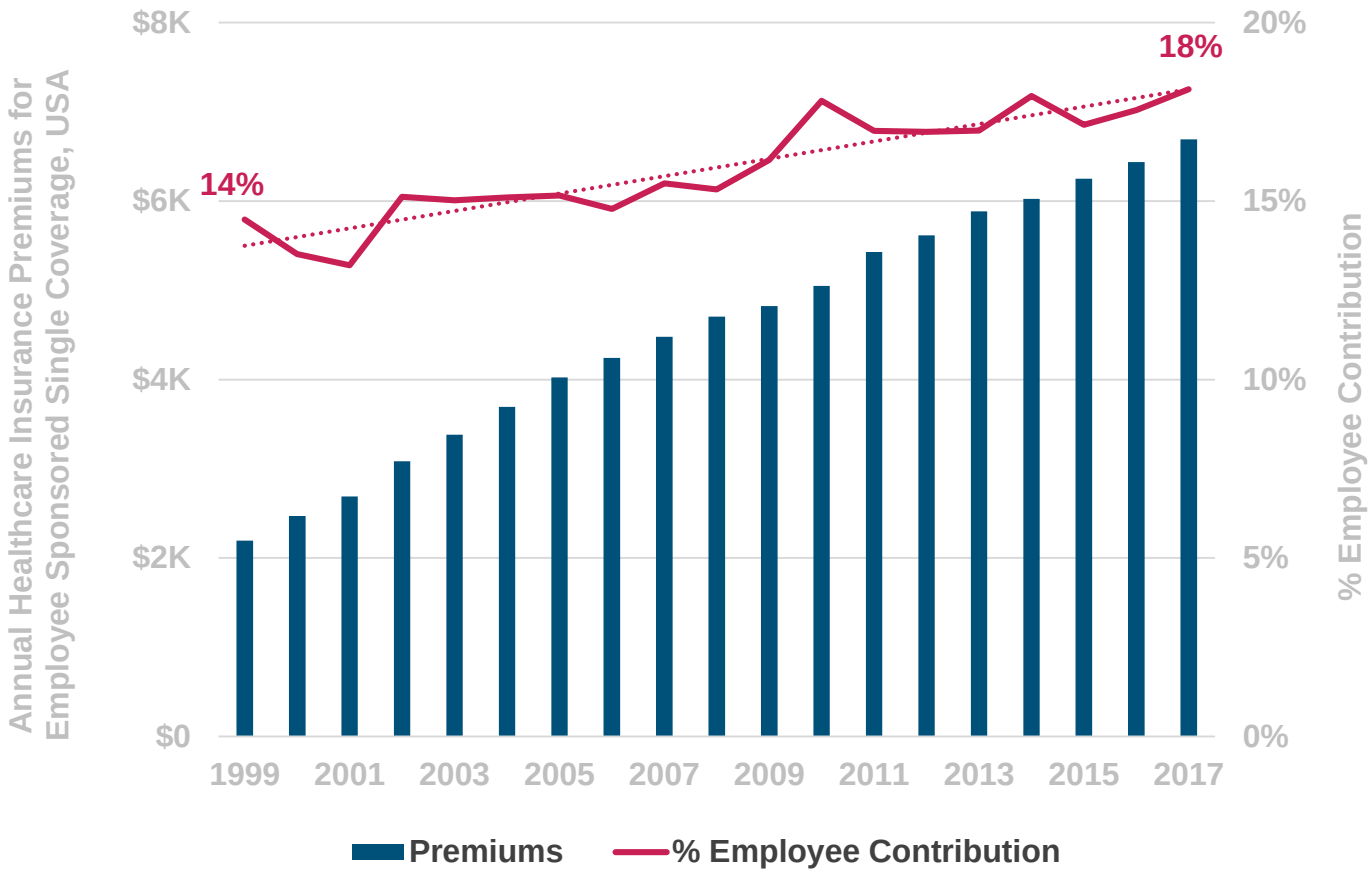
Source: USA Bureau of Labor Statistics (BLS), Consumer Expenditure Survey. *Pensions + Insurance includes deductions for private retirement accounts, social security, and life insurance. **Other Includes education and miscellaneous other expenses. Note: Results based on Surveys of American Urban & Rural Households (Families & Single Consumers). 1972 data reflects non-annual survey conducted by BLS + Census Bureau to adjust CPI. 1990 and 2017 Data Based on Annual Survey performed by BLS + Census Bureau. Healthcare costs include insurance, drugs, out-of-pocket medical expenses, etc.. 2017 = mid-year figures.

Healthcare Spending =

Increasingly Shifting to Consumers…

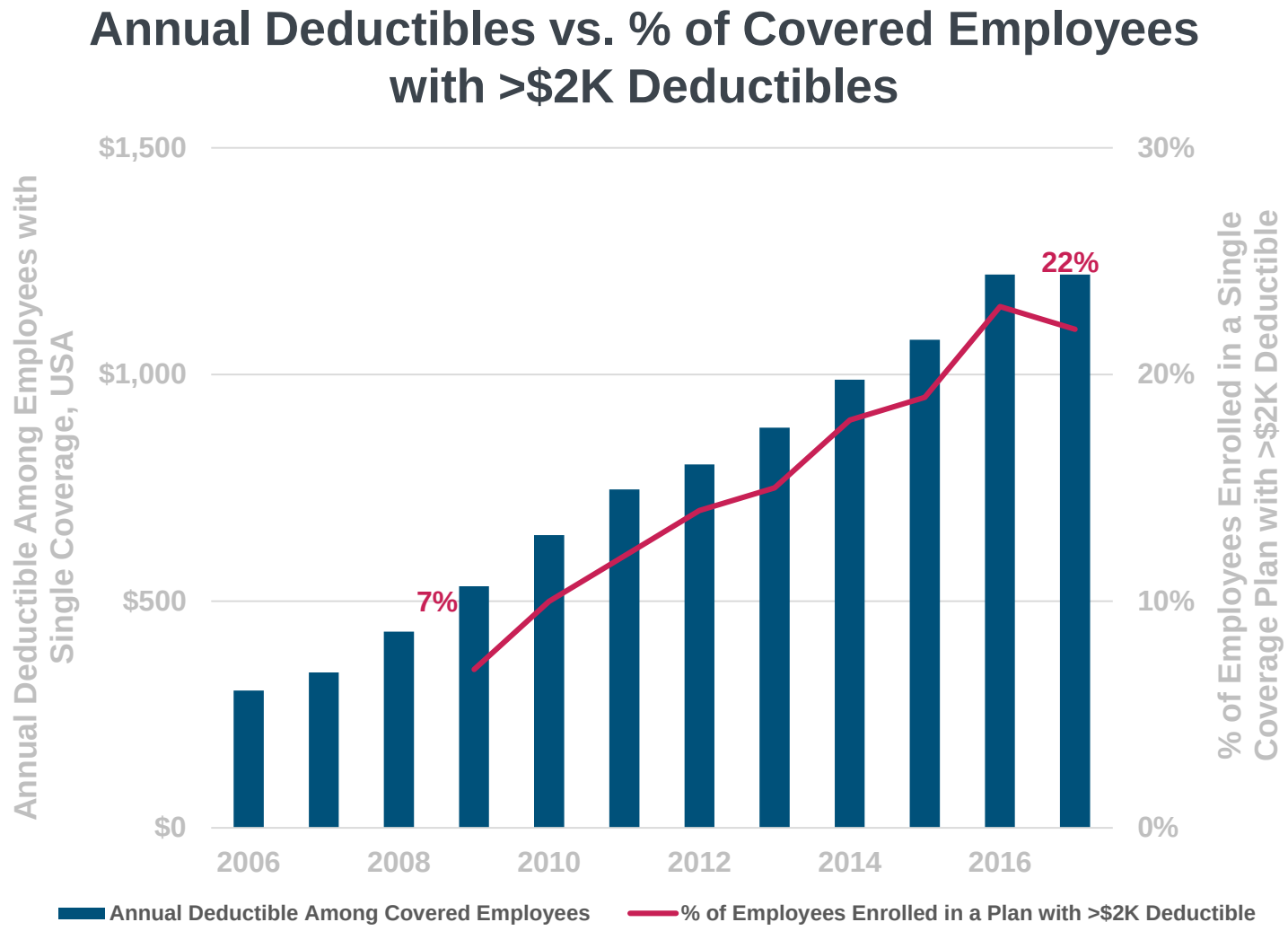
USA Healthcare Insurance Costs = Rising for All… Consumers Paying Higher Portion @ 18% vs. 14% (1999)…

Annual Health Insurance Premiums vs. Employee Contribution



Source: Kaiser Family Foundation Employer Health Benefits Survey (9/17). Note: n = 2,000 private, non-federal businesses with at least 3 employees. Employers are asked for full person costs of healthcare coverage and the employee contribution.

…USA Healthcare Deductible Costs = Rising A Lot… Employees @ >$2K Deductible = 22% vs. 7% (2009)



Source: Kaiser Family Foundation Employer Health Benefits Survey (9/17). Note: n = 2,000 private, non-federal businesses with at least 3 employees. Employers are asked for full person costs of healthcare coverage and the employee contribution.

When Consumers Start Spending More
They Tend To Pay More
Attention to Value + Prices…

Will Market Forces
Finally Come to Healthcare &
Drive Prices Lower for Consumers?

Healthcare Patients Increasingly Developing Consumer Expectations…

Modern Retail Experience

Digital Engagement

On-Demand Access

Vertical Expertise

Transparent Pricing

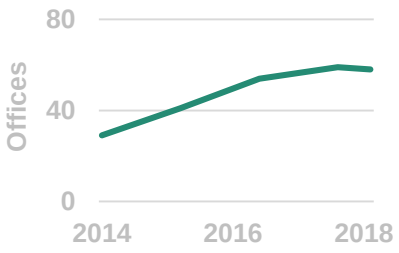
Simple Payments

Healthcare Consumerization…

Modern Retail Experience

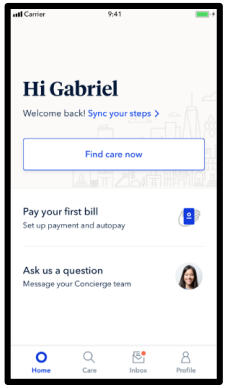
One Medical

Office Locations

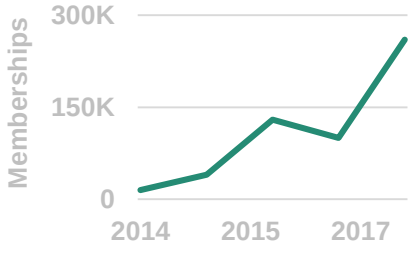


Digital Healthcare Management

Oscar

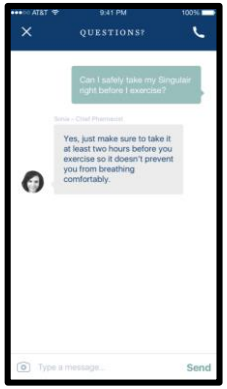


Memberships

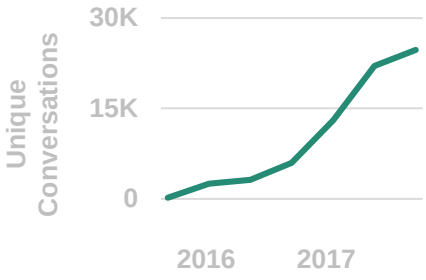


On-Demand Pharmacy

Capsule



Unique Conversations

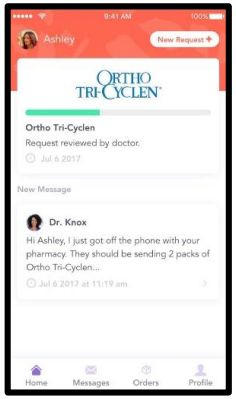


Source: One Medical, Web.Archive.org, Oscar, Capsule. Note: Oscar data as of the first month of each year based on enrollments timing.

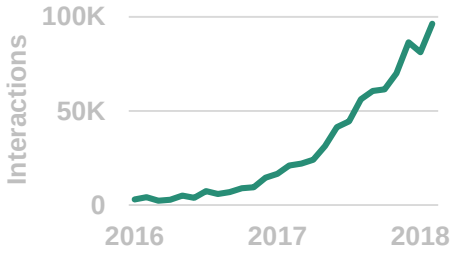
…Healthcare Consumerization

Women's Healthcare Specific Solutions

Nurx



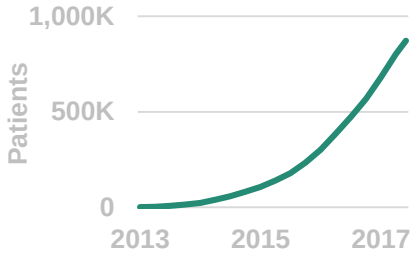
Medical Interactions*



Transparent Pricing

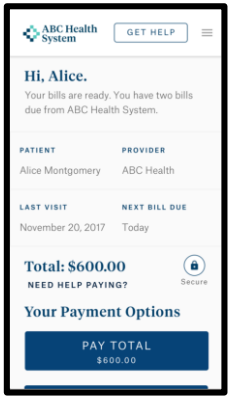
Dr. Consulta

Patients

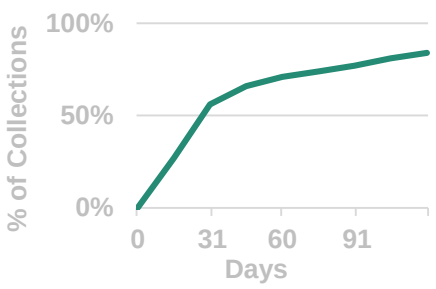


Simplified Healthcare Billing

Cedar



% of Collections**



Source: Nurx, Dr. Consulta, Cedar. *Medical interactions include prescriptions, lab orders, & messages from MDs / RNs. **Cedar data represents the % of total collections using Cedar over time at a multispecialty group with 450 physicians and an ambulatory surgical center.

Consumerization of Healthcare
+ Rising Data Availability =

On Cusp of Reducing
Consumer Healthcare Spending?

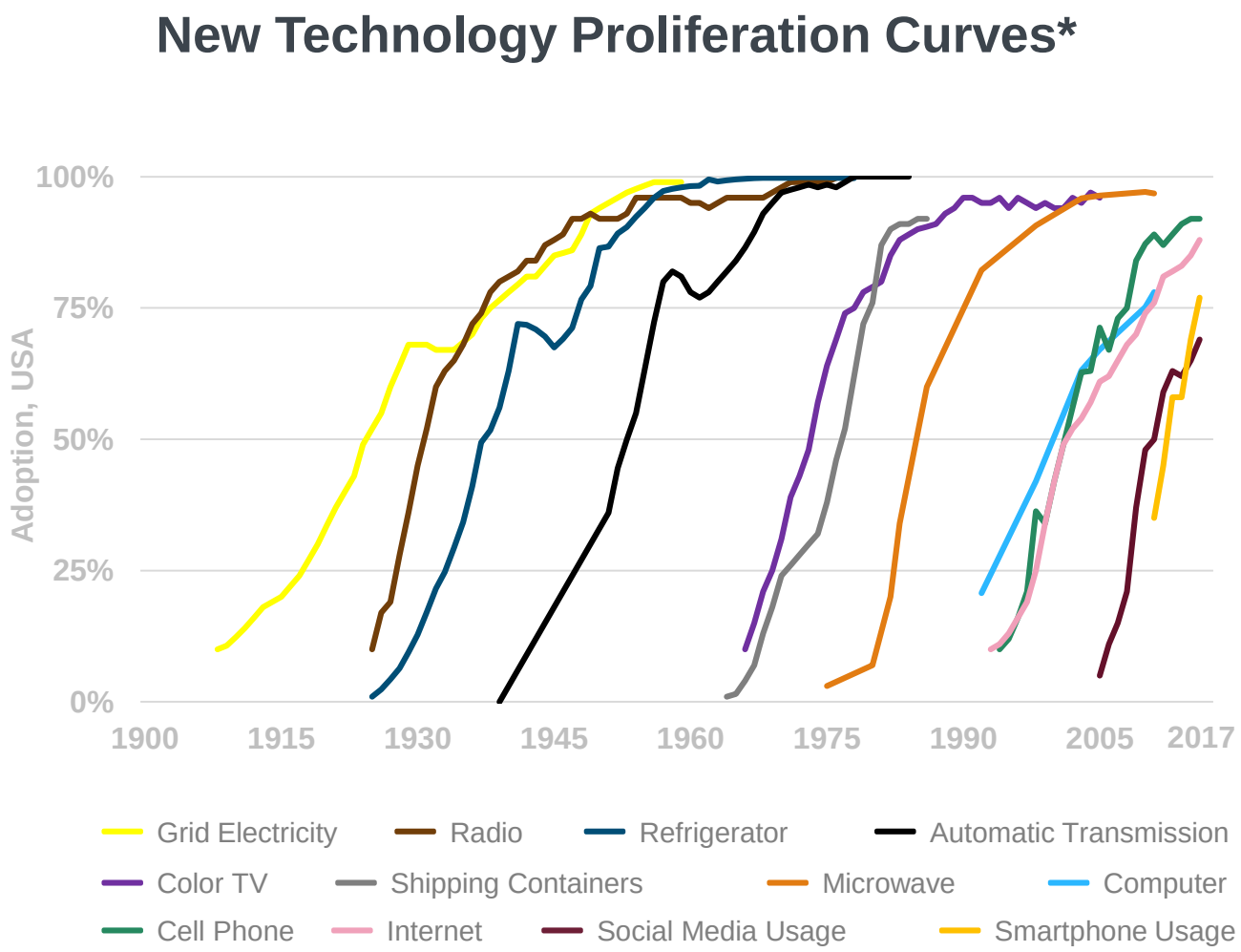
WORK =

CHANGING RAPIDLY…
INTERNET HELPING, SO FAR…

Technology Disruption =

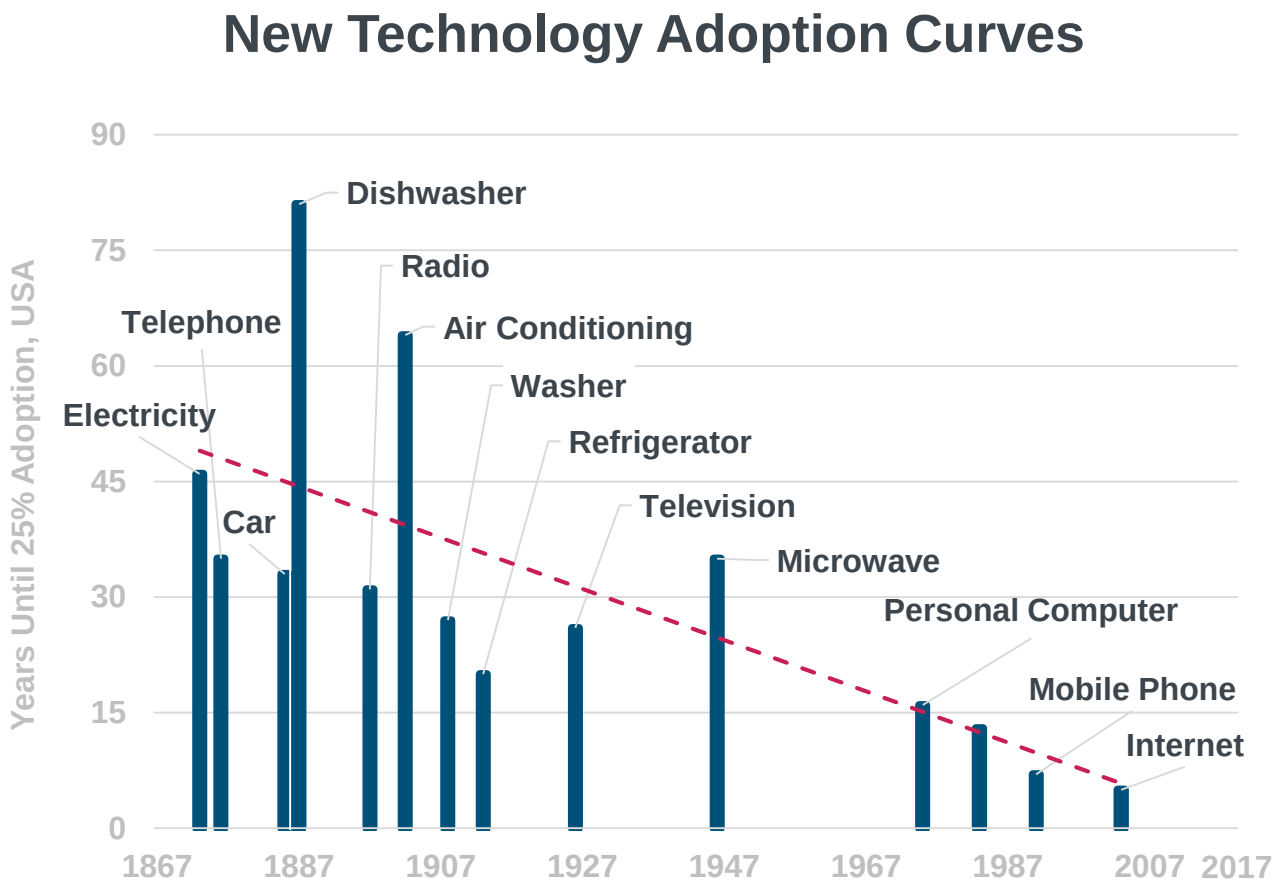
Not New...But Accelerating

Technology Disruption = Not New…



Source: 'Our World In Data' collection of published economics data including Isard (1942), Grubler (1990), Pew Research, USA Census Bureau, and others. *Proliferation defined by share of households using a particular technology. In the case of features (e.g., Automatic Transmission), adoption refers to share of feature in available models.

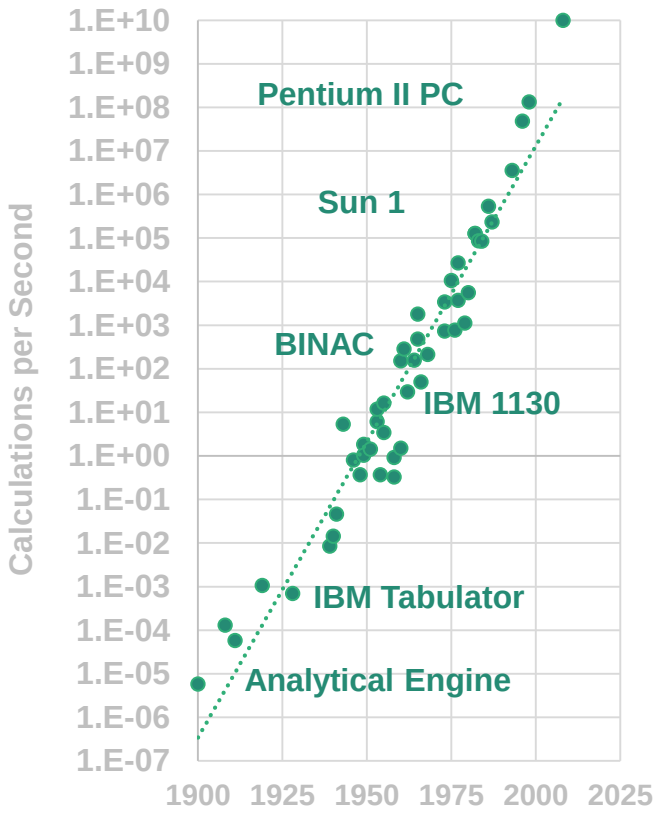
…Technology Disruption = Accelerating…Internet > PC > TV > Telephone



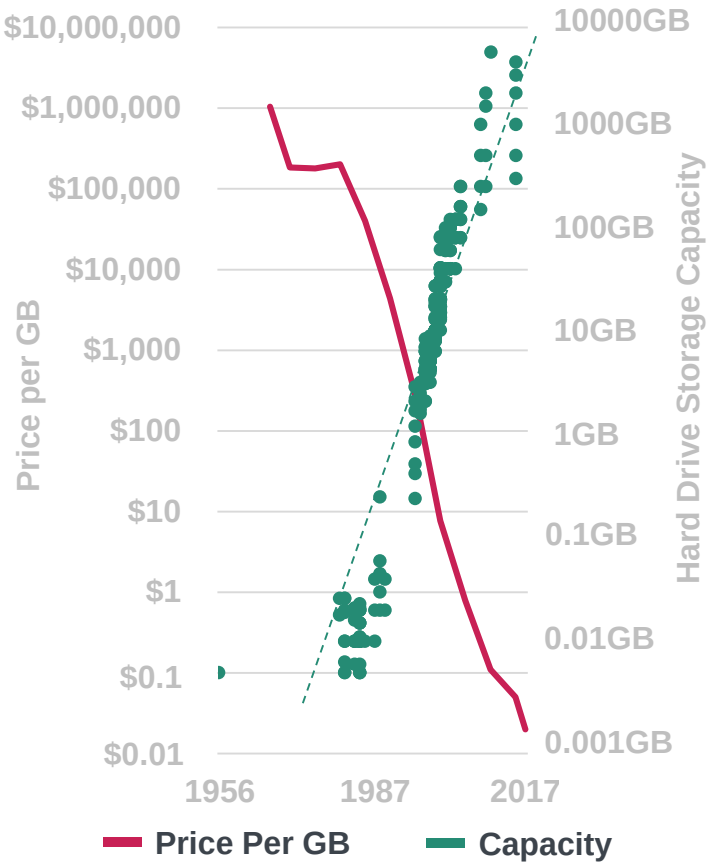
Source: The Economist (12/15), Pew Research Center (1/17), Asymco (11/13).
Note: Starting years based on invention year of each consumer product.

Technology Disruption Drivers = Rising & Cheaper Compute Power + Storage Capacity...

$1,000 of Computer Equipment

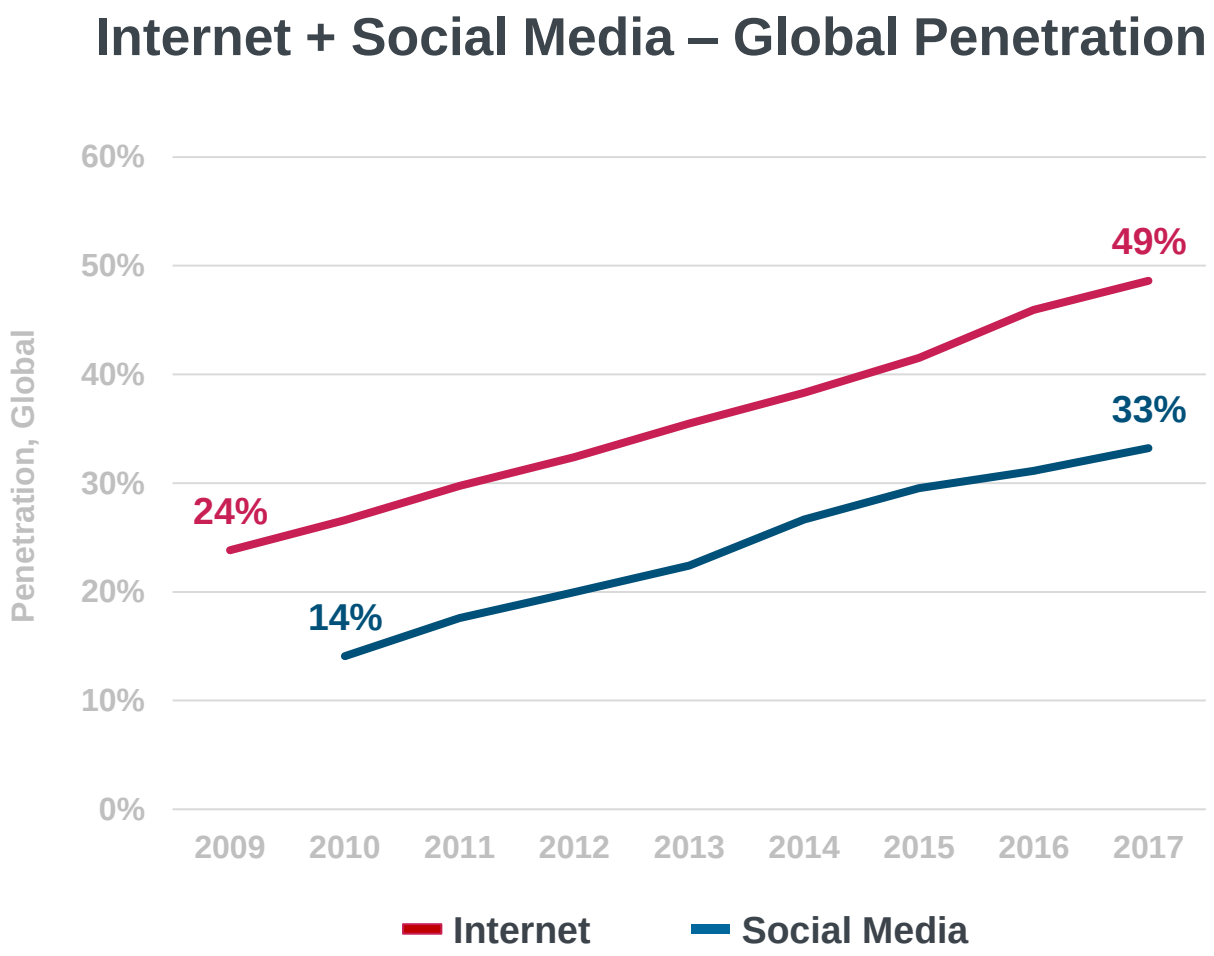


Storage Price vs. Hard Drive Capacity



Source: John McCallum @ IDC, David Rosenthal @ LOCKSS Program – Stanford): Kryder's Law. Time + Ray Kurzweil analysis of multiple sources, including Gwennap (1996), Kempt (1961) and others. Note: All figures shown on logarithmic scale.

...Technology Disruption Drivers = Rising & Cheaper Connectivity + Data Sharing



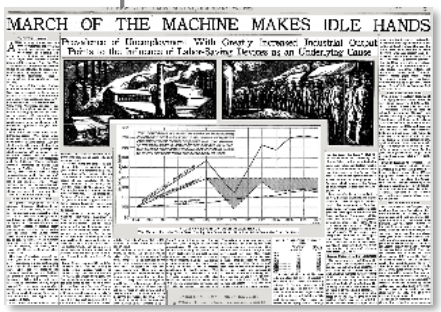
Source: United Nations / International Telecommunications Union, USA Census Bureau. Internet user data is as of mid-year Internet user data: Pew Research (USA), China Internet Network Information Center (China), Islamic Republic News Agency / InternetWorldStats / KP estimates (Iran), KP estimates based on IAMAI data (India), & APJII (Indonesia). Population sourced from Central Intelligence Agency database. eMarketer estimates for Social Media users based on number of active accounts, not unique users. Penetration calculated as a % of total population based on the CIA database.

New Technologies =

Created / Displaced Jobs Historically

New Technologies =
Job Concerns / Reality Ebb + Flow Over Time

1920 1940 1960 1980 2000 2020



MARCH OF THE MACHINE MAKES IDLE HANDS

Prosperity of Unemployment. With Greatly Increased Industrial Output Put Down to the Influence of Labor-Saving Devices as an Underlying Cause

DOES MACHINE DISPLACE MEN IN THE LONG RUN?

New Studies Cited as Old Argument Is Renewed Over Significance of 'Technological Unemployment'

"IS THE ROBOT BEGINNING TO THINK?"

Will Robots Take Our Children's Jobs?

By ALEX WILLIAMS DEC. 11, 2017

200,000 a Year Will Lose Jobs To Automation, U.S. Aides Say

By MILTON BRACKER

Special to The New York Times.

HARRIMAN, N. Y., May 4—A decline of at least 200,000 in nonagricultural jobs a year during the next decade was predicted at a conference on automation and technological change here today.

The term used was "dislacement." Which means the decline in jobs caused by increased output for each man-hour.

The estimate was made in a paper by Evan Clague and Leon Greenberg of the Department of Labor. Mr. Clague is Commissioner of Labor Statistics; Mr. Greenberg is a divisional chief in the Bureau of Labor Statistics.

Their paper, one of nine distributed at the twenty-first American Assembly of Columbia University at Arden House, did not represent an official view of the Labor Department. But it was of particular interest to the seventy participants in the assembly.

An expert associated with the Clague-Greenberg paper said that actually the 200,000 was a "modest" figure. He thought the 200,000 to 300,000 might be more accurate.

of the total decline in productive employment. The ratio for all employes was 17 per cent.

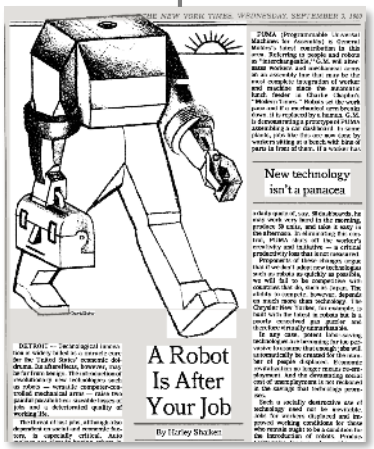
"It is generally expected," the report said, "that during the next decade the economy will grow at a faster pace than it has in recent years, but that output per man-hour will also increase more rapidly."

The forecast of at least 200,000 disemployed annually for the next ten years included an estimated total of 100,000 production workers.

The balance would be made up of nonproduction workers in manufacturing, and workers in nonmanufacturing fields. There are nearly twice as many workers in nonmanufacturing fields as in manufacturing, the paper said.

Prof. John T. Dunlop, chairman of the Economics Department at Harvard, edited the assembly papers. He said the 200,000 figure was the first, such estimate to be attempted.

Both Professor Dunlop and others associated with the paper said the significance of the figure was not as an absolute statistic but as a hint of the scope



New technology isn't a panacea

A Robot Is After Your Job

By Harley Shaiken

DETROIT — Increasingly sophisticated computers and robots are changing the United States' economic debate. So should labor unions.

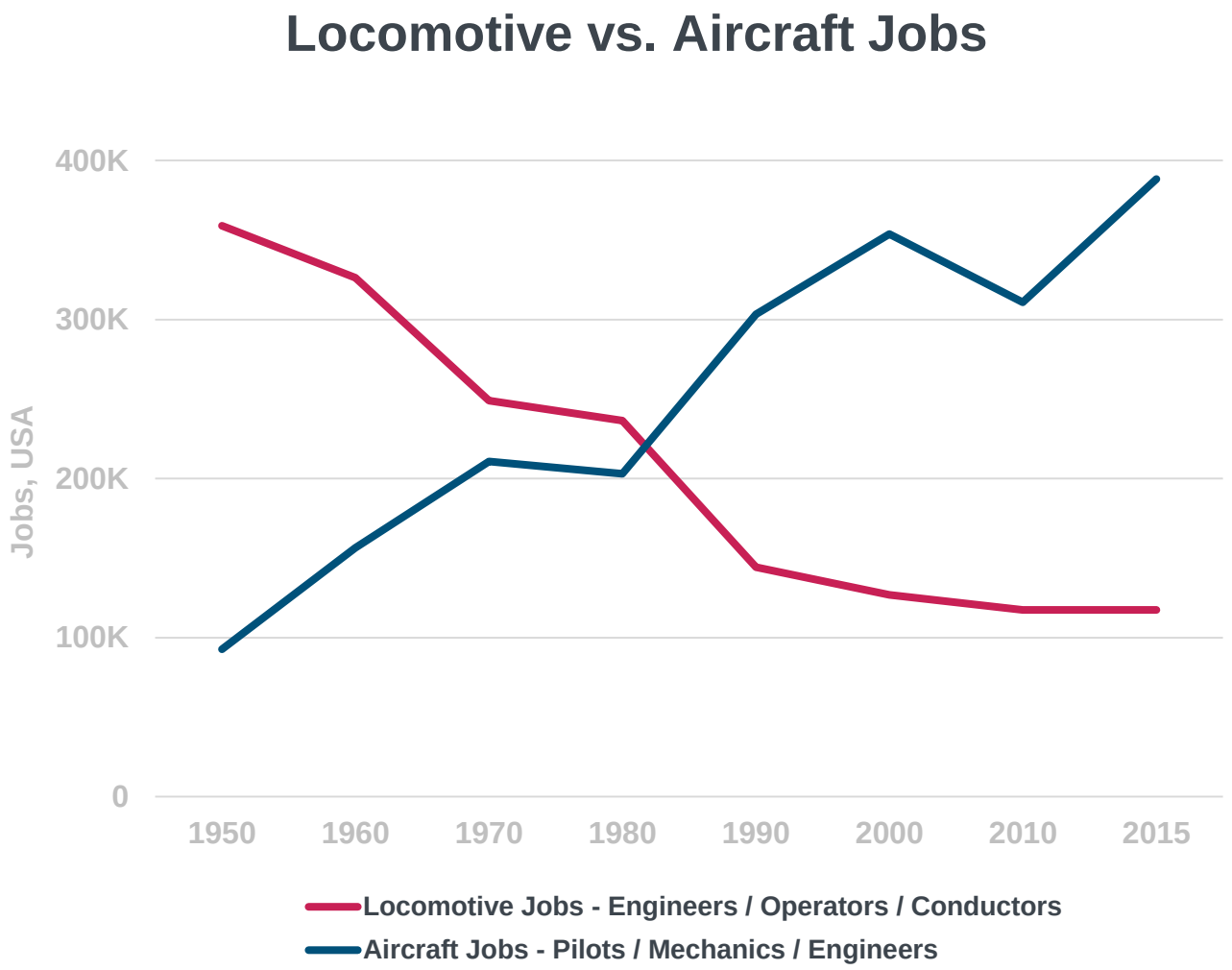
Proponents of these changes argue that these tools will help create jobs by making U.S. industry so competitive that consumers will buy more goods. The robots, in complex, however, depends on much more than technology. The Chrysler New Yorker, for example, is built with the latest in robots but is a poorly conceived gas guzzler and therefore eventually unmarketable.

In any case, robots are not inherently job-destroying technologies. Technological innovation has always led to a net increase in employment and the diminishing social cost of unemployment is not reduced at the margin that technology generates.

Such a socially destructive use of technology need not be inevitable. Job workers displaced and impoverished working conditions for those who remain might not be a solution to the introduction of robots. Proper

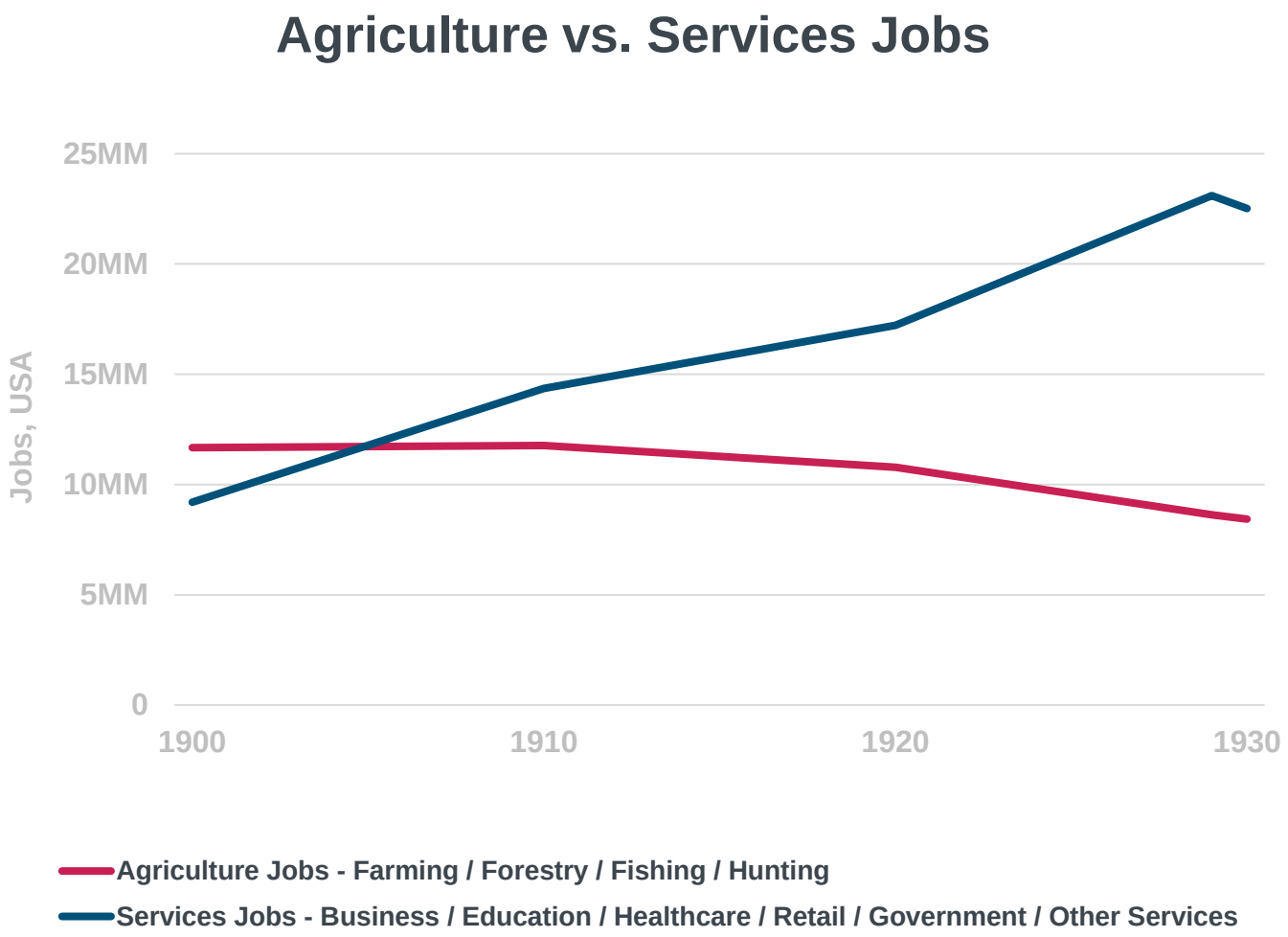
Source: New York Times, 2/26/1928, article by Evans Clark. Originally sourced from Louis Anslow, "Robots have been about to take all the jobs for more than 200 years," Timeline, 5/7/16. The New York Times, 2/24/1940, article by Louis Stark. Originally sourced from Louis Anslow, "Robots have been about to take all the jobs for more than 200 years," Timeline, 5/7/16. The New York Times, 5/4/1962, article by Milton Bracker. New York Times, 9/3/1940, article by Harley Shaiken. Originally sourced from Louis Anslow, "Robots have been about to take all the jobs for more than 200 years," Timeline, 5/7/16. 2017 Article = The New York Times.

New Technologies =
Aircraft Jobs Replaced Locomotive Jobs...



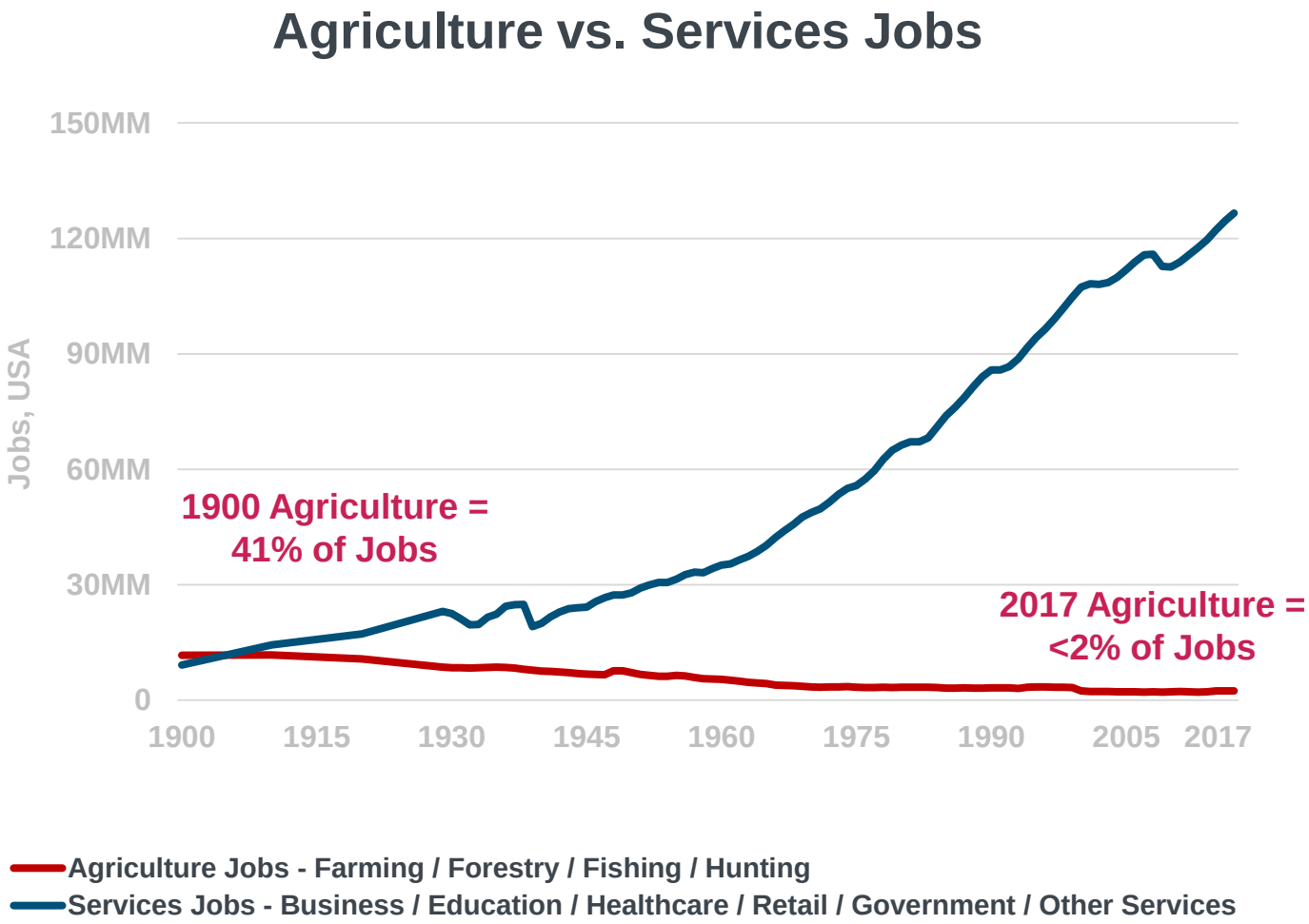
Source: ITIF analysis of IPUMS data (Atkinson + Wu); St. Louis Federal Reserve FRED Database. Note: IPUMS data tracks historical employment (since 1950) using 2010 Census occupational codes. (7140:Aircraft Mechanics + Service Technicians; 9030: Aircraft Pilots + Flight Engineers; 9200: Locomotive Engineers + Operators; 9230: Railroad Brake, Signal, + Switch Operators; 9240: Railroad Conductors + Yardmasters).

…New Technologies = Services Jobs Replaced Agriculture Jobs …



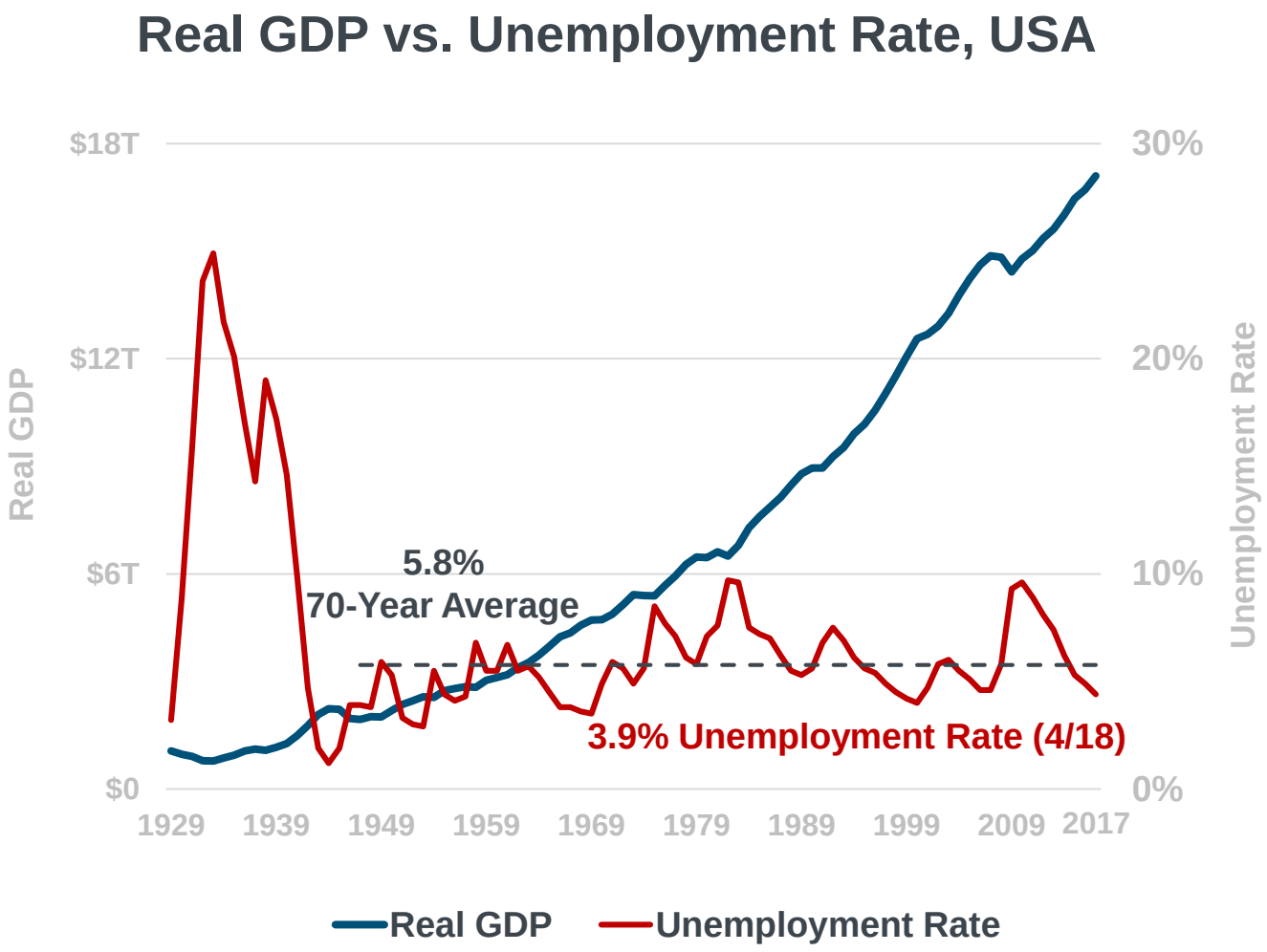
Source: Growth & Structural Transformation – Herrendorf et al. (NBER, 2013) Services includes all non-farm jobs except goods-producing industries such as natural resources / mining, construction and manufacturing.

…Agriculture = <2% vs. 41% of Jobs in 1900



Source: St. Louis Federal Reserve FRED Database, Growth & Structural Transformation – Herrendorf et al. (NBER, 2013), Bureau of Labor Statistics Note: Pre-1948 Agriculture data = Herrendorf et al. Post 1948 = Bureau of Labor Statistics. Pre-1939 services data = Herrendorf et al. Post 1939 services data = Bureau of Labor Statistics. Services includes all non-farm jobs except excluding Goods-Producing industries such as Natural Resources / Mining, Construction and Manufacturing.

70 Years = New Technology Concerns Ebb / Flow... GDP Rises...Unemployment Ranges 2.9 - 9.7%



Source: St. Louis Federal Reserve FRED Database, Bureau of Economic Analysis, BLS.
Note: Real GDP based on chained 2009 dollars. Unemployment rate = annual average.

Will Technology Impact Jobs Differently This Time?

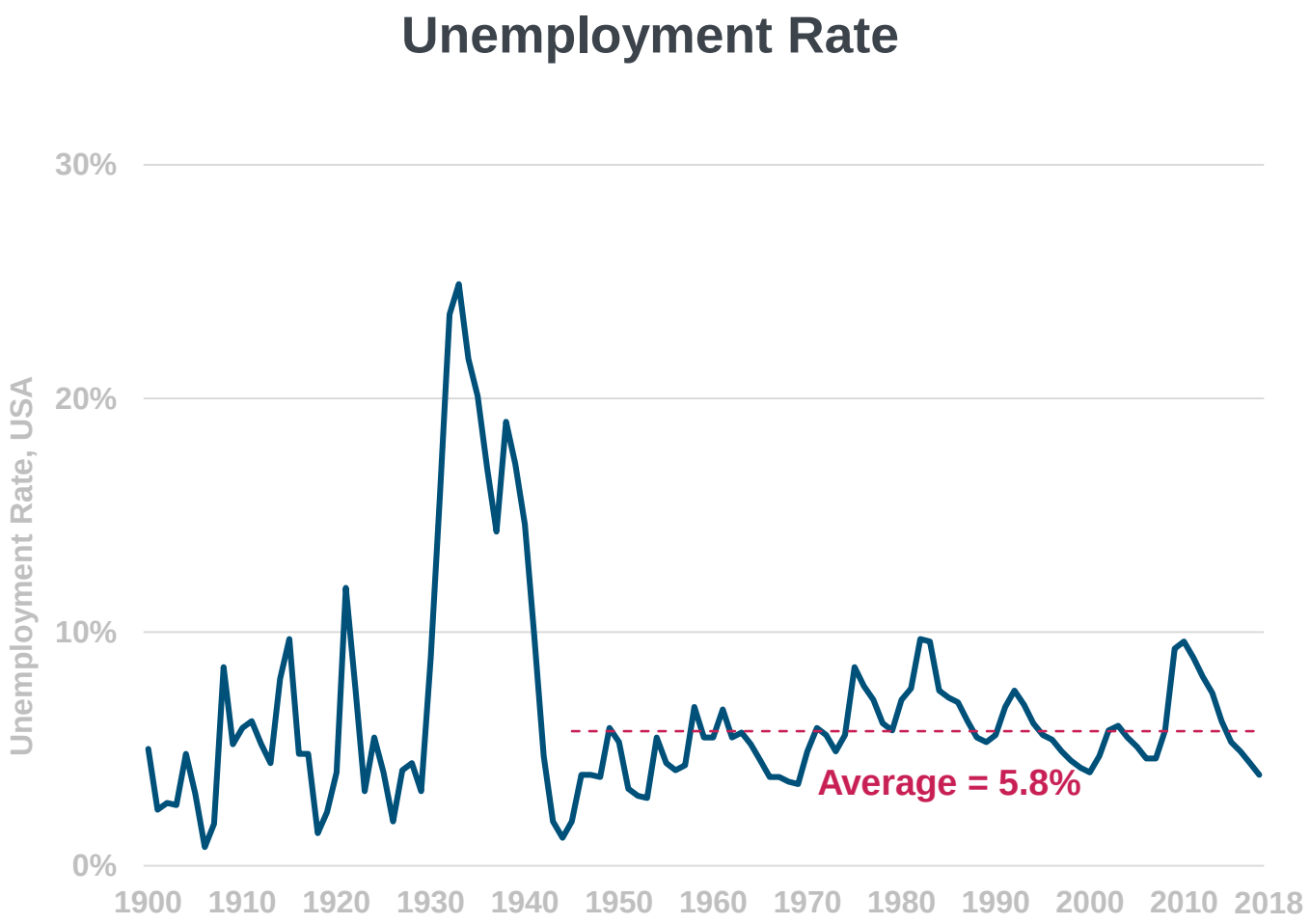
Perhaps...But It Would Be Inconsistent With History as...

New Jobs / Services + Efficiencies + Growth Typically Created Around New Technologies

Job Market =

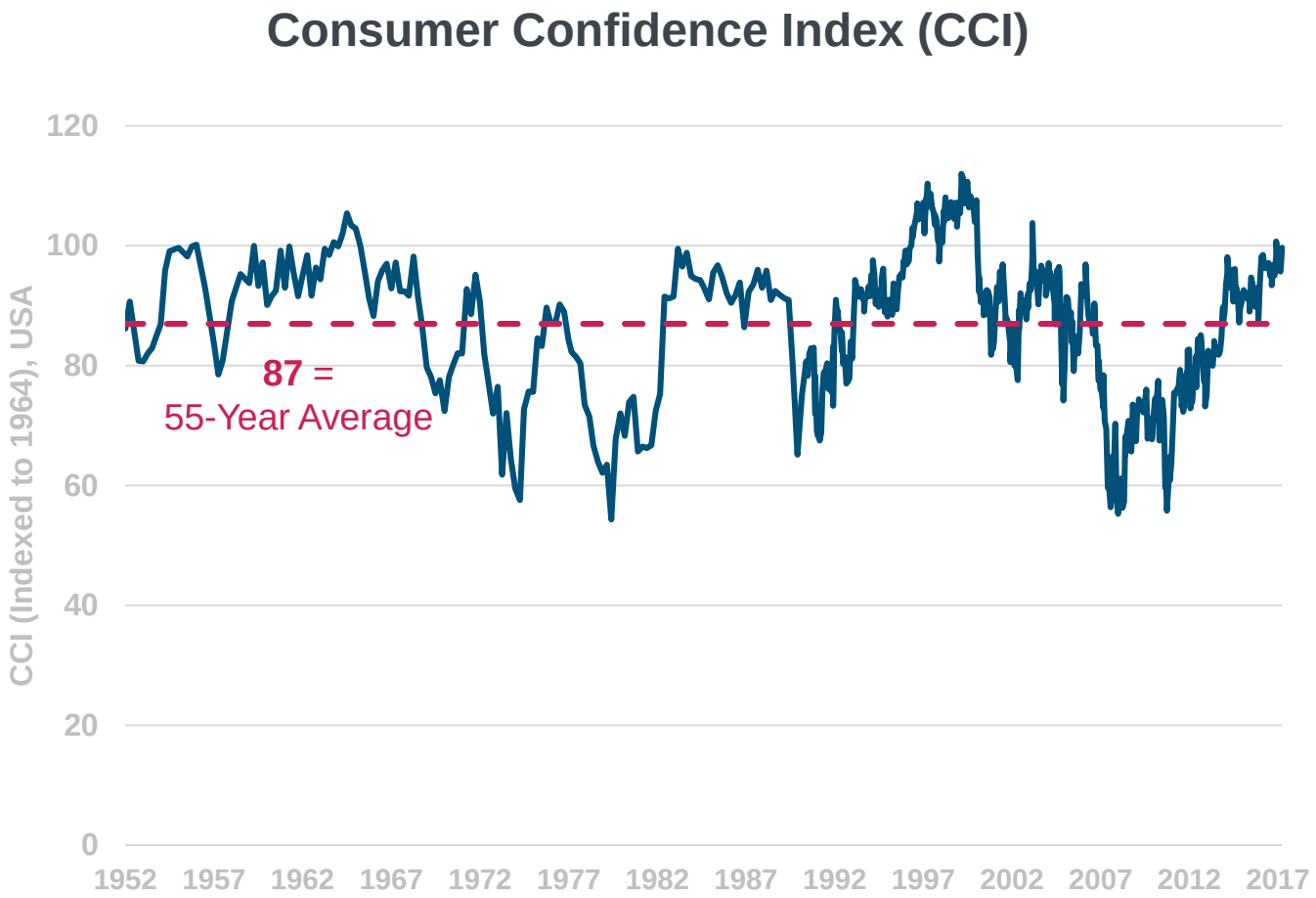
Solid Based on Traditional High-Level Metrics, USA

Unemployment @ 3.9% =
Well Below 5.8% Seventy Year Average



Source: St Louis Federal Reserve FRED Database, Bureau of the Budget (1957). Note: Unemployment rate calculated by diving the total workforce by the total number of unemployed people. People are classified as unemployed if they do not have a job, have actively looked for work in the prior 4 weeks and are currently available for work.

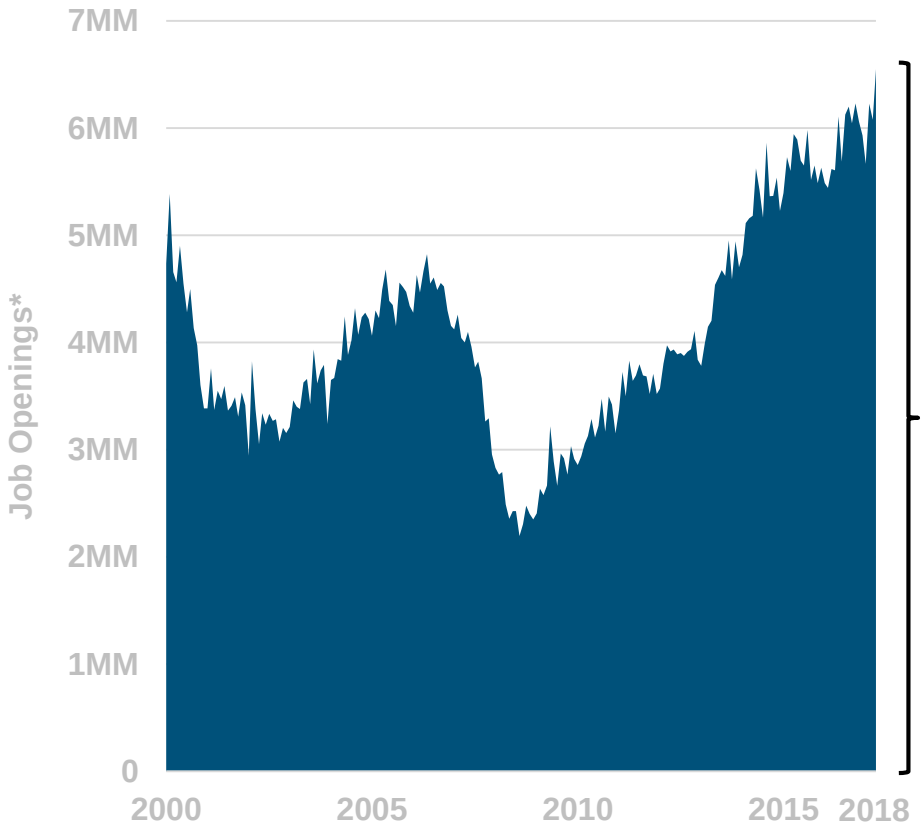
Consumer Confidence = High & Rising…
Index @ 100 vs. 87 Fifty-Five Year Average



Source: St. Louis Federal Reserve FRED Database. Note: Indexed to Q1:66 = 100. Consumer Confidence Index (Michigan Consumer Sentiment Index) is a broad measure of American consumer sentiment, as measured through a 50-question telephone survey of at least 500 USA residents each month.

Job Openings = 17 Year High…
@ 7MM…~3x Higher vs. 2009 Trough

Job Openings* – USA



6.6MM Job Openings (3/18)

1.4MM = Professional Services + Finance

1.3MM = Healthcare + Education

1.2MM = Trade / Transportation / Utilities

879K = Leisure / Hospitality

661K = Mining / Construction / Manufacturing

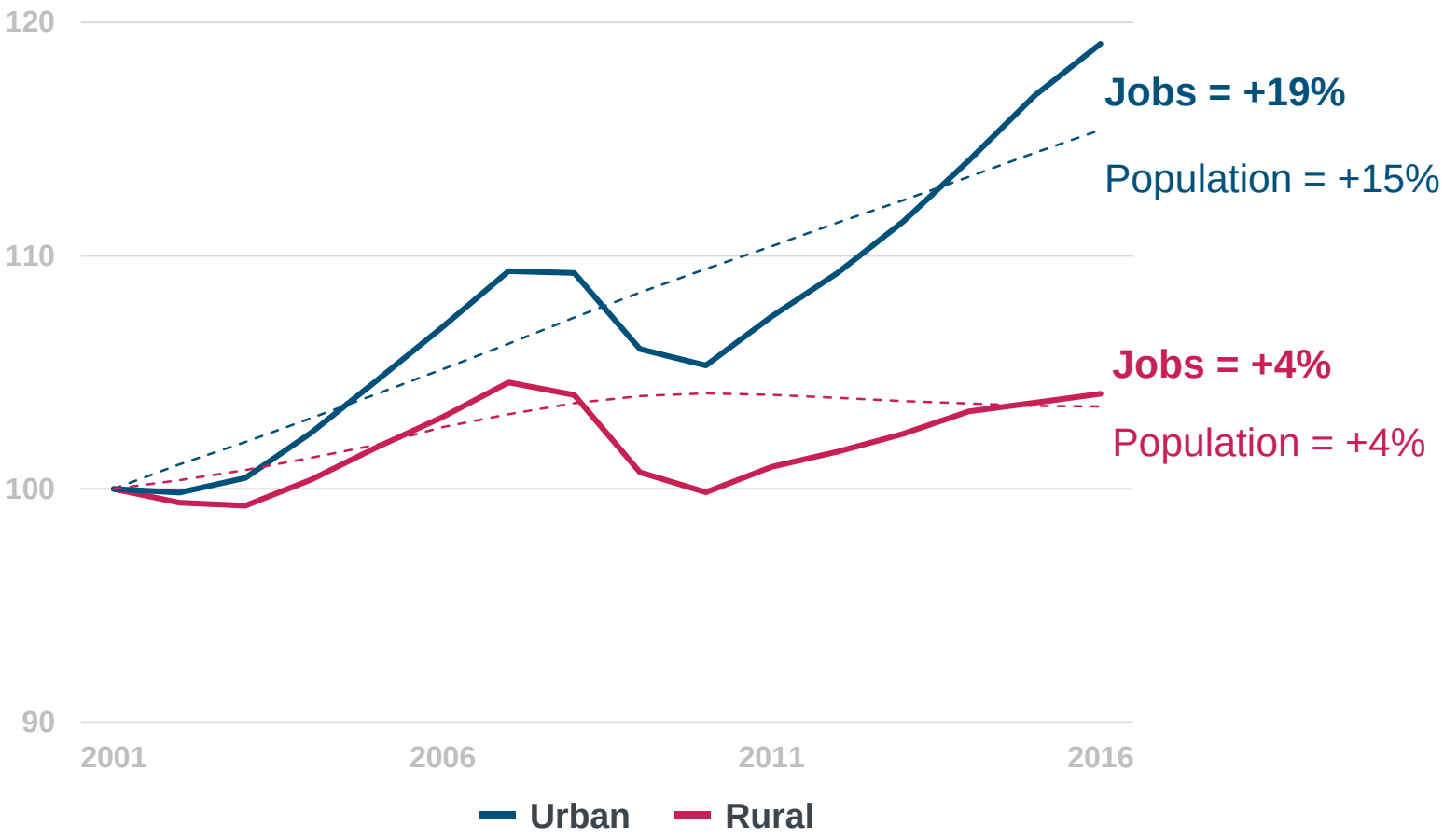
622K = Government

486K = Other

Source: St Louis Federal Reserve FRED Database. *A job opening is defined as a non-farm specific position of employment to be filled at an establishment. Conditions include the following: there is work available for that position, the job could start within 30 days, and the employer is actively recruiting for the position.

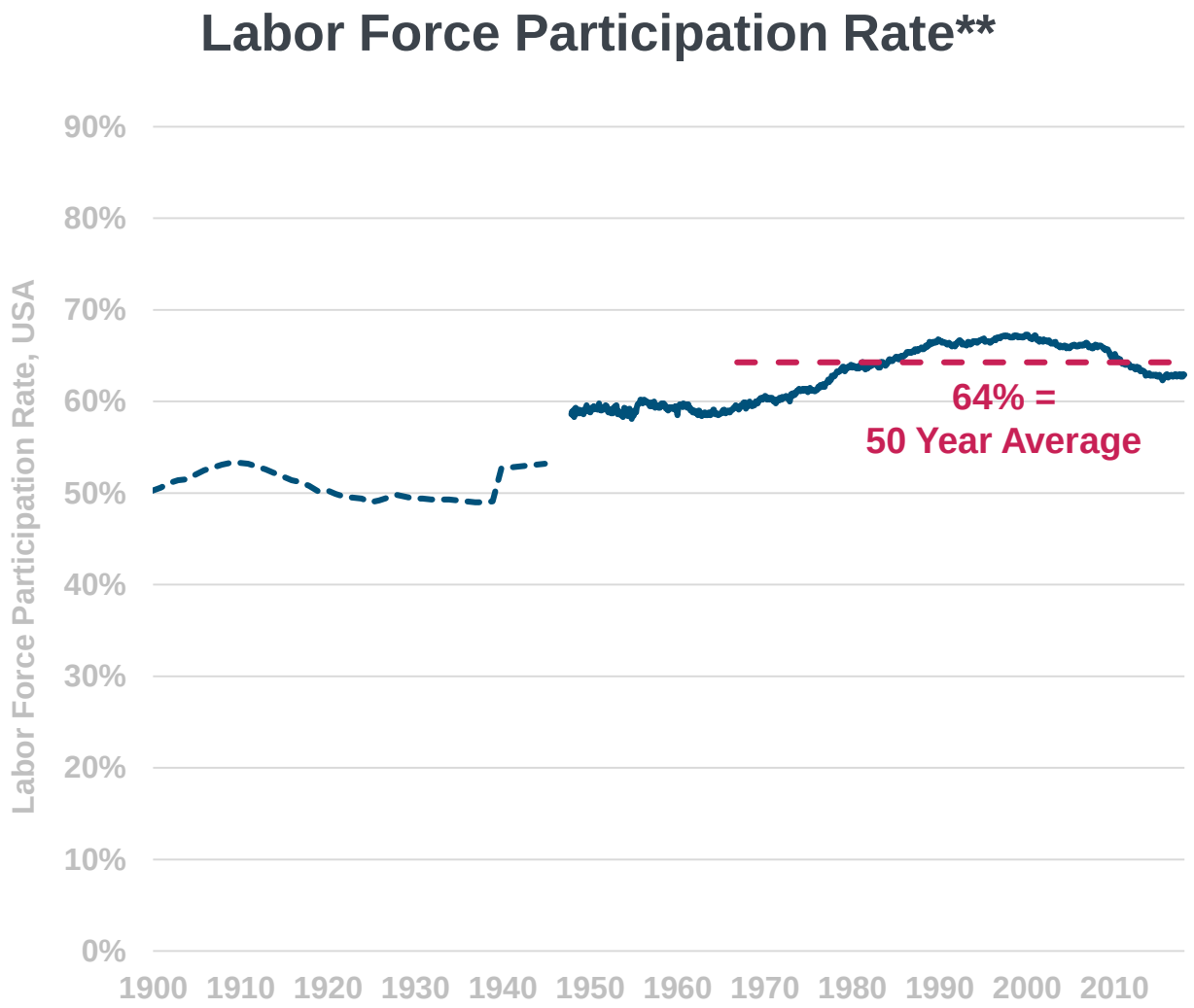
Job Growth =
Stronger in Urban Areas Where 86% of Americans Live

Job / Population Growth – Urban vs. Rural (Indexed to 2001)



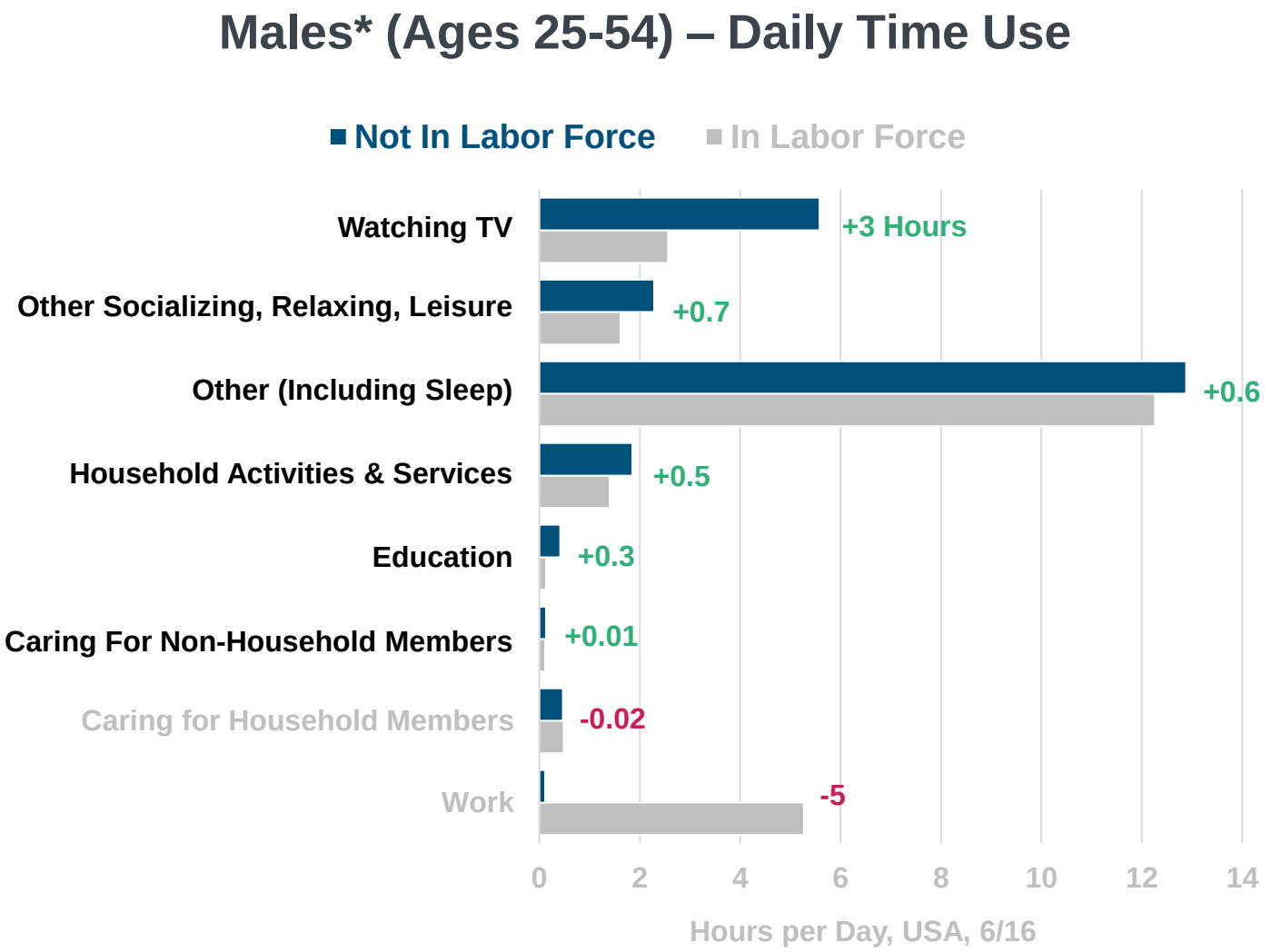
Source: USDA ERS, BLS. Note: LAUS county-level data from BLS are aggregated into urban (metropolitan/metro) and rural (nonmetropolitan / non-metro), based on the Office of Management and Budget's 2013 metropolitan classification. Metro areas defined as counties with urban areas >50K in population and the outlying counties where >35% of population commutes to an urban center for work. 'Rural' data reflects total non-metro employment, where population has been declining since 2011.

Labor Force Participation @ 63% = Below 64% Fifty-Year Average...~3.5MM People Below Average*



Source: St Louis Federal Reserve FRED Database, BLS. *In March 2018, ~161.8MM Americans were in the labor force (62.9% participation). Participation @ 50-year average of 64.3% would imply a labor force of 165.3MM. The labor force participation rate is defined as the section of working population in the age group of 16+ in the economy currently employed or seeking employment. **For data from 1900-1945 the labor force participation rate includes working population over the age of 10.

Most Common Activities For Many Who Don't Work* = Leisure / Household Activities / Education

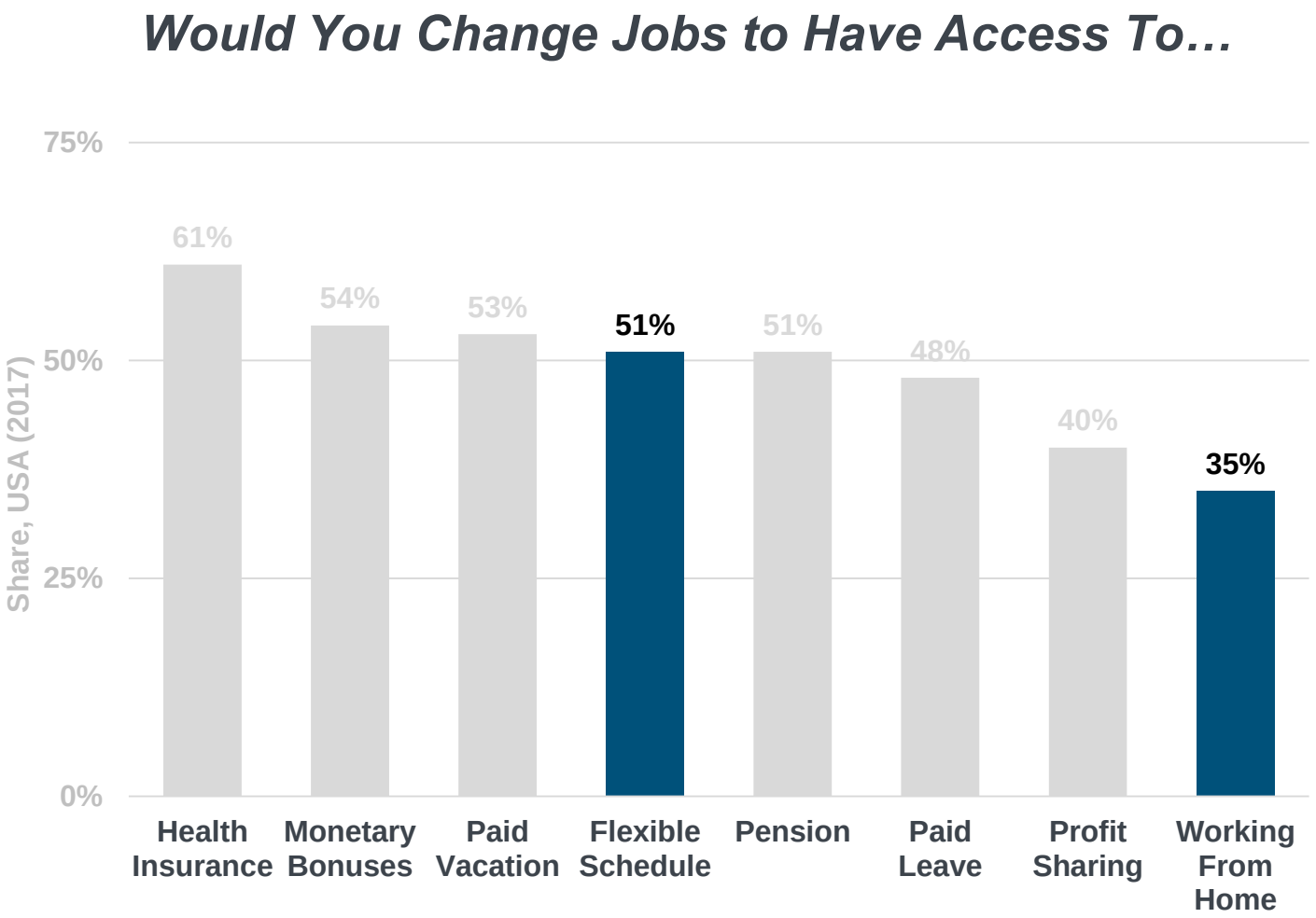


Source: 2014 American Time Use Survey, CEA calculations, BLS. Note: Prime-age males defined as men between the ages of 25-54. Daily hours may not add up to 24 since some individuals do not report all time spent. Household activities include cleaning, cooking, yardwork & home maintenance not related to caregiving.

Job Expectations =

Evolving

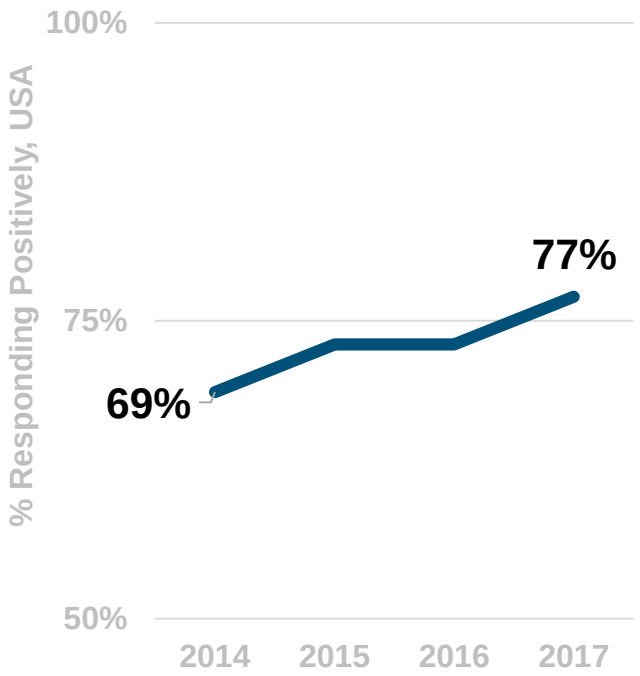
Most Desired Non-Monetary Benefit for Workers = Flexibility per Gallup



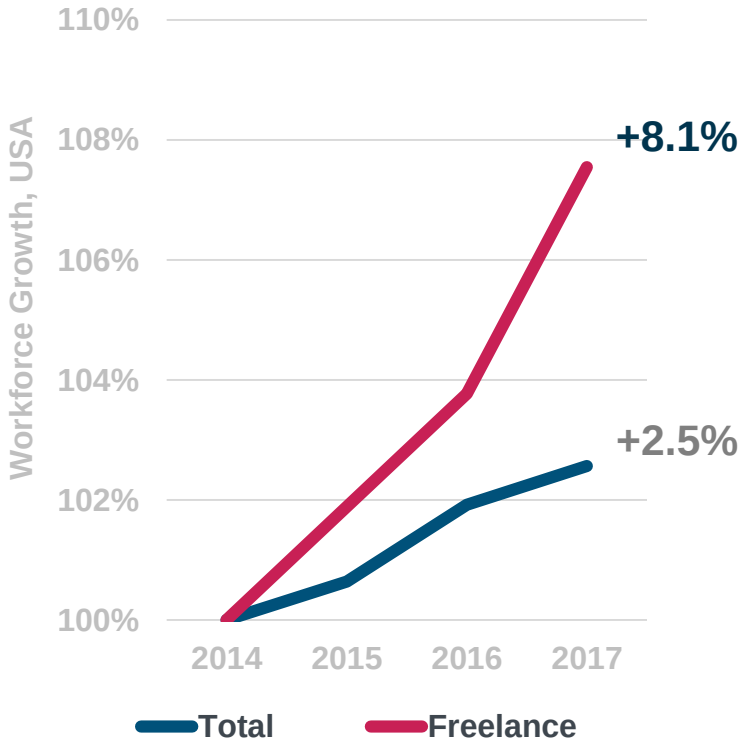
Source: Gallup 2017 State of the American Workplace Note: *Flexible schedule defined as ability to choose own hours of work. Gallup developed State of the American Workplace using data collected from more than 195,600 USA employees via the Gallup Panel and Gallup Daily tracking in 2015 and 2016, and more than 31 million respondents through Gallup's Q12 Client Database. First launched in 2010, this is the third iteration of the report.

Technology = Makes Freelance Work Easier to Find… Freelance Workforce = 3x Faster Growth vs. Total Workforce

Has Technology Has Made It Easier To Find Freelance Work?



Workforce Growth – Freelance vs. Total



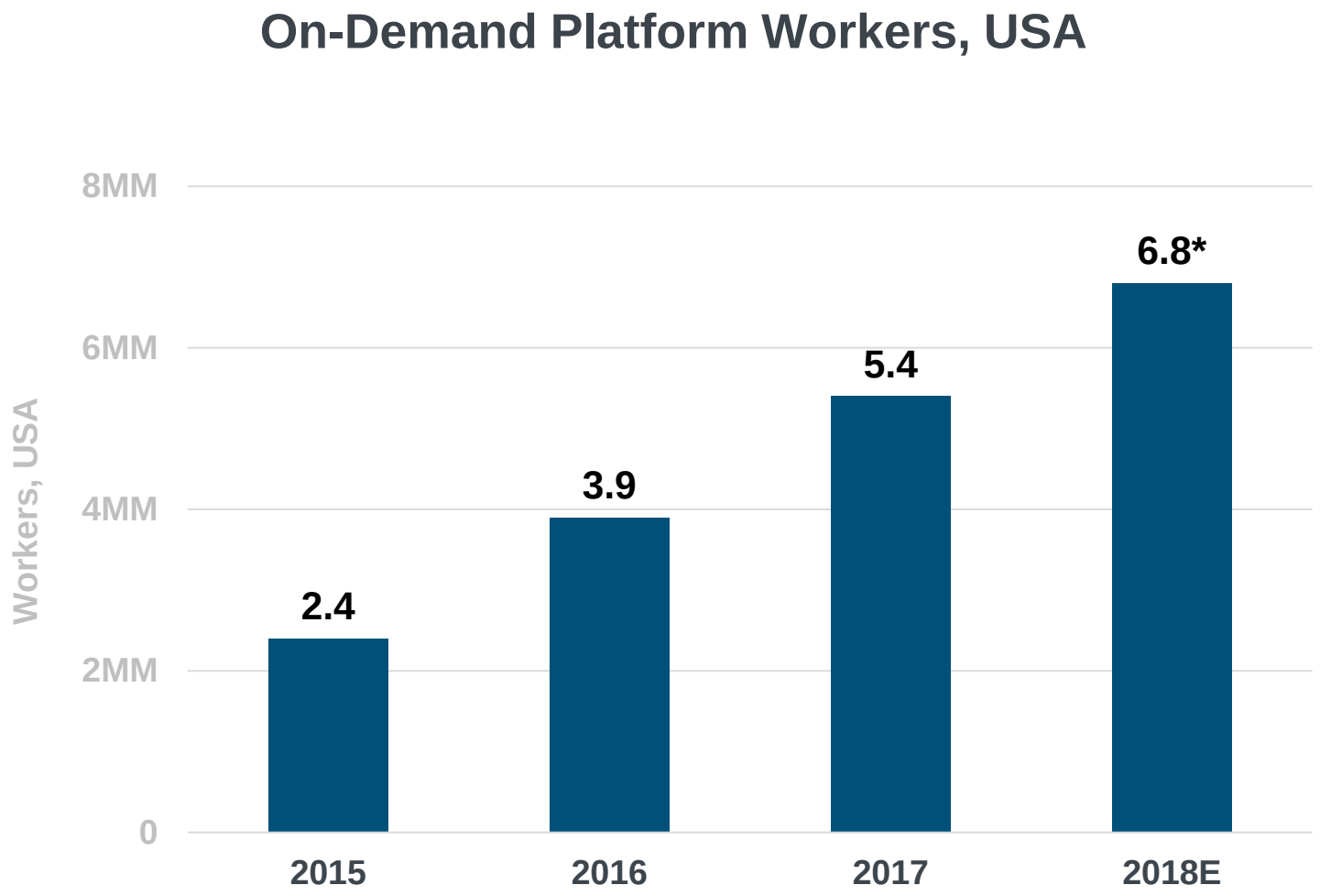
Source: 'Freelancing in America: 2017' survey conducted by Edelman Research, co-commissioned by Upwork and Freelancers Union. Note: Survey conducted 7/17-8/17, n = 2,173 Freelance Employees who have received payment for supplemental temporary, or project-oriented work in the past 12 months.

On-Demand Jobs =

Big Numbers + High Growth

Increasingly Filling Needs for Workers Who Want Extra Income / Flexibility... Have Underutilized Skills / Assets

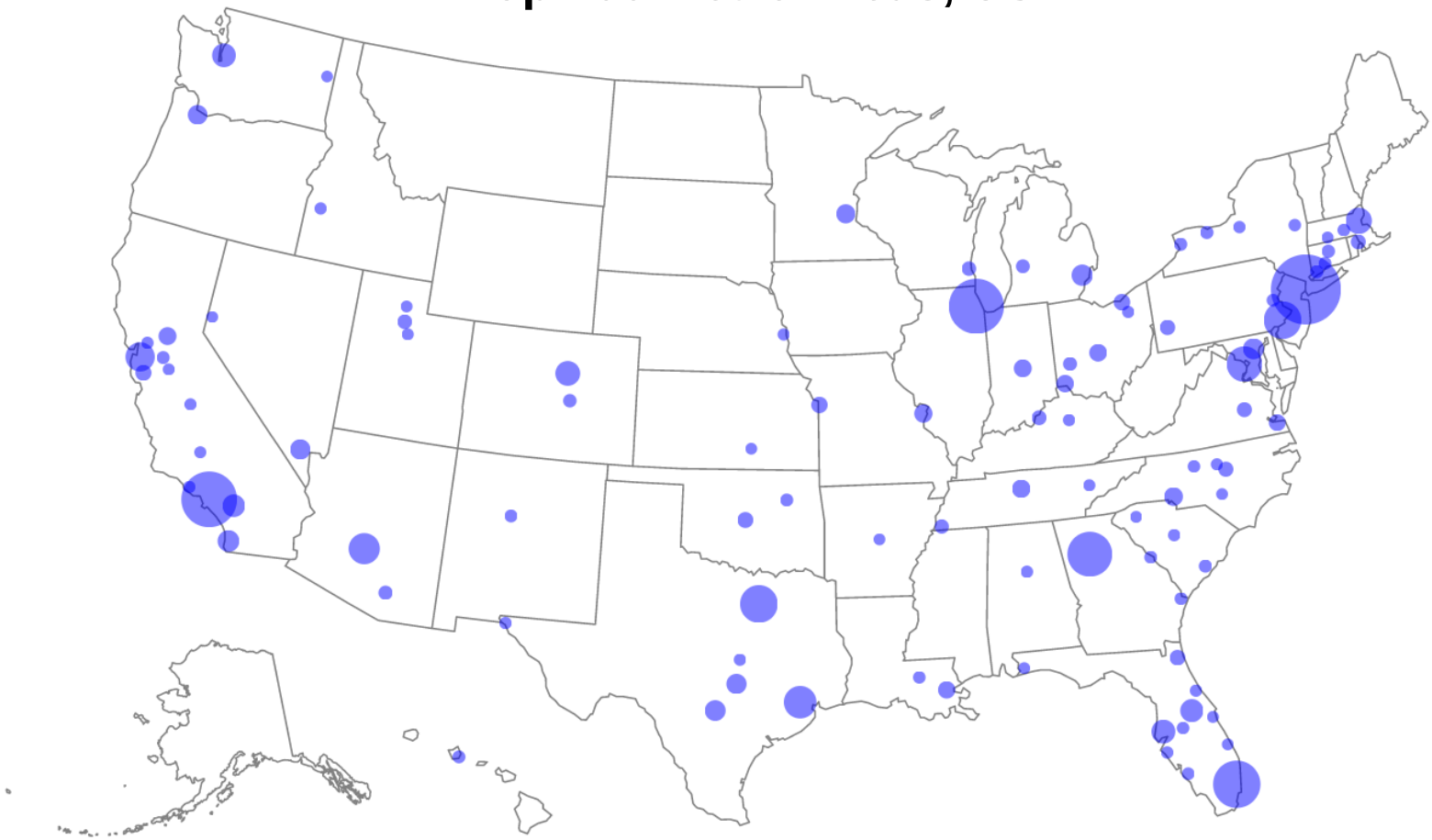
On-Demand Workers = 5.4MM +23%, USA per Intuit



Source: Intuit (2017/2018). *2018 = Forecast from 2017 data. Preliminary 2018 results appear to be in line with forecast as of 5/16/18.
Note: On-demand workers defined as online marketplace workers including transportation and/or logistics for people or products, online talent marketplaces, renting out space. Providing other miscellaneous consumer and business services (e.g. TaskRabbit, Gigwalk, Wonolo, etc.). Workers defined as 'active' employees that have done 'significant' on-demand work within the preceding 6 months.

On-Demand Jobs =
>15MM Applicants on Checkr Platform Since 2014, USA

Checkr Background Check On-Demand Applicants – Top 100 Metro Areas, USA

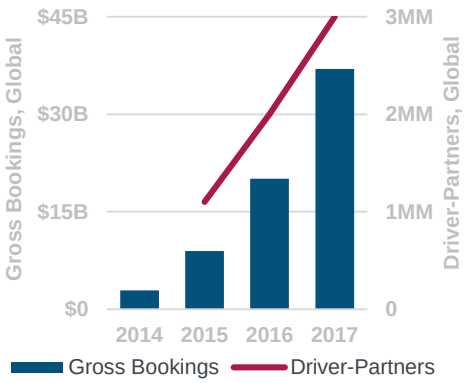


Source: Checkr (2018)

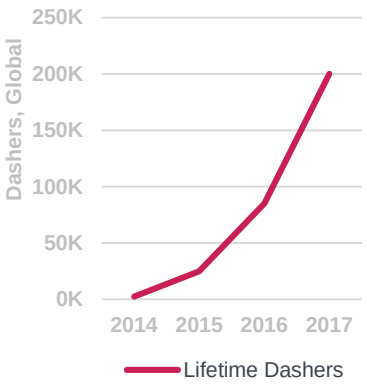
On-Demand Jobs = Big Numbers + High Growth

Real-Time Platforms

Uber @ 3MM Driver-Partners

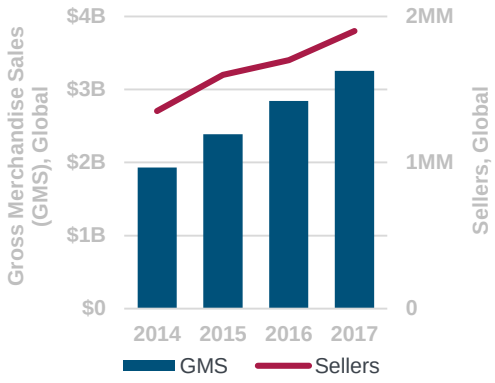


DoorDash @ 200K Dashers

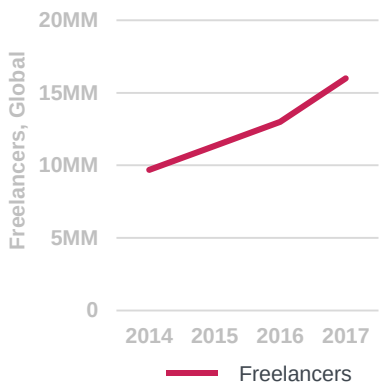


Internet-Enabled Marketplaces

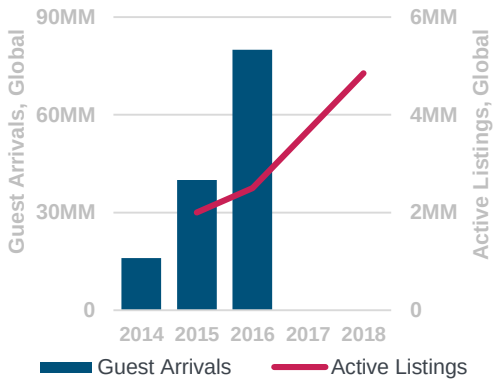
Etsy @ 2MM Sellers



Upwork @ 16MM Freelancers



Airbnb @ 5MM Listings



KLEINER PERKINS
2018
INTERNET TRENDS

Uber Source: Uber Note: ~900K USA Uber Driver-Partners. As of 1/15, based on historical growth rates, it is estimated that >90% of USA Uber driver-partners drive for UberX. DoorDash Source: DoorDash. Note: Lifetime Dashers defined as the total number of people that have dashed on the platform, most of which are still active. Etsy Source: Etsy. Note: In 2017, 65% of Etsy Sellers were USA-based (1.2MM). Upwork Source: Upwork. Airbnb Source: Airbnb, Note: Airbnb disclosed in 2017 that ~660K of their listings were in USA. A 2017 CBRE study of ~256K USA Airbnb listings + ~177K Airbnb hosts in Austin, Boston, Chicago, LA, Miami, Nashville, New Orleans, New York City, Oahu, Portland, San Francisco, Seattle, & Washington D.C. found 83% of hosts are single-listing hosts / non-full-home hosts. This implies >500K USA hosts.

On-Demand Jobs =

Big Numbers + High Growth

Filling Needs for Workers Who Want Extra Income / Flexibility... Have Underutilized Skills / Assets

On-Demand Work Basics + Benefits = Extra Income + Flexibility, USA per Intuit

	Extra Income	Flexibility
Basics	**37%** = Run Own Business	**71%** = Always Wanted To Be Own Boss
	33% = Use Multiple On-Demand Platforms	**46%** = Want To Control Schedule
	26% = Employed Full-Time (W2 Wages)	**19%** = Responsible for Family Care
	14% = Employed Part-Time (W2 Wages)	**9%** = Active Student
	5% = Retired	
Benefits	**57%** = Earn Extra Income	**91%** = Control Own Schedule
	21% = Make Up For Financial Hardship	**50%** = Do Not Want Traditional Job
	19% = Earn Income While Job Searching	**35%** = Have Better Work / Life Balance
	$34 Average Hourly Income	**11** Average Weekly Hours With Primary On-Demand Platform
	$12K Average Annual Income	**37** Average Weekly Hours of Work (All Types / Platforms)
	24% Average Share of Total Income	

Source: Intuit, 2017 Note: Intuit partnered with 12 On-Demand Economy platforms which provided access to their provider email lists. (n = 6,247 respondents who had worked on-demand within the past 6 months). The survey focused on online talent marketplaces. Airbnb and other online capital marketplaces were not included.

On-Demand

Platform Specifics…

Uber =
3MM Global Driver-Partners +~50% Y/Y (2017)

Uber Driver-Partners (USA = 900K)…

$21 = Average Hourly Earnings
17 = Average Weekly Hours
30 = Average Trips Per Week

Basics

80% = Had Job Before Starting Uber

72% = Not Professional Driver

71% = Increased Income Driving Uber

66% = Have Other Job

Motivations

91% = Earn Extra Income

87% = Set Own Hours

85% = Work / Life Balance

74% = Maintain Steady Income

32% = Earn Income While Job Searching

Source: Drivers + Basics = Hall & Krueger (2016) 'An Analysis Of The Labor Market For Uber's Driver-partners In The United States.' Other = Cook, Diamond, Hall, List, & Oyer (2018) 'The Gender Earning Gap in the Gig Economy' Note: % Statistics based on 12/14 survey of Uber Drivers in 20 markets that represent 85% of all USA Uber Driver-Partners

Etsy =
2MM Global Active Sellers +9% (Q1)

Etsy Sellers (USA = 1.2MM)…

$1.7K = Annualized Gross Merchandise Sales (GMS) per Seller
$3.4B = Annualized GMS +20% (Q1)
99.9% = USA Counties with Etsy Seller(s)

Basics

97% = Operate @ Home
87% = Identify as Women
58% = Sell / Promote Etsy Goods Off Etsy.com
53% = Started Their Business on Etsy
49% = Use Etsy Income for Household Bills
32% = Etsy Sole Occupation
32% = Have Traditional Full-Time Job
28% = Operate From Rural Location
27% = Have Children @ Home
13% = Etsy Portion of Annual Household Income

Motivations

68% = Creativity Provides Happiness
65% = Way to Enjoy Spare Time
51% = Have Financial Challenges
43% = Flexible Schedule
30% = Use Etsy Income for Savings

Source: "Etsy SEC filings + "Crafting the future of work: the big impact of microbusinesses: Etsy Seller Census 2017" Published by Etsy. Survey measured 4,497 USA-based sellers on Etsy's marketplace In 2017, 65% of Etsy Sellers were USA-based (1.2MM).

Airbnb =
5MM Global Active Listings (5/18)

Airbnb Hosts (USA Listings = 600K+)…

$6,100 = Average Annual Earnings per Host Sharing Space
97% = Price of Listing Kept by Hosts (9/17)
43% = Airbnb Income Used for Rent / Mortgage / Home Improvement

Basics

80%+ = Share Home in Which They Live

60%+ = 'Superhosts' Who Identify as Women

29% = Not Full-Time Employed

18% = Retirees

Motivations

57% = Use Earnings to Stay in Home

36% = Spend >30% of Total Income on Housing

12% = Avoided Eviction / Foreclosure Owing to Airbnb Earnings

Source: Average Earnings + Foreclosure Avoidance = 'Introducing The Living Wage Pledge" Airbnb (9/17), Superhost Gender Identity = 'Women Hosts & Airbnb" (3/17), Employment Status & Earning Usage = '2017 Seller Census Survey' (5/18). Note: A Superhost is an Airbnb host with a 4.8+ rating, 90% response rate, 10+ stays/year, and 0 cancellations. Superhosts are marked as such on Airbnb.com

No [Uber] driver-partner is ever told where or when to work.

This is quite remarkable – an entire global network miraculously 'level loads' on its own.

Driver-partners unilaterally decide when they want to work and where they want to work.

The flip side is also true – they have unlimited freedom to choose when they do NOT want to work…

The Uber Network…is able to elegantly match supply & demand without 'schedules' & 'shifts'…

That worker autonomy of both time & place simply does not exist in other industries.

- Bill Gurley – *The Thing I Love Most About Uber* – *Above the Crowd*, 4/18

On-Demand + Internet-Related Jobs =

Scale Becoming Significant

DATA GATHERING + OPTIMIZATION =

YEARS IN MAKING…
INCREASINGLY GLOBAL + COMPETITIVE

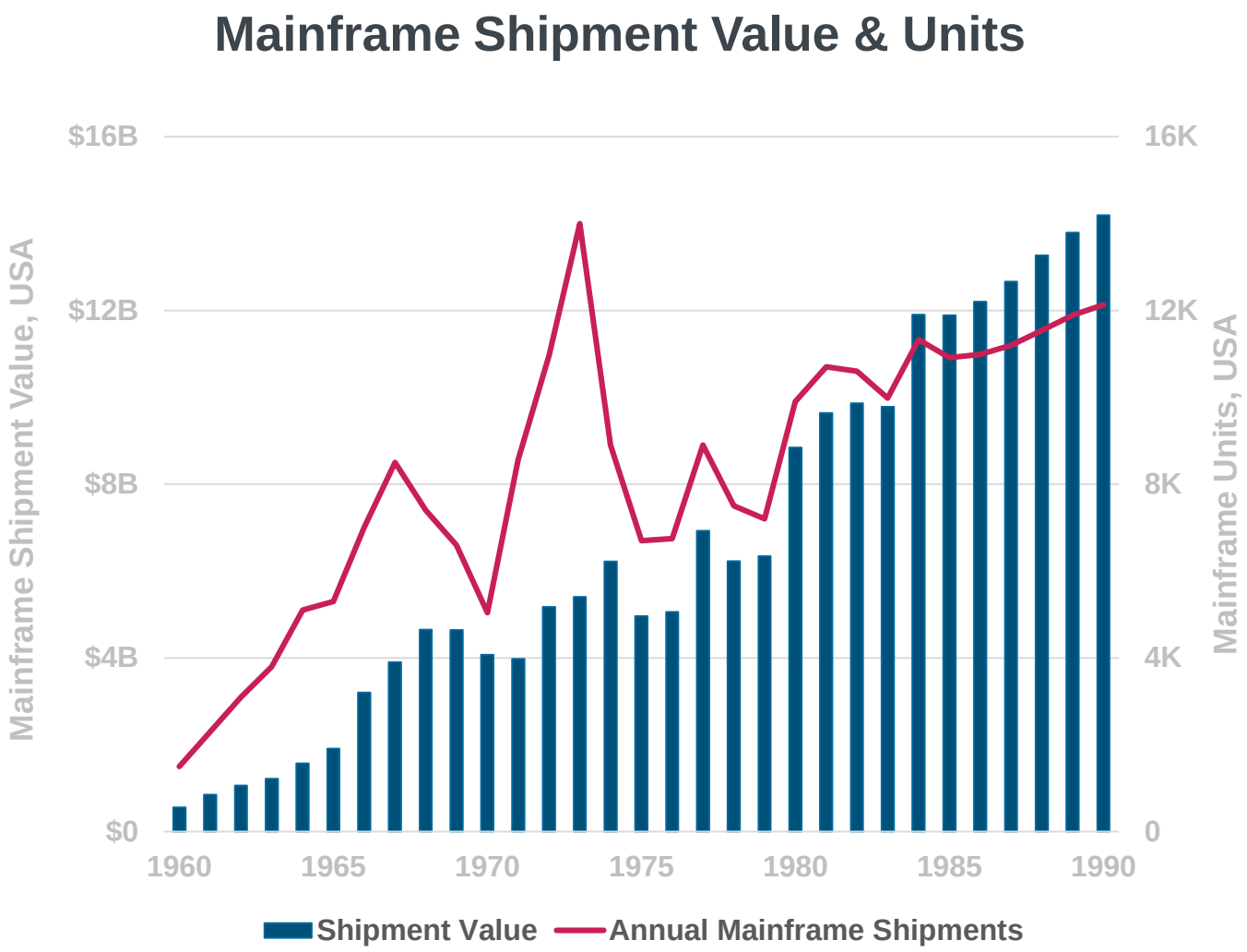
Data Gathering + Optimization =

Accelerates With
Computer Adoption...

Mainframes
(Early 1950s*→)…

* In 1952 IBM launched the first fully electronic data processing system, the IBM 701.

Data Gathering + Optimization (1950s →) = Enabled by Mainframe Adoption…



Source: W. Edward Steinmueller: The USA Software Industry: An Analysis and Interpretive History (3/95).

…Data Gathering + Optimization (1950s →) = Government Mainframe Deployment…

1955 1960 1965

Social Security

Calculate Benefits for
15MM Recipients (62MM Now)

NASA

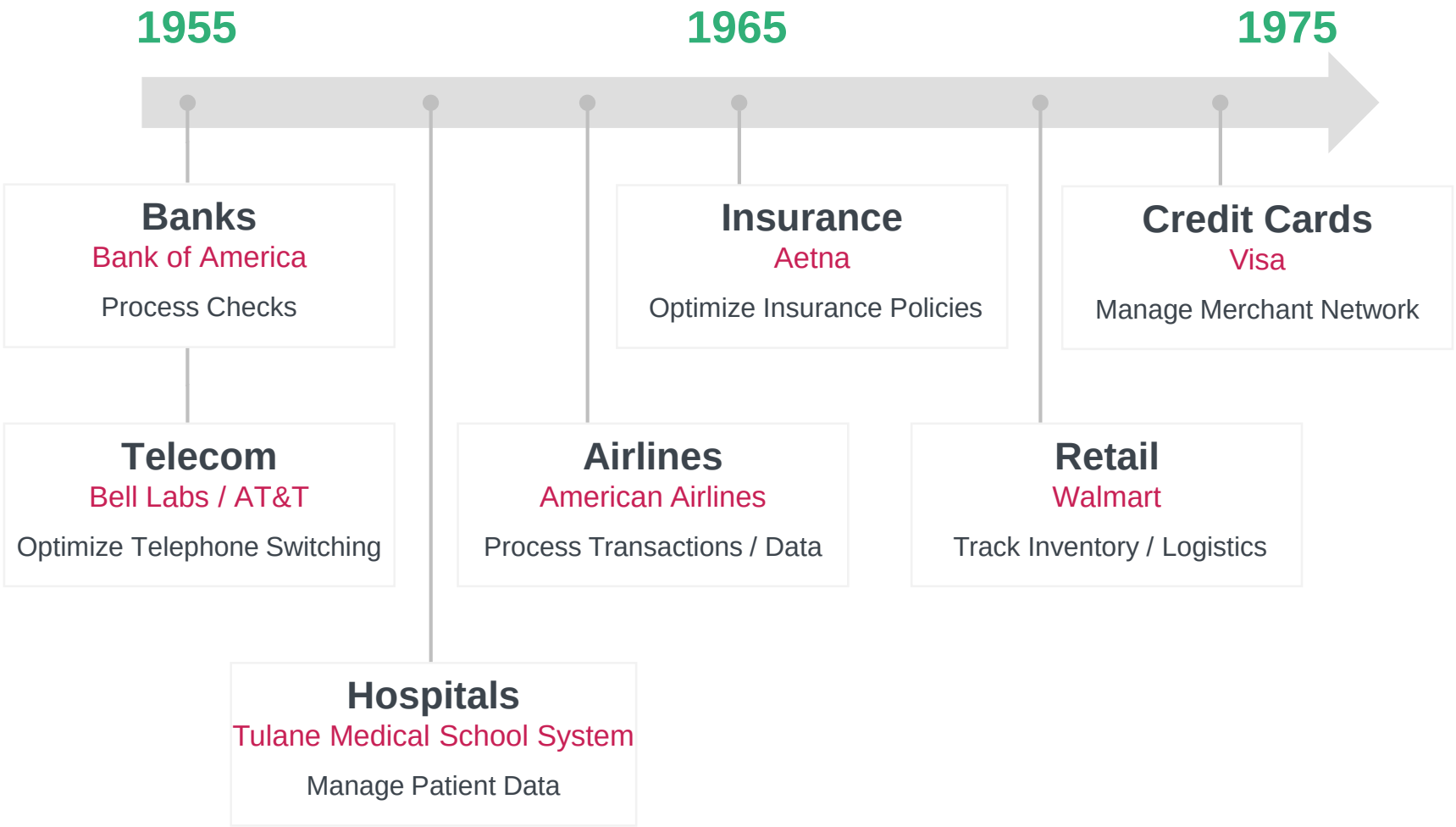
Calculate Real-Time
Orbital Determination

IRS

Calculate / Store
55MM Records (126MM Now)

Source: Social Security Administration (75th Anniversary Retrospective), NASA – 'Computers in Spaceflight', CNET – "IRS Trudges on With Aging Computers" (5/08). Note: Social Security includes Americans receiving retirement benefits, old-age / survivors insurance, unemployment benefits, or disability benefits. Tax records includes include total households since all are required to file taxes regardless of amount owed.

…Data Gathering + Optimization (1950s →) = Business Mainframe Deployment



Source: Bank of America, IBM, Computer World (9/85), Network Computing (3/04), Computer History Museum, Walmart Museum. Note: Banks (1952): Bank of America adopted 'Electronic Recording Method of Accounting' system developed by Stanford Research Institute. Telecom (1955): Bell Labs installed the IBM 650 to facilitate engineering for complex automated telephone switching systems. Hospitals (1959): Tulane Medical School System installed the IBM 650 to process medical record data. Airlines (1962): IBM computers integrated into SABRE system. Insurance (1965): Aetna installed IBM's 360 to automate policy creation. Retail (1972): Walmart established a data processing facility. Credit Cards (1973): Year IBM partnered with Visa.

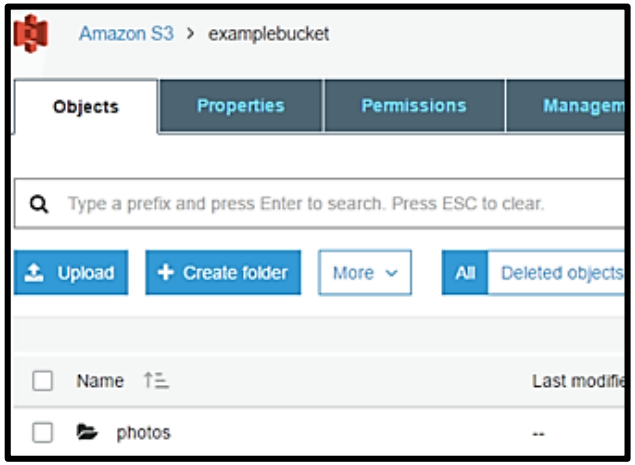
...Data Gathering + Sharing + Optimization =

Accelerates With
Computer Adoption...

Consumer Mobiles + The Cloud (2006→)...

Computing Big Bangs = Cloud (2006) + Consumer Mobile (2007)…

2006
Amazon AWS



*Until now, a sophisticated & scalable data storage infrastructure has been **beyond the reach of small developers.***

- Amazon S3 Launch FAQ, 2006

2007
Apple iPhone

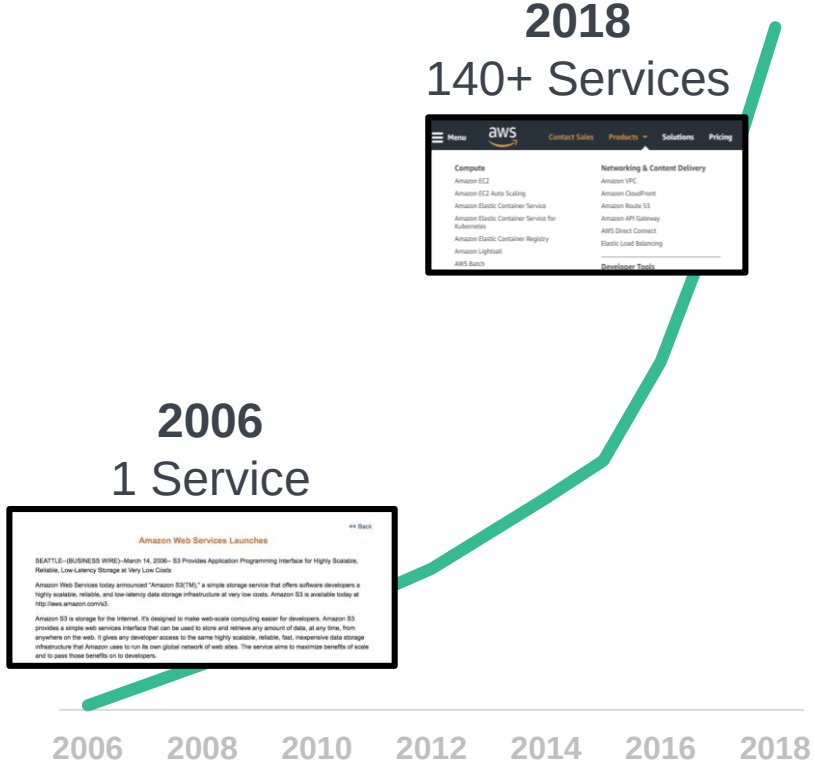
*Why run such a sophisticated operating system on a mobile device? Well, because **it's got everything we need**.*

- Steve Jobs, iPhone Launch, 2007

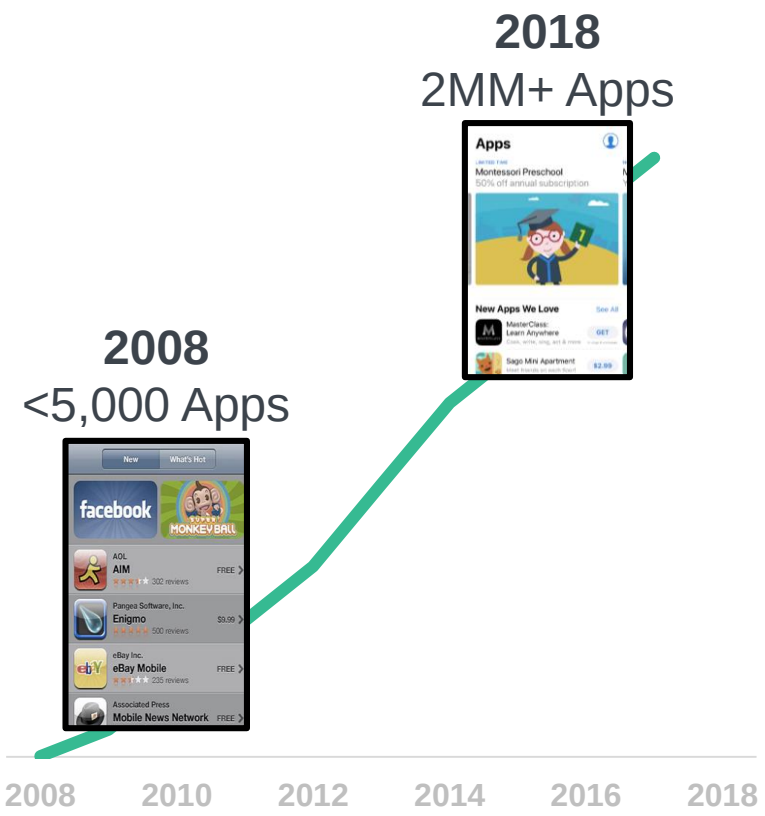
Source: Wikimedia, Apple, Amazon, Steve Jobs Photo by Tom Coates.

…Computing Big Bangs = Cloud (2006) + Consumer Mobile (2007)

Amazon AWS – # of Services

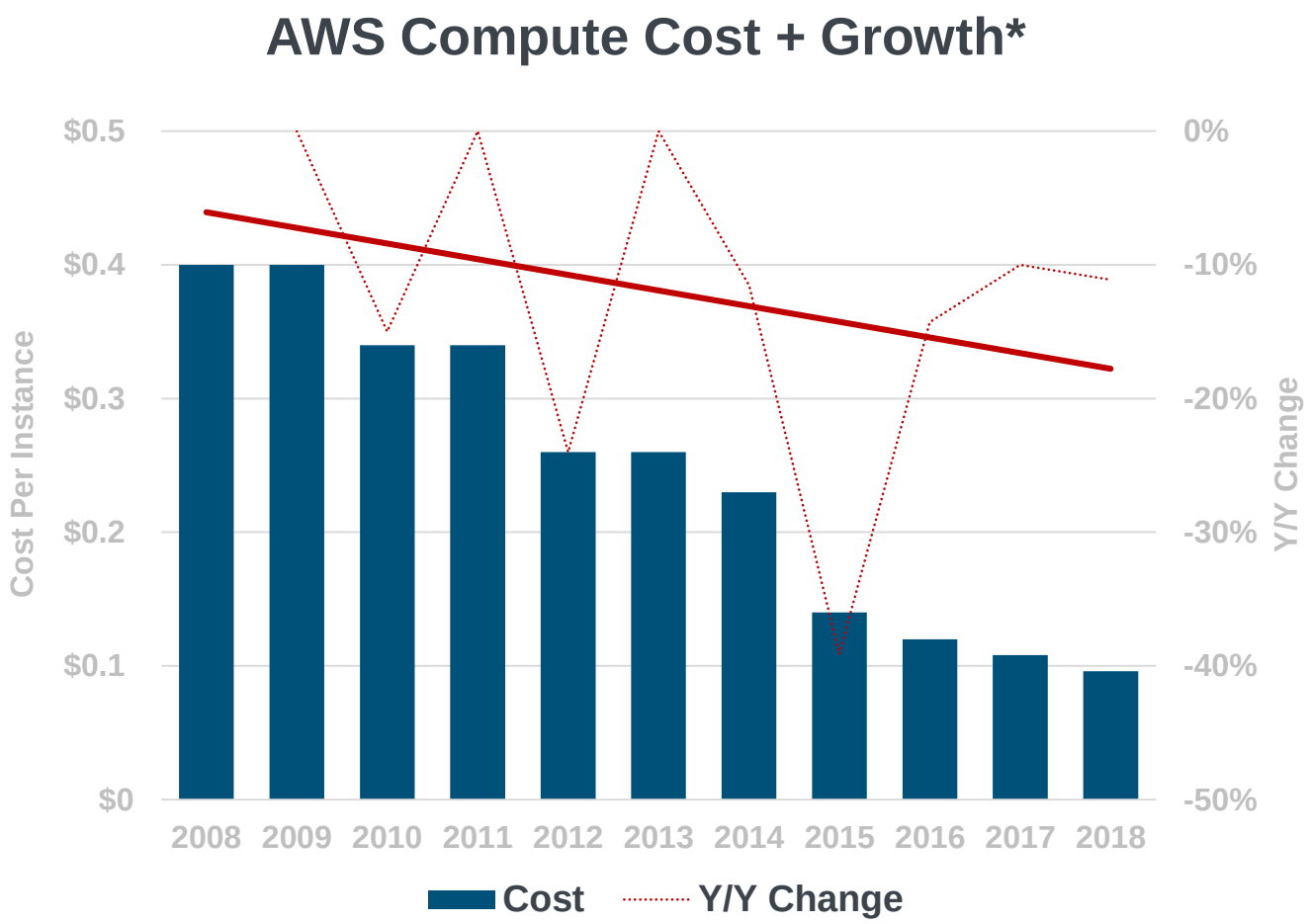


Apple iOS – # of Apps



Source: Amazon, The Internet Archive. Apple; AppleInsider. Note: Based on Apple releases. Includes all iPhone/iPad/Apple TV applications available for download. Data as of 5/18.

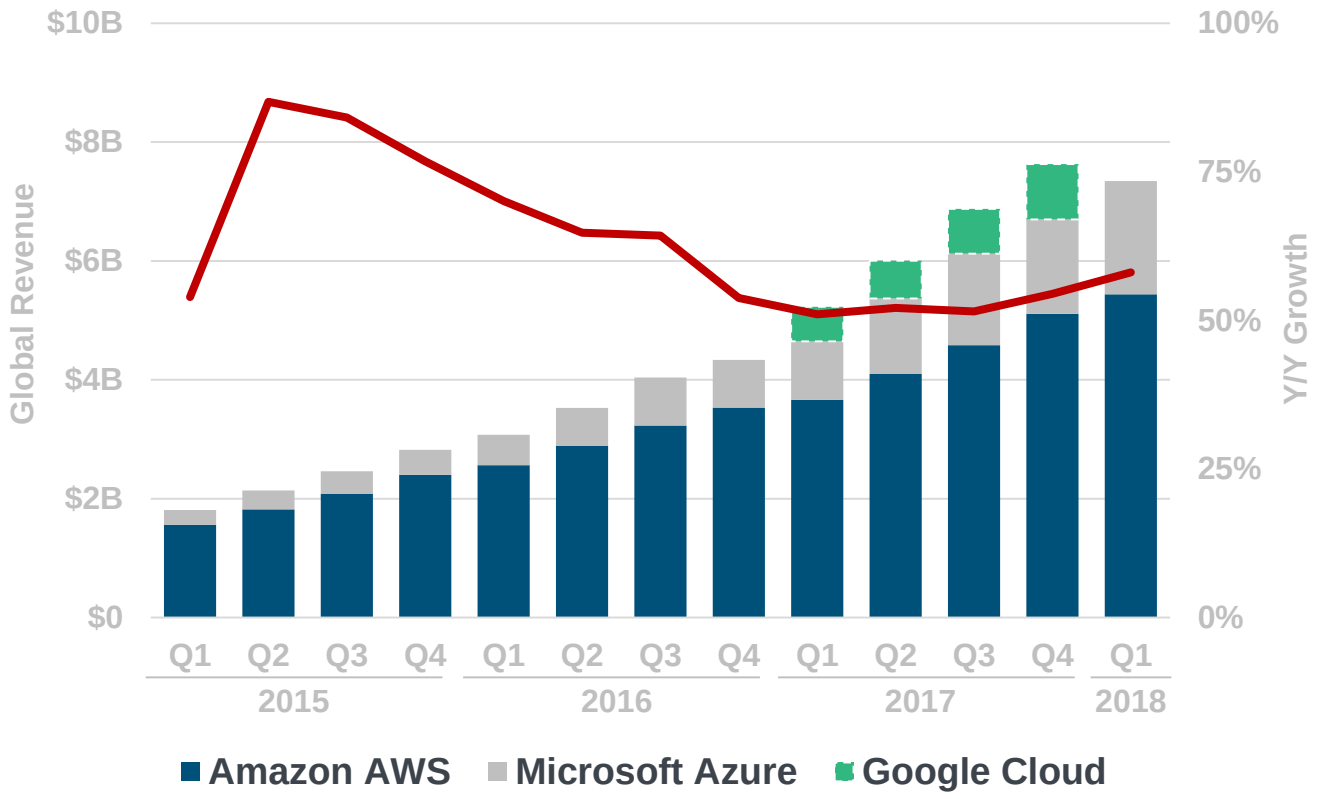
...Computing Big Bangs Volume Effects = Cloud Compute Cost Declines Continue -11% vs. -10% Y/Y...



Source: The Internet Archive. *Cost data reflects price of 'current generation' m.large on-demand Linux instance in USA-East Virginia (m1.large = 2008-2013, m3.large = 2014-2015, m4.large = 2016-2017, m5.large = 2018). m.large chosen as a representative instance of general purpose compute; pricing does not account for increasing instance performance.

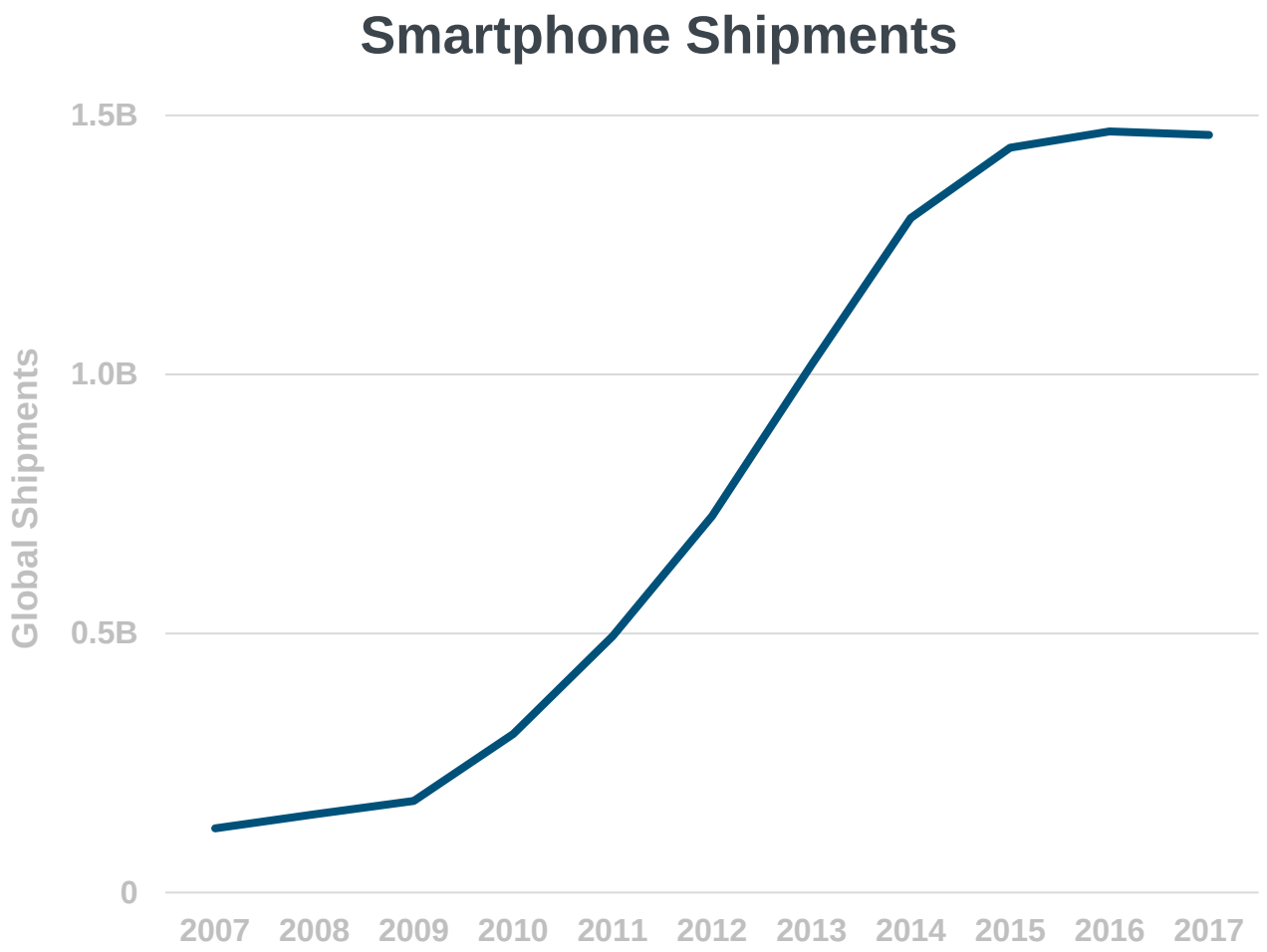
...Computing Big Bangs Volume Effects = Cloud Revenue Re-Accelerating +58% vs. +54% Q/Q

Cloud Service Revenue – Amazon + Microsoft + Google



Source: Amazon AWS = Company filings, Microsoft Azure = Keith Weiss @ Morgan Stanley (4/18), Google Cloud = Brian Nowak @ Morgan Stanley (5/18). Note: Google Cloud revenue excluded in Y/Y growth rate calculation due to limited quarterly estimates.

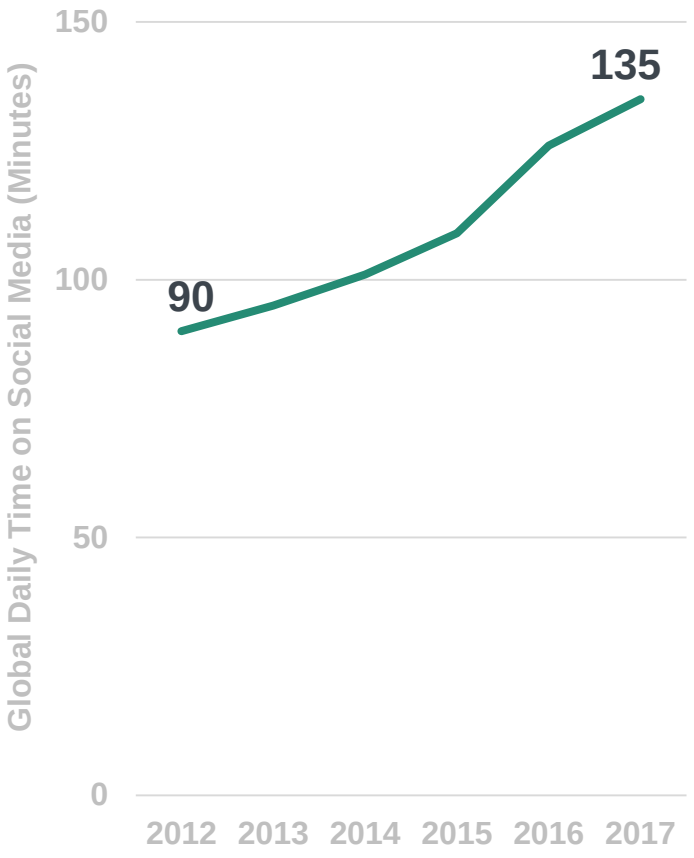
Data Gathering + Sharing + Optimization (2006 →) = Enabled by Consumer Mobile Adoption...



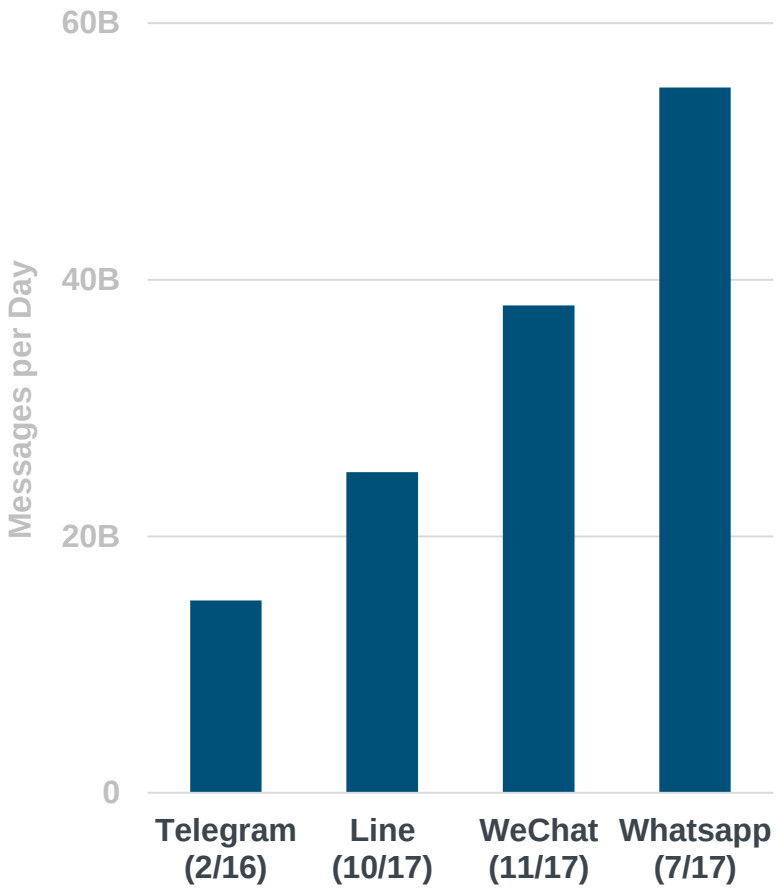
Source: Morgan Stanley (Katy Huberty, 3/18), IDC.

...Data Gathering + Sharing + Optimization (2006 →) = Enabled by Social Media Adoption…

Time Spent on Social Media



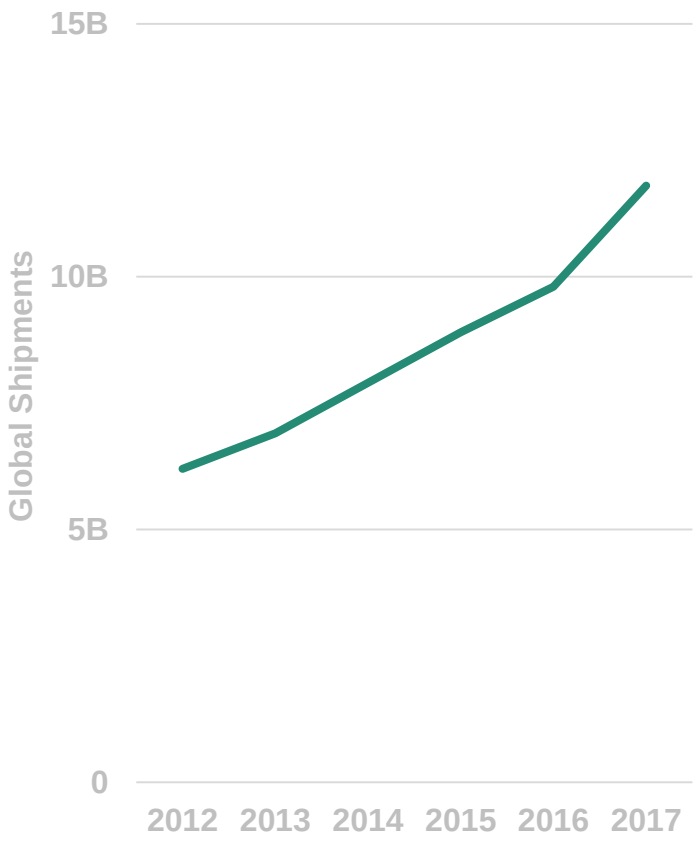
Messages per Day



Source: Global Web Index (9/17), Telegram (2/16), Line (10/17), WeChat (11/17), Whatsapp (7/17).
Note: Per Global Web Index, social media time spent for Internet users aged 16-64. n = 61,196 (2012), 156,876 (2013), 168,046 (2014), 198,734 (2015), 211,024 (2016), 178,421 (2017).

...Data Gathering + Sharing + Optimization (2006 →) = Enabled by Sensor Pervasiveness...

MEMS Sensor / Actuator Shipments



Sensors + Data = In More Places

Visual Navigation
Google Maps

Shared Transportation
Mobike

Home Temperature
Nest

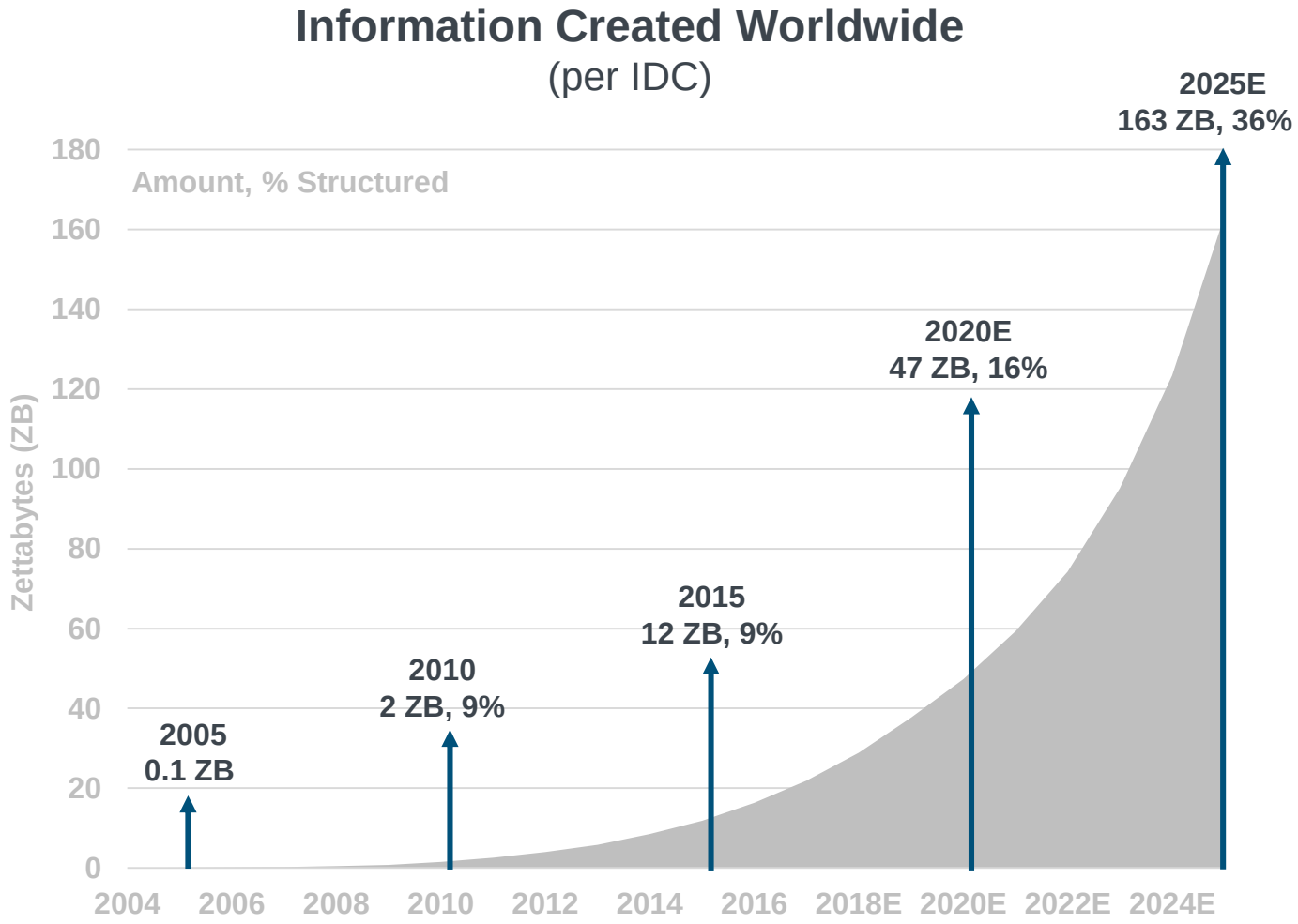
Predictive Maintenance
Samsara

Fitness Tracking
Motiv

Precision Cooking
Joule

Source: IC Insights (2018), Google Maps, Mobike, Nest, Samsara, Motiv, Joule. Note: MEMS sensors and actuators includes all MEMS-based sensors (e.g., Accelerometers, Gyroscopes, etc.), but does not include optical sensors, like CMOS image sensors, also includes actuators made using MEMs processes, per IC Insights.

...Data Gathering + Sharing + Optimization (2006 →) = Ramping @ Torrid Pace



Source: IDC Data Age 2025 Study, sponsored by Seagate (4/17). Note: 1 petabyte = 1MM gigabytes, 1 zeta byte = 1MM petabytes. The grey area in the graph represents data generated, not stored. Structured data indicates data that has been organized so that it is easily searchable and includes metadata and machine-to-machine (M2M) data.

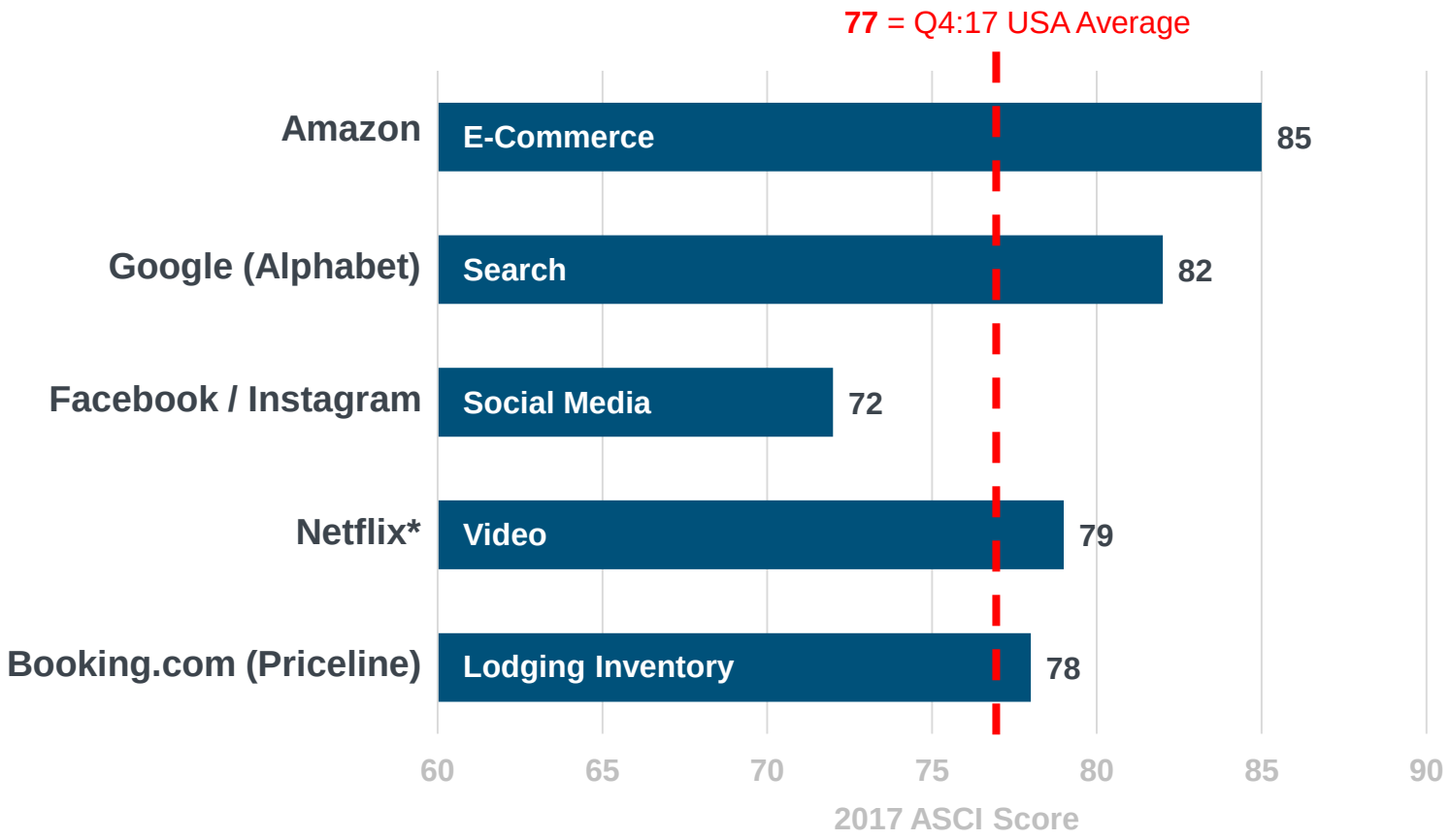
Data =

Can Be Important Driver of Customer Satisfaction

USA Internet Data Leaders = Relatively High Customer Satisfaction

American Customer Satisfaction Index (ASCI) Scores

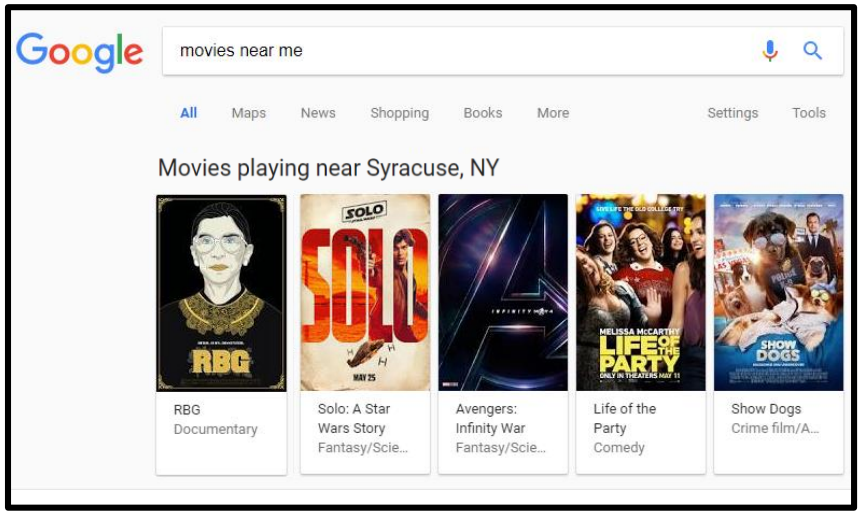
(Internet Data Companies >$100B Market Capitalization, 5/18, USA)



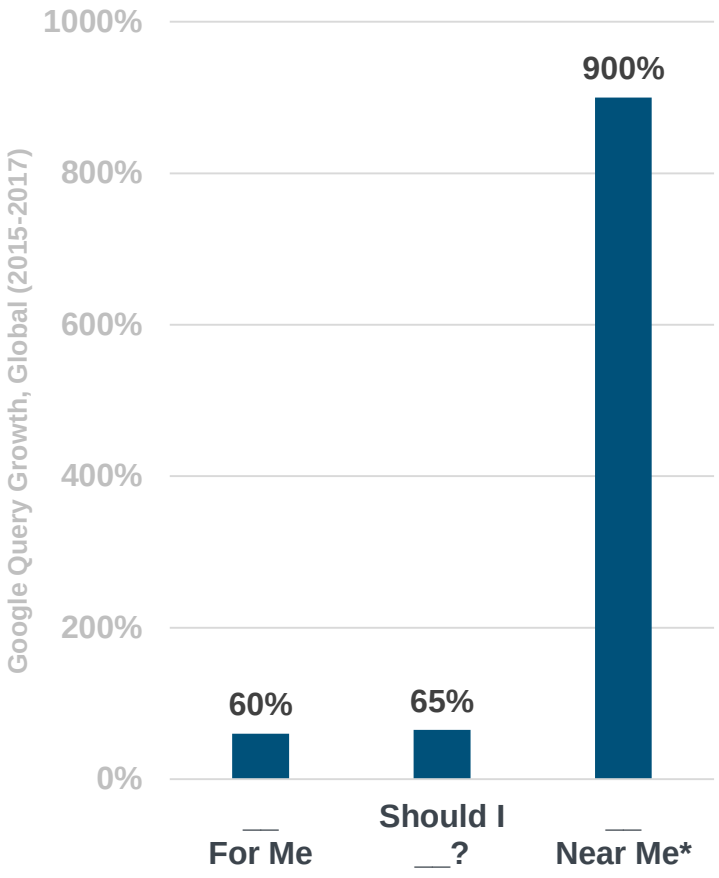
Source: American Customer Satisfaction Index (ASCI). *Netflix data from 2016, as ASCI score was not tracked in 2017. Instagram / Facebook average score used as 'Facebook' score. Priceline.com used as 'Booking Holdings' score. Note: ASCI is a tool first developed by The University of Michigan to measure consumer satisfaction with various companies, brands, and industries. ACSI surveys 250K USA customers annually via email, responses to weighted questions are used to create a cross-industry score on a scale of 0-100. Top 2017 Score = 87 (Chick-fil-A).

Google Personalization = Queries…
Drive Engagement + Customer Satisfaction

Data-Driven Personalization



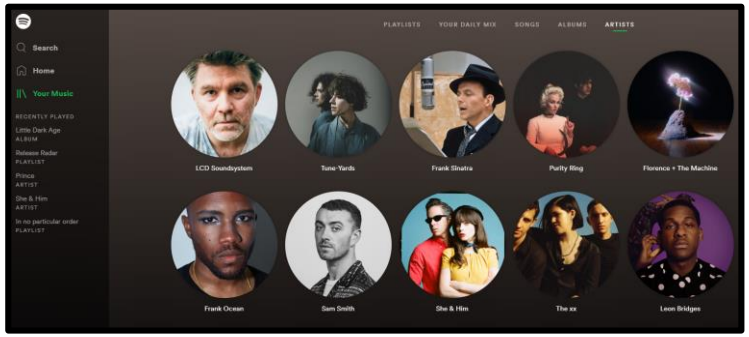
Query Growth
(2015 -2017)



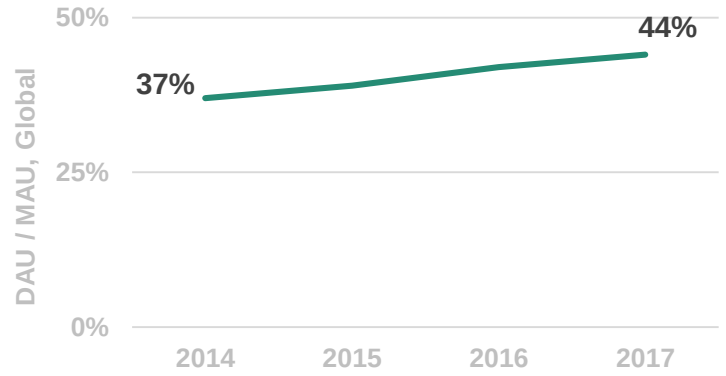
Source: Google (5/18). Note: Google queries only personalized for geo-location data. *Reflects mobile queries, where location data is readily available / important.

Spotify Personalization = Preferences… Drive Engagement + Customer Satisfaction

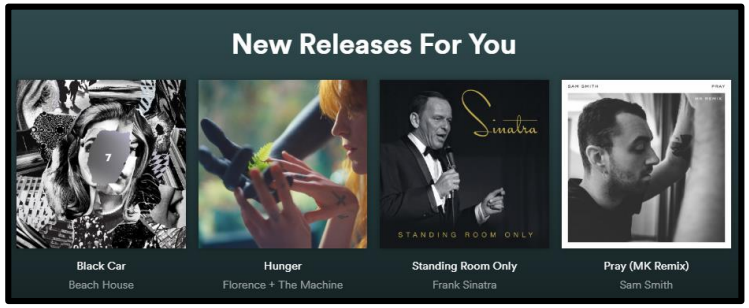
User Preferences



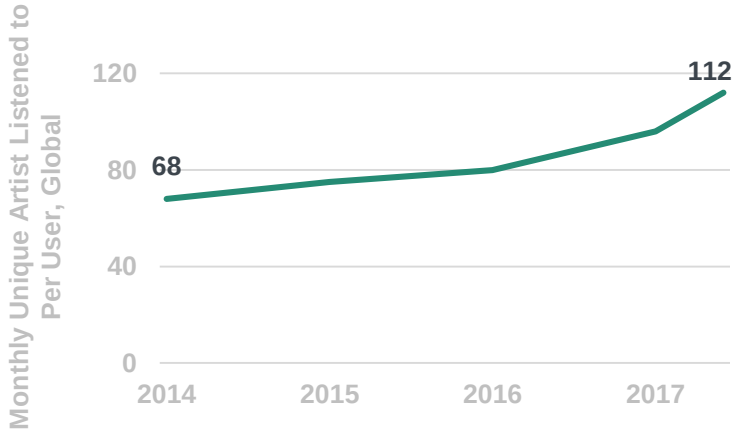
Spotify Daily Engagement



Data-Driven Personalization



Unique Artist Listening



Source: Spotify, Benjamin Swinburne @ Morgan Stanley (4/18)
Note: Monthly unique artists listened to per user as of 5/18.

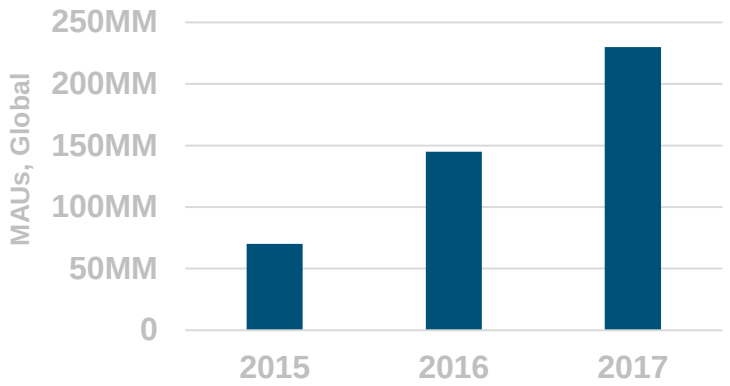
Toutiao Personalization = Interests…
Drive Engagement + Customer Satisfaction

Data-Driven Personalization

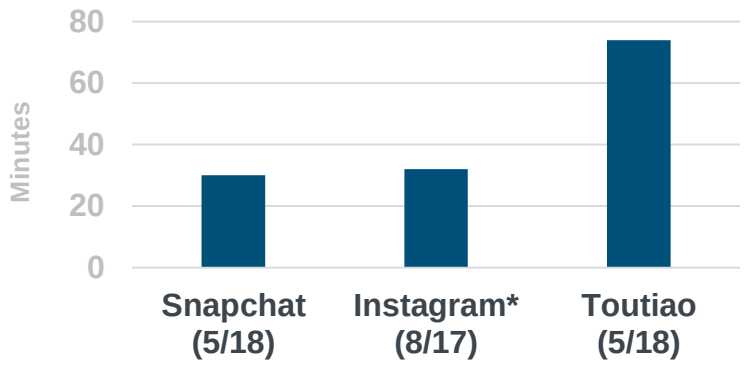
Main Page – User A

Main Page – User B

MAUs



Minutes Spent per Day

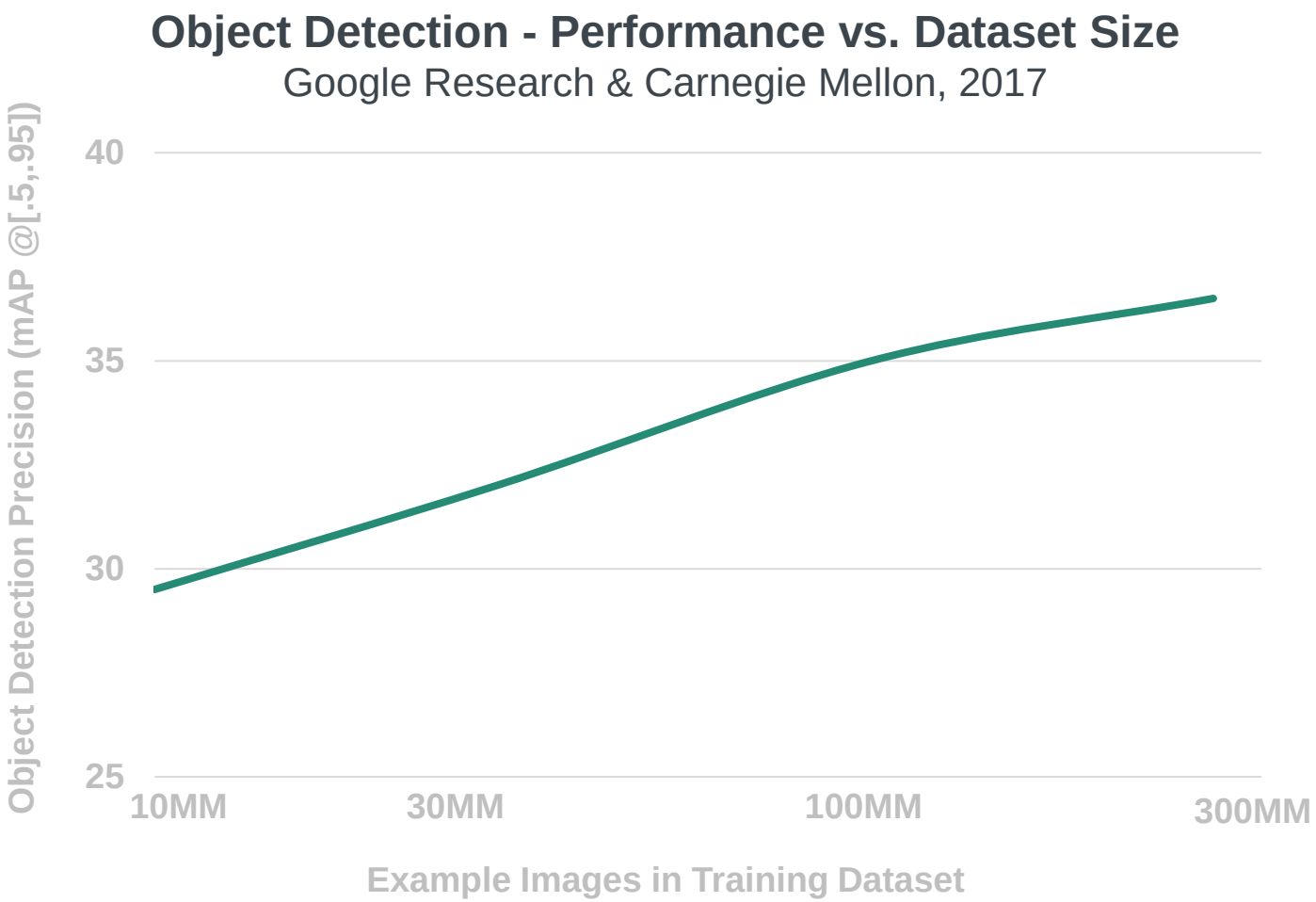


Source: Toutiao (5/18), Snap (5/18), Instagram (8/17).
*Instagram data reflects time spent by users under the age of 25, assumed to be representative of all Instagram users.

Data =

Improves Predictive Ability of Many Services

Data Volume = Foundational to Algorithm Refinement + Artificial Intelligence (AI) Performance…



Source: Revisiting Unreasonable Effectiveness of Data in Deep Learning Era – Sun, Shrivastava, Singh, & Gupta, 2017
Note: Chart reflects object detection performance when initial checkpoints are pre-trained on different subsets of JFT-300M tagged image dataset. X-axis is the data size in log-scale, y-axis is the detection performance in mAP@[.5,.95] on "COCO minival" testing set.

…Data Volume = Foundational to Tool / Product Improvement... Artificial Intelligence (AI) Predictive Capability

AWS 'Data Flywheel' – Amazon Rekognition*

More Data

Pricing

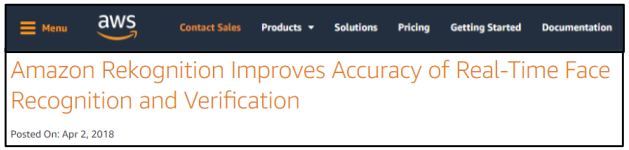
More Uploads = Lower Average Price

Image Analysis Tiers	Price per 1,000 Images Processed
First 1 million images processed* per month	$1.00
Next 9 million images processed* per month	$0.80
Next 90 million images processed* per month	$0.60
Over 100 million images processed* per month	$0.40

Better Analytics

Accuracy

Regular Improvements



Better Products

Features

Regular Improvements

More Customers

Customers

Large / Small Enterprises + Public Agencies

CITY OF ORLANDO C-SPAN Pinterest

Source: Amazon Artificial Intelligence on AWS Presentation (6/17). *Amazon Rekognition enables users to detect objects, people, text, scenes, and activities in their photos and videos using machine learning.

Artificial Intelligence (AI)
Service Platforms for Others =

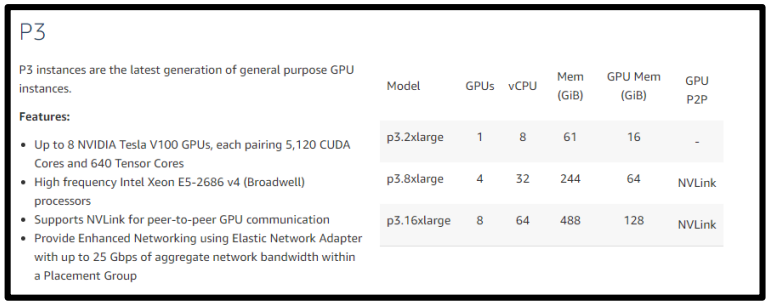
Emerging from Internet Leaders

Amazon = AI Platform Emerging from AWS…
Enabling Easier Data Processing / Collection for Others…

Amazon AWS AI Services / Infrastructure

Rekognition Image Recognition

AI Hardware – Scalable GPU Compute Clusters



P3

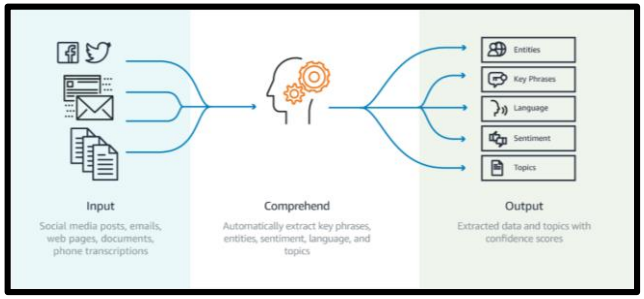
P3 instances are the latest generation of general purpose GPU instances.

Features:

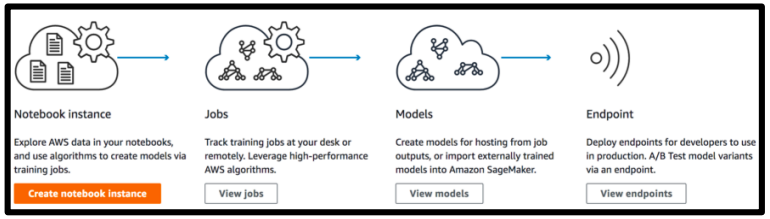
- Up to 8 NVIDIA Tesla V100 GPUs, each pairing 5,120 CUDA Cores and 640 Tensor Cores
- High frequency Intel Xeon E5-2686 v4 (Broadwell) processors
- Supports NVLink for peer-to-peer GPU communication
- Provide Enhanced Networking using Elastic Network Adapter with up to 25 Gbps of aggregate network bandwidth within a Placement Group

Model	GPUs	vCPU	Mem (GiB)	GPU Mem (GiB)	GPU P2P
p3.2xlarge	1	8	61	16	-
p3.8xlarge	4	32	244	64	NVLink
p3.16xlarge	8	64	488	128	NVLink

Comprehend Language Processing



SageMaker Machine Learning Framework



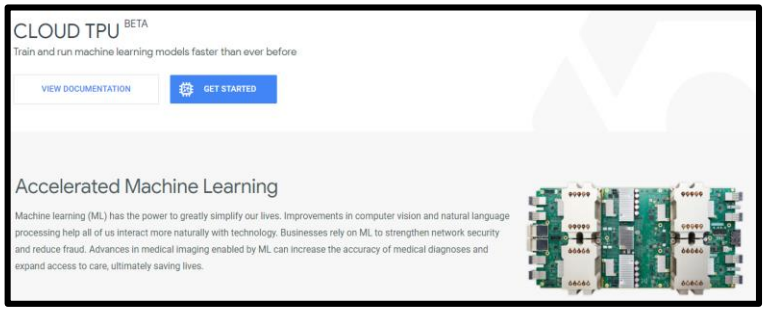
Source: Amazon. AWS = Amazon Web Services.

...Google = AI Platform Emerging from Google Cloud… Enabling Easier Data Processing / Collection for Others

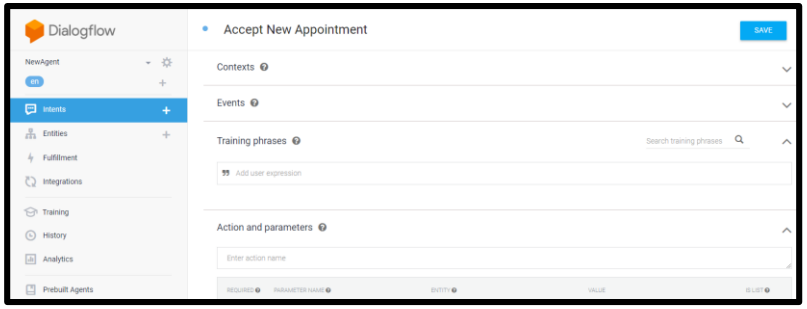
Google Cloud AI Services / Infrastructure

Google Cloud Vision API

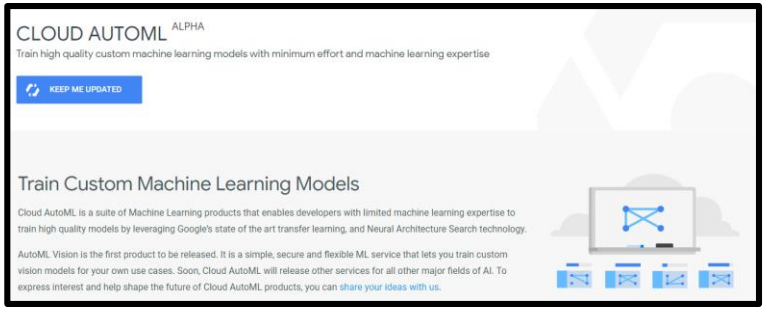
AI Hardware – Tensor Processing Units



Dialogflow Conversational Platform



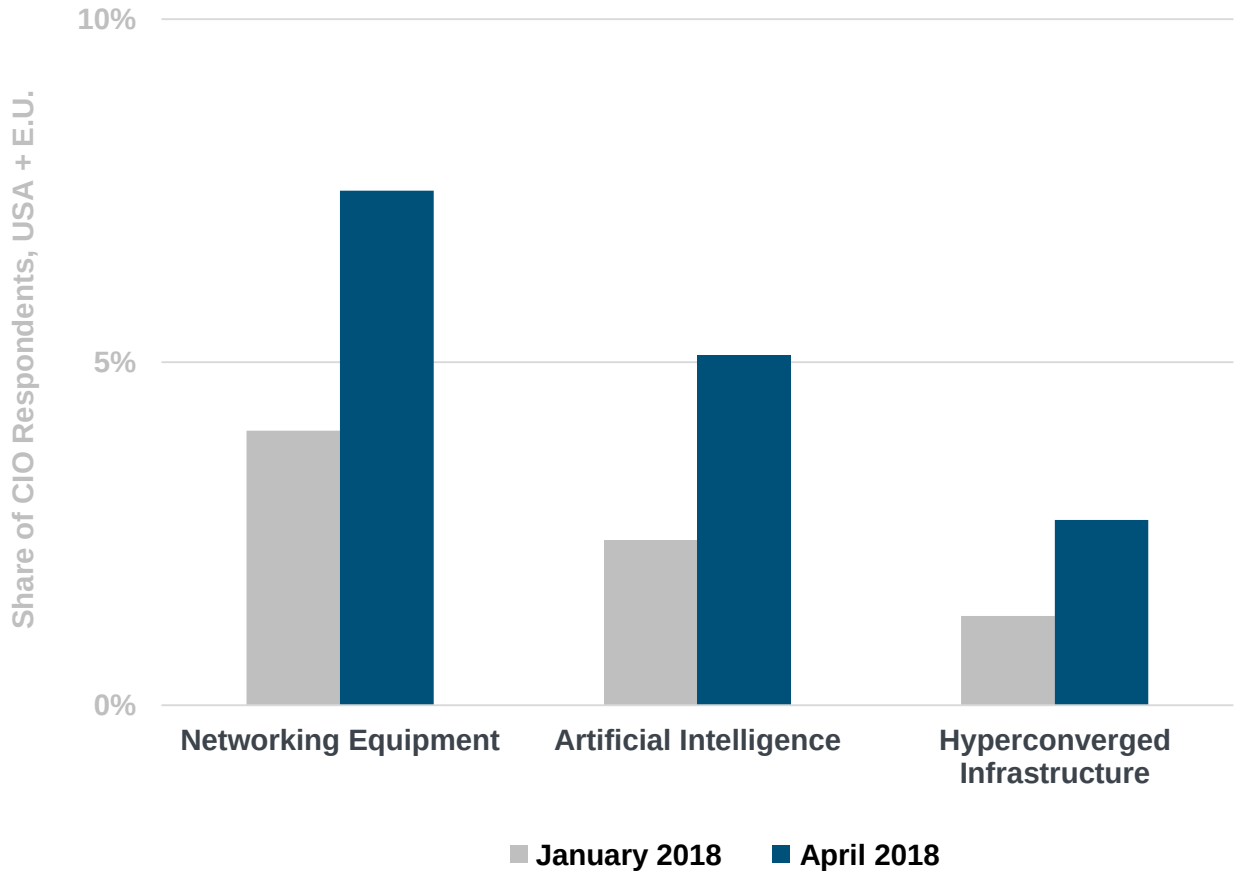
Cloud AutoML – Custom Models



Source: Google

AI in Enterprises = Small But Rapidly Rising Spend Priority… Per Morgan Stanley CIO Survey (4/18 vs 1/18)

Which IT Projects Will See The Largest Spend Increase in 2018?



Source: AlphaWise, Morgan Stanley Research. Note: n = 100 USA / E.U. CIOs. Note: Full Question Text = 'Which three External IT Spending projects will see the largest percentage increase in spending in 2018?'

AI is one of the most important things humanity is working on.
It is more profound than electricity or fire…

We have learned to harness fire for the benefits of humanity but we had to overcome its downsides too.

…AI is really important, but we have to be concerned about it.

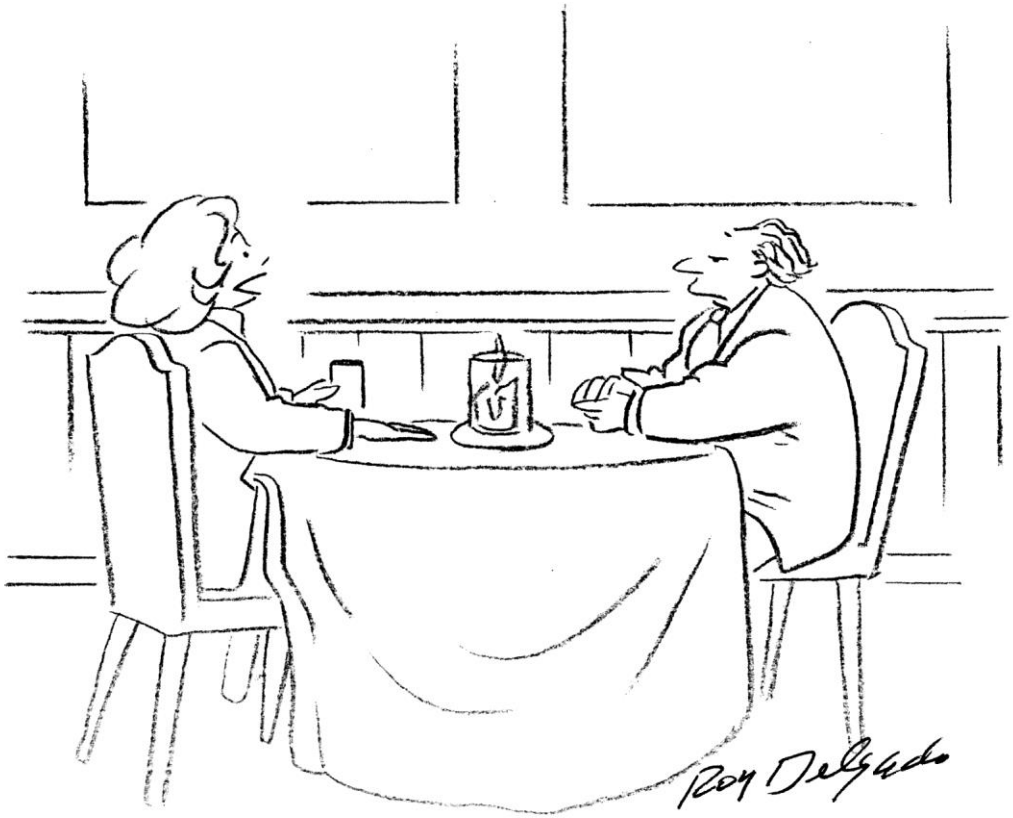
- Sundar Pichai, CEO of Google, 2/18

Source: CNBC (2/18).

Data Sharing =

Creates Multi-Faceted Challenges

Data + Consumers = Love-Hate Relationship



" Just because I hate you doesn't mean I don't love you. "

Source: Cartoonstock, Artist: Roy Delgado

Most Online Consumers Share Data for Benefits…

USA Consumers per Deloitte

79%

Willing to Share Personal Data For ‘Clear Personal Benefit’

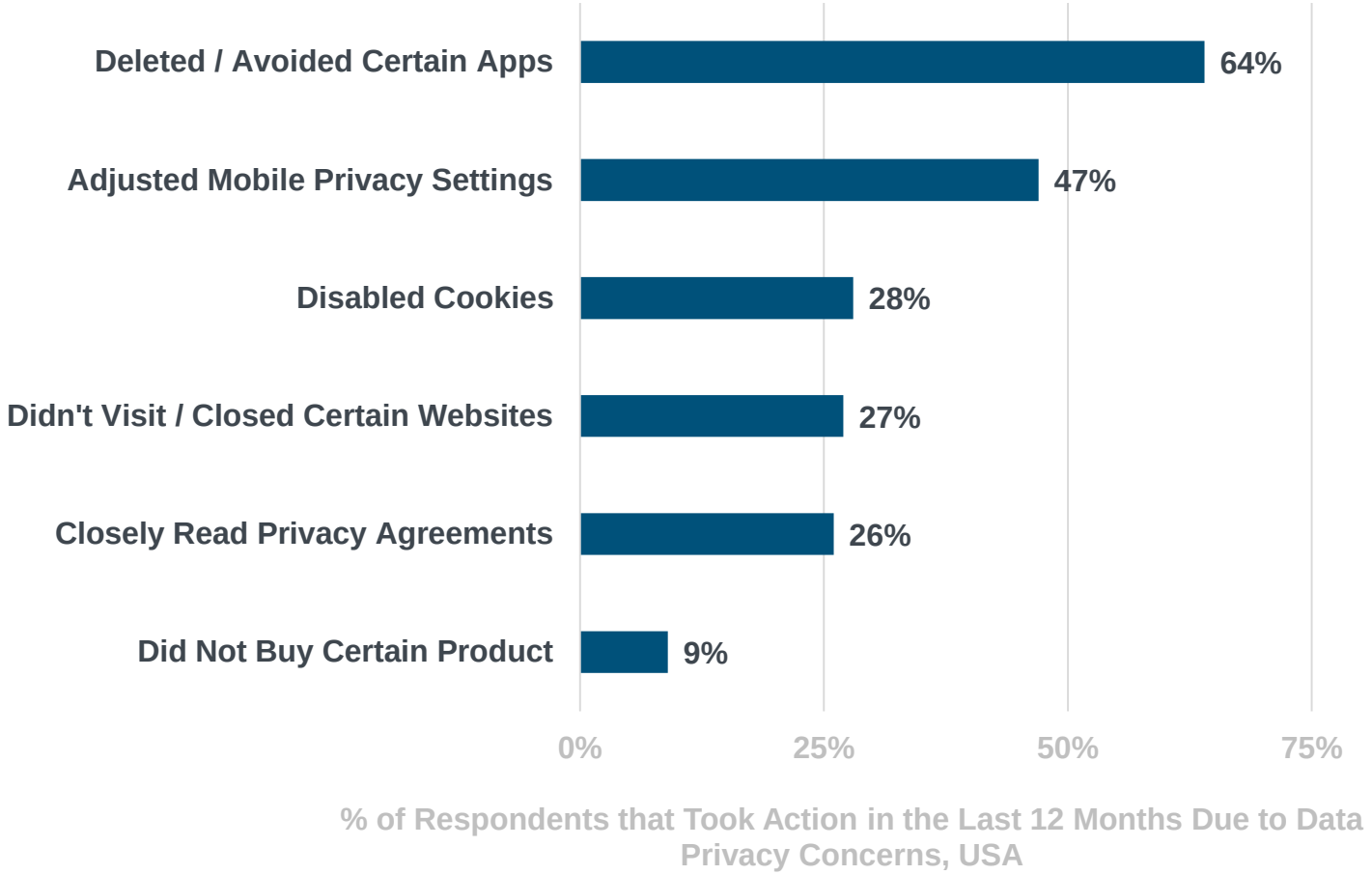
>66%

Willing To Share Online Data With Friends & Family

Source: USA Consumer Data = Deloitte *To share or not to share* (9/17)
Note: n = 1,538 USA customers surveyed in cooperation with SSI in 2016.

…Most Online Consumers Protect Data When Benefits Not Clear

Consumers Taking Action To Address Data Privacy Concerns



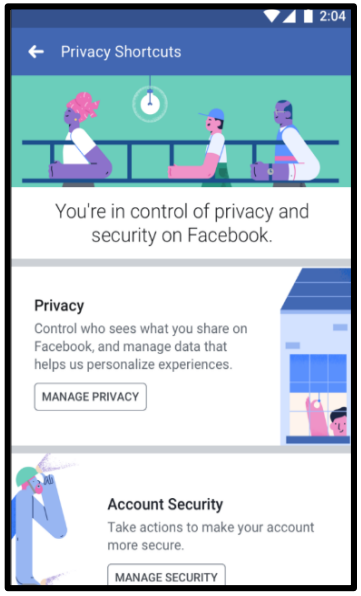
Source: Deloitte *To share or not to share* (9/17)
Note: n = 1,538 USA consumers in cooperation with SSI.

Internet Companies = Making Consumer Privacy Tools More Accessible (2018)

Facebook

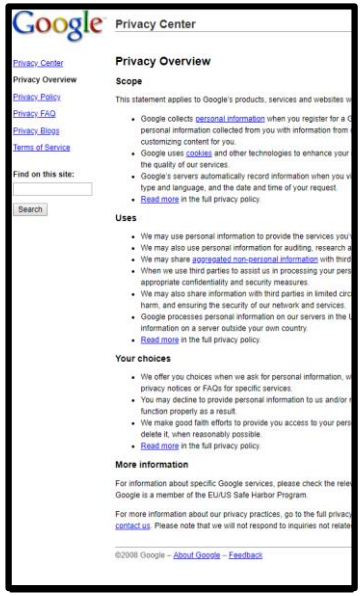
2008

2018

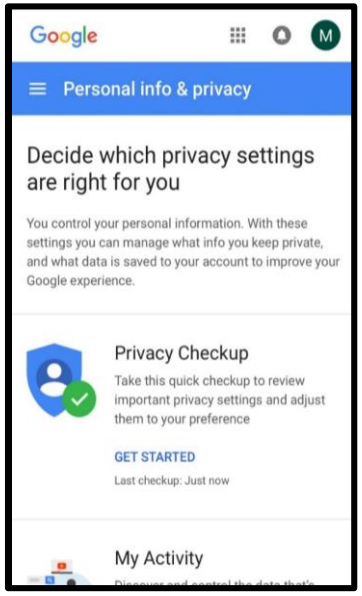


Google

2008



2018

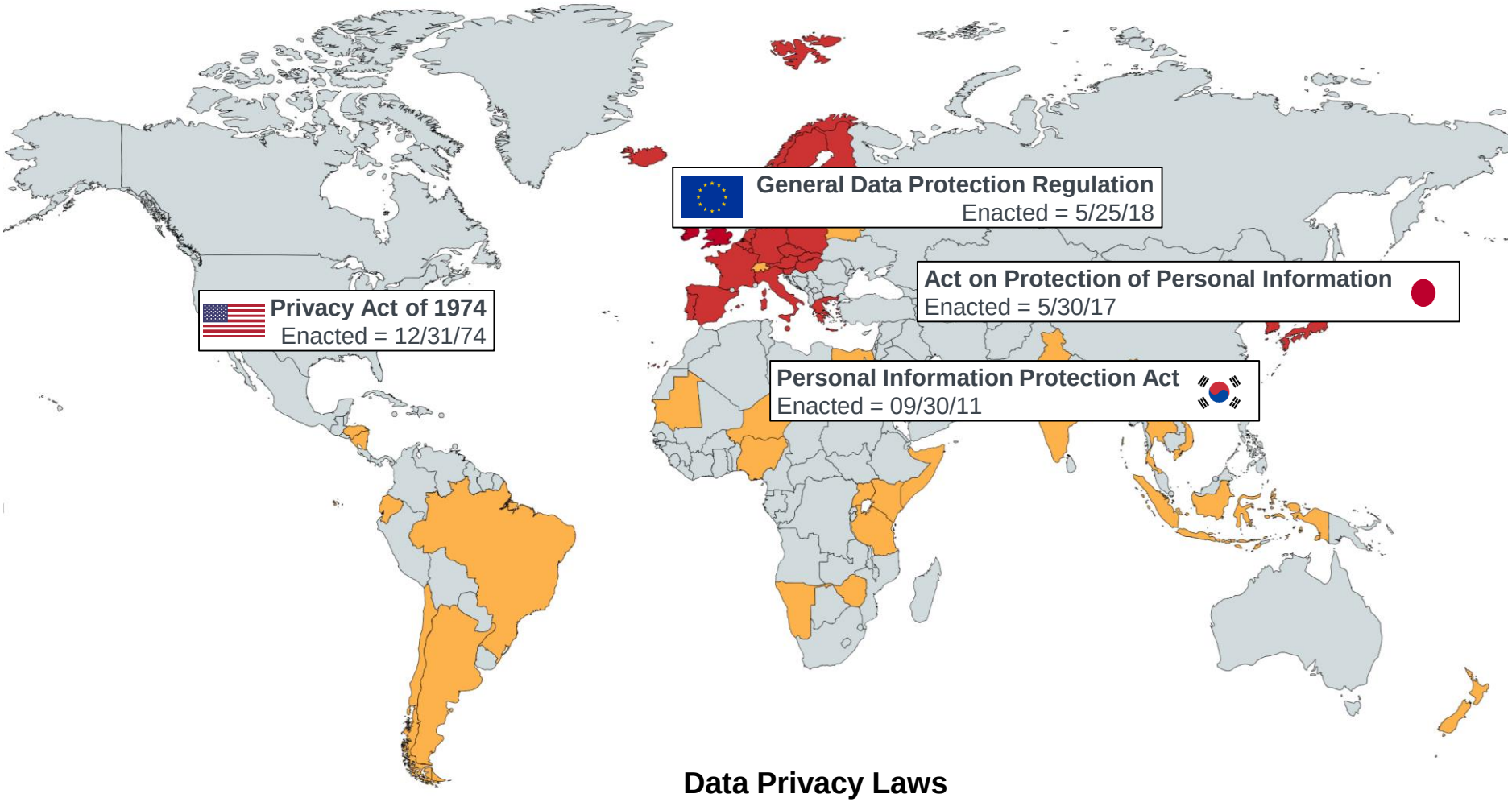


Source: Facebook, Google

Data Sharing =

Varying Views

EU / Asia / Americas =
Rising Regulatory Focus on Data Collection + Sharing…



Source: Wikimedia, USA Congress, EU, Japan Government, South Korea Government, Argentina Government.
Note: Argentina proposed a 2017 draft amendment to the Personal Data Protection Act that would strengthen current regulation and align with most GDPR requirements. Japan enacted an amendment to its Act on Protection of Personal Information that went into effect on 5/30/17. All EU countries grouped due to passage of EU-wide GDPR laws.

...China = Encouraging Data Collection

[Xi Jingping] called for building high-speed, mobile, ubiquitous & safe information infrastructure, integrating government & social data resources, & improving the collection of fundamental information...

[Xi stated] The Internet, 'Big Data,' Artificial Intelligence, & 'The Real Economy' should be interconnected.

- ***Xinhua State News Agency, 12/9/17***

Ministry of Industry & Information Training to Build 'Big Data' Datacenter
Xinhua State Press Agency, 5/07/17

China to Further Promote Government Information Sharing & Disclosure
Xinhua State Press Agency, 12/7/17

China Launches 'Big Earth' Big Data Project To Boost Science Data Sharing
Xinhua State Press Agency, 2/13/18

Source: Xinhua (PRC's official Press Agency).

Cybersecurity =
Threats Increasingly Sophisticated...Targeting Data

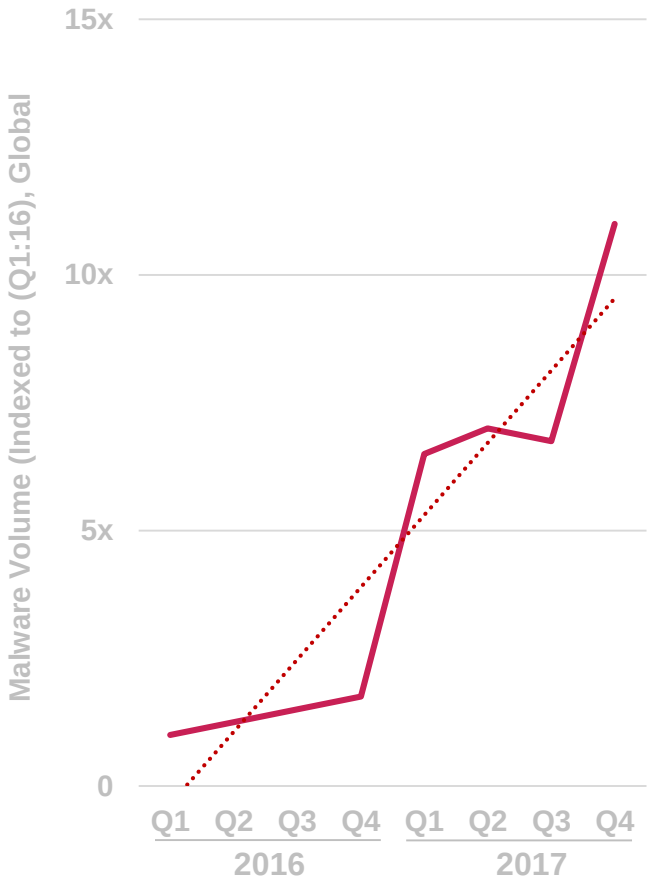
Adversaries are taking malware to unprecedented levels of sophistication & impact...

Weaponizing cloud services & other technology used for legitimate purposes...

And for some adversaries, the prize isn't ransom, but obliteration of systems & data.

- Cisco 2018 Annual Cybersecurity Report, 2/18

Observed Malware Volume



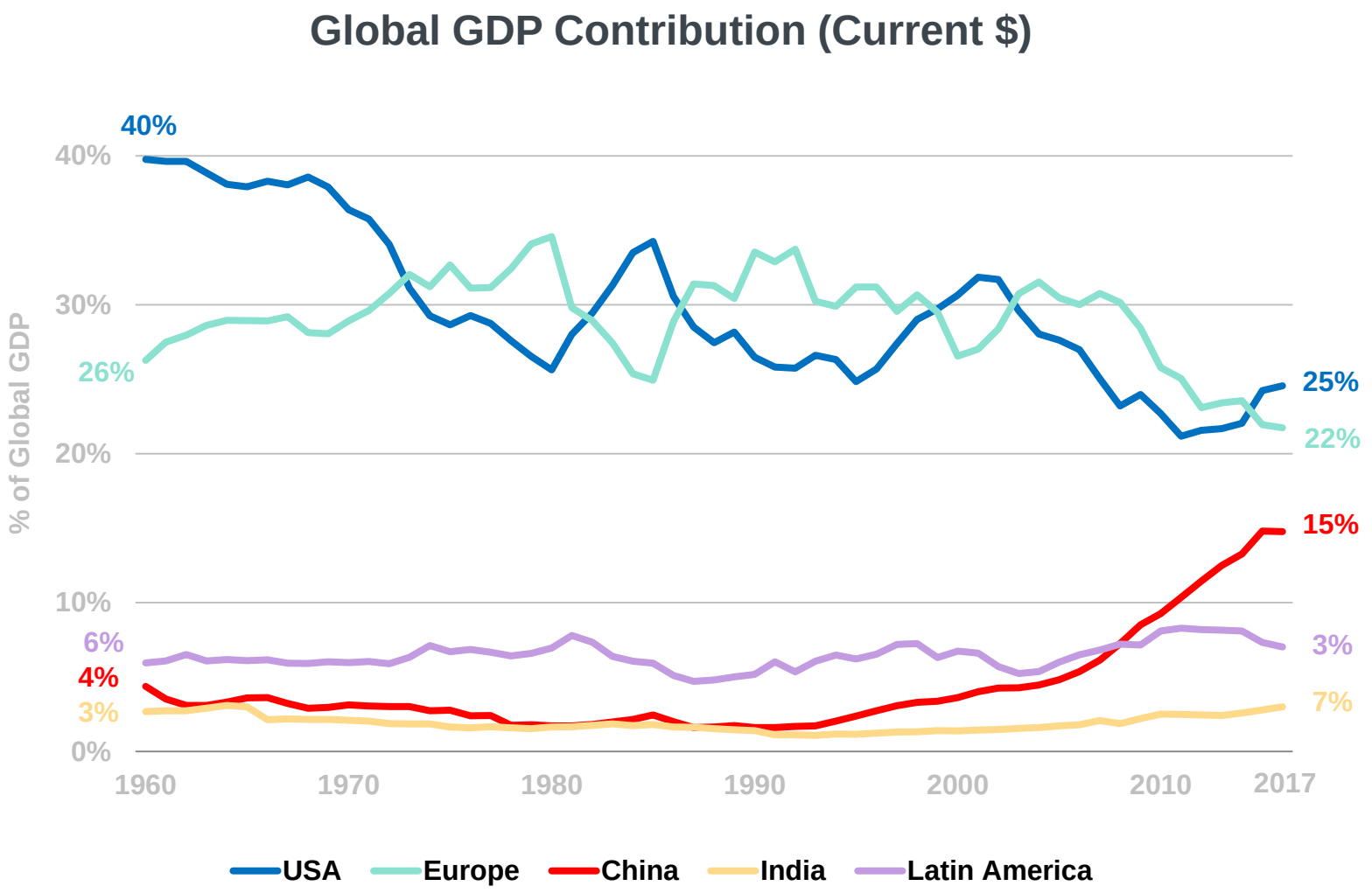
Source: Cisco 2018 Annual Cybersecurity Report. Note: Data collected by Cisco endpoint security equipment / software. While Malware volume increased ~11x from Q1:16 to Q4:17, traffic events process by the same equipment only increased ~3x.

Global Internet Leadership =

USA & China

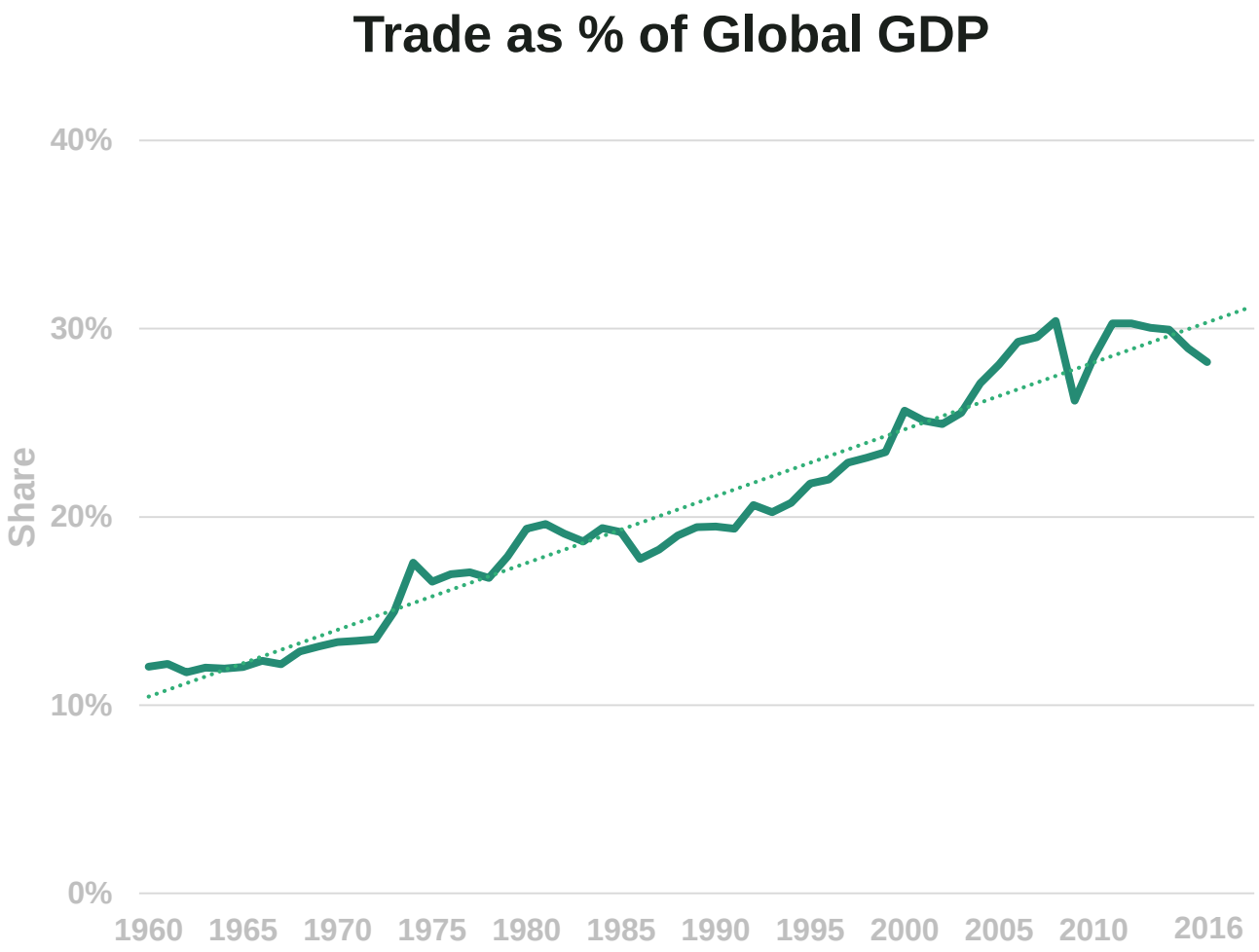
Economic Leadership...

Relative Global GDP (Current $) = USA + China + India Gaining…Other Leaders Falling



Source: World Bank (GDP in current $). Other countries account for ~30% of global GDP.

Cross-Border Trade = Increasingly Important to Global Economy



Source: World Bank. Note: 'World Trade' refers to the average of Imports & Exports (to account for goods in-transit between years) for all nations.

Internet Leadership =

A Lot's Happened Over 5-10 Years…

Today's Top 20 Worldwide Internet Leaders *5 Years Ago** = USA @ 9…China @ 2…

Public / Private Internet Companies, Ranked by Market Valuation (5/29/18)

Rank			Market Value ($B)
2018	Company	Region	5/29/13
1)	Apple	USA	$418
2)	Amazon	USA	121
3)	Microsoft	USA	291
4)	Google / Alphabet	USA	288
5)	Facebook	USA	56
6)	Alibaba	China	--
7)	Tencent	China	71
8)	Netflix	USA	13
9)	Ant Financial	China	--
10)	eBay + PayPal**	USA	71
11)	Booking Holdings	USA	41
12)	Salesforce.com	USA	25
13)	Baidu	China	34
14)	Xiaomi	China	--
15)	Uber	USA	--
16)	Didi Chuxing	China	--
17)	JD.com	China	--
18)	Airbnb	USA	--
19)	Meituan-Dianping	China	--
20)	Toutiao	China	--
		Total	$1,429

Source: CapIQ, CB Insights, The Wall Street Journal, media reports. *Only includes public companies in 2013. **eBay + PayPal combined for comparison purposes though PayPal spun-off of eBay on 7/20/15.

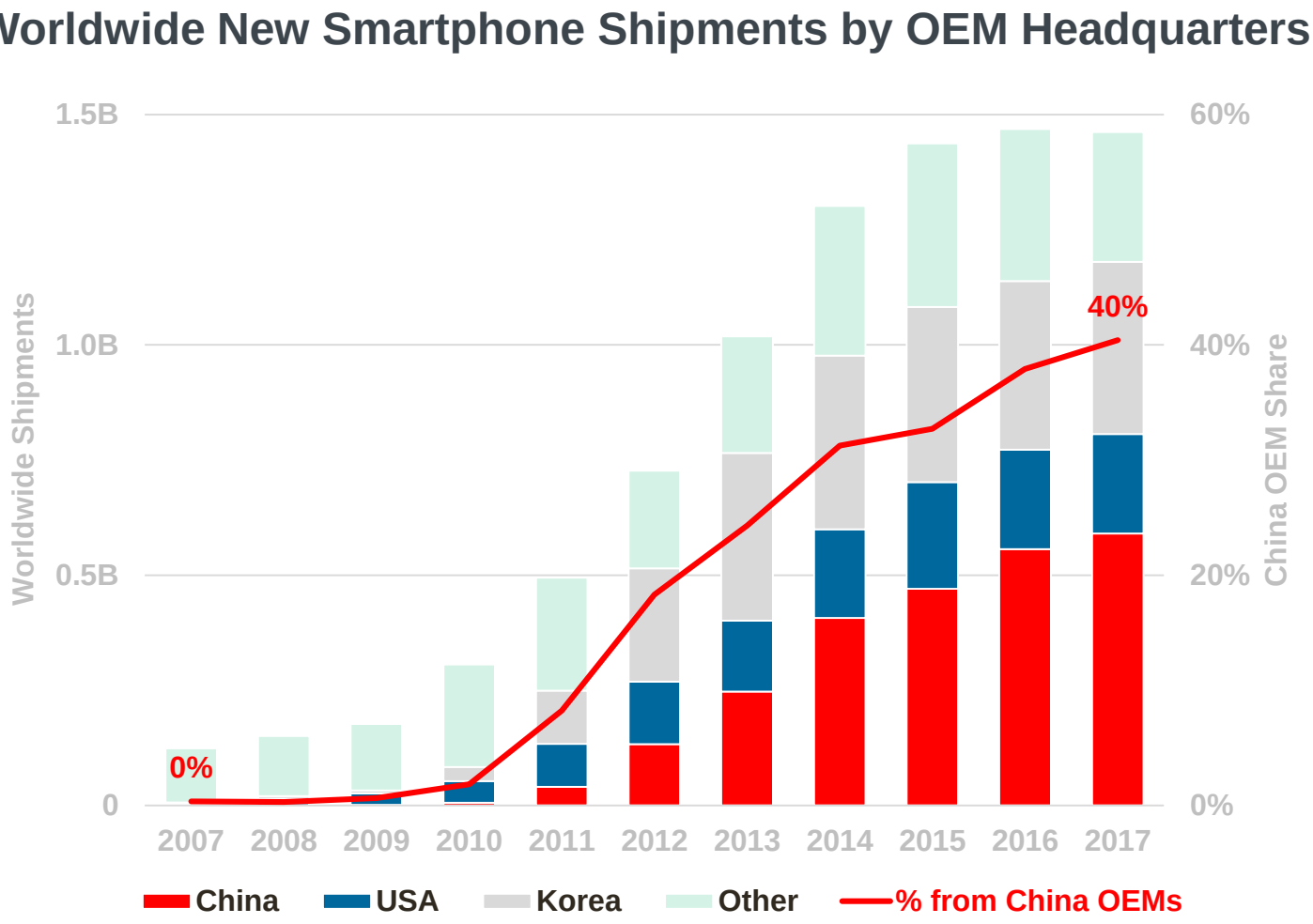
…Today's Top 20 Worldwide Internet Leaders *Today* = USA @ 11…China @ 9

Public / Private Internet Companies, Ranked by Market Valuation (5/29/18)

Rank 2018	Company	Region	Market Value ($B) 5/29/13	5/29/18
1)	Apple	USA	$418	$924
2)	Amazon	USA	121	783
3)	Microsoft	USA	291	753
4)	Google / Alphabet	USA	288	739
5)	Facebook	USA	56	538
6)	Alibaba	China	--	509
7)	Tencent	China	71	483
8)	Netflix	USA	13	152
9)	Ant Financial	China	--	150
10)	eBay + PayPal*	USA	71	133
11)	Booking Holdings	USA	41	100
12)	Salesforce.com	USA	25	94
13)	Baidu	China	34	84
14)	Xiaomi	China	--	75
15)	Uber	USA	--	72
16)	Didi Chuxing	China	--	56
17)	JD.com	China	--	52
18)	Airbnb	USA	--	31
19)	Meituan-Dianping	China	--	30
20)	Toutiao	China	--	30
		Total	$1,429	$5,788

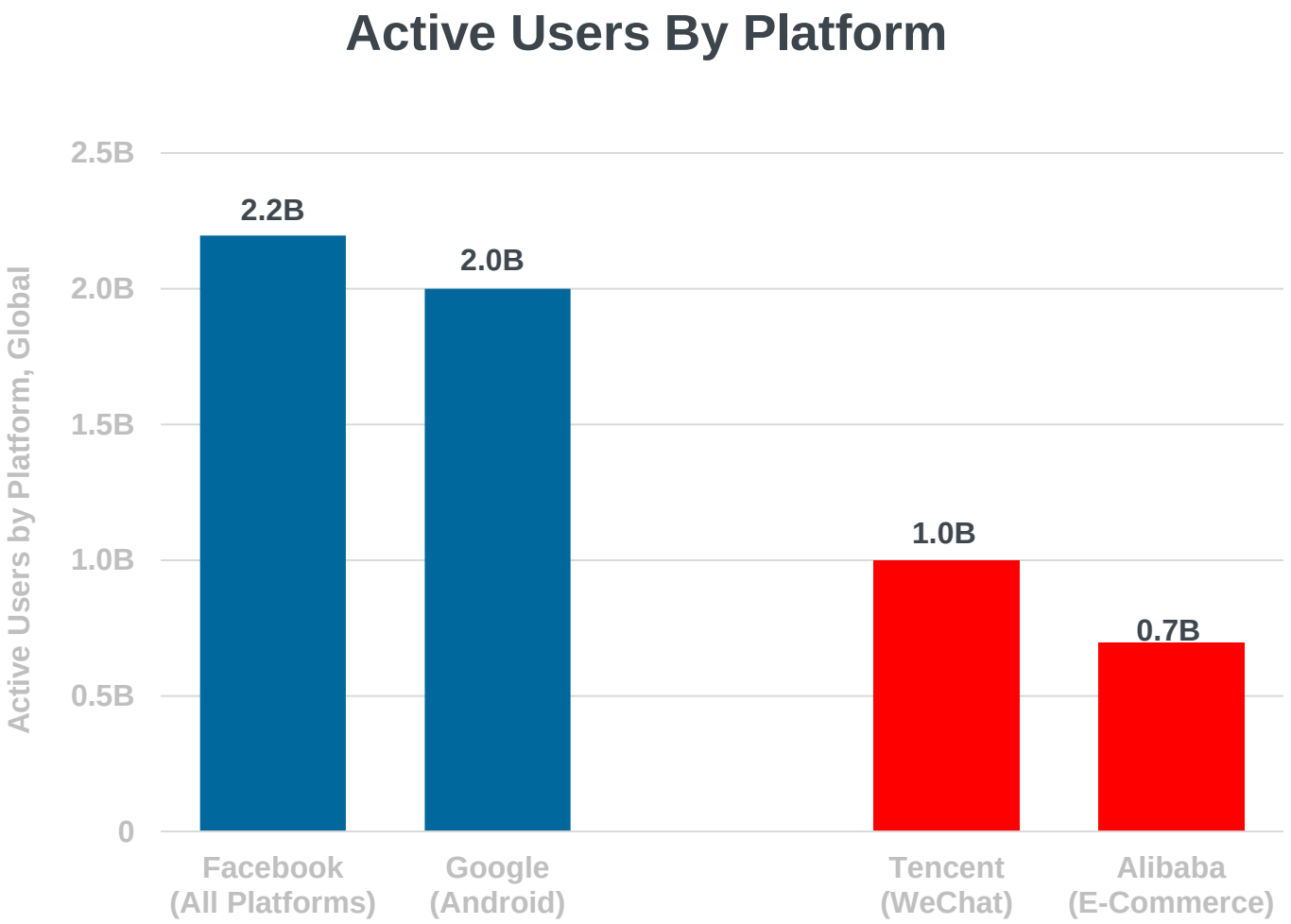
Source: CapIQ, CB Insights, Wall Street Journal, media reports. *eBay + PayPal combined for comparison purposes though PayPal spun-off of eBay on 7/20/15. Market value data as of 5/29/18. The Wall Street Journey, Recode, TechCrunch, Reuters, and the Information articles detail the latest valuations for Ant Financial (4/18), Xiaomi (5/18), Uber (2/18), Didi Chuxing (12/17), Airbnb (3/17), Meituan-Dianping (10/17), and Toutiao (12/17).

Smartphones = China @ #1 Worldwide OEM...
@ 40% vs. 0% Share Ten Years Ago...USA @ 15% vs. 3%



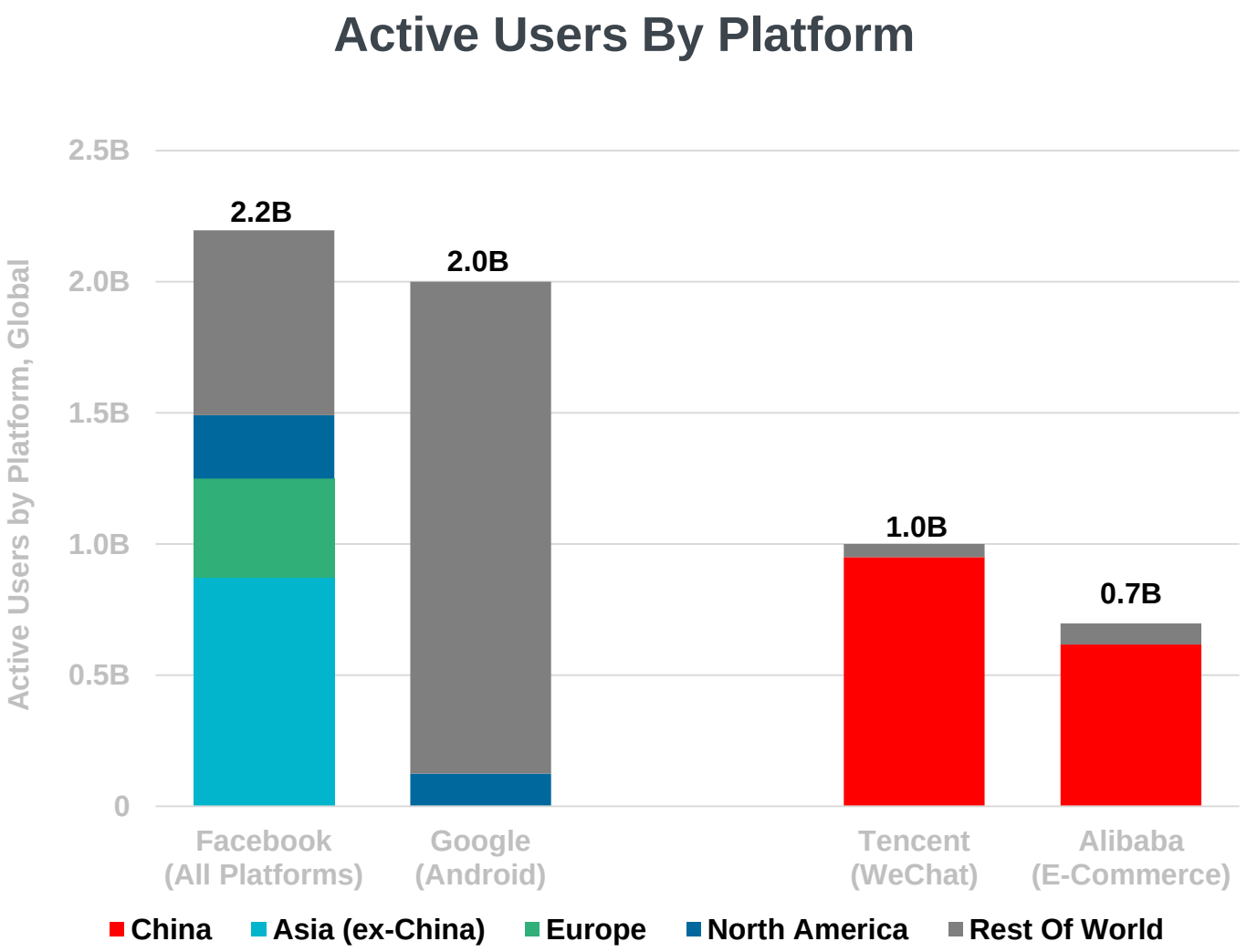
Source: Katy Huberty @ Morgan Stanley (3/18), IDC. Note: OEM = Original Equipment Manufacturer.

Internet Globally =
USA Platforms = Lead User Numbers…



Source: Facebook (4/18), Google (5/17), Tencent (3/18), Alibaba (5/18). Note: Facebook = MAUs, Google = MAUs, Tencent WeChat = MAUs, Alibaba = Mobile MAUs.

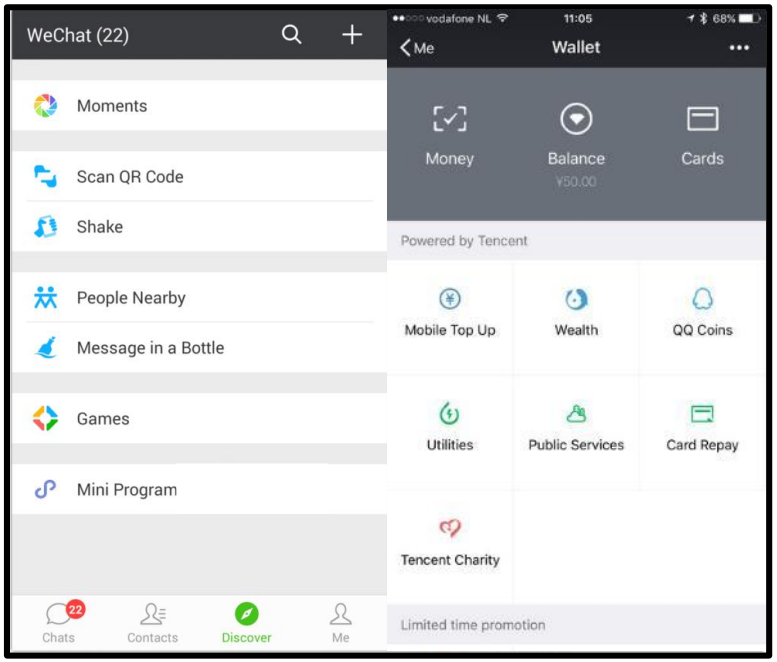
…Internet by Country = China Platforms = Lead User Numbers…in China



Source: Hillhouse Capital. Facebook (4/18), Google (5/17), Newzoo (Google Android USA estimate, 1/18), Tencent (3/18), Alibaba (5/18). Note: Facebook = MAUs, Google = MAUs (Newzoo Global Mobile Market Report estimates that there are 125MM active Android smartphones in the USA in 2017), Tencent WeChat = monthly active accounts vs. users as many Chinese users have multiple accounts (ex. 688MM users sent red envelopes during the 2018 Chinese New Year), Alibaba = Annual active consumers. Estimated WeChat ex-China MAU <5% of total per Hillhouse. Estimate Alibaba ex-China annual active consumers (Lazada + Aliexpress) = 80MM annual active customers per Hillhouse.

China Feature + Data-Rich Internet Platforms = Largest # of Users in One Country

Tencent
WeChat + WeChat Pay



Photos…Friends…Games…
Apps…Finances…Bills…

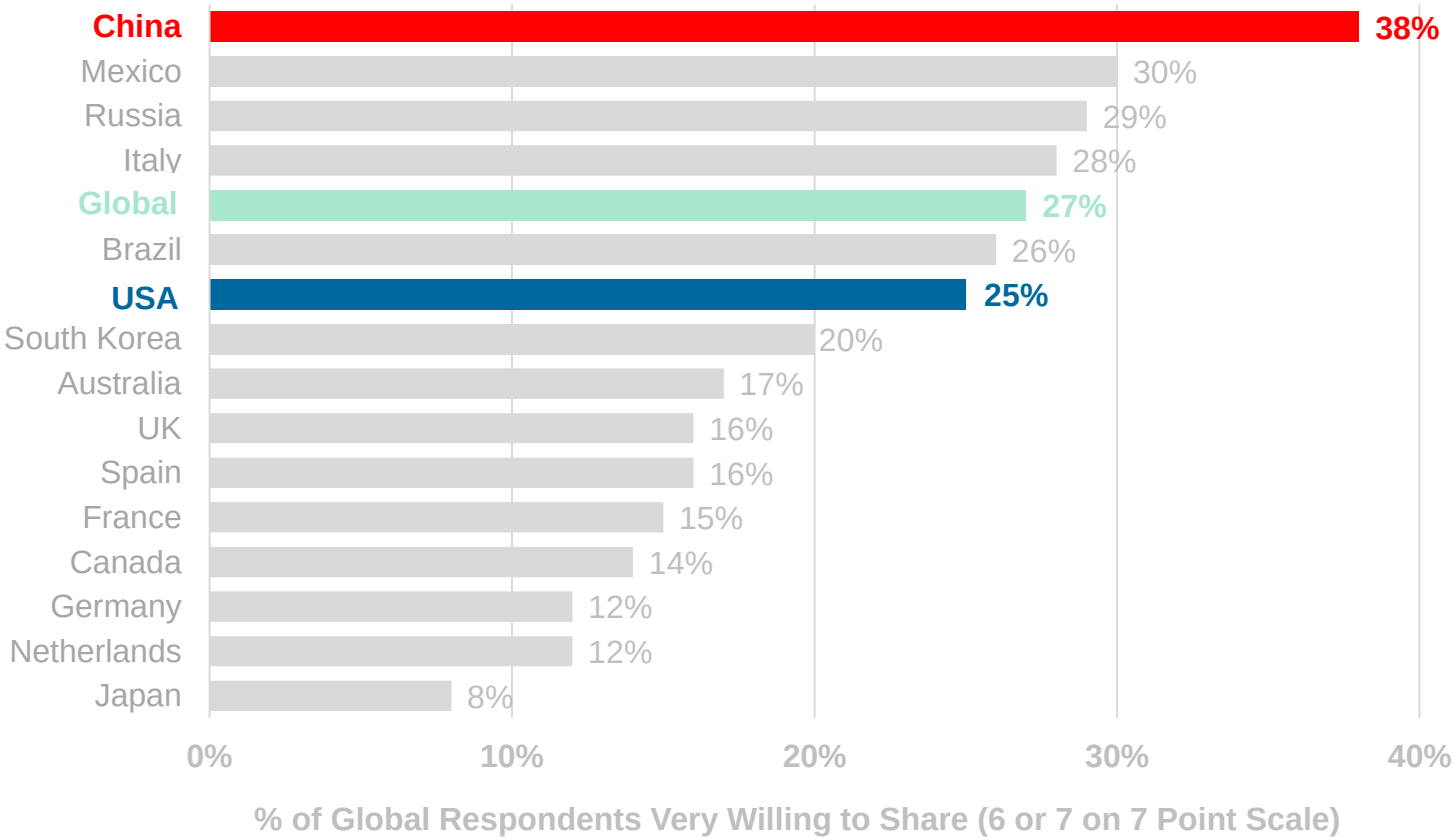
Alibaba
TaoBao + Alipay

Searches…News…Brands…
Feedback…Finances…Bills…

Source: Tencent, Alibaba

China Internet Users = More Willing to Share Data for Benefits vs. Other Countries per GfK

Would you share personal data (financial, driving records, etc.) for benefits (e.g., lower cost, personalization, etc.)?



Source: GfK Survey (1/17). Note: n = 22K of internet users ages 15+. A scale of 1-7 were used to identify the level of agreement with the following statement: "I am willing to share my personal data (health, financial, driving records, energy use, etc.) in exchange for benefits or rewards like lower costs or personalized service" – using a scale where "1" means "don't agree at all" and "7" means "agree completely."

China Digital Data Volume @
Significant Scale & Growing Fast =

Providing Fuel for
Rapid Artificial Intelligence Advancements

Artificial Intelligence =

USA & China…

Artificial Intelligence Competition = Increasingly Complex Tasks…China Momentum Strong

6th World Computer Chess Championship

1) Deep Thought (USA)
2) Bebe (USA)
3) Cray Blitz (USA)

China = **No Entrants**

Large Scale Visual Recognition Challenge 2010

1) NEC-UIUC* (USA + Japan)
2) XRCE (France / EU)
3) University of Tokyo (Japan)

China = **11th Place**

RoboCup-99 Soccer Simulation League

1) CMUnited-99 (USA)
2) MagmaFreiburg (Germany)
3) Essex Wizards (UK)

China = **No Entrants**

Stanford Question Answering Dataset (Ongoing)

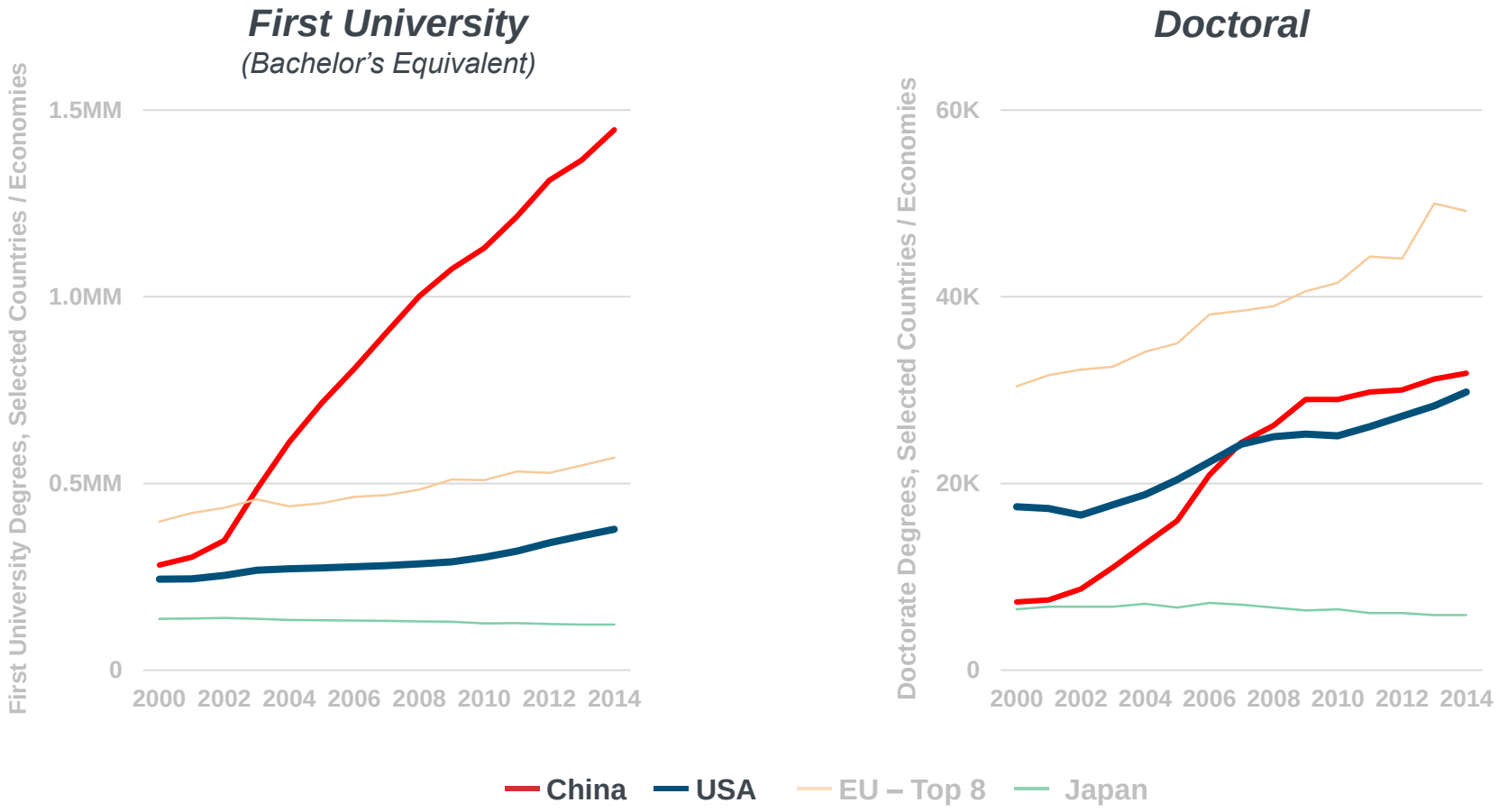
1) Google + Carnegie Mellon (USA)
2) Microsoft* **+ NUDT** (USA + **China**)
3) **YUANFUDAO (China)**
4) **HIT + iFLYTEK (China)**
5) **Alibaba (China)**

Source: International Computer Games Association, RoboCup, Image-Net, Stanford. Note: Stanford Question Answering Dataset is a set of 100,000+ human-generated questions covering 500+ Wikipedia articles. Scores ranked by Exact Match Accuracy, which refers to the share of questions correctly parsed / answered. Highest Score included for teams with multiple results (i.e. Google + Carnegie Melon) *National Affiliation refers to main campus of sponsoring Group / Company / University. Microsoft submitting team based in Beijing (lead by Feng-Hslung Hsu who was lead developer of 'Deep Thought' while @ Carnegie Mellon). NEC team based in USA.

Natural Science & Engineering Higher Education = China Graduation Rates Rising Rapidly per National Science Foundation

Annual Natural Science & Engineering Degrees

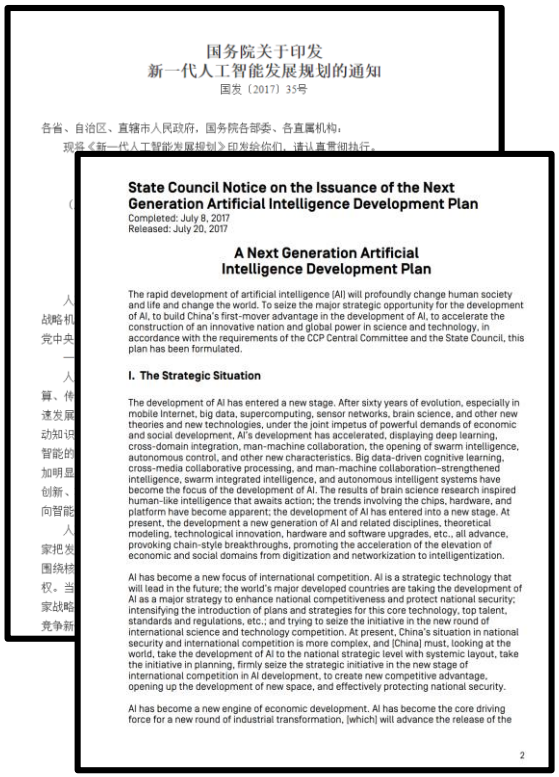
(Agricultural Sciences / Biological Sciences / Computer Sciences / Earth, Atmospheric & Ocean Sciences / Mathematics / Engineering)



Source: USA National Science Foundation analysis of National Bureau of Statistics (China), Government of Japan, UNESCO, OECD, National Center for Education Statistics, IPEDS, & National Center for Science / Engineering data. Note: Data for the majority of the countries were collected under same OECD, EU, and UIS guidelines & field groupings in the ISCED-F are similar to fields used in China, a major degree producer. Natural sciences include agricultural sciences; biological sciences; computer sciences; earth, atmospheric, and ocean sciences; & mathematics. EU-Top 8 for doctoral degrees includes UK / Germany / France / Spain / Italy / Portugal / Romania / Sweden. EU-Top 8 for first university degrees includes UK / Germany / France / Poland / Italy / Spain / Romania / The Netherlands. The # of S&E doctorates awarded rose from about 8K in 2000 to more than 34K in 2014. Despite the growth in the quantity of doctorate recipients, some question the quality of the doctoral programs in China (Cyranoski et al. 2011). The rate of growth in doctoral degrees in S&E and in all fields has considerably slowed starting in 2010, after an announcement by the Chinese Ministry of Education indicating that China would begin to limit admissions to doctoral programs & focus on quality of graduate education (Mooney 2007). Also in China, first university degrees increased greatly in all fields, with a larger increase in non-S&E than in S&E fields. China experienced an increase of almost 1.2MM degrees and up more than 400% from 2000 to 2014. China has traditionally awarded a large proportion of its first university degrees in engineering, but the percentage declined from 43% in 2000 to 33% in 2014.

Artificial Intelligence Focus = China Government Highly Focused on Developing AI

Artificial Intelligence - Next Generation Development Plan Goals



国务院关于印发
新一代人工智能发展规划的通知
国发〔2017〕35号

各省、自治区、直辖市人民政府，国务院各部委、各直属机构：

State Council Notice on the Issuance of the Next Generation Artificial Intelligence Development Plan
Completed: July 8, 2017
Released: July 20, 2017

A Next Generation Artificial Intelligence Development Plan

The rapid development of artificial intelligence (AI) will profoundly change human society and life and change the world. To seize the major strategic opportunity for the development of AI, to build China's first-mover advantage in the development of AI, to accelerate the construction of an innovative nation and global power in science and technology, in accordance with the requirements of the CCP Central Committee and the State Council, this plan has been formulated.

I. The Strategic Situation

The development of AI has entered a new stage. After sixty years of evolution, especially in mobile Internet, big data, supercomputing, sensor networks, brain science, and other new theories and new technologies, under the joint impetus of powerful demands of economic and social development, AI's development has accelerated, displaying deep learning, cross-domain integration, man-machine collaboration, the opening of swarm intelligence, autonomous control, and other new characteristics. Big data-driven cognitive learning, cross-media collaborative processing, and man-machine collaboration–strengthened intelligence, swarm integrated intelligence, and autonomous intelligent systems have become the focus of the development of AI. The results of brain science research inspired human-like intelligence that awaits action; the trends involving the chips, hardware, and platform have become apparent; the development of AI has entered into a new stage. At present, the development a new generation of AI and related disciplines, theoretical modeling, technological innovation, hardware and software upgrades, etc., all advance, provoking chain-style breakthroughs, promoting the acceleration of the elevation of economic and social domains from digitization and networkization to intelligentization.

AI has become a new focus of international competition. AI is a strategic technology that will lead in the future; the world's major developed countries are taking the development of AI as a major strategy to enhance national competitiveness and protect national security; intensifying the introduction of plans and strategies for this core technology, top talent, standards and regulations, etc.; and trying to seize the initiative in the new round of international science and technology competition. At present, China's situation in national security and international competition is more complex, and [China] must, looking at the world, take the development of AI to the national strategic level with systemic layout, take the initiative in planning, firmly seize the strategic initiative in the new stage of international competition in AI development, to create new competitive advantage, opening up the development of new space, and effectively protecting national security.

AI has become a new engine of economic development. AI has become the core driving force for a new round of industrial transformation, [which] will advance the release of the

2

1) Build Open & Coordinated AI Innovation Systems

2) Foster a Highly Efficient Smart Economy

3) Construct Safe / Convenient Intelligent Society

4) Strengthen Military-Civilian Integration in AI

5) Build Safe & Efficient Information Infrastructure

6) Plan Next Generation AI Science & Technology Projects

Source: New America Translation of China State Council documents (7/20/17).

Artificial Intelligence = USA Ahead…
China = Focused + Organized + Gaining

I'm assuming that [USA's] lead [in Artificial Intelligence] will continue over the next five years, & that China will catch up extremely quickly.

In five years we'll kind of be at the same level, possibly.

It's hard to see how China would have passed us in that period, although their rate of improvement is so impressively good.

- Eric Schmidt, Chairman, US Defense Innovation Advisory Board, Keynote Address at Artificial Intelligence & Global Security Summit, 11/13/17

ECONOMIC GROWTH DRIVERS =

EVOLVE OVER TIME…

Century	Economic Growth Drivers
Pre-18th	**Cultivation & Extraction**
19-20th	**Manufacturing & Industry**
21st…	**Compute Power & Human Potential**

Lifelong Learning =

Crucial in Evolving Work Environment &

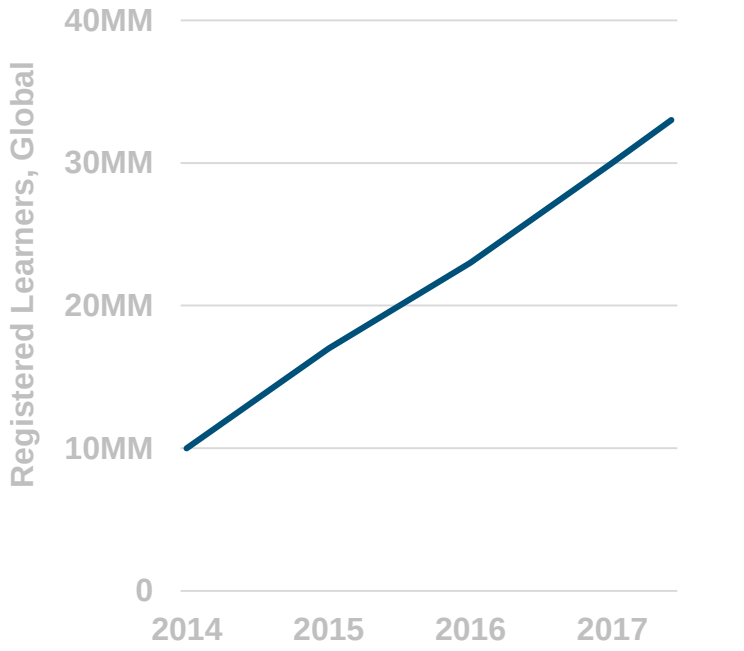
Tools Getting Better + More Accessible

Lifelong Learning = 33MM Learners +30% (Coursera)…

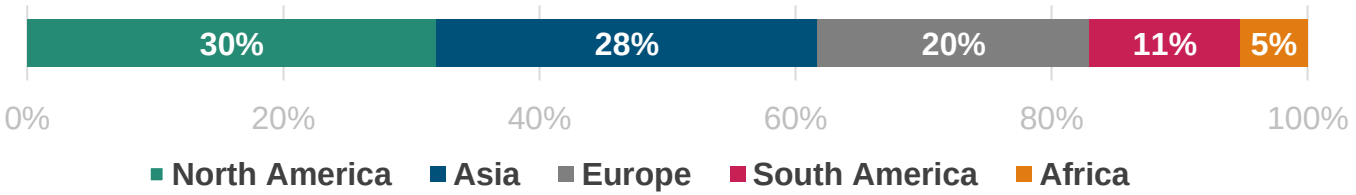
Top Courses, 2017

- **Machine Learning** Stanford
- **Neural Networks & Deeper Learning** Deeplearning.ai
- **Learning How to Learn: Powerful Mental Tools to Help You Master Tough Subjects** UC San Diego
- **Introduction to Mathematical Thinking** Stanford
- **Bitcoin & Cryptocurrency Technologies** Princeton
- **Programming for Everybody** University of Michigan
- **Algorithms, Part I** Princeton
- **English for Career Development** University of Pennsylvania
- **Neural Networks / Machine Learning** University of Toronto
- **Financial Markets** Yale

Learners



Learners by Geography



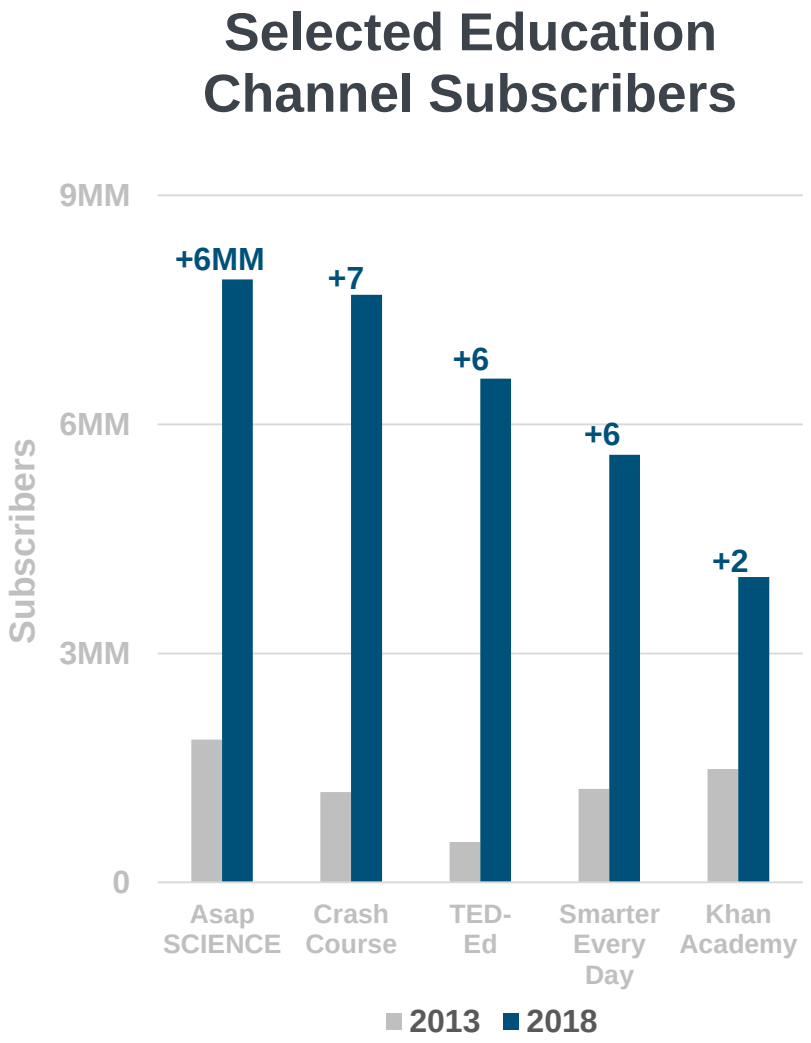
Source: Coursera. Note: Course popularity based on average daily enrollments. Graph shows learners as of 5/18.

…Lifelong Learning = Educational Content Usage Ramping Fast (YouTube)…

1B
Daily Learning Video Views

70%
Viewers Use Platform to Help Solve Work / School / Hobby Problems

+38%
Growth Y/Y (2017)
Job Search Video Views
(e.g., Resume-Writing Guides)



Source: YouTube (5/18).

…Lifelong Learning = Employee Re-Training Engagement High (AT&T)…

‘Workforce 2020’ / ‘Future Ready’ Programs

$1B

Allocated for web-based employee training.
Partners = Coursera / Udacity / Universities.

2.9MM

Emerging tech courses completed by employees.
Most popular courses = Cyber Security / Machine Learning / Data-Driven Decision Making / Virtual Collaboration.

194K

Employees (77% of workforce) actively engaged in re-training.

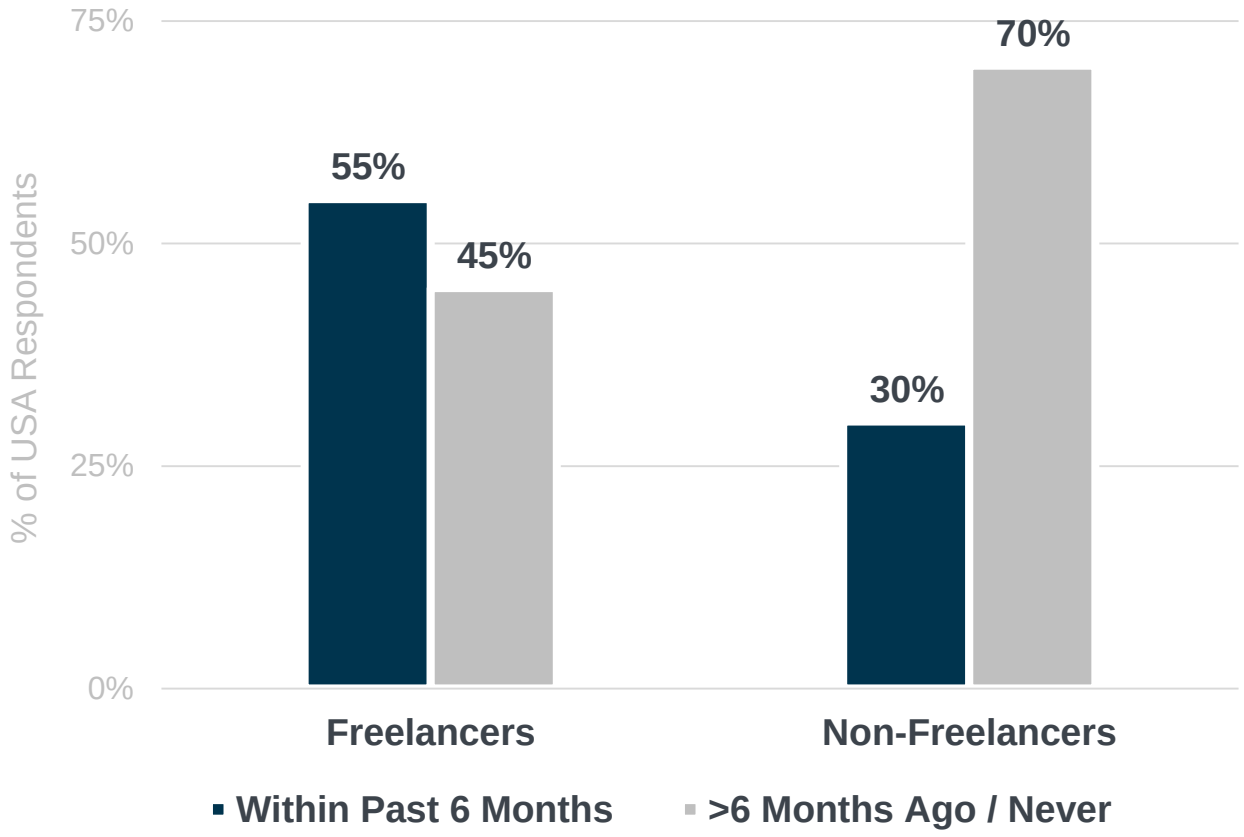
61%

Share of promotions received by re-trained employees (2016-Q1:18)

Source: AT&T (4/18).

…Lifelong Learning = >50% of Freelancers Updated Skills Within Past 6 Months

When Did You Last Participate in Skill-Related Training?



Source: Edelman Research / Upwork 'Freelancing In America: 2017.' Note: Survey conducted July-August 2017 on 2,173 Freelance Employees who have received payment for supplemental temporary, or project-oriented work in the past 12 months.

CHINA INTERNET =

ROBUST ENTERTAINMENT + RETAIL INNOVATION

下载中文版

*Disclaimer – The information provided in the following slides is for informational and illustrative purposes only. No representation or warranty, express or implied, is given and no responsibility or liability is accepted by any person with respect to the accuracy, reliability, correctness or completeness of this Information or its contents or any oral or written communication in connection with it. Hillhouse Capital may hold equity stakes in companies mentioned in this section. A business relationship, arrangement, or contract by or among any of the businesses described herein may not exist at all and should not be implied or assumed from the information provided. The information provided herein by Hillhouse Capital does not constitute an offer to sell or a solicitation of an offer to buy, and may not be relied upon in connection with the purchase or sale of, any security or interest offered, sponsored, or managed by Hillhouse Capital or its affiliates.

China Macro Trends =

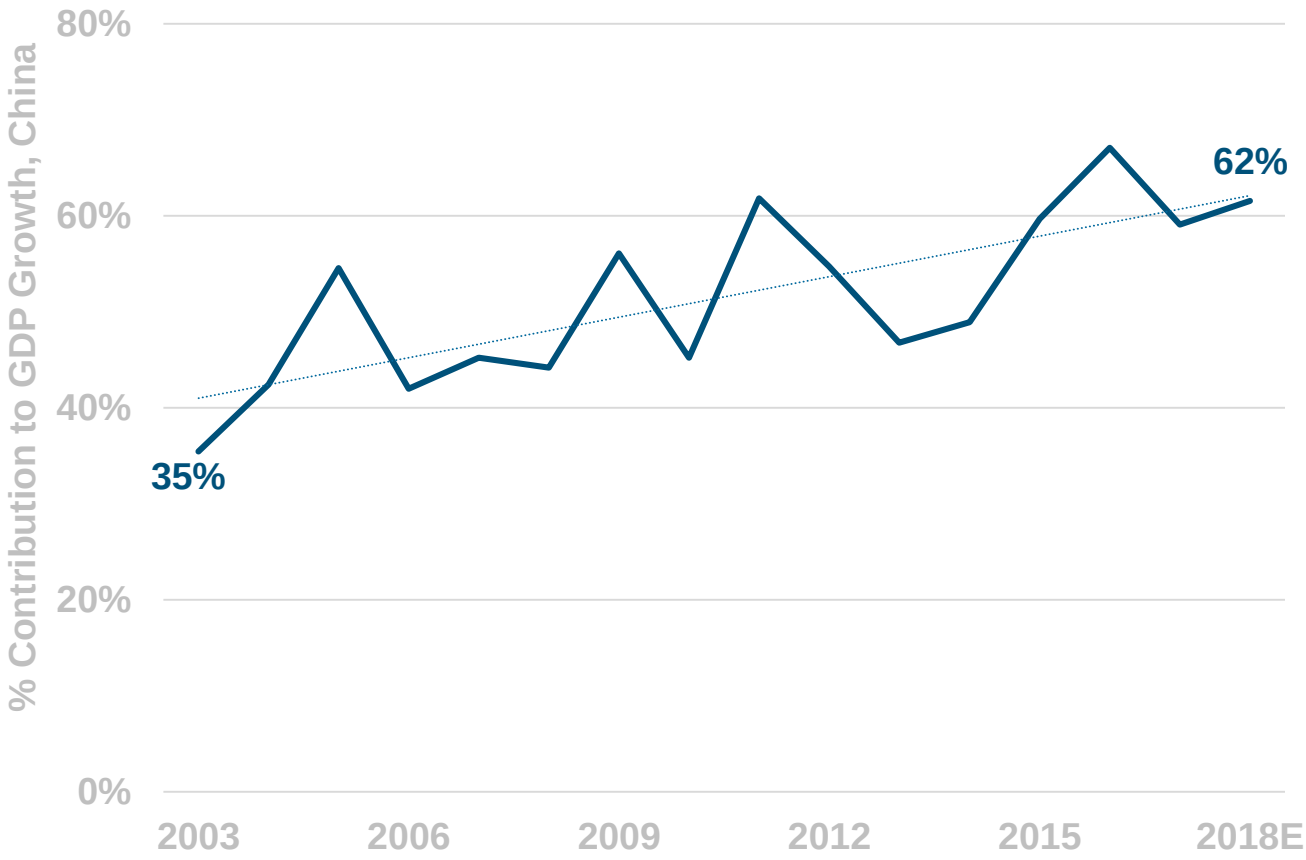
Strong

China Consumer Confidence = Near 4 Year High… Manufacturing Index = Expanding

Source: China National Bureau of Statistics (CNNIC), Morgan Stanley Research. Note: The Purchasing Managers Index is Measured by China National Bureau of Statistics Based on New Orders, Inventory Levels, Production, Supplier Deliveries & the Employment Environment. Score of 50+ Indicates an Expanding Manufacturing Sector. Consumer Confidence is a Measure of Consumers' Sentiment About the Current / Future State of the Domestic Economy, Indexed to 100.

China GDP Growth = Increasingly Driven by Domestic Consumption… @ 62% vs. 35% of GDP Growth (2003）

China Domestic Consumption Contribution to GDP Growth

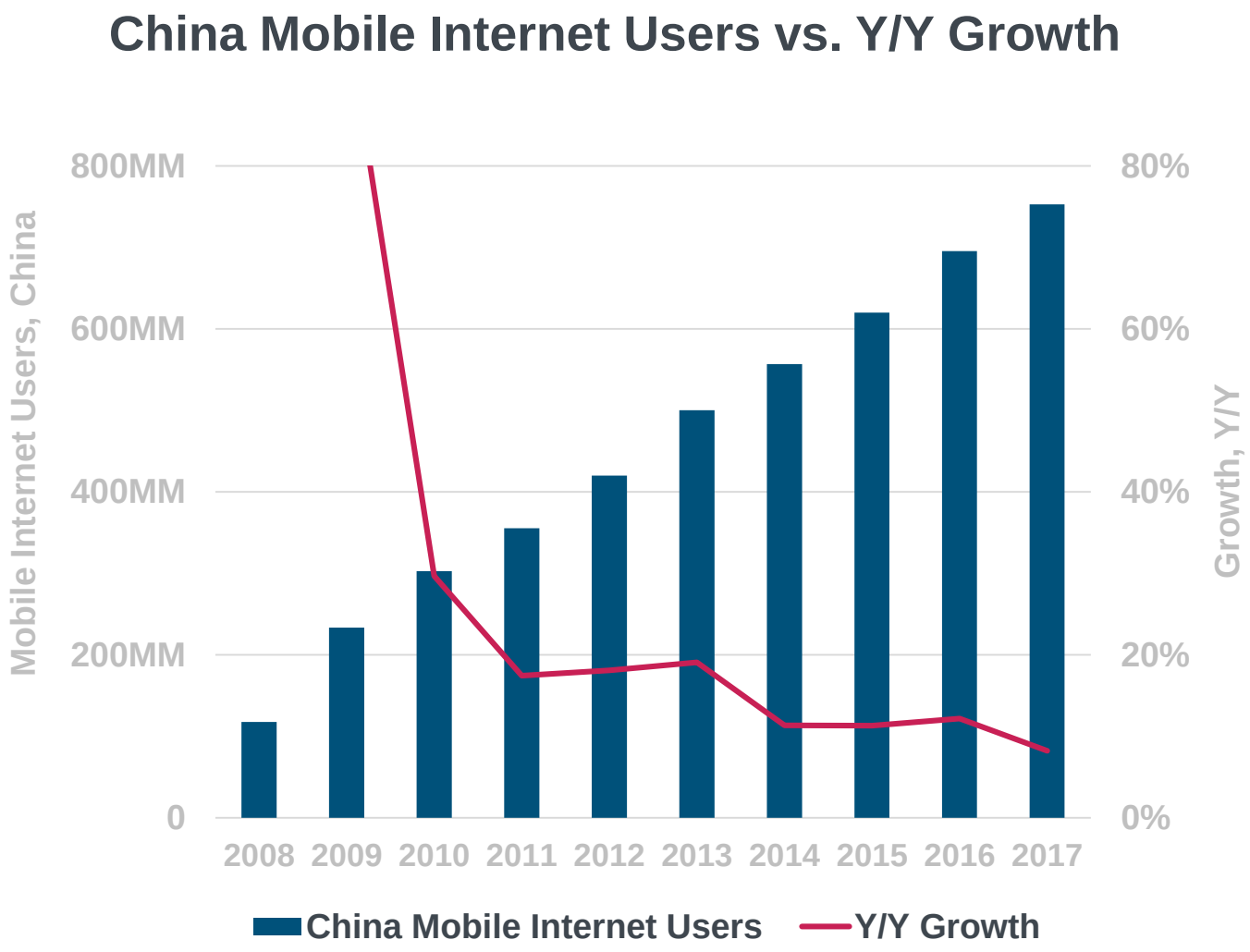


Source: China National Bureau of Statistics, Morgan Stanley Research. Note: Domestic Consumption Includes Household and Government Consumption. Other Drivers of GDP Growth Include Investments (Gross Capital Formation) and Net Export of Goods and Services.

China Internet Usage =

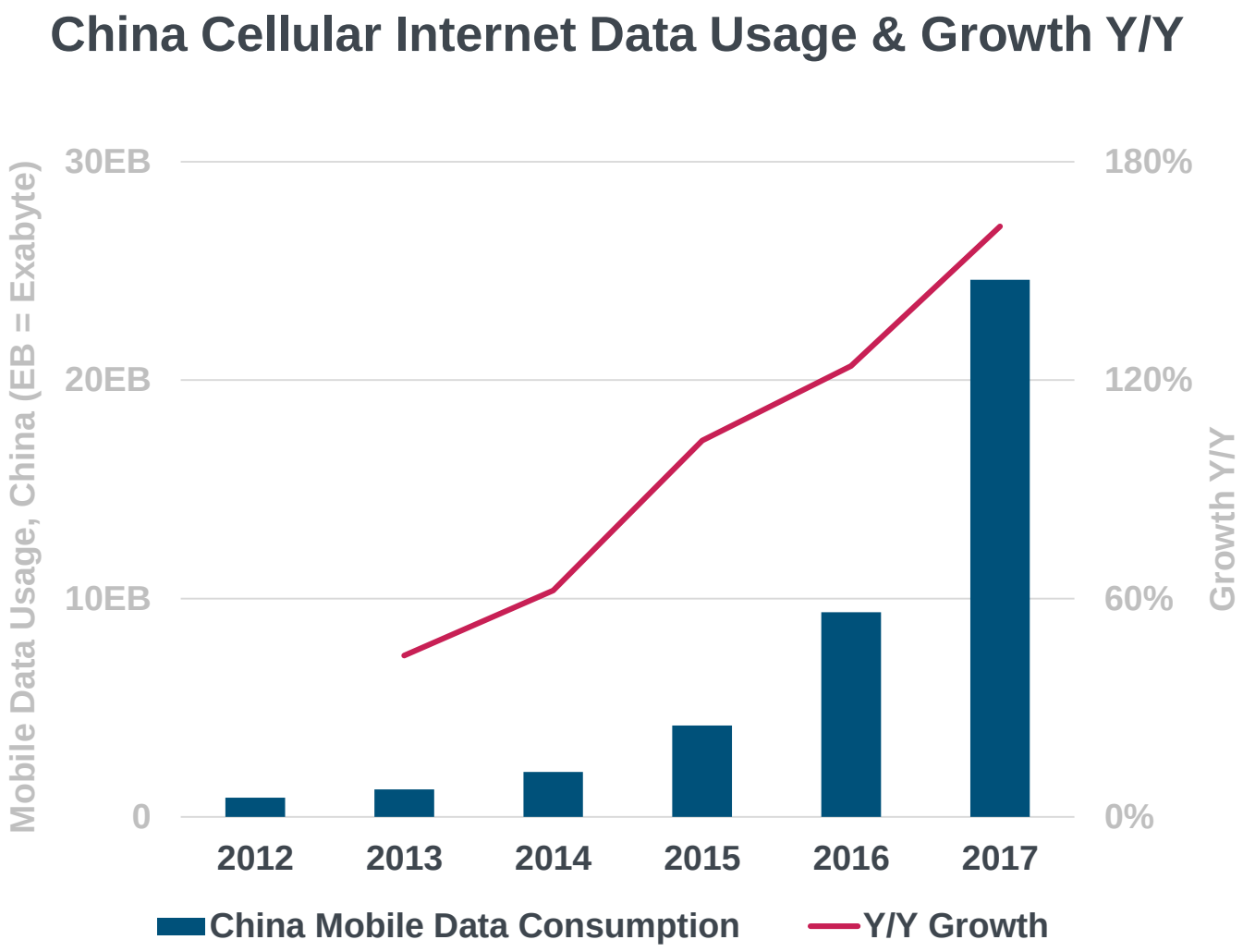
Accelerating

China Mobile Internet Users = 753MM…+8% vs. 12% Y/Y



Source: China Internet Network Information Center (CNNIC).
Note: Mobile Internet User Data is as of Year-End.

China Mobile Internet (Data) Usage = Accelerating…+162% vs. +124% Y/Y



Source: China Ministry of Industry and Information Technology.
Note: Cellular Internet Refers to 3G/4G Network data.

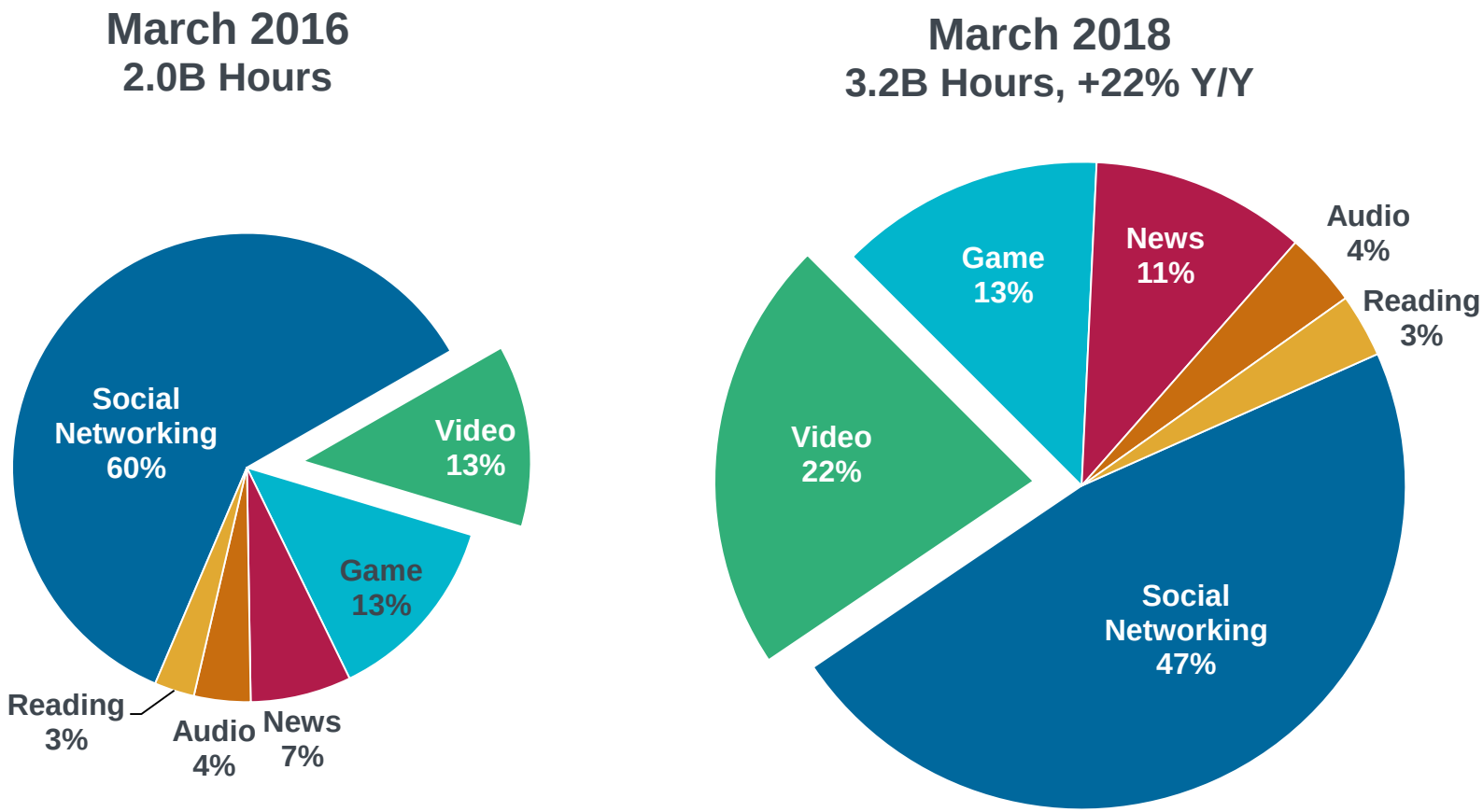
China Online Entertainment =

Long + Short-Form Video &
Team-Based Multiplayer Mobile Games

Growing Quickly

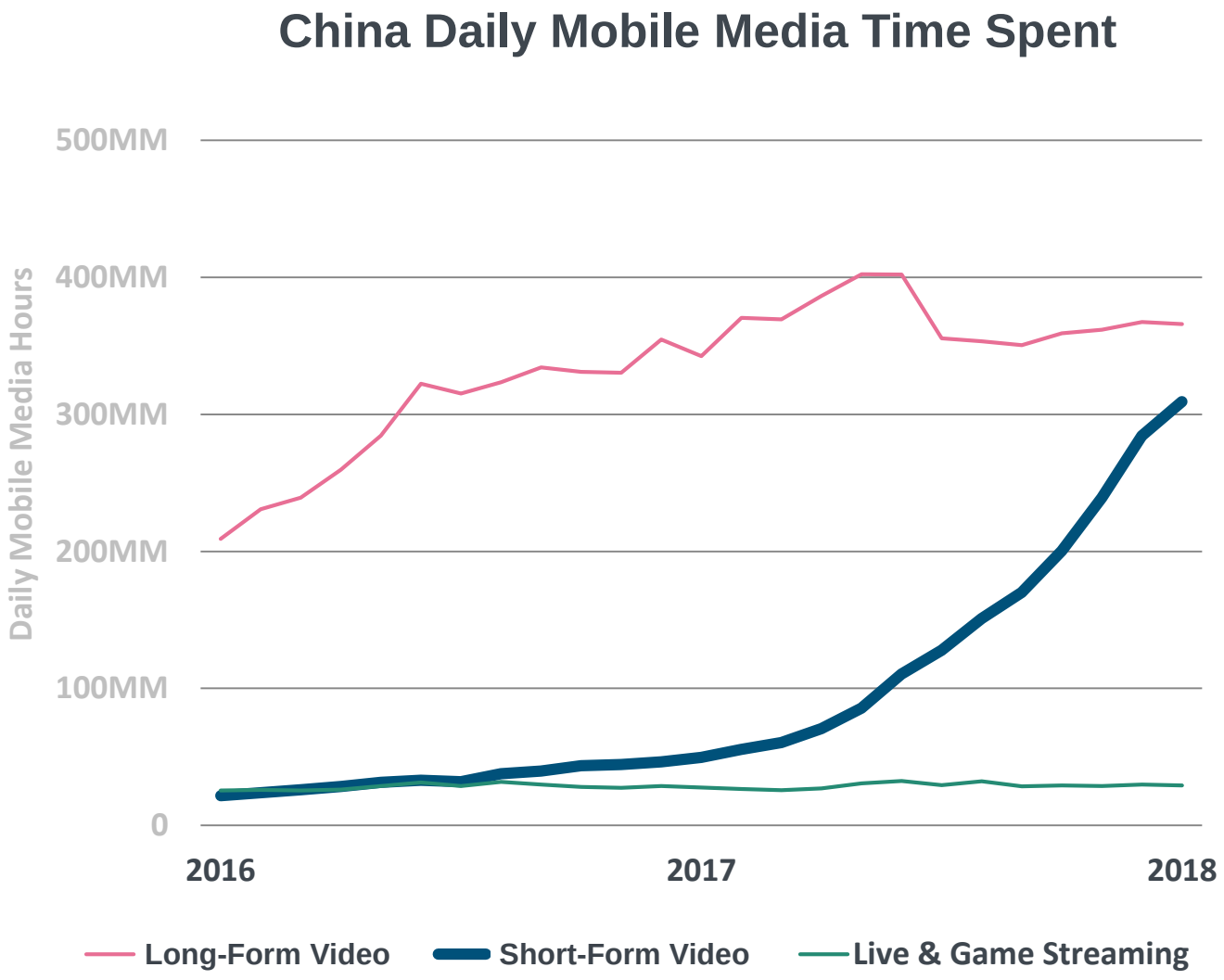
China Mobile Media / Entertainment Time Spent = +22% Y/Y…Mobile Video Growing Fastest

China Mobile Media / Entertainment Daily Time Spent



Source: QuestMobile (3/18).

China Short-Form Video = Usage Growing Rapidly…



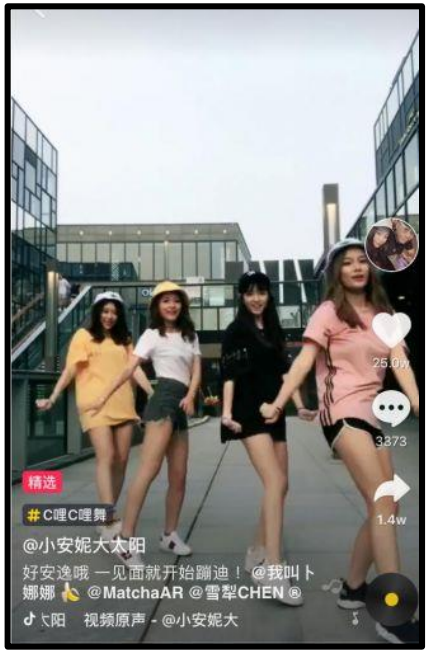
Source: QuestMobile (3/18). Note: Short-Form Videos are typically <5 Minute in Length and include companies such as Kuaishou, Douyin, Xigua. Long-Form Videos include companies such as iQiyi, Tencent Video, Youku, Bilibili.

…China Short-Form Video Leaders = 100MM+ DAU… Massive Growth + High Engagement (50 Minute Daily Average)

Douyin (Tik-Tok)

AI-Augmented Mobile Video Creation / Personalized Feed

DAU = **95MM +78x Y/Y**
Daily Time Spent = **52 Minutes**
DAU / MAU Ratio = **57%**



Kuaishou

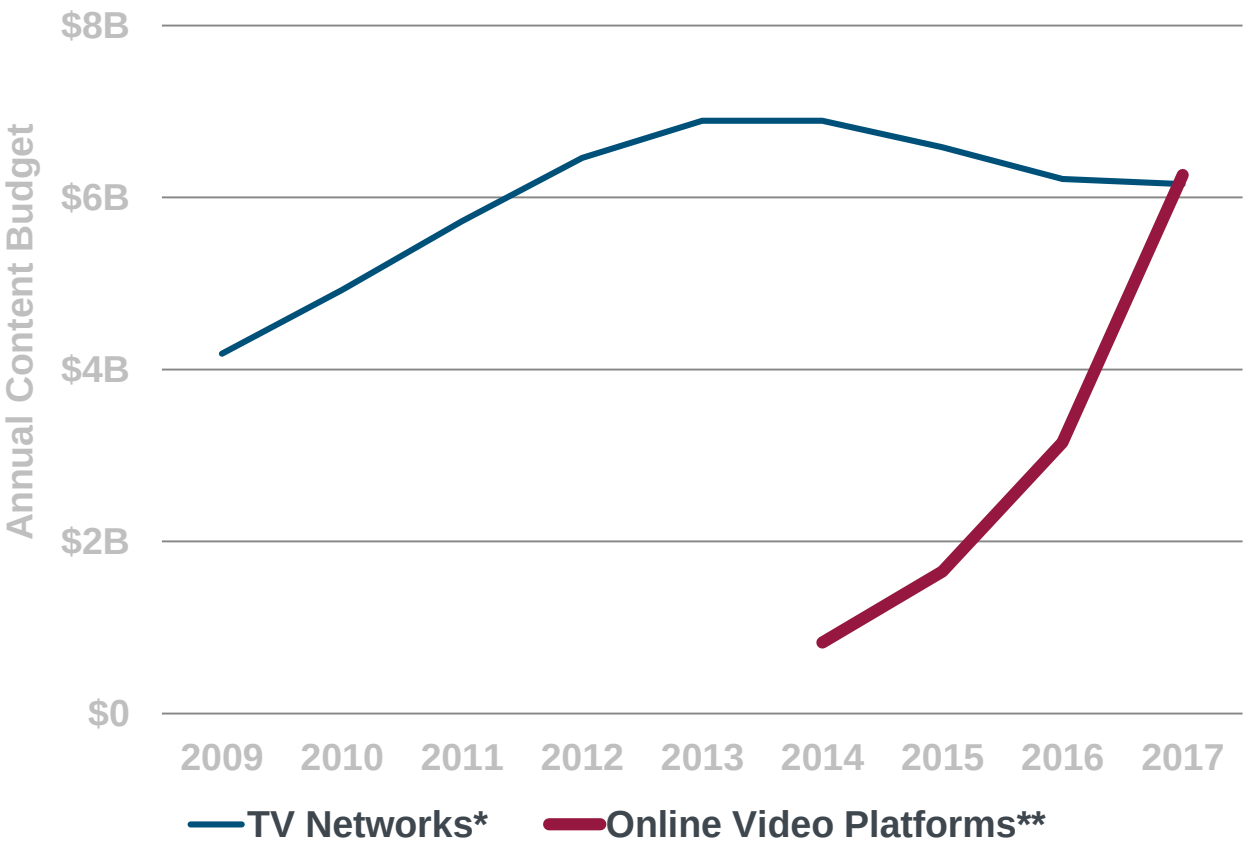
De-Centralized / Personalized / Location-Based Mobile Video Discovery

DAU = **104MM +2x Y/Y**
Daily Time Spent = **52 Minutes**
DAU / MAU Ratio = **46%**

Source: QuestMobile (4/18).

China Online Long-Form Video Content Budgets = Exceeded TV Networks (2017)…

China TV Networks* vs. Online Video Platform** Content Budget

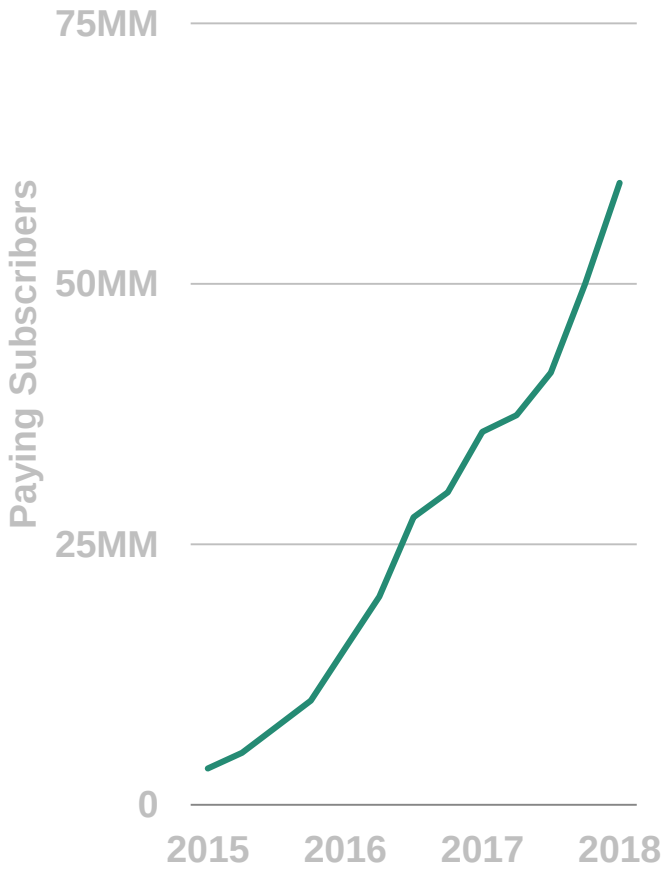


Source: Public disclosures, Goldman Sachs, Bank of America, Hillhouse estimates. *Includes estimates from CCTV, provincial satellite TV channels and major local TV networks. **Includes iQiyi + Tencent Video + Youku.

…China Online Long-Form Video Original / Exclusive Content = Driving Industry-Wide Paying Subscriber Growth

Original / Exclusive Content

iQiyi Paying Subscribers



Source: Subscriber data per iQiyi (3/18). Tencent Video and Youku are not standalone publicly listed companies hence do not provide regular disclosure on paying subscribers. Tencent Video last announced more than 62MM subscribers in 2/18.

China Team-Based Multiplayer Mobile Games = Lead Game Time Spent in China

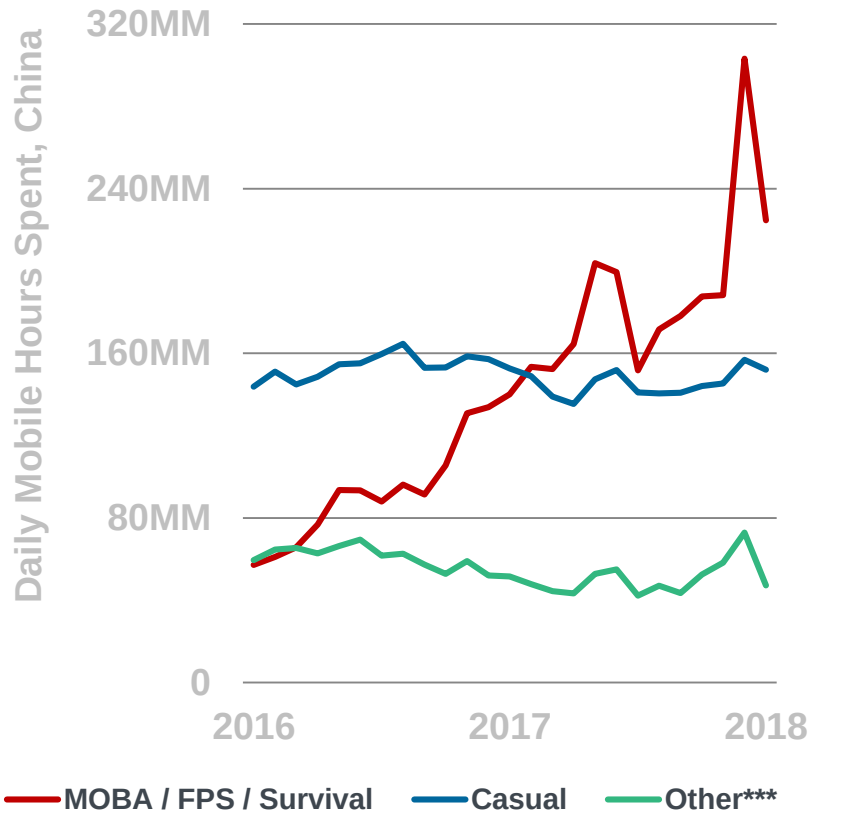
Honor of Kings

80MM+ China DAU

PUBG Mobile

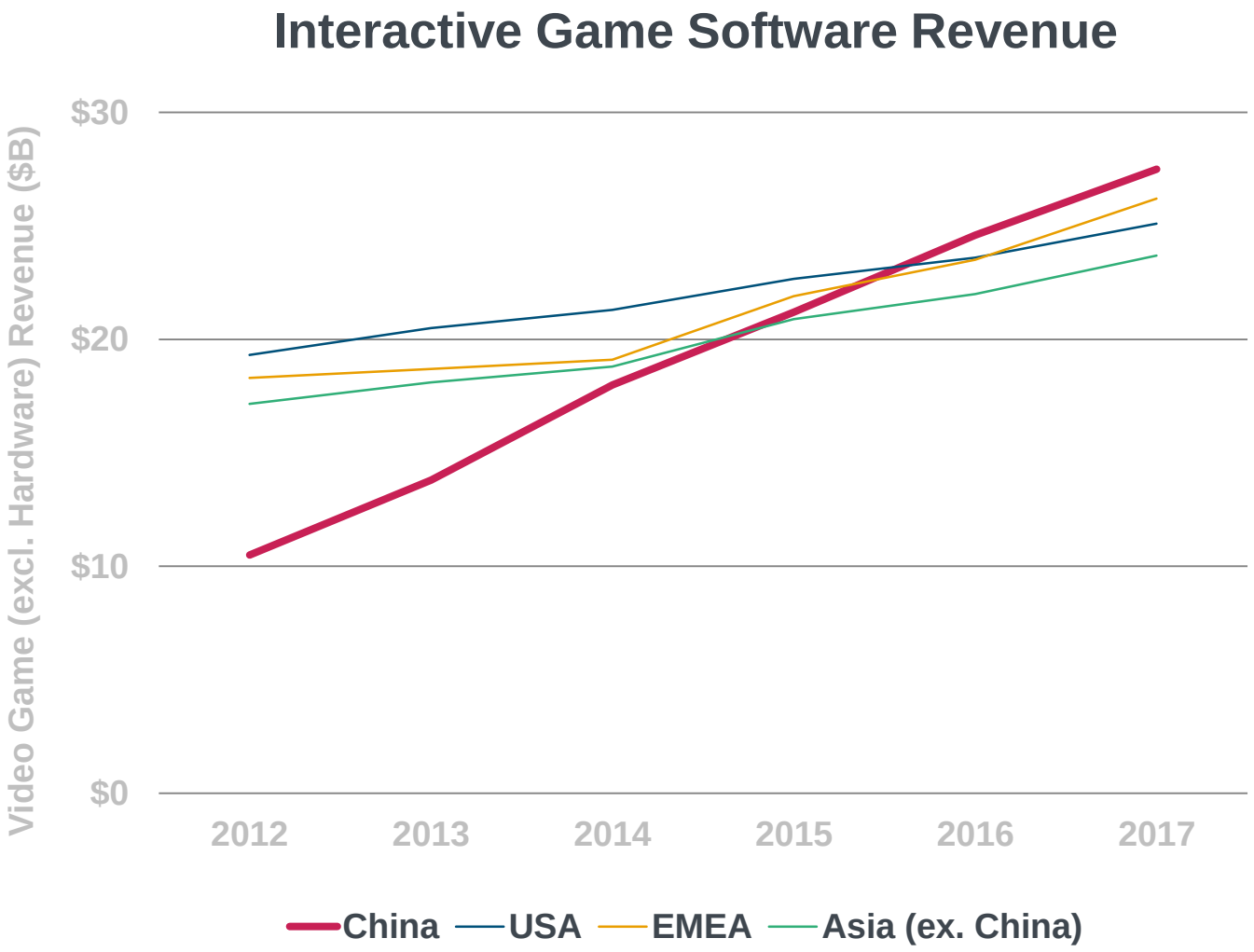
50MM+ China DAU

China Mobile Games Daily Hours



Source: Questmobile (3/18). *MOBA is Multiplayer Online Battle Arena; **FPS is First Person Shooting, FPS / Survival games include Tencent's PUBG Mobile and NetEase's Rules of Survival. ***Other genre includes RPG, action, racing, strategy, card battle, and other games.

Global Interactive Game Revenue = China #1 Market in World* > USA (2017)

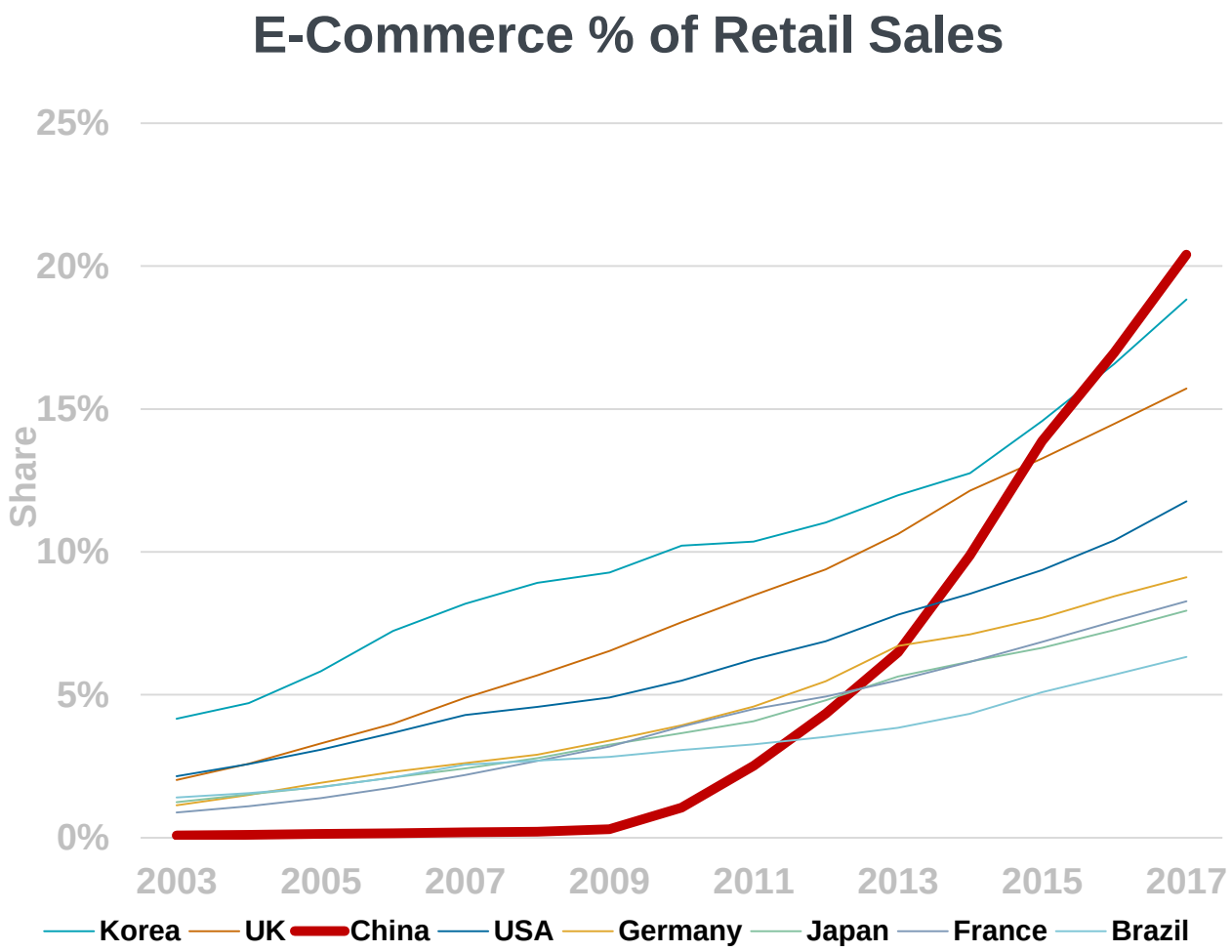


Source: Newzoo. *Excludes console / gaming PC hardware revenue.

China Retail Innovation =

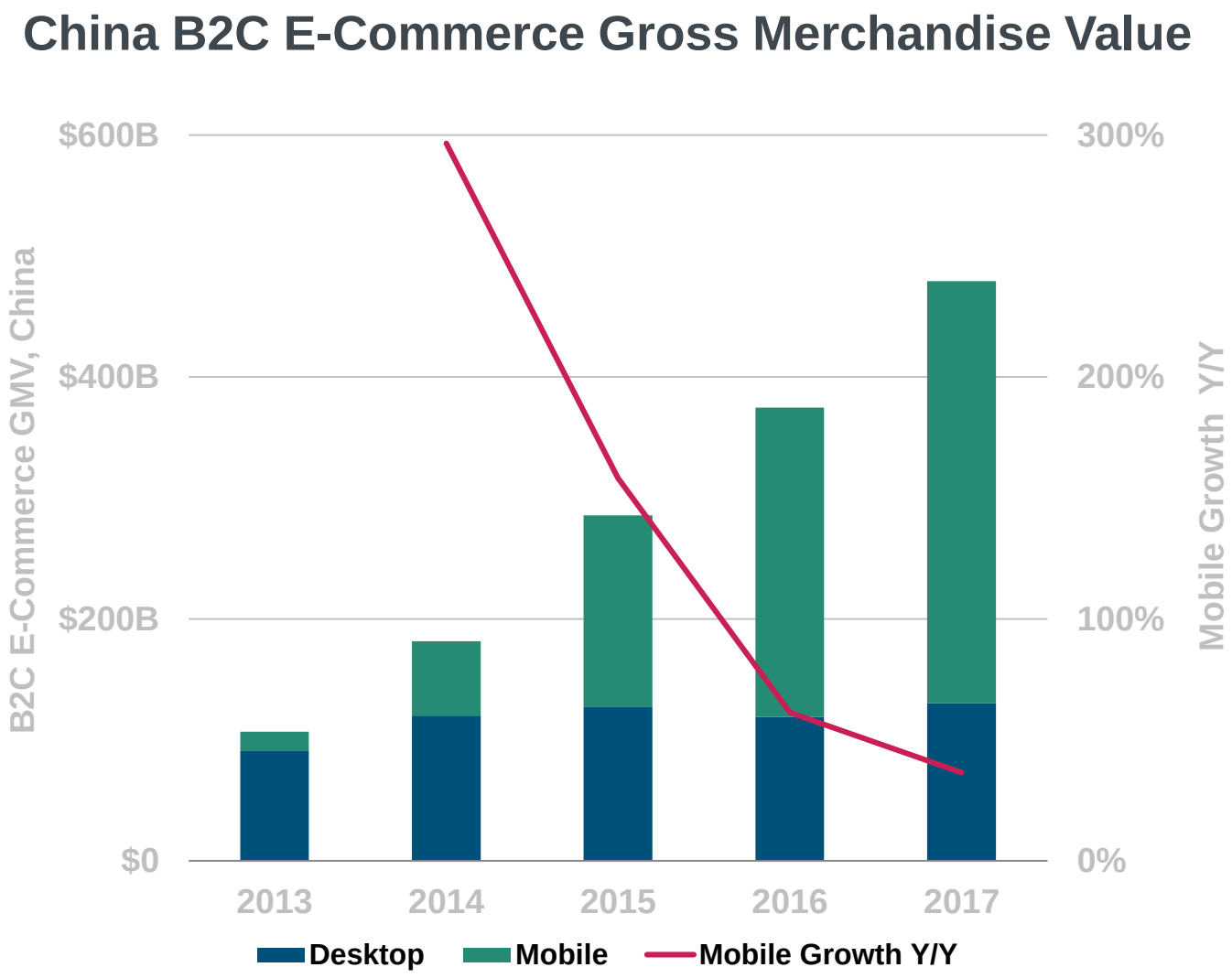
Spreading from Online to Offline

Worldwide E-Commerce Share Gains Continue…
China @ 20% = Highest Penetration Rate + Fastest Growing



Source: Euromonitor. Note data excludes certain consumer-to-consumer (C2C) transactions.

China E-Commerce = Strong Growth +28% Y/Y… Mobile = 73% of GMV



Source: iResearch. Note: Assumes constant USD / RMB rate = 6.9.

Hema Stores = Re-Imagining Grocery Retail Experience… High Quality + Convenience + Digital…

Digital Grocery Store

SKU Selection =
Based on Customer Data..
Alipay Membership To Pay

Restaurant

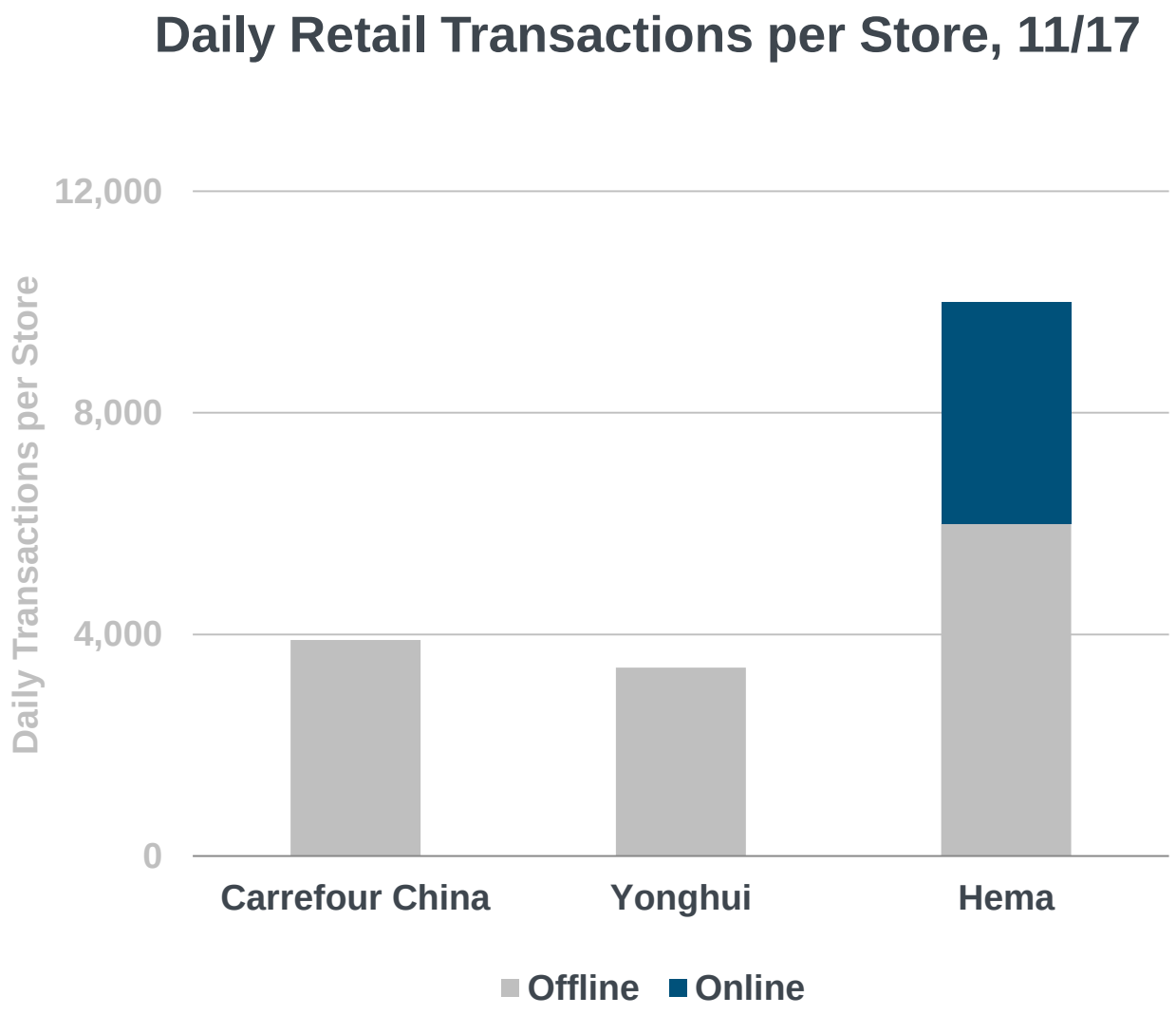
Cook To Order Chefs /
Eat-in-Shop

Real-Time E-Commerce

Ceiling-Conveyor System /
In-Store Fulfillment /
30-Minute Delivery

Source: Hillhouse. Note: As of 4/18, there are 37 Hema stores in China.

…Hema Stores = Material Portion of Orders Online… Driving Higher Sales Productivity vs. Offline Peers

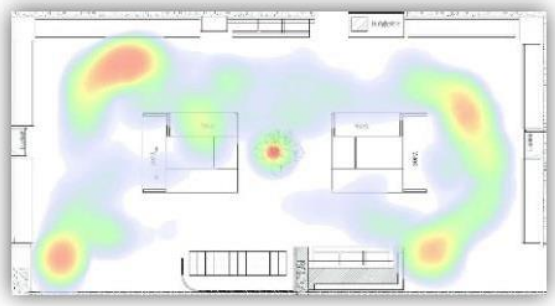


Source: Bernstein Research. Note: Hema data points in chart came from stores in Shanghai and Hangzhou in 11/17. In Q1:18, more than 50% of Hema store orders were placed online for home delivery.

Belle =
Re-Imagining Offline Retail Experience with Online Analytics

Traffic Heat Map

Optimize Layout



RFID in Shoes / Floor Mat

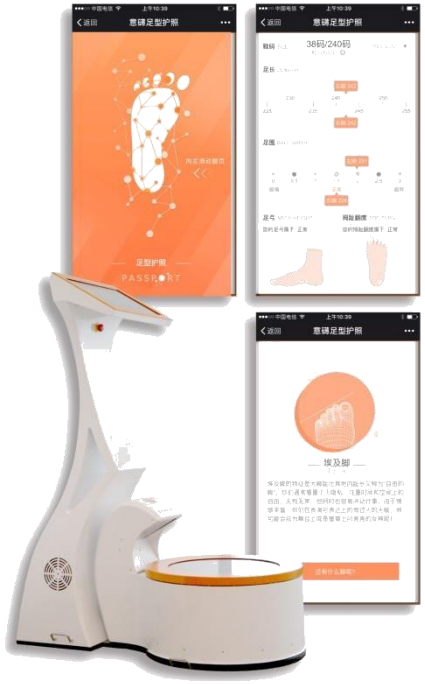
Conversion Analysis

138 fittings / 37 sales
27% conversion

168 fittings / 5 sales
3% conversion

3D Foot Scan

Personalization



Source: Belle, Hillhouse Capital.

China

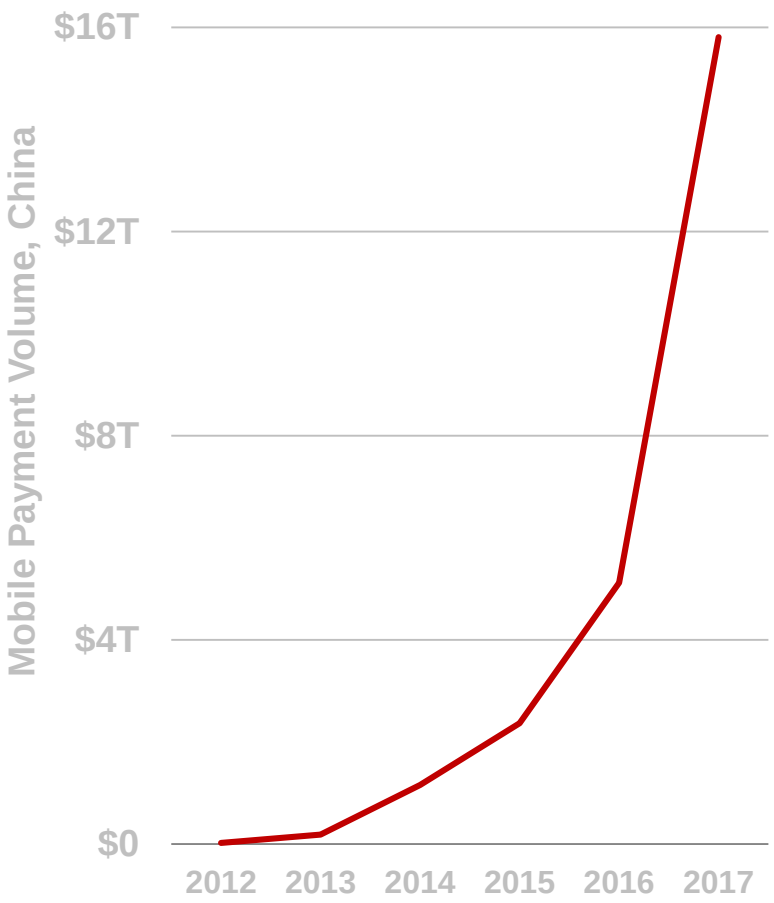
Online Payments / Advertising /

On-Demand Transportation =

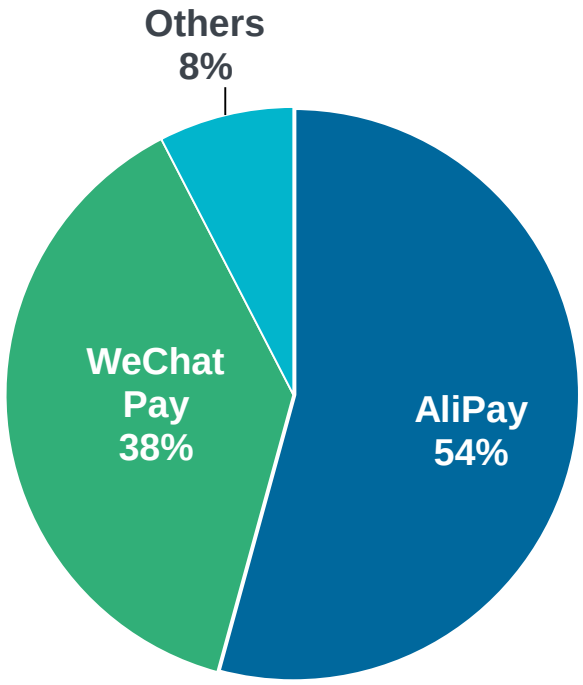
Growing Rapidly

China Mobile Payment Volume = +209% vs. +116% Y/Y Led by Alipay + WeChat Pay

China Mobile Payment Volume



China Mobile Payment Share*

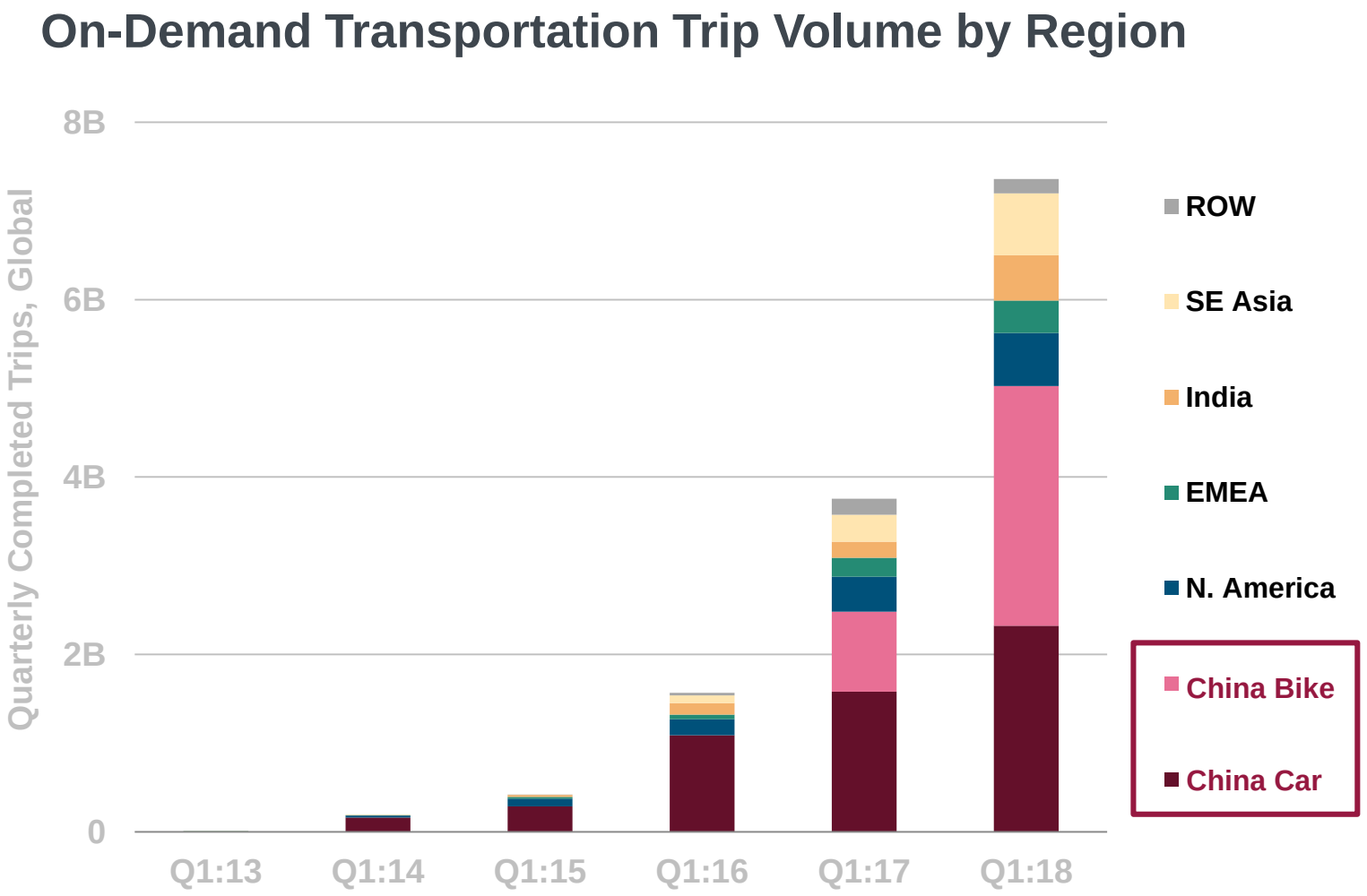


Source: Analysys (Q1:18, 3/18). *Excludes certain P2P and transfer payments. Assumes constant USD / RMB rate = 6.9.

China Online Advertising Revenue = +29% vs. 29% Y/Y

Source: iResearch. Note: Assumes constant USD / RMB rate = 6.9.

China On-Demand Transportation (Cars + Bikes) = +96%... 68% Global Share & Rising



Source: Hillhouse Capital estimates. Note: Includes on-demand taxi, private for-hire vehicles, as well as on-demand for-hire motorbike and bike trips booked through smartphone apps.

ENTERPRISE SOFTWARE =

USABILITY / USAGE IMPROVING

Consumer-Like Apps =

Changed Enterprise Computing

Dropbox (2007) = Pioneered… Consumer-Grade Product With Enterprise Appeal…

Dropbox synchronizes files across your / your team's computers…files are securely backed up to Amazon S3.

It takes concepts that are proven winners from the dev community & puts them in a package that my little sister can figure out…

Competing products force the user to constantly think & do things…

With Dropbox, you hit "Save," as you normally would & ***everything just works****.*

- Drew Houston, Founder, Y Combinator Application, Summer 2007

...Dropbox = Pioneered...
Consumerization of Enterprise Software Business Model

Inflection Points

2008 = Consumer / Individual

Free Premium Features for Referral Launch…
8 Months to 1MM Users

2013 = Enterprise / Team

Dropbox for Business Launch…
30% = Dropbox Business Share of Paid Users (2018)

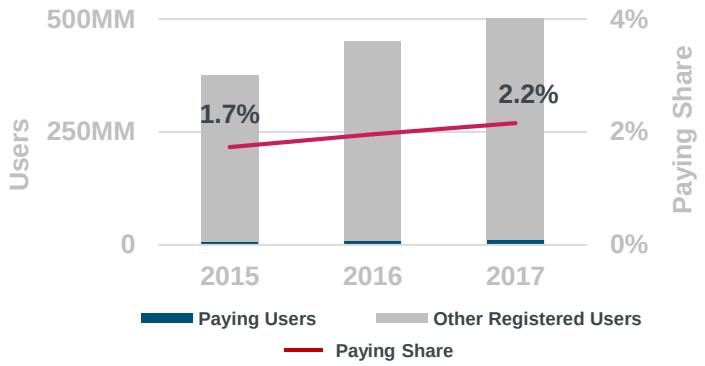
2015 = Revenue / Sales Efficiency

Free-to-Pay User Conversion Launch…
90% = Revenue From Self-Serve Channels (2018)…
>40% = New Teams with Former Individual Paid User (2018)

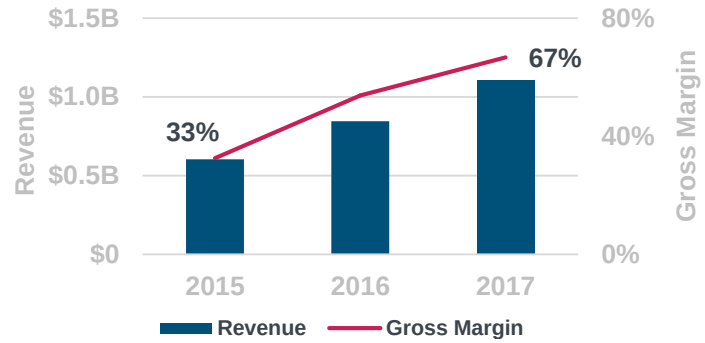
2018 = Platform

Integrated Product Suite Launch…
*3 = Major Product Launches Since 2017**

Users



Revenue & Gross Margin



Source: Ilya Fushman @ Kleiner Perkins. Dropbox, Techcrunch, JMP Securities estimates of Dropbox public releases of registered users. *Major products = Paper, Showcase, & Smart Sync.

Slack (2013) = Pioneered…
Enterprise-Grade Product With Consumer Look & Feel...

When you want something really bad,
you will put up with a lot of flaws.

But if you do not yet know you want something,
your tolerance will be much lower.

That's why it is especially important for us to build a beautiful, elegant and considerate piece of software.

Every bit of grace, refinement, & thoughtfulness on our part will pull people along.

Every petty irritation will stop them &
give the impression that it is not worth it.

- Stewart Butterfield, Slack Founder / CEO (2013)

...Slack = Pioneered…
Consumerization of Enterprise Software Business Model

Slack Inflection Points

2013 = Small Teams

Consumer-Like Onboarding Launch…
128K Users 6 Months Post-Launch (2014)

2015 = Platform

3rd-Party App Directory Launch…
>1.5K Apps in Slack App Directory (2018)
>200K Developers on Slack Platform (2018)

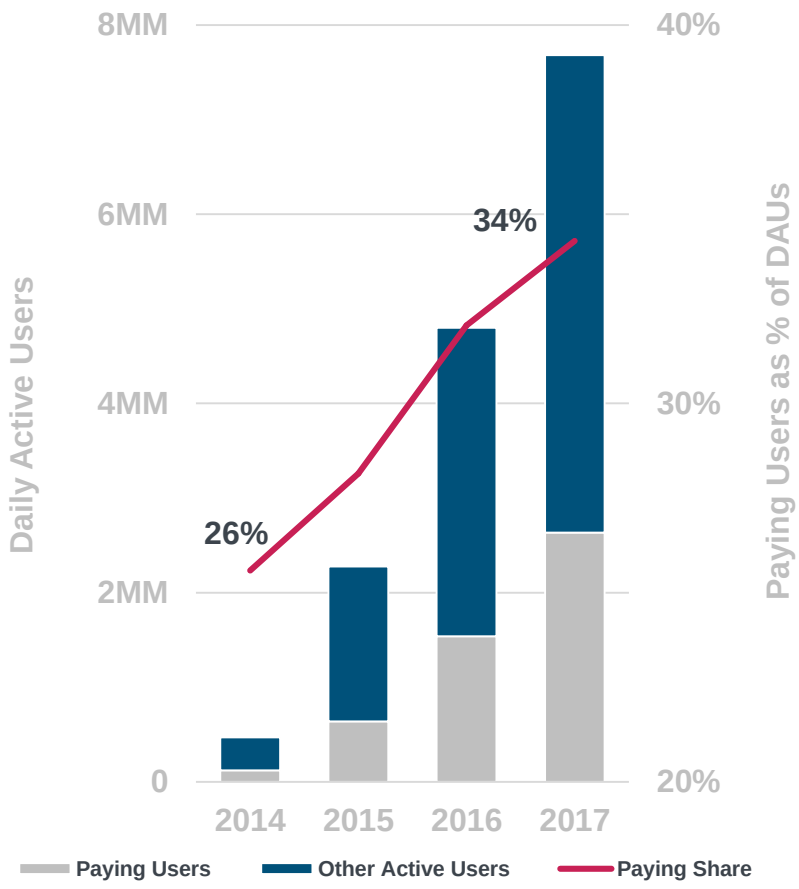
2015 = Revenue / Sales Efficiency

Free-to-Pay User Conversion Launch…
>400% = 2015 Y/Y Paid Subscription Growth

2017 = Enterprise / Large Teams

Enterprise Features Plan Launch…
>70K = Paid Teams (2018)…
>500K = Organizations Using Slack (2018)
>150 = Large Enterprises Using Slack Grid (2018)

Slack Daily Active Users



Source: Slack.

Enterprise Software Success Formula

Build Amazing Consumer-Grade Product

Leverage Virality Across Individual Users To Grow Personal + Professional Adoption @ Low Cost

Harvest Individual Users for Enterprise Go-to-Market With Dedicated Product + Inside / Outbound Sales

Build Enterprise-Grade Platform + Ecosystem

Net = Low Cost Product-Driven Customer Acquisition + Strong / Sticky Business Model

- Ilya Fushman @ Kleiner Perkins

Source: Ilya Fushman @ Kleiner Perkins.

Messaging Threads =

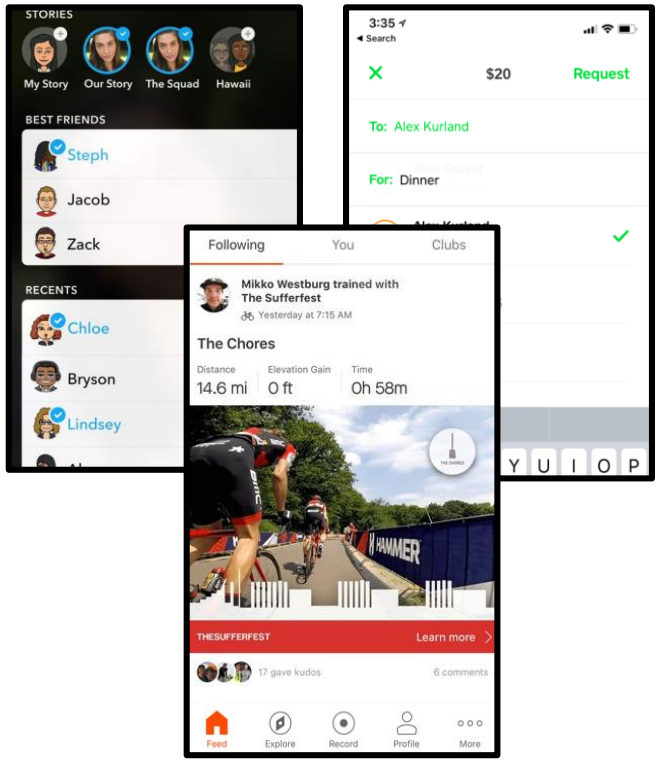
Transforming Collaboration...
Distributing + Increasing Productivity

Messaging Threads = Increasingly Foundational for Consumers + Enterprises

Consumer Services…

Snapchat
Social

Square Cash
Payments

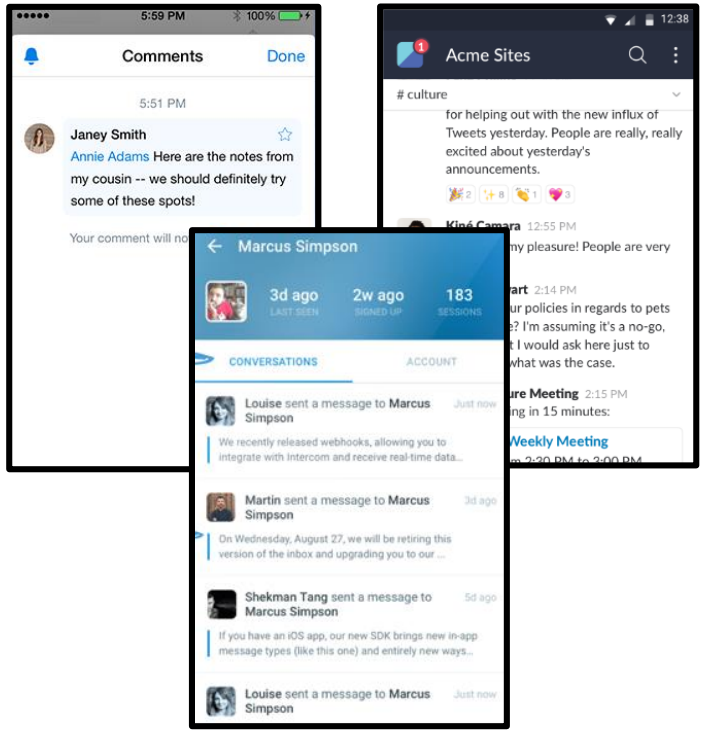


Strava
Workouts

…Enterprise Services

Dropbox
File Management

Slack
Communication



Intercom
Customer Interactions

Source: Snapchat, Square, Strava, Dropbox, Slack, Intercom.

Google Set Out to…

'Organize the World's Information &
Make It Universally Accessible & Useful'

Now Apps...

Organize Business Information &
Make It Accessible & Useful
Within Enterprises

Enterprise Messaging Threads =

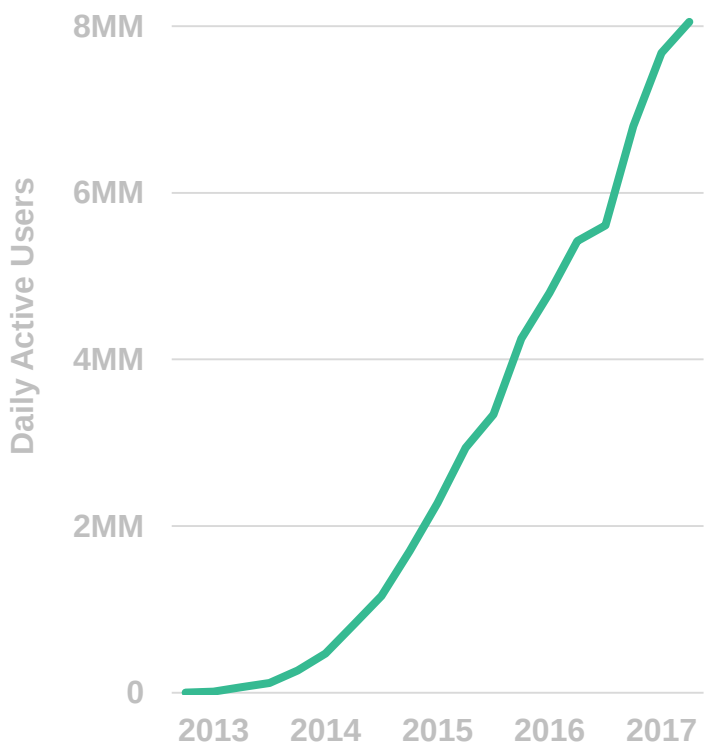
Organizing Information + Teams…
Providing Context + History...

Slack = Communication Threads...
Organizing Information by Channel Topic…

Slack Benefits

- **32%** Decline in Email Usage
- **24%** Reduction in Employee Onboarding Time
- **23%** Faster Time to Market For Development Teams
- **23%** Decline in Meetings
- **10%** Rise in Employee Satisfaction

Slack Daily Active Users



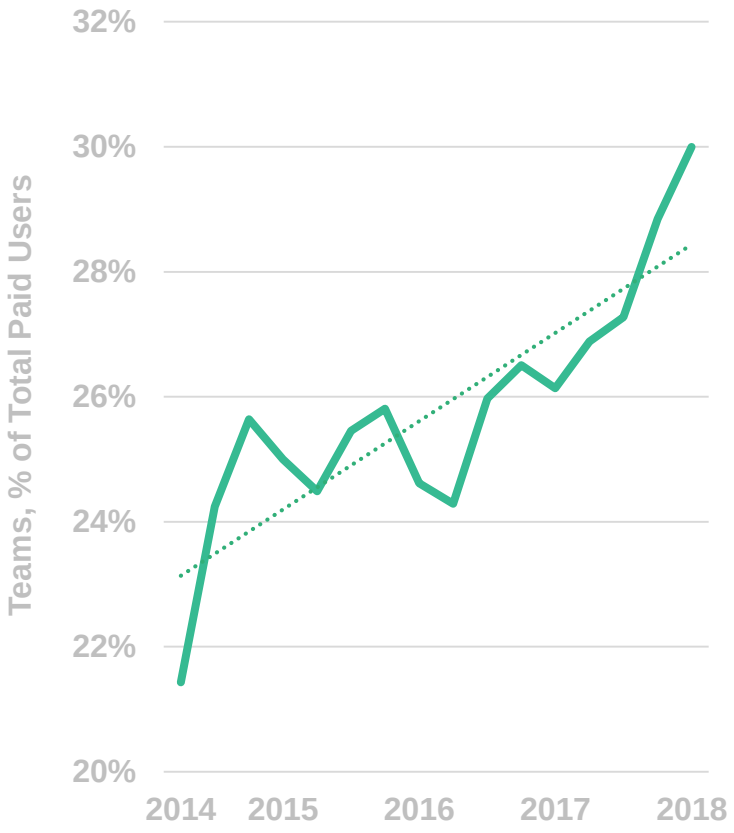
Source: Slack (5/18), IDC "The Business Value of Slack" research report (2017).

...Dropbox = File Management Threads... Organizing Data by File + Version

Dropbox Benefits

- **6x** Rise in Employees on Multi-Department Teams
- **31%** Decline in IT Time Spent Supporting Collaboration
- **3.7K** Hours Saved Annually Per Organization in Document Management
- **6%** Rise in Sales Team Productivity

Teams % of Paid Users



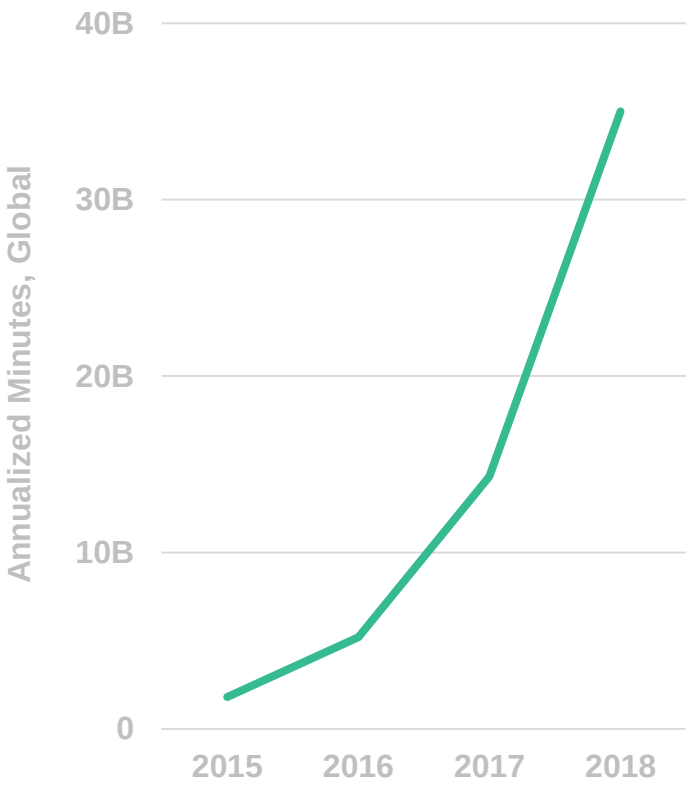
Source: Dropbox. Piper Jaffray (4/18, Teams % of paid users). Dropbox + IDC commissioned study for Dropbox on effects of enterprises using Dropbox (Dropbox benefits, 2016).

...Zoom = Visual Communication / Meeting Threads... Distributing + Increasing Productivity…

Zoom Benefits

- **85%** Improved Collaboration
- **71%** Improved Productivity
- **62%** Supported Flexible Work Schedule
- **58%** Built Trust Among Remote Workers
- **58%** Reduced Meeting Times
- **48%** Removed Company Silos
- **72** Net Promoter Score

Annualized Meeting Minutes

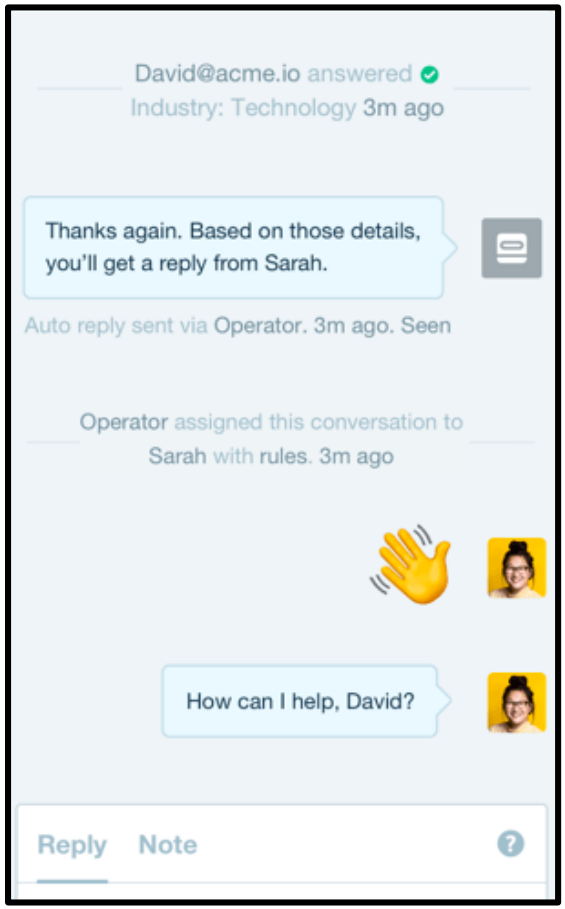


Source: Survey conducted by Zoom Video Communications of Zoom customers +700 responses (2/18).

...Intercom = Customer Transaction Threads... Organizing Customer Dialog

Intercom Benefits

- **82%** Rise in Conversion For Customers Chatting In Intercom
- **36%** Rise in Conversion For Customers Assisted by 'Operator' Chatbot
- **13%** Rise in Order Value for Customers Chatting in Intercom



Source: Intercom.

…Enterprise Messaging Threads =

Helping Improve Productivity + Collaboration

USA INC.* =

WHERE YOUR TAX DOLLARS GO

*** USA, Inc. Full Report:** http://www.kleinerperkins.com/blog/2011-usa-inc-full-report

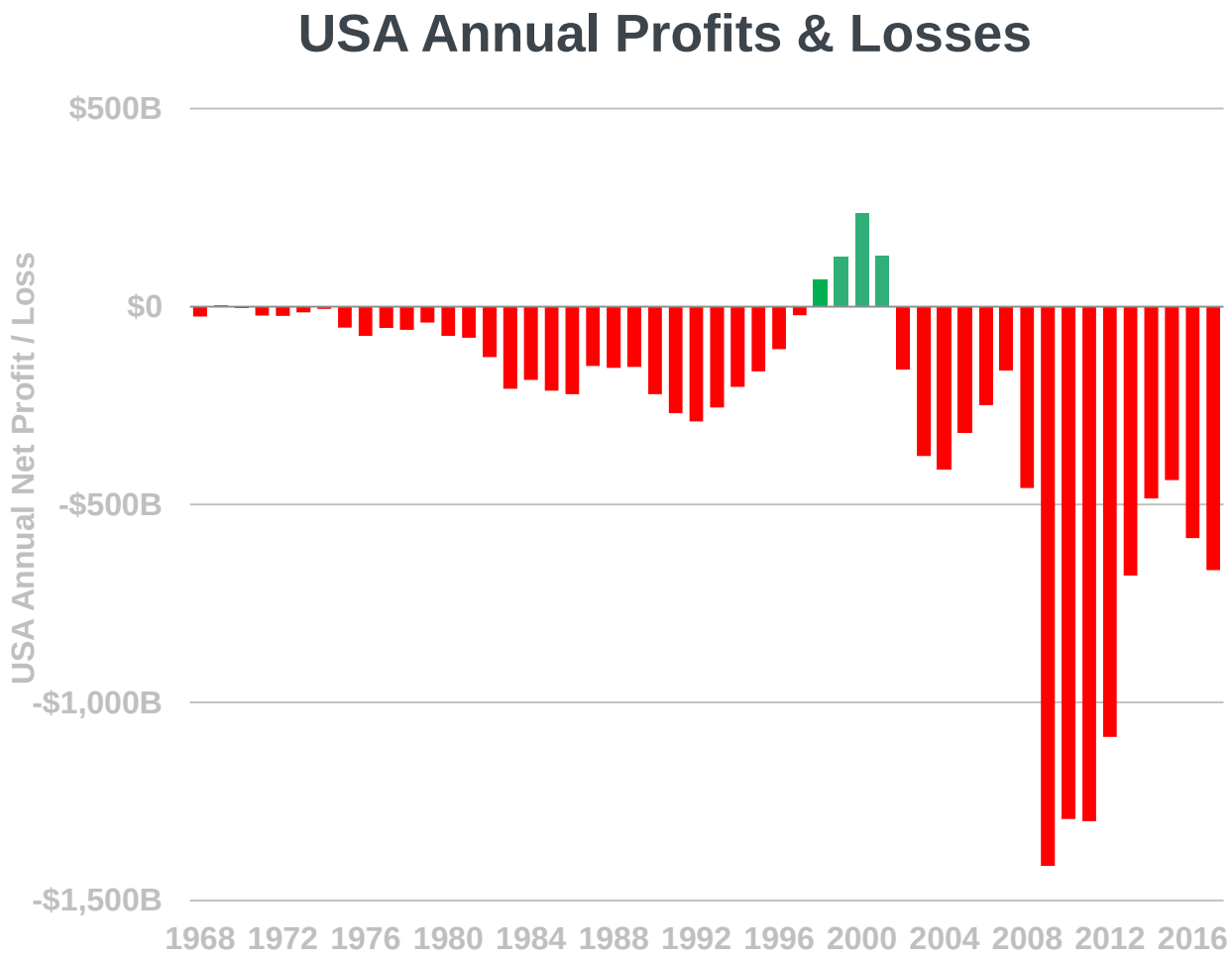
USA Income Statement = -19% Average Net Margin Over 30 Years…

USA Income Statement

	F1987	F1992	F1997	F2002	F2007	F2012	F2017	Comments
Revenue ($B)	**$854**	**$1,091**	**$1,579**	**$1,853**	**$2,568**	**$2,449**	**$3,316**	**+5% Y/Y average over 25 years**
Y/Y Growth	***11%***	***3%***	***9%***	***-7%***	***7%***	***6%***	***2%***	
Individual Income Taxes*	$393	$476	$737	$858	$1,163	$1,132	$1,587	Largest Driver of Revenue
% of Revenue	*46%*	*44%*	*47%*	*46%*	*45%*	*46%*	*48%*	
Social Insurance Taxes	$303	$414	$539	$701	$870	$845	$1,162	Social Security & Medicare Payroll Tax
% of Revenue	*36%*	*38%*	*34%*	*38%*	*34%*	*35%*	*35%*	
Corporate Income Taxes*	$84	$100	$182	$148	$370	$242	$297	Fluctuates with Economic Conditions
% of Revenue	*10%*	*9%*	*12%*	*8%*	*14%*	*10%*	*9%*	
Other	$74	$101	$120	$146	$165	$229	$270	Estate & Gift Taxes / Duties / Fees / etc.
% of Revenue	*9%*	*9%*	*8%*	*8%*	*6%*	*9%*	*8%*	
Expense ($B)	**$1,004**	**$1,382**	**$1,601**	**$2,011**	**$2,729**	**$3,537**	**$3,982**	
Y/Y Growth	***1%***	***4%***	***3%***	***8%***	***3%***	***-2%***	***3%***	
Entitlement / Mandatory	$421	$648	$810	$1,106	$1,450	$2,030	$2,519	Risen Owing to Rising Healthcare Costs + Aging Population
% of Expense	*42%*	*47%*	*51%*	*55%*	*53%*	*57%*	*63%*	
Non-Defense Discretionary	$162	$231	$275	$385	$494	$616	$610	Education / Law Enforcement / Transportation / Government Administration…
% of Expense	*16%*	*17%*	*17%*	*19%*	*18%*	*17%*	*15%*	
Defense	$283	$303	$272	$349	$548	$671	$590	2007 increase driven by War on Terror
% of Expense	*28%*	*22%*	*17%*	*17%*	*20%*	*19%*	*15%*	
Net Interest on Public Debt	$139	$199	$244	$171	$237	$220	$263	Has Benefitted from Declining Interest Rates Since Early 1980s
% of Expense	*14%*	*14%*	*15%*	*9%*	*9%*	*6%*	*7%*	
Surplus / Deficit ($B)	**-$150**	**-$290**	**-$22**	**-$158**	**-$161**	**-$1,088**	**-$666**	**-19% Average Net Margin, 1987-2017**
Net Margin (%)	***-18%***	***-27%***	***-1%***	***-9%***	***-6%***	***-44%***	***-20%***	

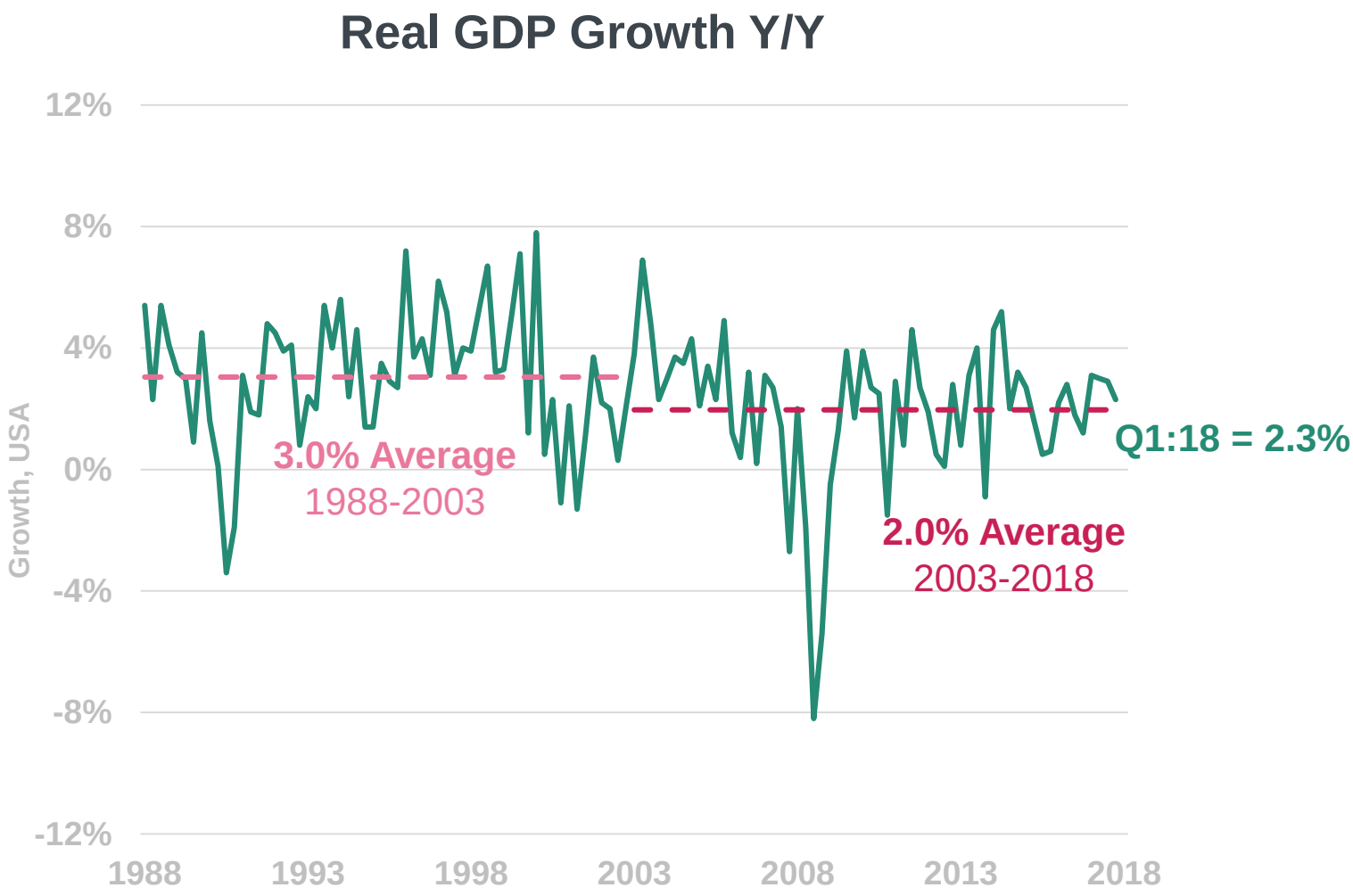
Source: Congressional Budget Office, White House Office of Management and Budget. *Individual & corporate income taxes include capital gains taxes. Note: USA federal fiscal year ends in September. Non-defense discretionary includes federal spending on education, infrastructure, law enforcement, judiciary functions.

…USA Income Statement = Net Loses in 45 of 50 Years



Source: Congressional Budget Office, White House Office of Management and Budget. Note: USA federal fiscal year ends in September.

Real GDP Growth @ 2.3% (Q1)...
1988-2003 @ 3.0%...2003-2018 @ 2.0% Average

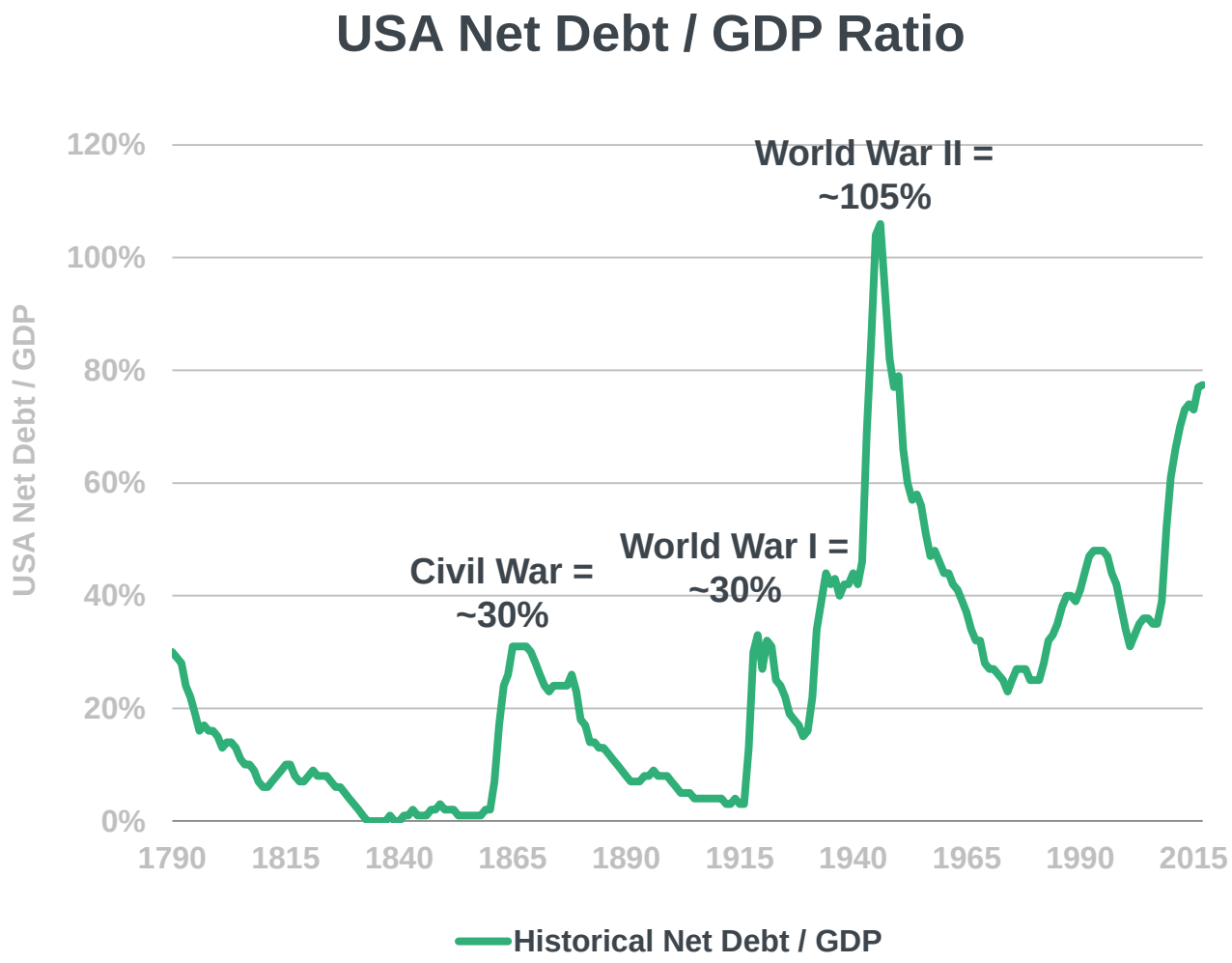


Source: Bureau of Economic Analysis (BEA). Note: Real GDP based on chained 2009 dollars. Growth defined as growth over preceding period, seasonally adjusted annual rate.

USA Rising
Debt Commitments =

Non-Trivial Challenge

Net Debt / GDP Ratio = Highest Level Since WWII



Source: Congressional Budget Office Long-Term Outlook (3/18).

USA Public Debt / GDP Level = 7th Highest vs. Major Economies

Country	Government Debt % of GDP	Government Debt 2017 ($B)
1) Japan	240%	$12,317
2) Greece	180	403
3) Lebanon	152	80
4) Italy	133	2,798
5) Portugal	126	301
6) Singapore	111	362
7) USA	**108**	**20,939**
8) Jamaica	107	16
9) Cyprus	106	24
10) Belgium	104	561

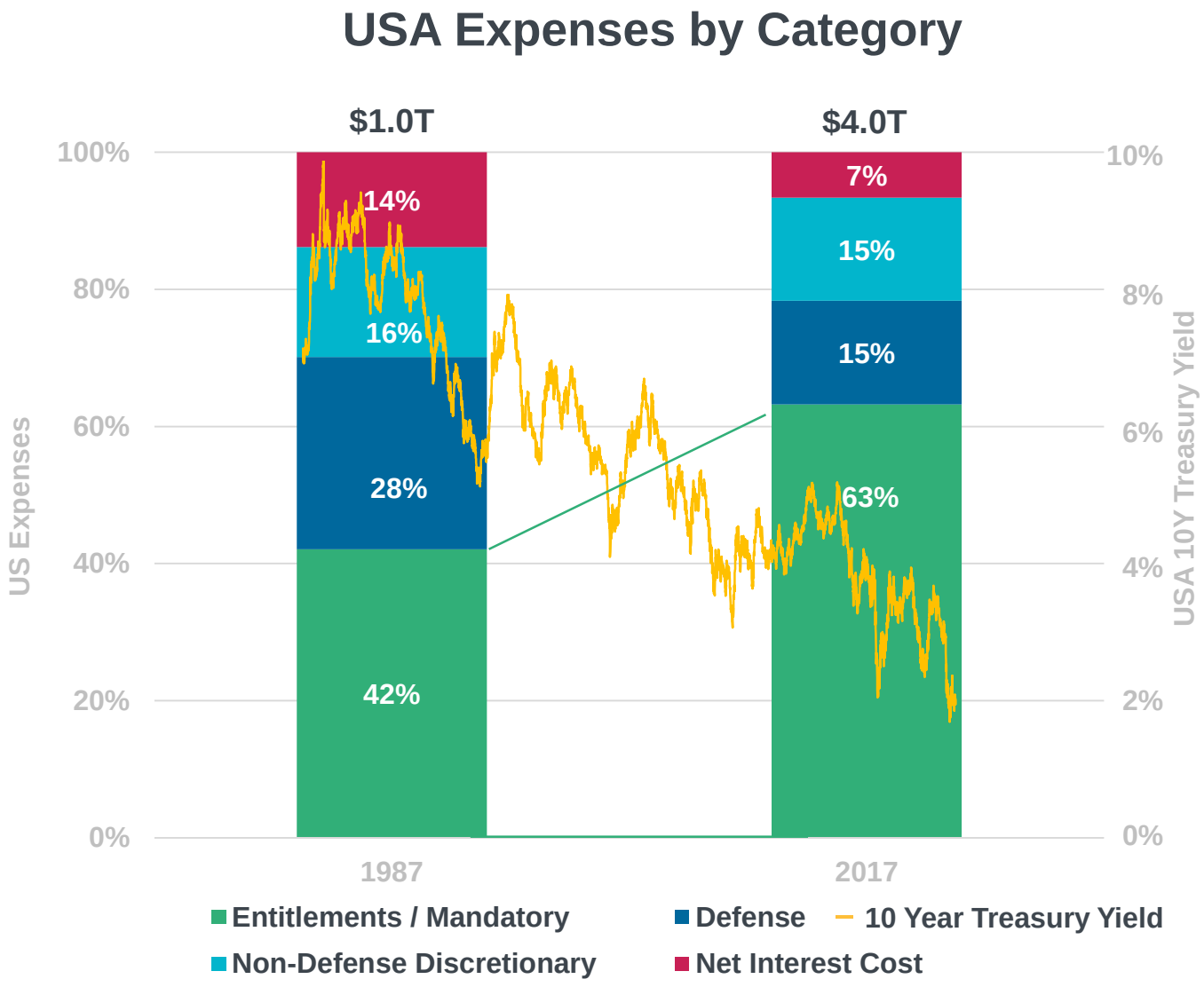
Country	Government Debt % of GDP	Government Debt 2017 ($B)
11) Egypt	101%	$199
12) Spain	99	1,412
13) France	97	2,730
14) Jordan	96	39
15) Bahrain	91	31
16) Canada	90	1,482
17) UK	89	2,532
18) Mozambique	88	12
19) Ukraine	86	92
20) Yemen	83	30

Source: IMF 2017 Estimates Note: Ranking excludes countries with public debt less than $10B in 2015. Public debt includes federal, state and local government debt but excludes unfunded pension liabilities from government defined-benefit pension plans and debt from public enterprises and central banks. FX rates as of 3/28/18.

USA Rising
Debt Drivers =

Spending on
Healthcare Entitlements
(Medicare + Medicaid)

USA Entitlements = 63% vs. 42% of Government Spending Thirty Years Ago…



1987 → 2017 Change

Debt*
+$13T (+650%)

Entitlements
+$2.1T (+498%)

Non-Defense Discretionary
+$448B (+277%)

Defense
+$308B (+109%)

Net Interest Cost:
+$124B (+89%)

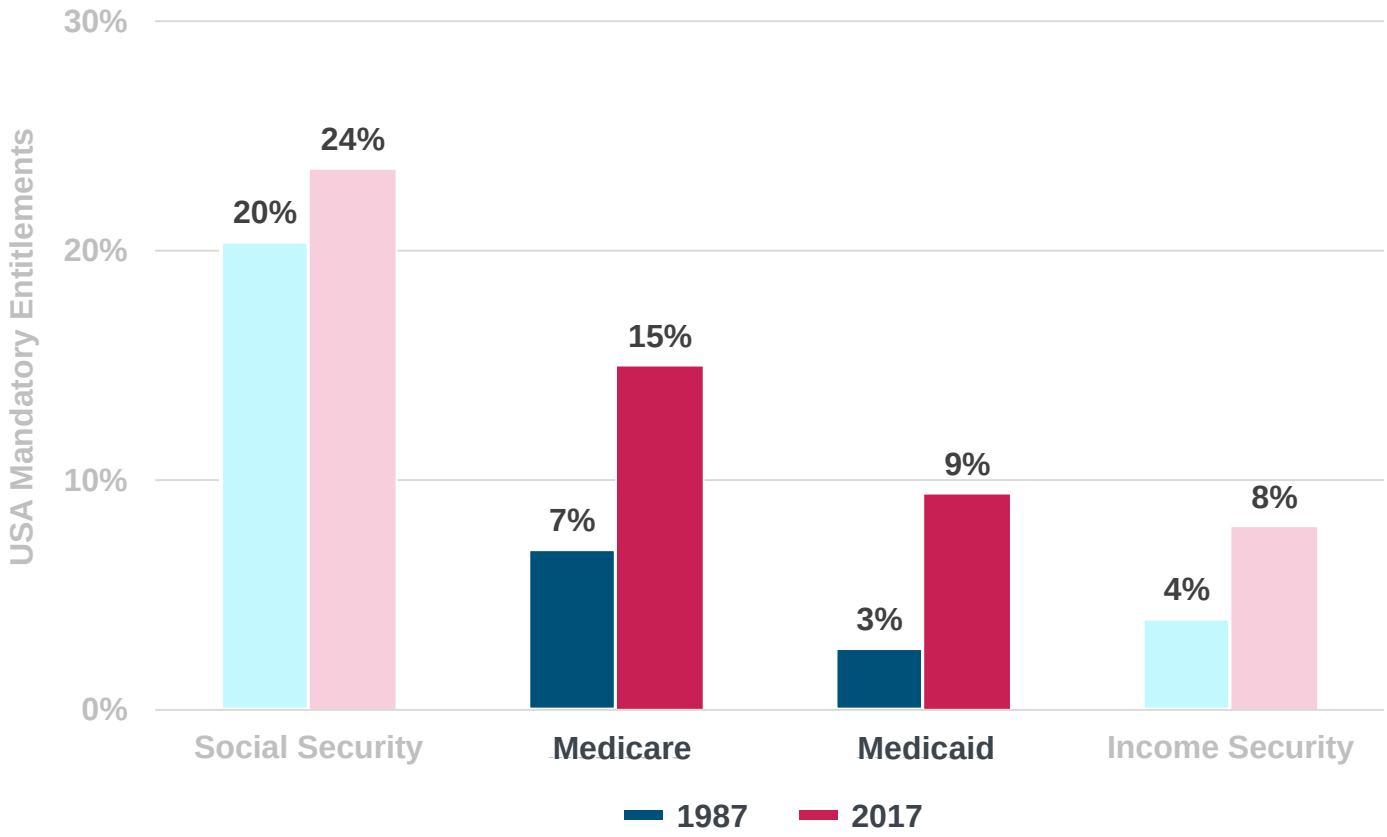
Source: Congressional Budget Office, White House Office of Management and Budget, USA Treasury
*Debt reflects net debt (i.e. excludes debt issued by The Treasury and owned by other Government accounts)
Note: Yellow line represents yield on 10-year USA Treasury bill from 12/31/86 to 12/31/17.

…USA Entitlements = Medicare + Medicaid Driving Most Spending Growth…

USA Entitlements by Category

1987 Entitlements* = **$349B / 35% of Expenses**

2017 Entitlements* = **$2.2T / 56% of Expenses**



Source: Congressional Budget Office, White House Office of Management and Budget. *1987 Income Security programs defined as Food Stamps + SSI + Family Support + Child Nutrition + Earned Income Tax Credit + Other. 2017 Income Security defined as Earned Income Tax Credit + SNAP + SSI + Unemployment + Family Support + Child Nutrition. In 2017, there was an additional ~$200MM in mandatory spending, including Veterans' pensions & ~$73MM in 1987.

USA Entitlements Growth Over 30 Years = Looking @ Numbers…Closer to Home

2016

$59K =
Median USA Household Income

$20K =
Average Entitlement Payout per Household from Federal Government…
Scale = Equivalent to 34% of Household Income

1986

$25K =
Median USA Household Income

$5K =
Average Entitlement Payout per Household from Federal Government…
Scale = Equivalent to 19% of Household Income

Source: Congressional Budget Office, White House Office of Management and Budget, US Census Bureau

IMMIGRATION =

IMPORTANT FOR USA TECHNOLOGY JOB CREATION

USA = 56% of Most Highly Valued Tech Companies Founded By… 1st or 2nd Generation Americans…1.7MM Employees, 2017

Immigrant Founders / Co-Founders of Top 25 USA Valued Public Tech Companies, Ranked by Market Capitalization

Rank	Company	Mkt Cap ($MM)	LTM Rev ($MM)	Employees	Founder / Co-Founder (1st / 2nd Gen Immigrant)	Generation
1	Apple	$923,554	$239,176	123,000	Steve Jobs	2nd – Syria
4	Amazon.com	782,608	177,866	566,000	Jeff Bezos	2nd – Cuba
3	Microsoft	753,030	95,652	124,000	--	--
2	Alphabet / Google	739,122	110,855	80,110	Sergey Brin	1st – Russia
5	Facebook	537,648	40,653	25,105	Eduardo Saverin	1st – Brazil
6	Intel	257,791	62,761	102,700	--*	--
7	Cisco	202,083	48,096	72,900	--	--
8	Oracle	188,848	39,472	138,000	Larry Ellison / Bob Miner	2nd – Russia / 2nd – Iran
11	Netflix	152,025	11,693	4,850	--	--
10	NVIDIA	150,894	9,714	10,299	Jensen Huang	1st – Taiwan
9	IBM	129,635	79,139	366,600	Herman Hollerith	2nd – Germany
12	Adobe Systems	119,271	7,699	17,973	--	--
13	Booking.com	100,013	12,681	22,900	--	--
14	Texas Instruments	108,912	14,961	29,714	Cecil Green / J. Erik Jonsson	1st – UK / 2nd – Sweden
15	PayPal	95,858	13,094	18,700	Max Levchin / Luke Nosek / Peter Thiel / Elon Musk***	1st – Ukraine / 1st – Poland / 1st – Germany / 1st – South Africa
16	Salesforce.com	94,260	10,480	25,000	--	--
17	Qualcomm	86,333	22,360	33,800	Andrew Viterbi	1st – Italy
19	Automatic Data Processing	57,237	12,790	58,000	Henry Taub	2nd – Poland
21	VMware	55,282	7,922	20,615	Edouard Bugnion	1st – Switzerland
20	Activision Blizzard	53,772	7,017	9,625	--	--
18	Applied Materials	52,439	15,463	18,400	--	--
23	Intuit	50,471	5,434	8,200	--	--
22	Cognizant Technology	43,597	14,810	260,000	Francisco D'Souza / Kumar Mahadeva	1st – India** / 1st – Sri Lanka
24	eBay	37,304	9,567	14,100	Pierre Omidyar	1st – France
25	Electronic Arts	34,763	4,845	8,800	--	--

Source: CapIQ as of 4/16/18. "The 'New American' Fortune 500" (2011), a report by the Partnership for a New American Economy, as well as "Reason for Reform: Entrepreneurship" (10/16), "American Made, The Impact of Immigrant Founders & Professionals on U.S. Corporations." *While Andy Grove (from Hungary) is not a co-founder of Intel, he joined as COO on the day it was incorporated. **Francisco D'Souza is a person of Indian origin born in Kenya. ***Max Levchin / Luke Nosek / Peter Thiel's startup Confinity merged with Elon Musk's startup X.com to form PayPal in 3/00.

USA = Many Highly Valued Private Tech Companies Founded By… 1st Generation Immigrants

Company	Immigrant Founder / Co-Founder	Country of Origin	Market Value ($B)
Uber	Garrett Camp	Canada	$72
SpaceX	Elon Musk	South Africa	25
Palantir	Peter Thiel	Germany	21
WeWork	Adam Neumann	Israel	21
Stripe	John Collison, Patrick Collison	Ireland	9
Wish (ContextLogic)	Peter Szulczewski, Danny Zhang	Canada	9
Moderna Therapeutics	Noubar Afeyan, Derrick Rossi	Armenia / Canada	8
Robinhood	Baiju Bhatt, Vlad Tenev	India / Bulgaria	6
Slack	Stewart Butterfield, Serguei Mourachov, Cal Henderson	Canada / Russia / UK	5
Tanium	David Hindawi	Iraq	5
Credit Karma	Kenneth Lin	China	4
Houzz	Adi Tatarko, Alon Cohen	Israel	4
Instacart	Apoorva Mehta	India	4
Bloom Energy	KR Sridhar	India	3
Oscar Health	Mario Schlosser	Germany	3
Unity Technologies	David Helgason	Iceland	3
Avant	Al Goldstein, John Sun, Paul Zhang	Uzbekistan / China / China	2
Zenefits	Laks Srini	India	2
AppNexus	Mike Nolet	Holland	2
ZocDoc	Oliver Kharraz	Germany	2
Sprinklr	Ragy Thomas	India	2
Compass	Ori Allon	Israel	2

Company	Immigrant Founder / Co-Founder	Country of Origin	Market Value ($B)
JetSmarter	Sergey Petrossov	Russia	$2
Warby Parker	Dave Gilboa	Sweden	2
Carbon3D	Alex Ermoshkin	Russia	2
Infinidat	Moshe Yanai	Israel	2
Tango	Uri Raz, Eric Setton	Israel / France	2
Quanergy	Louay Eldada, Tianyue Yu	Lebanon / China	2
Zoox	Tim Kentley-Klay	Australia	2
Eventbrite	Renaud Visage	France	2
Apttus	Kirk Krappe	UK	2
Cloudflare	Michelle Zatlyn	Canada	2
Proteus Digital Health	Andrew Thompson	UK	2
Anaplan	Guy Haddleton, Michael Gould	New Zealand / UK	1
Rubrik	Bipul Sinha	India	1
OfferUp	Arean Van Veelen	Netherlands	1
Actifio	Ash Ashutosh	India	1
Gusto	Tomer London	Israel	1
Medallia	Borge Hald	Norway	1
FanDuel	Nigel Eccles, Tom Griffiths, Lesley Eccles	UK	1
AppDirect	Daniel Saks, Nicolas Desmarais	Canada	1
Evernote	Stepan Pachikov, Phil Libin	Azerbaijan / Russia	1
Udacity	Sebastian Thrun	Germany	1
UiPath*	Daniel Dines, Marius Tirca	Romania	1
Zoom Video	Eric Yuan	China	1

Source for Valuation and Founders Backgrounds: Based on analysis by the Wall Street Journal, CB Insights, Forbes and Business Insider
Note: Due to varying definitions of unicorns, may not align with various unicorn lists. As of April 2018 there are 105 US-based, venture-backed unicorns (including rumored valuations). *UiPath is headquartered in New York, NY but was originally founded in Romania.

APPENDIX

Global Industry Classification System (GICS) (Slides 39 / 41 / 42)

GICS is a four-tiered, hierarchical industry classification system. It consists of 11 sectors, 24 industry groups, 68 industries and 157 sub-industries. The GICS methodology is widely accepted as an industry analytical framework for investment research, portfolio management and asset allocation. Companies are classified quantitatively and qualitatively. Each company is assigned a single GICS classification at the sub-industry level according to its principal business activity. MSCI and S&P Global use revenues as a key factor in determining a firm's principal business activity. Earnings and market, however, are also recognized as important and relevant
information for classification purposes.

Global industry coverage is comprehensive and precise. The classification system is comprised of over 50,000 trading securities across 125 countries, covering approximately 95% of the world's equity market capitalization.
Company classifications are regularly reviewed and maintained. Specialized teams from two major index providers — MSCI and S&P Global — have defined review procedures, refined over nearly 15 years.

Each sector includes the following industries:

- **Energy** = Energy Equipment & Services, Oil, Gas & Consumables Fuels
- **Materials** = Chemicals, Construction Materials, Containers & Packaging, Metals & Mining, Paper & Forest Products
- **Industrials** = Aerospace & Defense, Building Products, Construction & Engineering, Electrical Equipment, Industrial Conglomerates, Machinery, Trading Companies & Distributors, Commercial Services & Suppliers, Professional Services, Air Freight & Logistics, Airlines, Marine, Road & rail, Transportation Infrastructure
- **Consumer Discretionary** = Auto Components, Automobiles, Household Durables, Leisure Products, Textiles, Apparel & Luxury Goods, Hotels, Restaurants & Leisure, Diversified Consumer Services, Media, Distributors, Internet & Direct Marketing Retail, Multiline Retail, Specialty Retail
- **Consumer Staples** =Food & Staples Retailing, Beverages, Food Products, Tobacco, Household Products, Personal Products
- **Healthcare** = Healthcare Equipment & Supplies, Healthcare Providers & Services, Healthcare Technology, Biotechnology, Pharmaceuticals, Life Sciences Tools & Services
- **Financials** = Commercial Banks, Thrifts & Mortgage Finance, Diversified Financial Services, Consumer Finance, Capital Markets, Mortgage Real Estate Investment Trusts (REITs), Insurance
- **Information Technology** = Internet Software & Services, IT Services, Software, Communications Equipment, Computers & Peripherals, Electronic Equipment & Instruments, Semiconductors & Semiconductors Equipment
- **Telecommunication Servi**ces = Diversified Telecommunication Services, Wireless Telecommunication Services
- **Utilities** = Electric Utilities, Gas Utilities, Multi-Utilities, Water Utilities, Independent Power & Renewable Electricity Producers
- **Real Estate** = Equity Real Estate Investment Trusts (REITs), Real Estate Management & Development

Source: MSCI, S&P 500

Disclaimer

This presentation has been compiled for informational purposes only and should not be construed as a solicitation or an offer to buy or sell securities in any entity, or to invest in any Kleiner Perkins (KP) entity or affiliated fund.

The presentation relies on data + insights from a wide range of sources, including public + private companies, market research firms + government agencies. We cite specific sources where data are public; the presentation is also informed by non-public information + insights. We disclaim any + all warranties, express or implied, with respect to the presentation. No presentation content should be construed as professional advice of any kind (including legal or investment advice).

We publish the Internet Trends report on an annual basis, but on occasion will highlight new insights. We may post updates, revisions, or clarifications on the KP website.

KP is a venture capital firm that owns significant equity positions in certain of the companies referenced in this presentation, including those at http://www.kleinerperkins.com/companies.

Any trademarks or service marks used in this report are the marks of their respective owners, who are not participating partners or sponsors of the presentation or of KP or its affiliated funds + such owners do not endorse the presentation or any statements made herein. All rights in such marks are reserved by their respective owners.