DEALMAKERS IN TECHNOLOGY

TRANSACTION TRENDS IN A.I.

Munich · May 2019

GP.Bullhound

Today's speaker

Dr. Nikolas Westphal

Nikolas.Westphal@gpbullhound.com

- Director at GP Bullhound, Berlin

- Doctorate in finance from Leipzig Graduate School of Management

- TMT investment banking since 2005

- 12 years in London; in Berlin since 2017

- Focus on fundraisings and exits

- Selected recent transactions:
  - $30m growth financing of Mambu by Bessemer
  - Buyout of Magix by Capiton
  - Sale of Elbkind to Reply
  - Sale of Acmeo to H.I.G.-backed Inifigate
  - $15m growth financing of TIS by 83North

- Focus on software, digital services, (I)IoT and cloud infrastructure

Dealmakers in Technology

$19bn+

of value delivered to clients

530+

successful transactions

100+

professionals

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Entertainment

Digital Services

Software

eCommerce

Fintech

Table of Content

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I.
INTRODUCTION:
Riding the smart enterprise wave

A routine news report…

A train carriage containing controlled nuclear materials was stolen in Cincinnati today. Its whereabouts are unknown.

The incident occurred on the downtown train line, which runs from Covington and Ashland stations.

In an email to Ohio news outlets, the U.S. Department of Energy said it is working with the Federal Railroad Administration to find the thief.

"The theft of this nuclear material will have significant negative consequences on public and environmental health, our workforce and the economy of our nation," said Tom Hicks, the U.S. Energy Secretary, in a statement. "Our top priority is to secure the theft and ensure it doesn't happen again."

The stolen material was taken from the University of Cincinnati's Research Triangle Park nuclear research site, according to a news release from Department officials.

The Nuclear Regulatory Commission did not immediately release any information.

According to the release, the U.S. Department of Energy's Office of Nuclear Material Safety and Security is leading that team's investigation.

"The safety of people, the environment and the nation's nuclear stockpile is our highest priority," Hicks said. "We will get to the bottom of this and make no excuses.

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…or is it?

The text on the preceding page has been written at the first attempt by an <u>unsupervised</u> machine learning model called **GPT-2**. The **GPT-2** has been trained simply to predict the next word in 40 GB of Internet text.

The technology has not been released due to concerns about potential malicious applications.
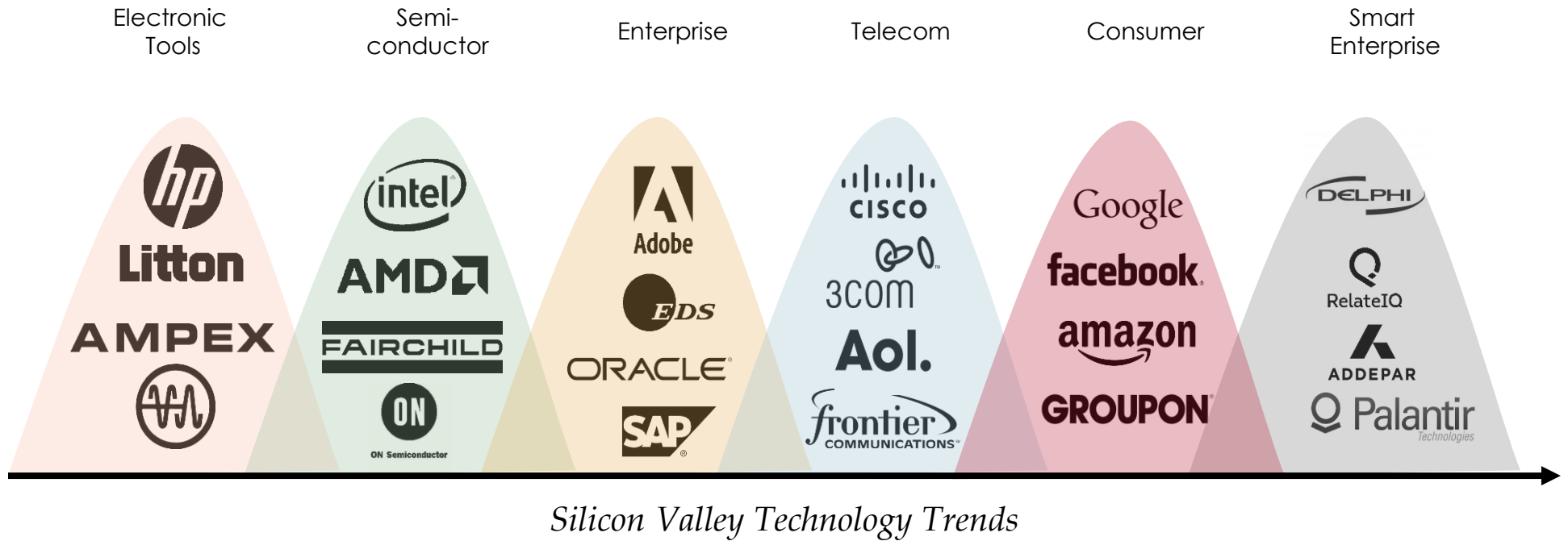
Source: OpenAI Foundation,
"Better Language Models and Their Implications"
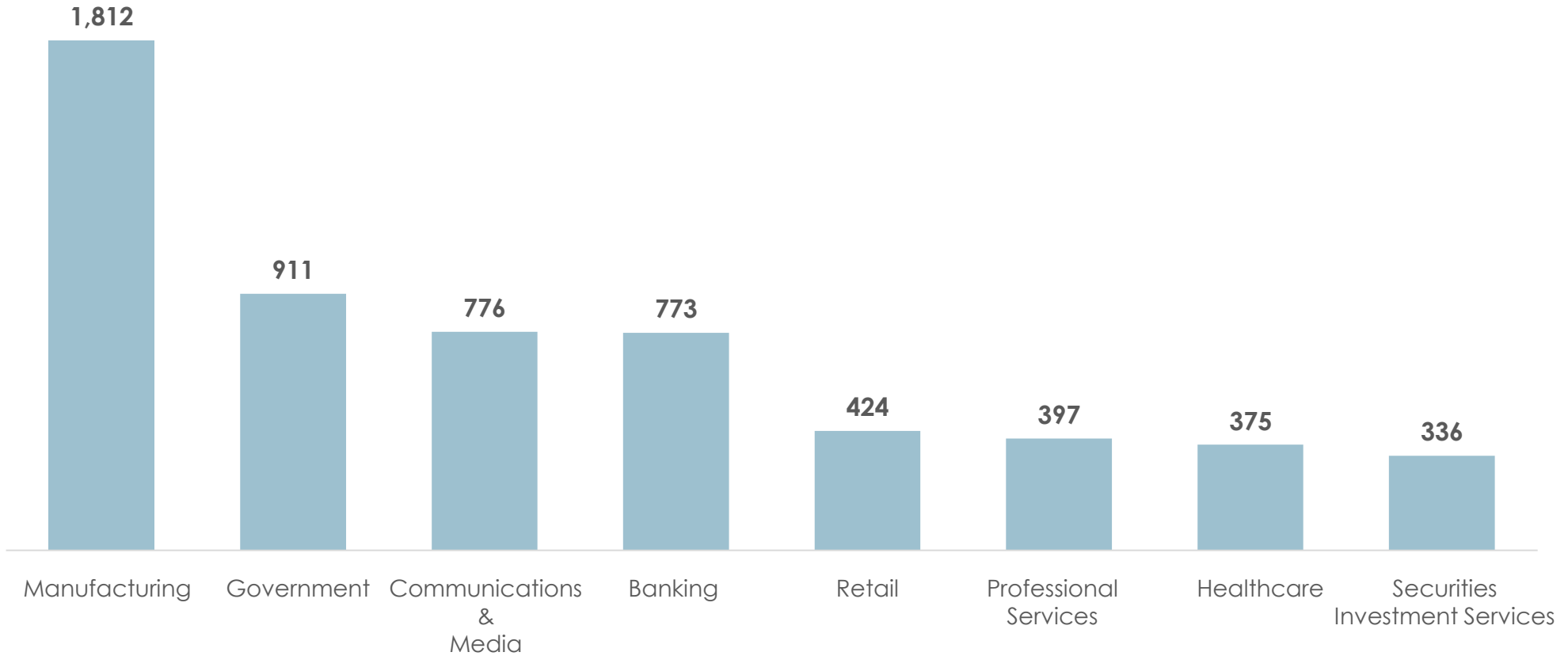*https://openai.com/blog/better-language-models/*
February 2019

The smart enterprise revolution: agile, intelligent, non-linear

Electronic Tools

Semi-conductor

Enterprise

Telecom

Consumer

Smart Enterprise

Silicon Valley Technology Trends

Data: the new oil of the global economy...

Annual data creation by industry (petabytes)

Industry	Value
Manufacturing	1,812
Government	911
Communications & Media	776
Banking	773
Retail	424
Professional Services	397
Healthcare	375
Securities Investment Services	336

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…driving immense efficiency gains on the back of AI

Impact of AI on industry output (Real Gross Value Added [1] in 2035 in the USA in $trn)

	Baseline	AI "steady state" scenario
Manufacturing	8.4	12.2
Prof. Services	7.5	9.3
Wholesale & Retail	6.2	8.4
Public Services	4.0	4.9
Media & Comms.	3.7	4.7
Financial Services	3.4	4.6
Construction	2.8	3.3
Logistics	2.1	2.9
Healthcare	2.3	2.7
Hospitality	1.5	2.0
Utilities	1.0	1.3

■ Baseline   ■ AI "steady state" scenario
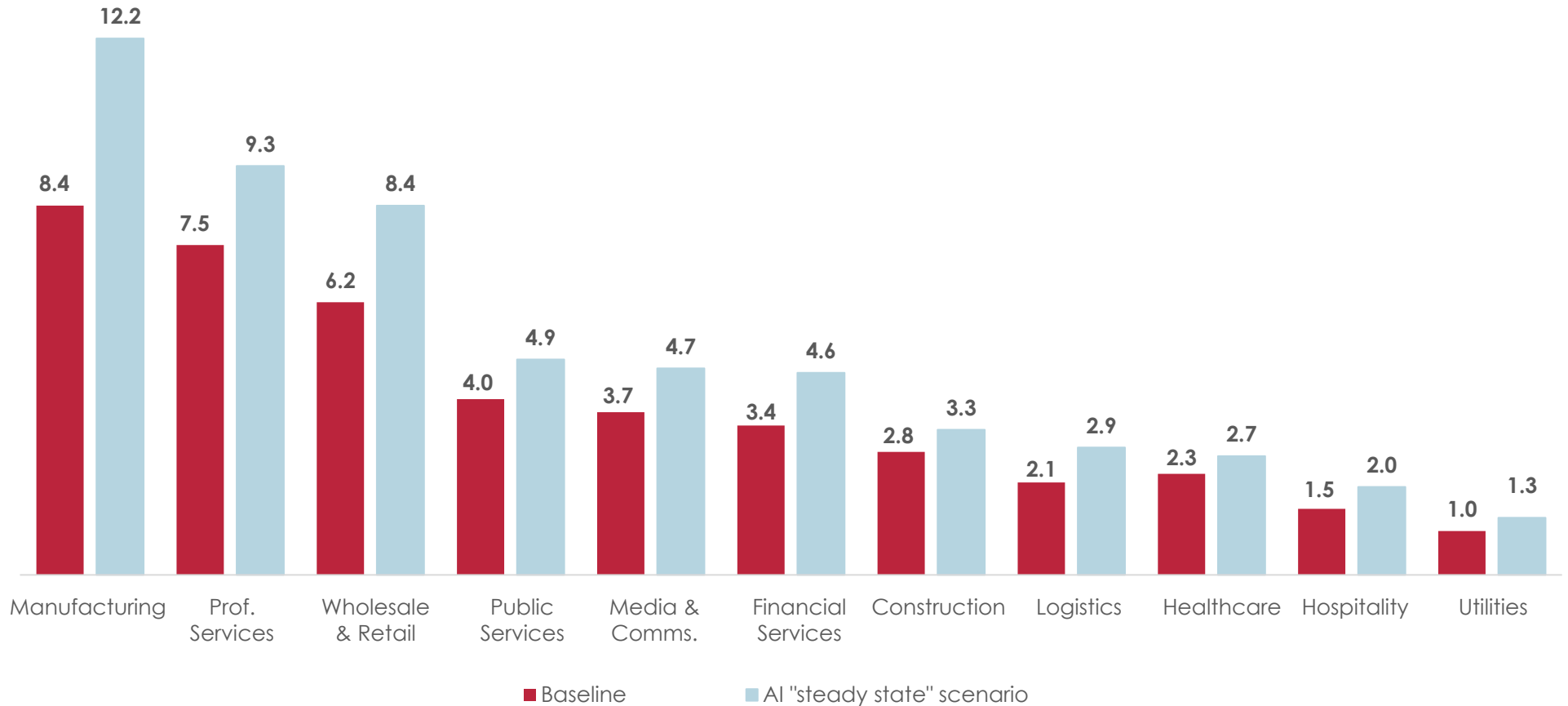
A range of repeatable tasks can be automated today

Areas of Task Automation

Forecasting

Goal-oriented communication

Planning and organisation

Pattern recognition

Monitoring and observation

Repetitive manual labour

31% *of companies expected to add AI over next year*

47% *of digitally mature organisations have AI strategies*

4.5x *increase in jobs requiring AI skills since 2013*

70% *of employees feel that AI has increased the appeal of their work*
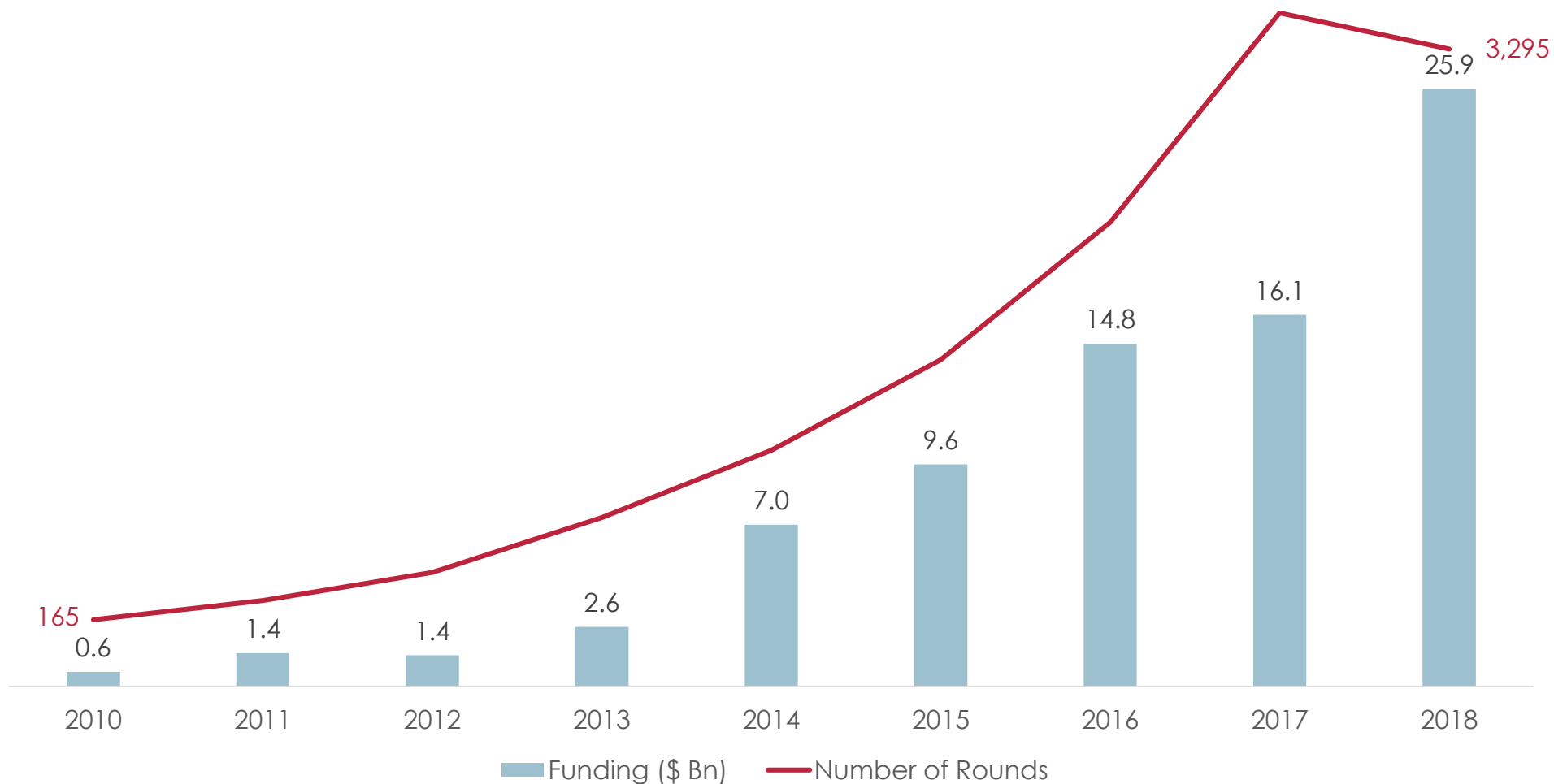
II.
VENTURE ENVIRONMENT
New platforms nearing maturity

Continuously increasing VC funding into AI

Artificial Intelligence & Machine Learning VC Funding ($ Bn)

Year	Funding ($ Bn)	Number of Rounds
2010	0.6	165
2011	1.4	
2012	1.4	
2013	2.6	
2014	7.0	
2015	9.6	
2016	14.8	
2017	16.1	
2018	25.9	3,295

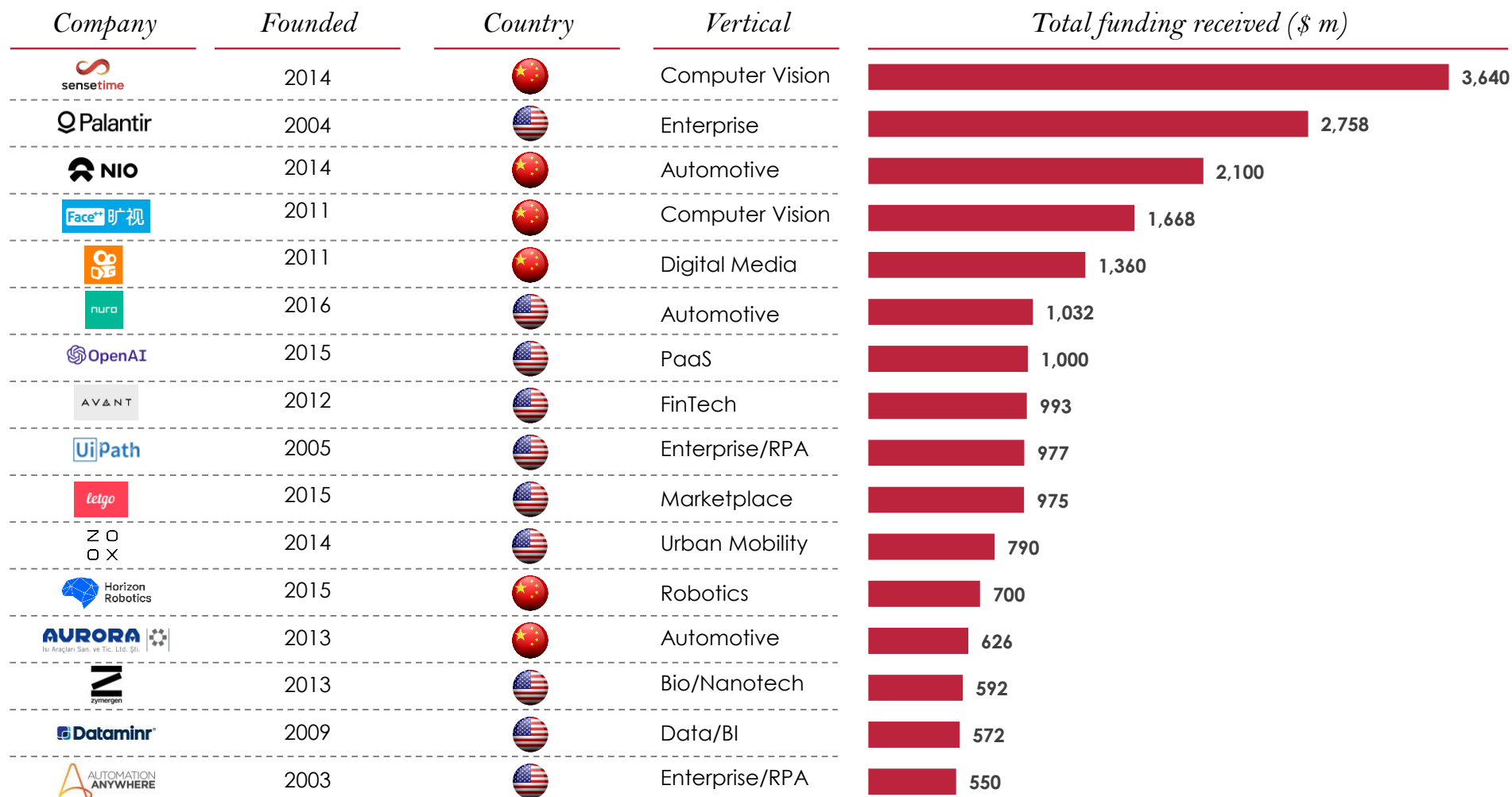Funding ($ Bn) — Number of Rounds

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Continuously increasing VC funding into AI (continued)

Artificial Intelligence & Machine Learning VC Funding ($ Bn) − excluding Uber

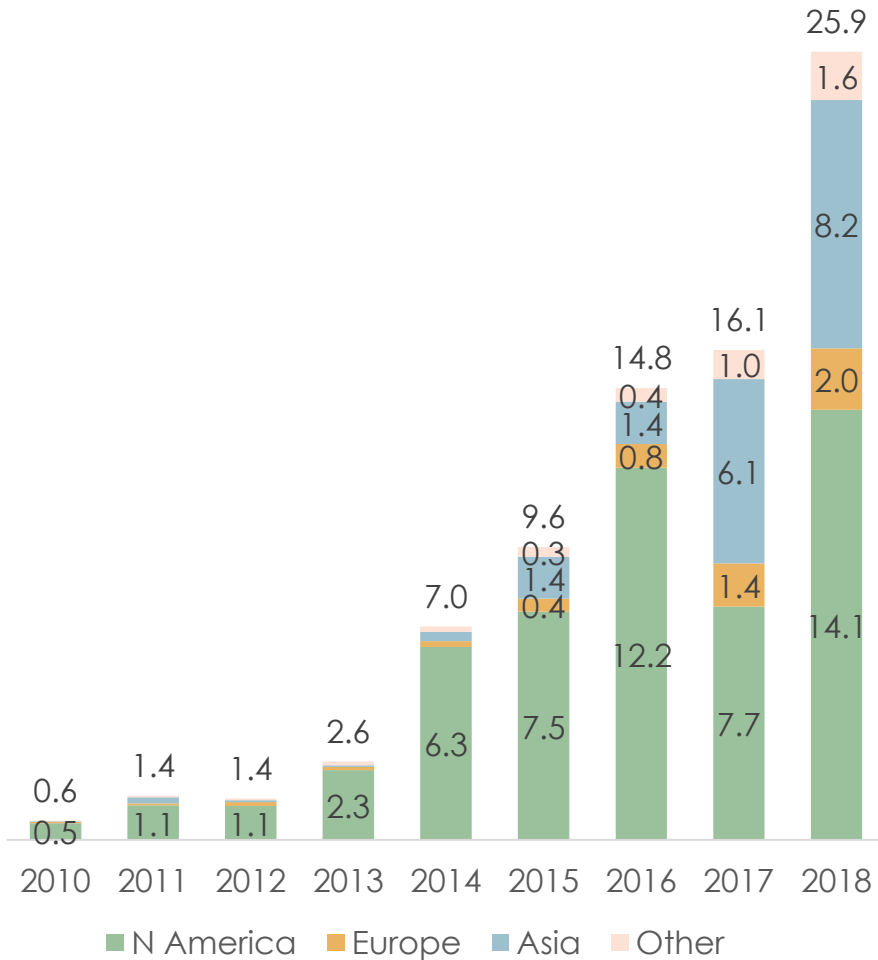Legend: Funding ($ Bn) — Number of Rounds

Data points:
- 2010: 0.6, 165 rounds
- 2011: 1.4
- 2012: 1.4
- 2013: 2.6
- 2014: 4.6 (Uber)
- 2015: 6.0 (Uber)
- 2016: 9.2 (Uber)
- 2017: 16.1
- 2018: 25.9, 3,295 rounds
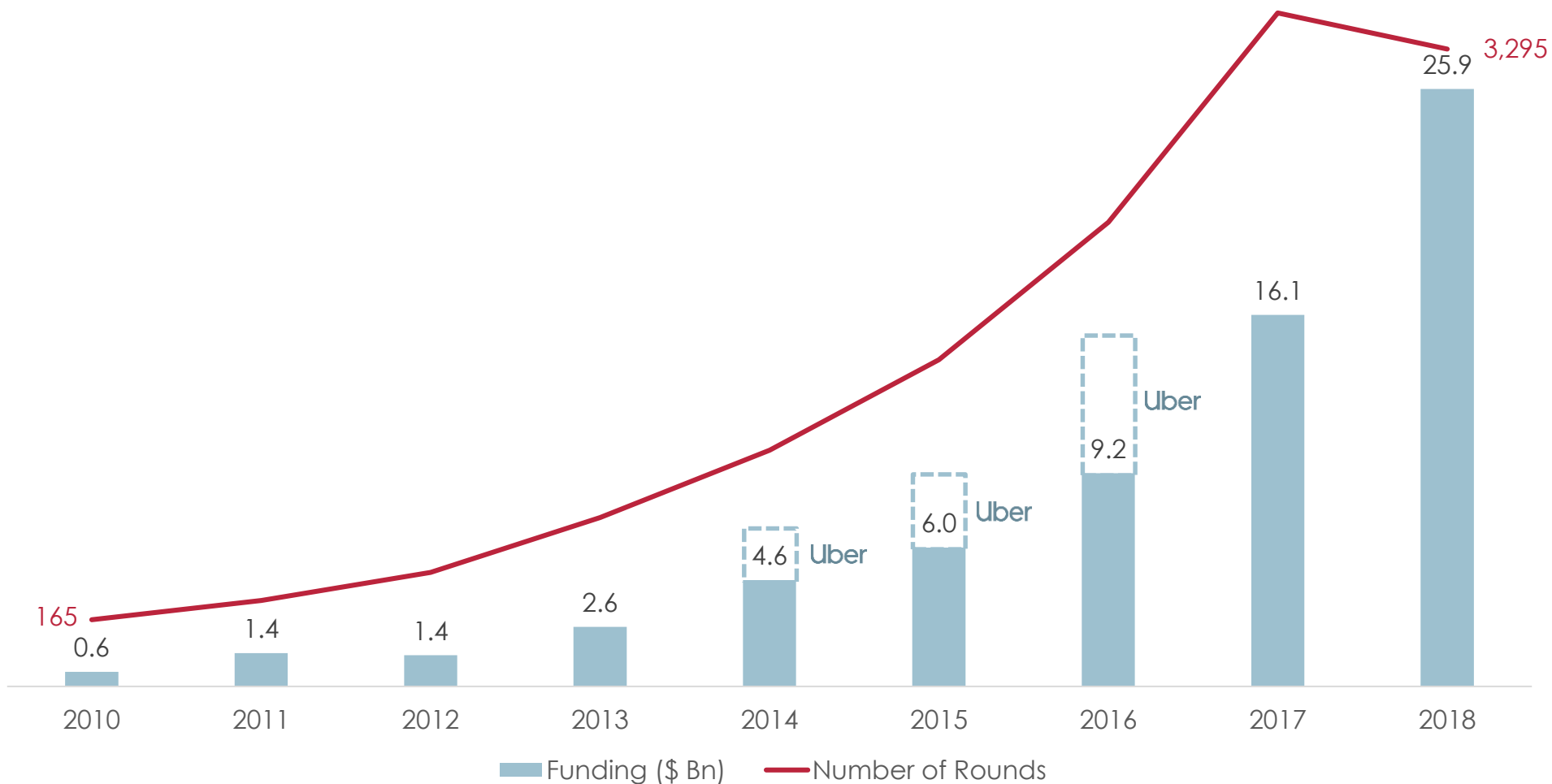
Best-funded AI start-ups

Top-15 best funded AI start-ups (selected)

Company	Founded	Country	Vertical	Total funding received ($ m)
sensetime	2014	🇨🇳	Computer Vision	3,640
Palantir	2004	🇺🇸	Enterprise	2,758
NIO	2014	🇨🇳	Automotive	2,100
Face++ 旷视	2011	🇨🇳	Computer Vision	1,668
(logo)	2011	🇨🇳	Digital Media	1,360
nuro	2016	🇺🇸	Automotive	1,032
OpenAI	2015	🇺🇸	PaaS	1,000
AVANT	2012	🇺🇸	FinTech	993
UiPath	2005	🇺🇸	Enterprise/RPA	977
letgo	2015	🇺🇸	Marketplace	975
ZOOX	2014	🇺🇸	Urban Mobility	790
Horizon Robotics	2015	🇨🇳	Robotics	700
AURORA Isı Araçları San. ve Tic. Ltd. Şti.	2013	🇨🇳	Automotive	626
zymergen	2013	🇺🇸	Bio/Nanotech	592
Dataminr	2009	🇺🇸	Data/BI	572
AUTOMATION ANYWHERE	2003	🇺🇸	Enterprise/RPA	550

Regional trends in funding

Funding amounts over time ($ Bn)

Year	N America	Europe	Asia	Other	Total
2010	0.5				0.6
2011	1.1				1.4
2012	1.1				1.4
2013	2.3				2.6
2014	6.3				7.0
2015	7.5	0.4	1.4	0.3	9.6
2016	12.2	0.8	1.4	0.4	14.8
2017	7.7	1.4	6.1	1.0	16.1
2018	14.1	2.0	8.2	1.6	25.9

■ N America ■ Europe ■ Asia ■ Other

Total AI funding by region 2010-2018 ($ Bn)

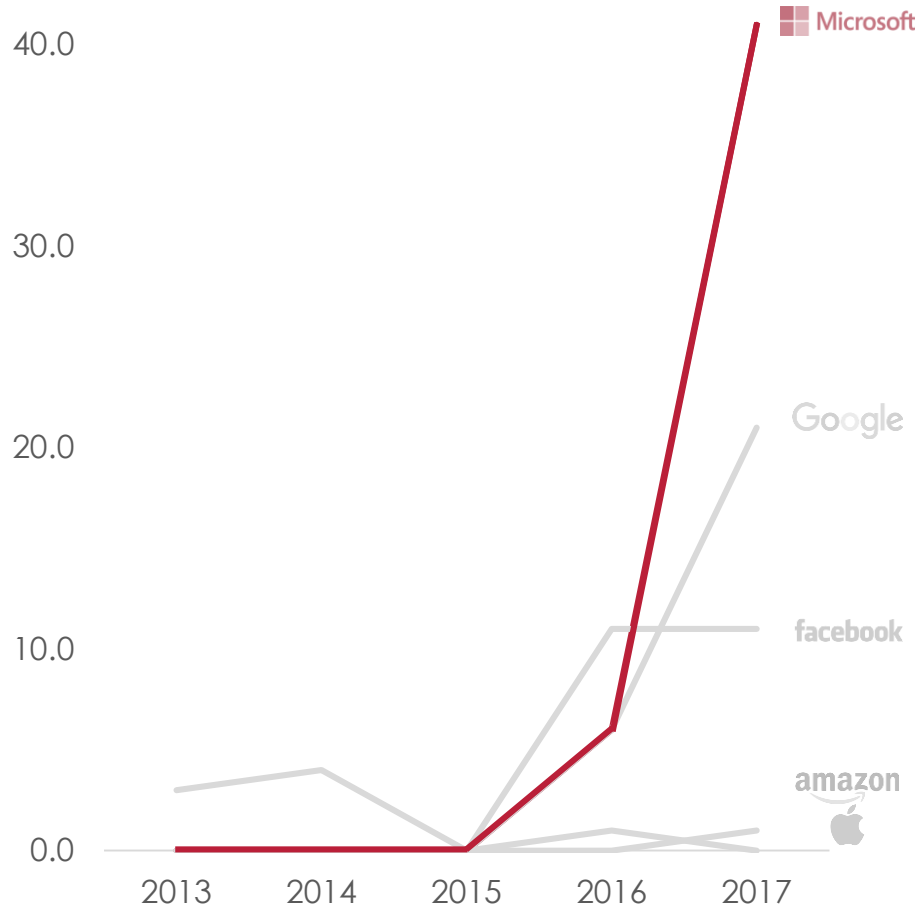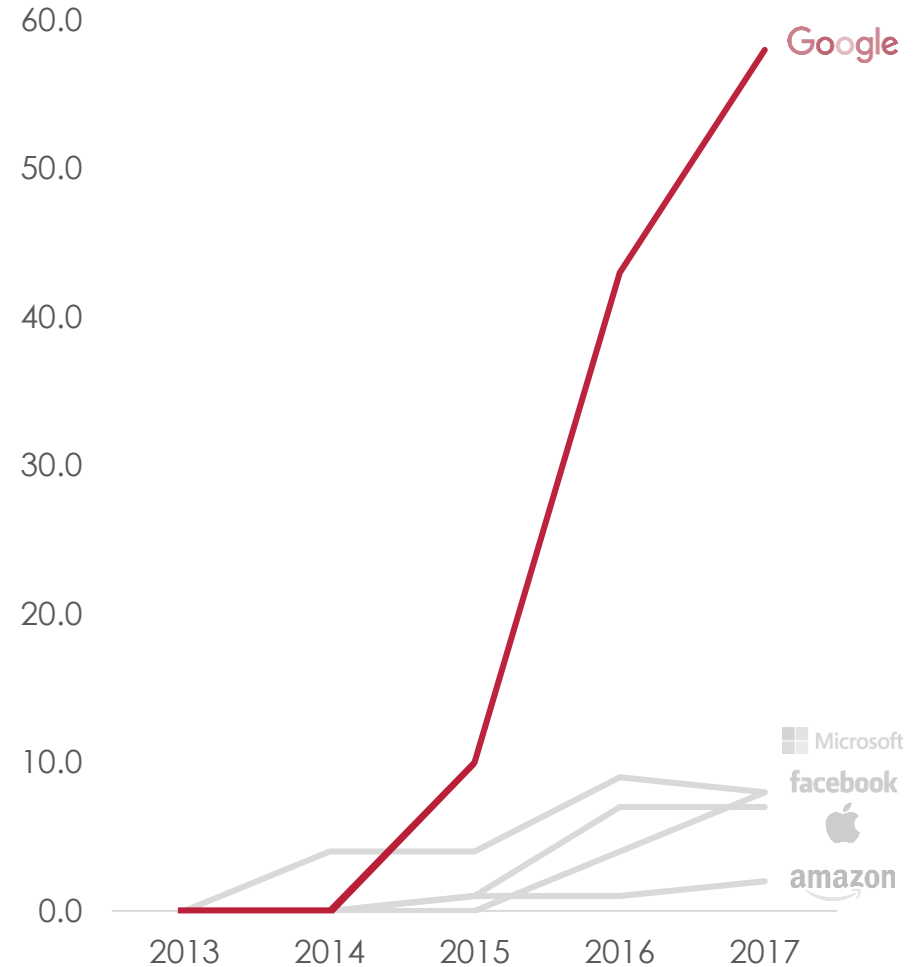|	N America	Europe	Asia	Other
% of Total	67%	6%	22%	5%
# of Deals	6,876	3,292	1,668	1,569
$ Bn	52.9	5.1	17.6	3.7
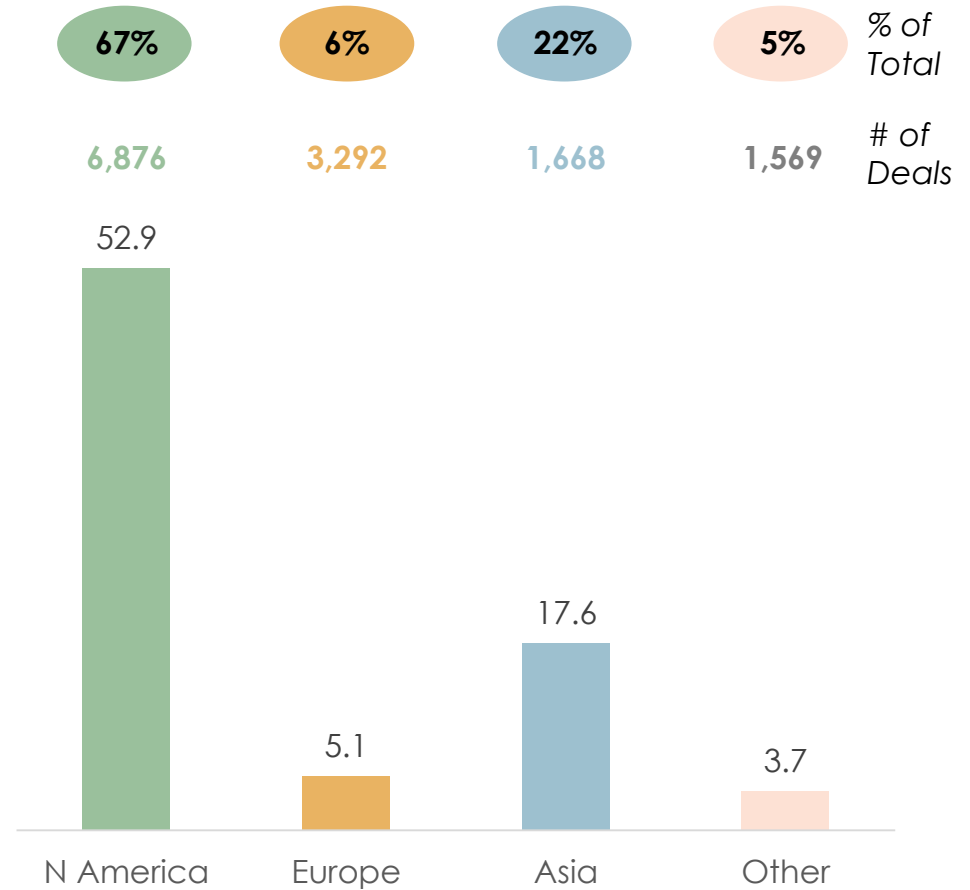
III.
M&A MARKET
The global race for AI

Big strategics starting to focus on AI

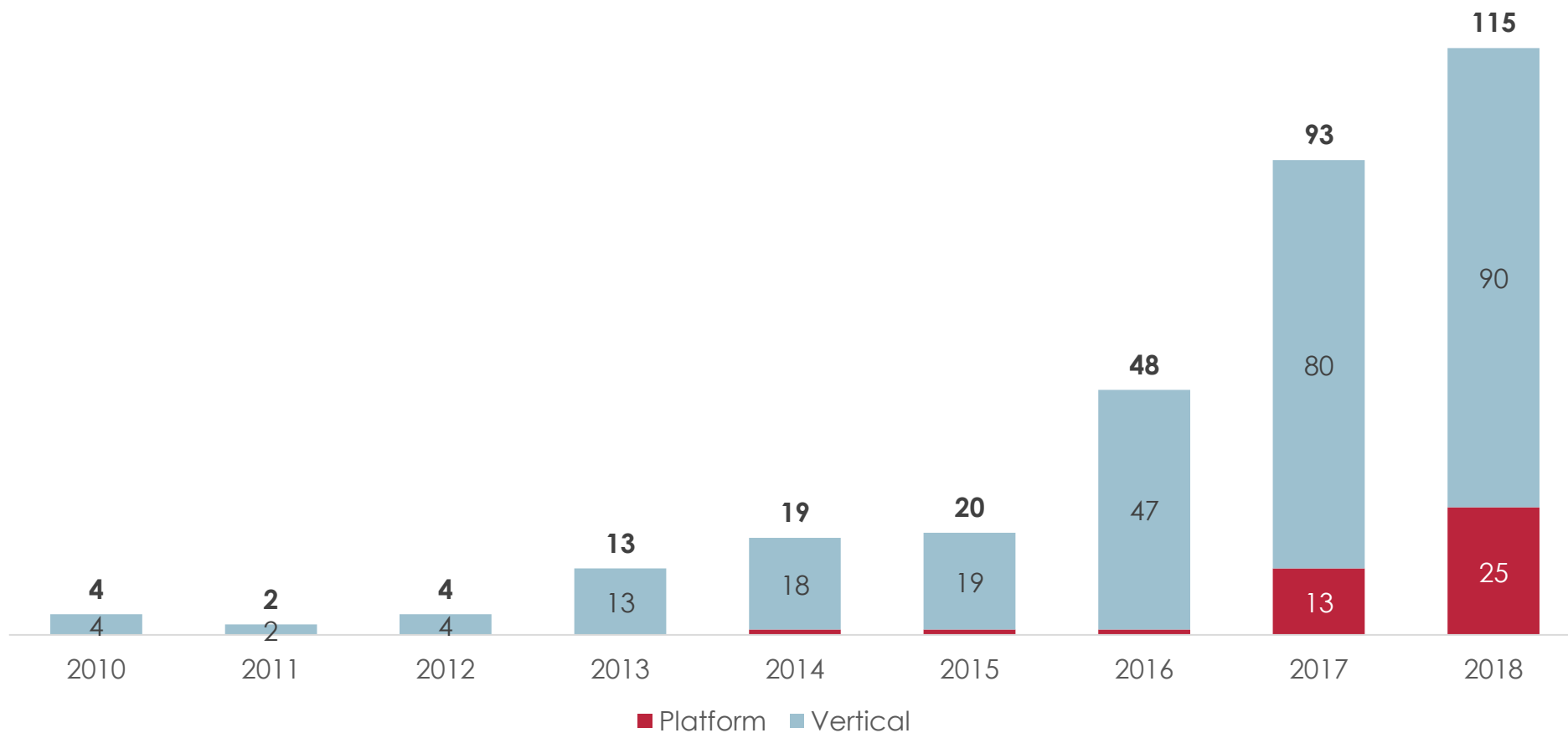*Quarterly earnings calls: mentions of "Artificial Intelligence"*

Quarterly earnings calls: mentions of "Machine Learning"
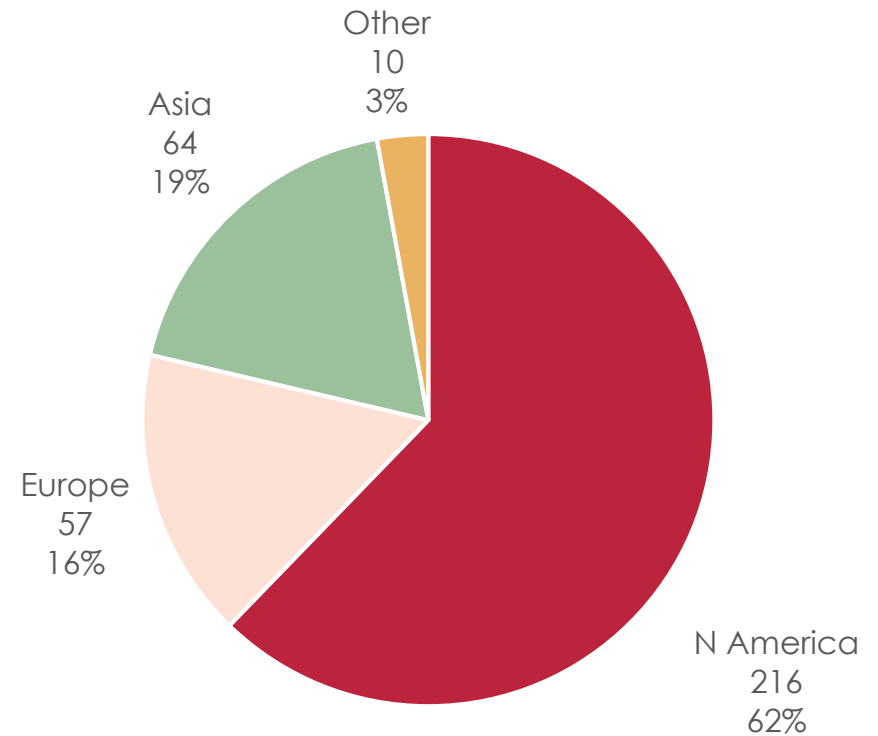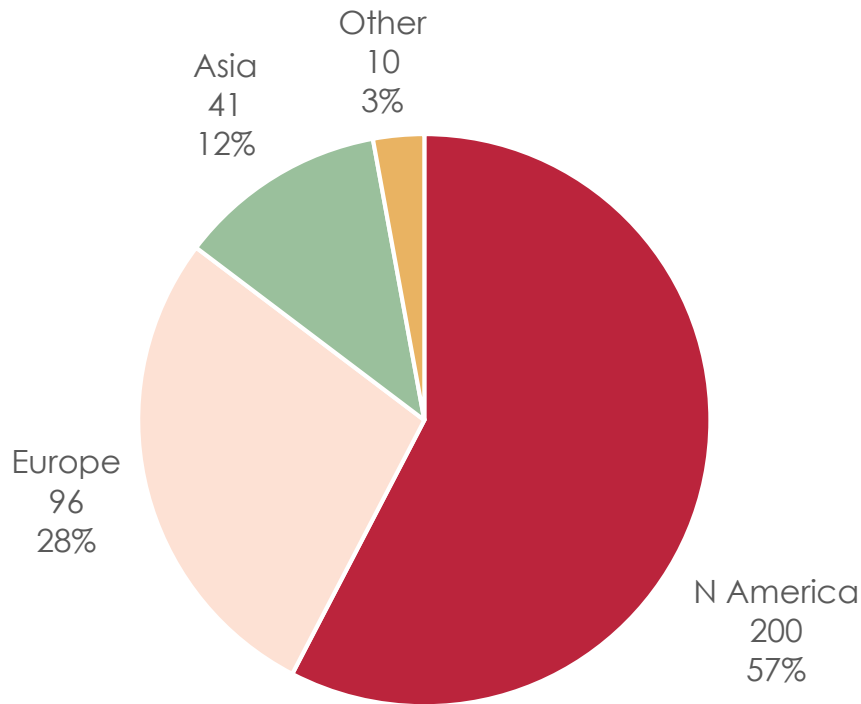
M&A transaction trends in AI

Annual AI M&A (number of transactions)

Chart: Annual AI M&A (number of transactions), stacked bars by Platform and Vertical

Year	Total	Platform	Vertical
2010	4		4
2011	2		2
2012	4		4
2013	13		13
2014	19		18
2015	20		19
2016	48		47
2017	93	13	80
2018	115	25	90

■ Platform ■ Vertical

Regional differences in AI M&A

Inbound pie chart:
- Other: 10, 3%
- Asia: 41, 12%
- Europe: 96, 28%
- N America: 200, 57%

Legend: ■ N America ■ Europe ■ Asia ■ Other

Outbound pie chart:
- Other: 10, 3%
- Asia: 64, 19%
- Europe: 57, 16%
- N America: 216, 62%

Legend: ■ N America ■ Europe ■ Asia ■ Other

Source: Mergermarket; GP Bullhound Analysis

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Most active acquirors

Investor	Country	Number of AI acquisitions 2010-2018
Baidu 百度	China	Platform: 1, Vertical: 7 — **8**
Google	USA	Platform: 2, Vertical: 6 — **8**
Apple	USA	Vertical: 6 — **6**
Microsoft	USA	Platform: 4, Vertical: 1 — **5**
salesforce	USA	Platform: 1, Vertical: 4 — **5**
Qualcomm	USA	Platform: 3, Vertical: 2 — **5**
ORACLE	USA	Platform: 2, Vertical: 3 — **5**
SAMSUNG	South Korea	Platform: 2, Vertical: 2 — **4**
splunk>	USA	Vertical: 4 — **4**
intel	USA	Vertical: 3 — **3**
CISCO	USA	Vertical: 3 — **3**
Alibaba Group	China	Platform: 1, Vertical: 2 — **3**
BMW	Germany	Platform: 1, Vertical: 1 — **2**
VW	Germany	Platform: 1 — **1**
BOSCH	Germany	Platform: 1 — **1**
SIEMENS	Germany	Vertical: 1 — **1**

Legend: ■ Platform ■ Vertical

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Largest AI acquisitions 2010-2018

Target	Investor	Year	Deal size ($ m)
Mobileye (An Intel Company)	intel	2017	12,288
HORTONWORKS	cloudera	2018	1,374
91 Wireless Websoft	Baidu百度	2013	1,227
MModal (Technology Business)	3M	2018	791
PlanGrid (AN AUTODESK COMPANY)	AUTODESK	2018	682
beeline	NMC New Mountain Capital LLC	2018	494
krux	salesforce	2016	452
KENSHO	S&P Global	2018	397
POLONIEX	CIRCLE	2018	286
DeepMind	Alphabet	2014	241
figure eight	appen	2019	231
dynamic yield	McDonald's	2019	227
mopub	twitter	2013	223
CYLANCE	BlackBerry	2018	193
TouchCommerce	NUANCE	2016	166

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Selected characteristics of AI acquisitions

	25% Percentile	50% Percentile	75% Percentile	Maximum
Size (€m)	9	23	74	12,228
	Boston AI	VIST GROUP	LAYER 6	MOBILEYE An Intel Company
EV/Revenue (x)	3.1	7.1	28.4	550.2
	[x+1]	HORTONWORKS	Findify	91 Wireless Websense
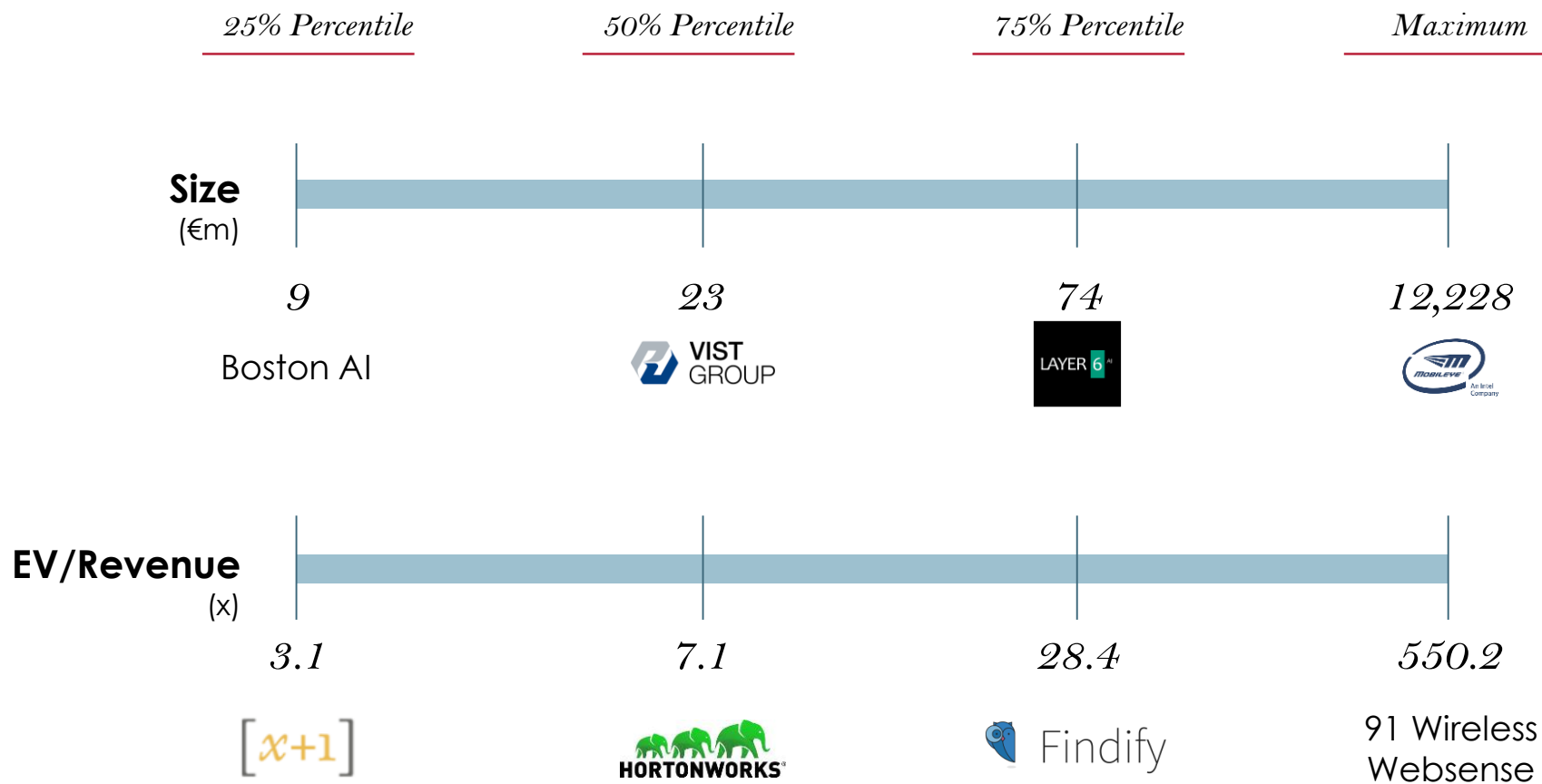
IV.
KEY TAKEAWAYS
for strategic acquirors and investors

Define an AI strategy around your key verticals

AI adoption across the value chain driving companies' performance

AI adoption in key industries across the value chain

AI index

	Overall AI index	MGI Digitization index		Depth of AI technologies	AI spend	Supporting digital assets		Product development	Operations	Supply chain and distribution	Customer experience	Financial and general management	Workforce management		Exposure to AI in workforce	AI resources per worker
			Assets				**Usage**							**Labor**		
High tech and telecom.																
Automotive and assembly																
Financial services																
Resources and utilities																
Media and entertainment																
Consumer packaged																
Transportation and logistics																
Retail																
Education																
Professional services																
Health care																
Materials and construction																
Travel and tourism																

Relatively low — Relatively high

AI adoption vs. profit margins

Self-reported current profit margin
Difference from industry average (unweighted) (percentage points)

- Non-adopters
- Partial AI adopters or experimenters
- AI adopters with proactive strategy
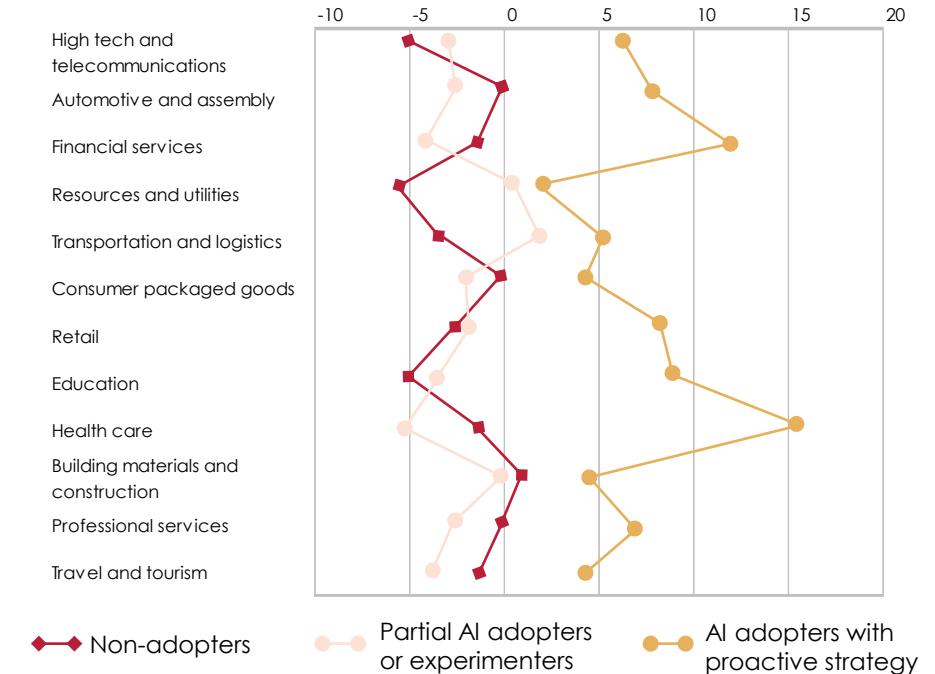
[1] Operating profit margin for selected sectors as a share of turnover, for continuing operations and before exceptional items.
[2] Firms that are big data and cloud service users and report their strategic posture towards AI to be: "Disrupting our industry using AI technology is at the core of our strategy","We have changed our longer-term corporate strategy to address the AI threat or opportunity disruption," or "We have developed a coordinated plan to respond to the AI threat or opportunity but have not changed out longer-term corporate strategy."

Build an early-stage ecosystem around your AI strategy

Example: strategic venture investments in industrial automation / smart manufacturing

Investor	*Country*	*Number of venture investments by vertical*

Investor	Country	Wearables & VR/AR	Data & analytics	Simulation & design	Robotics & (additive) manufacturing	IIoT Platforms & Hardware	Total
GE	USA	3	17	13	23	19	**75**
intel	USA	9	9	12	11	8	**49**
SIEMENS	Germany	5	9	12	10	7	**43**
Alphabet	USA	1	13	6	15	7	**42**
BOSCH	Germany	8	9	7	2	10	**36**
CISCO	USA	2	4	11	1	16	**34**
SAMSUNG	Korea	2	4	4	5	16	**31**
QUALCOMM	USA		4	4	5	10	**23**
Microsoft	USA		2	4	2	9	**17**
ABB	USA		3		8	1	**12**

■ Wearables & VR/AR ■ Data & analytics ■ Simulation & design ■ Robotics & (additive) manufacturing ■ IIoT Platforms & Hardware

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Plug strategic capability gaps with acquisitions

Example: Microsoft / XOXCO and Oracle / DataFox

- **Recent M&A:**
  Acquired by Microsoft

- **Vertical:**
  Conversational
  chat bots

- Key future engagement tool

- Microsoft Bot Framework:
  already 360,000+ developers

- **Recent M&A:**
  Acquired by
  Oracle

- **Vertical:**
  Automated data extraction

- Extracts and structures
  content from millions of
  public sources

Be prepared to invest at strategic valuation levels

"Rule of 40" software valuations vs. selected AI transaction multiples

"Rule of 40" software valuations… | *…vs. selected AI acquisition multiples*
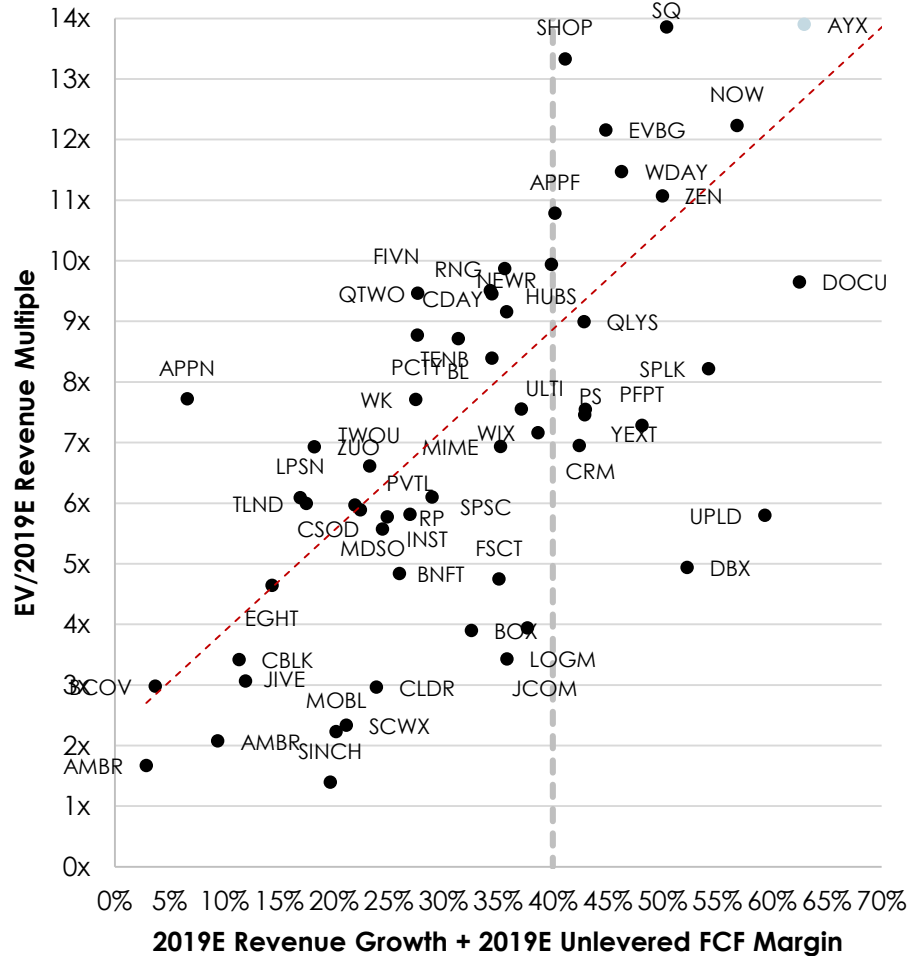
550x

Maximum AI EV/Revenue acquisition multiple

28x

75% percentile AI EV/Revenue acquisition multiple

7x

Median AI EV/Revenue acquisition multiple

SUPPLEMENTARY MATERIALS

Why now?

Examples of vertical platforms starting to gain critical mass

UiPath

- **Recent funding:** $225 – Series C, Sep-18
- **Vertical:** Robotic process automation
- Automation of back-office tasks
- Rapid take-up, especially via channels

Bright Machines

- **Recent funding:** $180 – Series A, Oct-18
- **Vertical:** Industrial automation
- Combines AI and computer vision with agile robots
- Vision of "lights-out factory"

XOXCO

- **Recent M&A:** Acquired by Microsoft
- **Vertical:** Conversational chat bots
- Key future engagement tool
- Microsoft Bot Framework: already 360,000+ developers

DataFox

- **Recent M&A:** Acquired by Oracle
- **Vertical:** Automated data extraction
- Extracts and structures content from millions of public sources

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Technology universe share price development

Share Price Development of Selected Indices

Legend: Tech Majors — IT Services — E-Commerce & Marketplaces — Enterprise Software & SaaS Index — S&P500 — Dax30

Data labels: +173.5%, +115.8%, +66.0%, +29.2%, +6.8%, +1.94%

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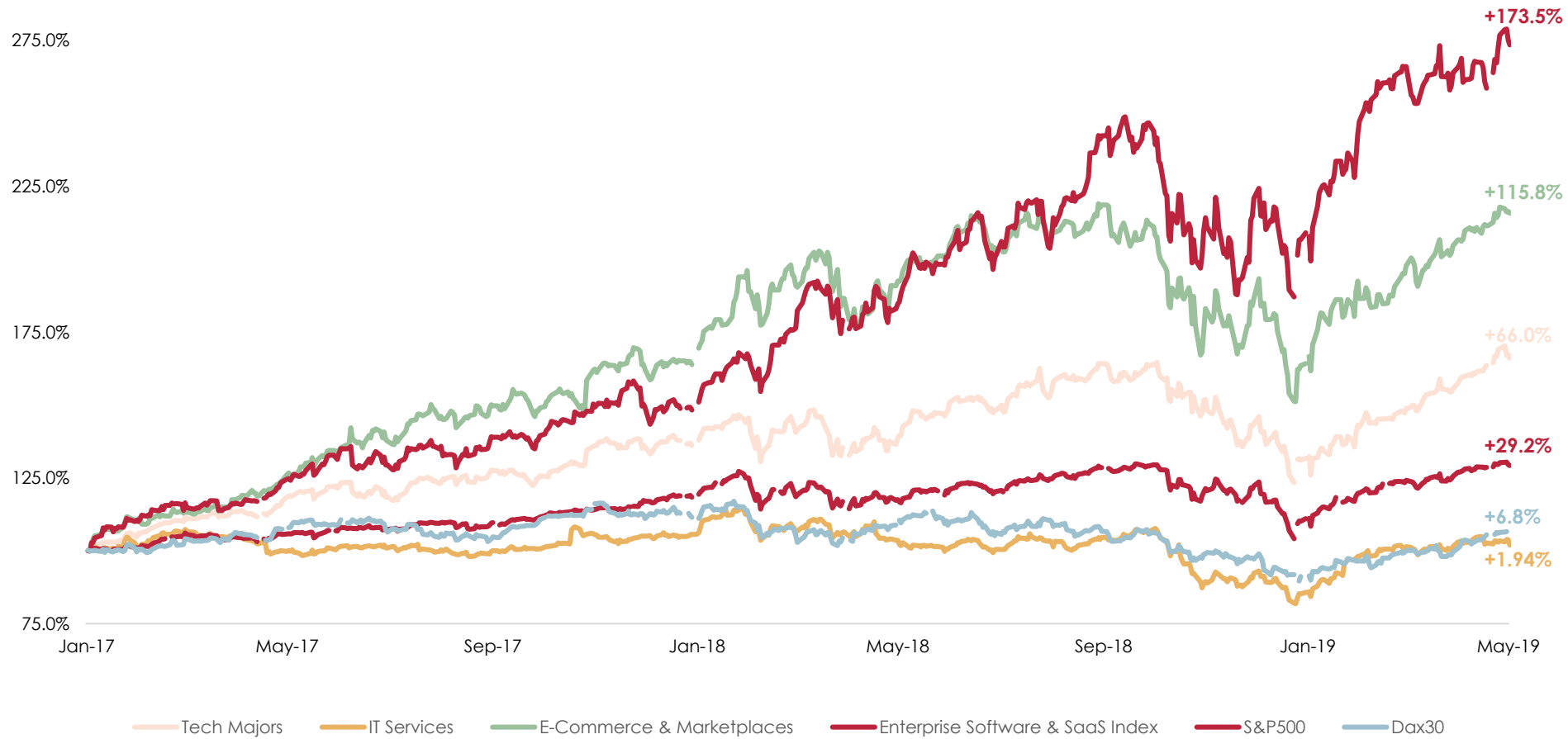
Valuation development over time

Historical EV / NTM EBITDA Trading Performance of Selected Indices

Median EV / NTM EBITDA

	5Y	3Y	1Y	Today
Enterprise Software & SaaS Index	**30.4x**	**33.0x**	**35.9x**	**43.4x**
Tech Majors	11.2x	12.2x	12.4x	13.1x
E-Commerce / Marketplaces	16.0x	15.3x	13.6x	13.7x
IT Services	8.7x	8.6x	8.6x	8.9x
DAX 30	8.3x	8.4x	8.1x	8.9x
S&P 500	**11.2x**	**11.6x**	**11.5x**	**11.9x**

Legend: Enterprise Software & SaaS Index — Tech Majors — E-Commerce / Marketplaces — IT Services — DAX 30 — S&P 500

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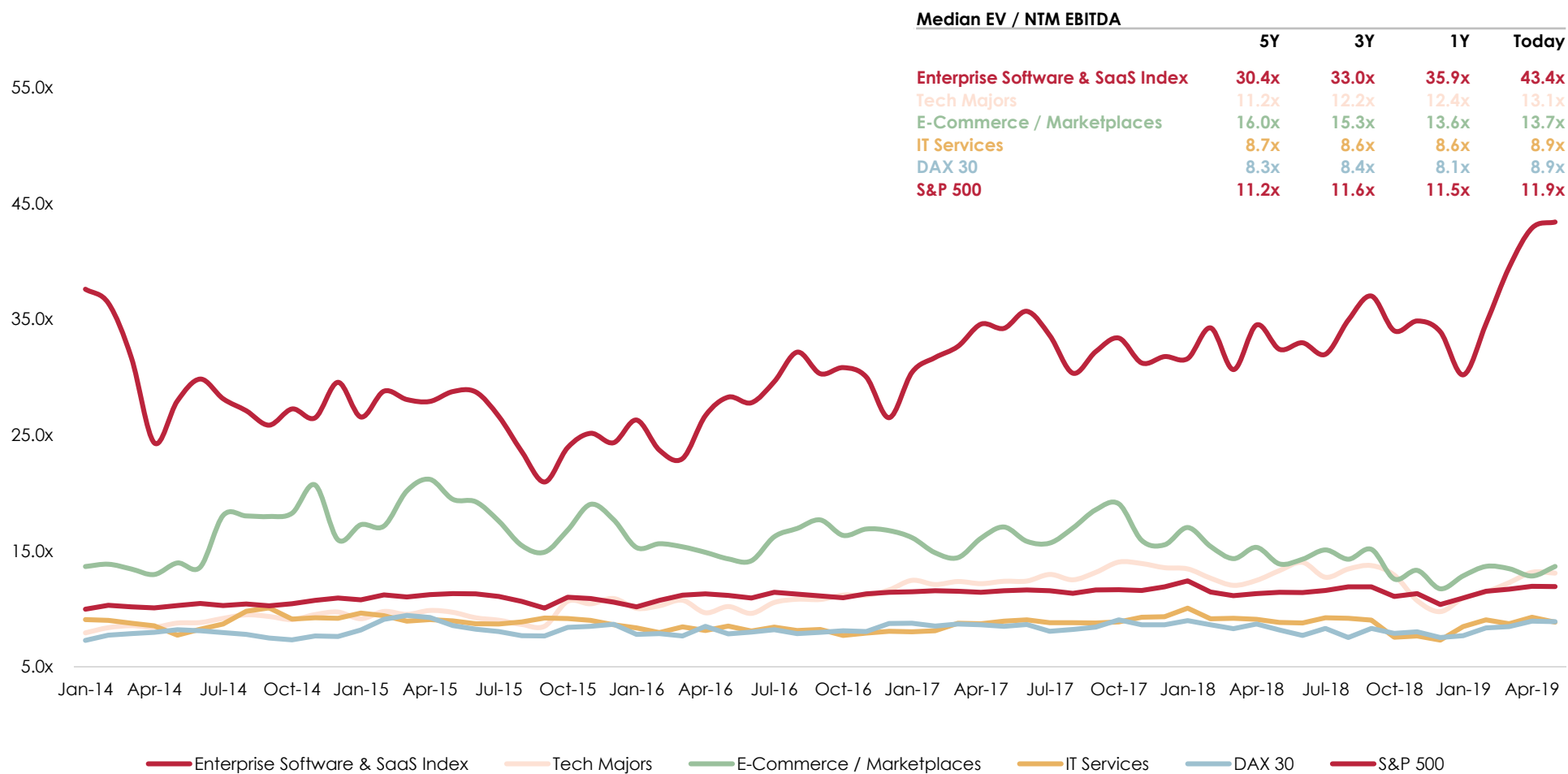
Private equity is awash with capital ...

Private Equity: Dry Powder by Fund Type, 2009 - Q3 2018

Dry Powder ($bn)

Legend: ■ Venture Capital ■ Buyout ■ Growth ■ Other Private Equity*
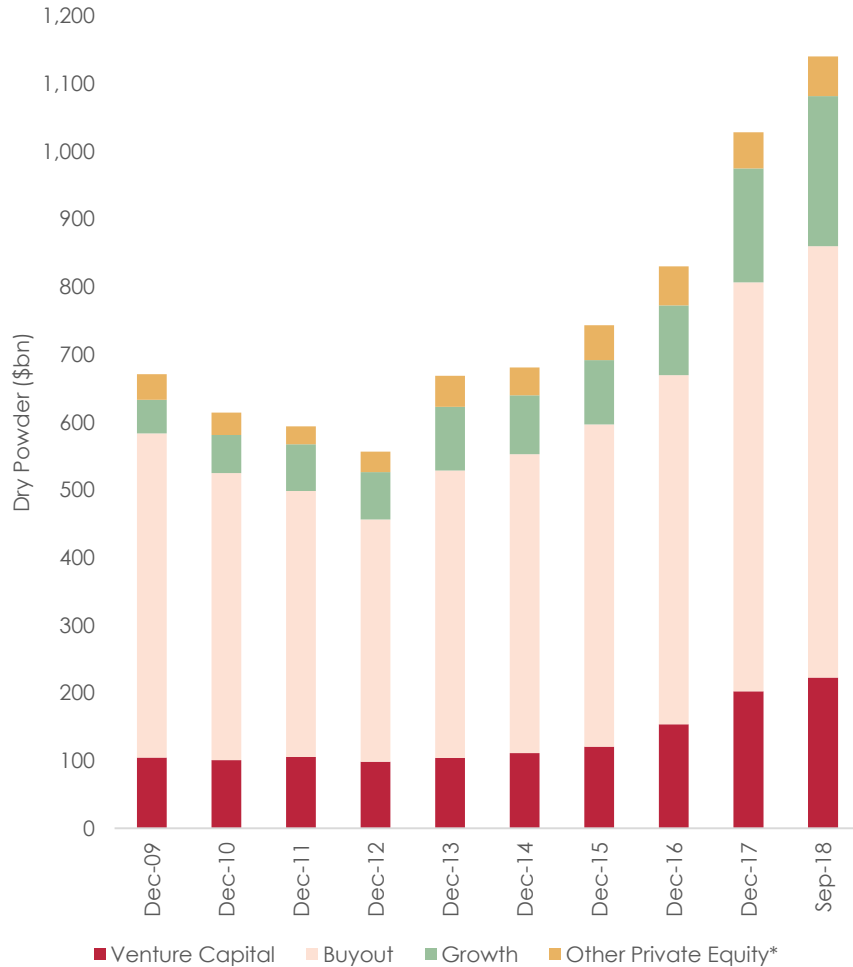
PE Funds in Market over Time, Q1 2013 – Q3 2018 [1]

Legend: ■ No. of Funds Raising ■ Aggregate Capital Targeted ($bn)
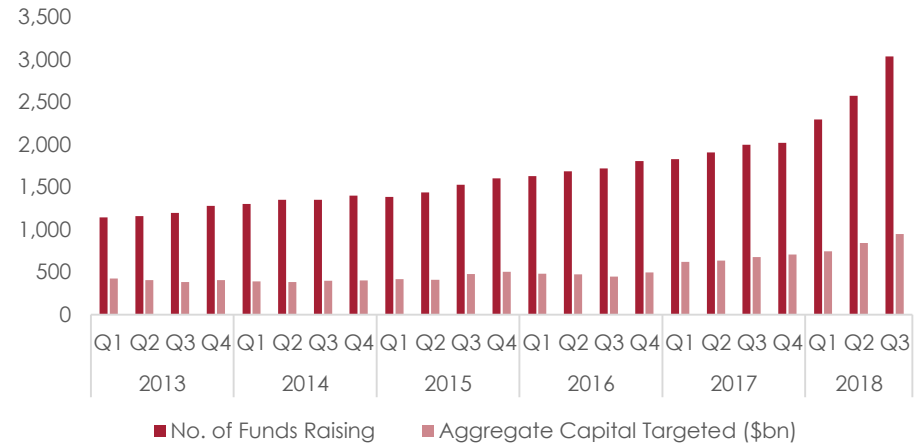
Largest Private Equity Funds Closed in Q2 2018

Fund	Firm	Fund Size (m)	Fund Type	Geographic Focus
Carlyle Asia Partners V	Carlyle Group	6,550 USD	Buyout	Asia
Bain Capital Europe V	Bain Capital	4,350 EUR	Buyout	Europe
Nordic Capital Fund IX	Nordic Capital	4,300 EUR	Buyout	Europe
TowerBrook Investors V	TowerBrook Capital Partners	4,250 USD	Buyout	US
General Atlantic Investment Partners 2017	General Atlantic	3,289 USD	Growth	US
Thoma Bravo Discover Fund II	Thoma Bravo	2,400 USD	Buyout	US
Blackstone Capital Partners Asia	Blackstone Group	2,300 USD	Buyout	Asia
BGH Capital Fund I	BGH Capital	2,600 AUD	Buyout	Australasia
Inflexion Buyout Fund V	Inflexion Private Equity Partners	1,250 GBP	Buyout	Europe
Atlas Capital Resources III	Atlas Holdings	1,675 USD	Turnaround	US

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… leading to an increasingly crowded market and bigger and bigger deals

Strategies Targeted by PEs in the NTM, Q3 2016 – Q3 2018

Proportion of Fund Searches

Legend: Q2 2016, Q2 2017, Q2 2018

- Buyout: 70%, 71%, 70%
- Venture Capital: 50%, 51%, 53%
- Growth: 42%, 51%, 50%
- Fund of Funds: 16%, 14%, 16%
- Secondary: 15%, 13%, 15%
- Turnaround: 9%, 5%, 8%
- Co-Investment: 5%, 5%, 6%
- Balanced: 2%, 3%, 2%
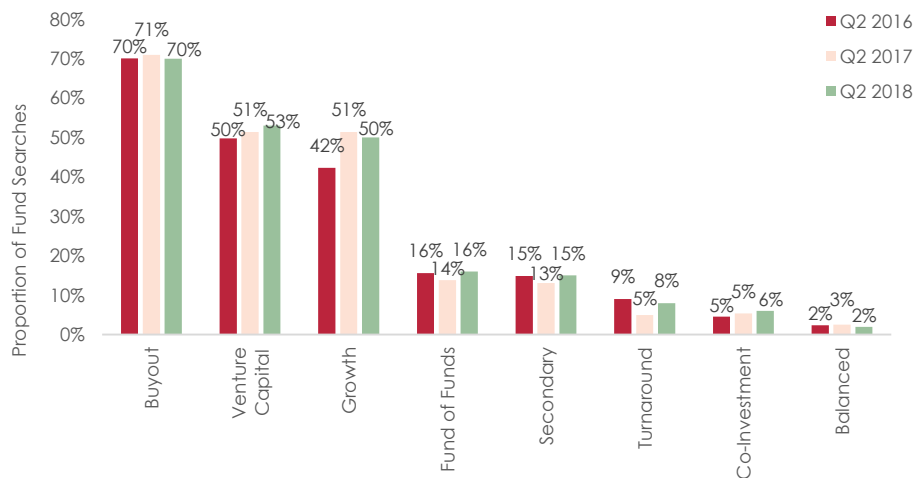
Regions Targeted by PEs in the NTM, Q2 2016 – Q2 2018

Proportion of Fund Searches

Legend: Q2 2016, Q2 2017, Q2 2018

- North America: 51%, 50%, 56%
- Europe: 53%, 52%, 61%
- Asia-Pacific: 31%, 30%, 31%
- Rest of World: 11%, 11%, 9%
- Emerging Markets: 19%, 19%, 16%
- Global: 37%, 39%, 45%
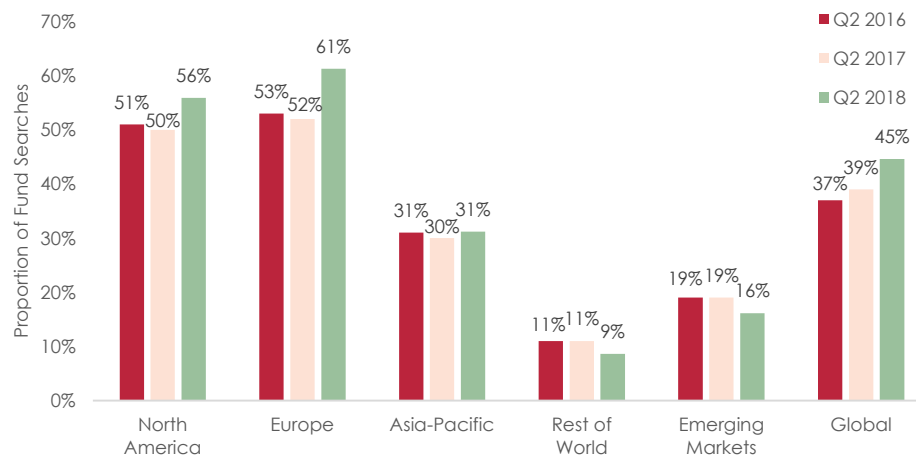
European buyout activity

Deal Value (EURbn):
- 2010: 185€
- 2011: 193€
- 2012: 163€
- 2013: 239€
- 2014: 322€
- 2015: 437€
- 2016: 231€
- 2017: 353€
- 2018: 406€

# of Deals closed:
- 2010: 798
- 2011: 860
- 2012: 866
- 2013: 900
- 2014: 1,175
- 2015: 1,398
- 2016: 1,166
- 2017: 1,171
- 2018: 986

Legend: Deal Value (EURbn), # of Deals closed

Source: Pitchbook.com, Preqin.com

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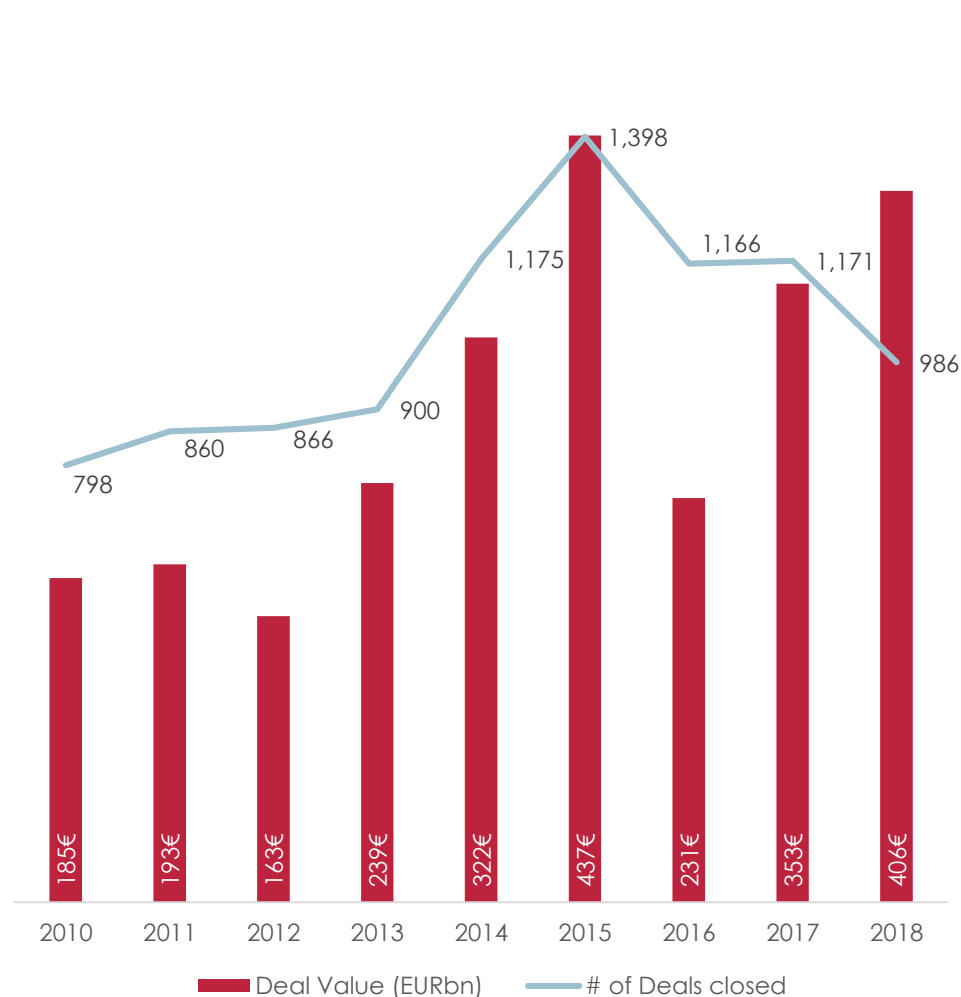
Rule of 40% – Public SaaS

2018E Growth and Profitability of Public SaaS Companies in GPB Index

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Source(s): Capital IQ
Note: Data based on GP Bullhound SaaS Index, constituents can be found in Appendix A,
excludes outliers and companies with "N/A"
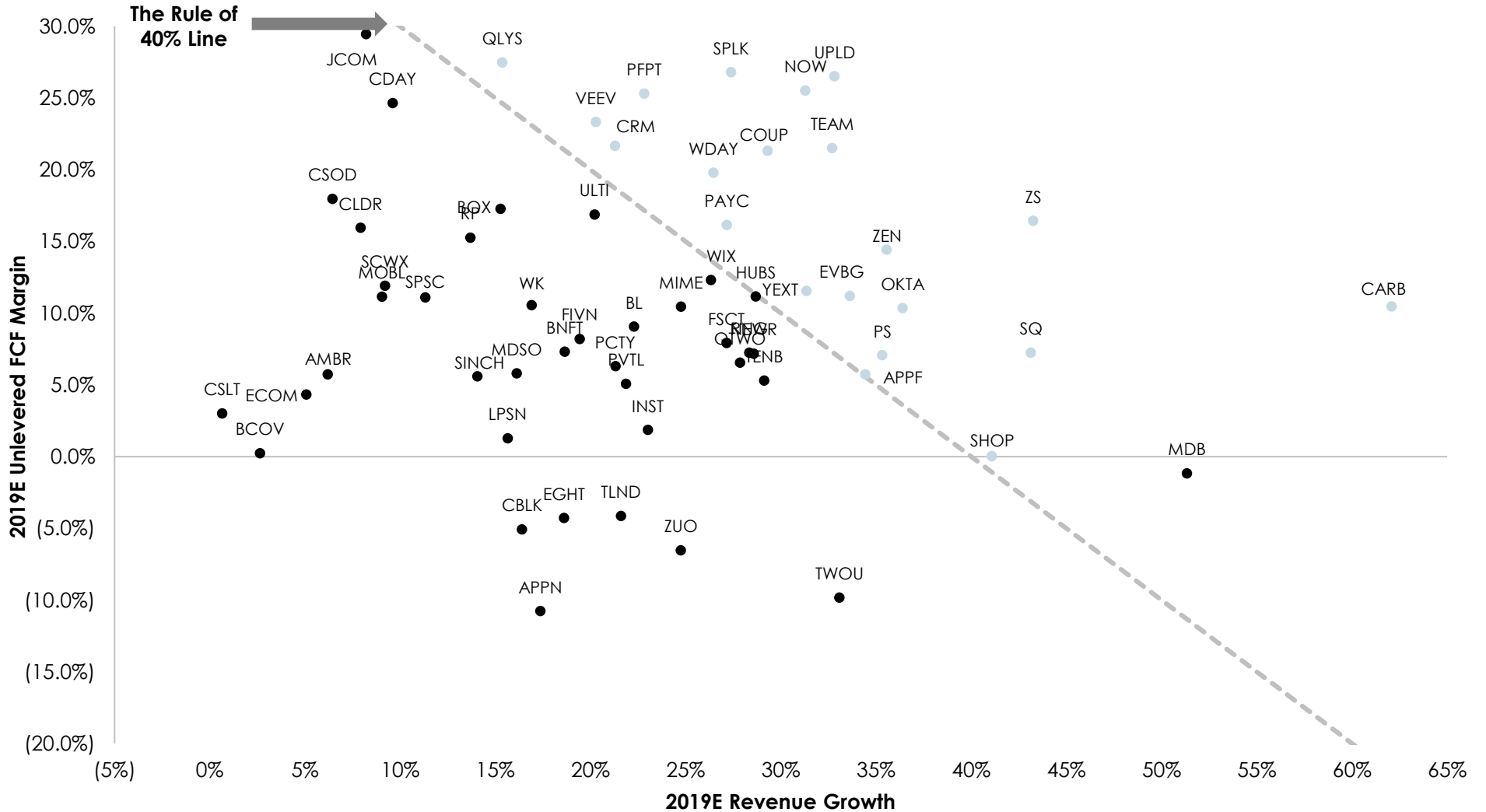
Rule of 40% – Public SaaS (Cont'd)

Companies whose summed revenue growth rate and FCF margin is greater than 40%, are valued higher by investors than those below this 'rule of 40' line

Sub-Performers ---- Market-Performers ---- Out-Performers

Y-axis: EV/2019E Revenue Multiple (0x – 14x)

X-axis: 2019E Revenue Growth + 2019E Unlevered FCF Margin (0% – 70%)

Data point labels: SQ, AYX, SHOP, NOW, EVBG, WDAY, APPF, ZEN, FIVN, DOCU, RNG, NEWR, CDAY, QTWO, HUBS, QLYS, PCTY, BL, TENB, SPLK, WK, ULTI, PS, PFPT, APPN, WIX, YEXT, CRM, ZUO, TWOU, MIME, LPSN, PVTL, TLND, MDSO, CSOD, SPSC, INST, RP, FSCT, UPLD, BNFT, BOX, DBX, EGHT, LOGM, JCOM, CBLK, CLDR, JIVE, BCOV, MOBL, SCWX, AMBR, SINCH, AMBR

Source(s): Capital IQ

Note: Data based on GP Bullhound SaaS Index, excludes outliers and companies with "N/A"

Horizontal vs. Vertical Focused Cloud Software Trends

Vertical-specific has lower Sales & Marketing spend as a percentage of revenue

However, generally lower growth and valuation multiples

Horizontal Software

Median: 46%

	Docusign	Okta	Salesforce	ServiceNow	Dropbox	Workday	Ultimate Software	GP Bullhound SaaS Index
	75%	60%	46%	46%	32%	32%	25%	40%
EV/LTM Revenue	13.0x	25.0x	10.1x	16.2x	6.4x	15.2x	9.0x	
FY19/18E Revenue Growth	6.9%	50.7%	26.8%	31.3%	18.3%	31.7%	20.2%	

Vertical-Specific Software

Median: 21%

	Castlight Health	Medidata Solutions	Blackbaud	RealPage	Appfolio	Veeva
	31%	24%	23%	19%	18%	17%
EV/LTM Revenue	2.4x	7.0x	4.7x	6.8x	12.8x	18.6x
FY19/18E Revenue Growth	0.3%	16.1%	4.8%	13.7%	34.6%	25.9%

Outlook: what AI may hold in store for us

- **From the 1910s to the 2000s, labor distribution has changed to reflect shifts in society**
  - » Farmers in the U.S. declined from 24% to <1% of labor force
  - » Technical professions rose 20%, teachers doubled, and health workers grew by 7x
  - » The concept of an engineer meanwhile went from almost non-existent, to 5% of the workforce

- **Though concerns exist around impact of AI and workforce automation, we believe working conditions will improve**
  - » AI will augment tasks that existing employees spend far too much of their time completing
  - » More flexible work hours and work environments
  - » Less confinement and time commuting = increased productivity

- **Many innovators in the space are painting a picture of symbiosis between humans and artificial intelligence**
  - » Potential to assist many professions including surgeons, machinists, soldiers and chefs
  - » "EQ" professions will become more important again

- **Ethics still need to be explored**
  - » E.g.: is it right to delegate core HCM tasks to a machine learning algorithm?

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