



# The Collapse of Intellectual Property

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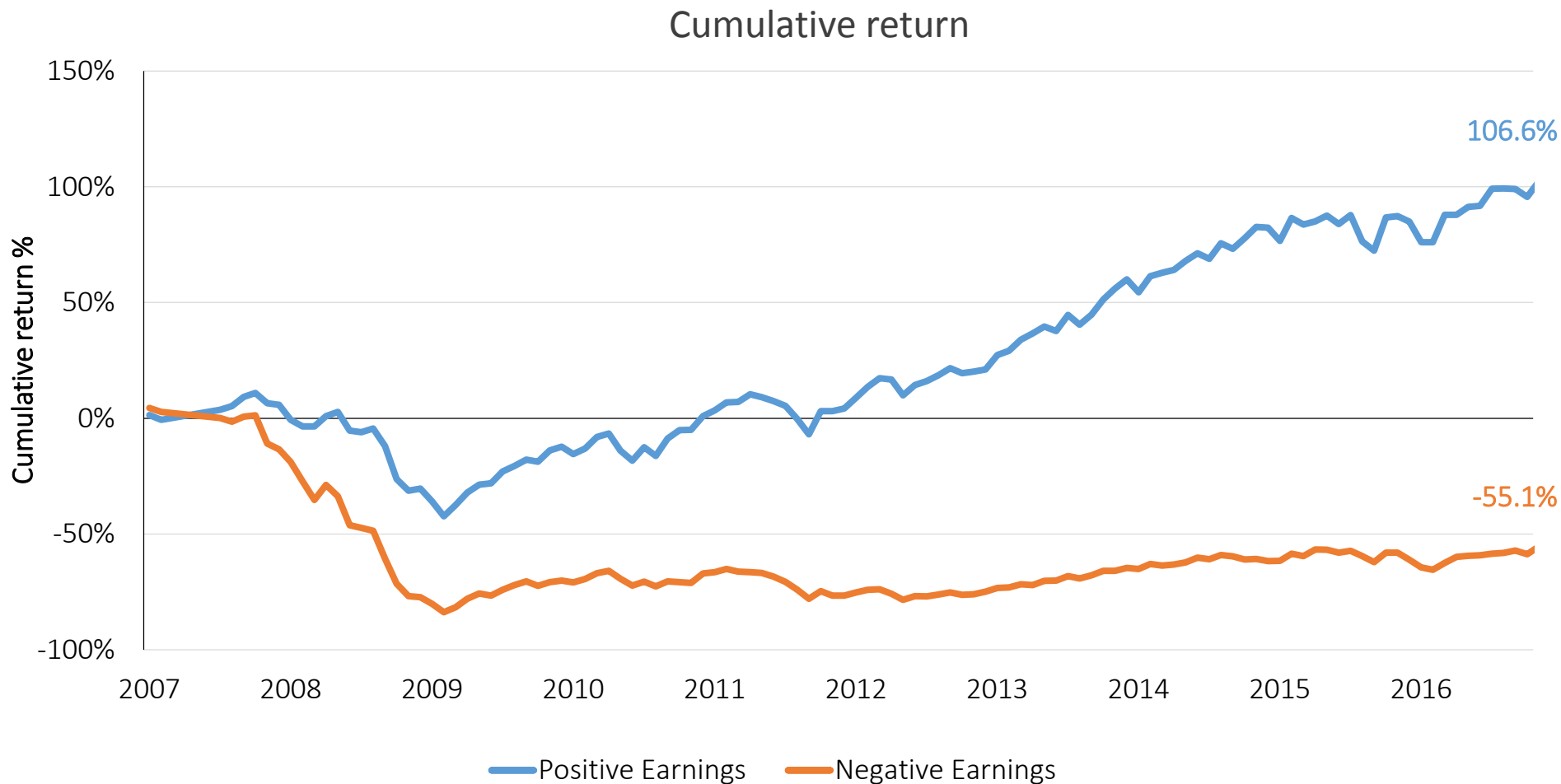
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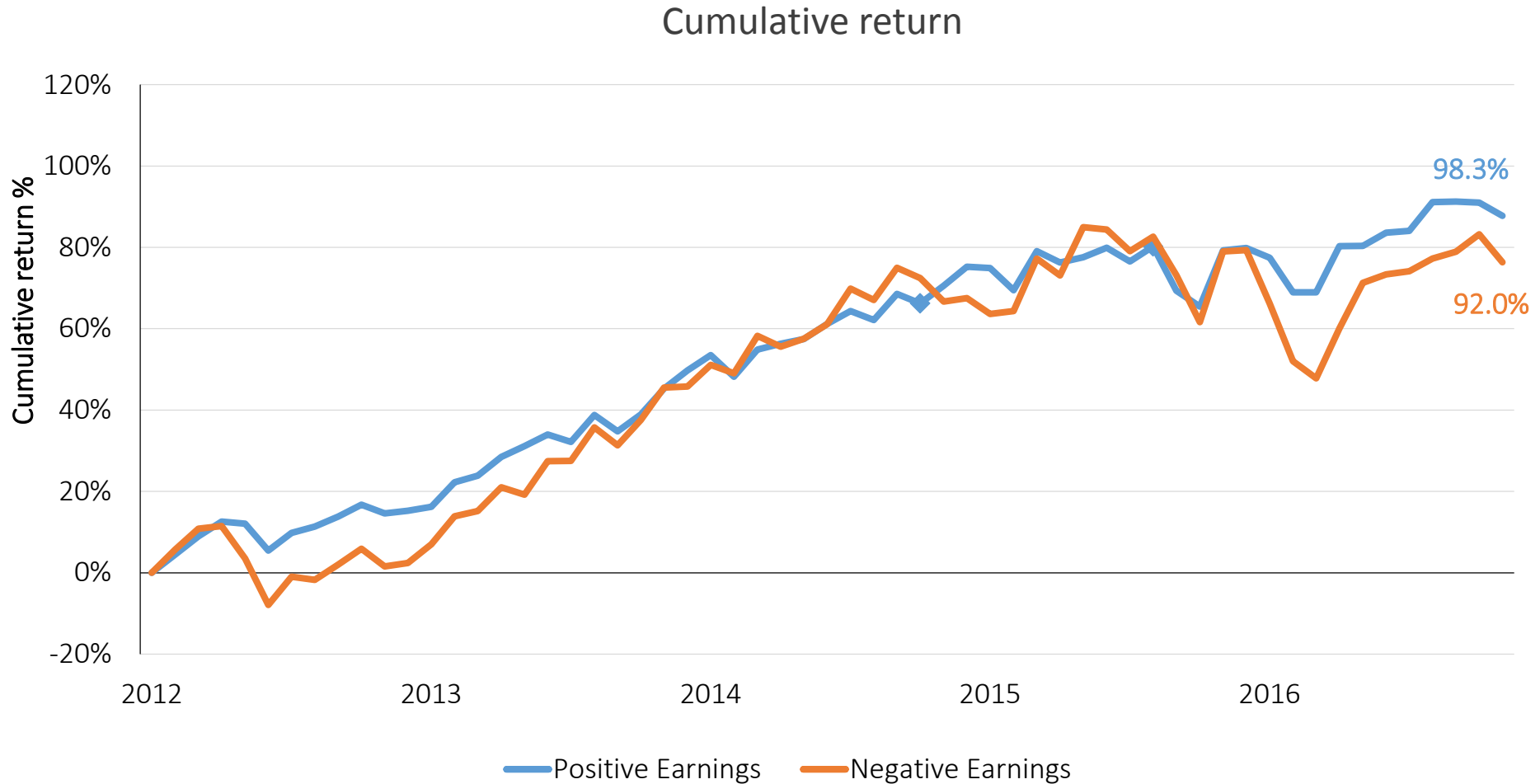
# Dispersion of equity returns – normal?



38793.1

Source: Compustat earnings per share (EPS) data from December 2006 – December 2016 for the S&P 500. Each portfolio of positive and negative earnings companies is rebalanced monthly and market cap weighted. Data labels are cumulative returns as of 31st December 2016.

# Dispersion of equity returns – abnormal?



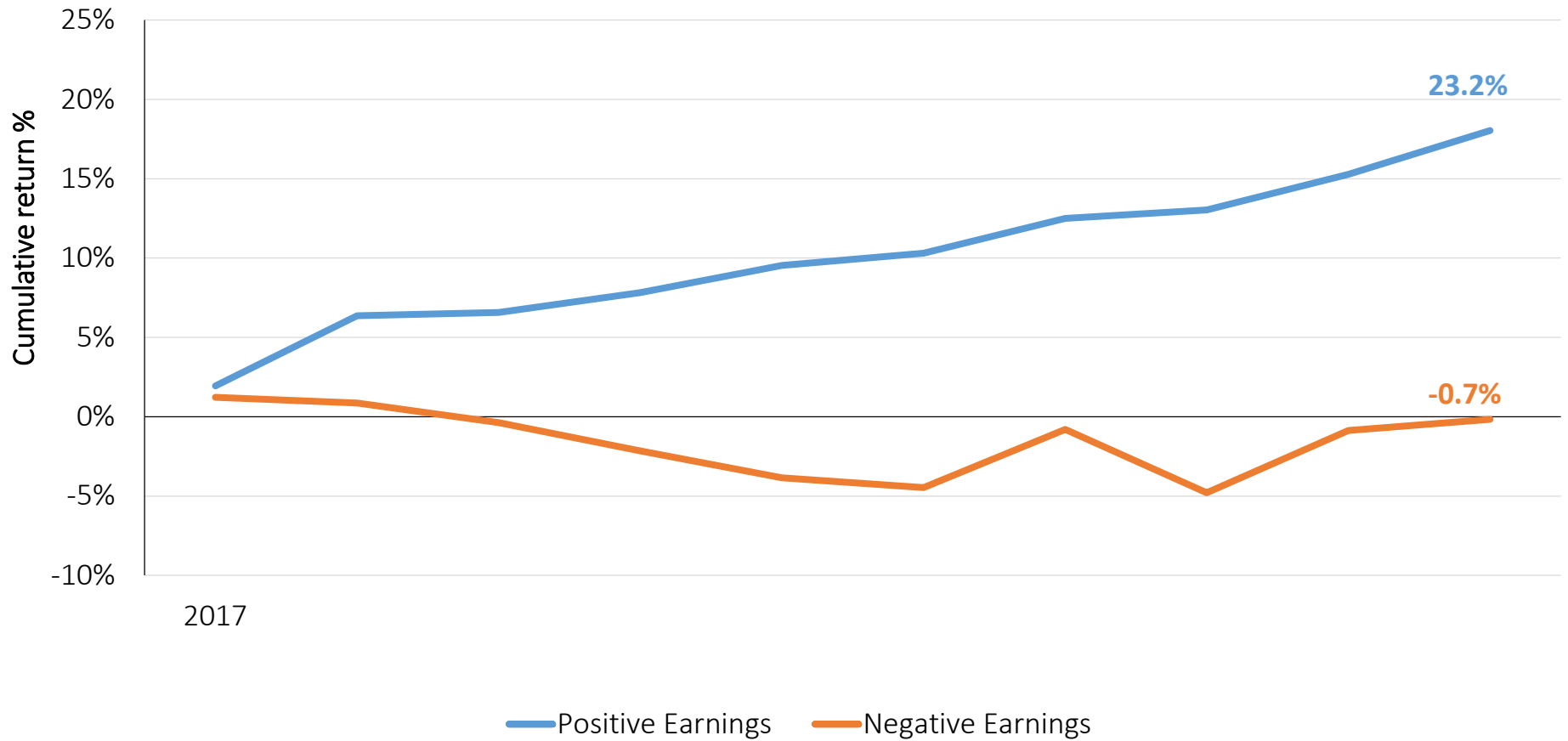
38793.1

Source: Compustat earnings per share (EPS) data from December 2011 – December 2016 for the S&P 500. Each portfolio of positive and negative earnings companies is rebalanced monthly and market cap weighted. Data labels are cumulative returns as of 31st December 2016.

# Dispersion of equity returns



## Cumulative return

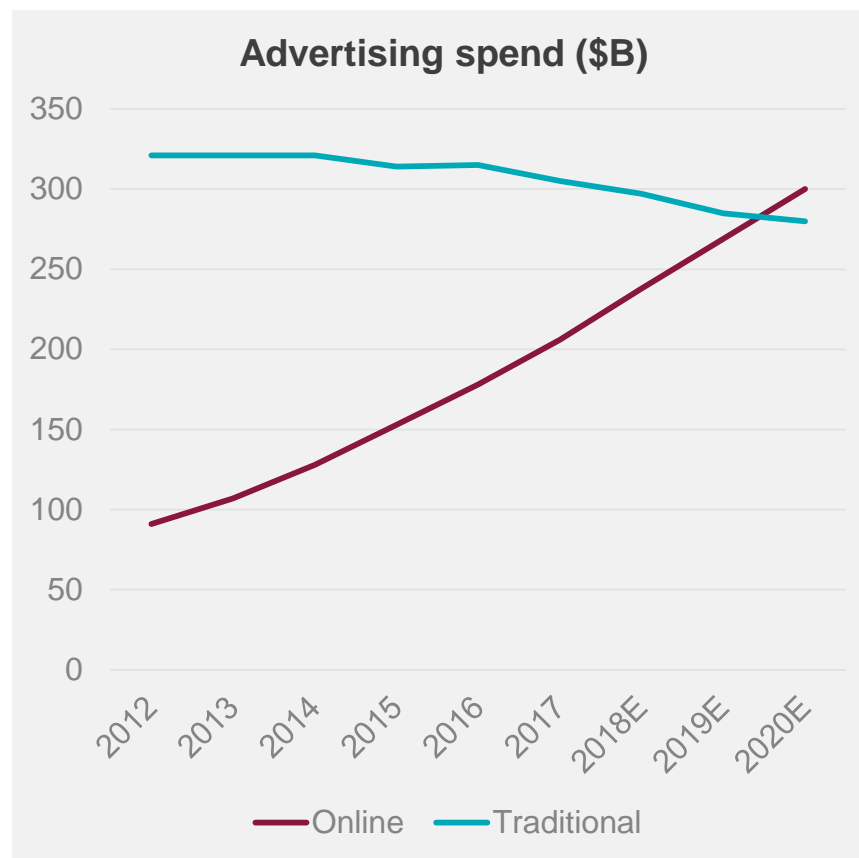
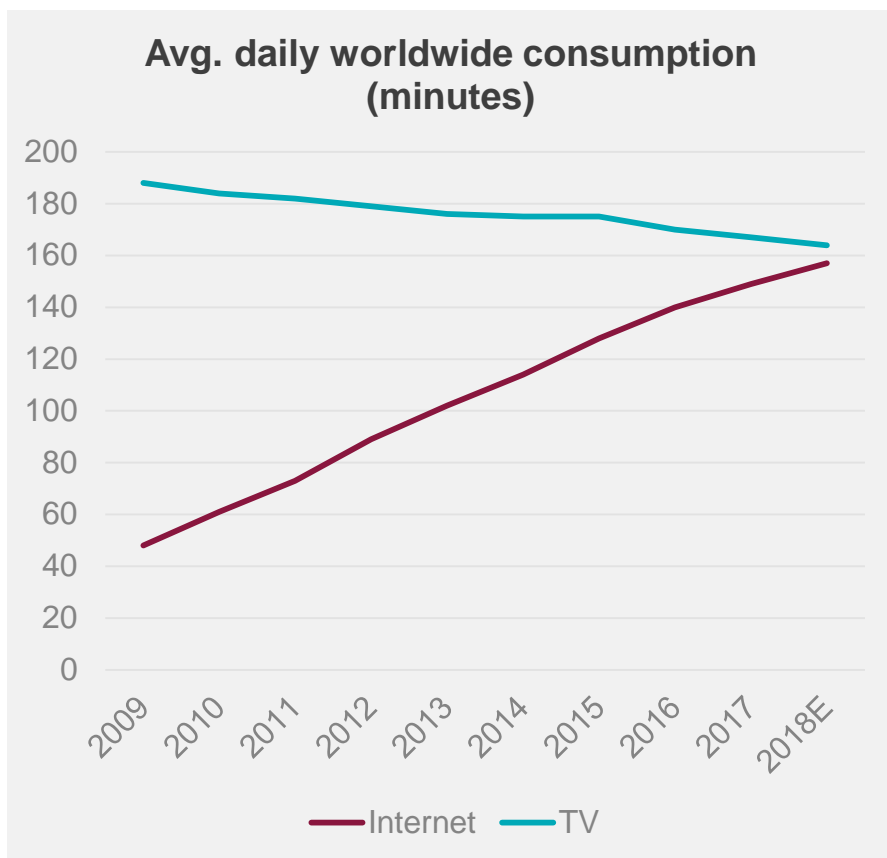


Source: Compustat earnings per share (EPS) data from December 2016 – December 2017 for the S&P 500. Each portfolio of positive and negative earnings companies is rebalanced monthly and market cap weighted. Data labels are cumulative returns as of 31st December 2017.

- 
- Major disruption occurring in the global economy
    - What industries will be affected?
    - Who could the winners and losers be?
    - Why stock selection will become mission critical?

# Disruption in major profit pools

Advertising – Time spent vs. money spent



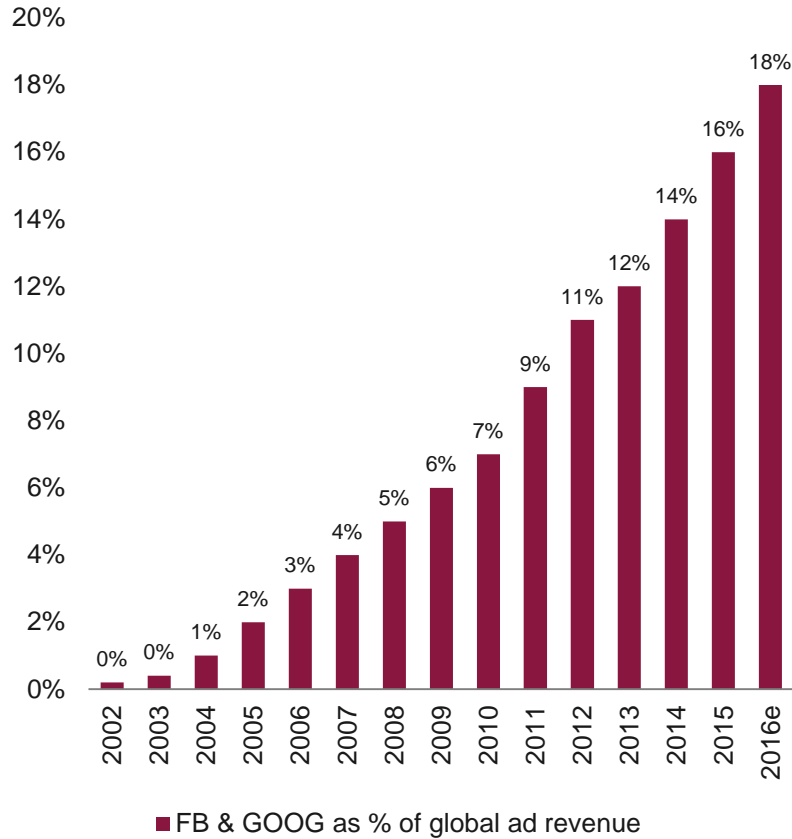
Source: (LHS) Statista via Zenith/Recode. (RHS)Magna Global, Goldman Sachs Global Investment Research, Jan. 16, 2017. Latest data available

# Disruption in major profit pools

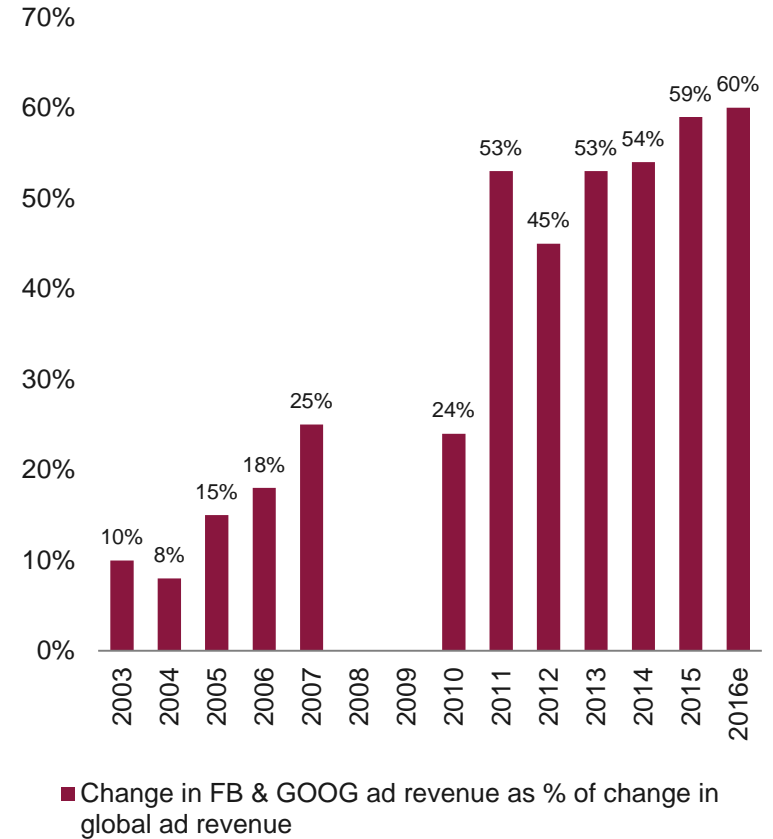
Advertising – who might win/lose with this shift?



FB & GOOG growing share of ad spending



FB & GOOG have 60% share of all incremental ad spending globally



Source: Credit Suisse, Zenith Optimedia Note Facebook data available from 2010. As-of 9/30/2017

The companies referenced are used for informational purposes only, and do not necessarily represent holdings in any MFS portfolio.

# Disruption in major profit pools

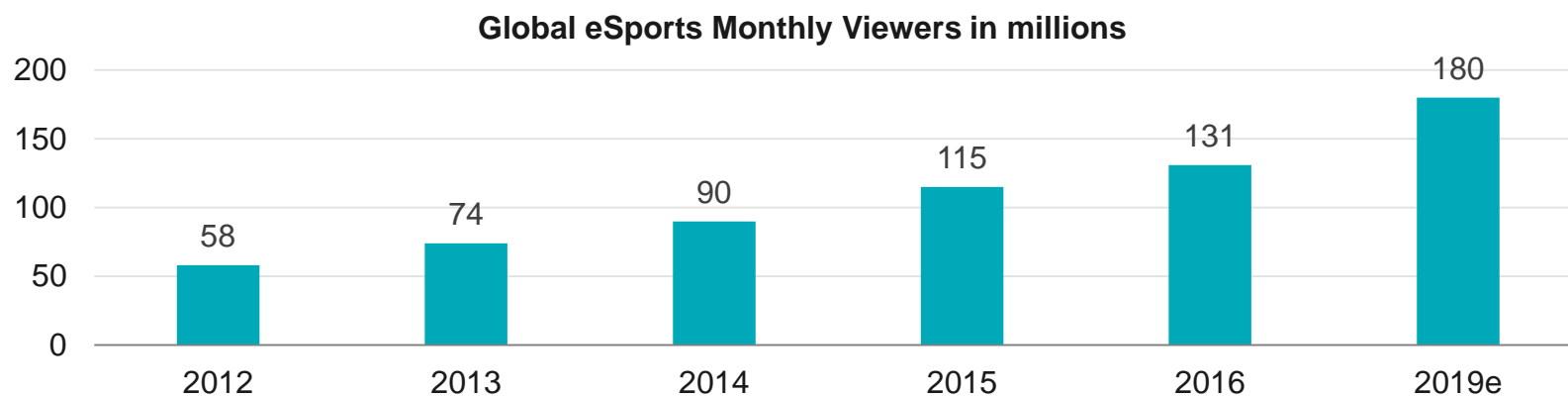
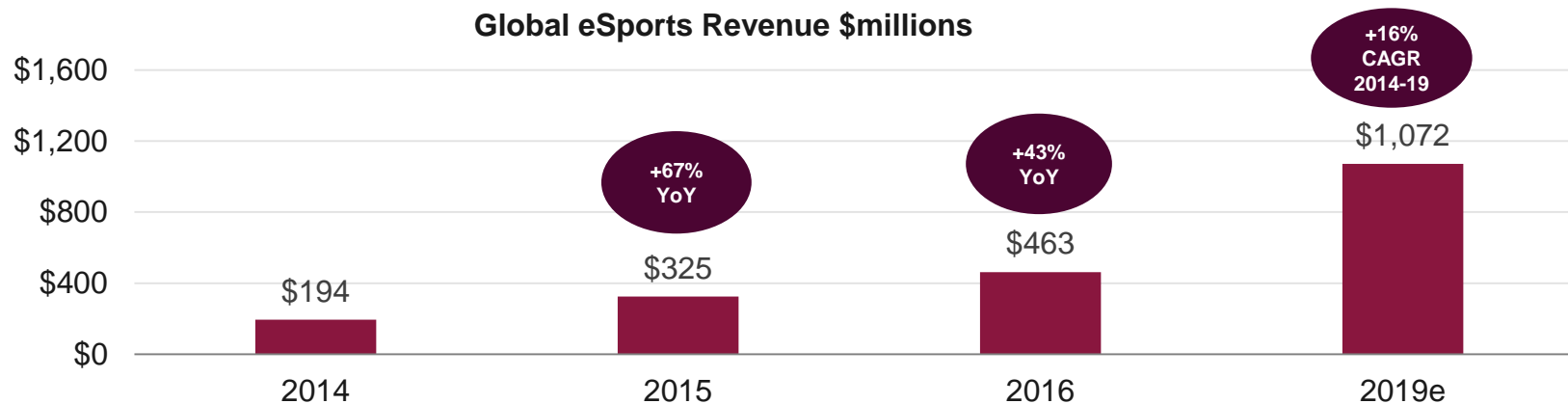
Media





# Disruption in major profit pools

Media - the rise of eGaming



Source for top chart: Kleiner Perkins May 2017 /bNewzoo Global eSports Market Report (2/17), Newzoo press release (1/16), Newzoo Casual Connect Europe Presentation (2/15)

Source for bottom chart: Newzoo 2016 Global eSports Market Report

# Disruption in major profit pools

The house where it all began



# Disruption in major profit pools

Retail - Warehouses are the new black....



Amazon has 75 fulfillment centers in the US...one located within 20 miles of half of US population



Largest distribution center has 2.4m of total usable square footage...which is about 1/2 the size of Magic Kingdom



They have 110m square feet of warehouses...which equals the total area of all 750 Costco stores put together

Source: L2 Gartner, Baltimore Business Journal, eMarketer, Curbed, MVPVL. Latest data available

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# Disruption in major profit pools

Brick and mortar retailing



Country	Shopping Center GLA (sq ft)	Population (millions)	GLA per capita
U.S.	7,527	319	24
Canada	542	36	15
U.K.	318	64	5
France	264	64	4
Italy	171	60	3
Spain	142	46	3
Germany	195	80	2

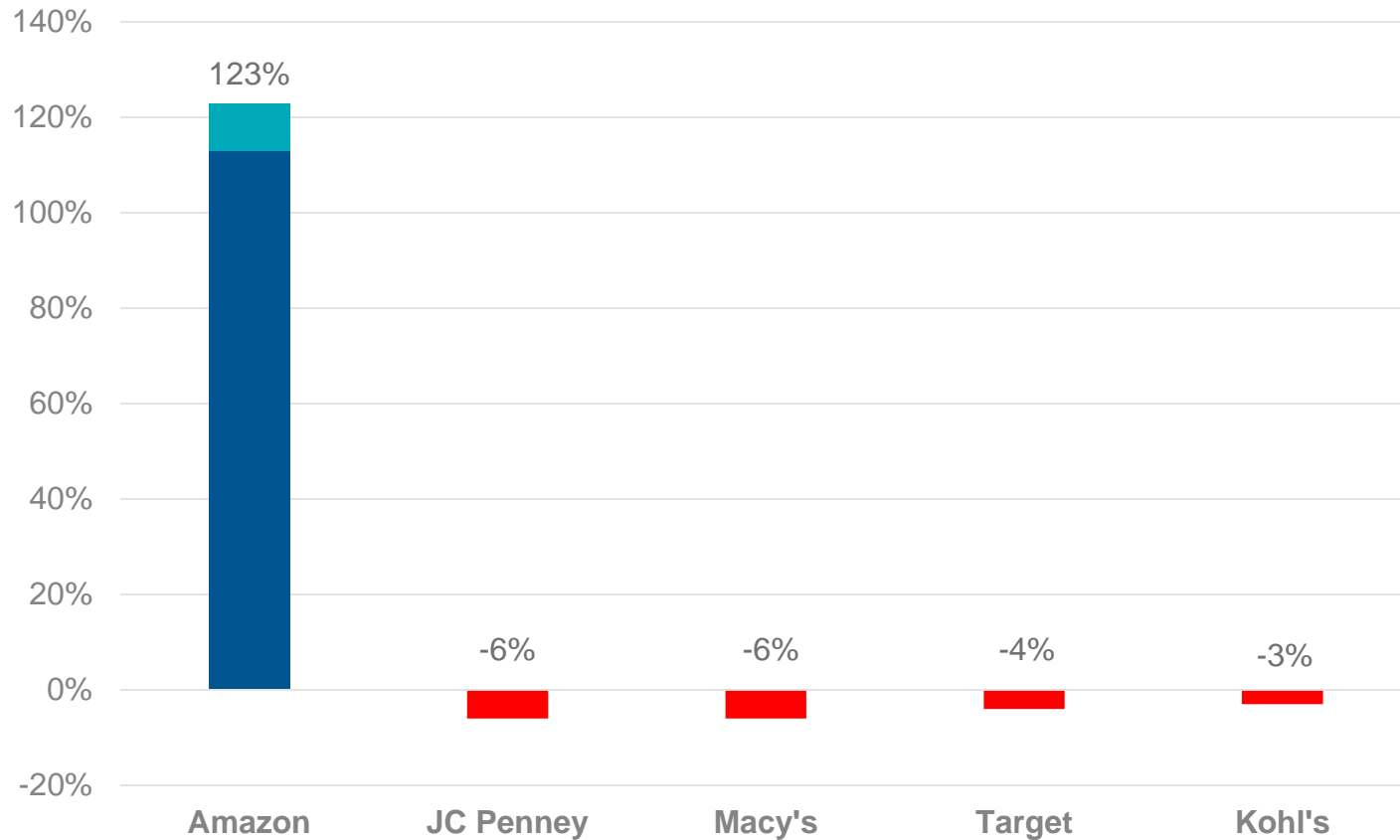
Source: ICSC September 2015 (latest data available).

# Disruption in major profit pools

Retail - How do you stay alive when sales are headed south?



## Cumulative Sales Growth 2012-2016



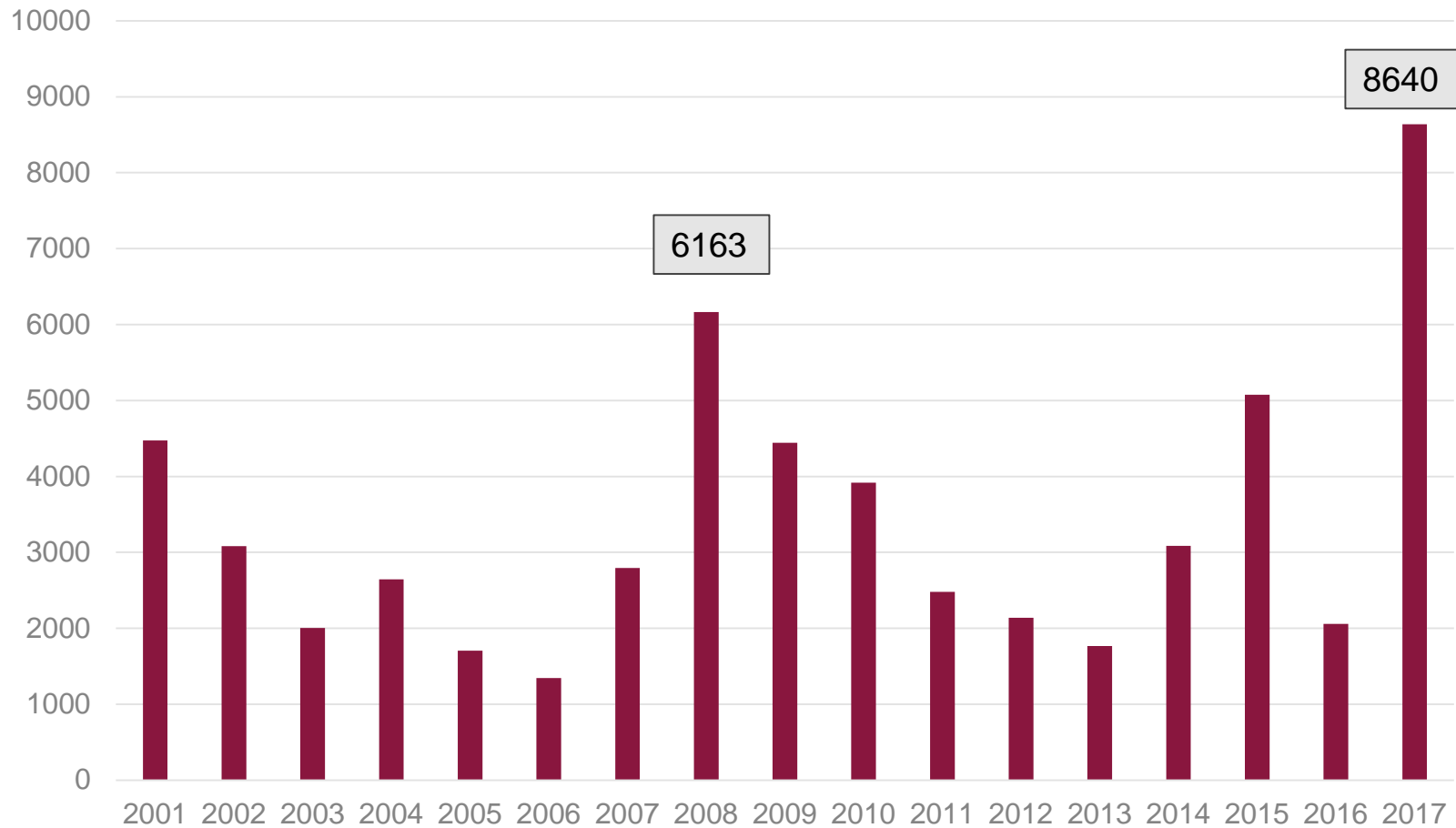
Source: Factset. The companies referenced are used for informational purposes only, and do not necessarily represent holdings in any MFS portfolio

# Disruption in major profit pools

Retail - All-time high in store closures



## US Retail Store Closures



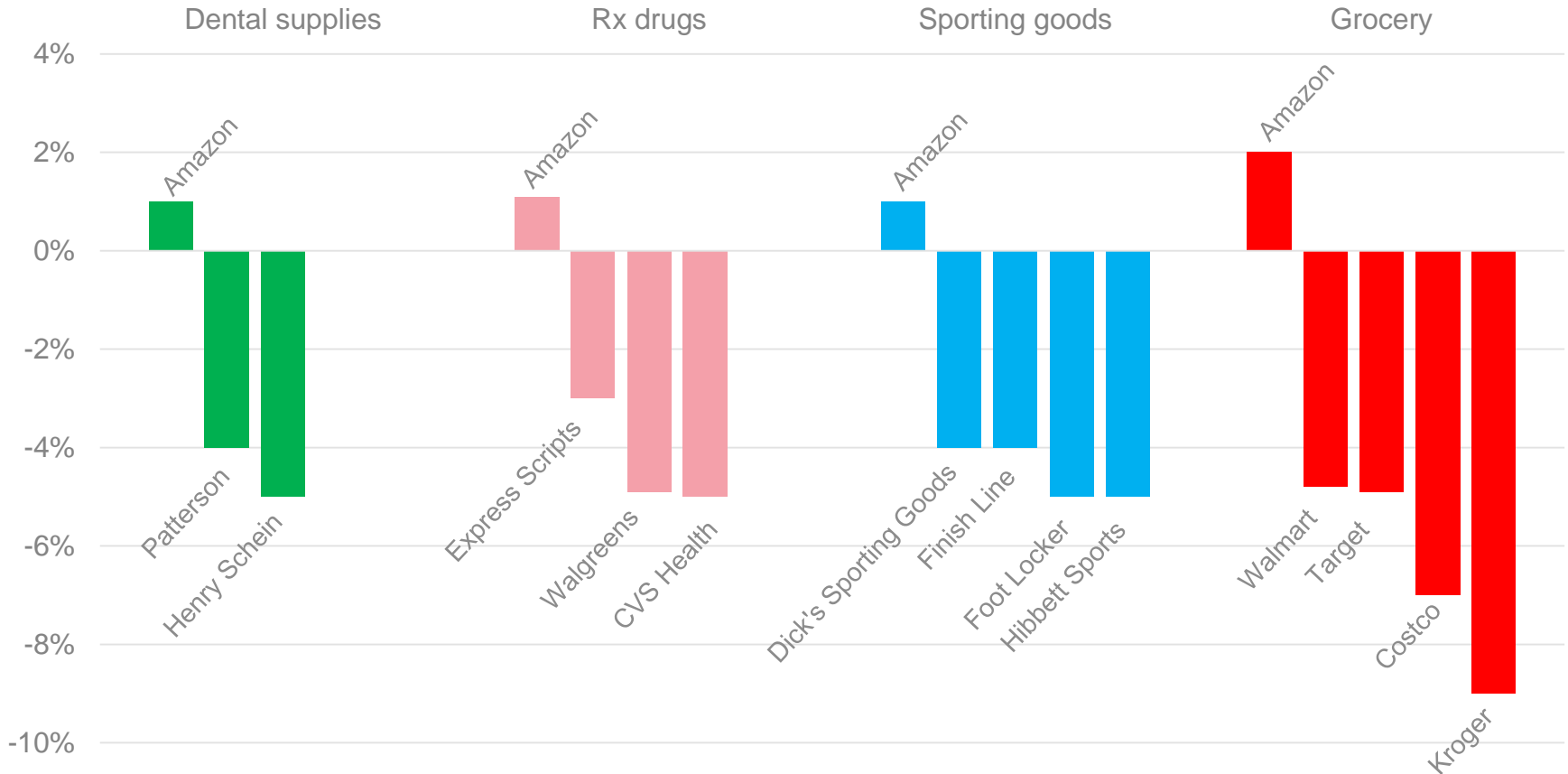
Source: Credit Suisse

# Disruption in major profit pools

Groceries, drugs, etc.– The Amazon effect



Impact on stock price in 1<sup>st</sup> 24 hours following Amazon announcement



Source: L2 Gartner analysis of Yahoo Finance data. 1/4/18

# Disruption in major profit pools

Consumer brands example - batteries



## Comparison of AAA batteries bought on amazon.com

	Duracell	Amazon Basics
Percent of ratings 4/5 stars (total #)	77% (1040)	86% (13041)
Conversion rate	10.2%	17.7%
Price per battery	65 cents	24 cents
Percent of online sales	21%	31%
Marketing budget <sup>1</sup>	\$50.6m	\$0

Sources: Amazon.com, L2 Gartner, 1010Data. Latest data available

<sup>1</sup> Marketing budget for Duracell 5 year average per Statista. Latest data available

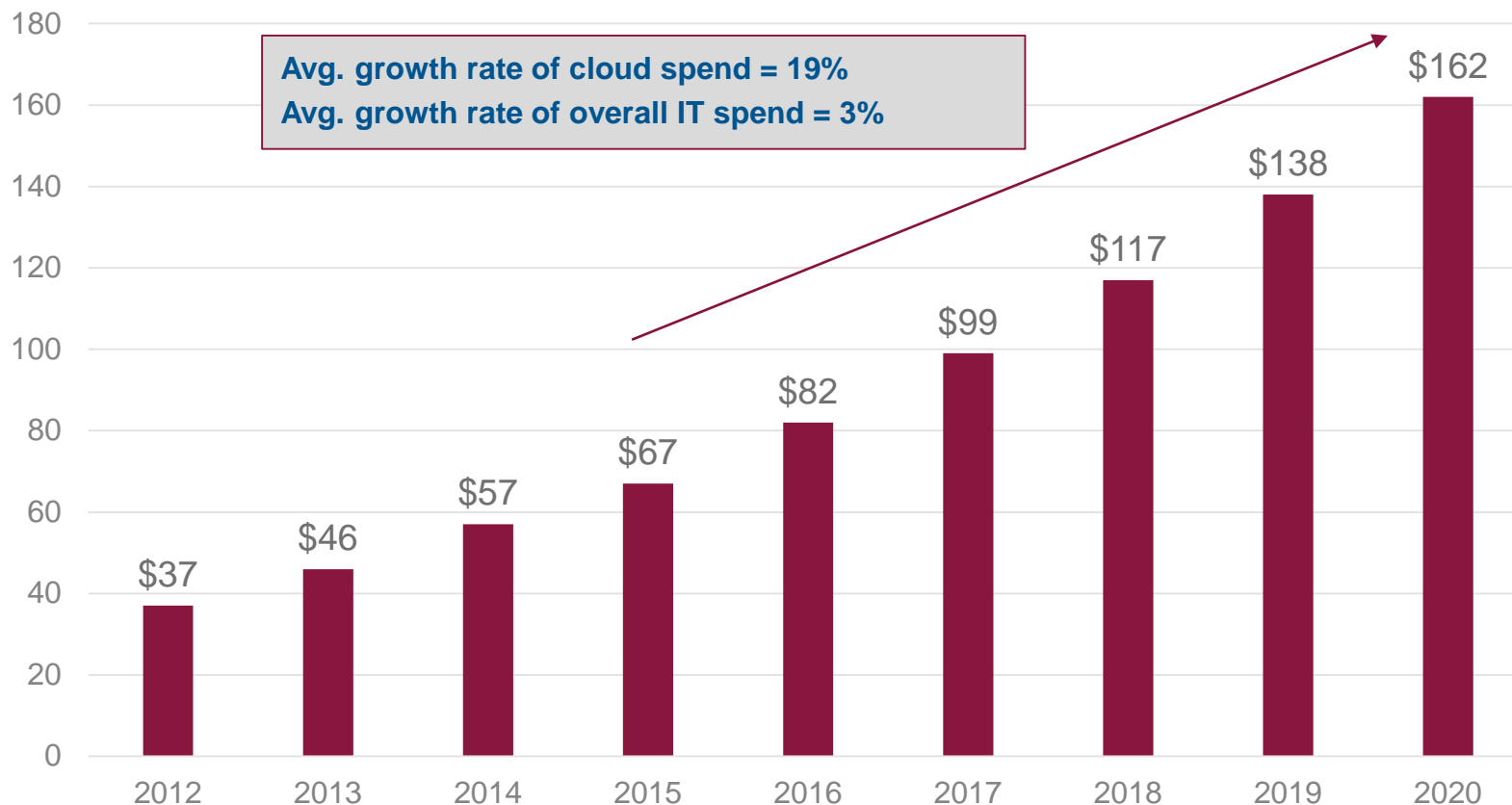


# Disruption in major profit pools

The IT stack: compute, storage, service



## Worldwide spending on public cloud computing (\$B)



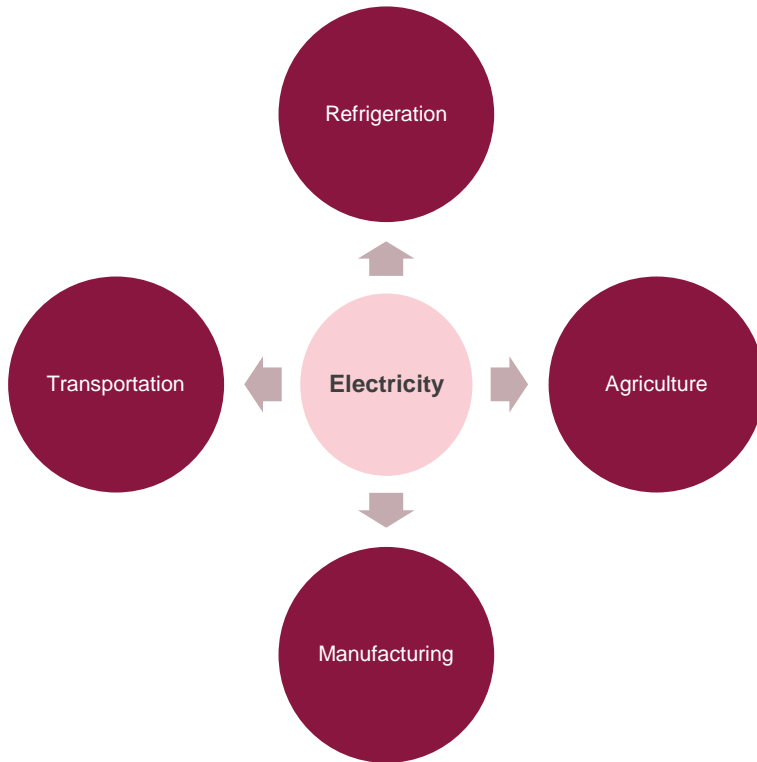
Source: IDC Whitepaper, September 2016. Data after 2016 is estimates.

# Disruption - artificial intelligence

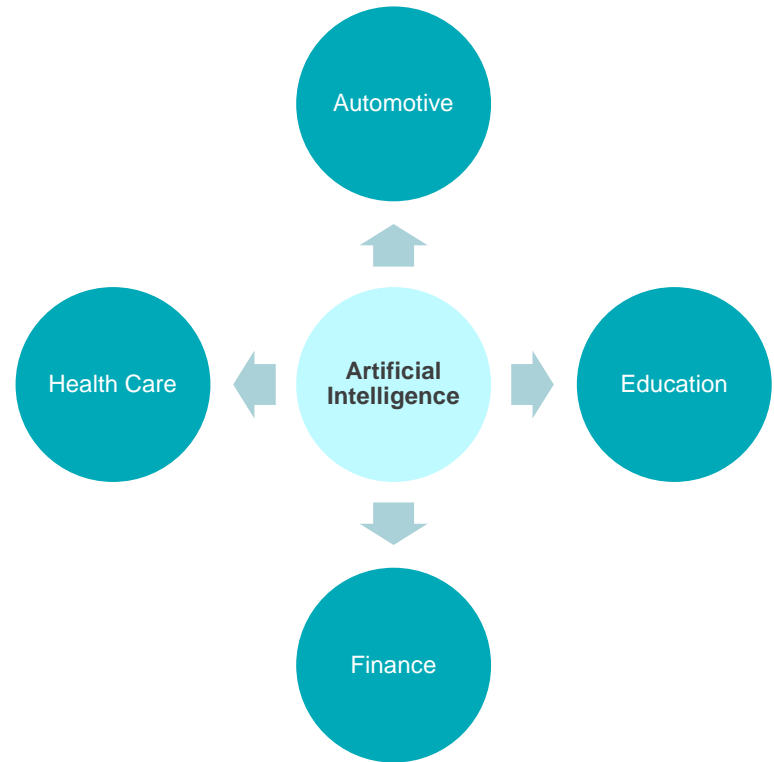
Artificial intelligence is the new electricity"



## 19<sup>th</sup> & 20<sup>th</sup> centuries

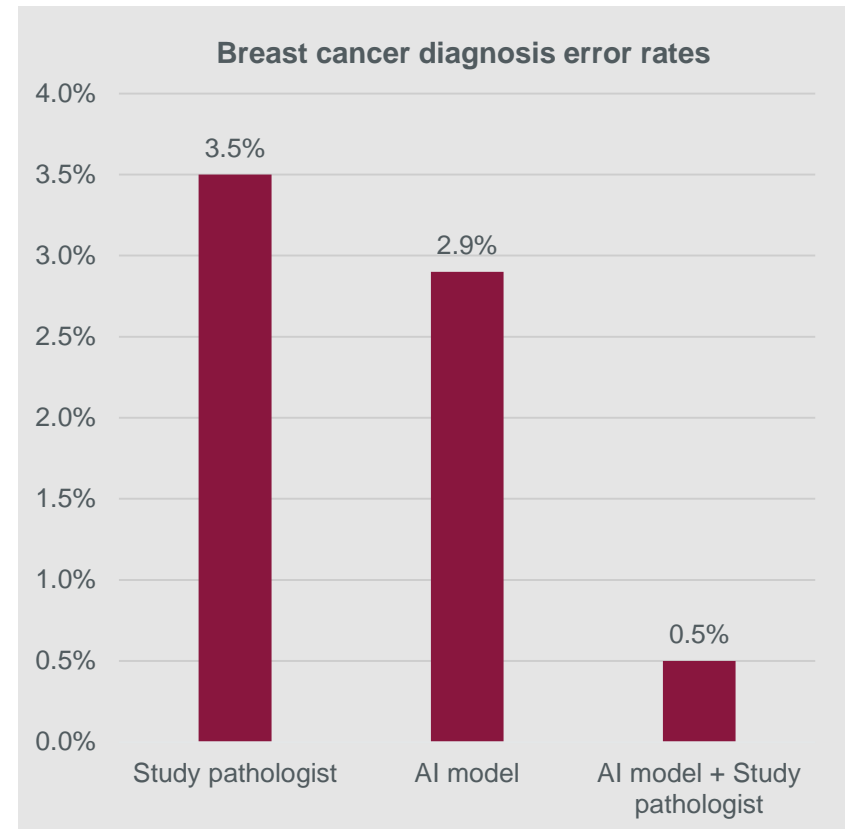
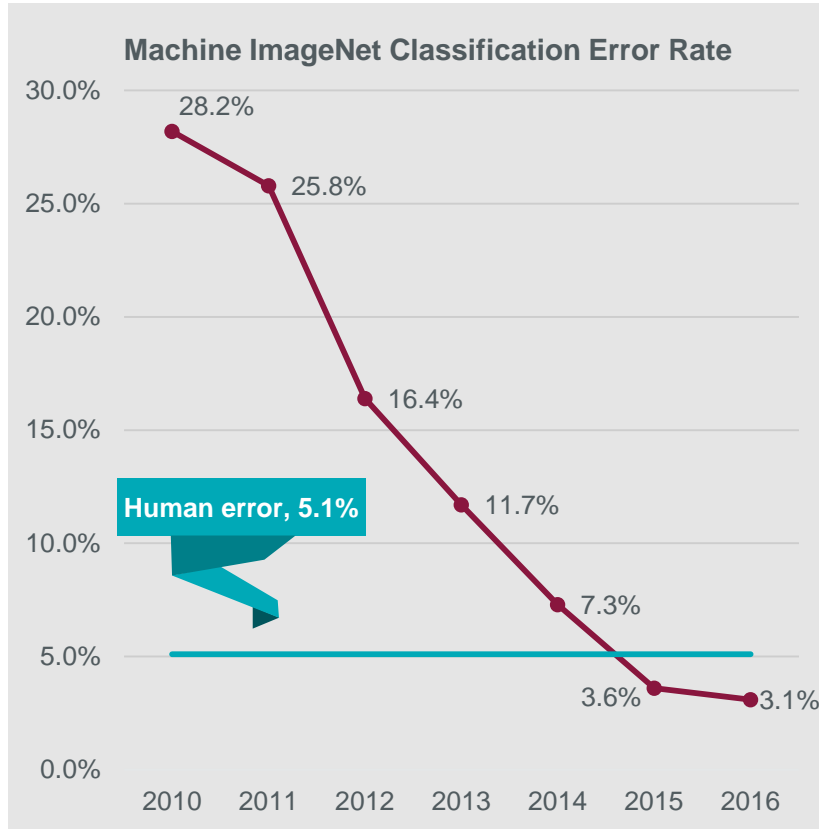


## 21<sup>st</sup> century



# Disruption - artificial intelligence

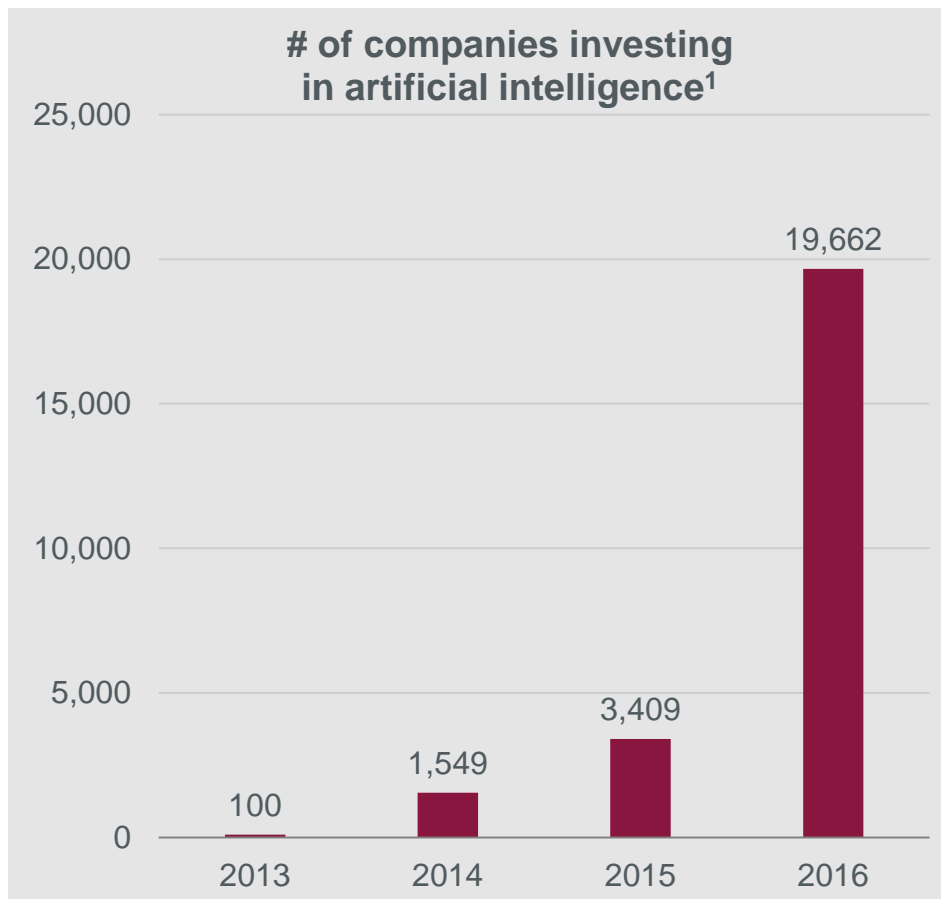
Artificial intelligence improving health care diagnoses



Source: (RHS) NVIDIA article from September 2016 on error rates achieved in 2016 Camelyon Grand Challenge. (LHS) ImageNet and Bernstein analysis.

# Disruption - artificial intelligence

Breadth and depth of companies investing in AI is exploding



## Applications of AI include:

- ▶ **Automotive**
  - Autonomous vehicles
  - Driver-assist safety features
- ▶ **Health Care**
  - Medical diagnostics
  - Drug development
- ▶ **Defense**
  - Surrogate operators for combat
  - Flight simulation for training
- ▶ **Finance**
  - Fraud detection
  - Personal finance
- ▶ **Manufacturing**
  - Robotics and automation
  - Predictive maintenance
- ▶ **Communications**
  - Speech, face and handwriting recognition
  - Natural language processing

Source: NVIDIA

<sup>1</sup> number of companies buying artificial intelligence processors from NVIDIA as reported by NVIDIA

"If you don't like  
change...you will like  
irrelevance even less."  
-General Eric Shinseki

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