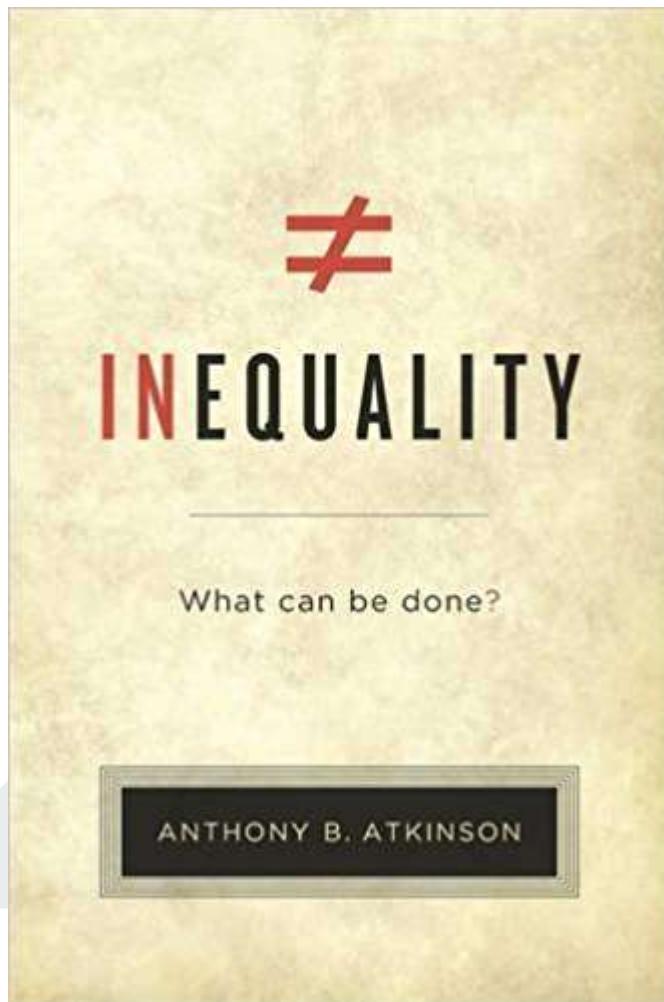
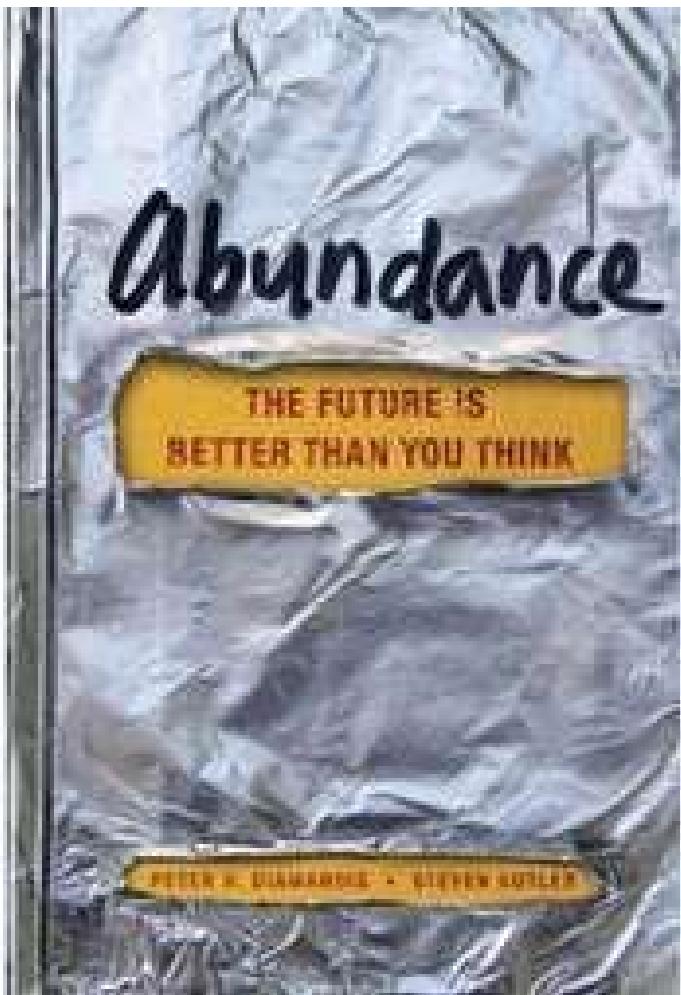


Tendències IND+I 2018

Què ha passat en el darrer any

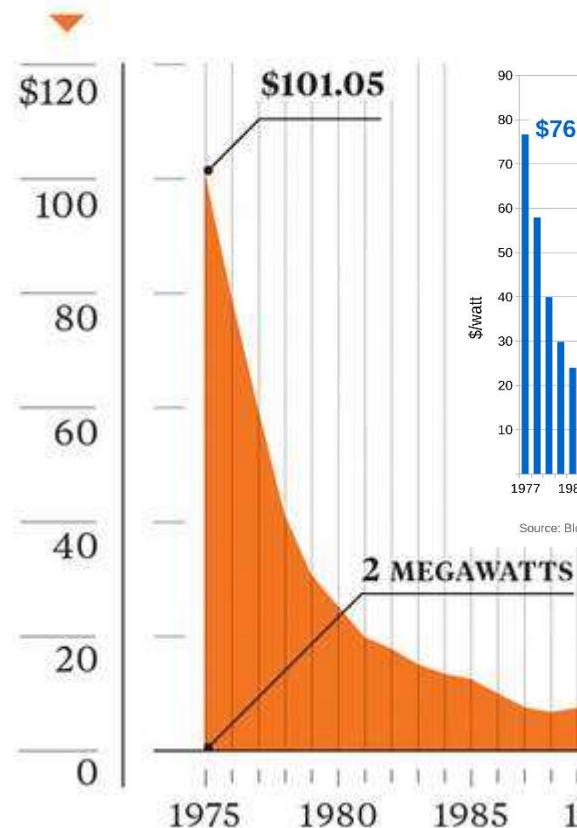
Xavier Ferràs, MBA, PhD
Viladecans, 03 de maig de 2018



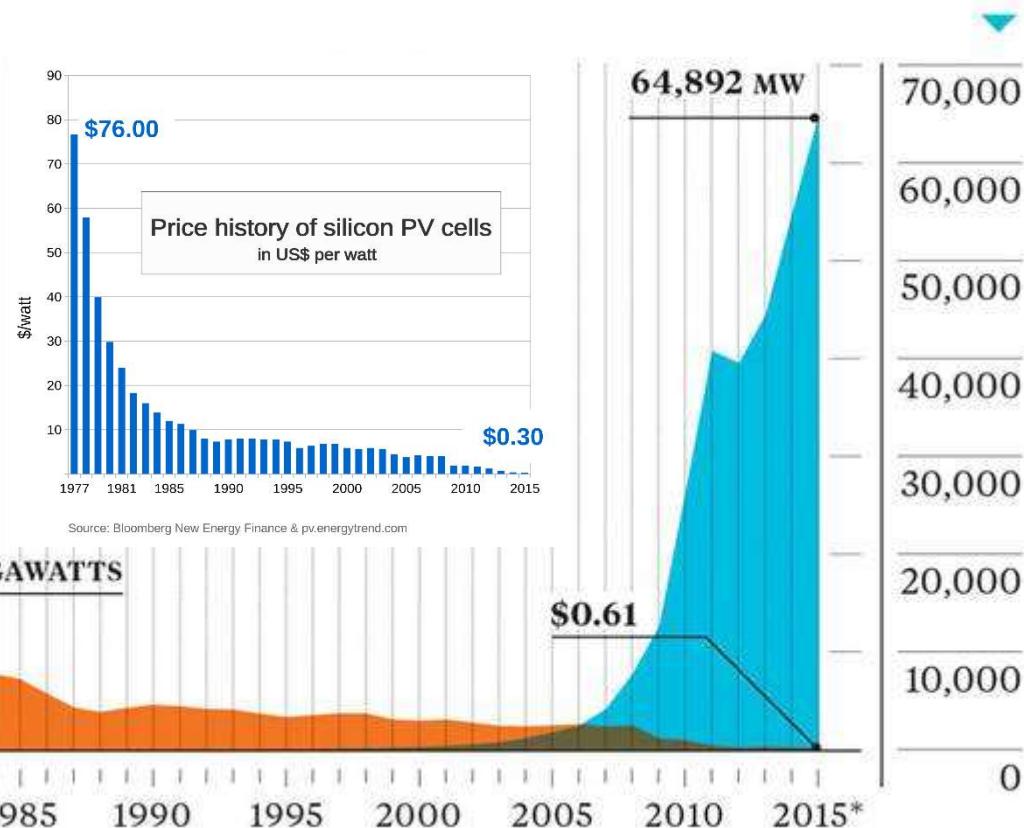


Solar technology

Price of a solar panel per watt



Global solar panel installations



Source: Bloomberg



Germany Just Got Almost All of Its Power From Renewable Energy

Photographer: Kristian Boos/Bloomberg



Germany Just Smashed an Energy Record, Generating 85% Electricity From Renewables

Earth & Energy



India Is Scrapping a Major Coal Project in Favor of Renewables



UNIVERSITAT DE VIC
UNIVERSITAT CENTRAL DE CATALUNYA

Solar Could Beat Coal to Become the Cheapest Power on Earth

By Jess Shankleman and Chris Martin
3 de enero de 2017 1:00 CET Updated on 3 de enero de 2017 13:16 CET

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Solar technology

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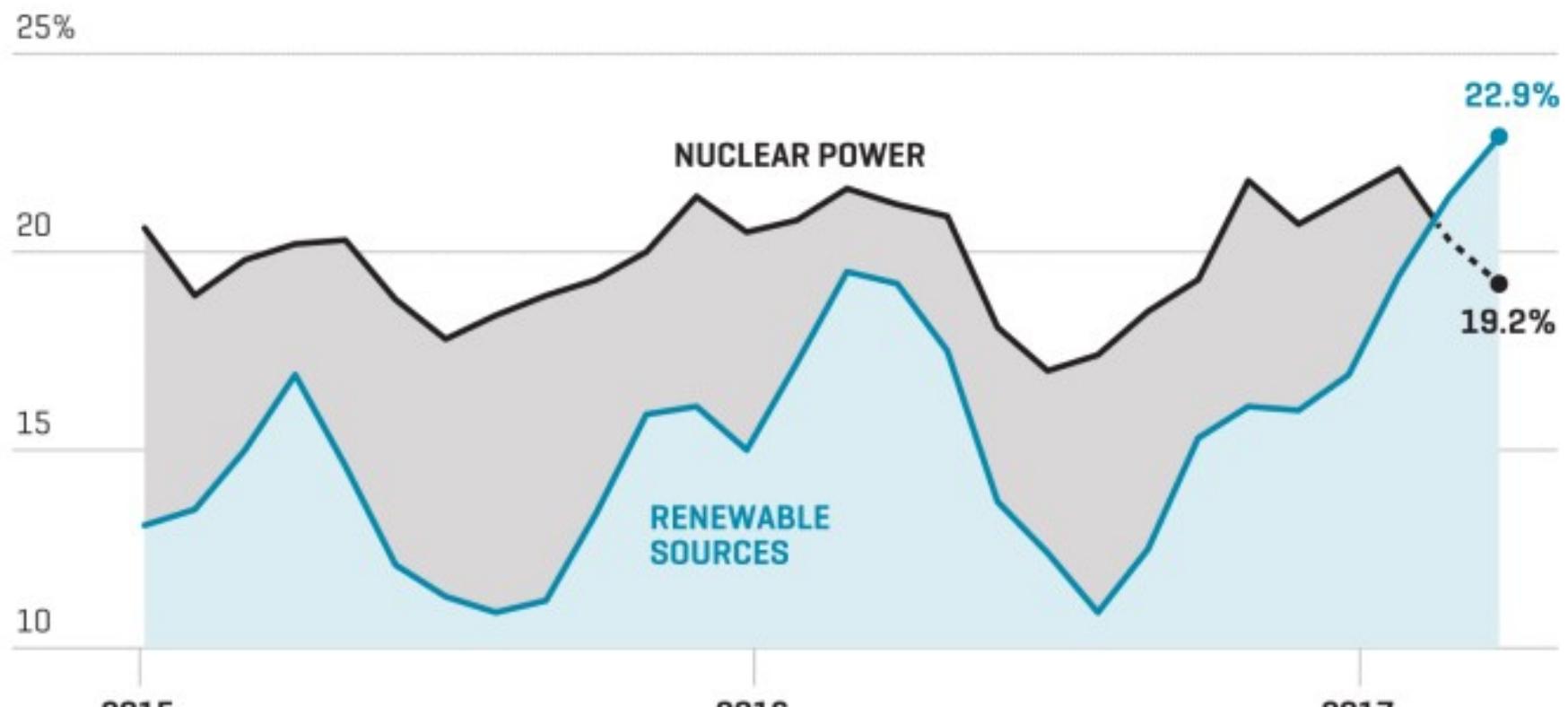
THE SCIENCES MIND HEALTH TECH SUSTAINABILITY EDUCATION VIDEO PODCASTS BLOGS STORE

SUSTAINABILITY

A Way to the Most Abundant Energy

Viable solar energy has been a long-sought-after goal, but with new and affordable technologies, we might soon be able to make the switch

SOURCES OF U.S. NET ELECTRICAL GENERATION



N. RAPP / FORTUNE MAGAZINE

SOURCE: EIA

“Clean” Meat



believe that in 30 years or so we will no longer need to kill any animals and that all meat will either be clean or plantbased, taste the same and also be much healthier for

MENU

FAST COMPANY



TECHNOLOGY

LEADERSHIP

ENTERTAINMENT

IDEAS

VIDEO

NEWS

05.02.18 | 6:55 AM

Lab-Grown Meat Is Getting Cheap Enough For Anyone To Buy

A company called Future Meat Technologies, which just got a large investment from meat giant Tyson Food, is perfecting a process that could see us soon grilling meat grown in a bioreactor.



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0:43
03/05/2018



“Clean” Meat or “Fake” Meat?

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The battle between the beef industry and Silicon Valley's lab-grown meat startups is heating up

Leanna Garfield [✉](#) [Twitter icon](#)

⌚ Feb. 21, 2018, 4:35 PM [🔥 1,230](#)

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Digital Humans

Feature: MIT Technology Review

In the news today on MIT Technology Review:

"Customer Service Chatbots Are About to Become Frighteningly Realistic"

By: Tom Simonite // March 22, 2017



WISeKey and Soul Machines Develop INeS, an AI Digital Human Bot to answer cybersecurity IoT questions

PRESS RELEASE GlobeNewswire

© Apr. 25, 2018, 01:01 AM

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INeS Integrates with the IBM Watson IoT Platform

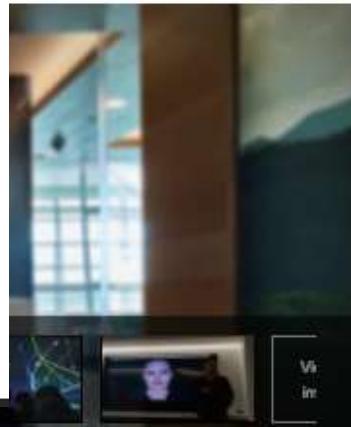
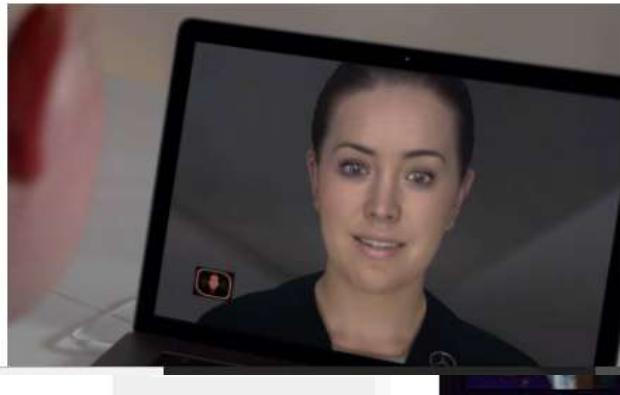
The Morning Download: Daimler Financial CIO Explores Ever-More Lifelike Chatbots

By Steve Rosenbush
Mar 2, 2018 8:26 am ET

0 COMMENTS

f 228 in t g+ w m

0 Comments



Sophie, the 'digital human', greeted guests at the recent US launch of Air New Zealand's global marketing campaign *A Better Way to Fly*.

Sophie showed her advanced emotional intelligence and responsiveness as she answered questions about New Zealand as a tourist destination and the airline's products and services.

ked with Soul Machines to create 'Sophie' as it explores how artificial disruptive technologies can be used to help travelers.



THE WALL STREET JOURNAL.



Soul Machine's first build of AVA in October 2017, not yet in her contextual environment.

BUSINESS | JOURNAL REPORTS: LEADERSHIP

Digital Assistants Start to Get More Human

The coming chatbots will be smarter and more useful. But they will still have plenty of limits.

Polanyi's Paradox



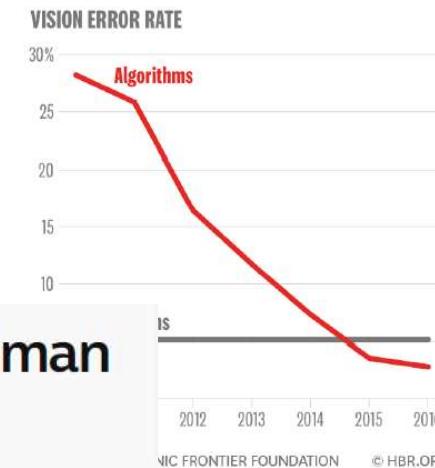
Facial recognition technology spots wanted man in crowd of 60,000 Chinese concert-goers

By Tracey Shelton

Updated 17 Apr 2018, 1:30pm

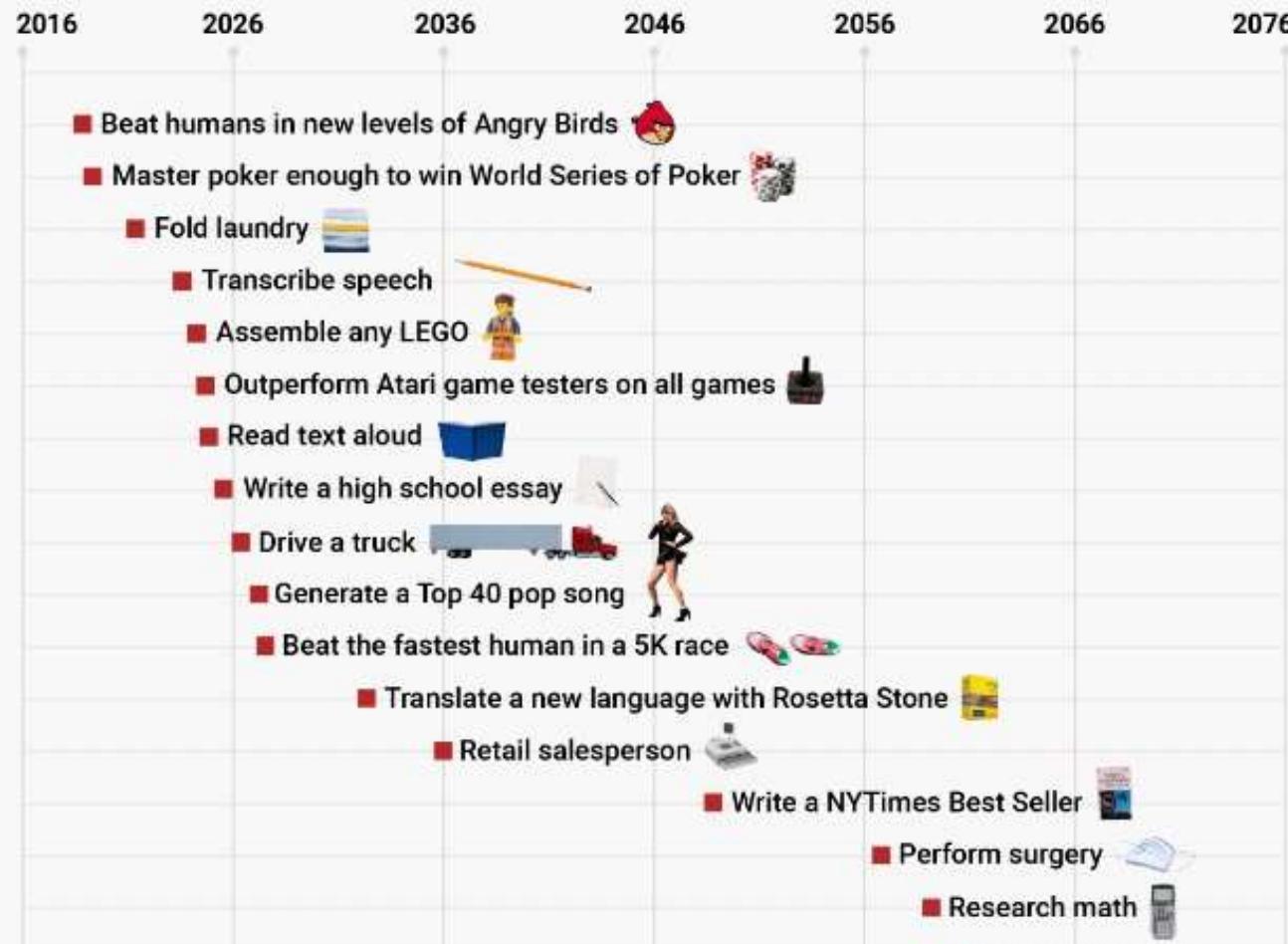


Puppy or Muffin?



BY ERIK BRYNJOLFSSON AND ANDREW McAFFEE
THE BUSINESS OF ARTIFICIAL INTELLIGENCE
What it can — and cannot — do for your organization

WHEN JOBS/TASKS WILL BE TAKEN OVER BY MACHINES



SOURCES: Grace, Salvatier, et al

BUSINESS INSIDER

BUSINESS



Epic Fails?

Tesla may still be stuck in Model 3 ‘manufacturing hell’

By Reuters

December 27, 2017 | 10:19am | Updated

AdChoices

Tesla shareholder wants to remove Elon Musk from chairman position

Megan Rose Dickey @meganrosedickey / Apr 27, 2018

Comment



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Epic Fails?

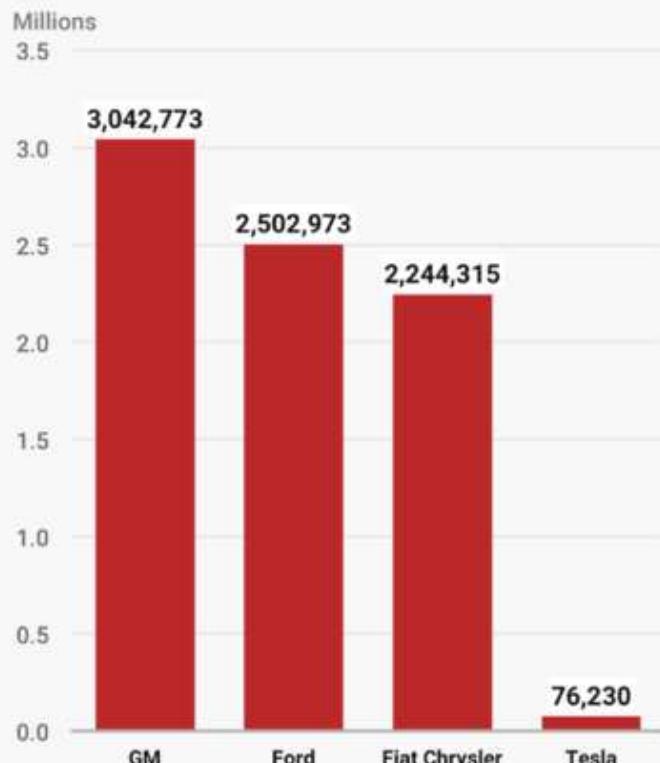


MARKET CAP VS AUTO SALES

Market Capitalization



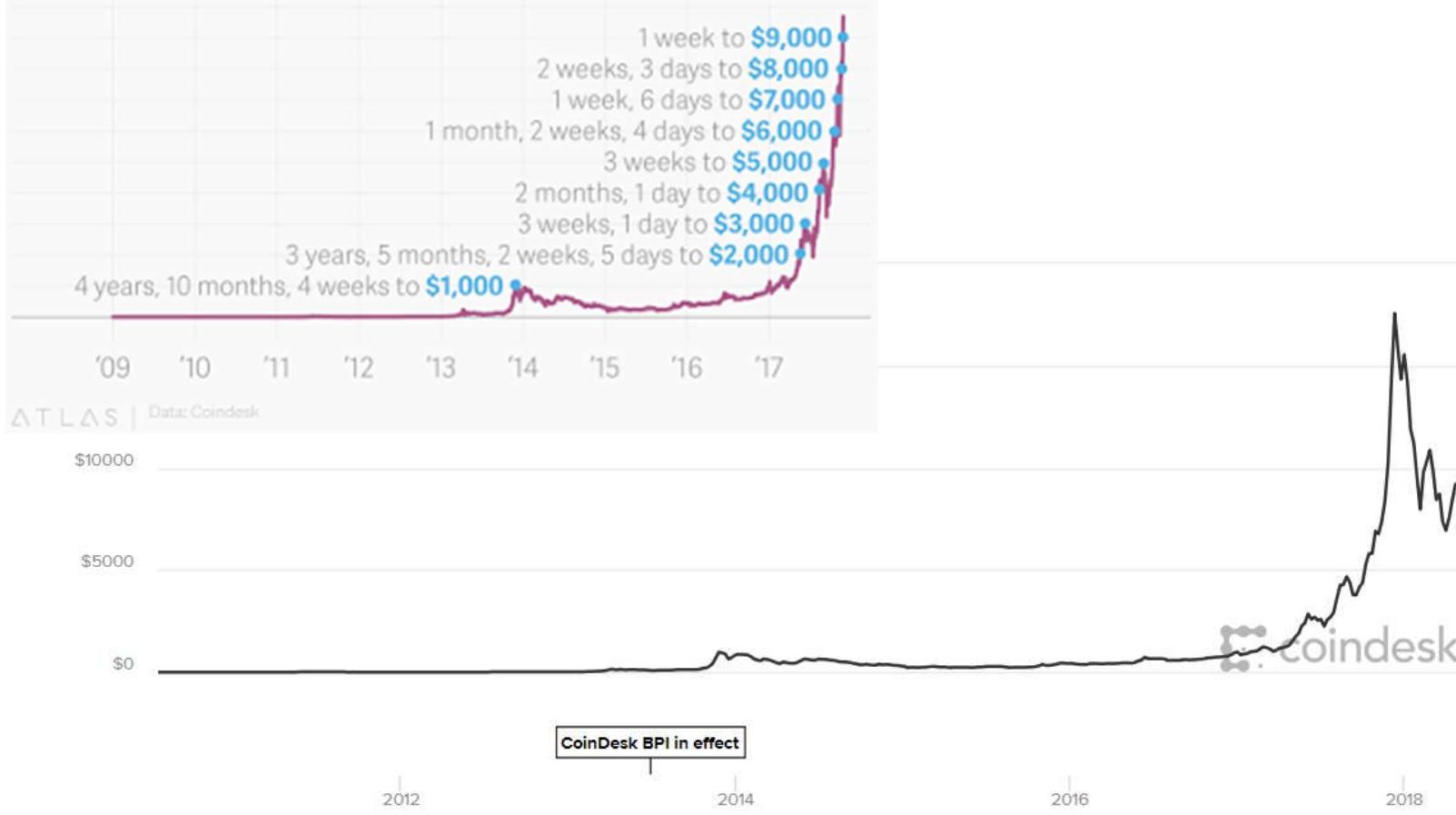
2016 Auto Sales



SOURCE: GM Authority/Ford Authority/PR Newswire/Tesla/Markets Insider. Tesla sales are worldwide; others are US.

BUSINESS INSIDER

Bitcoin price milestones





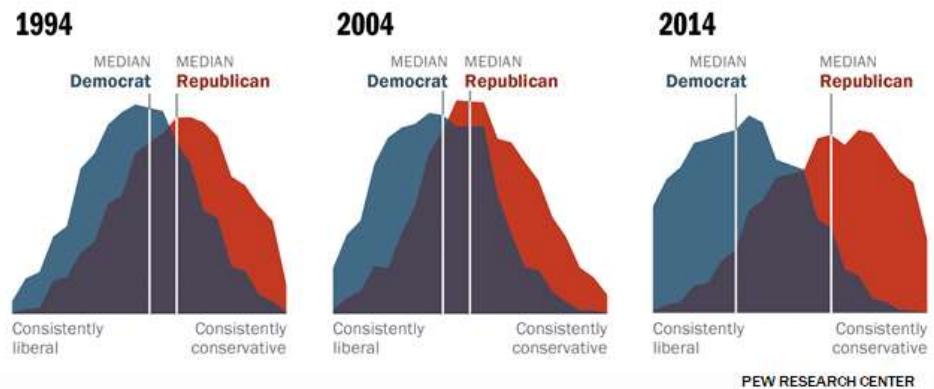
ISSIE LARDOWSKY BUSINESS 04.04.18 05:43 PM

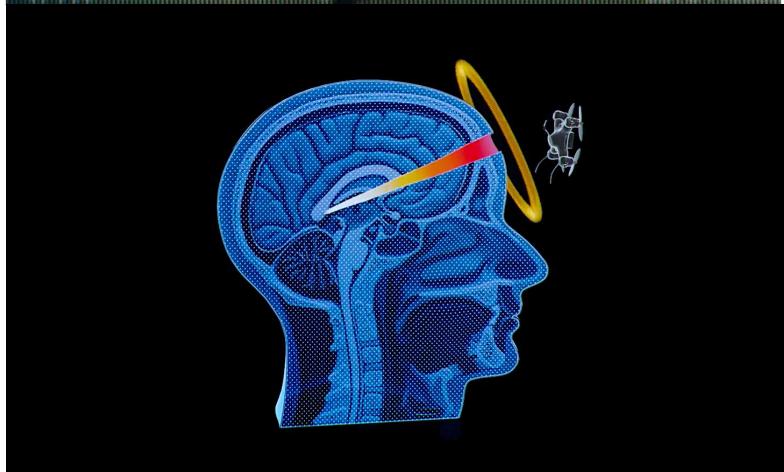
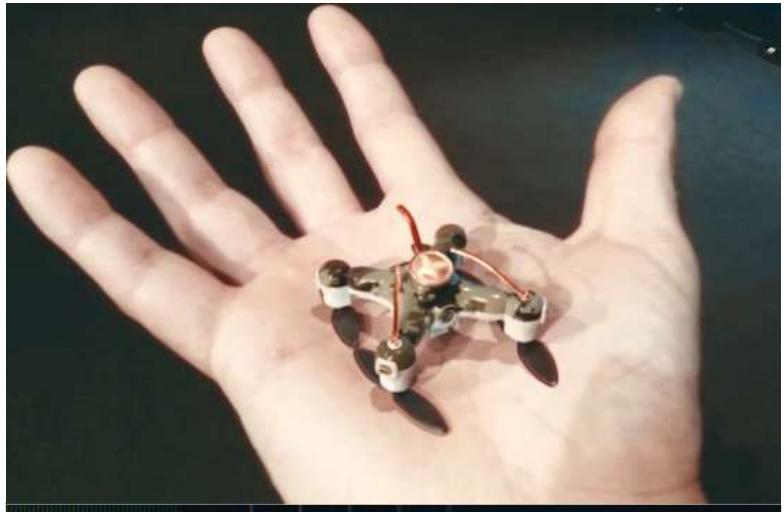
FACEBOOK EXPOSED 87 MILLION USERS TO CAMBRIDGE ANALYTICA



Democrats and Republicans More Ideologically Divided than in the Past

Distribution of Democrats and Republicans on a 10-item scale of political values

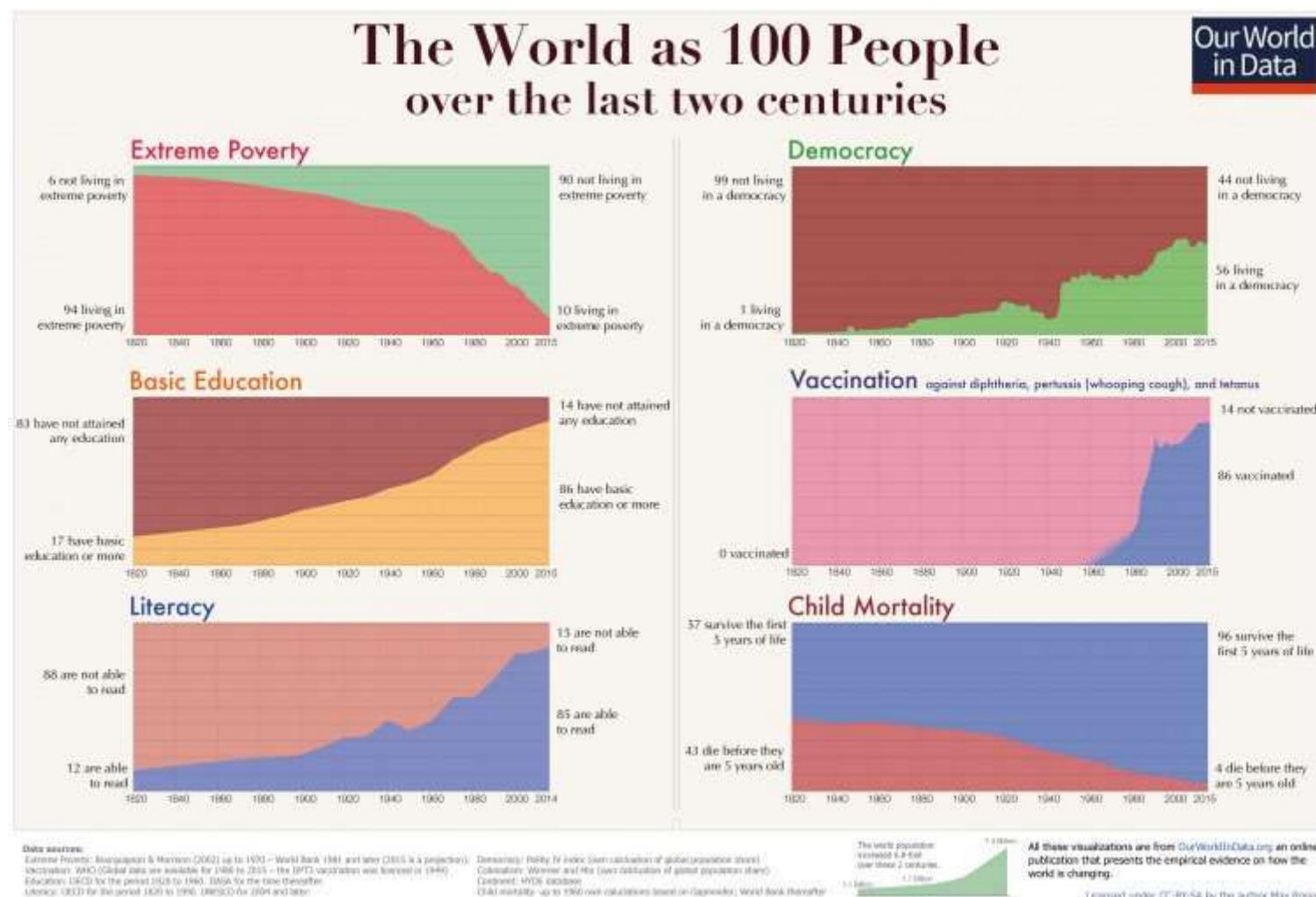




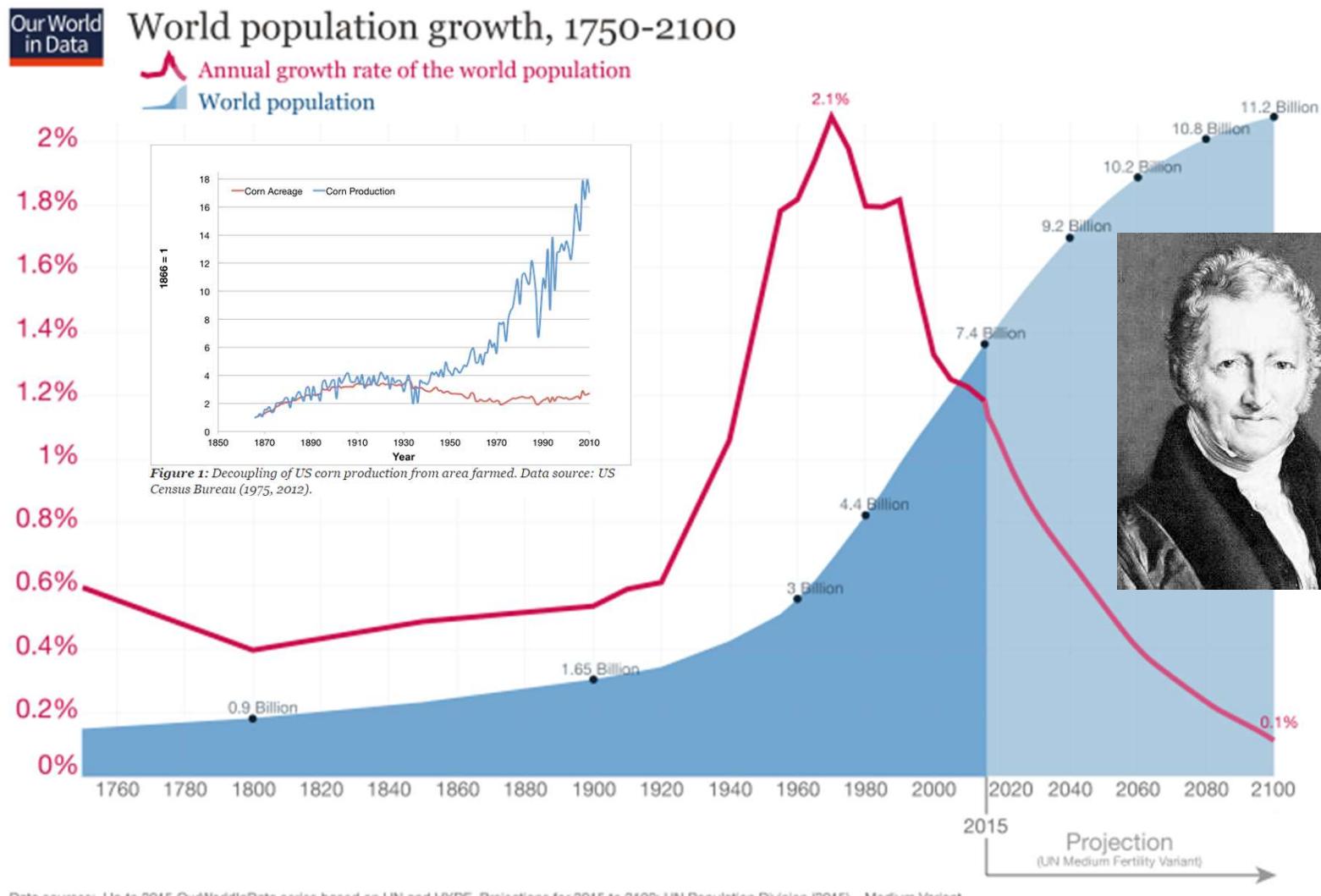
Slaughterbots



Techno-optimism!



Malthus was wrong!



The advent of the Distribution Era



The second economy

W. Brian Arthur

Digitization is creating a second economy that's vast, automatic, and invisible—thereby bringing the biggest change since the Industrial Revolution.

W. Brian Arthur is a visiting researcher with the Intelligent Systems Lab at the Palo Alto Research Center (PARC) and an external professor at the Santa Fe Institute. He is an economist and technology thinker and a pioneer in the science of complexity. His 1994 book, *Increasing Returns and Path Dependence in the Economy* (University of Michigan Press, December 1994), contains several of his seminal papers. More recently, Arthur was the author of *The Nature of Technology: What It Is and How It Evolves* (Free Press, August 2009).

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Tech titans, manufacturing midgets 2

Company valuations*, \$bn

US technology firms



German manufacturing firms



Source: Thomson Reuters

*At November 17th 2015

Economist.com

The value-distribution problem Google futurist and director of engineering: Basic income will spread worldwide by the 2030s



Ariel Schwartz [✉](#) [🐦](#)

© Apr. 14, 2018, 5:50 AM [1,541](#)



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Opinion



Universal Basic Income Didn't Fail in Finland. Finland Failed It.

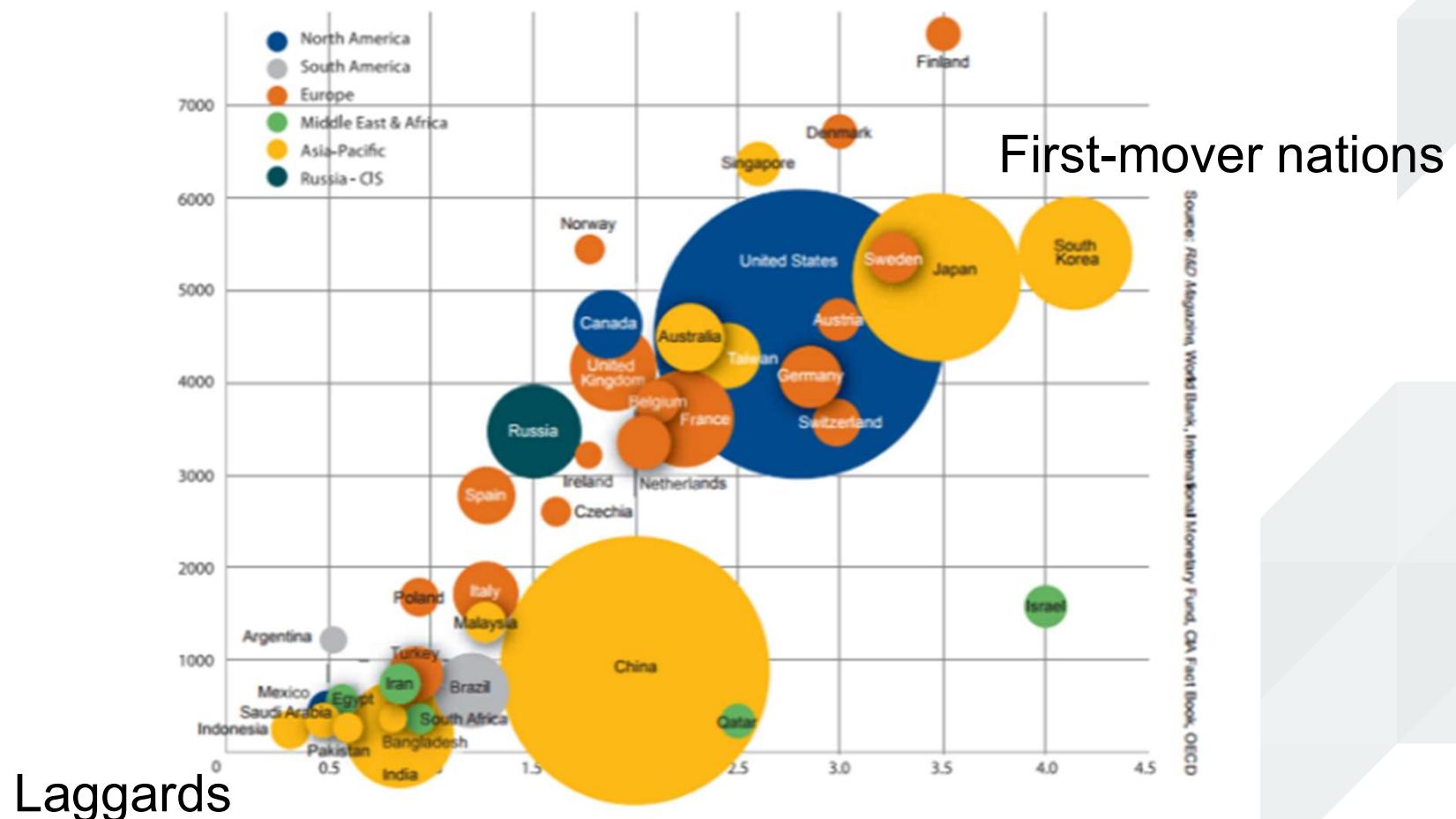
By **Antti Jauhiainen and Joona-Hermann Mäkinen**

Mr. Jauhiainen and Mr. Mäkinen are co-founders of Parecon Finland, a think tank focused on participatory economics and democracy.

May 2, 2018



The value-creation problem

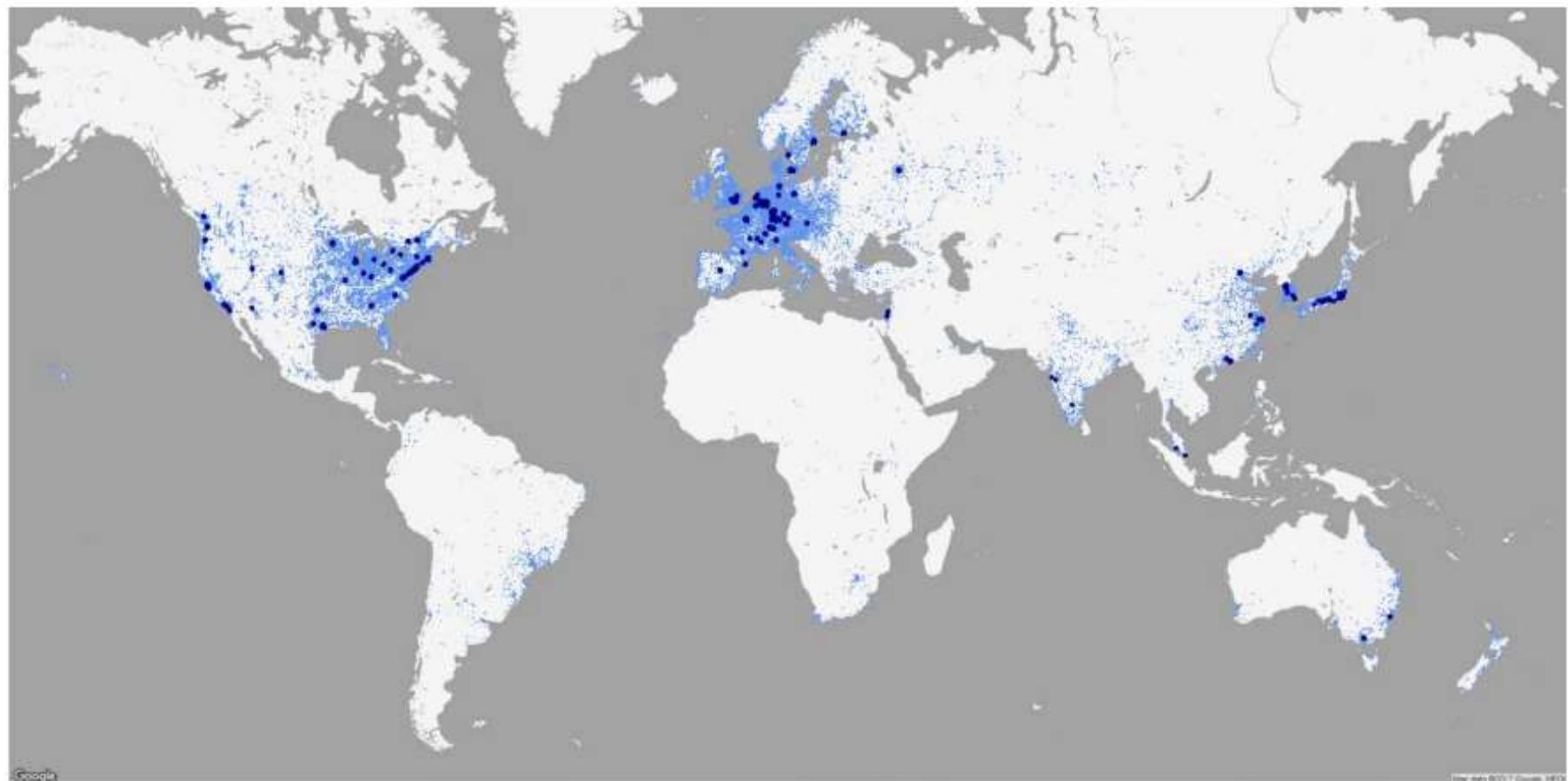


Bloomberg 2017 Innovation Index

2017 rank	2016 rank	YoY change	Economy	Total score	R&D intensity	Manufacturing value-added	Productivity	High-tech density	Tertiary efficiency	Researcher concentration	Patent activity
1	1	0	S. Korea	89.00	1	1	32	4	2	4	1
2	3	+1	Sweden	83.98	5	11	15	7	18	5	6
3	2	-1	Germany	83.92	9	3	16	5	12	16	9
4	5	+1	Switzerland	83.64	8	6	2	11	16	14	4
5	7	+2	Finland	83.26	4	13	20	15	5	3	5
6	6	0	Singapore	83.22	14	5	12	17	1	6	12
7	4	-3	Japan	82.64	3	9	28	8	27	9	3
8	9	+1	Denmark	81.93	6	17	5	13	22	2	11
9	8	-1	U.S.	81.44	10	22	10	1	34	20	2
10	11	+1	Israel	81.23	2	30	30	3	20	1	18
11	10	-1	France	80.99	12	34	18	2	10	18	10
12	13	+1	Austria	80.46	7	7	11	23	6	10	17
13	16	+3	Belgium	77.18	11	21	9	10	19	19	25
14	14	0	Norway	76.89	19	36	3	12	25	8	15
15	18	+3	Netherlands	75.23	17	24	19	6	44	15	19
16	15	-1	Ireland	74.94	22	2	6	16	13	22	31
17	17	0	U.K.	74.52	20	38	21	14	7	17	14
18	20	+2	Australia	73.33	13	44	1	20	21	12	21

Innovation is “sticky”

Figure 1: Top-100 clusters of inventive activity



Source: WIPO

Table 2: Cluster ranking

Rank	Cluster name	Territory(ies)	Number of PCT filings
1	Tokyo-Yokohama	Japan	94,079
2	Shenzhen-Hong Kong	China/Hong Kong (China)	41,218
3	San Jose-San Francisco, CA	United States	34,324
4	Seoul	Republic of Korea	34,187
5	Osaka-Kobe-Kyoto	Japan	23,512
6	San Diego, CA	United States	16,908
7	Beijing	China	15,185
8	Boston-Cambridge, MA	United States	13,810
9	Nagoya	Japan	13,515
10	Paris	France	13,461
11	New York, NY	United States	12,215
12	Frankfurt-Mannheim	Germany	11,813
13	Houston, TX	United States	9,825
14	Stuttgart	Germany	9,528
15	Seattle, WA	United States	8,396
16	Cologne-Dusseldorf	Germany	7,957
17	Chicago, IL	United States	7,789
18	Eindhoven	Netherlands/Belgium	7,222
19	Shanghai	China	6,639
20	Munich	Germany	6,578
21	London	United Kingdom	6,548
22	Tel Aviv	Israel	5,659
23	Daejeon	Republic of Korea	5,507
24	Stockholm	Sweden	5,211
25	Los Angeles, CA	United States	5,027

Source: WIPO

Top R&D spenders

strategy&



PwC > Consulting > Strategy > Global Innovation 1000

2017 Rank	Company Name	Country	Industry group	2016	2017	2016	2017	2016	2017
1	Amazon.com, Inc.	United States	Retailing	12.5	16.1	107.0	136.0	11.7%	11.8%
2	Alphabet Inc.	United States	Software and Services	12.3	13.9	75.0	90.3	16.4%	15.5%
3	Intel Corporation	United States	Semiconductors and Semicon...	12.1	12.7	55.4	59.4	21.9%	21.5%
4	Samsung Electronics Co., Ltd.	South Korea	Technology Hardware and Eq...	12.0	12.7	166.7	167.7	7.2%	7.6%
5	Volkswagen Aktiengesellschaft	Germany	Automobiles and Components	12.5	12.1	225.2	229.4	5.6%	5.3%
6	Microsoft Corporation	United States	Software and Services	12.0	12.0	93.6	85.3	12.9%	14.1%
7	Roche Holding AG	Switzerland	Pharmaceuticals, Biotechnolo...	9.4	11.4	49.6	51.8	19.0%	21.9%
8	Merck & Co., Inc.	United States	Pharmaceuticals, Biotechnolo...	6.7	10.1	39.5	39.8	17.0%	25.4%
9	Apple Inc.	United States	Technology Hardware and Eq...	8.1	10.0	233.7	215.6	3.5%	4.7%
10	Novartis AG	Switzerland	Pharmaceuticals, Biotechnolo...	9.5	9.6	50.4	49.4	18.8%	19.4%
11	Toyota Motor Corporation	Japan	Automobiles and Components	9.5	9.3	254.7	247.5	3.7%	3.8%

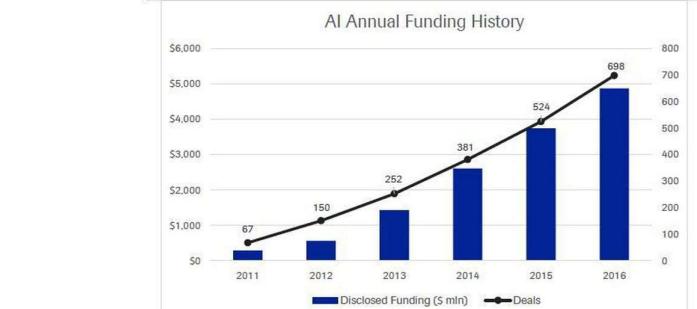
Richest companies by market cap

Rank		First quarter ^{[21][note 1]}		Second quarter ^{[22][note 1]}		Third quarter ^{[23][note 1]}		Fourth quarter
1	USA	Apple Inc. ▲ 753,718		USA Apple Inc. ▼ 749,124		USA Apple Inc. ▲ 791,726		USA Apple Inc. ▲ 868,880 ^[11]
2	USA	Alphabet Inc. ▲ 573,570 ^[12]		USA Alphabet Inc. ▲ 628,610 ^[12]		USA Alphabet Inc. ▲ 664,550 ^[12]		USA Alphabet Inc. ▲ 727,040 ^[12]
3	USA	Microsoft ▲ 508,935		USA Microsoft ▲ 528,778		USA Microsoft ▲ 568,965		USA Microsoft ▲ 659,910 ^[13]
4	USA	Amazon.com ▲ 423,031		USA Amazon.com ▲ 466,471		USA Amazon.com ▼ 459,435		USA Amazon.com ▲ 563,540 ^[14]
5	USA	Berkshire Hathaway ▲ 410,880 ^[16]		USA Berkshire Hathaway ▲ 418,880 ^[16]		USA Berkshire Hathaway ▲ 451,840 ^[16]		USA Facebook ▲ 512,760 ^[18]
6	USA	ExxonMobil ▲ 339,897		USA Johnson & Johnson ▲ 357,310	CHN	Alibaba Group ▲ 436,850 ^[17]	CHN	Tencent ▲ 493,340 ^[24]
7	USA	Johnson & Johnson ▲ 337,947		USA Facebook ▲ 357,176	CHN	Tencent ▲ 405,007	USA	Berkshire Hathaway ▲ 489,490 ^[16]
8	USA	Facebook ▲ 334,552	CHN	Alibaba Group ▲ 356,390 ^[17]		USA Facebook ▲ 399,946	CHN	Alibaba Group ▲ 440,712 ^[24]
9	USA	JPMorgan Chase ▲ 313,761	CHN	Tencent ▲ 344,879		USA ExxonMobil ▲ 348,248	USA	Johnson & Johnson ▲ 375,360 ^[20]
10	USA	Wells Fargo ▲ 278,516		USA ExxonMobil ▲ 341,947		USA Johnson & Johnson ▼ 347,497	USA	JPMorgan Chase ▲ 371,050 ^[19]

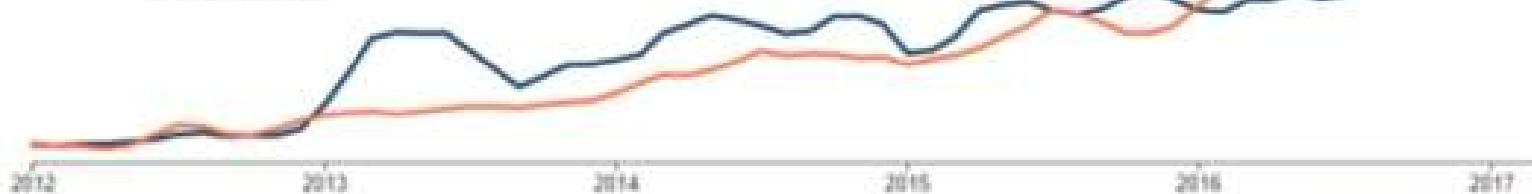
MEDIA TRENDS: AI VS BIG DATA

● Big Data
● AI OR Artificial Intelligence

AI Annual Funding History



Source: Cowen and Company; CB Insights



CB INSIGHTS

CB INSIGHTS

www.cbinsights.com

16

Tech Giants Are Paying Huge Salaries for Scarce A.I. Talent

Nearly all big tech companies have an artificial intelligence project, and they are willing to pay experts millions of dollars to help get it done.

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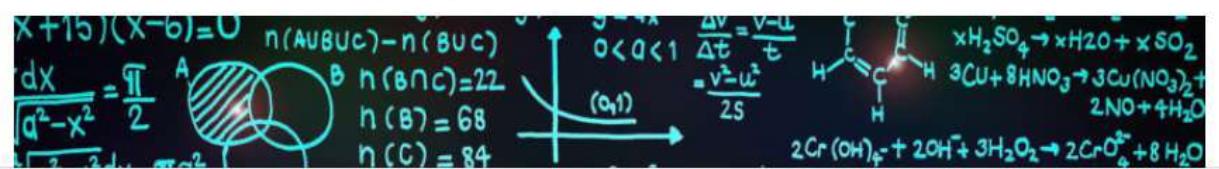
By CADE METZ OCT. 22, 2017

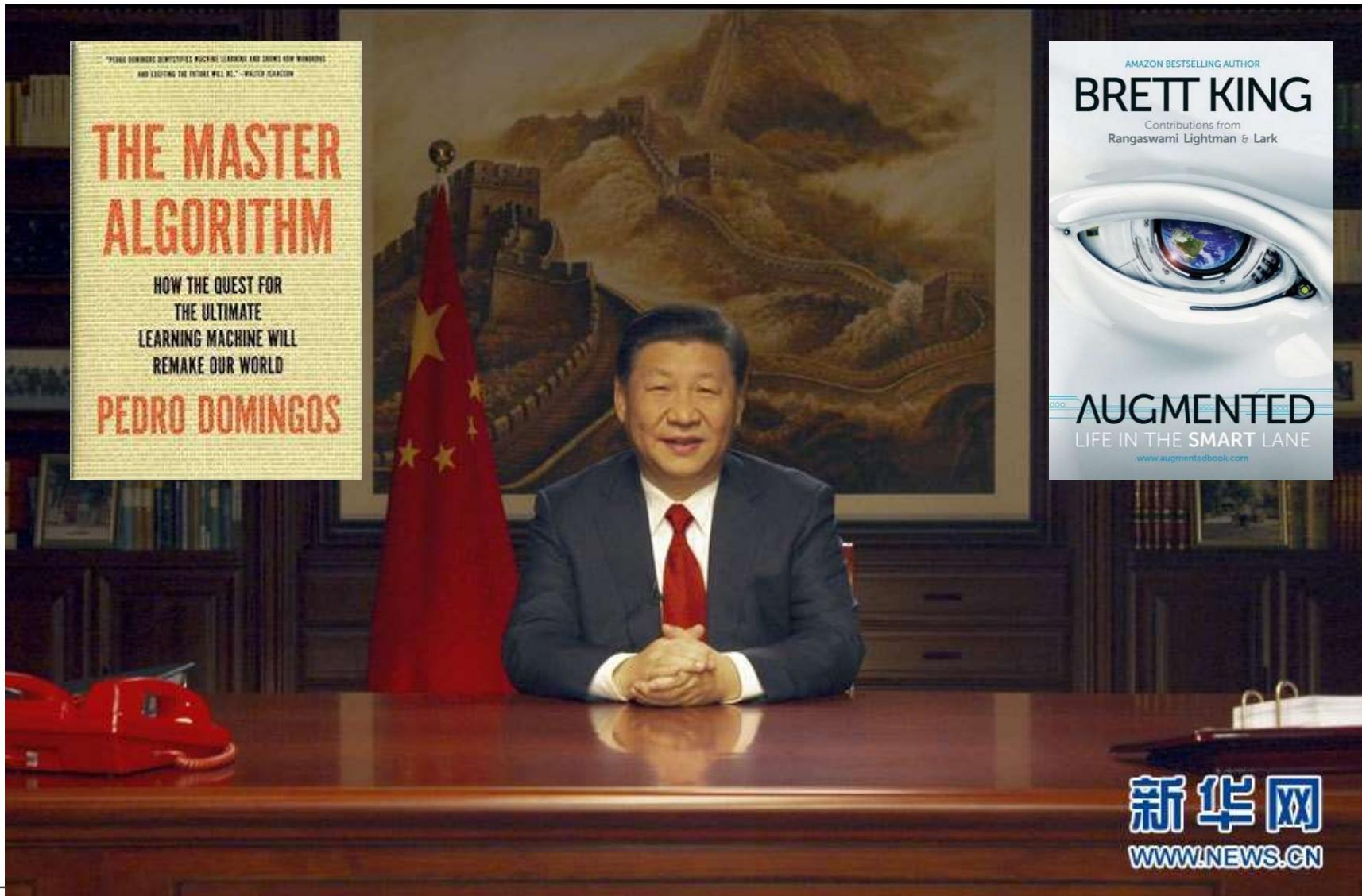


Amazon vs. Google vs. Microsoft: Big tech firms gird for AI talent battle

Companies will pay handsomely for top scientists and engineers.

Greg Sterling on March 1, 2018 at 1:25 pm







The image shows the top navigation bar of the CNBC website. It features the NBC peacock logo and the word "CNBC" in white on a dark blue background. To the right is a search bar with the placeholder "Search Quotes, News & Video" and a magnifying glass icon. Below the search bar is a horizontal menu with links: HOME, NEWS, MARKETS, INVESTING, TECH, MAKE IT, VIDEO, SHOWS, and MORE. To the right of the menu is another NBC logo. Further right are three buttons: "PRO" (green), "LIVE TV" (orange), and "WATCHLIST" (blue). A user profile icon is also present.

TECH

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China is building a giant \$2.1 billion research park dedicated to developing A.I.

- China is planning to build a 13.8 billion yuan (\$2.1 billion) technology park for the development of artificial intelligence

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China Now Has the Most Valuable AI Startup in the World

Bloomberg News

9 de abril de 2018 3:00 CEST

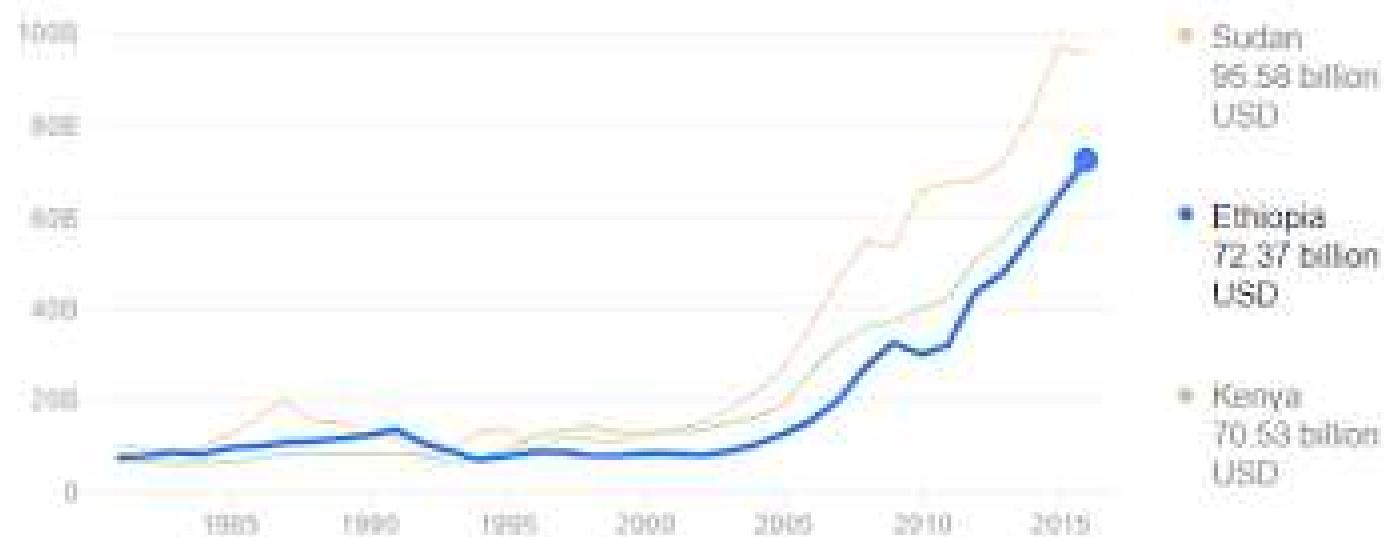
- It becomes the world's richest-valued private AI startup
- The company drives China's ambition to dominate global AI



África, the next China?

Ethiopia / Gross domestic product

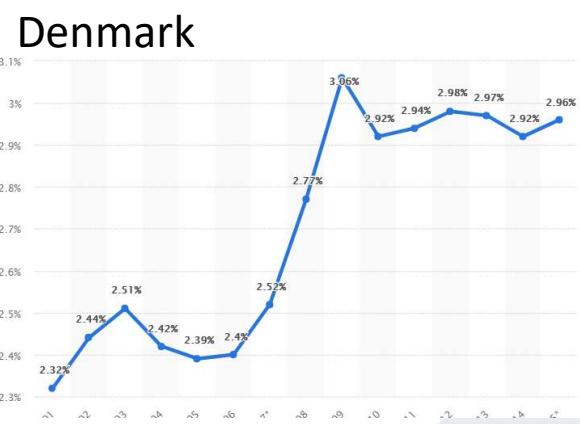
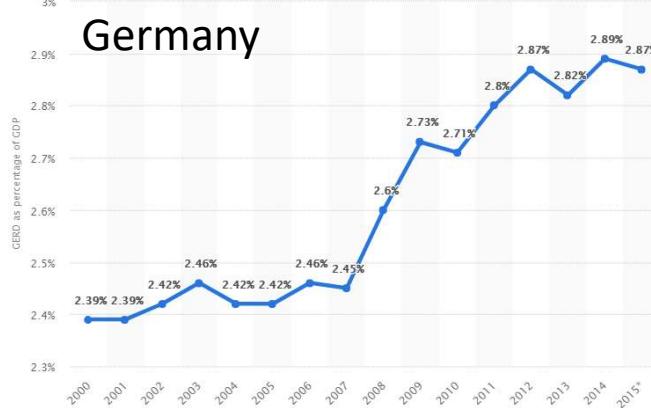
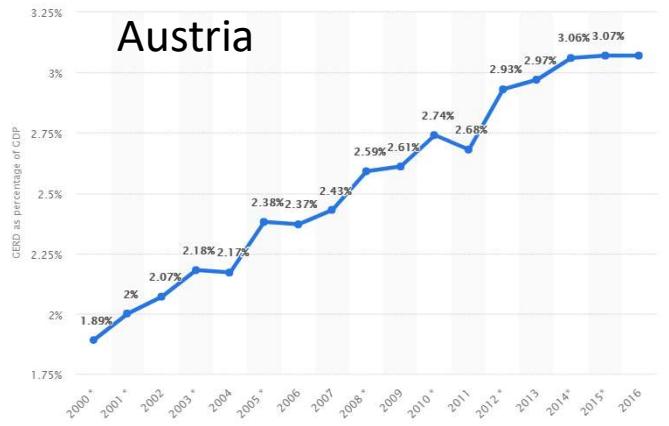
72.37 billion USD (2016)



Explore more

Sources include: World Bank

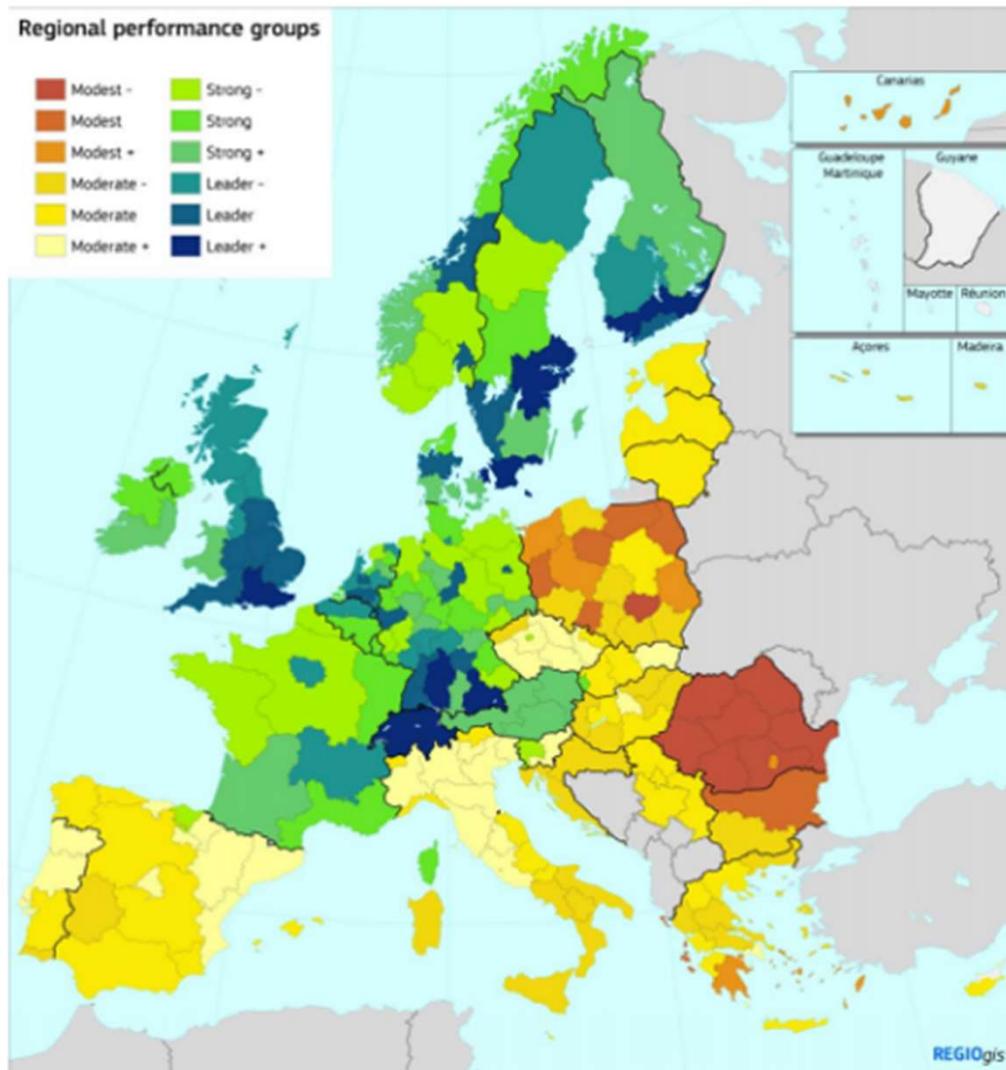
Feedback



Regional Innovation Scoreboard

Regional performance groups

- Modest -
- Modest
- Modest +
- Moderate -
- Moderate
- Moderate +
- Strong -
- Strong
- Strong +
- Leader -
- Leader
- Leader +





**“I can convince
my country about
change precisely
because I embrace
it.”**

INTERVIEW WITH WIRED
THURSDAY, MARCH 29TH, 2018



Macron's €1.5 billion plan to drag France into the age of artificial intelligence

Paris unveils plans to drag country into the age of artificial intelligence.



TECH • ARTIFICIAL INTELLIGENCE

United Kingdom Plans \$1.3 Billion Artificial Intelligence Push



APR 26, 2018 @ 05:38 PM 1,981 ▾

2 Free Issues of

Britain, France And Germany Fight It Out To Be Europe's AI Leader



Sam Shead, CONTRIBUTOR

I cover artificial intelligence and Google DeepMind. [FULL BIO ▾](#)

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POWERHOUSE

Portugal generated enough renewable energy to power the whole country in March



UNIVERSITAT DE VIC
UNIVERSITAT CENTRAL DE CATALUNYA



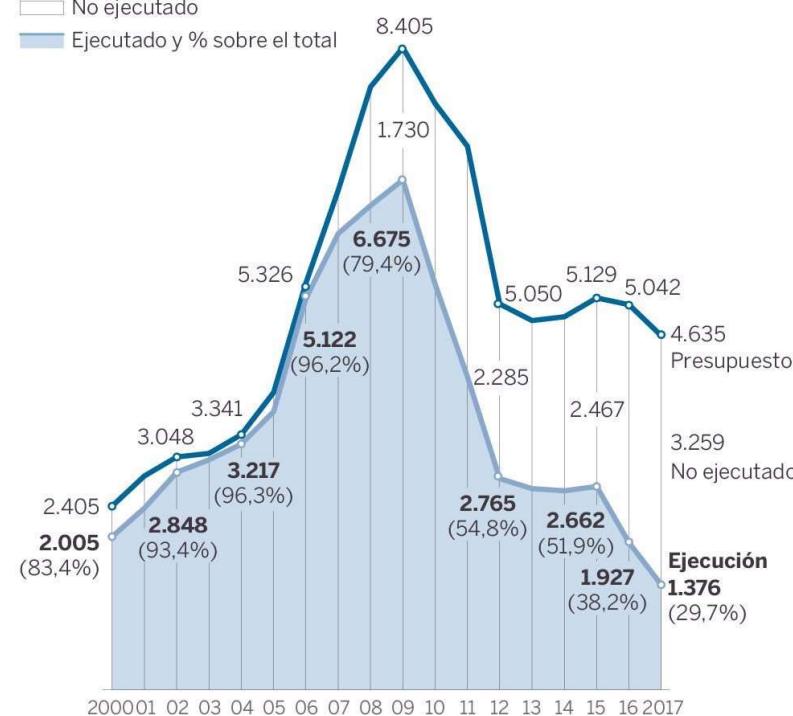
Bye bye, Europe?



EJECUCIÓN DEL PRESUPUESTO DEL ESTADO EN INNOVACIÓN

En millones de euros

- Presupuesto
- No ejecutado
- Ejecutado y % sobre el total

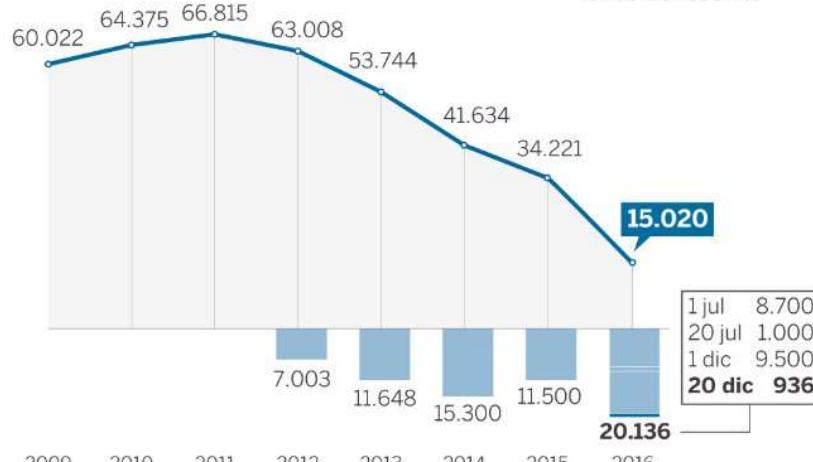


FONDO DE RESERVA DE LA SEGURIDAD SOCIAL

En millones de euros

- Fondo acumulado

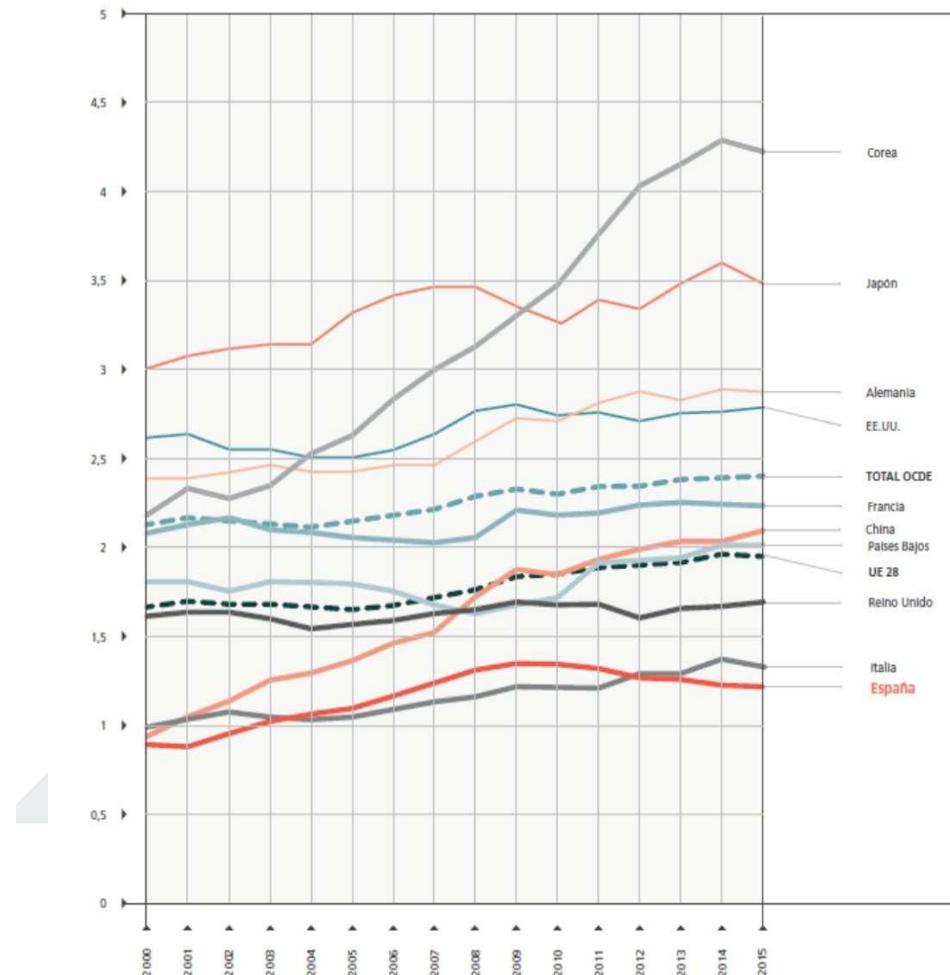
- Retiradas del fondo de reserva

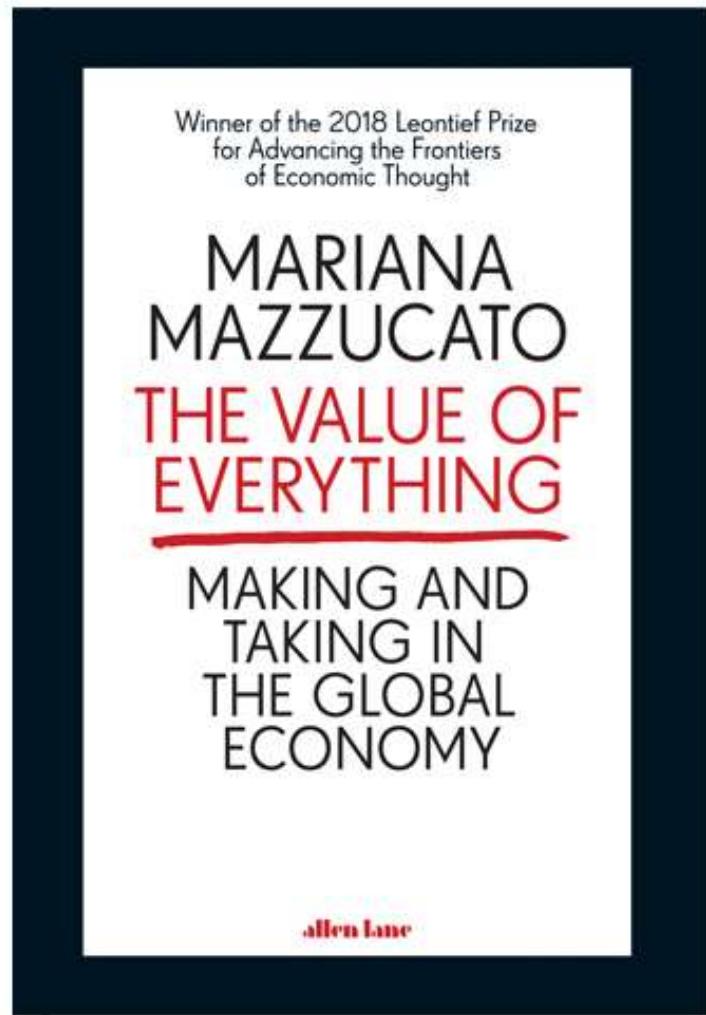


Fuente: Ministerio de Empleo y Seguridad Social. EL PAÍS

I+D en España

Gráfico 58. Evolución del esfuerzo en I+D, en gasto como % PIB. Periodo 2000 a 2015.





'MAZZUCATO'S IDEAS ARE FUEL FOR A GROWING POLITICAL DEBATE ABOUT WHAT PORTION OF THE COUNTRY'S WEALTH SHOULD BE TAKEN BY THE PRIVATE SECTOR'
RANA FOROOHAR, TIME

'ONE OF THE MOST OUTSTANDING ECONOMISTS OF OUR GENERATION'
CHRISTIAN KERN,
FORMER CHANCELLOR OF AUSTRIA

Thanks for your attention!
Xavier Ferràs
Xavier.ferras@uvic.cat
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