

Tendències IND+I 2017

Què ha passat en el darrer any

Xavier Ferràs, MBA, PhD

Viladecans, 26 d'Abril de 2017

The Economist

OCTOBER 4TH-10TH 2008

www.economist.com

World on the edge

- Our guide to America's election
- Europe's Schadenfreude
- Music on your phone
- Reassessing China
- Somalia's pirates





How Sarah Palin Took On Big Oil—And (Sort of) Won



The Extreme TB Epidemic: Photos By James Nachtwey

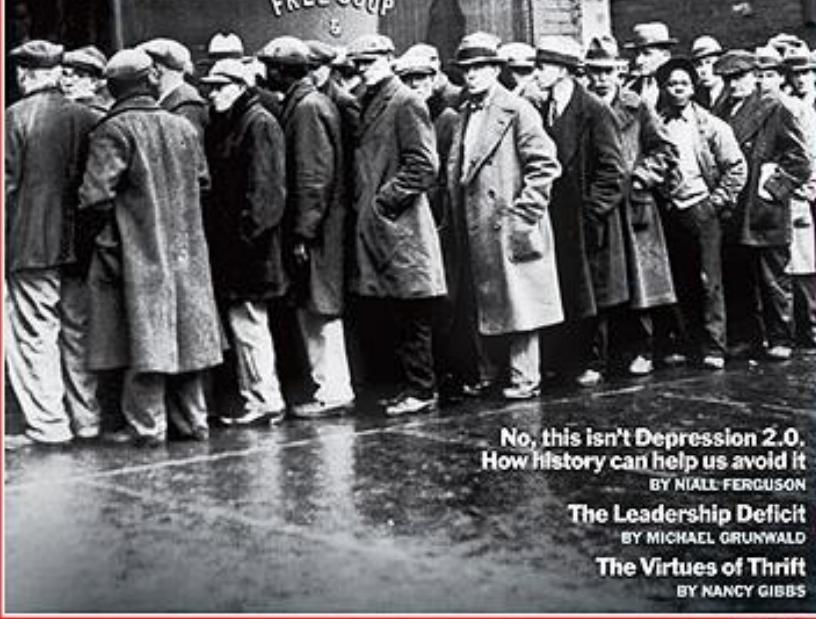


Robert Redford Remembers Paul Newman

TIME

The New Hard Times

FREE SOUP

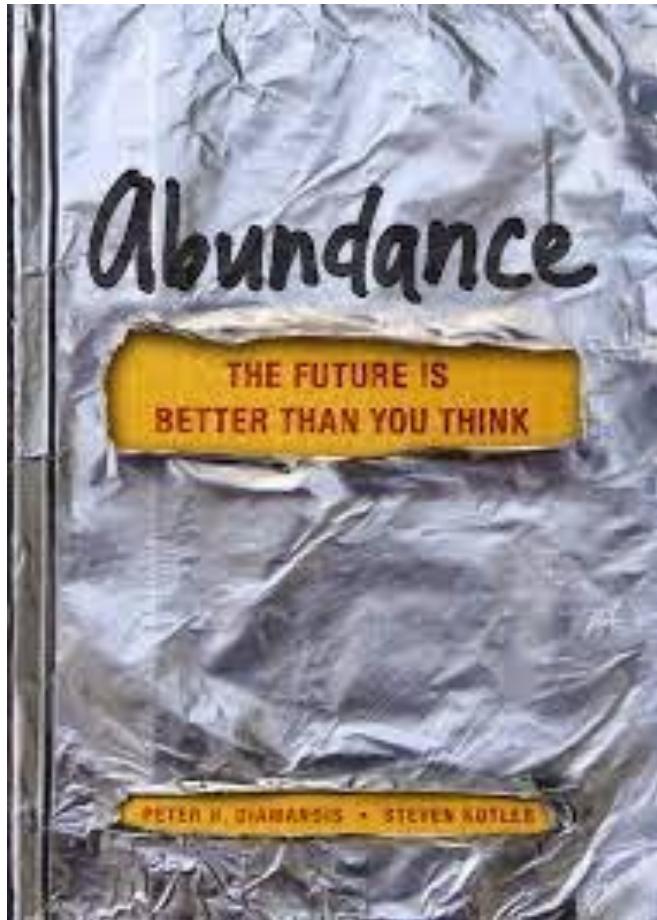


No, this isn't Depression 2.0. How history can help us avoid it
BY NIALE FERGUSON

The Leadership Deficit
BY MICHAEL GRUNWALD

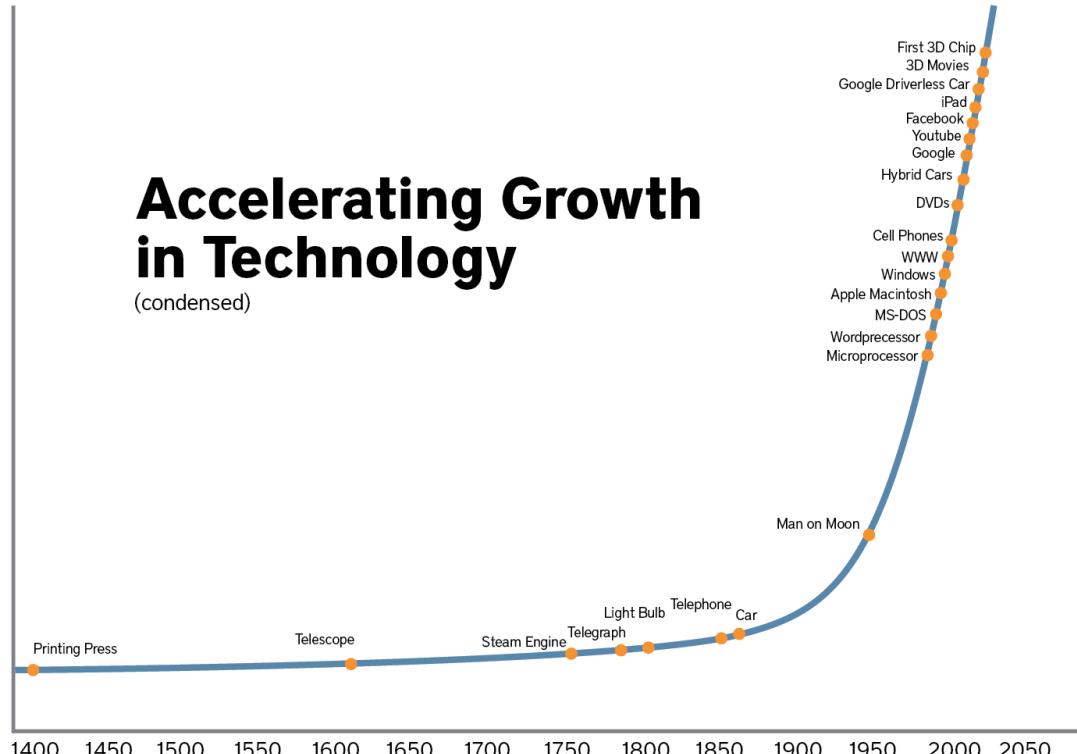
The Virtues of Thrift
BY NANCY GIBBS

A World of Exponential Growing

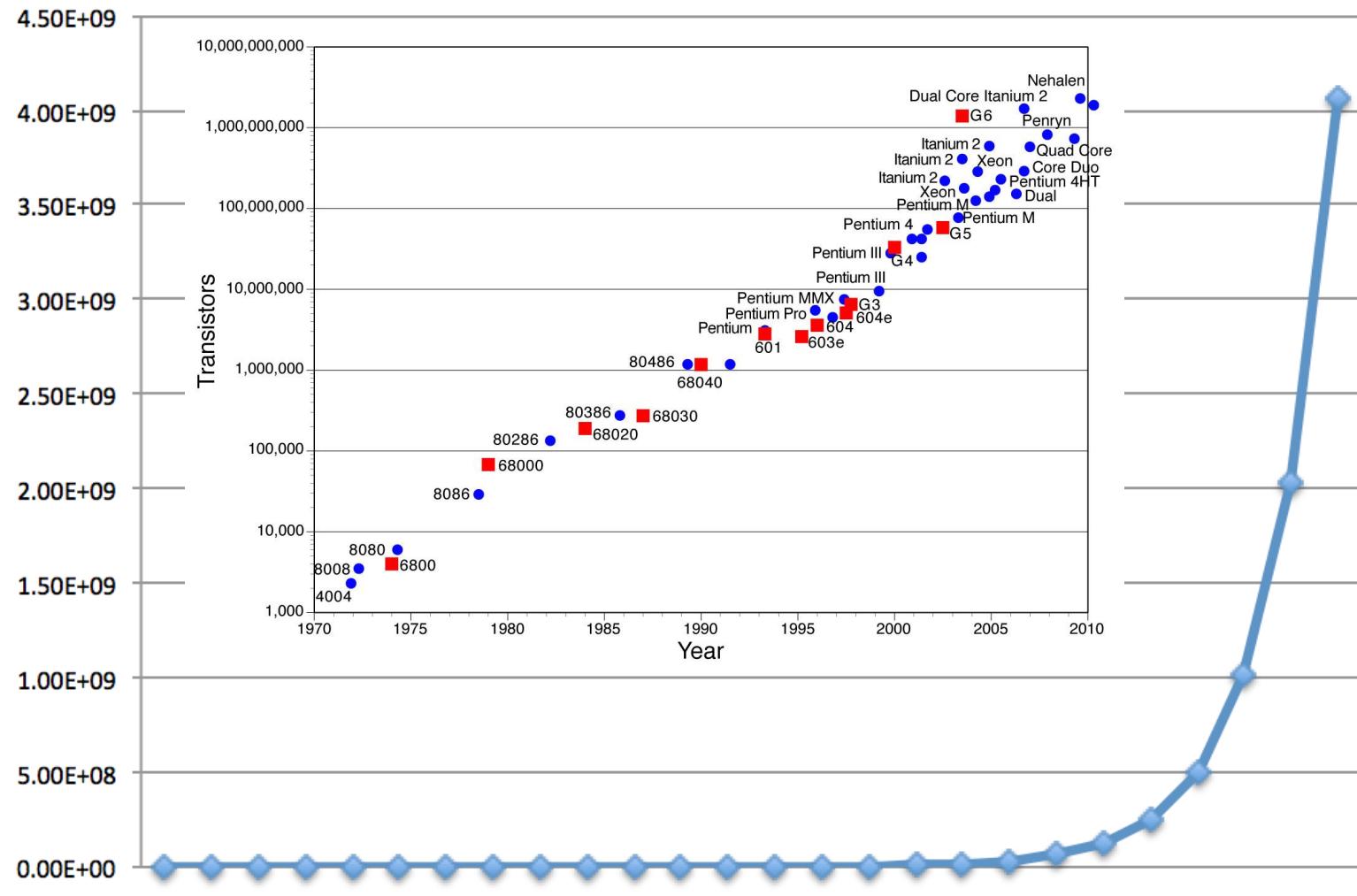


Accelerating Growth in Technology

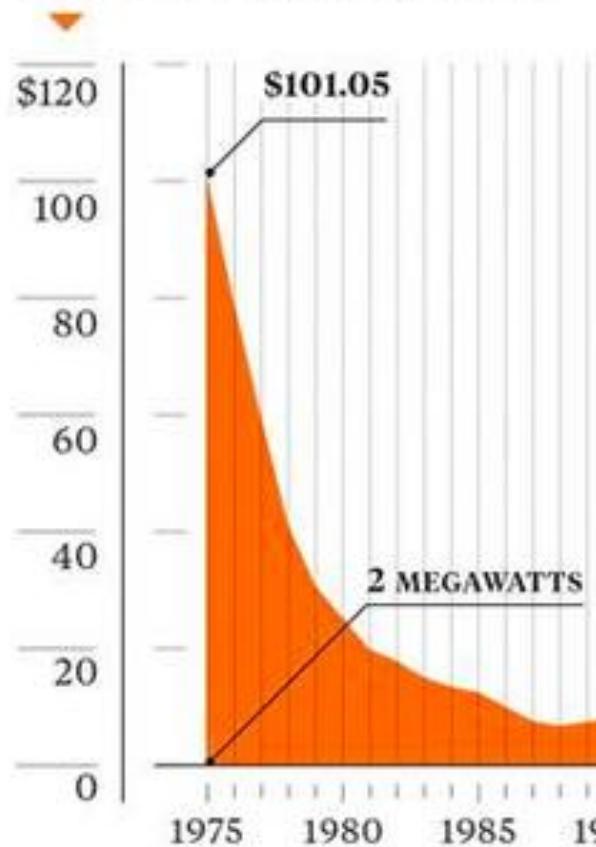
(condensed)



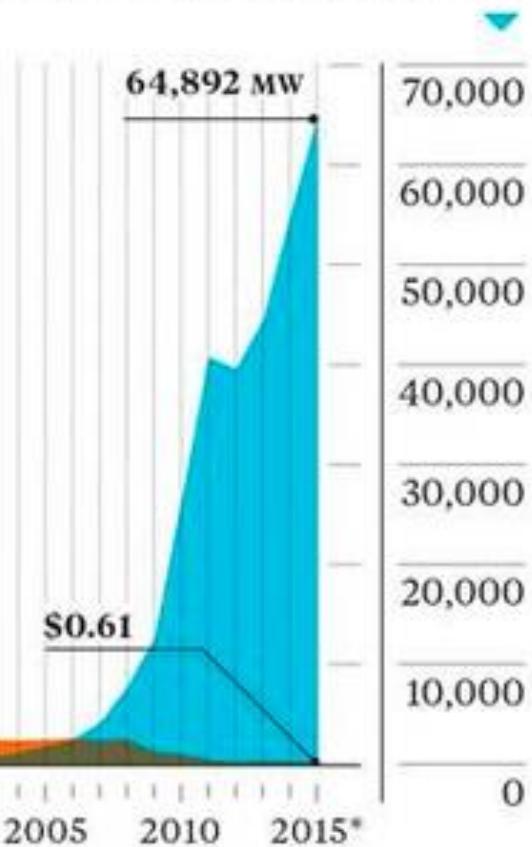
Transistors per chip over 50 years (Moore's Law)



Price of a solar panel per watt



Global solar panel installations



16 de Maig de 2016



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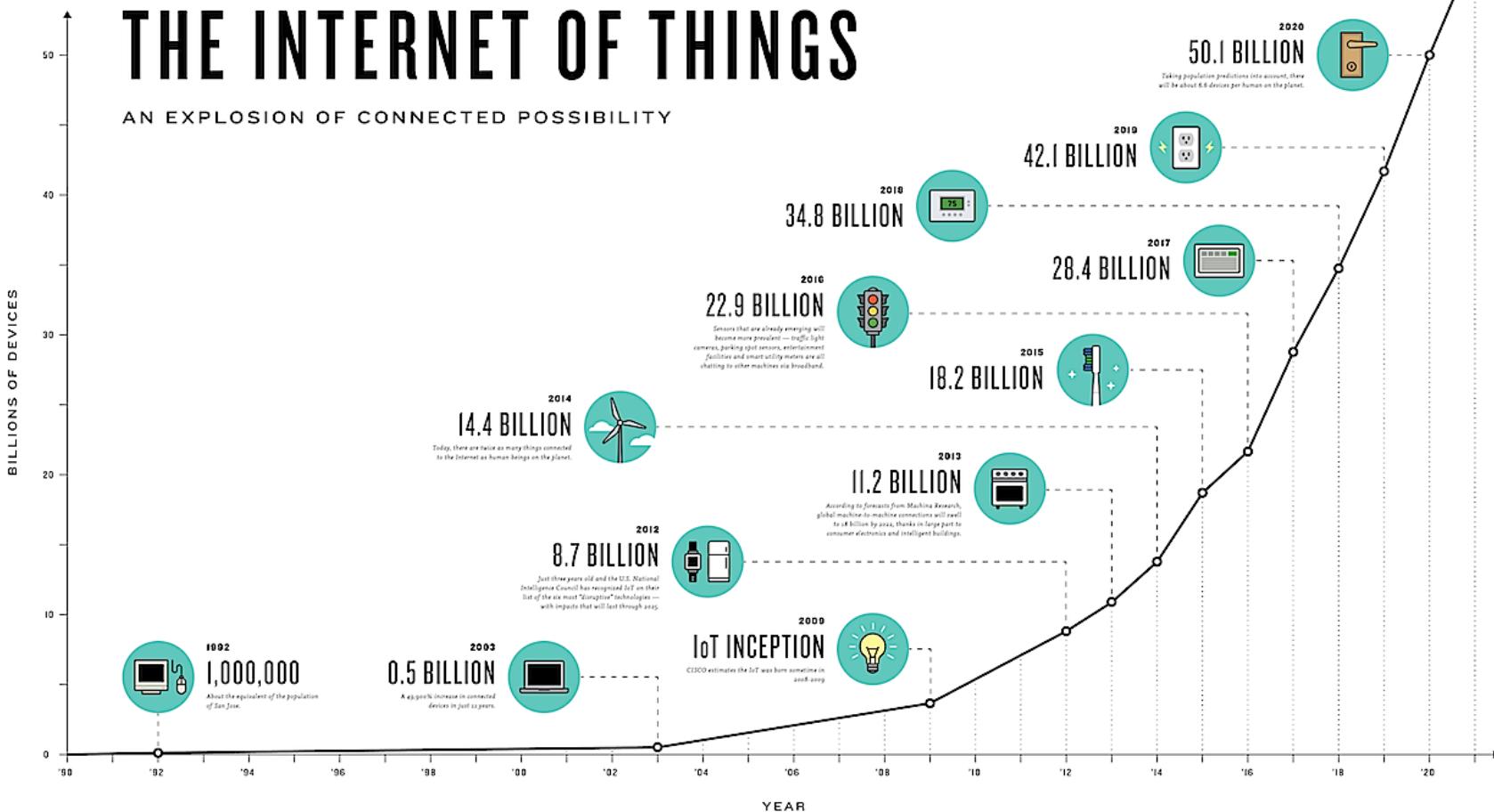


Germany Just Got Almost All of Its Power From Renewable Energy

Photographer: Kristian Boos/Bloomberg

THE INTERNET OF THINGS

AN EXPLOSION OF CONNECTED POSSIBILITY

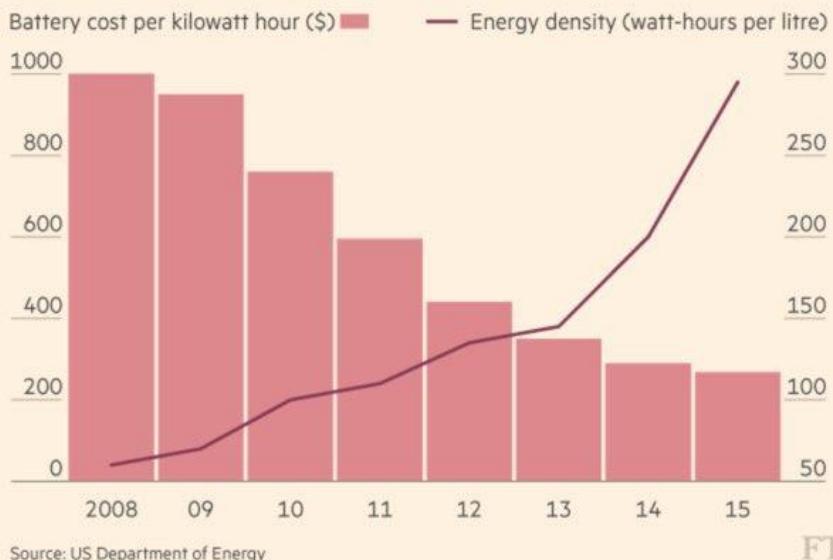


It's All About the Batteries

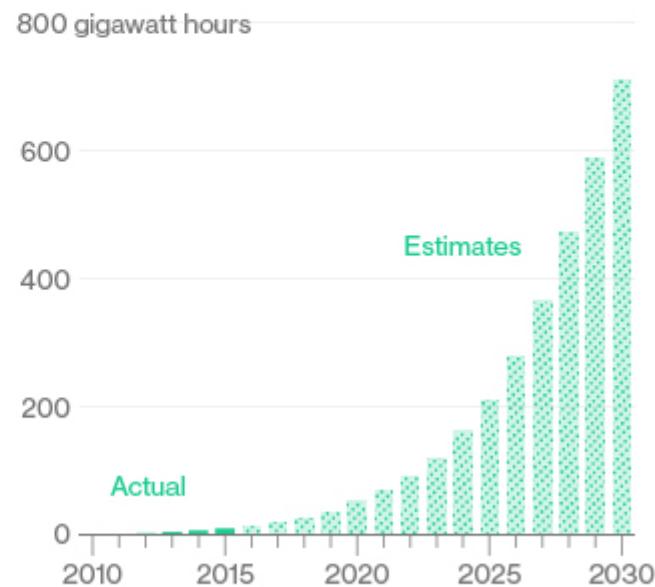
Batteries make up a third of the cost of an electric vehicle.
As battery costs continue to fall, demand for EVs will rise.

Cost for lithium-ion battery packs

Evolution of lithium-ion batteries



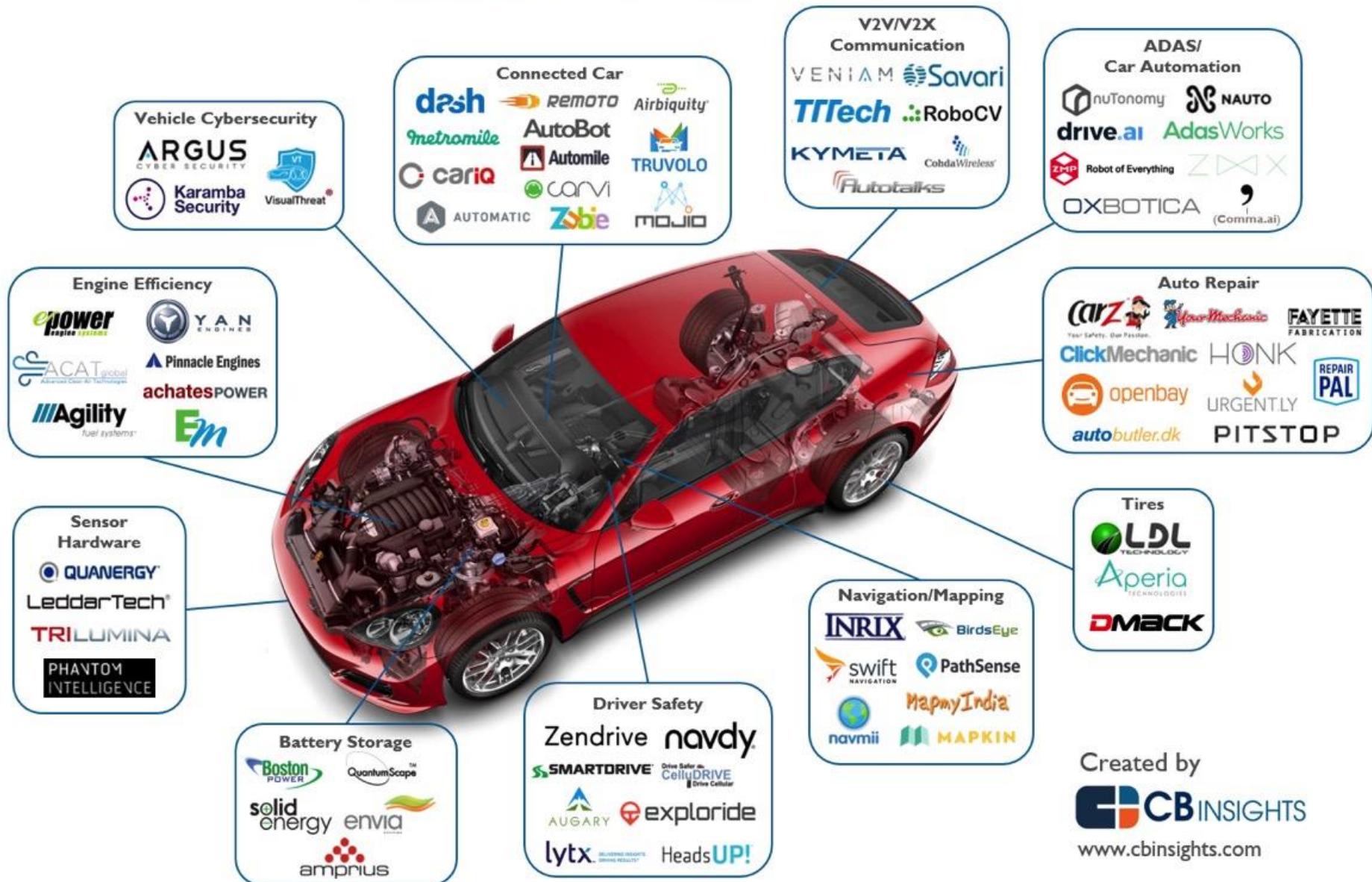
Yearly demand for EV battery power



Source: Data compiled by Bloomberg New Energy Finance

Bloomberg

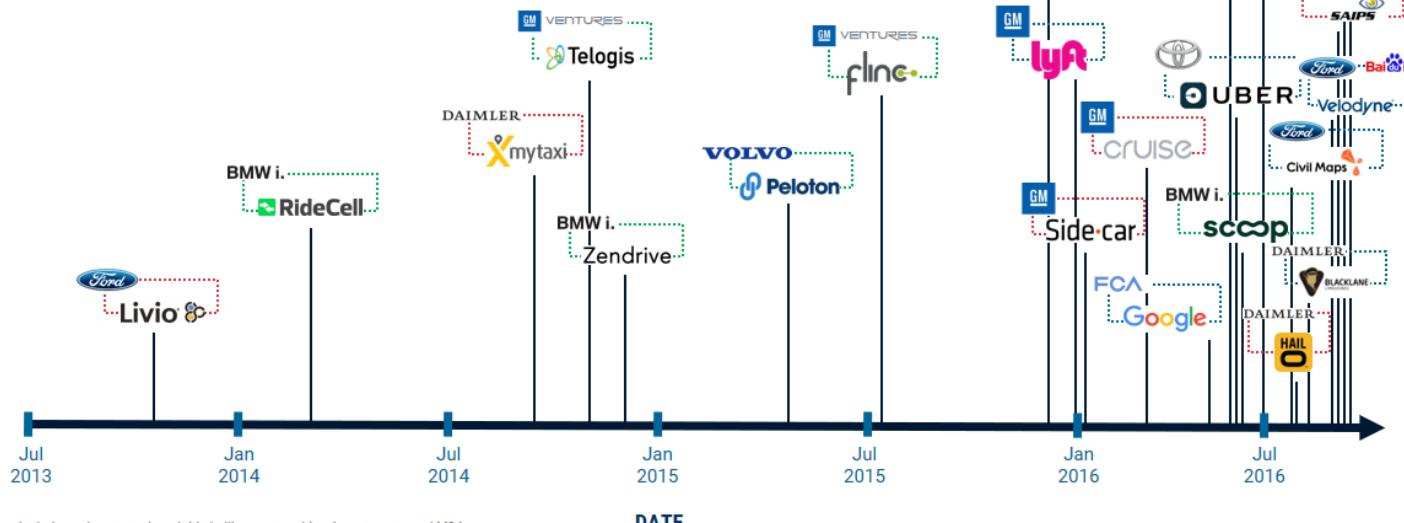
Unbundling The Automobile





BIG AUTO'S MOVES IN AUTO TECH AND RIDE-HAILING

MAJOR TECH PARTNERSHIPS, INVESTMENTS, & ACQUISITIONS



Includes only auto tech and ride-hailing partnerships, investments, and M&A.
Investments mark date of first investment for a corporation/CVC.

DATE

NEWS / BEST COUNTRIES / BEST COUNTRIES

www.cbinsights.com

First Self-Driving Cars Debut in Singapore

The city-state's collaboration with a U.S. startup is ahead of initiatives by Uber and other companies.

Uber Debuts Self-Driving Cars in Pittsburgh

A Lab-Grown Burger Gets a Taste Test

By HENRY FOUNTAIN AUG. 5, 2013



Mark Post, a Dutch researcher at the University of Maastricht, held a sample of in-vitro, or cultured meat. The project

1 MINUTE READ

The \$325,000 Lab-Grown Hamburger Now Costs Less Than \$12

A real burger made without the cruelty and pollution is now within reach.

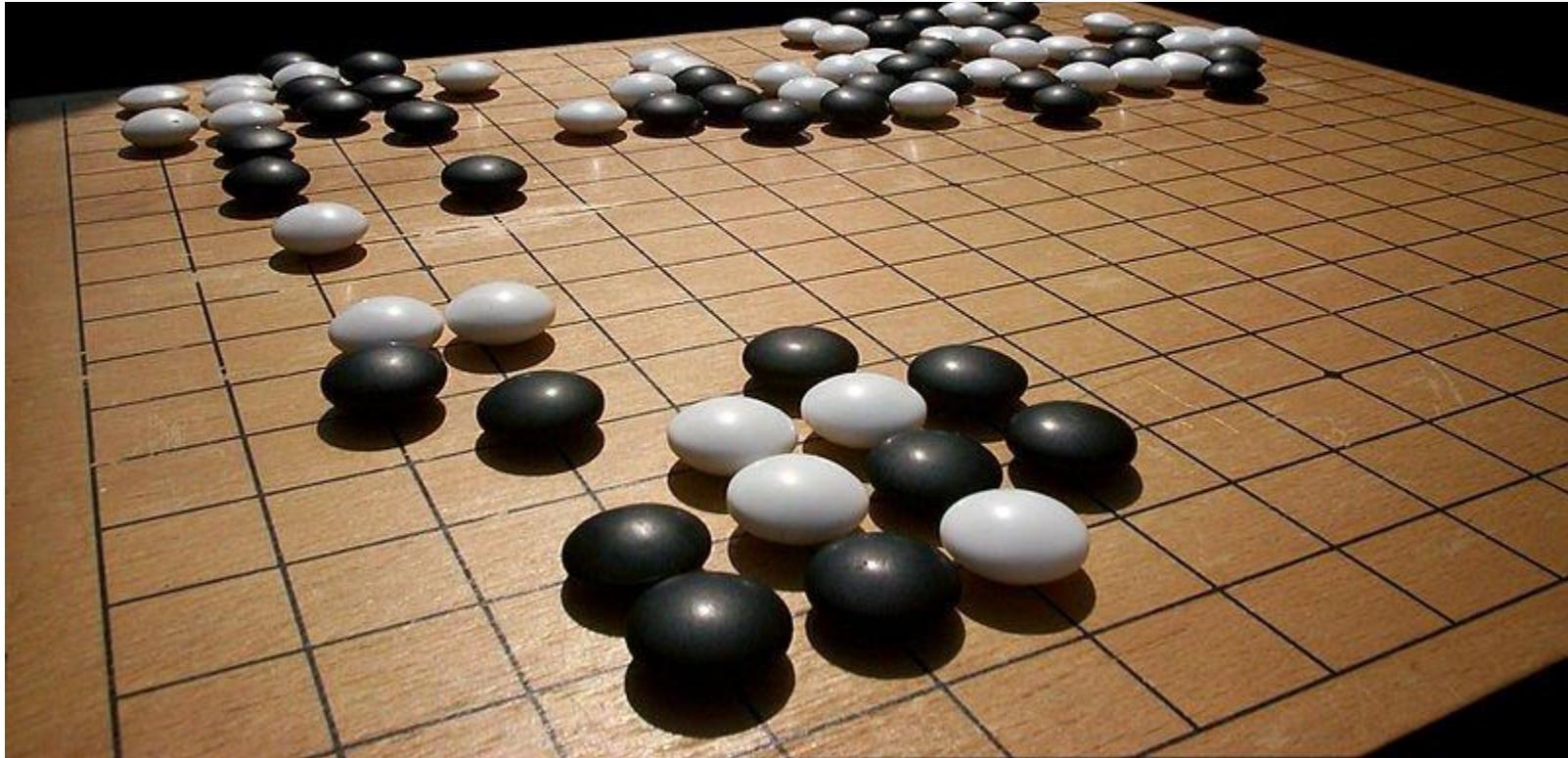






Google AI beats Go world champion again to complete historic 4-1 series victory

Posted Mar 15, 2016 by [Jon Russell \(@jonrussell\)](#)



AI just 3D printed a brand-new Rembrandt, and it's shockingly good

The Next Rembrandt project used data and deep learning to produce uncanny results



*there is no one else in the world.
there is no one else in sight.
they were the only ones who mattered.
they were the only ones left.
he had to be with me.
she had to be with him.
i had to do this.
i wanted to kill him.
i started to cry.
i turned to him.*

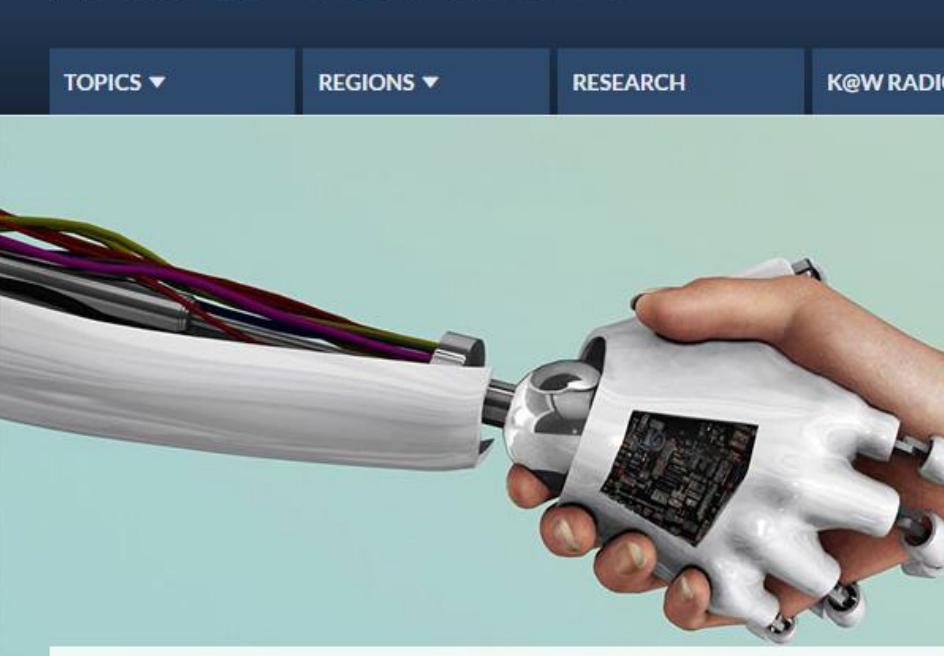
*this was the only way.
it was the only way.
it was her turn to blink.
it was hard to tell.
it was time to move on.
he had to do it again.
they all looked at each other.
they all turned to look back.
they both turned to face him.
they both turned and walked away.*

*i dont like it , he said.
i waited for what had happened.
it was almost thirty years ago.
it was over thirty years ago.
that was six years ago.
he had died two years ago.
ten , thirty years ago.
" it 's all right here.*

AI Computer Beats Human Poker Players by Nearly \$800,000



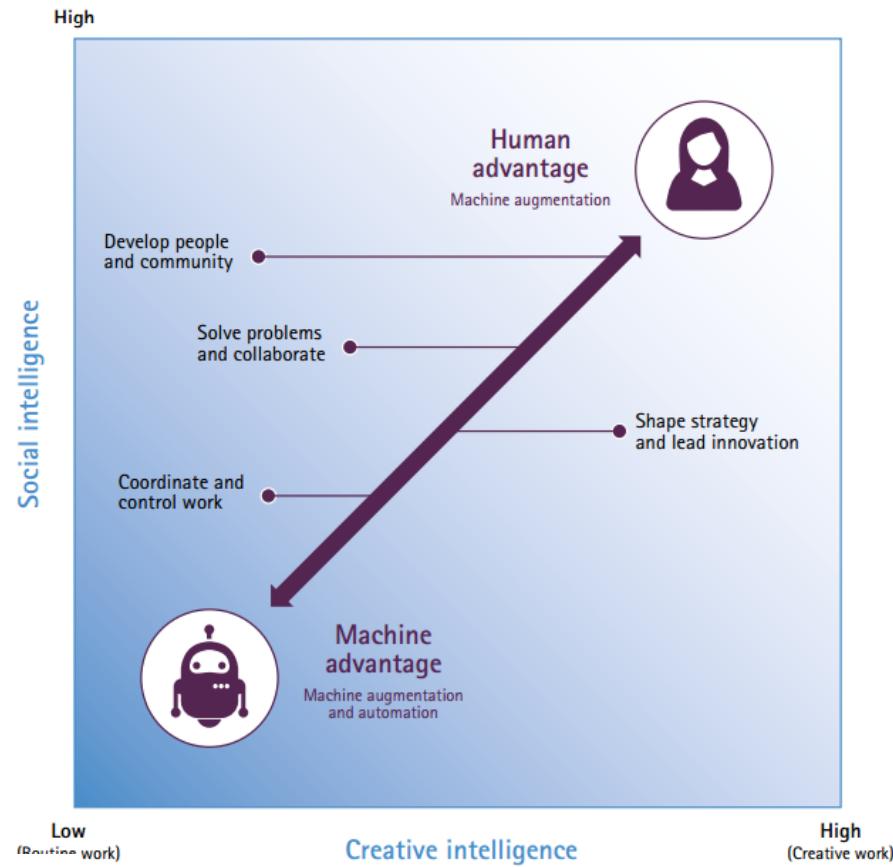
World's largest hedge fund to replace managers with artificial intelligence



MANAGEMENT

Can a Robot Be Your Boss?

Insurance firm to replace human workers with AI system



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



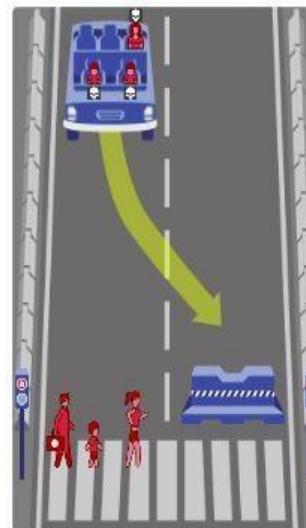
Apple joins research group for ethical AI with fellow tech giants

by James Vincent | [@jjvincent](#) | Jan 27, 2017, 7:02am EST

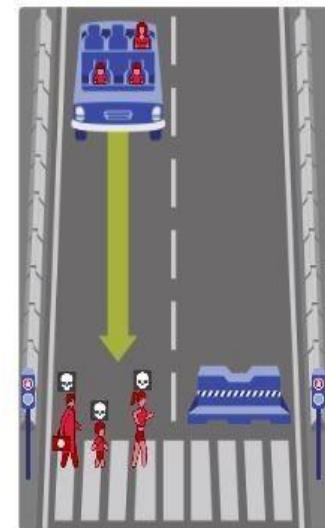
[!\[\]\(76571bca9499390beeae0a355d0e74a9_img.jpg\) SHARE](#) [!\[\]\(252c453ce8bf12288303f5e0aad9760a_img.jpg\) TWEET](#) [!\[\]\(446f8e4f0cf83bbdc6ff4e80979b1eae_img.jpg\) LINKEDIN](#)



What should the self-driving car do?



Show Description

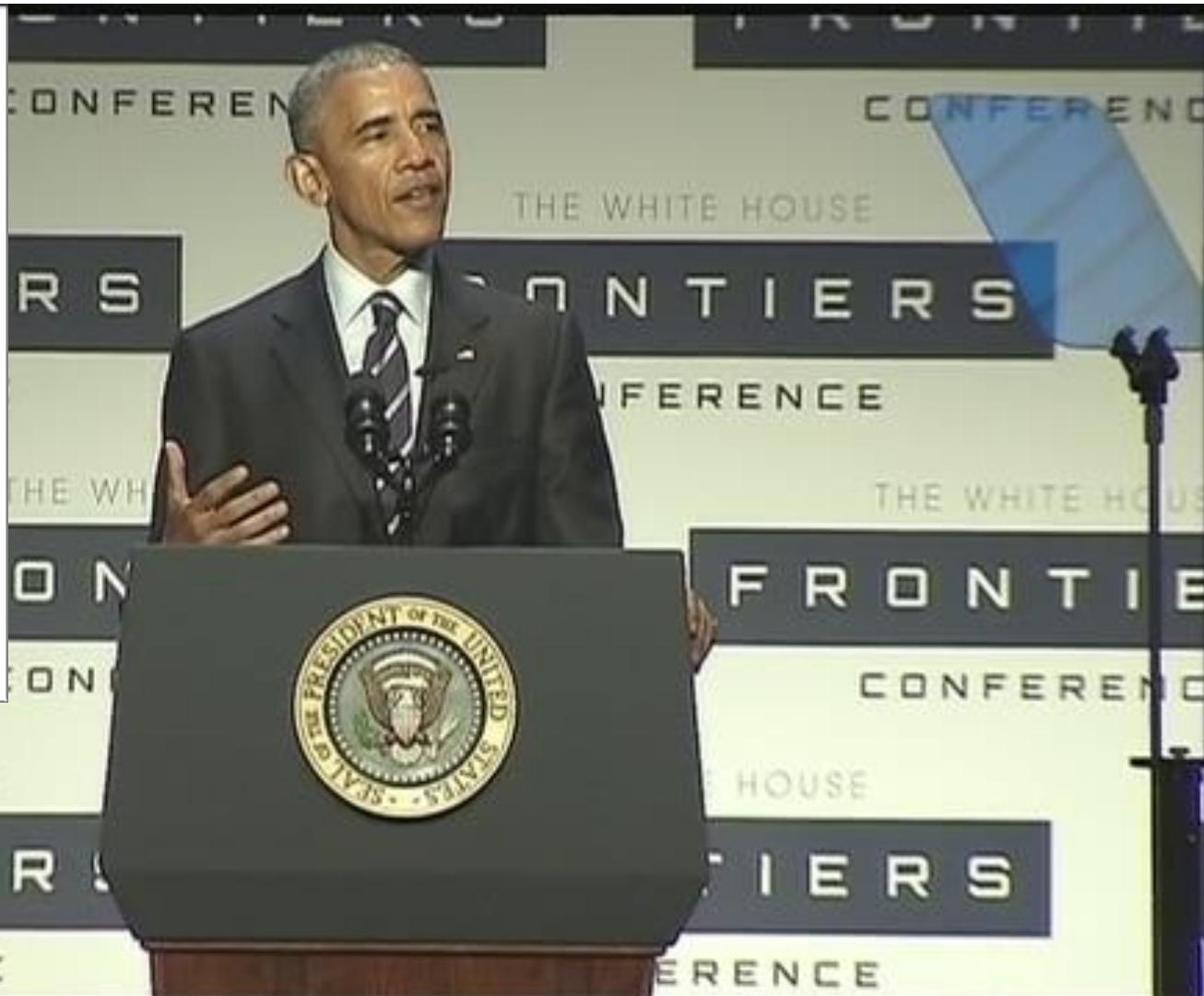


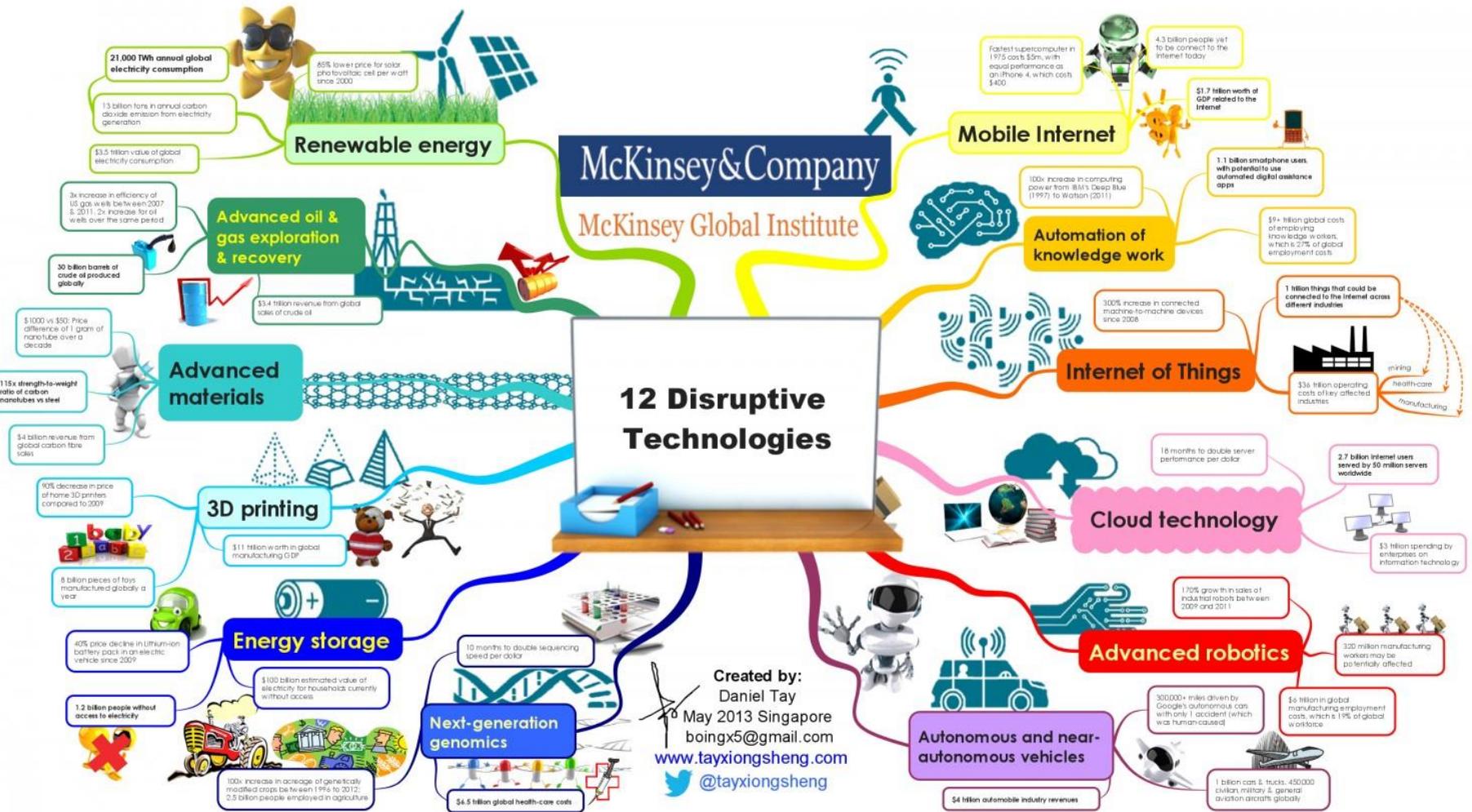
Show Description

Artificial Intelligence,
Automation, and the Economy

Executive Office of the President

December 2016





Towards a world of inequality?



Tech titans, manufacturing midgets

2

Company valuations*, \$bn

US technology firms



German manufacturing firms



Source: Thomson Reuters

* At November 17th 2015

Economist.com

The Global Innovation 1000: The top innovators and spenders

Click on the tabs below to learn more about the Top 20 R&D Spenders or the 10 Most Innovative Companies.

2016 2015 2014 2013 2012 2011 2010 2009 2008 2007 2006 2005

2016: 10 Most Innovative Companies

2016 Rank	▼	2015 Rank	Company	Geography	Industry	R&D Spend (\$Bn)*
1	►	1	Apple	United States	Computing and electronics	8.1
2	►	2	Alphabet	United States	Software and internet	12.3
3	▲	6	3M	United States	Industrials	1.8
4	►	3	Tesla Motors	United States	Automotive	0.7
5	▼	5	Amazon	United States	Software and internet	12.5
6	►	4	Samsung	South Korea	Computing and electronics	12.7
7	►	NA	Facebook	United States	Software and internet	4.8
8	►	8	Microsoft	United States	Software and internet	12
9	►	7	General Electric	United States	Industrials	4.2
10	▲	9	IBM	United States	Computing and electronics	5.2

* R&D spend data is based on the most recent full-year figures reported prior to July 1st.

LA BATALLA DE LOS TITANES TECNOLÓGICOS

En millones de dólares.

	Facturación de 2016	Resultado neto de 2016	Capitalización	Empleados, en miles
Apple	218.012	45.217	677.223	116.000
Alphabet	90.272	19.478	557.444	70.000
Microsoft	93.100	16.768	429.089	114.000
amazon	135.987	2.371	382.775	341.400
Facebook	27.638	10.217	378.530	17.048

* A media sesión del 6/2/2017

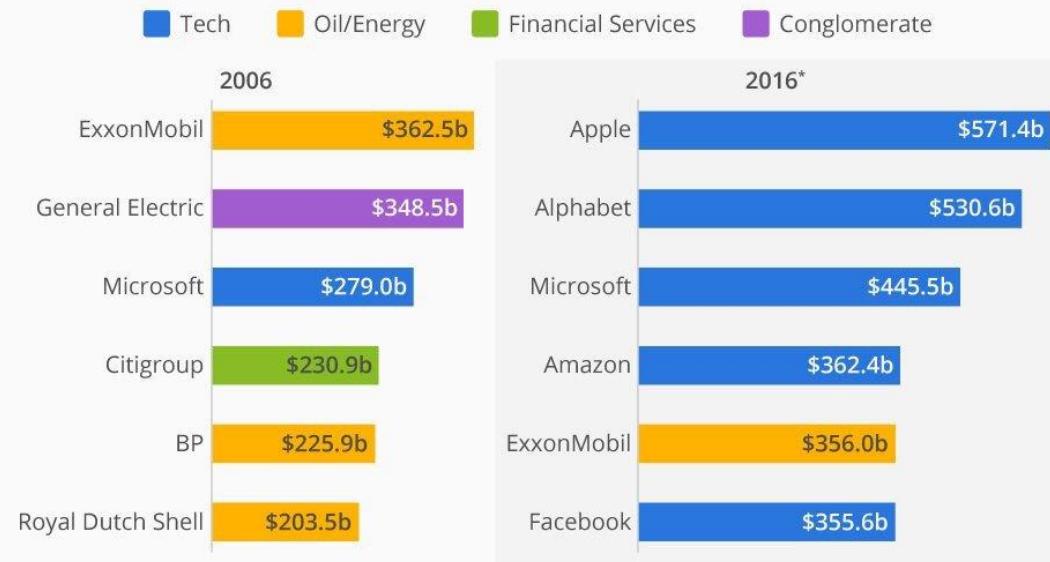
A efectos comparativos, la facturación y resultado neto de Apple y Microsoft se ha calculado para el año natural 2016 en vez de para sus respectivos años fiscales.

Fuente: Bloomberg y datos de las compañías.

Expansión

The Age of Tech

Market capitalization of the world's most valuable public companies



* as of August 1, 2016
Sources: Yahoo! Finance, Forbes

statista

EN ESPAÑA

Amenaza para la banca: FB ya puede operar como entidad de dinero electrónico

Permitirá realizar envíos de dinero persona a persona a través de Facebook Messenger, tal y como ya sucede en Estados Unidos



LOOKING FORWARD

Turns Out Many Consumers Are Interested in Banking With Google, Amazon, and Facebook

Reuters

Jan 11, 2017

Lo + Visto



La noche en París



La finalista de Miss

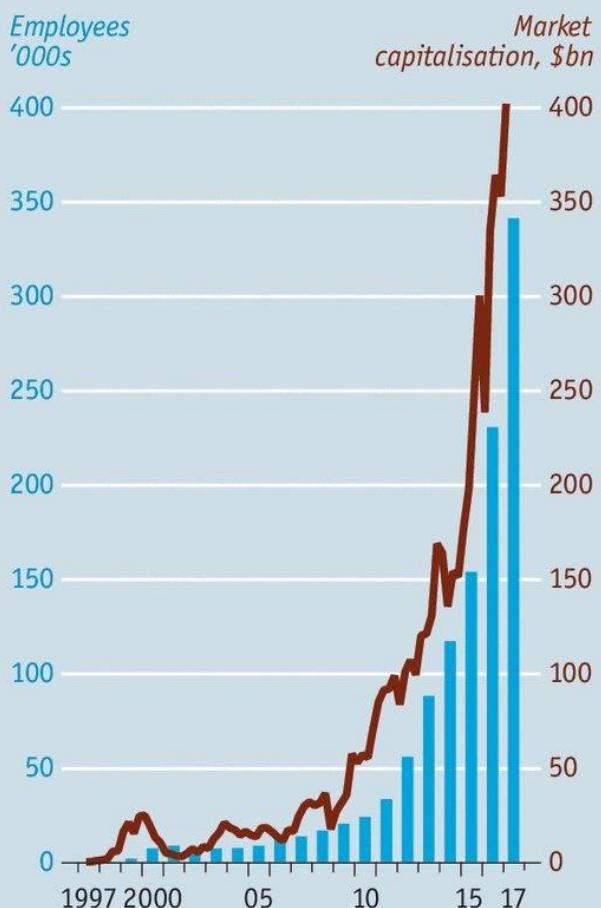


The retail apocalypse is creating a 'slow-rolling crisis' that is rippling through the US economy

Delivering

Amazon

Employees
'000s



Hayley Peterson [✉](#) [🐦](#)
Apr. 17, 2017, 7:50 PM 1,091



FACEBOOK



LINKEDIN



TWITTER



EMAIL



PRINT

NUMBER OF RETAIL STORES CLOSING IN EARLY 2017

*Payless	1,000
RadioShack	552
The Limited	250
Family Christian	240
Wet Seal	171
*Bebe	170
Crocs	160
JCPenney	138
BCBG	120
American Apparel	110
Kmart	108
hhgregg	88
Staples	70
CVS	70
Macy's	68
Hilfiger & Fitch	60
Guess	60

≡ FORTUNE | Finance

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1,000

SS INSIDER

Amazon and the Race to Be the First \$1 Trillion Company



Alibaba joins the race for driverless cars with

[✉](#) [G+](#) [f](#) [Twitter icon](#) [in](#) [Smiley icon](#)



to test self-driving cars in Calif.



A CNBC SPECIAL REPORT

[TECH](#) | [MOBILE](#) | [SOCIAL MEDIA](#) | [ENTERPRISE](#) | [CYBERSECURITY](#) | [TECH GUIDE](#)

Chinese tech titan Baidu is opening up its driverless car tech to challenge Google, Tesla

- Baidu has opened sourced its driverless car technology
- It is aiming for fully autonomous vehicles by 2020
- Baidu is stepping up its challenge to Google and Tesla

Arjun Kharpal | [@ArjunKharpal](#)
Wednesday, 19 Apr 2017 | 4:24 AM ET



↓ EMPRESA

Amazon lleva la moda a la industria 4.0 con una fábrica para producir bajo demanda

El gigante estadounidense del ecommerce se vuelca en el negocio de la moda y traza un primer plano de lo que sería una fábrica de producción de prendas de vestir totalmente automatizada en la que no es necesaria la presencia humana

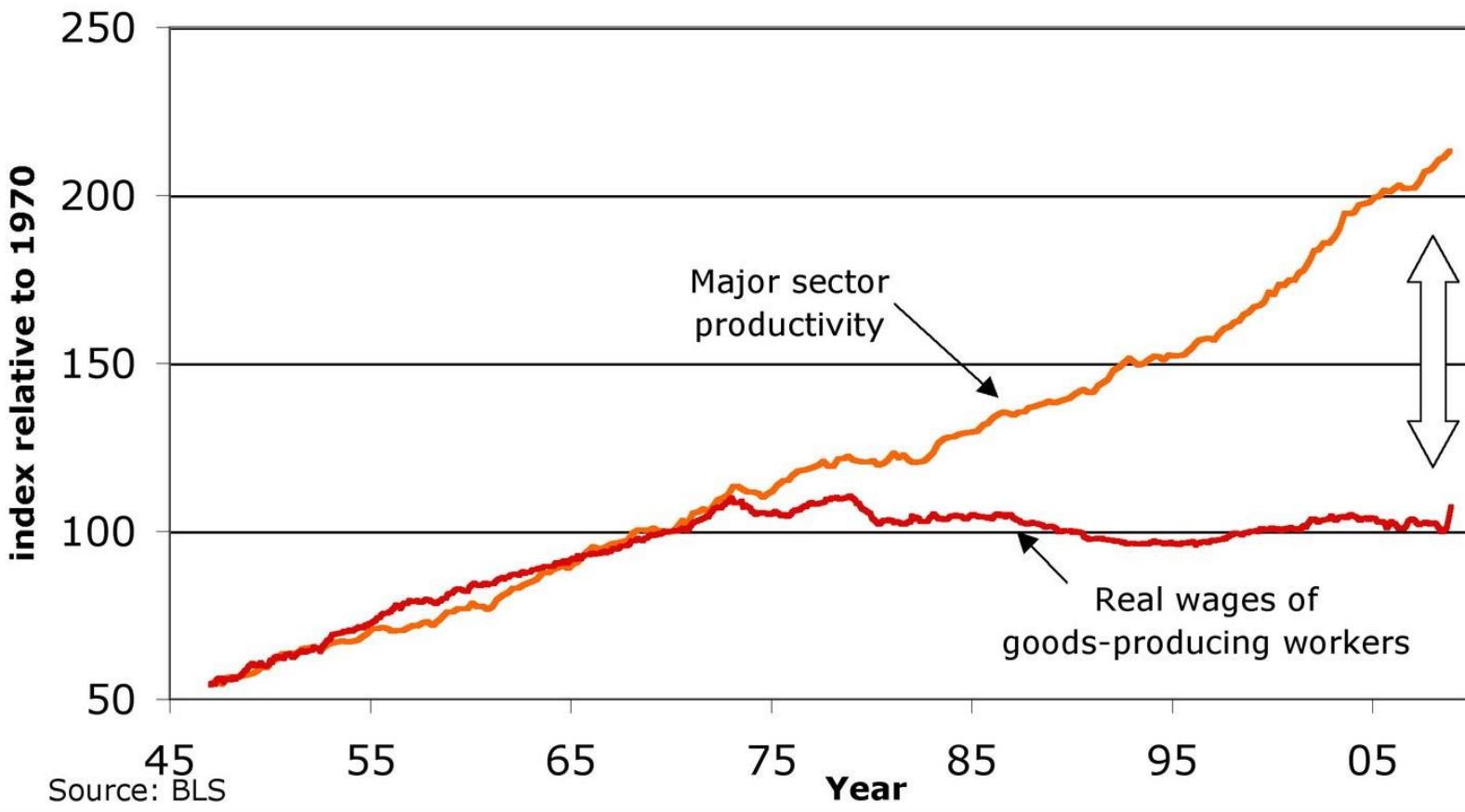
19 ABR 2017 — 10:19

MODAES

TEMAS RELACIONADOS

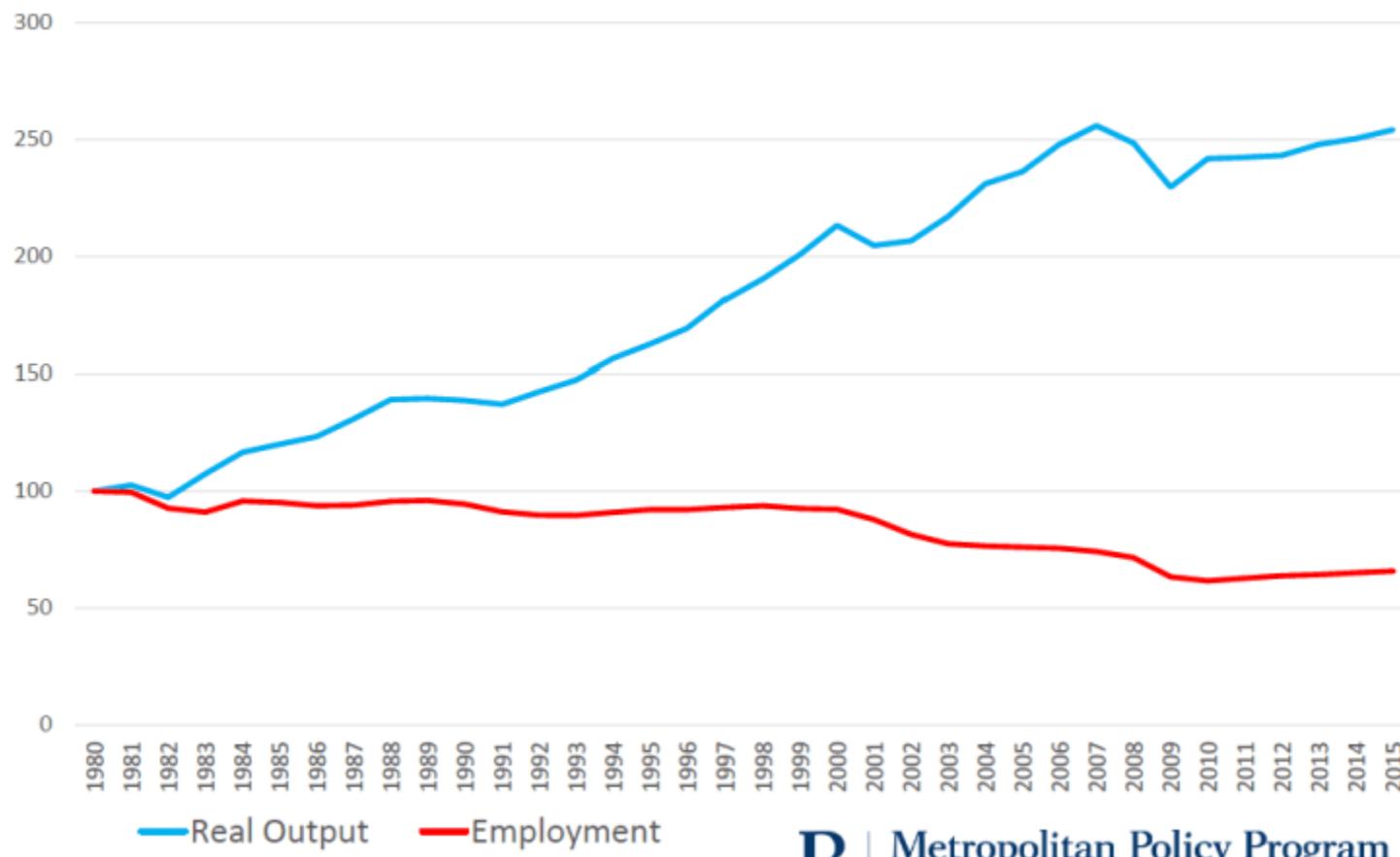


Productivity and average real earnings



More Output, Less Employment

The manufacturing sector has gotten more productive, while giving fewer people jobs (normalized as a percent of levels in 1980).

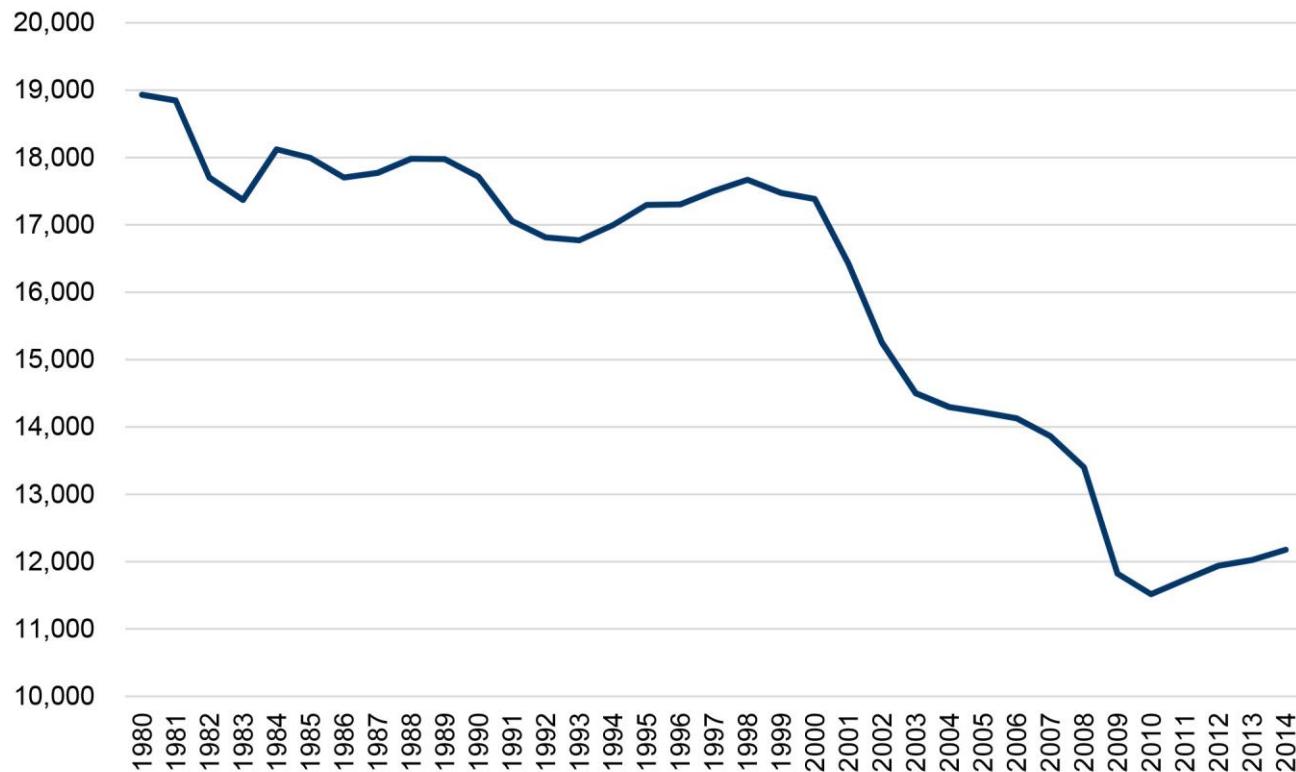


Source: Brookings' analysis of Moody's Analytics estimates

B | Metropolitan Policy Program
at BROOKINGS

U.S. Employment in Manufacturing Industries

Thousands of Jobs, 1980-2014



Source: Brookings Analysis of Moody's Analytics Data

B | Metropolitan Policy Program
at BROOKINGS

A tale of two countries

The share of U.S. pre-tax income accruing to the bottom 50 percent and top one percent of income earners, 1962-2014

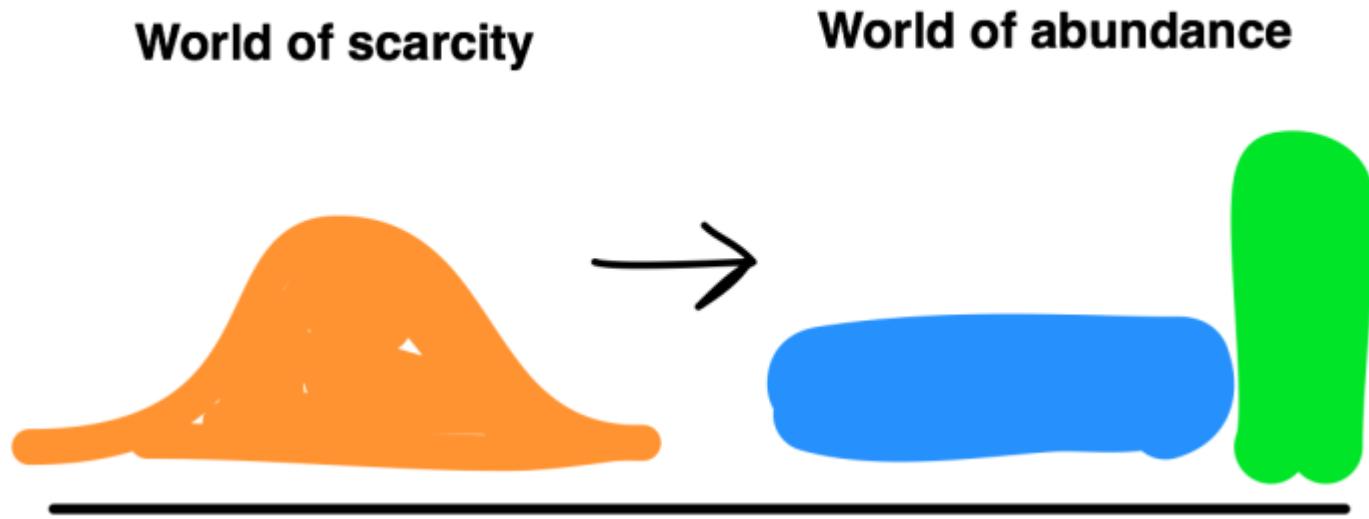


Source: Thomas Piketty, Emmanuel Saez, and Gabriel Zucman, "Distributional National Accounts: Methods and Estimates for the United States," 2016, Cambridge, MA: National Bureau of Economic Research

Note: The unit is the individual adult and incomes within married couples are split equally.



A “winner-takes-it-all model”





Global Agenda | Entrepreneurship | Social Innovation

Universal basic income has support from some big names

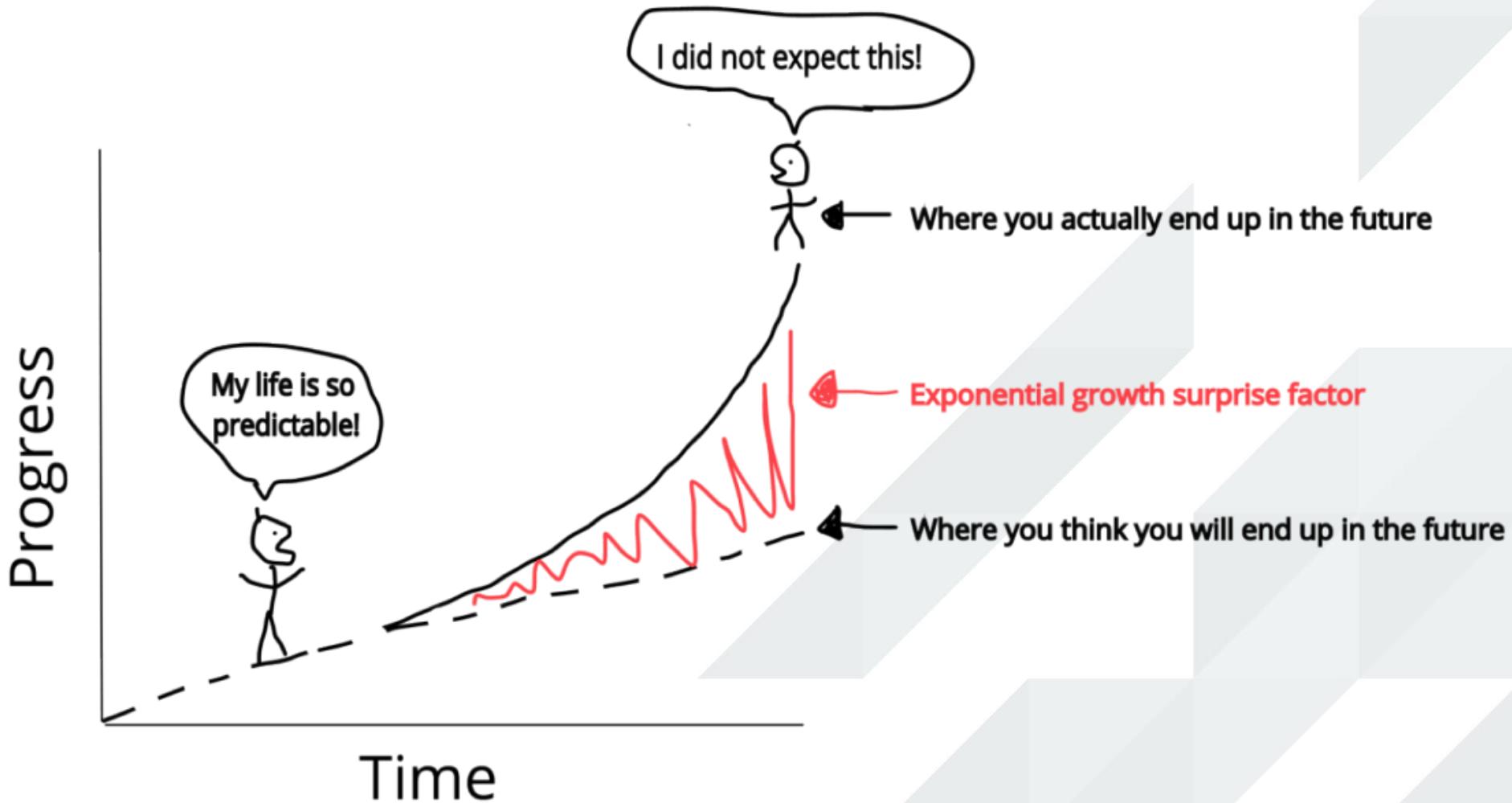


"UNCONDITIONAL
BASIC INCOME
IS NOT LEFT
OR RIGHT.
IT'S FORWARD."

A look at some of the entrepreneurs who have supported universal basic income.

Image: REUTERS/Rashid Umar Abbasi

¿I QUI PAGA LA FESTA?



FUTURE OF WORK

Bill Gates Says Robots Should Be Taxed Like Workers

David Z. Morris

Feb 18, 2017



In a new [interview with Quartz, Microsoft](#) founder Bill Gates makes a rather stunning argument—that robots who replace human workers should incur taxes equivalent to that worker's income taxes.

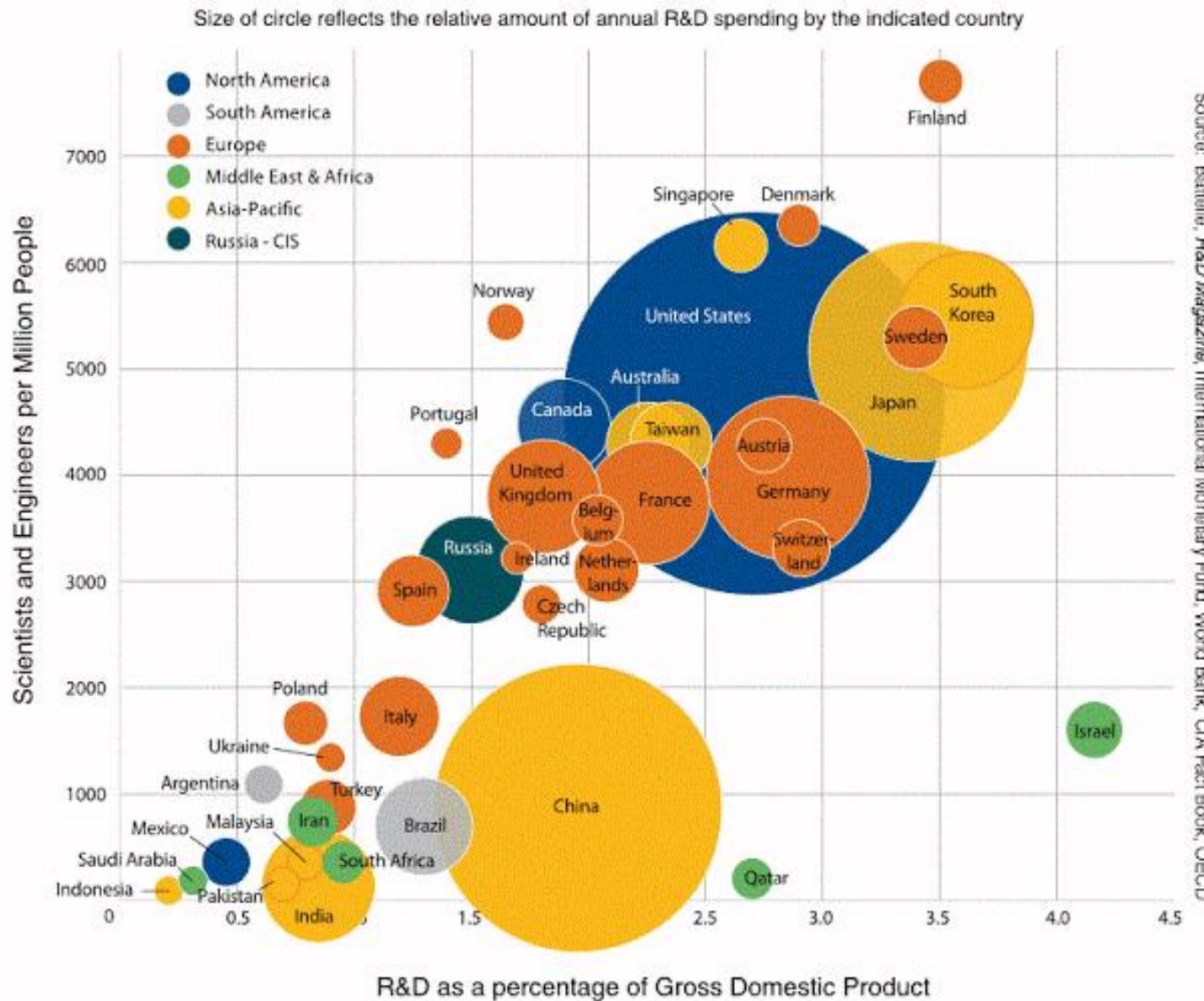
“Right now, the human worker who does, say, \$50,000 worth of work in a factory that income is taxed.... If a robot comes in to do the same thing, you'd



“The competitiveness of a company depends on its individual **strategy** and the **quality of the environment** where it competes”

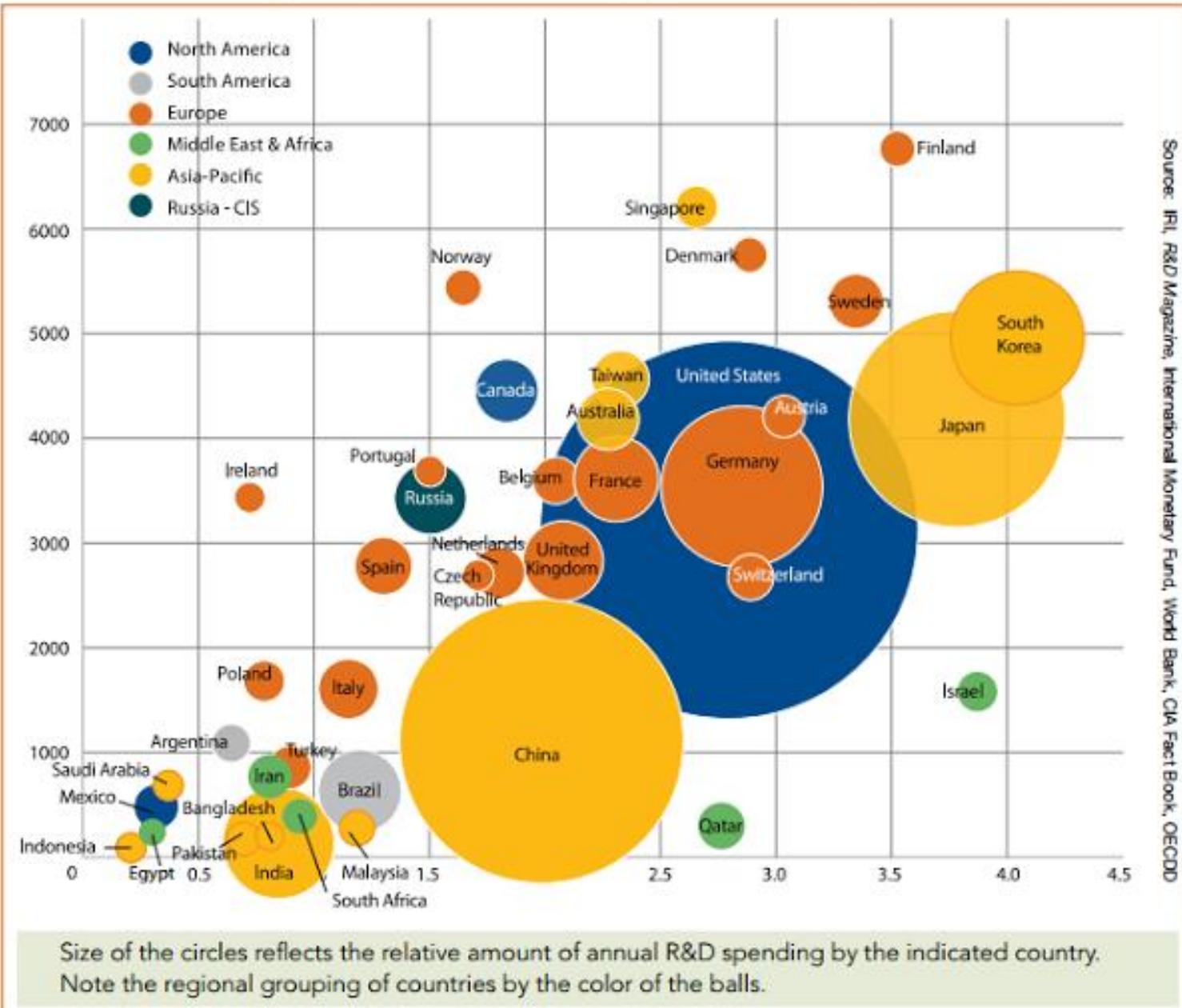
Michael E. Porter, Harvard BS

The global technology competition



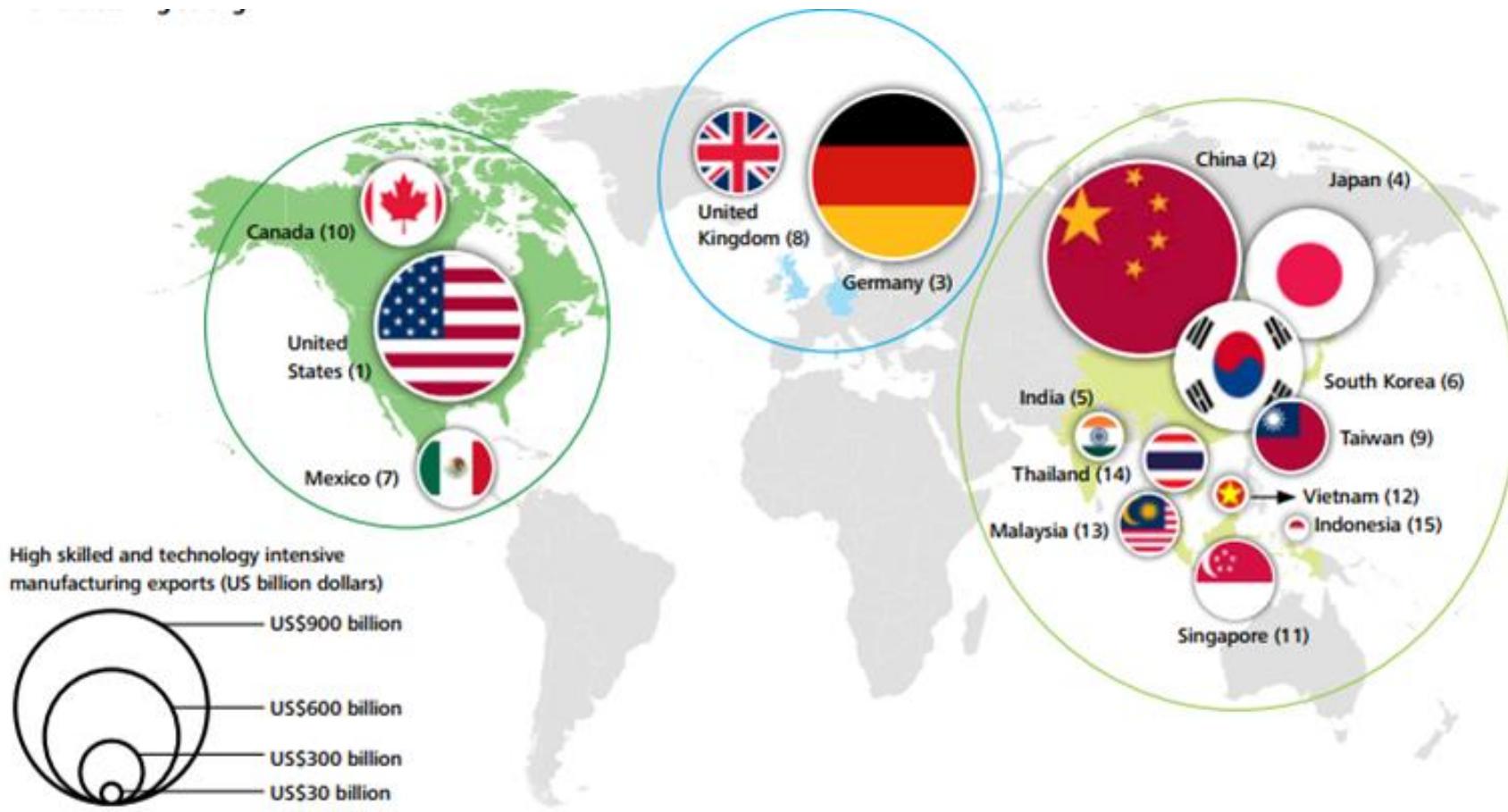
Source: Battelle, R&D Magazine, International Monetary Fund, World Bank, CIA Fact Book, OECD

The global technology competition



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	-	S. Korea	89.00	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	9	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

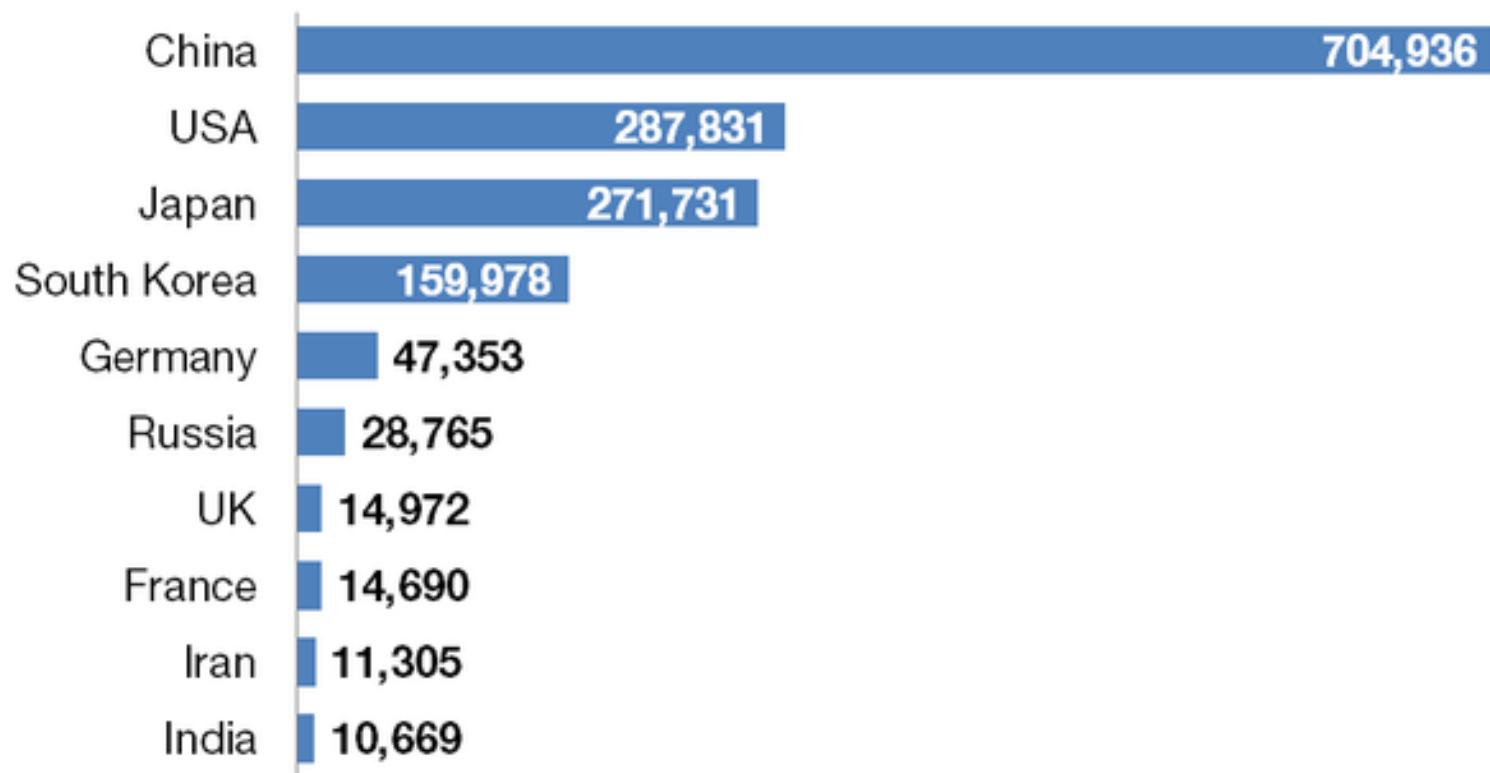


Note: Figures in parentheses represent the projected 2020 GMCI rank by CEOs

Source: Deloitte Touche Tohmatsu Limited and US Council on Competitiveness, 2016 Global Manufacturing Competitiveness Index, Deloitte analysis based on UNCTAD data²⁶

Countries filing the most patent applications

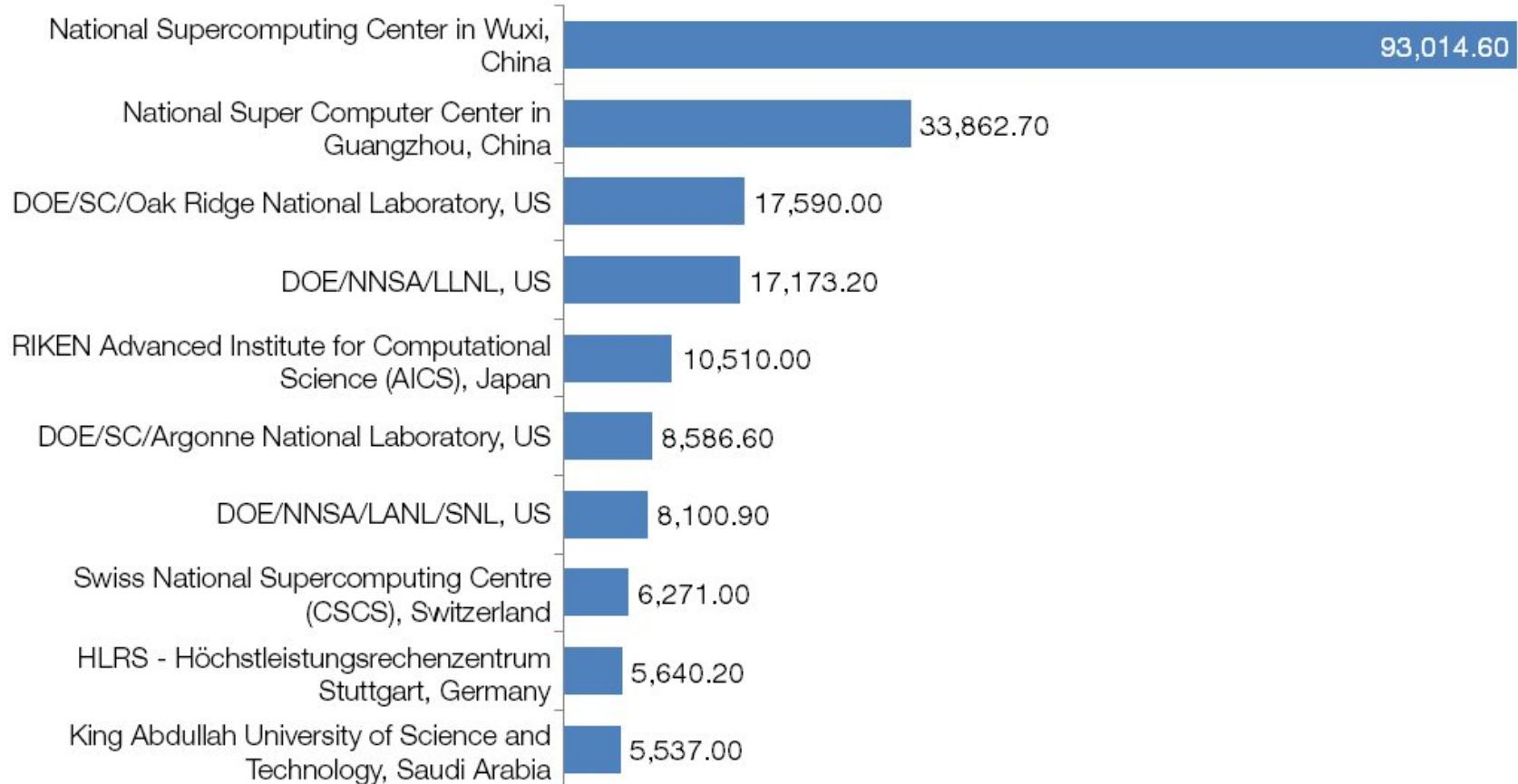
Number of applications in 2013



Source: World Intellectual Property Organization (WIPO)

Top 10 supercomputers

RPeak (Teraflops per second) on the LINPACK benchmark



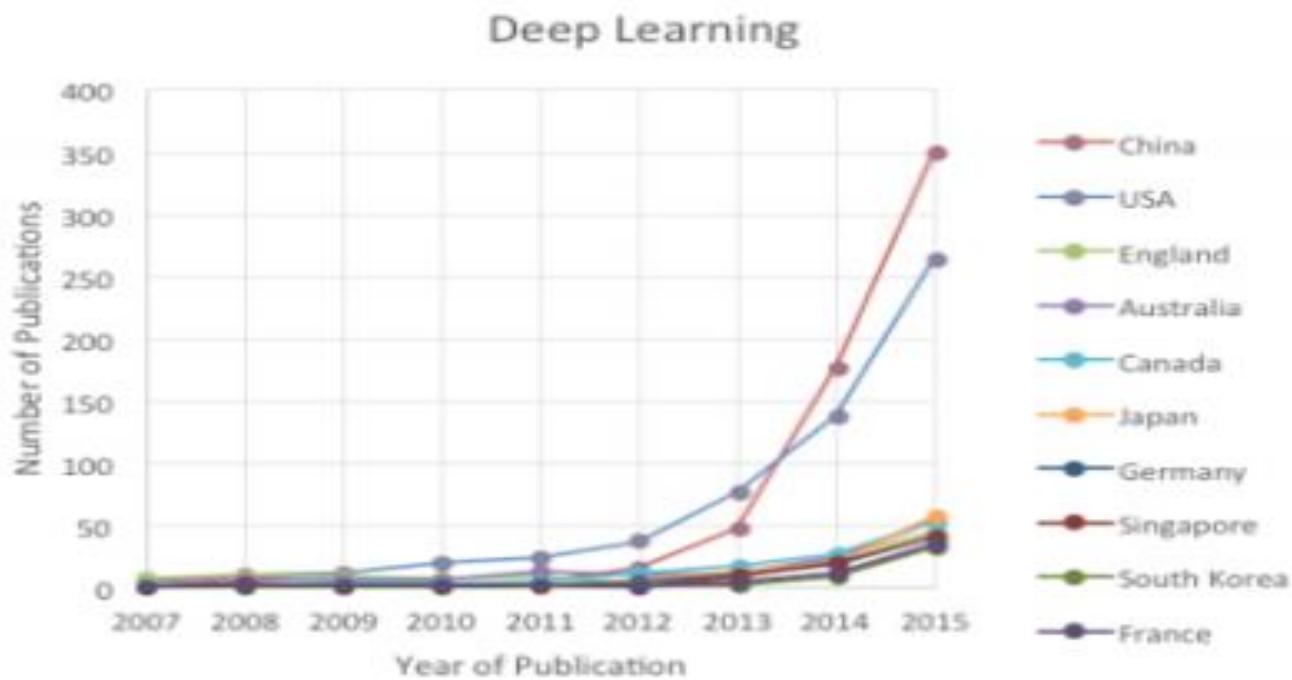
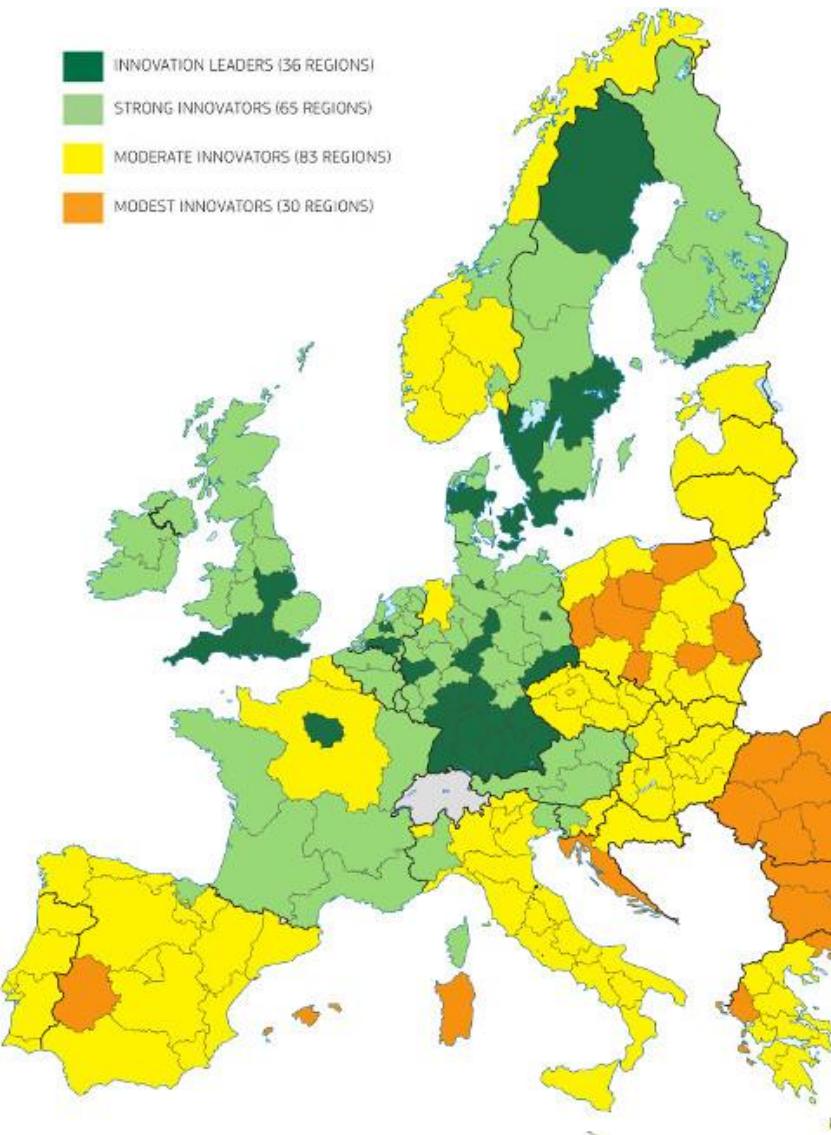
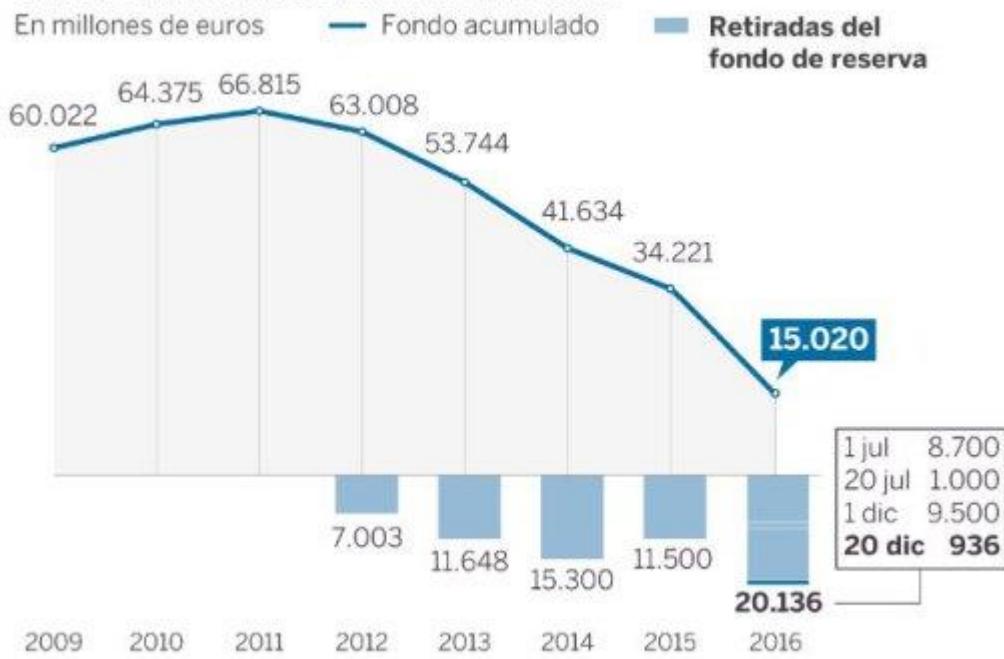


Figure 1: Journal articles mentioning "deep learning" or "deep neural network", by nation.⁶²



FONDO DE RESERVA DE LA SEGURIDAD SOCIAL

En millones de euros



Fuente: Ministerio de Empleo y Seguridad Social.

EL PAÍS

Industry 4.0: speed, flexibility, cost

Innovation Clusters

Close Cooperation between Governments of German Länder,
Universities, Industry and Fraunhofer



- 1 Digital Production
- 2 Mechatronic Machine Systems
- 3 Optical Technologies (JOIN)
- 4 Automotive Quality Saar
- 5 Digital Commercial Vehicle Technology (DNT)
- 6 Nano for Production
- 7 Personal Health
- 8 Adaptronics
- 9 Future Security BW
- 10 Technologies for Hybrid Lightweight Construction (KITE HyLITE)
- 11 Multifunctional Materials and Technologies (MultiMaT)
- 12 Polymer Technologies
- 13 Virtual Development, Engineering and Training (VIDET)
- 14 Turbine Production Technologies (TurPro)
- 15 Secure Identity
- 16 Maintenance, Repair and Overhaul in Energy and Traffic (MRO)
- 17 Electronics for Sustainable Energy Use (under developm.)
- 18 Cloud Computing for Logistics (under development)

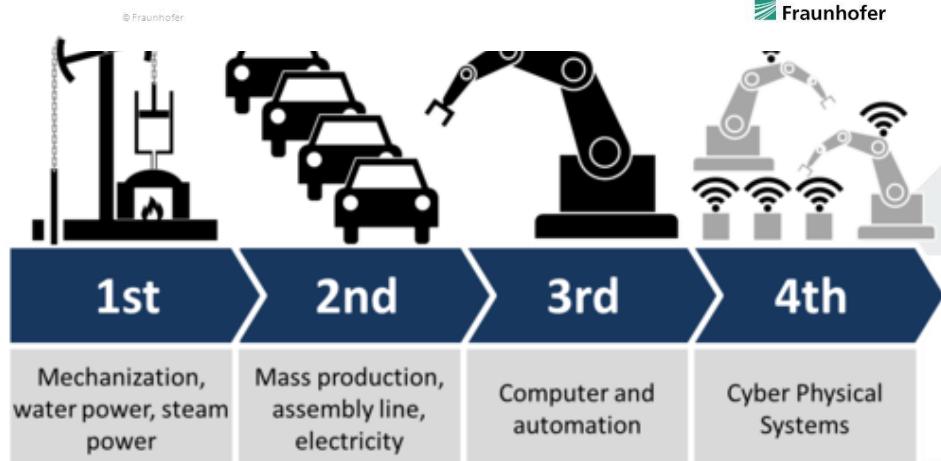
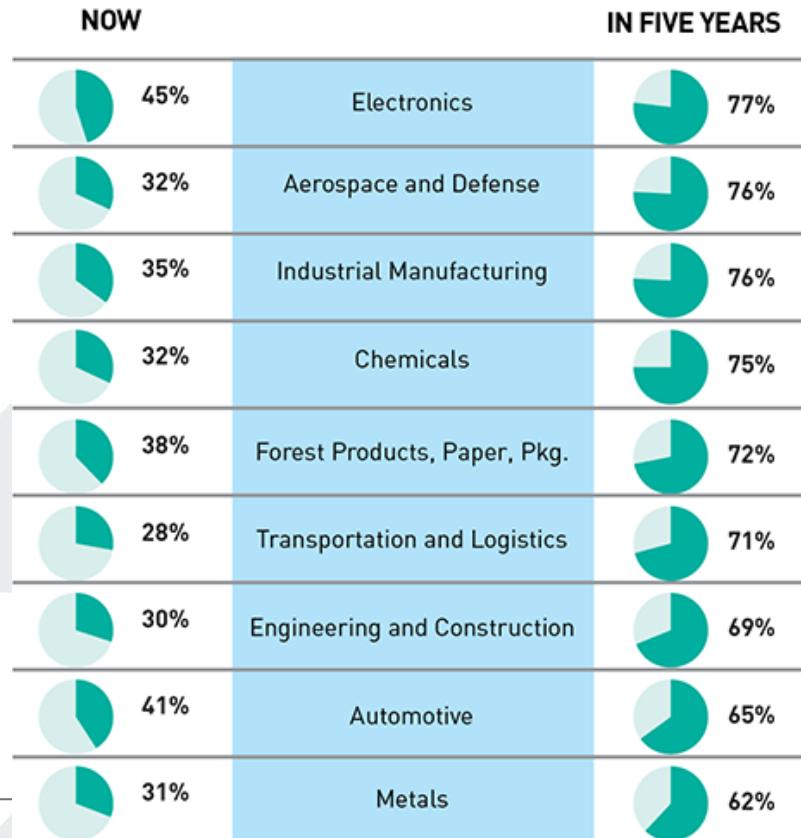


Exhibit 1: Adoption of Industry 4.0, by Sector

Respondents were asked: "How would you classify the current level of digitization and integration [in operations, supply chain, and related activities] in your company? What levels are you expecting in the next five years?"



Source: "Industry 4.0: Building the Digital Enterprise," PwC

Advanced manufacturing

Adidas's high-tech factory brings production back to Germany

Making trainers with robots and 3D printers

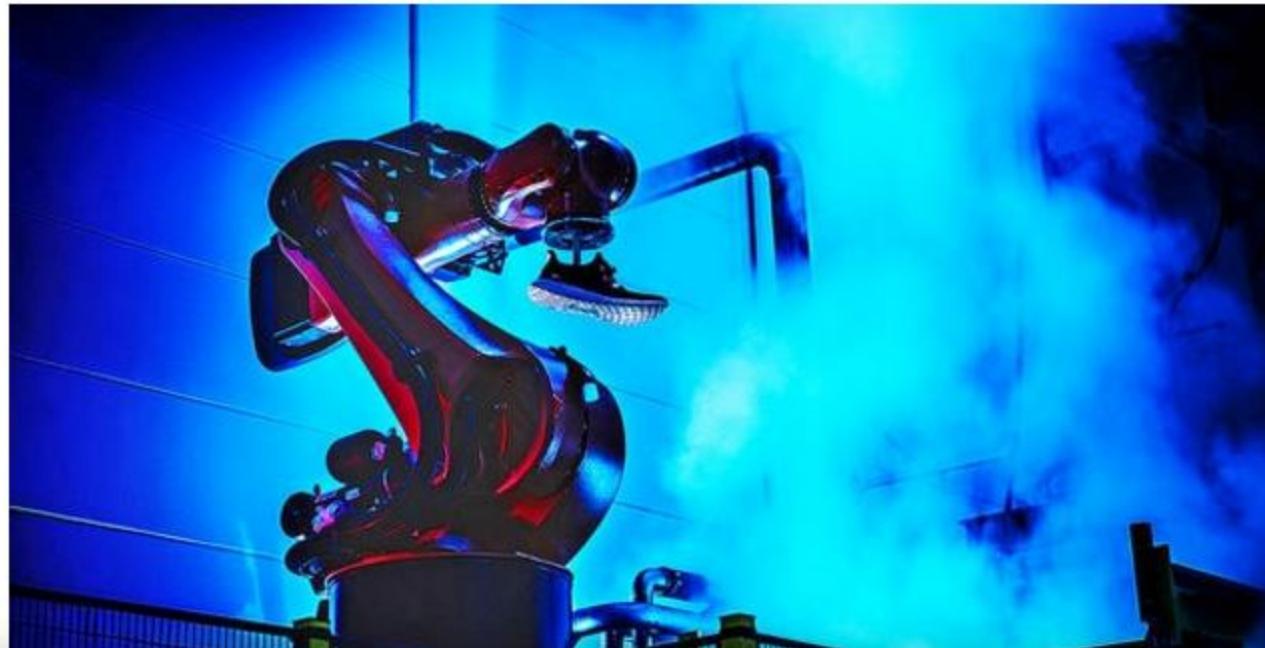
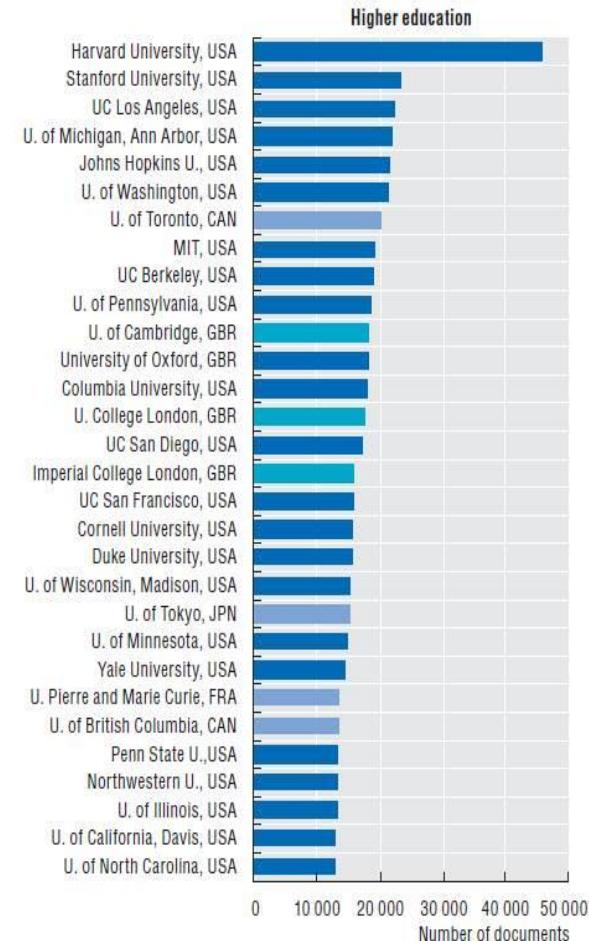


Table 1. Germany vs. the United States on Key Economic Indicators

	Germany	United States
Economic Output		
Share of GDP in Manufacturing	22%	12%
Share of Manufacturing GDP in Medium & High-Tech Manufacturing	58%	42%
Trade		
Total Exports as a Share of GDP	52%	14%
Share of Merchandise Exports in Manufacturing	82%	62%
Trade Balance in Manufactured Goods	\$425 billion	-\$668 billion
Innovation		
Total Researchers Per 1000 Workers	8.22	8.08
R&D Expenditures as a Share of GDP	2.98%	2.79%
Share of Corporate R&D in Manufacturing	86%	68%
Number of Top 50 Universities in Leiden Impact Rankings	0	39
Patents per 1000 Researchers	53.03	38.74
New Firm Entrants as a Share of Total Firms	7.90%	8.50%
Workforce		
Share of Employment in Manufacturing	20%	10%
Average Hourly Compensation in Manufacturing	\$45.79	\$35.67
Share of Graduates in STEM Fields (OECD Rank/36)	3	33
Youth Unemployment Rate	8%	14%



Source: World Bank and OECD national accounts data; OECD Science and Technology Indicators; CWTS Leiden Ranking; OECD Entrepreneurship at a Glance data; U.S. Bureau of Labor Statistics.



4 MINUTE READ

Why More Tech Companies Are Hiring People Without Degrees

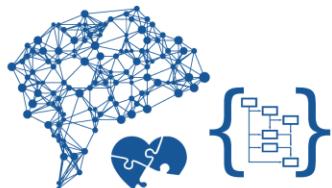
Silicon Valley is starting to realize that the huge talent pool of nontraditional candidates may be the answer to its pipeline problem.



Top 10 skills

in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility



in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity



Thanks for your attention!
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