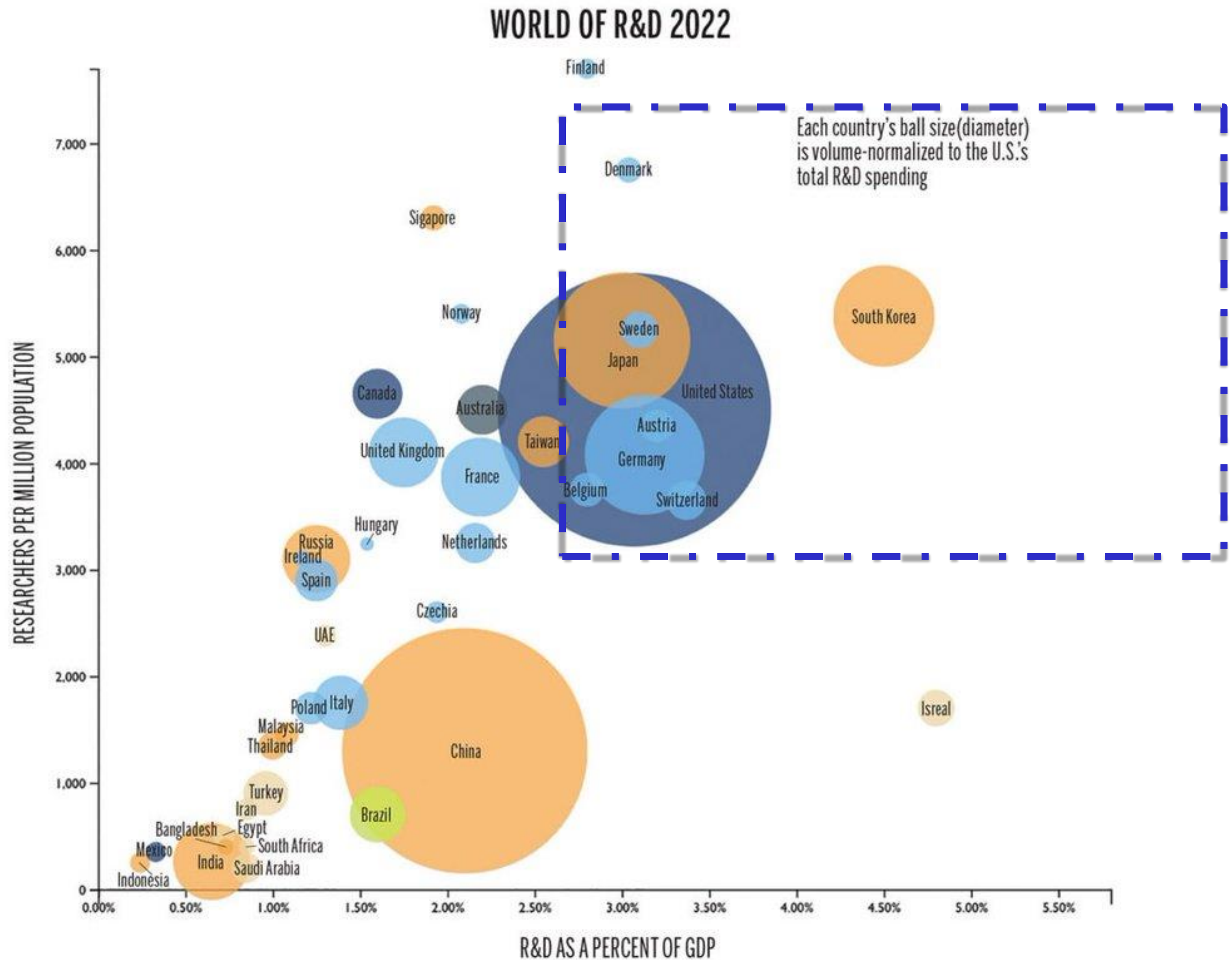


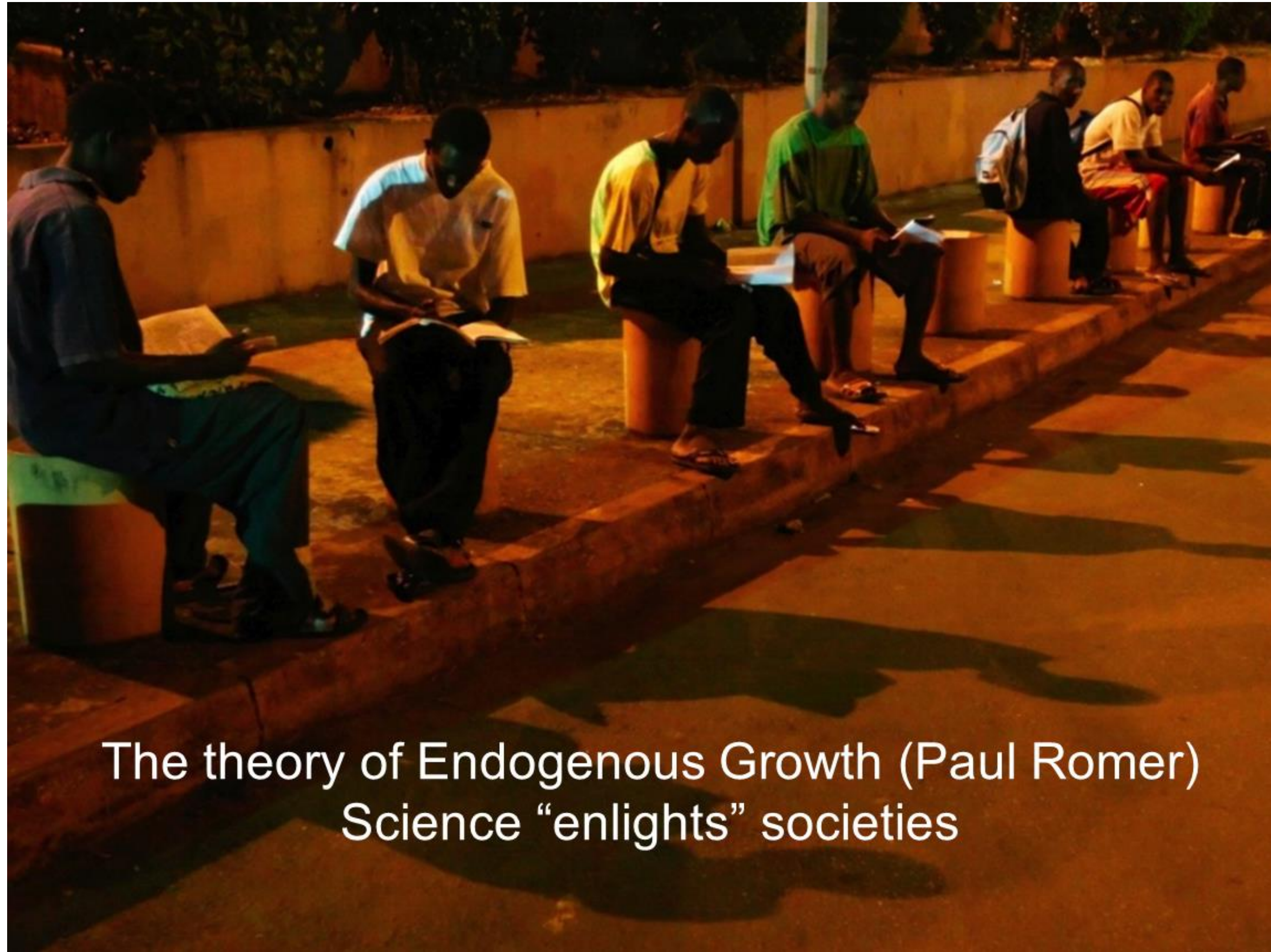
Innovació, Tecnologia i Territori

Xavier Ferràs, MBA, PhD



esade

Scientific policy to “enlight” societies



The theory of Endogenous Growth (Paul Romer)
Science “enlights” societies

United States Patent [19] 3,757,306
Boone [45] Sept. 4, 1973

[54] COMPUTING SYSTEMS CPU
[75] Inventor: Gary W. Boone, Houston, Tex.
[73] Assignee: Texas Instruments Incorporated, Dallas, Tex.
[22] Filed: Aug. 31, 1971
[21] Appl. No.: 176,668

[52] U.S. Cl. 340/172.5, 307/303
[51] Int. Cl. G06f 7/00, H03k 19/08
[58] Field of Search 340/172.5; 235/157; 307/238, 303

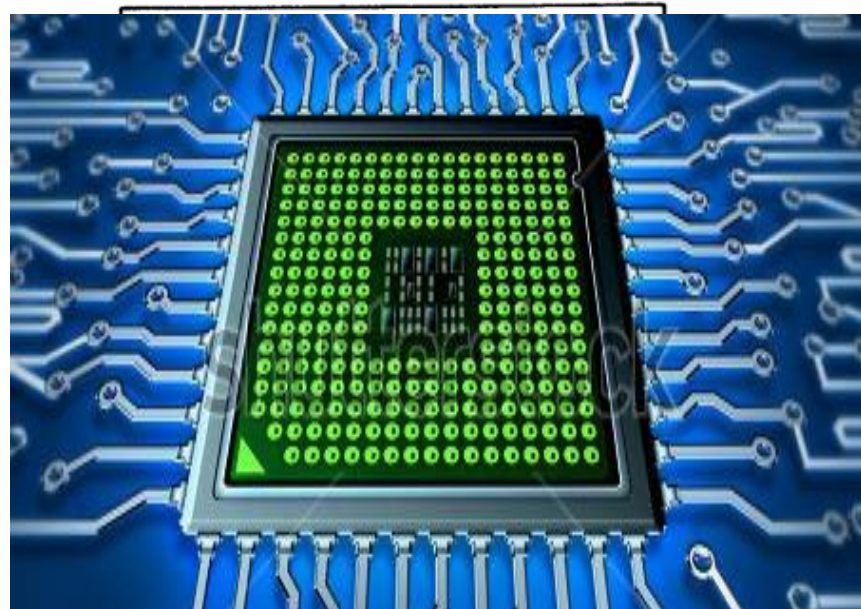
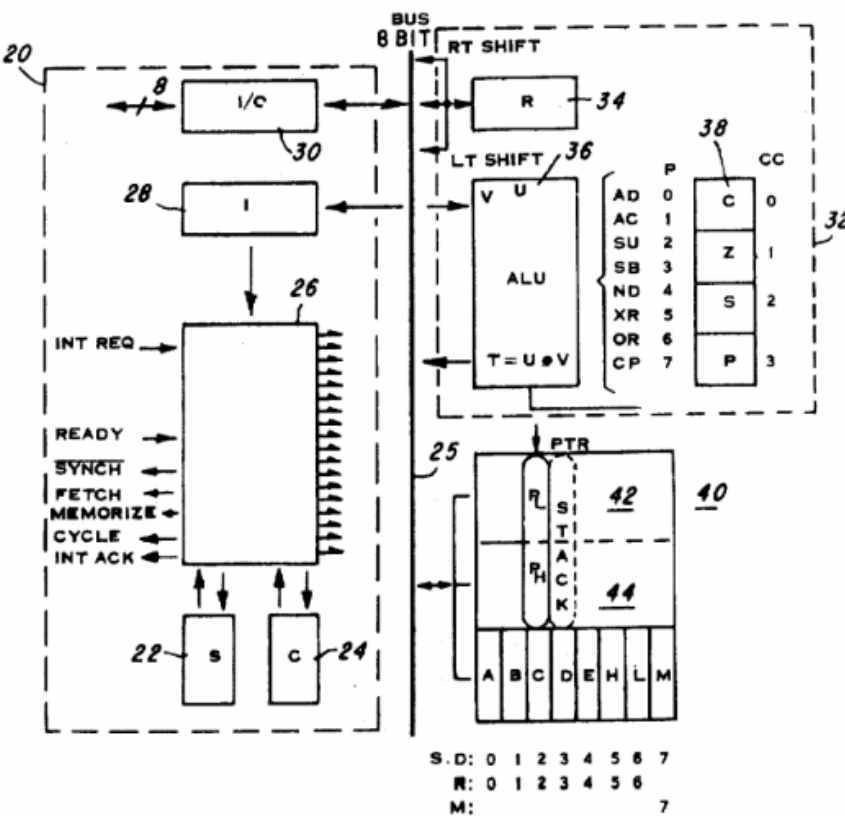
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Primary Examiner—Paul J. Henon
Assistant Examiner—Mark Edward Nusbaum
Attorney—Harold Levine, John G. Graham, et al.

[57] ABSTRACT
A central processing unit (CPU) is utilized in combination with external random access or serial memory units. The CPU includes a parallel arithmetic logic unit (ALU), accumulator and file register, program and memory address register, and a 7 level program address stack. The parallel processor includes programmable logic arrays, shift registers, and random access memories combined monolithically on a single chip. The CPU is capable of addressing up to 65 kilobytes of memory, and has an instruction cycle time on the order of 10 microseconds. Interface logic synchronizes operation of the CPU with the external memory. An 8-bit parallel bus interconnects the functional elements of the CPU. An external 8-bit bus is used to interconnect the external memory units with the CPU. Multiplexing techniques enable both input and output data to be transmitted over the same bus, simplifying design and improving reliability.

8 Claims, 56 Drawing Figures



	Pizza	Procesadores
Precio unitario	10 €	?
Coste unitario	3 €	?
Margen unitario	7 €	?
Proveedores	Queso, tomate	No hay
Instalaciones	Horno	?
Primer cliente	Mercado masivo	?
Ventas diarias	200 unidades	?
Beneficios netos diarios	1400 €	?
Inversión inicial	100.000 €	Millones

Telepizza crowns the selective stock market (IBEX 35)

febrero de 2016 | 2€ | Año XXX | nº 8.960 | Edición Catalunya

1986 | 2016

30

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Cómo vender más

¿Por qué Moody's desconfía de un país que crece más del 3%? p26

Telepizza, a Bolsa

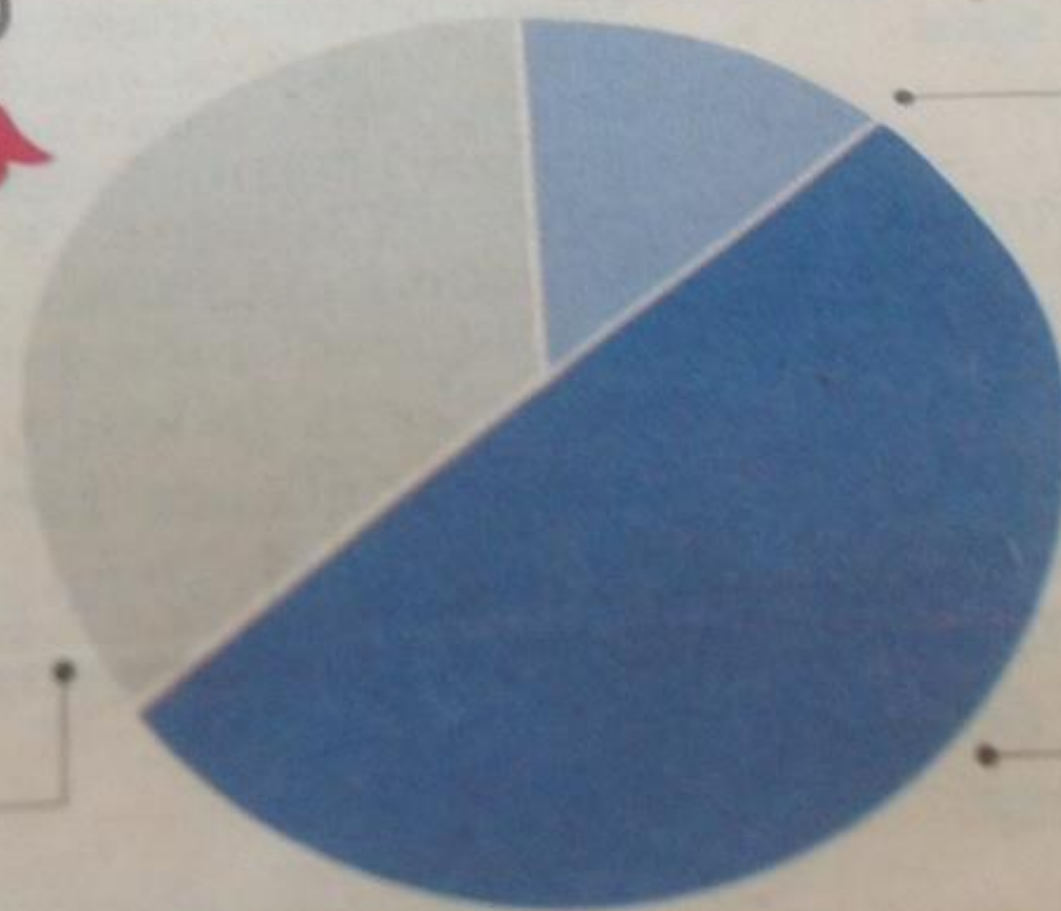
La compañía, valorada en 1.200 millones de euros, prepara su regreso al parque

La cadena de restauración Telepizza, controlada por el fondo Permira y la firma de capital riesgo KKR, ha presentado a la CNMV un borrador del folleto para su retorno al mercado bursátil antes del 1 de mayo, lo que convertiría a Telepizza en la primera empresa de comida rápida en la primera bolsa en España este año. Los dueños de la compañía planean colocar alrededor del 50% del capital y mantener el accionariado tras la oferta pública. P3/LA LLAVE

EL ACCIONARIADO
En porcentaje.

telepizza

KKR
36%



Otros fondos
13%

Permira y Carbal
51%

El grupo llevó a cabo en 2015 una refinanciación allanando el camino para la salida a bolsa.

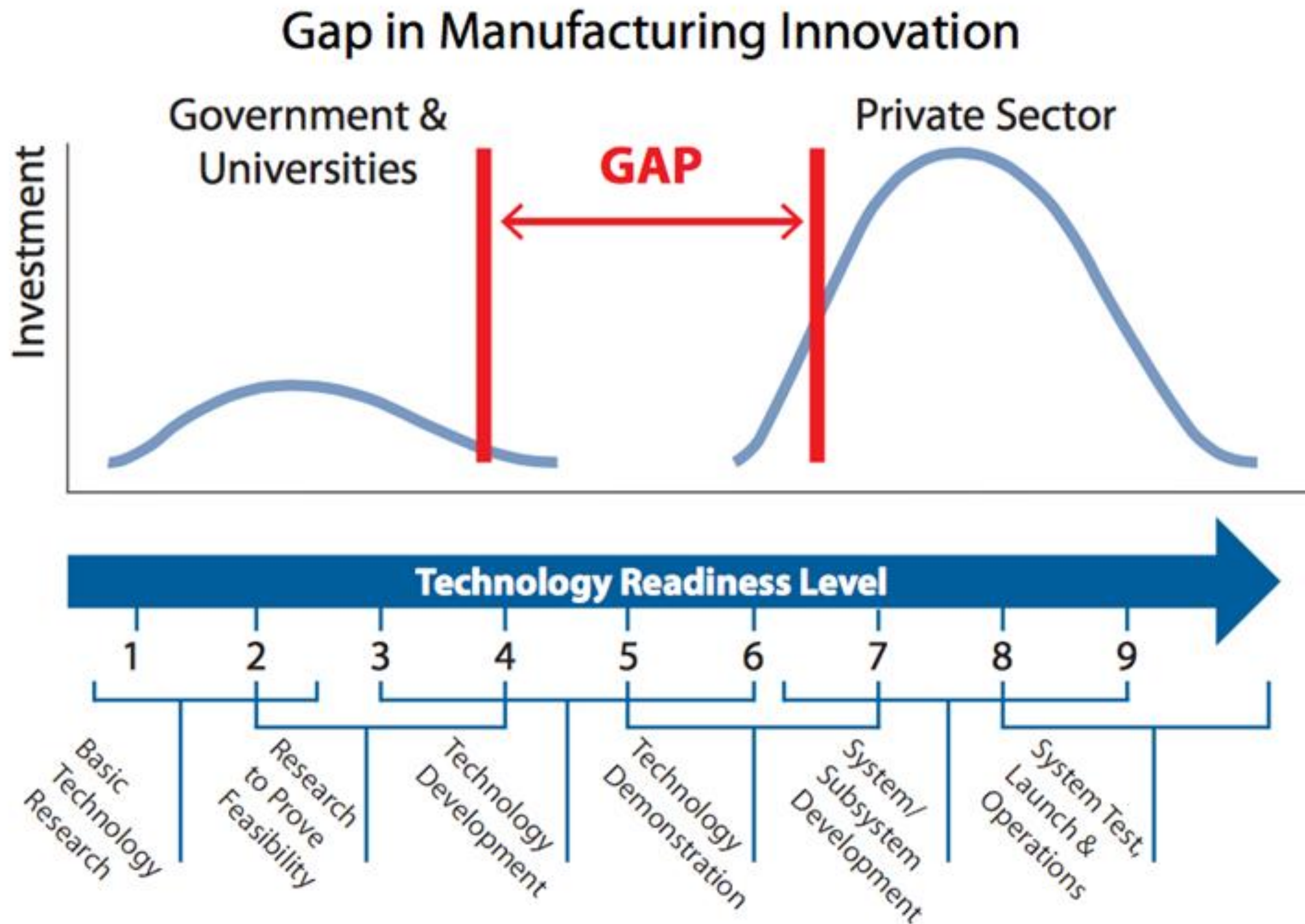
Corte de costes. Reunión y Volo seguirán en el mercado.

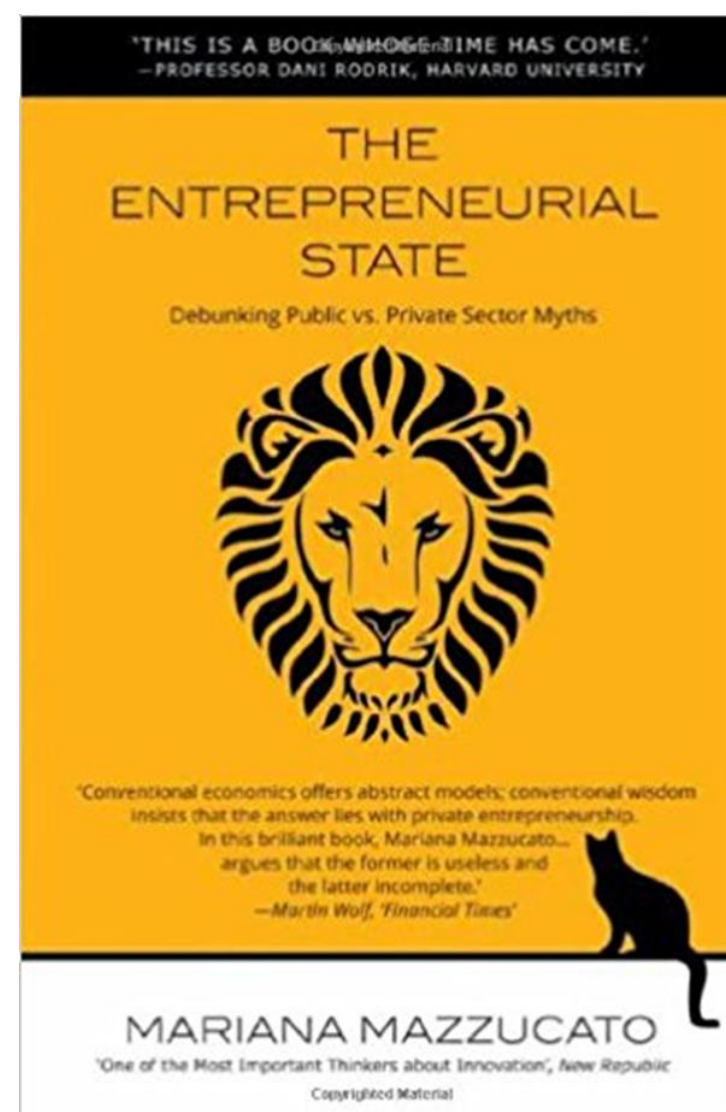
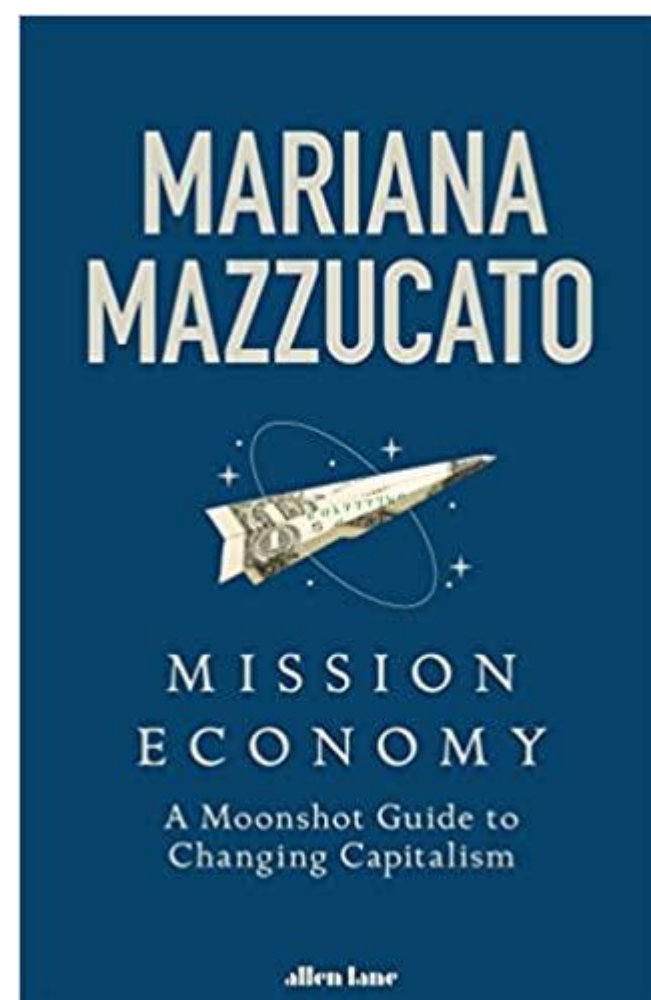
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The “market failure” effect



What project is better for individual & national competitiveness?





- Missions
- Targeted grants
- Soft loans
- Tax policy
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Microsoft wins Pentagon's \$10 billion JEDI cloud contract, beating Amazon

Published: Oct 28, 2019 7:47 a.m. ET



Aa

Amazon spokesman says company is 'surprised' that AWS was beaten for hotly contested cloud project that led to Oracle lawsuit



Science is global; Innovation is local

PHYSICAL REVIEW APPLIED 9, 064008 (2018)

Absorption Coefficient of a Semiconductor Thin Film from Photoluminescence

G. Rey,* C. Spindler, F. Babbe, W. Rachad, and S. Siebentritt

Laboratory for Photovoltaics, Physics and Materials Science Research Unit, L-4422 Belvaux, Luxembourg

M. Nuys and R. Carius

Forschungszentrum Jülich GmbH Institut für Energie und Klimaforschung, 52425 Jülich, Germany

S. Li and C. Platzer-Björkman

Ångström Solar Center, Solid State Electronics, Uppsala University, 751 21 Uppsala, Sweden

(Received 10 May 2017; revised manuscript received 8 February 2018; published 8 June 2018)

The photoluminescence (PL) of semiconductors can be used to determine their absorption coefficient (α) using Planck's generalized law. The standard method, suitable only for self-supported thick samples, like wafers, is extended to multilayer thin films by means of the transfer-matrix method to include the effect of the substrate and optional front layers. α values measured on various thin-film solar-cell absorbers by both PL and photothermal deflection spectroscopy (PDS) show good agreement. PL measurements are extremely sensitive to the semiconductor absorption and allow us to advantageously circumvent parasitic absorption from the substrate; thus, α can be accurately determined down to very low values, allowing us to investigate deep band tails with a higher dynamic range than in any other method, including spectrophotometry and PDS.

DOI: 10.1103/PhysRevApplied.9.064008

I. INTRODUCTION

Sub-band-gap absorption in semiconductors is a critical parameter for device application because sub-band-gap absorption is due to defects and disorder, which influence the performance of any semiconductor-based device [1]. Thin-film transistors are good examples: the mobility is affected by band tailing [2], although the band-tail-state effect on carrier transport is strongly material dependent [3]. Band tails are also known to reduce the efficiency of solar cells [4,5] and to be the limiting factor in the case of amorphous Si solar cells [6].

Recently, De Wolf *et al.* showed an empirical linear relationship between band tailing and the voltage deficit (the difference between band-gap energy and open-circuit voltage) for several solar-cell technologies [7]. Band tailing in semiconductors may occur at both conduction and valence band edges in a nonsymmetrical way [8]. If the band tails are described by Urbach behavior [9] [exponential decrease of the density of states (DOS) from the band edges towards midgap], which is observed in most materials [10–14], the extension of the joint DOS below the band-gap energy is

determined by the band edge, which shows the broadest extension into the band gap [15].

Besides Urbach behavior, various models have been proposed to describe nonexponential tails [16]. As the joint DOS is reflected in the absorption coefficient, α , its measure in the sub-band-gap energy region is of prime interest for band-tail investigations. Because the sub-band-gap absorbance is weak, especially for thin films, photoluminescence (PL) can be advantageously used due to its capability of measuring extremely low α values, whereas other methods such as ellipsometry and spectrophotometry are limited.

Indeed, PL has been proven to be able to measure α down to 10^{-16} cm^{-1} on Si wafers [17]. The equation rigorously derived for self-supporting samples like wafers has also been applied to thin films [16]. But in that case, the difference between the front interface, the film-substrate interface, and the substrate back-side reflectivity is ignored. Here, we propose a rigorous yet analytical method to retrieve α from PL spectra measured on multilayered structures. We also discuss the advantages and limitations of PL-based absorption measurements in the case of defect-related absorption.

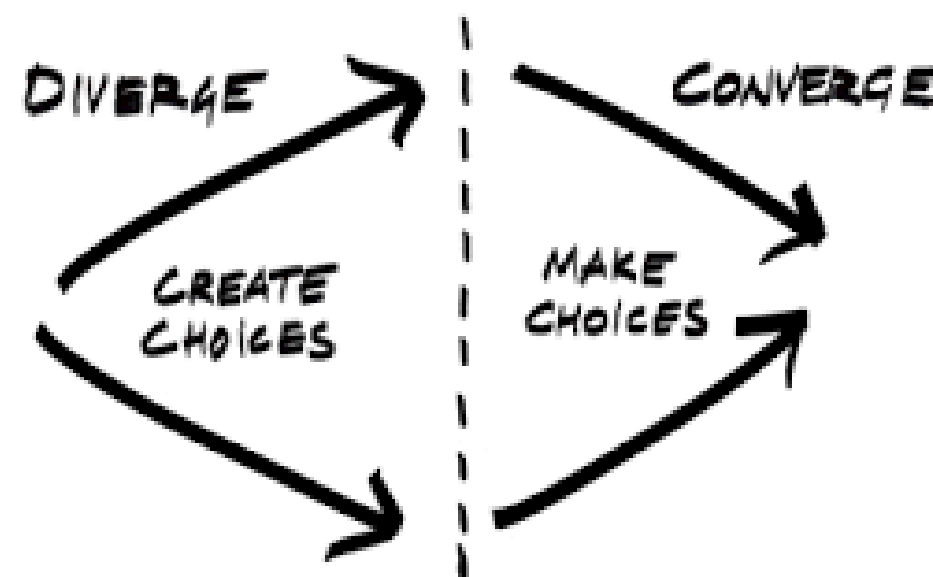
II. MODEL

A. Emission and absorption rates

The radiative transition rate per volume and per energy unit between an upper (u) and a lower (l) electronic state can be derived from Fermi's golden rule [18]:

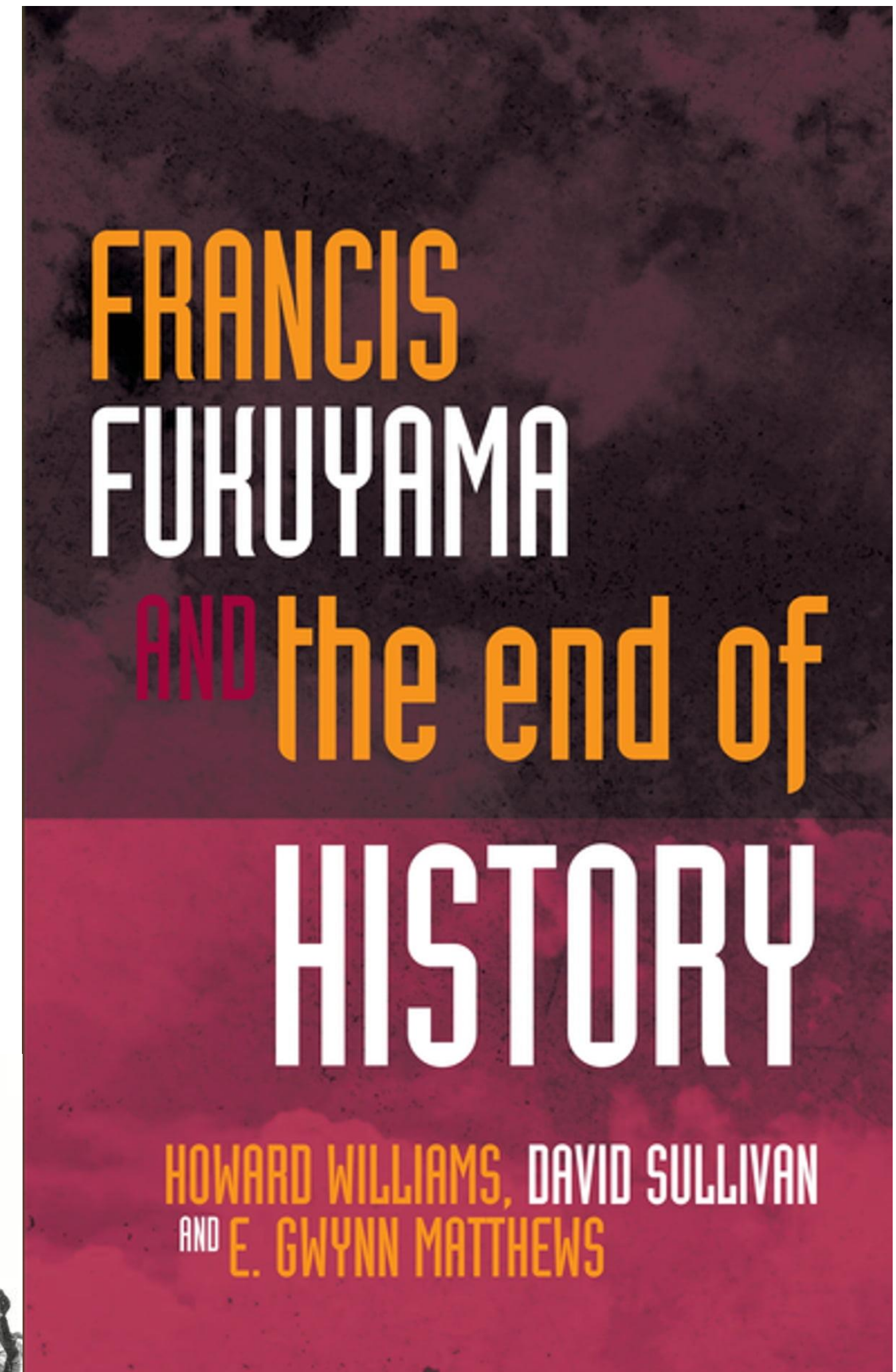
*germrey@gmail.com

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1989: The End of History



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Donna Lu

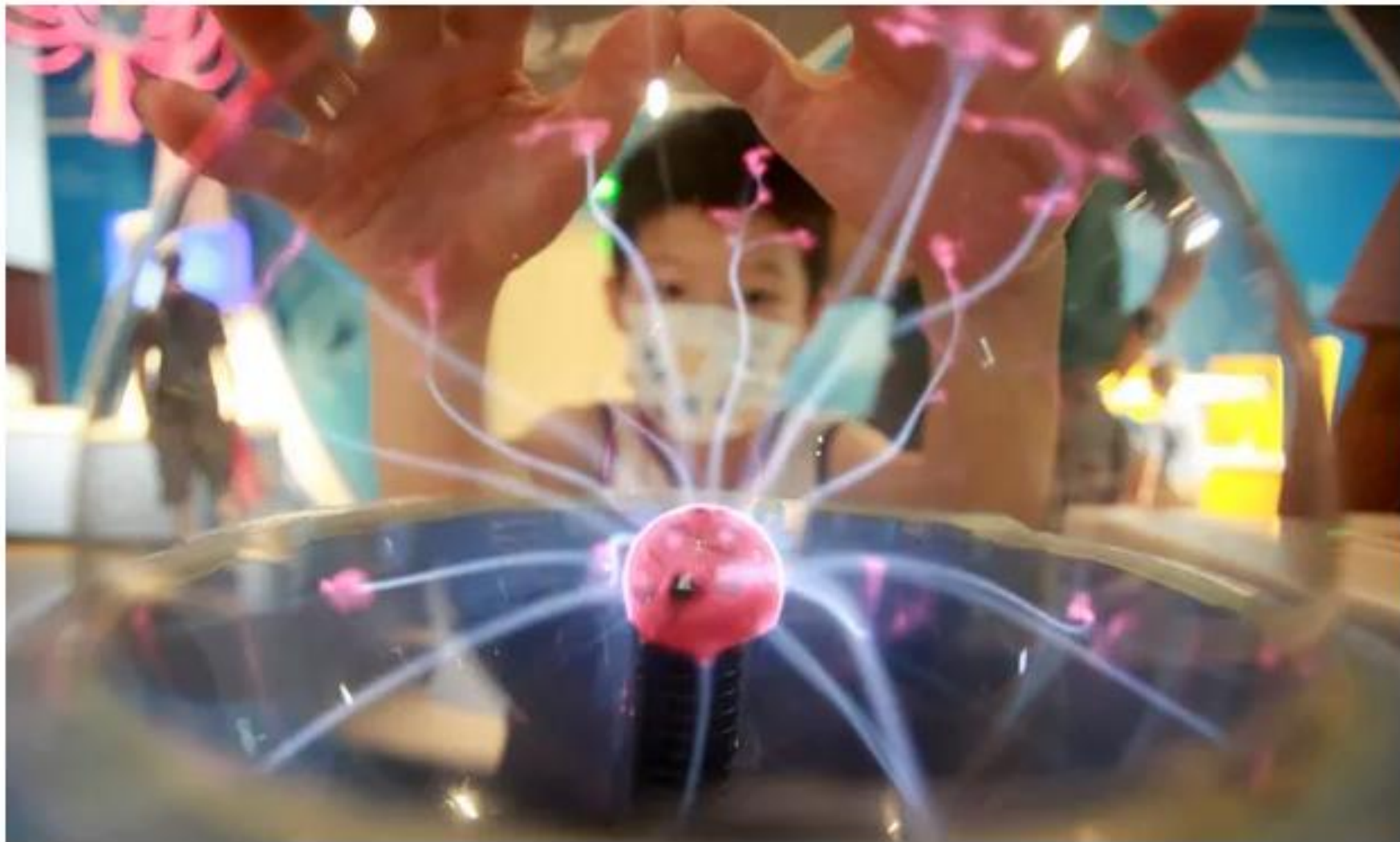
@donnadlu

Thu 11 Aug 2022 06:17 BST

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China overtakes the US in scientific research output

Between 2018 and 2020 China published 23.4% of the world's scientific papers, eclipsing the US



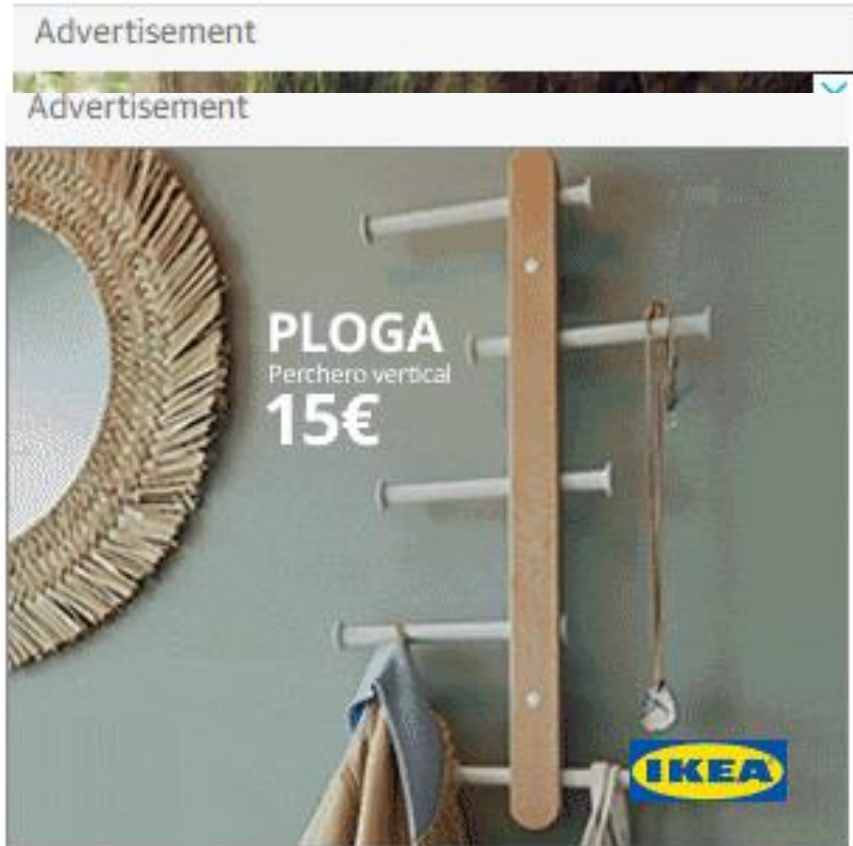
The Japanese report also found that Chinese research comprised 27.2% of the world's top 1% most frequently cited papers

Photograph: Xinhua/Rex/Shutterstock

China has overtaken the US as the world leader in both scientific research output and “high impact” studies, according to a report published by Japan’s

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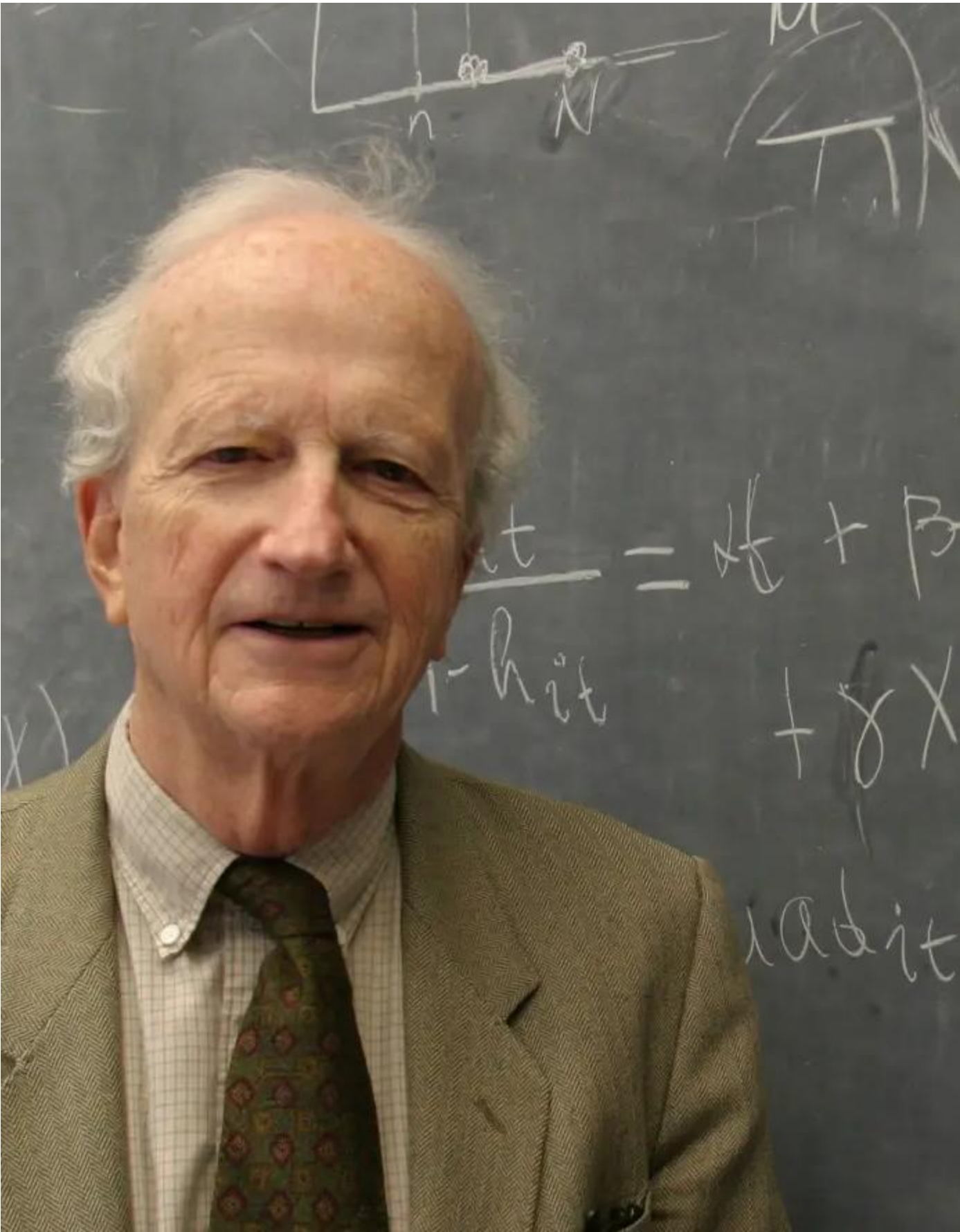


PLOGA

Perchero vertical

15€

IKEA



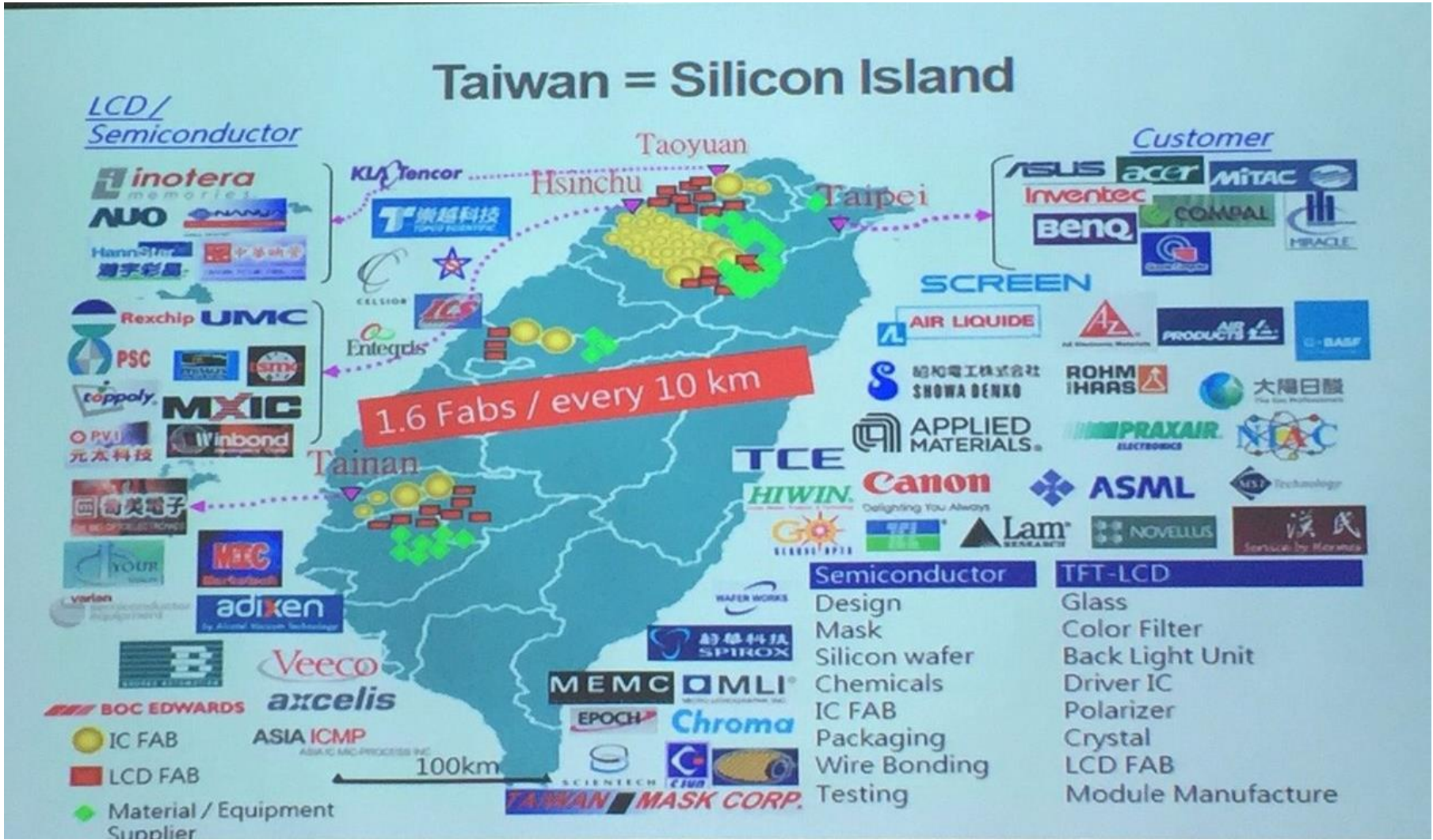
Gary Becker, Nobel Prize
“The best industrial policy is
none at all”

SOURCE / ECONOMY

China to develop 10,000 ‘little giants’ in push for advanced manufacturing

‘Hidden champions’ key to closing gaps in advanced manufacturing with West

By GT staff reporters
Published: Jul 05, 2021 07:45 PM



China's Sputnik Moment?

How Washington Boosted Beijing's Quest for Tech Dominance

By [Dan Wang](#) July 29, 2021

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★
CHINA,
SILICON VALLEY,
AND THE
NEW WORLD ORDER
KAI-FU LEE**

China's 'Sputnik Moment' and the Sino-American Battle for AI Supremacy

September 25th, 2018



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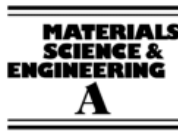
Finance & economics | The incubator state

Xi Jinping's bold plan for China's next phase of innovation

If it works, the strategy will redraw the country's economic map



Materials Science and Engineering A253 (1998) 8–15



Ion implantation of semiconductors

J.S. Williams

Department of Electronic Materials Engineering, Research School of Physical Sciences and Engineering, Australian National University, Canberra 0200, Australia

Abstract

Ion implantation was first applied to semiconductors over 30 years ago as a means of introducing controllable concentrations of n- and p-type dopants at precise depths below the surface. It is now an indispensable process in the manufacture of integrated circuits. This review gives a brief and selected overview of ion beam modification of semiconductors, treating both fundamental and technological issues of current interest. Damage introduction during ion irradiation and its removal during a thermal annealing step are key issues which are highlighted. Some semiconductors are easily damaged and amorphised (e.g. silicon) whereas others (e.g. gallium nitride) are quite resistant to damage production due to efficient dynamic defect annihilation during implantation. The conditions needed to remove implantation damage also vary dramatically from one semiconductor to another: amorphous layers in silicon can be recrystallised to completely remove disorder at $\sim 600^\circ\text{C}$, whereas extended defects in gallium nitride require temperatures of $> 1400^\circ\text{C}$ to remove them. High dose implantation can result in the formation of supersaturated solid solutions, alloys and compounds, often with intriguing properties as a result of the non-equilibrium aspects of ion implantation. Formation of silicon dioxide layers directly during oxygen bombardment of silicon, even under cryogenic implantation conditions, is given as an example. From the standpoint of semiconductor technology, there are several current issues under intense study. Two of these are highlighted with respect to silicon technology: the problems of transient enhanced diffusion of dopants during low temperature annealing due to residual implantation-induced defects, and the need to remove extremely low concentrations of metals from active device regions. Finally, some recent novel applications of implantation in compound semiconductors are treated. © 1998 Published by Elsevier Science S.A. All rights reserved.

Keywords: Ion implantation; Semiconductors; Silicon processing; Radiation damage; Compound semiconductors

1. Introduction

The semiconductor industry has been the juggernaut that has driven implantation technology. There have now been > 8000 implantation machines delivered to the semiconductor industry, more than 95% involved in the manufacture of advanced silicon chips alone [1]. Indeed, processing of $0.35\ \mu\text{m}$ CMOS chips can involve more than 30 separate implantation steps [2]. Driven to a very large extent by requirements of the semiconductor industry, there has been an enormous research effort into a broad range of ion beam modification processes in semiconductors over the past 3 decades. For example, the production and removal of implantation damage [3–6], diffusion and electrical (optical) activation of implanted dopants during subsequent annealing [7–10], formation of insulating layers such as silicon dioxide [11] and conducting silicide layers [12] by direct implantation, controlled introduction of irradiation-induced defects to tailor specific electrical [13] and

optical [14] properties, together with fundamental studies of defects [15–18] and diffusion [19–21] are all extremely active research areas.

This review briefly treats some of the above areas of research activity, concentrating on damage production and its removal in a range of semiconductors, silicon dioxide formation by oxygen implantation into silicon and a selection of recent technological applications of implantation in both silicon and compound semiconductors. Examples taken from the author's recent research will be given to illustrate each of these areas.

2. Damage accumulation and its removal

When an energetic ion enters a solid it loses energy by two processes: (i) by elastic or nuclear collisions with the matrix atoms causing direct atom displacements and disorder; and (ii) by inelastic or electronic processes in which the electrons of the solid are excited [3]. In



January 15, 2021

Eric S. Lander, Ph.D.
President and Founding Director
Broad Institute of MIT and Harvard

Dear Dr. Lander:

In 1944, President Franklin D. Roosevelt authored a letter to his science advisor, Dr. Vannevar Bush, posing the question of how science and technology could best be applied to benefit the nation's health, economic prosperity, and national security in the decades that would follow the Second World War. Dr. Bush's response came in the form of a report, titled *Science—the Endless Frontier*, that would form the basis of the National Science Foundation and set the course of scientific discovery in America for the next 75 years.

Those years have brought about some of the most consequential scientific advancements in human history with America leading the way. But three quarters of a century later, the contours of our lives have changed. Technologies and industries have risen and fallen, and the emergence of the digital arena has redefined the ways we innovate, communicate, and experience the world. And the nature of discovery itself has changed by leaps and bounds—reaching celestial heights, and microscopic complexities, that were unimaginable not so long ago.

For this reason, I believe it is essential that we refresh and reinvigorate our national science and technology strategy to set us on a strong course for the *next* 75 years, so that our children and grandchildren may inhabit a healthier, safer, more just, peaceful, and prosperous world. This effort will require us to bring together our brightest minds across academia, medicine, industry, and government—breaking down the barriers that too often limit our vision and our progress, and prioritizing the needs, interests, fears, and aspirations of the American people.

President Roosevelt asked Dr. Bush to consider four specific questions. Today, I am tasking you and your colleagues with five. My hope is that you, working broadly and transparently with the diverse scientific leadership of American society and engaging the broader American public, will make recommendations to our administration on the **general strategies, specific actions, and new structures** that the federal government should adopt to ensure that our nation can continue to harness the full power of science and technology on behalf of the American people.

NEWS SEMICONDUCTORS

South Korea's \$450-Billion Investment Latest in Chip Making Push > Ten-year investment part of a global race to secure semiconductors

China / Science

China's tech hub Shenzhen to invest US\$108 billion in R&D over 5 years

TECH

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By Éanna Kelly and John McCabe



Technology

TSMC to Spend \$100 Billion Over Three Years to Grow Capacity

By Debby Wu

1 de abril de 2021 3:52 CEST Updated on 1 de abril de 2021 10:34 CEST

Photographer: Maurice Tsal/ Bloomberg

Company	2020 R&D Expenditures
Amazon (US)	\$40.43 Billion
Alphabet (US)	\$27.3B
Huawei (China)	\$20B
Microsoft (US)	\$19.3B
Apple (US)	\$18.75B
Samsung (South Korea)	\$17.8B*
Intel (US)	\$13.28B
Alibaba (China)	\$7.43B
IBM (US)	\$6.31B
Oracle (US)	\$6.07B
Qualcomm (US)	\$5.98B

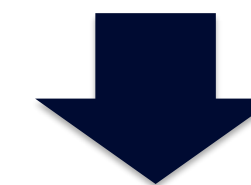
To have a reference, the total expenditure in R&D of the whole Spanish economy is \$ 18.5 B

<https://www.technewsworld.com/story/86977.html>

Annex Table 3
Top 100 clusters, 2021

Cluster rank	Cluster name	Economy	Share of total PCT filings (%)	Share of total publications (%)	Total	Rank change
1	Tokyo–Yokohama	JP	10.78	1.61	12.40	0
2	Shenzhen–Hong Kong–Guangzhou	CN/HK	7.79	1.51	9.30	0
3	Beijing	CN	2.62	2.95	5.57	1
4	Seoul	KR	3.93	1.61	5.54	–1
5	San Jose–San Francisco, CA	US	3.69	1.03	4.72	0
6	Osaka–Kobe–Kyoto	JP	2.88	0.72	3.60	0
7	Boston–Cambridge, MA	US	1.44	1.47	2.91	0
8	Shanghai	CN	1.36	1.49	2.85	1
9	New York City, NY	US	1.11	1.54	2.66	–1
10	Paris	FR	1.26	1.02	2.28	0
11	San Diego, CA	US	1.77	0.38	2.15	0
12	Nagoya	JP	1.74	0.24	1.99	0
13	Washington, DC–Baltimore, MD	US	0.43	1.44	1.86	0
14	Los Angeles, CA	US	0.89	0.78	1.67	0
15	London	GB	0.42	1.21	1.63	0
16	Houston, TX	US	0.96	0.51	1.46	0
17	Seattle, WA	US	1.05	0.38	1.42	0
18	Nanjing	CN	0.21	1.07	1.28	3
19	Amsterdam–Rotterdam	NL	0.40	0.88	1.28	–1
20	Cologne	DE	0.73	0.53	1.26	–1
21	Hangzhou	CN	0.60	0.60	1.20	4
22	Daejeon	KR	0.87	0.29	1.16	0
23	Chicago, IL	US	0.50	0.64	1.14	–3
24	Munich	DE	0.74	0.36	1.09	–1
25	Wuhan	CN	0.24	0.82	1.05	4
26	Stuttgart	DE	0.82	0.21	1.03	0
27	Tel Aviv–Jerusalem	IL	0.66	0.35	1.01	–3
28	Taipei–Hsinchu	TW	0.29	0.69	0.97	–1
29	Singapore	SG	0.38	0.52	0.90	–1
30	Philadelphia, PA	US	0.31	0.58	0.89	1
31	Melbourne	AU	0.19	0.69	0.87	4
32	Moscow	RU	0.18	0.68	0.86	0
33	Xi'an	CN	0.08	0.77	0.86	7
34	Minneapolis	US	0.58	0.27	0.85	–4

Cluster rank	Cluster name	Economy	Share of total PCT filings (%)	Share of total publications (%)	Total	Rank change
52	Tianjin	CN	0.08	0.53	0.61	4
53	Qingdao	CN	0.28	0.32	0.60	16
54	Montréal, QC	CA	0.19	0.41	0.60	–2
55	Heidelberg–Mannheim	DE	0.36	0.23	0.59	–2
56	Copenhagen	DK	0.28	0.30	0.59	–2
57	Atlanta, GA	US	0.16	0.40	0.56	–2
58	Cambridge	GB	0.26	0.29	0.55	–1
59	Changsha	CN	0.06	0.48	0.54	7
60	Rome	IT	0.08	0.45	0.53	–2
61	Cincinnati, OH	US	0.37	0.15	0.52	–2
62	Bengaluru	IN	0.32	0.20	0.52	–2
63	Suzhou	CN	0.33	0.18	0.51	9
64	Delhi	IN	0.09	0.41	0.50	3
65	Dallas, TX	US	0.29	0.20	0.49	–3
66	São Paulo	BR	0.07	0.41	0.48	–5
67	Pittsburgh, PA	US	0.15	0.33	0.48	–3
68	Nuremberg–Erlangen	DE	0.33	0.14	0.47	–5
69	Chongqing	CN	0.09	0.38	0.47	8
70	Ann Arbor, MI	US	0.12	0.35	0.47	–5
71	Vienna	AT	0.14	0.30	0.44	–1
72	Oxford	GB	0.14	0.31	0.44	–1
73	Hefei	CN	0.07	0.37	0.44	6
74	Helsinki	FI	0.25	0.19	0.44	–6
75	Harbin	CN	0.02	0.40	0.42	5
76	Jinan	CN	0.07	0.34	0.41	6
77	Vancouver, BC	CA	0.13	0.27	0.41	–3
78	Lyon	FR	0.22	0.19	0.41	–2
79	Busan	KR	0.20	0.20	0.40	–4
80	Cleveland, OH	US	0.12	0.27	0.39	–7
81	Changchun	CN	0.02	0.37	0.39	6
82	Phoenix, AZ	US	0.23	0.16	0.39	–4
83	Hamamatsu	JP	0.33	0.04	0.37	2
84	Kanazawa	JP	0.32	0.05	0.37	7
85	Ottawa, ON	CA	0.18	0.19	0.37	–4
86	Brisbane	AU	0.11	0.25	0.36	–3
87	Bridgeport–New Haven, CT	US	0.12	0.24	0.36	–3
88	Austin, TX	US	0.20	0.15	0.35	–2
89	Ankara	TR	0.04	0.30	0.35	–1
90	Shenyang	CN	0.04	0.30	0.34	14
91	Hamburg	DE	0.17	0.17	0.34	–1



Half of the main 25
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globalization: from
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to insourcing the high
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TSMC eyes Germany as possible location for first Europe chip plant

Taiwanese chipmaker looking at ways to lower costs at planned Japan factory



NEWS

Germany: Tesla seeks to build battery factory near Berlin

Tesla has also changed its application for emission control approval for its construction plans. The new application formally requests the additional battery production facility Tesla had already hinted at.

VW partners with Chinese company for German battery factory

Automaker aims to be top three global battery manufacturer

NATHAN EDDY in ✉

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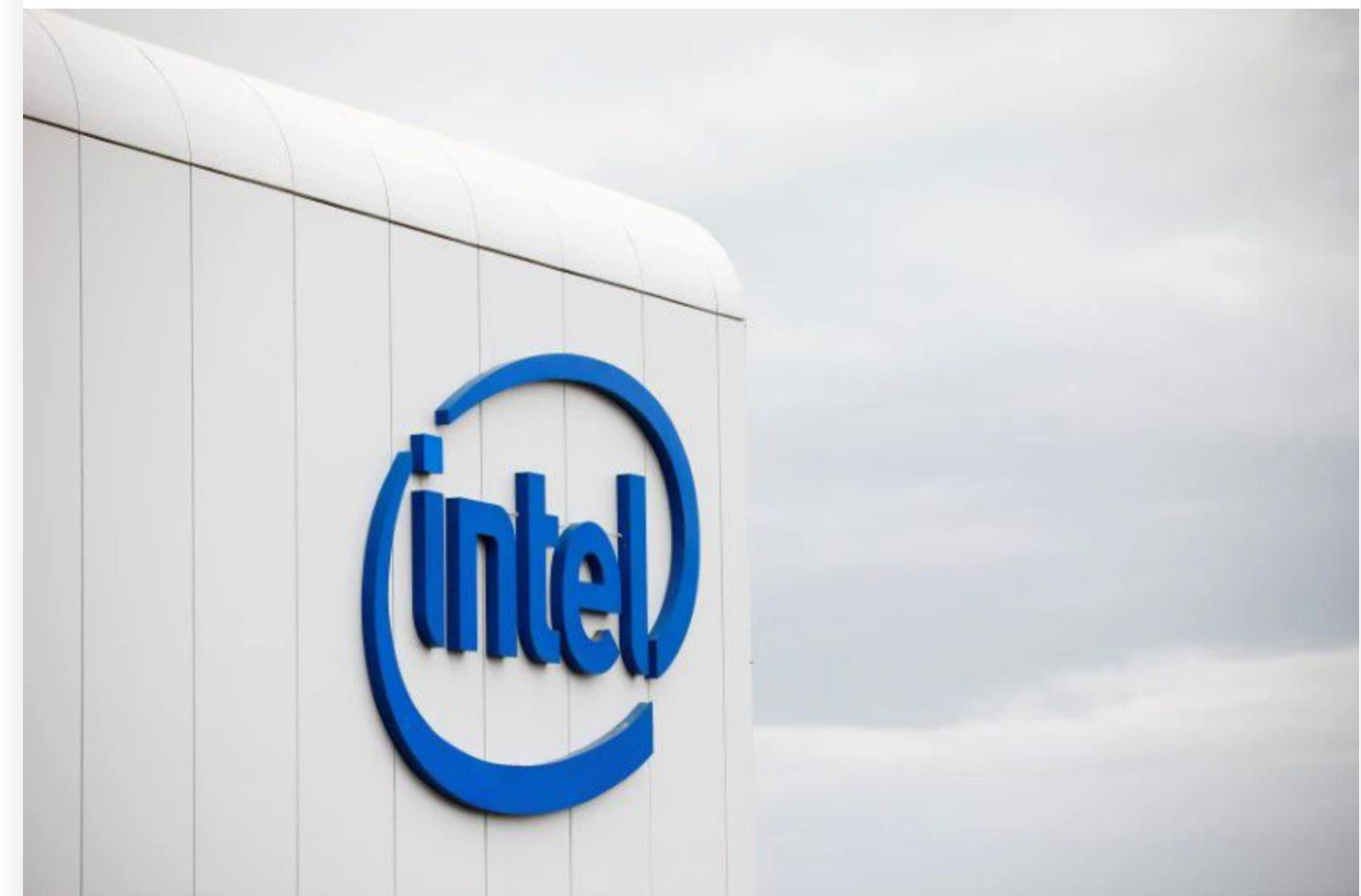
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Business

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BASF, Porsche partner on battery development

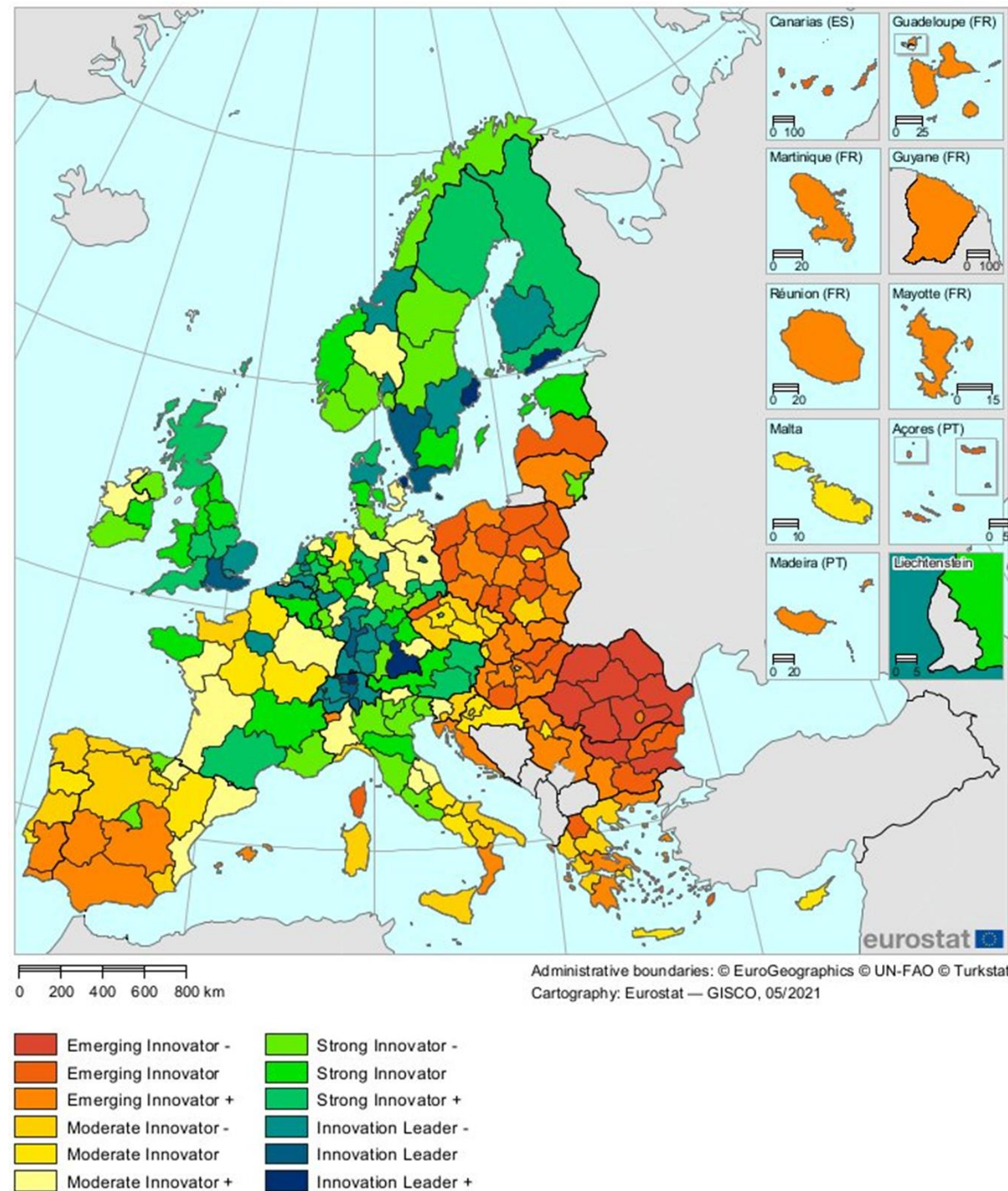
Published date: 21 July 2021

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German chemicals producer BASF and Cellforce Group, a joint venture between Porsche and Custom Cells, have agreed to develop high-performance battery cells for electric vehicles (EVs).

Bosch opens \$1.2 billion chip plant in Germany



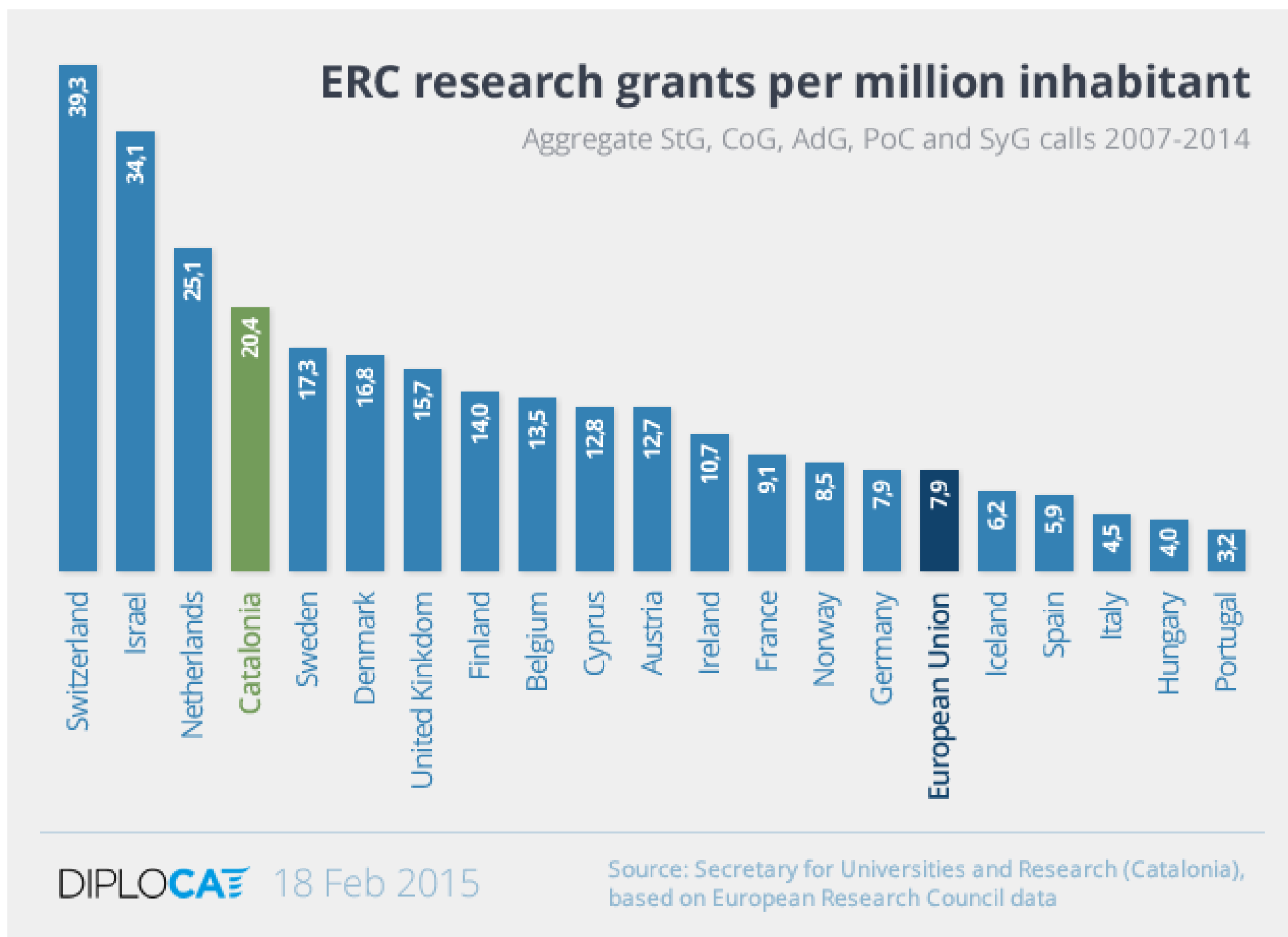
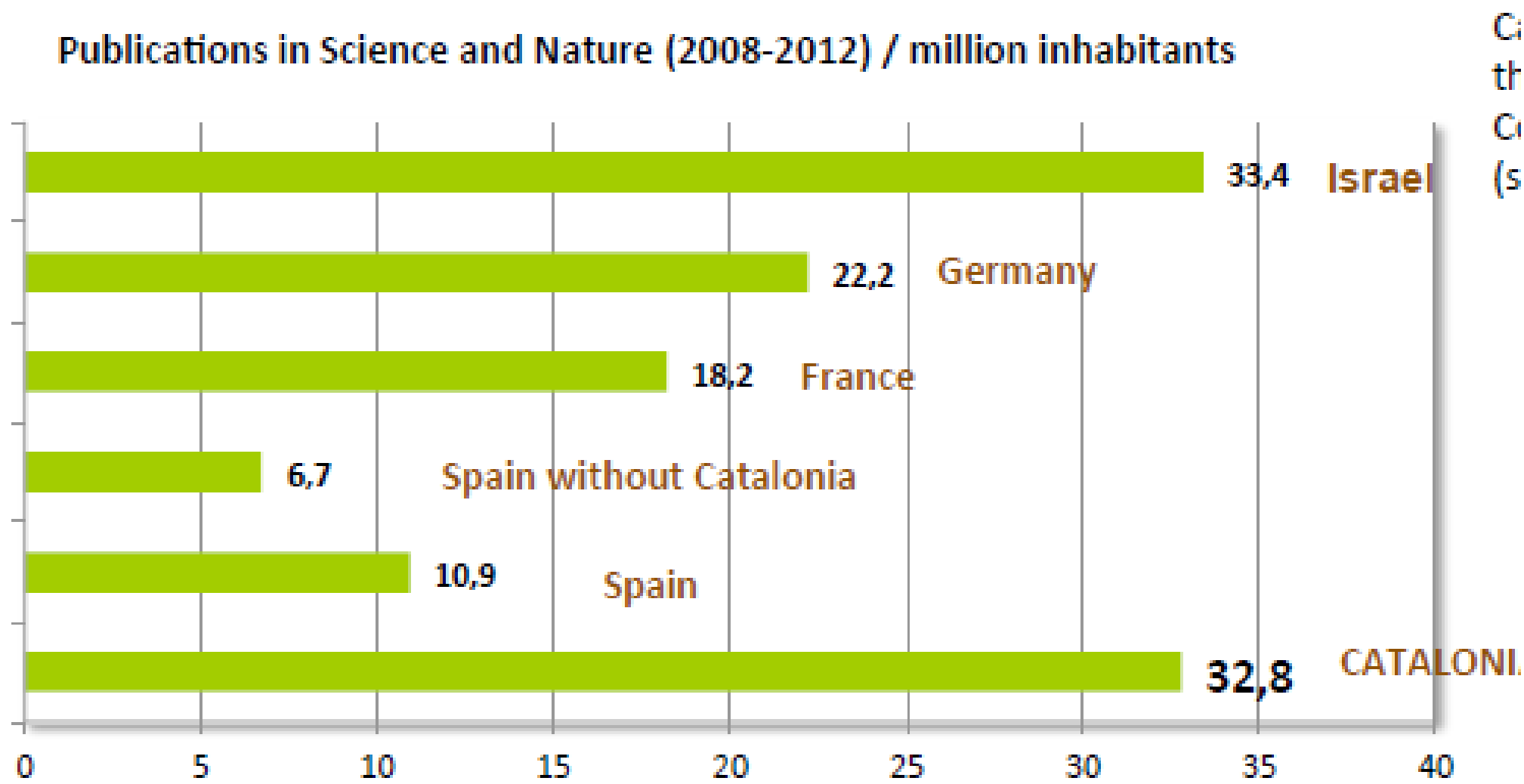
For Cyprus, Estonia, Latvia, Luxembourg and Malta, performance group membership is identical to that in the EIS 2021 report. For these countries, the corresponding colour codes for the middle sub-group of regions have been used.

Bloomberg 2021 Innovation Index

2021 Rank	2020 Rank	YoY Change	Country	Total Score	R&D Intensity	Manufacturing Value-added	Productivity	High-tech Density	Tertiary Efficiency	Researcher Concentration	Patent Activity
1	2	+1	S. Korea	90.49	2	2	36	4	13	3	1
2	3	+1	Singapore	87.76	17	3	6	18	1	13	4
3	4	-1	Switzerland	87.60	3	5	7	11	15	4	18
4	1	-3	Germany	86.45	7	6	20	3	23	12	14
5	5	0	Sweden	86.39	4	21	12	6	7	7	21
6	8	+2	Denmark	86.12	8	17	3	8	22	2	23
7	6	-1	Israel	85.50	1	30	18	5	34	1	8
8	7	-1	Finland	84.86	11	12	17	13	14	10	10
9	13	+4	Netherlands	84.29	14	26	14	7	25	8	9
10	11	+1	Austria	83.93	6	9	15	23	16	9	15
11	9	-2	U.S.	83.59	9	24	5	1	47	32	2
12	12	0	Japan	82.86	5	7	37	10	36	18	11
13	10	-3	France	81.73	12	39	12	2	26	21	16
14	14	0	Belgium	80.75	10	23	16	15	43	14	13
15	17	+2	Norway	80.70	15	49	4	14	5	11	24
16	15	-1	China	79.56	13	20	45	9	17	39	3
17	16	-1	Ireland	79.41	35	1	2	12	42	17	39
18	18	0	U.K.	77.20	21	44	25	17	4	20	22
19	20	+1	Australia	76.81	20	55	8	16	10	31	7
20	19	-1	Italy	76.73	26	15	28	21	41	25	12
21	22	+1	Canada	75.98	22	35	21	25	37	22	5
22	21	-1	Slovenia	73.64	18	8	27	41	11	16	27
23	25	+2	Poland	73.38	33	19	34	19	28	33	30
24	26	+2	Russia	72.84	37	32	41	20	21	24	25
25	29	+4	New Zealand	72.57	27	41	29	26	40	15	29
26	24	-2	Czech Rep.	71.55	19	4	24	45	32	19	26
27	28	+1	Hungary	70.73	23	14	32	24	53	28	48
28	23	-5	Iceland	69.99	16	40	1	54	12	5	34
29	27	-2	Malaysia	69.68	24	10	46	27	50	42	31
30	30	0	Greece	68.47	34	48	43	29	9	26	47
31	33	+2	Spain	67.91	31	33	33	38	19	27	37
32	32	0	Romania	66.72	57	22	30	22	20	50	40
33	35	+2	Turkey	66.68	39	13	50	35	31	46	20
34	37	+3	Latvia	65.91	49	46	31	30	6	40	49
35	31	-4	Luxembourg	65.59	32	45	11	47	60	6	6
36	40	+4	Thailand	65.42	36	18	52	33	30	45	35
37	34	-3	Portugal	64.63	28	34	40	49	3	23	46
38	39	+1	Hong Kong	64.06	42	60	10	31	46	30	17
39	36	-3	Estonia	63.77	25	28	19	54	8	29	51
40	38	-2	Lithuania	62.74	40	16	22	54	2	34	55
41	42	+1	Bulgaria	61.34	47	31	47	37	39	36	50
42	47	+5	Malta	59.51	51	51	23	42	24	37	38
43	44	+1	U.A.E.	58.89	29	36	26	50	49	43	41
44	41	-3	Slovakia	58.23	43	11	35	53	51	35	52
45	43	-2	Croatia	57.68	38	37	38	52	33	38	54
46	46	0	Brazil	57.21	30	59	54	32	48	51	43
47	50	+3	S. Africa	54.06	44	53	53	34	58	57	28
48	NR	-	Serbia	53.74	41	38	51	48	45	41	57
49	48	-1	Cyprus	53.64	52	58	42	36	38	48	59

7 European countries are still in the top 10:
Germany, Austria, Netherlands, Denmark,
Sweden, Finland, Switzerland

The success of the INDUSTRY 4.0 MODEL

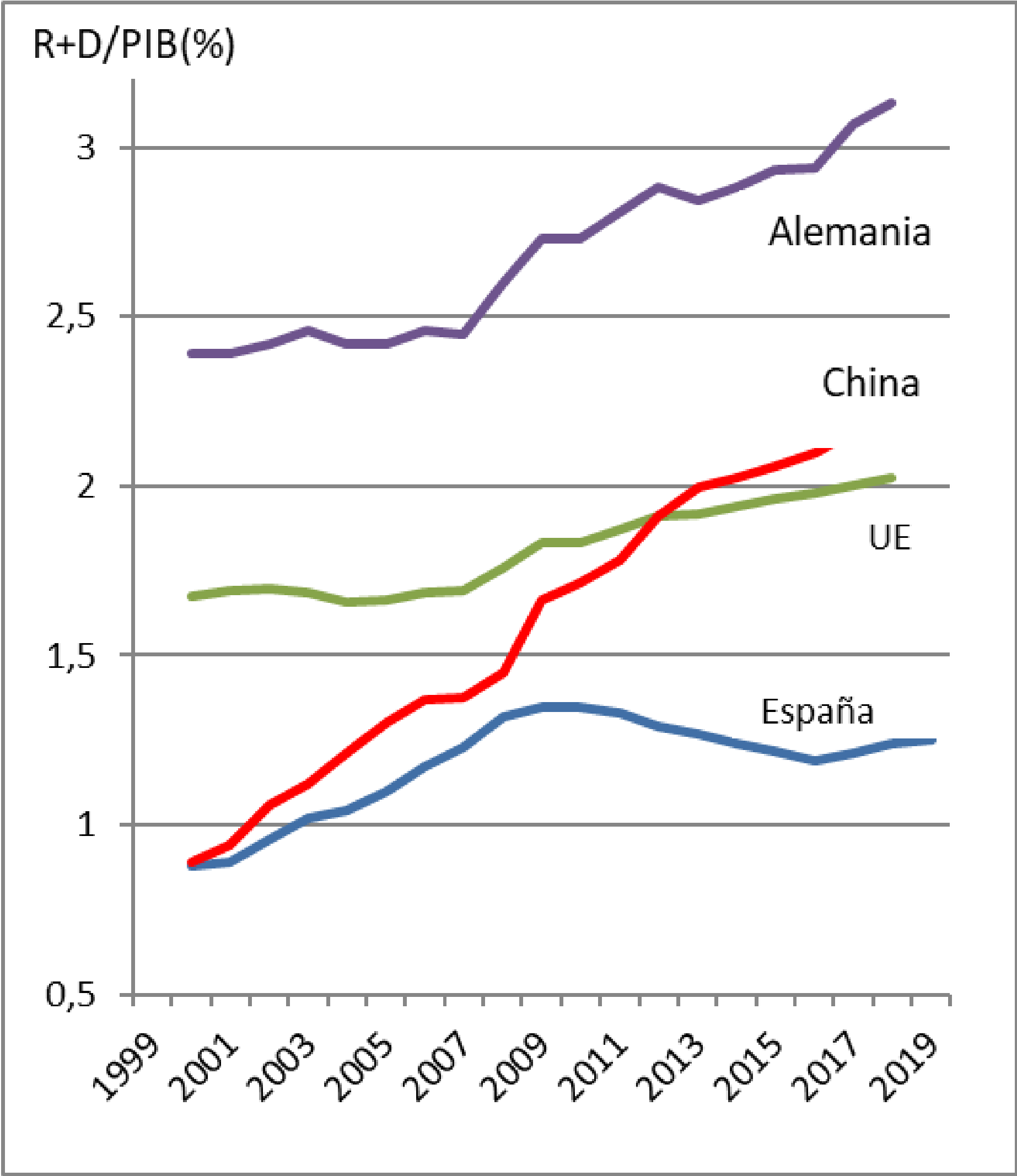


Los mejores emprendedores españoles

LAS 'START-UPS' MÁS EXITOSAS

Empresa	Sector	Año de fundación	Financiación (en millones de €)
LetGo	Segunda mano	2015	
Cabify	Coche compartido	2011	36
Glovo	Reparto	2015	285
Wallapop	Segunda mano	2013	
Jobandtalent	RR HH	2009	114
Flywire	Pagos entre países	2009	89,2
TravelPerk	Viajes de empresa	2016	73,5
Pagantis	Crédito	2011	67
Devo	'Big Data'	2011	64,2
Busuu	Idiomas	2008	
Cooltra	Alquiler de motos	2002	56
CornerJob	Empleo	2015	54
Fever	Planes de ocio	2012	53,5
ID Finance	Créditos online	2012	52,6
eDreams Odigeo	Viajes	1999	
Spotahome	Alquiler de pisos	2014	47,5
Badi	Alquiler de pisos	2015	45
Civici	Voto electrónico	2016	35
Carto	Geolocalización	2012	26,7
Mr. Jeff	Lavandería	2015	25
Kantox	Pagos entre países	2011	20
Exxotica	Viajes	2014	14,5
Deporvillage	Comercio electrónico	2010	7

Fuente: elaboración propia.



FONDO DE RESERVA DE LA SEGURIDAD SOCIAL

En millones de euros



* La cifra incluye los rendimientos que obtiene el fondo por inversiones.

Fuente: Ministerio de Empleo y Seguridad Social. EL PAÍS



*El que divide al número de trabajadores en dos partes iguales, los que tienen un salario superior y los que tienen un salario inferior.

Fuente: INE

Expansión

esade

The winds of globalization have changed



Thanks for your attention!

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