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CHINA

Challenges and Prospects from an Industrial and Innovation Powerhouse

Koen Jonkers

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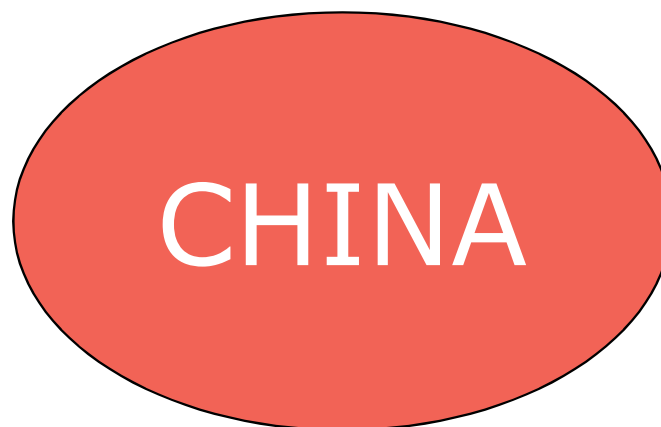




'MIC 2025'



Industrial leader



R&I powerhouse



Uneven playing field?

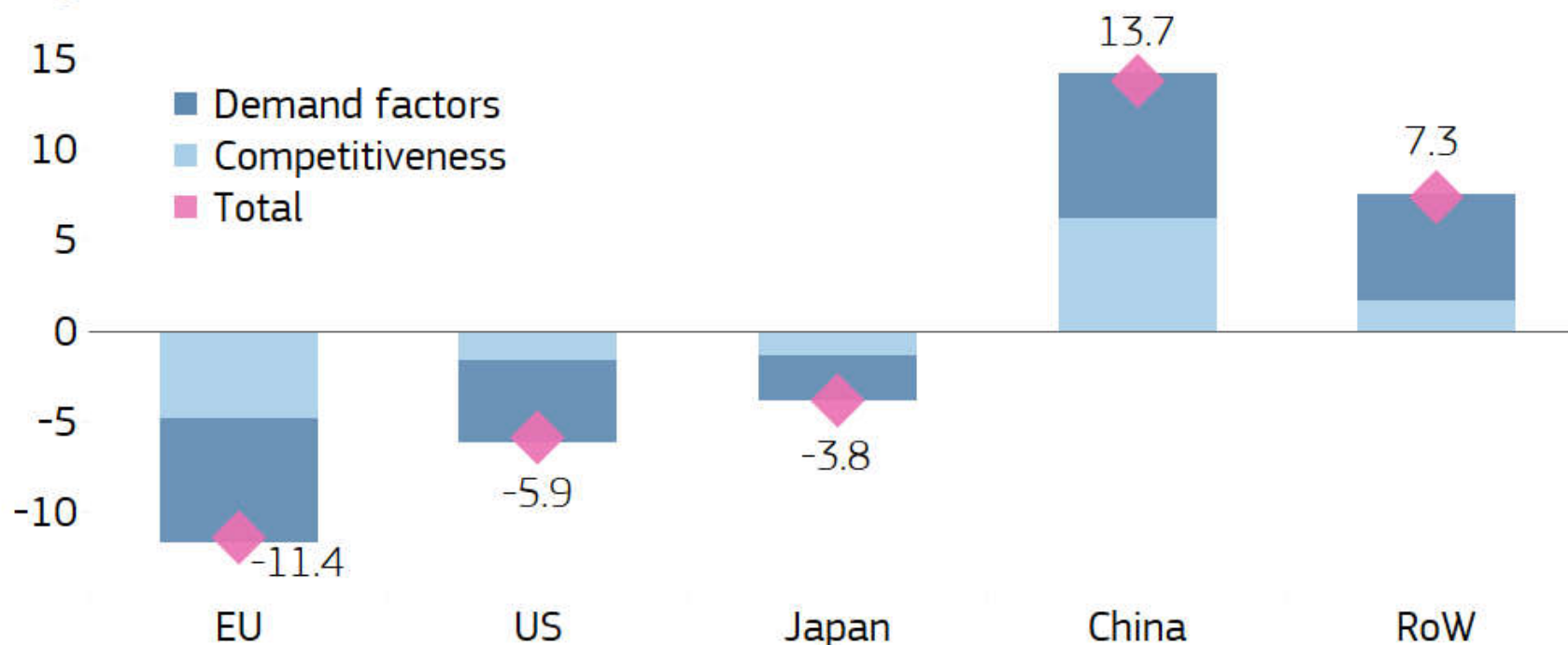


Investments in companies

China's next big objective: an industrial leader

China has more than tripled its share in manufacturing GVCs – from 6% to 19%

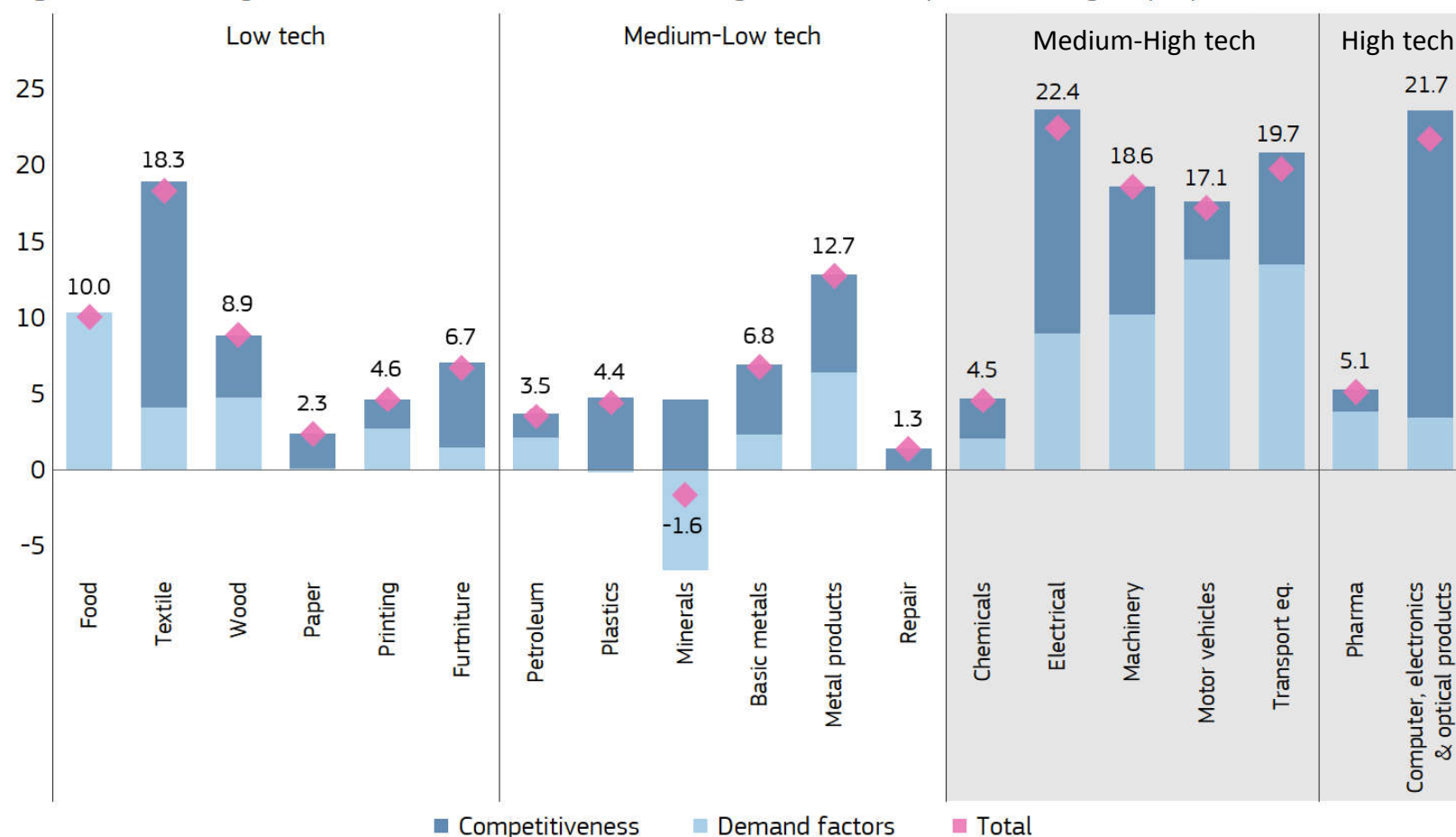
Figure 2.1: Global share in manufacturing value chains; Change in pct points, 2000-2014



Source: JRC based on WIOD (2016)

Largest gains in medium-high and high-tech sectors

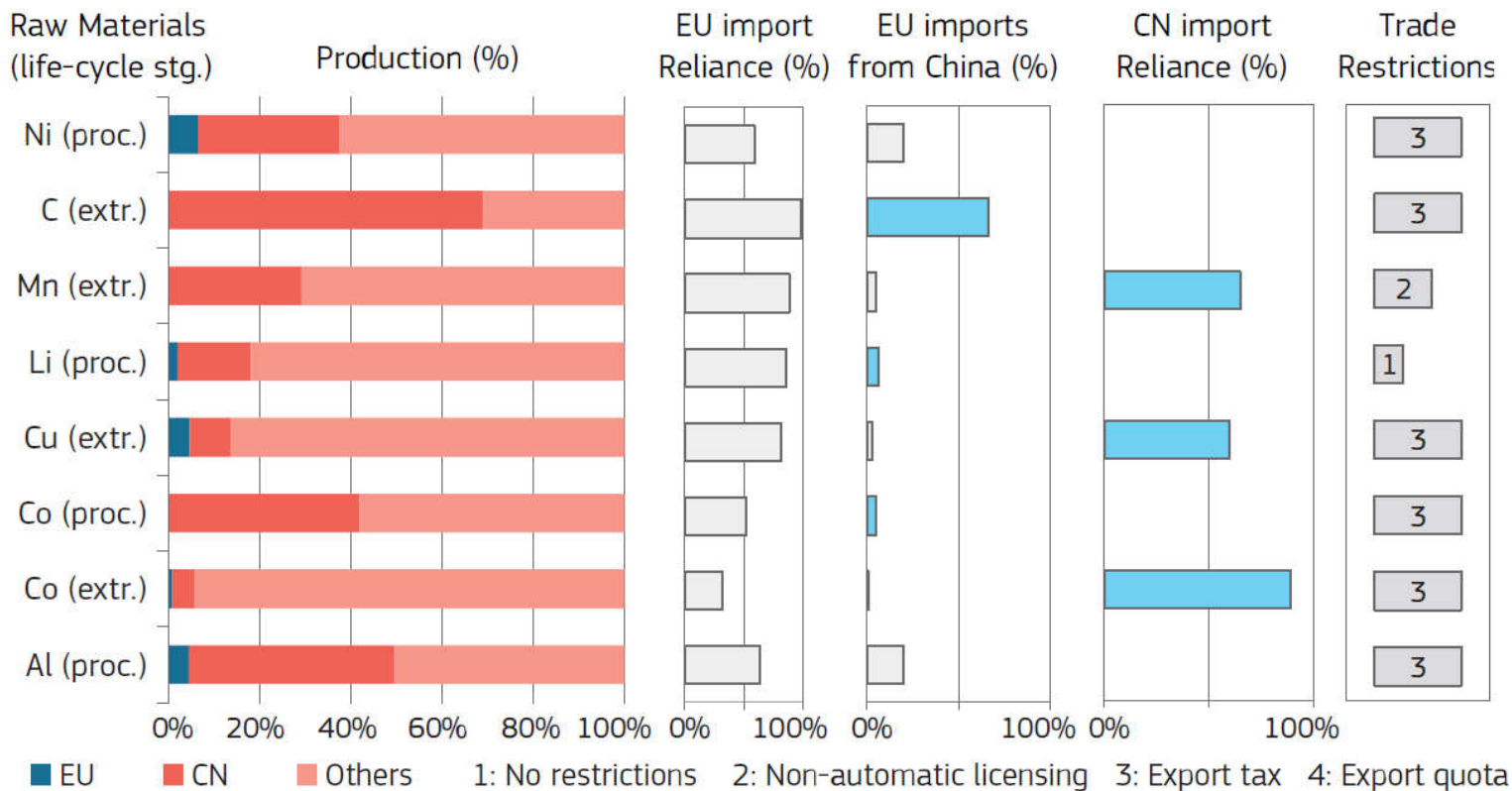
Figure 2.2: China's global value-added shares in manufacturing value chains, by sector; Change in pct points, 2000-2014



Source:
JRC based on WIOD (2016)

China is likely to become an important supplier of raw materials for new energy vehicles

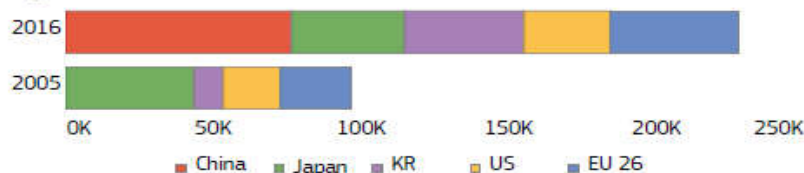
Figure 16.2: Raw materials for electric vehicle batteries



Source: JRC based on OECD (2014), EC (2017a,b), Gulley et al. (2018)

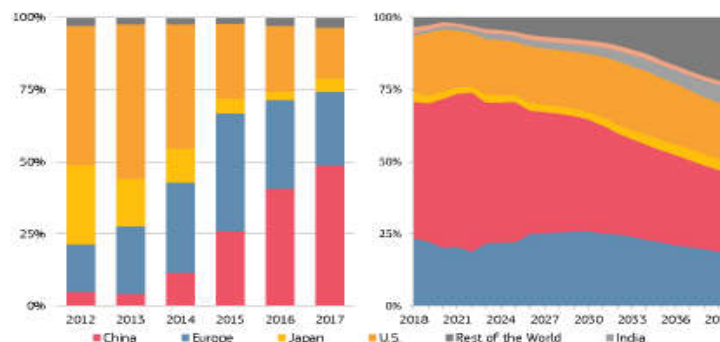
China holds 30% of the industrial robotics market and this share is growing rapidly

Figure 13.1: Sales of industrial robots



China has already a 50% share in the global market for energy vehicles

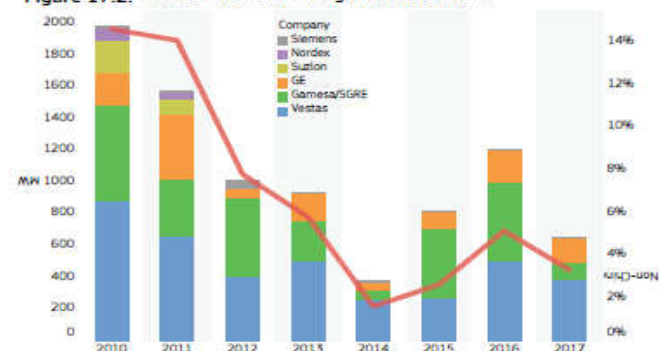
Figure 16.1: Global electric vehicle sales shares, %



Source: JRC based on CAAM (2018) and Bloomberg NEF (2018a)

Shrinking market shares for non-Chinese manufacturers of wind energy equipment

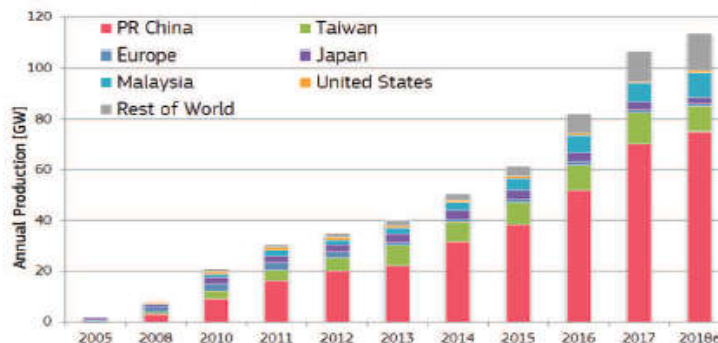
Figure 17.2: Market shares of foreign manufacturers



Source: JRC(2018)

China has become the world's largest solar cells producer by tailored support for large firms

Figure 18.1: World PV solar cell production from 2005 to 2018 (estimate)

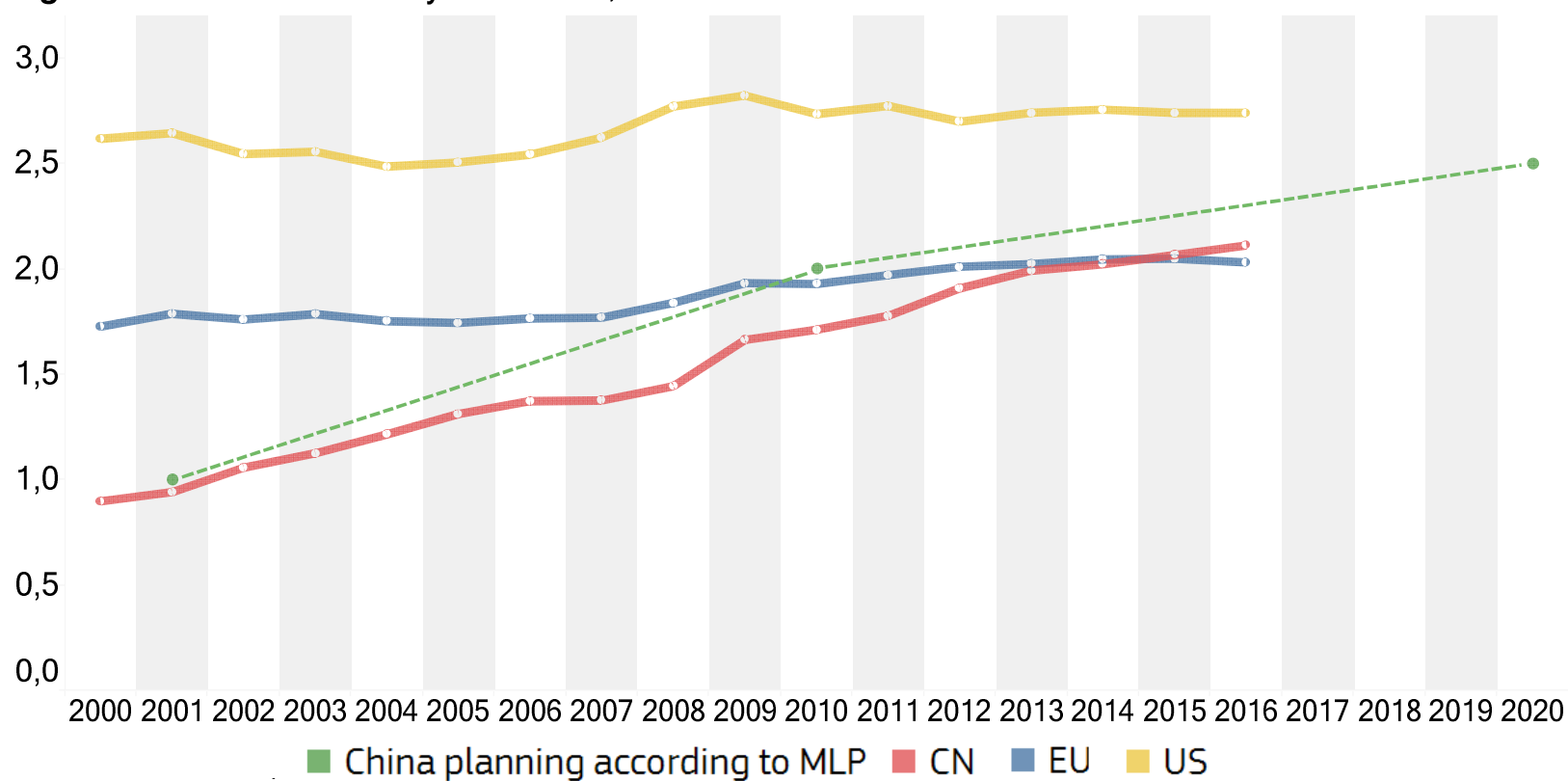


Source: Photon (2012) PV News (2015) and JRC PV Status Reports (2018) 2002-2018

China is a new R&I powerhouse

China spends more on R&D as a proportion of GDP than the EU

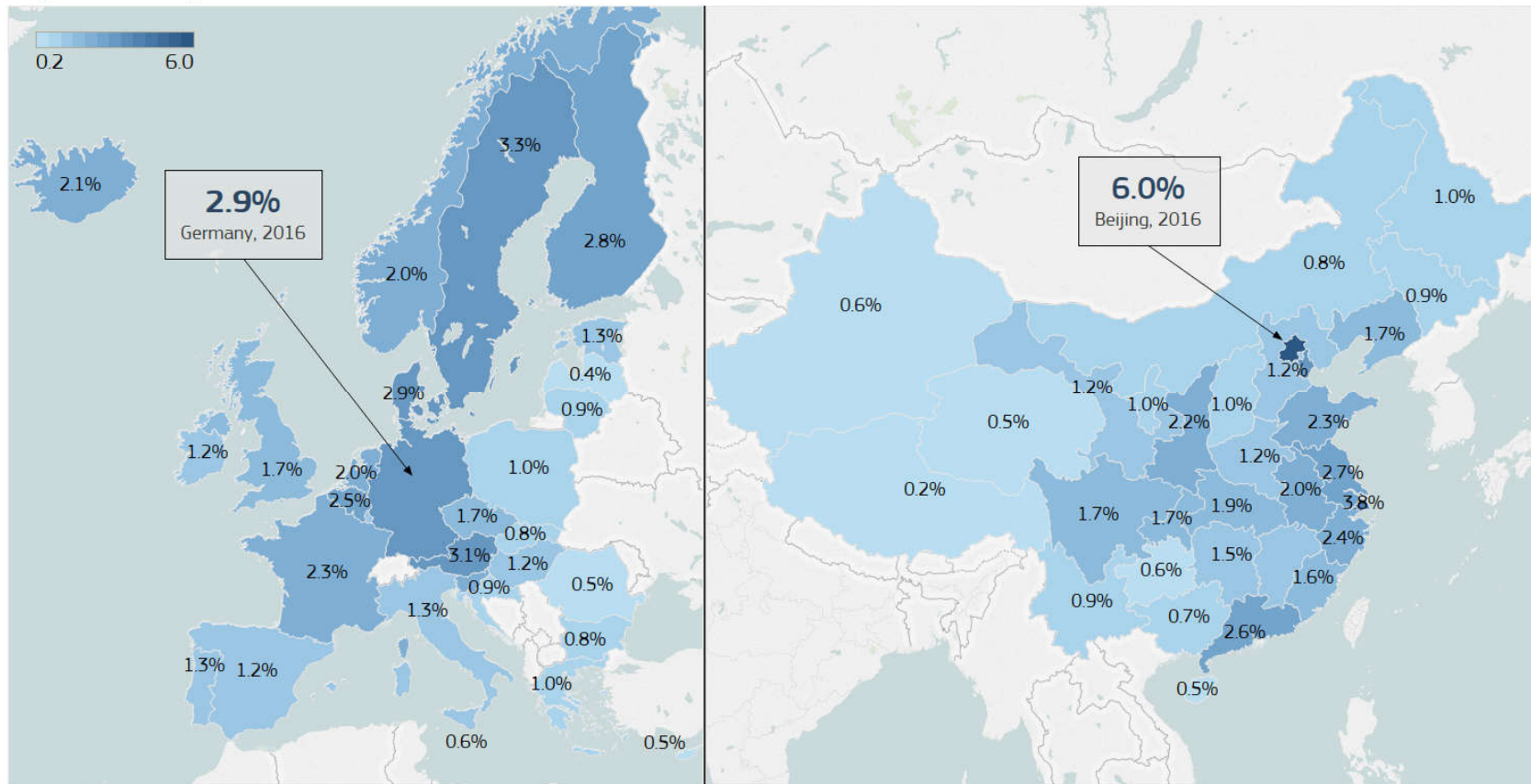
Figure 9.1: GERD intensity in the US, EU and China



Source: OECD - MSTI for China in 2016, United States in 2015 and 2016; Eurostat for the European Union

... but as the EU, it has challenges such as regional disparities (R&D spending is an indicator)

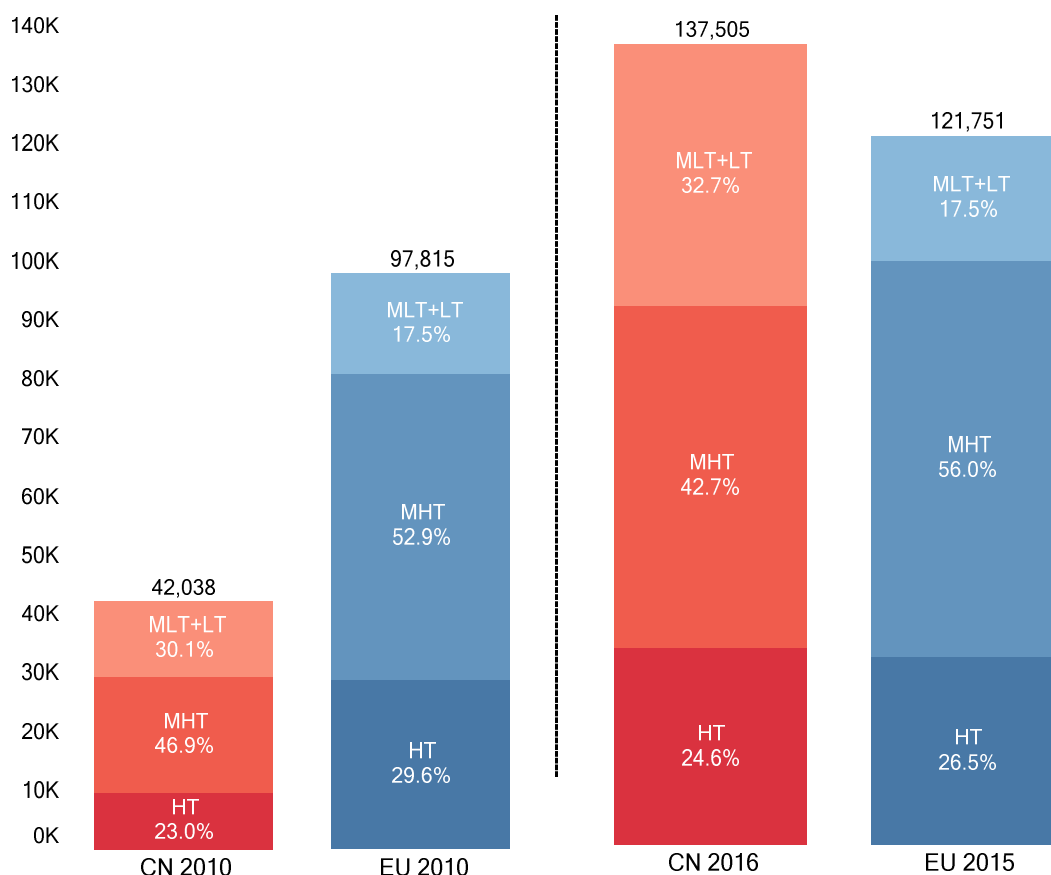
Figure 9.8: Regional GERD intensities in China and the EU



Source: China Statistical yearbook of S&T 2017

China overtakes the EU in total as well as in medium-high and high-tech BERD

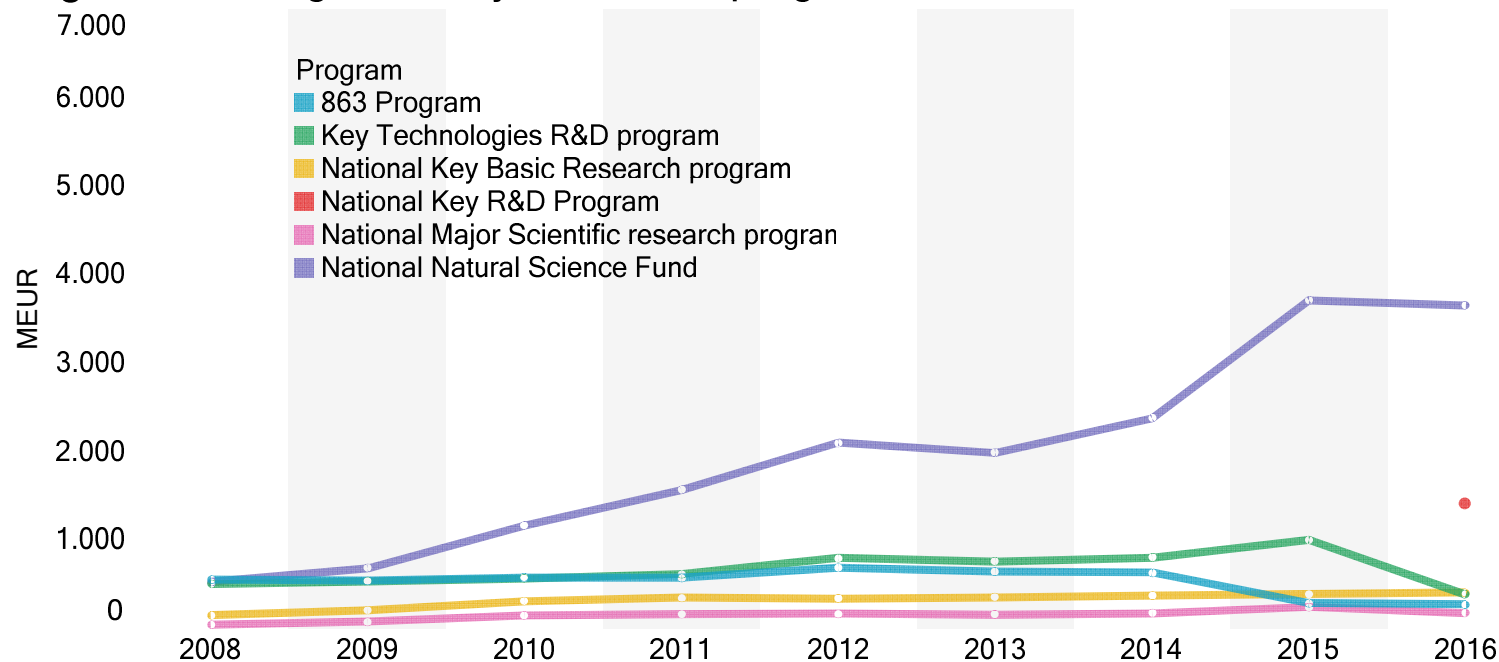
Figure 9.2: BERD in HT/MT/LT sectors in the EU and China



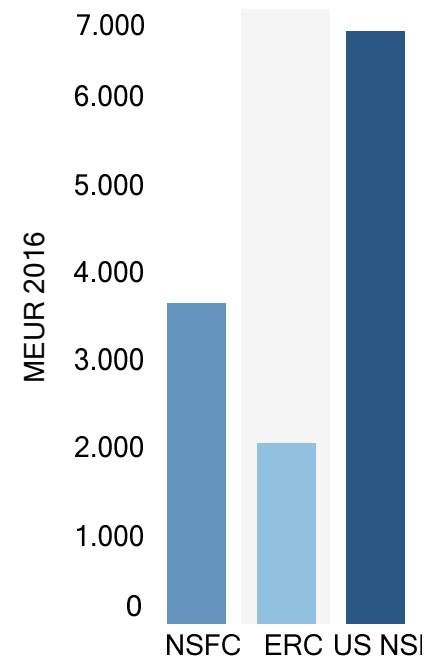
Source: China Statistical Yearbook of S&T 2001; 2017 - Eurostat

The budget of the Chinese Research Council (NSFC) is almost double that of the ERC

Figure 9.9: Budget for major research programmes

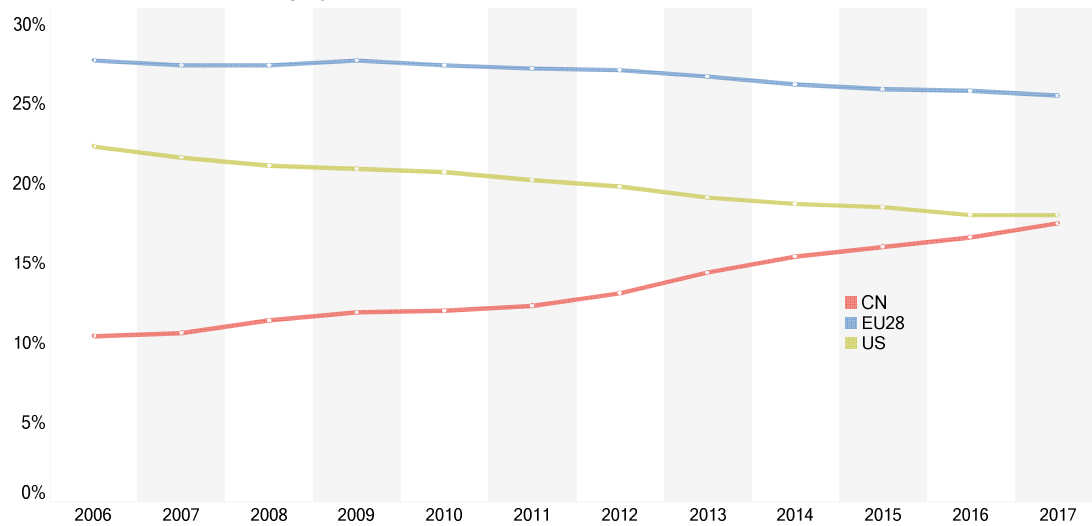


Source: China Statistical Yearbook of S&T 2017



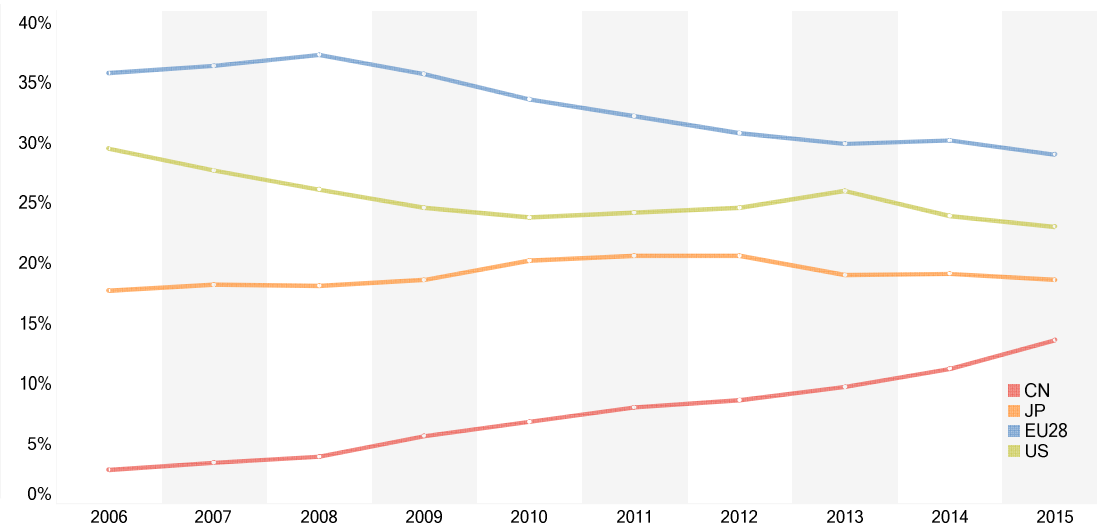
S&T output as well as the output and impact of China's publications and patents are rising fast

Figure 9.3: Top 10 % highly cited publications - US, EU and China world shares



Source: Elsevier Scopus data

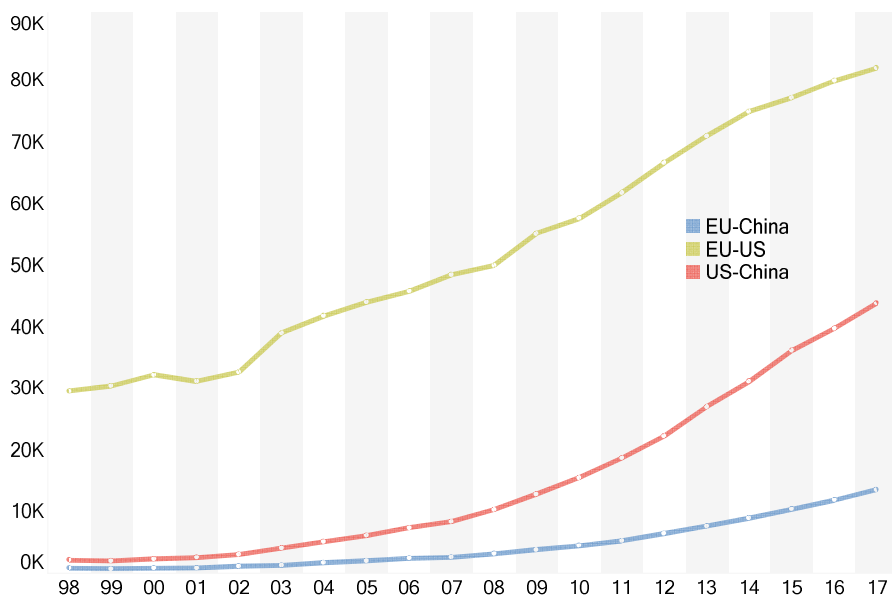
Figure 9.4: World shares in transnational patents filings (EPO+PCT)



Source: PATSTAT - computations based on Frietsch (forthcoming)

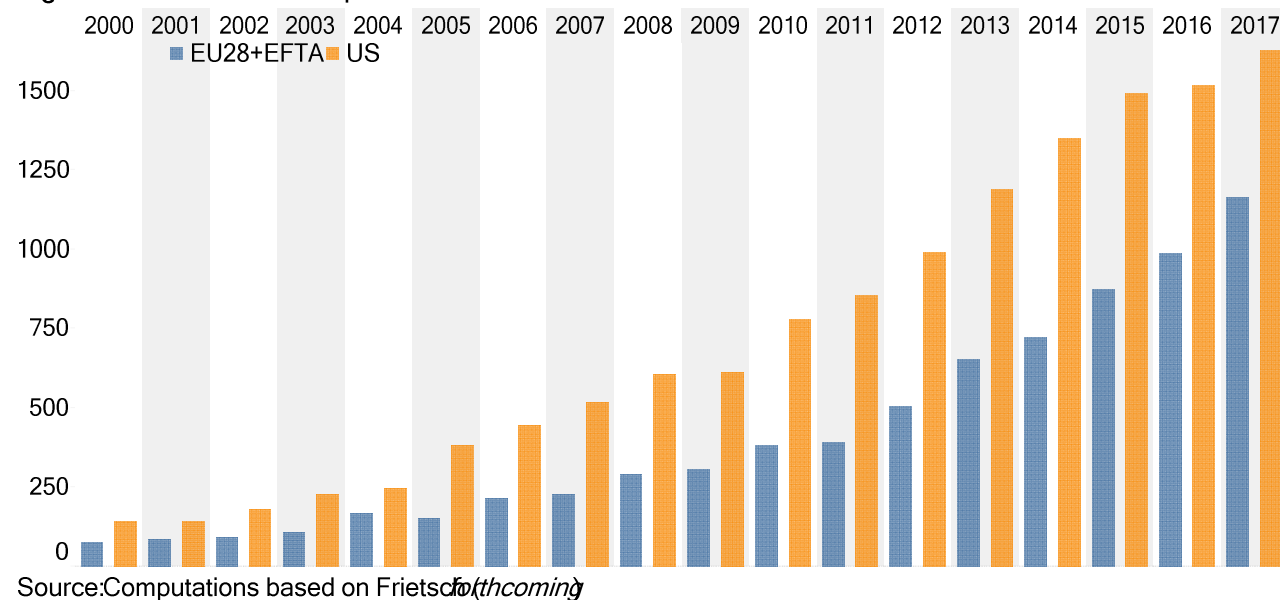
The US benefits more than the EU from China's rise in S&T

Figure 10.1: International co-publications between the US, EU and Ch



Source: Co-publications based on JRC elaboration of Scopus data

Figure 10.7: Number of co-publications between Chinese researchers and EU/US firms

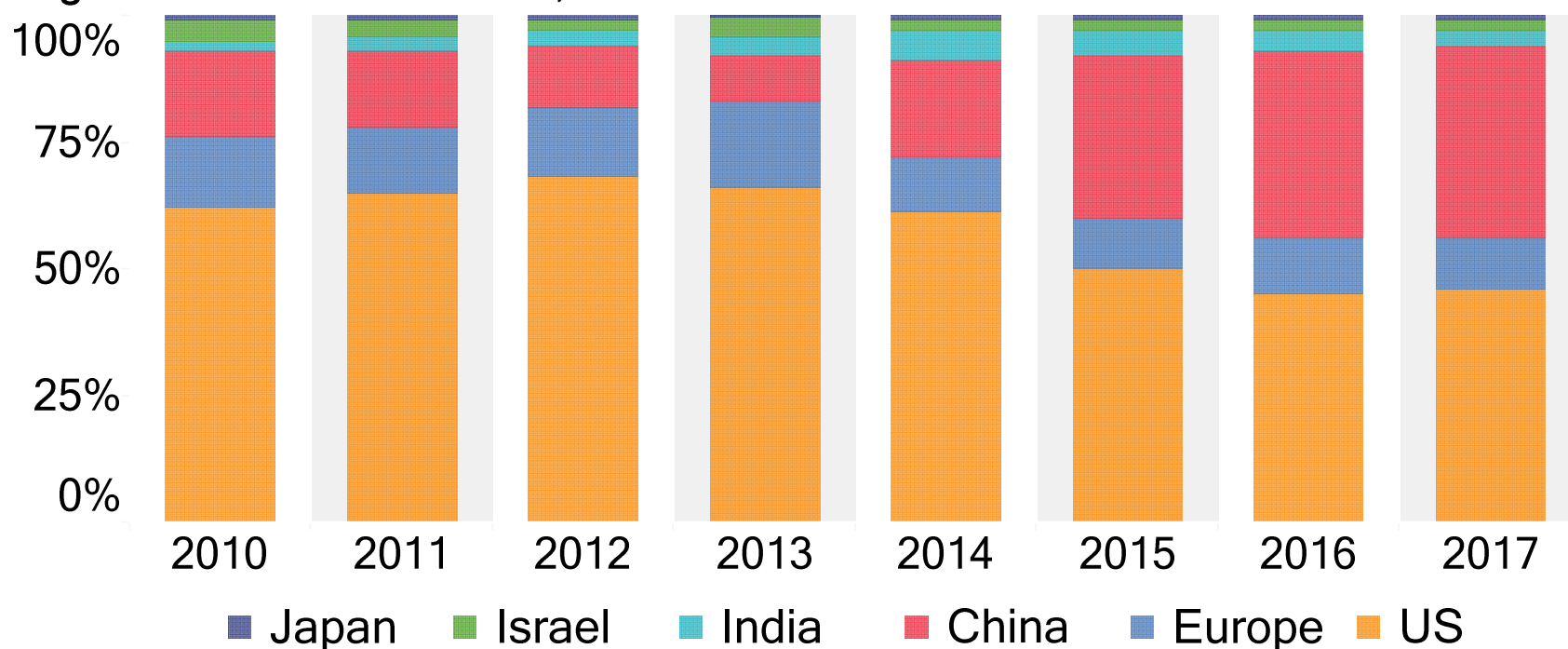


Source: Computations based on Frietsch et al. (forthcoming)

China is investing in leading companies

China progressively increased its world share of venture capital

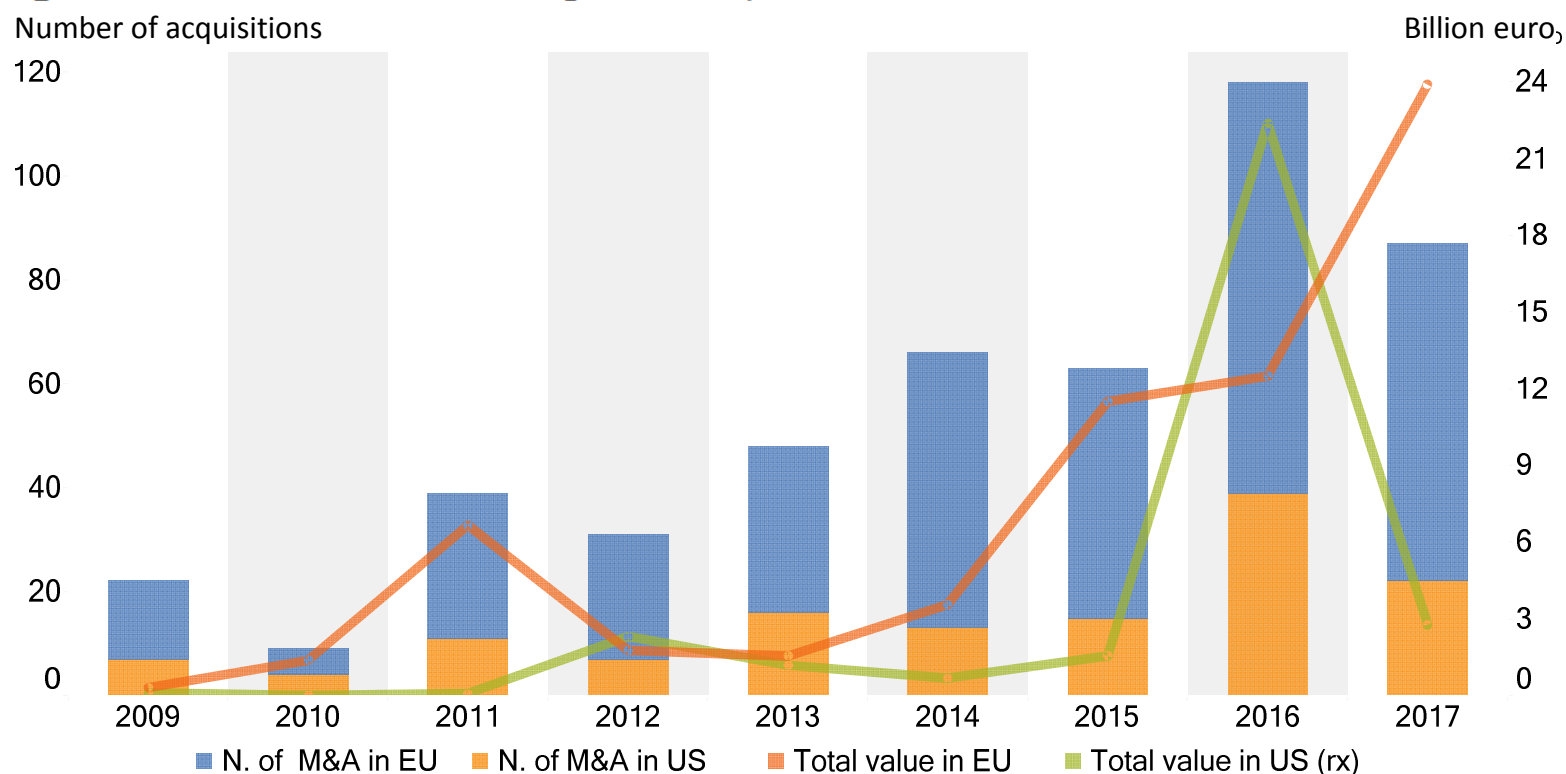
Figure 5.1: World VC trends, 2010-2017



Source: Nepelski *et al.* (2014)

Increasing number and value of Chinese cross-border M&A deals

Figure 4.1: Chinese cross-border mergers and acquisitions (M&As) in EU and US

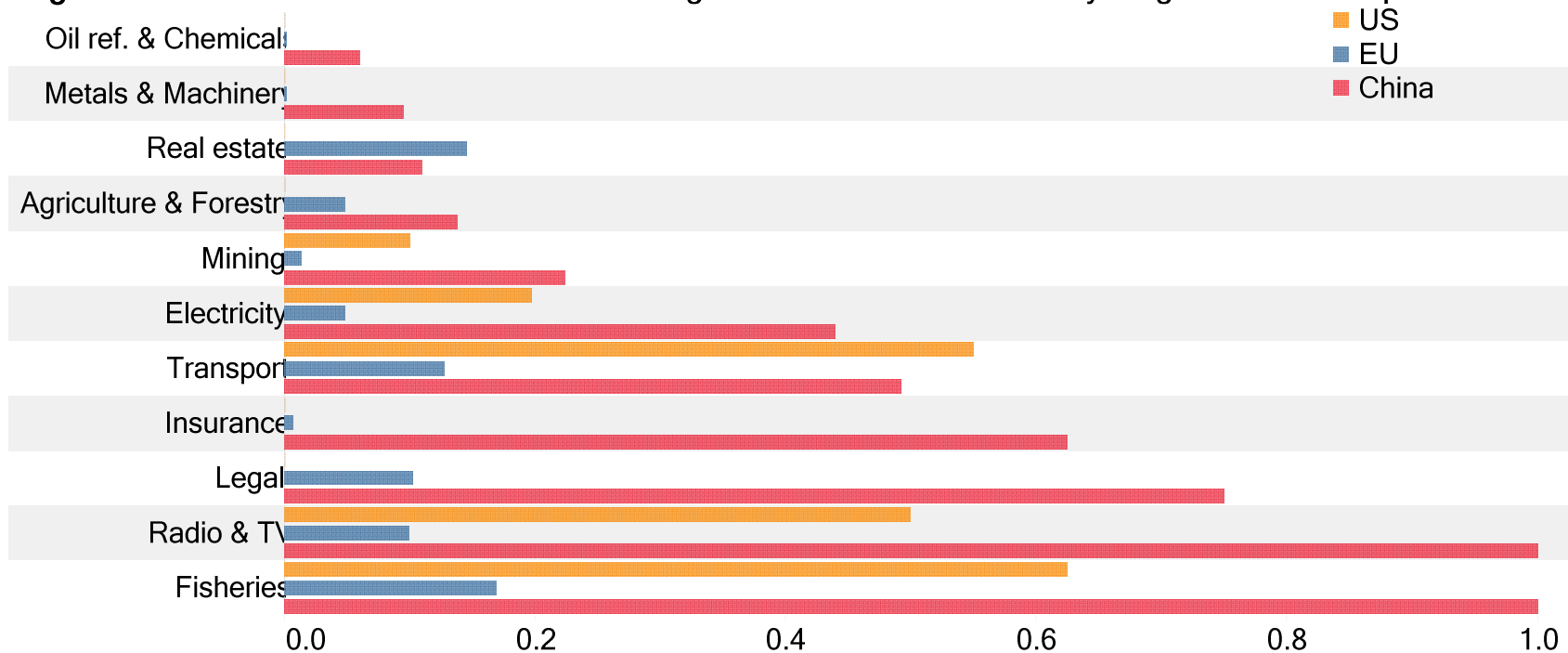


Source: JRC calculations based on Bureau van Dijk data (Zephyr and Orbis) for a sample of EU and US firms, shared across datasets to increase cross-reliability of deals and balance sheet data. Note: The aggregate value of the M&A deals is only indicative as many of the deals do not report the value.

Does China provide an
uneven playing field
for European companies?

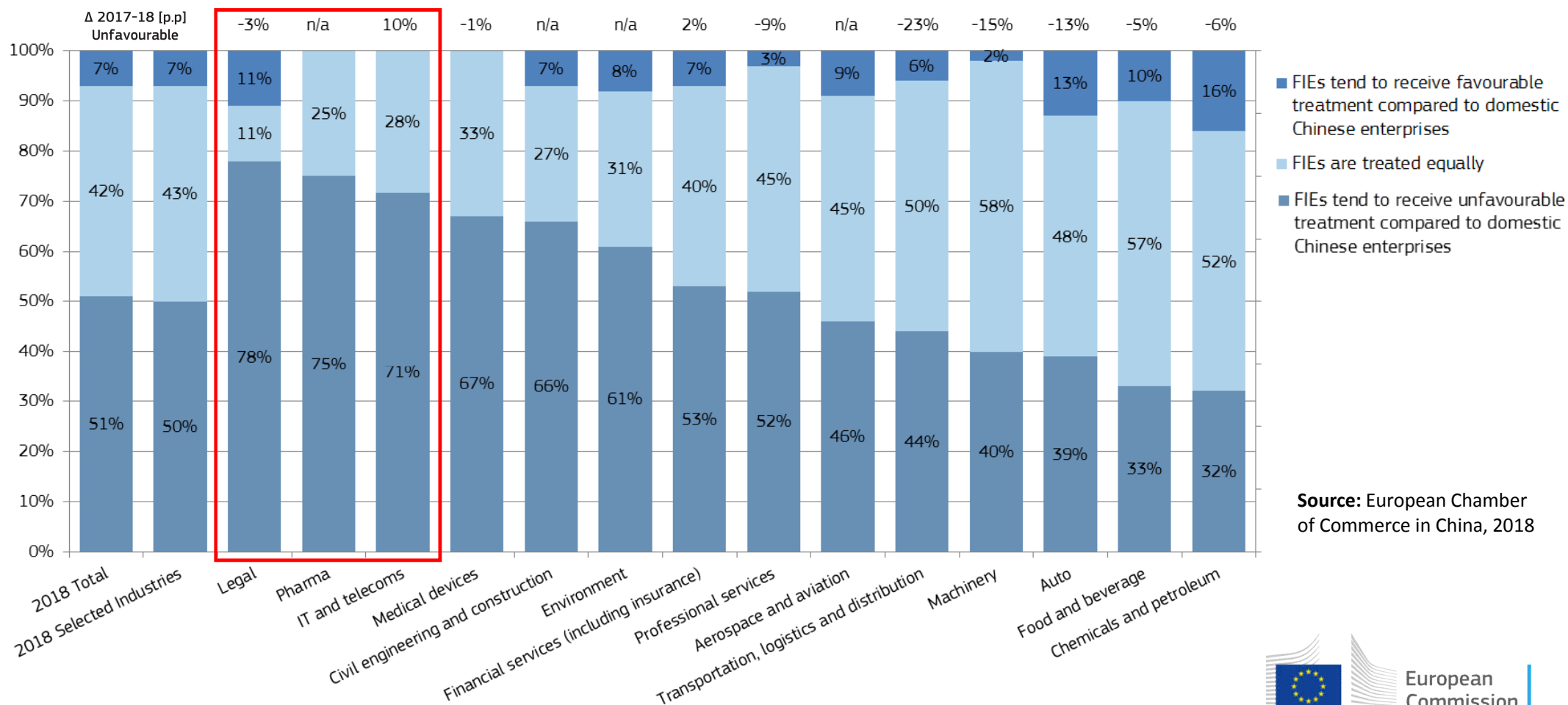
China's restrictions on FDIs are much stronger than in the EU and US

Figure 8.1: Chinese restrictions on FDI are higher than in the EU in every single sector except real estate



Source: FDI Restrictiveness Index - OECD, 2017

Particularly in the legal, pharmaceutical and IT sectors



China's strategy for industrial and technological leadership

'Made in China 2025' aims to transform China into a global powerhouse in high-tech industries

The 10 key sectors



New information technology



Numerical control tools



Aerospace equipment



High-tech ships



Railway equipment



Energy saving



New materials



Medical devices



Agricultural machinery



Power equipment

'MIC 2025': a strategy for Chinese firms to attain a dominant position in their domestic market

Table 1.1: Semi-official targets for the domestic market share of Chinese products

Industry sector	Target 2020, %	Target 2025, %
High performance medical devices	50	70
High-tech ship components	60	80
Industrial robots	50	70
Mobile phone chips	35	40
New and renewable energy equipment	0	80
New energy vehicles	70	80
Tractors above 200hp and harvesters	30	60
Wide-body aircrafts	5	10

Source: Made in China 2025 - Backgrounder S&DP (2018)

China aims to reach the technological frontier in key sectors

Table 19.1 – Horizontal Analysis of the Chinese Industry

Indicator	ICT	Mach.	Mat.	Electrical	Rail	Aero	Pharma	Medical
Competitiveness (GVC; RCA)	++	+	-	++	+	--	--	-
FDI (M&As)	++	++	x	x	--	-	--	--
Venture Capital	+	n.a.	+	n.a.	n.a.	n.a.	+	++
BERD	x	x	-	x	n.a.	n.a.	++	++
Investment Conditions	--	+	+	n.a.	n.a.	X	--	--

Source: JRC Elaboration

Conclusion

China is making rapid progress towards achieving global innovation and industrial leadership in key sectors

Thank you for your attention

<https://ec.europa.eu/jrc/en/china-report-challenges-and-prospects>

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