



# A SNAPSHOT OF CHINA'S INNOVATION SYSTEM AND POLICY

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# Outline

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- A statistical snapshot
- Hot issues
- Key policy issues going forward
- Latest highlights



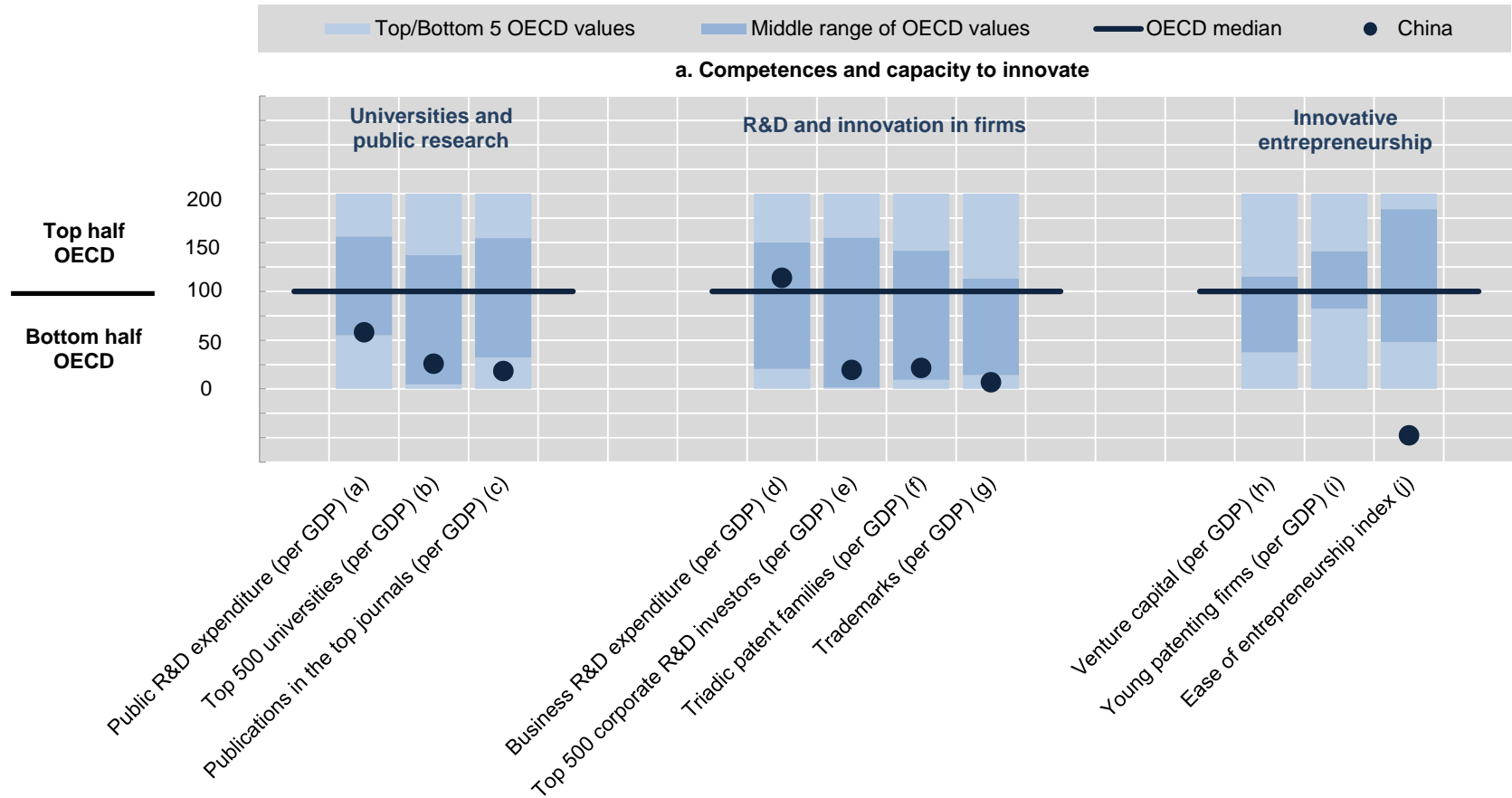
# Some key figures:

<i><b>Economic and environmental performance</b></i>	<b>CHN</b>	<b>OECD</b>	<i><b>Gross domestic expenditure on R&amp;D</b></i>	<b>CHN</b>	<b>OECD</b>
<b>Labour productivity</b>			<b>GERD</b>		
GDP per hour worked, USD PPP, 2013	n.a.	47.7	Million USD PPP, 2012	293 550	1 107 398
(annual growth rate, 2008-13)	n.a.	(+0.8)	As a % of total OECD, 2012	<b>26.5</b>	100
<b>Green productivity</b>			<b>GERD intensity and growth</b>		
GDP per unit of CO2 emitted, USD, 2011	1.3	3.0	As a % of GDP, 2012	<b>1.98</b>	2.40
(annual growth rate, 2007-11)	(+4.1)	(+1.8)	(annual growth rate, 2007-12)	<b>(+17.2)</b>	(+2.0)
<b>Green demand</b>			<b>GERD publicly financed</b>		
NNI per unit of CO2 emitted, USD, 2011	n.a.	3.0	As a % of GDP,	n.a.	0.77
(annual growth rate, 2007-11)	n.a.	(+1.6)	(annual growth rate, 2007-12)	<b>(+14.2)</b>	(+2.8)

*Source: OECD Science, Technology and Industry Outlook 2014 (forthcoming)*



# Benchmarking China's STI performance v.s. OECD

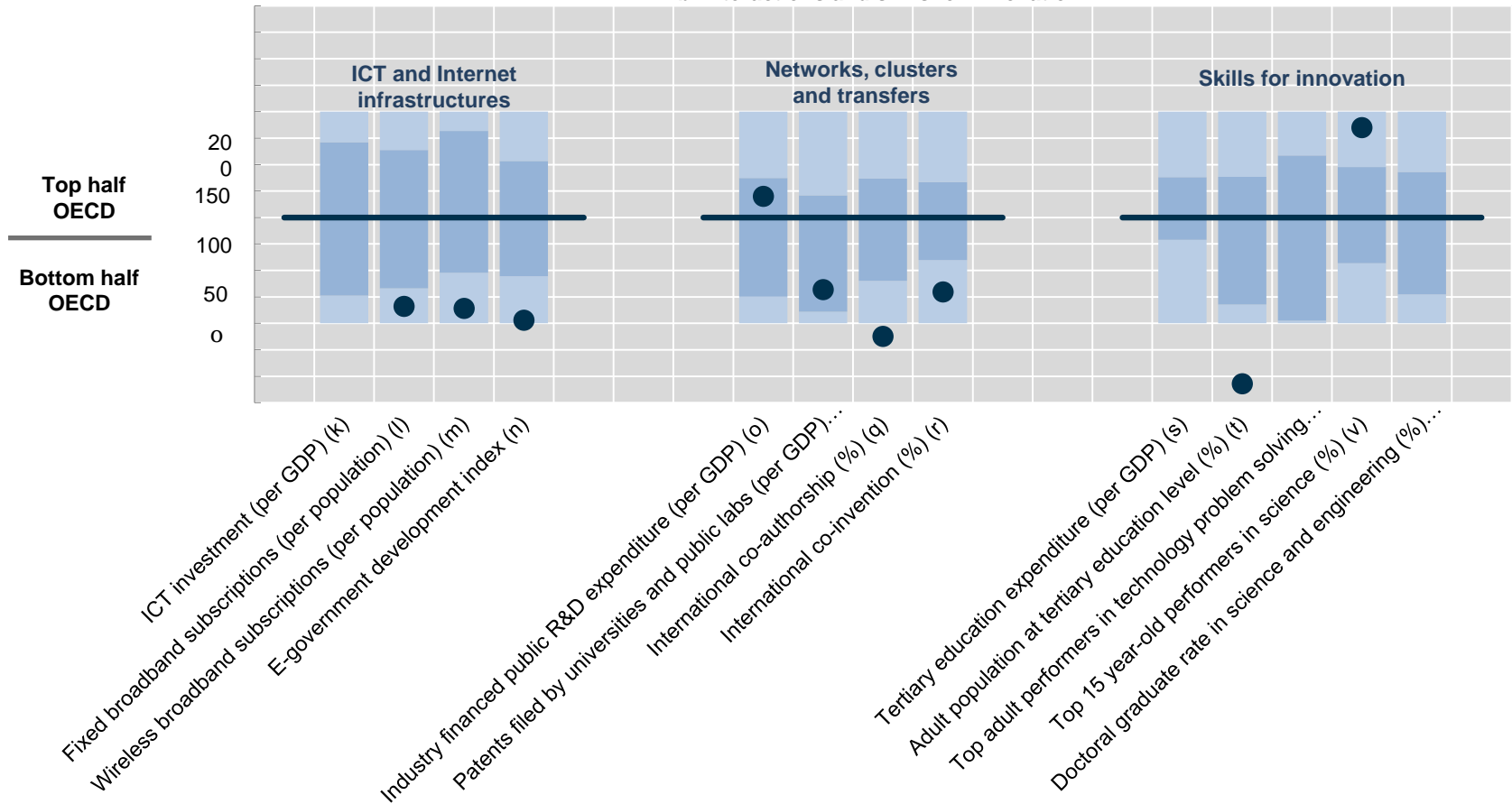


Source: OECD Science, Technology and Industry Outlook 2014 (forthcoming)



# Benchmarking China's STI performance v.s. OECD

b. Interactions and skills for innovation



Source: OECD Science, Technology and Industry Outlook 2014 (forthcoming)



# BERD Structure and its evolution

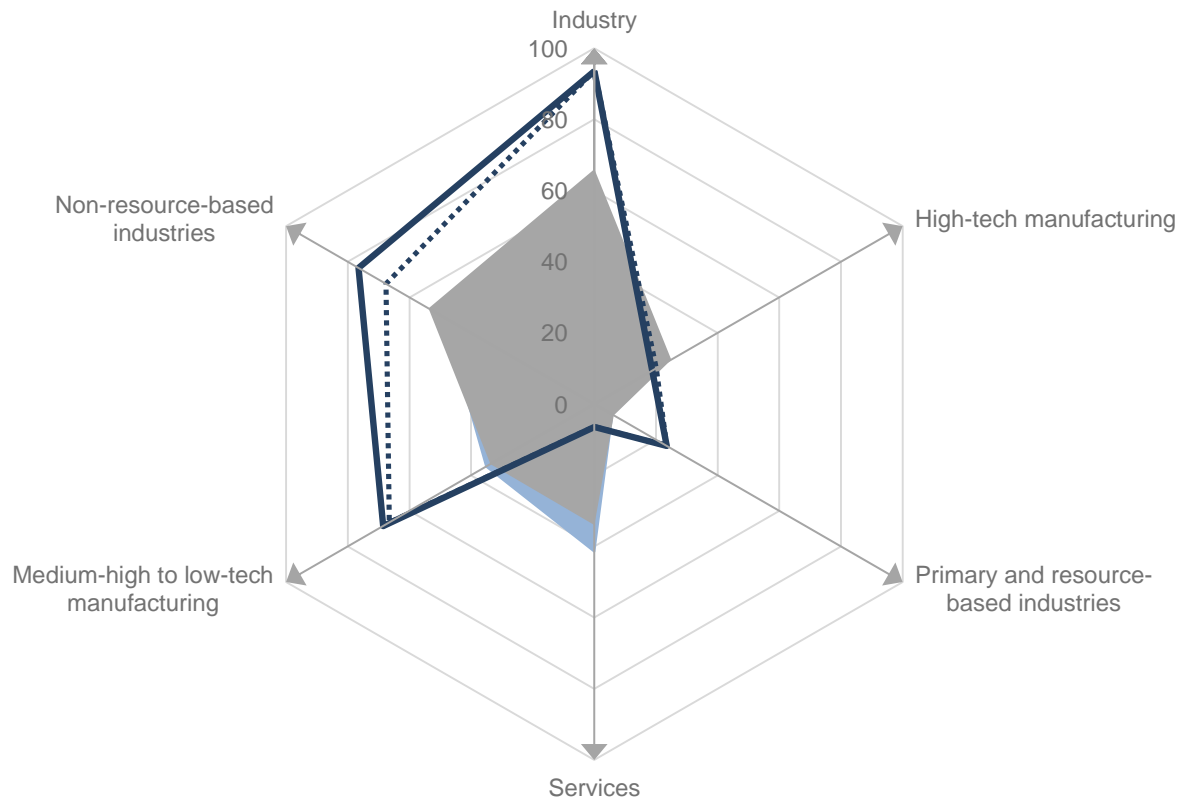
## % of BERD, 2011

■ OECD

■ OECD median (2007)

■ China

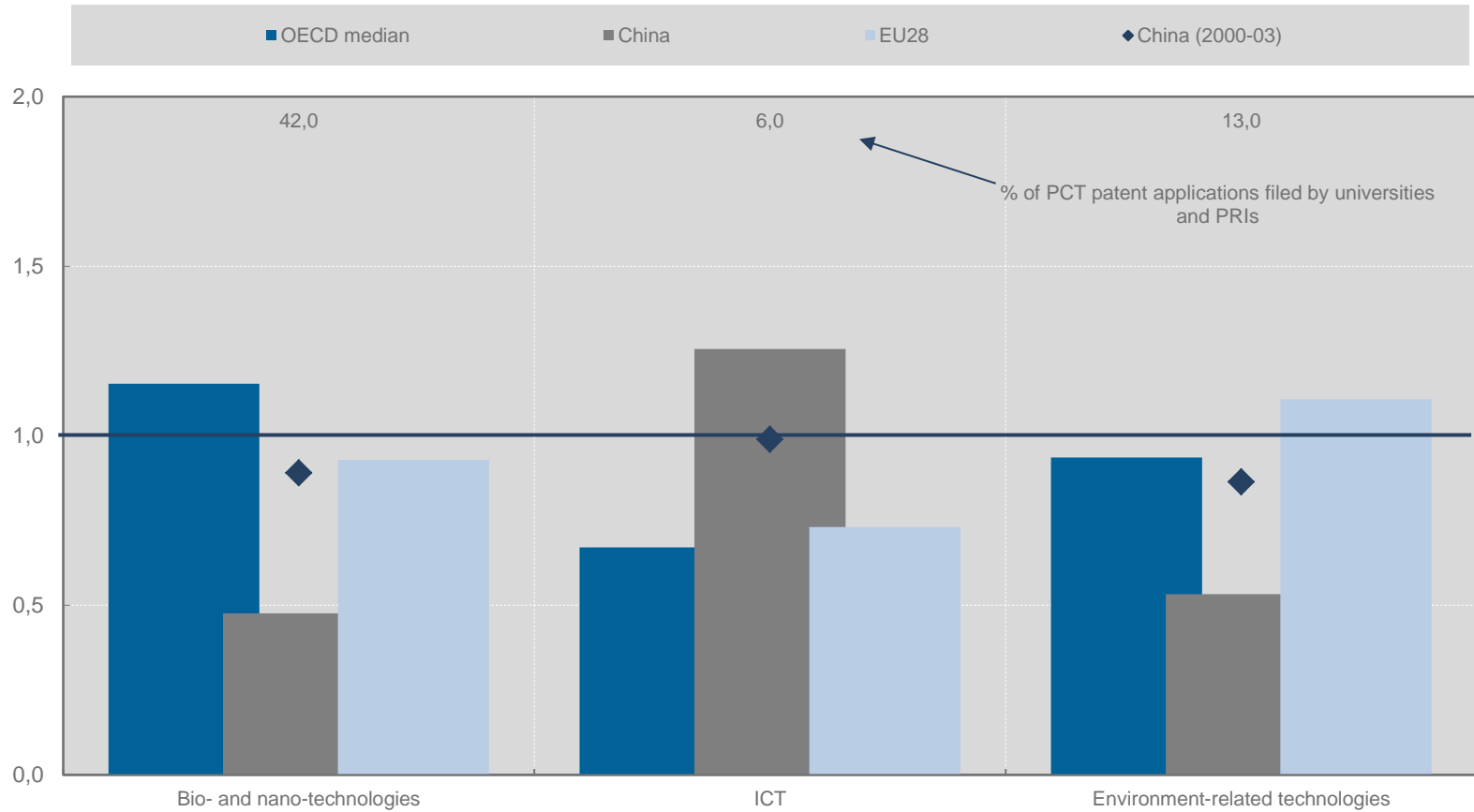
■ China (2007)



Source: OECD Science, Technology and Industry Outlook 2014 (forthcoming)



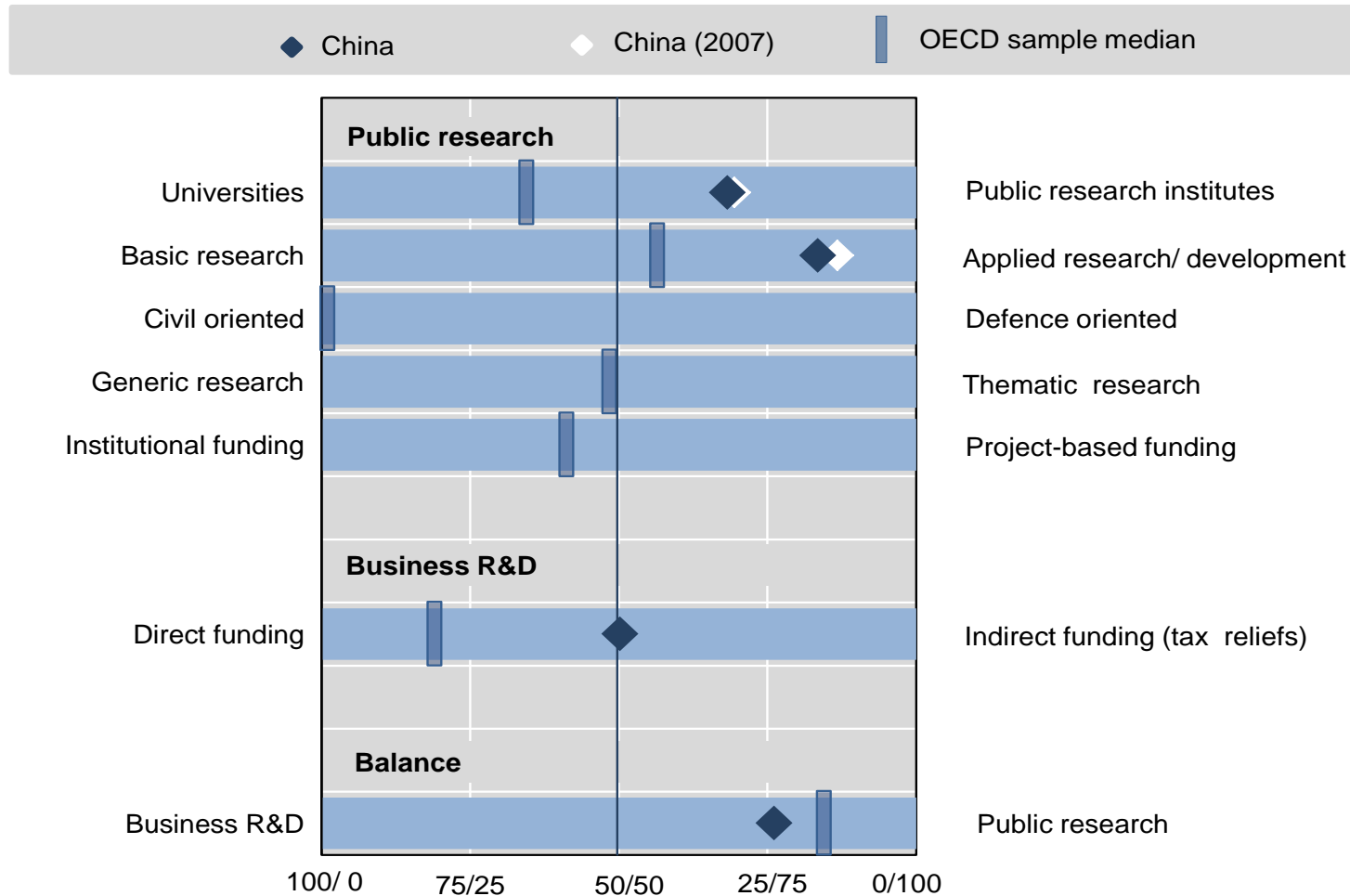
# China's revealed technology advantage in selected tech areas



Source: OECD Science, Technology and Industry Outlook 2014 (forthcoming)



# Allocation of public funds to R&D, by sector, type and mode of funding, 2012.

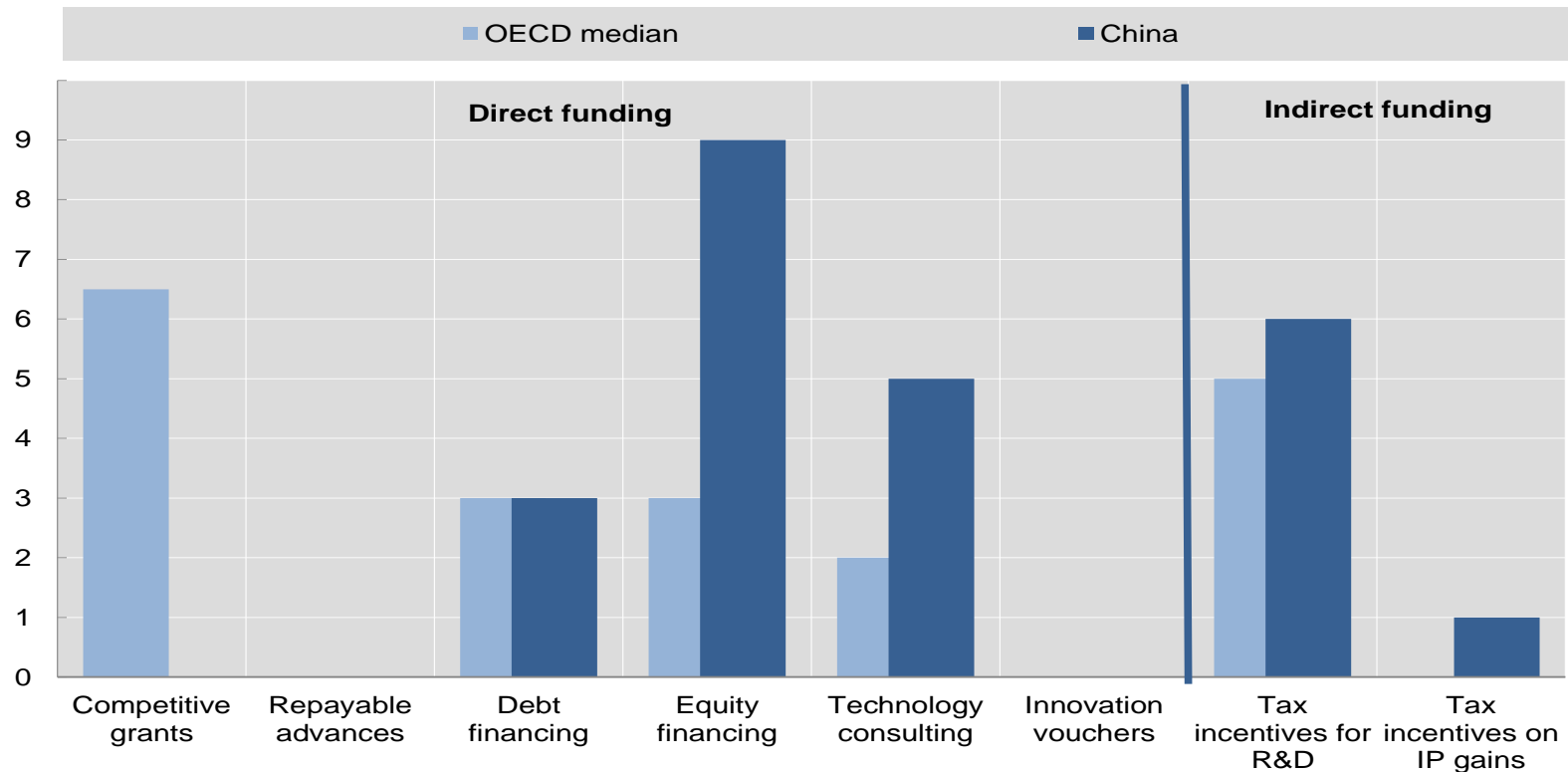


Source: OECD Science, Technology and Industry Outlook 2014 (forthcoming)





# Most relevant instruments of public funding of business R&D, 2014.



Source: OECD Science, Technology and Industry Outlook 2014 (forthcoming)



## ***Hot issue 1: Encouraging innovation in firms and supporting entrepreneurship and SMEs.***

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- The business sector accounts for 74% of GERD (1.51% of GDP, 2012), and Chinese firms are active both as R&D performers and contractors (Panel 1<sup>d,o</sup>).
- Although the number of patent application by Chinese residents has soared in recent years, Chinese innovation output is still lagging in terms of international patenting and trademark registration (Panel 1<sup>f,g</sup>) by OECD standards.
- There is a lack of venture capital and the business environment is difficult for innovative start-ups.
- The dominance of state-owned enterprises (SOEs), especially in public utilities, tends to mitigate the pressures to innovate that normally arise from competition.
- Improving the business sector's innovation capability is therefore a key challenge. Various policy instruments foster an enterprise-centred innovation system and emphasise the indigenous innovation capacity of Chinese firms.



## ***Hot issue 2: Innovating to address social challenges***

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- China faces serious social challenges, not only those typical for emerging economies, such as eco-sustainability, food security, but also those facing OECD countries, such as public health and ageing, all of which will require contributions from STI.
- The National S&T Major Projects therefore focus strongly on public health, ageing, food and drug safety, and disaster prevention. Energy and health are among the four sectoral focuses of the Innovation 2020 Programme of the CAS.
- China has also promoted “*inclusive innovation*”, i.e. innovation by and for low-income people. Existing initiatives include the Spark Programme, which promotes agricultural and rural developments by facilitating peasants’ access to relevant technologies and related training and the S&T Programme for Public Wellbeing, which supports the commercialisation of technologies that can benefit social development, both implemented under the Ministry of S&T.



## *Hot issue 3: Innovating to contribute to sustainable and green growth*

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China aims to change to an ecologically sustainable mode of growth and development, by enhancing the role of STI.

Currently China's green productivity, at USD 1.3 (GDP per unit of CO<sub>2</sub> emitted, 2011), was much lower than e.g. EU27's at USD 4.

At 3.3% a year, however, it grew faster than the OECD median at 1.5% over 2007-11. The government's 12<sup>th</sup> Five-Year Plan (2011-15) sets the target for green productivity growth at 17% over the five-year period.

The present 12th Five-Year-Plan for S&T Development therefore focuses considerable attention on energy and climate change and has triggered a new wave of industrial policies in support of clean energy industries and related low-carbon technologies.

Yet, China's RTA in biotechnology and green technologies has slipped considerably in recent years (Panel 3).



## ***Hot issue 4: Strengthening public R&D capacity and infrastructures.***

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- Although many PRIs became corporate entities as part of the reform of the S&T system in the early 2000s, PRIs still dominate China's public research landscape;
- They are strongly oriented towards applied and experimental R&D (Panel 4) which could be the role of the enterprise sector. Meanwhile China's basic research has a too low share of GERD.
- The government issued “Opinions on Deepening the Reform of the Scientific and Technological System and Speeding up the Building of a National Innovation System” in September 2012.
- The new round of PRI reforms aims to clarify the roles of the three types of PRI (commercial innovation, social welfare and basic research), and to establish appropriate governance, management and funding mechanisms to fulfil their missions.



## ***Hot issue 5: Fostering high-end human resources for S&T and research.***

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- Although China has the world's largest pool of human resources for S&T, the tertiary-qualified share of the population is still extremely low (Panel 1<sup>t,w</sup>).
- Furthermore, China lacks world-class researchers. Both the Thousand Talents Programme approved by the Organisation Department of the Chinese Communist Party and the 100 Talents of the Chinese Academy of Sciences aim to attract and retain top-tier academics, including from overseas;
- The National Plan for Science and Technology Talent Development (2010-20) addresses the business sector's need for innovative personnel, by supporting mobility of the highly skilled and by investing in innovation platforms and national key labs to cultivate talented, leading R&D personnel.
- Living allowances and funding for postdoctoral research in enterprises are provided as well.



# Going forward - Key challenges for policy attention

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- *Enterprise innovation*: a more market based approach, a level playing field for private/public, Chinese and foreign firms; improve financing for business innovation and more effective IPR, and cooperate governance reform of SOEs.
- *Public R&D*: clarify role and appropriate management mechanisms for different types of research; ensuring efficiency and transparency in the allocation of public funding, create an conducive environment for research and innovation, balancing investment between different types of research;
- *Human resources*: greater international openness of the STI system, right incentive for researchers and creative environment, transparent and fair R&D funding; while pay attention to non-technical skills for innovation, and encourage companies to invest in HR, and building up vocational education



## Most recent developments

CCTV 13

新闻

### 习近平主持召开 中央财经领导小组第七次会议强调 加快实施创新驱动发展战略 加快推动经济发展方式转变

各类创新人才特别是最缺的人才。三是深化改革，建立健全体制机制。要面向世界科技前沿、面向国家重大需求、面向国民经济主战场，精心设计和大力推进改革，让机构、



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## Selected recent highlights

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- Highest political leadership: August 18, president Xi chaired the 7th meeting of the CCP Central Leading Group on Financial and Economic Work to implement the innovation-driven deployment strategy;
- Xi's visit to CAS (2013 July), which effectively launched the new radical reform of CAS;
- A year later, the blueprint of CAS' radical reorganisation and reform and its so-called pioneer action (率先行动) plan were unveiled.
- New, increased openness in policy making; e.g. evaluation, and 13<sup>th</sup> 5y plan's preparation
- The new policy framework for semiconductor industry was announced in June 2014.



# OBRIGADO-THANK YOU-谢谢!

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