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Towards a *new new* geography of
innovation – the rise of Chinese
innovation giants and its implications

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New geography of production

- Global production network has been evolving into a 'new geography'
- China has become the world's manufacture centre:
 - produces 70% of the world's photocopiers, 55% of its DVD players, 50% of its cameras, 30% of its air conditioners, and 25% its washing machines (Wilsdon & Keeley, 2007)
- However, the core of the value chain remains within the Triad

New geography of innovation

- MNCs are increasingly moving their R&D activities into emerging economies
 - Between 2004 and 2007, global multinationals increased their total R&D sites by 6%, 83% of those were in China and India (Jaruzelski & Dehoff, 2008)
- Foreign corporate R&D in China
 - The pioneers: Motorola (1993), Ericsson (1997), Microsoft (1998), Nokia (1988)
 - 107 autonomous R&D centres by foreign firms (2004), > 600 in 2008, >1,000 in 2010 (MOFCOM)
- The traditional wisdom: innovation and internationalisation of innovation is driven by the west and imposed on the rest

This is changing fast

- Increasing number of global R&D centres in China
- Surging overseas R&D investment by Chinese firms
- Growth of China's spending on R&D >20% each year since 1999 (OECD, 2007)
- To build an 'innovation-oriented society'
 - To increase R&D intensity to 2.5% by 2020 (0.7% in 1998, 1.3% in 2005)
 - among the top five countries worldwide in terms of patents and scientific citations
- Emerging Chinese overseas direct investment (ODI) and MNCs
 - ODI \$12.3bn in 2005, 26bn in 2007, 43.3bn in 2009, 59bn in 2010 (MOFCOM, 2011)
- The rise of Chinese innovation giants?

Global innovation giants – from China

- **Table 1 number of Chinese companies in the BIS R&D Scoreboard global list (2003 - 2010)**

	2003	2004	2005	2006	2007	2008	2009	2010
Number	1	2	4	7	8	11	16	20

Table 2 'Global' and 'industrial ranking' of selected Chinese companies, 2003-10

		2003	2004	2005	2006	2007	2008	2009	2010
China Petroleum & Chemical	Global ranking	309	337	358	260	233	202	212	205
	Industrial ranking	9	11	11	8	9	9	9	9
PetroChina	Global ranking		219	202	185	162	148	108	80
	Industrial ranking		7	6	6	5	5	2	1
ZTE	Global ranking			269	298	228	214	186	131
	Industrial ranking			54	62	46	41	40	24
Lenovo	Global ranking			931	356	333	324	391	403
	Industrial ranking			168	76	66	64	68	68

Table 2 continued

Semiconductor manufacturing	Global ranking				701	657	705	735	528
	Industrial ranking				133	116	120	121	
CNOOC	Global ranking				963	1059	939	945	904
	Industrial ranking				15	17	20	20	20
TCL	Global ranking				1051				
	Industrial ranking				190				
Tencent	Global ranking					1218	1110	864	583
	Industrial ranking					109	83	58	42
China Telecom	Global ranking					1228	880	978	900
	Industrial ranking					18	14	14	15

Table 2 continued

Shanghai Electric	Global ranking								581	533
	Industrial ranking								31	32
Huawei	Global ranking									70
	Industrial ranking									14
Metallurgical Corporation of China	Global ranking									408
	Industrial ranking									18
SAIC Motor	Global ranking									420
	Industrial ranking									42
China Railway	Global ranking									788
	Industrial ranking									18
<i>Source: BIS R&D scoreboard (2003-10)</i>										

Table 3 Chinese innovation giants and ascending stars

	BIS ranking 2010		R&D investment (2009/10)		R&D investment per employee (2009/10)	
	Global	industrial	£m	growth over average of the last 4 yrs (%)	£'000	growth over the last average of 4 yrs (%)
The giants						
Oil & gas producers						
PetroChina	80	1	896.81	93;	1.7	65
Industrial average			281.12	28.9;	2.7	32
Technology hardware & equipment						
ZTE	131	24	554.92	100;	7.9	28
Huawei	70	14	1185.26	na	12.5	na
Industrial average			388.89	3.5;	18.3	-5.7

Table 3 continued

Construction & Materials						
China Railway Construct ion	155	1	468.25	NA	2.2	NA
China Commun ication Construct ion	364	5	157.56	334;	5.1	202
Industrial average			126.47	11.3;	2	18.5
Industrial engineering						
China South Locomoti ve	372	15	153.87	NA	na	NA
Industrial average (63)			160.78	13.7;	6.4	12.1

Table 3 continued

The ascending stars						
Software & computer services						
Tencent	583	42	88.53	207;	11.8	58
Industrial average			330.71	14.2;	18	3.9
Electric & electrical equipment						
BYD	519	37	102.54	84;	0.6	21
Industrial average			301.96	9.7;	6.8	-5.2
Industrial engineering						
Dongfang Electric	803	50	57.78	90;	3	NA (23 on last year)
Shanghai Electric	533	32	98.36	122	3.4	143 (20 on last year)
Industrial average			160.78	13.7;	6.4	12.1

Chinese innovation giants – mere copycats or real innovators?

- China South Locomotive –
 - CRH2 300-350 km/h Electric Multi Unit; CRH380A EMU 380km/h;
 - R&D networks domestically and overseas;
 - patents (554 granted in 2009 alone)

Chinese innovation giants – mere copycats or real innovators?

- Huawei:
 - No. 4 applicant under PCT in 2010, No. 2 in 2009;
 - 49,040 patents accumulated and 17,765 granted up to Dec. 2010;
 - Leading player in LTE and many standard orgs.;
 - 20 research institutes and over 20 joint innovation centres with big Ts;
 - “More than any other, Huawei is the firm that is overturning the widely held perception that Chinese companies are merely imitators rather than innovators” (Economist, 2010)

Chinese innovation giants – mere copycats or real innovators?

- ZTE, Tencent, BYD ...

The rise of Chinese innovation giants - outcomes

- Commercially significant innovations (frugal innovation, architectural innovation), disrupting global competition?
- Change of global leadership and re-configuration in many industries;
- Global innovation networks/global value chains led by Chinese firms – *new new* geography of innovation and new phase of internationalisation of innovation?

new phase of R&D internationalisation – Chinese R&D investment in the UK?

- Telecom:
 - ZTE innovation centre in London (10 overseas centres in near future);
 - Huawei joint innovation centre (with BT) in Ipswich
- Automotive:
 - SAIC in Longbridge and Leamington Spa
 - Changan Auto in Nottingham
 - Lifan Auto in Oxford
- Pharmaceutical/Biopharma/Medical:
 - Mindray
 - Weigo
 - Xiangcam in Cambridge
- Engineering
 - Zhuzhou Times Electric in Lincoln
 - CQME in Rochdale

The rise of Chinese innovation giants - implications

- Change in global value chain + global innovation networks
- Knowledge transfer + industrial upgrading

- Thank you!
- And questions?