evidence

The new geography of science

Jonathan Adams

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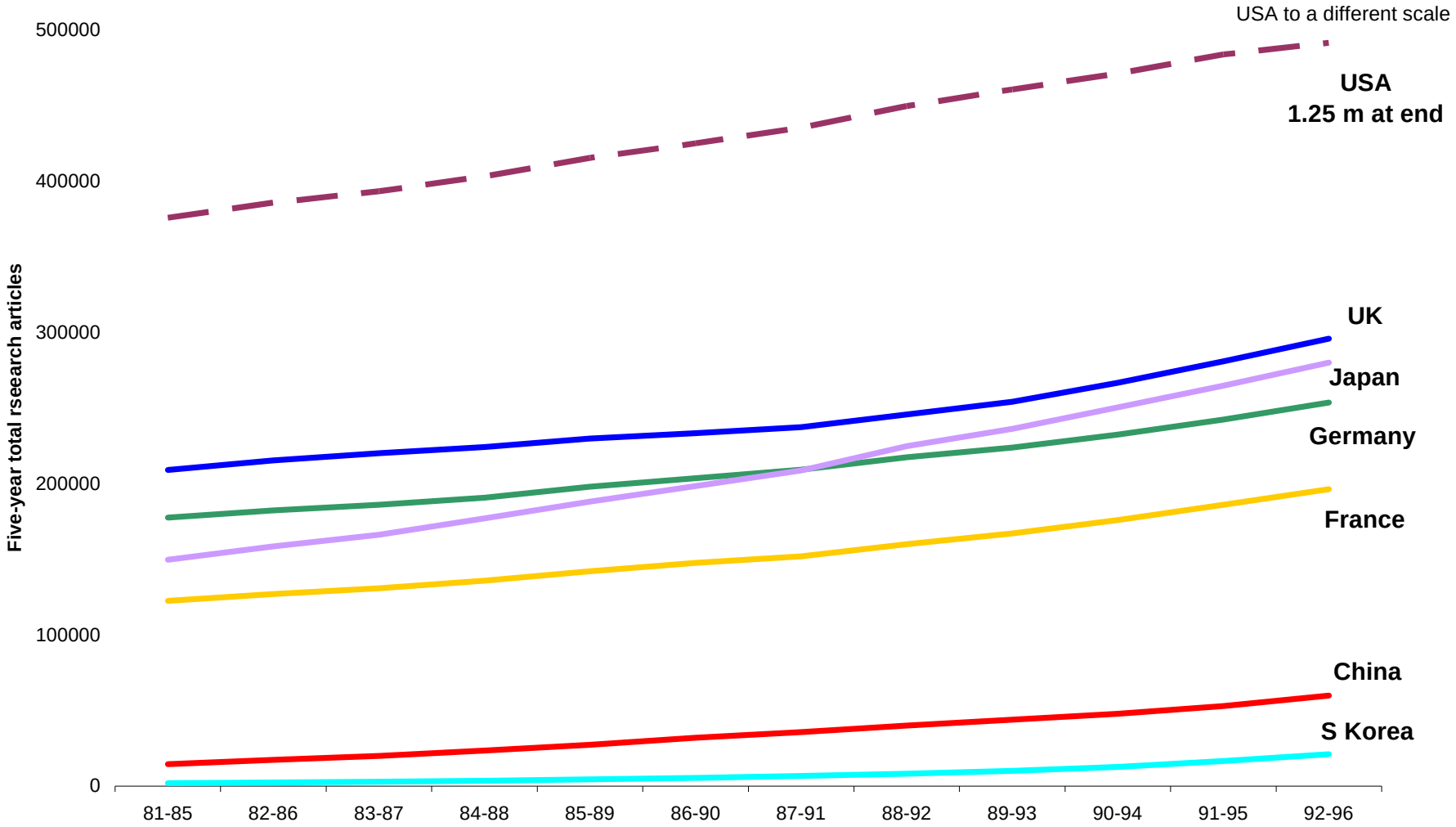
IATUL conference on ‘Global access to science’

Background

- *Evidence* is a UK company specialising in research performance analysis and interpretation
  - JA has a background in Government and university research policy and management
- We generate reports, services and products for research-based organisations in the UK and Europe
  - We look for innovative analyses and presentations
- Annual report on international target indicators for the UK Office of Science and Technology/Innovation (OSI)

http://www.evidence.co.uk/

The world of research once enjoyed certainties and steady, stable growth



Data source: Thomson Scientific analysed by Evidence Ltd

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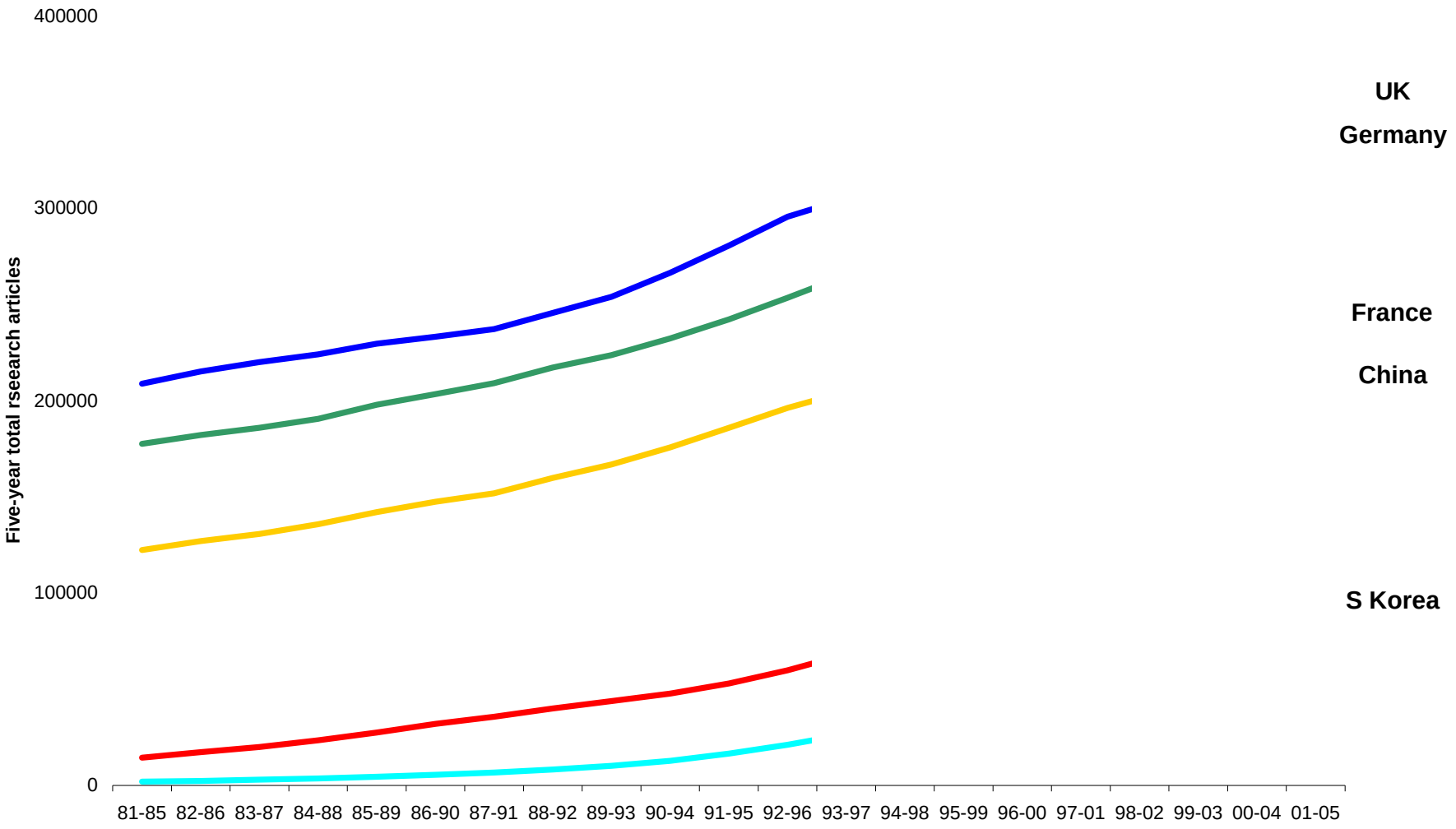
And then



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Collaboration

- Research collaboration is growing at all levels
  - It offers access to greater intellectual and physical resources
  - It brings multiple viewpoints to bear on a challenge
  - It enables parallel research lines to address large, complex challenges
  - It supports interdisciplinary problem solving
- We have not had a clear picture of how much, in what subjects, between which partners and why it works
  - We have relied on an old geography: the G8 and Europe
- The mechanisms to support international collaboration are complex and divided, and need to be improved
  - Can we scale up levels of collaboration and ensure strong links?
- There is talk in Europe and the US about the growing R&D ‘threat’ of a new geography - China and India
  - What about the benefits that can flow to all sides?

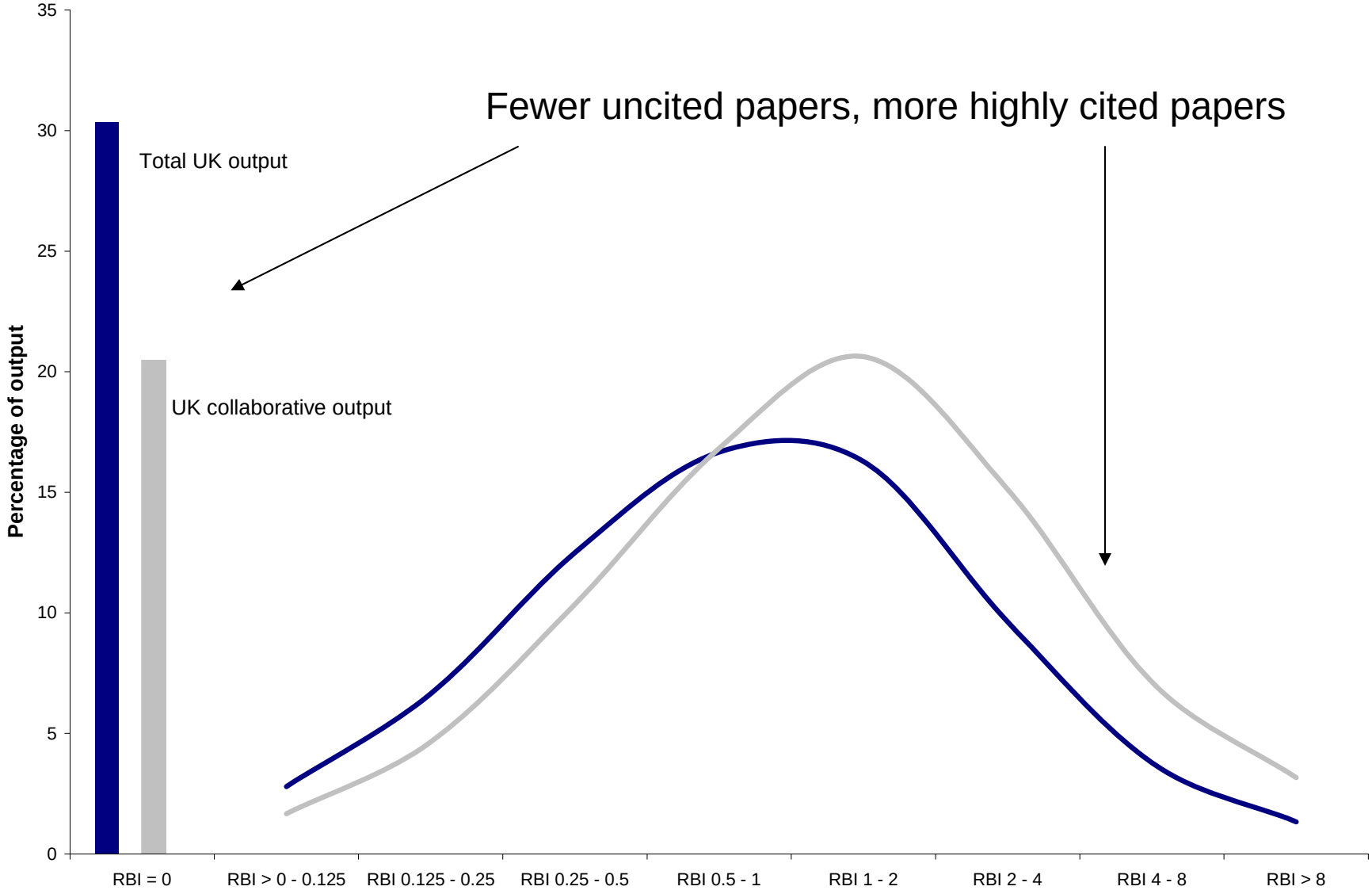
The UK collaborates more every year, and with new partners

	Joint papers 1997		Joint papers 2004	
	Count	% UK	Count	% UK
USA	5824	32.5	10660	31.9
GERMANY	2406	13.4	4831	14.5
FRANCE	1932	10.8	3628	10.9
NETHERLANDS	1255	7.0	2482	7.4
AUSTRALIA	955	5.3	2202	6.6
SWITZERLAND	809	4.5	1582	4.7
P R CHINA	269	1.5	1365	4.1

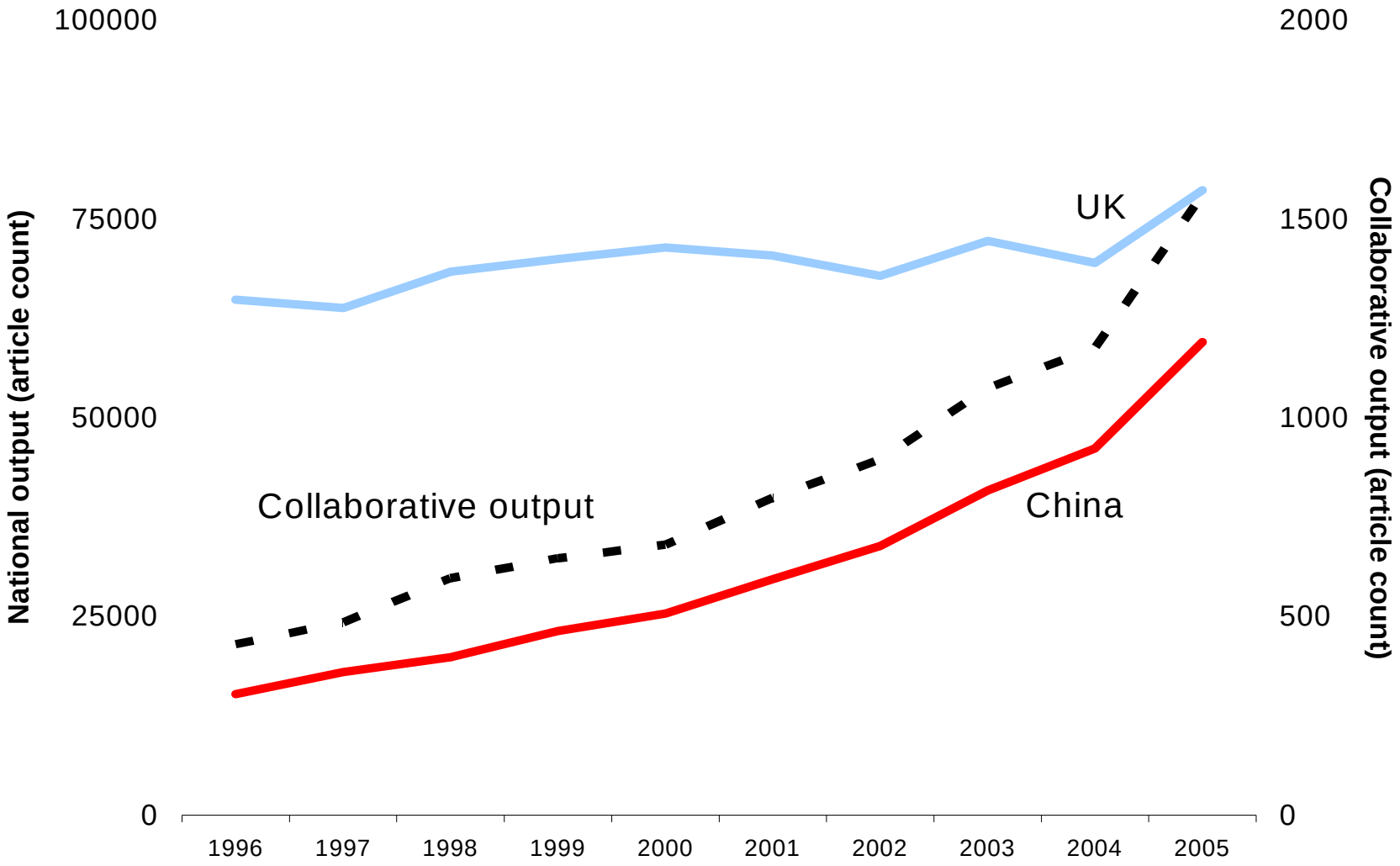
Collaboration takes a large share of domestic output in many countries

Country	***2001-2005***			
	Output	Output % world	Collaboration	Collab % output
UK	358674	8.92	144457	40.28
USA	1352443	33.65	334662	24.74
CANADA	184378	4.59	75659	41.03
FRANCE	244825	6.09	107729	44.00
GERMANY	340882	8.48	146615	43.01
JAPAN	360880	8.98	77197	21.39
AUSTRALIA	116954	2.91	46502	39.76
CHINA	210099	5.23	54529	25.95

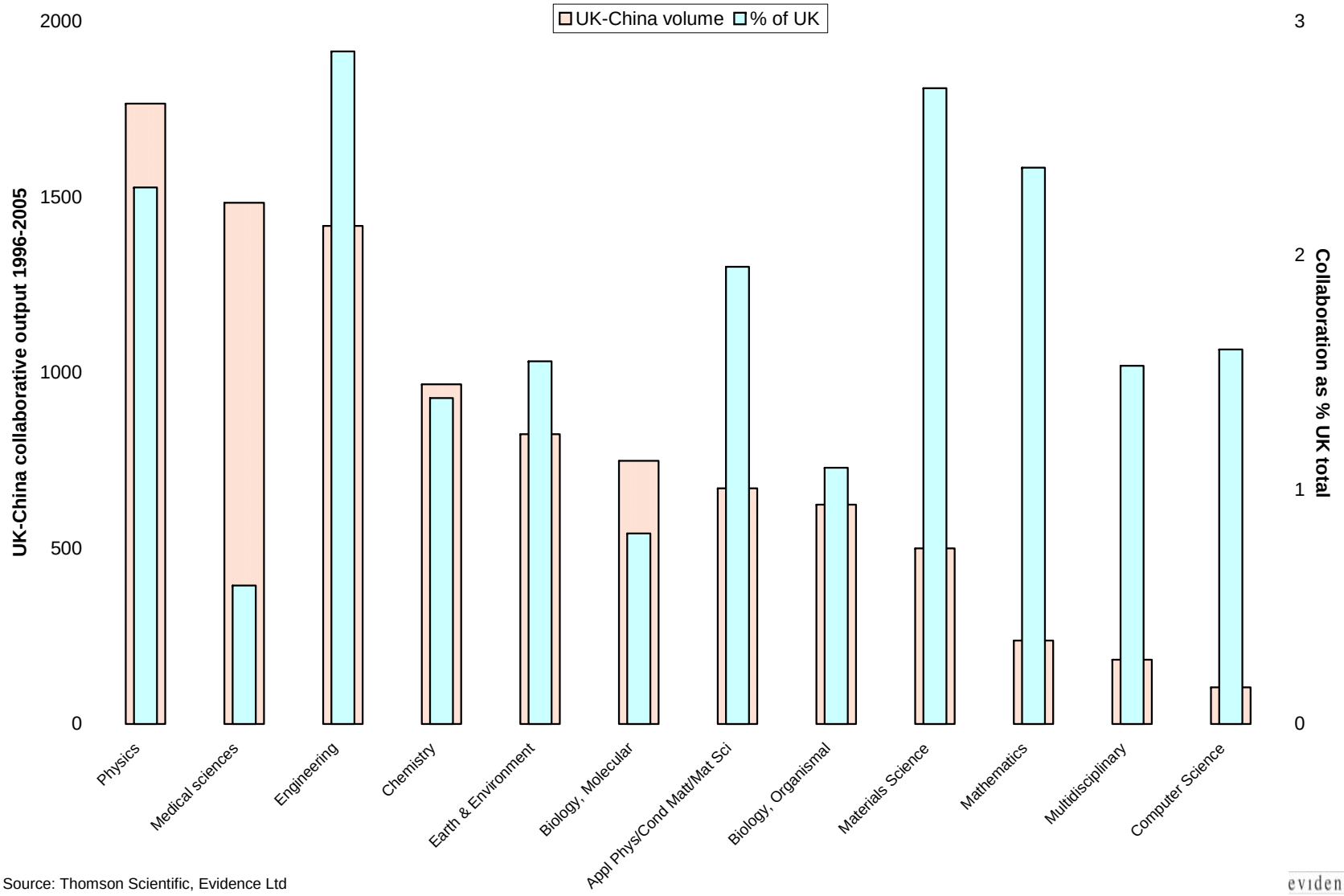
Collaboration provides ‘added value’



The pace of collaboration is increasing in the ‘new geography’



Collaborative profile by subject is complex



Source: Thomson Scientific, Evidence Ltd

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Growth relativities are also complex

China	*Collaboration 2001-2005*				
	Total	**UK**	**USA**	**FRA**	**GER**
Clinical	12590	1564	6478	508	883
Health and related	1689	169	663	63	122
Biological Sciences	10507	1129	4163	433	880
Environment	5873	588	2350	320	528
Mathematics	4779	463	1652	202	364
Physical Sciences	26114	2314	7932	1726	3551
Engineering	21696	2058	6330	837	1856

	Growth since 96-00			
	UK	**USA**	**FRA**	**GER**
Clinical	1.77	2.56	1.85	2.64
Health and related	1.43	1.95	2.33	2.26
Biological Sciences	2.09	2.79	2.34	2.49
Environment	2.15	2.91	2.32	2.46
Mathematics	1.70	1.89	2.04	1.62
Physical Sciences	1.98	2.01	2.06	1.81
Engineering	1.87	1.89	2.28	1.62

Impact varies with partners – and citation gain is not always positive

Partner country	Clinical		Biological		Maths		Physical		Engineering	
2001-2005										
UK	1.21		1.42		1.20		1.33		1.12	
+ USA	2.33	3	2.40	2	1.56	2	2.25	2	1.71	4
+ CANADA	2.32	5	1.87	5	0.98	5	2.52	1	1.73	3
+ FRANCE	2.61	1	2.20	4	1.39	3	1.86	5	1.80	1
+ GERMANY	2.33	4	2.24	3	1.70	1	1.90	4	1.75	2
+ JAPAN	2.36	2	2.64	1	0.93	6	1.86	6	1.54	5
+ AUSTRALIA	1.85	6	1.48	7	1.13	4	2.19	3	1.17	6
+ CHINA	1.77	7	1.67	6	0.81	7	1.20	7	0.91	7

Why partner with China if impact is lower? Motivation is complex, but do we know WHO is collaborating?

We need to explore these dynamics

- Relative volume and relative opportunity
  - The balance differs in the old and new economies
- Collaboration is costly, so there needs to be a substantial ‘gain’
- Why do researchers collaborate?
  - Top-down policies and bottom-up motivations
- In the past, only leading researchers were involved
  - But a second-tier may now be able to navigate the new maps
- Will we gain most from the outcomes - or the experience?
  - Within the new geography we will gain as much from the ‘why’ and ‘how’ of research cultures as we do from ‘what’

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