

Recent developments and challenges in the internationalisation of business R&D

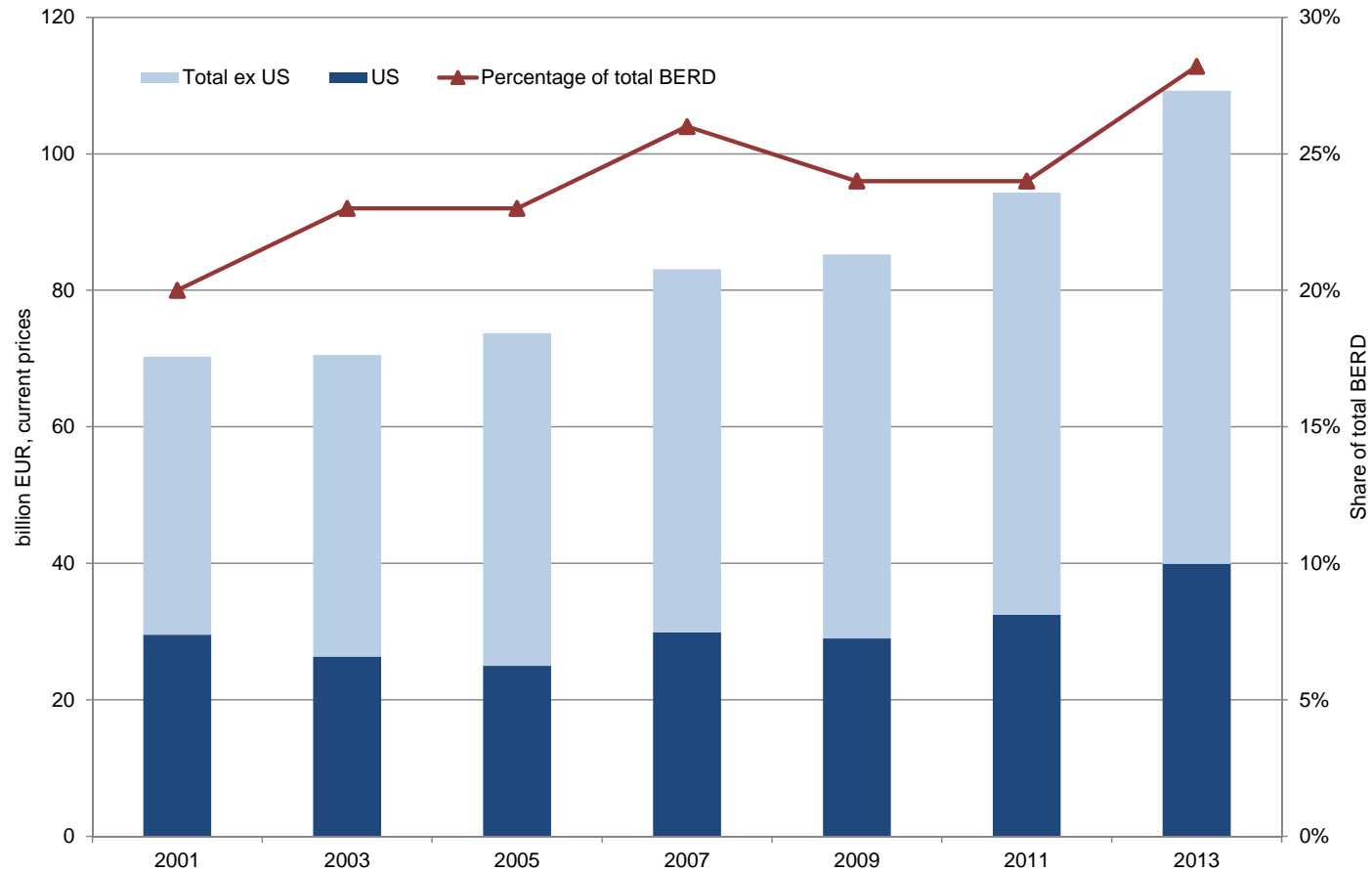
Bernhard Dachs, Georg Zahradnik, AIT

Topic of the talk

- Internationalisation of business R&D: research and development activities (R&D) of firms performed **outside their home countries**
- In the last 30 years it has emerged from a very minor issue to a driving force of change in national innovation systems
 - Patel/Pavitt, JIBS 1991: “Research and development – despite globalisation of production and sales - remains far from being globalized”

R&D by foreign-owned firms is increasing

Inward BERD in bn EUR and share of total BERD, 2001-2013

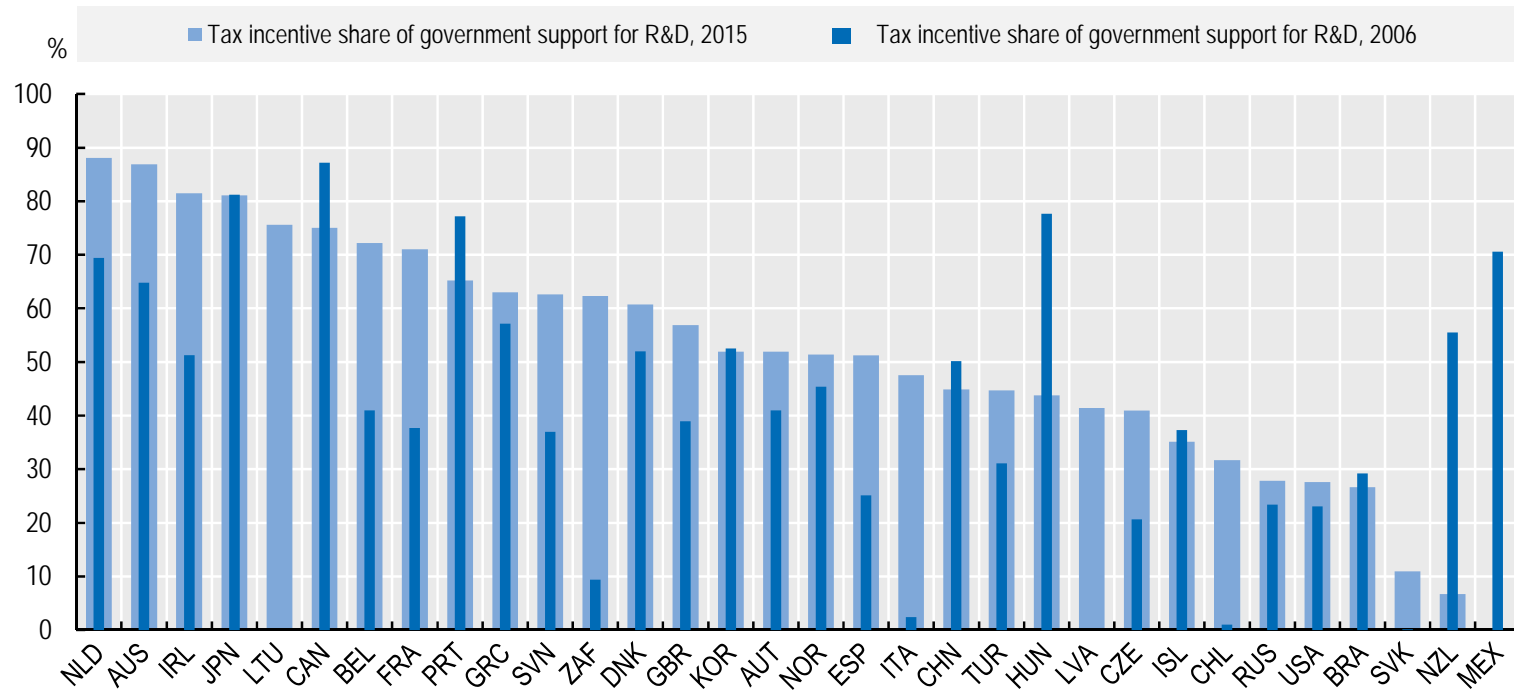


What is new in the internationalisation of business R&D?

- Changes in funding regimes for business R&D
- The rise of services in R&D internationalisation
- R&D internationalisation in emerging economies

Changes in funding regimes and R&D internationalisation

- Tax incentives are currently offered by 30 of the 35 OECD countries and a number of non-OECD countries (OECD STI Scoreboard '17).
- 22 out of 35 countries increased the share of tax incentives in the policy mix



R&D tax incentives and MNEs

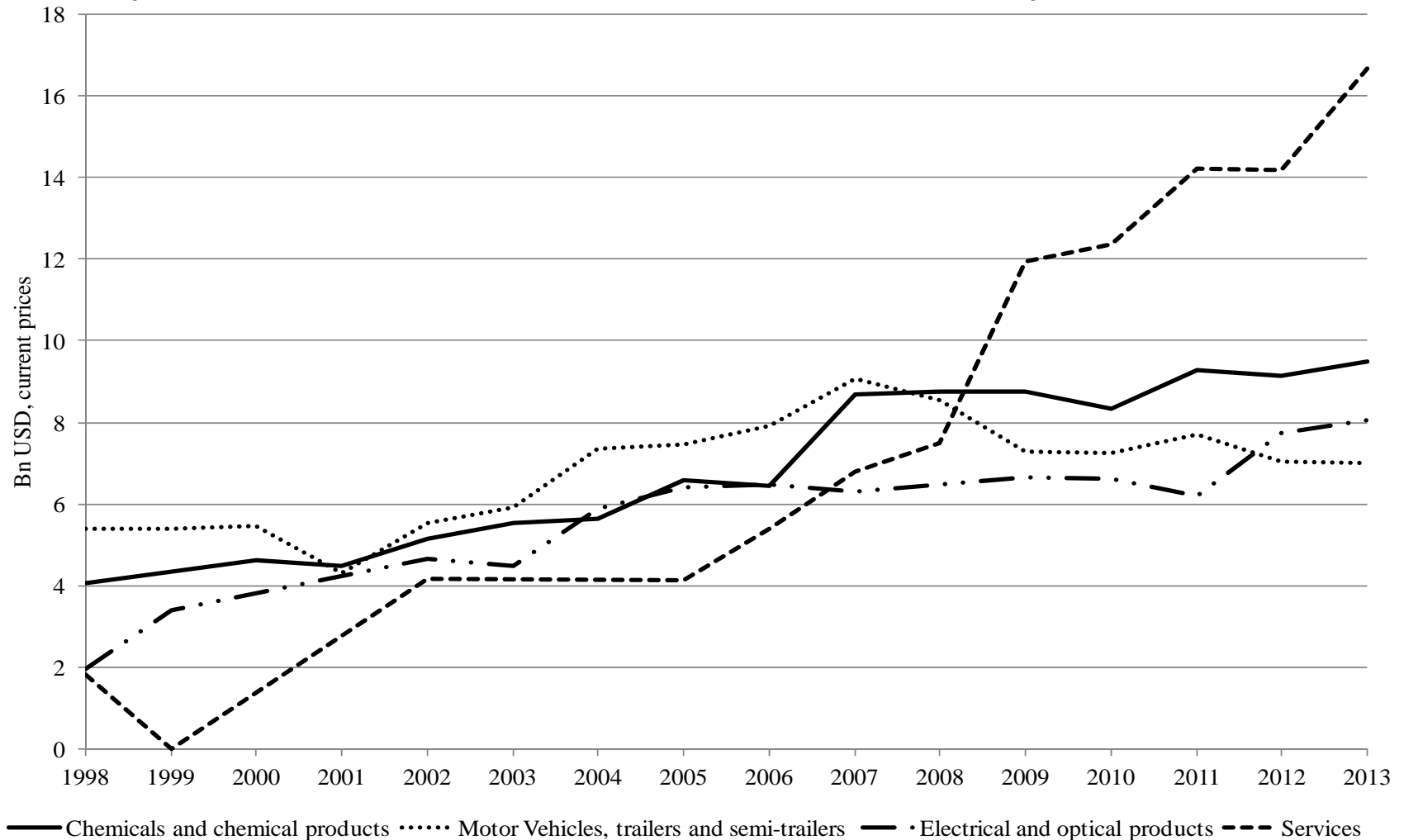
- The literature usually assumes that public funding has only a minor effect on the location decisions of R&D by MNEs
- The difference is that R&D tax credits favour large R&D spenders
 - No upper ceiling in many countries,
 - Costs of applying for and administering R&D funding are considerably lower,
 - Opportunities to shift R&D costs between countries
 - Income-based tax incentives for R&D (patent boxes) may be particularly appealing for MNEs with multiple R&D locations
- Fiscal incentives to R&D have a significant and positive effect on the amount of inward BERD (Poti and Spallone, 2016)
- The new all-purpose investment incentive to attract and retain FDI? - Bellak and Leibrecht (2016)

The role of services in R&D internationalisation

- FDI and R&D internationalisation is dominated by high-tech sectors: pharmaceuticals, chemicals, automotive, electronics, machinery
- These sectors are still very important;
- However, since the crisis of 2008/09, growth of R&D internationalisation is fuelled by service sectors to a considerable degree

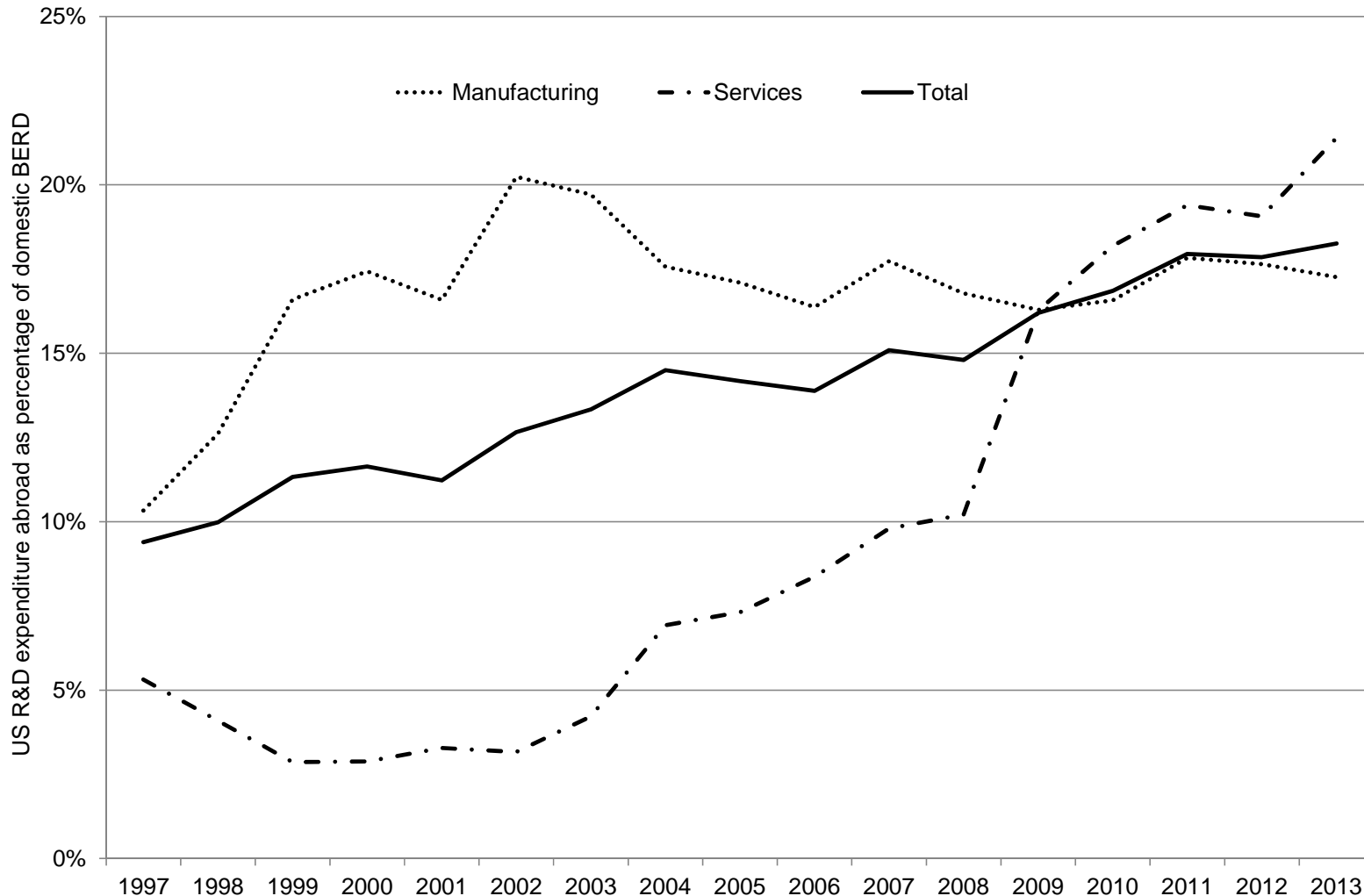
Service R&D expenditure abroad is growing faster

R&D expenditures of US firms abroad, 1998-2013, sector split



Services drive R&D of US firms abroad

Ratio of R&D expenditure abroad and at home, United States, 1997 - 2013



Source: US Department of Commerce, own calculations

The role of services in R&D internationalisation

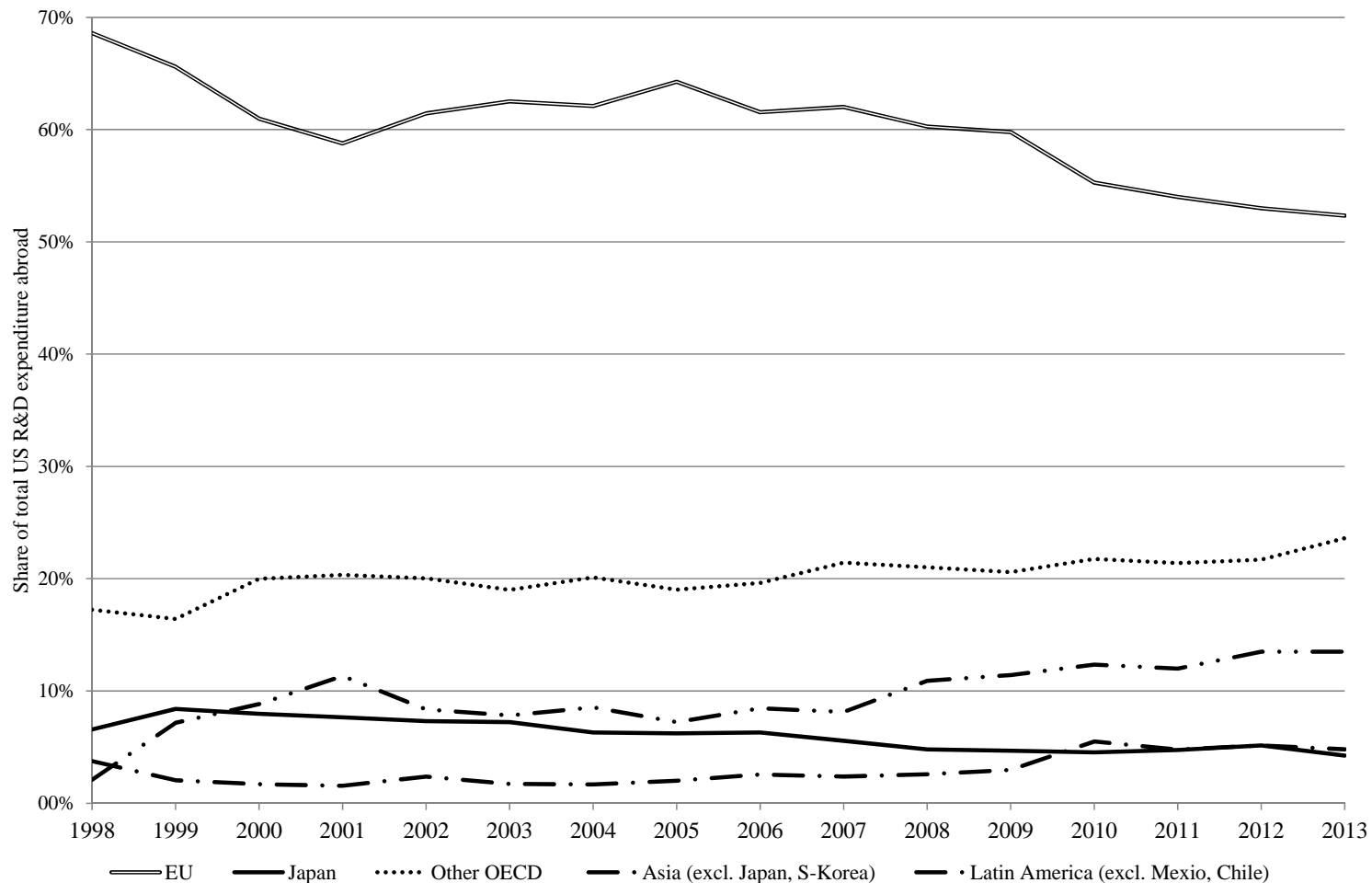
- Drivers of R&D internationalisation of services
 - Tradeability revolution in services (Grossman, Rossi-Hansberg 2008, Baldwin 2006)
 - Changes in the division of labour in sectors (for example drug testing, drug development by specialized biotech companies)
 - Higher R&D intensity of services because of new technologies (ICT, software services)
- Services are the ‚dark matter‘ of R&D internationalisation
 - In countries where data is available, services account for a third of R&D by foreign-owned firms (and most of the growth)
 - However, for most countries data for service sectors is missing
 - EU directive on FATS statistics does not require the collection of service data

The role of emerging economies in R&D internationalisation

- Emerging economies became important host countries for R&D
 - This reflects growing markets in these countries, but also increasing strength of their university and education systems
 - The rise of Brazil, China, India, etc, however is slower than many think
 - R&D is still much more concentrated in high-income countries than production
- We know too little about foreign-owned firms in these countries
 - We know total inward BERD for China (~4 bn EUR) but not the European share, no data for India
 - US firms spend around the same amount on R&D in China and India
- MNEs from emerging economies are entering the US and Europe
 - There is evidence on R&D by Chinese, Indian, etc. firms in Europe
 - It is, however, still a minor group compared to US, Canadian, Japanese, etc. inward investment in Europe

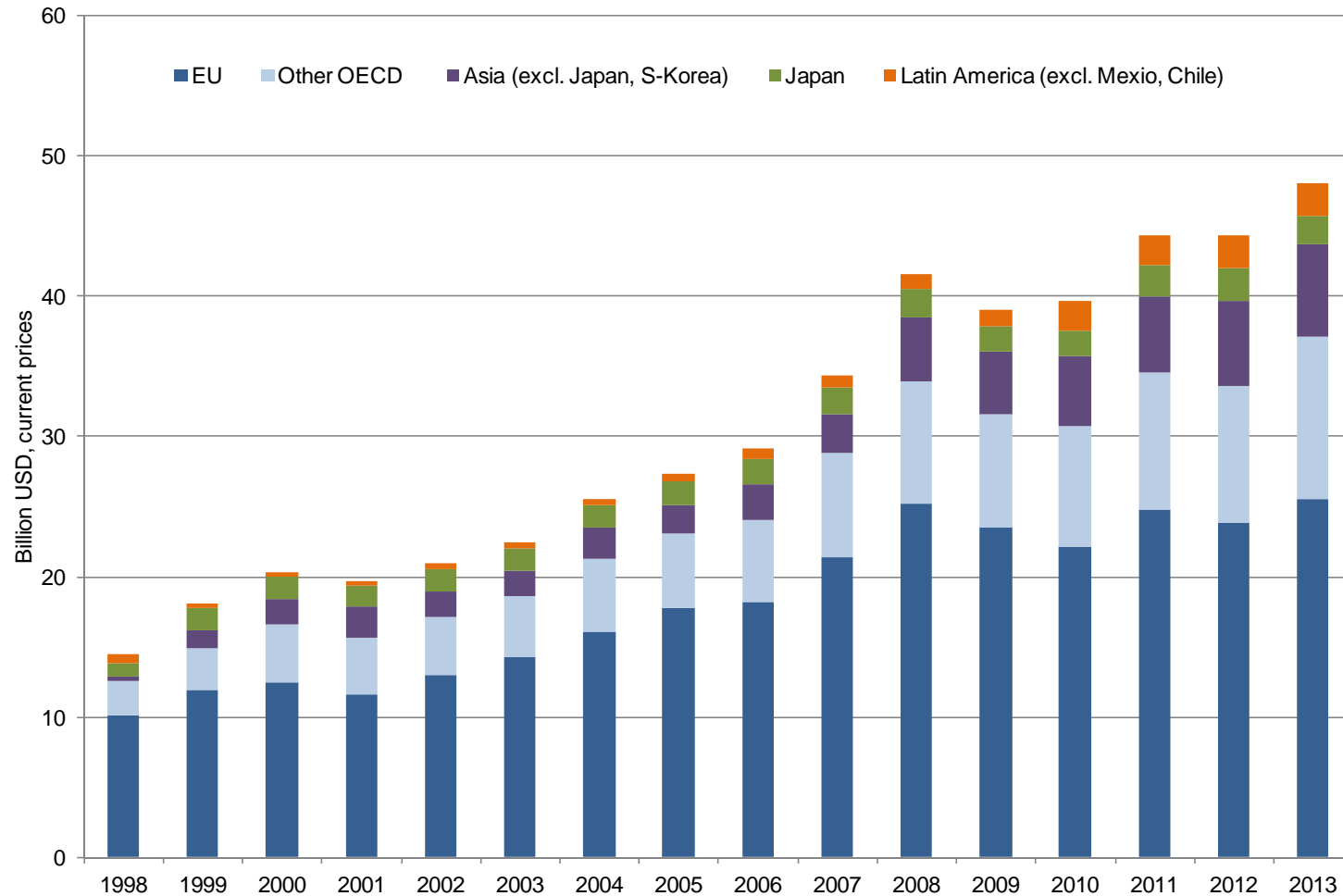
Asia's share on global US R&D activities is increasing

R&D expenditures of US firms abroad, 1998-2013, shares



Is the EU still attractive for US firms? – yes

R&D expenditures of US firms abroad, 1998-2013



Source: US Bureau for Economic Analysis

The role of emerging economies in R&D internationalisation

- The rise of EMNEs creates new questions for research on the internationalisation of R&D
 - It challenges old views on the global diffusion of knowledge from the most to least developed countries
 - Raises new questions on the nature of superior assets of EMNEs, given that these firms evolve in more restrained environments than firms in advanced economies (Narula 2012).
 - The rise of EMNEs has created fears of 'predatory behaviour' - that state-owned EMNEs will acquire domestic companies, exploit their knowledge and leave.
- It brings back family and state ownership, two governance models which have become quite unfamiliar in the US and the EU
 - Family- and state-owned firms may have different cultures of decision-making, and follow different rationales in R&D internationalisation.

Thank you for your attention!

Bernhard Dachs, Georg Zahradnik
AIT Austrian Institute of Technology
Center for Innovation Systems & Policy