



Measurement and Indicator Development – Globalisation of R&D

A Creative Imperative

The creative imperative. . .

"We are entering a new era, not just for business but for the whole world. It is one in which this 'creative imperative' will come to dominate our lives, at home, at work, and at leisure, and in which *the assumptions, tools, and frameworks which leaders from business, government and civil society have employed to make decisions over the past decade are no longer valid.*"

Klaus Schwab (Davos, 22-01-06)



Five policy themes of globalization. . .

- Changing economic landscape
- Growing future jobs
- New mindsets and changing attitudes
- Regional identities and struggles
- Emergence of China and India

(Davos, January 2006).

Some EU policy priorities identified . . .

- Promote greater coherency between innovation policies.
- Improve regulatory environment.
- Increase the average research investment level to 3% by 2010.
- Improve R&D capacity for innovation capability.

Improve R&D capacity for innovation capability . . .

- It is people that develop and apply knowledge so we need to consider
 - Indicators on stocks - domestic supply and through mobility.
 - Indicators on activities (application of skills).
 - Linkages between knowledge base and output (e.g. research, patents, products).

Forecasting S&E supply and demand in a globalizing market is an inexact science at best but . . .

- **Globalization means countries are sources, transit countries or destination countries for skilled workers. Multinational corporations are recruiting in a competitive global labour market and need to be able to understand and use the rules efficiently.** (Dr. Chubin, NSB, U.S.)
- **Recent predictions for the US — S&E occupation growth will rise faster than overall growth with one estimate at 70% faster than overall growth.** (National Science Foundation, 2006)
- **Europe needs to increase its supply of researchers from 500,000 to 800,000 FTEs by 2010.** (Gago report)

Countries have developed programmes to encourage inflow of researchers and skilled S&E personnel . . .

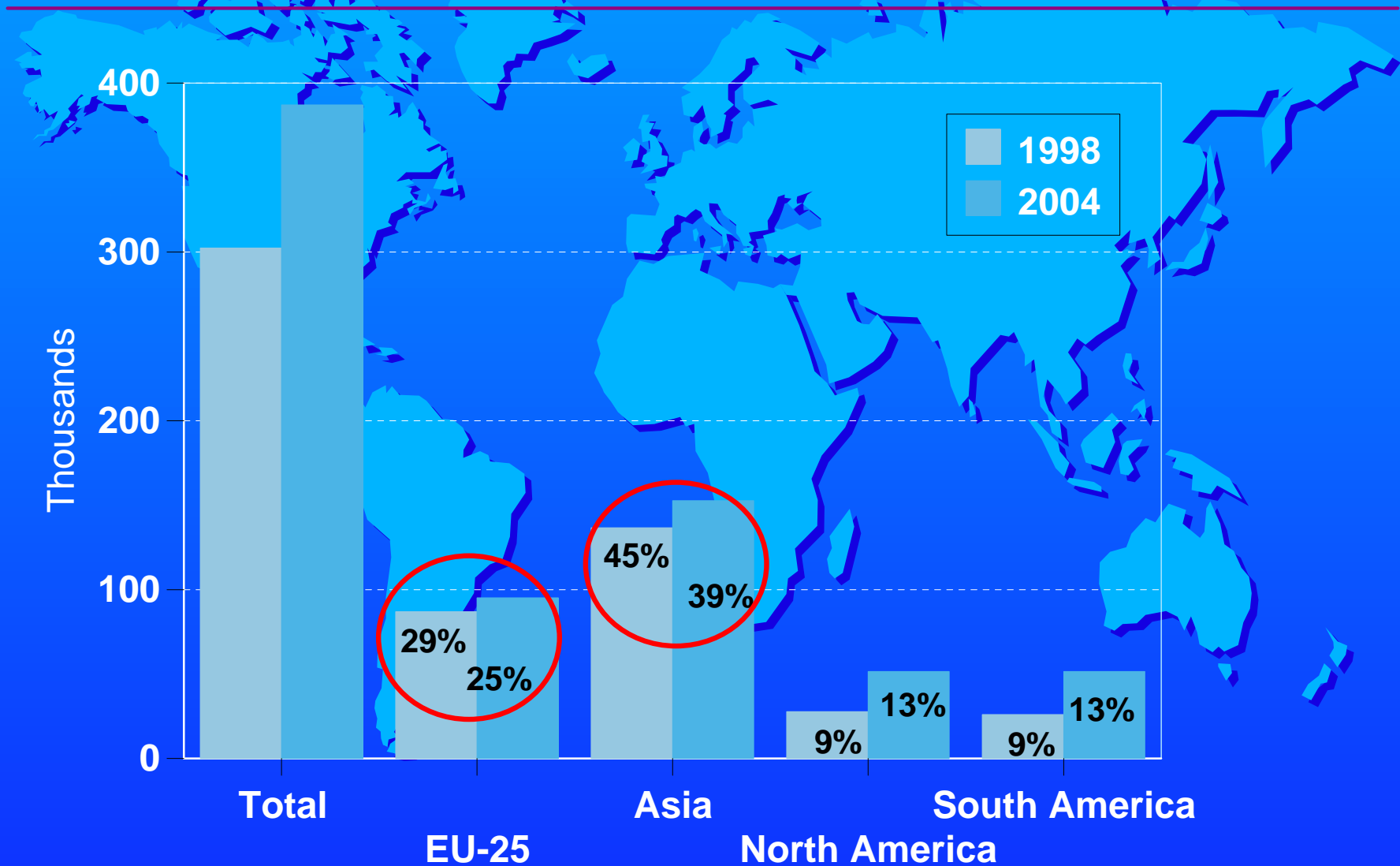
Policy has put specific programmes in place to facilitate foreign S&E worker entry

- Germany - *Green Card*
- U.S. - *H-1B Visa*

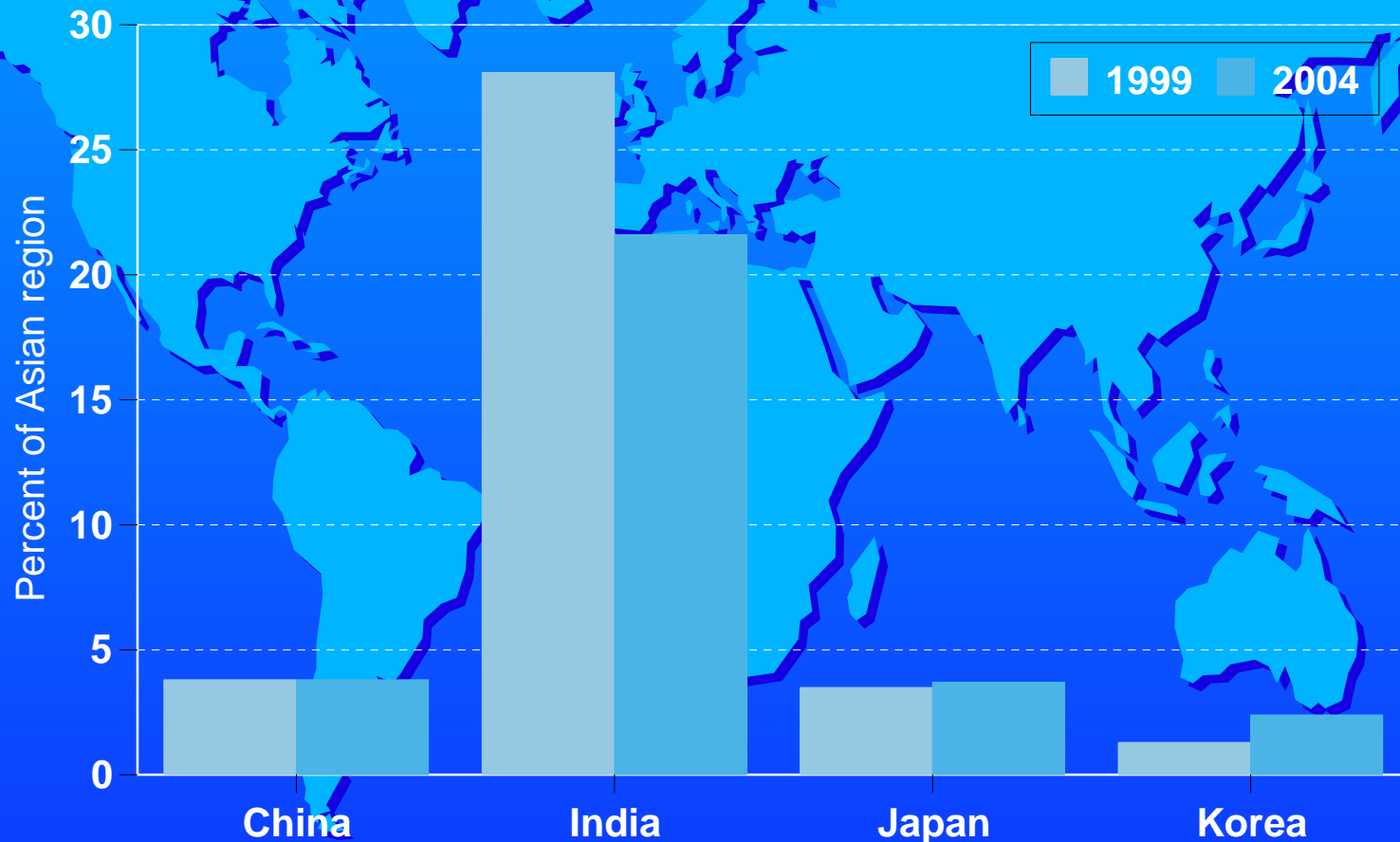
Policy has '*tinkered*' with existing programmes to facilitate foreign S&E worker entry for targetted sectors —

- Netherlands - '*fast track*' for IT workers
- Ireland - '*fast track*' for designated sectors where skill shortages are critical (e.g. IT workers, nurses).

Globalization of R&D and shifts in source countries for S&E workers — in the U.S. numbers are increasing in absolute terms but source country representation is shifting - to what extent is globalization a factor?



Globalization and a changing role for Asian countries — the U.S. data shows a shift among some of the key supplying countries in the Asian region. Are there more opportunities for research at home?



Source: MERIT, based on USCIS H-1B data.

Research has been carried out to identify reasons for researchers moving abroad — the top reasons cited by European researchers include. . .

- 1. Broader scope in position and activities.**
- 2. Better access to leading edge technologies.**
- 3. Better access to career opportunities.**
- 4. Better access to R&D funding.**
- 5. Better wages.**

How will globalization of R&D influence the 'push' and 'pull' factors of international mobility?

Multinational companies and their growing role in global R&D . . .

- Multinationals account for 46% of global R&D expenditures and 69% of global business R&D.
- Four of the top ten multinationals (as measured by R&D expenditures) are "based" in the EU — for now: Daimler Chrysler (Germany), Siemens (Germany), Volkswagen (Germany) and Nokia (Finland).

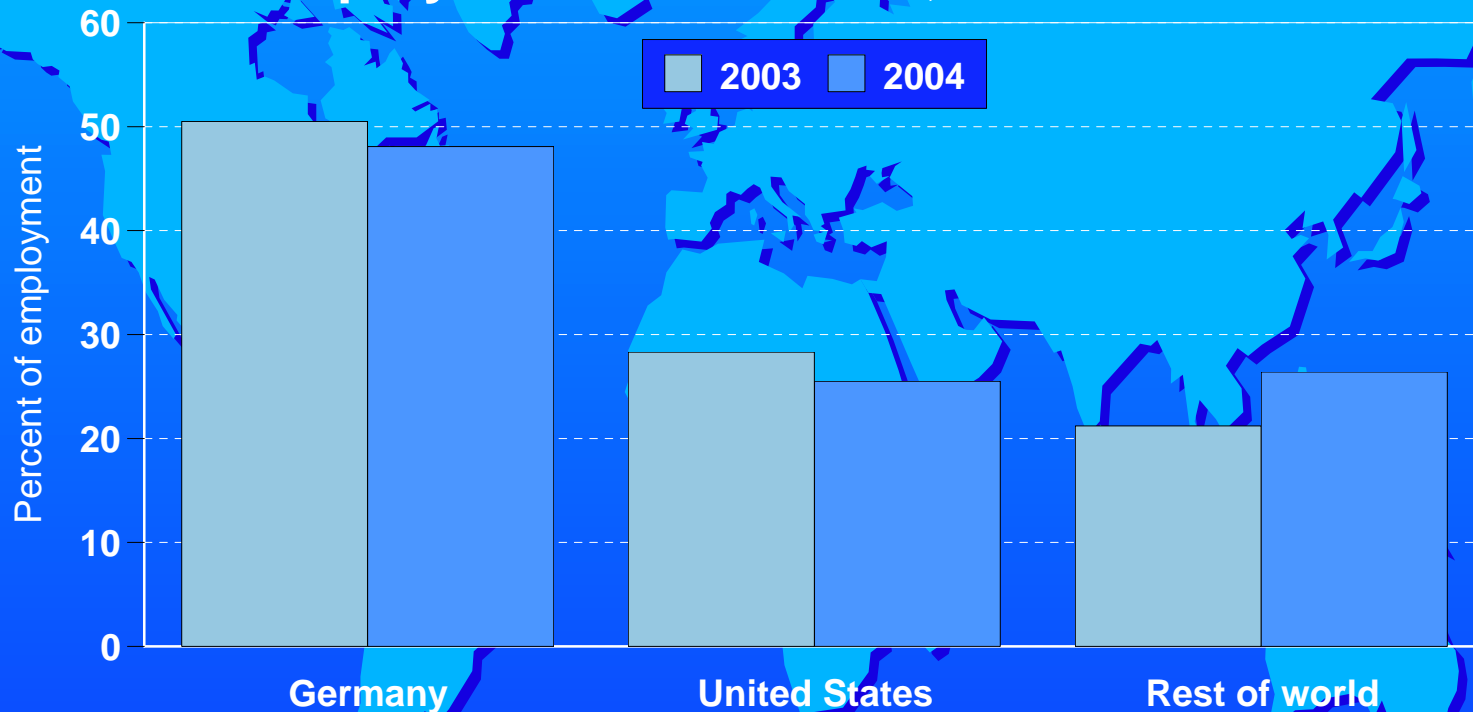
Drivers of global R&D are changing . . .

- Relocation of R&D overseas is no longer driven solely by the need for local adaptation or to tap established networks.
- Top reasons for relocation now include
 - availability and access to research talent
 - reduction of R&D costs.

Multinationals' employment patterns are changing —

"DAIMLEYCHRYSLER has manufacturing facilities in 17 countries and is owned by European, U.S. and other international investors."

Employment distribution, 2003 and 2004.



- Number of DaimlerChrysler employees rose from 362,063 in 2003 to 384,723 in 2004 — at the same time, the share of employment in Germany and the United States fell.