
IP, Rx, FDI, Trade

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The opinions expressed and arguments employed herein do not necessarily reflect the official views of GEM-Sciences Po or the OECD.

Outline of talk

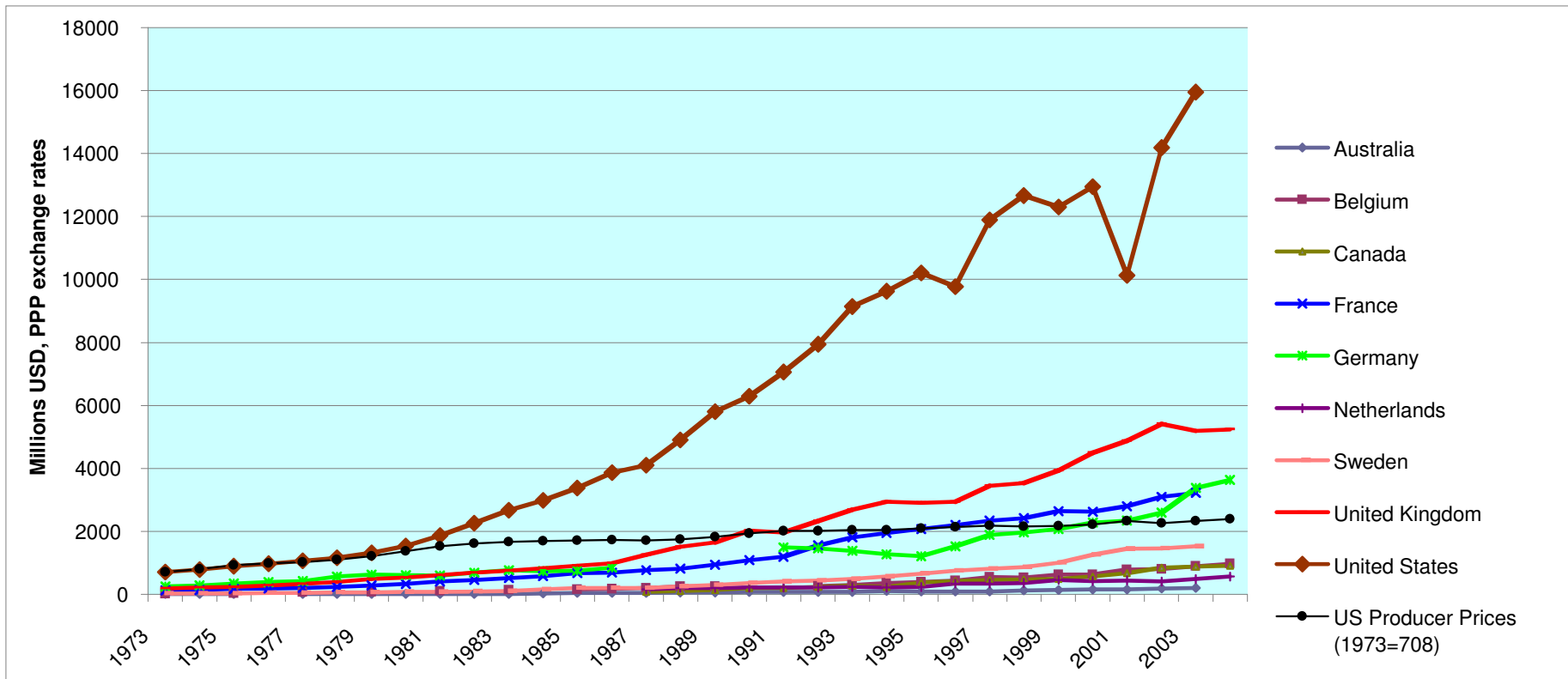
- Elements: IGWG, TRIPS
- Pharmaceutical industry characteristics
- IPR strengthening since 1990
- Analysis: IPR change and ...
 - Merchandise imports
 - FDI
 - Patenting
- Conclusions

RE: IGWG - Draft Global Strategy

How has IPR reform since 1990 performed in relation to some of the Global Strategy themes?

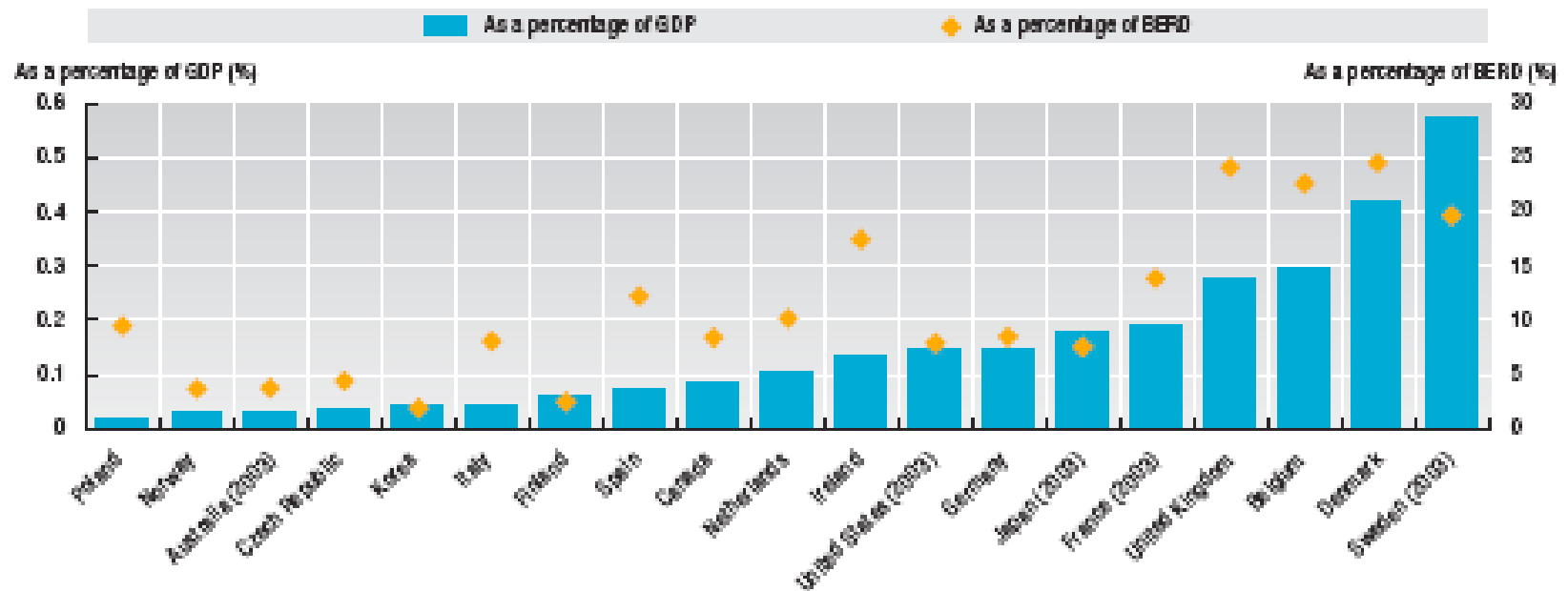
- IP regimes
- R&D
- Access
- Technology transfer
- Innovative capacity

Rx sector expenditure on R&D, OECD countries, 1973-2004



Source: *OECD Research and Development Expenditure in Industry* database.

R&D expenditure in the pharmaceutical industry as a percentage of GDP and BERD,⁵ 2004



StatLink <http://dx.doi.org/10.1787/116882541724>

Source: OECD (2007), *Science, Technology and Industry Scoreboard*.

Technology intensity of the pharmaceutical sector, selected OECD countries, 1999

Sector	R&D in relation to production (%)	R&D in relation to value added in sector (%)
Pharmaceuticals (ISIC 2423)	10.5	22.3
Chemicals excluding pharmaceuticals (ISIC 24, excl. 2423)	2.9	2.2
Total manufacturing (ISIC 15 – 37)	2.6	7.2

Source: OECD (2005), *Science, Technology and Industry Scoreboard 2005*, Paris.

Source: OECD (2005), *Science, Technology and Industry Scoreboard*.

Review of TRIPS & Patents

- TRIPS established minimum global standards for IPRs, including patents, effective 1995
- Protection: min. 20 years, most technologies, with some exclusions permitted
- Rights holders: means to prevent 3rd party abuse
- Governments must ensure legal protection for IPRs, sufficient penalties to deter abuse
- Patent owners: the right to transfer, license, assign
- Governments: may in some cases compulsory lic.

TRIPS (1995): Tech Transfer

Art. 7: “The protection & enforcement of IPRs should contribute to the promotion of technological innovation and to the transfer & dissemination of technology, to the mutual advantage of producers & users of technological knowledge and in a manner conducive to social & economic welfare, and to a balance of rights & obligations.”

Art. 66.2: Dev'd countries shall provide incentives promoting tech transfer to LDCs

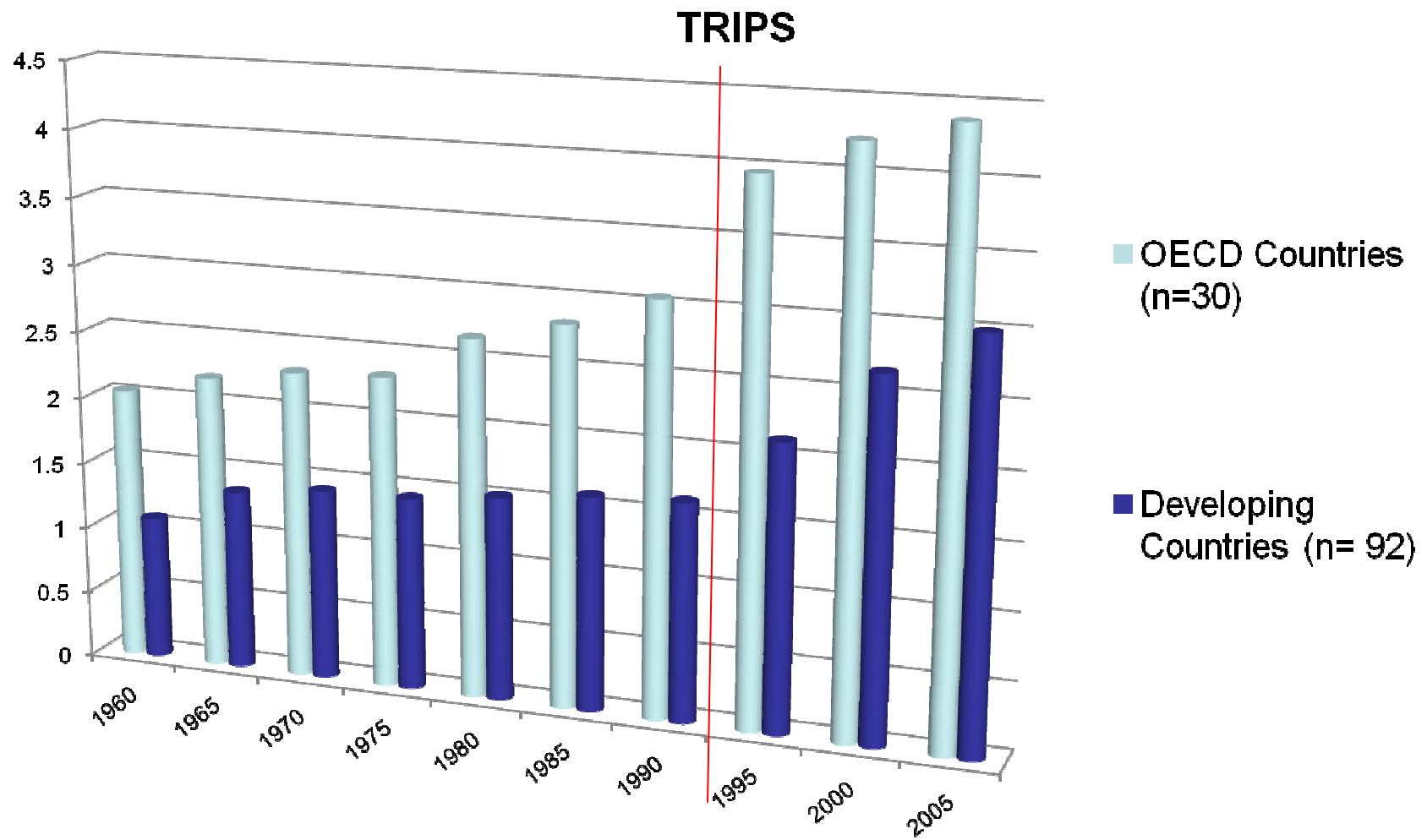
IPR Strengthening: Patent Rights Index, 1990-2005

- Scored 0 = low to 5 = high
- Components include:
 - Membership in international treaties (e.g. Paris)
 - Product coverage (e.g. Rx, chem, food, surgical)
 - Restrictions on patent rights (e.g. comp licensing)
 - Enforcement (e.g. prelim. Injunctions)
 - Duration of protection (20 years = full)

 - Builds on Ginarte and Park (1997), Park (2005)

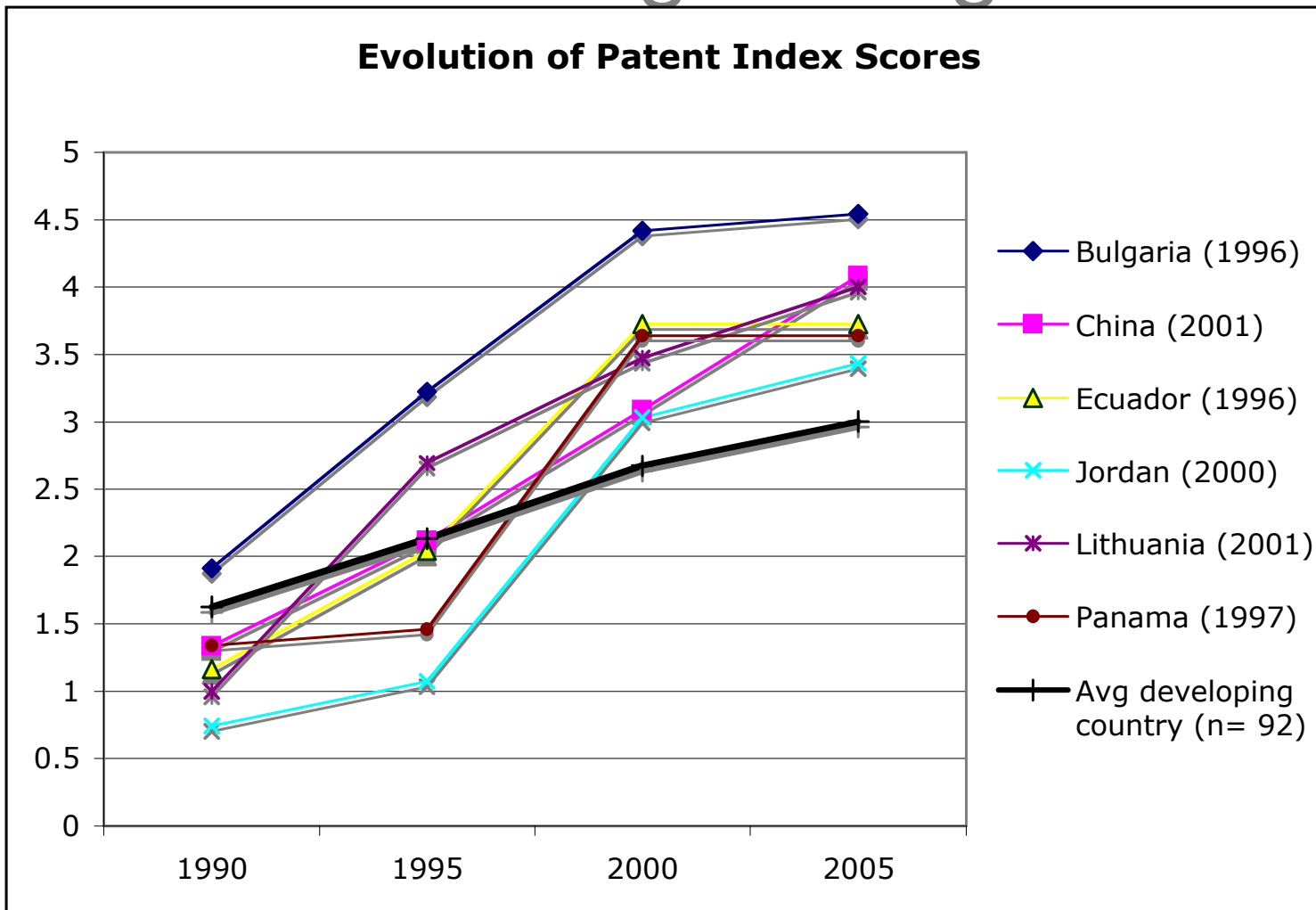
Index of Patent Rights

Based on laws on the Books (0 = weak, 5 = strong)



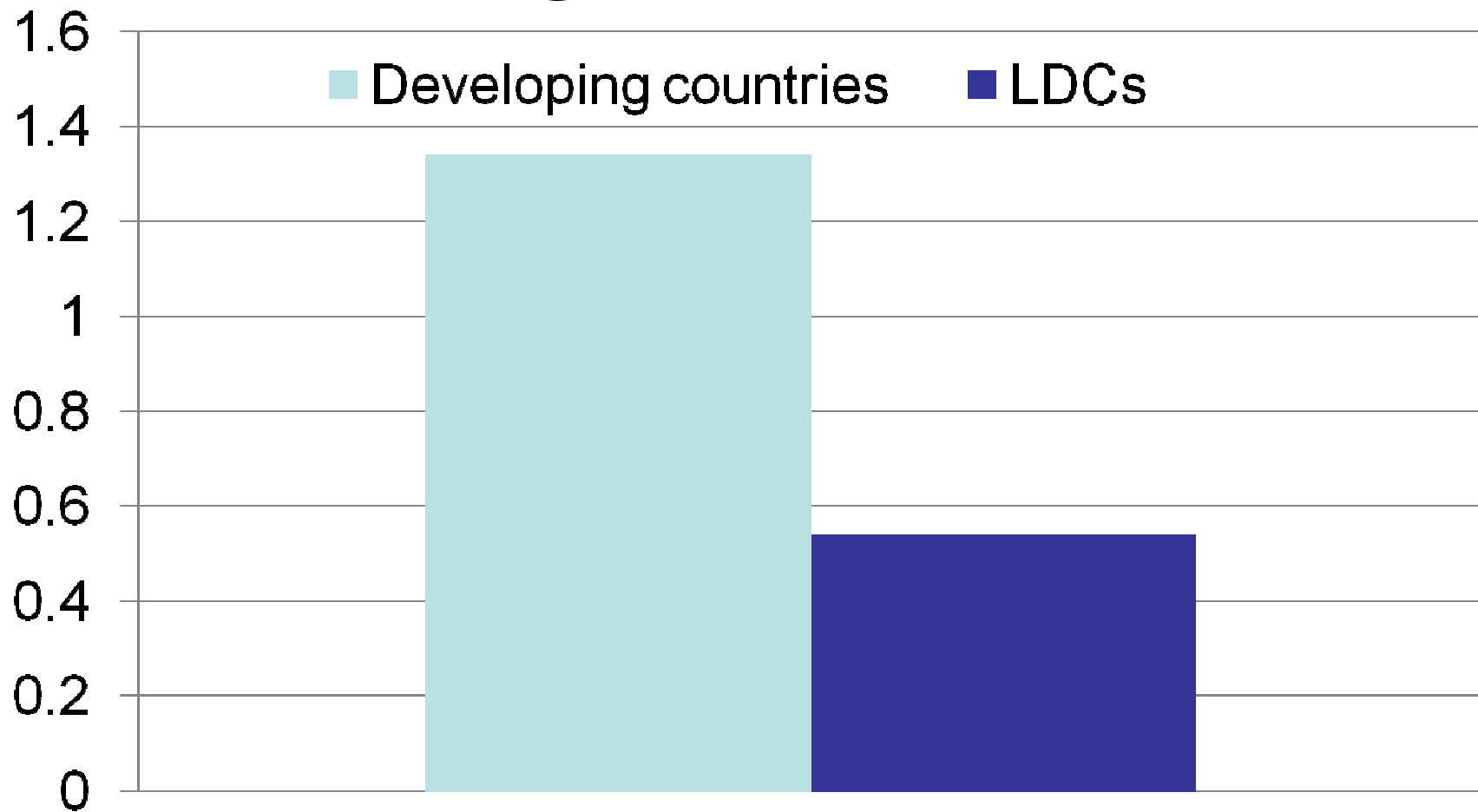
Source: data underlying Park and Lippoldt (2008).

WTO Accession and IPR Strengthening

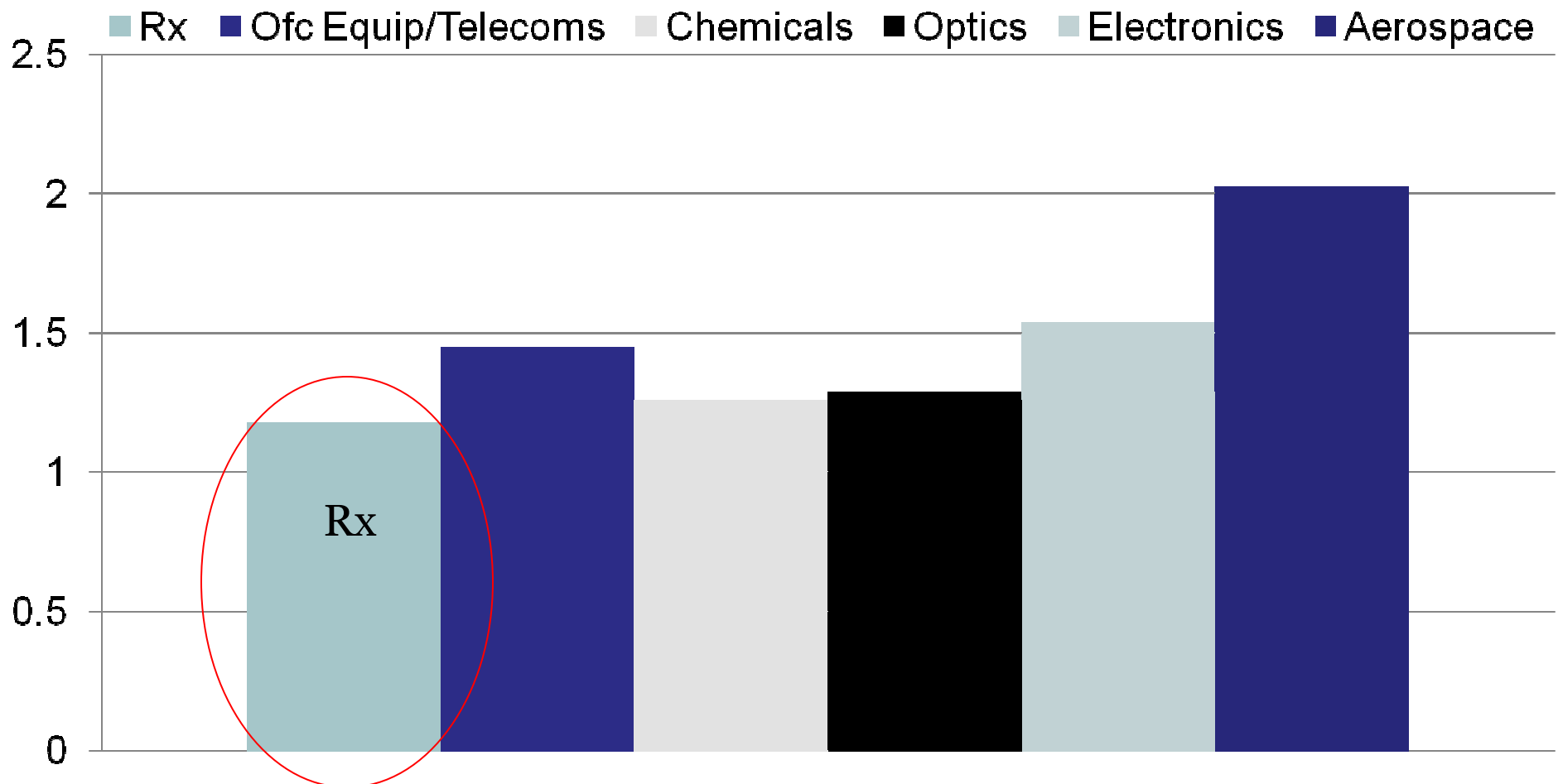


Source data: Park and Lippoldt (2008), also next 2 slides

Merchandise Imports: % change associated with 1% change in Patent Rights Index, 1990-2005

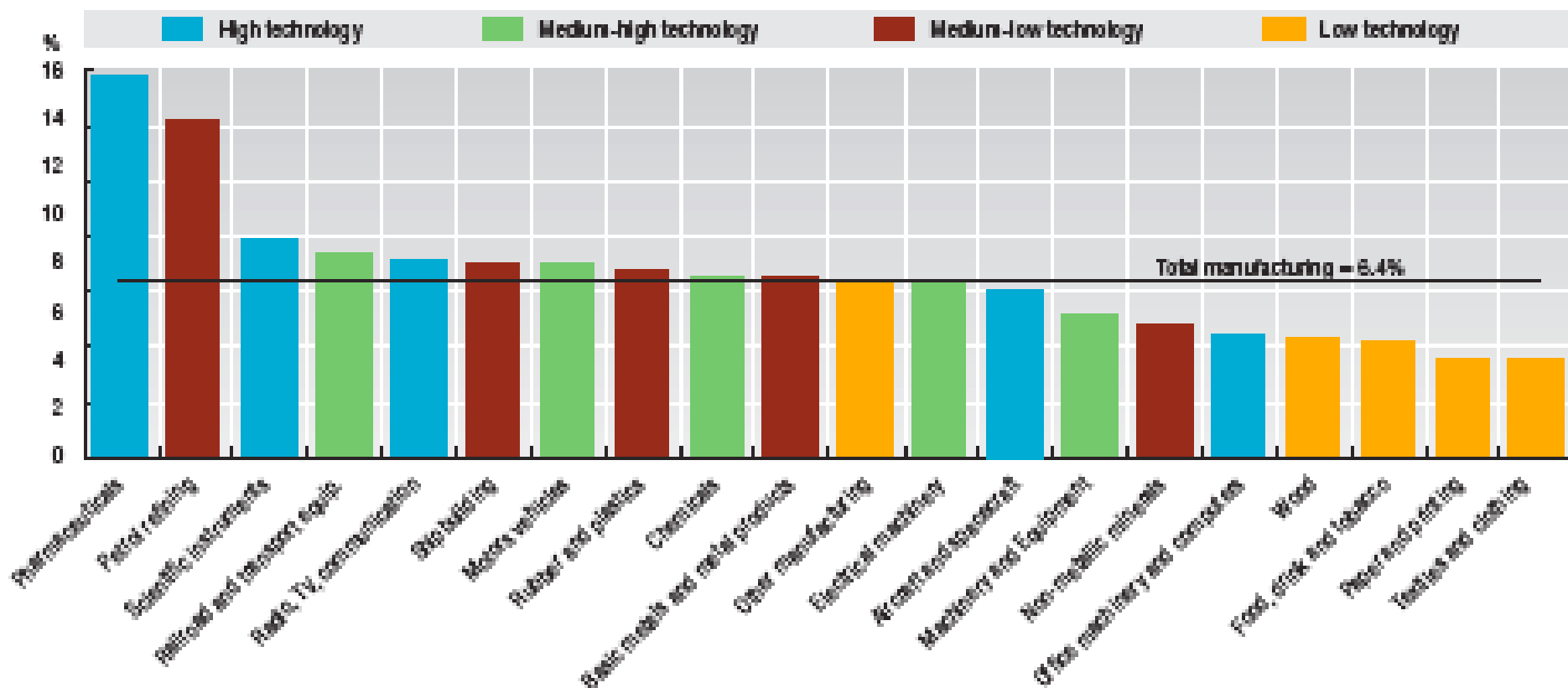


Dev'g Co & LDC merchandise imports: % change associated with 1% change in Patent Rights Index, 1990-2005



Growth of OECD¹ manufacturing trade² by industry and technological intensity

Average annual growth rate, 1996-2005



Source: <http://dx.doi.org/10.1787/120423112608>

Source: OECD (2007), *Science, Technology and Industry Scoreboard*.

1. Excluding Luxembourg and the Slovak Republic.

2. Average value of total OECD exports and imports of goods.

Technology gap: case of pharmaceutical production capacity

KEY

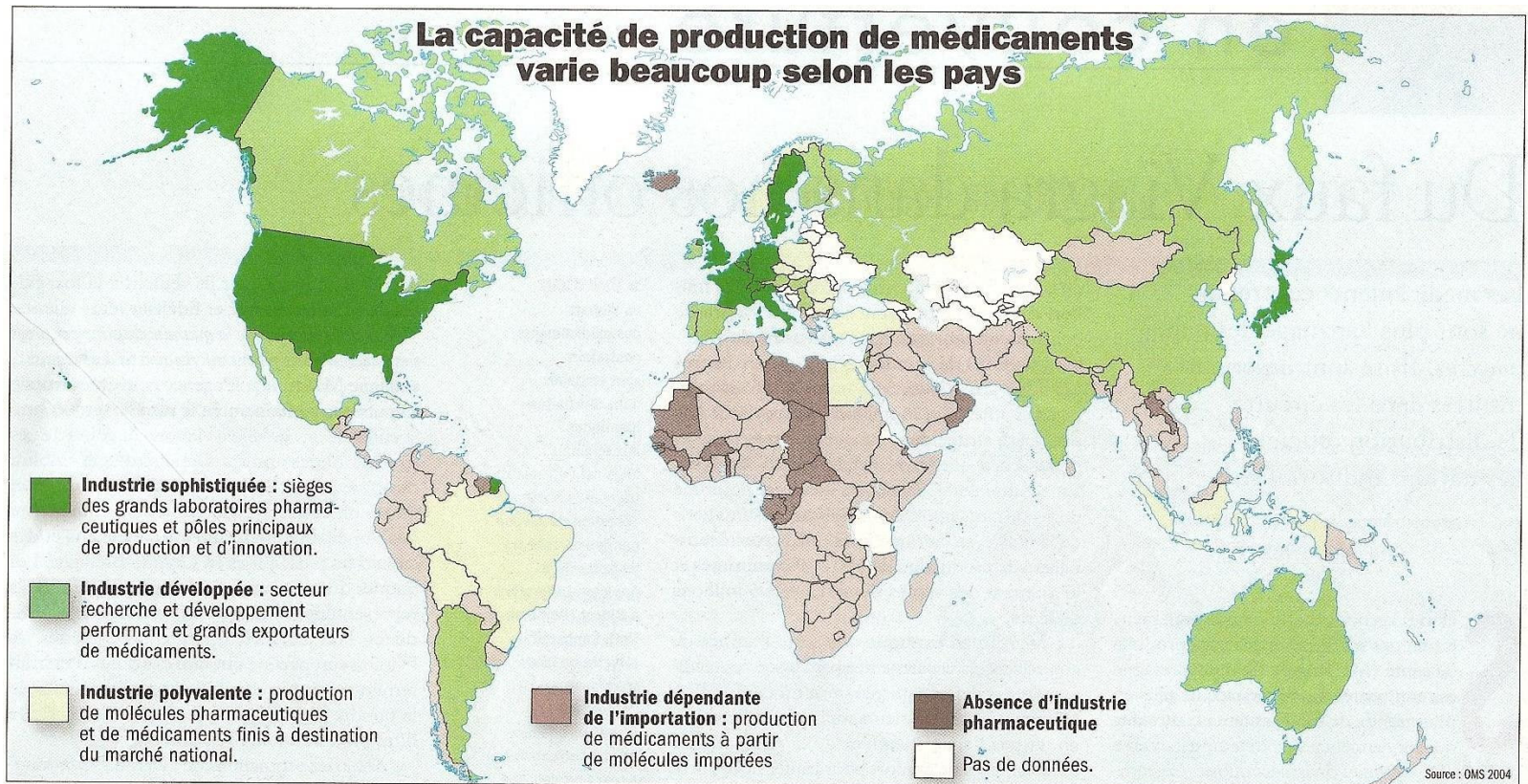
•Very advanced Rx Industry

•Developed Rx Industry

•Domestic Rx production

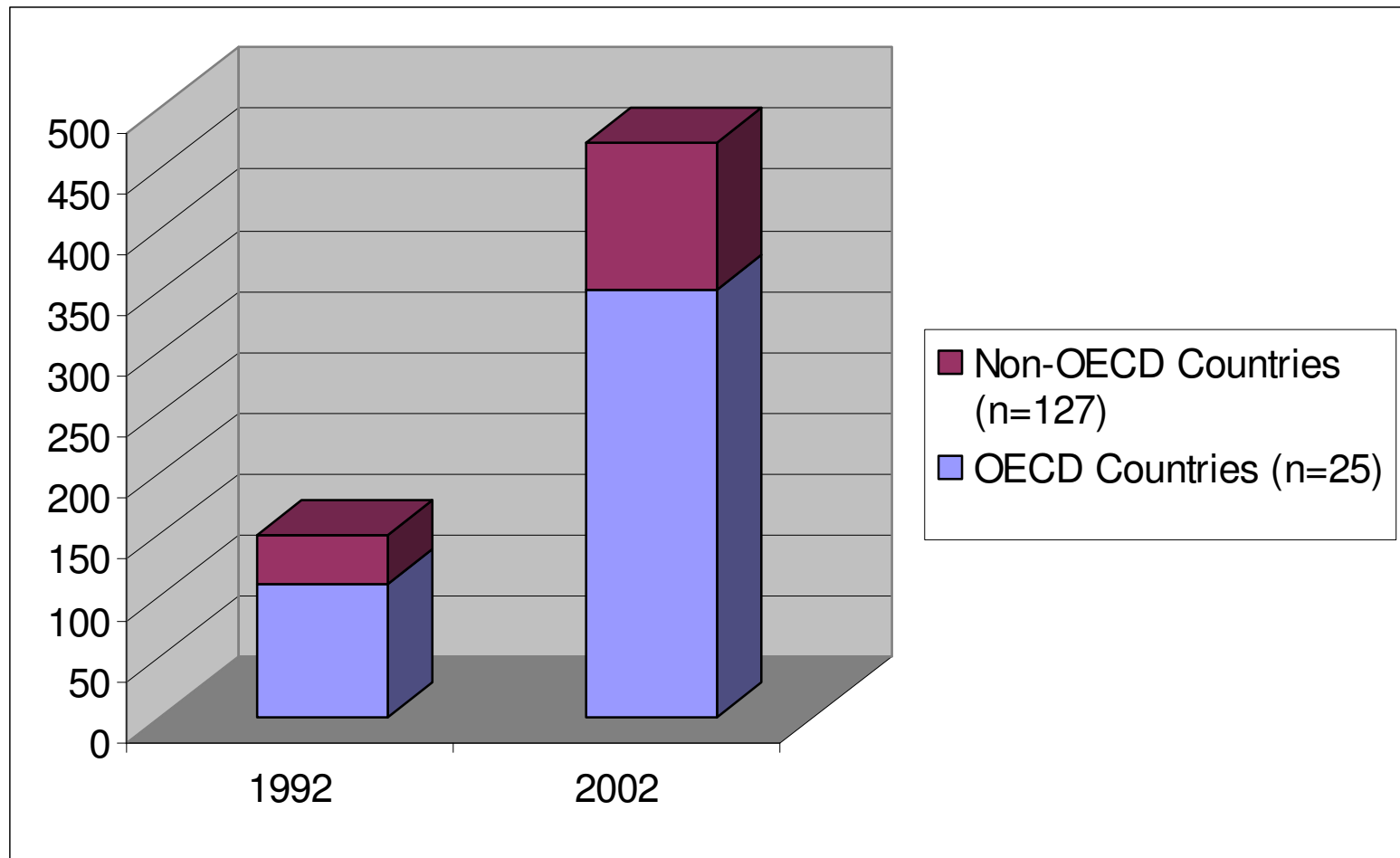
•Rx industry dependent on imported components

•No Rx industry



Source: *Courrier International* No. 892, 1-7 March 2007, p.43

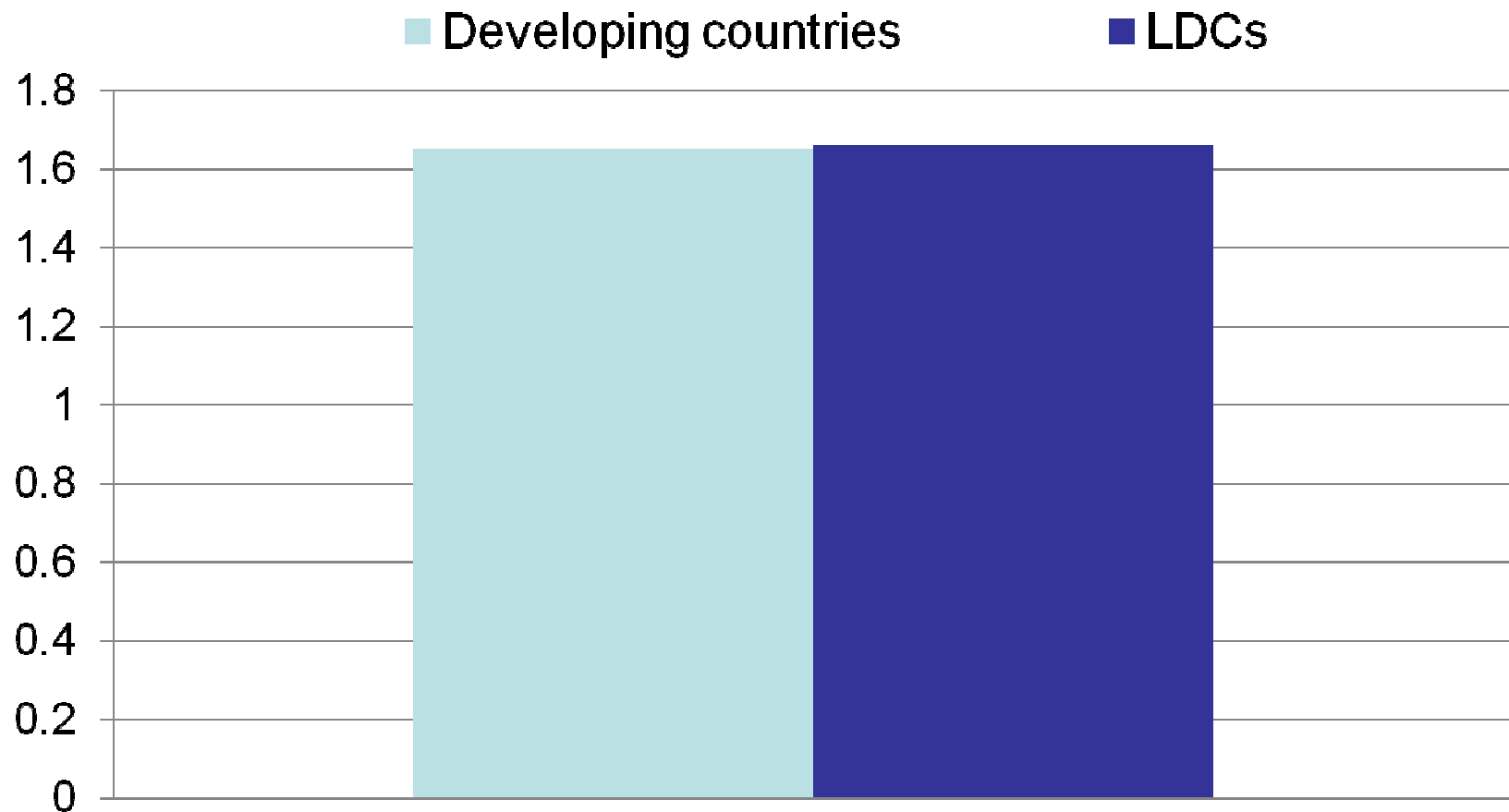
Net inflows of FDI, USD millions



Note: EIU - gross inflows 2006: USD 1335 bn

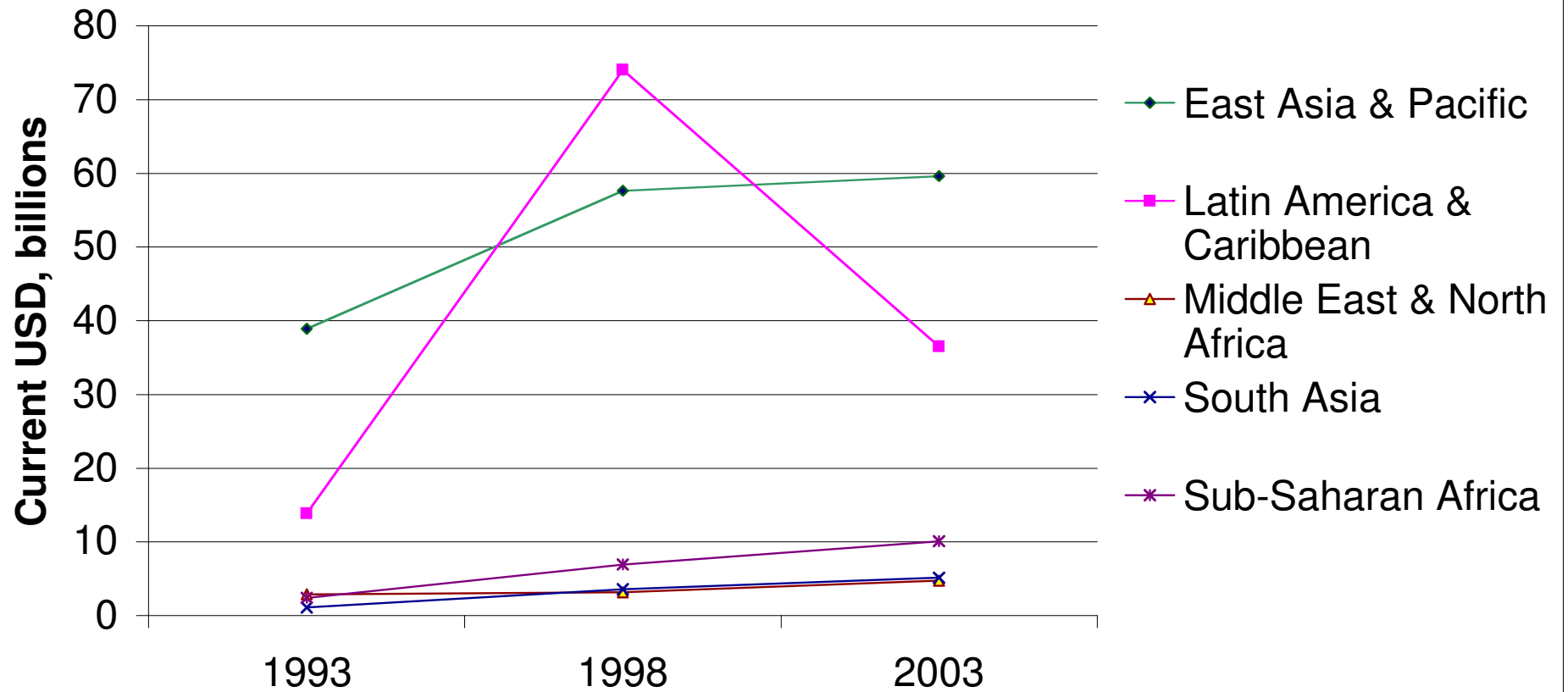
Source: World Bank, *World Development Indicators*, on-line edition.

Stock of inward FDI: % change associated with 1% change in Patent Rights Index, 1990-2005

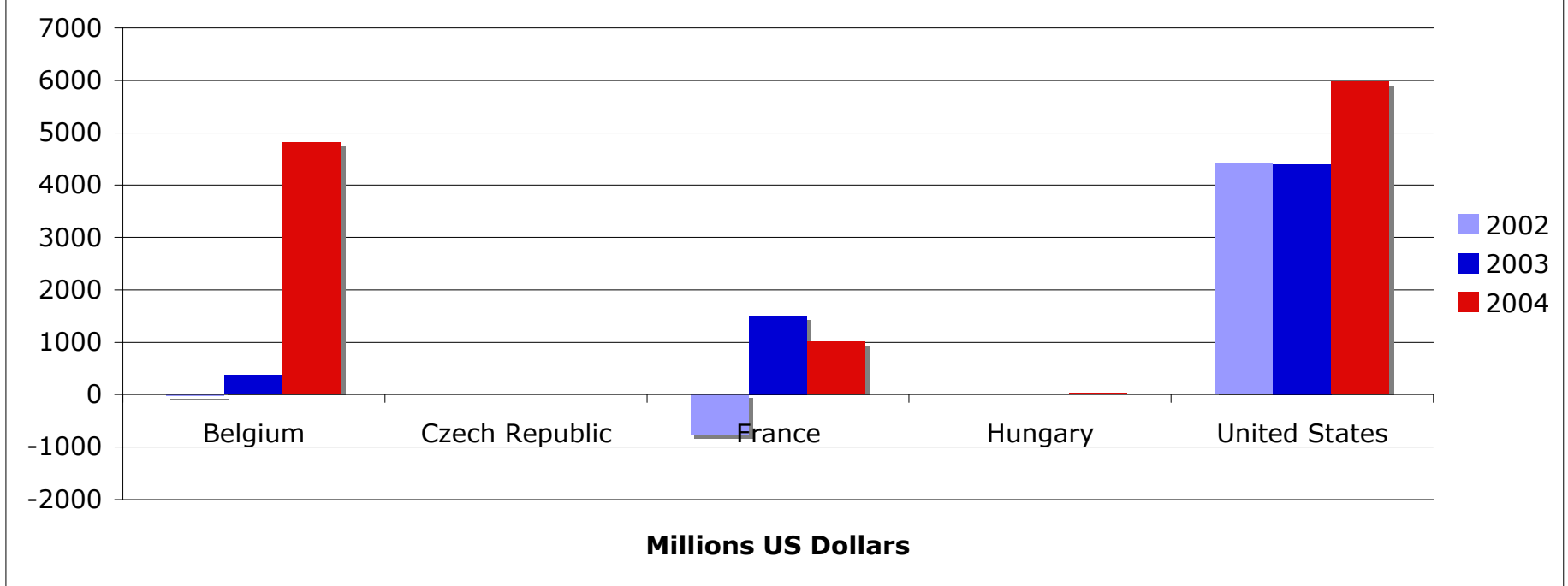


Source data: Park and Lippoldt (2008).

Foreign direct investment, net inflows



Direct Investment - Outflows: Rx, Med Chems, Botanicals



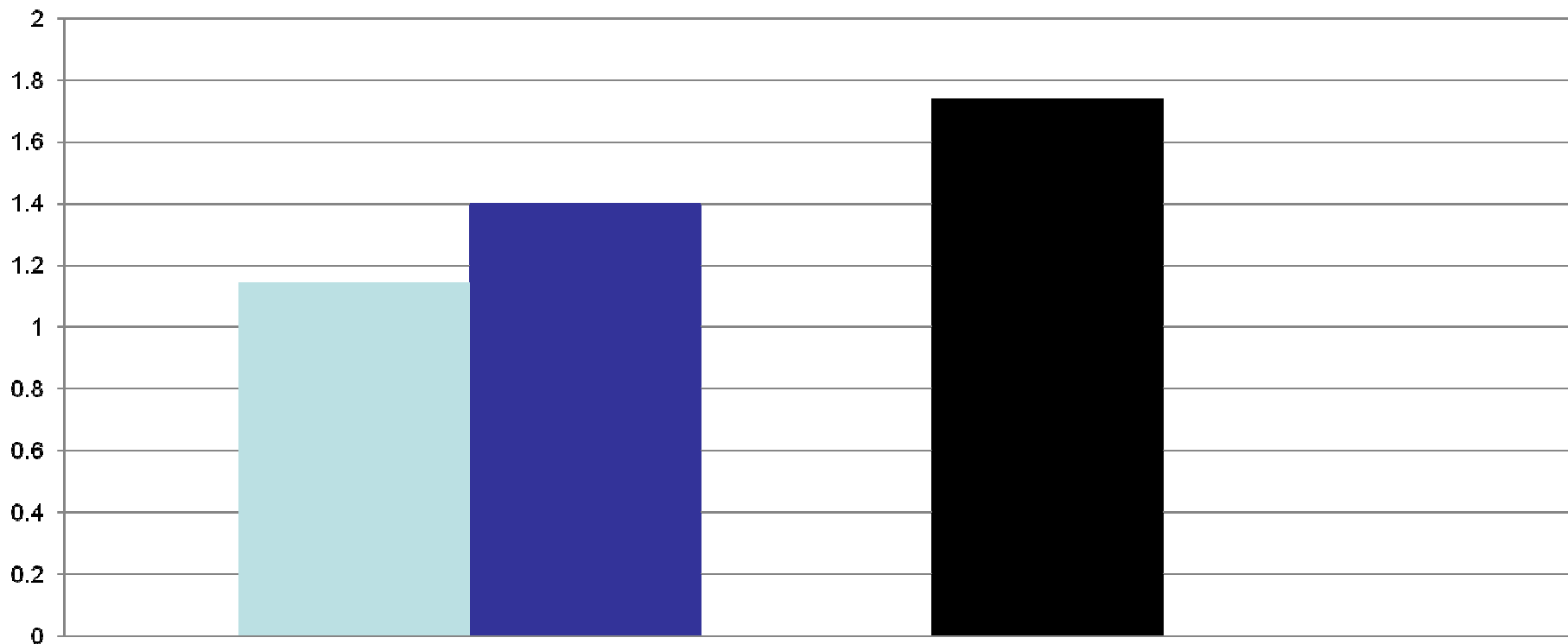
Source: OECD (2006), International Direct Investment Statistics.

Examples of FDI to Devg Cos

- **Sanofi Aventis (HQ: France)**
 - Bringing production closer to the areas where the product is being used (transfer of all production from Italy to South Africa of a drug to treat TB), developed and produced Lactacyd in Vietnam
 - Clinical Research Units: created in India (2006), China (2005)
- **Novartis (HQ: Switzerland)**
 - Novartis Institute for Tropical Diseases in Singapore (expanded research to include malaria along with TB, dengue fever)
 - China Leadership Development Center (ca. 2004), Expansion plans include new r&d center in Shanghai; development & production plant in Changshu
- **GlaxoSmithKline (HQ: UK)**
 - Vaccine production facilities built in India / Singapore
- **AstraZeneca (HQ: UK)**
 - Partnership with African Medical and Research Foundation (AMREF) to strengthen healthcare systems TB / HIV / Malaria in Uganda
 - New Innovation Center China, \$100 million
 - Egypt: new mfg facility in Egypt (Dec. 2006) \$32 million
 - India: 2003 built dedicated TB research center in Bangalore, India

Dev'g co stock of US outward FDI: % change associated with 1% change in Patent Rights Index, 1990-2005

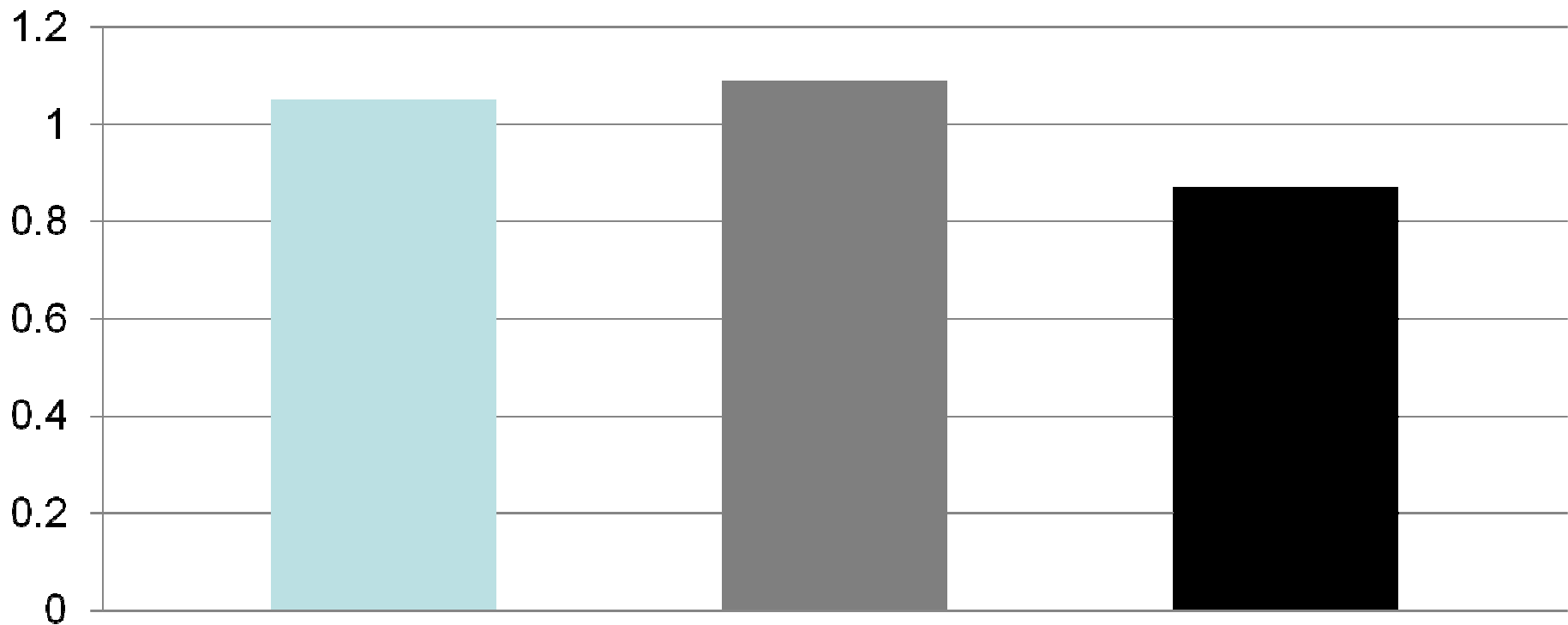
■ Chemicals ■ Machinery ■ Electronics (not sgnf) ■ Services ■ Computers (not sgnf)



Source data: Park and Lippoldt (2008).

Innovation in dev'g cos: % change associated with 1% change in Patent Rights Index, 1990-2005

■ Patent apps by non-residents ■ Patent apps by residents ■ R&D as % of GDP



Source data: Park and Lippoldt (2008).

Conclusions

- Changing economic environment: globalisation, ICTs, strengthening of IPRs
- IPRs play key role in the ability of the pharma sector to capitalise on their innovation; positive relationship between IPRs and FDI, trade, R&D, patent apps.
- IPRs: One important factor – among others – influencing trade and investment decisions
- Rx locational decisions: global competition

IGWG themes touched upon:

- IP regimes
- Access
- R&D
- Technology transfer
- Innovative capacity



Thank you for your attention.