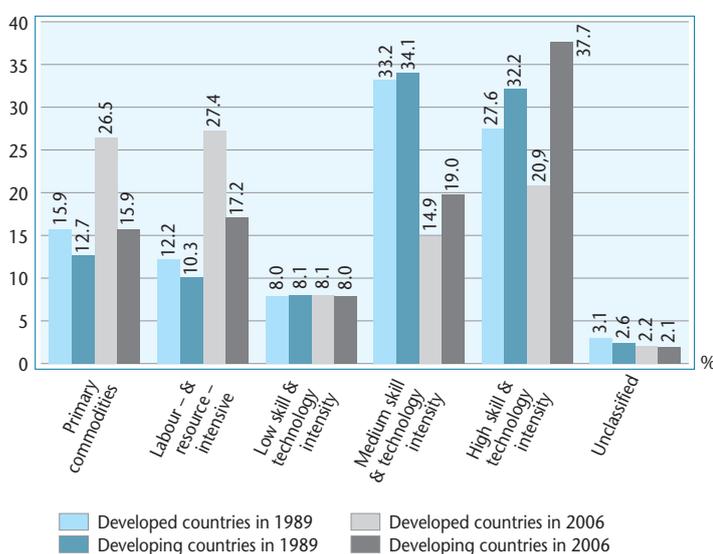


### Merchandise trade balance

- In the new geography of production, countries or regions previously outside the production circuit for high value-added or high-technology goods have begun to develop niche markets via restructuring strategies and rationalisation of production on a world scale.
- Primary and low-technology goods have fallen significantly as a percentage of developing-country exports, while the proportion of exports with more embodied technology are increasing.
- While developing countries are gaining ground in the production and trading of technology-intensive goods, developed countries are seeing their historical lead in these segments diminish.

### Brazil: Breakdown of exports to developed/developing countries by skill & technology intensity, 1989 & 2006 (in per cent)



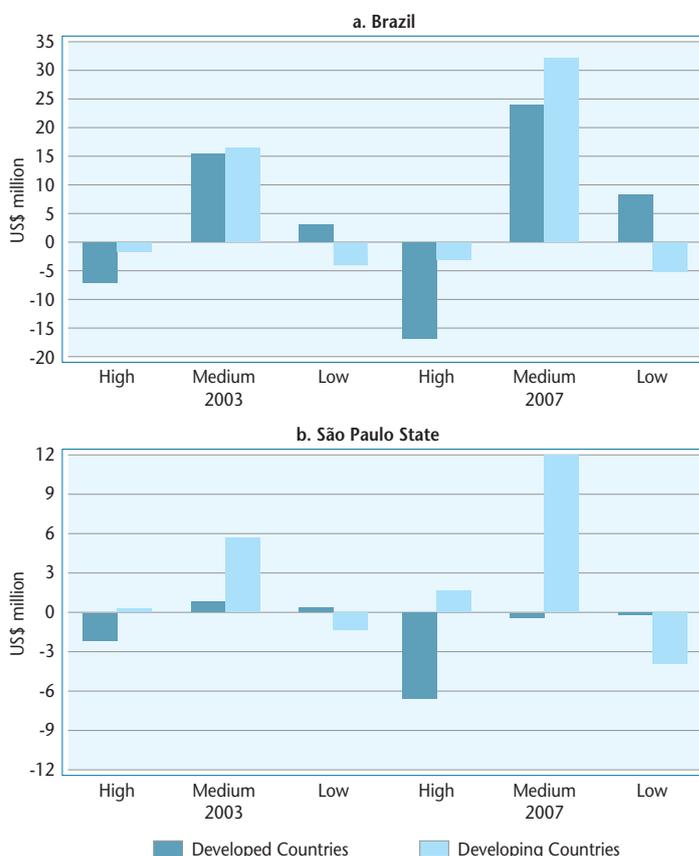
Source: COMTRADE. Based on tabulations by Kasahara & Rodrigue (2008).

- Between 2002 and 2005, U.S. high-tech exports increased US\$83.7 billion in net terms, while U.S. high-tech imports grew US\$124.1 billion.
- At the same time, Chinese high-tech exports and imports increased US\$194.4 billion and US\$178.7 billion respectively.
- Despite China's emergence and significance as an exporter of high-tech products, America's deficit has not prevented it from remaining the world hub for scientific and technological development.
- In Brazil, the highlight was growth of US\$37.3 billion in medium-technology exports between 2002 and 2005, while imports rose US\$10.6 billion.
- This shows the importance of the medium technology category, which includes primary agricultural commodities as well as agribusiness, as a driver of the strong growth in Brazilian exports in recent years.
- Between 2002 and 2005, Japan, France and the U.K. exported high-tech products with a higher average value than their imports. This was not the case for Germany, Italy, China, India, Indonesia, Poland, Spain or Brazil.

### Patterns of trade in technology-intensive goods for Brazil and São Paulo State

- São Paulo State makes a significant contribution to exports of products classified as technology intensive.
- While São Paulo State's exports are growing above all in categories of manufactured goods intensive in research and development, manufactures requiring specialised suppliers, and goods intensive in scale and labour, sales by other states (Brazil excluding São Paulo) are growing significantly in primary agricultural, mineral and energy products, agro-food products, and scale-intensive products.
- Thus the only overlap is in scale-intensive manufactures, largely reflecting decentralisation of the automotive industry.
- São Paulo State's share of Brazil's trade deficit in high-tech products is significant (55% and 58% in 2003 and 2007 respectively). This deficit is due above all to trade with developed countries.
- São Paulo State's trade surplus in medium-tech products jumped from US\$8.3 billion in 2003 to US\$15.7 billion in 2007.
- However, São Paulo State reported an overall merchandise trade surplus of only US\$3.4 billion in 2007. This reflected very large deficits in high-tech goods (US\$10.8 billion) and low-tech goods (US\$1.6 billion).

### Brazil & São Paulo State: Merchandise trade by type of partner & technology intensity, 2003 & 2007



Sources: MDIC. Secex.

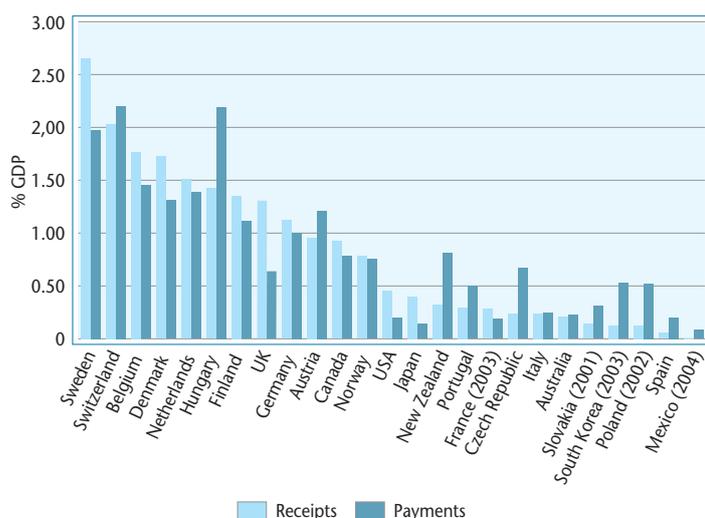
## Technology services

### International context

- Exports of technology services grew 13% per annum worldwide between 2001 and 2006 on average, while imports grew 11.7% p.a.
- With regard to economic blocs, exports and imports of technology services by the BRICs<sup>1</sup> rose 24.7% and 19.8% p.a. respectively in the same period.
- The U.S. remained the leading net exporter of disembodied technology.
- Japan has reported surpluses since the early 1990s, remaining a net exporter since then.

1 Brazil, Russia, India and China.

### Selected countries: Flows of receipts & remittances relating to technology services (% GDP), 2005



Source: OECD 2007.

### Brazil

- Professional technical services are the main item in Brazil's receipts from technology flows. Despite a fall between 2005 and 2008, this item continued to account for 67.8% of Brazilian sales of technology services in 2008 (R\$3.6 billion).

### Breakdown of Brazilian receipts from technology services by type of service, 2005-08 (in per cent)

	2005	2006	2007	2008
Professional technical services	89.33	66.34	64.99	67.76
Trademarks & patents (filings, maintenance etc.)	2.34	1.73	2.45	2.35
Software acquisition	1.71	1.64	2.23	2.39
Industrial designs, drawings & models	1.42	0.79	0.59	0.70
Equipment assembly	1.40	4.62	2.30	3.20
Technical assistance	1.29	18.42	17.88	10.60
Engineering designs, drawings & models	0.97	2.66	5.52	7.14
Copyright	0.79	1.21	0.91	1.03
Other custom assembly	0.27	0.61	0.33	0.41
Engineering project implementation & installation	0.25	1.11	1.28	1.51
Complementary services	0.13	0.49	0.65	0.90
Technology provisioning	0.05	0.17	0.13	0.74
Trademark licensing	0.02	0.12	0.44	0.49
Technical-economic project implementation & installation	0.01	0.02	0.04	0.10
Franchising	0.00	0.01	0.01	0.01
Trademark assignment	0.00	0.03	0.23	0.41
Patent licensing	0.00	0.04	0.03	0.24

Source: Central Bank of Brazil (BACEN).

- In the period 2005-08, some 60% of Brazilian payments related to technology flows were for software acquisition and professional technical services (almost US\$5 billion).

### Breakdown of Brazilian payments for technology services by type of service, 2005-08 (in per cent)

	2005	2006	2007	2008
Software acquisition	34.3	34.5	30.9	31.9
Professional technical services				
Technology provisioning	14.5	11.8	15.3	16.8
Technical assistance	6.9	6.0	6.3	6.5
Copyright	6.7	8.7	5.9	5.6
Patent licensing	4.1	3.7	3.7	2.4
Complementary services	3.9	3.4	4.3	4.6
Trademark licensing	1.5	2.2	2.5	2.0
Franchising	0.6	0.7	0.8	1.5
Equipment assembly	0.3	0.3	0.2	0.2
Trademarks & patents (filings, maintenance etc.)	0.3	0.3	0.3	0.5
Industrial designs, drawings & models	0.1	0.1	0.1	0.1
Engineering designs, drawings & models	0.1	0.1	0.3	0.3
Engineering project implementation & installation	0.1	0.1	0.0	0.1
Trademark assignment	0.0	0.0	0.1	0.0
Other custom assembly	0.0	0.0	0.0	0.0
Technical-economic project implementation & installation	0.0	0.0	0.0	0.0

Source: Central Bank of Brazil (BACEN).

- The number of technology transfer agreements registered with INPI in 2006 was 1,559. Most of these agreements (929) were classified under "technical & scientific assistance". This was the most important type of technology transfer in every year of the period 1996-2006.
- Trademark use and technology provisioning came next, with 432 registered agreements in aggregate. As for the origin of the technology involved, the U.S. and Germany were the main suppliers under the agreements registered in the period. The U.S. accounted for about 30% of the total in terms of registered agreements, and Germany for 15%.
- Brazil's deficit in technology flows cannot be considered irreversible.
- Nor can it be considered a reflection of a widening gap with developed countries, since many such countries also have large deficits.
- Brazil's deficit may be interpreted as resulting from absent or insufficient competencies. Alternatively, it may be generated by a specific segment of the economy.

1. Brazil, Russia, India and China.