



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



Challenges in Knowledge Intensive Services: The Technology Balance of Payments

João Cadete de Matos

Banco de Portugal

Head of the Statistics Department

João Miguel Coelho

Banco de Portugal

Head of the Current and Capital
Accounts Statistics Unit



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM

Institutional framework and compilation system

Technology Balance of Payments (TBP) is compiled by the Portuguese central bank (**Banco de Portugal**) in the context of the **Balance of Payments Statistics (BoP)**

The Organic Law of the Banco de Portugal (BP)

- Attributes to the BP the **responsibility** for the compilation and production of balance of payments statistics (and of **technology balance of payments**)
- Attributes to the BP the **power to require** to any public or private body the supply of **necessary information** for compliance with the provisions of the aforementioned purpose

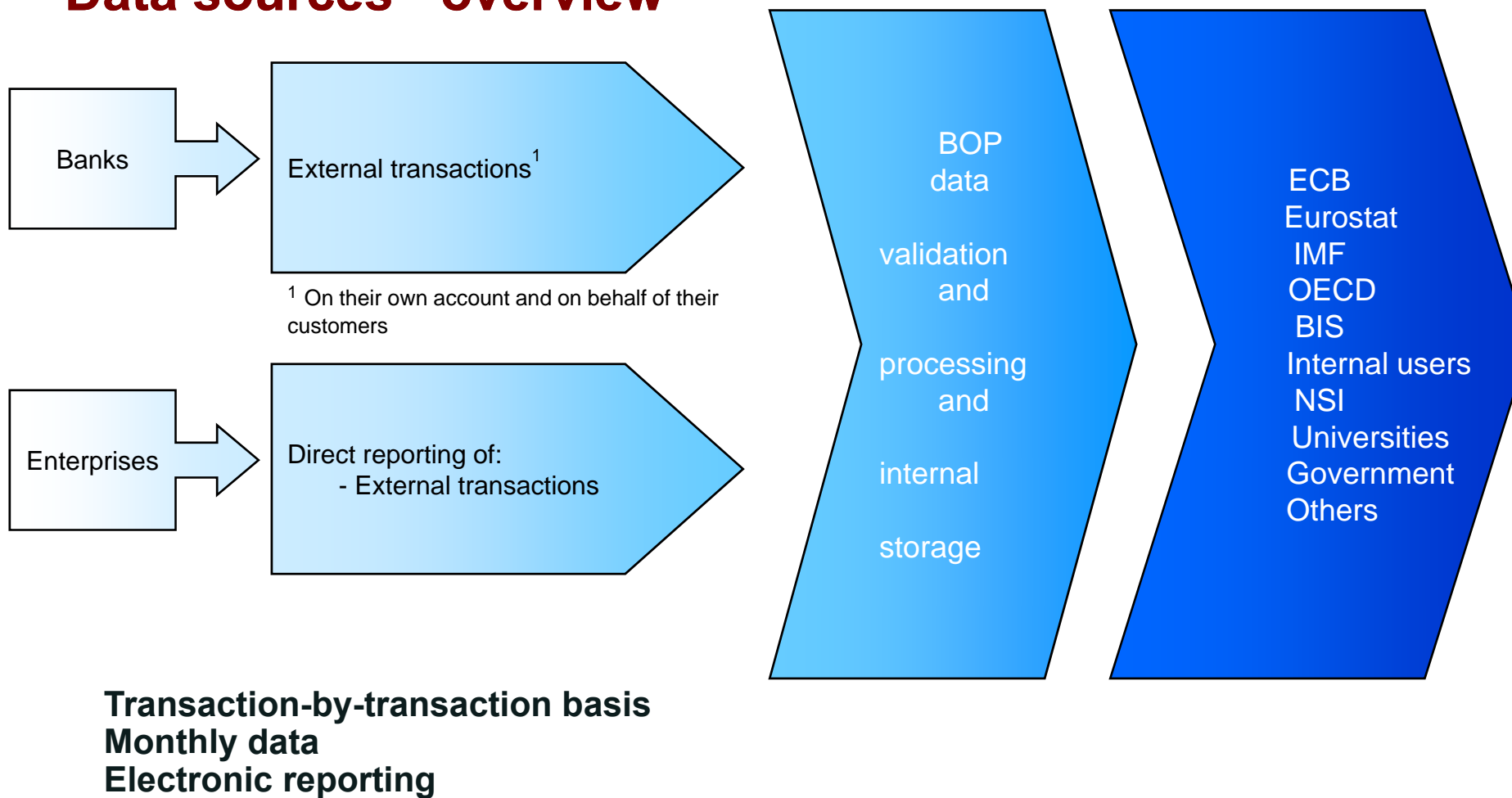
In order to comply with the main international methodological **recommendations regarding the BoP (and also TBP statistics)**, the Portuguese statistical production system has been **running, and evolving, since 1993**.



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM

Data sources - overview





DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



Definitions and standard components

International Standards

- Balance of Payments Manual, 5th edition (IMF, 1993)
- Technology Balance of Payments Manual (OECD, 1990)



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM

Definitions and standard components

The Technology Balance of Payments (TBP) is a **sub-division of the Balance of Payments statistics (BoP)**

- “The technology balance of payments registers the **commercial transactions related to international technology and know-how transfers**. It consists of money paid or received for the use of patents, licences, know-how, trademarks, patterns, designs, technical services (including technical assistance) and for industrial research and development (R&D) carried out abroad, etc. **The coverage may vary from country to country and the TBP data should be considered as only partial measures of international technology flows.** “

Glossary of statistical terms, OECD



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



Definitions and standard components

Four types of transactions (TBP)

- **Acquisition and use of royalties and license fees**
- **Technical assistance services**
- **Research and development**
- **Other technical services**

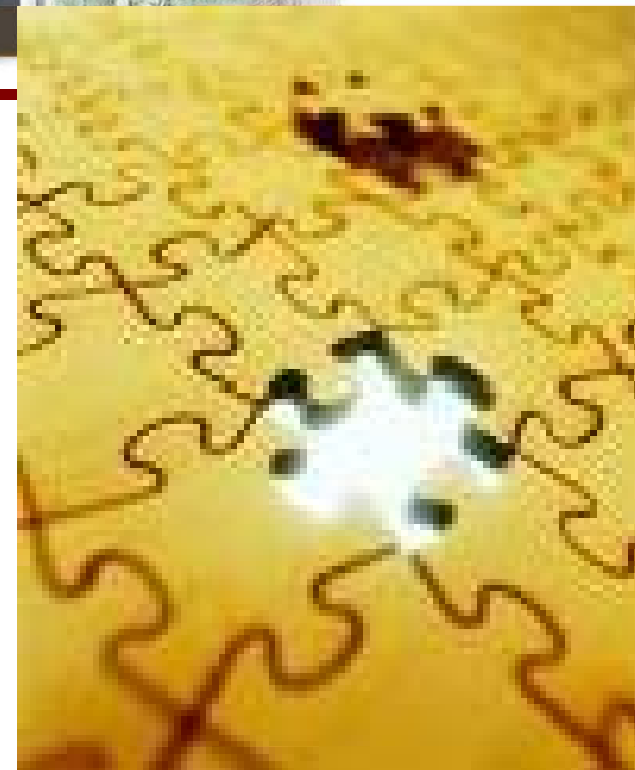


DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



The Portuguese Technology Balance of Payments





DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM

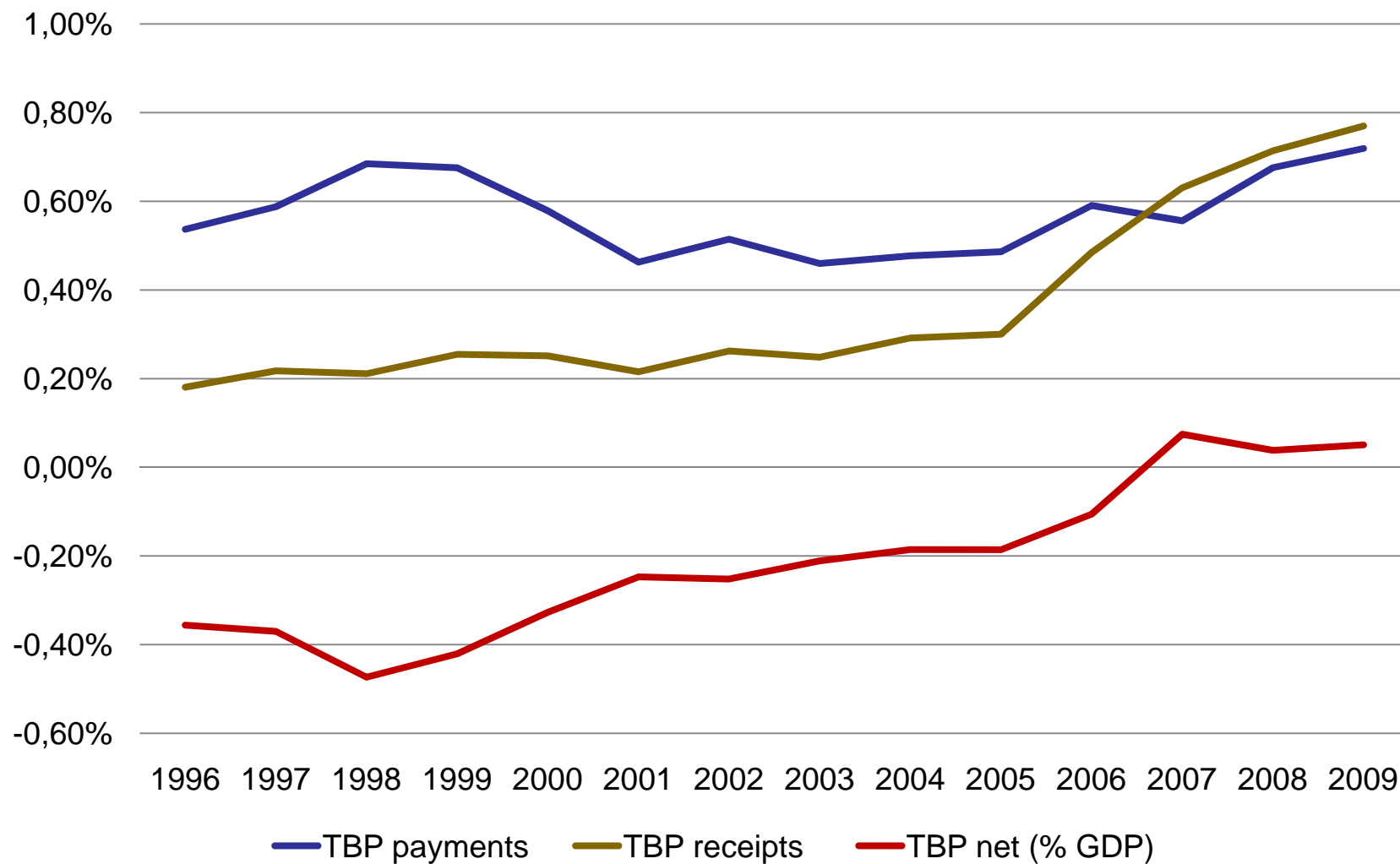
		1996	2003	2009	Annual Growth Rate (1996-2003)	Annual Growth Rate (2003-2009)
Exports	Goods- Total	19 323	29 266	31 900	6.1%	1.4%
	Services - Total	6 078	10 938	16 294	8.8%	6.9%
	Travel	3 687	5 849	6 918	6.8%	2.8%
	Transport	1 096	2 094	4 139	9.7%	12.0%
	Technology Services	147	337	1 260	12.6%	24.6%
Imports	Goods- Total	26 897	42 707	49 396	6.8%	2.5%
	Services - Total	5 002	7 302	10 311	5.6%	5.9%
	Travel	1 763	2 131	2 712	2.7%	4.1%
	Transport	1 355	2 246	3 020	7.5%	5.1%
	Technology Services	475	641	1 173	4.4%	10.6%

in Millions of Euros



DEPARTAMENTO DE ESTATÍSTICA

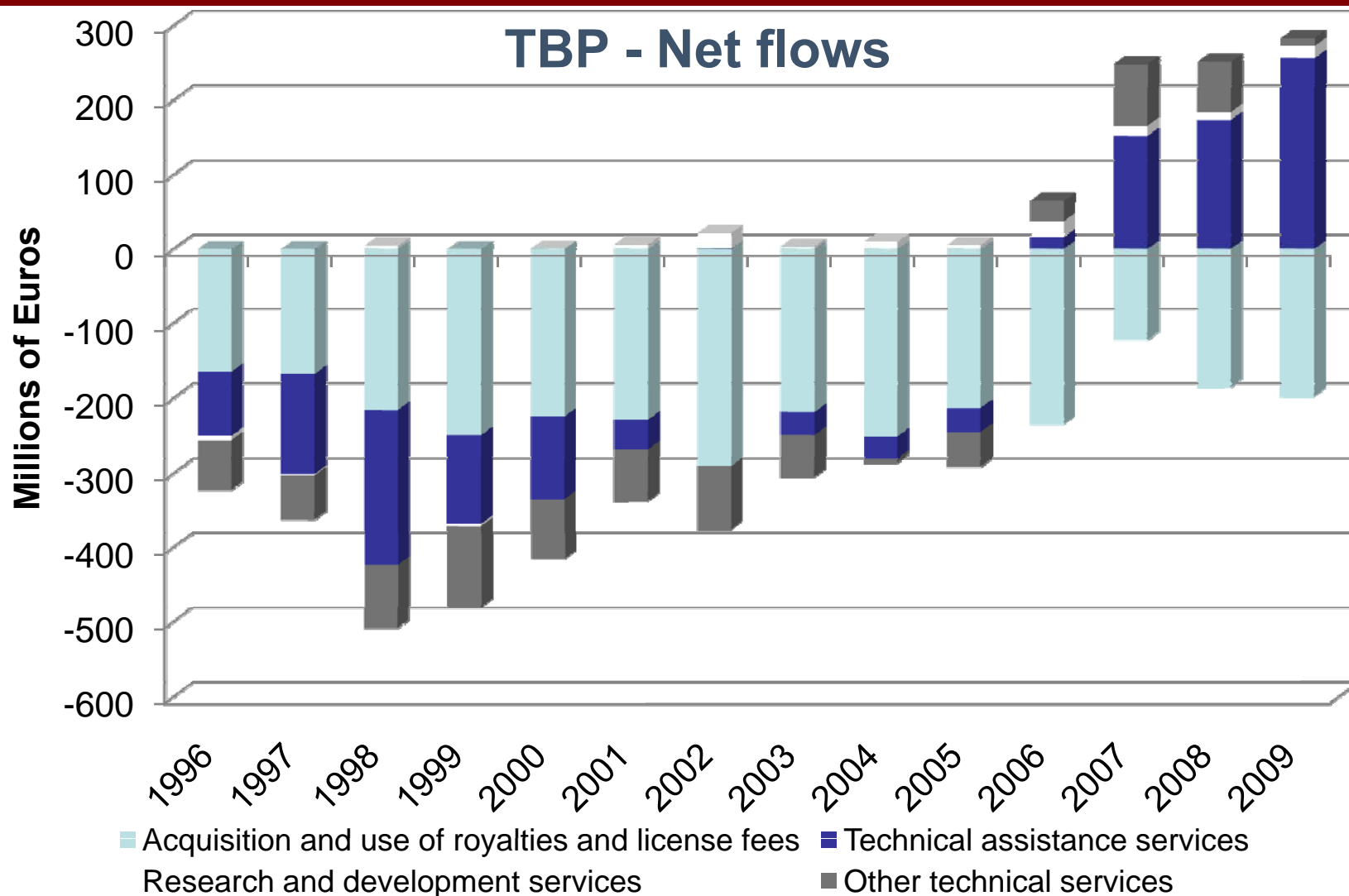
Banco de Portugal
EUROSYSTEM





DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



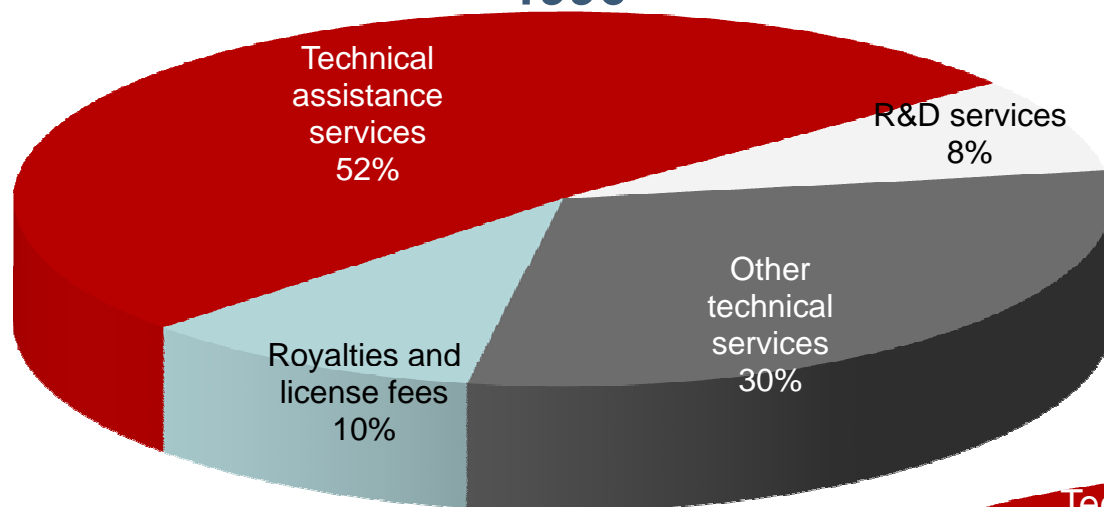


DEPARTAMENTO DE ESTATÍSTICA

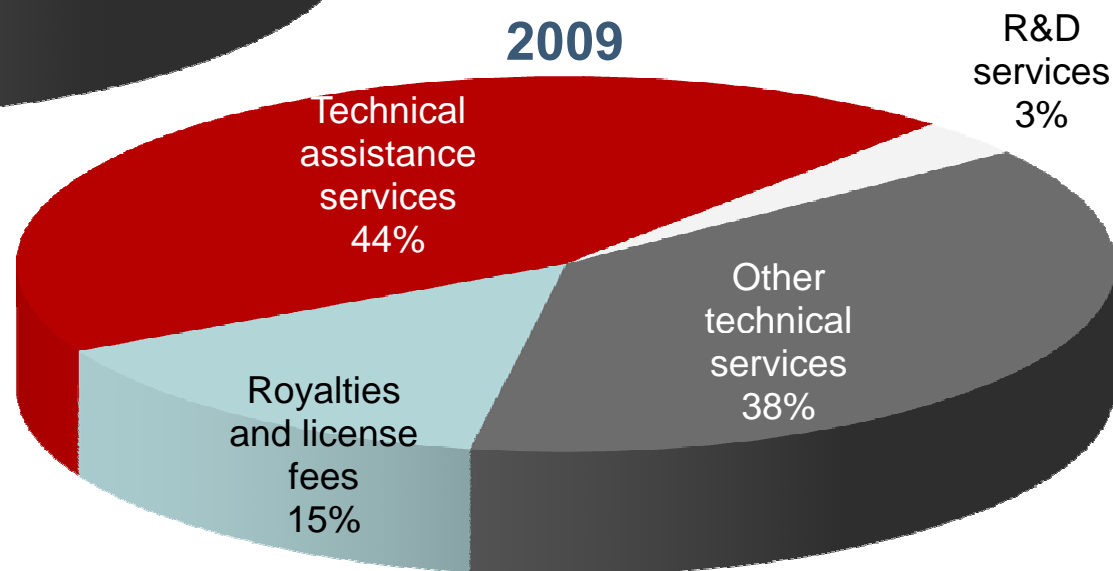
Banco de Portugal
EUROSYSTEM

Receipts

1996



2009



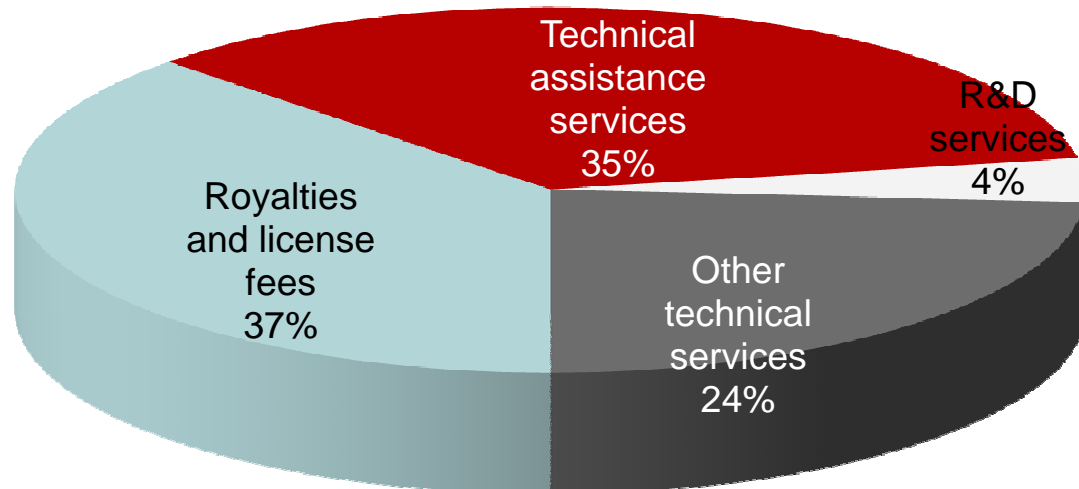


DEPARTAMENTO DE ESTATÍSTICA

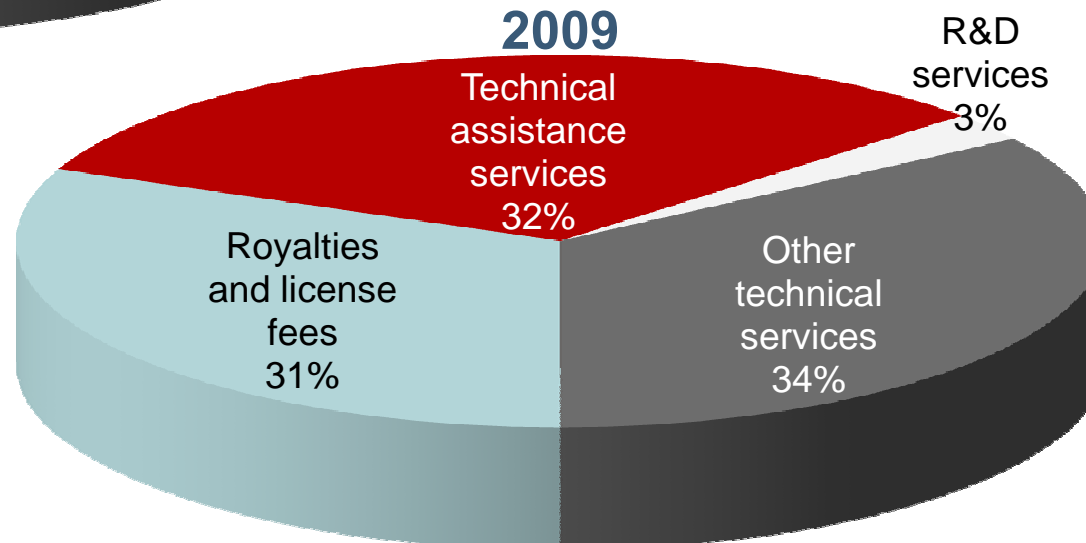
Banco de Portugal
EUROSYSTEM

Payments

1996



2009

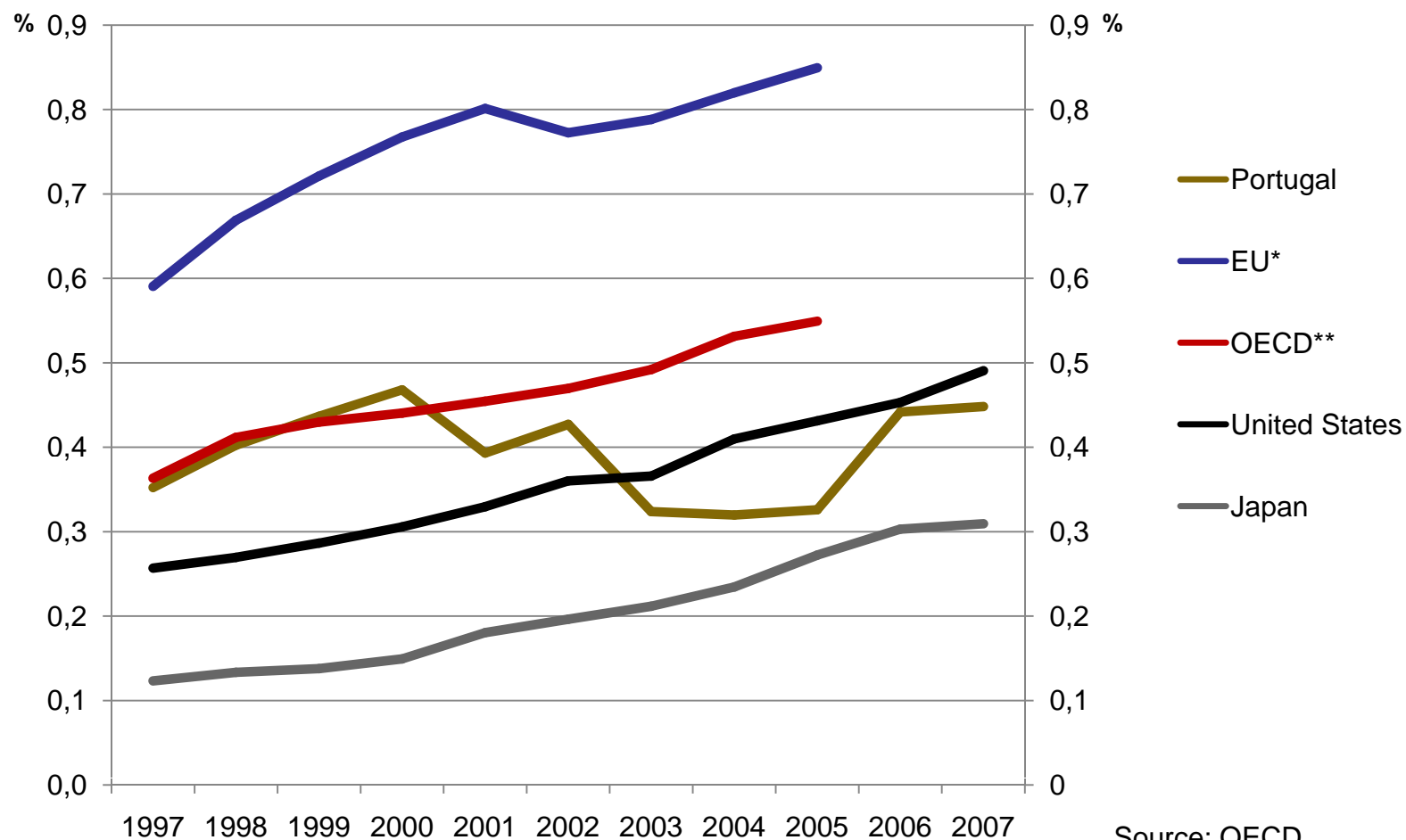




DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM

Average TBP flows (as a % of GDP)

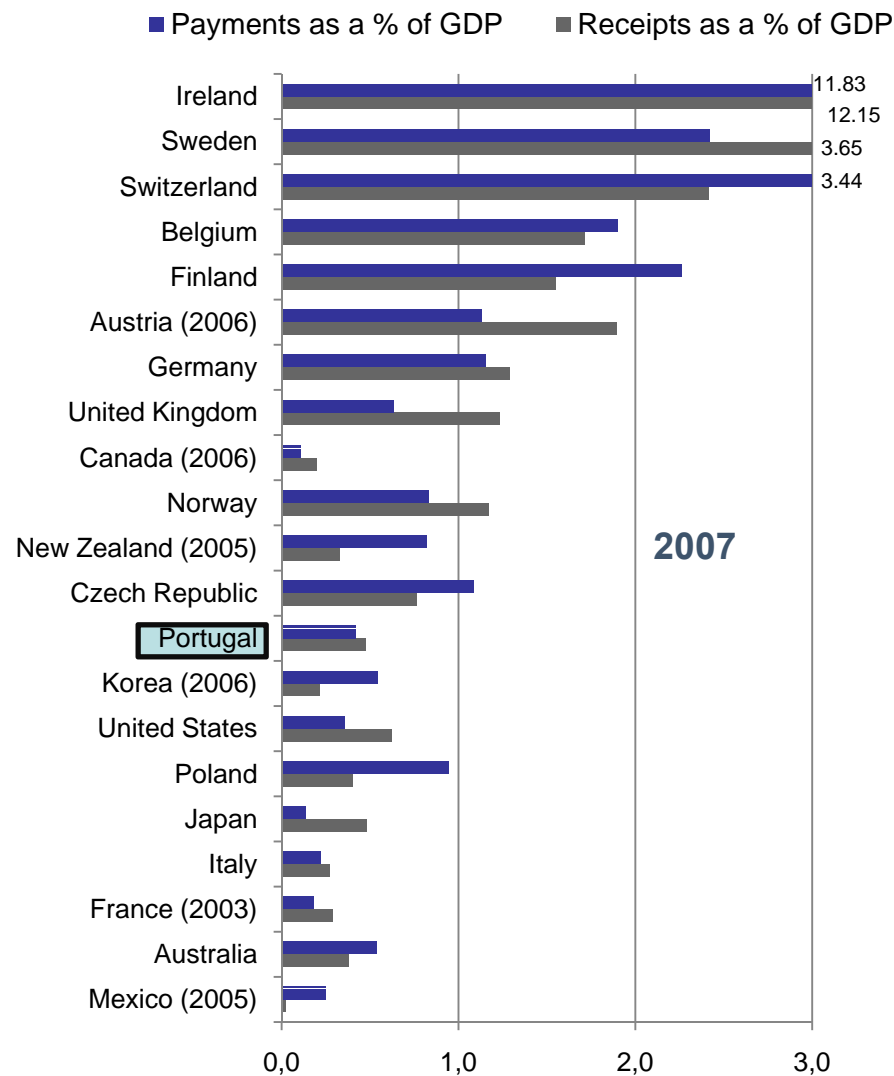
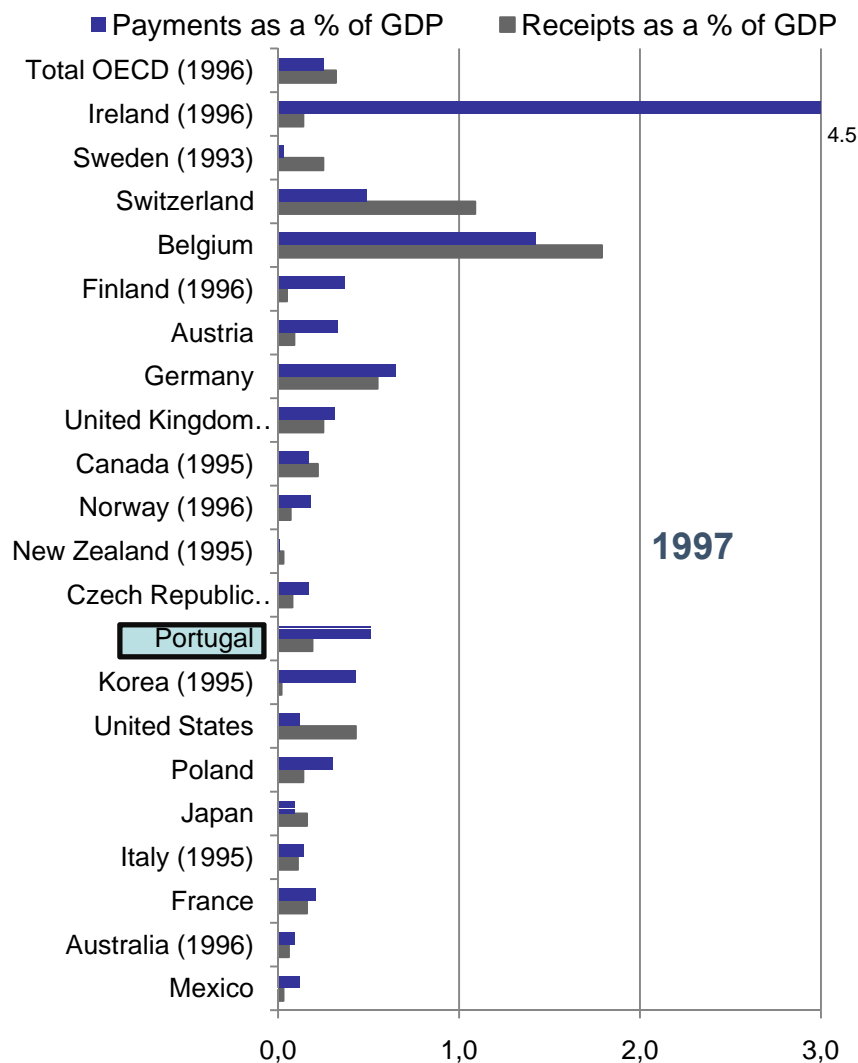


Source: OECD



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



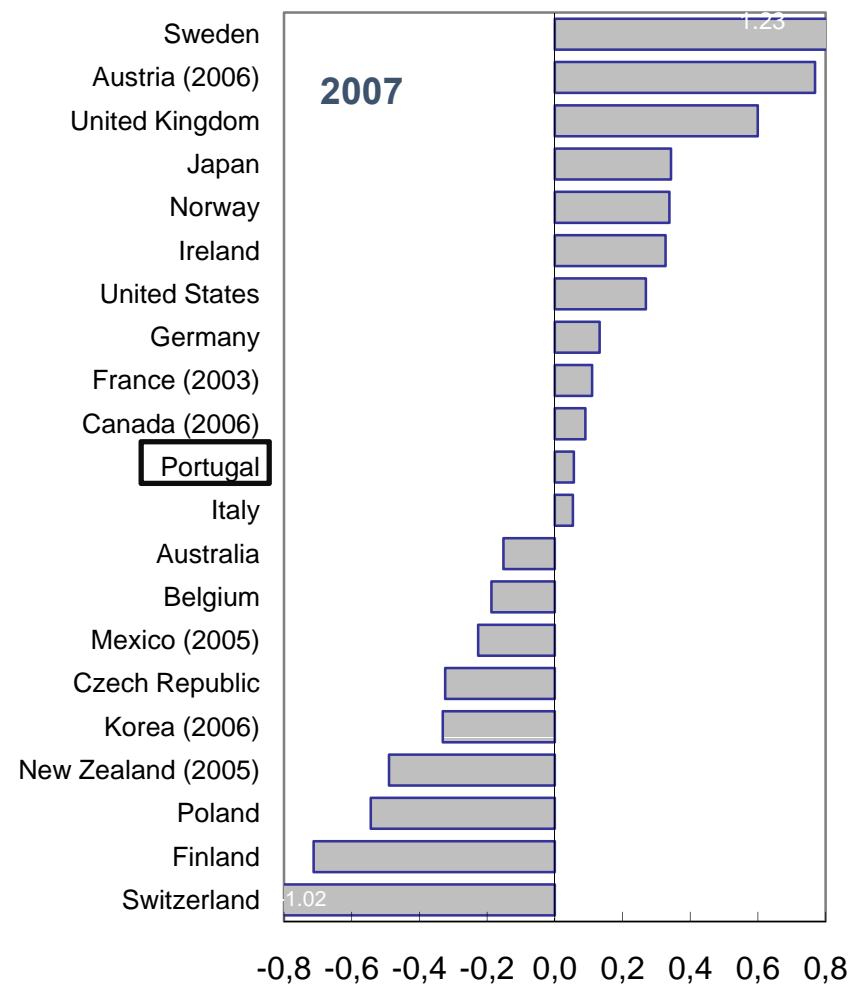
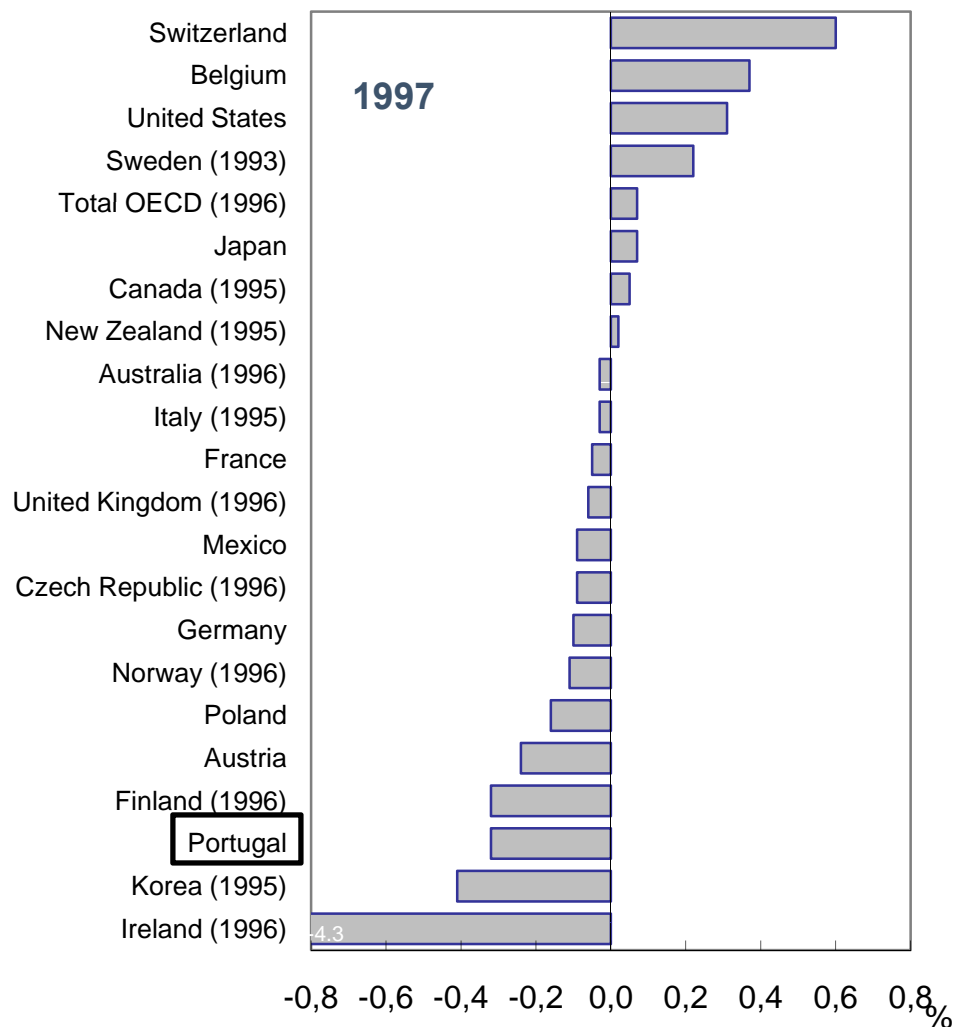
Source: OECD



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM

Net flows as a % of GDP

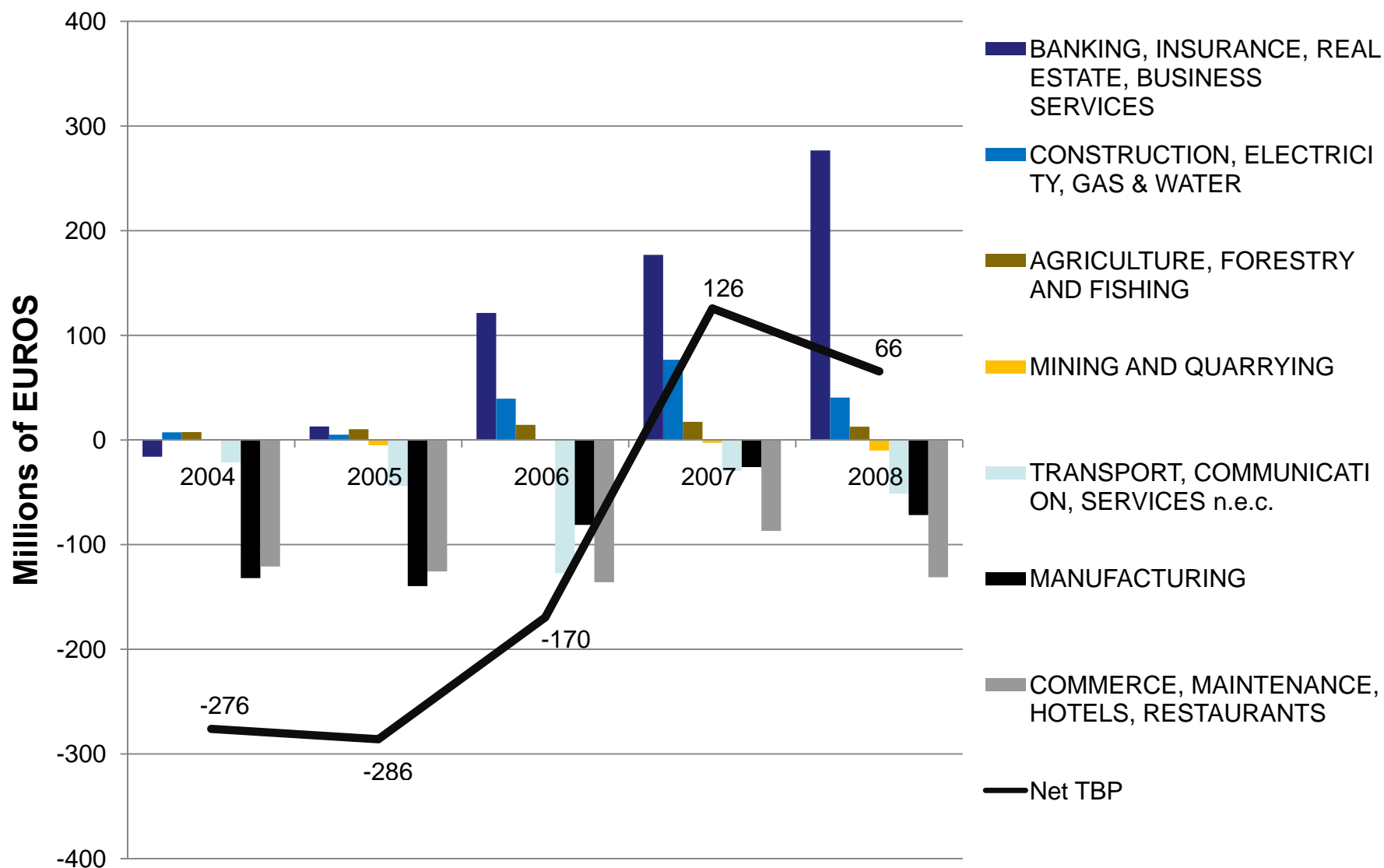


Source: OECD



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM

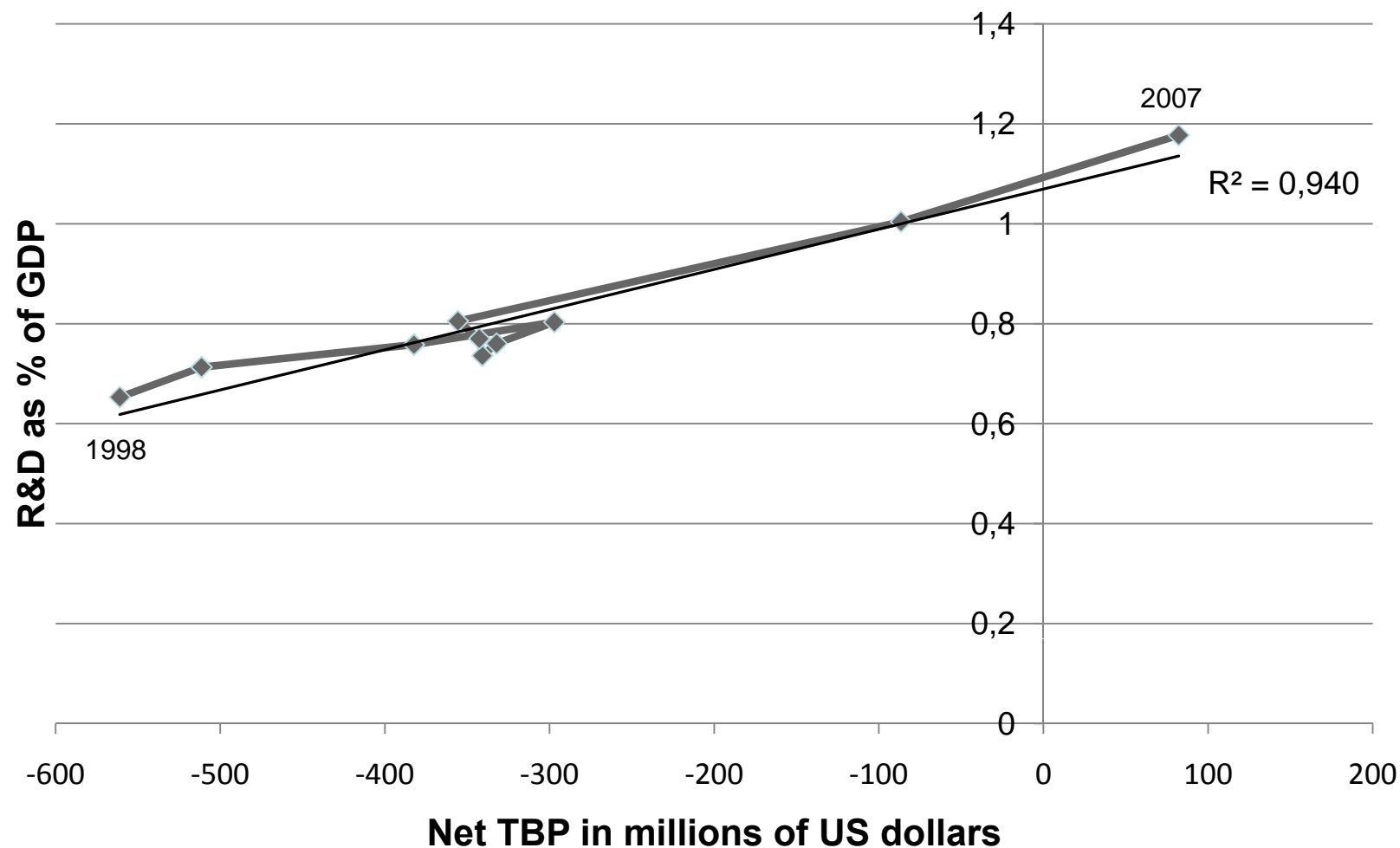




DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM

Portugal

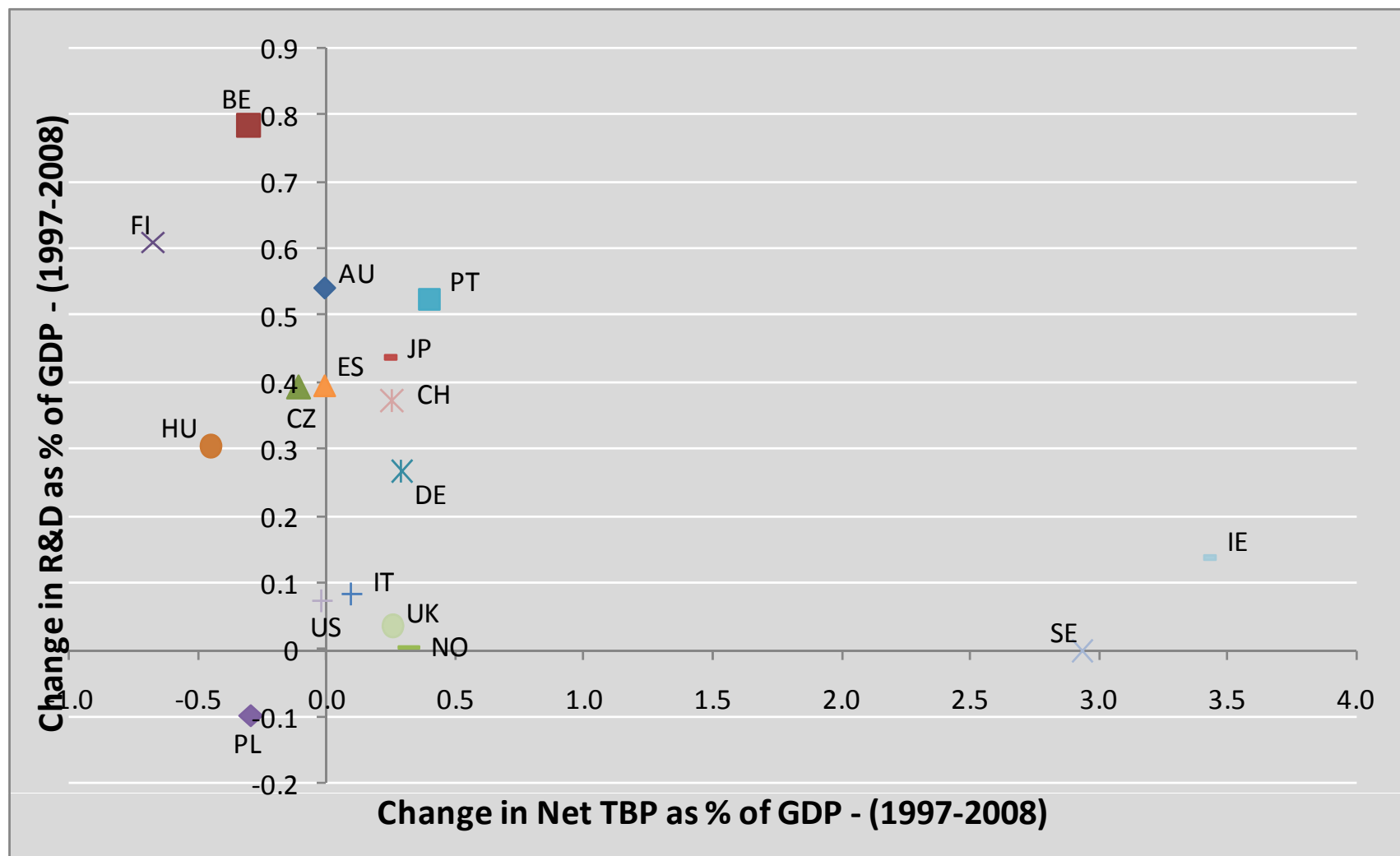


Source: OECD



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



Source: OECD



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM

ANNEX



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



Definitions and standard components

Acquisition and use of royalties and license fees

Royalties and license fees cover the exchange of payments and receipts between residents and non-residents for the **authorized use of intangible, non-produced, non-financial assets and proprietary rights** (such as **patents, copyrights, trademarks, industrial processes, franchises**, etc.) and with the use, through licensing agreements, of **produced originals or prototypes.**”

Transactions involving **non-industrial intellectual property** (films, recordings, copyright materials) have to be **excluded** from the TBP. Similarly, **software trade should be excluded**, except where the software is protected as part of a patented process.



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



Definitions and standard components

Technical assistance services

Includes services that call for the supplier to make use of technical skills and help the user to carry out a productive activity. Preliminary technical studies and engineering work required for the design and preparation of industrial projects, including product definition, process and plant specification, general design and detailed drawings for the installation.

Architectural design of urban and other development projects(with engineering content); planning and project design and supervision of dams, bridges, airports, turnkey projects, etc.;
surveying, cartography, product testing and certification and technical inspection services.



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



Definitions and standard components

Research and development

Research and development services cover those services that are associated with **basic research, applied research and experimental development** of new products and processes.

In principle, such activities in the **sciences, social sciences and humanities are covered**; included is the development of operating systems that represent technological advances.

(cont.)



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



Definitions and standard components

Research and development

(cont.)

Only the industrial and technological R&D must be included in the TBP.
The financial flows relating to R&D may also be of two kinds:

- Funds provided by **multinational firms to finance R&D performed by their affiliates, as well as funds which affiliates remit to their parent companies** as an “entry fee” or advance payment for a subsequent transfer of technology;
- Financial flows between **related and unrelated firms which have agreed to conduct joint R&D** either in existing research facilities or in a subsidiary company they have set up together for that purpose.



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



Definitions and standard components

Other technical services

- Computer and information services cover computer data and news-related service. Included are: data bases, such as development, storage, and on-line time series; data processing – including tabulation, provision of processing services on a time-share or specific (hourly) basis, and management of facilities of others on a continuing basis; hardware consultancy; software implementation – including design, maintenance and repair of computers and peripheral equipment
- Includes only software programmes protected by industrial property that allow a genuine transfer of technology to take place.

(cont)



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



Definitions and standard components

Other technical services

(cont)

Includes general **technical assistance for industrial operation and maintenance**, including staff training, secondment of technicians, consultancy services and assistance for quality control and trouble-shooting.

Major civil engineering contracts, **mineral and petroleum prospecting, contract work and repair activities** should be excluded.



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



Definitions and standard components

Limitations

The first limitation is with **transfers of technology without a specific financial counterpart** (intra-firm transfers within multinational enterprises or cross-licencing)

The second concerns the “total price” paid for technology by the recipient bearing other forms of payment (charges for ancillary goods and services) in mind as well as the direct cost (e.g. royalties)

The third limitation is in the **distortion produced by different national tax systems, tax havens and exchange controls**. They all produce discrepancies between financial flows declared as technology transactions and actual transfers of technology.



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM

Definitions and standard components

Interpreting the data

A precondition for using TBP as science and technology (S&T) indicator **is that each country has to clarify what the balance includes.** The items of the TBP must be defined as clearly as possible.

Interpretation of the TBP will typically involve analysing its internal structure by type of transaction, by branch of industry and so on.

As S&T indicator, TBP data first need to **be supplemented by considering other international data,** for instance, on trade in goods with a high technology content, filling of international patents and the activity of multinationals, all of which are essential in assessing the **technological competitiveness of economies**



DEPARTAMENTO DE ESTATÍSTICA

Banco de Portugal
EUROSYSTEM



Definitions and standard components

Interpreting the data (cont)

TBP data **serve a dual purpose**, providing both a record of the **international financial flows associated with the circulation of technology** and a partial indication of S&T output

Given the **variety of ways in which technology can circulate internationally**, the TBP is not on its own a sufficient indicator of technology diffusion.

Due to possible asymmetries of TBP expenditures and receipts, **balances (or net figures) should not be used precipitately, or exclusively.**