

## II. READINESS FACTORS: INPUTS TO THE SPACE ECONOMY

### 1. Governmental budgets for space activities

National and other institutional budgets often contribute to the start-up and development of capital-intensive and high technology sectors such as space. This section provides details on two aspects of government budgets dedicated to space activities: 1) Civilian space programmes as presented annually in Government Budget Appropriations or Outlays for Research and Development (GBAORD); and 2) Public institutional space budgets, covering both civilian and military budgets.

#### Civilian space programmes in Government Budget Appropriations or Outlays for R&D (GBAORD)

Since the beginning of the space age, government support for research and development (R&D) in the space sector has been crucial for developing civilian systems and applications. An analysis of GBAORD trends shows that civil space-related R&D budgets of many countries have peaked in the early to mid-1990s then decreased or stagnated, except for the Russian Federation (Figure 1.1). This trend may not translate into less funding. In fact, as more government support has been devoted to overall R&D in the OECD area over the years (i.e. the total GBAORD for OECD countries has more than doubled since 1996), the share dedicated to space R&D has generally benefitted from extra funding. The OECD total for civil space-related R&D budgets was USD 18.355 billion in 2009 (in current USD PPP), with a few large countries dominating the total (Figure 1.2). G7 countries dominated many of the top positions, with the United States leading with a budget of USD 10.8 billion. Other countries with relatively high space R&D expenditures include the Russian Federation, Japan, France, Germany and Italy. In addition, many countries have developed dual-use and military space programme, which may fall in defence R&D budgets.

#### Methodological notes

GBAORD data are assembled by national authorities analysing their budget for R&D content and classifying these outlays by “socio-economic objective” on the basis of NABS 2007 (Nomenclature for the analysis and comparison of scientific programmes and budgets) (OECD, 2002). GBAORD data have the advantage of being timely and reflecting current government priorities. However, the data refer to budget provisions, not to actual expenditures, and the breakdown in socio-economic objectives brings some limitations (i.e. the “exploration and exploitation of space” category excludes military space programmes, which are included in a specific “defence” category). GBAORD data can provide trends, which can be usefully complemented by other data (e.g. institutional budgets). Current USD PPP have been used to make budgets comparable.

#### Source

OECD (2010), *Main Science and Technology Indicators Database*, [www.oecd.org/sti/msti](http://www.oecd.org/sti/msti).

#### Further reading

OECD (2002), *Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development*, OECD Publishing, Paris.

#### Note

1.1 and 1.2: Non-OECD country.

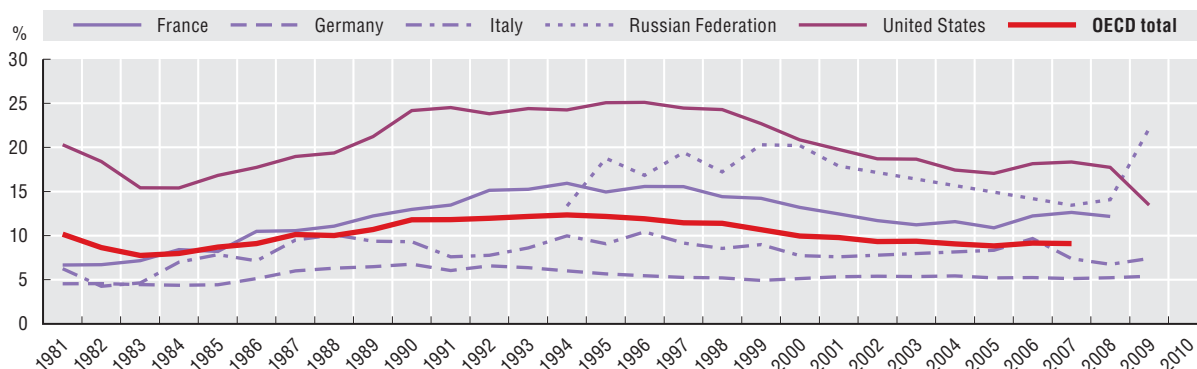
Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.

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#### 1.1 Civil space programmes as a percentage of civil GBAORD for selected countries

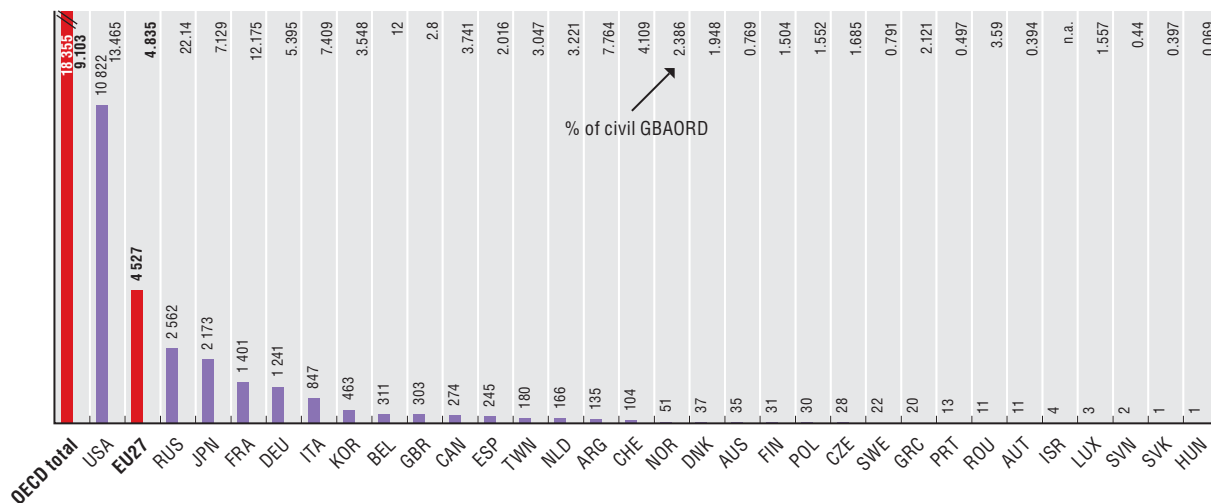
1981 to 2010 (or latest available year)



StatLink <http://dx.doi.org/10.1787/888932400247>

#### 1.2 Civil space budget in Government Budget Appropriations or Outlays for R&D (GBAORD)

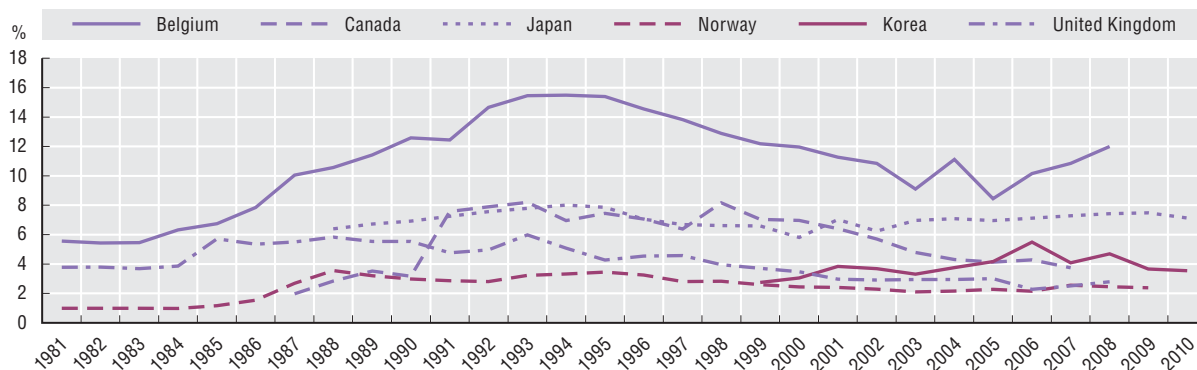
Current USD PPP million and as % of civil GBAORD, 2010 or latest year available



StatLink <http://dx.doi.org/10.1787/888932400266>

#### 1.3 Civil space programmes as a percentage of civil GBAORD for selected countries

1981 to 2010 (or latest available year)



StatLink <http://dx.doi.org/10.1787/888932400247>

## II. READINESS FACTORS: INPUTS TO THE SPACE ECONOMY

### 1. Governmental budgets for space activities

#### National budgets for space

Since the first publication of *The Space Economy at a Glance* in 2007, the number of OECD and non-OECD countries with space programmes has continued to rise, as well as the governmental space budgets dedicated to military and civilian applications. The G7 countries still represent the bulk of institutional investments in space with some USD 53 billion in 2009, followed by the very active BRIC countries, with USD 9.6 billion (Figure 1.5). The total space budget of the 35 countries examined represents conservatively some USD 64.4 billion in 2009, and an estimated USD 65.3 billion in 2010 (see Section 1). Based on preliminary analysis, a number of countries have reduced their space budgets in 2010 because of budgetary measures (e.g. Greece, Spain), while others are investing more as part of their innovation and R&D strategies (e.g. France, Germany, India, the United States). Reduction or more modest increases are however expected in 2011 in most OECD and non-OECD countries, as the impacts of the economic crisis are reflected in governments' expenditures. Five countries have invested more than USD 2 billion in both 2009 and 2010 (the United States, China, Japan, France and the Russian Federation), with the United States leading the way at more than USD 43 billion. The European Space Agency had a budget of 3.59 billion in 2009 (EUR 3.74 billion in 2010) (Table 1.4). Finally, the European Union contributes about EUR 700 million annually to space activities, under its current 2007-13 financial plan. These funds, allocated to the general European Union budget by member states, are primarily dedicated to the Galileo satellite navigation programme and to the Global Monitoring for Environment and Security (GMES) programme. The trend in rising budgets translates in some cases in larger share of space investments in GDP (Figure 1.6). However, the evolutions in the space budget's share in GDP between 2005 and 2009 may be affected by both an increase/decrease of space budgets (e.g. the Russian Federation has tripled its space budget since 2003), but also by changes in GDP itself (e.g. India's GDP has grown on average 8.4% annually since 2004). Overall, space represents a very small share of GDP in the cases of both BRIC and G7 countries (between 0.001% and 0.002% of total GDP).

#### Methodological notes

Estimates were done using institutional sources for budget information and provide orders of magnitude, which may still underestimate the amounts devoted to space programmes worldwide, especially as fiscal years may be different from country to country. Looking at public budgets dedicated to space activities poses several methodological challenges. When they are available publicly, budgets may not necessarily match current expenditures. In addition, published budgets may not reveal large confidential segments of space programmes (e.g. for military purposes) and/or may be classified under other areas of government expenditure. The risk of double counting exists too, as a number of governments provide direct and indirect funding to space-related international organisations. Chinese figures are estimates based on recent investments and not official data. All values are converted in current USD and/or PPP using OECD databases for the currency exchange rates (national units per USD, monthly average) and World Bank databases for the GDP data.

#### Sources

- European Space Agency (ESA) (2010), *Annual Report*, [www.esa.int](http://www.esa.int).
- OECD (2010), *National Accounts at a Glance 2010*, [www.oecd.org/statistics/nationalaccounts/ata glance](http://www.oecd.org/statistics/nationalaccounts/ata glance).
- World Bank (2010), *World Development Indicators Database*, <http://data.worldbank.org>.

#### Further reading

- OECD (2007), *The Space Economy at a Glance 2007*, OECD Publishing, Paris.
- OECD (2009), *Measuring Government Activity*, OECD Publishing, Paris.

#### Notes

- 1.5: Chinese data based on estimates.
- 1.6: Non-OECD countries. Chinese data based on estimates.
- Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.

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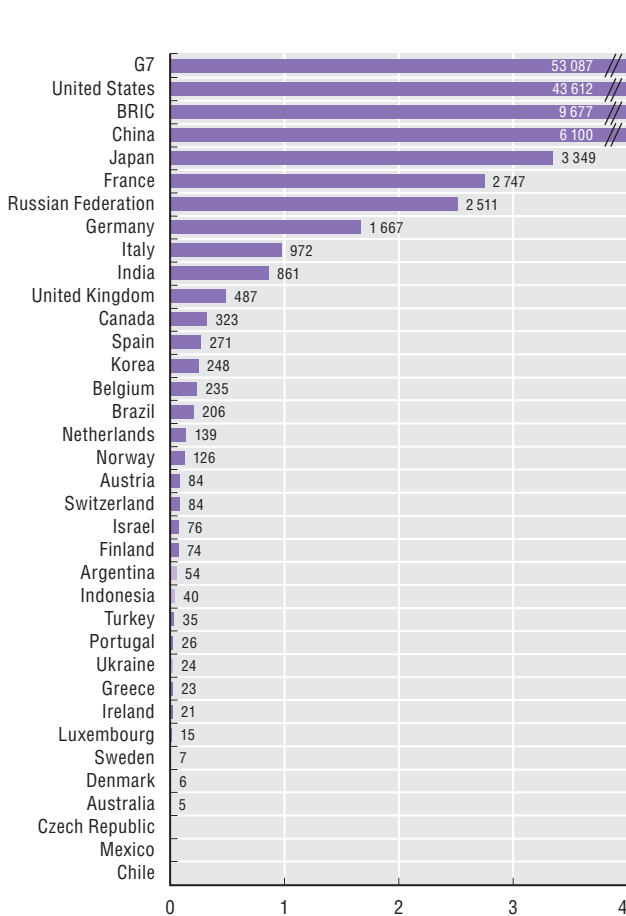
#### 1.4 European Space Agency Budget, 2010

	EUR million	%		EUR million	%
France	681.4	18.2	Finland	18.8	0.5
Germany	625.8	16.7	Canada	20.8	0.6
Italy	370	9.9	Ireland	15.1	0.4
United Kingdom	254.7	6.8	Portugal	18.8	0.5
Belgium	160	4.3	Luxembourg	10.9	0.3
Spain	195.2	5.2	Greece	16.2	0.4
Netherlands	95.2	2.5	Czech Republic	10.2	0.3
Switzerland	91	2.4	Co-operating states	5.2	0.1
Sweden	53	1.4	European Union	754.8	20.2
Austria	50.6	1.4	Other	206.1	5.5
Denmark	30.7	0.8			
Norway	60.2	1.6	<b>Total</b>	<b>3 744.7</b>	<b>100</b>

Source: ESA (2010).

#### 1.5 Space budgets of selected OECD and non-OECD countries, 2009

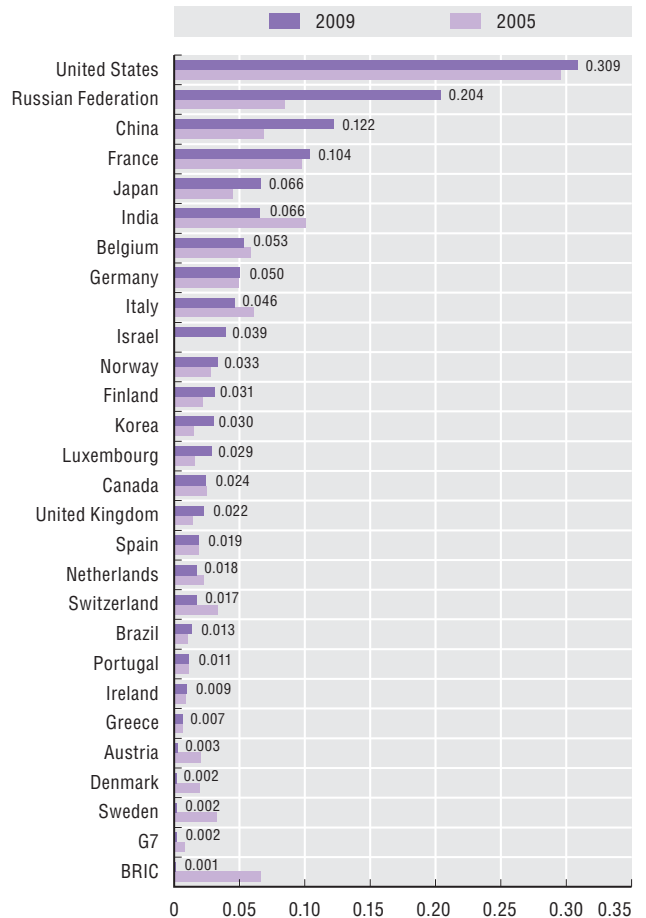
Current USD million



Source: OECD (2010) and World Bank (2010).

#### 1.6 Space budgets of selected OECD and non-OECD countries as a share of GDP, 2005 and 2009

Percentage



Source: OECD (2010) and World Bank (2010).

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