

Statistics on Research and Innovation

Update 2015



CONTENTS

Foreword.....	4
5. Policy and financial measures for science and technology	5
<i>Figure 5.1 - EU FP7 funding to R&S in some OECD countries, 2008-2012</i>	<i>6</i>
<i>Figure 5.2 -EU structural funds for research, technology, development, innovation allocated to some EU countries, 2007-2013</i>	<i>7</i>
<i>Figure 5.3 - Sectoral distribution of the number of venture capital investment in high-tech industries in Italy, 2013.....</i>	<i>8</i>
<i>Figure 5.4 - Venture capital investment in high-tech industries on total investment in high-tech industries in Italy, 2006-2013.....</i>	<i>9</i>
<i>Figure 5.5 - Venture capital investment in some OECD and non-OECD countries, 2012.....</i>	<i>10</i>
<i>Figure 5.6 - Venture capital investment on GDP by stage of development in some OECD countries, 2012</i>	<i>11</i>
6. R&D personnel in Italy	12
2 <i>Table 6.1 - R&D personnel in Italy, 2007-2012</i>	<i>13</i>
<i>Figure 6.1 - R&D personnel by institutional sector in Italy, 2000-2012.....</i>	<i>14</i>
<i>Figure 6.2 - Researchers in some OECD and non-OECD countries, 2012</i>	<i>15</i>
<i>Figure 6.3 - Researchers by sector of performance in some OECD and non-OECD countries, 2011.....</i>	<i>16</i>
<i>Figure 6.4 - Researchers per 1000 employees in some OECD and non-OECD countries, 2012</i>	<i>17</i>
<i>Figure 6.5 - Human resources in science and technology on total employment in some OECD and non-OECD countries, 2011</i>	<i>18</i>
7. Patents.....	19
<i>Figure 7.1 - Triadic patents filed (EPO, JPO) and granted (USPTO) in some OECD and non-OECD countries, 2012</i>	<i>20</i>
<i>Figure 7.2 - Patent grants with the Patent Cooperation Treaty (PCT) in some OECD and non-OECD countries, 2013</i>	<i>21</i>
<i>Figure 7.3 - High-tech patent applications to the EPO in some OECD countries, 2011.....</i>	<i>22</i>
<i>Figure 7.4 - Patents, trademarks and industrial designs filed at EC Offices in some OECD and non-OECD countries, 2010-2012</i>	<i>23</i>
<i>Figure 7.5 - Top two technologies patented by technology fields on total patent applications in some OECD and non-OECD countries, 2009-2011.....</i>	<i>24</i>
<i>Figure 7.6 - Patents citing non-patent literature by technology field in some OECD and non-OECD countries, 2007-2012</i>	<i>25</i>

8. Publications.....	26
<i>Figure 8.1 - Scientific publications by Italian authors in the most important international journals, 2000-2011</i>	<i>27</i>
<i>Figure 8.2 - Scientific publications by Italian authors in several disciplines on the Italian total, 2011</i>	<i>28</i>
<i>Figure 8.3 - Scientific publications by Italian authors in several disciplines on the world total of each discipline, 2011</i>	<i>29</i>
<i>Figure 8.4 - Scientific articles by authors of some OECD and non-OECD countries on the world total, 2011</i>	<i>30</i>
<i>Figure 8.5 - Top cited publications in international collaboration as a percentage of scientific publications in some OECD and non-OECD countries, 2003-2011.....</i>	<i>31</i>
<i>Table 8.1 - International collaboration on S&E articles by authors of some OECD and non-OECD countries, 2012</i>	<i>32</i>
9. International trade of technology	33
<i>Figure 9.1 - TBP payments and receipts in some OECD countries, 2012.....</i>	<i>34</i>
<i>Figure 9.2 - TBP payments over R&D expenditure in some OECD countries, 2012.....</i>	<i>35</i>
<i>Figure 9.3 - Trade by groups of Italian high-tech products, 2009 and 2012</i>	<i>36</i>
<i>Figure 9.4 - Italian export market shares over total OECD exports in some high-tech manufacturing sectors, 2005-2013.....</i>	<i>37</i>
<i>Figure 9.5 - Trade of high-tech goods in some OECD countries, 2011.....</i>	<i>38</i>

English edition

Statistics on Research and Innovation - 2015

FOREWORD

The National Research Council (CNR) continues updating the publication “Statistics on Research and Innovation – ITALY” that has been edited by the Institute of research on firms and development (CERIS), 2010.

The publication can be considered a work in progress, which presents selected data, as soon as they are available, as well as tables and figures with new indicators on science, technology and innovation.

4

For a long time the Rome research unit of the Research Institute of Sustainable Economic Growth-IRCRES (former CERIS) has been carrying out an activity of documentation and elaboration of indicators and data concerning the sector of science and technology. Anna Maria Scarda (IRCRES-CNR associate) handled the selection and construction of the most relevant indicators, with the contribution of Mario De Marchi and the technical assistance of Enrico Viarisio of the Turin headquarter of IRCRES, who cooperates in collecting and elaborating the data and in drawing up graphs and tables.

For enquiries about the publication, please contact:

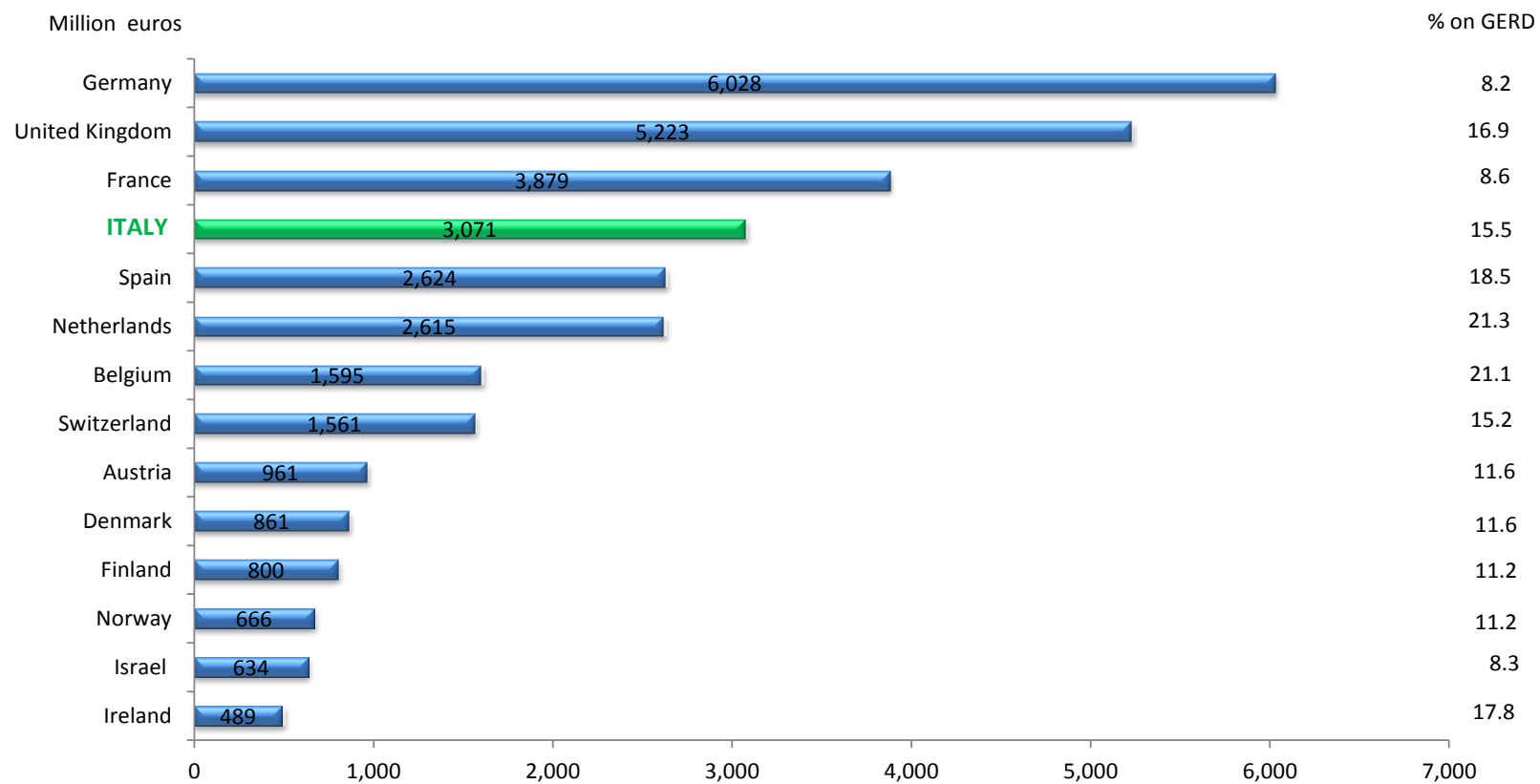
Anna Maria Scarda (annamaria.scarda@ircres.cnr.it),

Mario De Marchi (mario.demarchi@ircres.cnr.it),

Enrico Viarisio (enrico.viarisio@ircres.cnr.it).

5. POLICY AND FINANCIAL MEASURES FOR SCIENCE AND TECHNOLOGY

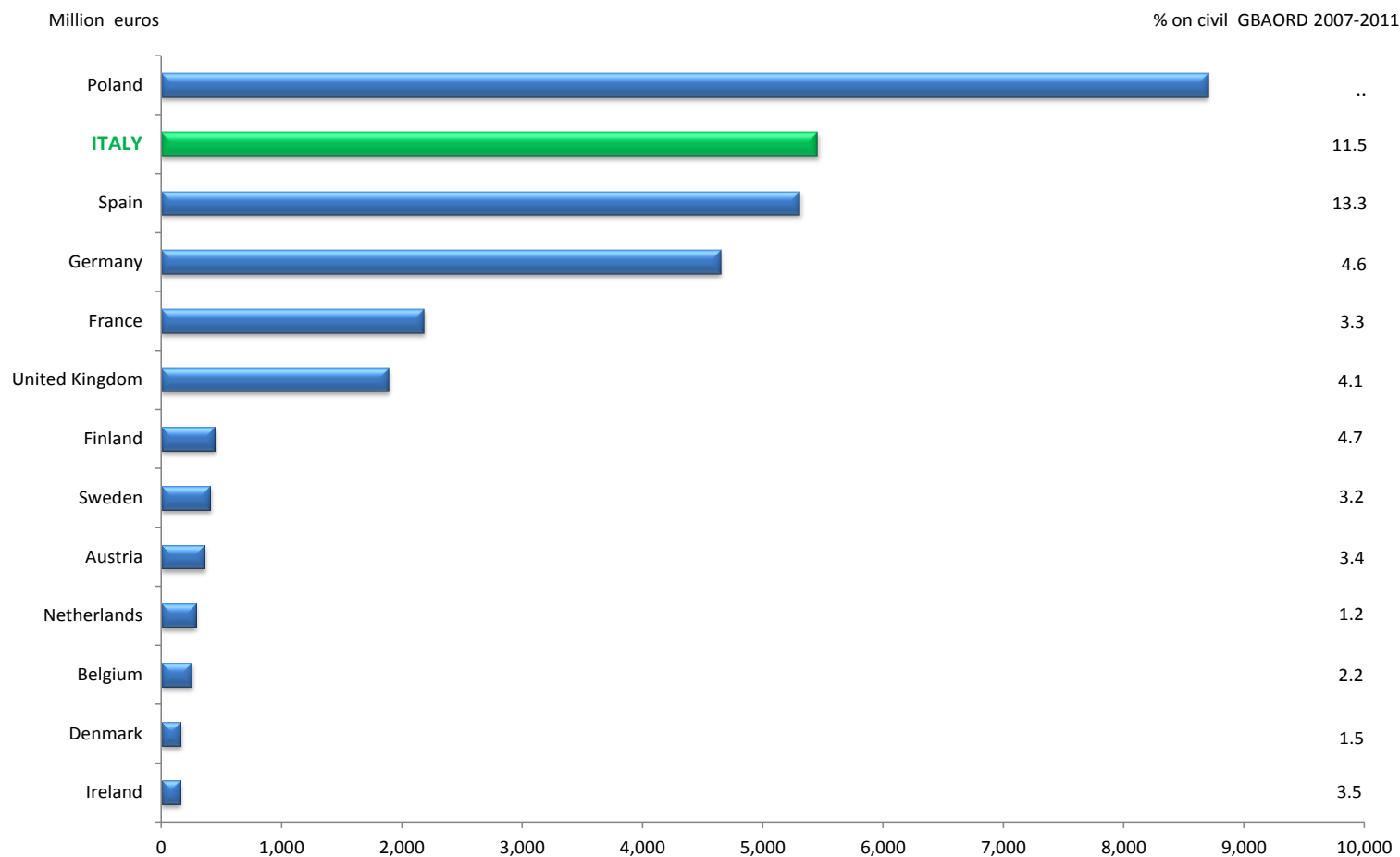
Figure 5.1 - EU FP7 funding to R&S in some OECD countries, 2008-2012



Note: Financial contribution refers to retained proposals

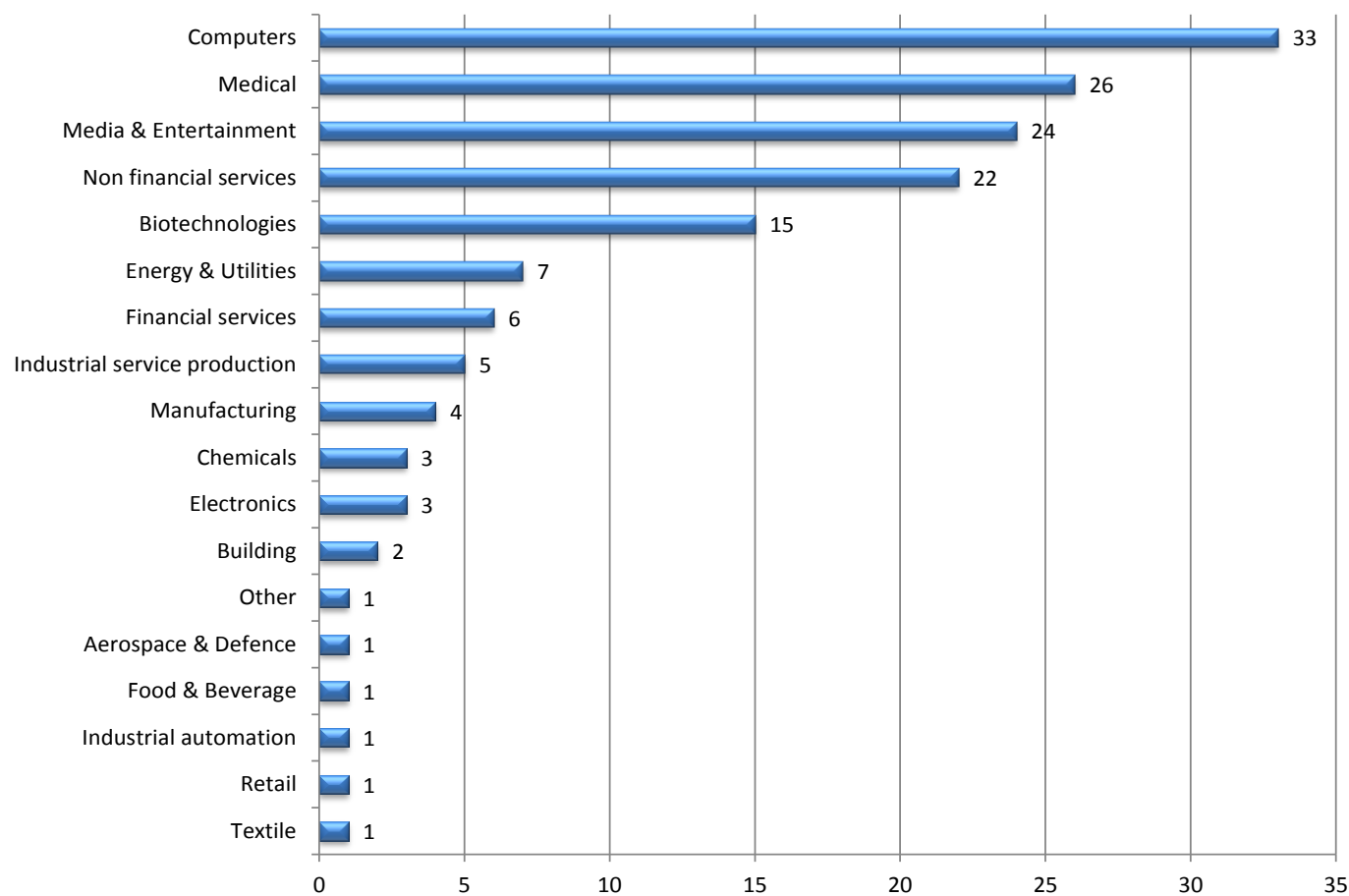
Source: European Commission, Innovation Union Competitiveness Report 2013

Figure 5.2 -EU structural funds for research, technology, development, innovation allocated to some EU countries, 2007-2013



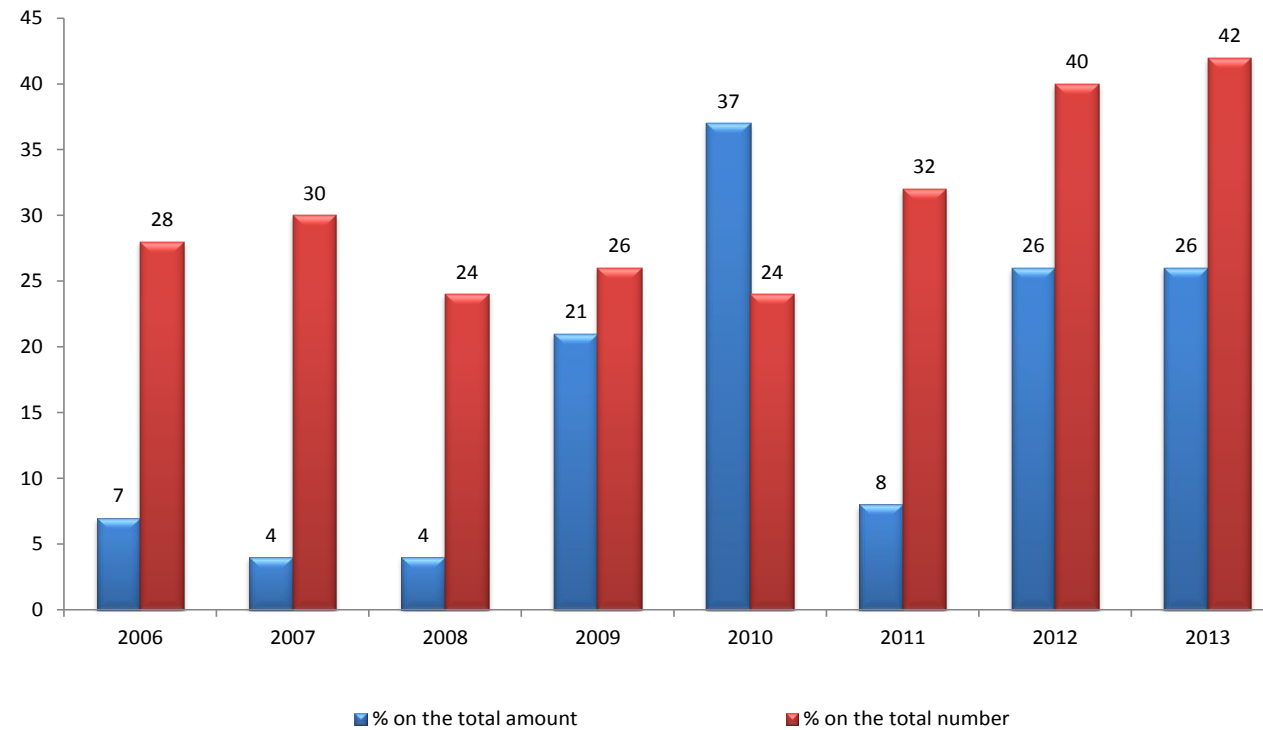
Source: European Commission, Innovation Union Competitiveness Report 2013

Figure 5.3 - Sectoral distribution of the number of venture capital investment in high-tech industries in Italy, 2013



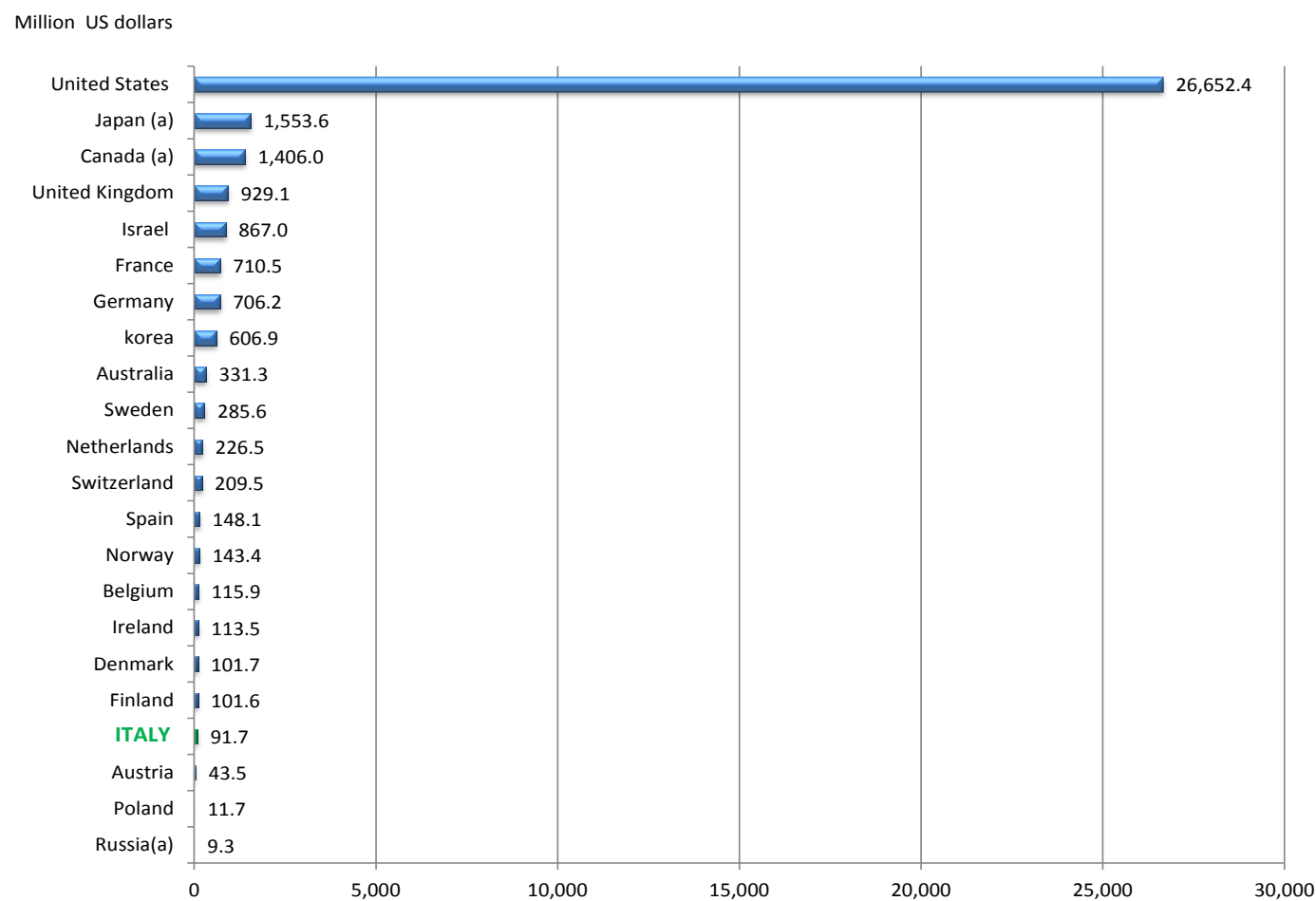
Source: AIFI, *Il mercato italiano del Private Equity e Venture Capital nel 2013*.

Figure 5.4 - Venture capital investment in high-tech industries on total investment in high-tech industries in Italy, 2006-2013



Source: AIFI, *Il mercato italiano del Private Equity e Venture Capital nel 2013*

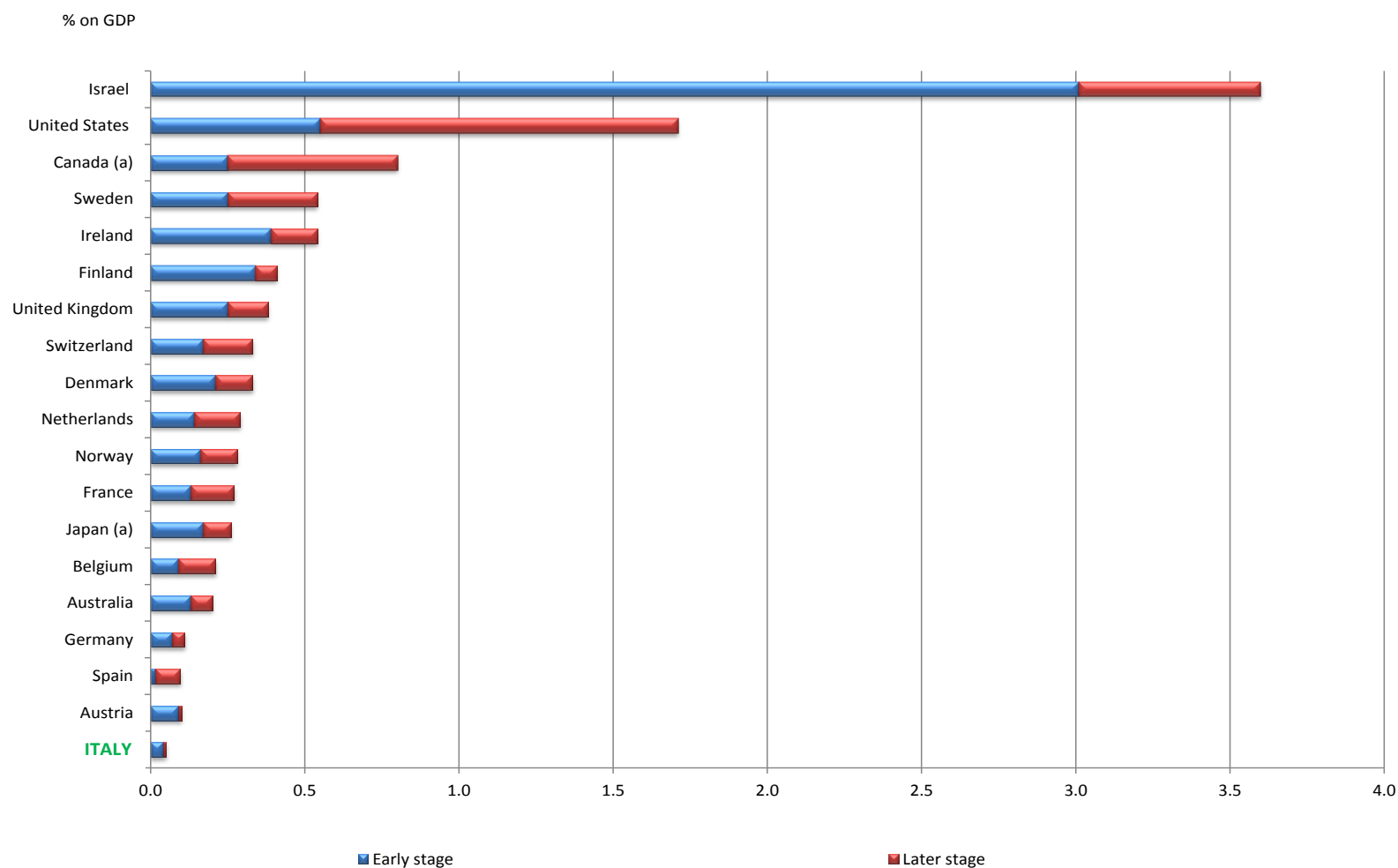
Figure 5.5 - Venture capital investment in some OECD and non-OECD countries, 2012



Note: (a) 2011

Source: OECD, *Entrepreneurship at a Glance 2013*

Figure 5.6 - Venture capital investment on GDP by stage of development in some OECD countries, 2012



Note: (a) 2011

Source: OECD, Entrepreneurship at a Glance 2013

6. R&D PERSONNEL IN ITALY

Table 6.1 - R&D personnel in Italy, 2007-2012

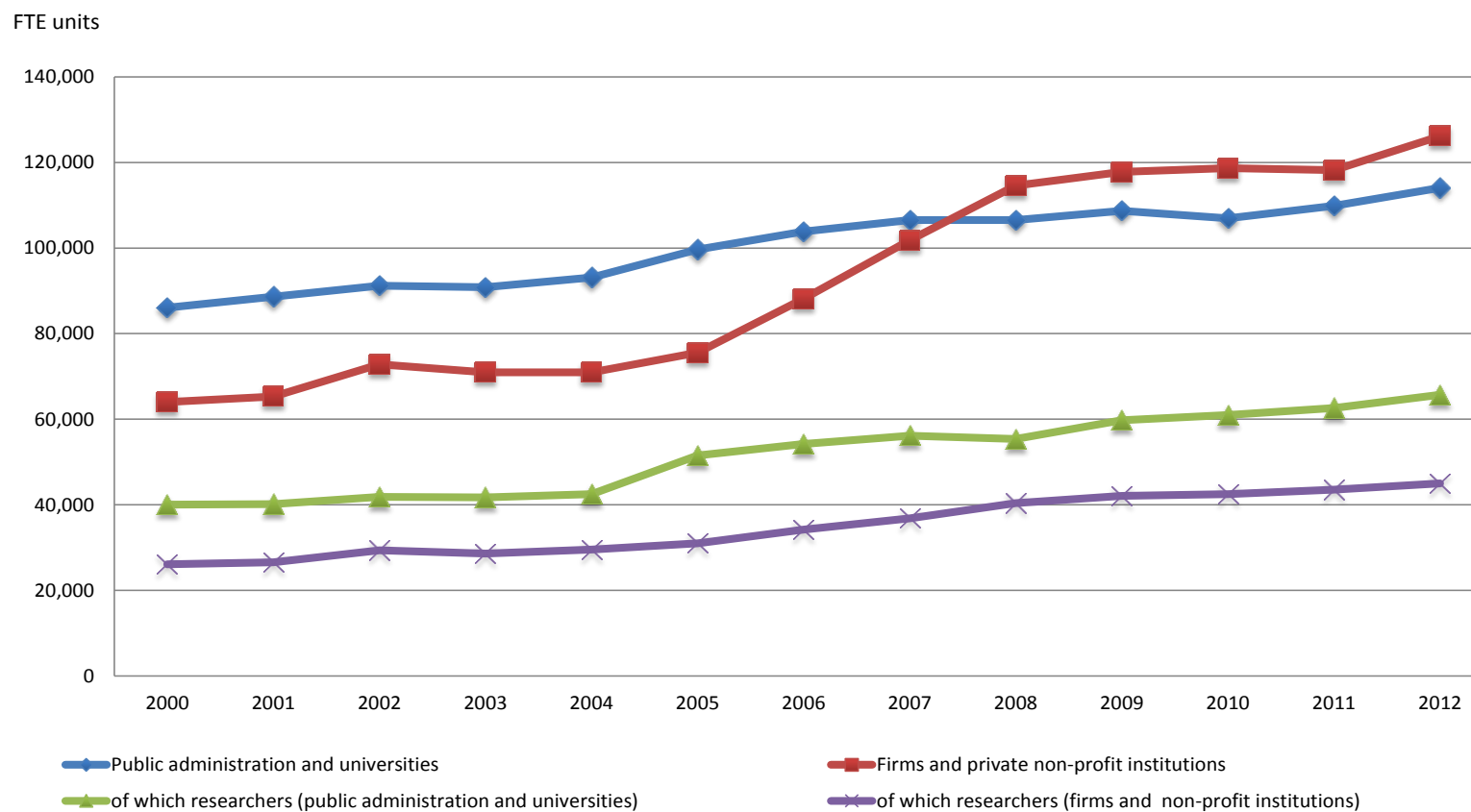
FTE units

Research sectors	2007		2008		2009		2010		2011		2012	
	Researchers	Other personnel	Researchers	Other personnel	Researchers	Other personnel	Researchers	Other personnel	Researchers	Other personnel	Researchers	Other personnel
Public administrations	17,291	18,183	15,554	18,522	16,678	17,086	17,496	17,169	18,780	17,373	20,499	17,352
Universities (a)	38,860	32,203	39,809	32,665	43,067	31,883	43,470	28,828	43,828	29,895	45,223	30,984
Private non-profit institutions (b)	3,978	4,102	3,894	4,028	3,953	4,092	4,162	2,295	3,735	2,005	3,906	2,053
Firms	32,871	60,899	36,509	70,134	38,143	71,626	38,298	73,915	39,808	72,670	41,067	79,095
Total	93,000	115,387	95,766	125,349	101,841	124,687	103,426	122,207	106,151	121,943	110,695	129,484

(a) Corrections of data on personnel engaged in research activities in some non-profit organizations has led to a sharp decline in 2010 data on staff researcher compared to 2009.

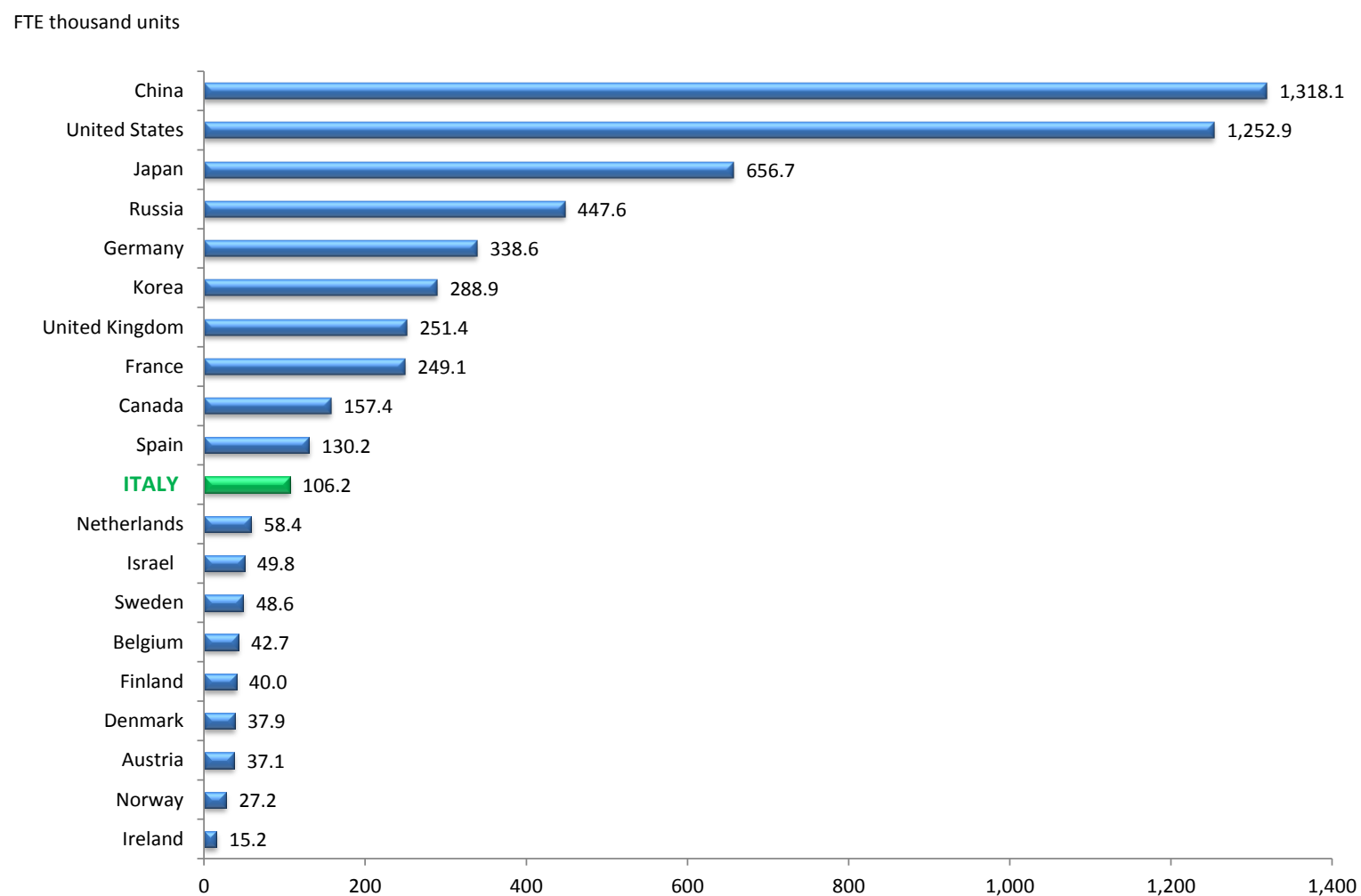
Source: Istat

Figure 6.1 - R&D personnel by institutional sector in Italy, 2000-2012



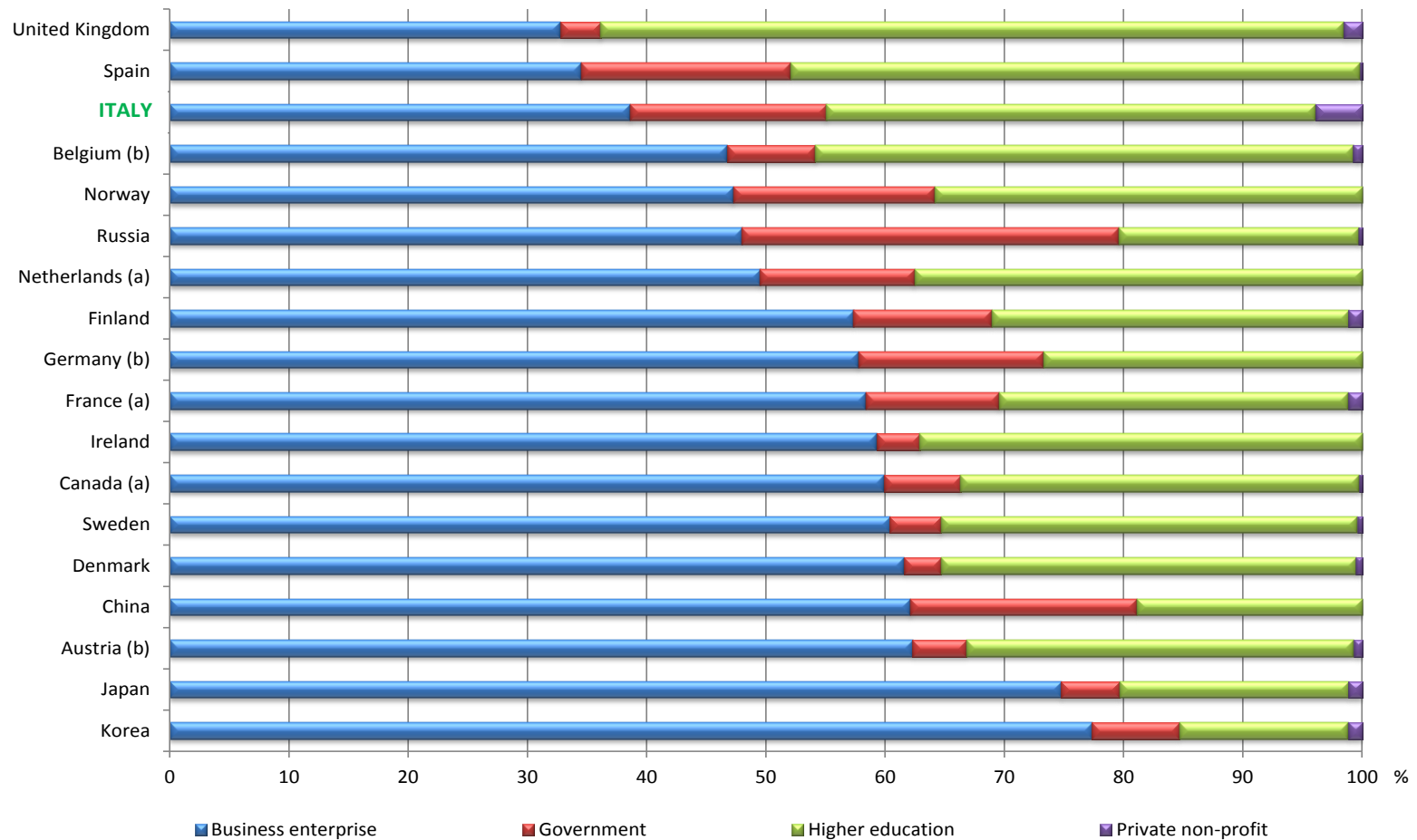
Source: Istat

Figure 6.2 - Researchers in some OECD and non-OECD countries, 2012



Source: OECD, Main Science and Technology Indicators, 2014-2

Figure 6.3 - Researchers by sector of performance in some OECD and non-OECD countries, 2011

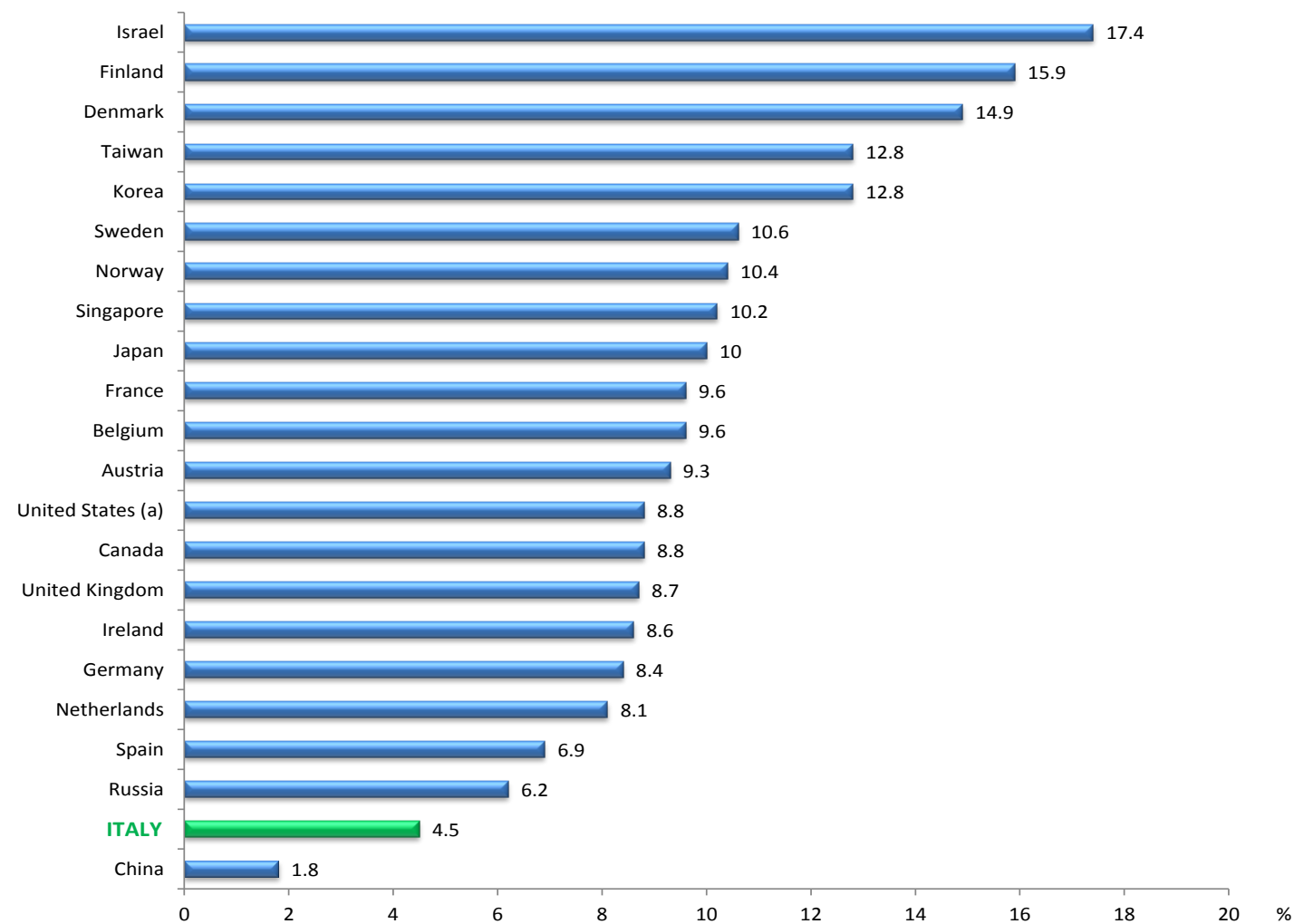


Note: (a) 2010

Note: (b) 2009

Source: OECD Science Technology and Industry Indicators Scoreboard 2013

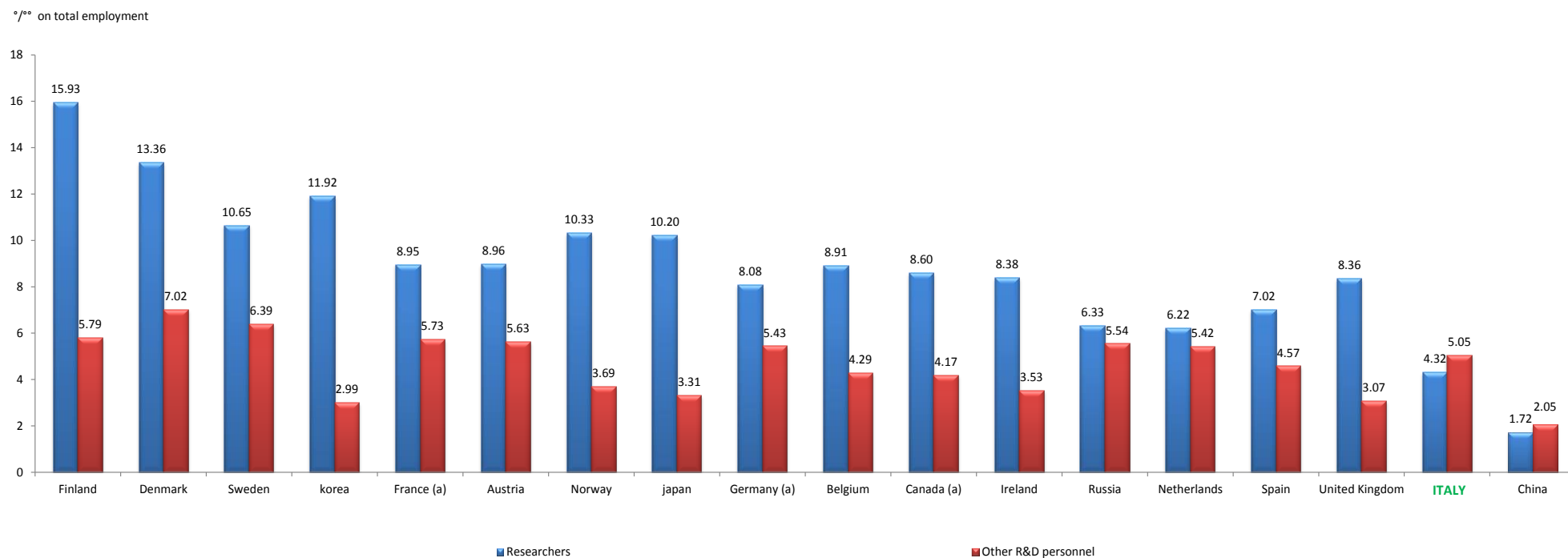
Figure 6.4 - Researchers per 1000 employees in some OECD and non-OECD countries, 2012



Note: (a) 2011

Source: OECD, Main Science and Technology Indicators, 2014-2

Figure 6.5 - Human resources in science and technology on total employment in some OECD and non-OECD countries, 2011

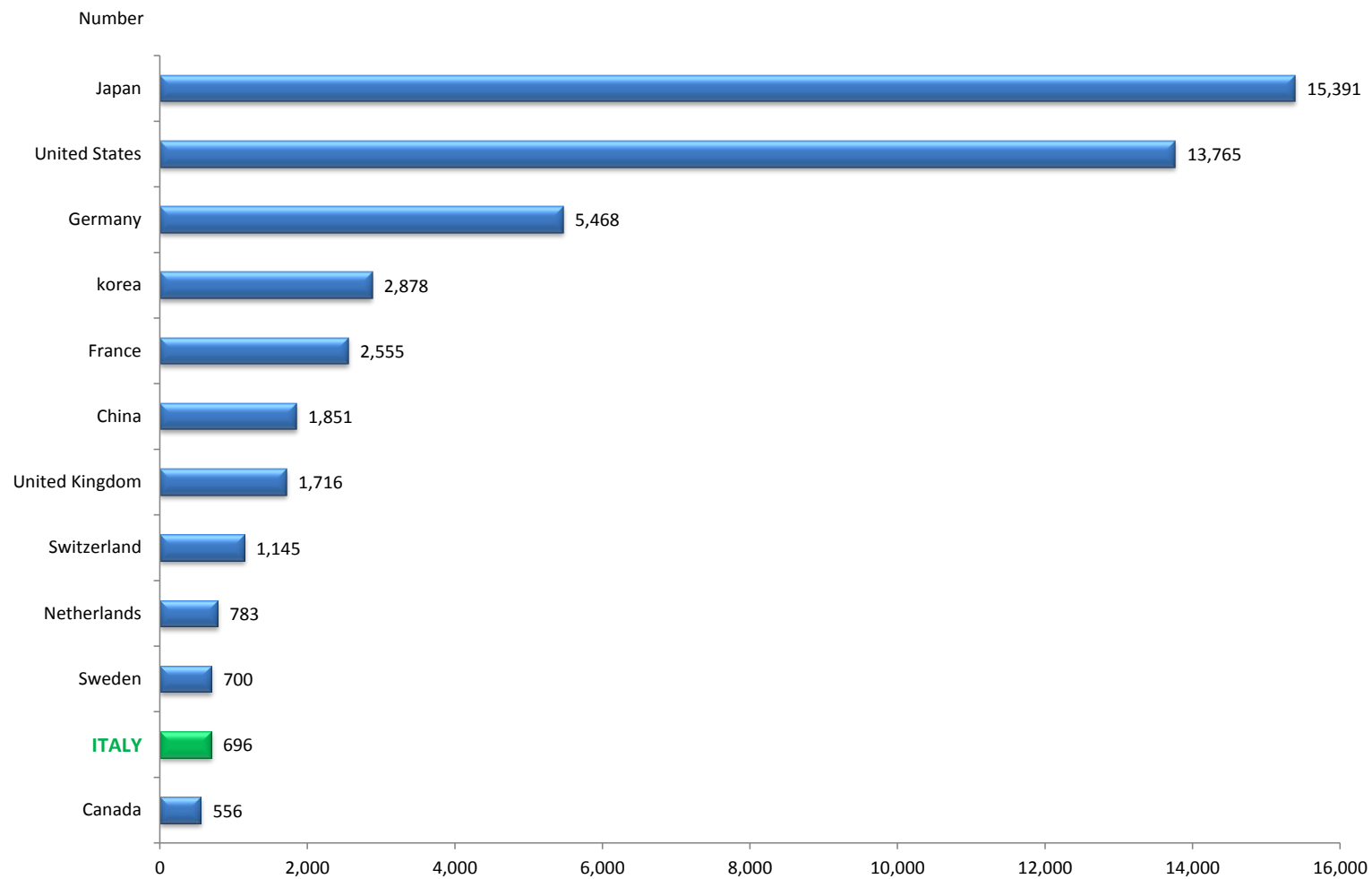


Note: (a) 2010

Source: OECD, Science, Technology and Industry Scoreboard, 2013

7. PATENTS

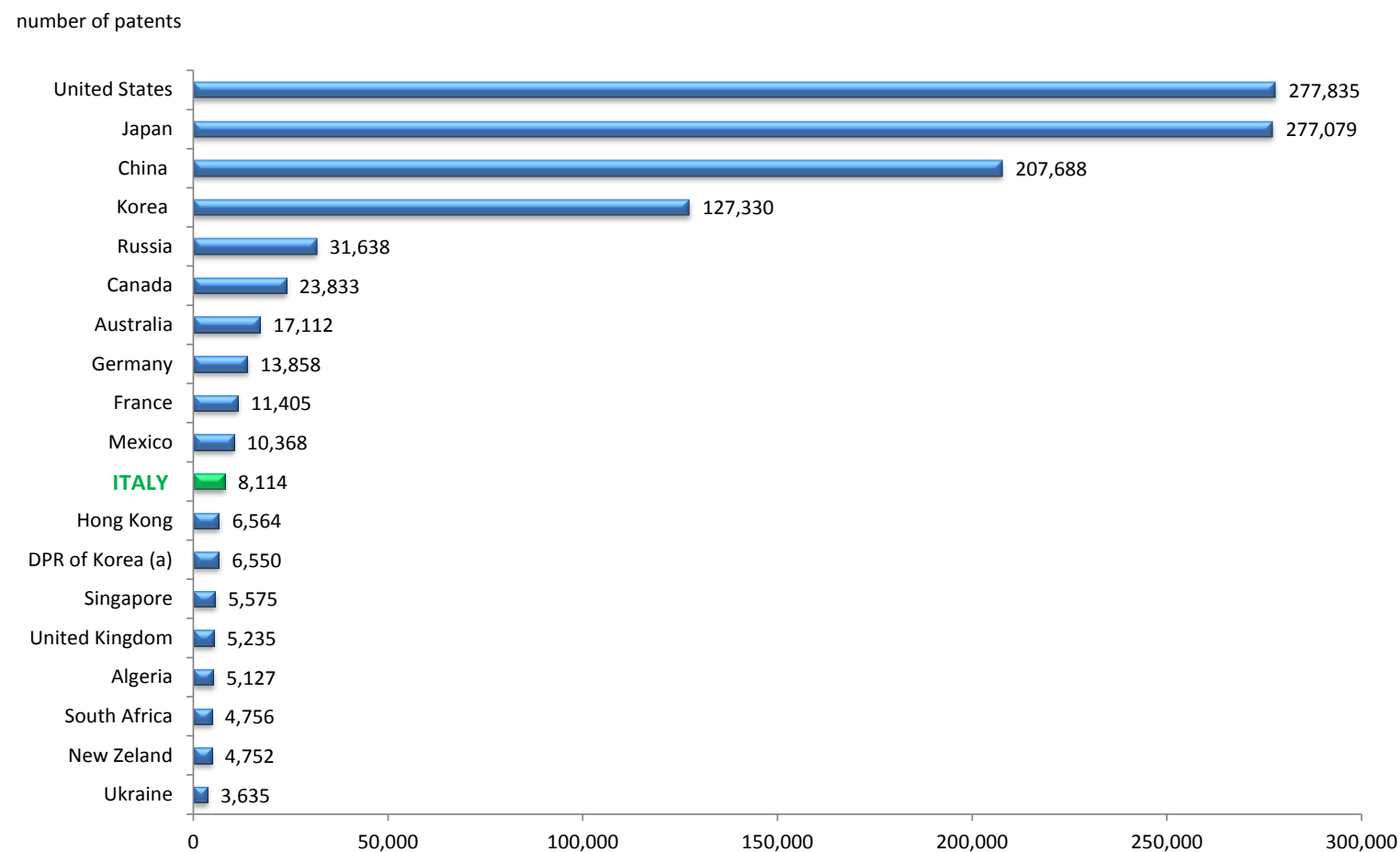
Figure 7.1 - Triadic patents filed (EPO, JPO) and granted (USPTO) in some OECD and non-OECD countries, 2012



Note: OECD Secretariat estimates.

Source: OECD, Main Science and Technology Indicators, 2014-2

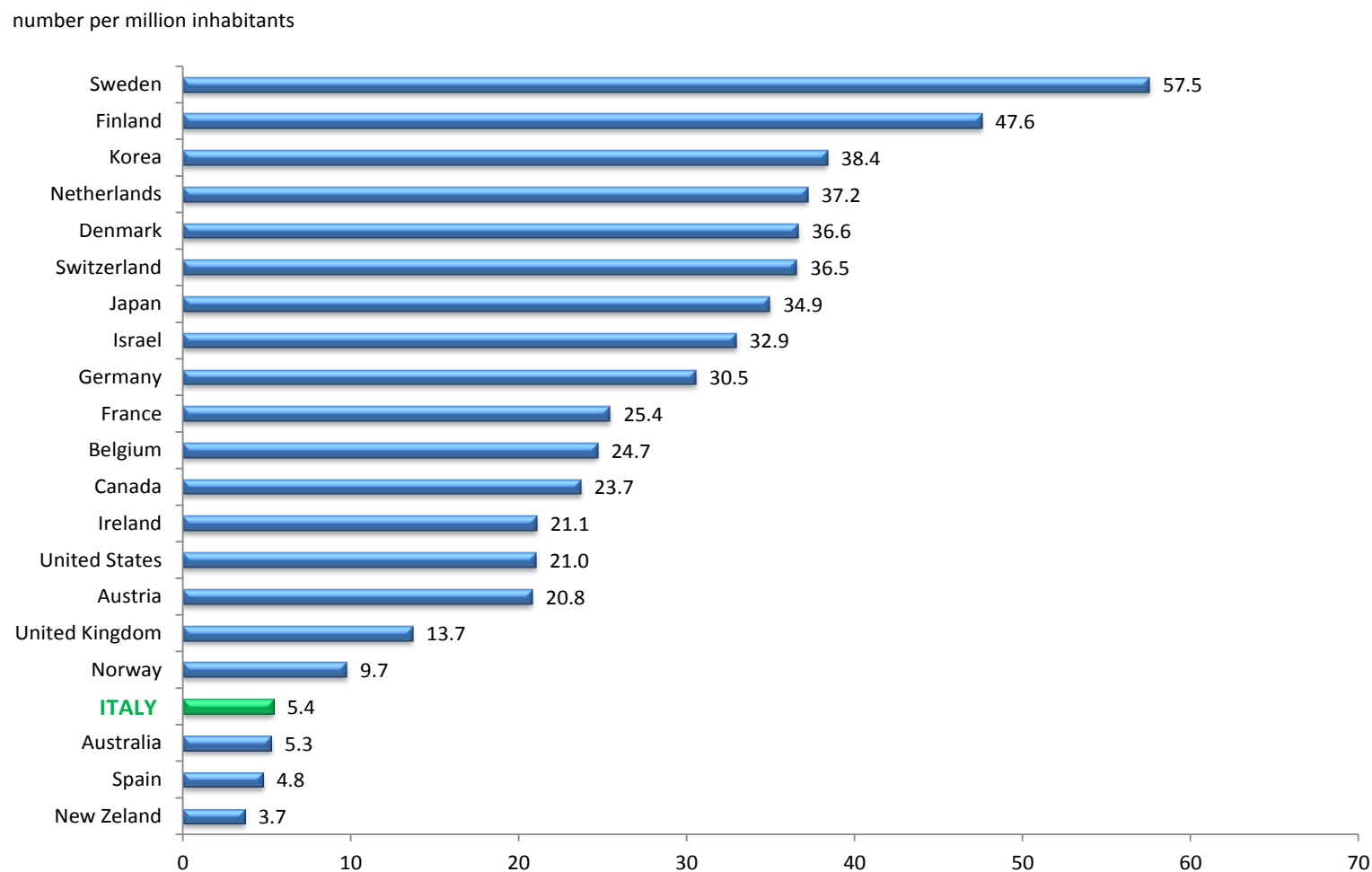
Figure 7.2 - Patent grants with the Patent Cooperation Treaty (PCT) in some OECD and non-OECD countries, 2013



Note: (a) 2012

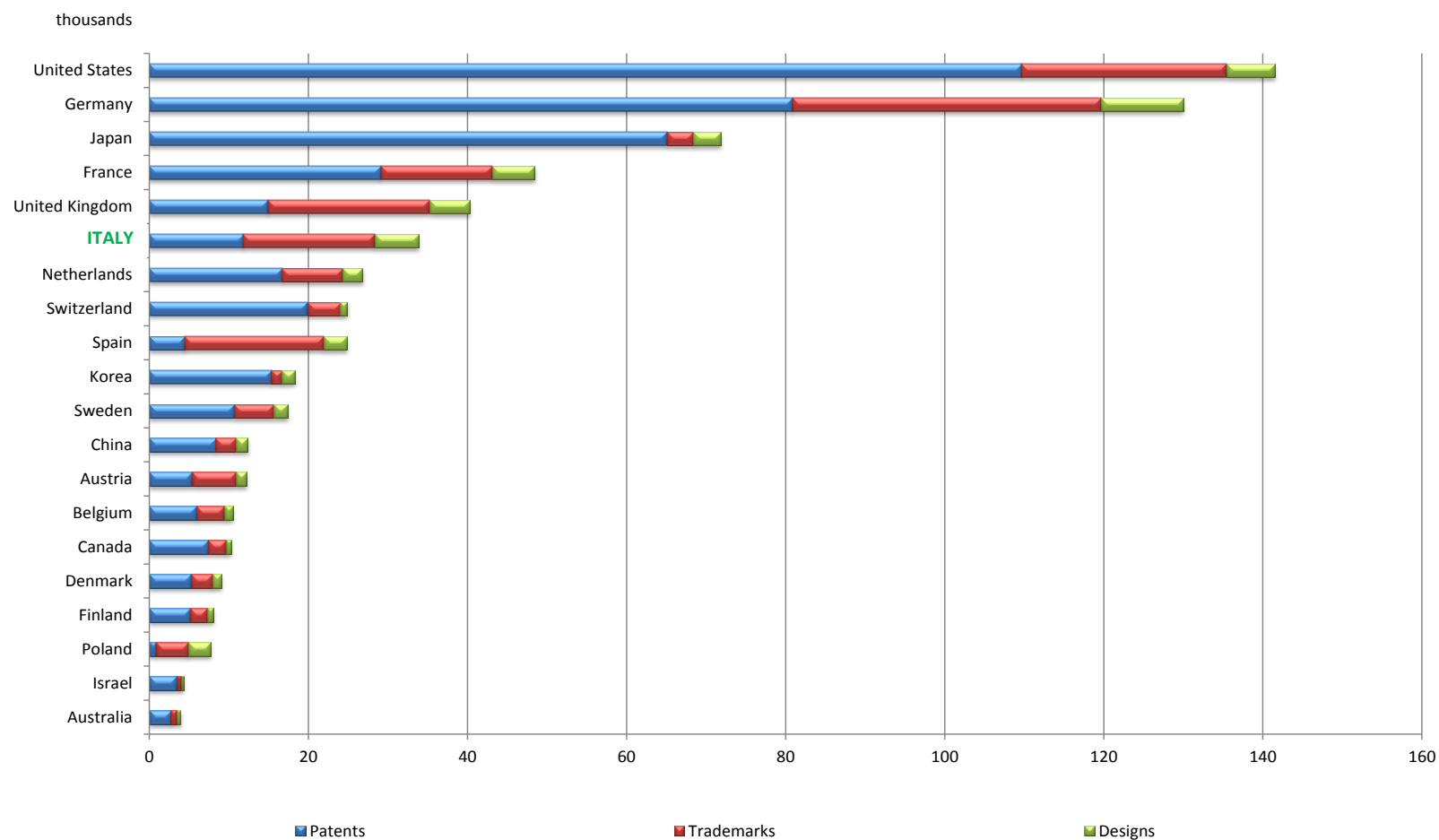
Source: WIPO Indicators 2014 Edition

Figure 7.3 - High-tech patent applications to the EPO in some OECD countries, 2011



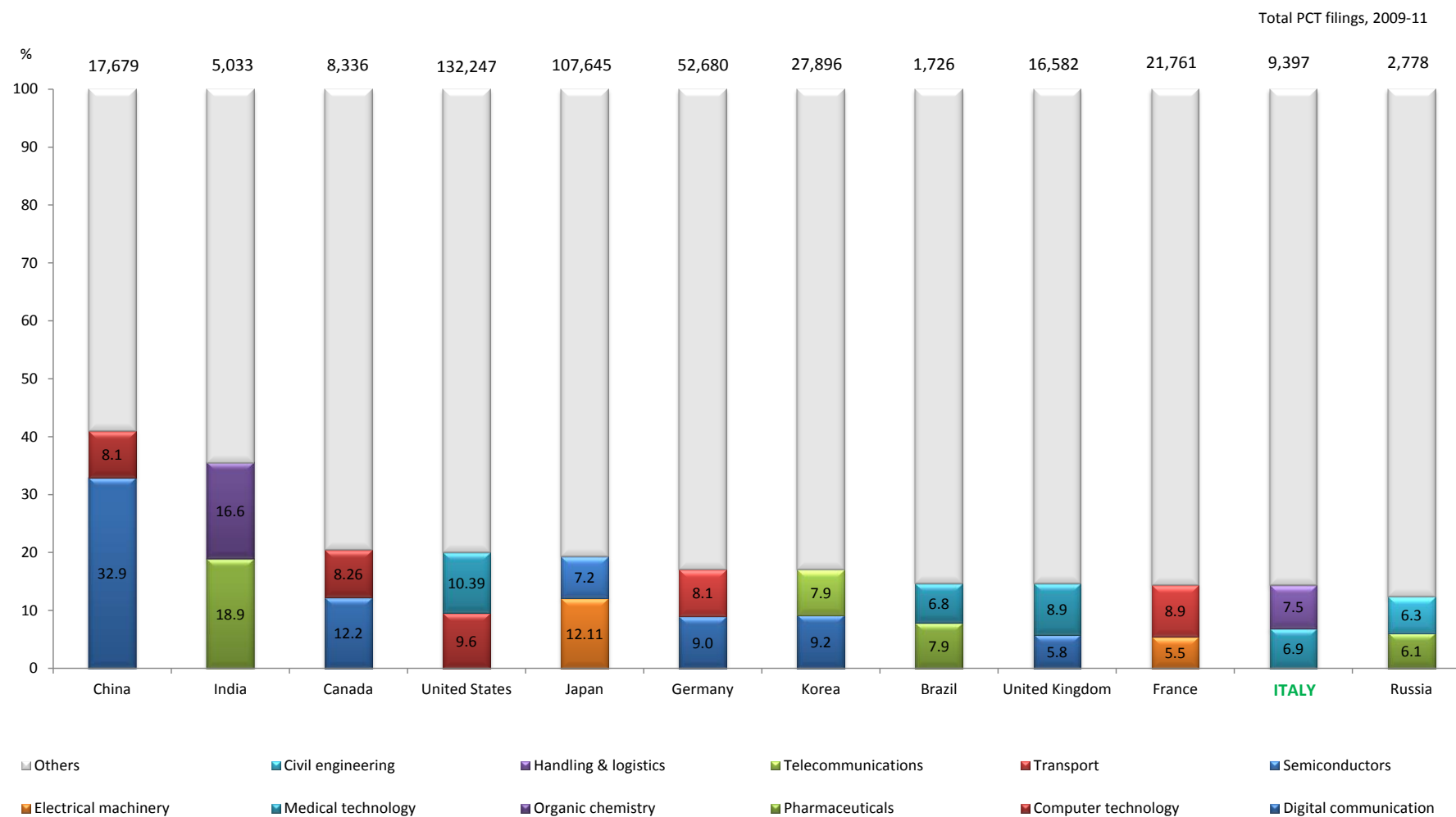
Source: EUROSTAT database

Figure 7.4 - Patents, trademarks and industrial designs filed at EC Offices in some OECD and non-OECD countries, 2010-2012



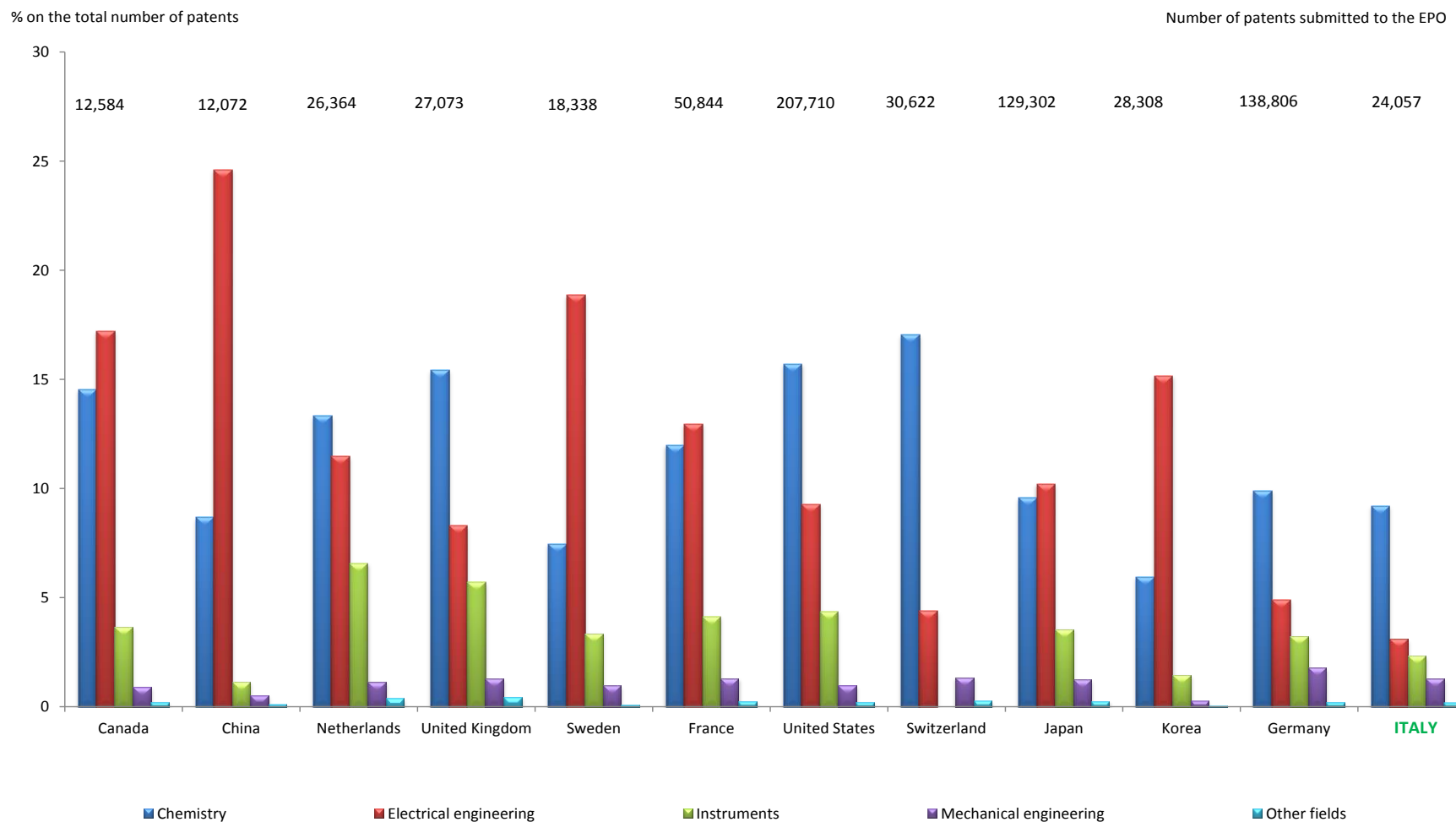
Source: OECD Science Technology and Industry Scoreboard 2013

Figure 7.5 - Top two technologies patented by technology fields on total patent applications in some OECD and non-OECD countries, 2009-2011



Source: OECD Science Technology and Industry Scoreboard 2013

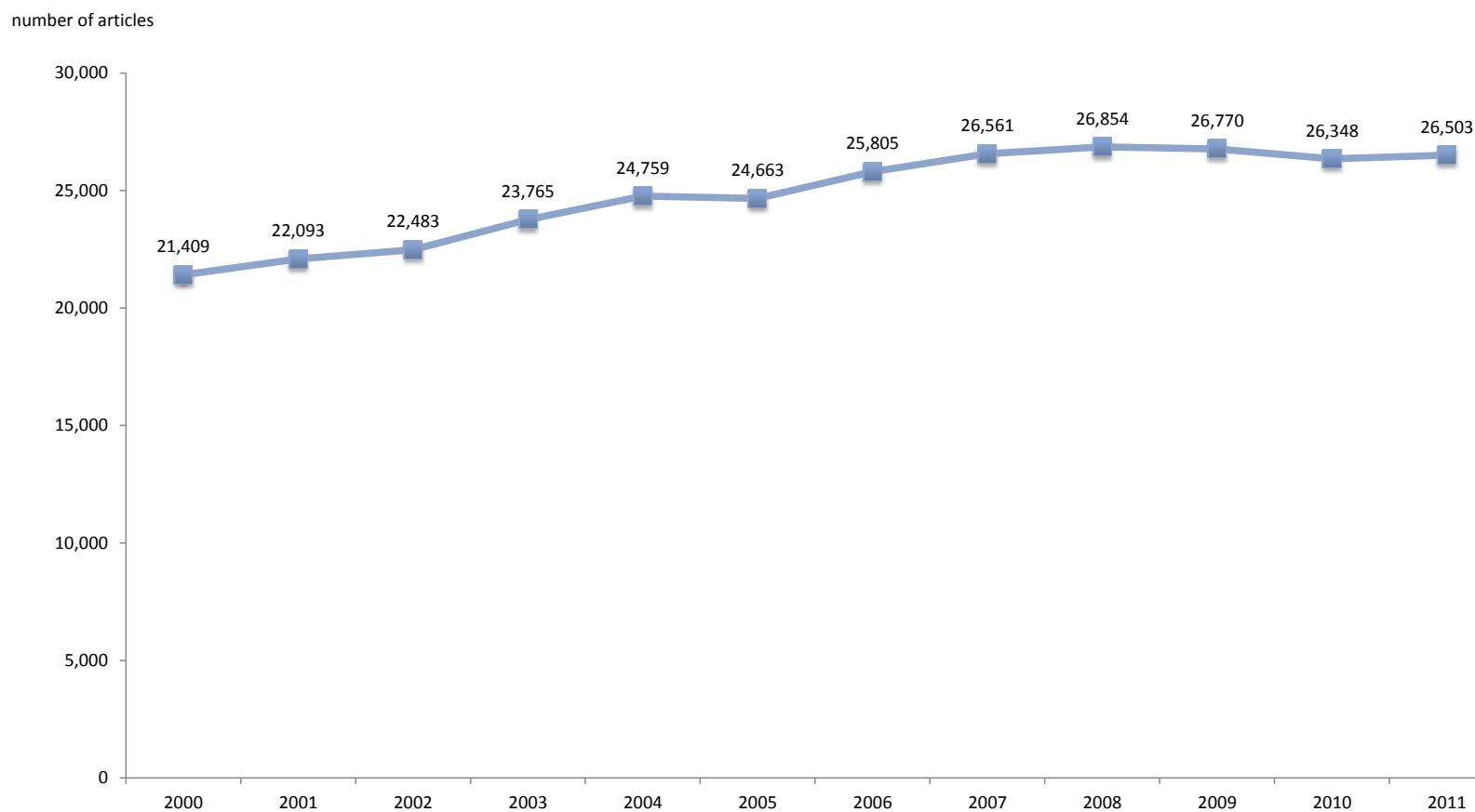
Figure 7.6 - Patents citing non-patent literature by technology field in some OECD and non-OECD countries, 2007-2012



Source: OECD Science Technology and Industry Scoreboard 2013

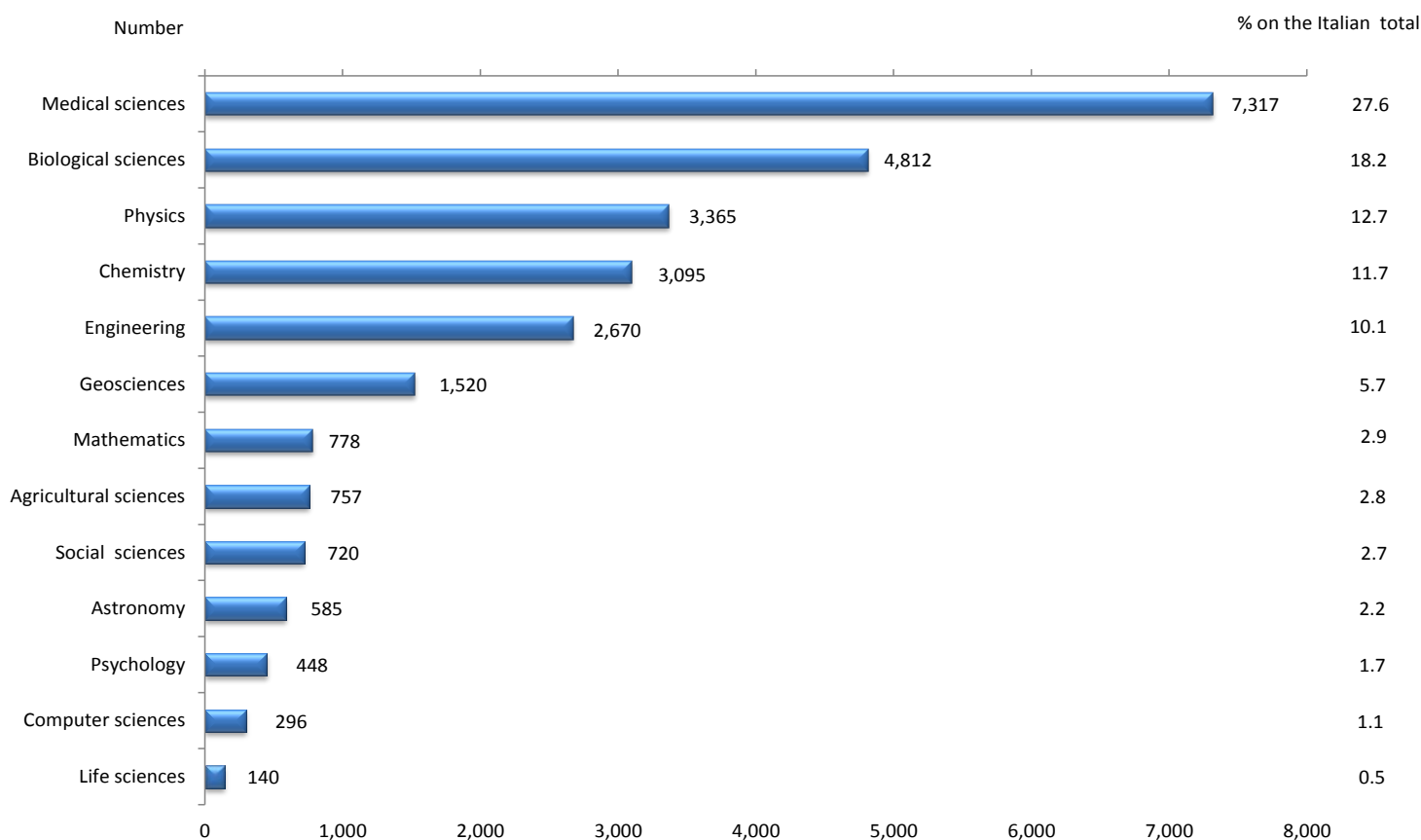
8. PUBLICATIONS

Figure 8.1 - Scientific publications by Italian authors in the most important international journals, 2000-2011



Source: National Science Foundation, National Center for Science and Engineering Statistics, and The Patent Board TM, special tabulations (2013) from Thomas Reuters, SCI and SSCI, Science and Engineering Indicators 2014.

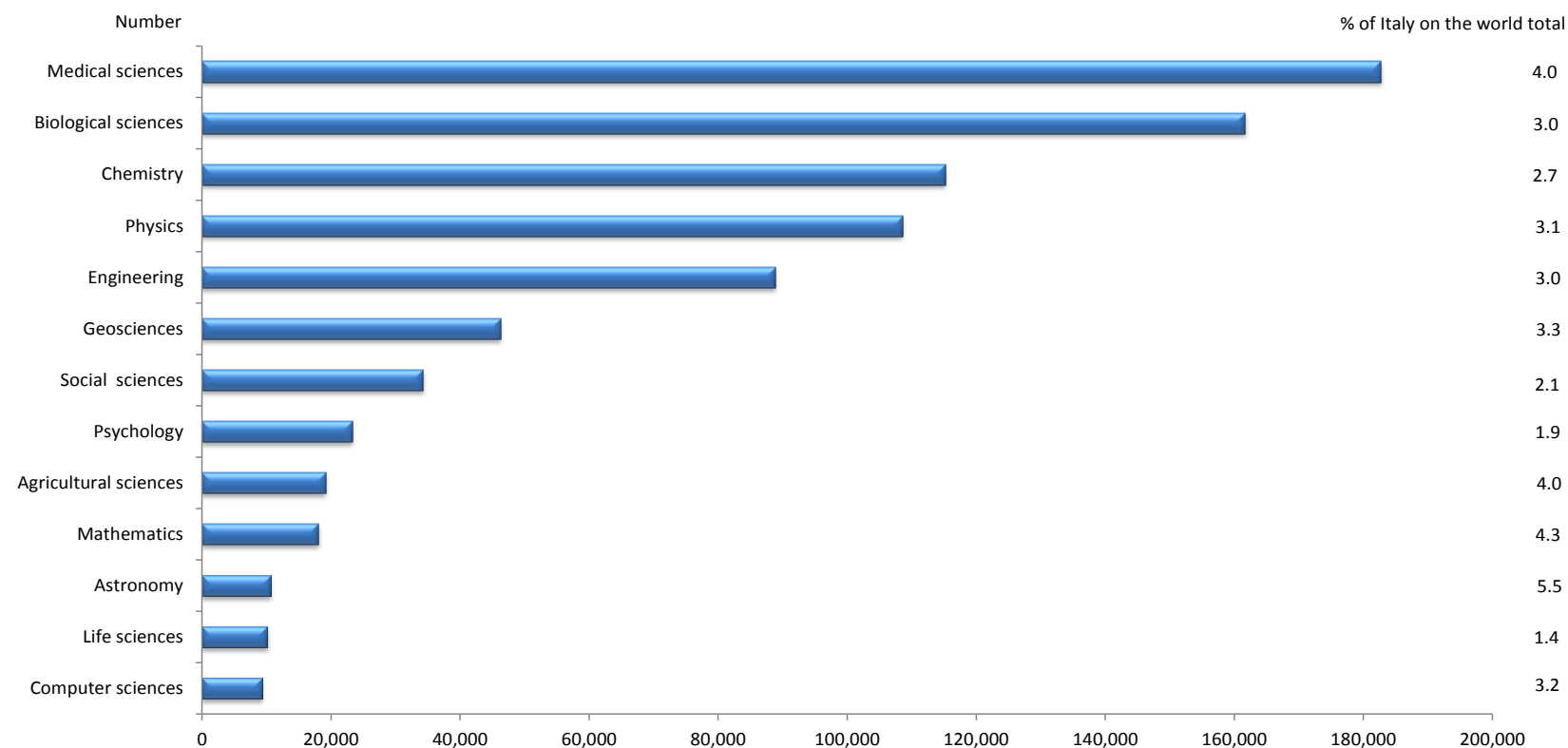
Figure 8.2 - Scientific publications by Italian authors in several disciplines on the Italian total, 2011



N. of articles: 26.503

Source: National Science Foundation, National Center for Science and Engineering Statistics, and The Patent Board TM, special tabulations (2013) from Thomas Reuters, SCI and SSCI, Science and Engineering Indicators 2014.

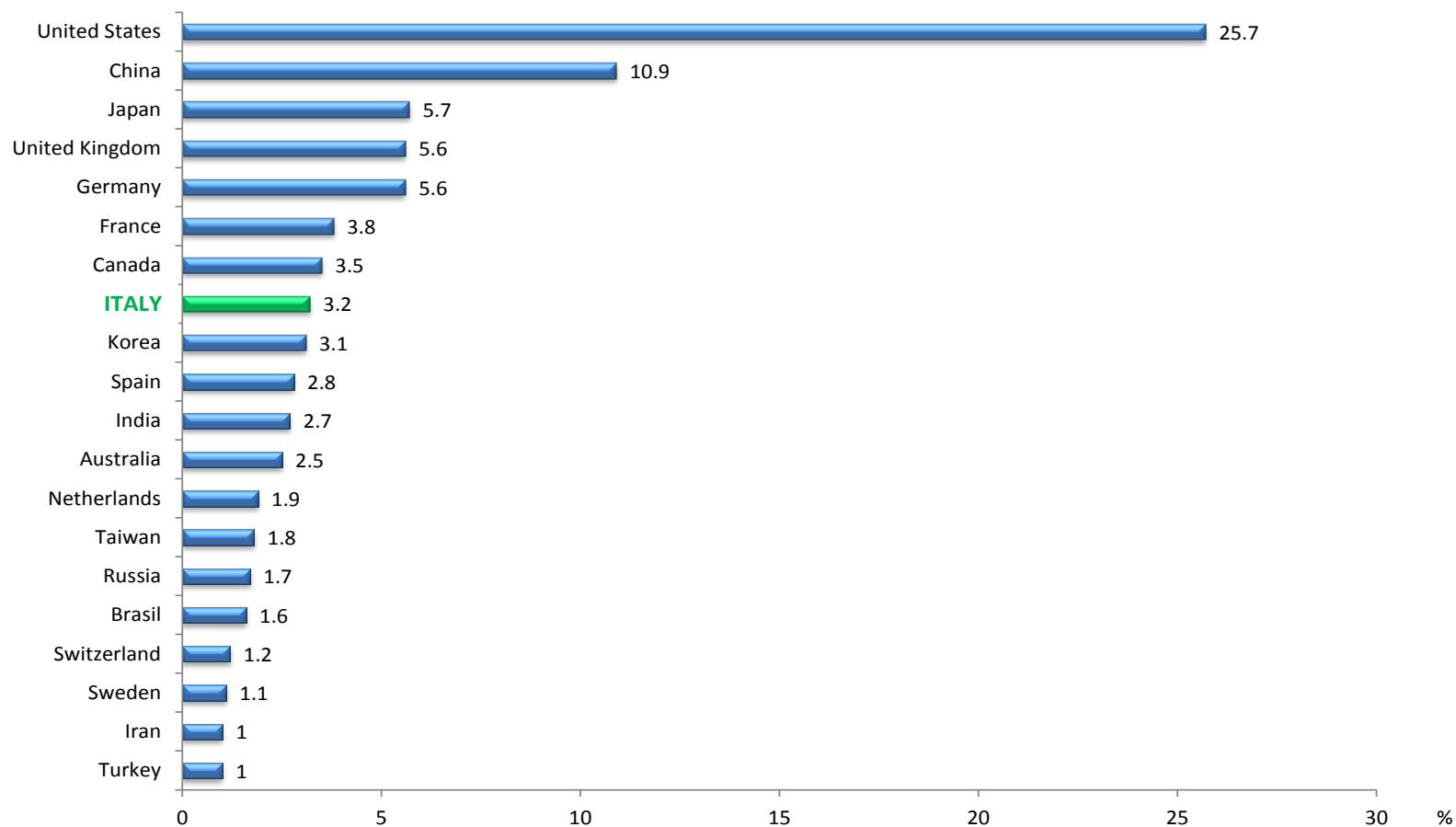
Figure 8.3 - Scientific publications by Italian authors in several disciplines on the world total of each discipline, 2011



N. of articles: 827.705

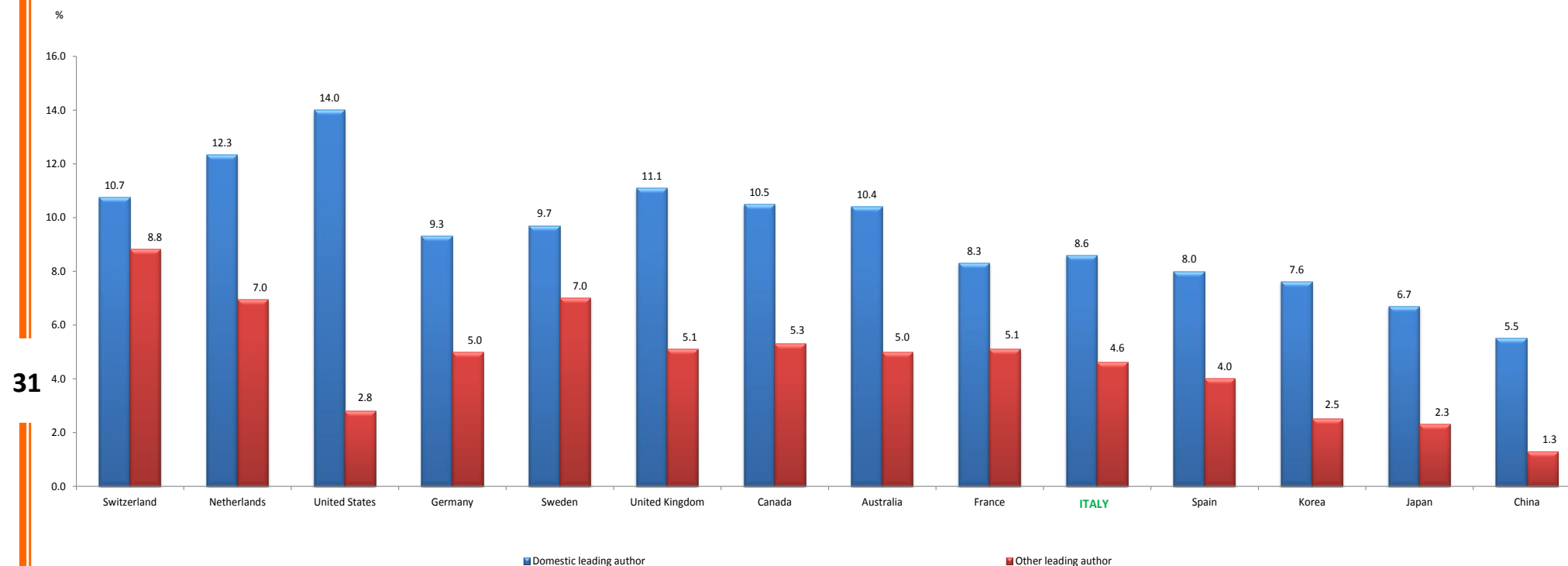
Source: National Science Foundation, National Center for Science and Engineering Statistics, and The Patent Board TM, special tabulations (2013) from Thomas Reuters, SCI and SSCI, Science and Engineering Indicators 2014.

Figure 8.4 - Scientific articles by authors of some OECD and non-OECD countries on the world total, 2011



Source: National Science Foundation, National Center for Science and Engineering Statistics, and The Patent Board TM, special tabulations (2013) from Thomas Reuters, SCI and SSCI, Science and Engineering Indicators 2014.

Figure 8.5 - Top cited publications in international collaboration as a percentage of scientific publications in some OECD and non-OECD countries, 2003-2011



Source: OECD Science Technology and Industry Scoreboard 2013

Table 8.1 - International collaboration on S&E articles by authors of some OECD and non-OECD countries, 2012

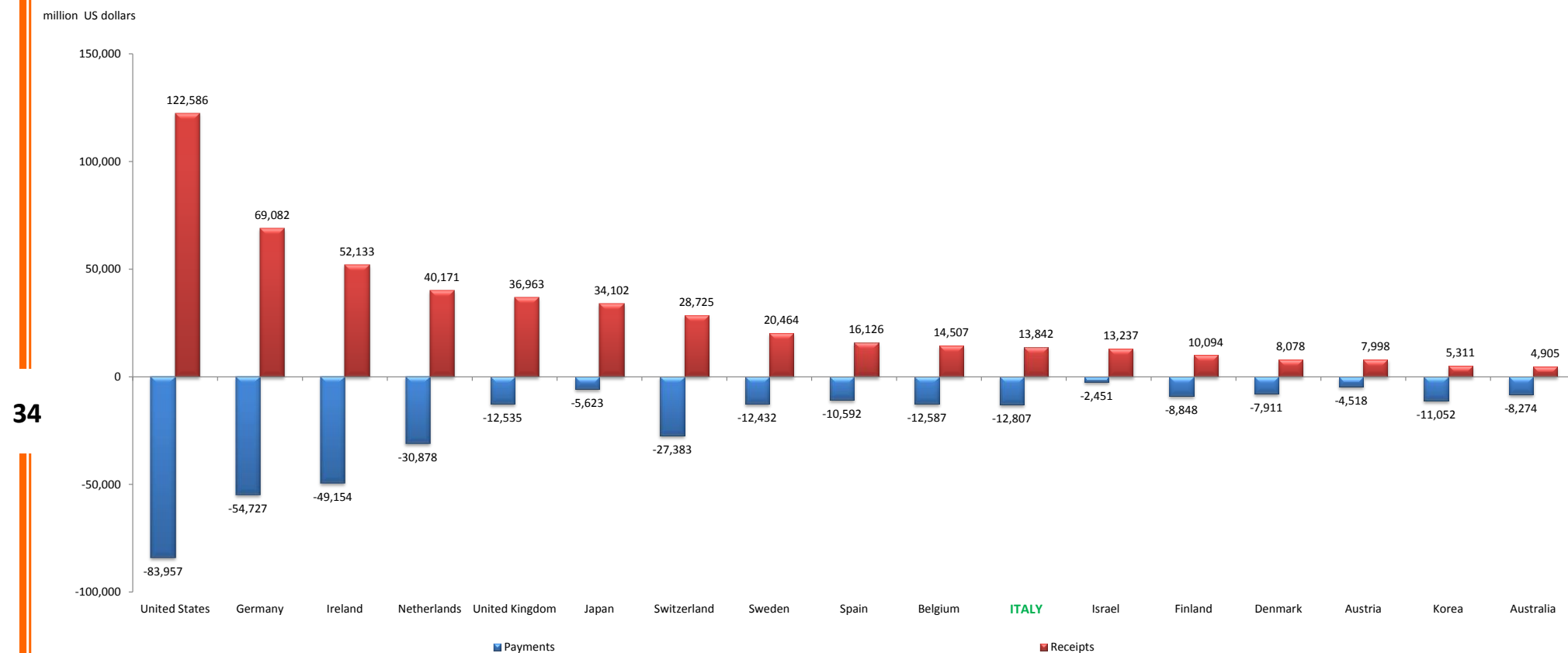
	%												Numbers of articles
	United States	United Kingdom	Germany	France	Italy	Canada	Spain	China	Japan	Australia	Netherlands	Switzerland	
United States		14.3	13.3	8.8	7.4	11.4	5.8	16.2	6.8	6	5.6	4.8	91,183
United Kingdom	33.2		18.2	13.4	11.4	8.6	9.9	8.2	4.9	9.7	10.4	4.8	39,227
Germany	31	18.2		14.1	11.3	6.6	9.3	7	5.6	5.6	10.3	10.8	39,161
France	28.5	2.7	19.6		14.7	8.7	12.3	6.1	5.4	5.5	8.5	9.2	28,150
Italy	34	22.6	22.4	21		7.2	16.2	4.7	5.4	5.6	10.6	10.2	19,697
Canada	48.9	15.8	11.2	11.5	6.6		5.4	10.9	5.3	7.8	6.6	4.8	21,286
Spain	29.5	21.5	20.2	19.1	17.6	6.4		4.4	4.4	5.1	9.6	7.3	18,045
China	47.5	12.2	8.9	5.5	3	7.5	2.6		9.7	8.7	3.1	2.4	31,081
Japan	37.1	11.5	13.2	9	6.4	6.8	4.8	18.1		6.2	4	4.8	16,591
Australia	32.9	23	13.3	9.4	6.7	10	5.6	16.3	6.2		7.1	5.2	16,575
Netherlands	33.7	26.7	26.6	15.8	13.7	9.2	11.4	6.4	4.4	7.7		8.9	15,187
Switzerland	33.4	20.7	32.5	19.8	15.4	7.8	10.1	5.8	6.1	6.6	10.4		13,031

Note: Each collaborating country credited one count, but a number of articles has three or more coauthors.

Source: National Science Foundation, National Center for Science and Engineering Statistics, and The Patent Board TM, special tabulations (2013) from Thomas Reuters, SCI and SSCI, Science and Engineering Indicators 2014.

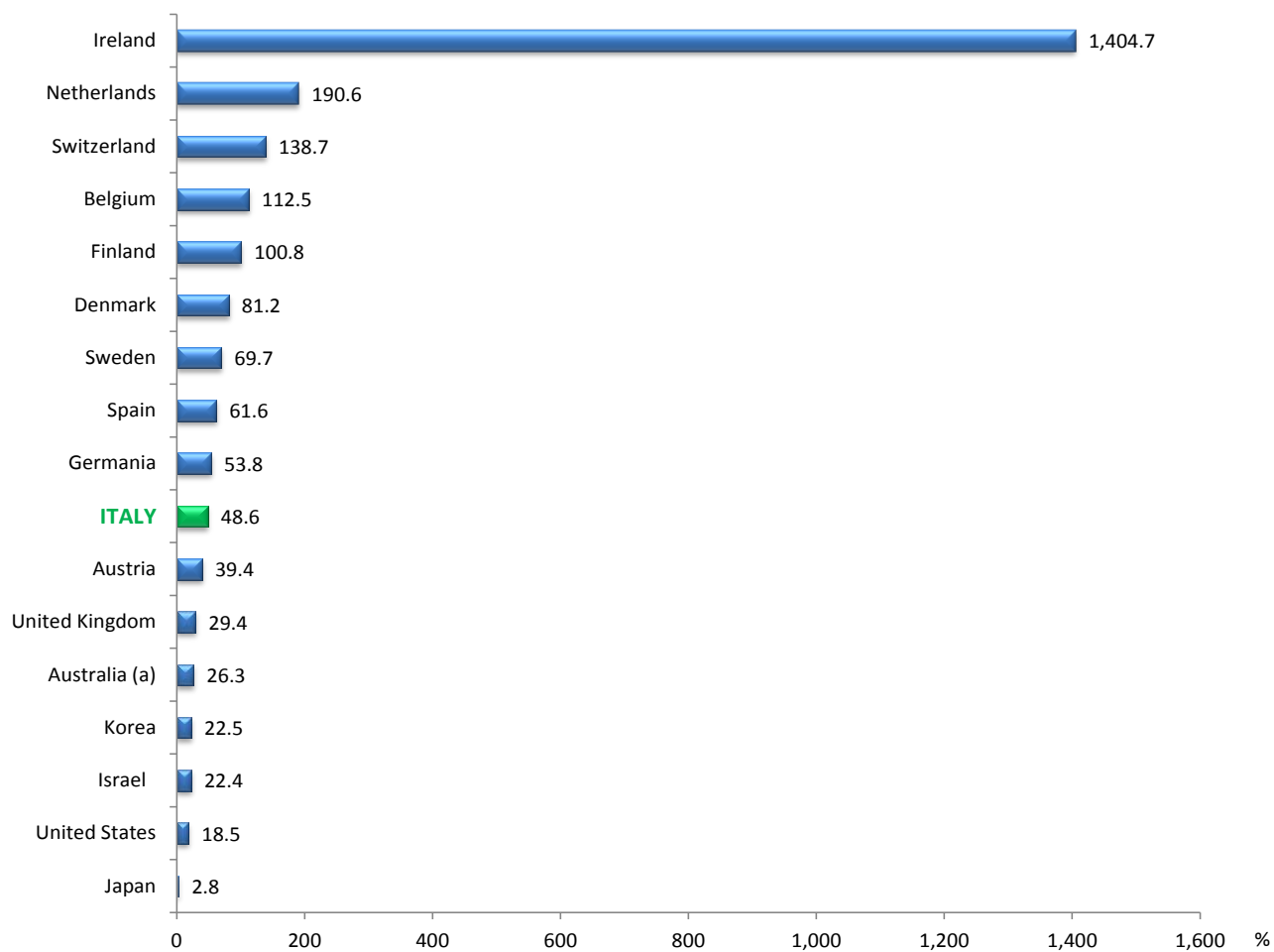
9. INTERNATIONAL TRADE OF TECHNOLOGY

Figure 9.1 - TBP payments and receipts in some OECD countries, 2012



Source: OECD, MSTI, vol. 2014/2

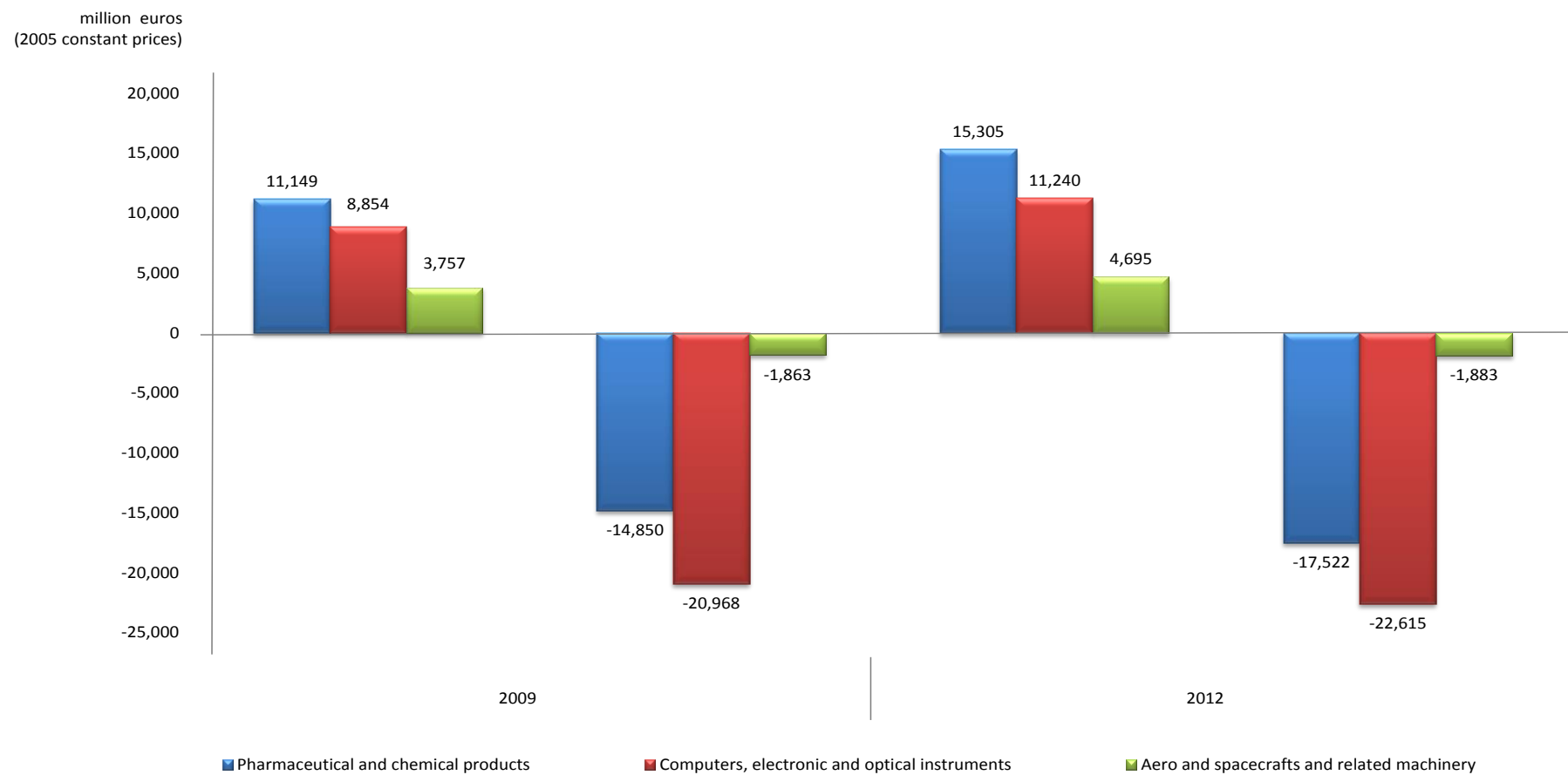
Figure 9.2 - TBP payments over R&D expenditure in some OECD countries, 2012



Note: (a) 2011

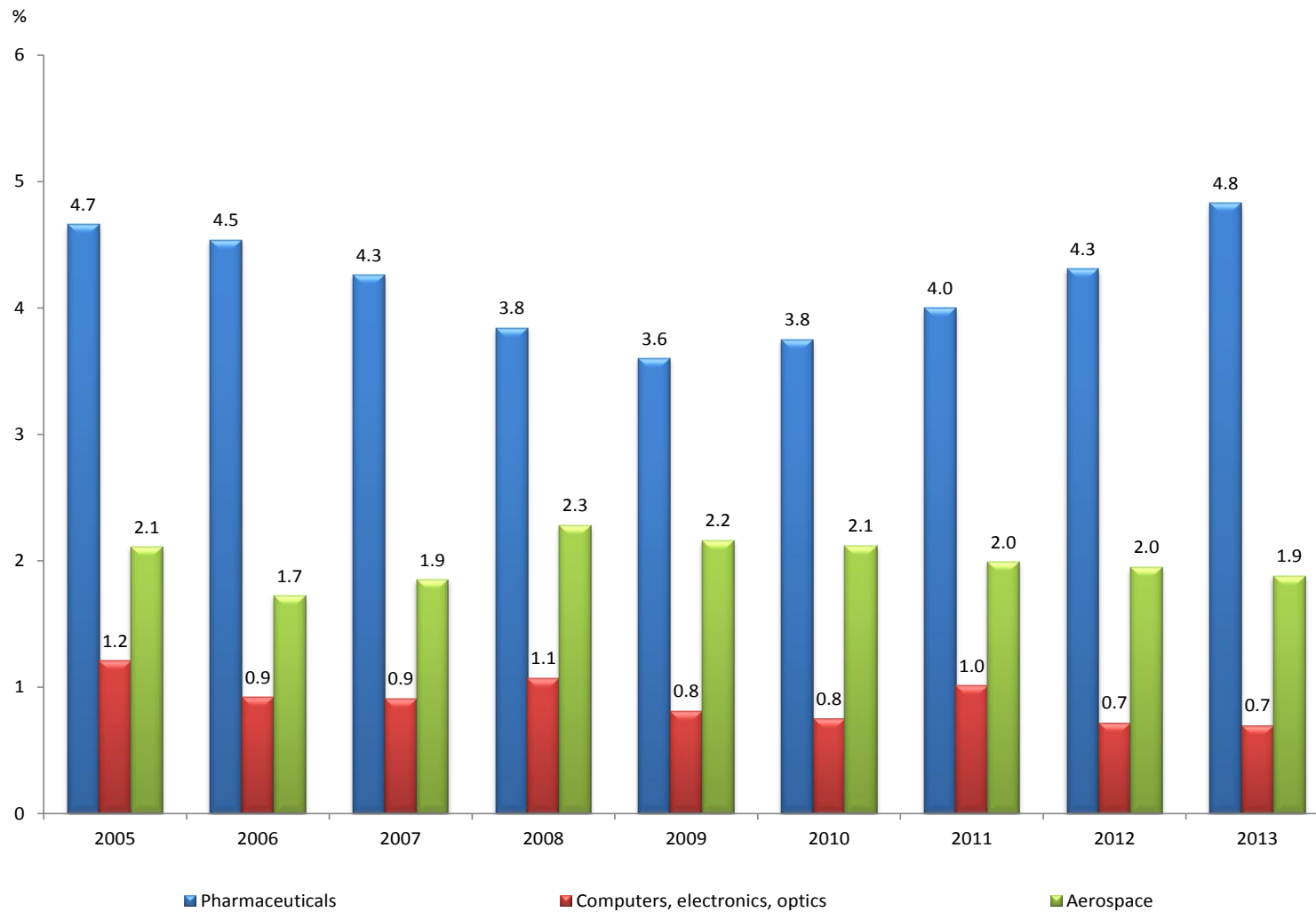
Source: OECD, MSTI, vol. 2014/2

Figure 9.3 - Trade by groups of Italian high-tech products, 2009 and 2012



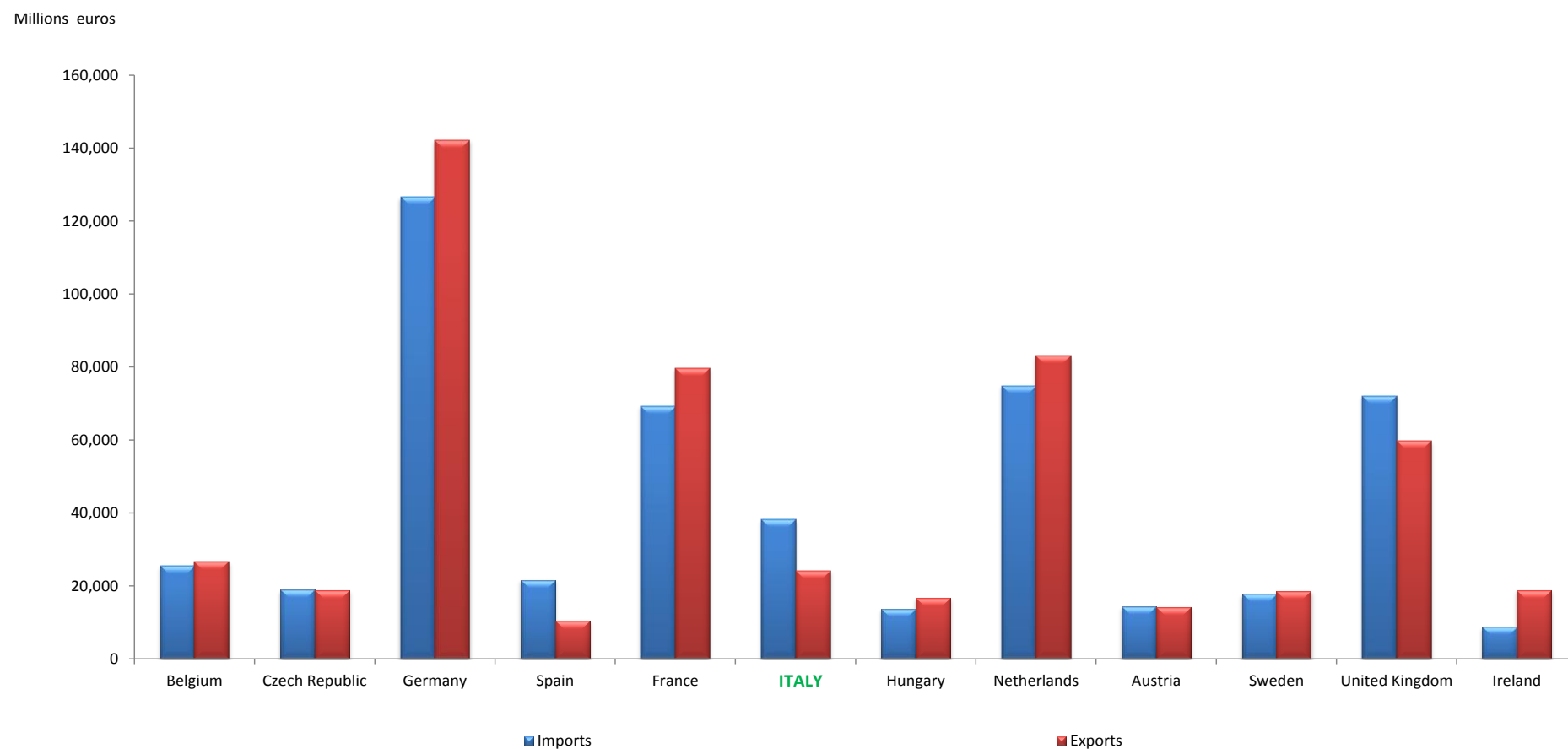
Source: Servizio Statistico Nazionale - Istat, Commercio estero e attività internazionali delle imprese 2014

Figure 9.4 - Italian export market shares over total OECD exports in some high-tech manufacturing sectors, 2005-2013



Source: OECD, Main Science and Technology Indicators, 2013-2, 2014-2

Figure 9.5 - Trade of high-tech goods in some OECD countries, 2011



Source: EUROSTAT, Science, technology and innovation in Europe, 2013