



SUMMARY REPORT OF THE 2013 UIS INNOVATION DATA COLLECTION



United Nations
Educational, Scientific and
Cultural Organization

UNESCO
INSTITUTE
for
STATISTICS

UNESCO

The constitution of the United Nations Educational, Scientific and Cultural Organization (UNESCO) was adopted by 20 countries at the London Conference in November 1945 and entered into effect on 4 November 1946. The Organization currently has 195 Member States and 9 Associate Members.

The main objective of UNESCO is to contribute to peace and security in the world by promoting collaboration among nations through education, science, culture and communication in order to foster universal respect for justice, the rule of law, and the human rights and fundamental freedoms that are affirmed for the peoples of the world, without distinction of race, sex, language or religion, by the Charter of the United Nations.

To fulfil its mandate, UNESCO performs five principal functions: 1) prospective studies on education, science, culture and communication for tomorrow's world; 2) the advancement, transfer and sharing of knowledge through research, training and teaching activities; 3) standard-setting actions for the preparation and adoption of internal instruments and statutory recommendations; 4) expertise through technical cooperation to Member States for their development policies and projects; and 5) the exchange of specialized information.

UNESCO Institute for Statistics

The UNESCO Institute for Statistics (UIS) is the statistical office of UNESCO and is the UN depository for global statistics in the fields of education, science and technology, culture and communication.

The UIS was established in 1999. It was created to improve UNESCO's statistical programme and to develop and deliver the timely, accurate and policy-relevant statistics needed in today's increasingly complex and rapidly changing social, political and economic environments.


This report was prepared by Luciana Marins, Assistant Programme Specialist, assisted by Oula Hajjar, Statistical Assistant, and reviewed by Martin Schaaper, Programme Specialist (UNESCO Institute for Statistics).

Published in 2015 by:

UNESCO Institute for Statistics
P.O. Box 6128, Succursale Centre-Ville
Montreal, Quebec H3C 3J7
Canada

Tel: +1 514-343-6880
Email: uis.publications@unesco.org
<http://www.uis.unesco.org>

ISBN 978-92-9189-175-7
Ref: UIS/2015/COM/TD/2

 **DataLink:** <http://dx.doi.org/10.15220/978-92-9189-175-7-en>

© UNESCO-UIS 2015

This publication is available in Open Access under the Attribution-ShareAlike 3.0 IGO (CC-BY-SA 3.0 IGO) license (<http://creativecommons.org/licenses/by-sa/3.0/igo/>). By using the content of this publication, the users accept to be bound by the terms of use of the UNESCO Open Access Repository (<http://www.unesco.org/open-access/terms-use-ccbysa-en>).

The designations employed and the presentation of material throughout this publication do not imply the expression of any opinion whatsoever on the part of UNESCO concerning the legal status of any country, territory, city or area or of its authorities or concerning the delimitation of its frontiers or boundaries.

The ideas and opinions expressed in this publication are those of the authors; they are not necessarily those of UNESCO and do not commit the Organization.

Acknowledgements

The UNESCO Institute for Statistics (UIS) would like to express its gratitude to the national experts for kindly completing the questionnaire of the UIS 2013 innovation data collection. Additionally, the continued support and collaboration of the African Union – The New Partnership for Africa's Development (AU/NEPAD), the Network for Science and Technology Indicators – Ibero-American and Inter-American (RICYT), the Organisation of Economic Co-operation and Development (OECD) and Eurostat are sincerely appreciated.

Country and region codes

ARG	Argentina
AUS	Australia
AUT	Austria
BLR	Belarus
BEL	Belgium
BRA	Brazil
BUL	Bulgaria
CAN	Canada
CHN	China
HKG	China, Hong Kong Special Administrative Region (China, Hong Kong)
COL	Colombia
CRI	Costa Rica
CRO	Croatia
CUB	Cuba
CYP	Cyprus
CZE	Czech Republic
DNK	Denmark
ECU	Ecuador
EGY	Egypt
SLV	El Salvador
EST	Estonia
FIN	Finland
FRA	France
DEU	Germany
GHA	Ghana
HUN	Hungary
ISL	Iceland
IND	India
IDN	Indonesia
IRL	Ireland
ISR	Israel
ITA	Italy
JPN	Japan
KAZ	Kazakhstan
KEN	Kenya
LVA	Latvia
LTU	Lithuania
LUX	Luxembourg
MYS	Malaysia
MLT	Malta
MEX	Mexico
MAR	Morocco
NLD	Netherlands
NZL	New Zealand
NIG	Nigeria
NOR	Norway
PAN	Panama
PHL	Philippines
POL	Poland

PRT	Portugal
KOR	Republic of Korea (Korea, Rep.)
ROM	Romania
RUS	Russian Federation
SRB	Serbia
SVK	Slovakia
SVN	Slovenia
ZAF	South Africa
ESP	Spain
SWE	Sweden
TUR	Turkey
UGA	Uganda
UKR	Ukraine
GBR	United Kingdom of Great Britain and Northern Ireland (United Kingdom)
TZA	United Republic of Tanzania
URY	Uruguay

Table of contents

	Page
Acknowledgements.....	iii
Country and region codes.....	iv
Section 1. The 2013 UIS innovation data collection.....	8
Section 2. Innovation rates.....	9
2.1 Types of innovators	9
2.2 Innovation-active and innovative firms	11
Section 3. Innovation activities.....	15
Section 4. Linkages.....	17
4.1 Sources of information.....	17
4.2 Cooperation	19
Section 5. Hampering factors.....	22
5.1 Hampering factors for innovation-active firms	22
5.2 Hampering factors for non-innovative firms.....	24
Section 6. Final remarks	26
Annex I. Notes.....	27
Annex II. Methodological procedures of the national innovation surveys.....	28
Annex III. Tables	32

Section 1. The 2013 UIS innovation data collection

The key role that innovation plays in the process of economic growth and development has been widely recognised and discussed. In order to design and implement adequate industrial and innovation policies, policymakers need to have the appropriate data in hand. Unfortunately, this is not always the case. Despite efforts over the last two decades to standardise innovation definitions and indicators, it remains a challenge to understand and measure innovation, as well as produce innovation indicators, at both national and international levels.

The UNESCO Institute for Statistics (UIS) is committed to increasing the availability of timely, accurate and policy-relevant statistics in the field of science, technology and innovation (STI). For this purpose, in 2013 the UIS launched its first global innovation data collection. Country-level data covering innovation in manufacturing were gathered in order to produce a set of indicators on the types of innovation implemented by firms, the activities and linkages that they made use of, as well as the obstacles they faced when trying to innovate.

This was the first time that a dataset with innovation indicators was produced and made publicly available – not just by the UIS but by organizations worldwide – for countries at different stages of development. In addition to the innovation indicators, details on the methodological procedures of the national surveys of the 65 countries can also be found in the UIS Data Centre¹.

This report presents the main results of the 2013 UIS innovation data collection. For analytical purposes, countries are arranged into two groups according to their income levels², namely: i) high-income countries; and ii) low- and middle-income countries.

Lastly, it is worth stressing that instead of comparing countries in a ‘most or least, best or worst’ ranking fashion, this report seeks to identify trends, common features or dissimilarities presented by firms in countries with different levels of income when undertaking innovative efforts (see also **Box 1**).

Box 1. Methodological procedures of the national surveys and international comparisons

The main purpose of the Oslo Manual is to provide the methodological guidelines for the collection and interpretation of innovation data that are reliable and internationally comparable. Despite the existence of the Oslo Manual for more than 20 years, innovation statistics are not fully harmonised at the international level, as countries do not always adopt exactly the same methodological procedures to carry out their national innovation surveys.

In the UIS innovation data collection in 2013, countries were asked to report data only for manufacturing. This was a deliberate choice that aimed to foster comparability, as customarily manufacturing industries are fully – or at least almost fully – covered in innovation surveys. In practice, however, not all countries were able to supply data that solely and fully covered manufacturing. There were cases where the data in addition to manufacturing covered other industries – such as mining, construction and services – and others where the manufacturing industries were partially covered.

Another issue that hinders comparability is the fact that not all the countries were able to produce estimations. This means that for such countries the indicators produced do not represent the whole national manufacturing industry. They only refer to the firms that replied to the national innovation survey.

Detailed information on the methodological procedures of the national surveys can be found in **Annex II**.

¹ UIS Data Centre, innovation dataset: <http://data.uis.unesco.org/Index.aspx?queryid=244>

² Based on the classification of the World Bank: <http://data.worldbank.org/about/country-and-lending-groups>

Section 2. Innovation rates

Guidelines to measure product innovation and process innovation have been part of the scope of the Oslo Manual since its first edition (OECD, 1992). The most recent edition of the manual (OECD and Eurostat, 2005) also covers two other types of innovation, namely organizational and marketing innovation.

Definition

An **innovation** is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations. A common feature of an innovation is that it must have been implemented. A new or improved product is implemented when it is introduced on the market. New processes, marketing methods or organizational methods are implemented when they are brought into actual use in the firm's operations (Oslo Manual §37, 146).

An innovation does not need to be commercially successful: a new product may not sell as much as expected and can turn out to be a commercial failure.

Until the publication of the third edition of the Oslo Manual, the term technological innovation was used to refer to product and process innovation, while non-technological innovation would relate to organizational and marketing innovations. In addition to including these two types of innovations in its scope, the updated manual has eliminated this distinction, particularly to avoid a narrow interpretation of the word 'technological' by firms from the services sector. However, still ten years after the third edition was published, the misuse of this nomenclature is recurrent.

This section presents innovation rates of countries. Firstly, these rates are presented for each one of the four types of innovation. Subsequently, the discussion is narrowed to indicators related to product and process innovation, regardless of organizational or marketing innovation.

2.1 Types of innovators

Figure 1 illustrates the shares of manufacturing firms that implemented the four types of innovation in high-income countries. Process innovation prevails with the highest shares of innovators in 12 out of 34 countries – including Canada (48%) and Ireland (41.6%). Product innovation appears in second place, prevailing in ten high-income countries as the type of innovation that was implemented by most firms. This was, for example, observed in Germany, where 49.5% of the manufacturing firms were product innovators.

Marketing innovation, on the other hand, concentrates the lowest share of innovators in more than one-half of these countries. In spite of its predominance in 12 countries, process innovation also has the lowest shares of innovators in 10 high-income economies. One of them is Hong Kong Special Administrative Region of China, where only 0.5% of the firms implemented process innovation.

Definitions

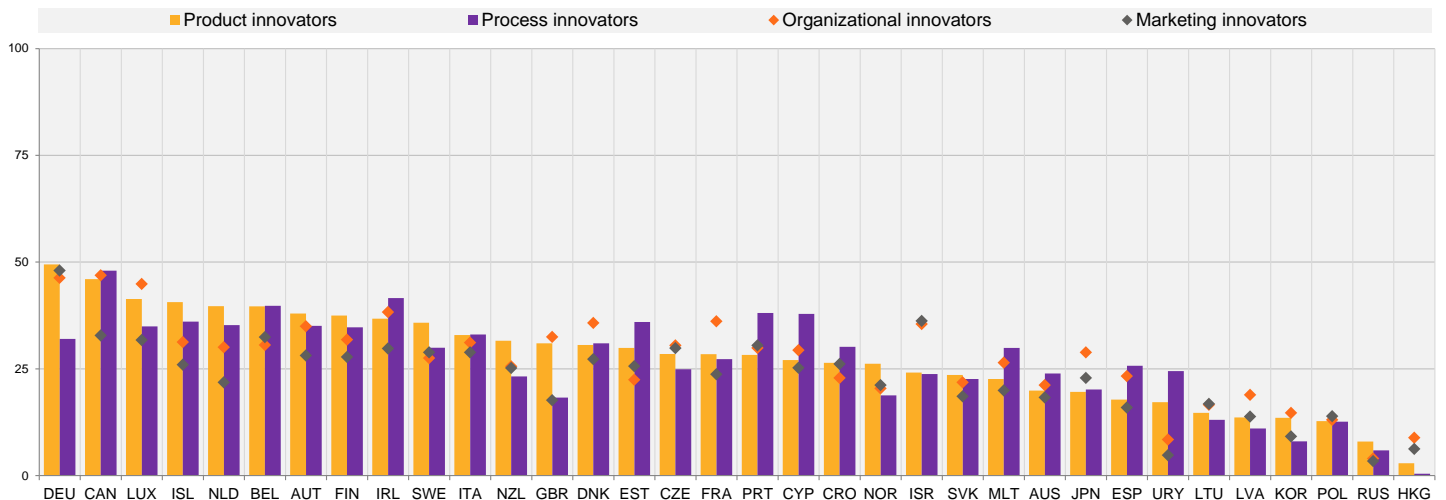
Product innovation is the implementation of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness, or other functional characteristics (Oslo Manual §156). Firms that implemented at least one product innovation are product innovators.

Process innovation is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software (Oslo Manual §163). Firms that implemented at least one process innovation are process innovators.

Organizational innovation is the implementation of a new organizational method in the firm's business practices, workplace organization or external relations (Oslo Manual §177). Firms that implemented at least one organizational innovation are organizational innovators.

Marketing innovation is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion, or pricing (Oslo Manual §169). Firms that implemented at least one marketing innovation are marketing innovators.

Figure 1. Innovators in high-income countries (as a percentage of manufacturing firms)



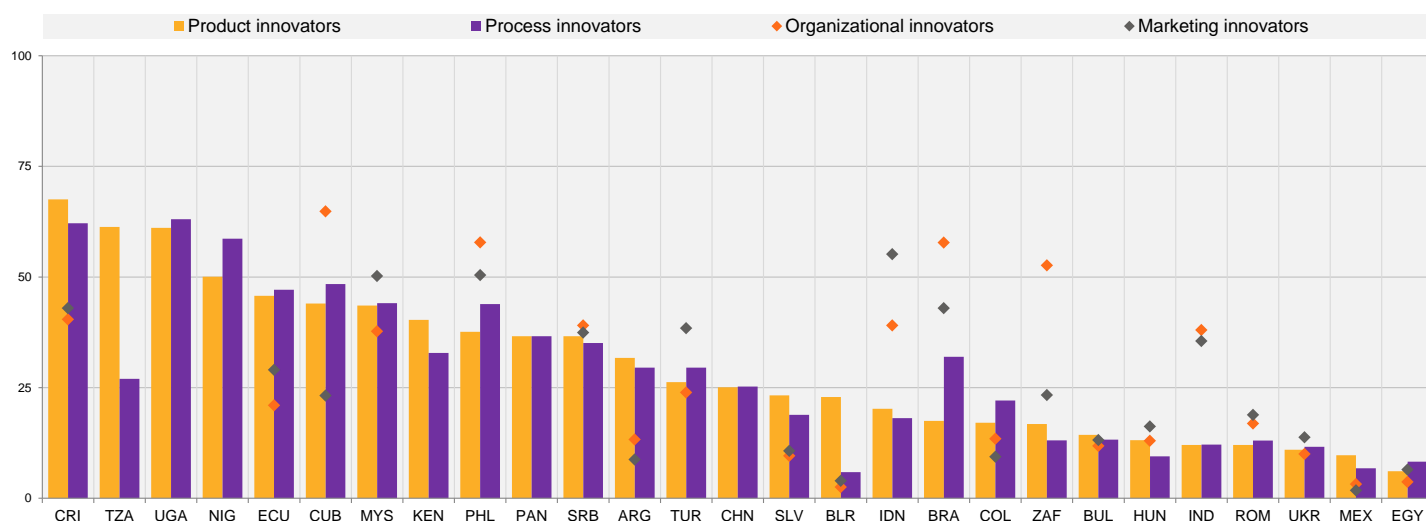
Notes: Please consult Annexes I and II.

Source: 2013 UIS innovation data collection and Eurostat

The shares of innovators in low- and middle-income countries are shown in **Figure 2**. In this group, product innovation leads the way in 9 out of 27 countries. This is the case in Costa Rica (67.5%), for example. Process innovation is implemented by most firms in 7 countries, including Uganda (63.1%) and Nigeria (58.6%).

In relative terms, there are more countries where firms mostly implemented marketing innovation. It is important to note, however, the number of countries without data on organizational and marketing innovation. There seems to be two main reasons for this. The first one is the low quality and reliability of the data, which impede their dissemination, while the second is due to the fact that when conducting an innovation survey for the first time some countries prefer to leave these two types of innovation out of the survey scope, mainly because of their complexity and subjectivity.

Figure 2. Innovators in low- and middle-income countries (as a percentage of manufacturing firms)



Notes: Please consult Annexes I and II.

Source: 2013 UIS innovation data collection, Eurostat and AU/NEPAD

2.2 Innovation-active and innovative firms

There are a few basic indicators³ on innovation that are often used along with the indicators on the share of innovators. Mainly they refer to the combination of firms that implemented more than one type of innovation or had abandoned or ongoing innovation activities. In this report, two basic indicators are examined: the percentage of innovative firms and the percentage of innovation-active firms. At times, these indicators can cover the four types of innovation. However, it is common practice – particularly in regard to the latter – to cover only product or process innovation, as is done in this report.

Henceforth, this report will focus on product and process innovation, regardless of organizational or marketing innovation. Despite the formal measurement of four types of innovation, most of the innovation indicators traditionally cover product and process innovations and subjects related to their development and implementation. This is mainly attributable to the fact that organizational and marketing innovations were out of the measurement scope of previous editions of the Oslo Manual.

³ Contrary to research and experimental development (R&D) indicators, a flagship innovation indicator has not been established yet, despite the existence of methodological guidelines for more than 20 years.

Definitions

Innovation-active firms are those that implemented product or process innovations or had abandoned or ongoing innovation activities to develop product or process innovations.

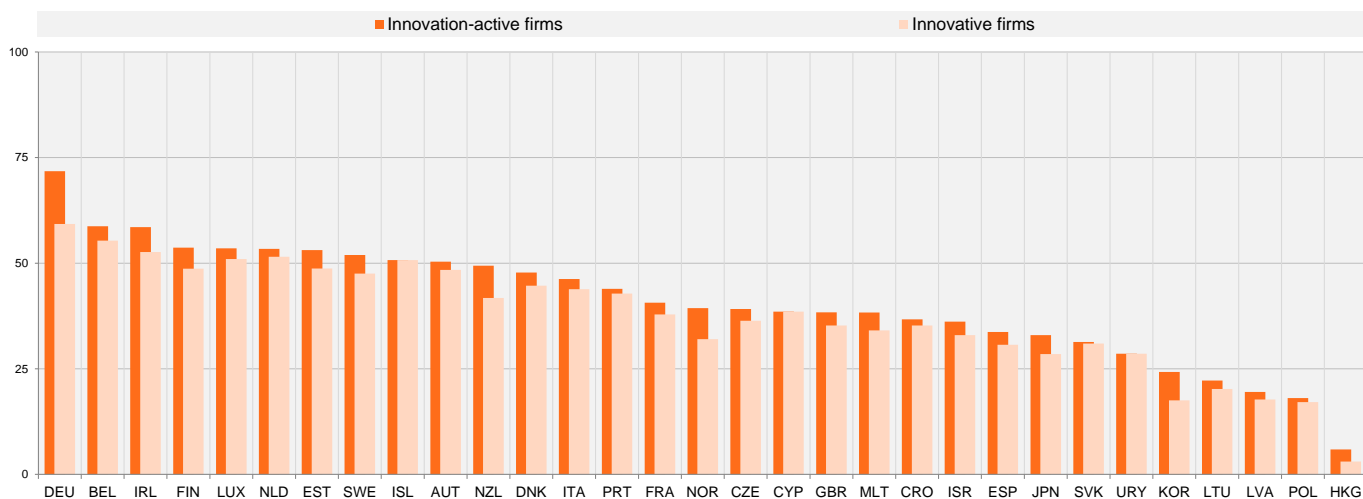
Innovative firms, in turn, only include those firms that really implemented product or process innovations.

Figures 3 and 4 present the shares of product or process innovation-active and innovative firms in high- and low- and middle-income countries, respectively. In these figures, the difference between the darker and lighter bars is the share of firms that only had abandoned or ongoing innovation activities.

In the group of high-income countries, not many gaps are observed between the two bars. There is only one country, Germany, where the percentage of innovation-active firms includes more than 10% of firms with abandoned or ongoing innovation activities. From the share of 71.8% innovation-active firms, around 12.5% correspond to firms that only had abandoned or ongoing innovation activities. This means that 59.3% of firms in fact implemented product or process innovations.

When it comes to low- and middle-income countries, there are four cases where the participation of firms with only abandoned or ongoing innovation activities in the composition of the rate of innovation-active firms is higher than 10%. For example, in Panama 72.9% of innovation-active firms includes 25.6% of firms with only abandoned or ongoing innovation activities. This gives the country a share of 47.3% firms that were actually innovative.

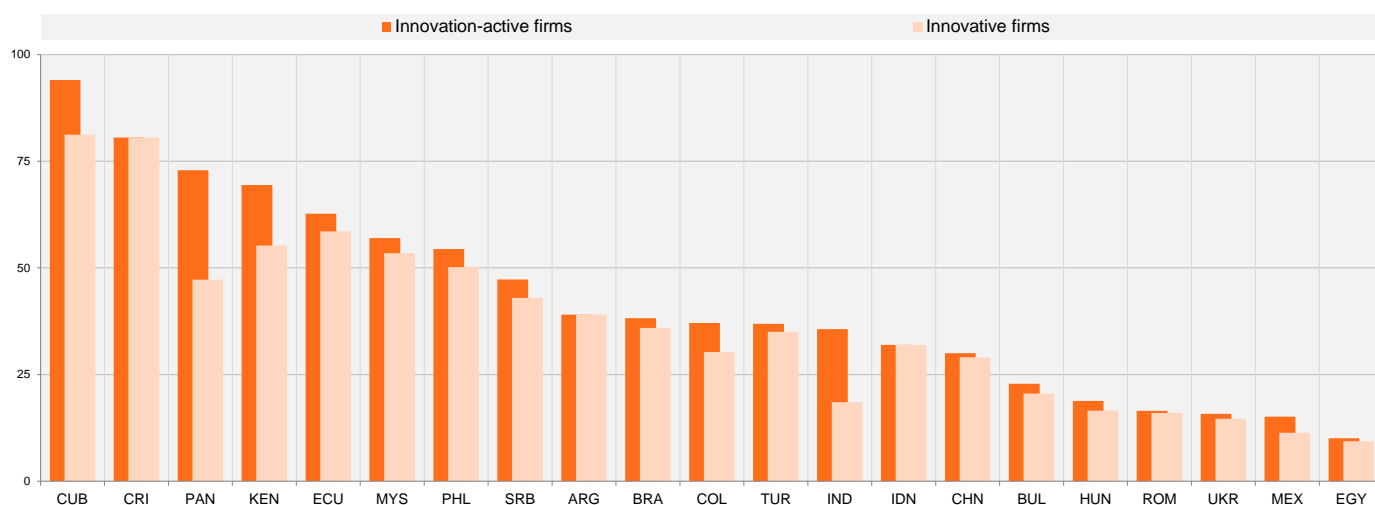
Figure 3. Innovation-active and innovative firms in high-income countries (as a percentage of manufacturing firms)



Notes: Please consult Annexes I and II.

Source: 2013 UIS innovation data collection and Eurostat

Figure 4. Innovation-active and innovative firms in low- and middle-income countries (as a percentage of manufacturing firms)



Notes: Please consult Annexes I and II.

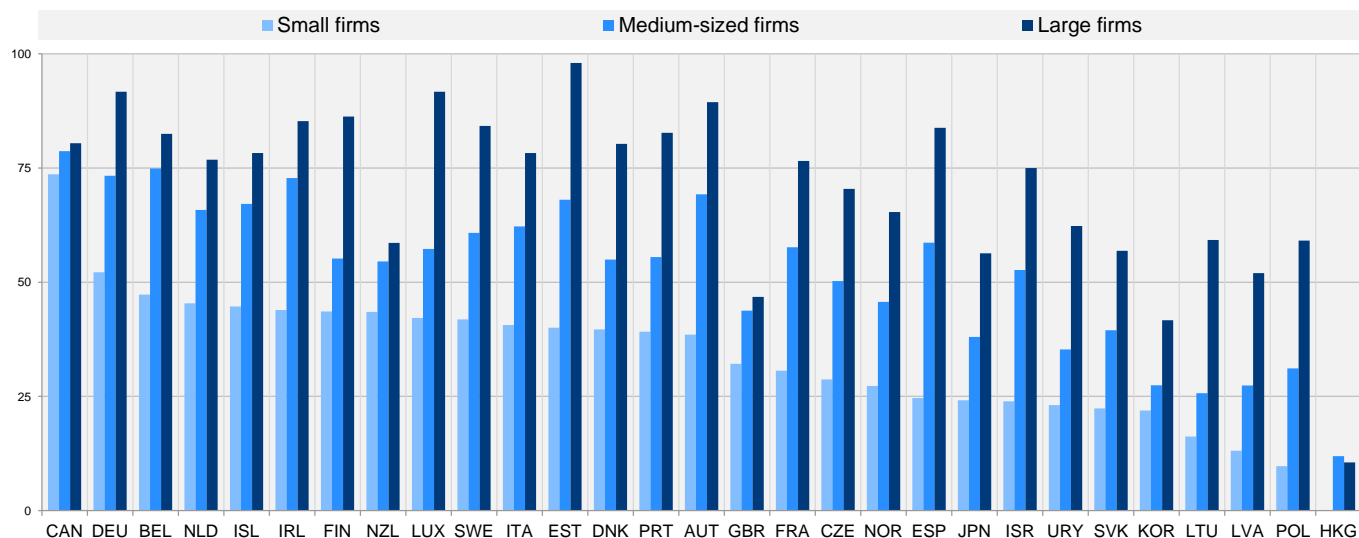
Source: 2013 UIS innovation data collection and Eurostat

Since the size of a firm is indicative in innovation, size breakdowns are another important component to cover when producing business innovation indicators. The shares of product or process innovative firms by size class are illustrated in **Figures 5** and **6** for high-, low- and middle-income countries. Overall, larger manufacturing firms tend to present higher rates of innovation.

In the group of high-income countries, the share of innovators in large firms is above 50% in 26 out of the 29 countries for which this breakdown is available. The exceptions are the United Kingdom (46.8%), the Republic of Korea (41.7%) and Hong Kong Special Administrative Region of China (10.5%). In fact, there are 17 high-income countries where more than 75% of large firms implemented product or process innovations. In low- and middle-income countries, a higher concentration of innovative firms is also observed. The difference is that there is only one country where the share of large innovative firms surpasses 75%, Costa Rica at 75.9%.

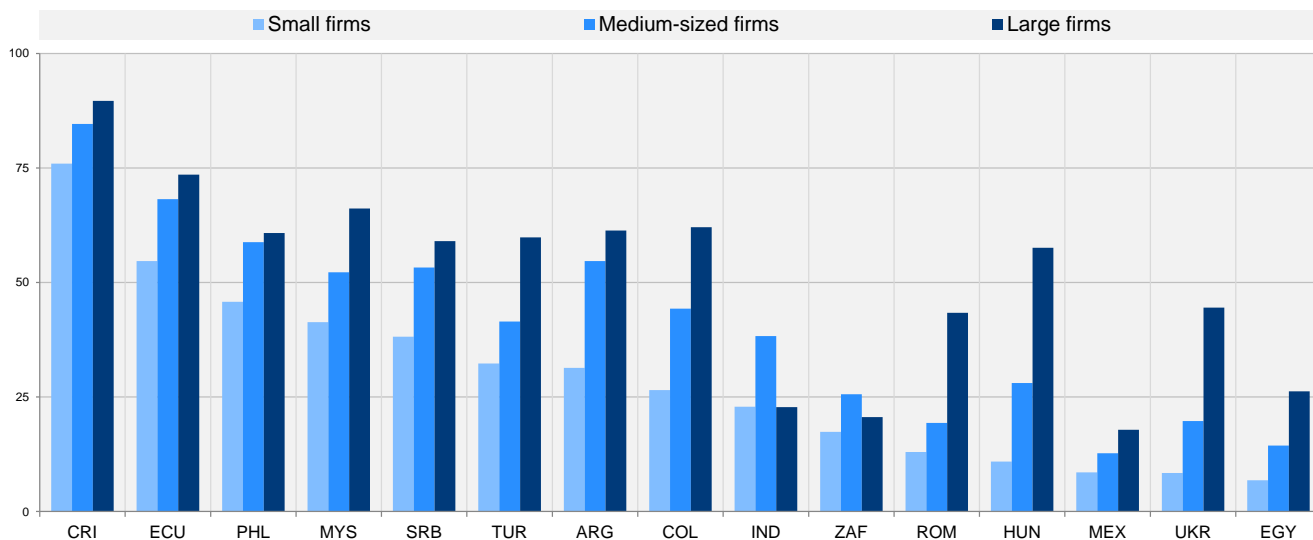
Lastly, it is important to highlight the fact that product or process innovations are basically present in all countries, regardless of the size class analysed. The only economy where a deviation is observed is in Hong Kong Special Administrative Region of China where only 0.1% of small firms were innovative in terms of product or process.

Figure 5. Innovative firms in high-income countries by size class (as a percentage of manufacturing firms in each size class)



Notes: Please consult Annexes I and II.
Source: 2013 UIS innovation data collection and Eurostat

Figure 6. Innovative firms in low- and middle-income countries by size class (as a percentage of manufacturing firms in each size class)



Notes: Please consult Annexes I and II.
Source: 2013 UIS innovation data collection and Eurostat

Section 3. Innovation activities

There is a difference between implementing an innovation and engaging in innovation activities. The former represents either the introduction of a new or significantly improved product on the market or the actual use of new or significantly improved processes and new organizational and marketing methods in the firm's operations. The latter, in turn, refers to steps taken by firms with the aim of implementing an innovation. Innovation activities include: intramural R&D; extramural R&D; acquisition of machinery, equipment and software; acquisition of other external knowledge; training; market introduction of innovations; and other preparations.

Definition

Innovation activities are all scientific, technological, organizational, financial and commercial steps which actually lead, or are intended to lead, to the implementation of innovations. Some innovation activities are themselves innovative, others are not novel activities but are necessary for the implementation of innovations. Innovation activities also include R&D that is not directly related to the development of a specific innovation (Oslo Manual §149).

In national innovation surveys, questions about innovation activities are usually addressed to product or process innovation-active firms. In some countries, however, all innovators respond to the questions⁴. **Table 1** presents the percentage of innovation-active manufacturing firms that engaged in different types of innovation activities.

The predominant innovation activity in 58% of high-income countries is the acquisition of machinery, equipment and software. The share of firms that engaged in such activity varies from 24.2% in Hong Kong Special Administrative Region of China to 98.3% in Cyprus. Internal R&D prevails as the activity performed by most of the innovation-active firms in 32% of these countries. In the Republic of Korea, for instance, 86.4% of firms were internal R&D performers. In contrast, the acquisition of other external knowledge presented the lowest shares of engagement in 55% of high-income countries. In Spain, for instance, only 1.7% of the innovation-active firms engaged in such activity.

In the group of low- and middle-income countries, the predominant innovation activity is also the acquisition of machinery, equipment and software, with 64% of countries having the highest shares of firms engaging in this activity. There are only three countries in this group with the shares of firms performing this activity being lower than 50%. Another interesting finding is that training for innovation prevails in four African countries: Tanzania (96.4%), Kenya (91.4%), Ghana (86%) and Uganda (73.7%). External R&D, conversely, was the activity that presented the lowest shares of engagement in 71% of these countries. Cuba has a much higher share of firms that contracted out R&D (41.3%) than those that performed it internally (9.8%).

⁴ Further information on methodological issues, including the variations on the definition of innovation-active firms, can be found in Annexes I and II.

Table 1. Firms that engaged in innovation activities (as a percentage of innovation-active manufacturing firms)

	In-house R&D	Contracted-out (external) R&D	Acquisition of machinery, equipment and software	Acquisition of external knowledge	Training	Market introduction of innovations	Other preparations
High-income countries							
Australia	18.0	4.8	41.3	5.1	21.7	25.4	21.2
Austria	63.4	34.1	71.6	33.1	61.1	48.1	52.0
Belgium	71.1	34.2	71.2	21.1	61.7	36.6	34.2
China, Hong Kong	83.7	16.6	24.2	16.4	32.8	44.1	90.8
Croatia	66.8	32.7	84.7	28.5	54.7	41.9	48.2
Cyprus	39.6	29.4	98.3	60.4	90.6	53.6	93.6
Czech Republic	61.0	29.9	77.1	22.0	44.2	41.5	47.7
Denmark	49.3	19.9	52.7	40.3	26.4	:	:
Estonia	51.3	26.9	87.6	44.0	50.6	32.5	80.2
Finland	84.3	59.4	69.7	42.6	33.5	41.3	40.0
France	72.4	34.0	61.3	29.7	58.0	35.5	43.3
Germany	56.9	21.2	:	:	:	:	:
Ireland	57.9	25.9	53.8	14.0	:	:	:
Israel	46.5	22.0	88.8	10.1	37.9	42.3	20.4
Italy	50.6	18.1	83.6	12.1	29.4	28.3	9.0
Japan	55.9	23.2	49.1	52.2	53.7	37.0	38.3
Latvia	37.6	20.2	56.5	31.1	35.1	40.4	34.8
Lithuania	56.7	40.5	62.7	36.1	50.3	37.5	25.6
Luxembourg	59.3	31.7	70.7	25.1	74.3	50.9	39.5
Malta	53.0	3.0	45.0	9.0	39.0	29.0	32.0
Netherlands	68.6	26.7	55.9	15.9	37.5	25.6	23.8
New Zealand	34.5	:	48.8	15.8	31.4	32.9	57.2
Norway	77.9	40.8	57.9	28.4	60.0	39.0	43.6
Poland	36.0	20.9	77.1	19.8	52.0	35.7	43.7
Portugal	41.0	18.6	65.7	11.5	51.6	24.2	34.0
Republic of Korea	86.4	14.8	51.9	11.4	47.3	27.0	44.2
Russian Federation	18.9	20.0	64.1	12.7	18.3	9.6	:
Slovakia	52.8	26.9	73.8	18.8	58.4	55.2	59.3
Spain	37.1	20.7	30.0	1.7	15.4	20.3	8.4
Sweden	67.5	33.3	81.9	56.2	25.3	33.5	23.3
Uruguay	38.7	4.3	78.2	14.5	50.2	:	24.8
Low- and middle-income countries							
Argentina	71.9	19.3	80.4	15.1	52.3	:	51.4
Belarus	26.4	18.0	61.0	0.9	13.8	9.6	55.4
Brazil	17.3	7.1	84.9	15.6	62.8	33.7	33.8
Bulgaria	13.8	7.0	65.8	14.5	29.4	23.2	28.7
China	63.3	22.1	66.0	28.1	71.5	60.6	36.9
Colombia	22.4	5.8	68.6	34.6	11.8	21.4	:
Costa Rica	76.2	28.3	82.6	38.9	81.2	:	75.9
Cuba	9.8	41.3	90.2	36.6	22.1	83.8	11.9
Ecuador	34.8	10.6	74.5	27.0	33.7	10.6	10.1
Egypt	39.3	5.4	66.1	9.8	52.7	17.9	33.9
El Salvador	41.6	6.7	:	:	:	82.7	:
Ghana	42.1	14.0	80.7	15.8	86.0	71.9	45.6
Hungary	51.4	25.2	66.2	20.0	34.3	23.8	38.0
India	35.5	11.4	67.6	16.1	39.2	16.7	14.8
Indonesia	58.4	6.2	47.8	27.0	46.5	59.3	94.2
Kenya	44.1	40.9	89.2	50.5	91.4	73.1	68.8
Malaysia	69.3	17.4	59.8	21.9	71.4	48.1	64.5
Mexico	42.9	14.5	35.4	2.6	12.5	11.4	18.0
Morocco	60.3	39.7	:	:	:	:	:
Nigeria	48.8	30.7	82.9	51.7	81.2	61.0	40.5
Panama	11.4	4.7	32.2	8.5	10.0	:	5.2
Romania	37.4	10.1	75.4	12.7	34.2	37.6	27.7
Serbia	59.9	26.2	76.1	20.1	51.6	51.3	34.5
South Africa	54.1	22.4	71.2	24.8	69.6	42.6	47.7
Tanzania	39.3	27.4	79.8	51.2	96.4	64.3	53.6
Turkey	33.0	11.6	53.3	14.4	43.1	49.1	41.2
Uganda	60.1	34.5	68.5	39.9	73.7	56.0	41.5
Ukraine	23.6	9.9	73.2	9.7	20.3	14.0	23.2

Notes: Please consult Annexes I and II; “:” stands for not available.

Source: 2013 UIS innovation data collection, Eurostat and AUNEPAD

Section 4. Linkages

The guidelines of the Oslo Manual place business firms – active in manufacturing, primary industries or the services sector – in the centre of the innovation measurement framework. This by no means suggests that firms are alone when innovating. On the contrary, innovation is an interactive process and the innovation activities of firms may rely on their linkages with other sources of knowledge.

Linkages are sources of knowledge and technology, ranging from passive sources of information to suppliers of embodied and disembodied knowledge and technology to cooperative partnerships. Each linkage connects the firm to other agents in the innovation system: government laboratories, universities, policy departments, regulators, competitors, suppliers and customers (Oslo Manual §252-254).

From a policymaking perspective, it is therefore important to clearly identify the linkages that firms rely on to foster innovation. Innovation surveys usually try to measure two types of linkages: sources of information and cooperation.

4.1 Sources of information

Table 2 presents the sources of information that are rated as ‘highly important’ for innovation by innovation-active firms. Internal sources of information are most frequently rated as highly important by firms from both groups of countries.

Definition

The innovative activities of a firm partly depend on the variety and structure of its links to sources of information, knowledge, technologies, practices, and human and financial resources (Oslo Manual §252). **Sources of information** are the sources that provide information for new innovation projects or contribute to the completion of existing innovation projects.

The enterprise or enterprise group is the source of information most frequently rated as highly important for 96% of high-income countries. Only one country in this group has a predominance of another source of information – in the Russian Federation, 34.9% of firms rated clients or customers as highly important sources. Even in this case, the share is just marginally higher – around 2 percentage points.

In the group of low- and middle-income countries, in addition to the predominance of internal sources in 63% of countries, market sources, mainly clients or customers, prevail in 33% of countries. Moreover, Argentina is the only country where suppliers cumulate the highest share of firms rating them as a highly important source of information (52.7%). Similarly, the government or public research institutes are the prevailing source of information solely in Cuba (24.7%).

Table 2. Firms that rated sources of information as highly important (as a percentage of innovation-active manufacturing firms)

	Internal	Market				Institutional		Other		
	Within your enterprise or enterprise group	Suppliers of equipment, materials, components, or software	Clients or customers	Competitors or other enterprises in your sector	Consultants, commercial labs, or private R&D institutes	Universities or other higher education institutions	Government or public research institutes	Conferences, trade fairs, exhibitions	Scientific journals and trade/technical publications	Professional and industry associations
High-income countries										
Australia	72.9	28.6	42.1	21.0	13.7	1.2	2.9	10.0	23.0	16.3
Belgium	55.1	26.7	28.7	8.4	4.7	5.2	1.6	11.7	6.7	3.1
Croatia	44.0	27.7	33.2	14.5	5.3	2.7	0.5	14.1	8.2	2.4
Cyprus	92.8	71.9	63.4	48.1	41.3	6.0	5.5	63.0	31.5	20.4
Czech Republic	42.7	21.8	36.8	18.5	3.9	4.3	2.3	13.3	3.8	1.9
Estonia	30.1	29.4	18.8	9.3	5.8	4.2	1.1	12.7	2.0	1.3
Finland	63.4	17.3	41.1	11.7	3.6	4.5	2.8	8.8	3.4	2.5
France	51.2	19.9	27.8	9.4	6.2	3.4	3.1	10.8	7.9	5.5
Israel	79.3	17.6	19.1	7.9	7.5	3.7	2.2	13.7	6.7	2.1
Italy	35.5	18.8	17.6	4.5	15.1	3.7	1.0	9.7	3.7	4.4
Japan	33.7	20.7	30.5	7.5	6.2	5.1	4.8	4.6	2.0	2.9
Latvia	44.4	23.3	23.9	16.5	7.8	3.4	1.6	20.2	7.1	3.4
Lithuania	37.5	15.6	18.9	12.2	4.1	2.9	3.8	13.1	2.2	0.5
Luxembourg	68.3	36.5	46.1	24.6	12.6	7.8	3.6	38.3	24.0	18.6
Malta	46.0	39.0	38.0	21.0	10.0	4.0	2.0	13.0	2.0	3.0
New Zealand	86.4	51.0	76.3	43.1	43.4	10.2	16.0	45.9	48.3	21.4
Norway	79.1	50.4	78.3	30.0	9.4	7.2	10.5	10.5	16.0	30.4
Poland	48.2	20.2	19.2	10.1	5.2	5.8	7.3	14.8	10.3	4.8
Portugal	33.9	18.5	30.3	10.2	5.9	3.2	2.2	13.9	6.0	4.3
Republic of Korea	47.4	16.1	27.7	11.3	3.4	3.9	6.1	6.7	5.2	4.9
Russian Federation	32.9	14.1	34.9	11.3	1.7	1.9	:	7.4	12.0	4.1
Slovakia	50.5	27.2	41.6	18.1	2.8	2.5	0.6	12.4	13.6	1.4
Spain	45.5	24.2	20.9	10.4	8.7	5.0	7.7	8.7	4.7	3.9
Uruguay	52.9	24.2	40.3	21.2	13.6	5.8	:	27.1	18.0	:
Low- and middle-income countries										
Argentina	26.4	52.7	36.3	16.4	28.5	40.0	42.4	:	:	:
Brazil	41.3	41.9	43.1	23.8	10.2	7.0	:	:	:	:
Bulgaria	28.6	22.4	26.1	13.6	5.5	:	:	13.6	9.4	5.1
China	49.5	21.6	59.7	29.6	17.1	8.9	24.7	26.7	12.0	14.8
Colombia	97.6	42.5	52.6	32.1	28.4	16.2	8.0	43.7	47.3	24.5
Cuba	13.6	:	11.5	5.1	:	19.6	24.7	:	:	:
Ecuador	67.0	34.9	59.0	27.1	10.7	2.0	2.2	22.2	42.5	6.3
Egypt	75.9	32.1	16.1	17.0	2.7	1.8	0.9	22.3	13.4	4.5
El Salvador	:	26.4	40.3	5.4	15.2	3.8	1.8	13.9	10.3	:
Ghana	43.9	29.8	35.1	17.5	5.3	:	3.5	14.0	7.0	14.0
Hungary	50.5	26.4	37.4	21.3	13.0	9.9	3.3	16.6	9.6	7.7
India	58.5	43.3	59.0	32.6	16.8	7.9	11.0	29.7	15.1	24.5
Indonesia	0.4	1.3	1.8	1.3	0.9	0.4	0.4	0.9	0.9	0.9
Kenya	95.7	88.2	90.3	80.6	52.7	37.6	39.8	71.0	64.5	72.0
Malaysia	42.4	34.5	39.0	27.9	15.0	9.5	16.7	28.1	21.7	23.6
Mexico	92.2	43.6	71.9	44.0	19.0	26.4	23.6	36.9	24.5	:
Morocco	:	51.3	56.4	15.4	17.9	6.4	12.8	43.6	34.6	25.6
Nigeria	51.7	39.3	51.7	30.0	14.6	6.8	4.1	11.5	7.1	20.2
Panama	43.6	10.9	15.2	6.6	5.2	2.4	2.4	5.2	0.5	1.9
Philippines	70.7	49.5	66.2	37.9	21.2	10.1	7.1	21.7	16.7	15.7
Romania	42.1	31.8	33.5	20.5	5.2	3.3	2.0	14.3	10.2	3.5
Serbia	36.2	18.3	27.3	10.5	7.8	5.3	2.6	14.8	10.3	5.7
South Africa	44.0	17.9	41.8	11.6	6.9	3.1	2.3	12.9	16.7	8.4
Tanzania	61.9	32.1	66.7	27.4	16.7	7.1	11.9	16.7	9.5	20.2
Turkey	32.6	29.1	33.9	18.0	5.2	3.7	2.8	19.7	9.4	6.9
Uganda	60.9	24.8	49.0	23.0	12.2	3.2	5.0	16.4	8.3	11.3
Ukraine	28.6	22.4	21.9	11.0	4.7	1.9	4.6	14.7	9.1	4.0

Notes: Please consult Annexes I and II.
 “:” Not available.

Source: 2013 UIS innovation data collection, Eurostat and AU/NEPAD

4.2 Cooperation

In contrast to the use of sources of information, innovation cooperation requires that the parties collaborating play an active role in the work being undertaken. Innovation cooperation can take place along supply chains and involve customers and suppliers in the joint development of new products, processes or other innovations. Exchange of technological and business information naturally accompanies the trade of goods and services. Information on customer needs and their experience with a supplier's product play a key role in innovation. Innovation cooperation can also involve horizontal collaboration, with firms working jointly with other firms or public research institutions (Oslo Manual §273-274).

Definition

Cooperation is the active participation in joint innovation projects with other organizations. These may either be other firms or non-commercial institutions. The partners need not derive immediate commercial benefit from the venture. Pure contracting out of work, where there is no active collaboration, is not regarded as cooperation (Oslo Manual §271).

Table 3 presents the percentage of innovation-active manufacturing firms that cooperated with certain partners in order to develop their innovation activities. When it comes to the active collaboration in innovation projects, linkages with the market appear to play a more important role than internal ones.

Opposite to the indicator on sources of information, the enterprise or enterprise group prevails as a partner in only one high-income country – Malta at 13%. In 74% of countries in this group, suppliers predominate as innovation partners. Likewise, the predominance of suppliers and clients or customers as innovation partners is observed in low- and middle-income countries, where competitors and consultants also appear as the leading cooperation partners of firms in Argentina (9.7%) and Egypt (7.1%), respectively.

Box 2. Linkages with institutional sources and partners

In this report, the term 'institutional' covers interactions with two types of agents: i) universities or other higher education institutions; and ii) the government or public research institutes. Overall, the linkages with them are remarkably low.

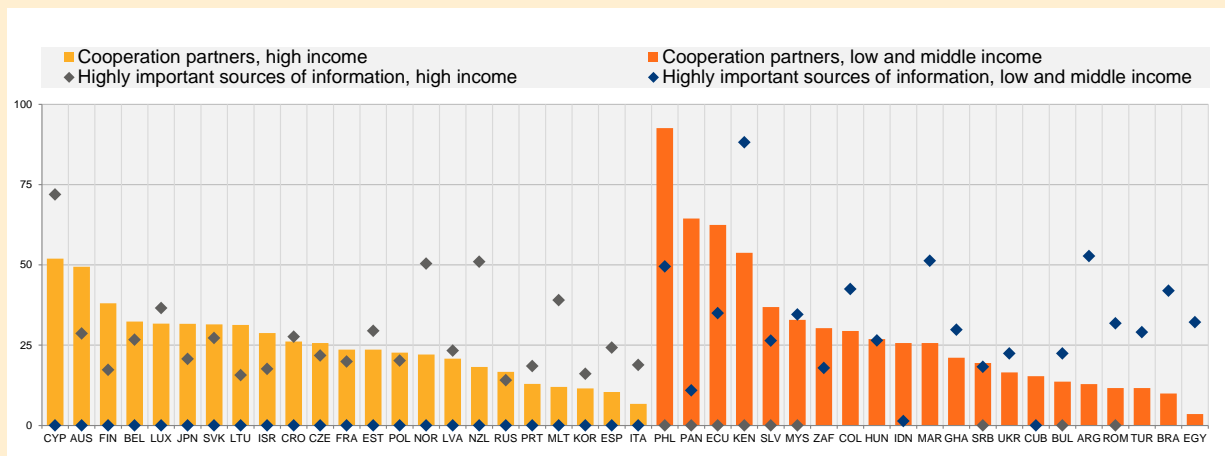
There is only one country where an institutional source prevails as a source of information: in Cuba, 24.7% of innovation-active firms rated the government or public research institutes as a highly important source of information.

The situation is more critical when it comes to cooperation. Only in Argentina (16.1%) and the Republic of Korea (12.8%) is the government or public research institutes an important innovation partner for firms. Moreover, universities and other higher educational institutions – major contributors to the innovation process of business firms – are the predominant innovation partners in Germany⁵ only, where 17.1% of innovation-active firms cooperated with such partners.

Figure 7 illustrates the percentages of firms that had linkages with universities or other higher education institutions. With the exception of New Zealand, high-income countries have higher shares of firms cooperating with these agents than rating them as a highly important information source. In low- and middle-income countries, this happens in 65% of cases.

⁵ Sources of information are out of the scope of the German innovation survey, for this reason, the country was not included in Figure 7.

Figure 7. Firms that had linkages with universities or other higher education institutions (as a percentage of innovation-active manufacturing firms)



Notes: Please consult Annexes I and II.

Source: 2013 UIS innovation data collection, Eurostat and AU/NEPAD.

Table 3. Firms that cooperated with partners (as a percentage of innovation-active manufacturing firms)

	Internal	Market				Other	
	Other enterprises within your enterprise group	Suppliers of equipment, materials, components, or software	Clients or customers	Competitors or other enterprises in your sector	Consultants, commercial labs, or private R&D institutes	Universities or other higher education institutions	Government or public research institutes
High-income countries							
Australia	21.4	49.4	41.6	21.4	36.2	1.4	5.6
Austria	21.2	30.2	22.8	8.0	20.2	24.7	11.6
Belgium	17.7	32.4	19.2	9.3	16.5	19.6	10.8
Croatia	8.6	26.1	21.6	13.9	12.3	13.9	9.1
Cyprus	8.1	51.9	45.5	37.0	34.0	7.7	9.4
Czech Republic	14.5	25.6	21.1	10.0	14.0	16.6	6.6
Denmark	16.8	28.9	25.1	9.1	17.2	14.5	10.5
Estonia	20.3	23.6	23.1	10.5	11.3	9.9	2.5
Finland	23.6	38.1	41.6	33.2	34.2	33.8	24.8
France	16.1	23.6	20.2	9.8	14.3	13.2	10.8
Germany	8.6	14.2	13.5	3.0	8.7	17.1	8.1
Iceland	6.2	9.5	23.7	3.8	1.9	10.4	15.6
Ireland	15.4	19.6	17.0	4.1	15.1	13.0	10.0
Israel	:	28.8	40.1	15.4	20.3	14.4	10.1
Italy	2.2	6.7	5.1	2.7	6.6	5.3	2.2
Japan	:	31.7	31.5	19.9	16.9	15.7	14.4
Latvia	14.0	20.8	19.6	14.0	10.6	5.9	1.9
Lithuania	17.7	31.3	24.2	11.3	14.8	13.1	8.6
Luxembourg	22.8	31.7	29.9	19.2	22.8	19.2	22.8
Malta	13.0	12.0	8.0	4.0	7.0	7.0	3.0
Netherlands	14.5	26.3	14.7	7.7	13.7	11.0	7.8
New Zealand	:	18.2	18.7	16.6	:	7.2	5.9
Norway	16.8	22.1	22.0	7.6	19.4	14.3	18.1
Poland	11.2	22.7	15.2	7.7	10.1	12.6	9.0
Portugal	5.1	13.0	12.2	4.7	8.3	7.5	4.8
Republic of Korea	:	11.5	12.8	8.1	6.3	10.0	12.8
Russian Federation	12.6	16.7	10.9	3.9	5.1	9.1	15.6
Slovakia	18.6	31.5	27.8	20.8	16.1	15.7	10.8
Spain	5.5	10.4	6.7	3.5	6.3	7.3	9.7
Sweden	33.3	35.9	30.7	14.2	29.7	18.3	8.8
Turkey	10.4	11.6	10.7	7.4	7.9	6.4	6.6
United Kingdom	6.2	9.4	11.0	3.8	4.5	4.7	2.5
Low- and middle-income countries							
Argentina	:	12.9	7.6	3.5	9.3	14.5	16.1
Brazil	:	10.0	12.8	5.2	6.2	6.3	:
Bulgaria	3.9	13.6	11.2	6.4	5.8	5.7	3.0
Colombia	:	29.4	21.0	4.1	15.5	11.2	5.3
Costa Rica	:	63.9	61.1	16.5	49.6	35.3	8.1
Cuba	:	15.3	28.5	22.1	:	14.9	26.4
Ecuador	:	62.4	70.2	24.1	22.1	5.7	3.0
Egypt	:	3.6	7.1	0.9	7.1	1.8	0.9
El Salvador	:	36.9	42.1	1.3	15.3	5.5	3.4
Ghana	28.1	21.1	31.6	17.5	22.8	12.3	8.8
Hungary	15.5	26.9	21.1	16.4	20.1	23.1	9.9
Indonesia	:	25.7	15.9	8.0	10.2	8.4	4.9
Kenya	:	53.8	68.8	54.8	51.6	46.2	40.9
Malaysia	:	32.9	28.8	21.2	25.5	20.7	17.4
Mexico	:	:	:	9.7	:	7.0	6.1
Morocco	:	25.6	:	:	19.2	3.8	:
Panama	:	64.5	0.5	18.5	3.8	1.4	7.6
Philippines	91.2	92.6	94.1	67.6	64.7	47.1	50.0
Romania	2.8	11.7	10.6	6.2	5.9	7.2	3.1
Serbia	16.6	19.4	18.3	13.0	12.4	12.5	9.8
South Africa	14.2	30.3	31.8	18.6	21.1	16.2	16.2
Ukraine	:	16.5	11.5	5.3	5.7	4.2	6.6

Notes: Please consult Annexes I and II.
“:” Not available.

Source: 2013 UIS innovation data collection, Eurostat and AU/NEPAD

Section 5. Hampering factors

Policymakers and business leaders need accurate information on factors that support innovation, as well as on the obstacles that may hinder it, which may take many forms. For this report, the hampering factors for innovation activities have been divided into four categories: cost factors; knowledge factors; market factors; and reasons not to innovate. The results are presented for innovation-active firms and non-innovative firms.

Definitions

Innovation activity may be hampered by a number of factors. There may be reasons for not starting innovation activities at all; there may be factors that slow innovation activity or affect them negatively. These **hampering factors** include: economic factors, such as high costs or lack of demand; knowledge factors, such as lack of skilled personnel; market factors, such as uncertainty in the demand for innovative products; and other factors, such as regulations (Oslo Manual §410).

5.1 Hampering factors for innovation-active firms

Table 4 presents the hampering factors which were highly important for innovation-active firms. Cost factors are the prevailing obstacles in both groups of countries.

In the high-income group, the lack of funds within the enterprise or enterprise group was the cost factor rated as highly important by most of the firms in 48% of countries, followed by the high costs of innovation, which prevailed in 33% of the countries. Altogether cost factors were the obstacle that was most frequently rated as highly important by innovation-active firms in 81% of high-income countries.

Moreover, in a few high-income countries there was the predominance of hampering factors of a different nature, namely knowledge and institutional factors. The lack of qualified personnel was the knowledge hampering factor most frequently rated as highly important by the innovation-active firms in Australia, Japan and Uruguay. The difficulty of finding cooperation partners was the prevailing knowledge hampering factor for firms in Canada. Additionally, the uncertain demand for innovative goods or services, a market hampering factor, prevailed in Luxembourg (16.8%).

The predominance of cost hampering factors is also observed in the group of low- and middle-income countries. Cost factors were the obstacles most frequently rated as highly important by innovation-active firms in 92% of countries. In addition to the lack of internal funds and high costs of innovation, the lack of funding from sources outside the enterprise also appears as a predominant cost factor, most notably seen in Costa Rica and Mexico. Knowledge factors were the predominant obstacles for innovation-active firms in Egypt, where the lack of information on markets was a highly important hampering factor for 35.7% of the firms, and Panama, where 77.3% of the firms rated the lack of qualified personnel as a highly important obstacle for innovation.

Table 4. Innovation-active firms that rated hampering factors as highly important (as a percentage of innovation-active manufacturing firms)

	Cost factors			Knowledge factors				Market factors		Reasons not to innovate	
	Lack of funds within your enterprise or enterprise group	Lack of financing from sources outside the enterprise	Innovation costs are too high	Lack of qualified personnel	Lack of information on technology	Lack of information on markets	Difficulty in finding cooperation partners for innovation	Market dominated by established enterprises	Uncertain demand for innovative goods or services	No need due to prior innovations by your enterprise	No demand for innovations
High-income countries											
Australia	:	33.8	28.7	36.2	4.1	:	:	:	22.4	:	:
Belgium	16.8	10.7	19.2	16.2	5.6	5.0	6.2	14.0	10.2	1.9	3.1
Canada	21.5	12.9	:	25.8	:	:	27.4	:	22.5	:	:
Croatia	46.3	33.0	38.5	18.1	5.5	6.5	12.6	17.9	13.5	1.2	2.4
Cyprus	28.5	28.9	33.6	11.5	8.9	1.7	9.4	14.5	14.9	:	:
Czech Republic	35.7	20.0	24.8	11.9	2.5	2.5	4.1	19.4	12.7	2.9	4.4
Estonia	23.4	18.8	15.4	15.2	3.8	3.0	4.7	11.3	9.3	5.5	3.9
Finland	22.5	14.6	16.4	9.2	2.9	5.3	3.9	7.1	10.8	3.5	3.7
France	33.6	20.3	29.0	15.1	5.8	7.0	9.7	15.7	21.8	3.2	4.6
Iceland	23.7	19.9	15.6	4.3	2.4	2.4	5.7	2.8	8.1	2.4	2.8
Ireland	27.6	22.9	18.8	10.9	3.6	5.8	7.8	15.7	18.8	3.4	5.1
Italy	27.6	28.4	32.0	9.2	3.6	4.7	12.5	16.9	23.0	0.1	1.9
Japan	11.0	5.2	12.0	14.2	9.0	7.6	6.4	5.3	8.8	3.8	6.9
Latvia	25.8	17.7	28.9	15.2	4.3	9.3	16.8	20.8	14.6	7.8	7.8
Lithuania	27.1	20.1	26.6	14.1	4.5	5.7	8.8	18.2	8.8	1.4	a
Luxembourg	10.2	4.8	9.6	10.2	3.0	5.4	10.8	15.6	16.8	1.8	4.2
Malta	23.0	22.0	31.0	8.0	4.0	12.0	10.0	24.0	25.0	4.0	5.0
New Zealand	:	:	30.3	12.1	:	:	2.4	:	:	:	:
Norway	19.8	18.3	27.7	14.2	3.4	4.1	6.9	9.5	11.5	1.3	3.5
Poland	32.0	26.0	34.5	8.2	6.2	6.1	9.6	17.9	17.0	5.0	6.3
Portugal	39.6	34.9	42.9	15.2	7.6	7.4	15.3	18.2	21.7	4.2	8.2
Republic of Korea	24.6	11.1	16.8	15.8	11.8	9.3	6.0	5.6	14.5	2.0	2.5
Russian Federation	39.8	:	27.8	5.3	1.8	2.9	1.6	:	9.1	:	:
Slovakia	33.2	:	26.1	13.6	5.5	5.5	5.1	15.5	10.5	-	-
Spain	40.0	37.9	39.0	10.9	8.1	8.9	11.7	18.6	29.4	5.8	7.5
Sweden	21.2	11.8	12.4	12.0	2.3	4.2	3.4	12.6	8.3	1.3	2.6
Uruguay	:	:	:	32.0	13.0	18.4	:	:	:	:	:
Low- and middle-income countries											
Belarus	35.5	8.4	24.3	6.8	3.7	4.4	2.3	:	5.1	:	8.4
Brazil	:	20.1	25.0	23.7	8.1	6.5	10.6	:	:	:	:
Bulgaria	40.1	31.2	40.6	18.1	:	:	21.4	21.4	27.9	:	7.8
Colombia	27.0	18.2	:	11.0	7.3	9.4	16.4	:	19.4	:	:
Costa Rica	:	27.2	17.6	26.9	9.2	12.9	23.2	23.8	:	:	:
Cuba	55.3	39.1	10.6	26.8	54.0	33.2	:	:	27.2	:	:
Ecuador	28.2	23.9	37.9	23.8	22.5	17.8	15.5	20.9	16.7	:	:
Egypt	28.6	30.4	22.3	26.8	33.9	35.7	28.6	24.1	31.3	25.9	25.9
El Salvador	55.6	:	:	50.7	28.9	:	:	:	41.4	:	34.7
Ghana	47.4	28.2	38.6	14.1	7.0	8.8	17.5	19.3	12.3	5.3	:
Hungary	31.1	20.4	29.3	14.2	4.0	4.2	7.0	13.4	22.5	2.3	4.9
India	58.7	32.0	36.0	53.3	31.2	34.8	:	24.3	19.7	:	:
Indonesia	1.8	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	:	:
Kenya	47.3	35.5	51.6	17.2	12.9	10.8	17.2	23.7	18.3	3.2	5.4
Malaysia	50.5	46.2	61.9	38.3	20.5	21.4	23.3	40.0	36.9	7.6	7.4
Mexico	48.5	57.9	52.6	19.1	22.6	24.3	:	:	26.4	:	:
Nigeria	51.0	45.9	48.5	13.7	15.6	14.4	23.4	22.7	22.0	11.5	9.3
Panama	33.6	7.1	15.6	77.3	59.7	59.7	55.5	69.7	44.1	47.9	32.2
Philippines	19.1	10.2	20.9	11.7	8.2	10.0	5.6	14.7	9.9	:	:
Romania	39.3	26.4	30.4	8.5	2.4	4.7	7.1	22.2	19.6	5.8	5.7
Serbia	56.4	38.3	45.1	9.7	5.7	5.4	16.6	22.0	21.7	5.4	6.6
South Africa	38.1	23.5	33.5	23.0	11.9	11.7	13.1	17.5	15.5	3.0	2.9
Tanzania	52.4	48.8	42.9	33.3	20.2	13.1	16.7	21.4	19.0	7.1	3.6
Uganda	50.3	40.2	51.1	13.3	19.7	15.2	26.3	28.3	26.1	5.8	7.6
Ukraine	65.6	38.1	57.0	13.5	6.6	6.0	17.9	34.7	16.8	6.1	9.9

Notes: Please consult Annexes I and II.

“:” Not available.

“-” Nil.

Source: 2013 UIS innovation data collection, Eurostat and AU/NEPAD

Other factors, such as the lack of information on technology, market domination by established enterprises, prior implementation of innovations and the absence of demand for innovation, were not seen as important obstacles in any country in both groups. As previously mentioned, cost factors – particularly lack of funds within the enterprise or enterprise group – appear to be predominant for both groups.

One noticeable difference between the two groups is the percentage of firms that rated hampering factors as highly important. Amongst the high-income countries, Portugal had the highest share, with 42.9% of innovation-active firms considering innovation costs to be too high. In low- and middle-income countries, in contrast, a few countries had more than one-half of innovation-active firms rating these factors as highly important. In Panama, for instance, in addition to the already mentioned 77.3% of firms that considered the lack of qualified personnel to be highly important, four other factors were also rated as highly important by more than one-half of the firms: the lack of information on technology (59.7%), the lack of information on markets (59.7%), the difficulty in finding cooperation partners for innovation (55.5%) and the market domination by established enterprises (69.7%).

5.2 Hampering factors for non-innovative firms

Table 5 presents the the hampering factors which were highly important for non-innovative firms. Similar to what was observed in the case of innovation-active firms, cost factors are also the obstacle that hindered innovation most in non-innovative firms.

In 42% of high-income countries, high costs of innovation were the hampering factor that firms that did not innovate most frequently rated as highly important. Lack of funds within the enterprise or enterprise group appears in second place, prevailing in 23% of these countries. It is worth noticing that in 19% of countries, most of the non-innovative firms considered the lack of need to innovate due to no demand for innovations to be a highly important hampering factor. This was the case for instance for 29.1% of the non-innovative firms in the Czech Republic.

High costs of innovation also prevailed as an obstacle for non-innovative firms in 38% of low- and middle-income countries. As observed in the case of innovation-active firms, high costs of innovation appear in second place for non-innovative firms, being the predominant hampering factor in 21% of the low- and middle-income countries. Moreover, it is interesting to observe that the lack of funding from sources outside the enterprise is the predominant hampering factor for non-innovative firms in the same two countries where it prevailed amongst innovation-active firms, namely: Costa Rica and Mexico.

Another remark worth mentioning is the observed prevalence of obstacles that are not related to costs or knowledge in some cases, in particular the reasons not to innovate. The lack of demand for innovation was rated as a highly important hampering factor by 41.8% of the non-innovative firms in Kazakhstan and by 54.6% of the non-innovative firms in South Africa. For the latter, the same factor was rated as highly important by only 2.9% of the innovation-active firms.

Table 5. Non-innovative firms that rated hampering factors as highly important (as a percentage of non-innovative manufacturing firms)

	Cost factors			Knowledge factors				Market factors		Reasons not to innovate	
	Lack of funds within your enterprise or enterprise group	Lack of financing from sources outside the enterprise	Innovation costs are too high	Lack of qualified personnel	Lack of information on technology	Lack of information on markets	Difficulty in finding cooperation partners for innovation	Market dominated by established enterprises	Uncertain demand for innovative goods or services	No need due to prior innovations by your enterprise	No demand for innovations
High-income countries											
Australia	:	12.4	9.5	15.3	:	:	:	:	18.5	:	:
Belgium	13.4	10.3	19.0	12.4	4.4	4.3	6.8	13.9	14.8	12.1	22.9
Croatia	28.3	21.4	29.2	9.8	3.8	3.3	8.4	13.1	11.5	4.0	5.6
Cyprus	63.3	56.0	64.2	19.3	13.0	8.9	13.9	42.1	52.2	43.0	43.7
Czech Republic	27.3	15.8	23.7	7.1	2.5	2.5	6.0	16.5	12.9	10.2	29.1
Estonia	23.7	21.2	16.6	8.6	2.2	2.1	5.2	13.6	9.7	6.4	7.8
Finland	15.1	8.8	14.0	7.3	5.4	5.0	7.6	8.9	13.5	8.2	7.4
France	21.2	12.2	21.5	11.3	4.8	5.1	7.7	12.9	17.4	12.9	24.5
Iceland	7.0	12.4	4.3	:	:	:	:	2.7	:	5.4	2.7
Ireland	25.9	22.4	24.8	7.0	2.7	3.6	4.8	13.0	16.0	14.7	17.2
Italy	36.4	27.5	35.1	8.8	4.0	4.7	12.9	19.1	24.3	2.1	15.1
Japan	10.8	4.1	9.0	11.1	7.8	6.5	5.7	5.3	7.1	4.0	7.6
Latvia	28.4	23.8	35.7	13.3	7.1	8.4	18.2	25.9	21.4	9.6	16.3
Lithuania	34.6	28.2	35.3	14.5	9.2	9.9	15.5	26.6	22.0	25.3	21.8
Luxembourg	2.8	-	3.7	1.9	-	-	0.9	0.9	1.9	6.5	24.3
Malta	8.5	3.5	12.7	4.9	2.8	2.1	2.1	8.5	5.6	3.5	7.0
New Zealand	:	:	17.4	7.2	:	:	2.0	:	:	:	:
Norway	6.8	6.7	7.7	3.8	1.5	1.7	2.7	3.5	6.5	1.2	2.2
Poland	31.4	26.6	33.4	16.4	14.0	13.5	18.4	21.7	22.7	16.7	16.8
Portugal	34.7	30.8	45.0	11.2	7.6	9.2	18.3	23.6	34.1	10.3	19.4
Republic of Korea	10.8	3.9	5.8	6.0	3.5	3.5	2.6	2.4	6.4	3.4	12.4
Russian Federation	32.9	:	24.1	8.0	4.2	4.1	3.3	:	8.1	:	:
Slovakia	23.9	:	31.6	9.7	4.5	4.6	12.8	12.4	16.9	11.8	16.8
Spain	36.7	31.0	38.1	18.3	14.3	13.1	15.2	18.8	28.5	11.2	24.5
Sweden	8.5	4.9	7.5	4.7	2.7	1.7	2.4	7.1	6.1	3.9	7.9
Uruguay	:	:	:	32.6	5.0	8.5	:	:	:	:	:
Low- and middle-income countries											
Belarus	83.4	57.7	69.5	69.4	63.9	62.0	49.4	:	47.7	:	54.1
Brazil	:	7.9	11.5	8.4	2.8	2.1	2.6	:	:	13.6	2.1
Bulgaria	39.6	28.1	36.4	14.4	8.9	8.9	18.7	20.7	23.9	5.5	10.4
Colombia	25.6	22.2	:	28.5	28.5	28.4	21.9	:	26.2	:	:
Costa Rica	:	37.7	26.4	34.0	15.1	26.4	22.6	37.7	:	:	:
Cuba	60.0	26.7	:	33.3	53.3	66.7	:	:	40.0	:	:
Ecuador	6.8	5.9	11.5	10.3	7.0	6.2	5.0	7.1	4.7	20.6	14.9
Egypt	16.0	17.0	13.2	17.2	24.3	32.9	20.1	17.6	20.2	20.1	21.6
Hungary	26.2	18.4	28.0	11.0	5.0	5.1	8.7	16.1	22.8	5.3	11.9
India	67.2	43.8	28.5	44.2	32.1	35.0	:	23.7	20.3	:	:
Indonesia	0.8	0.6	0.8	0.6	0.6	0.6	0.6	0.6	0.6	:	:
Kazakhstan	15.2	:	:	3.1	:	:	:	16.9	:	23.0	41.8
Malaysia	38.2	32.2	45.1	35.3	12.6	13.2	12.6	34.4	32.5	6.6	6.0
Mexico	49.9	55.9	52.7	31.5	34.3	30.1	:	:	27.8	:	:
Nigeria	55.2	47.1	41.6	20.8	22.6	18.6	21.7	20.4	18.6	9.5	12.2
Panama	17.7	12.9	35.5	22.6	48.4	46.8	25.8	43.5	46.8	35.5	6.5
Philippines	23.9	14.5	26.0	9.5	13.3	8.2	8.6	16.0	12.1	7.4	13.0
Romania	39.2	26.3	34.6	12.9	7.0	6.6	14.5	19.9	19.0	:	:
Serbia	11.5	15.2	22.9	29.7	26.5	18.0	22.2	24.8	24.9	23.0	27.6
South Africa	31.0	20.2	24.6	16.7	8.8	3.9	8.8	28.3	19.1	11.0	54.6
Tanzania	30.2	26.4	26.4	20.8	15.1	11.3	13.2	20.8	9.4	3.8	1.9
Turkey	26.0	19.3	38.5	14.7	9.1	6.6	11.0	19.0	19.6	10.0	23.6
Uganda	41.7	25.5	29.8	11.9	14.9	10.6	19.3	40.5	22.3	13.6	8.8
Ukraine	21.6	10.5	19.0	4.5	2.3	2.2	7.6	10.9	6.5	3.3	7.7

Notes: Please consult Annexes I and II.

“:” Not available.

“-” Nil.

Source: 2013 UIS innovation data collection, Eurostat and AU/NEPAD

Section 6. Final remarks

Over the last decade, there has been a remarkable increase in the number of countries conducting innovation surveys, notably on the African continent. The production of reliable statistics for international comparison, however, remains a challenge, mainly due to the variations in the methodological procedures adopted by countries. Therefore, caution is required when making comparisons, especially when dealing with countries that do not have grossed up results. Likewise, drafting policy recommendations should not be based uniquely on the results of this data collection.

The purpose of this report was to present the main results of the 2013 UIS innovation data collection and examine the main features of the innovation process in high- and low- and middle-income countries, identifying its communalities and variations between these two groups.

First, manufacturing firms that implement innovations are present in all countries. Process innovation was the most frequently implemented by firms in high-income countries, while product innovation prevailed amongst firms in the group of low- and middle-income countries. The pervasiveness of innovation was also observed size-wise. The results showed that firms from all size classes implemented product or process innovation, with the exception of Hong Kong Special Administrative Region of China with a share of 0.1% of small product or process innovators. Moreover, as one would expect, larger size classes concentrate higher shares of innovators.

Second, in terms of innovation activities, the acquisition of machinery, equipment and software was the activity performed by most firms in both groups of countries. However, differences are observed in regard to the runner-up activity. In high-income countries, the second most performed innovation activity was internal R&D, while training held the second place in low- and middle-income countries. Moreover, evidence showed that in 20 out of 31 high-income countries (around 65%), internal R&D was performed by more than one-half of innovation-active firms. In the low- and middle-income group, internal R&D was performed by more than one-half of innovation-active firms in 10 out of 28 countries (36%).

Moreover, evidence showed that most of the innovation-active firms in both groups relied on internal information sources to develop their innovation activities or projects. However, market sources, mainly clients or customers, also played a relevant role as a source of information in 33% of the low- and middle-income countries.

The situation is different when it comes to cooperation for innovation, where overall internal linkages prevailed only in Malta (13%) within the high-income countries. Suppliers were the predominant cooperation partners of innovation-active firms in 74% of high-income countries and in 52% of low- and middle-income countries. In the latter group, clients or customers were also the most frequent cooperation partners of innovation-active firms in 39% of countries. As suppliers and clients or customers are market sources, this could be an indication of the importance of the connection to the market for the innovation process.

Lastly, regarding the hampering factors for innovation activities, cost factors – in particular the lack of funds within the enterprise or enterprise group – were the main obstacle faced by innovation-active firms. This was observed in high- as well as low- and middle-income countries. Costs factors also prevailed as an obstacle for non-innovative firms. However a different cost factor stood out in high-income countries, namely the high costs of innovation.

Annex I. Notes

Abandoned and ongoing innovation activities include activities in which firms engaged in order to develop product or process innovation. Differences are observed in the following countries: Argentina, Canada, Morocco: firms with abandoned and ongoing innovation activities are not identified; Kazakhstan: firms with abandoned innovation activities are not identified; Australia, Costa Rica (for innovation activities and cooperation), Cuba, El Salvador, Malaysia, Panama (except for Figure 4), Russian Federation (except for innovation activities): coverage refers to product, process, organizational or marketing innovation.

Innovation-active firms include firms that implemented or had abandoned or ongoing innovation activities to develop product or process innovation. Differences are observed in the following countries: Kazakhstan: firms with abandoned innovation activities are not identified; Australia, Cuba, El Salvador, Panama (except for Figure 4), Russian Federation (except for innovation activities): coverage refers to product, process, organizational or marketing innovation; Costa Rica (for innovation activities and cooperation): coverage refers to product, process, organizational or marketing innovation and firms with abandoned or ongoing innovation activities are not identified; Malaysia: firms that implemented or had abandoned or ongoing innovation activities for product or process innovation, regardless of organizational or marketing innovation or had abandoned or ongoing innovation activities for product, process, organizational or marketing innovation.

The degree of importance of the sources of information for innovation was not measured in Argentina, Australia and Colombia. Data for Panama also cover medium degree of importance.

Cooperation covers the active participation with other firms or public institutions in innovation activities, as well as non-active collaboration in El Salvador and Republic of Korea.

The degree of importance of the factors hampering innovation was not measured in Australia, Canada and Kazakhstan. Data for Panama also cover medium degree of importance.

Data are population estimates, except for the following countries that submitted survey data: Argentina, Costa Rica, Cuba, Egypt, Ghana, India, Indonesia, Kenya, Malaysia, Morocco, Nigeria, Panama, Philippines and Tanzania. Use of survey data in comparisons is not recommended.

Eurostat countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Turkey, United Kingdom of Great Britain and Northern Ireland.

Metadata information is available at: http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/inn_esms.htm

Annex II. Methodological procedures of the national innovation surveys

Table A1. Basic methodological procedures of the national innovation surveys for high-income countries

	Observation period	Statistical unit	Sampling frame	Cut-off point criterion/ criteria	Survey method	Type of data	Other remarks
Australia	2010-2011	Kind of activity unit (KAU)	National statistical business register	Number of employees	Sample survey	Grossed up data (population estimates)	:
Canada	2010-2012	Enterprise	National statistical business register	Number of employees and revenues	Sample survey	Grossed up data (population estimates)	:
China, Hong Kong	2011	Kind of activity unit (KAU)	National statistical business register, alternative admin/ commercial sources, ad hoc lists	Number of employees	Sample survey	Grossed up data (population estimates)	Data cover all industry sections except agriculture, forestry, and fishing; mining and quarrying; taxi; public light buses; and personal services
Israel	2010-2012	Establishment	National statistical business register	Number of employees	Sample survey	Grossed up data (population estimates)	:
Japan	2009-2011	Enterprise	National statistical business register	Number of employees	Sample survey	Grossed up data (population estimates)	ISIC Rev. 4 C12 is not covered
New Zealand	2011/12-2012/13	Enterprise	National statistical business register	Number of employees and turnover	Sample survey	Grossed up data (population estimates)	Occasional differences in some indicators may be due to independent rounding
Korea, Rep.	2009-2011	Enterprise	National statistical business register	Number of employees	Sample survey	Grossed up data (population estimates)	ISIC Rev. 4 C12 is not covered; ISIC Rev. 4 C33 is dispersed into a couple of other categories; Occasional differences in some indicators may be due to independent rounding
Russian Federation	2010	Enterprise	:	Number of employees and turnover	Census	Grossed up data (population estimates)	Data cover only medium-sized and large enterprises
Uruguay	2007-2009	Enterprise	Administrative data	Number of employees and turnover	Sample survey	Grossed up data (population estimates)	:

Notes: “:” Not available.

Source: 2013 UIS innovation data collection

Table A2. Basic methodological procedures of the national innovation surveys for low- and middle-income countries

Country	Observation period	Statistical unit	Sampling frame	Cut-off point criterion/ criteria	Survey method	Type of data	Other remarks
Argentina	2007	Enterprise	National statistical business register	Turnover	Sample survey	Survey data (use in comparisons is not recommended)	:
Belarus	2012	Enterprise	National statistical business register	Number of employees	Census	Survey data	:
Brazil	2009-2011	Enterprise	National statistical business register	Number of employees	Combined (Sample survey: firms with 10-499 employees; Census: firms with 500 or more employees)	Grossed up data (population estimates)	Occasional differences in some indicators may be due to independent rounding; Cut off point: at least 10 employees
China	2004-2006	Enterprise	National statistical business register	Number of employees, turnover and total assets	Combined (Sample survey: small enterprises; Census: medium-sized and large enterprises)	Grossed up data (population estimates)	:
Colombia	2009-2010	Enterprise	National statistical business register	Number of employees	Census	Survey data	ISIC Rev. 3.1 D37 is not covered; For organizational and marketing innovation: ISIC Rev. 3.1 16 is included in ISIC Rev. 3.1 36
Costa Rica	2010-2011	Enterprise	National statistical business register	Number of employees	Sample survey	Survey data (use in comparisons is not recommended)	:
Cuba	2003-2005	Enterprise	National statistical business register	Number of employees	Sample survey	Survey data (use in comparisons is not recommended)	Data cover only large enterprises
Ecuador	2009-2011	Enterprise	National statistical business register	Number of employees and turnover	Sample survey	Grossed up data (population estimates)	:
Egypt	2008-2010	Enterprise	Ad hoc lists	Number of employees	Sample survey	Survey data (use in comparisons is not recommended)	ISIC Rev. 4 C19, C24 and C29 are not included
El Salvador	2010-2012	Enterprise	National statistical business register, alternative admin/commercial sources and ad hoc lists	Number of employees and turnover	Sample survey	Grossed up data (population estimates)	ISIC Rev. 4 C12 and C33 are not covered
Ghana	2008-2010	Enterprise	:	Number of employees	Sample survey	Survey data (use in comparisons is not recommended)	Industries covered: Material engineering, Other engineering and technologies, Economic and business, Basic medicine, Media and communication, Environmental engineering, etc; Source: AU/NEPAD
India	2007/08-2009/10	Enterprise	National statistical business register	Number of employees	Sample survey	Survey data (use in comparisons is not recommended)	:
Indonesia	2009-2010	Establishment	National statistical business register	Number of employees	Sample survey	Survey data (use in comparisons is not recommended)	Data cover only medium-sized and large enterprises
Kazakhstan	2012	Enterprise	National statistical business register	Number of employees	Combined (Sample survey: small enterprises; Census: medium-sized and large enterprises)	Grossed up data (population estimates)	:
Kenya	2008-2011	Enterprise	National statistical business register	Number of employees	Sample survey	Survey data (use in comparisons is not recommended)	Industries covered: Agric, forestry & fishing, Min & quar, Manuf, Elect act, Water supply, Constr, Wholesale and retail trade, Transp and storage, Hosp, Info & com, Fin & insurance act, Prof serv, Public admin & defense, Educ, Health, Arts, entert & recreation, Admin & other sup act; Cut off point: at least 10 employees
Malaysia	2009-2011	Establishment	Ad hoc lists	Number of employees and turnover	Sample survey	Survey data (use in comparisons is not recommended)	ISIC Rev. 4 C12, C19 and C30 are not covered
Mexico	2010-2011	Enterprise	National statistical business register and ad hoc lists	Number of employees	Sample survey	Grossed up data (population estimates)	ISIC Rev. 3.1 D37 is not covered; Data for organisational and marketing innovation refer to 2011 only
Morocco	2009-2010	Enterprise	National statistical business register & Statistics Direct, Min of Com, Ind & New Technologies	Turnover	Sample survey	Survey data (use in comparisons is not recommended)	:
Nigeria	2008-2010	Enterprise	:	Number of employees	Sample survey	Survey data (use in comparisons is not recommended)	Cut off point: at least 10 employees; - Data cover manufacturing and services; Source: AU/NEPAD
Panama	2006-2008	Enterprise	National statistical business register and ad hoc lists	Turnover	Sample survey	Survey data (use in comparisons is not recommended)	Data cover only large enterprises
Philippines	Jan 2009-Jun 2010	Establishment	National statistical business register	Number of employees	Sample survey	Survey data (use in comparisons is not recommended)	Industries covered: Food manufacturing, Electronics, IT manuf, ICT trade, SW publishing, Telecom serv, HW consultancy, Other sw, Consultancy and Supply
South Africa	2005-2007	Enterprise	National statistical business register	Turnover	Sample survey	Grossed up data (population estimates)	:
Tanzania	2008-2010	Enterprise	:	Number of employees	Sample survey	Survey data (use in comparisons is not recommended)	Cut off point: at least 5 employees; Industrial coverage: manuf, process, eng, serv & print; Source: AU/NEPAD
Uganda	2008-2010	Enterprise	:	Number of employees and turnover	Sample survey	Grossed up data (population estimates)	Cut off point: at least 5 employees and turnover of at least 10 million Shillings; Data cover mining, manuf & serv; Source: AU/NEPAD
Ukraine	2010-2012	Enterprise	National statistical business register	Number of employees	Combined (Sample survey: small enterprises; Census: medium-sized and large enterprises)	Grossed up data (population estimates)	Occasional differences in some indicators may be due to independent rounding

Notes: “:” Not available.

Source: 2013 UIS innovation data collection

Table A3. Size classes for high-income countries

	Micro firms	Small firms	Medium-sized firms	Large firms
Australia	0-4 employees	5-19 employees	20-199 employees	200 or more employees
Canada	Not covered	20-99 employees and revenues of at least \$250,000 Canadian dollars (CAD)	100-249 employees and revenues of at least CAD \$250,000	250 employees or more and revenues of at least CAD \$250,000
China, Hong Kong	Not covered	0-9 employees	10-99 employees	100 employees and over
Israel	Not covered	10-49 employees	50-249 employees	250 or more employees
Japan	Not covered	10-49 employees	50-249 employees	250 or more employees
New Zealand	6-19 employees and a turnover of at least 30,000 NZ dollars	20-49 employees and a turnover of at least 30,000 NZ dollars	50-99 employees and a turnover of at least 30,000 NZ dollars	100 or more employees and a turnover of at least 30,000 NZ dollars
Korea, Rep.	10-49 employees	50-99 employees	100-299 employees	300 or more employees
Russian Federation	Not covered	Not covered	101-250 employees / 401-1,000 million Roubles	250 employees and more / 1,000 million Roubles and more
Uruguay	Not covered	5-19 employees / 0-19,448,999 Uruguayan Pesos (UP)	20-99 employees / 19,449,000-145,867,499 UP	100 employees or more / 145,867,500 UP or more

Source: 2013 UIS innovation data collection

Table A4. Size classes for low- and middle-income countries

	Micro firms	Small firms	Medium-sized firms	Large firms
Argentina	Not covered	1-70 million Argentinian Pesos (AP)	71-280 million AP	281 million AP
Belarus	Not covered	16-100 employees	101-250 employees	251 employees or more
Brazil	Not covered	:	:	:
China	Not covered	0-300 employees / 5-29.999... million Chinese Yuan / 0-39.999... million Chinese Yuan (CY)	300-1,999 employees / 30-299.999... million Chinese Yuan / 40-399.999... million CY	2,000 employees or more / 300 million Chinese Yuan or more / 400 million CY or more
Colombia	1-9 employees	10-50 employees	51-200 employees	More than 200 employees
Costa Rica	Not covered	6-25 employees	26-100 employees	101 employees or more
Cuba	Not covered	Not covered	Not covered	200 employees or more
Ecuador	Not covered	10-49 employees / 100,000.50-1,000,000.49 US dollars (USD)	50-199 employees / 1,000,000.50-2,000,000.49 USD	200-1,000,000 employees / 2,000,000.49-99,999,999,999 USD
Egypt	1-9 employees	10-49 employees	50-249 employees	250 employees or more
El Salvador	Not covered	10-50 employees / 100,001-1,000,000 USD	51-100 employees / 1,000,001-7,000,000 USD	10 employees and more / 7,000,001 USD and more
Ghana	:	10-29 employees	30-99 employees	100 or more employees
India	0-99 employees	100-499 employees	500-999 employees	1,000 employees or more
Indonesia	Not covered	Not covered	20-99 employees	100 employees or more
Kazakhstan	Not covered	11-50 employees	51-250 employees	251 employees or more
Kenya	Not covered	:	:	:
Malaysia	Not covered	5-50 employees / 250,000-10 million Ringgit Malaysia (RM)	51-150 employees / 10-25 million RM	More than 150 employees / 25 million RM and above
Mexico	Not covered	20-50 employees	51-250 employees	251 employees or more
Morocco	1-3 million Dirhams	3-10 million Dirhams	10-175 million Dirhams	175 or more million Dirhams
Nigeria	Not covered	:	:	:
Panama	Not covered	Not covered	Not covered	16,000,000 USD or more
Philippines	1-9 employees	10-99 employees	100-199 employees	200 or more employees
South Africa	Less than 5 million South African Rands (ZAR)	5-13 million ZAR (for manufacturing)	13-51 million ZAR (for manufacturing)	More than 51 million ZAR (for manufacturing)
Tanzania	Not covered	:	:	:
Uganda	Not covered	:	:	:
Ukraine	Not covered	10-49 employees	50-249 employees	250 or more employees

Notes: “:” Not available.

Source: 2013 UIS innovation data collection

Annex III –Tables

Table A5. Innovators in high-income countries (as a percentage of manufacturing firms)

	Product innovators	Process innovators	Organizational innovators in manufacturing	Marketing innovators
Australia	19.9	23.9	21.2	18.3
Austria	38.0	35.1	35.0	28.1
Belgium	39.6	39.8	30.6	32.4
Canada	46.0	48.0	46.9	32.8
China, Hong Kong	2.9	0.4	8.9	6.3
Croatia	26.4	30.1	22.9	26.1
Cyprus	27.0	37.9	29.3	25.2
Czech Republic	28.5	24.9	30.5	29.8
Denmark	30.6	31.0	35.7	27.3
Estonia	29.9	36.0	22.4	25.6
Finland	37.5	34.7	31.8	27.8
France	28.4	27.3	36.1	23.7
Germany	49.5	32.0	46.3	48.0
Iceland	40.6	36.1	31.3	26.0
Ireland	36.8	41.6	38.3	29.7
Israel	24.1	23.8	35.5	36.2
Italy	32.9	33.0	31.2	28.8
Japan	19.6	20.2	28.8	22.9
Korea, Rep.	13.5	8.0	14.7	9.2
Latvia	13.6	11.0	18.9	13.8
Lithuania	14.7	13.1	16.6	16.8
Luxembourg	41.3	34.9	44.9	31.7
Malta	22.6	29.9	26.4	19.9
Netherlands	39.7	35.3	30.0	21.8
New Zealand	31.6	23.2	25.6	25.2
Norway	26.2	18.8	20.4	21.2
Poland	12.8	12.6	13.0	13.9
Portugal	28.3	38.1	29.9	30.5
Russian Federation	8.0	5.9	4.0	3.4
Slovakia	23.6	22.6	21.8	18.5
Spain	17.8	25.7	23.3	15.9
Sweden	35.8	29.9	27.5	28.8
United Kingdom	31.0	18.3	32.5	17.6
Uruguay	17.2	24.5	8.4	4.8

Notes: Please consult Annexes I and II.

Source: 2013 UIS innovation data collection and Eurostat

Table A6. Innovators in low- and middle-income countries (as a percentage of manufacturing firms)

	Product innovators	Process innovators	Organizational innovators in manufacturing	Marketing innovators
Argentina	31.7	29.5	13.3	8.7
Belarus	22.9	5.9	2.5	3.9
Brazil	17.5	32.0	57.8	42.9
Bulgaria	14.3	13.2	11.8	13.1
China	25.1	25.3	:	:
Colombia	17.1	22.1	13.4	9.4
Costa Rica	67.5	62.1	40.4	43.0
Cuba	44.0	48.4	64.8	23.2
Ecuador	45.8	47.1	21.0	29.0
Egypt	6.1	8.3	3.7	6.5
El Salvador	23.3	18.9	9.6	10.7
Hungary	13.1	9.5	13.0	16.2
India	12.1	12.1	38.0	35.5
Indonesia	20.2	18.1	39.0	55.2
Kenya	40.3	32.8	:	:
Malaysia	43.6	44.1	37.7	50.2
Mexico	9.7	6.8	3.2	1.8
Nigeria	50.1	58.6	:	:
Panama	36.6	36.6	:	:
Philippines	37.6	43.9	57.8	50.4
Romania	12.1	13.1	16.9	18.8
Serbia	36.6	35.1	39.0	37.4
South Africa	16.8	13.1	52.6	23.3
Tanzania	61.3	27.0	:	:
Turkey	26.2	29.5	23.9	38.4
Uganda	61.1	63.1	:	:
Ukraine	11.0	11.6	10.0	13.8

Notes: Please consult Annexes I and II.
 “:” Not available.

Source: 2013 UIS innovation data collection, Eurostat and AU/NEPAD

Table A7. Innovation-active and innovative firms in high-income countries (as a percentage of manufacturing firms)

	Innovation-active firms	Innovative firms
Austria	50.4	48.4
Belgium	58.7	55.3
China, Hong Kong	5.9	3.1
Croatia	36.7	35.2
Cyprus	38.5	38.5
Czech Republic	39.2	36.4
Denmark	47.8	44.7
Estonia	53.1	48.7
Finland	53.7	48.7
France	40.6	37.9
Germany	71.8	59.3
Iceland	50.7	50.7
Ireland	58.5	52.6
Israel	36.2	33.0
Italy	46.2	43.9
Japan	33.0	28.5
Korea, Rep.	24.2	17.5
Latvia	19.5	17.7
Lithuania	22.2	20.2
Luxembourg	53.5	51.0
Malta	38.3	34.1
Netherlands	53.4	51.5
New Zealand	49.4	41.7
Norway	39.4	32.0
Poland	18.1	17.1
Portugal	43.9	42.8
Slovakia	31.3	31.0
Spain	33.7	30.7
Sweden	51.9	47.5
United Kingdom	38.4	35.2
Uruguay	28.6	28.6

Notes: Please consult Annexes I and II.

Source: 2013 UIS innovation data collection and Eurostat

Table A8. Innovation-active and innovative firms in low- and middle-income countries (as a percentage of manufacturing firms)

	Innovation-active firms	Innovative firms
Argentina	39.0	39.0
Brazil	38.2	35.9
Bulgaria	22.8	20.6
China	30.0	29.1
Colombia	37.1	30.3
Costa Rica	80.6	80.6
Cuba	94.0	81.2
Ecuador	62.7	58.6
Egypt	10.1	9.4
Hungary	18.8	16.5
India	35.6	18.5
Indonesia	32.0	32.0
Kenya	69.4	55.2
Malaysia	57.0	53.5
Mexico	15.1	11.4
Panama	72.9	47.3
Philippines	54.4	50.2
Romania	16.5	16.0
Serbia	47.3	43.0
Turkey	36.9	35.0
Ukraine	15.8	14.6

Notes: Please consult Annexes I and II.

Source: 2013 UIS innovation data collection, Eurostat and AU/NEPAD

Table A9. Innovative firms in high-income countries by size class (as a percentage of manufacturing firms in each size class)

	Small	Medium-sized	Large
Canada	73.6	78.7	80.4
Germany	52.2	73.3	91.7
Belgium	47.3	74.9	82.5
Netherlands	45.4	65.8	76.8
Iceland	44.7	67.1	78.3
Ireland	43.9	72.8	85.2
Finland	43.6	55.2	86.3
New Zealand	43.5	54.5	58.6
Luxembourg	42.2	57.3	91.7
Sweden	41.9	60.8	84.2
Italy	40.6	62.2	78.3
Estonia	40.0	68.1	98.0
Denmark	39.6	55.0	80.3
Portugal	39.2	55.5	82.7
Austria	38.5	69.2	89.4
United Kingdom	32.1	43.8	46.8
France	30.6	57.7	76.5
Czech Republic	28.7	50.2	70.4
Norway	27.3	45.7	65.3
Spain	24.6	58.6	83.8
Japan	24.1	38.0	56.3
Israel	23.9	52.7	75.0
Uruguay	23.1	35.3	62.3
Slovakia	22.4	39.5	56.9
Korea, Rep.	21.9	27.5	41.7
Lithuania	16.2	25.7	59.2
Latvia	13.1	27.4	52.0
Poland	9.7	31.1	59.1
China, Hong Kong	0.1	11.9	10.5

Notes: Please consult Annexes I and II.

Source: 2013 UIS innovation data collection and Eurostat

Table A10. Innovative firms in low- and middle-income countries by size class (as a percentage of manufacturing firms in each size class)

	Small	Medium-sized	Large
Costa Rica	75.9	84.6	89.7
Ecuador	54.7	68.2	73.5
Philippines	45.8	58.8	60.8
Malaysia	41.4	52.2	66.1
Serbia	38.1	53.2	59.0
Turkey	32.3	41.5	59.9
Argentina	31.4	54.7	61.3
Colombia	26.5	44.3	62.1
India	22.9	38.3	22.8
South Africa	17.4	25.6	20.6
Romania	13.0	19.3	43.4
Hungary	10.9	28.1	57.6
Mexico	8.6	12.7	17.9
Ukraine	8.4	19.8	44.5
Egypt	6.8	14.4	26.2

Notes: Please consult Annexes I and II.

Source: 2013 UIS innovation data collection, Eurostat and AU/NEPAD