Target 9.a: Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States

Indicator 9.a.1: Total official international support (official development assistance plus other official flows) to infrastructure

Institutional information

Organization(s):

Organisation for Economic Co-operation and Development (OECD)

Concepts and definitions

Definition:

Gross disbursements of total ODA and other official flows from all donors in support of infrastructure.

Rationale:

Total ODA and OOF flows to developing countries quantify the public effort (excluding export credits) that donors provide to developing countries for infrastructure.

Concepts:

ODA: The DAC defines ODA as "those flows to countries and territories on the DAC List of ODA Recipients and to multilateral institutions which are

- i) provided by official agencies, including state and local governments, or by their executive agencies; and
- ii) each transaction is administered with the promotion of the economic development and welfare of developing countries as its main objective; and

is concessional in character and conveys a grant element of at least 25 per cent (calculated at a rate of discount of 10 per cent).

(See http://www.oecd.org/dac/stats/officialdevelopmentassistancedefinitionandcoverage.htm)

Other official flows (OOF): Other official flows (excluding officially supported export credits) are defined as transactions by the official sector which do not meet the conditions for eligibility as ODA, either because they are not primarily aimed at development, or because they are not sufficiently concessional. (See http://www.oecd.org/dac/stats/documentupload/DCDDAC(2016)3FINAL.pdf, Para 24).

Support to infrastructure includes all CRS sector codes in the 200 series (see here: http://www.oecd.org/dac/stats/purposecodessectorclassification.htm)

Comments and limitations:

Data in the Creditor Reporting System are available from 1973. However, the data coverage is considered complete since 1995 for commitments at an activity level and 2002 for disbursements.

Methodology

Computation Method:

The sum of ODA and OOF flows from all donors to developing countries for infrastructure.

Disaggregation:

This indicator can be disaggregated by type of flow (ODA or OOF), by donor, recipient country, type of finance, type of aid, sub-sector, etc.

Treatment of missing values:

• At country level

Due to high quality of reporting, no estimates are produced for missing data.

• At regional and global levels

Not applicable.

Regional aggregates:

Global and regional figures are based on the sum of ODA and OOF flows to the agriculture sector.

Sources of discrepancies:

DAC statistics are standardized on a calendar year basis for all donors and may differ from fiscal year data available in budget documents for some countries.

Data Sources

Description:

The OECD/DAC has been collecting data on official and private resource flows from 1960 at an aggregate level and 1973 at an activity level through the Creditor Reporting System (CRS data are considered complete from 1995 for commitments at an activity level and 2002 for disbursements).

The data are reported by donors according to the same standards and methodologies (see here: http://www.oecd.org/dac/stats/methodology.htm).

Data are reported on an annual calendar year basis by statistical reporters in national administrations (aid agencies, Ministries of Foreign Affairs or Finance, etc.

Collection process:

A statistical reporter is responsible for the collection of DAC statistics in each providing country/agency. This reporter is usually located in the national aid agency, Ministry of Foreign Affairs or Finance etc.

Data Availability

On a recipient basis for all developing countries eligible for ODA.

Calendar

Data collection:

Data are published on an annual basis in December for flows in the previous year.

Detailed 2015 flows was published in December 2016.

Data providers

Data are reported on an annual calendar year basis by statistical reporters in national administrations (aid agencies, Ministries of Foreign Affairs or Finance, etc.

Data compilers

OECD

References

URL:

www.oecd.org/dac/stats

References:

See all links here: http://www.oecd.org/dac/stats/methodology.htm

Target 9.b: Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities

Indicator 9.b.1: Proportion of medium and high-tech industry value added in total value added

Institutional information

Organization:

United Nations Industrial Development Organization (UNIDO)

Concepts and definitions

Definition:

The proportion of medium and high-tech industry (MHT hereafter) value added in total value added of manufacturing (MVA hereafter) is a ratio value between the value added of MHT industry and MVA.

Rationale:

Industrial development generally entails a structural transition from resource-based and low technology activities to MHT activities. A modern, highly complex production structure offers better opportunities for skills development and technological innovation. MHT activities are also the high value addition industries of manufacturing with higher technological intensity and labour productivity. Increasing the share of MHT sectors also reflects the impact of innovation.

Concepts:

The MHT industry is defined using OECD classification as the following by International Standard Industrial Classification of All Economic Activities (ISIC hereafter) Revision 3 and Revision 4 Division respectively:

ISIC	Description	ISIC	Description
Rev.4		Rev.3	
20	Manufacture of chemicals and chemical	24	Manufacture of chemicals and chemical
	products		products
21	Manufacture of basic pharmaceutical	242	Manufacture of other chemical products
	products and pharmaceutical preparations		
26	Manufacture of computer, electronic and	321	Manufacture of electronic valves and tubes
	optical products		and other electronic components
27	Manufacture of electrical equipment	31	Manufacture of electrical machinery and
			apparatus n.e.c.
28	Manufacture of machinery and equipment	29	Manufacture of machinery and equipment
	n.e.c.		n.e.c.
29	Manufacture of motor vehicles, trailers and	34	Manufacture of motor vehicles, trailers and
	semi-trailers		semi-trailers
30*	Manufacture of other transport equipment	35**	Manufacture of other transport equipment

* Excluding 301 (Building of ships and boats)

** Excluding 351 (Building and repairing of ships and boats)

MVA is the value added of manufacturing industry, which is Section C of ISIC Rev.4, and Section D of ISIC Rev.3.

Comments and limitations:

Value added by economic activity should be reported at least at 3-digit ISIC for compiling MHT values.

Methodology

Computation Method:

The indicator is calculated as the share of the sum of the value added from MHT economic activities to MVA.

Sum of value added in MHT economic activities MVA * 100

Disaggregation:

No disaggregation available.

Treatment of missing values:

- At country level Missing values are imputed based on the methodology from Competitive Industrial Performance Report (UNIDO, 2014)
- At regional and global levels No regional and global aggregates currently available.

Regional aggregates:

No regional aggregates compiled.

Sources of discrepancies:

Conversion to USD or difference in ISIC combinations may cause discrepancy between national and international figures.

Methods and guidance available to countries for the compilation of the data at the national level:

UNIDO (2010), Industrial Statistics - Guidelines and Methodology: This publication is intended to serve as a handbook for statisticians involved in the regular industrial statistics programmes of NSOs or line ministries. It describes the statistical methods related to the major stages of industrial statistics operation. <u>http://www.unido.org/publications/cross-cutting-services/industrial-statistics-guidelines-and-methodology.html</u>

International Recommendations for Industrial Statistics (IRIS) 2008 https://unstats.un.org/unsd/publication/seriesM/seriesm 90e.pdf

System of National Accounts (SNA) 2008 https://unstats.un.org/unsd/publication/seriesf/SeriesF_2Rev5e.pdf International Standard Industrial Classification of All Economic Activities (ISIC) https://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27

Quality assurance

UNIDO (2009), UNIDO Data Quality: A quality assurance framework for UNIDO statistical activities <u>https://open.unido.org/api/documents/4814740/download/UNIDO-Publication-2009-4814740</u>

Data Sources

Description:

Data can be found in UNIDO INDSTAT4 Database by ISIC Revision 3 and ISIC Revision 4 respectively.

Collection process:

Data are collected using General Industrial Statistics Questionnaire which is filled by NSOs and submitted to UNIDO annually. Data for OECD countries are obtained directly from OECD. Country data are also collected from official publications and official web-sites.

Data Availability

Description: More than 140 economies

Time series: 1990 onwards with 3 years lag to the current calendar year

Calendar

Data collection: Data are collected annually from NSOs and OECD

Data release: UNIDO INDSTAT database is updated between March and April every year.

Data providers

National statistical offices (NSOs) in non-OECD countries, and OECD countries by OECD

Data compilers

Name: United Nations Industrial Development Organization (UNIDO)

References

URL:

www.unido.org/statistics https://stat.unido.org/

References:

UNIDO Publication - The Industrial Competitiveness of Nations 2013 Competitive Industrial Performance (CIP) report 2016 International Standard Industrial Classification of All Economic Activities 2008

Target 9.c: Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020 Indicator 9.c.1: Proportion of population covered by a mobile network, by technology

Institutional information

Organization(s):

International Telecommunication Union (ITU)

Concepts and definitions

Definition:

Proportion of population covered by a mobile network, broken down by technology, refers to the percentage of inhabitants living within range of a mobile-cellular signal, irrespective of whether or not they are mobile phone subscribers or users. This is calculated by dividing the number of inhabitants within range of a mobile-cellular signal by the total population and multiplying by 100.

Rationale:

The percentage of the population covered by a mobile cellular network can be considered as a minimum indicator for ICT access since it provides people with the possibility to subscribe to and use mobile-cellular services to communicate. Over the last decade, mobile-cellular networks have expanded rapidly and helped overcome very basic infrastructure barriers that existed when fixed-telephone networks – often limited to urban and highly populated areas - were the dominant telecommunication infrastructure.

While 2G (narrowband) mobile-cellular networks offer limited (and mainly voice-based) services, higherspeed networks (3G and LTE) provide increasingly high-speed, reliable and high-quality access to the Internet and its increasing amount of information, content, services, and applications. Mobile networks are therefore essential to overcoming infrastructure barriers, helping people join the information society and benefit from the potential of ICTs, in particular in least developed countries.

The indicator highlights the importance of mobile networks in providing basic, as well as advanced communication services and will help design targeted policies to overcome remaining infrastructure barriers, and address the digital divide. Many governments track this indicator and have set specific targets in terms of the mobile population coverage (by technology) that operators must achieve.

Concepts:

"The indicator is based on where the population lives, and not where they work or go to school, etc. When there are multiple operators offering the service, the maximum population number covered should be reported. Coverage should refer to LTE, broadband (3G) and narrowband (2G) mobile-cellular technologies and include:

- 2G mobile population coverage: Mobile networks with access to data communications (e.g. Internet) at downstream speeds below 256 Kbit/s. This includes mobile-cellular technologies such as GPRS,
CDMA2000 1x and most EDGE implementations. The indicator refers to the theoretical ability of subscribers to use non-broadband speed mobile data services, rather than the number of active users of such services.

- 3G population coverage: refers to the percentage of inhabitants that are within range of at least a 3G mobile-cellular signal, irrespective of whether or not they are subscribers. This is calculated by dividing the number of inhabitants that are covered by at least a 3G mobile-cellular signal by the total population and multiplying by 100. It excludes people covered only by GPRS, EDGE or CDMA 1xRTT.

- LTE population coverage: Refers to the percentage of inhabitants that live within range of LTE/LTE-Advanced, mobile WiMAX/WirelessMAN or other more advanced mobile-cellular networks, irrespective of whether or not they are subscribers. This is calculated by dividing the number of inhabitants that are covered by the previously mentioned mobile-cellular technologies by the total population and multiplying by 100. It excludes people covered only by HSPA, UMTS, EV-DO and previous 3G technologies, and also excludes fixed WiMAX coverage.

As technologies evolve and as more and more countries will deploy and commercialize more advanced mobile-broadband networks (5G etc.), the indicator will include further breakdowns."

Comments and limitations:

Some countries have difficulty calculating overall mobile-cellular population coverage. In some cases, data refer only to the operator with the largest coverage, and this may understate the true coverage.

Methodology

Computation Method:

The indicator percentage of the population covered by a mobile network, broken down by technology, refers to the percentage of inhabitants living within range of a mobile-cellular signal, irrespective of whether or not they are mobile phone subscribers or users. This is calculated by dividing the number of inhabitants within range of a mobile-cellular signal by the total population and multiplying by 100.

Disaggregation:

Based on the data for the percentage of the population covered by a mobile network, broken down by technology, and on rural population figures, countries can produce estimates on rural and urban population coverage. ITU produces global estimates for the rural population coverage, by technology.

Treatment of missing values:

• At country level

Missing values are estimated using data published by mobile cellular operators that have the largest market share.

• At regional and global levels

Missing values are estimated using data published by mobile cellular operators that have the largest market share.

Regional aggregates:

Global and regional estimates are produced using weighted country-level data. First, the missing countrylevel data are estimated using data of the dominant mobile operator. Once all the country-level percentages are available, the number of people covered by the mobile signal is calculated by multiplying the percentage of population covered by the signal to the population of the country. The regional and world total population covered by a signal were calculated by summing the country-level data. The aggregate percentages were calculated by dividing the regional totals by the population of respective groups.

Sources of discrepancies:

None. ITU uses the data provided by countries, including the in-scope population that is used to calculate the percentages.

Data Sources

Description:

This indicator is based on an internationally agreed definition and methodology, which have been developed under the coordination of ITU, through its Expert Groups and following an extensive consultation process with countries. It is also a core indicator of the Partnership on Measuring ICT for Development's Core List of Indicators, which has been endorsed by the UN Statistical Commission (last time in 2014).

ITU collects data for this indicator through an annual questionnaire from national regulatory authorities or Information and Communication Technology Ministries, who collect the data from Internet service providers.

Collection process:

ITU collects data for this indicator through an annual questionnaire from national regulatory authorities or Information and Communication Technology Ministries, who collect the data from Internet service providers.

Data Availability

By 2015, data on 2G mobile population coverage were available for about 147 countries, from developed and developing regions, and covering all key global regions. Data on 3G mobile population coverage were available for 152 countries and data on LTE mobile population coverage were available for 124 countries. ITU publishes data on this indicator yearly.

Calendar

Data collection:

Data are collected through the short ITU World Telecommunication/ICT Indicators Questionnaire in April of each year and published in June of each year.

Data release:

June 2016.

Data providers

Telecommunication/ICT regulatory authority, or Ministry of ICTs.

Data compilers

ITU

References

URL:

http://www.itu.int/en/ITU-D/Statistics/Pages/default.aspx

References:

ITU Handbook for the collection of Administrative Data on Telecommunications/ICT, 2011 (and revisions and new indicators), see:

http://www.itu.int/en/ITU-D/Statistics/Pages/publications/handbook.aspx

Related indicators

1.4, 2.3, 2.c, 9.1, 11.b, 13.1

Target 9.1: Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

Indicator 9.1.2: Passenger and freight volumes, by mode of transport

Institutional information

Organization(s):

International Civil Aviation Organization (ICAO)

Concepts and definitions

Definition:

Passenger and freight volumes is the sum of the passenger and freight volumes reported for the air carriers in terms of number of people and metric tonnes of cargo respectively.

The International Transport Forum (ITF) collects data on transport (rail and road) statistics on annual basis from all its Member countries. Data are collected from Transport Ministries, statistical offices and other institution designated as official data source. Although there are clear definitions for all the terms used in this survey, countries might have different methodologies to calculate tonne-kilometres and passenger-kilometres. Methods could be based on traffic or mobility surveys, use very different sampling methods and estimating techniques which could affect the comparability of their statistics.

• ITF (2016) Trends in the Transport Sector

Rationale:

Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all. Trans-border infrastructure development is best captured by passenger and freight volumes moved by Member States and Regions. A growth in passenger and freight volumes shows a robust infrastructure development happening in States and Regions along with the resultant socio-economic benefit. Air Transport is particularly important not only for the economic and job benefits but also because it is one of the only mode of transport that can be relied on during emergencies and disease outbreaks to reach food, medicines, medical personnel, vaccines and other supplies speedily to the affected persons in the affected areas.

Concepts:

The International Civil Aviation Organization (ICAO) through its Statistics Division have established standard methodologies and definitions to collect and report traffic (passenger and freight volume) data related to air transport. These standards and methodologies have been adopted by the 191 Member States of ICAO and also by the Industry stakeholders i,e air carriers and airports. The data of ICAO is used by States and also the World Bank for its development indicators. ICAO uses Air Transport Reporting Forms A, AS, B and C to arrive at the passenger and freight volumes for air transport.

Precise definition of all different concepts and metadata related to Air Transport Reporting Forms A, AS, B and C to arrive at the passenger and freight volumes for air transport. approved by the ICAO Statistics Division and Member States can be found at the ICAO website given below http://www.icao.int/sustainability/pages/eap-sta-excel.aspx/

Comments and limitations:

Coverage is for all ICAO 191 Member States

Methodology

Computation Method:

The indicator is calculated through a sum of the passenger and freight volumes reported for the air carriers through ICAO Air Transport Reporting Forms and grouped by Member States of ICAO.

Disaggregation:

The indicator can be dis-aggregated by -Country, Country pair, City Pair, Region, Segment (International and domestic)

Treatment of missing values:

• At country level

<u>For road and rail transport statistics</u>: In case of missing data for a country for which at least one data point is available since 2000, we calculate estimates based on the expected growth rate for the country. The growth rates are computed from other socio-economic variables, such as Gross Domestic Product (GDP), population or urbanization.

For non-ITF country, data points are estimated using the ITF model, which uses several covariates such as GDP, population, transport network coverage... A description of the model can be found in the ITF Transport Outlook 2017.

• ITF (2017) ITF Transport Outlook 2017, OECD Publishing

This model also uses several other data sources to make the calibration more robust in regions where ITF data does not have a good coverage.

- International Union of Railways (2015) Railway Statistics 2015 synopsis, UIC
- International Road Federation (2011) ITF World Road Statistics, IRF
- De Bod, A., & Havenga, J. (2010). Sub-Saharan Africa's rail freight transport system: Potential impact of densification on cost. Journal of Transport and Supply Chain Management, Vol. 4, pp. 89-101

Methods and guidance available to countries for the compilation of the data at the national level:

Metadata for ITF data on transport demand, freight and passengers, for road and rail 1. Primary data source: The International Transport Forum (ITF) collects data on transport statistics on annual basis from all its Member countries. Data are collected from Transport Ministries, statistical offices and other institution designated as official data source. Although there are clear definitions for all the terms used in this survey, countries might have different methodologies to calculate tonnekilometres and passenger-kilometres. Methods could be based on traffic or mobility surveys, use very different sampling methods and estimating techniques which could affect the comparability of their statistics.

• ITF (2016) Trends in the Transport Sector

2. Estimation method: In case of missing data for a country for which at least one data point is available since 2000, we calculate estimates based on the expected growth rate for the country. The growth rates are computed from other socio-economic variables, such as Gross Domestic Product (GDP), population or urbanization.

3. Modelling method: For non-ITF country, data points are estimated using the ITF model, which uses several covariates such as GDP, population, and transport network coverage. A description of the model can be found in the ITF Transport Outlook 2017.

• ITF (2017) ITF Transport Outlook 2017, OECD Publishing.

This model also uses several other data sources to make the calibration more robust in regions where ITF data does not have a good coverage.

- International Union of Railways (2015) Railway Statistics 2015 synopsis, UIC
- International Road Federation (2011) ITF World Road Statistics, IRF
- De Bod, A., & Havenga, J. (2010). Sub-Saharan Africa's rail freight transport system: Potential impact of densification on cost. Journal of Transport and Supply Chain Management, Vol. 4, pp. 89-101

Quality assurance

Data Sources

ICAO Air Transport Reporting Forms approved by the Statistics Division of ICAO and its Member States has been used to define standards, methodologies and to collect aviation data since the 1950's. ICAO definitions and metadata is also used by the Aviation Industry as the basis of collecting data and conducting analysis.

Data Availability

Description:

Data already provided for all 191 Member States that have air transport activities

Time series:

From 1970's

Calendar

Every year by June 10th data for the previous year is available to ICAO Member States at a country level

Data providers

Name:

ICAO

Description:

International Civil Aviation organisation (ICAO). Data provided to ICAO by ICAO Member States from its Ministry of Transport, Infrastructure or Aviation

Data compilers

International Civil Aviation organisation (ICAO)

NA

References

URL:

www.icao.int

Target 9.2: Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries

Indicator 9.2.1: Manufacturing value added as a proportion of GDP and per capita

Institutional information

Organization(s):

United Nations Industrial Development Organization (UNIDO)

Concepts and definitions

Definition:

Manufacturing value added (MVA) as a proportion of gross domestic product (GDP) is a ratio between MVA and GDP, both reported in constant 2010 USD.

MVA per capita is calculated by dividing MVA in constant 2010 USD by population of a country or area.

Rationale:

MVA is a well-recognized and widely used indicator by researchers and policy makers to assess the level of industrialization of a country. The share of MVA in GDP reflects the role of manufacturing in the economy and a country's national development in general. MVA per capita is the basic indicator of a country's level of industrialization adjusted for the size of the economy. One of the statistical uses of MVA per capita is classifying country groups according to the stage of industrial development.

Concepts:

The gross value added is defined as output minus intermediate consumption and equals the sum of employee compensation, gross operating surplus of government and corporations, gross mixed income of unincorporated enterprises and taxes less subsidies on production and imports, except for net taxes on products (System of National Accounts 2008). Manufacturing refers to industries belonging to the sector C defined by International Standard Industrial Classification of All Economic Activities (ISIC) Revision 4, or D defined by ISIC Revision 3.

GDP represents the sum of gross value added from all institutional units resident in the economy. For the purpose on comparability over time and across countries MVA and GDP are estimated in terms of constant prices in USD. The current series are given at constant prices of 2010.

Comments and limitations:

Differences may appear due to different versions of System of National Accounts (SNA) or ISIC revisions used by countries.

Methodology

Computation Method:

MVA proportion to GDP = MVA/GDP*100. MVA per capita = MVA/population

Disaggregation:

No disaggregation available.

Treatment of missing values:

- At country level Boudt, Todorov, Upadhyaya (2009): Nowcasting manufacturing value added for cross-country comparison; Statistical Journal of IAOS
- At regional and global levels No imputation used.

Regional aggregates:

Regional, global aggregation of direct summation of country values within the country groups.

Sources of discrepancies:

Minor differences may arise due to 1) exchange rates for conversion to USD 2) different base years used for constant price data 3) methods for recent period estimation and 4) different versions of SNA and ISIC revisions used by countries.

Methods and guidance available to countries for the compilation of the data at the national level: International Recommendations for Industrial Statistics (IRIS) 2008 https://unstats.un.org/unsd/publication/seriesM/seriesm 90e.pdf

System of National Accounts (SNA) 2008 https://unstats.un.org/unsd/publication/seriesf/SeriesF_2Rev5e.pdf

International Standard Industrial Classification of All Economic Activities (ISIC) <u>https://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27</u>

Quality assurance

UNIDO (2009), UNIDO Data Quality: A quality assurance framework for UNIDO statistical activities <u>https://open.unido.org/api/documents/4814740/download/UNIDO-Publication-2009-4814740</u>

Data Sources

Description:

UNIDO maintains MVA database. Figures for updates are obtained from national account estimates produced by UN Statistics Division (UNSD) and from official publications.

Collection process:

The MVA and GDP country data are collected through a national accounts questionnaire (NAQ) sent by UNSD. More information on the methodology is available on https://unstats.un.org/unsd/snaama/methodology.pdf.

Missing or inconsistent values are verified with national sources and World Development Indicators (WDI). The preference is given to the data from national sources.

Population data are obtained from UN DESA Population Division. More information on the methodology is available on

https://esa.un.org/unpd/wpp/Publications/Files/WPP2015_Methodology.pdf.

Data Availability

Description: For more than 200 economies

Time series: 1990 onwards with 2 year lag to the current calendar year

Calendar

Data collection: Data collection is carried out by receiving data electronically throughout the year.

Data release: UNIDO MVA database is updated between March and April every year.

Data providers

United Nations Statistics Division (UNSD) and official publications

UNSD from national statistical offices (NSOs)

Data compilers

United Nations Industrial Development Organization (UNIDO)

References

URL:

www.unido.org/statistics https://unstats.un.org/unsd/snaama/methodology.pdf https://esa.un.org/unpd/wpp/Publications/Files/WPP2015 Methodology.pdf **References:**

International Yearbook of Industrial Statistics; UNIDO International Standard Industrial Classification of All Economic Activities 2008 System of National Accounts 2008

Target 9.2: Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries

Indicator 9.2.2: Manufacturing employment as a proportion of total employment

Institutional information

Organization(s):

United Nations Industrial Development Organization (UNIDO)

Concepts and definitions

Definition:

The indicator is represented by the share of manufacturing employment in total employment.

Rationale:

This indicator represents the contribution of manufacturing in job creation. In developing countries, it shows the ability of manufacturing to absorb surplus labour forces from agricultural and other traditional sectors towards production labour with higher wages. In industrialized countries, innovation and technology were the main drivers of product sophistication, especially in manufacturing, but in the meantime, emphasis has shifted to reduction in labour as part of cost-cutting measures. The structural changes promote capital-intensive industry and consequently, the share of manufacturing in total employment may decrease.

Concepts:

The employment is defined as comprising all persons of working age who, during a specified brief period, were in the following categories: a) paid employment (whether at work or with a job but not at work); or b) self-employment (whether at work or with an enterprise but not at work). No distinction is made between persons employed full time and those working less than full time

The sectors of economic activity are defined according to the International Standard Industrial Classification of All Economic Activities (ISIC), Revision 3 (1990) and Revision 4 (2008). Manufacturing refers to industries belonging to the sector D defined by ISIC Revision 3, or C defined by ISIC Revision 4.

Comments and limitations:

The data on employment are obtained from various sources including population censuses, labour force surveys, household surveys, population registers and official estimates. Surveys in some countries use a

cut-off point with the result that small manufacturing units which are not in the register are not included in the survey and consequently, employment data may be underestimated. Discrepancies can also be caused by differences in the definition of employment or working age. Moreover, in some countries informal employment is included in the figure for total employment. When assessing these data, special attention should be paid to the least developed countries (LDCs), since this group is not well represented.

Methodology

Computation Method:

Total employment in manufacturing activities Total employment in all economic activities * 100

Disaggregation:

Data can be disaggregated by gender.

Treatment of missing values:

• At country level

No imputation available

• At regional and global levels

No imputation available

Regional aggregates:

No regional aggregates compiled.

Sources of discrepancies:

The difference may arise due to: a) discrepancies in data sources; b) ISIC Revision used by a country; c) informal employment; d) cut-off point in surveys; e) working age definition; f) geographical coverage.

Data Sources

Description:

Figures for updates are obtained from national data and estimates produced by International Labour Organization (ILO). Data can be found in ILOSTAT database on employment by economic activity.

UNIDO provides data on manufacturing employment in INDSTAT database.

Collection process:

Information for this indicator has been assembled from a number of international repositories and is derived from a variety of sources, including household or labour force surveys, official estimates and censuses. In a very few cases and only where other types of sources are not available, information is derived from administrative records and establishment surveys.

The primary repositories used for the indicator are the ILOSTAT database, and EUROSTAT data, which are based on the European Labour Force Survey. These sources are augmented by various regional repositories, such as QUIPUSTAT, the ILO's Latin America and Caribbean Labour Information System, and by data gathered directly from publications or websites of national statistical offices.

UNIDO employment data are collected using General Industrial Statistics Questionnaire which is filled by NSOs and submitted to UNIDO annually. Data for OECD countries are obtained directly from OECD. Country data are also collected from official publications and official web-sites.

Data Availability

Description:

For around 100 economies

Time series:

1990 onwards with 2-3 years lag to the current calendar year

Calendar

Data collection:

Data are collected electronically throughout the year.

Data providers

ILO, UNIDO

Description:

ILO from national statistical offices (NSOs), EUROSTAT, QUIPSTAT, ILO's Latin America and Caribbean Labour Information System

UNIDO from national statistical offices (NSOs) in non-OECD countries, and OECD countries by OECD

Data compilers

United Nations Industrial Development Organization (UNIDO)

References

URL:

www.ilo.org/ilostat http://www.ilo.org/ilostat-files/Documents/description_ECO_EN.pdf www.unido.org/statistics https://stat.unido.org/

References:

Key Indicators of the Labour Market 2015 (KILM); ILO International Standard Industrial Classification of All Economic Activities 2008

Target 9.3: Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets

Indicator 9.3.1: Proportion of small-scale industries in total industry value added

Institutional information

Organization(s):

United Nations Industrial Development Organization (UNIDO)

Concepts and definitions

Definition:

Small-scale industrial enterprises, in the SDG framework also called **"small-scale industries"**, defined here for the purpose of statistical data collection and compilation refer to statistical units, generally enterprises, engaged in production of goods and services for market below a designated size class.

Proportion of "small-scale industries" in total industry value added represents an indicator calculating the share of manufacturing value added of small-scale manufacturing enterprises in the total manufacturing value added.

Rationale:

Industrial enterprises are classified to small compared to large or medium for their distinct nature of economic organization, production capability, scale of investment and other economic characteristics. "Small-scale industries" can be run with a small amount of capital, relatively unskilled labor and using local materials. Despite their small contribution to total industrial output, their role in job creation, especially in developing countries is recognized to be significant where the scope of absorbing surplus labor force from traditional sectors such as agriculture or fishery is very high. "Small-scale industries" are capable of meeting domestic demand of basic consumer goods such as food, clothes, furniture, etc.

Concepts:

International recommendations for industrial statistics 2008 (IRIS 2008) (United Nations, 2011) define an **enterprise** as the smallest legal unit that constitutes an organizational unit producing goods or services. The enterprise is the basic statistical unit at which all information relating to its production activities and transactions, including financial and balance-sheet accounts, are maintained. It is also used for institutional sector classification in the 2008 System of National Accounts.

An **establishment** is defined as an enterprise or part of an enterprise that is situated in a single location and in which only a single productive activity is carried out or in which the principal productive activity accounts for most of the value added. An establishment can be defined ideally as an economic unit that engages, under single ownership or control, that is, under a single legal entity, in one, or predominantly one, kind of economic activity at a single physical location. Mines, factories and workshops are examples. This ideal concept of an establishment is applicable to many of the situations encountered in industrial inquiries, particularly in manufacturing.

Although the definition of an establishment allows for the possibility that there may be one or more secondary activities carried out in it, their magnitude should be small compared with that of the principal activity. If a secondary activity within an establishment is as important, or nearly as important, as the principal activity, then the unit is more like a local unit. It should be subdivided so that the secondary activity is treated as taking place within an establishment separate from the establishment in which the principal activity takes place.

In the case of most **small-sized businesses**, the enterprise and the establishment will be identical. Some enterprises are large and complex with different kinds of economic activities undertaken at different locations. Such enterprises should be broken down into one or more establishments, provided that smaller and more homogeneous production units can be identified for which production data may be meaningfully compiled.

As introduced in IRIS 2008 (United Nations, 2011), an **economic activity** is understood as referring to a process, that is to say, to the combination of actions carried out by a certain entity that uses labor, capital, goods and services to produce specific products (goods and services). In general, industrial statistics reflect the characteristics and economic activities of units engaged in a class of industrial activities that are defined in terms of the International Standard Industrial Classification of All Economic Activities, Revision 4 (ISIC Rev.4) (United Nations, 2008) or International Standard Industrial Classification of All Economic Activities, Revision 3.1 (ISIC Rev. 3) (United Nations, 2002).

Total numbers of persons employed is defined as the total number of persons who work in or for the statistical unit, whether full-time or part-time, including:

- Working proprietors
- Active business partners
- Unpaid family workers
- Paid employees (for more details see United Nations, 2011).

The size of a statistical unit based on employment should be defined primarily in terms of the average number of persons employed in that unit during the reference period. If the average number of persons employed is not available, the total number of persons employed in a single period may be used as the size criterion. The size classification should consist of the following classes of the average number of persons employed: 1-9, 10-19, 20-49, 50-249, 250 and more. This should be considered a minimum division of the overall range; more detailed classifications, where required, should be developed within this framework.

Value added cannot be directly observed from the accounting records of the units. It is derived as the difference between gross output or census output and intermediate consumption or census input (United Nations, 2011). The value added at basic prices is calculated as the difference between the gross output at basic prices and the intermediate consumption at purchasers' prices. The valuation of value added closely corresponds to the valuation of gross output. If the output is valued at basic prices, then the valuation of value added is also at basic prices (the valuation of intermediate consumption is always at purchasers' prices).

All above mentioned terms are introduced to be in line with IRIS 2008 (United Nations, 2011).

Comments and limitations:

The main limitation of existing national data is varying size classes by country indicating that data are obtained from different target populations. Data of one country are not comparable to another.

The definition of size class in many countries is tied up with the legal and policy framework of the country. It has implications on registration procedure, taxation and different waivers aimed to promote "small-scale industries". Therefore, countries may agree on a common size class for compilation purposes. In this context, UNIDO proposes that all countries compile the employment and value added data by a size class of "small-scale industries" as with less than 20 persons employed. From such data, an internationally comparable data on the share of "small-scale industries" in total could be derived.

Methodology

Computation Method:

The proportion of "small-scale industries" in total value added is an indicator calculated as a share of value added for small-scale manufacturing enterprises in total manufacturing value added:

Manufacturing value added of "small - scale industries"Total manufacturing value added

Data Sources

Description:

Data are collected primary from national sources, from official publications and official web-sites, and from OECD (Structural and Demographic Business Statistics).

Collection process:

Countries were contacted to provide information on data availability for monitoring small-scale industrial enterprises. The data come mostly from annual industrial surveys, where value added is disaggregated by size classes given in terms of number of employees and from surveys focusing particularly on small enterprises, or small and medium enterprises in general.

Data Availability

Description:

Data for around 65 economies were collected

Time series:

Data are provided on very irregular basis. Data available from annual industrial surveys show yearly frequency, surveys on small and medium enterprises are conducted either irregularly or with a given time lag (for instance once in five years).

Data providers

National statistical offices (NSOs) in non-OECD countries, and OECD countries by OECD

Data compilers

United Nations Industrial Development Organization (UNIDO)

References

United Nations. (2002). International Standard Industrial Classification of All Economic Activities (ISIC Revision 4). New York : United Nations. <u>https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf</u>

United Nations. (2008). International Standard Industrial Classification of All Economic Activities (ISIC Revision 3.1). New York : United Nations. https://unstats.un.org/unsd/publication/SeriesM/seriesm_4rev3_1e.pdf

United Nations. (2011). International Recommendations for Industrial Statistics 2008 (IRIS 2008), New York: United Nations. <u>http://dx.doi.org/10.18356/677c08dd-en</u>

OECD. (2017). Structural and Demographic Business Statistics (SDBS). Paris: OECD. http://www.oecd.org/std/business-stats/structuralanddemographicbusinessstatisticssdbsoecd.htm

Target 9.3: Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets

Indicator 9.3.1: Proportion of small-scale industries in total industry value added

Institutional information

Organization(s):

United Nations Industrial Development Organization (UNIDO)

Concepts and definitions

Definition:

Small-scale industrial enterprises, in the SDG framework also called **"small-scale industries"**, defined here for the purpose of statistical data collection and compilation refer to statistical units, generally enterprises, engaged in production of goods and services for market below a designated size class.

Proportion of "small-scale industries" in total industry value added represents an indicator calculating the share of manufacturing value added of small-scale manufacturing enterprises in the total manufacturing value added.

Rationale:

Industrial enterprises are classified to small compared to large or medium for their distinct nature of economic organization, production capability, scale of investment and other economic characteristics. "Small-scale industries" can be run with a small amount of capital, relatively unskilled labor and using local materials. Despite their small contribution to total industrial output, their role in job creation, especially in developing countries is recognized to be significant where the scope of absorbing surplus labor force from traditional sectors such as agriculture or fishery is very high. "Small-scale industries" are capable of meeting domestic demand of basic consumer goods such as food, clothes, furniture, etc.

Concepts:

International recommendations for industrial statistics 2008 (IRIS 2008) (United Nations, 2011) define an **enterprise** as the smallest legal unit that constitutes an organizational unit producing goods or services. The enterprise is the basic statistical unit at which all information relating to its production activities and transactions, including financial and balance-sheet accounts, are maintained. It is also used for institutional sector classification in the 2008 System of National Accounts.

An **establishment** is defined as an enterprise or part of an enterprise that is situated in a single location and in which only a single productive activity is carried out or in which the principal productive activity accounts for most of the value added. An establishment can be defined ideally as an economic unit that engages, under single ownership or control, that is, under a single legal entity, in one, or predominantly one, kind of economic activity at a single physical location. Mines, factories and workshops are examples. This ideal concept of an establishment is applicable to many of the situations encountered in industrial inquiries, particularly in manufacturing.

Although the definition of an establishment allows for the possibility that there may be one or more secondary activities carried out in it, their magnitude should be small compared with that of the principal activity. If a secondary activity within an establishment is as important, or nearly as important, as the principal activity, then the unit is more like a local unit. It should be subdivided so that the secondary activity is treated as taking place within an establishment separate from the establishment in which the principal activity takes place.

In the case of most **small-sized businesses**, the enterprise and the establishment will be identical. Some enterprises are large and complex with different kinds of economic activities undertaken at different locations. Such enterprises should be broken down into one or more establishments, provided that smaller and more homogeneous production units can be identified for which production data may be meaningfully compiled.

As introduced in IRIS 2008 (United Nations, 2011), an **economic activity** is understood as referring to a process, that is to say, to the combination of actions carried out by a certain entity that uses labor, capital, goods and services to produce specific products (goods and services). In general, industrial statistics reflect the characteristics and economic activities of units engaged in a class of industrial activities that are defined in terms of the International Standard Industrial Classification of All Economic Activities, Revision 4 (ISIC Rev.4) (United Nations, 2008) or International Standard Industrial Classification of All Economic Activities, Revision 3.1 (ISIC Rev. 3) (United Nations, 2002).

Total numbers of persons employed is defined as the total number of persons who work in or for the statistical unit, whether full-time or part-time, including:

- Working proprietors
- Active business partners
- Unpaid family workers
- Paid employees (for more details see United Nations, 2011).

The size of a statistical unit based on employment should be defined primarily in terms of the average number of persons employed in that unit during the reference period. If the average number of persons employed is not available, the total number of persons employed in a single period may be used as the size criterion. The size classification should consist of the following classes of the average number of persons employed: 1-9, 10-19, 20-49, 50-249, 250 and more. This should be considered a minimum division of the overall range; more detailed classifications, where required, should be developed within this framework.

Value added cannot be directly observed from the accounting records of the units. It is derived as the difference between gross output or census output and intermediate consumption or census input (United Nations, 2011). The value added at basic prices is calculated as the difference between the gross output at basic prices and the intermediate consumption at purchasers' prices. The valuation of value added closely corresponds to the valuation of gross output. If the output is valued at basic prices, then the valuation of value added is also at basic prices (the valuation of intermediate consumption is always at purchasers' prices).

All above mentioned terms are introduced to be in line with IRIS 2008 (United Nations, 2011).

Comments and limitations:

The main limitation of existing national data is varying size classes by country indicating that data are obtained from different target populations. Data of one country are not comparable to another.

The definition of size class in many countries is tied up with the legal and policy framework of the country. It has implications on registration procedure, taxation and different waivers aimed to promote "small-scale industries". Therefore, countries may agree on a common size class for compilation purposes. In this context, UNIDO proposes that all countries compile the employment and value added data by a size class of "small-scale industries" as with less than 20 persons employed. From such data, an internationally comparable data on the share of "small-scale industries" in total could be derived.

Methodology

Computation Method:

The proportion of "small-scale industries" in total value added is an indicator calculated as a share of value added for small-scale manufacturing enterprises in total manufacturing value added:

Manufacturing value added of "small - scale industries"Total manufacturing value added

Data Sources

Description:

Data are collected primary from national sources, from official publications and official web-sites, and from OECD (Structural and Demographic Business Statistics).

Collection process:

Countries were contacted to provide information on data availability for monitoring small-scale industrial enterprises. The data come mostly from annual industrial surveys, where value added is disaggregated by size classes given in terms of number of employees and from surveys focusing particularly on small enterprises, or small and medium enterprises in general.

Data Availability

Description:

Data for around 65 economies were collected

Time series:

Data are provided on very irregular basis. Data available from annual industrial surveys show yearly frequency, surveys on small and medium enterprises are conducted either irregularly or with a given time lag (for instance once in five years).

Data providers

National statistical offices (NSOs) in non-OECD countries, and OECD countries by OECD

Data compilers

United Nations Industrial Development Organization (UNIDO)

References

United Nations. (2002). International Standard Industrial Classification of All Economic Activities (ISIC Revision 4). New York : United Nations. <u>https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf</u>

United Nations. (2008). International Standard Industrial Classification of All Economic Activities (ISIC Revision 3.1). New York : United Nations. <u>https://unstats.un.org/unsd/publication/SeriesM/seriesm_4rev3_1e.pdf</u>

United Nations. (2011). International Recommendations for Industrial Statistics 2008 (IRIS 2008), New York: United Nations. <u>http://dx.doi.org/10.18356/677c08dd-en</u>

OECD. (2017). Structural and Demographic Business Statistics (SDBS). Paris: OECD. http://www.oecd.org/std/business-stats/structuralanddemographicbusinessstatisticssdbsoecd.htm

Target 9.3: Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets

Indicator 9.3.2: Proportion of small-scale industries with a loan or line of credit

Institutional information

Organization(s):

United Nations Industrial Development Organization (UNIDO)

Concepts and definitions¹

Definition:

Small-scale industrial enterprises, in the SDG framework also called **"small-scale industries"**, defined here for the purpose of statistical data collection and compilation refer to statistical units, generally enterprises, engaged in production of goods and services for market below a designated size class.

This indicator shows the number of "small-scale industries" with an active line of credit or a loan from a financial institution in the reference year in percentage to the total number of such enterprises.

Rationale:

Industrial enterprises are classified to small compared to large or medium for their distinct nature of economic organization, production capability, scale of investment and other economic characteristics. "Small-scale industries" can be run with a small amount of capital, relatively unskilled labor and using local materials. Despite their small contribution to total industrial output, their role in job creation, especially in developing countries is recognized to be significant where the scope of absorbing surplus labor force from traditional sectors such as agriculture or fishery is very high. "Small-scale industries" are capable of meeting domestic demand of basic consumer goods such as food, clothes, furniture, etc.

Thus "small-scale industries" play an important role in the economy. However, it has quite limited access to financial services, especially in developing countries. In order to improve the skill of workers and technology for production, small-scale industrial enterprises require financial support in the form of preferential loan, credit etc. This indicator shows how widely financial institutions are serving the "small-scale industries". Together with the indicator SDG 9.3.1, this indicator reflects the main message of the target 9.3 which promotes to increase the access of "small-scale industries" to financial services.

¹ Some of the text on concepts and definition may be identical to Metadata submitted for Indicators 9.3.1.

Concepts:

International recommendations for industrial statistics 2008 (IRIS 2008) (United Nations, 2011) define an **enterprise** as the smallest legal unit that constitutes an organizational unit producing goods or services. The enterprise is the basic statistical unit at which all information relating to its production activities and transactions, including financial and balance-sheet accounts, are maintained. It is also used for institutional sector classification in the 2008 System of National Accounts.

An **establishment** is defined as an enterprise or part of an enterprise that is situated in a single location and in which only a single productive activity is carried out or in which the principal productive activity accounts for most of the value added. An establishment can be defined ideally as an economic unit that engages, under single ownership or control, that is, under a single legal entity, in one, or predominantly one, kind of economic activity at a single physical location. Mines, factories and workshops are examples. This ideal concept of an establishment is applicable to many of the situations encountered in industrial inquiries, particularly in manufacturing.

Although the definition of an establishment allows for the possibility that there may be one or more secondary activities carried out in it, their magnitude should be small compared with that of the principal activity. If a secondary activity within an establishment is as important, or nearly as important, as the principal activity, then the unit is more like a local unit. It should be subdivided so that the secondary activity is treated as taking place within an establishment separate from the establishment in which the principal activity takes place.

In the case of most **small-sized businesses**, the enterprise and the establishment will be identical. Some enterprises are large and complex with different kinds of economic activities undertaken at different locations. Such enterprises should be broken down into one or more establishments, provided that smaller and more homogeneous production units can be identified for which production data may be meaningfully compiled.

As introduced in IRIS 2008 (United Nations, 2011), an **economic activity** is understood as referring to a process, that is to say, to the combination of actions carried out by a certain entity that uses labor, capital, goods and services to produce specific products (goods and services). In general, industrial statistics reflect the characteristics and economic activities of units engaged in a class of industrial activities that are defined in terms of the International Standard Industrial Classification of All Economic Activities, Revision 4 (ISIC Rev.4) (United Nations, 2008) or International Standard Industrial Classification of All Economic Activities, Revision 3.1 (ISIC Rev. 3) (United Nations, 2002).

Total numbers of persons employed is defined as the total number of persons who work in or for the statistical unit, whether full-time or part-time, including:

- Working proprietors
- Active business partners
- Unpaid family workers
- Paid employees (for more details see United Nations, 2011).

The size of a statistical unit based on employment should be defined primarily in terms of the average number of persons employed in that unit during the reference period. If the average number of persons employed is not available, the total number of persons employed in a single period may be used as the size criterion. The size classification should consist of the following classes of the average number of persons employed: 1-9, 10-19, 20-49, 50-249, 250 and more. This should be considered a minimum division of the overall range; more detailed classifications, where required, should be developed within this framework. A **loan** is a financial instrument that is created when a creditor lends funds directly to a debtor and receives a nonnegotiable document as evidence of the asset. This category includes overdrafts, mortgage loans, loans to finance trade credit and advances, repurchase agreements, financial assets and liabilities created by financial leases, and claims on or liabilities to the International Monetary Fund (IMF) in the form of loans. Trade credit and advances and similar accounts payable/receivable are not loans. Loans that have become marketable in secondary markets should be reclassified under debt securities. However, if only traded occasionally, the loan is not reclassified under debt securities (IMF, 2011).

Lines of credit and loan commitments provide a guarantee that undrawn funds will be available in the future, but no financial liability/asset exists until such funds are actually provided. Undrawn lines of credit and undisbursed loan commitments are contingent liabilities of the issuing institutions— generally, banks (IMF, 2011). A loan or line of credit refers to regulated financial institutions only.

Comments and limitations:

The main limitation of existing national data is varying size classes by country indicating that data are obtained from different target populations. Data of one country are not comparable to another.

The definition of size class in many countries is tied up with the legal and policy framework of the country. It has implications on registration procedure, taxation and different waivers aimed to promote "small-scale industries". Therefore, countries may agree on a common size class for compilation purposes. In this context, UNIDO proposes that all countries compile the data by a size class of "small-scale industries" as with less than 20 persons employed. From such data, an internationally comparable data on the share of "small-scale industries" in total could be derived.

Methodology

Computation Method:

The proportion of "small-scale industries" with a loan or line of credit is calculated as the number of "smallscale industries" with an active line of credit or a loan from a financial institution in the reference year in percentage to the total number of such enterprises:

the number of "small – scale industries" with loan or line of creditTotal number of "small – scale industries"

Data Sources

Description:

Data were collected from the World Bank Enterprise Surveys as a pilot study on this indicator, however the preferable source of data are national statistical offices.

Collection process:

One of the main sources of data for this indicator currently available is the Enterprise Survey conducted by the World Bank which covers the formal sector and contains data for small and medium enterprises only (with 5 or more employees). In some countries, additional surveys, including Informal Surveys of unregistered enterprises and/or Micro Surveys for registered firms with less than five employees, are conducted and available at country level.

The Enterprise Survey is based on a representative sample of enterprises run by the private sector. The surveys cover a broad range of business environment topics including access to finance, corruption, infrastructure, crime, competition, and performance measures. Since 2002, the World Bank has collected these data from face-to-face interviews with top managers and business owners in over 130,000 companies in 135 economies.

The surveys have been conducted since 2002 by different units within the World Bank. Since 2005-06, most data collection efforts have been centralized within the Enterprise Analysis Unit. Data from 2006 onward is comparable across countries. The raw individual country datasets, aggregated datasets (across countries and years), panel datasets, and all relevant survey documentation are publicly available on the Enterprise Surveys web site.

The indicator uses a simple weighted percentage formula, where the weights are the sampling weights. The strata for Enterprise Surveys are firm size, business sector, and geographic region within a country. Enterprise Surveys provide indicators covering manufacturing and services activities. Proportion of "small-scale industries" with a loan or line of credit for manufacturing only can be extracted from the micro data. Enterprises are classified as small, medium or large based on the number of employees as follows:

Size of enterprise	Number of employees	
Small	5 to 19	
Medium	20 to 99	
Large	more than 99	

The survey also defines an enterprise with female ownership as an enterprise having at least one female owner, and female-managed is measured by whether the top manager is a woman.

Data Availability

Description: Data for around 130 economies were collected.

Time series:

Surveys are implemented every year in around 20 countries. Data frequency for each country is around 4 years.

Data providers

World Bank Enterprise Surveys

Data compilers

United Nations Industrial Development Organization (UNIDO)

References

International Monetary Fund. (2011). Public Sector Debt Statistics: Guide for Compilers and Users. Washington, DC: International Monetary Fund. <u>http://www.tffs.org/pdf/method/2013/psds2013.pdf</u>

United Nations. (2002). International Standard Industrial Classification of All Economic Activities (ISIC Revision 4). New York : United Nations. <u>https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf</u>

United Nations. (2008). International Standard Industrial Classification of All Economic Activities (ISIC Revision 3.1). New York : United Nations. <u>https://unstats.un.org/unsd/publication/SeriesM/seriesm_4rev3_1e.pdf</u>

United Nations. (2011). International Recommendations for Industrial Statistics 2008 (IRIS 2008), New York: United Nations. <u>http://dx.doi.org/10.18356/677c08dd-en</u>

World Bank Enterprise Surveys. 2017. Methodology. http://www.enterprisesurveys.org/methodology

Target 9.3: Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets

Indicator 9.3.2: Proportion of small-scale industries with a loan or line of credit

Institutional information

Organization(s):

United Nations Industrial Development Organization (UNIDO)

Concepts and definitions¹

Definition:

Small-scale industrial enterprises, in the SDG framework also called **"small-scale industries"**, defined here for the purpose of statistical data collection and compilation refer to statistical units, generally enterprises, engaged in production of goods and services for market below a designated size class.

This indicator shows the number of "small-scale industries" with an active line of credit or a loan from a financial institution in the reference year in percentage to the total number of such enterprises.

Rationale:

Industrial enterprises are classified to small compared to large or medium for their distinct nature of economic organization, production capability, scale of investment and other economic characteristics. "Small-scale industries" can be run with a small amount of capital, relatively unskilled labor and using local materials. Despite their small contribution to total industrial output, their role in job creation, especially in developing countries is recognized to be significant where the scope of absorbing surplus labor force from traditional sectors such as agriculture or fishery is very high. "Small-scale industries" are capable of meeting domestic demand of basic consumer goods such as food, clothes, furniture, etc.

Thus "small-scale industries" play an important role in the economy. However, it has quite limited access to financial services, especially in developing countries. In order to improve the skill of workers and technology for production, small-scale industrial enterprises require financial support in the form of preferential loan, credit etc. This indicator shows how widely financial institutions are serving the "small-scale industries". Together with the indicator SDG 9.3.1, this indicator reflects the main message of the target 9.3 which promotes to increase the access of "small-scale industries" to financial services.

¹ Some of the text on concepts and definition may be identical to Metadata submitted for Indicators 9.3.1.

Concepts:

International recommendations for industrial statistics 2008 (IRIS 2008) (United Nations, 2011) define an **enterprise** as the smallest legal unit that constitutes an organizational unit producing goods or services. The enterprise is the basic statistical unit at which all information relating to its production activities and transactions, including financial and balance-sheet accounts, are maintained. It is also used for institutional sector classification in the 2008 System of National Accounts.

An **establishment** is defined as an enterprise or part of an enterprise that is situated in a single location and in which only a single productive activity is carried out or in which the principal productive activity accounts for most of the value added. An establishment can be defined ideally as an economic unit that engages, under single ownership or control, that is, under a single legal entity, in one, or predominantly one, kind of economic activity at a single physical location. Mines, factories and workshops are examples. This ideal concept of an establishment is applicable to many of the situations encountered in industrial inquiries, particularly in manufacturing.

Although the definition of an establishment allows for the possibility that there may be one or more secondary activities carried out in it, their magnitude should be small compared with that of the principal activity. If a secondary activity within an establishment is as important, or nearly as important, as the principal activity, then the unit is more like a local unit. It should be subdivided so that the secondary activity is treated as taking place within an establishment separate from the establishment in which the principal activity takes place.

In the case of most **small-sized businesses**, the enterprise and the establishment will be identical. Some enterprises are large and complex with different kinds of economic activities undertaken at different locations. Such enterprises should be broken down into one or more establishments, provided that smaller and more homogeneous production units can be identified for which production data may be meaningfully compiled.

As introduced in IRIS 2008 (United Nations, 2011), an **economic activity** is understood as referring to a process, that is to say, to the combination of actions carried out by a certain entity that uses labor, capital, goods and services to produce specific products (goods and services). In general, industrial statistics reflect the characteristics and economic activities of units engaged in a class of industrial activities that are defined in terms of the International Standard Industrial Classification of All Economic Activities, Revision 4 (ISIC Rev.4) (United Nations, 2008) or International Standard Industrial Classification of All Economic Activities, Revision 3.1 (ISIC Rev. 3) (United Nations, 2002).

Total numbers of persons employed is defined as the total number of persons who work in or for the statistical unit, whether full-time or part-time, including:

- Working proprietors
- Active business partners
- Unpaid family workers
- Paid employees (for more details see United Nations, 2011).

The size of a statistical unit based on employment should be defined primarily in terms of the average number of persons employed in that unit during the reference period. If the average number of persons employed is not available, the total number of persons employed in a single period may be used as the size criterion. The size classification should consist of the following classes of the average number of persons employed: 1-9, 10-19, 20-49, 50-249, 250 and more. This should be considered a minimum division of the overall range; more detailed classifications, where required, should be developed within this framework. A **loan** is a financial instrument that is created when a creditor lends funds directly to a debtor and receives a nonnegotiable document as evidence of the asset. This category includes overdrafts, mortgage loans, loans to finance trade credit and advances, repurchase agreements, financial assets and liabilities created by financial leases, and claims on or liabilities to the International Monetary Fund (IMF) in the form of loans. Trade credit and advances and similar accounts payable/receivable are not loans. Loans that have become marketable in secondary markets should be reclassified under debt securities. However, if only traded occasionally, the loan is not reclassified under debt securities (IMF, 2011).

Lines of credit and loan commitments provide a guarantee that undrawn funds will be available in the future, but no financial liability/asset exists until such funds are actually provided. Undrawn lines of credit and undisbursed loan commitments are contingent liabilities of the issuing institutions— generally, banks (IMF, 2011). A loan or line of credit refers to regulated financial institutions only.

Comments and limitations:

The main limitation of existing national data is varying size classes by country indicating that data are obtained from different target populations. Data of one country are not comparable to another.

The definition of size class in many countries is tied up with the legal and policy framework of the country. It has implications on registration procedure, taxation and different waivers aimed to promote "small-scale industries". Therefore, countries may agree on a common size class for compilation purposes. In this context, UNIDO proposes that all countries compile the data by a size class of "small-scale industries" as with less than 20 persons employed. From such data, an internationally comparable data on the share of "small-scale industries" in total could be derived.

Methodology

Computation Method:

The proportion of "small-scale industries" with a loan or line of credit is calculated as the number of "smallscale industries" with an active line of credit or a loan from a financial institution in the reference year in percentage to the total number of such enterprises:

 $\frac{\textit{the number of "small - scale industries" with loan or line of credit}}{\textit{Total number of "small - scale industries"}}*100$

Data Sources

Description:

Data were collected from the World Bank Enterprise Surveys as a pilot study on this indicator, however the preferable source of data are national statistical offices.

Collection process:

One of the main sources of data for this indicator currently available is the Enterprise Survey conducted by the World Bank which covers the formal sector and contains data for small and medium enterprises only (with 5 or more employees). In some countries, additional surveys, including Informal Surveys of unregistered enterprises and/or Micro Surveys for registered firms with less than five employees, are conducted and available at country level.

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The surveys have been conducted since 2002 by different units within the World Bank. Since 2005-06, most data collection efforts have been centralized within the Enterprise Analysis Unit. Data from 2006 onward is comparable across countries. The raw individual country datasets, aggregated datasets (across countries and years), panel datasets, and all relevant survey documentation are publicly available on the Enterprise Surveys web site.

The indicator uses a simple weighted percentage formula, where the weights are the sampling weights. The strata for Enterprise Surveys are firm size, business sector, and geographic region within a country. Enterprise Surveys provide indicators covering manufacturing and services activities. Proportion of "small-scale industries" with a loan or line of credit for manufacturing only can be extracted from the micro data. Enterprises are classified as small, medium or large based on the number of employees as follows:

Size of enterprise	Number of employees	
Small	5 to 19	
Medium	20 to 99	
Large	more than 99	

The survey also defines an enterprise with female ownership as an enterprise having at least one female owner, and female-managed is measured by whether the top manager is a woman.

Data Availability

Description: Data for around 130 economies were collected.

Time series:

Surveys are implemented every year in around 20 countries. Data frequency for each country is around 4 years.

Data providers

World Bank Enterprise Surveys

Data compilers

United Nations Industrial Development Organization (UNIDO)

References

International Monetary Fund. (2011). Public Sector Debt Statistics: Guide for Compilers and Users. Washington, DC: International Monetary Fund. <u>http://www.tffs.org/pdf/method/2013/psds2013.pdf</u>

United Nations. (2002). International Standard Industrial Classification of All Economic Activities (ISIC Revision 4). New York : United Nations. <u>https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf</u>

United Nations. (2008). International Standard Industrial Classification of All Economic Activities (ISIC Revision 3.1). New York : United Nations. <u>https://unstats.un.org/unsd/publication/SeriesM/seriesm_4rev3_1e.pdf</u>

United Nations. (2011). International Recommendations for Industrial Statistics 2008 (IRIS 2008), New York: United Nations. <u>http://dx.doi.org/10.18356/677c08dd-en</u>

World Bank Enterprise Surveys. 2017. Methodology. http://www.enterprisesurveys.org/methodology

Target 9.4: By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities Indicator 9.4.1: CO₂ emission per unit of value added

Institutional information

Organization(s):

International Energy Agency (IEA) United Nations Industrial Development Organization (UNIDO)

Concepts and definitions

Definition:

Carbon dioxide (here after, CO_2) emissions per unit value added is an indicator computed as ratio between CO_2 emissions from fuel combustion and the value added of associated economic activities. The indicator can be computed for the whole economy (total CO_2 emissions/GDP) or for specific sectors, notably the manufacturing sector (CO_2 emissions from manufacturing industries per manufacturing value added (MVA).

 CO_2 emissions per unit of GDP are expressed in kilogrammes of CO_2 per USD constant 2010 PPP GDP. CO_2 emissions from manufacturing industries per unit of MVA are measured in kilogrammes of CO_2 equivalent per unit of MVA in constant 2010 USD.

Rationale:

The indicator CO₂ emissions per unit of value added represents the amount of emissions from fuel combustion produced by an economic activity, per unit of economic output. When computed for the whole economy, it combines effects of the average carbon intensity of the energy mix (linked to the shares of the various fossil fuels in the total); of the structure of an economy (linked to the relative weight of more or less energy-intensive sectors); of the average efficiency in the use of energy. When computed for the manufacturing sector (CO₂ emissions from fuel combustion per unit of manufacturing value added), it measures the carbon intensity of the manufacturing economic output, and its trends result from changes in the average carbon intensity of the energy mix used, in the structure of the manufacturing sector, in the energy efficiency of production technologies in each sub-sector, and in the economic value of the various output. Manufacturing industries are generally improving their emission intensity as countries move to higher levels of industrialization, but it should be noted that emission intensities can also be reduced through structural changes and product diversification in manufacturing.

CO₂ emission accounts for around 80% of all GHG emission from the manufacturing processes.

Concepts:

Total CO₂ emissions for an economy are estimated based on energy consumption data for all sectors.

CO₂ emissions from manufacturing are based on energy data collected across the following subsectors (energy used for transport by industry is not included here but reported under transport):

- Iron and steel industry [ISIC Group 241 and Class 2431];
- Chemical and petrochemical industry [ISIC Divisions 20 and 21] excluding petrochemical feedstocks;
- Non-ferrous metals basic industries [ISIC Group 242 and Class 2432];
- Non-metallic minerals such as glass, ceramic, cement, etc. [ISIC Division 23];
- Transport equipment [ISIC Divisions 29 and 30];
- Machinery comprises fabricated metal products, machinery and equipment other than transport equipment [ISIC Divisions 25 to 28];
- Food and tobacco [ISIC Divisions 10 to 12];
- Paper, pulp and printing [ISIC Divisions 17 and 18];
- Wood and wood products (other than pulp and paper) [ISIC Division 16];
- Textile and leather [ISIC Divisions 13 to 15];
- Non-specified (any manufacturing industry not included above) [ISIC Divisions 22, 31 and 32].

Energy data are collected at a country level, based on internationally agreed standards (UN International Recommendations on Energy Statistics). CO₂ emissions need to be estimated based on energy data and on internationally agreed methodologies (IPCC Guidelines for GHG inventories).

The IEA collects national energy data, according to internationally agreed energy statistics definitions and estimates CO2 emissions based on the IPCC Guidelines for GHG inventories Tier 1 methodology, producing internationally comparable CO2 emissions data for over 150 countries and regions.

The gross value added is defined as output minus intermediate consumption and equals the sum of employee compensation, gross operating surplus of government and corporations, gross mixed income of unincorporated enterprises and taxes less subsidies on production and imports, except for net taxes on products (System of National Accounts 2008). Manufacturing refers to industries belonging to the sector C defined by ISIC Revision 4, or D defined by ISIC Revision 3.

Comments and limitations:

Estimation of CO₂ emission data is not systematized in many countries, although is performed internationally based on harmonised energy data collected at national level. Energy data collection is generally well established, although in some cases national methodologies may differ from internationally agreed methodologies. National data sources include statistical offices, Energy Ministries, Environment agencies, among others. Energy consumption data and value added data are coming from different data sources which may raise some consistency issues.

Methodology

Computation Method:

CO2 emissions from fuel combustion are estimated based on energy consumption and on the IPCC Guidelines.

The total intensity of the economy is defined as the ratio of total CO2 emissions from fuel combustion and GDP.

The sectoral intensity is defined as CO₂ emission from manufacturing (in physical measurement unit such as tonnes) divided by manufacturing value added (MVA) in constant 2010 USD.

 $CO2 \ emission \ per \ unit \ of \ value \ added = \frac{CO2 \ emission \ from \ manufacturing \ (in \ kg)}{MVA \ (constant \ USD)}$

Disaggregation:

Data can be presented for national totals, for the manufacturing sector, and by industrial subsector.

Treatment of missing values:

• At country level

Boudt, Todorov, Upadhyaya (2009): Nowcasting manufacturing value added for cross-country comparison; Statistical Journal of IAOS

• At regional and global levels

No imputation is provided if values are missing for the entire country or the region. It can only be projected from the data reported for previous years.

Regional aggregates:

Regional aggregates are derived from the total number of available countries in a country group.

Sources of discrepancies:

Difference may arise 1) if the country has not submitted energy consumption data adequately disaggregated by sector or by energy sources 2) due to conversion of value data into USD.

Methods and guidance available to countries for the compilation of the data at the national level:

It is important that energy data collection and emissions calculations are consistent with international standards. CO2 emissions need to be estimated based on energy data and on internationally agreed methodologies. Energy data are collected at a country level, based on internationally agreed standards (UN International Recommendations on Energy Statistics). The IEA collects from countries energy data, according to internationally agreed energy statistics definitions. Then, the IEA estimates CO2 emissions based on country data and on the IPCC Guidelines for GHG inventories, producing internationally comparable CO2 emissions data for over 150 countries and regions. For energy data: the IEA sends standardised energy questionnaires (by fuel) to its Members and more globally to countries willing to provide data (e.g. all EU - jointly with Eurostat- most UNECE countries, and a few others submit these questionnaires). Questionnaires are available at:

http://www.iea.org/statistics/resources/questionnaires/annual/. For other countries, national data are processed to a consistent format. Therefore, the IEA is able to provide key energy statistics. More detail on methods and sources is available at: <u>http://wds.iea.org/wds/pdf/WORLDBAL_Documentation.pdf</u>.

To estimate CO2 emissions, the internationally agreed reference is the 2006 IPCC Guidelines on GHG Inventories. http://www.ipcc-nggip.iges.or.jp/public/2006gl/. For the underlying energy data, the reference is the UN International Recommendations on Energy Statistics:

https://unstats.un.org/unsd/energy/ires/. More information on methodologies from the IEA is available at: <u>http://wds.iea.org/wds/pdf/Worldco2_Documentation.pdf</u>.

Quality assurance

The IEA has extensive data quality checks on the energy data submissions (around 30 statisticians working on it), and iterates with countries on data issues and how to address them. http://www.iea.org/statistics/resources/questionnaires/annual/. The IEA also works in cooperation with the IPCC and the UNFCCC to ensure the highest consistency between international methodologies and methodologies adopted at the IEA; the IEA validates energy data submitted to the UNFCCC by countries within their inventories. The IEA convenes international workshops among partner Agencies working on energy data to ensure consistency between energy data at global level is enhanced continuously, and methodologies are harmonised.

The IEA has an extensive data quality assurance and validation process through exchange with national data providers worldwide. It also convenes its Energy Statistics Development Group meeting to discuss energy statistics developments with its Members, and cooperates with partners worldwide to ensure coherence of data and methods.

Data Sources

Description:

Data on total CO_2 emissions from fuel combustion, also disaggregated by sector, are taken from the International Energy Agency (IEA) database (IEA CO_2 Emissions from Fuel Combustion, 2016 Statistics: <u>https://www.iea.org/statistics/relateddatabases/co2emissionsfromfuelcombustion/</u>).

The IEA produces the indicator on total CO2 emissions/GDP, based on secondary sources for GDP (OECD National Accounts and World Bank Development indicators).

UNIDO maintains MVA database. Figures for updates are obtained from national account estimates produced by UN Statistics Division (UNSD).

Collection process:

Energy data are collected at the national level according to harmonised international definitions and questionnaires, as described in the UN International Recommendations for Energy Statistics (https://unstats.un.org/unsd/energy/ires/).

The estimates of CO2 emissions from fuel combustion are calculated by the IEA based on the IEA energy data and the default methods and emission factors from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (<u>http://www.ipcc-nggip.iges.or.jp/public/2006gl/</u>). More information on methodologies from the IEA is available at: <u>http://wds.iea.org/wds/pdf/Worldco2_Documentation.pdf</u>

The MVA and GDP country data are collected through a national accounts questionnaire (NAQ) sent by UNSD. More information on the methodology is available on https://unstats.un.org/unsd/snaama/methodology.pdf.

Data Availability

Description:

Data are available for more than 130 countries.

Time series: 1990 onwards with 3 years lag to the current calendar year

Calendar

Data collection:

Data collection is carried out by receiving data electronically throughout the year.

Data release:

The IEA releases its World CO2 emissions from fuel combustion statistics in Fall each year. UNIDO MVA database is updated between March and April every year.

Data providers

Name:

UNSD, IEA

Description: NSOs and national energy data collecting agencies provide the data to UNSD and IEA.

Data compilers

Name: UNIDO, IEA

Description:

IEA provides data on total CO2 emissions, CO2 emissions/GDP, manufacturing CO2 emissions. UNIDO compiles the data using its source for MVA data and IEA for data on CO_2 emissions.

References

URL:

https://www.iea.org/publications/freepublications/publication/co2-emissions-from-fuel-combustionhighlights-2016.html

www.unido.org/statistics https://unstats.un.org/unsd/snaama/methodology.pdf

References:

International Yearbook of Industrial Statistics; UNIDO CO₂ Emissions from Fuel Combustion; IEA System of National Accounts, 2008 Key world energy statistics 2016, IEA

Target 9.5: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending

Indicator 9.5.1: Research and development expenditure as a proportion of GDP

Institutional information

Organization(s):

United Nations Educational, Scientific and Cultural Organization (UNESCO)

Concepts and definitions

Definition:

Research and development (R&D) expenditure as a proportion of Gross Domestic Product (GDP) is the amount of R&D expenditure divided by the total output of the economy.

Rationale:

The indicator is a direct measure of Research and development (R&D) spending referred to in the target.

Concepts:

The OECD Frascati Manual (OECD, 2015) provides the relevant definitions for research and experimental development, gross domestic expenditure on R&D and researchers. Although an OECD manual, the application is global. During the 6th revision of the Frascati Manual, developing country issues were mainstreamed in the core of the Manual. The 7th edition was released in October 2015.

The following definitions, taken from the 2015 edition of the Frascati Manual are relevant for computing the indicator.

Research and experimental development (R&D) comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge.

Expenditures on intramural R&D represent the amount of money spent on R&D that is performed within a reporting unit.

Comments and limitations:

Research and development (R&D) data need to be collected through surveys, which are expensive, and are not done on a regular basis in many developing countries. Furthermore, (developing) countries do not always cover all sectors of performance. In particular the business sector is not always covered.

Methodology

Computation Method:

Computation of the indicator Research and development (R&D) expenditure as a proportion of Gross Domestic Product (GDP) is self-explanatory, using readily available GDP data as denominator.

Disaggregation:

R&D expenditure can be broken down by sector of performance, source of funds, field of science, type of research and type of cost.

Treatment of missing values:

• At country level

Missing data are not estimated by the UIS.

• At regional and global levels

Imputations are based on interpolations or extrapolations of data for other reference years. In case no data are available at all, the unweighted regional average is used as an estimate.

Regional aggregates:

Data are converted using purchasing power parities. Missing data are imputed using the methodology described above. R&D expenditure data are then added up by region and divided by GDP in PPP for that region. Similar for the global total.

Sources of discrepancies:

There are no differences in the underlying data. Difference may occur due to the use of difference data for the denominator used to calculate indicators.

Methods and guidance available to countries for the compilation of the data at the national level:

Countries are responsible themselves for the collection of R&D data at the national level, compile national totals and submit them to international organisations. All countries follow the guidelines of the Frascati Manual: <u>http://www.oecd-ilibrary.org/science-and-technology/frascati-manual-</u>2015_9789264239012-en.

All countries follow the international guidelines of the OECD Frascati Manual: <u>http://www.oecd-</u> <u>ilibrary.org/science-and-technology/frascati-manual-2015_9789264239012-en</u>. Countries starting to measure R&D can use UIS Technical Paper 11 for assistance, which can be downloaded here: <u>uis.unesco.org/sites/default/files/documents/guide-to-conducting-an-rd-survey-for-countries-starting-to-</u> <u>measure-research-and-experimental-development-2014-en.pdf</u>.

Quality assurance:

The UNESCO Institute of Statistics (UIS) sends out a questionnaire every year to collect R&D data from all countries (around 125 countries), which are not covered by the data collections of the other partner organizations such as the Organisation for Economic Co-operation and Development (OECD), Eurostat (Statistical Office of the European Union) and the Network on Science and Technology Indicators – Ibero-American and Inter-American (RICYT). In agreement with these three organisations, their data (which were collected from their member states/associated member states – around 65 countries-) are directly obtained from the respective databases (in the case of the OECD and Eurostat) or received from the partner (in the case of RICYT). There is also collaboration in Africa with the African STI Indicators Initiative (ASTII) of AU/NEPAD. For the data UIS sends a questionnaire to, the quality assurance process is the following:

- i. A questionnaire is sent to focal points in countries, generally within the Ministry of Science and Technology or the national statistical office.
- ii. UIS processes the questionnaires, communicating with the countries in case of questions, calculates indicators and releases the data and indicators on its website.
- Countries are requested to complete the questionnaire using the standard international classifications, therefore adjustments are generally not needed. The other agencies have similar procedures.

After processing the data, but before submitting the data for inclusion in the SDG database, UIS sends the calculated indicators for target 9.5 to all countries that do not submit their data to Eurostat or the OECD. This provides the countries with the opportunity to review the data and provide any modifications or additions before UIS submits the data to UNSD.

Data Sources

Description:

Data are collected through national Research and development (R&D) surveys, either by the national statistical office or a line ministry (such as the Ministry for Science and Technology).

Collection process:

The UNESCO Institute of Statistics (UIS) sends out a questionnaire every year to collect R&D data from all countries (around 125 countries), which are not covered by the data collections of the other partner organizations such as the Organisation for Economic Co-operation and Development (OECD), Eurostat (Statistical Office of the European Union) and the Network on Science and Technology Indicators – Ibero-American and Inter-American (RICYT). In agreement with these three organisations, their data (which were collected from their member states/associated member states – around 65 countries-) are directly obtained from the respective databases (in the case of the OECD and Eurostat) or received from the partner (in the case of RICYT). There is also collaboration in Africa with the African STI Indicators Initiative (ASTII) of AU/NEPAD, which may lead to a joint data collection in the future.

For the data UIS sends a questionnaire to, the process is the following:

- i. A questionnaire is sent to focal points in countries, generally within the Ministry of Science and Technology or the national statistical office.
- ii. UIS processes the questionnaires, communicating with the countries in case of questions, calculates indicators and releases the data and indicators on its website.
- iii. Countries are requested to complete the questionnaire using the standard international classifications, therefore adjustments are generally not needed.

Data Availability

Description:

Data available for over 130 countries for R&D expenditure as % of GDP

Time series:

Data available in the UIS database since reference year 1996, but historical data available back to 1981

Calendar

Data collection:

UIS sends out the questionnaire in September every year. The OECD and Eurostat collect data twice per year.

Data release:

July every year

Data providers

Data are collected through national R&D surveys, either by the national statistical office or a line ministry (such as the Ministry for Science and Technology).

Data compilers

Name:

The UNESCO Institute of Statistics (UIS), Organisation for Economic Co-operation and Development (OECD), Eurostat (Statistical Office of the European Union) and the Network on Science and Technology

Indicators – Ibero-American and Inter-American (RICYT), African STI Indicators Initiative (ASTII) of AU/NEPAD

References

URL:

www.uis.unesco.org

References:

OECD (2015), Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/9789264239012-en

UIS Data centre: http://data.uis.unesco.org/Index.aspx?DataSetCode=SCN_DS&popupcustomise=true&lang=en

Related indicators

2a, 3b, 12a, 14a, 17.6, 17.7

Target 9.5: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending

Indicator 9.5.2: Researchers (in full-time equivalent) per million inhabitants

Institutional information

Organization(s):

United Nations Educational, Scientific and Cultural Organization (UNESCO)

Concepts and definitions

Definition:

The researchers (in full-time equivalent) per million inhabitants is a direct measure of the number of research and development workers per 1 million people.

Rationale:

The indicator is a direct measure of the number of research and development workers per 1 million people referred to in the target.

Concepts:

The OECD Frascati Manual (OECD, 2015) provides the relevant definitions for research and experimental development, gross domestic expenditure on R&D and researchers. Although an OECD manual, the application is global. During the 6th revision of the Frascati Manual, developing country issues were mainstreamed in the core of the Manual. The 7th edition was released in October 2015.

The following definitions, taken from the 2015 edition of the Frascati Manual are relevant for computing the indicator.

Research and experimental development (R&D) comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge.

Researchers are professionals engaged in the conception or creation of new knowledge. They conduct research and improve or develop concepts, theories, models, techniques instrumentation, software or operational methods.

The Full-time equivalent (FTE) of R&D personnel is defined as the ratio of working hours actually spent on R&D during a specific reference period (usually a calendar year) divided by the total number of hours conventionally worked in the same period by an individual or by a group.

Comments and limitations:

R&D data need to be collected through surveys, which are expensive, and are not done on a regular basis in many developing countries. Furthermore, (developing) countries do not always cover all sectors of performance. In particular the business sector is not always covered.

Methodology

Computation Method:

Computation of the indicator Researchers (in full-time equivalent) per million inhabitants uses available population data as denominator.

Disaggregation:

Researchers can be broken down by sector of employment, field of science, sex and age.

Treatment of missing values:

• At country level

Missing data are not estimated by the UIS.

• At regional and global levels

Imputations are based on interpolations or extrapolations of data for other reference years. Second option is to make an estimate for FTE based on available headcount data. In case no data are available at all, the unweighted regional average is used as an estimate.

Regional aggregates:

Missing data are imputed using the methodology described above. The data for researchers in FTE are then added up by region and divided by the population data for that region. Similar for the global total.

Sources of discrepancies:

There are no differences in the underlying data. Difference may occur due to the use of difference data for the denominator used to calculate indicators.

Methods and guidance available to countries for the compilation of the data at the national level:

Countries are responsible themselves for the collection of R&D data at the national level, compile national totals and submit them to international organisations. All countries follow the guidelines of the Frascati Manual: <u>http://www.oecd-ilibrary.org/science-and-technology/frascati-manual-</u>2015_9789264239012-en.

All countries follow the international guidelines of the OECD Frascati Manual: <u>http://www.oecd-</u> <u>ilibrary.org/science-and-technology/frascati-manual-2015_9789264239012-en</u>. Countries starting to measure R&D can use UIS Technical Paper 11 for assistance, which can be downloaded here: <u>uis.unesco.org/sites/default/files/documents/guide-to-conducting-an-rd-survey-for-countries-starting-to-</u> <u>measure-research-and-experimental-development-2014-en.pdf</u>.

Quality assurance:

The UNESCO Institute of Statistics (UIS) sends out a questionnaire every year to collect R&D data from all countries (around 125 countries), which are not covered by the data collections of the other partner organizations such as the Organisation for Economic Co-operation and Development (OECD), Eurostat (Statistical Office of the European Union) and the Network on Science and Technology Indicators – Ibero-American and Inter-American (RICYT). In agreement with these three organisations, their data (which were collected from their member states/associated member states – around 65 countries-) are directly obtained from the respective databases (in the case of the OECD and Eurostat) or received from the partner (in the case of RICYT). There is also collaboration in Africa with the African STI Indicators Initiative (ASTII) of AU/NEPAD. For the data UIS sends a questionnaire to, the quality assurance process is the following:

- (i) A questionnaire is sent to focal points in countries, generally within the Ministry of Science and Technology or the national statistical office.
- (ii) UIS processes the questionnaires, communicating with the countries in case of questions, calculates indicators and releases the data and indicators on its website.
- (iii) Countries are requested to complete the questionnaire using the standard international classifications, therefore adjustments are generally not needed. The other agencies have similar procedures.

After processing the data, but before submitting the data for inclusion in the SDG database, UIS sends the calculated indicators for target 9.5 to all countries that do not submit their data to Eurostat or the OECD. This provides the countries with the opportunity to review the data and provide any modifications or additions before UIS submits the data to UNSD.

Data Sources

Description:

Data are collected through national R&D surveys, either by the national statistical office or a line ministry (such as the Ministry for Science and Technology).

Collection process:

The UIS sends out a questionnaire every year to collect R&D data from all countries (around 125 countries), which are not covered by the data collections of the other partner organizations such as the Organisation for Economic Co-operation and Development (OECD), Eurostat (Statistical Office of the European Union) and the Network on Science and Technology Indicators – Ibero-American and Inter-American (RICYT). In agreement with these three organisations, their data (which were collected from

their member states/associated member states – around 65 countries-) are directly obtained from the respective databases (in the case of the OECD and Eurostat) or received from the partner (in the case of RICYT). There is also collaboration in Africa with the African STI Indicators Initiative (ASTII) of AU/NEPAD, which may lead to a joint data collection in the future.

For the data UIS sends a questionnaire to, the process is the following:

- (i) A questionnaire is sent to focal points in countries, generally within the Ministry of Science and Technology or the national statistical office.
- (ii) UIS processes the questionnaires, communicating with the countries in case of questions, calculates indicators and releases the data and indicators on its website.
- (iii) Countries are requested to complete the questionnaire using the standard international classifications, therefore adjustments are generally not needed.

Data Availability

Description:

Data available for over 120 countries for Researchers (in FTE) per million inhabitants

Time series:

Data available in the UIS database since reference year 1996, but historical data available back to 1981

Calendar

Data collection:

UIS sends out the questionnaire in September every year. The OECD and Eurostat collect data twice per year.

Data release:

July every year

Data providers

Name:

national R&D surveys, either by the national statistical office or a line ministry (such as the Ministry for Science and Technology).

Description:

Data are collected through national R&D surveys, either by the national statistical office or a line ministry (such as the Ministry for Science and Technology).

Data compilers

The UIS, Organisation for Economic Co-operation and Development (OECD), Eurostat (Statistical Office of the European Union) and the Network on Science and Technology Indicators – Ibero-American and Inter-American (RICYT), African STI Indicators Initiative (ASTII) of AU/NEPAD

References

URL:

www.uis.unesco.org

References:

OECD (2015), Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/9789264239012-en.

UIS Data centre: http://data.uis.unesco.org/Index.aspx?DataSetCode=SCN_DS&popupcustomise=true&lang=en.

Related indicators

9.b, 12.a, 17.6, 17.7, 17.8