UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

SUSTAINABLE DEVELOPMENT GOALS

International Yearbook of Industrial Statistics

Edition 2022

Towards inclusive and sustainable development with reliable industrial statistics

International Yearbook of

Industrial Statistics

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UNIDO Statistics

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The full report is available online at www.unido.org.
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Abbreviations

CDP Committee for Development Policy *(see glossary)*
CIP Competitive Industrial Performance
CO_2 carbon dioxide
COVID-19 coronavirus disease

EIE emerging industrial economy
EPI Environmental Performance Index
EU European Union
Eurostat Statistical Office of the European Union
EVI Economic and Environmental Vulnerability Index *(see glossary)*

GDP gross domestic product *(see glossary)*
GII Gender Inequality Index *(see glossary)*
GNI gross national income *(see glossary)*

HAI Human Assets Index *(see glossary)*
HDI Human Development Index *(see glossary)*

IAEG-SDGs Inter-agency and Expert Group on SDG Indicators
IEA International Energy Agency
IHDI Inequality-adjusted Human Development Index *(see glossary)*
IIP index of industrial production *(see glossary)*
ILO International Labour Organization
IMF International Monetary Fund
ISIC International Standard Industrial Classification of All Economic Activities *(see glossary)*
ISIC Rev. 3 Revision 3 of ISIC
ISIC Rev. 4 Revision 4 of ISIC
ISID inclusive and sustainable industrial development

LDC least developed country *(see glossary)*
LLDC landlocked developing country
LT low technology

MHT medium-high and high technology
MPI Multidimensional Poverty Index *(see glossary)*
MT medium technology
MUVA mining and utilities value added *(see glossary)*
MVA manufacturing value added *(see glossary)*

NSO national statistical office

OECD Organisation for Economic Co-operation and Development

R&D research and development

SBS structural business statistics *(see glossary)*
SDC statistical disclosure control *(see glossary)*
SDG Sustainable Development Goal *(see glossary)*
SIDS small island developing State
SNA system of national accounts *(see glossary)*
STS short-term statistics *(see glossary)*

UN United Nations
UNDP United Nations Development Programme
UNIDO United Nations Industrial Development Organization
UNSD United Nations Statistics Division

VAT value-added tax

Foreword

Trustworthy and accurate information is more important than ever in the challenging times we are living through. One of our top priorities at UNIDO is collating comprehensive data on key industrial indicators and making it available to the wider public in a way which is both informative and engaging.

Data and statistics are cornerstones of industrial development. They help define the baselines and metrics of progress. They provide evidence to determine which policies work and which are ineffective. They also help identify the complex relationships between people, institutions, businesses and the physical and environmental capital which influence industrial activity. Accurate data and statistics give us and our partners the comparative indicators needed to distinguish between countries and sectors which are making significant progress and those lagging behind.

National and international development plans are relying more and more on evidence-based policymaking. At the global level, the best example is the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs), which are accompanied by clear targets and progress indicators. UNIDO plays an instrumental role by collecting international industrial statistics, compiling and harmonizing country-level data and disseminating these through its data portal and statistics publications. We then work together with Member States to make industrial statistics more widely available. The Organization also acts as the custodian agency for six industry-related SDG 9 indicators.

The *International Yearbook of Industrial Statistics* is UNIDO's main statistics publication. It presents a snapshot of the current state of industrial activity throughout the world. At the same time, it also highlights the remaining data gaps which could become a major obstacle for policymaking. In this twenty-eighth issue, the Yearbook relies on dashboards, visualizations and analytical texts to describe the latest trends by country groups and industrial sectors. It serves as an indispensable introduction to the rich databases maintained by UNIDO and sheds light on the world of industrial development.

Gerd Müller
Director General, UNIDO

Towards inclusive and sustainable development with reliable industrial statistics

1 Introduction

1.1 Preface

This is the twenty-eighth edition of the International Yearbook of Industrial Statistics, UNIDO's main statistical publication. It presents the latest developments in industrial sectors around the world through dashboards, visualizations and concise analysis. Its data are mostly sourced from UNIDO databases. This publication serves as an invitation for a deeper exploration of the current state and recent trends in industry in different countries, sectors, regions and the world. All underlying data are freely available on the UNIDO Statistics data portal. The Yearbook presents a snapshot of the latest available data from June 2022.

This is the first time the Yearbook is being published in a digital format only. It also represents a significant departure from previous issues by focusing on analyses and insights that can be extracted from the data, and leaves the presentation of detailed figures to the online data portal.

The first chapter serves as an introduction to industrial statistics, describing its definition from the perspective of official statistics. It motivates the study of trends in industrial sectors by highlighting their importance for all dimensions of sustainable development and puts UNIDO's longstanding work on industrial statistics into context as a reference for this Yearbook.

Industrial statistics comprise several broad sectors: manufacturing, mining and utilities. The second chapter presents the most recent developments in these sectors in general terms. It also examines the recent progress made towards Sustainable Development Goal (SDG) 9 (UNIDO is a custodian agency for six industry-related indicators under SDG 9). The competitive performance of industries is also analysed by studying the latest scores in UNIDO's Competitive Industrial Performance (CIP) Index.

Following the general presentation of industrial sectors, Chapters 3 and 4 review the manufacturing sector and the combined mining and utilities sectors in more detail. The latest trends in these sectors are discussed, and the results of a structural analysis of their different industries presented. In the case of manufacturing, for which more extensive information is generally available, a brief overview of indicators on international trade, employment, productivity and sustainability is also provided.

The Yearbook features an annually-changing thematic chapter. This particular issue focuses on least developed countries (LDCs), in light of the latest commitments agreed by national governments and the international community at the Fifth United Nations Conference on the Least Developed Countries (Doha, Qatar, 2022-2023). Chapter 5 highlights the role of industry in the sustainable development of this group of economies, and uses available data to review their progress towards structural transformation and industrial development. The chapter closes with a call for better industrial statistics in LDCs as the main source of evidence for guiding their industrial policy and advancing towards SDG 9.

1.2 What is industrial statistics?

The term *industry* generally refers to a "group of businesses that provide a particular product or service" [1]. More specifically, in the field of economic statistics, an industry is defined as "the set of all production units engaged primarily in the same or similar kinds of productive activity" [2, p. 9]. This is the definition used by the International Standard Industrial Classification of All Economic Activities (ISIC), which provides the international guidelines for cataloguing economic activity into specific industries, such as agriculture, mining, manufacturing or services.

ℹ: In this sense, every category of economic activity in ISIC is called an *industry*.

In economics, *industry* usually indicates "the process of making products by using machinery and factories" [1]. This definition is rather narrow, however, and it seems to only consider manufacturing activities as part of industry. For the purpose of UNIDO's statistical products, and this Yearbook in particular, *industrial statistics* refers to a broader group of productive activities, as presented in the box below.

Industrial statistics

This class of statistics reflects the characteristics and economic activities of all resident units in the reporting country, which are primarily active in the following productive activities defined in terms of the ISIC [3, p. 12; 2, pp. 79–172]:

- *Mining and quarrying* (ISIC Rev. 4 section B): the extraction of minerals that occur naturally as solids (coal and ores), liquids (petroleum) or gases (natural gas).
- *Manufacturing* (ISIC Rev. 4 section C): the physical or chemical transformation of materials, substances or components into new products.
- *Electricity, gas, steam and air-conditioning supply* (ISIC Rev. 4 section D): the provision of electric power, natural gas, steam, hot water and the like through a permanent infrastructure of lines, mains and pipes.
- *Water supply; sewerage, waste management and remediation activities* (ISIC Rev. 4 section E): activities related to the management (including collection, treatment and disposal) of various forms of waste, such as solid or non-solid industrial or household waste, as well as contaminated sites.

Sections D and E are usually combined under the *utilities* sector. Given its significance for economic development and gross domestic product (GDP), separate statistical information is usually available for manufacturing. Data for the rest of industrial activities are frequently grouped together under *mining and utilities*.

Mining and quarrying

Manufacturing

Electricity, gas, steam and air-conditioning supply

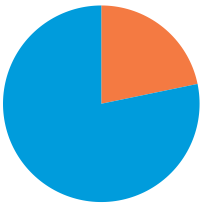
Water supply; sewerage, waste management and remediation activities

This definition is aligned with the standard use of the term *industry* in the field of official statistics. While this is crucial for the presentation of harmonized statistical data in the Yearbook and the United Nations (UN) statistical system as a whole, the reader should be aware of possible deviations from this definition when it comes to the everyday use of the term or its use in specialized literature outside official statistics. Specifically, the narrow definition mentioned at the beginning of this section seems to equate industry with manufacturing, while the above definition implies that manufacturing is only a subset within industry. The narrower definition is commonly used in economics and in the literature on industrialization and structural transformation, including within UNIDO. Thus, the reader is advised to consider the possibility of some fluidity in the use of the term *industry* and any derived concepts. Finally, it is worth noting that construction is not part of industry according to the current definition followed by official statistics.

In official statistics,
manufacturing
is only
one of four
industrial sectors

1.3 Why is industry important?

Globally, industry represented 21.8 per cent of GDP in 2021. Within industry, manufacturing accounted for 77.7 per cent of value added, while the remaining 22.3 per cent originated in mining and utilities [4]. Manufacturing is generally one of the most dynamic sectors in the global economy, both in terms of economic weight and links with all other sectors.



Industrial sectors
account for over
one-fifth
of the global economy

The positive relationship between industrialization and overall economic development originates in the sector's role as an important driver of technological advancement, which in turn promotes aggregate productivity growth, know-how and innovation benefitting the entire economy. Furthermore, economies of scale are more easily achieved in industry than in other sectors. Through its multiple cross-sectoral linkages, progress in the industrial sector frequently entails growth in the rest of the economy. Structural change into higher value-added industrial activities has therefore traditionally been considered the main path economies can take to achieve higher income levels and provide sustainable livelihoods for their population [5].

Industrialization not only contributes to economic growth and capabilities upgrading, it can also directly and indirectly support the achievement of the socioeconomic and environmental objectives embedded in the SDGs through the creation of jobs, improvements in working conditions, innovation and the development of new and greener production technologies (Figure 1.1). It is therefore important to consider broader measures of sustainable development beyond economic growth when studying the full impact of industry and designing supporting policies in this area [7; 8].

Industrialization
is a key driver of
inclusive
and
sustainable development

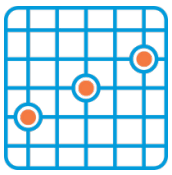
Figure 1.1 | Industry and its links with other SDGs
Source: [6, p. 6]

Comprehensive statistical evidence on the links between industry and other aspects of well-being is presented in [9]. Although a full description of these relationships is beyond the scope of this publication, this section will briefly describe some of the most relevant factors.

Human development is defined as the process of expanding people's freedoms and opportunities and improving their well-being. A long-standing indicator for measuring this concept is the Human Development Index (HDI) [10]. The left-side panel of Figure 1.2 indicates that the HDI and manufacturing value added (MVA) per capita are strongly correlated, pointing to the existence of a close relationship between the level of industrialization and human development.

The HDI is built on country-wide averages and does not consider how development gains are distributed within the population. The right-side panel of Figure 1.2 illustrates the relationship between the Inequality-adjusted Human Development Index (IHDI), an alternative measure of human development that penalizes unequal outcomes, and MVA per capita, corroborating the strong positive correlation between both variables.

The Multidimensional Poverty Index (MPI) provides an alternative measure of human development [10]. The relationship between MPI and MVA per capita is presented in the first panel of Figure 1.3. Although the MPI includes developing economies only, the graph shows that countries with higher MVA per capita also tend to register lower levels of multidimensional poverty. Countries with an MVA per capita of more than US$ 1,000 have an MPI that is close to zero.



There is a strong **positive correlation** between indicators of **industrialization** and **human development**

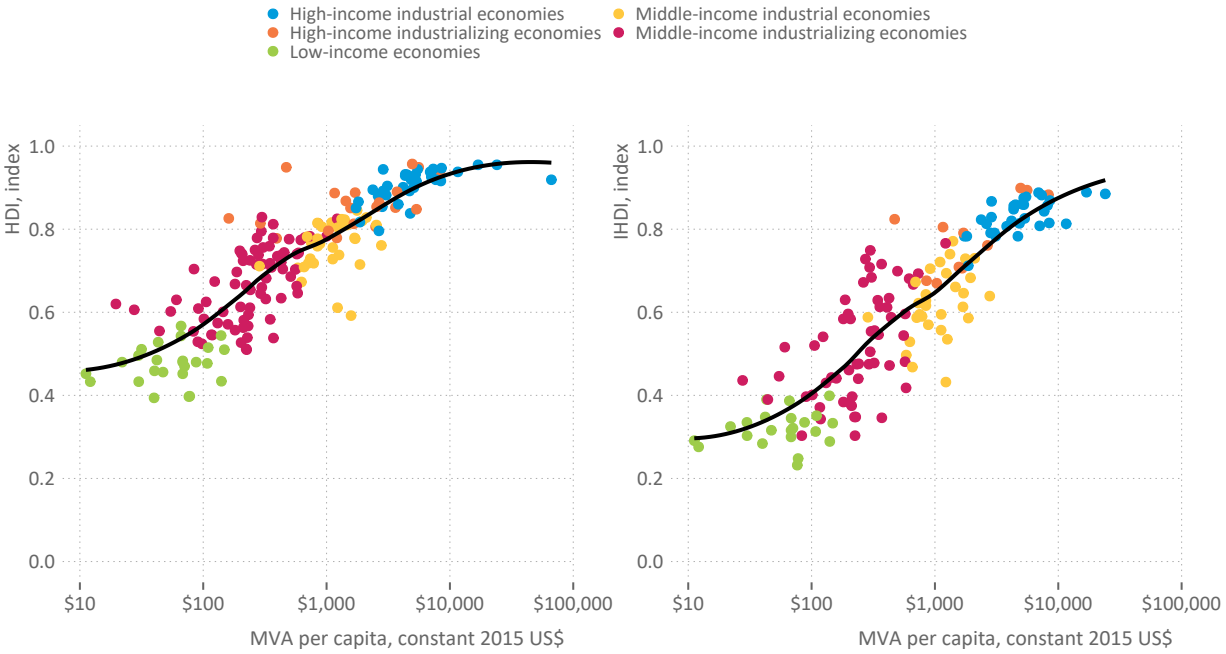


Figure 1.2 | Relationship between MVA per capita and HDI and IHDI, 2019
Source: [4; 10]
Note: For a description of the country classification used in these charts, see Annexes C and D.4.

Another issue related to development is gender inequality. Advancing gender equality remains one of the most important challenges for sustainable development, and past studies have highlighted the important role industry plays in improving women's well-being [11]. For example, there is a clear negative correlation between a country's level of industrialization, indicated by MVA per capita, and gender inequality, measured by the Gender Inequality Index (GII) [10]. Higher levels of MVA per capita are generally associated with lower levels of gender inequality (second panel of Figure 1.3). However, even if this correlation is strong, gender inequality within manufacturing activities remains high, with women often concentrated in low-wage, labour-intensive industries.

MPI
in countries with an
MVA per capita > US$ 1,000
is close to
zero

Health is another essential socioeconomic asset that benefits from industrial development and growth. This link was clearly exemplified during the coronavirus disease (COVID-19) pandemic. Locally-operating pharmaceutical and medical equipment industries can play a decisive role in meeting the global health challenge by developing innovative, safe and effective pharmaceutical products and working with other stakeholders to make them available, affordable and accessible to all [7]. The pandemic also revealed the strong role of the industrial sector in providing economic support and essential goods during the pandemic, but also as a foundation for post-pandemic recovery [6].

Industry
plays a significant role as a determinant and catalyst of
gender equality

Industry clearly has a direct impact on economic growth. Moreover, as

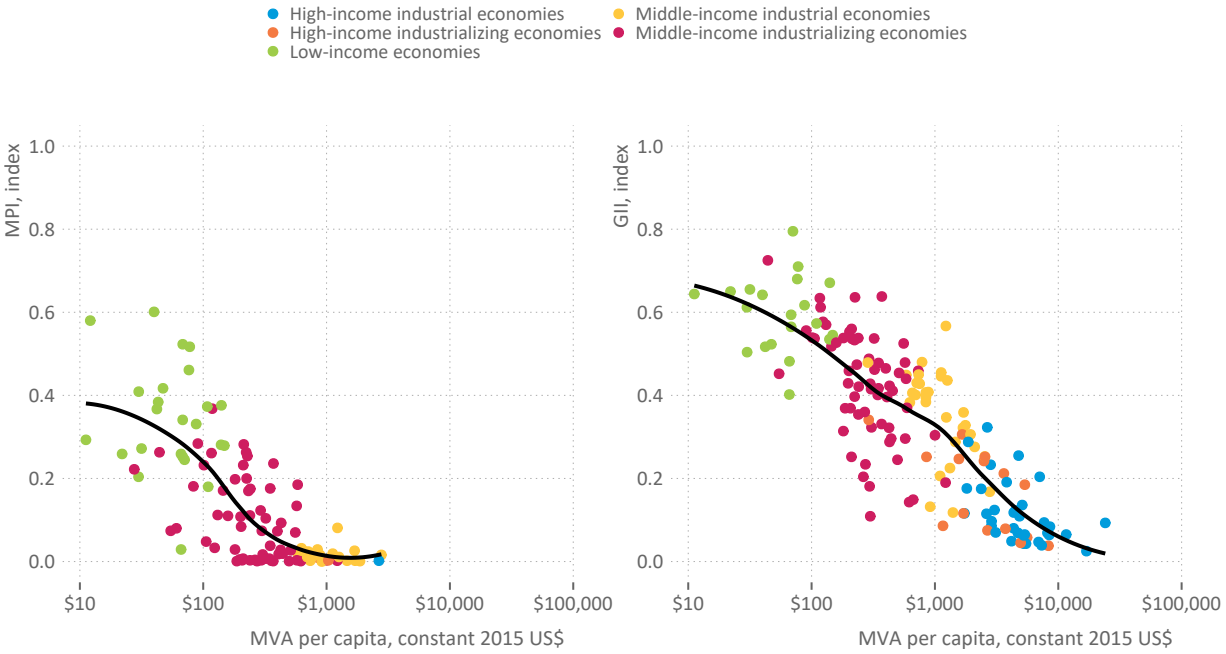


Figure 1.3 | Relationship between MVA per capita and MPI and GII, 2019
Source: [4; 10]
Note: For a description of the country classification used in these charts, see Annexes C and D.4.

outlined in this section, a multidimensional analysis reveals that industry also has positive linkages with overall socioeconomic development and well-being. This was recognized in the 2030 Agenda for Sustainable Development [12], which considers inclusive and sustainable industrial development as one of its goals, but also highlights the sector's importance for all other objectives. As countries work towards attaining their development goals, the linkages between industry and the rest of the economy are strengthened and the positive ripple effects of industrial growth are felt across the entire socioeconomic system.

1.4 How is industry measured?

The previous section highlighted the relative importance of manufacturing, mining and utilities in the economy. Yet how are industrial statistics, such as value added and other related variables, derived, bearing in mind the complexity of economies and the countless transactions that take place every day?

The products and services provided in the real world economy need to be categorized and measured, which calls for rules and some simplification. Hence, a starting point in economic statistics is defining various *statistical units* and measuring the activities these units engage in (such as production). These units can be enterprise groups, enterprises or firms from a legal perspective, although international

Industrial statistics define
basic units
to observe and measure
economic activity
for compiling information
to be used in
economic analyses
and
policymaking

recommendations suggest relying on the establishment as the preferred statistical unit [3, p. 16]. Figure 1.4 illustrates the relationship between the different administrative and statistical units within the sphere of business statistics.

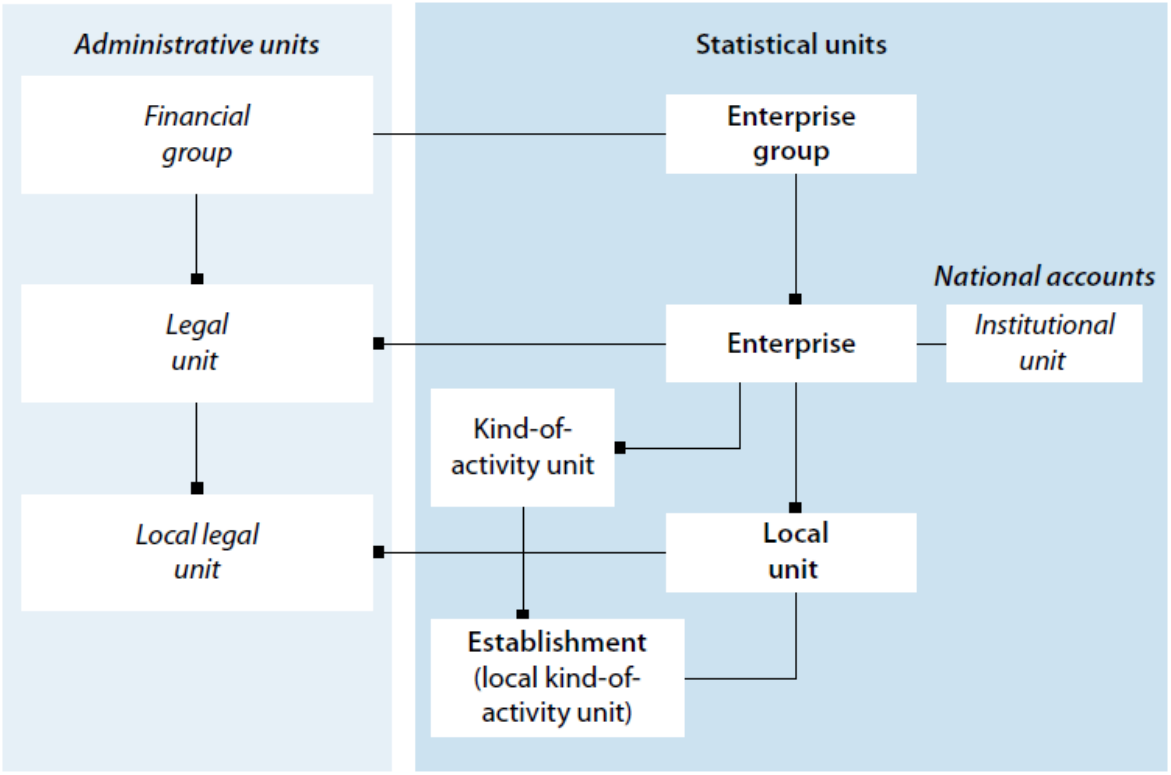


Figure 1.4 | Statistical units in business statistics
Source: [3, p. 28]
Note: A square signifies that one or more entities can be linked to the entity at the end of the connected line.

Following the delineation of basic observation units, business statisticians need to ideally collect administrative information on all such units within the national economy. This includes the addresses of establishments, size, main sector of activity, etc. Such basic information is best stored in a (statistical) business register. Since registered units are often required to file a copy of their accounts and reports to financial authorities, for instance to determine the applicable tax rate, a link to other administrative sources is useful as well. Once the existence of statistical units representing real economic entities is known and their information stored, national statistical offices (NSOs) can regularly carry out surveys and/or censuses to collect further information on variables of interest. The number of persons engaged or the value of output are examples of essential variables for compiling business statistics and for drawing a picture of a country's overall economic structure and development.

The resulting statistics within business statistics are often published as short-term statistics (STS) and structural business statistics (SBS). Each group usually serves a different purpose.

Short-term statistics (STS)

Infra-annual production-related statistics collected to monitor the business cycle. They are suitable for the short-term evaluation of supply, demand and production factors [3, p. 3]. Although available more frequently and in a timelier manner, they usually cover only some variables of interest and are published with a limited level of detail.

Structural business statistics (SBS)

These are production-related statistics that are collected and compiled to determine the structure, activity, competitiveness and performance of enterprises at national, regional and international levels. They generally provide annual information with respect to a reference year [3, p. 3]. Although available only annually and published with some delay, they usually cover a large number of variables at a highly granular level. Other common abbreviations used by NSOs are ABS (annual business statistics/survey) or AIS (annual industrial survey).

While STS focus on providing rapid information (monthly/quarterly) on the business cycle (e.g. index of industrial production (IIP)), SBS use business accounting information to calculate (multi-)annual macroeconomic aggregates, thus obtaining values for output or value added. The major connections of the components in relation to business accounting are presented in Figure 1.5.

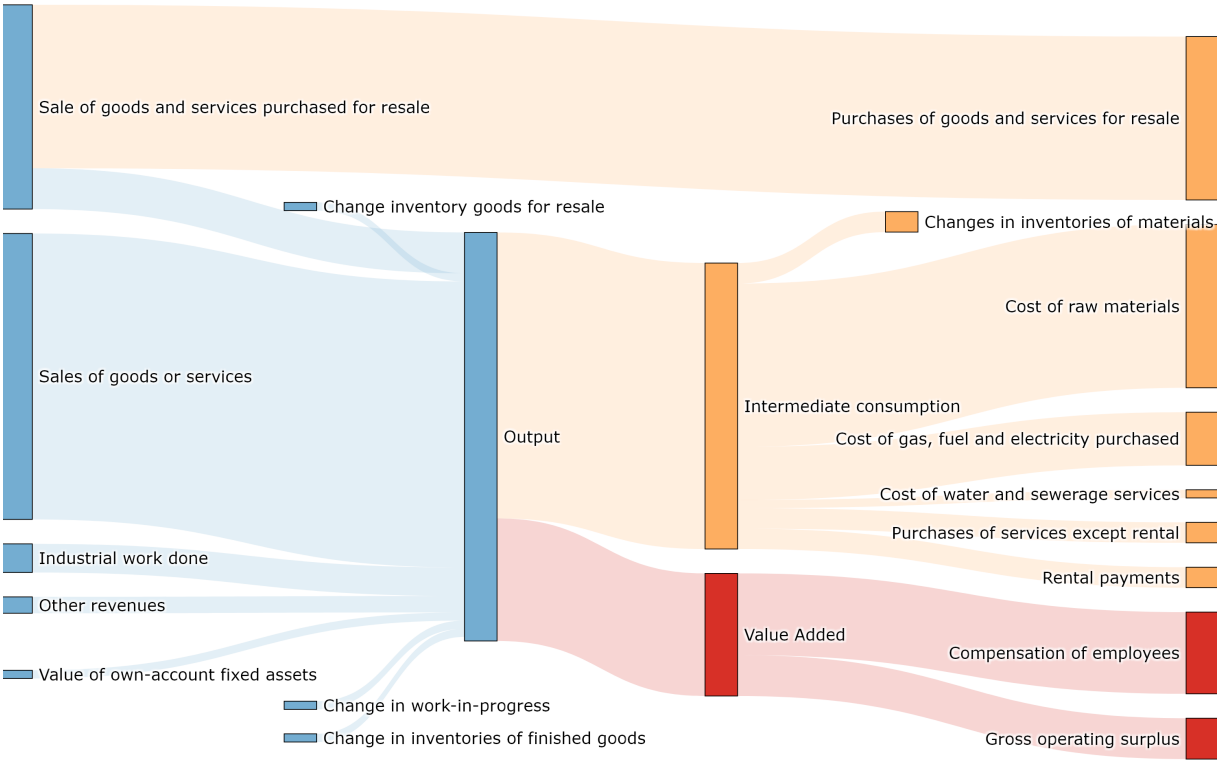


Figure 1.5 | Components of output, intermediate consumption and value added and their relationship to business accounting
Source: [13, p. 4]

Once data are available in SBS publications, national accounts can be obtained following further refinements, which are needed to properly reflect figures such as GDP and MVA that summarize a country's entire economy.

SBS and STS are essential sources for the compilation of national accounts, including GDP and MVA

Gross domestic product (GDP)

GDP basically derives from the concept of gross value added. GDP is the sum of gross value added of all resident producer units plus the part (possibly the total) of taxes on products that is not included in the valuation of output, less subsidies on products [14, p. 34].

Manufacturing value added (MVA)

This is a national accounts aggregate measuring the exclusive and exhaustive contribution of manufacturing to GDP [15, p. 5].

Although this process seems straightforward, in reality, it involves many steps and assumptions, since misreporting or conflicting sources and definitions may hamper comparability, among other sources of discrepancy. Furthermore, estimating the shadow or informal sector leads to considerable uncertainty in some cases. The interested reader can find further information about these issues in [13] as a starting point.

1.5 UNIDO Statistics

UNIDO has a UN mandate to compile international industrial statistics on manufacturing, mining and utilities, as defined in Section 1.2. This involves the regular collection and screening of industrial data from official sources and presenting them according to harmonized definitions and classifications. UNIDO also produces analytical indicators based on official data, which can be used to monitor a country's current situation and progress in terms of inclusive and sustainable industrial development (ISID).

Statistical products

The statistics are disseminated through various databases available on UNIDO Statistics data portal, as well as publications such as this Yearbook. These products offer statistical information to a wide range of users, including national governments, international development partners, academic and research institutions, as well as the business and statistical communities. Priority is given to quality assurance of statistics, especially in terms of international comparability and alignment with recommended concepts, definitions, classifications and coverage.

UNIDO industrial statistics databases

- INDSTAT [16; 17]
- MINSTAT [18]
- IDSB [19]
- Quarterly/monthly IIP [20; 21]
- National accounts [4]
- CIP index [22]

As a custodian agency of six indicators under SDG 9, UNIDO has been actively involved in the process of developing and monitoring the global indicator framework for the 2030 Agenda for Sustainable Development. UNIDO contributes to the *UN SDG Global Database* [23], reports to the Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs) and collaborates with countries on tracking their progress towards the 2030 Agenda.

SDG 9 monitoring

The organization closely cooperates with other international agencies, namely the International Labour Organization (ILO) on employment; the International Energy Agency (IEA) on carbon dioxide (CO_2) emissions; and the World Bank on access to finance, to produce data and compile the corresponding SDG indicators. Furthermore, UNIDO publishes the *SDG 9 Industry Index*, benchmarking countries' performance towards achieving the industry-related targets of SDG 9 [24]. Countries can monitor their progress and prospects towards achieving industry-related SDG targets by using the *SDG 9 Industry Tracker*, which uses the *SDG 9 Industry Index* and is supported by additional progress assessment measures. This tool is available at UNIDO Industrial Analytics Platform.

SDG 9 Industry Tracker

Industrial statistics are essential for formulating industrial development strategies and policies, analysing structural change and monitoring economic growth. UNIDO shares its expertise in industrial statistics with national and regional statistical offices by providing technical assistance and trainings on a wide range of topics. By implementing customized programmes to target countries' specific needs, UNIDO assists in strengthening the institutional capacity of NSOs and line ministries to collect industrial data, maintain business registers, set up short-term statistical indicators and information systems, carry out data analyses of industrial performance and track progress on SDGs. UNIDO furthermore provides capacity development activities on the usage of empirical data for economic analyses, which are relevant for industrial development in terms of promoting evidence-based policy-making.

Technical assistance and trainings

1.6 The International Yearbook of Industrial Statistics

This Yearbook presents a comprehensive summary of the most recent data in the manufacturing, mining and utilities sectors. It outlines the current performance of and latest developments in industry, allowing the reader to analyse patterns of growth, business cycle fluctuations and longer term trends, including progress towards structural change,

ISID and SDG 9. While the Yearbook focuses on aggregate trends observed in industrial sectors globally, it also highlights the main regional trends and sector-specific developments.

It relies on visualizations and short analytical texts to summarize the current situation in global industry and to highlight key insights extracted from the data. It is almost entirely sourced from information that is available on the UNIDO Statistics data portal. Interested readers are invited to visit this online resource to access the raw data and related statistical products.

All data presented in this Yearbook were compiled bearing in mind the requirements of international comparability and the statistical standards endorsed by the UN Statistical Commission. Concepts and definitions are drawn from international recommendations applicable to industrial statistics [3] and the classification of economic activities according to ISIC [2].

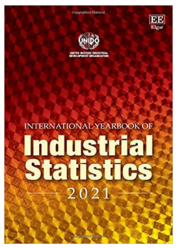
This is the twenty-eighth edition of the *International Yearbook of Industrial Statistics*, published by UNIDO since 1995. For historical reference, this publication replaced two reports: the *Handbook of Industrial Statistics* [27], which was published biennially by UNIDO until 1992, and the *United Nations Industrial Statistics Yearbook Volume I (General Industrial Statistics)* [28], which was discontinued after its 1991 edition was published in 1993. Those changes were introduced in line with the recommendations of the United Nations Statistical Commission at its twenty-seventh session.

The current edition of the Yearbook features several novelties compared to previous ones. It represents an effort to modernize this long-standing publication and expand its coverage to include all aspects of industrial statistics. It merges the contents of previous editions of the Yearbook (see [29] for the last edition under that format) and the biennial report *World Statistics on Mining and Utilities* (see [30] for the most recent edition).

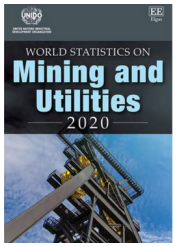
The Yearbook will continue upgrading and expanding its coverage of ISID indicators in coming years, reaffirming UNIDO's role as the international reference on industrial statistics.

Data featured in this Yearbook can be accessed at UNIDO Statistics data portal

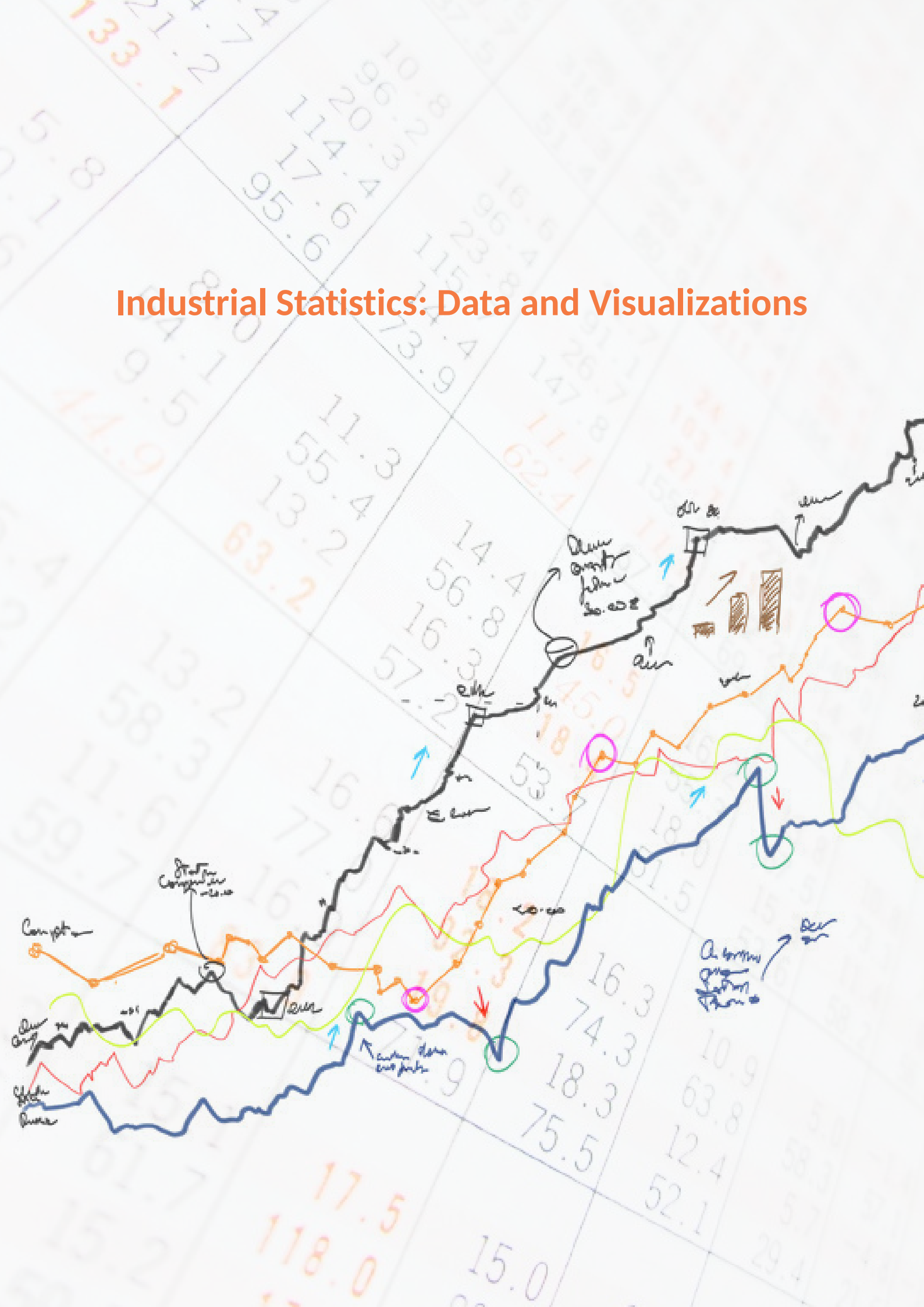
International Yearbook of Industrial Statistics 2021



World Statistics on Mining and Utilities 2020



Industrial Statistics: Data and Visualizations



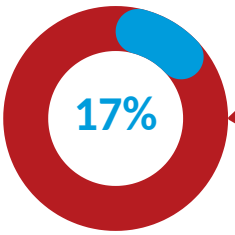
2 Global industrial statistics

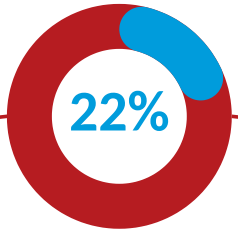
Global industrial statistics

Key figures

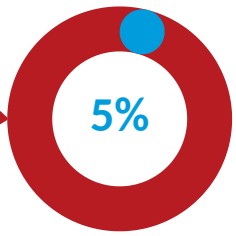
Industry accounts for more than **one-fifth** of the global economy

Manufacturing

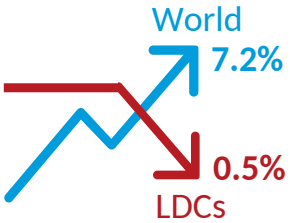




Mining and utilities



Globally, manufacturing grew by **7.2%** in 2021, but LDCs have been falling behind

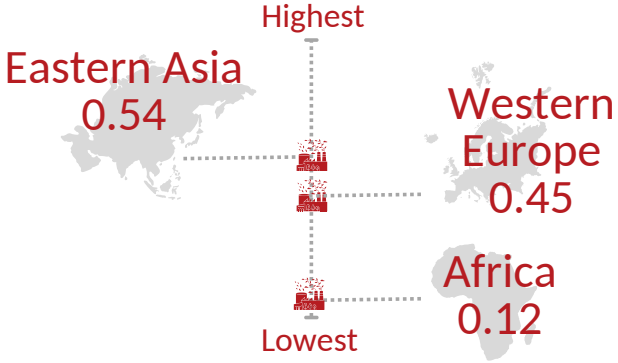


Achieving **inclusive and sustainable industrialization** at the core of **SDG 9**

Globally, mining and utilities grew by **3.7%** in 2021

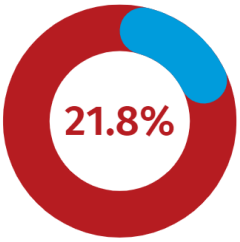
Only **1** in **3** small manufacturers has access to a loan or line of credit

SDG 9 Industry Index 2019



Top 5 economies CIP index 2020

This chapter presents recent developments and ongoing trends observed in industrial sectors worldwide. As described in Section 1.2, industry includes all economic activities classified within the manufacturing, mining and utilities sectors. Based on this definition, a general overview of industrial sectors is presented here, including a comprehensive evaluation of the impact of the COVID-19 pandemic, as well as the latest details on the progress of SDG 9 and competitiveness indicators. Manufacturing will be explored in-depth in Chapter 3, while Chapter 4 will focus on the mining and utilities sectors.



Industry
accounts for more than
one-fifth
of the global economy

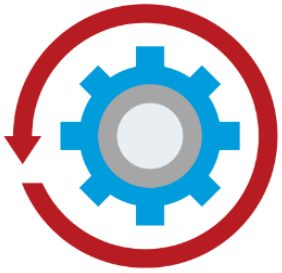
2.1 Recent trends in industrial sectors

The COVID-19 pandemic has had a severe impact on the world on many fronts, including on industrial sectors. Containment measures implemented by governments around the globe in an effort to contain the spread of the virus resulted in unprecedented impacts, such as restrictions to the movement of goods and people and disruptions in the supply chains of raw materials and intermediate goods, among others. This caused the most acute decline in growth since the financial crisis of 2008–2009.

The effects of the
COVID-19
pandemic on
industrial activity
were
less severe
than in the global
financial crisis

Compared to the financial crisis, however, the effects of COVID-19 on industrial activity were less severe on the whole and shorter in duration. While early predictions in mid-2020 about the expected economic downturn were especially grave, most countries around the globe had already bounced back by the end of 2020, and the majority continued on a path of growth throughout 2021. Due to this rapid recovery, industrial sectors in many countries exceeded their pre-pandemic output levels by the end of 2021. The most recent data confirm that the pandemic's effects are weakening, albeit at a different pace (Figure 2.1). Middle-income industrial economies are leading the recovery, with the highest dynamism among different groups presented in Figure 2.1.

Figure 2.2 reveals that the effects of the financial crisis of 2008–2009 were more severe on industrial sectors than those of the COVID-19 pandemic in 2020–2021. The figure presents separate series for MVA and mining and utilities value added (MUVA), as well as overall GDP growth as a point of reference. Compared to the financial crisis, the pandemic has had a slightly stronger impact on the economy overall than on the manufacturing sector. This is attributable to the fact that demand for manufactured goods—at least in some key and strategic industries—was sustained, even during the height of the crisis. The mining and utilities sectors, on the other hand, fell in line with the rest of global economic activity.



Middle-income
industrial
economies
are leading the
recovery

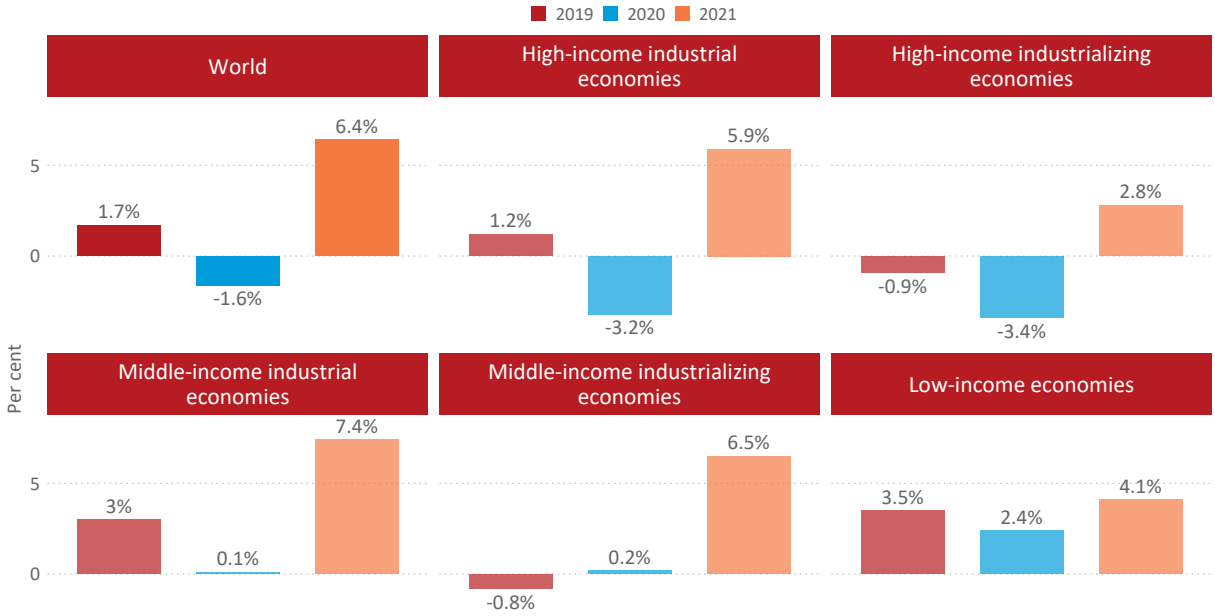


Figure 2.1 | Recent growth rates of industry value added
Source: [4]
Note: Growth rates are calculated over the values in constant 2015 US$ for the group aggregates.

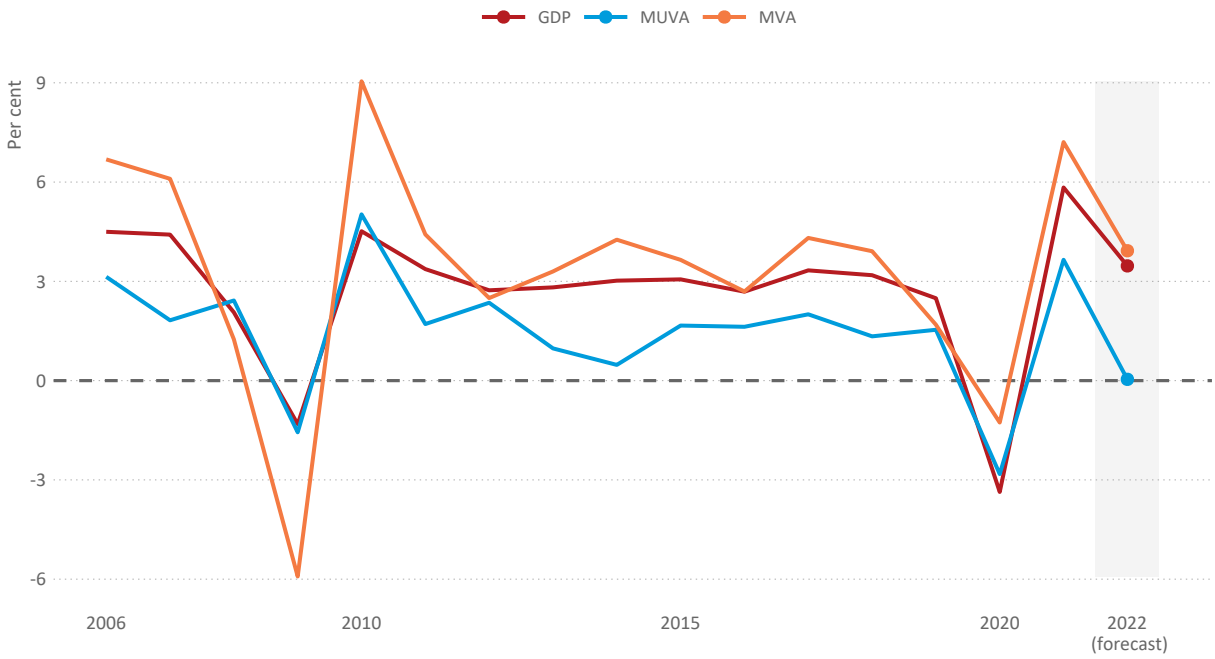


Figure 2.2 | Growth rates of global GDP, MVA and MUVA
Source: [4]
Note: Growth rates are calculated over the values in constant 2015 US$ for the global aggregates.

Figure 2.3 compares the contribution of each industrial sector to overall industrial growth in more detail. An initial insight gleaned from this graph is that manufacturing drives overall industrial growth in industrial economies. This can be explained by the higher relative share of manufacturing in industrial activity for this particular group of economies. In other industrializing economies, both the manufacturing and mining and utilities sectors have a significant influence on overall industrial growth. In low-income economies, it is the mining and utilities sector that drives industrial performance. A second insight is that the impact of the COVID-19 crisis was not homogeneous, neither for country groups nor for sectors. While manufacturing as well as mining and utilities in high-income economies registered declines in 2020, manufacturing continued to grow at subdued rates during the pandemic in middle-income countries and mining and utilities registered negative rates. In low-income economies, these sectors maintained relatively high growth rates during the pandemic.

Industrial production in most country groups is expected to decelerate significantly in 2022, as the world grapples with the aftermath of the pandemic and its uneven recovery, in addition to other sources of uncertainty, including continued disruptions in global supply chains and the conflict in Ukraine.

Manufacturing drives industrial growth in **industrial economies** while **mining and utilities** contribute the most in **low-income economies**

Industrial production is expected to **decelerate** significantly in **2022**

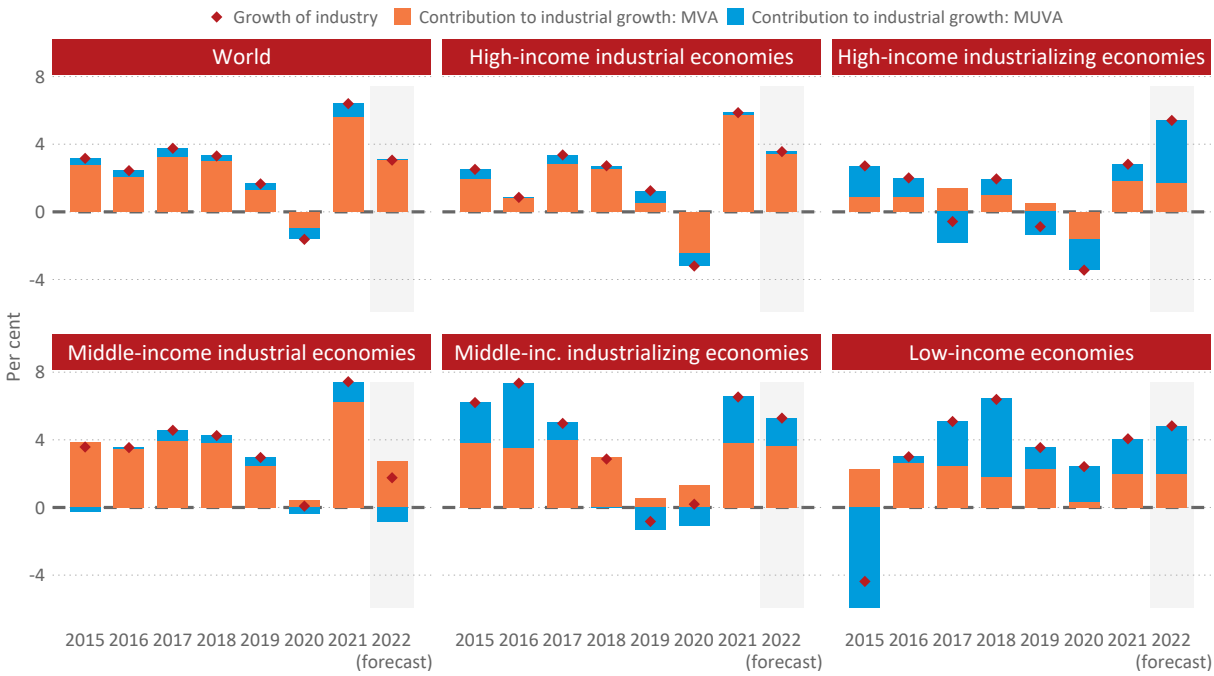


Figure 2.3 | Contribution of MVA and MUVA to industrial growth by country group
Source: [4]
Note: A sector's contribution to growth depends on its growth rate, calculated over the values in constant 2015 US$, and its respective weight in total industry.

2.2 SDG 9

Manufacturing serves as the main engine of **economic growth**

The COVID-19 crisis has demonstrated that manufacturing remains the backbone of economies and that industrial capabilities play a fundamental role for resilience. However, industrial recovery remains uneven across the world. Countries with stronger capabilities and more diversified industrial sectors have weathered both the economic and health impacts of the COVID-19 pandemic better than others [6]. But how has the pandemic affected industry-related SDG targets?

Global industrial production grew by 6.4 per cent in 2021—already surpassing its pre-pandemic level—after falling 1.6 per cent in 2020. Yet, recovery remains incomplete and unequal. While firms and households in high-income countries benefited from substantial policy support and a rapid roll-out of effective vaccines, manufacturing in LDCs stagnated due to subdued and volatile global demand and the disruption of global trade, in addition to tighter domestic economic policies.

Uncertain recovery prospects for **LDCs** could **jeopardize** their achievement of many **SDG targets** by **2030**

2.2.1 SDG 9.2

Despite the disruptions caused by the pandemic, the global share of MVA in total GDP increased from 16.2 per cent in 2015 to 16.9 per cent in 2021. Strong global demand for Asian manufactured goods drove the region's rapid economic recovery. Although LDCs' share of manufacturing grew from 11.3 per cent in 2015 to 12.8 per cent in 2020, it decreased to 12.5 per cent in 2021.

Uneven recovery of employment and income across population groups has increased inequalities within and between countries. The same trend has been observed in countries' manufacturing sector, reflected by MVA per capita. While Europe and Northern America reported an all-time high value of US$ 5,000 in 2021, LDCs' MVA per capita decreased to US$ 134, which is comparable to their value in 2018. The recovery prospects for LDCs thus remain ambiguous and could jeopardize their achievement of many SDG targets by 2030 (see Figure 2.4). A sufficient vaccination rate along with a fair distribution of vaccines within and between all countries, as well as continued economic support for those hit hardest by the crisis are essential for containing the consequences of the COVID-19 pandemic and strengthening overall recovery.

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

- 9.2.1 Manufacturing value added as a proportion of GDP and per capita
- 9.2.2 Manufacturing employment as a proportion of total employment

2.2.2 SDG 9.3

Small businesses operating in manufacturing and manufacturing-related services continue to face significant challenges due to ongoing demand and supply chain disruptions. Policy support for these firms could take the form, among other instruments, of facilitated access to financial

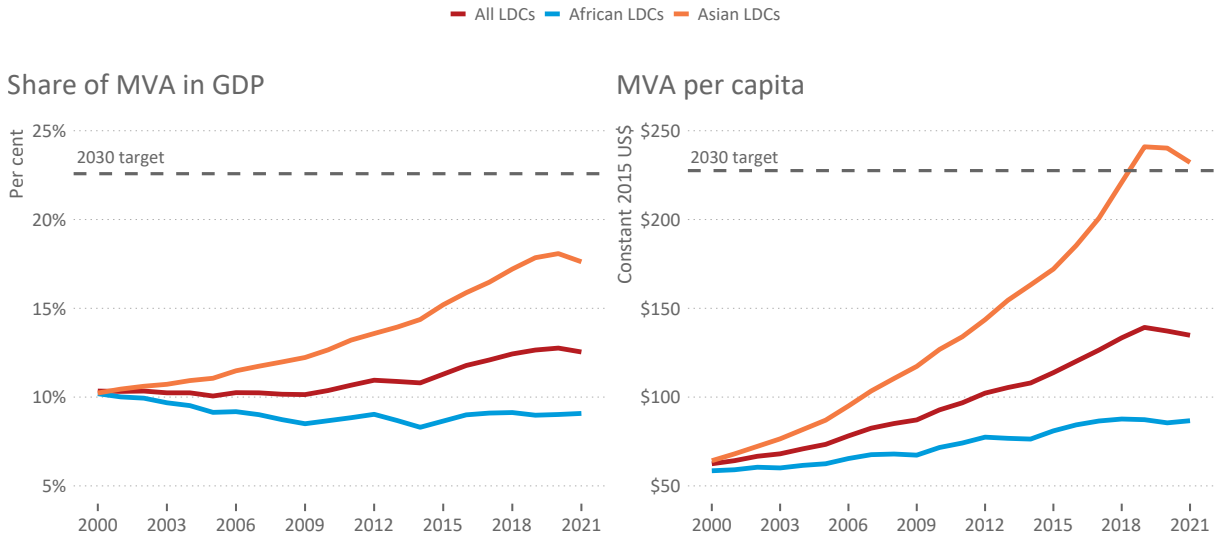


Figure 2.4 | Prospects of LDCs achieving SDG target 9.2 by 2030
Source: [31]
Note: This chart shows two SDG 9.2.1 indicators: share of MVA in GDP (left) and MVA per capita (right). Target values for both indicators are set up as doubling their 2015 level.

credit. According to the most recent available data, only one in three small manufacturing enterprises has a loan or line of credit. Moreover, access to credit remains uneven across countries and regions of the world. Sub-Saharan African countries and LDCs suffer most from lack of credit access. Only 15.7 per cent and 17.0 per cent, respectively, have access to financial services, which is well below the global average. By contrast, Latin America and the Caribbean and Oceania (excluding New Zealand and Australia) have the largest share of small manufacturing firms with a loan or line of credit, namely 44.2 per cent and 45.0 per cent, respectively.

There is limited data availability and timeliness for both SDG 9.3 indicators, which makes measuring progress on this target particularly challenging. Figure 2.5 illustrates the availability of data for both indicators by country. Even when countries report data on both indicators, information remains sparse, however, due to low publication frequency. Investing in statistical capacity building and improving existing statistical procedures are necessary to guide policymakers in making critical and time-sensitive decisions about which strategies to pursue in support of industrial sectors.

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.

- 9.3.1 Proportion of small-scale industries in total industry value added
- 9.3.2 Proportion of small-scale industries with a loan or line of credit

2.2.3 SDG 9.4

In addition to major social and economic disruptions worldwide, the COVID-19 outbreak also had an impact on how energy is produced,

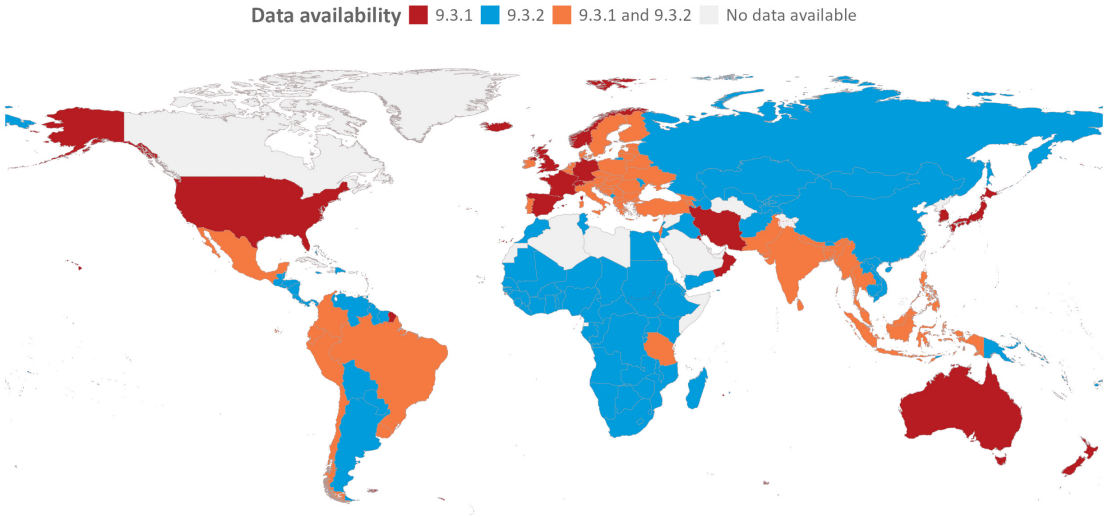


Figure 2.5 | Data availability of SDG indicators 9.3.1 and 9.3.2
Source: [31]

supplied and consumed around the world. Global CO_2 emissions declined by 5.8 per cent in 2020, or by nearly two billion tonnes—the largest decline ever recorded and almost five times greater than the drop in 2009 following the global financial crisis. Global CO_2 emissions fell more than energy demand in 2020 because the pandemic had a stronger relative effect on the demand for oil and coal than on other energy sources, including renewables. Despite the decline in 2020, global energy-related CO_2 emissions remained at 31.5 billion tonnes, reaching its highest average annual concentration in the atmosphere and around 50 per cent higher than when the industrial revolution began [32].

The gradual phasing-out of restrictions as well as widespread vaccination campaigns boosted the economic recovery, resulting in increased energy demand in 2021. Global energy-related CO_2 emissions are projected to rebound and grow by 6 per cent in 2021, as demand for coal, oil and gas speeds up with the economy. An increase by 6 per cent would be the second largest absolute rise in history, erasing two-thirds of the pandemic-related reduction seen in 2020 [32].

In 2019, global CO_2 emissions from manufacturing accounted for nearly 18 per cent of total CO_2 emissions from fuel combustion. Although the total amount of CO_2 emissions from manufacturing declined sharply from 2015 to 2017, this trend has been reverted since 2017. Global manufacturing CO_2 emission intensity continued to decrease from 0.50 kg/US$ in 2015 to 0.43 kg/US$ in 2019. However, there is a wide

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.

- ► 9.4.1 CO_2 emission per unit of value added

Manufacturing
accounts for nearly
18%
of total
CO_2 emissions

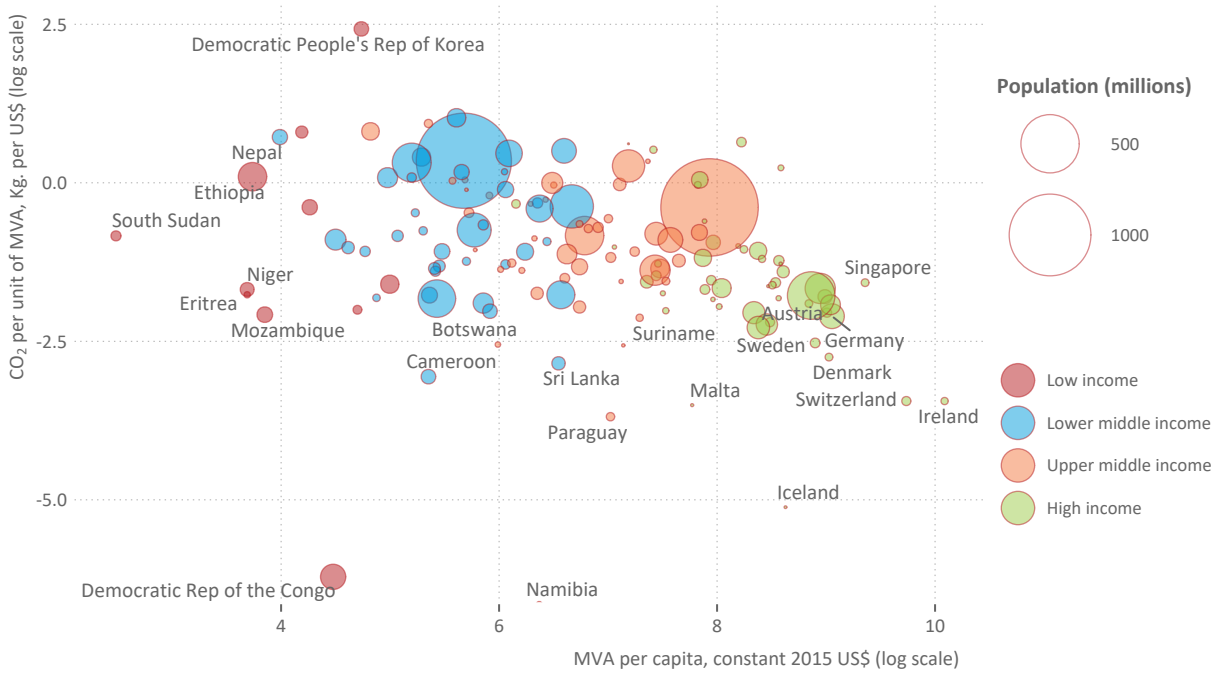


Figure 2.6 | Link between MVA per capita and CO_2 intensity in manufacturing, 2019
Source: [31]

disparity between regions. Countries with a higher MVA per capita, equipped with advanced industrial capacities and activity concentrated in less energy-intensive industries, have lower rates of CO_2 intensity in manufacturing regardless of population size (Figure 2.6). For example, the intensity of manufacturing CO_2 emissions in Central and Southern Asia remains much higher than in Europe and Northern America, at 1.27 kg/US$ and 0.21 kg/US$ in 2019, respectively.

2.2.4 SDG 9.b

As will be described in greater detail in the next chapter, higher technology manufacturing industries performed better during the COVID-19 crisis and therefore recovered faster, which is mainly attributable to industries such as computers, electronics and optical products, electrical equipment as well as pharmaceuticals. The majority of industries using medium- and high-technology have already reached pre-pandemic levels, except for motor vehicles and other transport equipment. In comparison, lower technology industries, such as textile and clothing or coke and refined petroleum products, remain below their pre-pandemic production levels. However, the manufacturing of some basic consumer goods, such as food products, benefited from sustained demand and maintained a stable growth trajectory with limited losses throughout the pandemic.

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.

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

Medium- and high-technology industries have already reached **pre-pandemic levels**

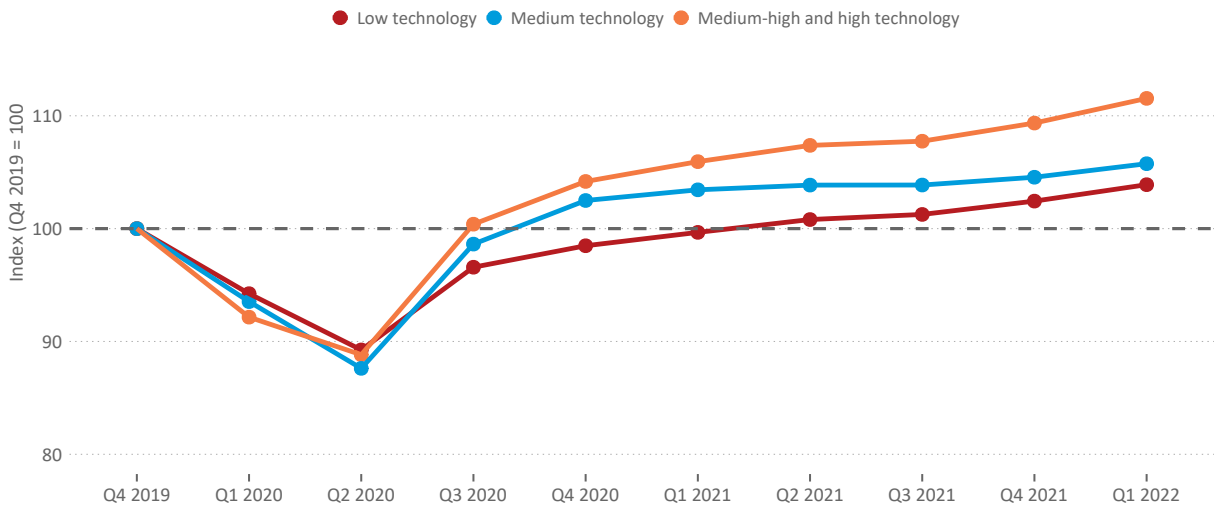
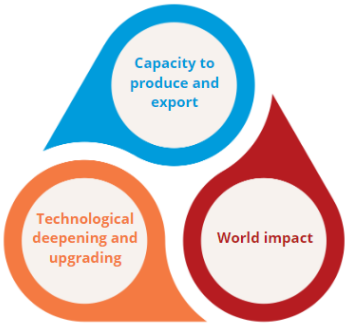


Figure 2.7 | COVID-19 recovery in manufacturing production by technology intensity
Source: [20; 31]
Note: This chart is based on the index of manufacturing production, with the period before the crisis (Q4 2019) set to 100.

2.3 Competitive Industrial Performance (CIP) Index

UNIDO has measured industrial competitiveness using the CIP Index since 2013. The index indicates how successful a country's industries are, in relative terms, at producing and selling their goods in domestic and foreign markets while moving along the technological ladder. The index allows for cross-country comparisons of industrial competitiveness while highlighting developmental challenges in industrial development. The CIP Index currently covers 154 economies for the period from 1990 to the latest available year, 2020. This section analyses the main insights from the index's most recent version.

: A description of the methodology and historical results can be found in previous CIP reports [33; 34; 35; 36]. A brief description of the CIP's dimensions and their aggregation into the composite index is presented in Annex C. The complete dataset is available in [22].



2.3.1 Global results

Figure 2.8 presents the economies with the most competitive industry according to the CIP Index over the last decade. It shows that the three most competitive industrial economies are presently Germany, China and Ireland. While Germany and China have ranked among the top three since 1990 and 2014, respectively, this year is the first time that Ireland entered the top three, replacing the United States of America, which is now in sixth position.

: The current score and rank on the CIP Index for all economies are presented in Annex A.

The full results reveal that there is a significant correlation between the level of income, stage of industrial development and industrial competitiveness. Indeed, higher levels of industrial development and industrial competitiveness are usually accompanied by higher income levels. For example, the top ten countries in the CIP ranking are almost exclusively high-income industrial economies. China, a middle-income industrial economy, is the only exception. The marked presence of industrial economies, either with a high or middle income, continues through the top quintile of the CIP Index, with 29 out of the 31 economies classified in this particular stage of industrial development. On the other hand, low-income economies are predominantly positioned in the bottom quintile. It should also be noted that no high-income industrial economy is found in the last two quintiles, which highlights the fact that high-income industrial economies are, without exception, very competitive.

Germany, China and Ireland are the three most competitive industrial economies

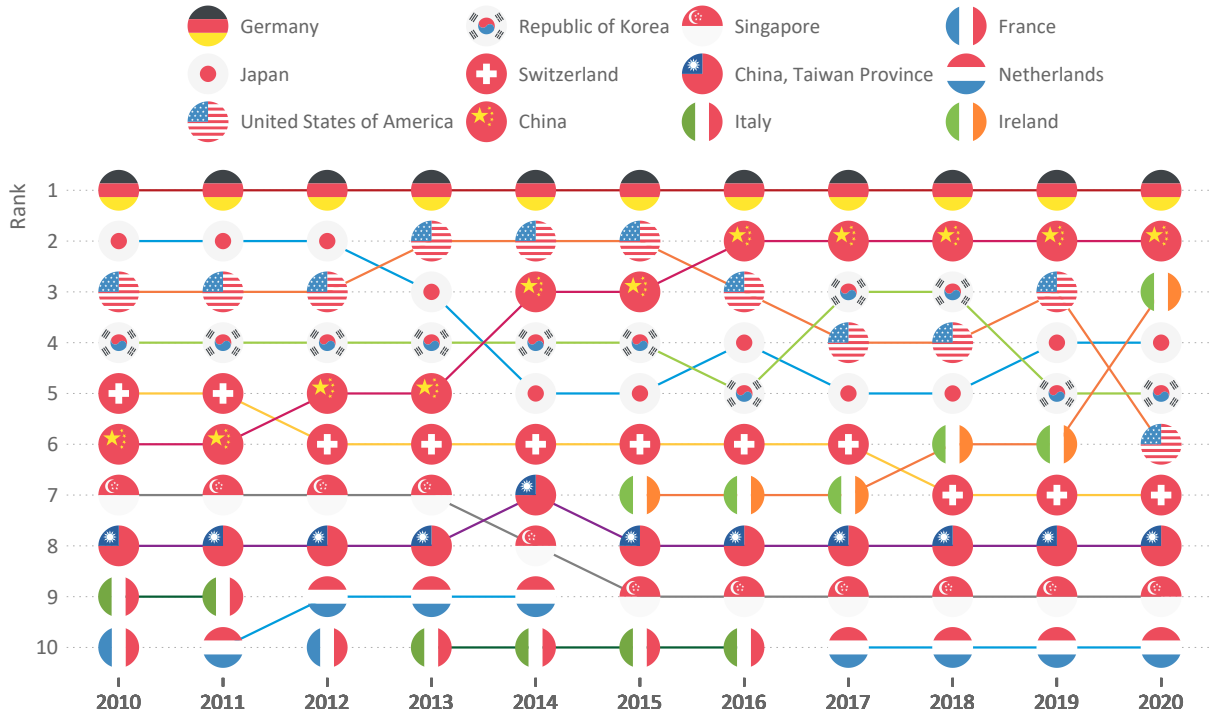


Figure 2.8 | Top ten economies in the CIP Index
Source: [22]

2.3.2 CIP results by industrial development group

As mentioned above, there is a high correlation between stage of industrialization and industrial competitiveness. Figure 2.9 confirms this premise, revealing a perceptible order in the development groups ranging from very competitive, high-income industrial economies to

low-income economies which are mostly found at the bottom of the CIP ranking.

Both high- and middle-income industrial economies achieve the highest scores in the index. High-income industrial economies rank first among the five groups presented in the figure. On average, these economies occupy the 27th position in the ranking. Middle-income industrial economies rank second, with an average rank in the 59th position. High- and middle-income industrializing economies follow in the third and fourth positions, with average rankings at the 70th and 104th positions, respectively. Lastly, low-income economies trail at the bottom, with an average ranking of 141.

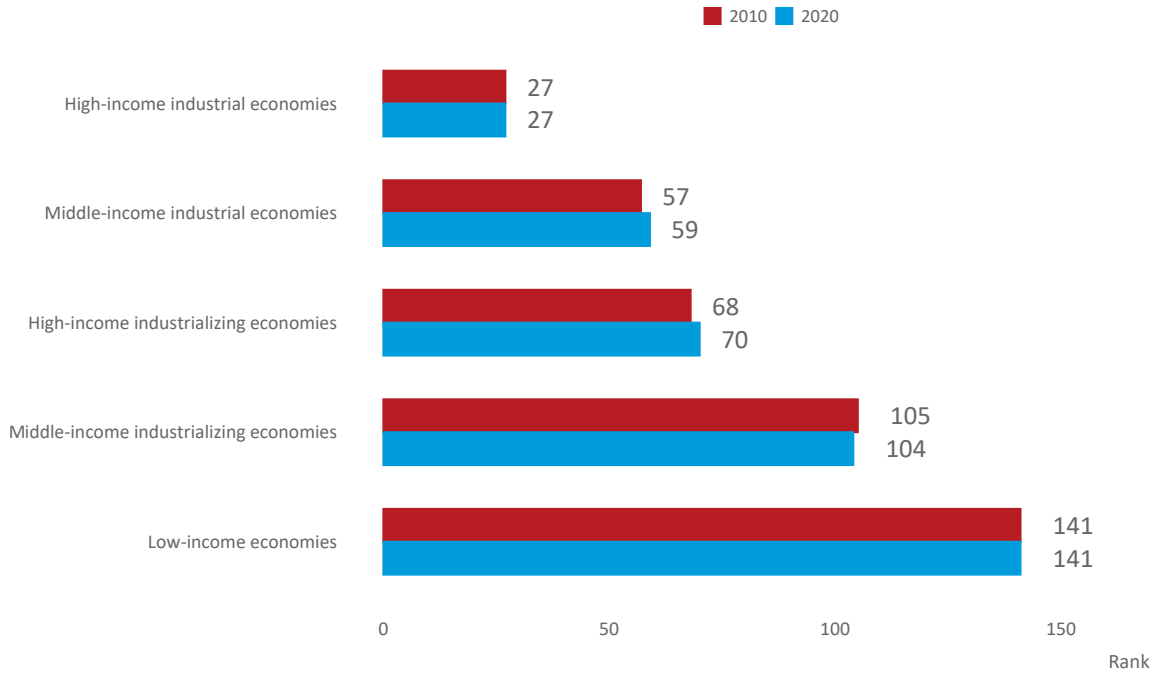


Figure 2.9 | Simple average of CIP ranking by country group
Source: [22]

Figure 2.9 also illustrates that the average ranking of middle-income industrial economies fell from the 57th to the 59th position between 2010 and 2020. Conversely, middle-income industrializing economies registered a minor improvement, advancing from an average rank of 105th in 2010 to 104th in 2020. High-income industrial economies remain at the frontier of industrial competitiveness, reaching the highest average ranking among all country groups.

Figure 2.10 presents each group's average rank, disaggregated by CIP dimension. This allows for the identification of the strengths and weakness of each group and provides a more detailed comparison between groups. For instance, the figure reveals that high-income industrial economies rank first across all dimensions, especially in the first dimension (21st position), highlighting their capacity to produce and export

High-income industrial economies remain at the frontier of industrial competitiveness

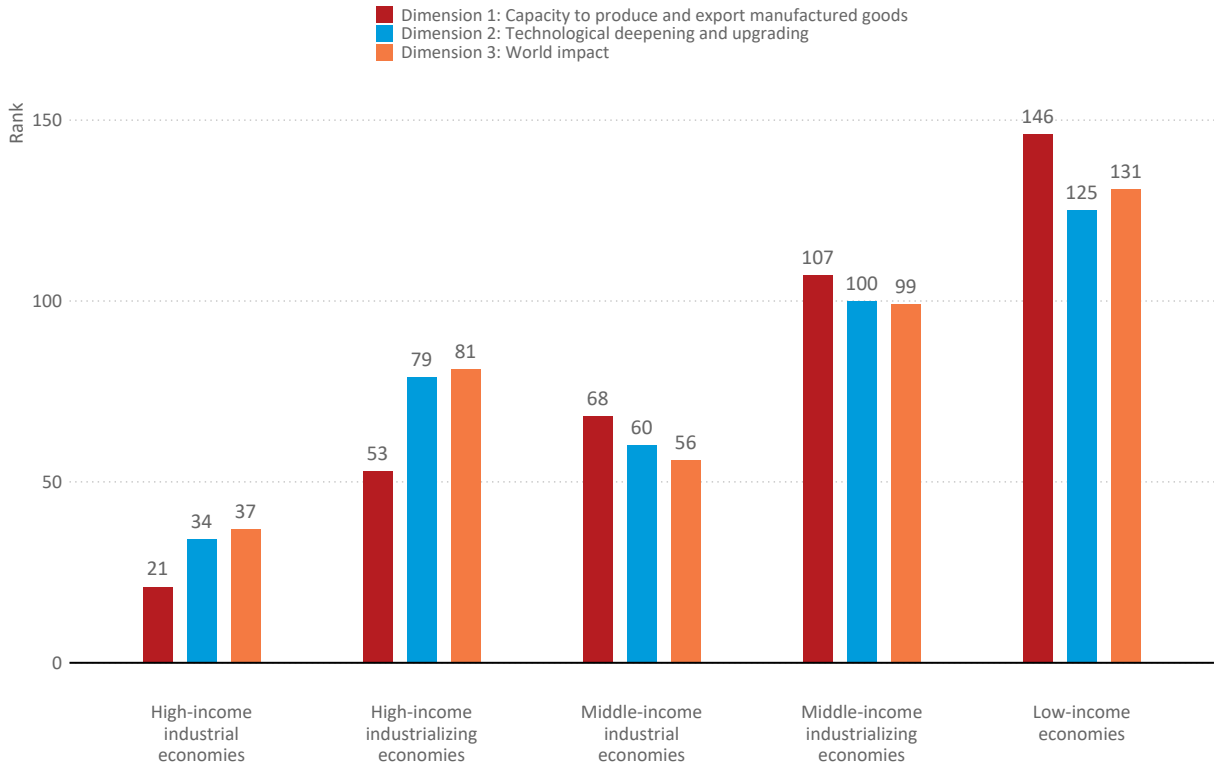


Figure 2.10 | Simple average of CIP ranking by dimension and country group, 2020
Source: [22]

manufactured goods. Even if high-income industrializing economies also rank highest in the first dimension (53rd position), they are positioned at a considerable distance with respect to the first group.

Unsurprisingly, middle-income industrial economies perform best in the world impact dimension. This can be explained by the presence of some of the largest manufacturing producers in the world: China, Mexico, Thailand, Türkiye, the Russian Federation, Brazil and Indonesia, among others. Similarly, middle-income industrializing economies also rank best in the third dimension, while they appear to be less competitive in the first one. Low-income economies face challenges in all competitiveness dimensions.

Middle-income industrial economies
perform best in the dimension
world impact
as they include some of the
largest manufacturing producers
in the world

2.3.3 Regional results

Figure 2.11 presents the average ranking by geographical region, ordered according to regions' average industrial competitiveness score in 2020. The figure shows that Europe is the most competitive region. In fact, the Europe region has 12 economies in the top 20 of the CIP ranking and, on average, their economies rank 41st. Europe is followed by Eastern Asia, with China and Japan taking the lead in this group. South-eastern Asia is in the third position, with Singapore, Malaysia

and Thailand as the regional leaders. However, other Asian regions had lower levels of industrial competitiveness. While Western Asia is still positioned in the upper half of the regional ranking, Southern and Central Asia lag behind, as the least competitive regions in the continent, reaching similar levels as Oceania and the Caribbean.

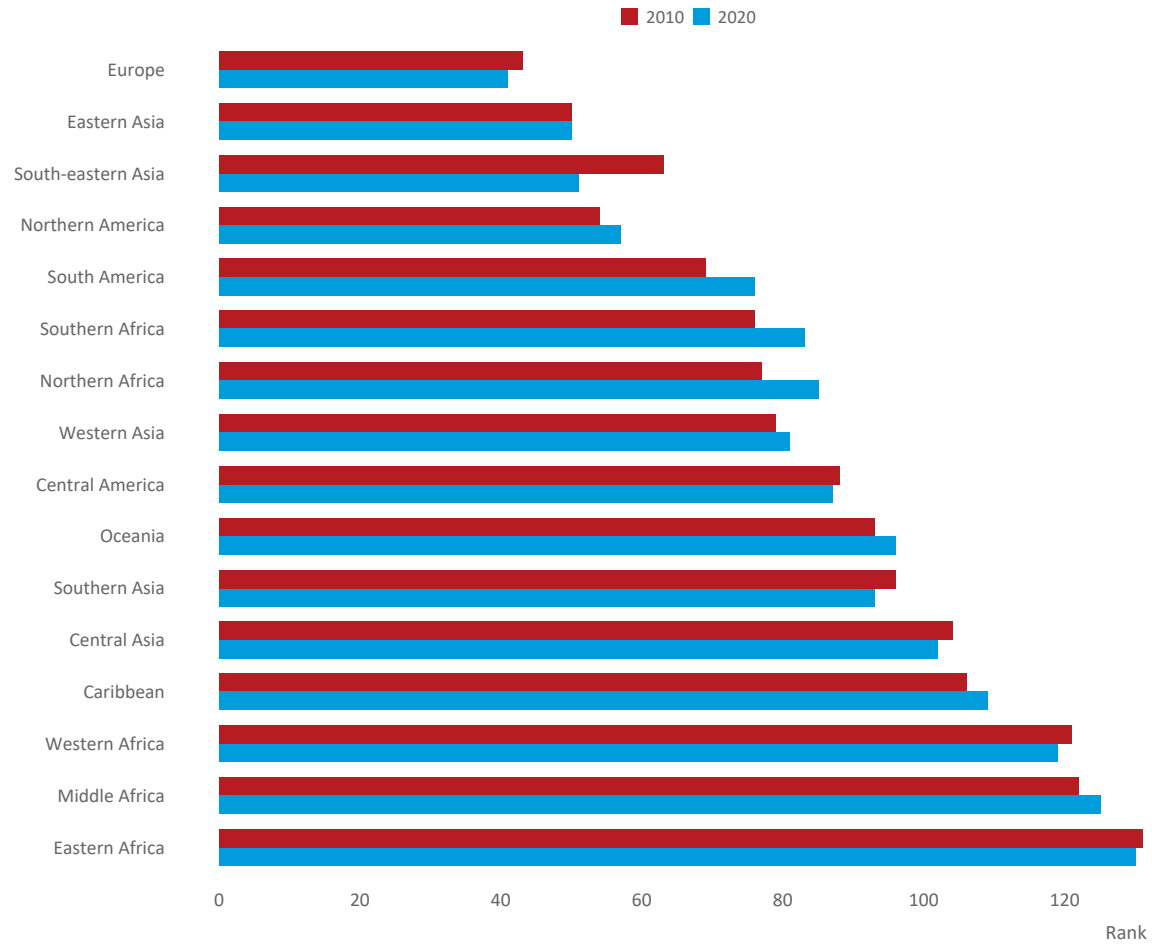


Figure 2.11 | Simple average of CIP rank by geographical region
Source: [22]

Northern America, led by the United States of America and Canada, follows. South America ranks fifth in the regional ranking, owing to the positive performance of Brazil (42nd in the CIP ranking), Chile (49th) and Argentina (57th). The lowest ranked region of the Americas is Central America, despite the positive performance of Mexico's industrial sector, which ranks 20th in the overall index.

Africa remains the least competitive continent, but its regions show considerable heterogeneity. While Southern and Northern Africa are positioned in the upper half of the figure, supported by the industrial performance of economies such as South Africa, Morocco and Egypt, other African regions—Western, Middle and Eastern Africa—remain in the last three positions of the ranking.

Europe has **12** economies in the **top 20** of the **CIP ranking**

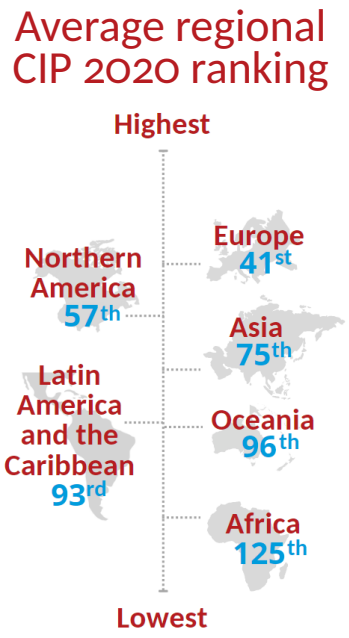
Table 2.1 | Simple average of CIP rank by dimension and geographical region

	Rank in dimension 1		*Rank in dimension 2*		*Rank in dimension 3*	
	2010	2020	2010	2020	2010	2020
Europe	37	35	44	41	52	51
Eastern Asia	52	52	52	59	51	51
South-eastern Asia	76	63	57	49	58	48
Northern America	48	49	56	73	55	56
South America	73	80	94	99	64	69
Southern Africa	64	69	74	86	87	94
Northern Africa	89	98	88	84	63	71
Western Asia	73	77	90	82	81	84
Central America	86	87	80	81	91	88
Oceania	83	85	114	118	98	100
Southern Asia	120	117	90	92	78	76
Central Asia	111	109	96	104	100	98
Caribbean	87	91	72	77	119	123
Western Africa	131	131	109	105	111	108
Middle Africa	117	121	124	118	113	118
Eastern Africa	136	135	118	127	121	118

Source: [22]

Some regions achieved significant improvements in their CIP rankings during the period 2010–2020, especially South-eastern Asia, as well as Southern Asia, Central Asia, Europe and Western Asia. On the other hand, the industrial performance of Southern and Northern Africa as well as of South America deteriorated considerably, with only minor losses also registered in Northern America, Oceania, Middle Africa, Western Asia and the Caribbean.

A more detailed analysis is presented in Table 2.1, which shows the average regional rankings by CIP dimension. The cells highlighted in blue represent an improvement of three or more positions in the ranking from 2010 to 2020, while the cells written in orange show a deterioration of a similar level. The table reveals that, for example, the positive performance of South-eastern Asia mentioned before, was achieved across the board, but mostly due to the progress made in the first dimension. By contrast, the negative change in industrial competitiveness of both Northern and Southern Africa was primarily the result of a deterioration in the first dimension in the former region, and a deterioration in the second dimension in the latter. The table also shows that most regions in the American continent registered a decline in the dimension rankings, especially South America and the Caribbean, which lost positions in all three dimensions.



Future developments on measuring industrial performance

UNIDO is currently working on a new industrial performance index in an effort to track more closely the Organization's mandate on ISID. The new index will measure how successful world economies are in developing their industrial sectors, in building higher value added and increasing their market share while reducing social gaps and environmental degradation (see Figure 2.12).

In the current version of the index, a country could be classified as a highly competitive industrial economy even if it lags behind in terms of social inclusion and environmental protection practices. Clearly, such a development path would be unsustainable. For this reason, the new index adopts a more holistic approach, which encompasses a broader perspective on industrial competitiveness, including environmental as well as social attributes.

The changes will be twofold. First, the new index will include social and environmental pillars in addition to the economic one, which is already captured in the index's current version. Second, the measurement of this economic pillar of industrial competitiveness will be modified to provide countries with more detailed policy guidance into specific products and markets that can serve as a pivot to boost industrial performance.

In addition, the new index will complement its basic indicators, which measure industrial performance outcomes, with a set of determinants or productive capacities (inputs) that will provide information on factors that explain the respective performance, and highlight areas which should be prioritized in policy programmes. It will also provide a framework for monitoring progress towards ISID at the subnational and sector levels.

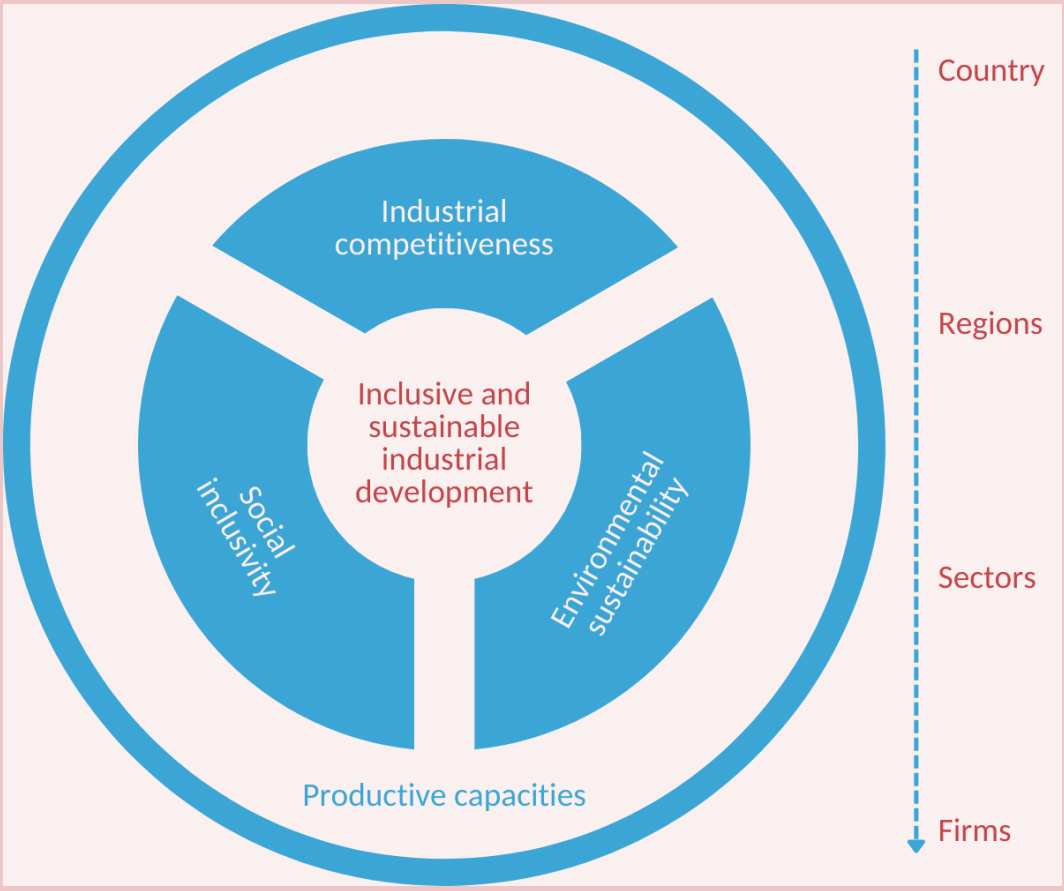


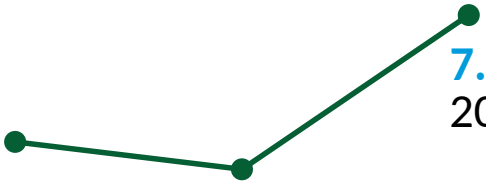
Figure 2.12 | Elements of UNIDO's forthcoming index of industrial performance

3 Spotlight on manufacturing

Spotlight on manufacturing

Key figures

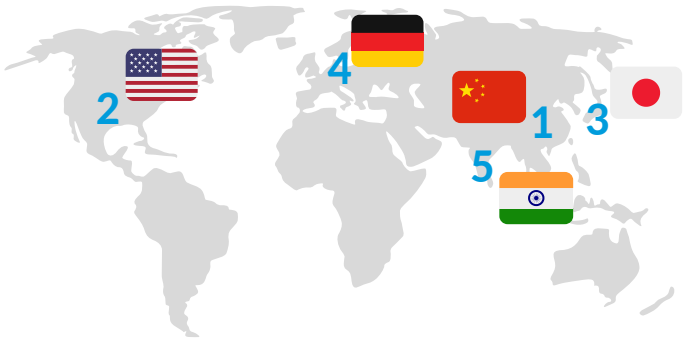
Manufacturing was strongly impacted by the COVID-19 crisis...



-1.3%
2020

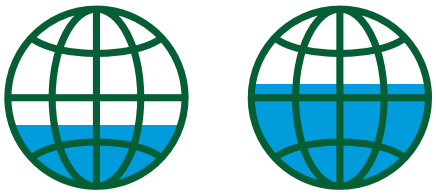
7.2%
2021

...but quickly bounced back in 2021, achieving its highest growth since 2010



Top 5 world manufacturers

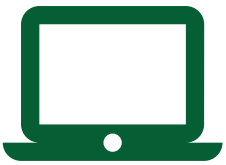
A changing manufacturing landscape, with Asia's global weight growing



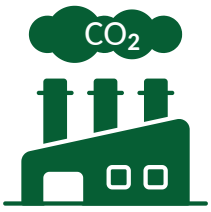
26%
1990

54%
2021

Higher-tech industries account for more than half of manufacturing in high-income industrial economies



Computer, electronic and optical products is now the world's largest manufacturing industry



Manufacturing is responsible for

18%

of energy-related CO_2 emissions

Low-income economies produce

9.5 times

the amount of CO_2 per unit of MVA compared with high-income economies

The previous chapter presented the most recent developments for all industrial sectors. This chapter focuses on the manufacturing sector. The first section discusses ongoing trends, particularly in view of the COVID-19 pandemic and other recent events, as well as longer term trends affecting the global distribution of manufacturing production. A more detailed analysis of the evolution of production disaggregated by manufacturing industries will follow in Section 3.2. The last two sections cover additional manufacturing indicators, including international trade, employment and productivity.

3.1 Current trends and distribution of world manufacturing

3.1.1 Annual manufacturing production

When the COVID-19 pandemic first rattled the world economy in early 2020, its impact was compounded by a global deceleration which had been ongoing since 2019 due to certain factors, such as the aftermath of Brexit and rising protectionism and trade tensions between large trading blocks. The growth of global manufacturing had slowed down to 1.7 per cent in 2019, less than half the growth rate observed in the two preceding years. It was in this unstable environment that the pandemic unleashed havoc on the world's manufacturing sector. The containment measures implemented to reduce the spread of the virus had a direct impact on manufacturing by disrupting global value chains and restricting the movement of people and goods, as well as stifling general demand. As a result, global manufacturing contracted by 1.3 per cent in 2020.

Global manufacturing experienced **deceleration** even before COVID-19

Despite ongoing uncertainties, the manufacturing sector recovered as many countries gradually began phasing out economic and social restrictions, and slowly returned to the pre-pandemic days. This resulted in an impressive growth of 7.2 per cent in global manufacturing in 2021. While this confirms that the manufacturing sector is on the path to recovery, the repercussions of the crisis continue to affect countries and their manufacturing activities, albeit at different degrees across regions and industrial sectors. In addition, the armed conflict in Ukraine is disrupting regional output. This has had negative consequences, albeit of uncertain magnitude, for the global manufacturing landscape due to, inter alia, Europe's dependence on fuel and other resources that are imported from the Russian Federation and Ukraine. The conflict's impact on economic activity has spread across the world through a multitude of channels.

Global MVA fell by **1.3%** in 2020 as the COVID-19 pandemic hit

...

...

but quickly **rebounded** in 2021, growing by **7.2%**

The impacts of the current crises notwithstanding, manufacturing indicators across the globe generally remained stable, as illustrated in

Figure 3.1 based on MVA per capita levels.[i] As has been the case over the last decades, Figure 3.1 shows that Northern America, Western Europe and some economies in Eastern Asia still have the highest MVA per capita level in the world. In stark contrast, Eastern and Middle Africa continue to report the lowest MVA per capita values. The rest of Africa as well as most of Latin America and the Caribbean registered middle-level MVA per capita values, indicating that their process of structural change remains a work-in-progress.

[i]: MVA per capita in constant US dollars serves as an indicator of industrial development, which allows for cross-country comparisons, irrespective of the size of the economy; although not a perfect indicator, it is usually used as a marker for structural change.

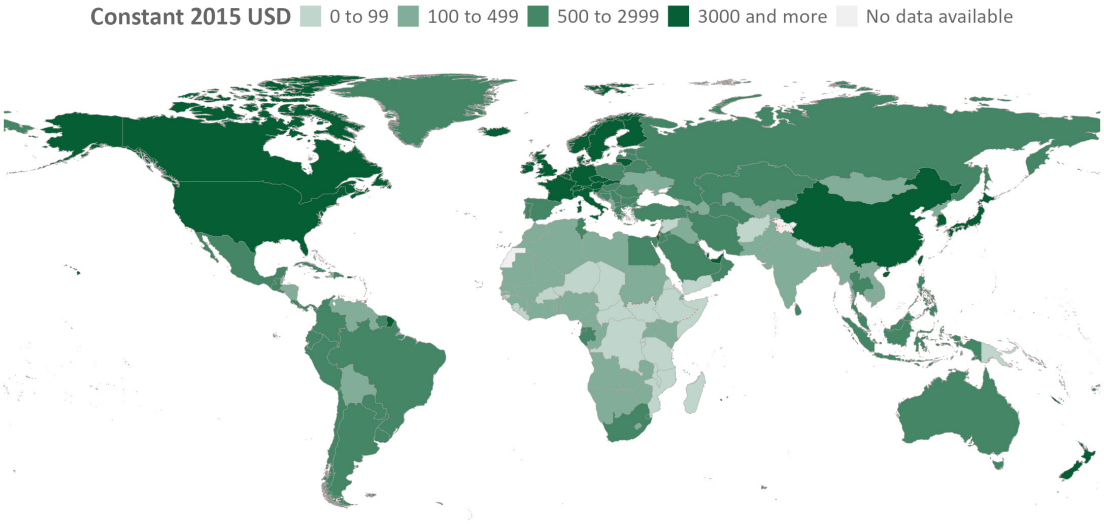


Figure 3.1 | MVA per capita by country, 2021
Source: [4]

Even though the pandemic affected the entire world, the scope of decline and subsequent recovery differed across the globe. As shown in Table 3.1, the group of middle-income industrial economies (excluding China) suffered the largest drop in MVA per capita in 2020 (-4.5 per cent), with high-income industrializing economies following closely behind (-4.3 per cent). On the other hand, middle-income industrializing economies attained a growth rate of 2.1 per cent during a time when most other groups experienced a decline in output.

Although all regions registered high manufacturing growth rates throughout 2021, significant differences in the pace of recovery persisted. For instance, while middle- and high-income industrial economies achieved a growth rate of 7.8 per cent and 7.0 per cent, respectively, low-income economies grew at a rate of only 3.9 per cent. It is worth noting the performance of emerging industrial economies (EIEs).[i] In 2020, at the height of the pandemic, this group's MVA grew by 2.6 per cent, while in 2021 it picked up speed and reached 8.0 per cent.

The pandemic also accelerated a process of global redistribution of manufacturing, one of the megatrends currently being observed [6].

Manufacturing in
industrial economies
recovered faster from
the COVID-19 crisis

[i]: Emerging industrial economies (EIEs) is a group of countries composed of low- and middle-income economies with the most dynamic manufacturing sector. For more details on the composition of this group, see Annex D.5.

Table 3.1 | Growth rate of MVA by country group

	2019	2020	2021
Industrial economies			
High-income industrial economies	0.7	-3.1	7.0
Middle-income industrial economies	3.1	0.6	7.8
Middle-income industrial economies (excl. China)	0.0	-4.5	5.9
China	4.4	2.6	8.5
Other industrializing economies			
High-income industrializing economies	1.4	-4.3	4.8
Middle-income industrializing economies	0.9	2.1	6.1
Low-income economies	4.3	0.7	3.9
Other groups			
Emerging industrial economies	3.9	2.6	8.0
Least developed countries (LDCs)	6.8	0.8	0.5

Source: [4]

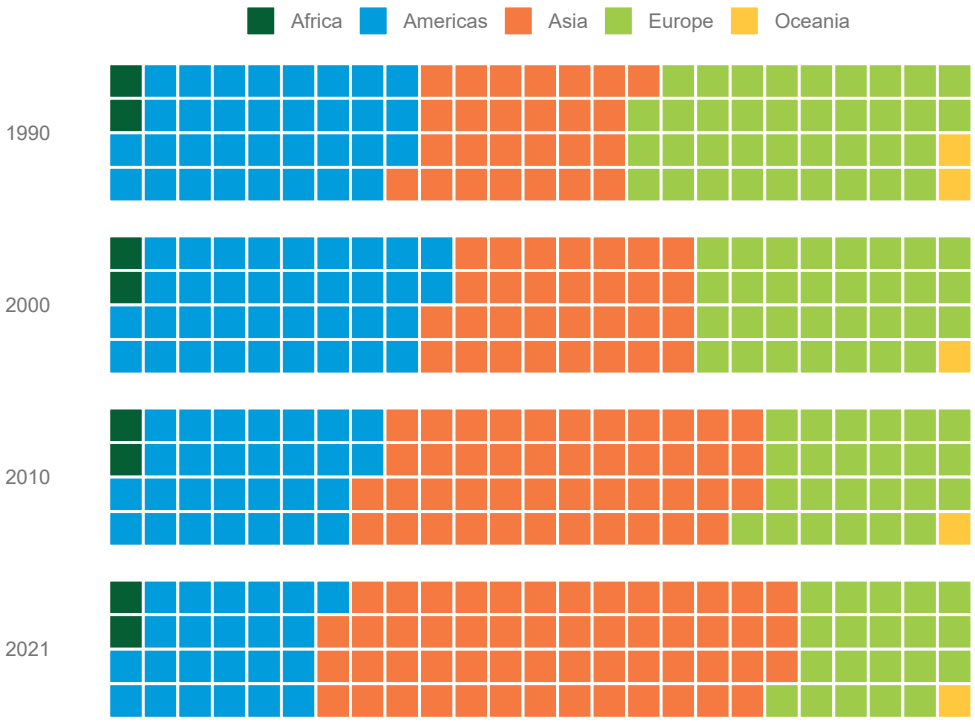


Figure 3.2 | Share of world MVA by geographical region
Source: [4]

Figure 3.2 shows that the world's manufacturing centers were located in Europe and the Americas in the 1990s, the latter primarily due to the production capacities of Northern America, with each of the two continents contributing 36.7 per cent and 33.2 per cent of world MVA, respectively.

However, the manufacturing landscape has steadily changed over the past three decades, with global production gradually moving away from traditional industrialized economies and into Asia, which cur-

Asia
accounts for
54%
of global MVA

rently accounts for a share of 54.1 per cent in world manufacturing. Within this region, China has established itself as the world's manufacturing powerhouse, its share of global manufacturing steadily growing from 3.5 per cent in 1990 to a staggering 30.5 per cent in 2021. To put this share into context, the two top performers on the continent that follow, India (3.2 per cent) and the Republic of Korea (3.1 per cent), account for a much lower share of global manufacturing, even if they remain important manufacturing players worldwide.

As of 2021, the United States of America was the second largest manufacturer, with a 16.8 per cent share in world production, with Japan following in third place, with a share of 7.0 per cent. Germany remains Europe's largest manufacturer, with a 4.8 per cent share in world manufacturing. Africa and Oceania accounted for only a small share of global manufacturing, namely 2.0 per cent and 0.7 per cent, respectively, in 2021.

Top five countries with the largest manufacturing sector and their share in global MVA

1. China (30.5)
2. United States of America (16.8)
3. Japan (7.0)
4. Germany (4.8)
5. India (3.2)

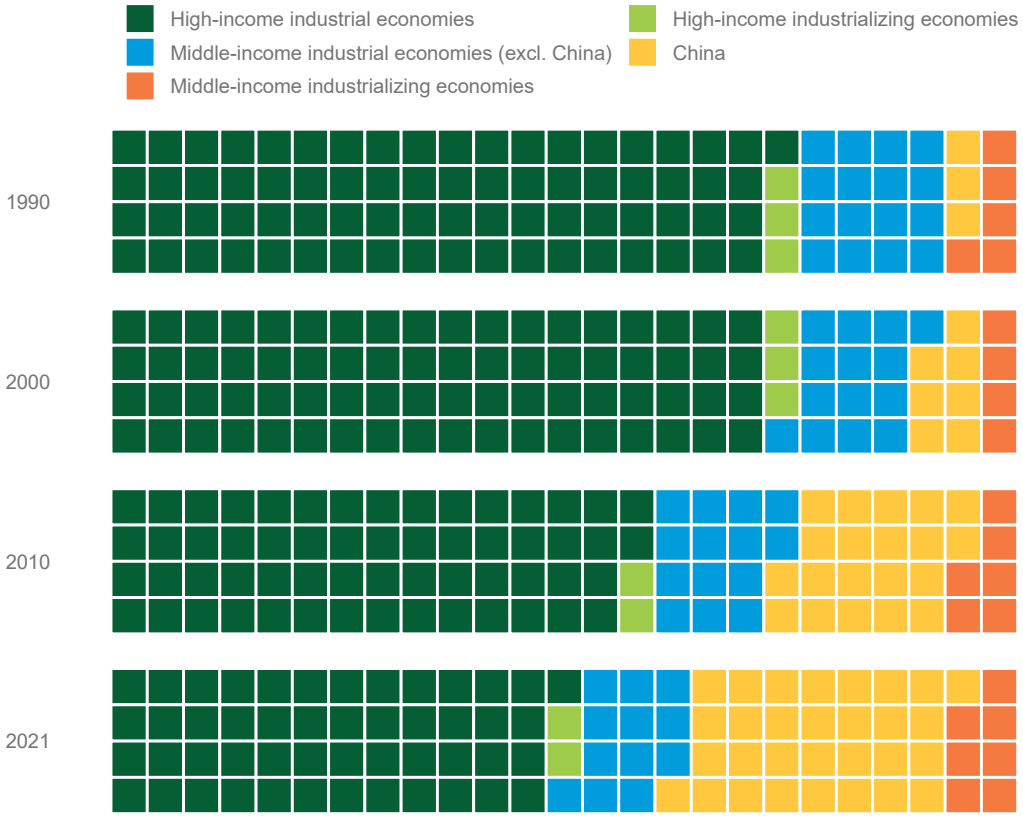


Figure 3.3 | Share of world MVA by country group
Source: [4]

Currently, industrial economies account for 91.0 per cent of global manufacturing output (Figure 3.3). The gap to other countries keeps widening (industrial economies' growth rate in 2021 was 7.4 per cent, while that of other industrializing economies was 5.7 per cent). The

share of industrial economies has remained relatively stable in recent decades, with a redistribution of production within the group. The share of low-income economies in world manufacturing remains low and continues to shrink: their share in world manufacturing decreased from 0.6 per cent in 1990 to 0.4 in 2021. The weight of these economies is so minor in comparative terms that it does not appear in the figure.

The share of
low-income economies
in global manufacturing
reached only
0.4%
in 2021

3.1.2 Quarterly manufacturing production

In addition to the insights obtained from annual manufacturing statistics presented above, the remainder of this section relies on seasonally-adjusted IIPs to provide a more timely analysis of trends observed in the manufacturing sector. The IIP, which is widely available in many countries, is one of the most important sources of information for tracking economic activity in a timely and consistent manner. The box below summarizes some of the main characteristics of this index.

Features of the IIP and UNIDO's IIP databases

- This series measures the volume of industrial output in real terms, free from price fluctuations.
- It is one of the most important short-term statistics (STS), used to keep track of economic activity in industrial sectors, including manufacturing.
- It is usually available in quarterly and monthly frequencies, although with different coverage and level of detail.
- UNIDO regularly collects and harmonizes IIP data from across the world.
- It is available as the quarterly IIP database [20], with a coverage of around 110 economies, and the monthly IIP database [21], which features 80 economies.
- Both databases include seasonally-adjusted data.

UNIDO databases
include
80 economies
(93% of global MVA)
with **monthly and quarterly IIP**
and around
30 additional economies
with **quarterly IIP** only

As mentioned earlier, the global decline in manufacturing caused by COVID-19 was less drastic than the financial crisis of 2008–2009. The quarterly data presented in Figure 3.4 confirms this, indicating that the pandemic's economic effects quickly receded a few months after its onset; global production already exceeded pre-pandemic levels one year after the initial outbreak. Figure 3.5 compares the two most recent global crises. This chart reconfirms that, on a global scale, the COVID-19 pandemic had a less severe and more short-lived impact on global manufacturing production than the 2008–2009 financial crisis. Nevertheless, increased volatility and persistent uncertainty remain and continue to exert a detrimental influence on economic decision-making. For example, the shortage of raw materials and disruptions

Within
four quarters
of the outbreak
of the COVID-19 crisis,
global manufacturing
reached
pre-pandemic
production levels

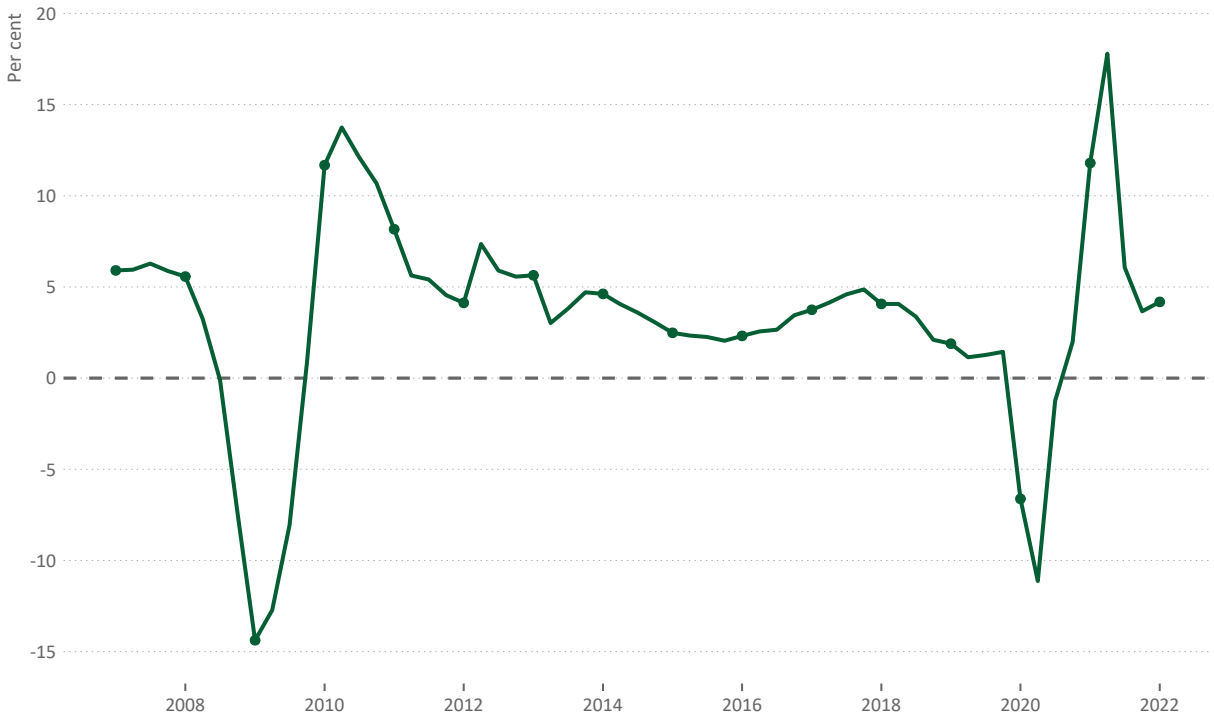


Figure 3.4 | Year-over-year quarterly growth rates of global manufacturing production
Source: [20]

to global supply chains still pose a major logistical threat in some industries, such as motor vehicles. This is further exacerbated by the ongoing conflict in Ukraine, with significant consequences globally, but especially for Europe.

Trends disaggregated by country group

The pandemic's impacts differed across countries and industrial sectors. Figure 3.6 illustrates recent trends by major country groups according to industrial development. Manufacturing production in China and other middle-income industrial economies generally recovered faster and remained more stable than in high-income industrial economies, whose output levels only returned to pre-pandemic levels in the first quarter of 2021.

Middle-income economies
led by China
were at the forefront of
post-pandemic recovery
in manufacturing

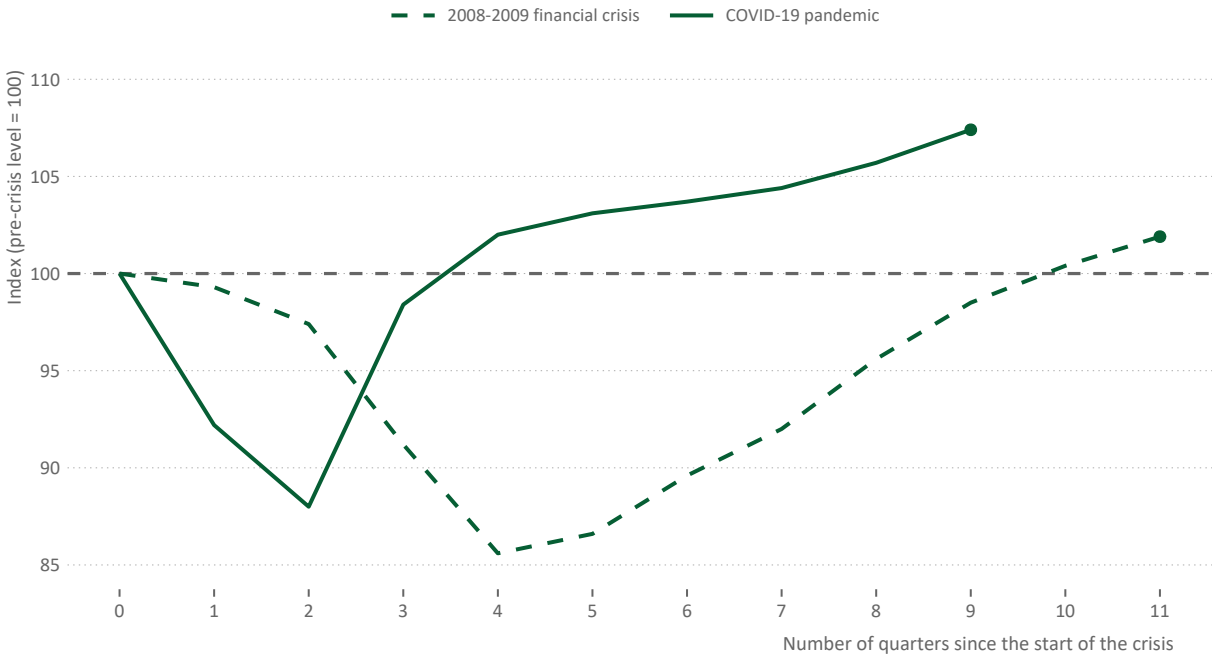


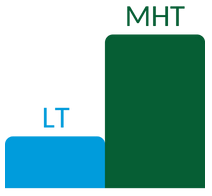
Figure 3.5 | Recovery in the global manufacturing sector during the two most recent global crises
Source: [20]
Note: This chart is based on the global index of manufacturing production, with the period before each crisis set to 100.

A clear distinction also emerges between economies with different income levels. Low-income economies, for instance, have not yet reached their pre-pandemic level of production, while middle-income industrializing economies have registered high growth rates in recent quarters, albeit with some volatility. The manufacturing output levels of other high-income industrializing economies, on the other hand, only managed to recover and reach pre-crisis levels in the last quarter of 2021.

Manufacturing in
low-income economies
has not yet recovered
from the COVID-19 crisis

Developments by manufacturing sector

With the onset of the COVID-19 crisis in the first half of 2020, all industrial sectors suffered a shock of similar magnitude, both in industrial and industrializing economies. However, the paths towards recovery have since varied in terms of speed and intensity, as shown in Figure 3.7. For example, industrial economies reported fewer production losses at the onset of the pandemic, compared to other industrializing economies. It is also worth noting that the sub-sectors of industrial economies classified as medium-high and high technology (MHT) showed faster and stronger recovery, already exceeding their pre-pandemic levels in the third quarter of 2020. Recovery in low technology (LT) industries has been lagging behind in both country groups.



Higher tech industries
recovered faster
from the crisis
than others

: A list of ISIC activities by technological intensity is included in Annex D.2.

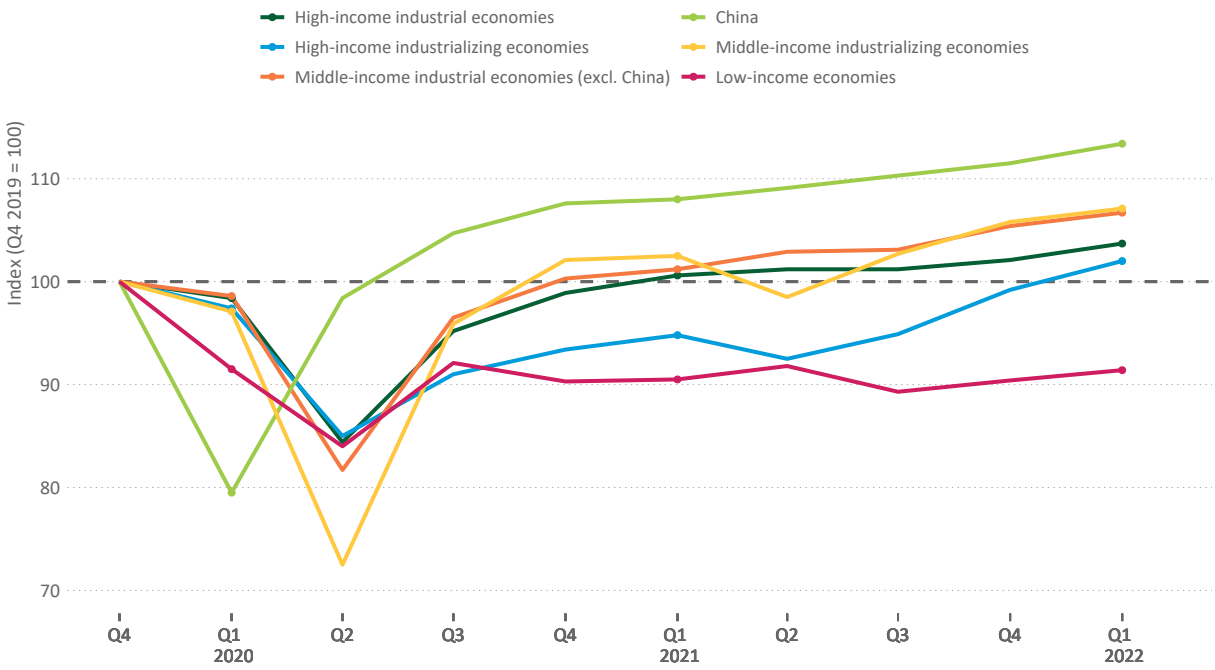


Figure 3.6 | COVID-19 recovery in manufacturing production by country group
Source: [20]
Note: This chart is based on the index of manufacturing production, with the period before the crisis (Q4 2019) set to 100.

Figure 3.7 | COVID-19 recovery in manufacturing production by technology intensity and country group
Source: [20]
Note: This chart is based on the index of manufacturing production, with the period before the crisis (Q4 2019) set to 100.

Figure 3.8, with disaggregated data by manufacturing sector at the ISIC 2-digit level, provides more granular insights into recent developments. In 2020, as more severe impacts related to the pandemic and the measures imposed by governments across the world affected the entire economy, most industries suffered significant losses. This was a sharp turnaround from ongoing trends observed in previous years, when the majority of industries were still thriving, although with a gradual deceleration. The only sectors that remained strong in 2020 were pharmaceuticals and computer and electronics, both higher-technology sectors that benefited from sustained demand throughout the crisis. These data therefore confirm the importance of high-technology production and its comparably higher growth rates. Nonetheless, the production of motor vehicles, a higher technology sector, remains a significant exception. This sector (ISIC Rev. 4 division 29) had already experienced production losses in 2019, which were further exacerbated during the crisis due to a collapse in demand and distribution shortages of materials and components.

Motor vehicles
and other transport equipment
are among the
industries most impacted
by the pandemic

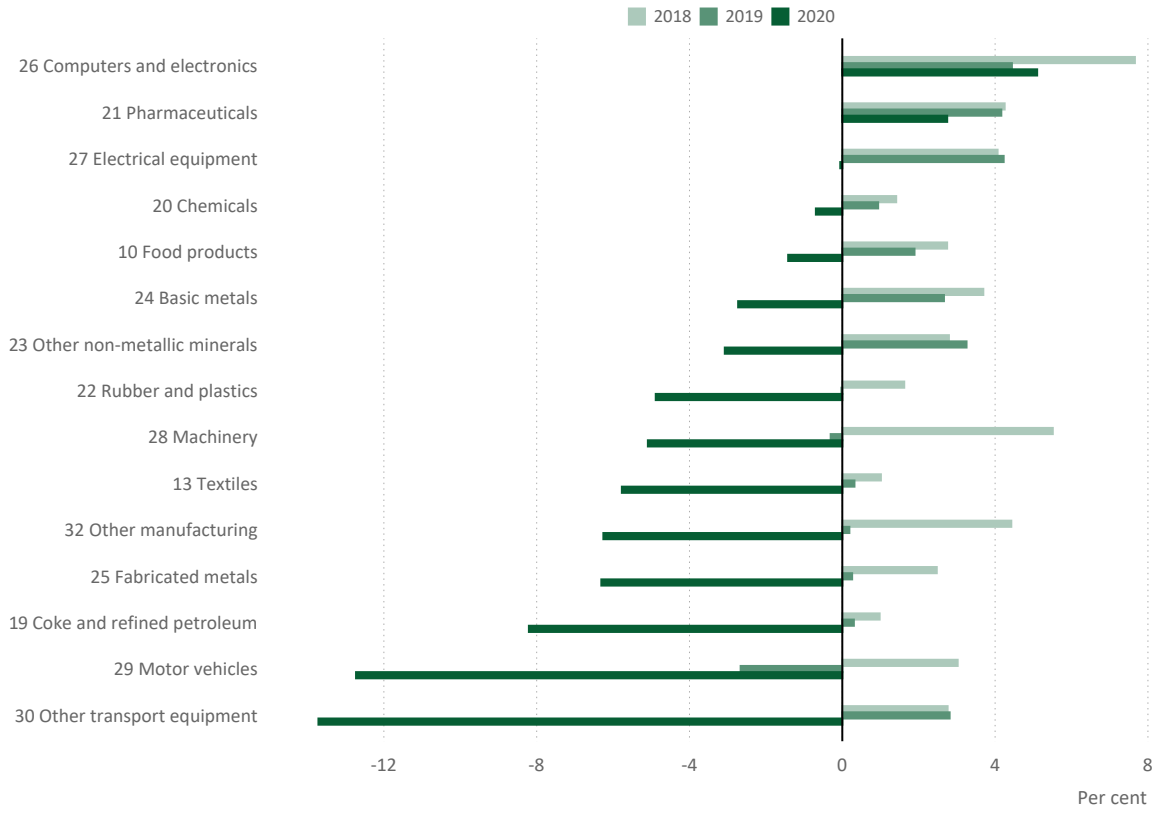


Figure 3.8 | Global growth rate of value added by manufacturing industry
Source: [20]

3.2 Structure and transformation of manufacturing industries

This section focuses on the contribution of different industrial activities to total manufacturing. It presents industry-level information according to ISIC Rev. 4 at the division (2-digit) level. Trends for leading manufacturers of selected country groups and the transformations that have taken place over the past 20 years are shown as well.

Figure 3.9 shows the distribution of value added in the world according to manufacturing sector, as well as its development over the last two decades. The figure reveals the sustained significance of the *manufacture of food products* (ISIC Rev. 4 division 10), as well as the impressive advances of most MHT industrial activities.ℹ These industries contributed the most to world MVA in 2020.

Between 2000 and 2020, *computer, electronic and optical products* (ISIC Rev. 4 division 26) evolved to become the most important industrial activity in terms of contribution to MVA, with its share almost doubling from 5.9 per cent to 11.6 per cent. This feature was not, however, common to all country groups. As shown in Figure 3.10, while high-income industrial economies and China have witnessed a steady increase in the weight of ISIC 26 since the 2000s, this trend has not been observed in other middle-income industrial economies.

Methodological explanation

The figures shown in this section are based on value added, compiled using base weights for the reference year 2015. These are mainly built using data from the Industrial Statistics Databases (INDSTAT). However, value-added figures are only available in current prices. The annual IIP is used to present trends over time, free from currency and price variations.

ℹ: A simplified classification by technological intensity for ISIC Rev. 4 at the division level is applied (see Annex D.2).

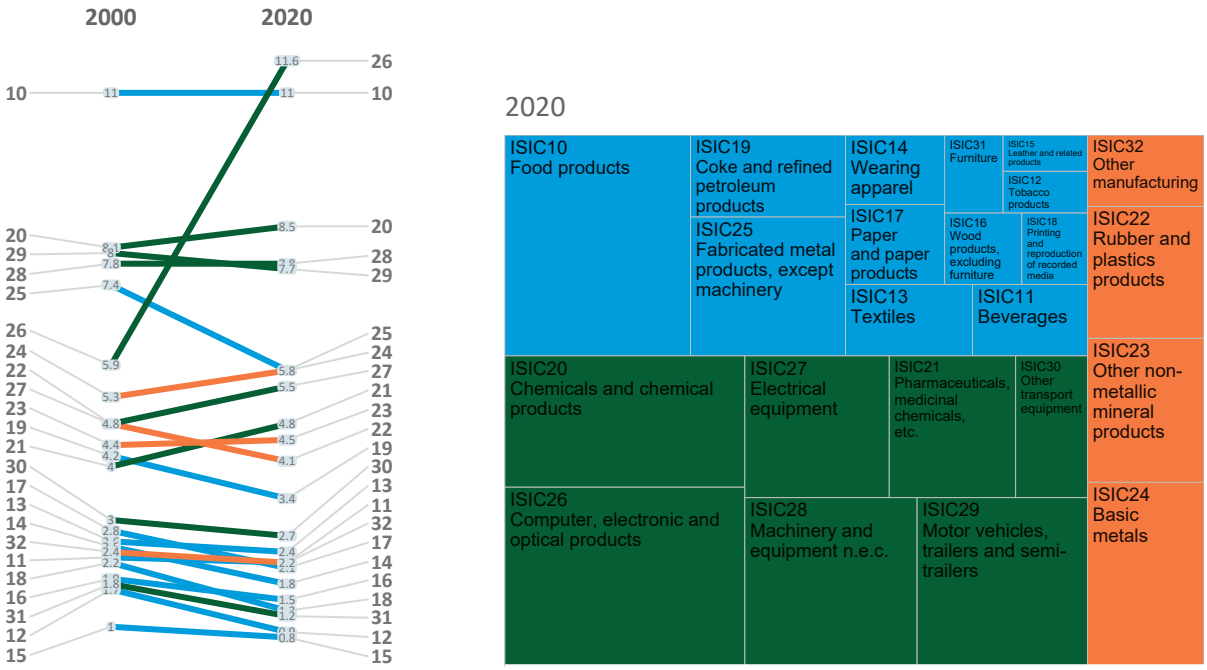


Figure 3.9 | Contribution of manufacturing industries to global MVA
Source: [16]. *Note:* The chart on the left shows the development between 2000 and 2020, indicating the sector's share of MVA in per cent; the chart on the right presents the most recent structure of global manufacturing by industrial activity; the colours distinguish manufacturing industries according to technological intensity: blue = low-technology (LT), orange = medium-technology (MT), green = medium-high and high-technology (MHT).

The relative importance of China's manufacturing sector, in particular, grew steadily within the group of industrial economies, which is evident in the changing intensity of shades shown in Figure 3.10. The country's transformation into the "world's factory" is clearly visible for several industries. By 2020, China had become the leading manufacturer for LT, medium technology (MT) as well as MHT products (see Figure 3.12). The United States of America ranks second in all three categories, followed by other large industrial economies, such as Japan and Germany.

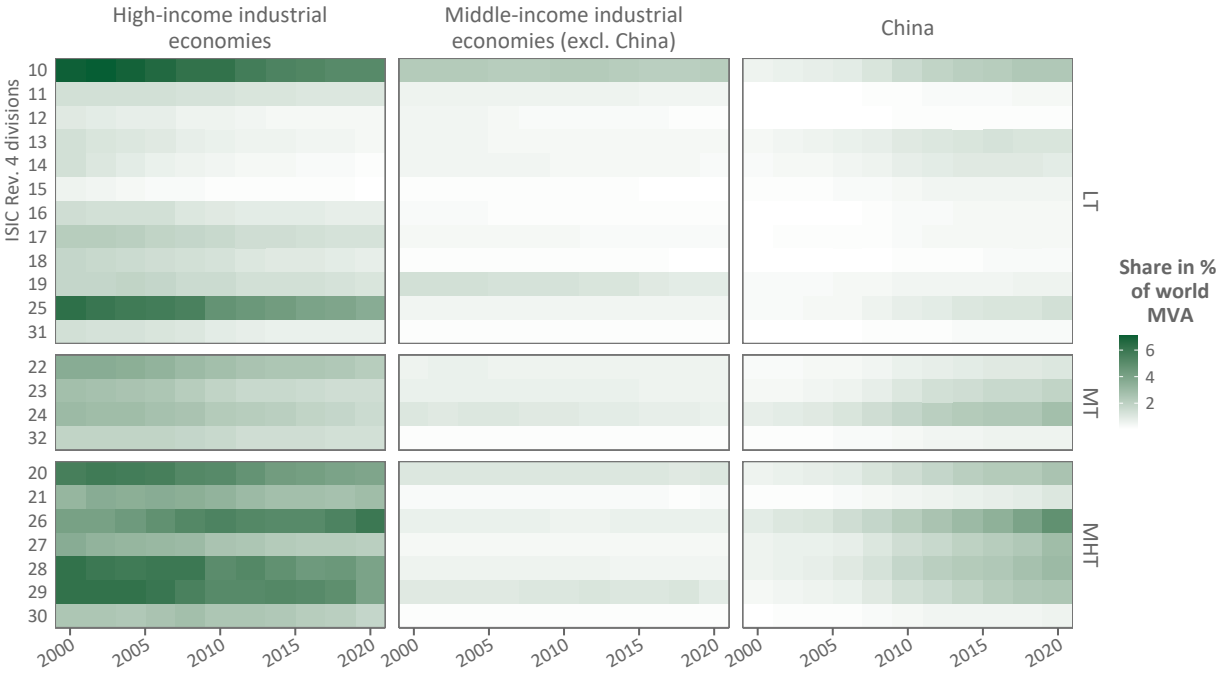


Figure 3.10 | Structure and development of manufacturing activities in industrial economies
Source: [16]
Note: LT = low-technology, MT = medium-technology, MHT = medium-high and high-technology

While the manufacture of MHT products is increasingly dominating the sectoral patterns of industrial economies, other industrializing economies show a more heterogeneous distribution of MVA. In this group of economies, as illustrated in Figure 3.11, MVA in recent years has primarily originated in ISIC Rev. 4 divisions 10 (food products), 19 (coke and refined petroleum products), 20 (chemicals and chemical products), 23 (other non-metallic mineral products), 24 (basic metals) and 21 (pharmaceuticals, medicinal chemicals, etc.)

It is worth noting that even when considering industrializing economies only, the share of low-income countries is close to zero and therefore almost invisible in the figure. This indicates that this group of economies, although it represents 8.5 per cent of the world population, has not managed to increase its share of world manufacturing production.

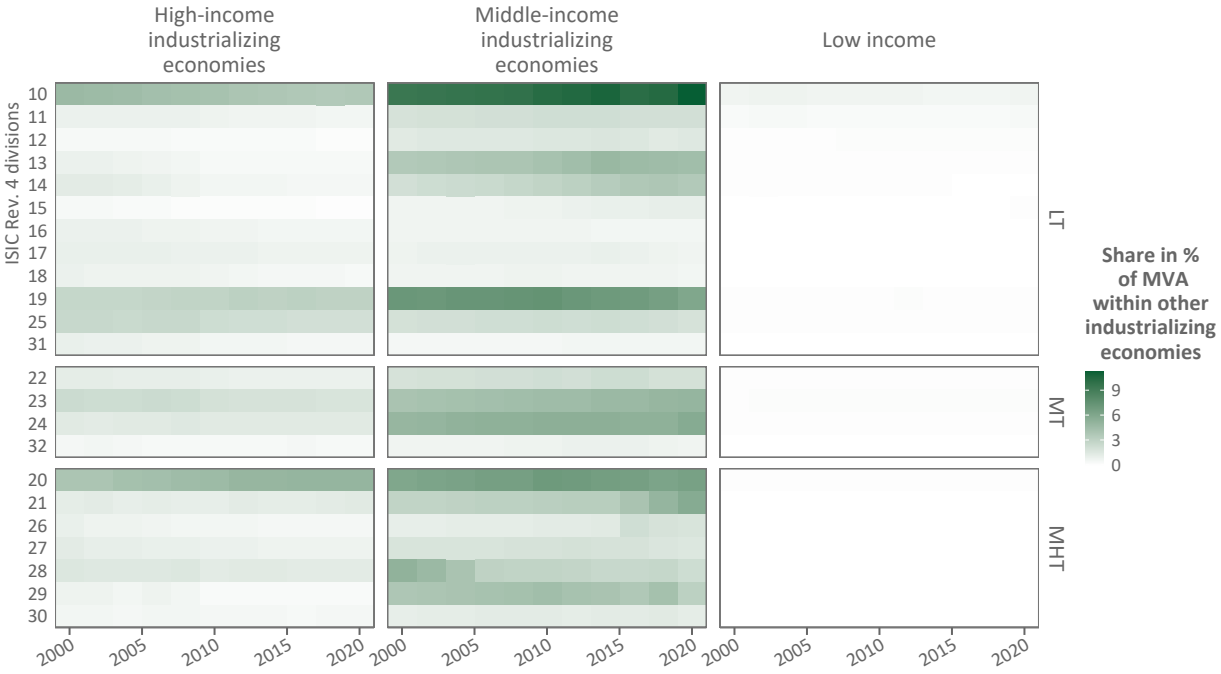
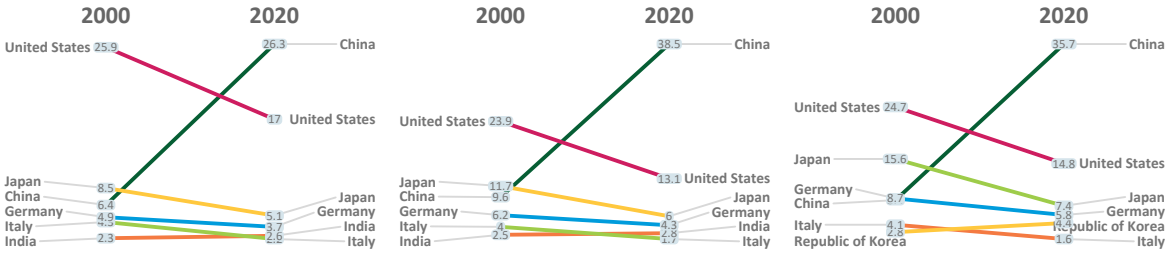


Figure 3.11 | Structure and development of manufacturing activities in other industrializing economies
Source: [16]
Note: LT = low-technology, MT = medium-technology, MHT = medium-high and high-technology



(a) Low-technology **(b)** Medium-technology **(c)** Medium-high and high-technology

Figure 3.12 | Leading manufacturers in the world by technological intensity
Source: [16]
Note: The figures present countries' share in global production, in per cent.

Table 3.2 | Leading manufacturers by technological intensity (Africa)

	2000	2020		2000	2020		2000	2020
Low-technology			**Medium-technology**			**Medium-high and high-technology**		
Egypt	23.6	25.2	Nigeria	5.8	22.0	Egypt	34.3	30.5
Nigeria	15.3	22.9	Egypt	32.5	18.3	South Africa	32.9	24.5
South Africa	20.3	12.2	South Africa	28.8	17.0	Morocco	13.9	16.0
Morocco	6.6	5.5	Morocco	9.6	7.8	Tunisia	5.0	4.9
Algeria	7.7	4.2	Angola	2.5	7.0	Nigeria	1.0	4.2
Angola	1.7	3.8	Ghana	2.0	3.3	Ghana	1.7	2.6
Ghana	2.7	3.5	Ethiopia	0.6	3.2	Kenya	2.1	2.6
Kenya	3.2	3.2	Senegal	2.1	3.0	Ethiopia	0.5	2.5
Tunisia	3.8	2.3	Tunisia	2.8	2.2	Senegal	1.9	2.3
Ethiopia	0.4	2.0	Zambia	0.9	1.7	Mali	0.4	1.7

Source: [17]. *Note:* Shares in per cent of total value added of the respective group; red points show minimum/maximum values.

Table 3.3 | Leading manufacturers by technological intensity (Americas)

Low-technology	2000	2020	Medium-technology	2000	2020	Medium-high and high-technology	2000	2020
United States	67.6	65.5	United States	71.8	69.9	United States	75.7	77.0
Brazil	7.3	7.6	Brazil	6.7	7.0	Mexico	5.3	6.2
Mexico	6.5	6.9	Mexico	5.7	6.7	Brazil	4.9	4.8
Canada	5.5	5.7	Canada	5.8	6.1	Canada	5.0	4.7
Argentina	3.5	4.0	Argentina	2.8	2.9	Puerto Rico	3.4	3.2
Colombia	1.3	1.8	Peru	0.9	1.3	Argentina	1.6	1.6
Chile	1.3	1.6	Colombia	0.8	1.2	Colombia	0.4	0.6
Peru	0.9	1.2	Ecuador	0.5	0.7	Chile	0.4	0.4
Ecuador	0.6	0.7	Chile	0.6	0.7	Cuba	1.5	0.3
Guatemala	0.4	0.7	Puerto Rico	0.5	0.6	Peru	0.2	0.3

Source: [17]. *Note:* Shares in per cent of total value added of the respective group; red points show minimum/maximum values.

Table 3.4 | Leading manufacturers by technological intensity (Asia and Oceania)

Low-technology	2000	2020	Medium-technology	2000	2020	Medium-high and high-technology	2000	2020
China	20.7	52.9	China	26.2	63.7	China	22.6	60.1
Japan	27.8	10.3	Japan	31.7	9.9	Japan	42.0	12.5
India	7.5	5.3	India	6.9	4.6	Republic of Korea	7.5	7.4
Indonesia	4.3	4.6	Republic of Korea	7.8	3.6	China, Taiwan Prov.	3.3	3.8
Republic of Korea	7.4	3.6	Türkiye	3.0	2.6	India	6.7	3.8
Türkiye	3.2	3.5	Indonesia	3.9	2.5	Indonesia	2.3	1.8
Thailand	4.1	1.9	China, Taiwan Prov.	3.4	1.5	Singapore	1.8	1.6
Australia	3.9	1.8	Thailand	4.0	1.5	Türkiye	1.4	1.4
Saudi Arabia	1.5	1.7	Australia	2.9	1.1	Thailand	3.3	1.1
Bangladesh	0.5	1.5	Malaysia	1.1	1.0	Malaysia	1.1	0.9

Source: [17]. *Note:* Shares in per cent of total value added of the respective group; red points show minimum/maximum values.

Table 3.5 | Leading manufacturers by technological intensity (Europe)

Low-technology	2000	2020	Medium-technology	2000	2020	Medium-high and high-technology	2000	2020
Germany	17.3	17.4	Germany	22.3	22.9	Germany	29.5	27.7
United Kingdom	10.4	11.9	Russian Federation	7.0	10.4	Ireland	3.0	8.0
Italy	15.0	10.5	Italy	14.4	9.1	France	11.1	7.8
France	14.1	9.1	United Kingdom	9.4	8.0	Italy	13.7	7.6
Russian Federation	4.8	8.7	France	10.4	7.9	United Kingdom	7.8	7.4
Spain	8.9	6.6	Spain	9.1	5.7	Switzerland	4.6	6.9
Poland	1.9	5.2	Poland	1.7	4.9	Russian Federation	4.1	6.0
Netherlands	3.2	3.5	Ireland	1.8	4.4	Spain	6.2	4.1
Switzerland	3.0	3.5	Switzerland	2.5	2.9	Netherlands	3.0	3.1
Austria	1.9	2.5	Austria	2.4	2.8	Sweden	3.6	2.7

Source: [17]. *Note:* Shares in per cent of total value added of the respective group; red points show minimum/maximum values.

Table 3.6 | Leading manufacturers for selected ISIC divisions (World)

	2000	2020
10 Food products		
China	5.5	22.1
United States	24.3	17.5
Japan	10.5	6.2
Indonesia	1.6	3.3
Germany	4.0	3.1
11 Beverages		
United States	19.3	18.3
China	3.7	17.9
Japan	10.1	6.2
Mexico	4.6	4.9
Brazil	2.9	2.7
12 Tobacco products		
United States	38.2	22.0
China	5.1	21.9
Indonesia	3.4	10.4
Japan	3.6	3.7
India	2.0	2.7
13 Textiles		
China	17.1	50.7
United States	18.5	5.1
Türkiye	4.2	5.1
India	4.6	4.1
Indonesia	2.1	3.1
14 Wearing apparel		
China	13.5	51.2
Bangladesh	1.3	7.0
Türkiye	2.4	4.4
India	2.3	3.2
Indonesia	1.6	2.9
15 Leather and related products		
China	16.5	56.5
Italy	21.7	6.2
Indonesia	3.7	6.0
Viet Nam	0.5	3.0
Brazil	7.1	2.7
16 Wood products, excluding furniture		
China	4.2	28.2
United States	27.4	18.4
Germany	5.4	4.9
Japan	8.1	4.5
Canada	4.9	3.6
17 Paper and paper products		
United States	38.8	25.4
China	4.6	20.2
Japan	9.4	6.6
Germany	5.0	4.6
Brazil	2.6	3.0

	2000	2020
18 Printing and reproduction of recorded media		
China	3.7	22.3
United States	34.1	22.0
Japan	14.2	11.9
Germany	5.8	4.2
United Kingdom	3.7	4.0
19 Coke and refined petroleum products		
United States	23.5	19.5
China	6.2	18.0
India	8.0	10.3
Russian Federation	4.6	5.9
Egypt	3.4	5.3
20 Chemicals and chemical products		
China	7.6	30.3
United States	31.4	17.4
Japan	9.1	5.4
Germany	7.3	4.5
India	3.4	3.5
21 Pharmaceuticals, medicinal chemicals, etc.		
China	4.7	21.8
United States	38.1	18.9
Switzerland	3.2	6.7
India	4.0	6.6
Japan	11.4	5.9
22 Rubber and plastics products		
China	6.0	26.7
United States	27.2	17.1
Japan	15.1	9.3
Germany	6.8	6.0
Republic of Korea	3.2	3.0
23 Other non-metallic mineral products		
China	8.7	41.8
United States	19.7	9.7
Japan	9.3	4.5
Germany	6.2	3.5
India	2.7	2.6
24 Basic metals		
China	14.4	49.2
United States	17.6	7.8
Japan	12.3	5.2
India	3.3	4.2
Russian Federation	4.5	4.0
25 Fabricated metal products, except machinery		
China	3.8	23.3
United States	29.3	20.2
Germany	8.1	8.1
Japan	12.0	6.7
Italy	6.9	3.8

	2000	2020
26 Computer, electronic and optical products		
China	15.7	41.5
United States	11.1	12.6
Republic of Korea	3.9	9.0
China, Taiwan Prov.	3.4	7.3
Japan	19.8	5.1
27 Electrical equipment		
China	11.8	52.2
United States	25.8	10.4
Japan	14.0	6.8
Germany	10.1	6.4
Republic of Korea	3.0	2.6
28 Machinery and equipment n.e.c.		
China	7.7	38.0
United States	20.0	11.1
Germany	13.3	9.9
Japan	17.6	9.8
Italy	7.6	3.9
29 Motor vehicles, trailers and semi-trailers		
China	5.6	32.5
United States	19.4	13.1
Japan	23.4	13.1
Germany	13.0	8.7
Mexico	3.4	4.1
30 Other transport equipment		
United States	40.2	32.5
China	4.7	21.1
Germany	3.4	5.2
France	5.4	4.8
United Kingdom	8.7	4.8
31 Furniture		
China	4.5	25.5
United States	32.0	19.6
Germany	8.3	5.3
Italy	7.0	4.3
Japan	5.4	3.5
32 Other manufacturing		
China	8.1	26.4
United States	39.1	26.1
Germany	6.6	7.0
Ireland	2.3	5.5
Japan	7.7	4.8

Source: [17]. *Note:* Shares in per cent of total value added of the respective group; red points show minimum/maximum values.

3.3 The manufacturing sector trade

3.3.1 Global export structure

The value of manufacturing exports grew from US$ 12.0 to US$ 14.7 trillion from 2010 to 2020. Yet this increase was not only observed in absolute terms. Indeed, the share of manufacturing exports in total merchandise exports also increased, as shown in Figure 3.13. This share grew from around 80.0 per cent to 86.0 per cent during this period, despite some fluctuations from 2016 to 2018.

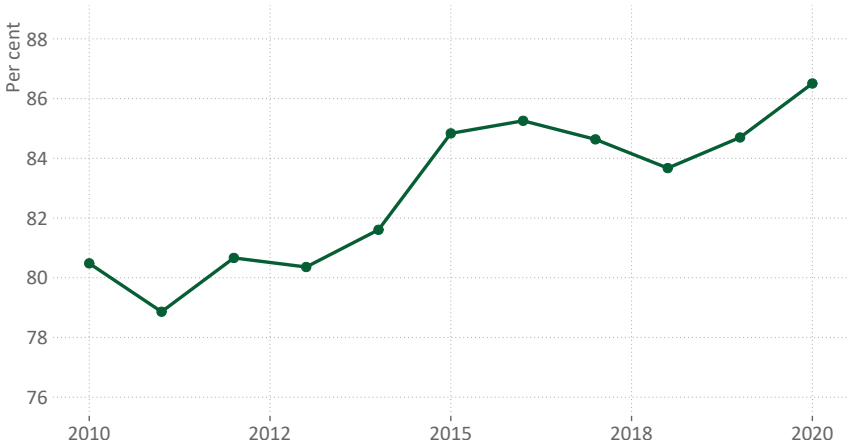
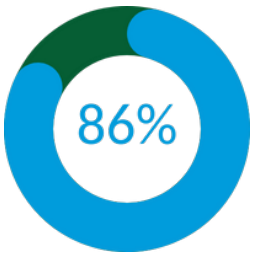


Figure 3.13 | Share of manufacturing trade in total merchandise trade
Source: [19]



The growing
majority
of global exports consist of
manufactured goods

When studying the distribution of manufacturing exports by country group, as illustrated in Figure 3.14, the export share of middle-income industrial economies shows a very clear increasing trend, while the share of high-income industrial economies has been gradually decreasing. The weight of low-income economies in global manufacturing exports remains minimal and is almost not visible in the figure.

In terms of trade by technology intensity in manufacturing,[i] exports from MHT industries experienced a slightly growing trend, as shown in Figure 3.15, increasing from 58.5 per cent in 2010 to 61.0 per cent in 2020. In contrast to MHT industries, trade from MT industries registered a gradually declining trend during the same period: exports decreased from 16.1 per cent in 2010 to 15.6 per cent in 2020. Exports from LT manufacturing sectors witnessed an increasing trend from 2010 to 2013: exports grew from 25.4 per cent in 2010 to 26.8 per cent in 2013. However, their share continuously decreased from 2014 to 2020: exports shrank from 26.7 per cent in 2014 to 23.4 per cent in 2020.

The share of
middle-income economies
in manufacturing exports increased from
23.7% in 2010
to
29.5% in 2020

[i]: List of ISIC activities by technological intensity is given in Annex D.2.

Figure 3.14 | Manufacturing export share by country group
Source: [19]

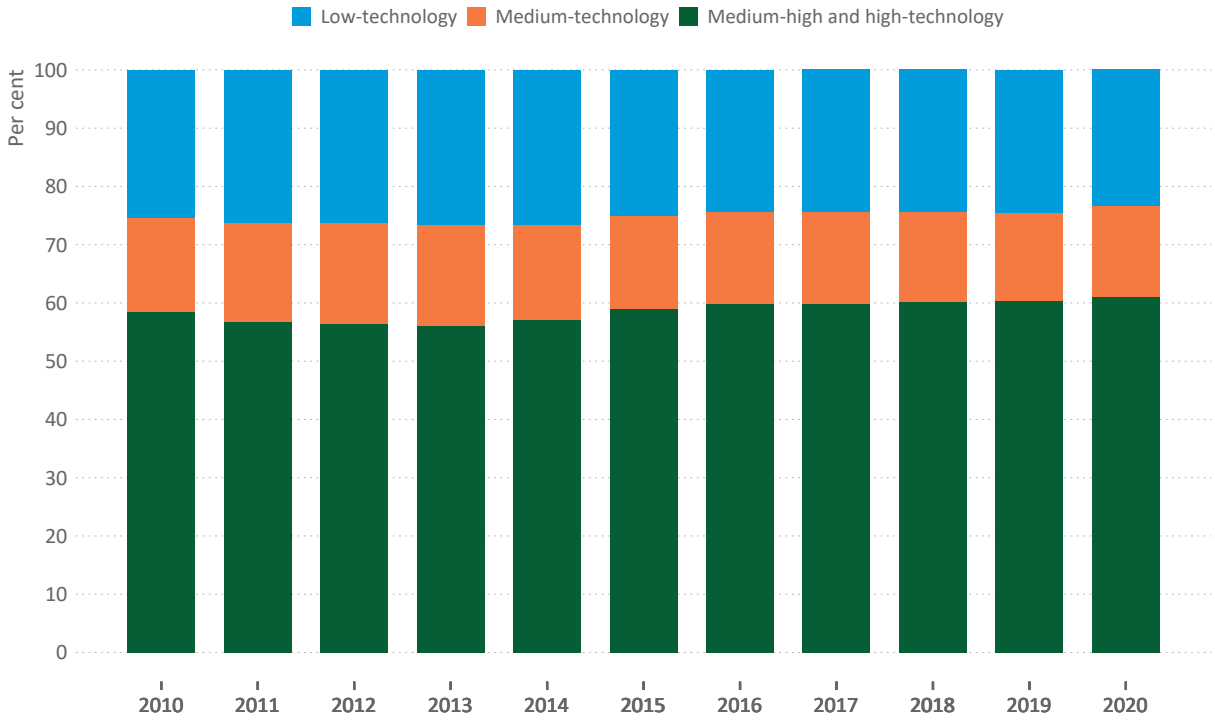


Figure 3.15 | Distribution of manufacturing exports by technology intensity
Source: [19]

3.3.2 Country performance

At the level of individual countries, the weight of manufactured goods in total merchandise exports is more diverse. Figure 3.16 shows this variety, illustrating how countries where manufactured goods make up the majority of exports are primarily concentrated in Europe, Northern and Central America, as well as Eastern, South-eastern and Southern Asia.

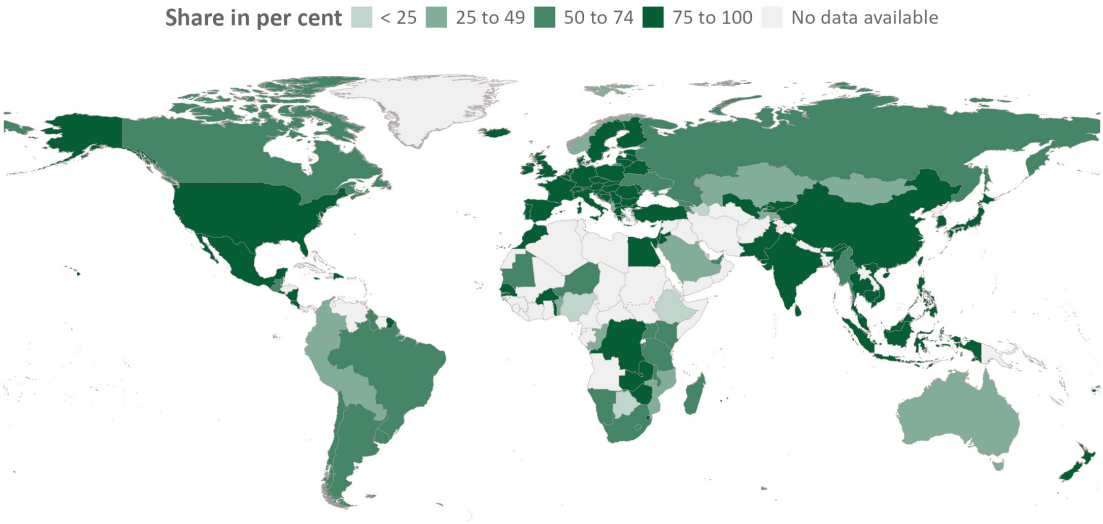
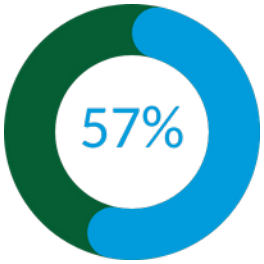


Figure 3.16 | Average share of manufacturing exports in total exports, 2010–2020
Source: [19]
Note: Simple averages by country calculated using available data over the period from 2010 to 2020.

The top ten manufacturing exporters in the world from 2010 to 2020 remained almost unchanged, as shown in Figure 3.17. The top four countries (China, Germany, the United States of America and Japan) remained in the same positions during the entire period. Together, these four countries accounted for around 38 per cent of world manufacturing exports, on average, during this period. France ranked fifth in 2010; however, it steadily declined until reaching ninth position in 2020. By contrast, China, Hong Kong SAR moved up from ninth position in 2011 to land in sixth or fifth position between 2015 and 2020. The Republic of Korea remained stable, ranking fifth or sixth during this period. Italy, the Netherlands and the United Kingdom have mostly been holding the eighth, ninth and tenth positions, except in 2020, when the United Kingdom dropped out of the top ten and was replaced by Singapore.ℹ



The top 10
manufacturing exporters
are responsible for
more than half
of world manufacturing exports

The world's top ten manufacturing importers between 2010 and 2020 also remained mostly unchanged, except that in 2015 and 2020 Mexico and the Republic of Korea ranked ninth, respectively. The rankings of the top three countries (United States of America, China and Germany)

ℹ: The data used in this section refers to total exports of manufactured goods, including re-exports.

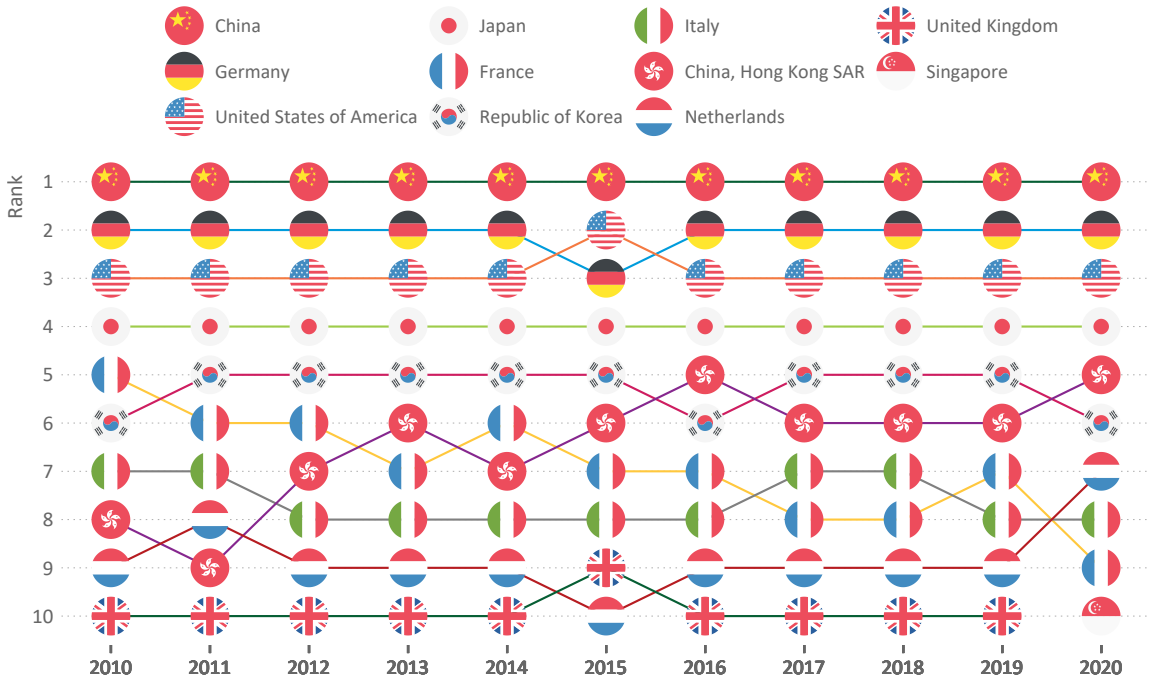


Figure 3.17 | Ranking of top ten economies in terms of manufacturing exports
Source: [19]

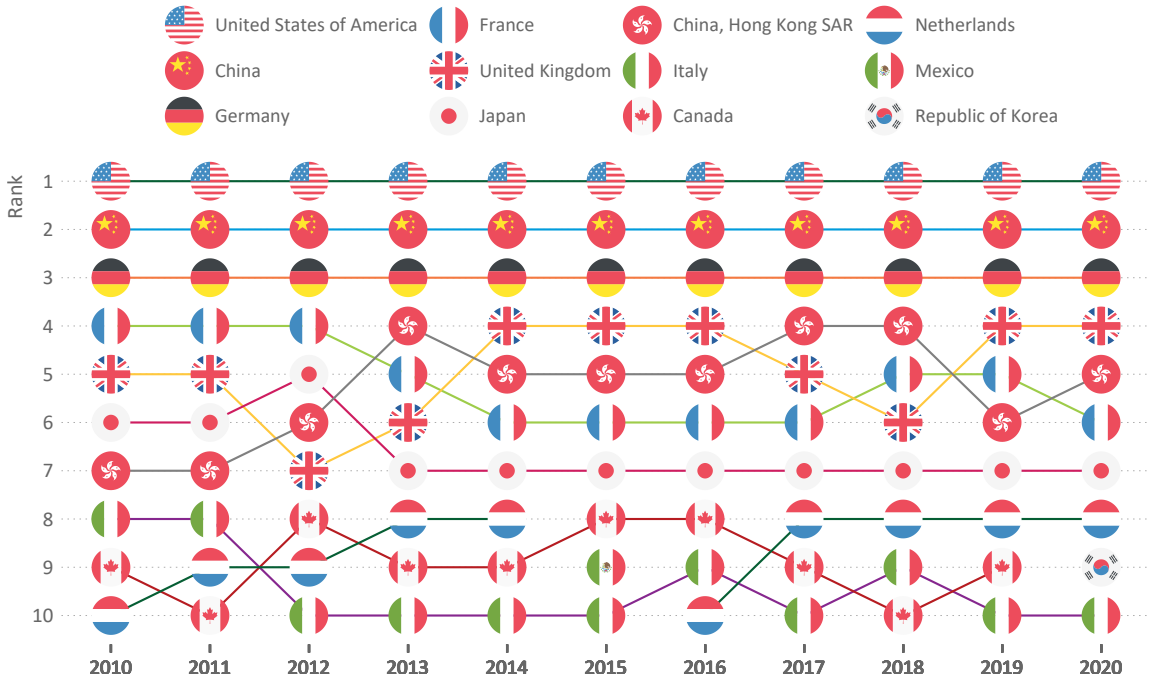


Figure 3.18 | Ranking of top ten economies in terms of manufacturing imports
Source: [19]

remained stable throughout this period, accounting for 28.2 per cent of world manufacturing imports in 2010, with this share increasing to 31.4 per cent by 2020.

In terms of technology intensity in manufacturing exports, China, Germany, the United States of America and Japan remained the top four MHT exporters throughout the period between 2010 and 2020, while the Republic of Korea ranked fifth, with the exception of 2010, when this position was held by France, and in 2016, 2019 and 2020, when China, Hong Kong SAR held this position. The top five MHT exporters comprised around 27 per cent of MHT world exports from 2010 to 2020. While Germany, the United States and Japan showed a clear declining trend, China registered an increasing trend, growing from 7.8 per cent in 2010 to 10.4 per cent in 2020, as shown in Figure 3.19.

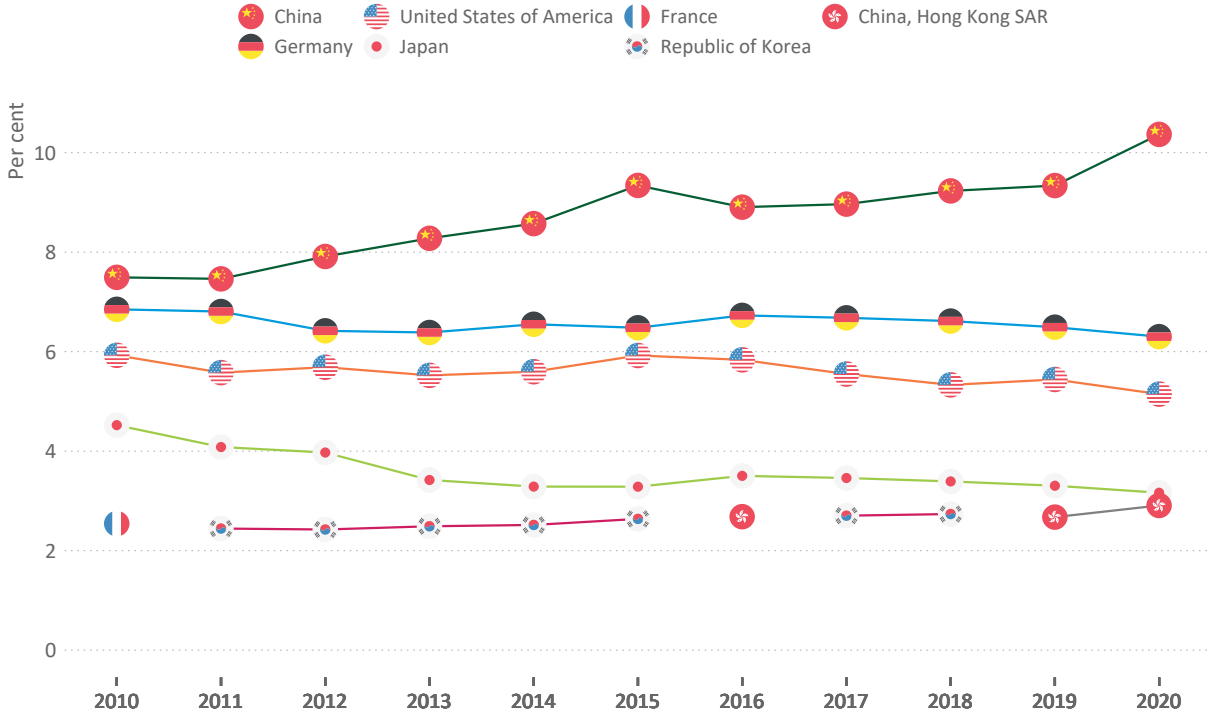


Figure 3.19 | Share of top five MHT exporters in total MHT exports
Source: [19]

3.3.3 Trade balance

The trade balance[i] of manufacturing goods differed significantly across country groups. Middle-income industrial economies maintained a trade surplus throughout the period of 2010 to 2020, which seems to have further improved in the last few years. By contrast, high-income industrial economies experienced a brief three-year period of increasing manufacturing trade surplus, from 2010 to 2013,

[i]: In this section, trade balance is expressed in relative terms, as a share of MVA of the respective country group.

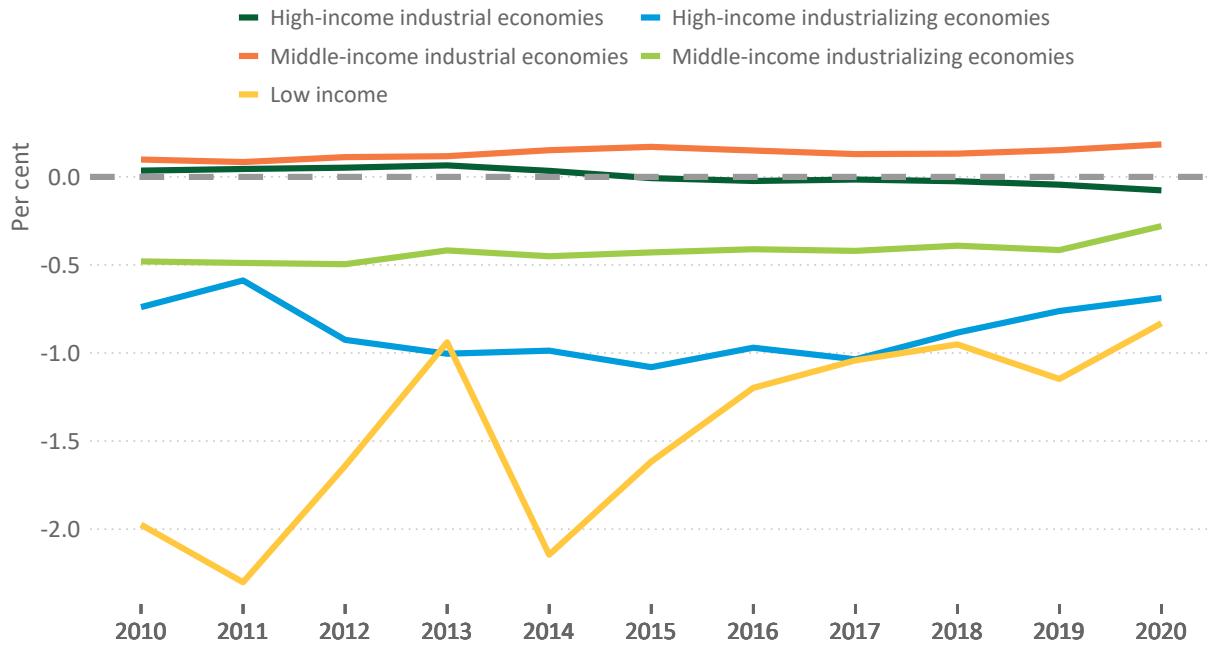


Figure 3.20 | Trade balance in manufacturing goods as a share of MVA, by country group
Source: [4; 19]

followed by a marked decrease since then. This country group has registered a manufacturing trade deficit since 2015, as shown in Figure 3.20. The other country groups also recorded a trade deficit throughout this period. While middle-income industrializing economies' trade deficit gradually moved towards zero, there were major fluctuations in high-income industrializing economies and low-income economies.

3.4 Indicators on employment, productivity and sustainability

3.4.1 Manufacturing employment and labour productivity

COVID-19-related containment measures severely impacted manufacturing employment

As mentioned in Section 2.2, the COVID-19 outbreak significantly disrupted labour markets around the world on a historically unprecedented scale. Global unemployment in 2020 affected more women, youth and medium- and low-skilled workers [37]. Prolonged lockdowns and travel bans, which were unthinkable before the pandemic, disrupted supply chains, leading to negative consequences for employment that were directly and indirectly linked to production networks.

Manufacturing was among the sectors hit hardest when the pandemic first broke out, initially via supply chain disruptions, containment measures and subsequently through a decline in demand. Globally, nearly

one in three jobs in manufacturing supply chains was likely lost. Working hours and/or pay were reduced, while deteriorating working conditions were also reported. The global share of manufacturing employment in total employment thus decreased significantly from 13.7 per cent in 2019 to 13.1 per cent in 2020.

The impact was particularly pronounced in middle-income countries, which had leveraged participation in production chains as a source of employment and growth. The decline in manufacturing employment in lower middle- and upper middle-income countries was 11.8 per cent and 7.4 per cent, respectively, compared with 3.4 per cent in low-income and 3.9 per cent in high-income countries. Some of the most severe impacts were felt in garment supply chains, which employ a larger share of women workers. Women, especially young women, were among the worst affected (Figure 3.21).

Manufacturing employment in **lower middle-income economies** declined by **11.8%** compared to **3.9%** in **high-income economies**

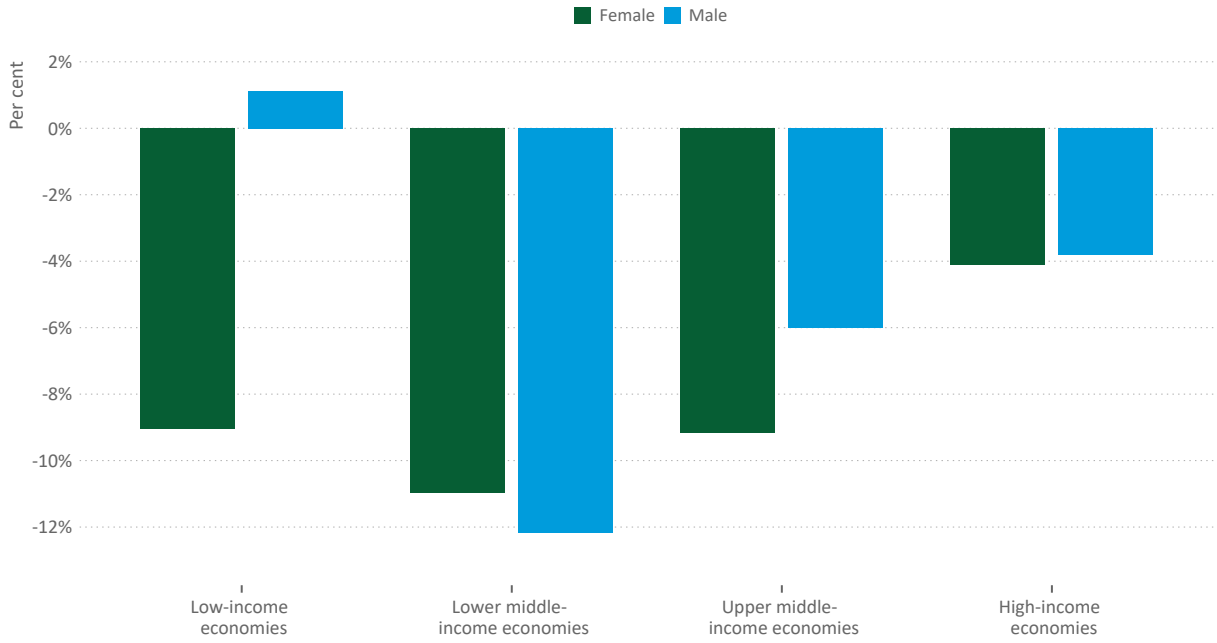


Figure 3.21 | Growth rate of manufacturing employment by sex and income group, 2019–2020
Source: [31]

In 2021, recovery in employment continued to be fragile and often uneven. Despite the rebound in economic activity, global employment has not yet reached pre-pandemic levels. Fiscal stimulus and vaccinations played a crucial factor in determining the differentiated labour market recovery in 2021.

Through its uneven impact on different types of firms, the pandemic significantly affected the composition of employment between 2019 and 2020. Larger firms, on average, produce more value added per employed person than smaller firms, which were more affected by the crisis, and this led to an unprecedented increase in aggregate

The pandemic has had an **unequal impact** on **manufacturing employment**, with **women** and **youth** most severely affected

labour productivity [37; 38]. Moreover, a growing productivity gap between low- and high-income economies is jeopardizing the positive contribution to inclusive growth and the creation of decent jobs (Figure 3.22).

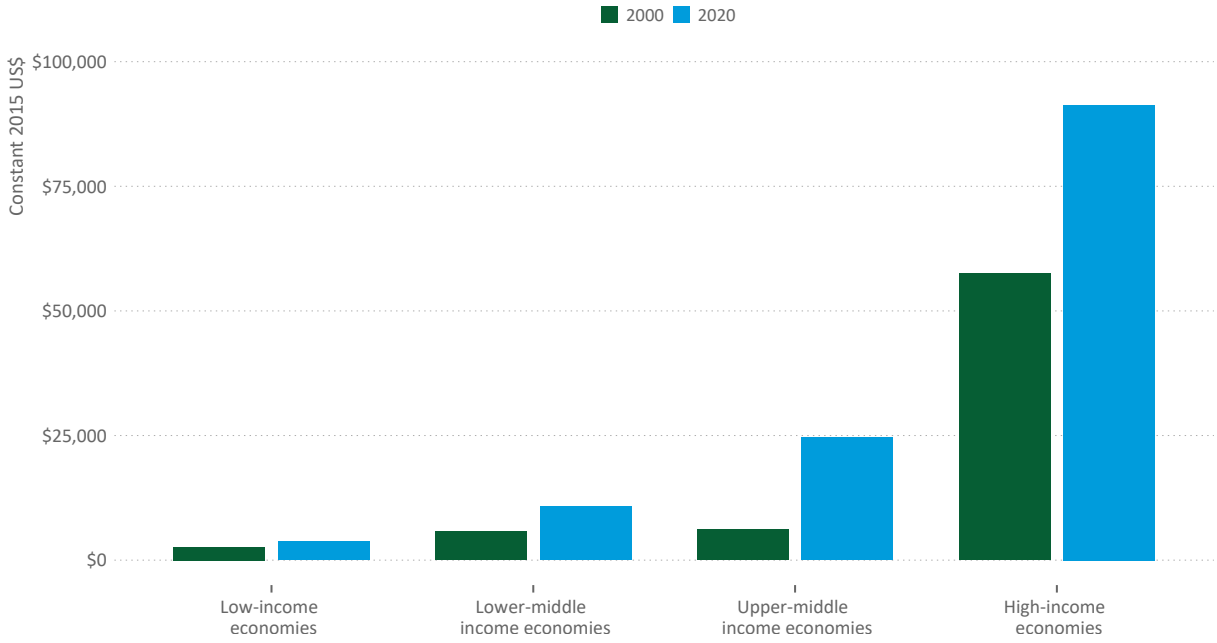


Figure 3.22 | MVA per person employed by income group
Source: [4; 31]

3.4.2 Energy efficiency and sustainability

The growing recognition of the impact of human activity on the environment requires moving to cleaner, more resource-efficient processes, including in manufacturing. The COVID-19 pandemic had an apparent respite on environmental degradation, although this unfortunately proved short-lived.

There was a practically uninterrupted increase in CO_2 emissions from manufacturing activity up to 2011, with a relative stabilization since then. While total emissions from manufacturing in high-income industrial economies remained stable, the share in global CO_2 emissions of middle-income industrial economies expanded significantly (Figure 3.23). When analysed in relative terms, measured as the manufacturing-related CO_2 emission intensity, we observe that the efficiency of manufacturing in nearly all country groups improved, with fewer emissions emitted per unit of manufacturing activity, except in low-income economies (Figure 3.24). However, despite these efficiency improvements, much needs to be done in this sector to meet international agreements to limit climate change.

Improvements in
efficiency in manufacturing
with falling
CO_2 emissions per unit of MVA
across most country groups

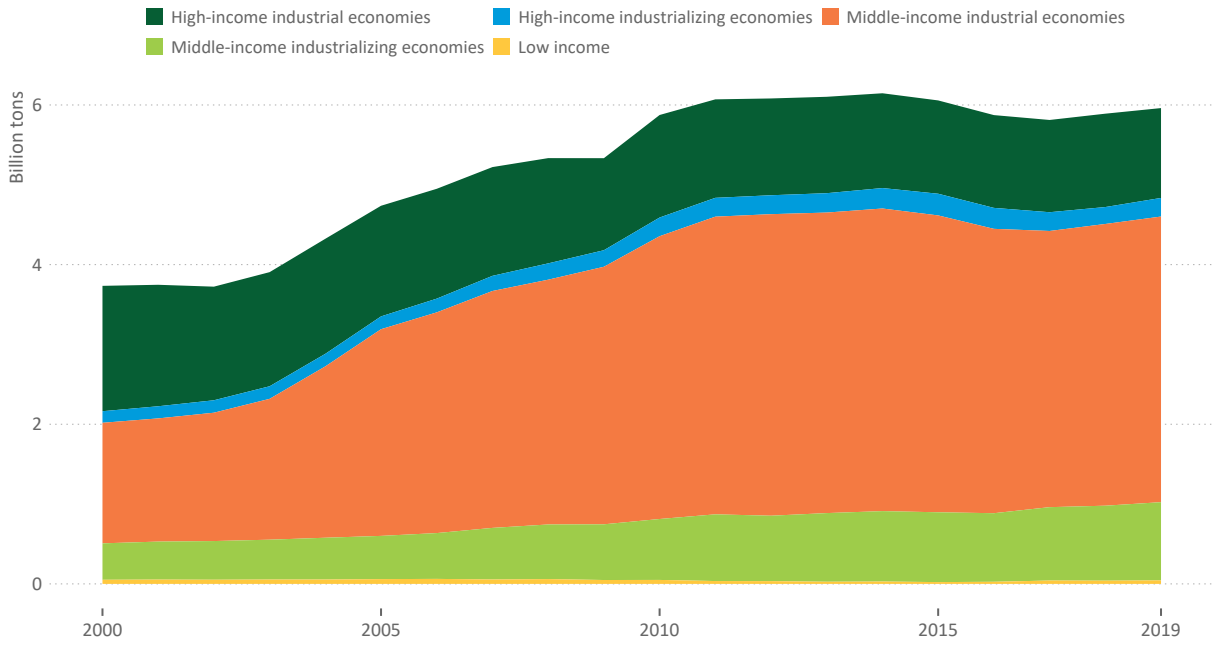


Figure 3.23 | CO_2 emissions from manufacturing industries
Source: [31]

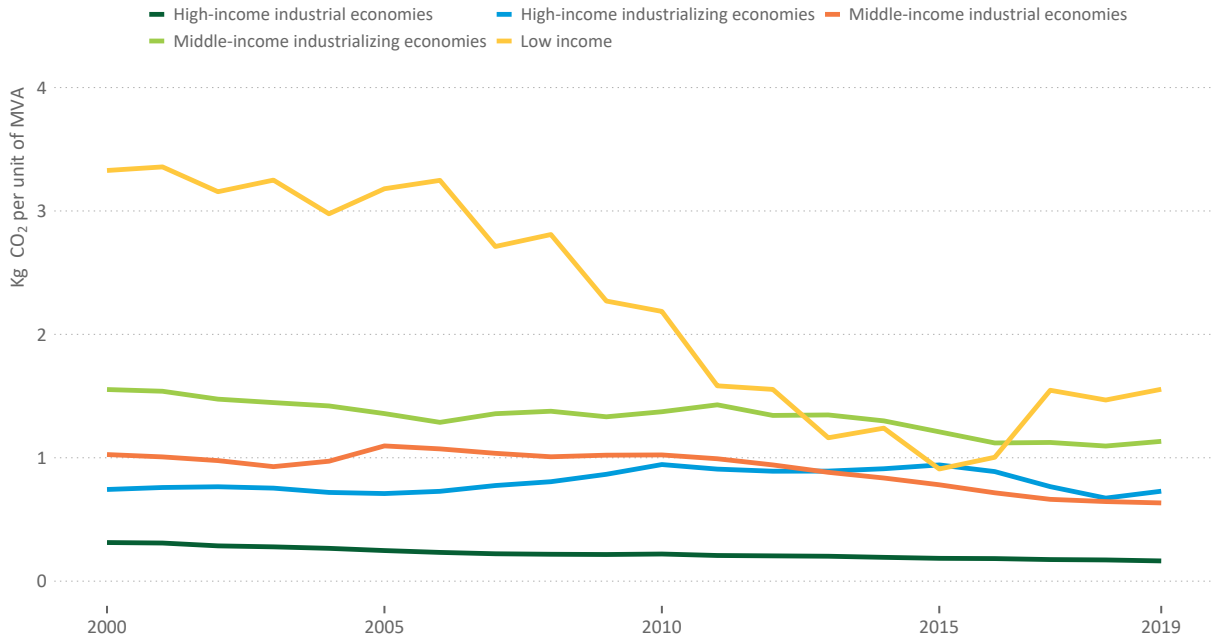


Figure 3.24 | CO_2 emissions from manufacturing industries per unit of MVA
Source: [4; 31]

As mentioned in Section 2.2, the pandemic-related decrease in greenhouse gas emissions rebounded in 2021, driven by an increased demand for coal, oil and gas, leading to energy-related CO_2 emissions above the pre-pandemic level [32].

The trend of decarbonization will depend on collective action by governments and the private sector as well as the global community, and the prioritization of climate change in their action plans for post-pandemic recovery. According to IEA's analysis in 2020, the industrial sector could contribute to a sustainable recovery by improving energy efficiency, with a potential emissions reduction of approximately two billion tonnes of CO_2 by 2030, which is a decline of more than 20 per cent [39].

CO_2 emissions only provide a partial view of the impacts of industry on the environment. A broader set of measures is indeed needed to assess the full account of how industrial activity affects the environment, including emissions of other greenhouse gases beyond CO_2, waste generation, water use, pollution of water sources and land, etc. Concerted action is needed to define the most relevant metrics to measure this broad impact, and regularly collect and disseminate the data required.

Implementing industrial energy efficiency measures could
reduce emissions
by around
2 billion tonnes of CO_2 by 2030

4 Mining and utilities in the spotlight

Mining and utilities in the spotlight

Key figures

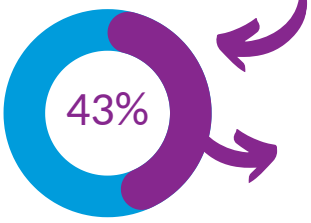
Mining and quarrying

Utilities

22 %

of the world's **industry value added** in 2021

Asia accounted for almost half



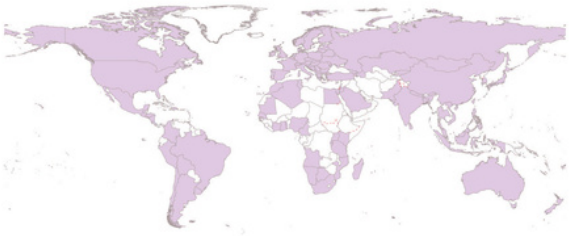
China's global weight is rising

3.5% 1990

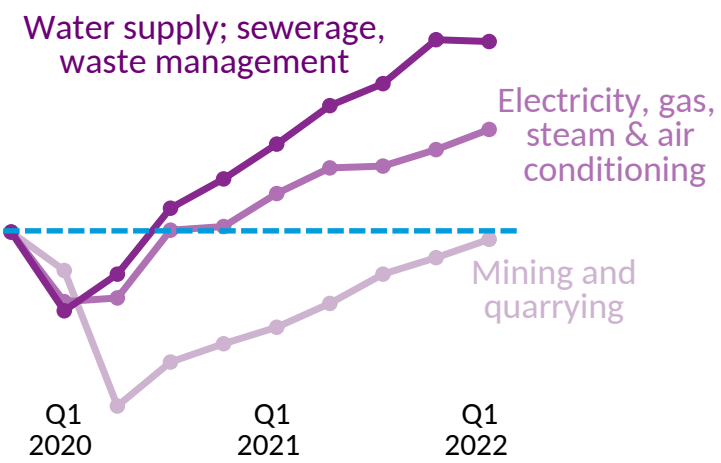
19% 2021

NEW sub-annual **production index data** in UNIDO's databases uncover recent developments

around **100** countries representing **80%** of value added



The COVID-19-related decline was lower in the utilities sector. Mining almost reached pre-pandemic levels in Q1 2022



As described in Section 1.2, mining and utilities are the other industrial sectors besides manufacturing. These sectors combined represented 22.3 per cent of global industry and 4.8 per cent of the world economy in 2021, in terms of value added [4]. Even if they have a lower economic weight than manufacturing, demand for natural resources and energy keeps rising due to rapid manufacturing growth and the overall increase of the population and economic activity. Despite the energy transition and enhanced resource efficiency that are necessary for attaining environmental sustainability, many of the innovations and technological advancements underpinning the Fourth Industrial Revolution and future sustainable activities will remain important consumers of mineral and energy resources. The mining and energy industries are also undergoing an important transformation towards advanced production processes. These rising trends are expected to continue unabated in the future, although at uneven speed across sectors and regions. It is therefore becoming increasingly important to provide high-quality data on these sectors' productive activities. This chapter describes the recent developments observed in these sectors, and highlights the important data challenges that remain.

22% of global industry in 2021

: Mining and utilities include three main sectors:

- Mining and quarrying (ISIC Rev. 4 section B);
- Electricity, gas, steam and air-conditioning supply (ISIC Rev. 4 section D);
- Water supply; sewerage, waste management and remediation activities (ISIC Rev. 4 section E).

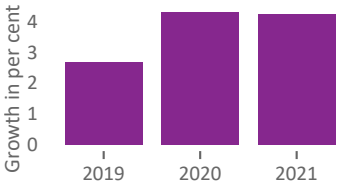
4.1 Current trends and distribution of world mining and utilities

4.1.1 Annual production in mining and utilities

As shown in the comparison in Figure 2.2, the mining and utilities sectors are usually less volatile than manufacturing. Nonetheless, the COVID-19 crisis proved an exception, with a stronger impact on these sectors due to severe demand and supply constraints. The recovery has also been more sluggish than in manufacturing.

Table 4.1 presents the growth rates of MUVA by country group. Industrial economies, both high- and middle-income, were the most affected by the crisis in 2020. China was an exception in this group, and continued growing during that year, albeit at a more muted rate. Other industrializing countries recorded, on average, a decline in activity level, with the exception of low-income economies that continued growing and even witnessed an acceleration in their production levels during the crisis.

Recovery in the mining and utilities sectors was already observable in 2021. This was led by the dynamism of China, which surged with an estimated growth rate of 8.8 per cent in 2021. Conversely, high-income economies grew at the lowest rate among all country groups presented in the table.



The mining & utilities sectors in low-income economies continued growing during the COVID-19 crisis

Table 4.1 | Growth rate of MUVA by country group

	2019	2020	2021
Industrial economies			
High-income industrial economies	3.7	-3.8	0.9
Middle-income industrial economies	2.5	-1.8	6.0
Middle-income industrial economies (excl. China)	-1.7	-4.7	3.0
China	6.9	1.0	8.8
Other industrializing economies			
High-income industrializing economies	-2.2	-2.9	1.6
Middle-income industrializing economies	-3.5	-2.9	7.3
Low-income economies	2.7	4.3	4.2
Other groups			
Least developed countries (LDCs)	0.6	1.0	5.1

Source: [4]

Differences with the manufacturing sector are obvious when studying the relative importance of mining and utilities at the country level, as shown in Figure 4.1. Although the highest levels of MUVA per capita are still being reported by a handful of high-income countries (with Qatar, Norway, Brunei Darussalam, Kuwait and the United Arab Emirates as the top five in the world), the distribution seems less correlated with level of income when compared to manufacturing (see Figure 3.1). Indeed, higher levels of MUVA per capita can be observed in all world regions, demonstrating the importance of natural resource endowments for these sectors.

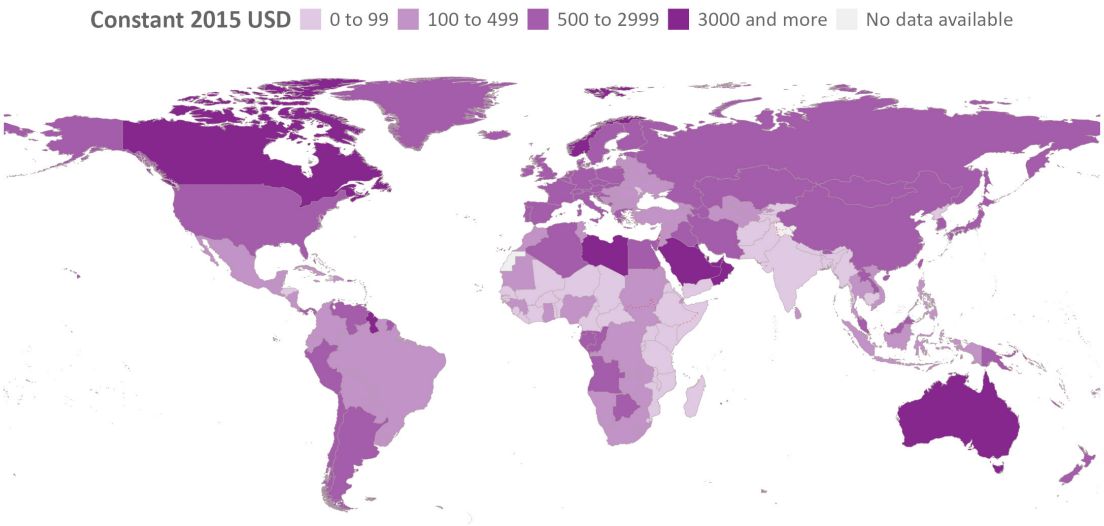


Figure 4.1 | MUVA per capita by country, 2021
Source: [4]

Another significant difference between the manufacturing and mining and utilities sectors is the stability in the global distribution of production. Unlike manufacturing, which has undergone a strong and persistent shift from Europe and the Americas towards Asia, and primarily China, the distribution of MUVA has remained comparatively stable over the last few decades. However, as shown in Figure 4.2, albeit at a more gradual pace than in manufacturing, Asia's weight has also increased at the detriment of Europe, while the shares of Africa, the Americas and Oceania have remained relatively constant.

By 2021, Asia accounted for an estimated 47.3 per cent of MUVA, followed by the Americas at 24.7 per cent and Europe at 18.3 per cent. This gradual development in the MUVA world distribution partially reflects the role of natural endowments, as described above, but also of policies that prioritize the development of these sectors.

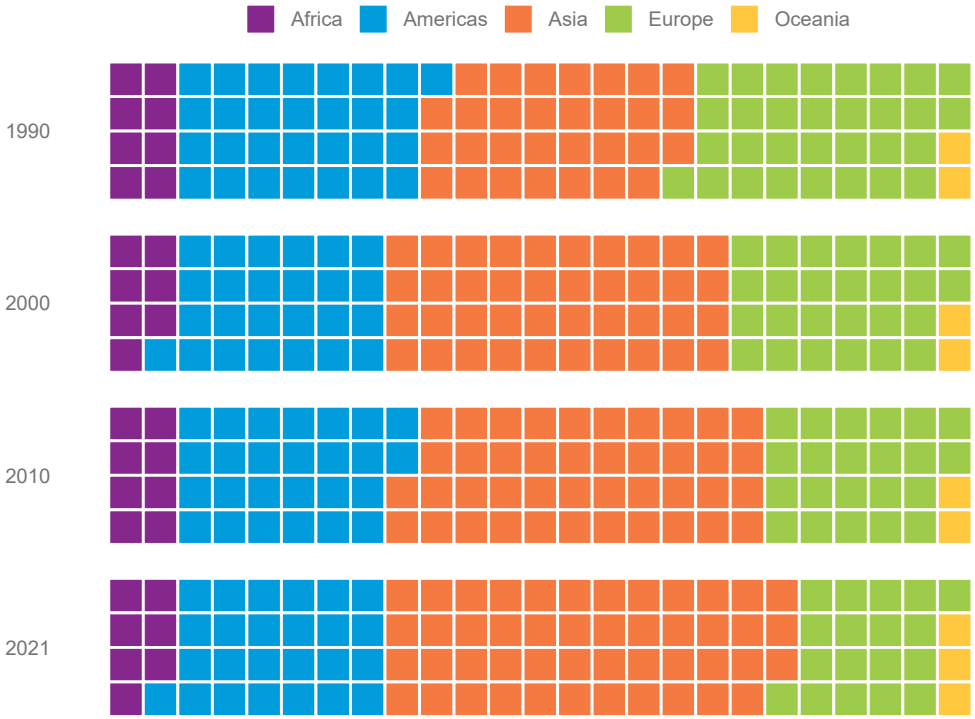
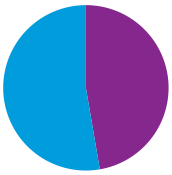


Figure 4.2 | Share of world MUVA by geographical region
Source: [4]

A similar conclusion can be reached when analysing the global distribution of these sectors by country groups according to stage of industrial development, shown in Figure 4.3. The distribution has remained remarkably stable, with the exception of China's increasing weight at the expense of other industrial economies. The country's share in the global production of mining and utilities increased from 3.5 per cent in 1990 to 19.0 per cent in 2021. The largest group in 2021 consisted of high-income industrial economies, with 37.5 per cent, followed by China and other middle-income industrial economies.

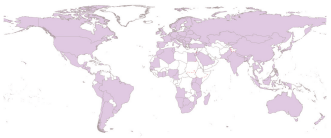


By 2021,
Asia
accounted for nearly
half
of global MUVA

Figure 4.3 | Share of world MUVA by country group
Source: [4]

4.1.2 Quarterly production in mining and utilities

Aside from the annual insights obtained from national accounts data that were described above, there are limited data with higher frequency or more detail on the economic activity of the mining and utilities sectors. As a result of a data collection exercise carried out by UNIDO in recent years, a database of quarterly information specific to these sectors is now available. This edition of the Yearbook features these data in an aggregated form for the first time.



New
quarterly
production index
data
on mining and utilities
in UNIDO databases cover
100 countries
representing
80% of value added

Mining and utilities sectors in the IIP

As described in Section 3.1, UNIDO regularly collects quarterly IIP data. Although the coverage of this index is limited to the manufacturing sector in some cases, there is also specific information on the mining and utilities sectors of many countries. UNIDO's quarterly IIP database [20] now includes country-level data of around 100 countries (representing around 80 per cent of the sectors' value added) for mining and quarrying (ISIC Rev. 4 section B) and electricity, gas, steam and air-conditioning supply (ISIC Rev. 4 section D).

Data availability for water supply; sewerage, waste management and remediation activities (ISIC Rev. 4 section D) is lower, with only approximately 60 countries reporting data on these sectors, corresponding to around 40 per cent of value added. The time series extend back to 2015.

Figure 4.4 compares production across all four industrial sectors. Since it includes data up to the first quarter of 2022, it is possible to study the effect of the COVID-19 pandemic on each of these sectors.

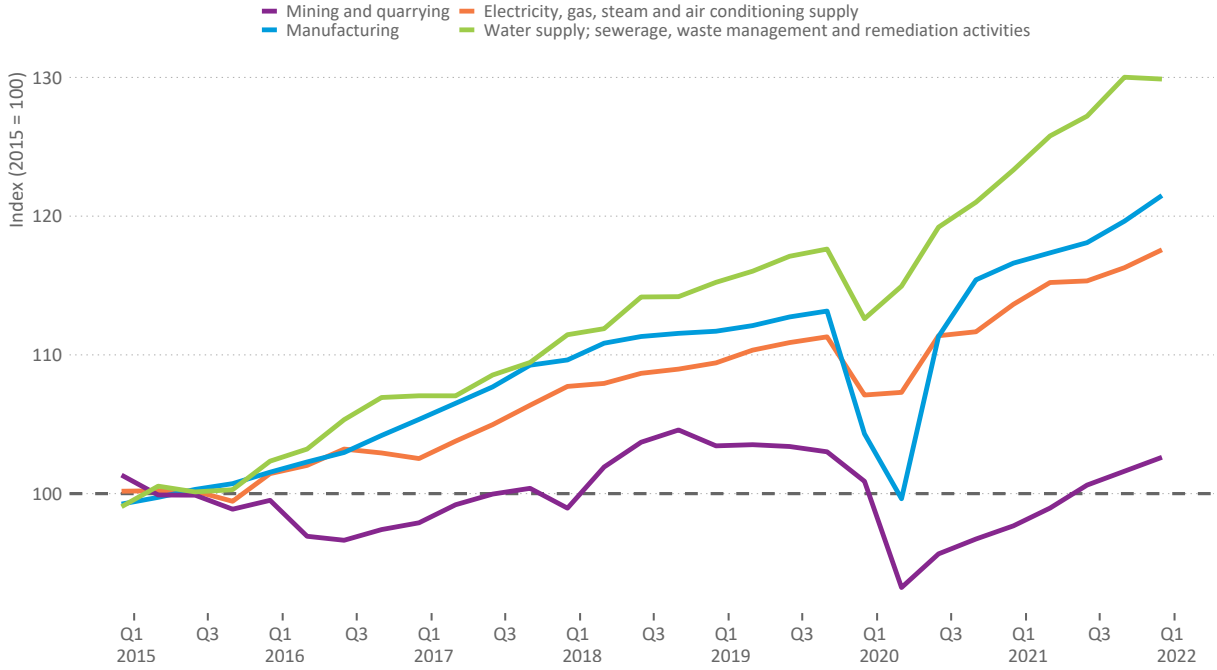


Figure 4.4 | Indices of industrial production by industrial sector
Source: [20]

At the global level, water supply (ISIC Rev. 4 E) has reported the highest growth since 2015, and was less impacted by COVID-19, in comparison to the other sectors. Electricity (ISIC Rev. 4 D) followed a similar path, although with less dynamism, with a sustained upward trend from 2015 until the start of the pandemic, and from mid-2020 onward. Mining (ISIC Rev. 4 B) faced greater volatility and a lower growth rate compared to the other sectors. The higher variability is expected to continue in coming decades, as this sector adapts to the changes brought about by different global initiatives to contain global warming and climate change. For comparative purpose, the figure also includes manufacturing. This sector suffered the highest decline in production of all industrial sectors during the pandemic, but bounced back to its pre-crisis level quickly thereafter. Detailed information and the latest trends in the manufacturing sector are presented in Chapter 3.

COVID-19-related drops in production were lower in utilities sectors

Figure 4.5 presents the performance of mining and electricity divided by main country groups. Due to limited availability of quarterly data

for water supply, country group disaggregation cannot be supported, and this sector is excluded from the figure. Production in industrial economies showed greater dynamism of both sectors in pre-pandemic years. However, activity in both country groups was drastically affected due to COVID-19. As already pointed out, production in the mining and quarrying sector has registered limited growth since 2015, compared to other industrial sectors, and it has yet to reach pre-pandemic levels in both country groups. On the other hand, the production of electricity and other utilities in ISIC D in both groups recorded a higher dynamism after the pandemic, quickly offsetting the losses suffered.

Production in **industrial economies** showed greater **dynamism** in pre-pandemic years

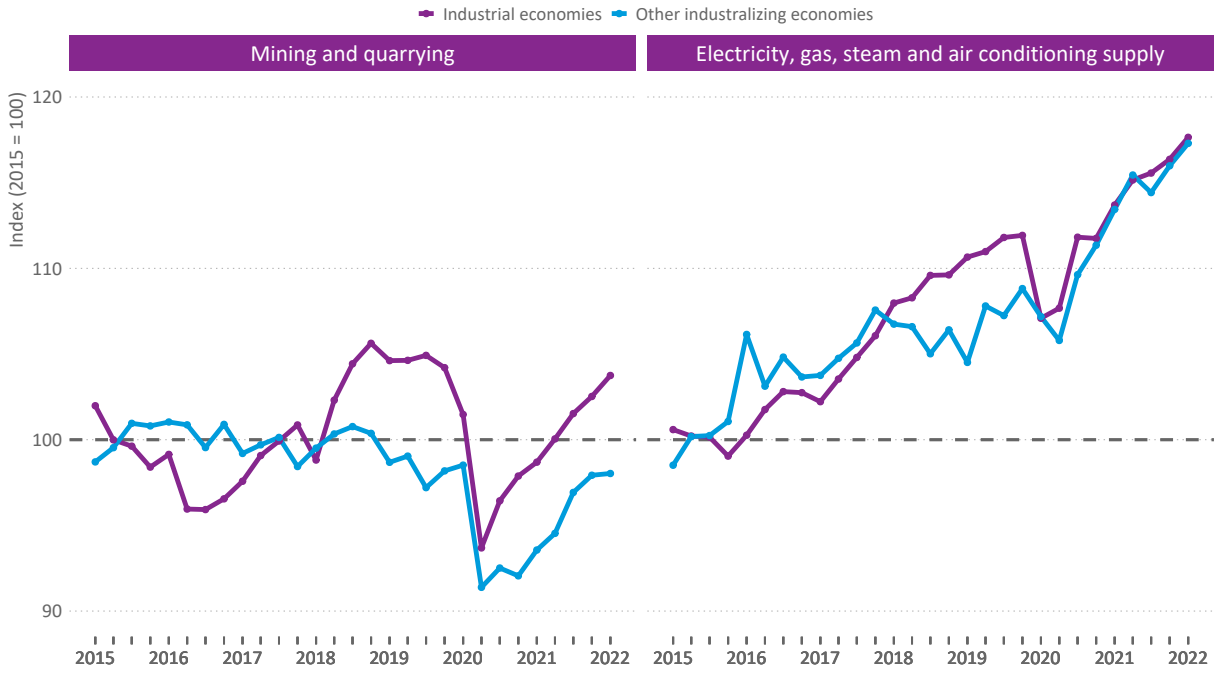


Figure 4.5 | Indices of production in the mining and electricity sectors by country group
Source: [20]

4.2 Structure and transformation of mining and utilities industries

This section presents the use and limitations of SBS to study developments in the mining and utilities sectors. UNIDO Statistics collects the relevant data through the *General Industrial Statistics Questionnaire* directly from NSOs, via the Statistical Office of the European Union (Eurostat) or from other official sources. As is the case in manufacturing, most countries already report data for mining and utilities based on the ISIC Rev. 4 classification. However, there are significant gaps in the data. Missing data are attributable not only to countries that do not report data to UNIDO or where no significant economic activity in one of the specified ISIC categories takes place. In addition,

Data gaps often hamper the close monitoring of the **mining and utilities sectors**

statistical disclosure control (SDC) requires NSOs to suppress data cells before publishing them, to prevent the disclosure of confidential information about respondents. This affects the mining and utilities sectors in particular because they are often dominated by a few large establishments or enterprises. That is why the number of data cells made available for public use is often limited.

: See glossary entry on *statistical confidentiality* for further information.

As shown in Figure 4.6, only very few countries have a consistently high coverage with reported non-zero values in UNIDO databases. The countries with the highest coverage are mostly located in Europe and Central Asia, and significant gaps remain in the rest of the Asian continent, Latin America and the Caribbean and Africa.

: The term *non-zero values* used here refers to reported values other than missing or zero. A zero can represent a value that is nil or negligible, but it is can also be reported implying suppressed data due to SDC.

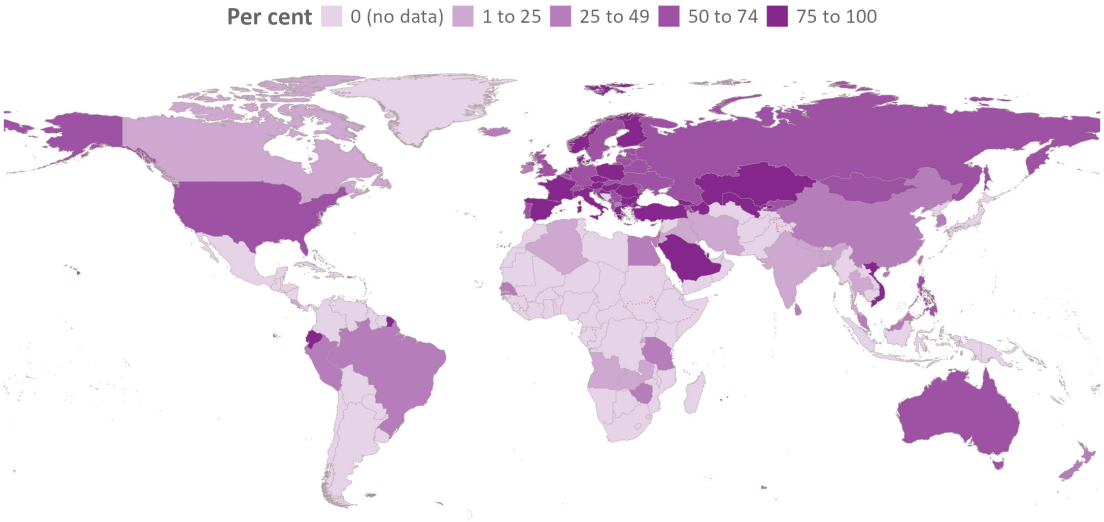


Figure 4.6 | Data availability in mining and utilities sectors: average share of reported non-zero values compared to the total number of data cells, 2015–2019
Source: [18]
Note: Only the variables *number of persons engaged/employees*, *wages and salaries*, *output* and *value added* for the years 2015 to 2019 available for ISIC B (divisions 05-09), D (division 35) and E (divisions 36-39) are considered for this calculation.

Given these significant data gaps, the analysis in this section only covers selected countries with sufficient data availability on the relevant ISIC Rev. 4 sections for the mining and utilities sectors. Table 4.2 presents the value added per capita of these countries, displaying the trends observed between 2015 and 2019. As already pointed out in the previous section, the table shows the different activity levels in these sectors by country. For instance, while mining and quarrying achieves very high value added per capita in countries such as Qatar, Norway and Australia, it remains at a low level in many other countries.

: Value added figures from industrial statistics might differ from those reported in national accounts. A summary of the reasons behind these deviations can be found in [13].

Table 4.2 | Value added per capita (in current dollars) in ISIC Rev. 4 B, D and E

	ISIC B		ISIC D		ISIC E	
	2015	2019	2015	2019	2015	2019
High-income industrial economies						
Australia	3,699	5,093				
Austria	127	115	653	811	248	284
Belgium	23	26	519	552	288	322
China, Taiwan Province	18	16	404	304	122	151
Croatia	215	20	309	296	152	232
Czechia	118	98	551	577	140	172
Estonia	158	154	444	495	110	150
Finland	97	149	701	909	183	241
France	31	23	526	635	181	223
Germany	70	50	510	803	320	410
Hungary	17	38	225	252	93	109
Ireland	64	108			85	218
Italy	66	45	456	544	242	291
Latvia	47	66	395	370	91	112
Lithuania	28	41	236	289	90	136
Luxembourg	53	68	996	808	243	248
Malta	0	23				
Netherlands	533	318	454	509	236	225
New Zealand	510	402	859	874	166	309
Poland	219	223	365	441	115	153
Slovakia	71	61	401	491	99	115
Slovenia	59	71	399	459	169	201
Spain	30	34	491	529	222	276
Sweden	192	227	847	1,079	208	200
United States	816	899				
Middle-income industrial economies						
Brazil	83	73				
Bulgaria	91	104	247	334	58	75
Belarus	35	47	174	203	43	46
Ecuador	6	331				
Mauritius	20	24	160	153	33	38
Peru	466	132	105	131	25	25
Romania			182	177	57	77
Serbia	120	142	219	233	67	81
Türkiye	45	55	129	154	44	26
High-income industrializing economies						
Cyprus	28	26				
Denmark	832	472	649	917	374	399
Greece	37	32	337	53	74	69

Table 4.2 | Value added per capita (in current dollars) in ISIC Rev. 4 B, D and E *(continued)*

	2015	2019	2015	2019	2015	2019
China, Hong Kong SAR			591	561	23	27
Norway	12,261	10,505	1,150	1,534	178	180
Portugal	42	50	436	438	154	165
Qatar	23,659	22,191	394	1,160	2	58
Middle-income industrializing economies						
Albania	118	116	115	104	18	36
Azerbaijan	1,451	1,689	75	46	9	9
Armenia	63	149	117	112	10	13
Georgia	27	31	64	89	20	21
Kazakhstan	1,327	1,413	178	138	26	24
Rep. of Moldova	5	7	18	36		
Viet Nam	78	89	126	268	12	18
Uzbekistan	81	108	43	31	3	3

Source: [18]. *Note:* Red points show minimum/maximum values.

Selected countries in the spotlight

The rest of this section focuses on two economies from the list included in Table 4.2. They will be presented in greater detail as an example of the insights the UNIDO Mining & Utilities Statistics Databases (MINSTAT) [18] can provide. However, in addition to the data gaps mentioned above, differences in concepts, definitions and coverage should also be taken into account. The box below describes how the database's metadata can be used to glean more information.

Metadata in industrial statistics

Variables in the National Accounts Database [4] present an exhaustive contribution of MVA and MUVA to the GDP of a national economy. By contrast, MINSTAT [18] and INDSTAT [16; 17] databases are usually derived from survey or census data. For the correct interpretation of such data, it is important to always consider the metadata along with the data values, since survey settings may not only vary between countries, but also between different years for the same country. All UNIDO databases include extensive metadata that should always be considered when interpreting and analysing the data.

Australia

Australia's mining sector plays an important role in its economy. This is confirmed in Table 4.2, which shows that this industry's value added per capita (ISIC Rev. 4 section B) is very high compared to other countries. MINSTAT offers more details on available data and metadata. Some highlights are presented below.

As shown in Figure 4.7, over 150,000 persons were engaged in mining and quarrying activities, (about 1.4 per cent of Australia's total work force).ℹ On average, an individual engaged in an establishment in this sector generated an output of over US$ 1 million and a value added of over half a million US$. The highest wages and salaries were paid

ℹ: Australia's data refer to the number of persons engaged and not the number of employees, which is the most common variable. For the difference between the two variables, see the glossary entry on *number of persons engaged/employees*.

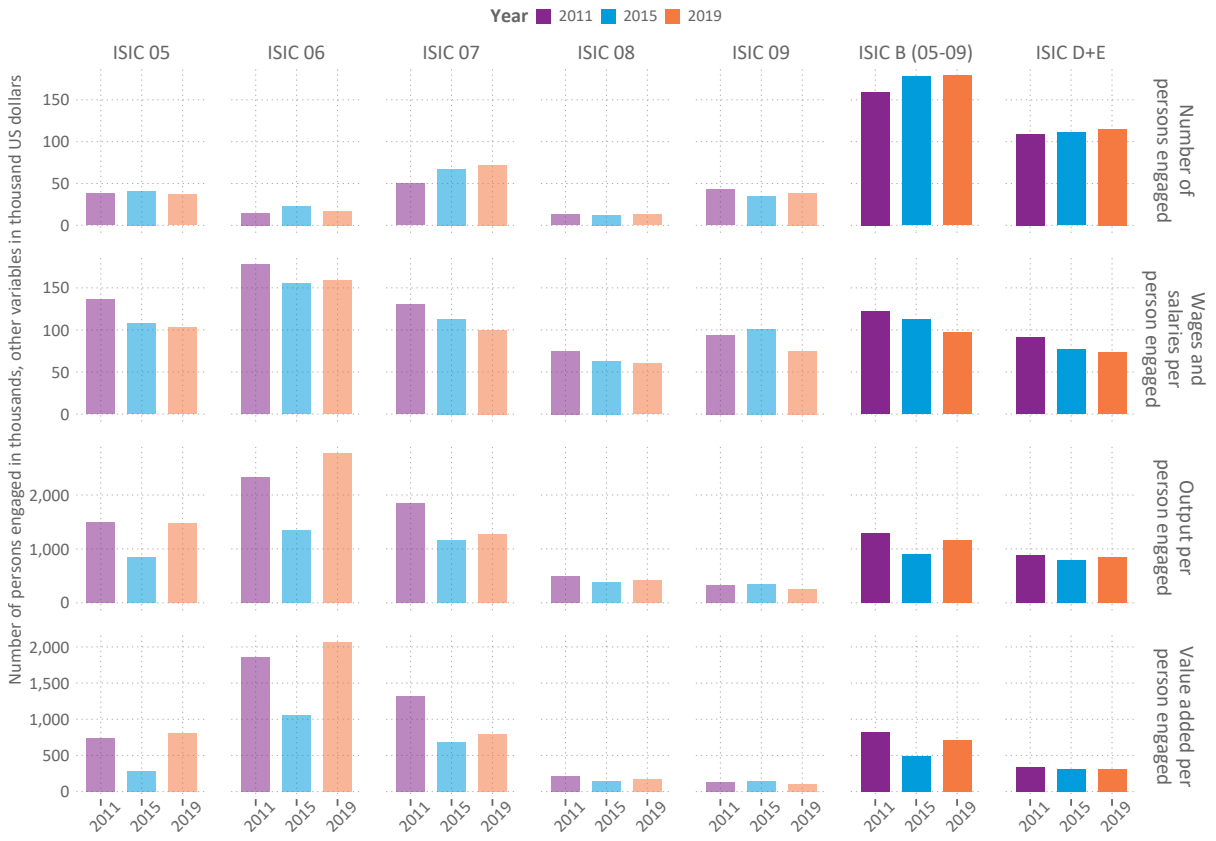


Figure 4.7 | Development of the mining and utilities industries in Australia for selected variables and years
Source: [18]
Note: ISIC 05 = Mining of coal and lignite, ISIC 06 = Extraction of crude petroleum & natural gas, ISIC 07 = Mining of metal ores, ISIC 08 = Other mining and quarrying, ISIC 09 = Mining support service activities, ISIC B (05-09) = Mining and quarrying, ISIC D+E = Electricity, gas, steam & air conditioning and water supply; sewerage, waste management.

in ISIC Rev. 4 division 06 ("Extraction of crude petroleum & natural gas"), with an average of US$ 150,000 per person engaged per year. By comparison, the average annual wages and salaries per worker engaged in the combined ISIC Rev. 4 sections D and E (i) ("Electricity, gas, steam & air conditioning" and "Water supply; sewerage, waste management") amounted to about US$ 75,000.

(i): UNIDO offers NSOs the flexibility to report a combination of ISIC codes in order to circumvent differences between ISIC and national classifications, but also as a strategy to minimize data cell suppressions due to SDC.

While Australia is known for its mining industries, Denmark is the highest ranked country in the Environmental Performance Index (EPI) [40]. In 2017, Denmark was declared the "leader in green energy" by the World Bank [41]. MINSTAT covers the relevant economic data for these important sectors. Table 4.3 presents detailed values for selected variables in the utilities sector, covering ISIC Rev. 4 sections D (groups 351-353) and E (groups 360, 370, 381-383 and 390). Since this country reported methodological breaks in the data, trends observed in the time series development should be interpreted cautiously. The reader is advised to consult the metadata in MINSTAT with its references to national publications for more details.

Denmark

Table 4.3 | Development of the utilities sector in Denmark, selected variables

Variable / ISIC Rev. 4	2008	2019
Number of employees		
351 Electric power generation, transmission	8,664	7,542
352 Manufacture of gas	670	938
353 Steam and air conditioning supply	2,993	1,864
360 Water collection, treatment and supply	2,778	2,114
370 Sewerage	2,620	1,864
381 Waste collection	7,883	3,034
382 Waste treatment and disposal	2,276	2,438
383 Materials recovery	1,295	1,581
390 Remediation activities	43	111
Wages and salaries per employee (in thousand dollars)		
351 Electric power generation, transmission	83	88
352 Manufacture of gas	156	79
353 Steam and air conditioning supply	54	41
360 Water collection, treatment and supply	13	18
370 Sewerage	47	68
381 Waste collection	34	65
382 Waste treatment and disposal	57	62
383 Materials recovery	69	66
390 Remediation activities	10	66
Output per employee (in thousand dollars)		
351 Electric power generation, transmission	1,109	1,323
352 Manufacture of gas	13,035	994
353 Steam and air conditioning supply	735	2,231
360 Water collection, treatment and supply	282	521
370 Sewerage	303	942
381 Waste collection	102	235
382 Waste treatment and disposal	568	410
383 Materials recovery	1,044	681
390 Remediation activities	129	353
Value added per employee (in thousand dollars)		
351 Electric power generation, transmission	270	566
352 Manufacture of gas	2,261	362
353 Steam and air conditioning supply	170	368
360 Water collection, treatment and supply	69	226
370 Sewerage	150	505
381 Waste collection	52	107
382 Waste treatment and disposal	163	147
383 Materials recovery	147	122
390 Remediation activities	41	97

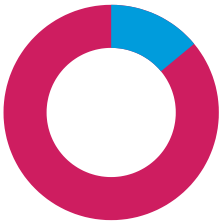
Source: [18]. *Note:* Red points show minimum/maximum values.

5 Special feature: Statistical profile of industry in LDCs

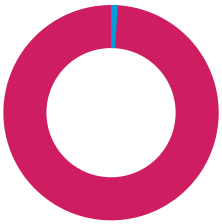
Statistical profile of industry in LDCs

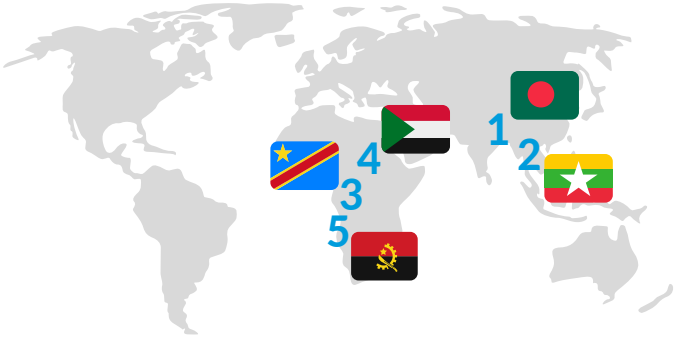
Key figures

LDCs comprise **14%** of the world population...

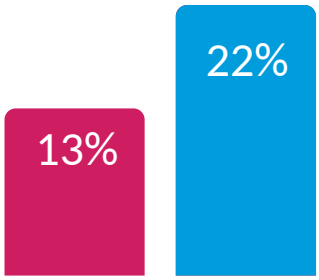


...but only **1%** of global MVA

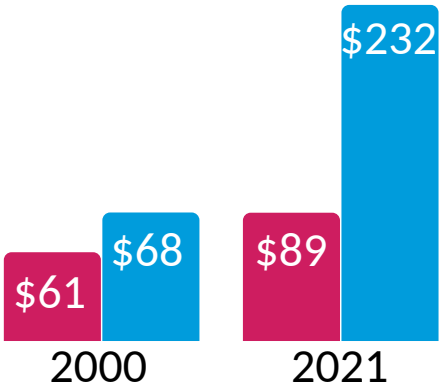




Top 5 manufacturers in LDCs



The manufacturing sector produces a smaller share of value added in LDCs compared to other low- and middle-income economies



MVA per capita of African LDCs and Haiti has been growing slowly, while soaring in LDCs in Asia and Oceania

At the height of the COVID-19 crisis, manufacturing output in LDCs fell by

↓17%

compared to its pre-pandemic level

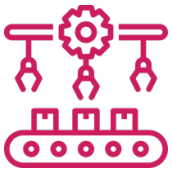
Limited availability of industrial statistics in LDCs compromise effective policymaking and monitoring of progress towards the SDG 9 targets

5.1 Introduction

Although sustainable development poses a challenge for all countries, some face more serious systematic economic and environmental vulnerabilities and policy gaps, leaving them stranded in a development trap. The UN created the category of least developed countries (LDCs) in 1971 to designate these countries and focus the international development community's support around them. For instance, the 2030 Agenda for Sustainable Development makes frequent reference to the needs and special characteristics of LDCs [12], while numerous SDG targets set specific objectives and provisions for this group of countries. Conferences specifically targeting the sustainable development of LDCs took place in 1981 (Paris, France), 1990 (Paris, France), 2001 (Brussels, Belgium), 2011 (Istanbul, Türkiye) and 2022-2023 (Doha, Qatar), each one culminating in the adoption of a comprehensive programme of action for LDCs.

Five UN Conferences on LDCs, most recently in Doha, Qatar in 2022-2023

Industry and structural transformation play an essential role in the sustainable development of LDCs. A lasting transition from economic activity in the primary sector to manufacturing and services, and from lower to higher productivity activities, is considered an essential step to increase aggregate productivity, achieve higher diversification and sustained growth, reduce risks and vulnerabilities, create employment opportunities and eradicate poverty in LDCs [42; 43].



Industry can play an important role in the sustainable development of LDCs

In fact, one of the six focus areas of the Doha Programme of Action for LDCs is "structural transformation as a driver of prosperity" [44, pp. 26–33]. This focus area reiterates ISID as one of the most important strategies for promoting sustainable development in LDCs and establishes specific goals and targets in this area. It also confirms the essential role of infrastructure, energy, trade and private sector development as factors supporting structural transformation. Another focus area of the programme of action emphasizes science, technology and innovation [44, pp. 21–26], which is also deeply connected with the manufacturing sector and the Fourth Industrial Revolution [45]. In the same vein, the ninth UNIDO Ministerial Declaration of the LDCs (Vienna, Austria, 2021) reaffirmed the acceleration of ISID as the development strategy for this country group [46].

Structural transformation and innovation are among the focus areas of the Doha Programme of Action

In light of the commitments agreed in the Doha Programme of Action for 2022-2031, this Yearbook devotes its special thematic chapter to LDCs. It presents a statistical profile of industrial sectors in this group of economies, identifying challenges and main gaps through relevant benchmarks. The chapter first describes the statistical criteria that determine the classification of LDCs and the role of industrial sectors therein. This is followed by a presentation of the LDCs' productive structure and their progress towards structural transformation and ISID. A brief description of COVID-19's impact on this group of economies,

based on available data, is also presented. The chapter closes with a call for improved industrial statistics to better guide and monitor their industrial policies.

5.2 What are LDCs?

LDCs are defined as "low-income countries suffering from the most severe structural impediments to sustainable development" [47]. In 2022, 46 economies are classified as LDCs. Figure 5.1 shows that they are located all over the world, but are mostly found in the African continent. In fact, 33 LDCs are located in Africa, nine in Asia, three in Oceania and one in the Americas. They account for 1.08 billion of the world's population and a combined GDP of US$ 1.16 trillion. For the purpose of analysis in this chapter, they will be divided into two subgroups: African LDCs plus Haiti, and LDCs in Asia and Oceania. This is also reflected in Figure 5.1.

There are
46
countries classified as
LDCs
located in
four continents

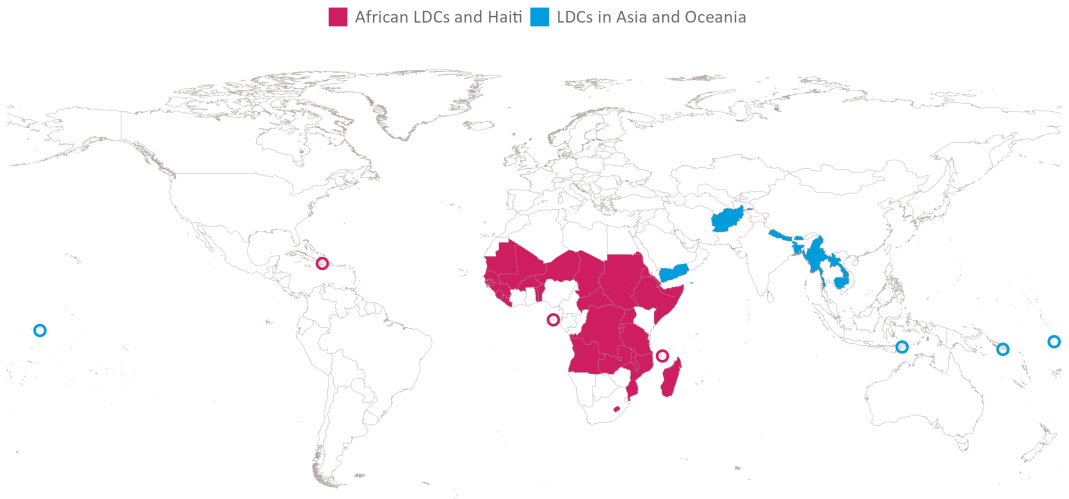


Figure 5.1 | Location of LDCs
Source: UNIDO

The list of LDCs is not fixed and allows for both new inclusions and graduations. The Committee for Development Policy (CDP), a subsidiary body of the UN Economic and Social Council, has the mandate to establish and review the indicators used as classification criteria for LDCs. This body determines how countries perform in the selected indicators and recommends which countries should leave or enter the LDC category.

The classification criteria consists of three indicators [48]:

1. Gross national income (GNI) per capita;

The **LDC category**
allows for
inclusion
and **graduations**
based on pre-specified criteria

2. Human Assets Index (HAI), a composite indicator which includes variables that measure health (under-five mortality rate, prevalence of stunting and maternal mortality ratio) and educational outcomes (gross secondary school enrolment ratio, adult literacy rate and gender parity index for gross secondary school enrolment);
3. Economic and Environmental Vulnerability Index (EVI), a composite indicator that includes risk metrics in economic (share of agriculture, forestry and fisheries value added in GDP; remoteness and landlockedness; merchandise export concentration; and instability of exports of goods and services) and environmental areas (share of population in low elevated coastal zones; share of population living on drylands; instability of agricultural production; and victims of disasters).

The decision for inclusion and graduation of **LDCs** rests on three criteria:
1. Income
2. Human assets
3. Vulnerability

Every three years, the CDP calculates the average of these indicators over the preceding three years and determines whether countries meet the inclusion and graduation thresholds described in Table 5.1. It is recommended for countries that meet the graduation thresholds for at least two of the three criteria in two consecutive triennial reviews to move out of the LDC category. A similar procedure is followed to determine inclusion in the LDC category. However, complementary country-specific indicators can also be considered. Note that the graduation threshold can be reached through one of two paths: either based on the three indicators or based on GNI per capita only.

In recent years, the following countries have graduated from the LDC group: Botswana (1994), Cabo Verde (2007), Maldives (2011), Samoa (2014), Equatorial Guinea (2017) and Vanuatu (2020). Among the current list of LDCs, Angola, Bangladesh, Bhutan, Lao People's Democratic Republic, Nepal, São Tomé and Príncipe and Solomon Islands are scheduled for graduation before 2030. The two most recent cases to enter the LDC category were two newly established countries: Timor-Leste and South Sudan.

The most recent **LDC graduation** was **Vanuatu** in **2020**

Figure 5.2 presents the most recent status of current LDCs in terms of the graduation criteria. The chart is divided into four zones according to the graduation thresholds of the HAI and EVI indicators. Countries in the bottom-right area meet both criteria, and most of them are already candidates for graduating the group. On the other hand, countries in

Table 5.1 | Inclusion and graduation thresholds for LDCs

	GNI per capita	HAI	EVI
Inclusion	$1,018 or below	60 or below	36 or above
Graduation, path 1	$1,222 or above	66 or above	32 or below
Graduation, path 2	$2,444 or above	-	-

Source: [48]

the top-left area have not yet reached the thresholds for any of the two criteria, but may still be candidates for graduation based on income only, such as Angola. The other two quadrants show countries that have met only one of the two criteria included in the vertical and horizontal axes.

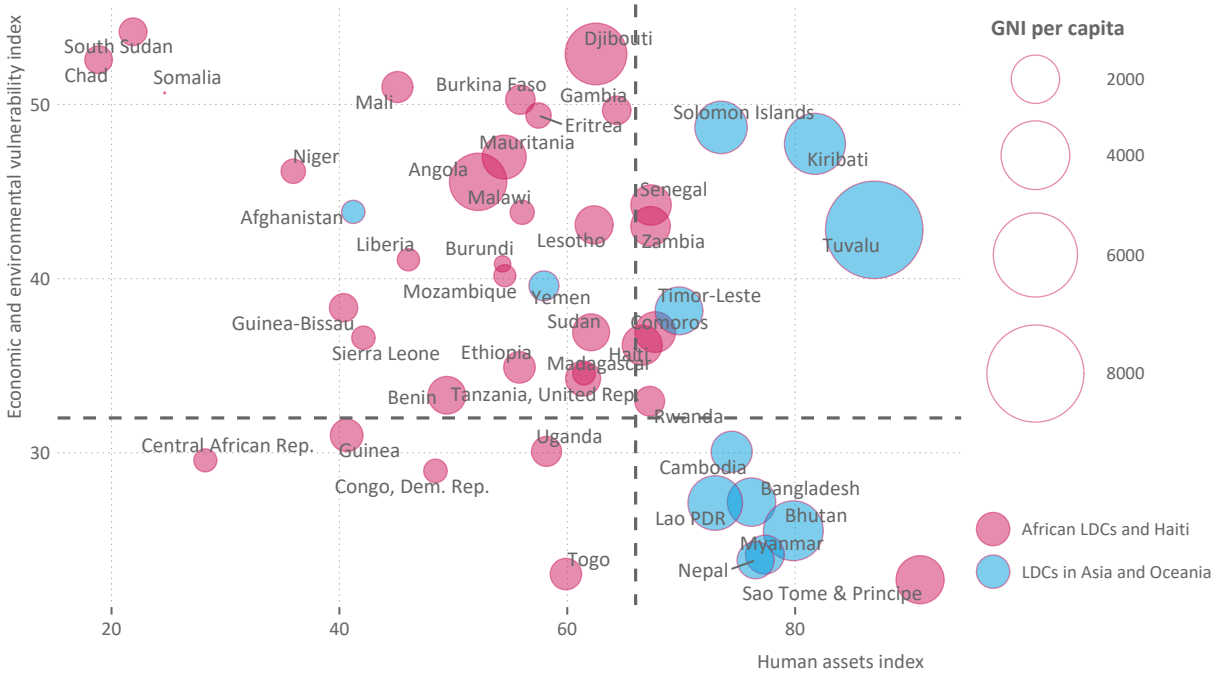


Figure 5.2 | LDC criteria, average 2018–2020
Source: UNIDO calculations based on data from [48]

In some cases, the "structural impediments" that affect LDCs mostly originate from the human assets dimension, while the economic and environmental risks remain limited. This is the case of Central African Republic and Guinea, for example. The opposite is true for the three LDCs in Oceania (Kiribati, Solomon Islands and Tuvalu), where environmental risks are substantial but human assets limitations are less pronounced. The three countries that lie furthest away from the three graduation thresholds are Chad, Somalia and South Sudan.

Industry has a direct impact in the assessment of LDCs through the EVI pillar. First, as the process of structural change takes hold, countries move out of primary economic activities (agriculture, forestry and fisheries) and into manufacturing and services. Second, because a stronger industrial base can promote export diversification. It can also reduce the instability of exports because manufacturing, especially of higher value-added goods, is characterized by more stable demand and more limited price variability than exports based on primary commodities. Industry can also have a significant impact on the income pillar.

Figure 5.3 illustrates the weight of LDCs in terms of different attributes

Industry
plays an important role in the
vulnerability
and
income
pillars that define the LDC category

of the global economy. While these countries comprise 15 per cent of total land area and nearly 14 per cent of the world population, they account for only 1.3 per cent of global GDP, 1.2 per cent of industry value added and 1.0 per cent of MVA. The fact that their weight when considering all industrial sectors is higher than when considering manufacturing only reflects the relatively higher importance of the mining and utilities sectors in these economies. Their share in global manufacturing exports only accounted for 0.6 per cent. When looking at manufacturing exports with higher technological content, their share falls to only 0.1 per cent. It is worrying that although LDCs' share of CO_2 emissions is only 0.1 per cent of the world total, they are among the economies most affected by the impacts of climate change [49].

LDCs
account for only
1%
of global MVA

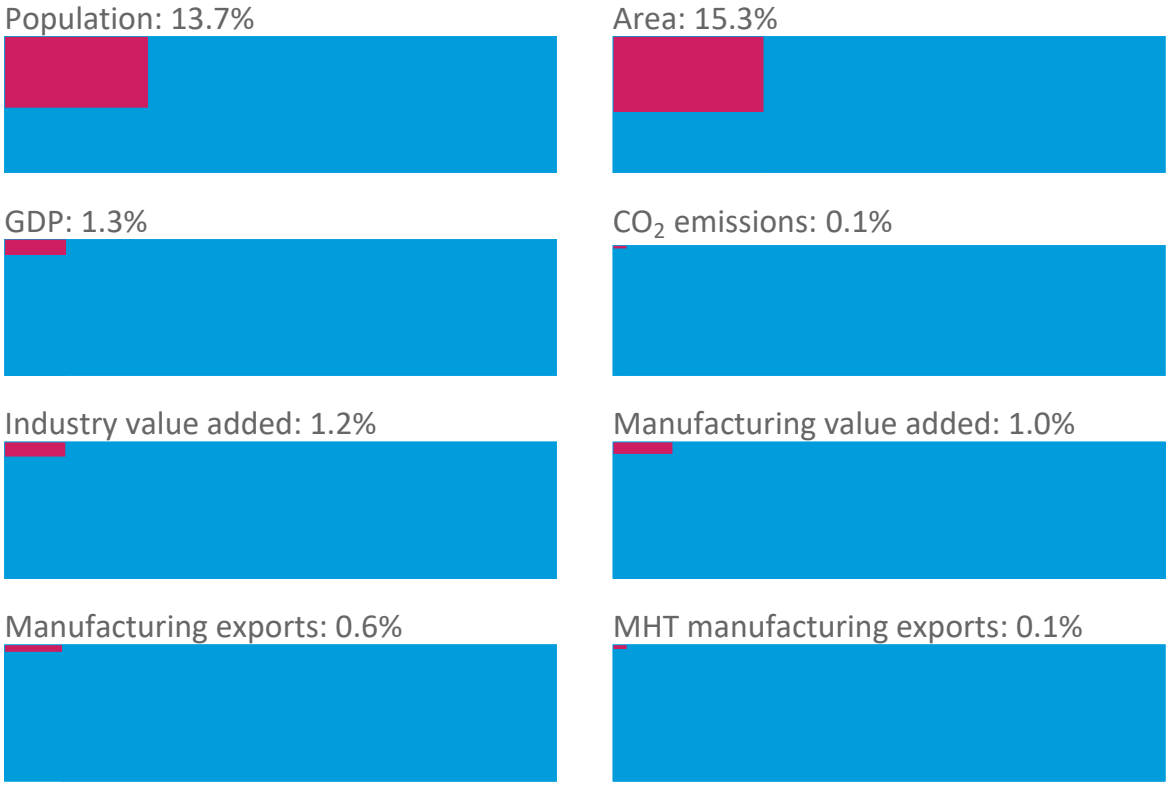


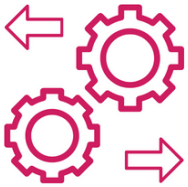
Figure 5.3 | Share of LDCs in the world economy, 2021
Source: UNIDO calculations based on data from [4; 31; 22; 50]
Note: Figures for CO_2 emissions are for 2019. Industry value added represents the combined value added of manufacturing as well as the mining and utilities sectors.

5.3 Industrial sectors and structural transformation in LDCs

Structural transformation, one of the most promising strategies for reaching higher economic growth and improving the population's living standards, involves a stable transition of economic activity from the

primary sector into manufacturing and higher value-added services, and from lower- to higher-productivity activities. This section presents recent progress achieved by LDCs in this regard.

Over the last three decades, this group of economies has only witnessed limited advancement, as shown in Figure 5.4. Although the weight of the primary sector has gradually declined, it still accounts for 20.8 per cent of total value added. However, while this has been accompanied by the growing weight of construction, services as well as mining and utilities, the share of manufacturing in 2020 (13.4 per cent) has practically remained as in 1990 (13.6 per cent). As a benchmark, the figure also presents the results for all other low- and middle-income economies. While the share in value added of the primary sector in this group of economies shrank from 15.1 per cent in 1990 to 9.2 per cent in 2020, and from 11.0 per cent to 6.3 per cent in mining and utilities, it substantially increased in the manufacturing sector, climbing from 14.7 per cent to 21.7 per cent over the same period.



The weight of
manufacturing
in LDCs' economies has remained
stationary
over the last three decades

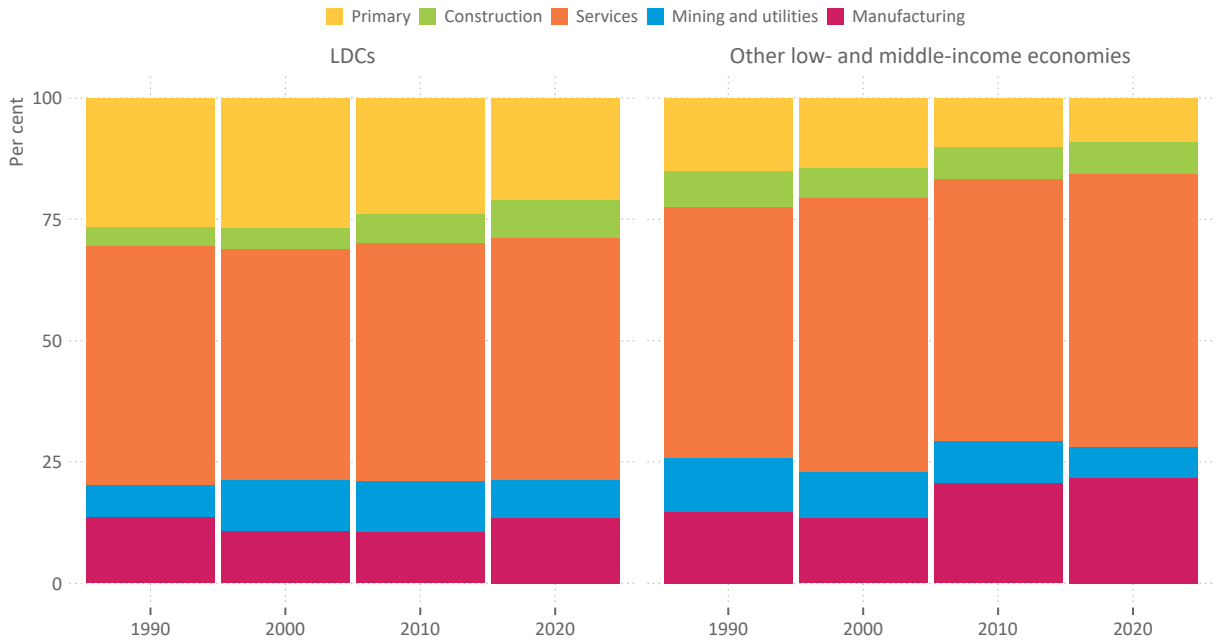


Figure 5.4 | Share of sectors in total value added
Source: UNIDO calculations based on data from [51]

Figure 5.5 takes a closer look at the manufacturing activities in LDCs in 2015, the most recent year with a relatively complete coverage at this level of detail. This chart presents the share of manufacturing sectors in total MVA. To facilitate comparison, it presents the distribution of value added in LDCs relative to the average of all low- and middle-income countries. In other words, a bar greater than zero indicates that the corresponding sector accounts for a greater share of manufacturing in LDCs than the average share in low- and middle-income countries. The chart shows that manufacturing activities in LDCs are concentrated

in low-technology activities, such as the manufacturing of wearing apparel (ISIC Rev. 4 division 14) and food production (ISIC Rev. 4 division 10). Activity in higher-technology industries, such as the manufacturing of computers and electronics (ISIC Rev. 4 division 26) or motor vehicles (ISIC Rev. 4 division 29), account for a lower share of MVA in LDCs. In fact, with only a few exceptions, low-technology industries (green bars) tend to be over-represented in LDCs, while high-technology (pink bars) and medium-technology industries (blue bars) are under-represented. Interestingly, pharmaceuticals is the only higher-technology industry in LDCs with greater weight in manufacturing compared to the average low- and middle-income country.

Most
lower technology industries
are over-represented in
LDCs

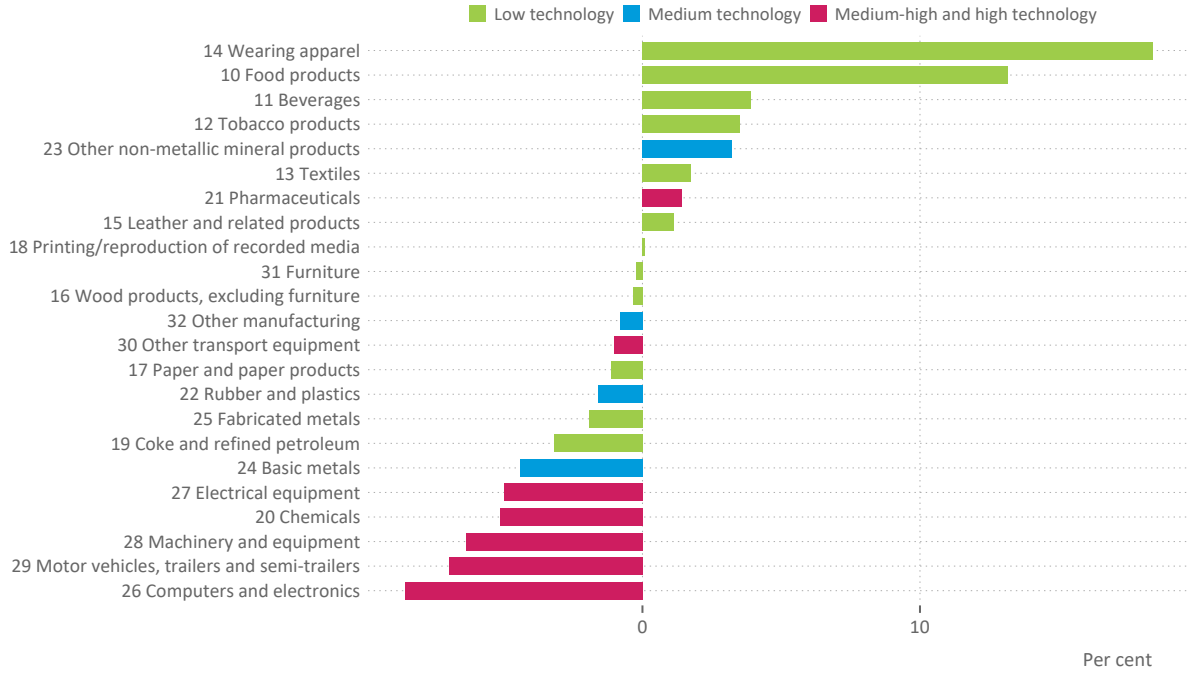


Figure 5.5 | Production structure of manufacturing industries in LDCs relative to the average of low- and middle-income economies, 2015
Source: [4; 16]
Note: Each bar represents the difference between the industry's average share in total manufacturing production in LDCs and the industry's average share in all low- and middle-income economies for the year 2015. A bar greater than zero indicates a higher concentration of manufacturing production in that sector in LDCs with respect to the average low- and middle-income economy. Figures calculated over 28 LDCs with available data.

These findings are also supported by LDCs' export basket. Figure 5.6 shows that this group of countries mostly export primary commodities. Although the relative importance of these goods has recently decreased, it is attributable to a shift towards low-technology manufactured goods. The share of higher-technology goods, however, has stagnated at very low levels. As a comparison, the right-side panel of the figure presents the export distribution of other low- and middle-income countries. Contrary to LDCs, all sectors have a significant weight in those countries' export baskets and, over the years, there has been a gradual increase in the share of medium- and high-technology exports and a decline in the relative importance of primary commodities.

The main
exports
of LDCs are
primary commodities
and
low-tech manufactured goods

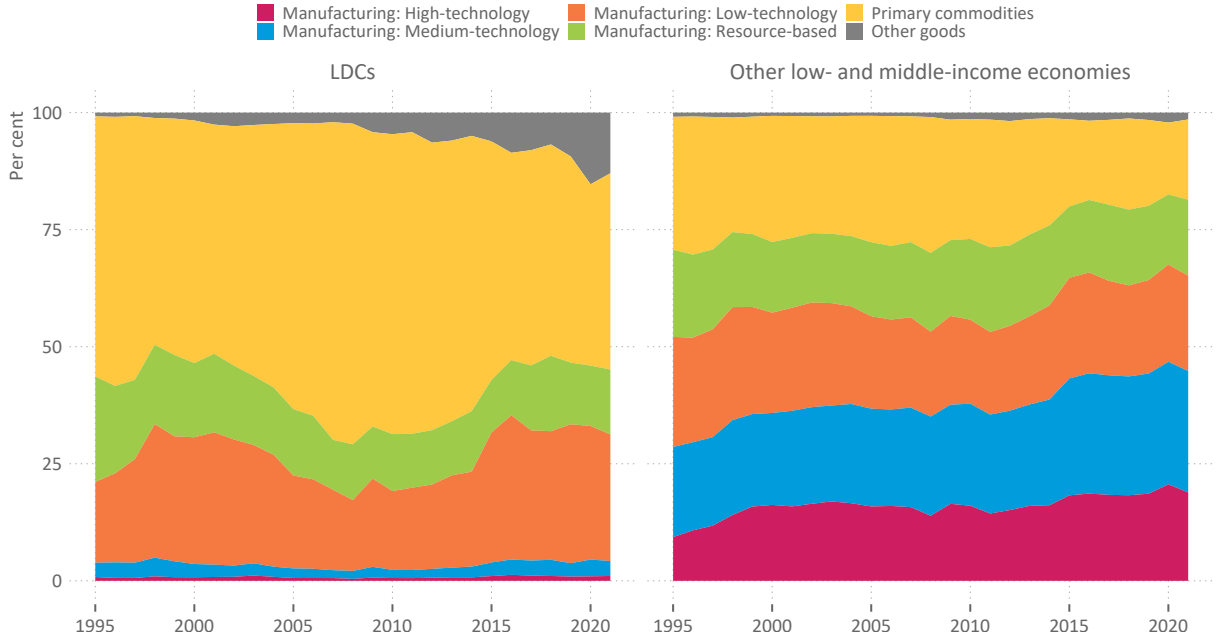
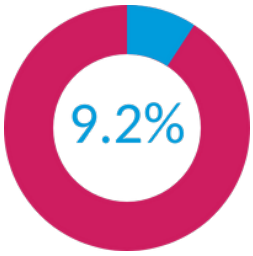


Figure 5.6 | Share of product groups in total allocated exports
Source: UNIDO calculations based on data from [52]

LDCs have therefore not achieved significant progress in structural transformation over the last decades. This is also verified when analysing two measures of the relative size of the manufacturing sector: MVA per capita and share of MVA in GDP. Both are used as markers of structural change. The first panel of Figure 5.7 shows that while other low- and middle-income economies have made important gains in the last two decades, progress in LDCs has been much slower, with an MVA of only US$ 135 per capita, in constant 2015 US dollars, and a share of manufacturing in GDP of 12.5 per cent in 2021.

It is worth noting that there is a significant heterogeneity in the outcomes of LDCs. The second panel of the figure shows the results separately for LDCs in the African continent plus Haiti and LDCs in Asia and Oceania. The two subgroups are clearly moving in opposite directions. While the share of MVA in GDP increased from 10.2 per cent in 2000 to 17.6 per cent in 2021 in LDCs in Asia and Oceania, this indicator declined in the other subgroup from 10.4 per cent in 2000 to 8.5 per cent in 2014, with only limited improvement since then, reaching 9.2 per cent in 2021. In terms of MVA per capita, while both subgroups had similar levels in 2000, slightly above US$ 60 in constant 2015 US dollars, African LDCs and Haiti registered an increase of 45 per cent over the 21-year period up to 2021, while in LDCs in Asia and Oceania, this indicator multiplied by 2.6 times over the same period.



The share of MVA in GDP, an indicator of **structural transformation**, remains **low** in **African LDCs and Haiti**

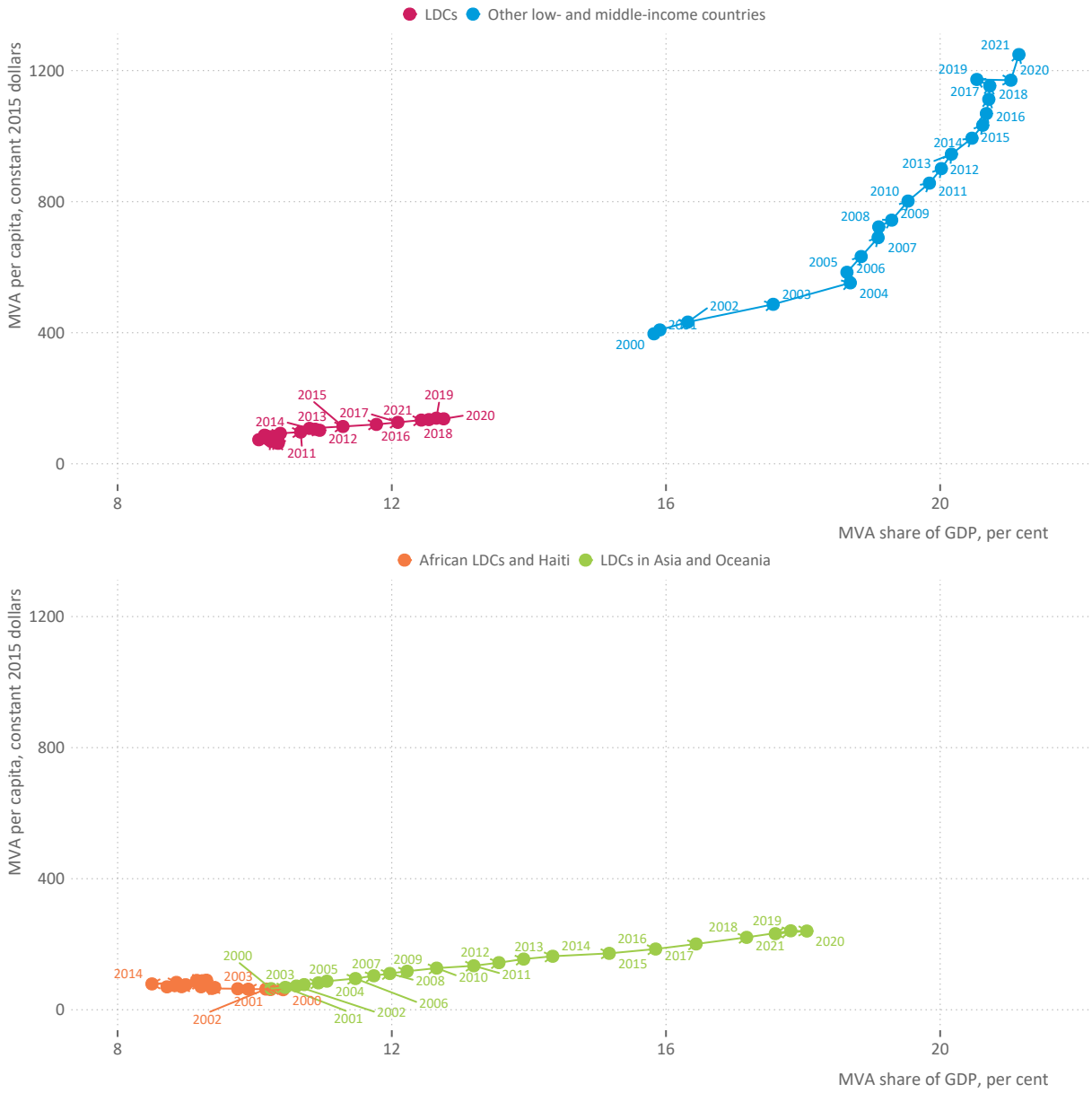


Figure 5.7 | Structural transformation indicators of selected country groups
Source: [4]

5.4 SDG 9 and industrial competitiveness performance

The indicators of industrial activity and trade of manufactured goods that were described above reveal that LDCs have only made limited progress in structural transformation and industrialization. This means that they are still lagging behind in terms of achieving SDG 9. Figure 2.4 already indicated that this group of countries was not on track to achieving the 2030 target for SDG indicator 9.2.1. Although Asian LDCs achieved considerable progress, African LDCs are lagging behind.

African & Asian LDCs
show
diverging trends
towards the
SDG 9 targets

A more comprehensive measure of SDG progress is presented in Figure 5.8, which depicts the most recent scores of UNIDO's SDG 9 Industry Index. This composite indicator combines the result of five SDG 9 indicators. Given significant data gaps, this index can only be calculated for 15 LDCs, an insufficient coverage for calculating averages or other summary statistics. Instead, the graph includes individual country scores, with each point representing a low- or middle-income economy and LDCs highlighted in a different colour. All included LDCs are located at the lower end of the distribution, with only three countries (Bangladesh, Myanmar and Senegal) approaching the median of low- and middle-income economies. To achieve the SDG 9 targets by 2030, it is essential to significantly accelerate progress in coming years.

The second panel of Figure 5.8 shows that the LDCs are also underperforming in terms of their industrial competitiveness, as measured by UNIDO's CIP Index. Of the 23 LDCs with available data, most are located at the bottom of the ranking, with only three economies (Bangladesh, Cambodia and Myanmar) reaching scores comparable to the median low- and middle-income economy.

Bangladesh
and
Myanmar
are the two LDCs with a stronger performance in both
SDG 9 progress
and
industrial competitiveness

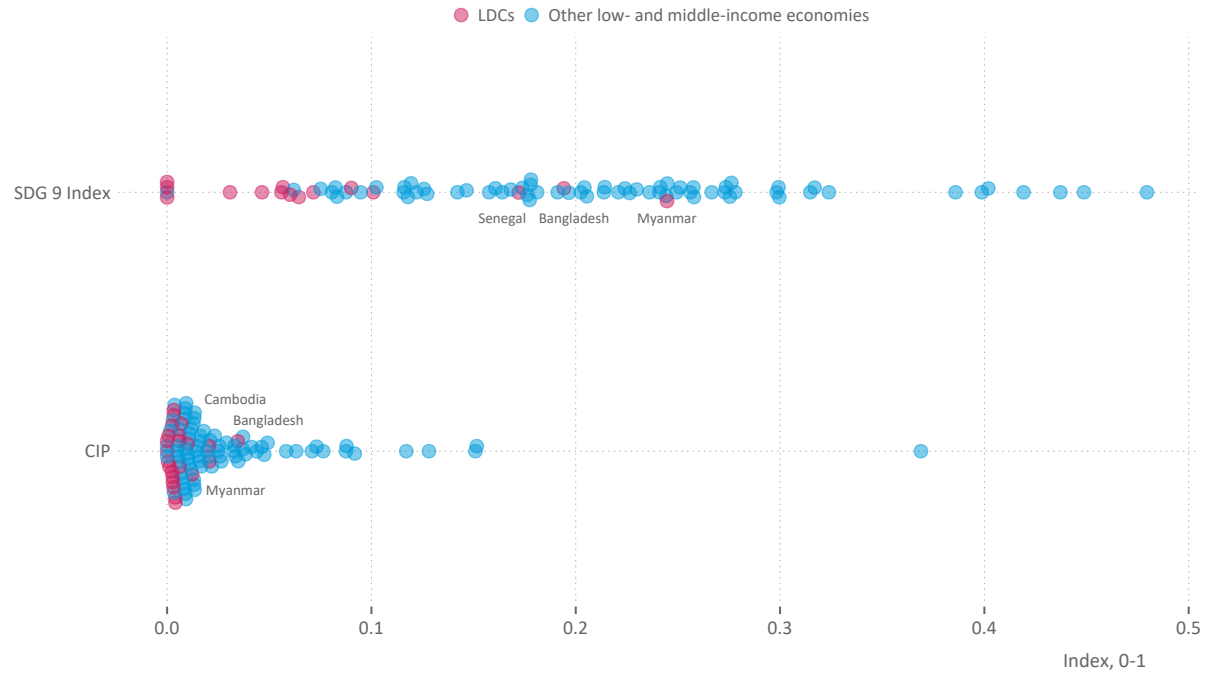


Figure 5.8 | SDG 9 Industry Index 2019 and CIP Index 2020 of selected country groups
Source: [31; 22]
Note: Due to data limitations, only 15 and 23 LDCs are included in the SDG 9 Industry Index and the CIP Index, respectively.

5.5 The impact of COVID-19 on LDCs

The COVID-19 crisis affected the entire world and all sectors of economic activity. LDCs were not spared and also suffered significant collapses in production. Figure 5.9 shows a timeline of the impacts on their manufacturing sectors. However, these figures must be taken as indicative, since they are built on information from only 12 LDCs, accounting for about half of the MVA in this group of countries, given significant data gaps.

The figure reveals that the second quarter of 2020 was the most severe period of the COVID-19 crisis for LDCs, when manufacturing output was 16.9 per cent below its pre-pandemic level. This was slightly worse than that of other low- and middle-income economies, whose manufacturing output at the height of the crisis was 14.2 per cent below their pre-pandemic level. However, the manufacturing sector in both groups recovered quickly and, by the next quarter, they had already exceeded their pre-crisis level. The most recent data seem to indicate that LDCs continued to recover faster than other low- and middle-income economies and by the first quarter of 2022, registering a manufacturing output of 18.4 per cent above their pre-pandemic level.

At the height of the
COVID-19 crisis,
LDCs' manufacturing output was
17%
below
its pre-pandemic level

Although this seems to indicate that the impact of COVID-19 in LDCs' manufacturing was not as severe as in other economies, there is also evidence that trade in manufactured goods did not recover at the same pace [53]. In addition, there is concern about the longer-term impact of the crisis on LDCs' sustainable development and graduation prospects through a variety of channels, including international trade, remittances, tourism, terms of trade and external finance [54; 6]. This could represent a setback in the fight against poverty and inequality in this group of economies.

There are
long-term
impacts
of the crisis through a variety of
channels,
including trade and financing

5.6 Data availability in LDCs

As indicated in many of the graphs presented in this chapter, the LDC aggregates were calculated from partial information available for only a fraction of the 46 economies. Although aggregate figures were presented only when they were sufficiently representative, they should still be considered with caution.

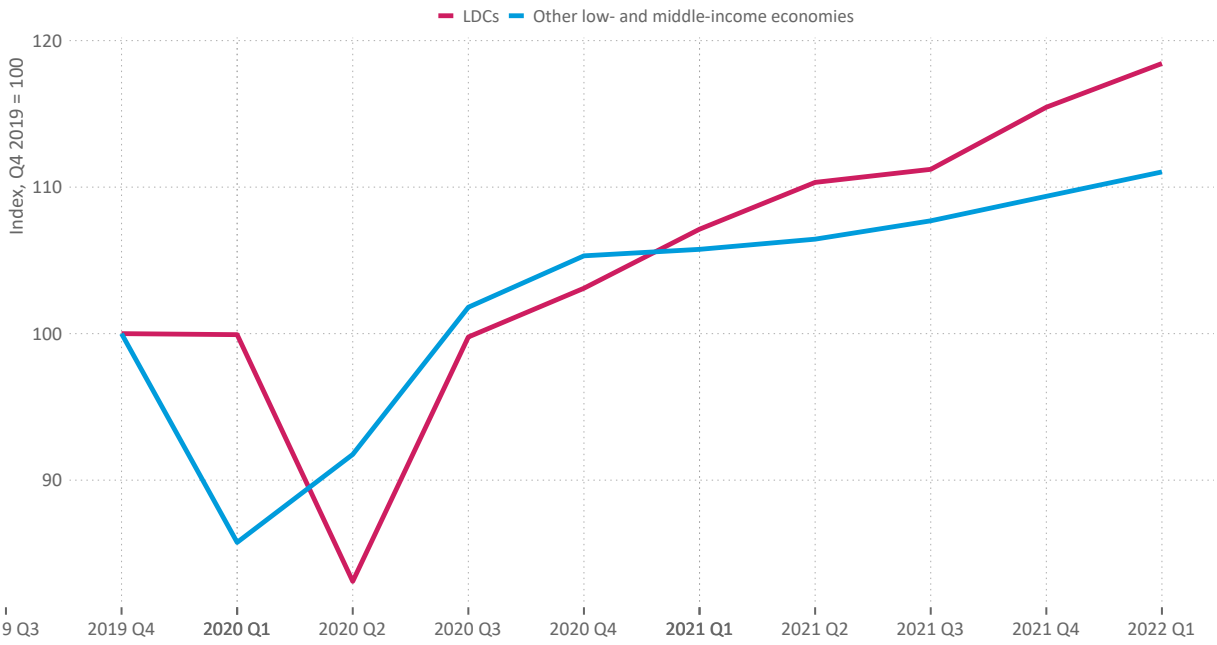


Figure 5.9 | Quarterly development of the index of industrial production (Q4 2019 = 100), selected country groups
Source: [20]
Note: Aggregates are calculated over 12 LDCs and 56 other low- and middle-income countries with available quarterly IIPs, representing 50 per cent and 97 per cent of total MVA of the respective group.

Data availability remains low in LDCs in many areas, including industrial statistics. Detailed SBS are available for only a handful of countries and they are only published sporadically. In terms of STS, only 12 LDCs publish a quarterly IIP on a regular basis, and only five countries produce a monthly IIP. Even when the data are published, they are mostly available with limited timeliness and granularity.

Although the production of industrial statistics is a costly exercise, it should receive high priority by NSOs, within a general effort to strengthen statistical offices and the implementation of evidence-based policy programmes. Robust industrial development and the economic transformation towards higher-productivity activities are important steps for creating sustained growth opportunities in LDCs and this process should be accompanied by strong policy support. A complete set of industrial statistics could provide the evidence base required to guide policy programmes, monitor their effectiveness and design corrective measures. This is an important step in achieving (and measuring) progress towards ISID and SDG 9.

Availability of timely and granular **industrial statistics** in **LDCs** remains **limited**

Annexes

A Key industrial indicators

Table A.1 | Industrial indicators by country/area, latest available year

	MVA per capita 2021 *(2015 US$)*	MVA growth rate 2021 *(%)*	MVA share in GDP 2021 *(%)*	MHT share in MVA 2019 *(%)*	Industry value added share in GDP 2021 *(%)*	Manufactured goods share in exports 2020 *(%)*	MHT share in manufacturing exports 2020 *(%)*	Manufacturing share in employment 2021 *(%)*	CO_2 intensity 2019 *(Kg/US$)*	CIP Index 2020 *(Rank)*
Afghanistan	28	-3.7	5.9	8.5	9.2	5.8	0.3	6.4	...	149
Albania	313	11.4	6.6	4.6	13.4	60.3	9.3	10.9	1.05	113
Algeria	193	3.1	4.9	2.7	21.4	32.7	3.9	10.7	1.50	96
Andorra	1,346	6.9	3.6	...	4.8	...	...	...	...	...
Angola	192	3.4	6.1	3.4	23.8	2.7	23.7	1.2	0.17	129
Anguilla	483	4.6	2.9	...	8.5	...	...	2.4	...	...
Antigua and Barbuda	329	2.9	2.4	...	8.4	...	...	4.6	...	...
Argentina	1,766	10.4	13.1	26.3	17.3	28.6	36.4	11.8	0.26	57
Armenia	504	5.6	11.9	7.0	20.2	73.8	12.4	6.2	0.25	98
Aruba	980	33.4	3.8	...	4.6	...	...	4.0	...	...
Australia	2,932	2.7	5.3	28.5	13.6	51.2	15.7	6.9	0.39	32
Austria	7,999	6.7	17.9	45.4	20.8	87.6	62.5	16.6	0.13	14
Azerbaijan	337	2.8	6.4	14.2	31.3	7.1	34.2	5.3	0.62	118
Bahamas	241	6.0	0.8	27.8	3.2	80.0	49.0	2.8	...	124
Bahrain	3,604	3.4	18.7	24.6	32.7	83.1	20.7	11.9	0.37	48
Bangladesh	356	6.8	20.6	7.8	23.8	97.5	1.9	14.4	0.47	66
Barbados	844	-0.9	6.1	38.1	9.3	86.1	35.0	6.0	...	117
Belarus	1,461	4.1	23.0	42.2	27.0	81.7	44.3	17.8	0.34	46
Belgium	5,440	8.4	12.8	50.9	15.0	88.7	59.6	11.5	0.29	13
Belize	253	7.6	6.1	18.5	10.3	61.0	0.2	8.0	...	135
Benin	121	2.8	9.8	...	11.0	...	...	16.4	0.34	...
Bermuda	594	1.0	0.5	38.5	1.7	99.4	25.4	1.7	...	145
Bhutan	229	-5.7	7.6	...	25.2	...	...	7.8	...	...
Bolivia (Plurinational State of)	370	4.4	11.9	9.6	22.9	33.7	4.4	11.4	0.52	103
Bosnia and Herzegovina	667	6.7	11.7	19.0	18.2	87.4	28.8	17.3	0.96	79
Botswana	383	9.4	5.3	7.9	18.5	96.0	5.0	5.8	0.08	94
Brazil	875	4.8	10.2	33.7	14.4	53.3	32.0	11.8	0.43	42
British Virgin Islands	1,022	4.2	2.1	...	3.4	...	...	2.5	...	...
Brunei Darussalam	5,977	-0.5	19.8	3.3	58.7	47.8	6.7	4.3	0.20	62

Table A.1 | Industrial indicators by country/area, latest available year *(continued)*

	MVA per capita 2021 *(2015 US$)*	MVA growth rate 2021 *(%)*	MVA share in GDP 2021 *(%)*	MHT share in MVA 2019 *(%)*	Industry value added share in GDP 2021 *(%)*	Manufactured goods share in exports 2020 *(%)*	MHT share in manufacturing exports 2020 *(%)*	Manufacturing share in employment 2021 *(%)*	CO_2 intensity 2019 *(Kg/US$)*	CIP Index 2020 *(Rank)*
Bulgaria	1,023	4.6	12.3	32.4	17.7	73.7	48.7	18.6	0.57	54
Burkina Faso	69	3.3	9.1	…	21.8	…	…	15.4	…	…
Burundi	29	1.2	10.7	2.6	11.8	37.0	5.6	1.8	…	148
Cabo Verde	211	4.4	6.8	27.1	11.4	80.4	1.2	9.6	…	140
Cambodia	230	4.7	16.6	0.3	19.4	75.3	12.5	15.1	0.27	84
Cameroon	213	3.3	15.7	7.6	19.7	24.7	11.7	10.3	0.05	121
Canada	4,347	6.2	9.9	36.3	16.8	63.5	54.7	9.2	0.34	19
Cayman Islands	809	4.0	0.9	…	3.4	…	…	1.1	…	…
Central African Republic	76	2.2	18.6	9.2	19.3	79.6	63.7	…	…	144
Chad	76	4.5	11.7	…	24.3	…	…	7.0	…	…
Chile	1,636	9.4	11.4	18.7	22.3	56.4	8.8	9.9	0.21	49
China	3,076	8.5	28.1	41.5	33.1	95.9	61.4	28.7	0.68	2
China, Hong Kong SAR	429	-1.9	1.0	38.1	2.2	19.2	38.8	2.6	0.72	86
China, Macao SAR	180	-4.4	0.5	4.0	1.0	73.0	0.2	1.6	…	146
China, Taiwan Province	9,774	13.9	35.5	68.4	37.8	96.5	82.2	26.4	0.17	8
Colombia	750	10.1	11.6	22.6	19.0	33.9	42.3	10.8	0.32	71
Comoros	81	1.6	6.0	…	6.9	…	…	9.5	…	…
Congo	112	-1.0	7.4	2.4	47.8	28.4	57.1	10.8	0.16	123
Congo, Dem. Rep. of	78	2.7	15.2	…	45.0	…	…	5.8	0.00	…
Cook Islands	328	-2.7	2.1	…	4.4	…	…	3.8	…	…
Costa Rica	1,568	5.5	12.3	14.4	15.2	71.8	56.9	9.9	0.12	64
Côte d'Ivoire	433	6.9	18.0	15.0	19.6	25.3	25.9	6.9	0.13	93
Croatia	1,873	11.0	13.2	28.7	17.4	82.3	49.2	17.7	0.28	53
Cuba	984	-0.3	13.7	16.2	15.8	33.3	63.4	9.3	0.49	91
Curaçao	684	14.9	4.6	…	11.8	…	…	6.7	1.85	…
Cyprus	1,112	2.6	5.4	27.3	7.3	84.5	40.5	7.2	0.36	88
Czechia	4,960	5.9	25.4	52.1	28.1	95.5	71.8	26.1	0.21	15
Denmark	8,767	6.4	14.9	58.4	17.0	85.1	60.9	11.4	0.06	18
Djibouti	102	3.3	3.1	…	8.2	…	…	0.2	…	…

Table A.1 | Industrial indicators by country/area, latest available year *(continued)*

	MVA per capita 2021 *(2015 US$)*	MVA growth rate 2021 *(%)*	MVA share in GDP 2021 *(%)*	MHT share in MVA 2019 *(%)*	Industry value added share in GDP 2021 *(%)*	Manufactured goods share in exports 2020 *(%)*	MHT share in manufacturing exports 2020 *(%)*	Manufacturing share in employment 2021 *(%)*	CO_2 intensity 2019 *(Kg/US$)*	CIP Index 2020 *(Rank)*
Dominica	210	-1.0	3.1	...	9.1	...	...	7.8	...	...
Dominican Republic	1,175	9.1	13.8	...	17.1	...	...	10.5	0.31	...
Ecuador	783	3.3	14.3	15.0	20.5	23.3	8.6	9.9	0.14	85
Egypt	588	3.0	14.9	20.9	27.7	66.7	34.2	10.5	0.67	65
El Salvador	612	12.0	15.2	19.1	19.3	93.8	17.2	16.1	0.40	80
Equatorial Guinea	1,366	5.5	21.6	...	44.7	...	...	...	1.40	...
Eritrea	40	2.5	6.1	9.7	15.9	34.6	14.7	...	0.17	150
Estonia	2,899	10.5	13.5	29.6	17.2	85.9	54.3	18.2	0.16	50
Eswatini	1,112	2.9	30.5	2.2	31.5	95.0	19.1	15.8	...	83
Ethiopia	46	7.6	5.6	16.1	6.6	15.1	29.0	3.2	1.10	141
Fiji	558	-0.6	11.9	7.8	15.1	61.7	12.0	5.6	...	120
Finland	7,261	6.2	15.7	45.6	18.7	83.6	52.7	12.6	0.15	24
France	4,047	9.2	10.3	50.4	12.4	85.6	65.3	11.0	0.13	12
French Polynesia	947	-3.6	4.9	...	7.2	...	...	6.2	...	...
Gabon	546	4.9	8.0	5.4	39.7	18.2	10.1	...	0.42	110
Gambia	22	0.8	3.2	3.9	6.0	23.6	3.9	1.3	...	151
Georgia	424	14.3	9.2	12.8	12.9	83.4	21.0	5.9	0.82	100
Germany	8,270	4.5	19.7	60.7	22.4	89.8	73.4	19.9	0.12	1
Ghana	239	3.1	11.5	10.8	25.9	11.6	10.6	11.5	0.34	116
Greece	1,979	6.9	10.2	19.6	14.1	78.0	35.9	9.9	0.23	47
Greenland	1,633	9.5	3.2	...	6.5	...	...	...	...	...
Grenada	348	5.9	3.8	...	7.6	...	...	...	...	...
Guatemala	578	5.0	14.0	22.4	16.7	63.5	25.0	11.6	0.17	76
Guinea	109	4.1	10.9	...	31.9	...	...	2.8	...	...
Guinea-Bissau	65	2.6	10.0	...	10.9	...	...	6.7	...	...
Guyana	302	2.9	2.7	...	50.5	...	...	10.5	0.35	...
Haiti	207	-1.6	16.9	5.3	19.1	83.0	3.8	1.4	0.25	133
Honduras	409	14.7	16.5	7.2	19.7	40.7	23.6	15.9	0.28	105
Hungary	2,911	10.8	18.7	53.5	21.3	91.7	77.5	21.2	0.21	26

Table A.1 | Industrial indicators by country/area, latest available year *(continued)*

	MVA per capita 2021 *(2015 US$)*	MVA growth rate 2021 *(%)*	MVA share in GDP 2021 *(%)*	MHT share in MVA 2019 *(%)*	Industry value added share in GDP 2021 *(%)*	Manufactured goods share in exports 2020 *(%)*	MHT share in manufacturing exports 2020 *(%)*	Manufacturing share in employment 2021 *(%)*	CO_2 intensity 2019 *(Kg/US$)*	CIP Index 2020 *(Rank)*
Iceland	5,392	2.9	9.1	14.9	13.4	24.4	32.4	9.5	0.01	77
India	331	8.8	16.6	41.3	21.1	85.9	40.0	11.3	1.42	40
Indonesia	776	3.9	20.1	37.3	27.6	73.0	31.6	13.9	0.69	39
Iran (Islamic Republic of)	712	6.6	13.2	44.7	26.5	39.1	33.0	17.4	1.66	55
Iraq	123	3.3	2.8	9.2	40.7	0.3	0.0	…	2.25	152
Ireland	35,134	21.2	39.3	54.5	40.5	95.6	60.1	11.6	0.03	3
Israel	5,004	7.5	11.8	40.0	13.5	93.8	64.3	10.9	0.11	29
Italy	4,555	9.0	14.8	43.2	17.4	90.7	56.4	18.6	0.11	11
Jamaica	386	0.7	8.2	18.8	13.1	90.4	1.4	6.1	0.26	106
Japan	8,110	2.9	23.0	56.6	26.1	89.4	81.5	15.6	0.19	4
Jordan	716	1.4	17.5	23.7	21.6	79.0	37.4	9.0	0.22	73
Kazakhstan	1,287	3.9	11.4	15.0	25.8	29.2	38.7	6.7	0.97	63
Kenya	145	4.6	8.9	12.1	12.3	50.2	21.2	6.8	1.08	108
Kiribati	61	0.5	4.1	…	5.7	…	…	14.3	…	…
Korea, Dem. People's Rep. of	112	3.1	18.8	…	34.5	…	…	…	11.32	…
Korea, Rep. of	8,745	4.7	26.6	63.8	29.2	96.6	77.7	15.9	0.15	5
Kosovo	605	10.0	13.6	…	20.4	…	…	…	0.72	…
Kuwait	1,649	0.8	6.8	38.8	50.1	25.2	13.0	5.6	0.97	68
Kyrgyzstan	173	3.0	15.3	2.4	18.7	33.5	20.9	10.5	0.62	125
Lao People's Dem. Rep	232	5.6	8.8	3.8	28.6	45.0	22.8	5.1	0.47	109
Latvia	1,902	3.6	11.5	21.9	13.8	79.3	44.0	12.6	0.17	56
Lebanon	321	-17.0	7.4	19.9	11.8	57.6	37.0	10.8	0.28	97
Lesotho	193	4.2	18.2	…	31.1	…	…	22.6	…	…
Liberia	23	-1.6	4.4	…	7.3	…	…	1.7	…	…
Libya	161	102.1	2.0	16.1	50.5	6.2	10.5	…	2.55	131
Liechtenstein	66,679	3.0	36.9	…	38.2	…	…	…	…	…
Lithuania	3,358	6.5	17.9	27.6	20.5	85.7	47.4	16.6	0.14	38
Luxembourg	5,375	8.2	4.8	20.8	6.0	89.1	47.8	3.2	0.28	45
Madagascar	37	3.8	8.4	3.6	10.1	45.7	3.8	6.7	…	137

Table A.1 | Industrial indicators by country/area, latest available year *(continued)*

	MVA per capita 2021 *(2015 US$)*	MVA growth rate 2021 *(%)*	MVA share in GDP 2021 *(%)*	MHT share in MVA 2019 *(%)*	Industry value added share in GDP 2021 *(%)*	Manufactured goods share in exports 2020 *(%)*	MHT share in manufacturing exports 2020 *(%)*	Manufacturing share in employment 2021 *(%)*	CO_2 intensity 2019 *(Kg/US$)*	CIP Index 2020 *(Rank)*
Malawi	71	4.9	12.5	11.3	16.4	17.2	18.3	3.8	…	143
Malaysia	2,459	2.2	22.7	44.0	32.3	89.5	65.2	16.7	0.46	21
Maldives	196	22.6	2.2	2.6	4.6	27.7	0.3	7.2	…	147
Mali	150	5.0	17.6	…	18.5	…	…	6.5	…	…
Malta	2,483	7.3	7.6	36.6	8.5	82.1	70.8	10.5	0.03	72
Marshall Islands	74	4.8	2.2	…	7.1	…	…	0.7	…	…
Mauritania	122	3.5	8.3	…	16.1	…	…	11.2	…	…
Mauritius	1,036	2.2	11.1	4.6	13.3	86.7	15.2	13.3	0.21	92
Mexico	1,572	5.3	17.0	45.0	21.1	84.6	80.5	16.5	0.25	20
Micronesia, Fed. States of	21	-4.6	0.8	…	4.6	…	…	2.4	…	…
Moldova, Rep. of	288	16.4	12.0	17.8	15.4	67.4	40.7	11.9	1.03	107
Monaco	5,677	2.6	3.4	…	3.4	…	…	…	…	…
Mongolia	421	1.0	10.3	3.0	24.3	39.5	1.3	7.4	1.19	101
Montenegro	343	10.5	4.7	14.9	12.1	64.9	30.7	6.1	0.90	128
Montserrat	430	7.8	3.1	…	8.3	…	…	2.5	…	…
Morocco	470	3.2	14.5	24.1	20.2	79.4	61.6	10.8	0.34	61
Mozambique	44	1.2	7.8	10.9	16.7	17.8	12.4	4.1	0.12	139
Myanmar	202	-34.0	20.8	23.7	30.2	46.0	14.8	12.2	0.15	82
Namibia	465	2.9	11.5	7.3	22.1	54.8	1.5	7.2	0.00	104
Nauru	2,244	10.4	21.6	…	33.8	…	…	0.5	…	…
Nepal	48	-0.1	4.8	8.6	7.4	83.7	11.2	14.5	2.06	134
Netherlands	5,596	5.5	11.3	51.5	13.6	82.7	59.6	8.3	0.25	10
New Caledonia	3,172	-9.2	10.5	…	14.0	…	…	3.4	…	…
New Zealand	4,573	4.7	10.3	21.3	13.2	47.0	18.0	8.7	0.30	44
Nicaragua	316	11.1	15.1	…	20.9	53.4	17.3	11.5	0.29	99
Niger	38	0.3	7.5	17.7	16.7	46.0	10.4	20.1	0.19	138
Nigeria	213	1.1	8.7	33.4	14.4	10.1	74.2	10.7	0.16	95
North Macedonia	586	6.0	11.1	32.0	15.8	93.1	65.4	19.9	0.77	74
Norway	4,866	2.5	6.3	40.2	24.9	32.4	49.3	7.2	0.20	37

Table A.1 | Industrial indicators by country/area, latest available year *(continued)*

	MVA per capita 2021 *(2015 US$)*	MVA growth rate 2021 *(%)*	MVA share in GDP 2021 *(%)*	MHT share in MVA 2019 *(%)*	Industry value added share in GDP 2021 *(%)*	Manufactured goods share in exports 2020 *(%)*	MHT share in manufacturing exports 2020 *(%)*	Manufacturing share in employment 2021 *(%)*	CO_2 intensity 2019 *(Kg/US$)*	CIP Index 2020 *(Rank)*
Oman	1,758	5.8	12.8	45.0	49.1	27.7	33.0	10.7	1.68	60
Pakistan	176	6.7	11.7	24.6	15.5	77.7	11.1	14.9	1.38	81
Palau	132	-8.9	1.1	…	3.6	…	…	0.5	…	…
Panama	715	12.0	5.2	6.2	11.3	58.8	7.7	7.4	0.52	119
Papua New Guinea	43	1.7	1.6	12.6	28.2	51.4	8.1	1.8	…	132
Paraguay	1,079	2.2	18.6	21.8	26.5	20.3	28.1	10.7	0.02	87
Peru	816	14.6	12.6	15.1	22.0	51.3	6.3	8.4	0.27	67
Philippines	656	4.9	19.2	47.2	23.4	89.2	81.2	8.1	0.17	43
Poland	2,669	9.7	17.2	33.1	21.9	88.8	54.1	19.4	0.31	23
Portugal	2,581	4.6	12.3	25.5	15.9	92.1	45.8	16.9	0.19	36
Puerto Rico	15,983	1.1	48.3	84.6	50.0	…	…	9.0	…	…
Qatar	4,898	1.3	8.8	65.0	43.9	12.4	74.0	4.7	1.27	51
Romania	2,045	6.5	17.7	46.1	21.7	90.5	64.1	19.6	0.29	33
Russian Federation	1,394	5.4	13.7	25.6	24.1	43.2	28.4	14.2	1.30	35
Rwanda	71	10.7	7.9	9.8	10.4	30.5	8.3	4.2	…	142
Saint Kitts and Nevis	1,080	-3.8	6.9	…	8.6	…	…	1.8	…	…
Saint Lucia	317	3.8	3.5	7.8	7.2	84.3	31.8	5.9	…	136
Saint Vincent and the Grenadines	246	-2.6	3.5	…	7.6	…	…	…	…	…
Samoa	197	-16.4	5.6	…	9.0	…	…	5.1	…	…
San Marino	14,700	4.4	33.7	…	33.7	…	…	31.3	…	…
Sao Tome and Principe	107	2.0	6.3	…	8.8	…	…	6.4	…	…
Saudi Arabia	2,387	4.9	12.6	36.7	36.4	22.3	60.1	10.2	1.05	41
Senegal	230	3.8	16.4	21.6	20.7	57.6	15.4	12.9	0.26	102
Serbia	988	6.9	14.1	24.6	20.4	83.8	46.7	9.5	0.49	59
Seychelles	1,083	13.4	7.2	…	9.8	…	…	5.9	…	…
Sierra Leone	10	0.1	1.6	…	2.8	…	…	4.1	…	…
Singapore	13,276	8.5	22.0	85.1	23.3	88.9	77.3	2.3	0.21	9
Sint Maarten (Dutch part)	128	-4.9	0.7	…	3.8	…	…	…	…	…

Table A.1 | Industrial indicators by country/area, latest available year *(continued)*

	MVA per capita 2021 *(2015 US$)*	MVA growth rate 2021 *(%)*	MVA share in GDP 2021 *(%)*	MHT share in MVA 2019 *(%)*	Industry value added share in GDP 2021 *(%)*	Manufactured goods share in exports 2020 *(%)*	MHT share in manufacturing exports 2020 *(%)*	Manufacturing share in employment 2021 *(%)*	CO_2 intensity 2019 *(Kg/US$)*	CIP Index 2020 *(Rank)*
Slovakia	3,402	6.3	19.0	50.7	22.4	95.4	74.4	24.9	0.35	27
Slovenia	5,657	11.0	22.6	37.2	25.5	92.5	69.6	22.1	0.16	30
Solomon Islands	240	-1.3	11.5	…	14.0	…	…	5.5	…	…
Somalia	2	3.8	2.4	…	3.2	…	…	10.7	…	…
South Africa	596	5.3	11.2	24.4	20.4	61.7	45.1	8.1	1.00	52
South Sudan	16	3.7	2.9	…	35.0	…	…	…	0.43	…
Spain	2,861	4.7	10.8	39.5	14.8	77.7	56.3	12.2	0.19	22
Sri Lanka	688	3.7	16.1	7.7	19.5	77.1	9.1	18.4	0.06	75
State of Palestine	311	4.7	10.9	7.6	12.7	84.7	15.9	12.0	…	112
Sudan	153	3.5	7.4	…	13.8	…	…	7.7	0.20	…
Suriname	1,250	-0.9	17.4	11.6	21.3	9.8	49.7	12.7	0.08	111
Sweden	7,288	9.8	13.2	52.4	15.9	89.6	61.4	9.8	0.08	17
Switzerland	17,025	5.2	19.3	65.5	21.3	73.2	71.6	10.8	0.03	7
Syrian Arab Republic	70	5.9	6.1	21.5	33.4	43.9	22.7	14.2	2.23	115
Tajikistan	200	8.0	15.4	2.6	22.1	49.6	3.8	5.4	1.09	130
Tanzania, United Rep. of	94	5.6	8.3	6.5	14.1	23.2	21.3	4.4	0.41	127
Thailand	1,623	1.4	25.8	41.4	31.4	84.4	63.1	15.9	0.45	25
Timor-Leste	23	0.4	1.5	…	27.5	…	…	7.2	…	…
Togo	116	7.0	13.9	…	20.2	…	…	15.3	0.14	…
Tonga	242	-0.3	5.8	1.6	9.4	46.3	23.5	17.4	…	153
Trinidad and Tobago	2,335	-1.2	15.7	39.6	30.8	66.1	34.5	7.7	0.55	58
Tunisia	533	2.7	14.6	27.6	18.6	90.4	51.6	18.3	0.73	70
Türkiye	2,241	13.9	16.9	33.7	20.3	87.9	44.4	18.9	0.41	28
Turkmenistan	1,906	4.0	35.6	…	37.7	…	…	…	0.21	…
Turks and Caicos Islands	148	-0.5	0.7	…	5.7	…	…	1.4	…	…
Tuvalu	63	3.8	1.6	…	2.0	…	…	3.7	…	…
Uganda	137	5.1	17.2	11.1	22.9	24.7	20.9	5.3	…	122
Ukraine	270	3.8	11.6	28.1	17.7	68.5	34.2	12.4	2.79	69
United Arab Emirates	3,761	3.0	9.9	37.5	33.1	39.7	13.4	8.0	1.90	31

Table A.1 | Industrial indicators by country/area, latest available year *(continued)*

	MVA per capita 2021 *(2015 US$)*	MVA growth rate 2021 *(%)*	MVA share in GDP 2021 *(%)*	MHT share in MVA 2019 *(%)*	Industry value added share in GDP 2021 *(%)*	Manufactured goods share in exports 2020 *(%)*	MHT share in manufacturing exports 2020 *(%)*	Manufacturing share in employment 2021 *(%)*	CO_2 intensity 2019 *(Kg/US$)*	CIP Index 2020 *(Rank)*
United Kingdom	4,202	7.5	9.3	48.2	12.4	75.4	65.9	9.1	0.10	16
United States of America	7,343	8.3	12.0	47.0	15.1	71.9	65.1	9.9	0.17	6
Uruguay	1,786	2.3	10.5	18.5	13.3	38.4	22.4	10.2	0.13	78
Uzbekistan	475	6.5	14.6	23.3	18.8	27.4	26.6	11.4	0.90	89
Vanuatu	87	-1.4	3.4	…	5.8	…	…	4.0	…	…
Venezuela (Bolivarian Rep. of)	191	-4.4	5.7	34.3	33.9	14.7	9.7	10.8	1.18	90
Viet Nam	487	6.0	18.0	39.0	29.3	89.9	57.5	21.0	1.59	34
Yemen	66	-0.5	10.0	2.1	14.9	96.4	0.2	5.5	0.68	154
Zambia	100	3.8	7.9	9.7	25.4	18.0	21.5	4.4	0.36	126
Zimbabwe	155	1.2	10.8	21.4	19.2	49.1	8.6	4.4	0.43	114

Source: [4; 31; 22; 52]

Note: MVA per capita figures are in constant 2015 US dollars. Figures based on national accounts variables for 2021 are UNIDO estimates. CO_2 intensity is calculated as CO_2 emissions in kilograms per unit of MVA in constant 2015 US dollars. With the objective of maximizing data availability, the latest observed value for manufacturing share in employment is used: 2021 for 32.3 per cent of the cases, 2020 for 21.5 per cent, 2019 for 10.3 per cent, and before 2019 for the remaining cases.

Table A.2 | Industrial indicators by country/area group, latest available year

	MVA per capita 2021 (2015 US$)	MVA growth rate 2021 (%)	MVA share in GDP 2021 (%)	MHT share in MVA 2019 (%)	Share in world MVA 2021 (%)	Industry value added share in GDP 2021 (%)	Manufacturing share in employment 2021 (%)	CO_2 intensity 2019 (Kg/US$)
Geographical region								
World	1,853	7.2	16.9	45.1	100.0	21.8	13.6	0.43
Africa	206	3.7	10.5	21.0	1.9	20.6	7.3	0.54
Northern Africa	407	3.6	11.3	20.3	0.7	25.0	11.6	0.68
Sub-Saharan Africa	161	3.7	10.1	21.4	1.2	18.4	6.6	0.47
Americas	3,232	7.7	12.1	44.1	22.8	15.9	11.1	0.21
Latin America and the Caribbean	1,090	6.0	13.2	36.2	4.9	18.6	12.0	0.32
Northern America	7,034	8.2	11.9	46.3	17.9	15.2	9.8	0.18
Asia	1,687	7.2	23.4	45.1	54.1	29.3	15.5	0.61
Central Asia	733	4.8	14.7	16.7	0.4	24.5	10.8	0.78
Eastern Asia	3,657	7.4	26.8	47.0	42.2	31.1	18.6	0.54
South-eastern Asia	928	3.0	21.1	44.7	4.3	27.9	14.8	0.54
Southern Asia	325	8.1	15.9	36.9	4.4	21.2	12.4	1.32
Western Asia	1,482	8.4	12.6	35.5	2.9	28.2	11.6	0.76
Europe	3,991	7.3	14.4	48.8	20.4	18.1	14.8	0.23
Eastern Europe	1,631	6.7	16.0	34.9	3.3	23.3	16.1	0.77
Northern Europe	6,314	10.6	12.8	49.6	4.6	16.9	9.8	0.09
Southern Europe	3,219	7.5	13.0	39.6	3.4	16.4	15.7	0.16
Western Europe	6,841	5.8	15.4	57.1	9.2	17.9	15.2	0.13
Oceania	2,335	2.9	5.9	26.8	0.7	13.8	6.7	0.40
Australia and New Zealand	3,192	3.1	6.0	26.9	0.7	13.6	7.2	0.37
Melanesia	177	-4.4	5.1	9.9	0.0	22.7	4.4	...
Micronesia	126	5.6	4.0	...	0.0	8.3	1.9	...
Polynesia	548	-5.0	4.9	1.6	0.0	7.4	7.9	...
Stage of industrial development								
High-income industrial economies	6,541	7.0	14.7	51.7	49.1	17.9	13.4	0.16
High-income industrializing economies	2,639	4.8	9.7	37.8	2.2	25.2	9.2	0.73
Middle-income industrial economies	2,059	7.8	22.9	39.3	41.9	28.5	16.5	0.63
Middle-income industrializing economies	314	6.1	13.6	32.2	6.5	21.7	11.8	1.13
Low-income economies	72	3.9	9.6	11.2	0.3	18.7	6.2	1.55

Table A.2 | Industrial indicators by country/area group, latest available year *(continued)*

	MVA per capita 2021 (2015 US$)	MVA growth rate 2021 (%)	MVA share in GDP 2021 (%)	MHT share in MVA 2019 (%)	Share in world MVA 2021 (%)	Industry value added share in GDP 2021 (%)	Manufacturing share in employment 2021 (%)	CO_2 intensity 2019 (Kg/US$)
Selected regional groups								
Common Market for Eastern and Southern Africa (COMESA)	186	4.0	11.6	18.1	0.8	23.2	5.2	0.65
Economic Community of Central African States (ECCAS)	125	3.6	10.4	5.3	0.2	28.9	4.0	0.21
Economic Community of West African States (ECOWAS)	192	2.6	10.2	28.8	0.5	16.5	8.5	0.18
East African Community (EAC)	108	5.2	9.9	10.1	0.1	15.3	2.6	0.80
Southern African Development Community (SADC)	185	4.5	10.1	17.9	0.5	21.7	5.3	0.65
Caribbean Community (CARICOM)	445	-0.7	9.9	25.0	0.1	20.7	6.8	0.37
Southern Common Market (MERCOSUR)	961	6.0	10.9	31.7	2.0	16.0	11.4	0.39
United States Mexico Canada Agreement (USMCA)	5,616	7.9	12.1	46.2	19.3	15.5	11.4	0.19
Association of Southeast Asian Nations (ASEAN)	930	3.0	21.1	44.7	4.3	27.9	14.8	0.54
Gulf Cooperation Council (GCC)	2,668	3.9	11.1	39.1	1.1	37.9	8.6	1.26
Commonwealth of Independent States (CIS)	996	5.2	13.8	25.3	2.0	24.1	13.1	1.21
Eurasian Economic Union (EAEU)	1,328	5.2	13.7	25.4	1.7	24.4	13.7	1.21
European Union (EU)	5,108	7.7	15.6	50.6	15.6	18.3	16.2	0.15
Other groups								
Emerging industrial economies	1,432	8.0	25.5	40.5	36.7	30.7	15.5	0.74
Least developed countries (LDCs)	135	0.5	12.5	10.5	1.0	20.1	7.9	0.38
Landlocked developing countries (LLDCs)	201	4.5	11.8	14.9	0.8	21.3	6.6	0.70
Small island developing states (SIDS)	2,306	5.0	20.3	73.6	1.1	23.9	7.9	0.30
BRICS	1,636	8.3	24.0	40.2	36.5	29.3	15.8	0.76
G20	2,607	7.5	17.3	45.7	87.9	21.4	15.1	0.42
OECD	5,366	6.9	14.3	49.8	50.6	17.7	13.5	0.17
Organization of the Petroleum Exporting Countries (OPEC)	519	4.1	9.5	36.5	1.8	29.8	9.6	1.17

Source: [4; 31]

Note: MVA per capita figures are in constant 2015 US dollars. Figures based on national accounts variables for 2021 are UNIDO estimates. CO_2 intensity is calculated as CO_2 emissions in kilograms per unit of MVA in constant 2015 US dollars. With the objective of maximizing data availability, the latest observed values for manufacturing share in employment are used to calculate the group aggregates.

B Explanatory notes

Unless otherwise indicated, *manufacturing* refers to ISIC Rev. 4 section C, and *mining and utilities* include sections B, D and E of ISIC Rev. 4 [2].

ISIC code numbers are accompanied by a descriptive title (for example, ISIC 16: "Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials"). For space considerations, however, the description is sometimes shortened (in this case, ISIC 16 may be described simply as "Wood products, excluding furniture").

In the presentation of statistical tables and visualizations, individual countries and areas are presented as economies. They are listed alphabetically, unless another ranking is more appropriate. Economies are classified according to their stage of industrial development and their geographical regions. Additional country groupings may be used whenever necessary. For a description of UNIDO's classification system, see Annex C. The list of economies according to all country groups used in the Yearbook is provided in Annex D.

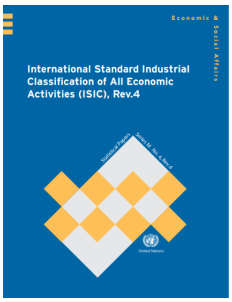
In some cases, data on economic activity are classified according to the technological intensity of industries: medium-high and high-technology, medium technology and low technology. For more details on the sources and industry allocation, see Annex D.2.

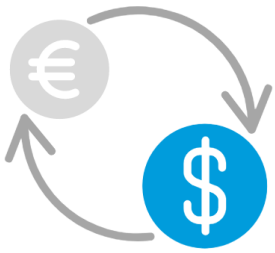
Unless otherwise stated, data for China do not include data for Hong Kong SAR, Macao SAR or Taiwan Province of China, which are presented separately.

References to dollars ($) are to dollars of the United States of America. National currencies have been converted into dollar equivalents by using period average exchange rates as published in [55] and other sources. Data converted into dollars by using current exchange rates may be influenced by exchange rate fluctuations. Annual variations in data converted in that manner may not reflect movements in national data.

: A list of ISIC codes and their corresponding descriptive titles is given in Annex D.1.

International Standard Industrial Classification of All Economic Activities





Growth rates are expressed in percentages. Periods set off by a hyphen (for instance, 2010–2020) include the beginning and end years. Apparent arithmetic discrepancies, such as percentages that do not add up to precise totals, may result from the rounding of basic data or figures known to different degrees of precision.

Throughout this publication, three dots (. . .) indicate that data are not available or are not separately reported.

C Overview of methodological aspects

One of the most important objectives of UNIDO's statistical databases and regular publications, such as this Yearbook, is providing statistical measures that facilitate international comparisons related to the manufacturing sector and the combined mining and utilities sectors. Bearing in mind the requirements of international comparability when maintaining a common platform for global industrial statistics, the data presented were compiled using the international recommendations and the standards promulgated by the UN. Concepts and definitions are drawn from [2; 3].

In this publication, information on industrial sectors and their groups are presented according to ISIC Rev. 4 [2]. Data reported in accordance with Revision 3 of ISIC (ISIC Rev. 3) [56] or other national or regional classifications of economic activities were converted to ISIC Rev. 4 using appropriate correspondence tables. In addition, UNIDO conducts imputations in case of missing data. The main objective is increasing the length of time series as well as the calculation of country group aggregates. Minor differences may arise during the conversion or estimation processes and users might find discrepancies when comparing data of later years with those of earlier years, published in the present edition of the Yearbook.

ISIC

The ISIC classification system of economic activity is maintained by United Nations Statistics Division (UNSD). The latest version of ISIC (Rev. 4) was adopted in 2006.

The Yearbook presents information sourced from a wide variety of data from national accounts, structural business statistics, industrial performance indicators and short-term statistics. These official data compiled by UNIDO, were originally collected by NSOs through surveys and censuses conducted periodically, as well as from business registers and other administrative sources. The data collected were generally complemented with estimations made by national experts.

Statistical indicators are displayed in the Yearbook in terms of percentage distributions, cross-country averages, ratios and shares, real growth rates and per capita measures. These indicators are constructed to facilitate international or time-based comparisons.

UNIDO databases provide statistical indicators to facilitate international or time-based comparisons

National accounts

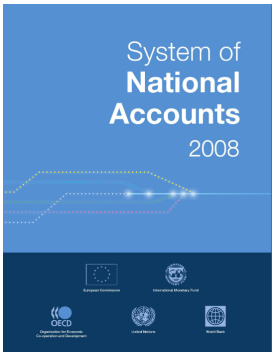
Data for total value added of the manufacturing sector (ISIC Rev. 4 section C) as well as for the combined mining and utilities sectors (ISIC Rev. 4 sections B, D and E) were estimated in accordance with the national accounting concept [57]. They represent the net contribution of the respective sectors to GDP. Information on MVA and MUVA serve as significant benchmarks for measuring performance in the respective industrial sectors. In this publication, both MVA per capita and the share of MVA in GDP are used as markers of a country's level of industrialization and its progress towards structural transformation.

UNIDO obtains data on GDP, MVA and other national accounts aggregates mostly from the National Accounts Main Aggregates Database [51]. This database is compiled by UNSD from official national accounts submitted by NSOs, supplemented with estimates generated by UNSD experts, whenever appropriate. This database, which includes data for more than 200 economies, is updated annually in December. Complete information on the estimation methodology is available in [58]. The base year of these data is currently 2015.

UNIDO Statistics complements this database with other national and international sources, as needed. In addition, UNIDO generates estimates of the main aggregates with the purpose of improving timeliness and facilitating comparability over time and across economies.

Population figures are based on data compiled by the Population Division of the United Nations Department of Economic and Social Affairs (DESA).

Main economic indicators are constructed based on the System of National Accounts



Index of industrial production (IIP)

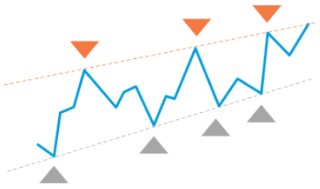
Another important economic benchmark used in the Yearbook is the IIP. This index measures the growth of industrial output in real terms. While the focus is primarily on the manufacturing sector (ISIC Rev. 4 section C), it frequently also includes some information on the mining and utilities sectors (ISIC Rev. 4 sections B, D and E). In the case of many economies, the index is available disaggregated by industries at the 2-digit level. It is usually available sub-annually, either quarterly or monthly. The IIP facilitates assessments of growth in industrial production in volume terms, independently from price fluctuations.

The information is compiled by UNIDO from NSOs' publications and other resources. Whenever the annual IIP is needed, it is either derived from the monthly or quarterly IIP, or collected from national sources if sub-annual data are not available. Similar to other industrial statistics compiled by UNIDO, information on IIP was obtained from Eurostat for

The IIP facilitates the study of growth in industrial production in volume terms independently from price fluctations

the majority of European countries. Most of the national indices are calculated using the Laspeyres formula and a combination of volume extrapolation and deflation methods. The methodologies followed are described in [59].

It should be noted that short-term estimates are often influenced by seasonal- and calendar-related effects, which hamper direct analysis of economic development. UNIDO therefore conducts seasonal adjustment of data whenever necessary. This is calculated by using the TRAMO/SEATS method in the JDemetra+ software.



UNIDO's IIP time series are
seasonally adjusted
for seasonal- and calendar-related effects

Currently, the base year of indices in the IIP databases is 2015. If any country uses a different base year or a different classification system other than ISIC Rev. 4, the national indices are converted as appropriate. Further information on the methodology and the estimation procedure of these indices is available in [60; 61].

Structural business statistics (SBS)

Indicators derived from SBS are also presented in the Yearbook. The information was originally collected and reported by NSOs, covering a wide range of variables and at a relatively detailed level of economic activity. However, the major statistical indicators exhibited here focus mainly on the manufacturing sector and the combined mining and utilities sectors at the 2-digit level of ISIC Rev. 4. The comprehensive data originating from SBS enhance assessment and comparison of industrial performance across countries at a relatively detailed level of economic activity.

SBS

These statistics are used as a source of information to understand the detailed structure, economic activity and performance of businesses.

These statistics were collected by UNIDO through various sources. They include UNIDO's General Industrial Statistics Questionnaire sent annually to NSOs, data compiled jointly by regional and international organizations such as Eurostat and the Organisation for Economic Co-operation and Development (OECD), and relevant publications issued by individual national authorities.

It is well understood that individual national data compilation schemes vary, which could affect comparability across economies. Hence, national authorities are encouraged to adhere to UN's concepts and definitions on industrial statistics, whenever possible.

Output is one of the most essential economic indicators in industrial statistics. Data reported on the census concept only cover activities of industrial nature. Whenever data based on census concept are not separately available, those derived from national accounts are used. The value of output in the case of estimates compiled on a production basis comprises:

a) the value of the sale of all products of the establishment;

b) the net change between the beginning and end of the reference period in the value of work in progress and stocks of goods to be shipped in the same condition as received;
c) the value of industrial work performed or industrial services rendered to others;
d) the value of goods shipped in the same condition as received less the amount paid for these goods; and
e) the value of fixed assets produced during the period by the unit for its own use.

In the case of estimates compiled on a shipment basis, the net change in the value of stocks of finished goods between the beginning and end of the reference period is also included. Gross output is equivalent to census output plus the revenue from activities of a non-industrial nature.

Valuation methods of output vary across countries. The main difference is the inclusion or exclusion of taxes and subsidies on products and other taxes and subsidies on production. Values at factor costs exclude taxes on production (taxes that the producing units are liable to pay as a result of engaging in production) and includes subsidies on production (subsidies that resident enterprises may receive as a result of engaging in production, with the exception of direct subsidies on products). Values at basic prices equal values at factor prices including taxes on production and excluding subsidies on production. Finally, values at producers' prices equal values at basic prices plus taxes on products (which are those taxes payable per unit of a product, excluding value-added tax (VAT)) minus subsidies on products (subsidies receivable per unit of a product) (for more details, see [13, p. 5]).

Value at factor costs
excludes taxes on production and includes subsidies on production

Value at basic prices
= value at factor costs + taxes on production - subsidies on production

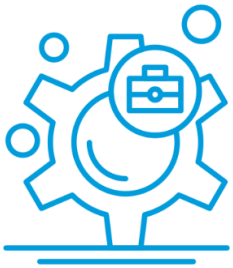
Value at producers' prices
= value at basic prices + taxes on products (excl. VAT) - subsidies on products

Another important economic measurement is value added, which is defined as the value of output less the value of inputs at purchasers' prices. Items covered in the latter include:

a) value of materials and supplies for production, including the cost of all fuels and electricity purchased;
b) the cost of services received (mainly payments for contract and commission work and repair and maintenance work).

If input estimates are compiled on a "received" rather than on a "consumed" basis, the result is adjusted for the net change between the beginning and the end of the period in the value of stocks of materials, fuel and other supplies. The estimates of value added are gross of depreciation and other provisions for capital consumption, unless otherwise stated. The valuation may be at factor costs, at basic prices or at producers' prices, depending on the treatment of indirect taxes and subsidies as described above.

Another important statistical concept presented in UNIDO's databases and this publication is employment. Estimates on the number of employees include both full-time and part-time workers, excluding working proprietors, active business partners, unpaid family workers and home workers. The figures reported usually refer to the average number of workers during the reference year, obtained as the sum of the "average number of employees" during the year and the total number of other workers measured for a single period of the year. National authorities may use the data on the number of persons engaged when those for the employees are not separately available. However, figures for persons engaged cover employees, working proprietors, active business partners and unpaid family workers. It is worth noting that this publication also uses employment estimates obtained through household or labour force surveys; although they are more timely and may provide a more complete coverage than employment estimates from SBS, they are not available with the same level of detail by industry of economic activity.



Employee

This is defined as a person who works for an employer on the basis of a contract of employment and receives compensation in the form of wages, salaries, fees, gratuities, piecework pay or remuneration in kind.

It must be noted that aggregated national accounts data and SBS may be combined with the objective of providing comprehensive statistics for analysing and comparing industrial performance across country groups at a relatively detailed level of economic activity. For instance, it is possible to construct indicators with the combined information from the IIP and value added estimates obtained from SBS. For each economy and industrial division, value added estimates were generated by applying IIP figures to the 2015 value added base weights. These weights were estimated by UNIDO using various national and international sources.

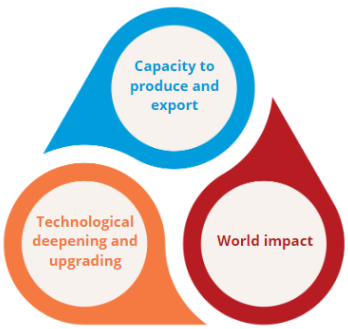
SBS vs. national accounts

In general, information on volume and prices is not available from SBS, while this is a key component of national accounting.

For more country-specific SBS, readers can refer to the databases freely available at UNIDO [26].

Competitive Industrial Performance (CIP) index

The CIP Index is a composite indicator that measures the capacity of countries to increase their presence in international and domestic markets, while developing industrial sectors and activities with higher value added and higher technological level. It is constructed by combining eight variables across three dimensions:



a) *Capacity to produce and export manufactured goods.* This dimension captures a country's ability to increase the presence of its manufactured goods in international and domestic markets. It covers comparable measures of the country's manufacturing production and exports, namely MVA and manufacturing exports in per capita terms. These indicators allow for cross-country

comparisons, independent of the differences in population or economy size.

b) *Technological deepening and upgrading*. The second dimension measures the technological complexity of manufacturing processes in a country by using two composite indices. First, the degree of industrialization intensity that estimates the complexity of production processes. This indicator consists of the share of MVA originating from MHT sectors and the share of MVA in GDP. Second, export quality, another composite indicator that measures the quality of the integration process of the country's manufacturing sector. This indicator is estimated based on the share of MHT manufacturing exports in total manufacturing exports, and the share of manufacturing exports in total exports.

c) *World impact*. The third dimension serves as a proxy for economies of agglomeration, scope and scale present in a country's manufacturing sector. It captures the world impact based on two indicators: the country's share in world MVA and in world trade of manufactured goods.

The higher the CIP score in any of the variables, the higher the country's industrial competitiveness

All variables are first standardized to $[0, 1]$ intervals. Scores for each dimension are obtained by calculating the geometric mean of the underlying variables. Finally, the overall CIP score is calculated as the geometric mean of the scores for the three dimensions. The higher the score in any of the variables, the higher the country's industrial competitiveness and its rank in the overall CIP Index. The detailed conceptual framework and methodology of the index is described in [62].

Sustainable Development Goal (SDG) 9 indicators

Following the adoption of the 2030 Agenda for Sustainable Development, the global indicator framework for SDGs was developed by the IAEG-SDGs. This was adopted by the UN General Assembly in July 2017 and is contained in the Resolution adopted by the General Assembly on Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development [63].

UNIDO is a custodian agency of six industry-related SDG indicators under Goal 9:

- 9.2.1 Manufacturing value added as a proportion of GDP and per capita
- 9.2.2 Manufacturing employment as a proportion of total employment
- 9.3.1 Proportion of small-scale industries in total industry value added

- 9.3.2 Proportion of small-scale industries with a loan or line of credit
- 9.4.1 CO_2 emission per unit of value added
- 9.b.1 Proportion of medium and high-tech industry value added in total value added.

The latest reference metadata information for all SDG indicators are available in [64]. The current global SDG database can be consulted at [23].

UNIDO has developed advanced tools for monitoring the performance of countries towards achieving the SDG 9 industry-related targets of the 2030 Agenda. These include an overall composite index, as well as a progress metric and an outlook assessment. They have the objective of identifying lagging cases and thus support countries in their successful implementation of ISID. These tools are available under the SDG 9 Industry Tracker of UNIDO's Industrial Analytics Platform (IAP) [25]. Detailed methodological notes about these tools are available at [11]. Data on SDG 9 indicators can also be obtained from [31].

What drives SDG 9 industry performance?
Check out the progress on
SDG 9 Industry Tracker

Country/area classifications

UNIDO databases and statistical publications rely to a great extent on a classification system for countries/areas. These are used with the objective of summarizing large amounts of country-level data into relevant insights and common trends observed in countries facing similar development challenges.

Countries/areas are classified according to their stage of industrial development and by income

The main classification proposed by UNIDO divides countries according to their stage of industrial development. It is a combination of two dimensions: (i) per capita income levels, sourced from the World Bank's 2022 income groups [65]; and (ii) structural transformation metrics (MVA per capita in constant US dollars and historical maximum of the share of MVA in GDP), calculated from UNIDO's databases. This classification system allocates countries/areas among five groups:

- *High-income industrial economies*: countries/areas that have achieved a high national income through a development path that resulted in highly industrialized economies.
- *High-income industrializing economies*: countries/areas with a high income level but with relatively low levels of industrialization.
- *Medium-income industrial economies*: countries/areas classified as medium-income economies, but that have already achieved positive outcomes in terms of structural transformation indicators.

- *Medium-income industrializing economies*: countries/areas classified as medium-income but that still remain at comparatively low levels of industrialization; these are some of the economies that could benefit the most from prioritizing industrial development in their policy strategies.
- *Low-income economies*: countries/areas that remain at low income levels and also underperform in industrial development indicators; these economies would greatly gain from an accelerated structural change process that could help them escape the development trap.

The list of economies according to these five groups is included in Annex D.4. Methodological details can be found in [66].

A special economic group proposed by UNIDO is that of emerging industrial economies. These are the most dynamic low- and middle-income economies in terms of their industrial performance. It includes economies that have continuously registered positive spells of growth in MVA. This group includes 13 economies: four middle-income industrial economies, seven middle-income industrializing economies and two low-income economies. The list is given in Annex D.5, while more information on the selection methodology can be found in [66].

Emerging industrial economies is a group of countries/areas characterized by a continuous **positive growth in MVA**

Countries/areas are also classified according to geographical region. The official UN classification of countries and areas for statistical use (M49) is used [67]. According to this classification, all world economies are assigned to one of five main regions (continents), which are then further divided into subregions. These regional groupings are, inter alia, the main classification system used for SDG indicators. The complete classification is given in Annex D.3.

The Yearbook also considers the three groups with specific development challenges, according to official UN lists. These are LDCs, landlocked developing countries (LLDCs) and small island developing State (SIDS), presented in Annex D.5. For the thorough examination of LDCs in Chapter 5, a further distinction is made: (i) African LDCs and Haiti, and (ii) LDCs in Asia and Oceania.

Geographical regions follow the official UN classification of countries and areas for statistical use: **M49 Standard**

Finally, additional groups may be considered whenever relevant. These include regional groups, economic alliances, free trade areas or political organizations. Official membership lists valid in 2022 are always used in these cases.

D Classifications

D.1 International Standard Industrial Classification of All Economic Activities

Table D.1.1 | ISIC Rev. 4 B – Mining and quarrying

Division	Group	Description
05		Mining of coal and lignite
	051	Mining of hard coal
	052	Mining of lignite
06		Extraction of crude petroleum & natural gas
	061	Extraction of crude petroleum
	062	Extraction of natural gas
07		Mining of metal ores
	071	Mining of iron ores
	072	Mining of non-ferrous metal ores
08		Other mining and quarrying
	081	Quarrying of stone, sand and clay
	089	Mining and quarrying n.e.c.
09		Mining support service activities
	091	Support activities for petroleum
	099	Support activities for other mining, quarrying

Source: [2]

Table D.1.2 | ISIC Rev. 4 C - Manufacturing

Division	Group	Description
10		Food products
	101	Processing/preserving of meat
	102	Processing/preserving of fish, etc.
	103	Processing/preserving of fruit, vegetables
	104	Vegetable and animal oils and fats
	105	Dairy products
	106	Grain mill products, starches and starch products
	107	Other food products
	108	Prepared animal feeds
11		Beverages
	110	Beverages
12		Tobacco products
	120	Tobacco products
13		Textiles
	131	Spinning, weaving and finishing of textiles
	139	Other textiles
14		Wearing apparel
	141	Wearing apparel, except fur apparel
	142	Articles of fur
	143	Knitted and crocheted apparel
15		Leather and related products
	151	Leather; luggage, handbags, saddlery, harness; fur
	152	Footwear
16		Wood products, excluding furniture
	161	Sawmilling and planing of wood
	162	Wood products, cork, straw, plaiting materials
17		Paper and paper products
	170	Paper and paper products
18		Printing and reproduction of recorded media
	181	Printing and service activities related to printing
	182	Reproduction of recorded media
19		Coke and refined petroleum products
	191	Coke oven products
	192	Refined petroleum products
20		Chemicals and chemical products
	201	Basic chemicals, fertilizers, etc.
	202	Other chemical products
	203	Man-made fibres
21		Pharmaceuticals, medicinal chemicals, etc.
	210	Pharmaceuticals, medicinal chemicals, etc.
22		Rubber and plastics products
	221	Rubber products
	222	Plastics products
23		Other non-metallic mineral products
	231	Glass and glass products
	239	Non-metallic mineral products n.e.c.
24		Basic metals
	241	Basic iron and steel
	242	Basic precious and other non-ferrous metals
	243	Casting of metals

Table D.1.2 | ISIC Rev. 4 C - Manufacturing *(continued)*

Division	Group	Description
25		Fabricated metal products, except machinery
	251	Struct.metal products, tanks, reservoirs
	252	Weapons and ammunition
	259	Other metal products; metal working services
26		Computer, electronic and optical products
	261	Electronic components and boards
	262	Computers and peripheral equipment
	263	Communication equipment
	264	Consumer electronics
	265	Measuring, testing equipment; watches, etc.
	266	Irradiation/electromedical equipment, etc.
	267	Optical instruments and photographic equipment
	268	Magnetic and optical media
27		Electrical equipment
	271	Electric motors, generators, transformers, etc.
	272	Batteries and accumulators
	273	Wiring and wiring devices
	274	Electric lighting equipment
	275	Domestic appliances
	279	Other electrical equipment
28		Machinery and equipment n.e.c.
	281	General-purpose machinery
	282	Special-purpose machinery
29		Motor vehicles, trailers and semi-trailers
	291	Motor vehicles
	292	Automobile bodies, trailers and semi-trailers
	293	Parts and accessories for motor vehicles
30		Other transport equipment
	301	Building of ships and boats
	302	Railway locomotives and rolling stock
	303	Air and spacecraft and related machinery
	304	Military fighting vehicles
	309	Transport equipment n.e.c.
31		Furniture
	310	Furniture
32		Other manufacturing
	321	Jewellery, bijouterie and related articles
	322	Musical instruments
	323	Sports goods
	324	Games and toys
	325	Medical and dental instruments and supplies
	329	Other manufacturing n.e.c.
33		Repair and installation of machinery/equipment
	331	Repair of fabricated metal products/machinery
	332	Installation of industrial machinery/equipment

Source: [2]

Table D.1.3 | ISIC Rev. 4 D - Electricity, gas, steam and air conditioning supply

Division	Group	Description
35		Electricity, gas, steam & air conditioning
	351	Electric power generation, transmission
	352	Manufacture of gas
	353	Steam and air conditioning supply

Source: [2]

Table D.1.4 | ISIC Rev. 4 E - Water supply; sewerage, waste management and remediation activities

Division	Group	Description
36		Water collection, treatment and supply
	360	Water collection, treatment and supply
37		Sewerage
	370	Sewerage
38		Waste collection, treatment, disposal activities
	381	Waste collection
	382	Waste treatment and disposal
	383	Materials recovery
39		Remediation activities
	390	Remediation activities

Source: [2]

D.2 Classification of manufacturing industries by technological intensity

UNIDO implements a classification that assigns manufacturing industries to three technology categories: medium-high and high technology (MHT), medium technology (MT) and low technology (LT). This classification is based on research and development (R&D) expenditure relative to value added, also known as R&D intensity. A taxonomy of manufacturing industries with different ranges of R&D intensity can be found in [68]. The classification, presented in Table D.2.1, relies on ISIC Rev. 4 at the division and group (2- and 3-digit) levels. A simplified version of this classification, listed in Table D.2.2, is based only on manufacturing industries at the division (2-digit) level. This can be used when broader manufacturing sectors are of interest or when only data at the division level are available [69].

Table D.2.1 | Classification of manufacturing industries by technological intensity (ISIC Rev. 4)

Division/Group	Description
Medium-high and high-technology	
20	Chemicals and chemical products
21	Pharmaceuticals, medicinal chemicals, etc.
252	Weapons and ammunition
26	Computer, electronic and optical products
27	Electrical equipment
28	Machinery and equipment n.e.c.
29	Motor vehicles, trailers and semi-trailers
30 (less 301)	Other transport equipment except ships and boats
325	Medical and dental instruments and supplies
Medium-technology	
22	Rubber and plastics products
23	Other non-metallic mineral products
24	Basic metals
301	Building of ships and boats
32 (less 325)	Other manufacturing except medical and dental instruments
33	Repair and installation of machinery/equipment
Low-technology	
10	Food products
11	Beverages
12	Tobacco products
13	Textiles
14	Wearing apparel
15	Leather and related products
16	Wood products, excluding furniture
17	Paper and paper products
18	Printing and reproduction of recorded media
19	Coke and refined petroleum products
25 (less 252)	Fabricated metal products except weapons and ammunition
31	Furniture

Source: [68]

Table D.2.2 | Simplified classification of manufacturing by technological intensity (ISIC Rev. 4)

Division	Description
Medium-high and high-technology	
20	Chemicals and chemical products
21	Pharmaceuticals, medicinal chemicals, etc.
26	Computer, electronic and optical products
27	Electrical equipment
28	Machinery and equipment n.e.c.
29	Motor vehicles, trailers and semi-trailers
30	Other transport equipment
Medium-technology	
22	Rubber and plastics products
23	Other non-metallic mineral products
24	Basic metals
32	Other manufacturing
33	Repair and installation of machinery/equipment
Low-technology	
10	Food products
11	Beverages
12	Tobacco products
13	Textiles
14	Wearing apparel
15	Leather and related products
16	Wood products, excluding furniture
17	Paper and paper products
18	Printing and reproduction of recorded media
19	Coke and refined petroleum products
25	Fabricated metal products, except machinery
31	Furniture

Source: UNIDO classification based on [68]

D.3 Country/area classification by geographical regions

Table D.3.1 | Country/area classification by geographical regions

Africa	**Americas**	China, Hong Kong SAR	Northern Europe
Eastern Africa	Caribbean	China, Macao SAR	Denmark
Burundi	Anguilla	China, Taiwan Province	Estonia
Comoros	Antigua and Barbuda	Democratic People's Rep of Korea	Finland
Djibouti	Aruba	Japan	Iceland
Eritrea	Bahamas	Mongolia	Ireland
Ethiopia	Barbados	Republic of Korea	Latvia
Kenya	British Virgin Islands	South-eastern Asia	Lithuania
Madagascar	Cayman Islands	Brunei Darussalam	Norway
Malawi	Cuba	Cambodia	Sweden
Mauritius	Curaçao	Indonesia	United Kingdom
Mozambique	Dominica	Lao People's Dem Rep	Southern Europe
Rwanda	Dominican Republic	Malaysia	Albania
Seychelles	Grenada	Myanmar	Andorra
Somalia	Haiti	Philippines	Bosnia and Herzegovina
South Sudan	Jamaica	Singapore	Croatia
Uganda	Montserrat	Thailand	Greece
United Republic of Tanzania	Puerto Rico	Timor-Leste	Italy
Zambia	Saint Kitts and Nevis	Viet Nam	Kosovo
Zimbabwe	Saint Lucia	Southern Asia	Malta
Middle Africa	Saint Vincent and the Grenadines	Afghanistan	Montenegro
Angola	Sint Maarten (Dutch part)	Bangladesh	North Macedonia
Cameroon	Trinidad and Tobago	Bhutan	Portugal
Central African Republic	Turks and Caicos Islands	India	San Marino
Chad	Central America	Iran (Islamic Republic of)	Serbia
Congo	Belize	Maldives	Slovenia
Democratic Rep of the Congo	Costa Rica	Nepal	Spain
Equatorial Guinea	El Salvador	Pakistan	Western Europe
Gabon	Guatemala	Sri Lanka	Austria
Sao Tome and Principe	Honduras	Western Asia	Belgium
Northern Africa	Mexico	Armenia	France
Algeria	Nicaragua	Azerbaijan	Germany
Egypt	Panama	Bahrain	Liechtenstein
Libya	Northern America	Cyprus	Luxembourg
Morocco	Bermuda	Georgia	Monaco
Sudan	Canada	Iraq	Netherlands
Tunisia	Greenland	Israel	Switzerland
Southern Africa	United States of America	Jordan	**Oceania**
Botswana	South America	Kuwait	Australia and New Zealand
Eswatini	Argentina	Lebanon	Australia
Lesotho	Bolivia (Plurinational State of)	Oman	New Zealand
Namibia	Brazil	Qatar	Melanesia
South Africa	Chile	Saudi Arabia	Fiji
Western Africa	Colombia	State of Palestine	New Caledonia
Benin	Ecuador	Syrian Arab Republic	Papua New Guinea
Burkina Faso	Guyana	Türkiye	Solomon Islands
Cabo Verde	Paraguay	United Arab Emirates	Vanuatu
Côte d'Ivoire	Peru	Yemen	Micronesia
Gambia	Suriname	**Europe**	Kiribati
Ghana	Uruguay	Eastern Europe	Marshall Islands
Guinea	Venezuela (Bolivarian Republic of)	Belarus	Micronesia, Federated States of
Guinea-Bissau	**Asia**	Bulgaria	Nauru
Liberia	Central Asia	Czechia	Palau
Mali	Kazakhstan	Hungary	Polynesia
Mauritania	Kyrgyzstan	Poland	Cook Islands
Niger	Tajikistan	Republic of Moldova	French Polynesia
Nigeria	Turkmenistan	Romania	Samoa
Senegal	Uzbekistan	Russian Federation	Tonga
Sierra Leone	Eastern Asia	Slovakia	Tuvalu
Togo	China	Ukraine	

Source: [67]

D.4 Country/area classification by stage of industrial development

Table D.4.1 | Country/area classification by stage of industrial development

High-income industrial economies			
Australia	France	Luxembourg	Singapore
Austria	Germany	Malta	Slovakia
Belgium	Hungary	Nauru	Slovenia
Brunei Darussalam	Ireland	Netherlands	Spain
Canada	Israel	New Caledonia	Sweden
China, Taiwan Province	Italy	New Zealand	Switzerland
Croatia	Japan	Poland	Trinidad and Tobago
Czechia	Latvia	Puerto Rico	United Kingdom
Estonia	Liechtenstein	Republic of Korea	United States of America
Finland	Lithuania	San Marino	Uruguay
High-income industrializing economies			
Andorra	Cayman Islands	Greece	Portugal
Anguilla	Chile	Greenland	Qatar
Antigua and Barbuda	China, Hong Kong SAR	Iceland	Saint Kitts and Nevis
Aruba	China, Macao SAR	Kuwait	Saudi Arabia
Bahamas	Cook Islands	Monaco	Seychelles
Bahrain	Curaçao	Montserrat	Sint Maarten (Dutch part)
Barbados	Cyprus	Norway	Turks and Caicos Islands
Bermuda	Denmark	Oman	United Arab Emirates
British Virgin Islands	French Polynesia	Palau	
Middle-income industrial economies			
Argentina	Ecuador	Mauritius	Serbia
Belarus	Egypt	Mexico	South Africa
Brazil	El Salvador	Panama	Sri Lanka
Bulgaria	Equatorial Guinea	Paraguay	Suriname
China	Eswatini	Peru	Thailand
Colombia	Indonesia	Philippines	Türkiye
Costa Rica	Jordan	Romania	Turkmenistan
Dominican Republic	Malaysia	Russian Federation	Venezuela (Bolivarian Republic of)
Middle-income industrializing economies			
Albania	Dominica	Lebanon	Saint Vincent and the Grenadines
Algeria	Fiji	Lesotho	Samoa
Angola	Gabon	Libya	Sao Tome and Principe
Armenia	Georgia	Maldives	Senegal
Azerbaijan	Ghana	Marshall Islands	Solomon Islands
Bangladesh	Grenada	Mauritania	State of Palestine
Belize	Guatemala	Micronesia, Federated States of	Tajikistan
Benin	Guyana	Mongolia	Timor-Leste
Bhutan	Haiti	Montenegro	Tonga
Bolivia (Plurinational State of)	Honduras	Morocco	Tunisia
Bosnia and Herzegovina	India	Myanmar	Tuvalu
Botswana	Iran (Islamic Republic of)	Namibia	Ukraine
Cabo Verde	Iraq	Nepal	United Republic of Tanzania
Cambodia	Jamaica	Nicaragua	Uzbekistan
Cameroon	Kazakhstan	Nigeria	Vanuatu
Comoros	Kenya	North Macedonia	Viet Nam
Congo	Kiribati	Pakistan	Zambia
Côte d'Ivoire	Kosovo	Papua New Guinea	Zimbabwe
Cuba	Kyrgyzstan	Republic of Moldova	
Djibouti	Lao People's Dem Rep	Saint Lucia	
Low income			
Afghanistan	Eritrea	Malawi	South Sudan
Burkina Faso	Ethiopia	Mali	Sudan
Burundi	Gambia	Mozambique	Syrian Arab Republic
Central African Republic	Guinea	Niger	Togo
Chad	Guinea-Bissau	Rwanda	Uganda
Democratic People's Rep of Korea	Liberia	Sierra Leone	Yemen
Democratic Rep of the Congo	Madagascar	Somalia	

Source: [66]

D.5 Other common country/area groups

Table D.5.1 | List of countries/areas included in emerging industrial economies

Emerging industrial economies			
Bangladesh	India	Myanmar	Viet Nam
Cambodia	Indonesia	Sri Lanka	
China	Lao People's Dem Rep	Uganda	
Ethiopia	Malaysia	United Republic of Tanzania	

Source: [66]

Table D.5.2 | List of countries/areas included in least developed countries (LDCs)

Least developed countries (LDCs)			
Afghanistan	Djibouti	Malawi	Somalia
Angola	Eritrea	Mali	South Sudan
Bangladesh	Ethiopia	Mauritania	Sudan
Benin	Gambia	Mozambique	Timor-Leste
Bhutan	Guinea	Myanmar	Togo
Burkina Faso	Guinea-Bissau	Nepal	Tuvalu
Burundi	Haiti	Niger	Uganda
Cambodia	Kiribati	Rwanda	United Republic of Tanzania
Central African Republic	Lao People's Dem Rep	Sao Tome and Principe	Yemen
Chad	Lesotho	Senegal	Zambia
Comoros	Liberia	Sierra Leone	
Democratic Rep of the Congo	Madagascar	Solomon Islands	

Source: [70]

Table D.5.3 | List of countries/areas included in landlocked developing countries (LLDCs)

Landlocked developing countries (LLDCs)			
Afghanistan	Central African Republic	Malawi	Rwanda
Armenia	Chad	Mali	South Sudan
Azerbaijan	Eswatini	Mongolia	Tajikistan
Bhutan	Ethiopia	Nepal	Turkmenistan
Bolivia (Plurinational State of)	Kazakhstan	Niger	Uganda
Botswana	Kyrgyzstan	North Macedonia	Uzbekistan
Burkina Faso	Lao People's Dem Rep	Paraguay	Zambia
Burundi	Lesotho	Republic of Moldova	Zimbabwe

Source: [71]

Table D.5.4 | List of countries/areas included in small island developing states (SIDS)

Small island developing states (SIDS)			
Anguilla	Dominica	Mauritius	Sao Tome and Principe
Antigua and Barbuda	Dominican Republic	Micronesia, Federated States of	Seychelles
Aruba	Fiji	Montserrat	Singapore
Bahamas	French Polynesia	Nauru	Sint Maarten (Dutch part)
Barbados	Grenada	New Caledonia	Solomon Islands
Belize	Guinea-Bissau	Palau	Suriname
British Virgin Islands	Guyana	Papua New Guinea	Timor-Leste
Cabo Verde	Haiti	Puerto Rico	Tonga
Comoros	Jamaica	Saint Kitts and Nevis	Trinidad and Tobago
Cook Islands	Kiribati	Saint Lucia	Tuvalu
Cuba	Maldives	Saint Vincent and the Grenadines	Vanuatu
Curaçao	Marshall Islands	Samoa	

Source: [72]

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Concepts and definitions

C | E | G | H | I | L | M | N | O | P | S | U | V | W

C

CO_2 emission intensity Indicator computed as the ratio between CO_2 emissions from fuel combustion and the value added of associated economic activities. It can be computed for the entire economy (total CO_2 emissions per unit of GDP) or for specific sectors, notably the manufacturing sector (CO_2 emissions from manufacturing per unit of MVA). 25, 57

Committee for Development Policy (CDP) Subsidiary body of the Economic and Social Council (ECOSOC) that advises the Council on a wide range of issues that are relevant for the implementation of the 2030 Agenda for Sustainable Development. It is composed of 24 members, nominated in their personal capacity by the UN Secretary-General and appointed by ECOSOC for a period of three years. Every three years, the CDP reviews the LDC category and recommends to ECOSOC and the UN General Assembly which countries should be included into or graduated from the list. 1, 76

E

Economic and Environmental Vulnerability Index (EVI) Composite indicator of a country's structural vulnerability to economic and environmental shocks, with higher values indicating a higher vulnerability. It is calculated by the CDP and used as one of the three criteria for inclusion or graduation from the LDC category (inclusion threshold is 36, while graduation threshold is 32). It is calculated as the equal-weighted average of eight variables grouped into two categories: economic (share of agriculture, forestry and fisheries in GDP; remoteness and landlockedness; merchandise export concentration; and instability of exports of goods and services) and environmental (share of population in low elevated coastal zones; share of population living on drylands; instability of agricultural production; and victims of disasters) [48]. 1, 77

Economies of scale In economics, this term refers to the reduced cost per unit that arises from a higher production level. 8

Electricity, gas, steam and air-conditioning supply This sector refers to ISIC Rev. 4 section D. It includes the provision of electric power, natural gas, steam, hot water, air-conditioning supply and the like through a permanent infrastructure of lines, mains and pipes. This section also includes the operation of electric and gas utilities, which generate, control and distribute electric power or gas. 7, 62, 65, 124

G

Gender Inequality Index (GII) Composite measure of gender inequality, quantifying gender-based disadvantage in three dimensions: reproductive health, empowerment and participation in the labor market. Higher scores in the GII indicate higher gender inequality levels. This indicator is produced by United Nations Development Programme (UNDP) [10]. 1, 10

Gross domestic product (GDP) GDP basically derives from the concept of gross value added. GDP is the sum of gross value added of all resident producer units plus the part (possibly the total) of taxes on products that is not included in the valuation of output, less subsidies on products [14, p. 34]. 1, 7, 14, 123

Gross national income (GNI) Sum of gross primary incomes receivable by resident institutional units or sectors. It is equal to GDP less primary incomes payable to non-resident units plus primary incomes receivable from non-resident units. In other words, it is equal to GDP less taxes (less subsidies) on production and imports, compensation of employees and property income payable to the rest of

the world, plus the corresponding items receivable from the rest of the world. In contrast to GDP, GNI is not a concept of value added, but a concept of income [14, p. 34]. 1, 76

H

Human Assets Index (HAI) Composite indicator of human capital level in a country, with higher values indicating a higher development of human capital. It is calculated by the CDP and used as one of the three criteria for inclusion or graduation from the LDC category (inclusion threshold is 60, while graduation threshold is 66). It is calculated as the equal-weighted average of six variables grouped into two categories: health (under-five mortality rate, prevalence of stunting and maternal mortality ratio) and education (gross secondary school enrolment ratio, adult literacy rate and gender parity index for gross secondary school enrolment) [48]. 1, 77

Human Development Index (HDI) Long-standing indicator measuring human development, defined as the process of expanding people's freedoms and opportunities and improving their well-being. The HDI is a composite index of three dimensions: 1) the ability to lead a long and healthy life, measured by life expectancy at birth; 2) the ability to acquire knowledge, measured by mean years of schooling and expected years of schooling; and 3) the ability to achieve a decent standard of living, measured by gross national income per capita. A higher HDI value indicates a higher human development level. This indicator is calculated and maintained by UNDP [10]. 1, 9

I

Index of industrial production (IIP) Indicator that describes changes in the volume of goods produced in industrial sectors over time. Its main purpose is to provide a measure of short-term changes in value added over a given reference period. However, since it is difficult to collect high-frequency data to accurately measure value added, gross output measures such as the value of production or turnover data are more commonly used. The IIP, being a volume index, is not influenced by price fluctuations [59, p. 11]. 1, 13, 102

Industrial statistics Field of statistics related to the characteristics and economic activities of all resident units in the reporting country that are primarily active in the following productive activities:

a. Mining and quarrying (ISIC Rev. 4 section B);
b. Manufacturing (ISIC Rev. 4 section C);
c. Electricity, gas, steam and air-conditioning supply (ISIC Rev. 4 section D);
d. Water supply; sewerage, waste management and remediation activities (ISIC Rev. 4 section E).

Industrial statistics form part of the broader domain of structural and short-term business statistics [3, pp. 2 and 12]. 3, 7, 14–16, 68

Industry This term refers to the set of all production units engaged primarily in the same or similar kinds of productive activity [2, p. 9] The ISIC provides the international guidelines for cataloguing economic activity into specific industries, such as agriculture, mining, manufacturing or services. 7, 8

Inequality-adjusted Human Development Index (IHDI) In addition to the original HDI, UNDP proposes several alternative versions of the index, including the IHDI. This indicator considers the distribution of each variable across the population and adjusts it by "discounting" each dimension's average value according to its level of inequality. The difference between the HDI and the IHDI is the human development cost of inequality [10]. 1, 9

Informal sector A production unit in the informal sector may be defined as a household enterprise with at least some production for sale or barter that meets one or more of the following criteria: limited size in terms of employment, non-registration of the enterprise and non-registration of its employees [3, p. 34]. 14

ISIC The International Standard Industrial Classification of All Economic Activities, abbreviated as ISIC, is a standard classification of economic activities arranged so that entities can be classified according to the activity they carry out. Currently, the fourth revision of ISIC [2] is the most commonly used, and it is the reference used throughout this Yearbook. The hierarchically structured ISIC Rev. 4 classification contains sections, divisions, groups and classes. The ISIC classification is maintained by UNSD. 1, 7, 101

L

Least developed country (LDC) The LDC category was established by the United Nations (UN) General Assembly in 1971. The UN defines LDCs as countries that have low-income levels and face severe structural impediments to sustainable development. 1

M

Manufacturing This industry refers to ISIC Rev. 4 section C. It includes activities related to the physical or chemical transformation of materials, substances or components into new products, although such a definition cannot be used as the single universal criterion for determining what constitutes manufacturing (see [2] for mode details on activities included and not included in manufacturing). The materials, substances or components transformed are raw materials that are products of agriculture, forestry, fishing, mining or products of other manufacturing activities. Substantial alteration, renovation or reconstruction of goods is generally considered to be manufacturing. The output of a manufacturing process may be finished in the sense that it is ready for utilization or consumption, or it may be semi-finished in the sense that it is to become an input for further manufacturing. 7, 124

Manufacturing value added (MVA) This is a national accounts aggregate measuring the exclusive and exhaustive contribution of manufacturing to GDP [15, p. 5]. 1, 9, 14

Mining and quarrying This industry corresponds to ISIC Rev. 4 section B. It includes activities related to the extraction of minerals that occur naturally as solids (coal and ores), liquids (petroleum) or gases (natural gas). Supplementary activities aimed at preparing the crude materials for marketing are also included, if they are undertaken in conjunction with mining, for example, crushing, grinding, cleaning, drying, sorting, concentrating ores, liquefaction of natural gas and agglomeration of solid fuels. 7, 62, 65, 124

Mining and utilities value added (MUVA) This is a national accounts aggregate measuring the exclusive and exhaustive contribution of mining and utilities sectors to GDP. 1, 20

Multidimensional Poverty Index (MPI) Non-monetary measure of poverty that considers indicators of health, education and living standards to determine a population's degree of poverty from multiple dimensions. It is an alternative to consumption- or income-based measures of poverty [10]. Theoretically, the MPI can take values between zero to one, with higher values indicating higher levels of multidimensional poverty. 1, 9

N

National accounts System of accounts based on the internationally recommended system of national accounts (SNA) and that provide a coherent, consistent and integrated set of macroeconomic accounts, balance sheets and tables based on a set of internationally agreed concepts, definitions, classifications and accounting rules. They provide a comprehensive accounting framework within which economic data can be compiled and presented in a format that is designed for purposes of economic analysis, decision-taking and policy-making [73]. 14, 68

Number of persons engaged and number of employees Total number of persons who worked in or for an establishment during the reference year. The concept covers working proprietors, active business

partners and unpaid family workers as well as employees, but usually excludes home workers. The figures reported under this concept refer normally to the average number of persons engaged during the reference year, obtained as the sum of the average number of employees during the year and the total number of other persons engaged measured for a single period of the year. 68, 70

O

Output The value of output comprises the value of sale of all products; the net change between the beginning and end of the reference period in the value of work in progress and stocks of goods to be shipped in the same condition as received; the value of industrial work performed or industrial services rendered to others; the value of goods shipped in the same condition as received less the amount paid for these goods; and the value of fixed assets produced during the period by the unit for its own use. Differences between countries may arise from differences in concepts and valuation methods. Note that these are industrial statistics [3] and national accounting concepts [14] and they cannot be directly observed from the accounting records of enterprises/establishments; they are approximated from available information as shown in Figure 1.5. 68

P

Primary commodity A good characterized by its fungibility, or its ability to be interchanged with other goods of the same type. Primary or basic commodities generally include limited value addition and their producers usually have low price and market power. They include agricultural products as well as minerals and metals. 78, 81

Productivity Productivity measures how efficiently inputs (such as labour, capital or energy) are used to produce goods and services. Firms and national economies can sustainably increase their productivity by enhancing the skills of the workforce, investing in better infrastructure, adopting new technologies, improving workers' safety and health or incorporating more efficient business practices. 57

S

Short-term statistics (STS) Infra-annual production-related statistics collected to monitor the business cycle. They are suitable for the short-term evaluation of supply, demand and production factors [3, p. 3]. Although available more frequently and in a timelier manner, they usually cover only some variables of interest and are published with a limited level of detail. 2, 13, 40

Statistical confidentiality Principle 6 of the *Fundamental Principles of Official Statistics* [74] stresses that data collected by national statistical agencies are to be strictly confidential and used exclusively for statistical purposes. Many NSOs therefore implement national rules on statistical confidentiality. The two main reasons for declaring data to be of primary confidentiality are:

a. too few units in a cell;
b. dominance of one or two units in a cell.

The limits of what constitutes "too few" or "dominance" vary between statistical domains. Statistical confidentiality is ensured through appropriate methods:

Physical protection: data is securely stored and not accessible to anyone without explicit authorization.

Statistical disclosure control (SDC): methods for reducing the risk that statistical units are identified when the statistical data is being published, including:

Tabular data protection: for aggregate information on respondents presented in tables (using suppression, rounding, combinations and interval publication).

Microdata protection: for information on statistical units (using local suppression, sampling, recoding, top and bottom coding, rounding, rank swapping and microaggregation).

2, 68, 126

Structural business statistics (SBS) These are production-related statistics that are collected and compiled to determine the structure, activity, competitiveness and performance of enterprises at national, regional and international levels. They generally provide annual information with respect to a reference year [3, p. 3]. Although available only annually and published with some delay, they usually cover a large number of variables at a highly granular level. Other common abbreviations used by NSOs are ABS (annual business statistics/survey) or AIS (annual industrial survey). 2, 13, 103

Sustainable Development Goals (SDGs) The 2030 Agenda for Sustainable Development [12], adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its core are the 17 SDGs, which are an urgent call for action by all countries in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality and spur economic growth—all while tackling climate change and working to preserve our oceans and forests. 2, 3, 6, 106 **Goal 9** Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. iv, 3, 15, 16, 20.

System of national accounts (SNA) A coherent, consistent and integrated set of macroeconomic accounts, balance sheets and tables based on a set of internationally agreed concepts, definitions, classifications and accounting rules [73]. 2, 125

U

UNIDO industrial statistics databases UNIDO Statistics currently maintains a variety of databases, as described below. These can be accessed at the UNIDO Statistics data portal. 14 The **Competitive Industrial Performance (CIP) index** benchmarks the ability of countries to produce and export manufactured goods competitively. 14. The **Industrial Demand-Supply Balance databases (IDSB)** [19] contain disaggregated data on the manufacturing sector, including a correspondence to international trade data. 14. The **IIP databases** (monthly and quarterly) [20; 21] contain data on the index of industrial production for the manufacturing as well as mining and utilities sectors. 14, 40, 65, 103. The **Industrial Statistics databases (INDSTAT)** [16; 17] contain disaggregated data for selected variables on the manufacturing sector. 14, 45, 70. The **Mining and Utilities Statistics databases (MINSTAT)** [18] contain disaggregated data for selected variables on the mining and utilities sectors. 14, 70, 71. The **National Accounts database** [4] contains aggregate data at the country, region and group level for several national accounts indicators related to industrial economic activity. 14, 70.

V

Value added Value added is defined as the value of output less the value of intermediate consumption, with the latter covering the value of materials and supplies for production plus the payments for services received. Gross value added is the most commonly used national accounting concept, it represents the contribution to GDP of institutional units in a branch of activity. The estimates are gross of depreciation and other provisions for capital consumption, unless otherwise stated. Note that these are industrial statistics [3] and national accounting concepts [14] and cannot be directly observed from the accounting records of enterprises/establishments; they are approximated from available information as shown in Figure 1.5. 68

W

Wages and salaries Aggregate that includes all payments in cash or in kind paid to employees during the reference year in relation to work performed for the establishment. Payments include direct wages

and salaries; remuneration for time not worked; bonuses and gratuities; housing allowances and family allowances paid directly by the employer; and payments in kind. Compensation of employees is equivalent to wages and salaries plus the employers' contributions to social security, pension and insurance schemes, as well as the benefits received by employees under these schemes and severance and termination pay. 68

Water supply; sewerage, waste management and remediation activities This industry, corresponding to ISIC Rev. 4 section E, includes activities related to the management (including collection, treatment and disposal) of various forms of waste, such as solid or non-solid industrial or household waste, as well as contaminated sites. Activities of water supply are also grouped in this section, since they are often carried out in connection with, or by units also engaged in, the treatment of sewage. 7, 62, 66, 124

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