

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

UNCTAD



SDG Pulse 2019

UNCTAD TAKES THE PULSE OF THE SDGS



UNITED NATIONS
Geneva, 2019

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United Nations publication issued by the
United Nations Conference on Trade and Development.

Foreword

In 2015, the United Nations launched the 2030 Agenda for Sustainable Development and corresponding SDGs. To support this programme a Global Indicator Framework was adopted by the United Nations Statistical Commission in March 2017 and subsequently adopted by the UN General Assembly in July 2017. That framework comprises 232 statistical indicators designed to measure the 17 goals and their respective 169 targets.

This first edition of the SDG Pulse illustrates in a very concrete way how UNCTAD is contributing to the 2030 Agenda. The report not only presents statistical updates for the indicators for which UNCTAD is a custodian or co-custodian, but it also presents a range of other complementary indicators that provide a wider context and more nuance to these complex topics.

This report also presents some case studies from UNCTAD's capacity development programme from a statistical perspective – presenting our activities and successes in hard numbers. These case studies are important as they illustrate the Results Based Management approach being adopted by UNCTAD – helping us to improve our responsiveness and accountability to member states.

Finally, this report will every year, highlight a thematic issue of immediate relevance. This year's theme addresses the many faces of inequality. In particular, to discuss how developments with regard to access to data and information may be creating new dimensions of inequality.

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UNCTAD

References

- United Nations (2017). Resolution adopted by the General Assembly on 6 July 2017 on the Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development. A/RES/71/313. New York.
- United Nations Statistical Commission (2017). Report on the forty-eighth session of the Statistical Commission (7-10 March 2017). E/2017/24-E/CN.3/2017/35. New York.

Introduction

Welcome to the first edition of UNCTAD's SDG Pulse – UNCTAD's new annual statistical publication reporting on developments relating to the 2030 Agenda for Sustainable Development (United Nations, 2015) and the Sustainable Development Goals (SDGs). The purpose of this report is to provide an update on the evolution of a selection of official and complementary SDG indicators; provide progress reports on the development of new concepts and methodologies for Tier 3 indicators; and to also showcase, beyond the perspective of the formal SDG indicators, how UNCTAD is contributing to the implementation of Agenda 2030. The report will also investigate thematic issues of relevance to Agenda 2030 – this year, the report discusses some measurement issues regarding inequality.

The report is organized by four broad categories:

Theme

The report can be read by theme. Here the indicators are sub-divided across the three themes to which UNCTAD's work contributes: Multilateralism for trade & development; productive growth; and structural transformation. Through this thematic lens, a wide range of indicators are presented and issues discussed, including: recent trends in trade including barriers to trade and policies to promote trade; investment, transport infrastructure, ICT for sustainable development, and debt sustainability; and industry and high value-added and sustainability.

Goals

The SDG indicators presented in this report are also categorised by goal. The goals and indicators selected reflect UNCTAD's broad mandate of economic and sustainable development. In some cases, UNCTAD is the custodian or co-custodian agency for the indicator. These indicators are supplemented with other complementary indicators. The SDG indicators presented in this report are:

Goal 2: Zero hunger

- Indicator 2.a.2: Total official international support to agriculture
- Indicator 2.b.1: Agricultural export subsidies
- Indicator 2.c.1: Indicator of food price anomalies

Goal 8: Decent work and economic growth

- Indicator 8.9.1: Tourism direct GDP
- Indicator 8.a.1: Aid for Trade commitments and disbursements

Goal 9: Industry, innovation and infrastructure

- Indicator 9.1.2: Passenger and freight volumes, by mode of transport
- Indicator 9.2.1: Manufacturing value added
- Indicator 9.4.1: CO2 emission per unit of value added
- Indicator 9.5.1: Research and development expenditure
- Indicator 9.5.2: Researchers relative to population
- Indicator 9.a.1: Total official international support to infrastructure
- Indicator 9.b.1: Proportion of medium and high-tech industry value added
- Indicator 9.c.1: Proportion of population covered by a mobile network

Goal 10: Reduce inequality

- Indicator 10.a.1: Proportion of tariff lines with zero-tariff*
- Indicator 10.b.1: Total resource flows for development

Goal 12: Responsible consumption & production

- Indicator 12.6.1: Number of companies publishing sustainability reports*

Goal 16: Peace, justice and strong institutions

- Indicator 16.4.1: Total value of inward and outward illicit financial flows*

Goal 17: Partnership for the goals

- Indicator 17.3.1: FDI, ODA and South-South Cooperation*
- Indicator 17.4.1: Debt service as a share of exports of goods and services
- Indicator 17.5.1: Implement investment promotion regimes for LDCs*
- Indicator 17.6.2: Fixed Internet broadband subscriptions
- Indicator 17.8.1: Proportion of individuals using the Internet
- Indicator 17.10.1: Worldwide weighted tariff-average*
- Indicator 17.11.1: Developing countries and LDCs' share of global exports*
- Indicator 17.12.1: Tariffs faced by developing countries, LDCs and SIDS*

UNCTAD in Action

The SDG indicators, which are essentially performance metrics, do not give a comprehensive picture of development. A lot of other data and statistics are required to fully understand the breath of activities underway. UNCTAD runs a wide-ranging capacity development programme. This report presents some case studies from UNCTAD's development programme from a statistical perspective – presenting UNCTAD's activities and successes in hard numbers. These case studies are important as they also illustrate the *Results Based Management* approach being adopted by UNCTAD – helping us to improve our responsiveness and accountability to member states.

In Focus

Every year, the SDG Pulse will highlight a specific aspect of the 2030 Agenda and discuss this issue from the slant or perspective of statistics. For this first edition, some aspects of inequality are discussed, including global economic and income inequalities, and also an emerging new dimension for inequality in a data driven world – access to data.

**Indicators for which UNCTAD is a custodian or co-custodian agency.*

References

United Nations (2015). Transforming our world: the 2030 Agenda for Sustainable Development. A/RES/70/1. New York. 21 October.

United Nations Statistics Division (2019). Tier classification for global SDG indicators. Available at <https://unstats.un.org/sdgs/iaeg-sdgs/tier-classification/> (accessed 14 May 2019).

Contents

<i>Foreword</i>	<i>iii</i>
<i>Introduction</i>	<i>iv</i>
<i>Contents</i>	<i>vii</i>
<i>Glossary</i>	<i>xv</i>

Theme 1: Multilateralism for trade and development 3

I. Developing economies in international trade..... 4

Developing economies in pace with world exports.....	5
Trade openness decreasing in developing economies	6
China, EU and the United States are the top trading partners of developing countries.....	7
LDCs' export product mix becoming more diverse.....	7
Tourism makes a significant contribution to developing economies	10
The 2030 Agenda reaching for sustainable tourism	12
Notes.....	14
References	14

II. New protectionism versus inclusive trade..... 16

The argument for free trade... ..	17
...but only when countries are ready.....	17
Trade agreements	18
Lowering tariffs could contribute to accrued trade and economic exchange	18
Tariffs applied to exports of LDCs and developing countries slowly reducing	19
Measures have been taken.....	20
Tariffs on imports continue to fall	22
More than 50 per cent of exports from developing countries are now eligible for duty free treatment	22
Rising trade protectionism and potential trade wars.....	23
Non-tariff measures – Hidden protectionism?	24
Notes.....	26
References	27

III. Trade, agriculture, food security and biodiversity..... 30

Changing trends in agricultural markets.....	31
Agricultural export subsidies are vanishing	33
Other intervention measures.....	35
Price information is valuable but lacking.....	35
UNCTAD work on trade in biodiversity-related products	37
Notes.....	38
References	38

IV. Policies to promote trade 40

What is Aid for Trade?	41
Steady increase in Aid for Trade over the last fifteen years.....	41
Asia and Africa remain the primary recipients of Aid for Trade.....	42
Official development assistance targets trade now more often	43

Transport, energy and agriculture receive the majority of Aid for Trade	43
Agriculture receives a notable share of Aid for Trade in Africa	44
References	44

Theme 2: Productive Growth 49

I. Robust and predictable sources of financing for sustainable development..... 50

Different external financing sources are better as sustaining different aspects of development.....	51
Recent trends in external financing	53
National and international investment policies of home countries promote investment in LDCs.....	54
Countries are modernizing international investment agreements	54
Africa was the main recipient for development finance.....	57
LDCs' own measures help to attract investment	57
Notes.....	58
References	58

II. Official international assistance has a special role in financing sustainable development..... 60

Official flows remain supportive of infrastructure projects.....	62
Official support – a significant source of funding for infrastructure in LDCs, LLDCs and SIDS.....	64
Agriculture no longer a priority for ODA, even when challenges keep mounting.....	65
Notes.....	67
References	67

III. Sustainable transport infrastructure in a world of growing trade and climate change development 70

Maritime freight keeps expanding, driven by global trade.....	71
Efficiency goes hand in hand with connectivity	73
Investment requirements in the transport sector will likely accelerate	74
Notes.....	77
References	77

IV. ICT offers great potential for development, but also risks..... 80

Access to ICT surged globally	81
More people are using Internet, but access is unequal	84
ICT is now an essential element of business	84
UNCTAD takes an active role in promoting ICT as a tool for development	85
Notes.....	86
References	86

V. Growing concerns on debt sustainability in some developing economies and LDCs..... 88

External debt has increased in developing and transition economies, with a growing weight of the private sector.....	89
Service costs on external debt remains an important challenge for financing sustainable development...	91
Notes.....	93
References	93

VI. Tackling illicit financial flows to unleash funds for development..... 96

We need to measure IFFs to understand and tackle the problem.....	97
---	----

Estimates show large illicit financial flows across countries	98
Trade misinvoicing is a significant channel for IFFs.....	99
Large scale of MNEs' profit shifting.....	100
Measuring FDI-related profit shifting.....	101
Conclusion.....	102
Notes.....	103
References	103

Theme 3: Structural Transformation 107

I. Towards sustainable industrialization and higher technologies..... 108

Rapid industrialization in developing economies of Asia and Oceania	109
Changing structure of value added and employment	110
Does structural transformation advance in LDCs?.....	111
Technology gap in manufacturing widening.....	111
Convergence in medium and high-tech manufactured exports.....	113
Modest growth in R&D intensity across the world.....	113

II. Signs of a greening economy?..... 118

Growth in greenhouse gas emissions paused around 2015, but resumed in 2017.....	119
Most carbon dioxide emitted in Asia – per unit GDP and in total	120
Population growth and rising prosperity drive carbon dioxide emissions	122
Decreasing carbon intensity cannot offset GDP growth in the less developed regions.....	123
Energy efficiency an important factor in cutting emissions.....	124
A mixture of positive and negative trends	124
Involving the private sector in the sustainable development agenda.....	125
Businesses striving to close large gaps in sustainability reporting	126
Notes.....	129
References	129

UNCTAD technical cooperation in support of SDGs 132

Notes.....	138
References	138

The many faces of inequality 140

Reducing inequality	140
Measuring inequality	141
Measuring inequality in the SDGs	141
Global economic inequality	142
Global income inequality	144
Inequality in gender and international trade	145
New dimensions of inequality	147
Lack of access to technology	148
Lack of access to and use of data	148
A concluding caution.....	150
Notes.....	151
References	152

List of figures, maps and tables

Multilateralism for trade and development 3

I. Developing economies in international trade..... 4

Figure

1	Developing economies' shares of global exports (SDG 17.11.1) of goods and services (Percentage)	6
2	LDCs' share of global exports (SDG 17.11.1) of goods and services (Percentage)	6
3	Trade openness index (Percentage).....	7
4	Top 5 partners for LDCs merchandise exports, 1995-2017 (Ranked by 2017, billions of USD).....	7
5	Product concentration index of exports in LDCs and developing economies (Percentage)	8
6	Export structure by product group in LDCs and developing countries (Percentage).....	8
7	Trade in services by group of economies and by service-categories, 2018 (Percentage).....	9
8	Annual average growth of services exports by LDCs, by service category, 2010-2018 (Percentage)	9
9	Revealed comparative advantage in service exports, 2018 (Proportion).....	10
10	International tourist arrivals, distribution by region, 2017 (Percentage)	12
11	International tourist arrivals (average annual growth rate).....	12
12	Emissions from accommodation, 2005 and 2035 projections (Mt CO ₂)	13

Map

1	Direct contribution of tourism to employment, 2018 (Percentage of global employment)	11
---	--	----

II. New protectionism versus inclusive trade..... 16

Figure

1	Multilateral and preferential tariff liberalization (Percentage)	19
2	Average tariffs applied by developed countries to exports of LDCs, by sector (SDG 17.12.1) (Percentage).....	20
3	Proportion of tariff lines worldwide with zero duty applied to products from developing countries and LDCs, by group of products (SDG 10.a.1) (Percentage).....	22
4	Proportion of tariff lines worldwide with zero duty applied to products from LDCs, by country (Percentage).....	23
5	Free trade and remaining tariffs, by broad category	23
6	Tariffs as a percentage of total American imports.....	24
7	NTMs in world trade (Percentage)	25
8	Trade restrictiveness of non-tariff measures relative to tariffs (Ad valorem equivalent faced when exporting).....	26

Map

1	Worldwide weighted average tariff, latest available data (SDG 17.10.1) (Percentage).....	19
---	--	----

Table

1	Tariff restrictiveness, matrix by region, 2017 (Percentage).....	21
---	--	----

III. Trade, agriculture, food security and biodiversity..... 30

Figure

1	Growth of world GDP and merchandise exports by product groups (Percentage)	31
2	Notifications to WTO of export subsidy outlay (SDG 2.b.1)	34
3	Restrictive measures in agricultural markets.....	35
4	Agricultural interventions by policy instrument, 2008–2018	36
5	Number of extreme climate-related disasters in LDCs	36

Map

1	Trade restrictive export subsidy interventions by country, 2008 - 2018.....	34
---	---	----

Table

1	Shares of the 20 major exporters and importers in total agricultural products (Percentage).....	32
2	Top 10 importers of agricultural products (Share in total value of imports).....	32
3	Top 10 exporters of agricultural products (Share in total value of exports)	33

IV. Policies to promote trade 40

Figure

1	Aid for Trade flows to all developing economies (Billions of US\$ in constant 2017 prices).....	42
2	Aid for Trade disbursements by recipient (Billions of US\$ in constant 2017 prices).....	42
3	Top ten recipients of total Aid for Trade commitments, 2017 (Billions of US\$ in constant 2017 prices).....	43
4	Aid for Trade, share of net ODA disbursements (Percent)	43
5	Distribution between sectors of total Aid for Trade disbursements (Proportion of total)	44
6	Aid for Trade by sector and region, 2016(Proportion of total).....	44

Productive Growth 49

I. Robust and predictable sources of financing for sustainable development..... 50

Figure

1	Total resource flows for development (SDG 10.b.1) (Billions of current US\$)	53
2	FDI, ODA and remittances in selected LDCs, 2017 (Percentage of budgetary central government revenue).....	54
3	Bilateral investment treaties with LDCs by development status.....	55
4	Trends in new BITs signed and entered in force each year with LDCs.....	56
5	Number of new national investment promotion and facilitation measures	57

Map

1	Official international support to agriculture as a percentage of primary sector GDP, 2017	66
---	---	----

Table

1	Economies with the most bilateral investment treaties with LDCs, as of end-2018.....	56
---	--	----

II. Official international assistance has a special role in financing sustainable development..... 60

Figure

1	Net ODA as percentage of GNI commitments and actual disbursements	61
2	Distribution of economic infrastructure needs by sector, 2016-2030 (Percentage).....	62
3	Official international support, total and to infrastructure (SDG 9.a.1) (Billions of constant 2017 US\$)	63
4	Distribution of official international support to infrastructure, 2017	63
5	International support to infrastructure by group of economies (Percentage of GDP)	64
6	Total official international support to agriculture (SDG 2.a.2)	65

Map

1	Official international support to agriculture as a percentage of primary sector GDP, 2017	66
---	---	----

III. Sustainable transport infrastructure in a world of growing trade and climate change development 70

Figure

1	Volume of international maritime cargo (Billions of tons loaded)	72
2	World seaborne trade by direction and group of economies (Billions of tons).....	72
3	Characteristics of maritime transport services, 2018.....	74
4	What is the probability that a natural disaster affects infrastructure? (Percentage)	76

Map

1	International maritime cargo flows by region, 2017 (Billions of tons).....	73
---	--	----

IV. ICT offers great potential for development, but also risks..... 80

Figure

1	Distribution of population by mobile network coverage, by technology, 2017 (SDG 9.c.1).....	82
2	ICT access indicators (Subscriptions per 100 inhabitants)	82
3	Fixed broadband subscriptions by speed, 2017 (SDG 17.6.1) (Subscriptions per 100 inhabitants)...	83

Map

1	International maritime cargo flows by region, 2017 (Billions of tons).....	85
---	--	----

V. Growing concerns on debt sustainability in some developing economies and LDCs..... 88

Figure

1	Public (PPG) and private (PNG) long-term external debt stocks, developing and transition economies (Trillions of US\$)	90
2	PPG and PNG long-term external debt stocks, developing and transition economies, by region (Billions of US\$).....	90
3	Debt service on PPG external long-term debt in developing and transition economies (SDG 17.4.1) (Percentage of exports of goods and services)	91
4	Debt service on total external long-term debt in developing and transition economies (Percentage of exports of goods and services)	92
5	Median ratio of PPG debt service to government revenue in LDCs (Percentage of government revenues).....	93

VI. Tackling illicit financial flows to unleash funds for development..... 96

Figure

1	MNE profit shifting, 2015, estimates from Tørsløv et al. (2018) (Percentage of corporate tax collected)	101
2	MNE profit shifting, 2015, estimates from Janský and Palanský (2018) (Tax loss as a percentage of GDP)	102

Map

1	IFFs from trade misinvoicing in developing and transition economies, 2015, estimates from Global Financial Integrity (2019) (Percentage of total trade).....	99
---	--	----

Structural Transformation 107

I. Towards sustainable industrialization and higher technologies..... 108

Figure

1	Trends in manufacturing value added per capita (SDG 9.2.1) (US\$ in constant 2010 prices).....	110
2	Share of manufacturing in value added (SDG 9.2.1) and employment (SDG 9.2.2) (Percentage) ...	110
3	Trend of the manufacturing share of value added (SDG 9.2.1) in LDCs compared to the target (Percentage).....	111
4	Proportion of medium and high-tech industry in manufacturing value added (SDG 9.b.1), by development status and region (Percentage).....	112
5	Share of medium and high-tech manufactured exports in total manufacturing exports (Percentage).....	113

6	R&D expenditure as a proportion of GDP (SDG 9.5.1) (Percentage of GDP)	115
---	--	-----

Table

1	Leading ten investors in R&D, ranked by PPP US\$, 2016 (SDG 9.5.1) (Countries ranked by GERD).....	114
2	Leading ten developing-country investors in R&D, 2016 (SDG 9.5.1) (Percentage of GDP, countries ranked by GERD).....	115
3	Leading ten R&D services exporters, 2016 (Countries ranked by exports value).....	116

II. Signs of a greening economy?..... 118

Figure

1	Greenhouse gas emissions and target reductions (SDG 9.4.1) (Gt of CO ₂ e).....	120
2	Carbon dioxide emissions, emissions intensity and GDP, by region, 2016 (SDG 9.4.1).....	122
3	Development of carbon dioxide emissions and their determinants, by region (1990=100).....	123
4	Changes in energy intensity (SDG 7.3.1) and their impacts on carbon intensity, by region, 1990-2016 (Gt of CO ₂ e).....	124
5	Compliance with sustainability reporting by UNCTAD Core Indicators (Percentage).....	126
6	Compliance with sustainability reporting, regional averages (Percentage)	128

Map

1	Geographic concentration of carbon dioxide emissions, in 1971, 1986, 2001 and 2016 (kg/km ² per year)	121
2	Compliance with sustainability reporting, country averages, March 2019 (Percentage)	127

UNCTAD technical cooperation in support of SDGs 132

Figure

1	Distribution of project expenditures by region, 2018	133
2	Percentage distribution of project expenditures by SDG, 2018 (In percentage of total expenditure)	133

Table

1	UNCTAD technical cooperation, by theme and product.....	134
2	Technical cooperation expenditure by theme, product and SDG, 2018	135
3	Technical cooperation expenditure by region and SDG, 2018	136
4	Technical cooperation expenditure by theme, product and region, 2018	137

The many faces of inequality 140

Figure

1	Distribution of world GDP, 2007-2017 (Percentage).....	142
2a	Real GDP per capita relative to world average, by development status, 1970-2017 (Percentage of world average).....	143
2b	Real GDP of developed relative to developing economies, 1970-2017 (Percentage)	143
3	Global income distribution, 1950-2016 (Proportion of global population at given level of income, per day, in US\$ at 2011 PPP).....	144
4	Global income distribution, 2016 (Proportion of global population at given level of income, per day, in US\$ at 2011 PPP).....	145
5	Labour productivity and salaries in exporter firms by the gender of the owner, 2016 (in constant €)	146
6	The gender gap in account ownership across regions, 2011 and 2017 (Proportion of account owners by gender)	147

Map

1	Change in scores for the use of statistics in policy making for plans published in
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Glossary

Ad-valorem equivalent	A tariff that is not a percentage (eg, dollars per ton) can be estimated as a percentage of the price — the ad valorem equivalent (WTO, 2019b). WTO (2019b). Glossary - a guide to ‘WTO speak’. Available at https://www.wto.org/english/thewto_e/glossary_e/glossary_e.htm (accessed 14 June 2019).
Advanced reporting requirement	Advanced reporting requirement represents a set of reporting elements, beyond the minimum reporting requirement, which demand additional information from companies in their sustainability reports for the purpose of measuring SDG indicator 12.6.1 (UNCTAD, 2017). UNCTAD (2017). Enhancing comparability of sustainability reporting: Selection of core indicators for company reporting on the contribution towards the attainment of the Sustainable Development Goals. TD/B/C.II/ISAR/81. Geneva. 11 September.
AFCFTA	African Continental Free Trade Agreement
Aid for Trade	Aid for Trade measures aimed at assisting developing countries to increase exports of goods and services, to integrate into the multilateral trading system, and to benefit from liberalized trade and increased market access. It is considered as part of ODA. Effective Aid for Trade will enhance growth prospects and reduce poverty in developing countries, as well as complement multilateral trade reforms and distribute the global benefits more equitably across and within developing countries. (WTO, 2006). It is measured as gross disbursements and commitments of total ODA from all donors for Aid for Trade (United Nations, 2019). United Nations (2019). SDG indicators: Metadata repository. Available at https://unstats.un.org/sdgs/metadata/ (accessed 14 May 2019)
Aid for Trade commitment	Aid for Trade commitment is a firm obligation, expressed in writing and backed by the necessary funds, undertaken by an official donor to provide specified assistance to a recipient country or a multilateral organisation (OECD, 2019a; AidFlows, 2019). AidFlows (2019). Glossary of AidFlows terms. Available at http://www.aidflows.org/about/ (accessed 17 June 2019) OECD (2019a). DAC glossary of key terms and concepts. Available at http://www.oecd.org/dac/dac-glossary.htm (accessed 15 May 2019)
Aid for Trade disbursements	Aid for Trade disbursements refer to the release of funds to or the purchase of goods or services for a recipient; by extension, the amount thus spent. Disbursements record the actual international transfer of financial resources, or of goods or services valued at the cost to the donor (AidFlows, 2019; OECD, 2019a) AidFlows (2019). Glossary of AidFlows terms. Available at http://www.aidflows.org/about/ (accessed 17 June 2019) OECD (2019a). DAC glossary of key terms and concepts. Available at http://www.oecd.org/dac/dac-glossary.htm (accessed 15 May 2019)

Arm's length principle	International standard that compares the transfer pricing charged between related entities with the price of similar transactions carried out between independent entities under comparable circumstances to determine acceptable transfer prices (United Nations, 2017). United Nations (2017). <i>Practical Manual on Transfer Pricing for Developing Countries 2017</i> . United Nations publication. Sales No. E.17.XVI.2. New York.
AU	African Union
B2C	Business to consumer
BIT	Bilateral investment treaty A type of IIA made between two countries regarding promotion and protection of investments made by investors from one country in the other country's territory, which commits the host country government to grant certain standards of treatment and protection to foreign investors (nationals and companies of the other country) and their investments (UNCTAD, 2019a). UNCTAD (2019a). IIA Navigator. Available at https://investmentpolicyhubold.unctad.org/IIA (accessed 15 May 2019).
Broadband	A general term meaning a telecommunications signal or device of greater bandwidth, in some sense, than another standard or usual signal or device. In data communications, this refers to a data transmission rate of at least 256 kbit/s. In the context of Internet, this can be delivered via fixed (wired) or mobile networks. (ITU, 2014) ITU (2014). <i>Manual for Measuring ICT Access and Use by Households and Individuals</i> . International Telecommunication Union. Geneva.
Carbon dioxide	Carbon dioxide (CO ₂) is a colourless, odourless and non-poisonous gas formed by combustion of carbon and in the respiration of living organisms (OECD, 2019). OECD (2019). Glossary of statistical terms. Available at https://stats.oecd.org/glossary/index.htm (accessed 19 April 2019).
Carbon dioxide equivalent	Carbon dioxide equivalent (CO ₂ e) is a measure used to compare the emissions from various greenhouse gases based upon their global warming potential. It represents the quantity of carbon dioxide that has equal global warming potential as the given quantity of a greenhouse gas (OECD, 2019). OECD (2019). Glossary of statistical terms. Available at https://stats.oecd.org/glossary/index.htm (accessed 19 April 2019).
Carbon intensity	Carbon intensity is the amount of emissions of carbon dioxide (CO ₂) released per unit of another variable such as gross domestic product (GDP), output energy use or transport (IPCC, 2014). IPCC (2014). Climate Change 2014, Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report (5AR) of the Intergovernmental Panel on Climate Change. IPCC.
Carbon price	Carbon price is the price per unit of avoided or released carbon dioxide (CO ₂) emission, or its CO ₂ equivalent. IPCC (2014). Climate Change 2014, Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report (5AR) of the Intergovernmental Panel on Climate Change. IPCC.

Carbon tax	Carbon tax is a levy on the carbon content of fossil fuels (IPCC, 2014). IPCC (2014). Climate Change 2014, Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report (5AR) of the Intergovernmental Panel on Climate Change. IPCC.
CH₂	Methane CH ₂
CIF	Cost, insurance and freight
CITES	Convention on international trade in endangered species
Communication on Progress	Communication on Progress (CoP) is a voluntary, public report through which a company informs stakeholders about its efforts to implement the principles of the United Nations Global Compact (United Nations Global Compact, 2013). United Nations Global Compact (2013). UN Global Compact policy on communicating progress. Available at https://www.unglobalcompact.org/library/1851 (accessed 6 March 2019).
Comply-or-explain approach	Comply-or-explain approach is a reporting practice under which companies are invited to explain the reasons for not providing all requested information in their sustainability reports or for not publishing a sustainability report at all (UNCTAD, 2013). UNCTAD (2013). Best practice guidance for policymakers and stock exchanges on sustainability reporting initiatives. TD/B/C.II/ISAR/67. Geneva. 28 August.
Conclusions of the DMFAS Advisory Group, November 2017	Biennial meeting of the DMFAS Advisory Group to advise the Secretary-General on a range of issues related to the management of the Programme
Containerized transport	Freight transport using intermodal containers of standard dimensions, i.e. containers that can be moved seamlessly between ships, trucks, trains and other modes of transport as well as storage. The two most commonly used are the 20-foot and the 40-foot containers. They form the basis of the main units of measure currently applied in transport: the twenty-foot equivalent Unit (TEU) and the forty-foot equivalent unit (FEU) (World Shipping Council, 2019). World Shipping Council (2019). About the industry. Available at http://www.worldshipping.org/about-the-industry/containers (accessed 19 April 2019).
DAC	Development assistance committee
Data revolution	Data revolution refers to the transformative actions needed to respond to the demands of a complex development agenda, improvements in how data is produced and used; closing data gaps to prevent discrimination; building capacity and data literacy in “small data” and big data analytics; modernizing systems of data collection; liberating data to promote transparency and accountability; and developing new targets and indicators (see http://www.undatarevolution.org/data-revolution/).
Debt service	Payments made to satisfy a debt obligation, including principal, interest, and any late payment fees (IMF, 2014). IMF (2014). <i>External Debt Statistics: Guide for Compilers and Users</i> . IMF. Washington, D.C.

Debt sustainability	A country's capacity to finance its policy objectives through debt instruments and service the ensuing debt (IMF, 2014). IMF (2014). <i>External Debt Statistics: Guide for Compilers and Users</i> . IMF. Washington, D.C.
DMFAS	Debt Management and Financial Analysis System Programme
Donor's statement, January 2019	Annual meeting with the bilateral donors to discuss the directions, priorities and financial resourcing of the Programme's work.
Dry bulk commodities	Raw materials that are shipped in large, unpacked parcels. They are usually classified as major and minor dry bulk commodities. Since 2006, the former includes iron ore, grains and coal, while the latter includes the rest of dry bulk commodities (UNCTAD, 2018). UNCTAD (2018a). <i>Review of Maritime Transport 2018</i> . United Nations publication. Sales No. E.18.II.D.5. New York and Geneva.
E-commerce	Sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders; it can involve business-to-business (B2B) or a business-to-consumer (B2C) transactions. (OECD, 2019) OECD (2019). Glossary of statistical terms. Available at https://stats.oecd.org/glossary/index.htm (accessed 19 April 2019).
Emission	Emission is the discharge of pollutants into the atmosphere from stationary sources such as smokestacks, other vents, surface areas of commercial or industrial facilities and mobile sources, for example, motor vehicles, locomotives and aircraft (OECD, 2019). OECD (2019). Glossary of statistical terms. Available at https://stats.oecd.org/glossary/index.htm (accessed 19 April 2019).
Employed in R&D in FTE	Employed in R&D in FTE is the ratio of working hours spent on R&D during a specific reference period (usually a calendar year) divided by the total number of hours conventionally worked in the same period by an individual or by a group (OECD, 2015) OECD (2015). <i>Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development</i> . OECD Publishing.
Energy intensity	Energy intensity is the ratio between gross inland energy consumption and GDP. It measures how much energy is required to generate one unit of GDP.
Entrepôt trade	If goods are imported from one country with the purpose of re-exporting to another, it is called Entrepot trade. Import duty is not levied on these goods. (WTO, 2008) WTO (2008). Definitions related to trade February. Available at http://detailsofworldtradeorganization.blogspot.com/2008/02/entreport-trade.html (accessed 18 June 2019).
EU	European Union
Export restrictiveness	The average level of tariff restrictions imposed on a country's exports as measured by the MA-TTRI.

Export subsidies	Export subsidies refer to the granting of support by governments to some beneficiary entity or entities to achieve export objectives. Export subsidies may involve direct payments to a firm, industry, producers of a certain agricultural product etc. to achieve some type of export performance. In addition, export subsidies may include low cost export loans, rebates on imported raw materials and tax benefits such as duty-free imports of raw material. They can also take the form of government financed marketing. Most subsidies have existed in agriculture. (United Nations, 2019). United Nations (2019). SDG indicators: Metadata repository. Available at https://unstats.un.org/sdgs/metadata/ (accessed 14 May 2019).
External debt	Outstanding amount of those actual current, and not contingent, liabilities that require payment(s) of principal and/or interest by the debtor at some point(s) in the future and that are owed to nonresidents by residents of an economy (IMF, 2014). In this section, only medium- and long-term liabilities are considered. IMF (2014). <i>External Debt Statistics: Guide for Compilers and Users</i> . IMF. Washington, D.C.
F-gases	Fluorinated gases (F-gases)
FDI	Foreign direct investment Investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate enterprise or foreign affiliate) UNCTAD (2016). UNCTAD (2016). <i>World Investment Report 2016: Investor Nationality: Policy Challenges</i> . UN.
FOB	Free on board
Food price anomalies	Food price anomalies refer to abnormally high or low market prices for food commodities. The indicator relies on a weighted compound growth rate that accounts for both within year and across year price growth. The indicator directly evaluates growth in prices over a particular month over many years, taking into account seasonality in agricultural markets and inflation, allowing to answer the question of whether or not a change in price is abnormal for any particular period. (United Nations, 2019) United Nations (2019). SDG indicators: Metadata repository. Available at https://unstats.un.org/sdgs/metadata/ (accessed 14 May 2019).
FTE	Full Time Equivalent FTE refers to a Full Time Equivalent unit of labour. An FTE is the hours worked by one employee on a full-time basis. The concept is used to convert the hours worked by several part-time employees into the hours worked by an equivalent full-time employee (ideally the comparison is standardized for gender and industry sector).
G20	The G20 or Group of Twenty is an international forum for the governments and central bank governors from 19 countries and the European Union (EU).
GATT	General Agreement on Trades and Tariffs
GDP	gross domestic product
GERD	Gross domestic expenditure on research and development

Global Warming Potential	Global Warming Potential (GWP) is an index measuring the radiative forcing following an emission of a unit mass of a given substance, accumulated over a chosen time horizon, relative to that of the reference substance, CO ₂ . The GWP thus represents the combined effect of the differing times these substances remain in the atmosphere and their effectiveness in causing radiative forcing (IPCC, 2014). IPCC (2014). Climate Change 2014, Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report (5AR) of the Intergovernmental Panel on Climate Change. IPCC.
GNI	Gross national income
Goods loaded	Merchandise destined for export, also referred to as “outbound trade volumes” (UNCTAD, 2018a). UNCTAD (2018a). <i>Review of Maritime Transport 2018</i> . United Nations publication. Sales No. E.18.II.D.5. New York and Geneva.
Goods unloaded	Merchandise destined for import, also referred to as “inbound trade volumes” (UNCTAD, 2018a). UNCTAD (2018a). <i>Review of Maritime Transport 2018</i> . United Nations publication. Sales No. E.18.II.D.5. New York and Geneva.
GPT	Generalized Preferential Tariff
Greenhouse gases	Greenhouse gases are gases that cause the ‘greenhouse effect’ by letting solar radiation reach the Earth’s surface and absorbing infrared energy emitted by the Earth. The concentration of some greenhouse gases in the atmosphere is rising as a result of human activities, leading to an increase of the Earth’s average temperature. The most important of these gases comprise: carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O) and fluorinated gases (F-gases), such as hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs) (WMO, 2019). Throughout this chapter, they are referred to as critical greenhouse gases. WMO (2019). Greenhouse gases. Available at https://public.wmo.int/en/our-mandate/focus-areas/environment/greenhouse%20gases (accessed 11 June 2019).
GRI	Global Reporting Initiative (GRI)
GSP	Generalized System of Preferences
Gt	Gigaton
GTA	Global Trade Alert
HDI	Human development index
IAEG-SDG	Inter-agency Expert Group on Sustainable Development Indicators
ICT	Information and Communications Technology A diverse set of technological tools and resources used to transmit, store, create, share or exchange information. These resources include computers, the Internet, live broadcasting technologies, recorded broadcasting technologies and telephony. (UNESCO Institute for Statistics, 2019) UNESCO Institute for Statistics (2019). Glossary. Available at http://uis.unesco.org/en/glossary (accessed 19 April 2019).

IFF	Illicit financial flow
IIA	International investment agreement They include two types of agreements: (1) bilateral investment treaties and (2) treaties with investment provisions. Treaties with investment provisions (e.g. a free trade agreement with an investment chapter) between two or more countries include commitments regarding cross-border investments (foreign investment or FDI), typically for the purpose of protection and promotion of such investments (UNCTAD, 2019a). UNCTAD (2019a). IIA Navigator. Available at https://investmentpolicyhubold.unctad.org/IIA (accessed 15 May 2019).
IIRC	International Integrated Reporting Council (IIRC)
IMF	International Monetary Fund
Import restrictiveness	The average level of tariff restrictions on imports as measured by the TTRI.
IMTS	International Merchandise Trade Statistics
Investment guarantee	An insurance, offered by governments or other institutions, to investors to protect against certain political risks in host countries, such as the risk of discrimination, expropriation, transfer restrictions or breach of contract (UNCTAD, 2015). UNCTAD (2015). <i>Investment Policy Framework for Sustainable Development</i> . UN.
IPA	investment promotion agency
ISAR	International Standards of Accounting and Reporting
ITU	International Telecommunications Union
Land-use change	Land-use change refers to a change in the use or management of land by humans, which may lead to a change in land cover (IPCC, 2014). IPCC (2014). Climate Change 2014, Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report (5AR) of the Intergovernmental Panel on Climate Change. IPCC.
LDC	Least developed country
LHS	Left Hand Side
Living wage	Living wage is defined by the Global Living Wage Coalition to mean the remuneration received for a standard workweek by a worker in a particular place sufficient to afford a decent standard of living for the worker and her or his family. Elements of a decent standard of living include food, water, housing, education, health care, transportation, clothing, and other essential needs including provision for unexpected events.
LLDC	Landlocked developing countries

MA-TTRI	An index measuring the average level of tariff restrictions imposed on exports.
Manufacturing value added	<p>Manufacturing value added (MVA) is the net-output of all resident manufacturing activity units. It is obtained by adding up their outputs and subtracting intermediate inputs (see United Nations, 2019). Manufacturing can broadly be understood as “the physical or chemical transformation of materials, substances, or components into new products” (United Nations, 2008), consisting of sector C in the International Standard Industrial Classification of all Economic Activities (ISIC) revision 4 (United Nations, 2019).</p> <ul style="list-style-type: none"> • United Nations (2008). <i>International Standard Industrial Classification of All Economic Activities (ISIC)</i>. Statistical papers / Department of International Economic and Social Affairs, Statistical Office of the United Nations Series M, No. 4, Rev. 4. United Nations publication. Sales No. E.08.XVII.25. New York, NY. • United Nations (2019). SDG indicators: <i>Metadata repository</i>. Available at https://unstats.un.org/sdgs/metadata/ (accessed 14 May 2019).
Medium and high-tech industry	Medium and high-tech industry is an industry in which producers of goods incur relatively high expenditure on research and development (R&D) per unit of output. The distinction between low, medium, and high-tech industries is based on R&D intensity, i.e. the ratio of R&D expenditure to an output measure, usually gross value added. For a list of the particular economic activities, considered to be medium and high-tech, see (UNIDO, 2017). UNIDO (2017). <i>Industrial Development Report 2018, Demand for Manufacturing: Driving Inclusive and Sustainable Industrial Development</i> .
Minimum reporting requirement	Minimum reporting requirement refers to a core set of economic, environmental, social and governance elements of sustainability information requested from companies in their sustainability reports for the purpose of measuring SDG indicator 12.6.1. Only reports including this information are counted towards the indicator (UNCTAD, 2017). UNCTAD (2017). Enhancing comparability of sustainability reporting: Selection of core indicators for company reporting on the contribution towards the attainment of the Sustainable Development Goals. TD/B/C.II/ISAR/81. Geneva. 11 September.
MNC	Multinational corporation
MNE	Multinational enterprise
Mobile money	A service in which the mobile phone is used to access financial products and services. (GSMA, 2010) GSMA (2010). Mobile Money Definitions July. Available at https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/06/mobilemoneydefinitionsnomarks56.pdf (accessed 10 April 2019).
Most favoured nation (MFN) tariffs	Most favoured nation (MFN) tariffs: are a tariff level that a member of the General Agreement on Tariffs and Trade of the WTO charges on a good to other members, i.e. a country with a most favoured nation status (See UNCTAD, 2018). It applies to imports from trading partners-members of the World Trade Organization (WTO), unless the country has a preferential trade agreement. It is the lowest possible tariff a country can assess on another country. UNCTAD (2018). <i>Trade and Development Report 2018: Power, Platforms and the Free Trade Delusion</i> . United Nations publication. Sales No. E.18.II.D.7. New York and Geneva.

N2O	Nitrous oxide (N2O)
NAFTA	North American Free Trade Agreement
Non-tariff measures (NTMs)	Non-tariff measures (NTMs) The official definition of NTMs is broad: NTMs are policy measures other than ordinary customs tariffs that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both such as technical barriers to trade, price-control measures,.. A detailed classification could be found here: (UNCTAD, 2019a) UNCTAD (2019a). Classification of Non-Tariff Measures. Available at https://unctad.org/en/Pages/DITC/Trade-Analysis/Non-Tariff-Measures/NTMs-Classification.aspx (accessed 14 June 2019).
OECD	Organisation for Economic Co-operation and Development
Official development assistance	Official development assistance Resource flows to countries and territories which are: (a) undertaken by the official sector; (b) with promotion of economic development and welfare as the main objective; (c) at concessional financial terms (implying a minimum grant element depending on the recipient country and the type of loan). In addition to financial flows, technical co-operation is also included (OECD, 2019a). OECD (2019a). DAC glossary of key terms and concepts. Available at http://www.oecd.org/dac/dac-glossary.htm (accessed 15 May 2019).
Official international support	For the purpose of the IAEG-SDG, official international support refers to assistance in the form of official development assistance and other official flows (United Nations Statistics Division, 2019). United Nations Statistics Division (2019). SDG indicators: Metadata repository. See https://unstats.un.org/sdgs/metadata/ (accessed 14 May 2019).
Other dry cargo	All dry cargo except major and minor bulk commodities (UNCTAD, 2018a). UNCTAD (2018a). <i>Review of Maritime Transport 2018</i> . United Nations publication. Sales No. E.18.II.D.5. New York and Geneva.
Other official flows	Other official flows Transactions by the official sector with countries and territories which do not meet the conditions for eligibility as ODA, either because they are not primarily aimed at development or because they do not meet the minimum grant element requirement (OECD, 2019a). OECD (2019a). DAC glossary of key terms and concepts. Available at http://www.oecd.org/dac/dac-glossary.htm (accessed 15 May 2019).
PPP	purchasing power parity
Preferential Trade Arrangements	Preferential Trade Arrangements can be established under paragraphs 4 to 10 of Article XXIV of GATT (WTO, 2019a) between parties through which one party can grant more favourable trade conditions to other parties of the arrangement and not to other WTO members. WTO (2019a). The basic rules for goods. Available at https://www.wto.org/english/tratop_e/region_e/regatt_e.htm#understanding (accessed 14 June 2019).

Private flows	Consist of flows at market terms financed out of private sector resources and private grants. They include FDI, private export credits, securities of multilateral agencies and bilateral portfolio investment. Private flows other than FDI are restricted to credits with a maturity of greater than one year (OECD, 2019a). OECD (2019a). DAC glossary of key terms and concepts. Available at http://www.oecd.org/dac/dac-glossary.htm (accessed 15 May 2019).
Private non-guaranteed debt	Private non-guaranteed External debt of the private sector that is not contractually guaranteed by a public sector unit resident in the same economy (IMF, 2014). IMF (2014). <i>External Debt Statistics: Guide for Compilers and Users</i> . IMF. Washington, D.C.
Productive capacity building	Strengthening economic sectors – from improved testing laboratories to better supply chains – to increase competitiveness in export markets (Negin, 2014) Negin J (2014). Understanding Aid for Trade part one. Available at http://www.devpolicy.org/understanding-aid-for-trade-part-one-a-dummys-guide-20140228/ (accessed 19 June 2019).
Public bond debt	Public debt in the form of sovereign international bonds traded in international capital markets (UNCTAD, 2017). UNCTAD (2017). <i>Debt Vulnerabilities in Developing Countries: A New Debt Trap? Volume I: Regional and Thematic Analyses</i> . UNCTAD/GDS/MDP/2017/4 (Vol I). Geneva.
Public sector debt	All debt liabilities of resident public sector units to other residents and nonresidents (IMF, 2014). IMF (2014). <i>External Debt Statistics: Guide for Compilers and Users</i> . IMF. Washington, D.C.
Publicly guaranteed debt	Public and publicly guaranteed External debt liabilities of the private sector, the servicing of which is contractually guaranteed by a public unit resident in the same economy as the debtor (IMF, 2014). IMF (2014). <i>External Debt Statistics: Guide for Compilers and Users</i> . IMF. Washington, D.C.
R&D	Research and development
R&D intensity	Research and development (R&D) intensity is defined as the ratio of gross domestic expenditure on research and development (GERD) to GDP (OECD, 2015). OECD (2015). <i>Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development</i> . OECD Publishing.
R&D services	R&D services cover services associated with basic and applied research and experimental development, including activities in the physical and social sciences and the humanities (OECD, 2015, section 11.5). The definition used for international trade includes also testing and product development that may give rise to patents (United Nations et al., 2012, itemKey/P4DUMQL3). OECD (2015). <i>Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development</i> . OECD Publishing. United Nations, IMF, OECD, European Commission, UNCTAD, UNWTO, and WTO (2012). <i>Manual on statistics of international trade in services 2010 (MSITS 2010)</i> . Rev. 1, United Nations.

Remittances	<p>Remittances are a cumulative measure consisting of three components: (a) personal remittances, (b) total remittances and (c) transfers to non-profit institutions serving households. They include cross-border remittance and resource flows (current and capital transfers in cash and kind), including migrants' and short-term employees' income transfers (personal remittances), acquired rights in social benefits (total remittances) and bilateral aid programmes (both private and public) to non-profit organizations (IMF, 2009). IMF (2009). <i>International Transactions in Remittances : Guide for Compilers and Users (RCG)</i>. IMF. Washington, D.C.</p> <ul style="list-style-type: none"> • IMF (2014). <i>Government Finance Statistics Manual 2014</i>. IMF. Washington, DC.
Research and development	<p>Research and (experimental) development comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge (OECD, 2015), see also (United Nations et al., 2009, para 10.103). United Nations, European Commission, IMF, OECD, and World Bank (2009). <i>System of national accounts 2008</i>. Rev. 5, United Nations. OECD (2015). <i>Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development</i>. OECD Publishing.</p>
Revealed comparative advantage	<p>Revealed comparative advantage in exports is the proportion of a country group's exports by service category, divided by the proportion of world exports in the corresponding category.</p>
RHS	Right Hand Side
Sanitary and phytosanitary measures	<p>Any measure applied:(a) to protect animal or plant life or health within the territory of the Member from risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms;(b) to protect human or animal life or health within the territory of the Member from risks arising from additives, contaminants, toxins or disease-causing organisms in foods, beverages or feedstuffs; (c) to protect human life or health within the territory of the Member from risks arising from diseases carried by animals, plants or products thereof, or from the entry, establishment or spread of pests; or (d) to prevent or limit other damage within the territory of the Member from the entry, establishment or spread of pests. Sanitary or phytosanitary measures include all relevant laws, decrees, regulations, requirements and procedures including, inter alia, end product criteria; processes and production methods; testing, inspection, certification and approval procedures; quarantine treatments including relevant requirements associated with the transport of animals or plants, or with the materials necessary for their survival during transport; provisions on relevant statistical methods, sampling procedures and methods of risk assessment; and packaging and labelling requirements directly related to food safety (UNCTAD, 2003). UNCTAD (2003). Course on Dispute Settlement - Module 3.9. WTO: SPS Measures. UNCTAD/EDM/Misc.232/Add.13. Available at https://unctad.org/en/Pages/DITC/TNCD/Dispute-Settlement-in-International-Trade.aspx.</p>
SASB	Sustainability Accounting Standards Board
SDG	Sustainable Development Goal
SIDS	Small Island Developing States

SITS	Statistics of International Trade in Services
SME	Small- and medium-sized enterprise
Soft infrastructure	Ideas and conceptual frameworks that give shape and direction to what is eventually physically manifest (<i>FutureStructure</i> , 2013). <i>FutureStructure</i> (2013). What is soft infrastructure? November.
South-South cooperation	Broad framework of collaboration among countries of the South in the political, economic, social, cultural, environmental and technical domains. It includes trade, FDI, regional integration efforts, technology transfers, sharing of solutions and experts, and other forms. Involving two or more developing countries, it can take place on a bilateral, regional, intraregional or interregional basis (UNOSSC, 2019). UNOSSC (2019). About South-South and Triangular Cooperation. Available at https://www.unsouthsouth.org/about/about-sstc/ (accessed 10 June 2019).
SPS	Sanitary and phytosanitary
Stocks-to-use ratio	A convenient measure of supply and demand interrelationships of commodities. This ratio indicates the level of carryover stock for any given commodity as a percentage of the total use of the commodity (Womach, 2005). Womach J (2005). Agriculture: A Glossary of Terms, Programs, and Laws, 2005 Edition. Congressional Research Service Reports. The Library of Congress. Order Code 97-905. June. Available at https://digital.library.unt.edu/ark:/67531/metacrs7246/ (accessed 18 June 2019).
Sustainability report	Sustainability report is a document published by an entity describing the economic, social, environmental impacts caused by its activities; it is composed of a certain number of disclosures along the main pillars of sustainable development. Synonyms: sustainability reporting (GRI, 2019). GRI (2019). About sustainability reporting. Available at https://www.globalreporting.org/information/sustainability-reporting/Pages/default.aspx (accessed 19 April 2019).
Tariff lines	Tariff lines are measured as proportion of total number of tariff lines (in per cent) applied to products imported from least developed countries and developing countries corresponding to a 0% tariff rate in HS chapter 01-97. (see SDG metadata)
Tariff trade restrictiveness index (TTRI)	An index measuring the average level of tariff restrictions imposed on imports
Tariffs	Tariffs are customs duties on merchandise imports, levied either on an ad valorem basis (percentage of value) or on a specific basis (e.g. \$7 per 100 kg). Tariffs can be used to create a price advantage for similar locally-produced goods and for raising government revenues. Trade remedy measures and taxes are not considered to be tariffs. (see SDG metadata)
TBT	Technical barriers to trade
Technical Barriers to Trade	Technical Barriers to Trade measures referring to technical regulations, and procedures for assessment of conformity with technical regulations and standards.

Tier 1	Tier 1 means that a SDG indicator has been classified by the IAEG-SDG as being conceptually clear, has an internationally established methodology and standards are available, and data are regularly produced by countries for at least 50 per cent of countries and of the population in every region where the indicator is relevant.
Tier 3 indicators	SDG indicator for which there is no internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested. (United Nations Statistics Division, 2019) United Nations Statistics Division (2019). Tier classification for global SDG indicators. Available at https://unstats.un.org/sdgs/iaeg-sdgs/tier-classification/ (accessed 14 May 2019).
Tier III indicator	SDG indicator for which there is no internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested. (United Nations Statistics Division, 2019) United Nations Statistics Division (2019). Tier classification for global SDG indicators. Available at https://unstats.un.org/sdgs/iaeg-sdgs/tier-classification/ (accessed 14 May 2019).
Total resource flows	In the context of the IAEG-SDG, these flows quantify the overall expenditures that donors provide to developing countries, including official and private flows, both concessional and non-concessional. Specifically, they include ODA, OOFs and private flows (United Nations, 2019a). UNCTAD (2019a). IIA Navigator. Available at https://investmentpolicyhubold.unctad.org/IIA (accessed 15 May 2019).
Tourism direct GDP	Measures direct contributions of tourism to national economy, since tourism does not exist as a separate industry in the standard industrial classification. Instead it is embedded in various other industries. (no SDG metadata)
Tourism sector	Tourism sector is the cluster of production units in different industries that provide consumption goods and services demanded by visitors. Such industries are called tourism industries because visitor acquisition represents such a significant share of their supply that in the absence of visitors, the production of these would cease to exist in meaningful quantity (UNWTO and ILO, 2014). (UNWTO and ILO, 2014). <i>Measuring Employment in the Tourism Industries: Guide with Best Practices</i> . Madrid.
TRAINS	Trade Analysis and Information System
UEBT	Union for Ethical BioTrade
UNCTAD (2017, para 2)	UNCTAD (2017). Final conclusions of the 11th DMFAS advisory group meeting November. Available at https://unctad.org/divs/gds/dmfas/news/Pages/DMFAS-Advisory-group.aspx (accessed 18 April 2019).
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNESCO UIS	United Nations Educational, Scientific and Cultural Organization Institute of Statistics

UNFCCC	United Nations Framework Convention on Climate Change
United Nations (2019, para 8)	United Nations (2019). Resolution adopted by the General Assembly on 20 December 2018. External debt sustainability and development. A/RES/73/221. New York, 20 January.
United Nations Global Compact	United Nations Global Compact is a voluntary initiative based on company-level commitments to adopt sustainability and socially responsible principles and to take steps to support UN goals (United Nations Global Compact, 2019). United Nations Global Compact (2019). See https://www.unglobalcompact.org (accessed 6 March 2019).
United Nations Secretary-General's Independent Expert Advisory Group on a Data Revolution (2014)	United Nations Secretary-General's Independent Expert Advisory Group on a Data Revolution (2014). A world that counts: Mobilising the data revolution for sustainable development. Available at http://www.undatarevolution.org/report (accessed 4 June 2019).
UNODC	United Nations Office on Drugs and Crime
UNWTO	The World Tourism Organization
Weighted mean applied tariff	Weighted mean applied tariff is the average of effectively applied rates weighted by the product import shares corresponding to each partner country (World Bank, 2019a). World Bank (2019a). Tariff rate, applied, weighted mean, all products (%). Available at https://data.worldbank.org/indicator/tm.tax.mrch.wm.ar.zs (accessed 14 June 2019).
Worldwide weighted tariff-average	Worldwide weighted tariff-average is used to aggregate tariff value for country groups. It is measured as value in percentage of weighted average tariffs applied to the imports of goods in HS chapter 01-97. It is recommended to make use of a weighting methodology based on the value of goods imported. The average level of customs tariff rates applied worldwide can be used as an indicator of the degree of success achieved by multilateral negotiations and regional trade agreements. (see SDG metadata)
WTO	World Trade Organisation



THEME 1


Multilateralism for trade and development

“Through trade, people’s satisfaction, merchants’ profits and countries’ wealth are all increased.”.

– Ibn Khaldun

Developing
economies
export
70%
of world
manufactured
goods



Developed
economies
still apply
2% tariff rates
to imports from
 **LDCs**

Ten out of
24 countries in
Sub-Saharan Africa
have the highest
levels of
food prices
in 2017



Asia received
the largest
share of global
 **Aid for Trade**
in 2017, with
 **38%** 
of the total

Multilateralism for trade and development

We live in an inter-connected world where goods and services are produced and traded globally. This has brought an unprecedented level of prosperity and has contributed to lifting millions out of poverty. However, barriers of trade remain and new threats to the multilateral trading system are constantly emerging.

It is essential to address these threats and impediments, and promote a broader participation that could continue to benefit all countries and the global economy. International trade is an engine for inclusive economic growth and poverty reduction, and an important means to achieve SDGs.

1. We provide analysis and policy recommendations and comprehensive statistical monitoring of Developing economies in international trade, including merchandise and services such as tourism. The following trade-related SDG indicators are covered:

- SDG Indicator 17.11.1: Developing countries' and least developed countries' share of global exports
- SDG indicator 8.9.1: Tourism direct GDP as a proportion of total GDP and in growth rate

2. We monitor the implementation of the principle of special and differential

treatment for developing countries in accordance with WTO agreements and study new developments in New protectionism versus inclusive trade:

- SDG indicator 17.10.1: Worldwide weighted tariff-average
- SDG indicator 17.12.1: Average tariffs faced by developing countries, LDCs and SIDS
- SDG indicator 10.a.1: Proportion of tariff lines applied to imports from LDCs and developing countries with zero-tariff

3. We tackle trade restrictions and distortions in world agricultural markets and present statistics on the links between Trade, agriculture, food security and biodiversity:

- SDG indicator 2.b.1: Agricultural export subsidies
- SDG indicator 2.c.1: Indicator of (food) price anomalies

4. We examine the role of Policies to promote trade, including Aid for Trade, in support of developing countries, particularly LDCs:

- SDG indicator 8.a.1: Aid for Trade commitments and disbursements



I. Developing economies in international trade

Target 17.11: Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020.

- Indicator 17.11.1: Developing countries' and least developed countries' share of global exports (Tier I)

Target 8.9: By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products.

- Indicator 8.9.1: Tourism direct GDP as a proportion of total GDP and in growth rate (Tier II)

Key messages

- **LDCs far from doubling their share in world exports by 2020**
- **Manufactured goods taking a larger share in exports in LDCs (35%) and developing economies (70%)**
- **Travel and transport driving services exports in developing economies**
- **Tourism accounted for over half of exports in SIDS**
- **Tourism's direct contribution to world GDP 3.2%**
- **1 in 10 jobs are directly or indirectly linked to tourism**
- **Tourism responsible for 8% of global greenhouse gas emissions**

SDG target 17.11 aims at significantly increasing the exports of developing countries, and at doubling the LDC's share in global exports by 2020. Statistics show that while exports in developing countries are growing, they are no longer outpacing the rest of the world. At the same time, trade openness has decreased most in developing economies.

While global trade is still dominated by exports of goods, with a 77 per cent share in 2018, the weight of trade in services is steadily increasing, reaching 23 per cent in 2018 compared with 17 per cent in 1980 (UNCTAD, 2019a). This is due to several factors, including the increasing commercialisation of intangible products, the larger role of services in global value chains and the gradual liberalisation of this sector.

Developing economies exports have become more diverse with manufactured goods now the largest item of merchandise exports, while services exports are driven by travel and transport. Developing countries today account for an increasing share of world tourism receipts, thus, taking tourism markets from developed economies. A dedicated section will look at sustainable tourism following the discussion on the inclusion of LDCs and other developing economies in world trade.

Developing economies in pace with world exports

Though the value of exports of goods and services from developing countries has increased notably since 2000, this growth has not outpaced the developed world. Developing countries' share in global exports has not grown since 2012. The growth of global exports has levelled off since 2012 and the same is true for the developing economies. In 2018, the total value of exports originating from developing countries was 4.3 times higher than in 2000. Developing countries' share of global exports of goods and services has risen from 29.7 per cent in 2000 to 41.5 per cent in 2012 and has levelled off since.



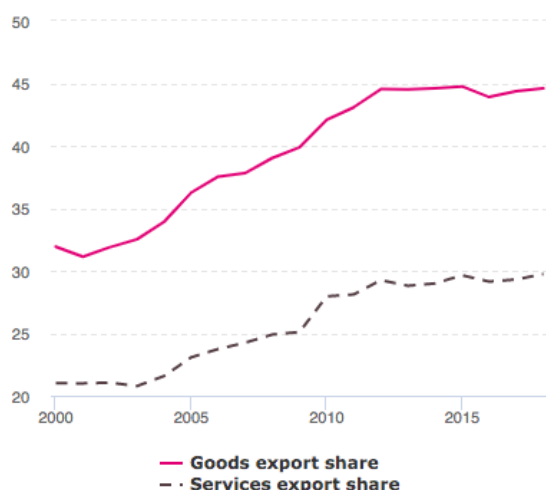
LDCs far from doubling their share in world exports by 2020

Looking at the trade in goods, developing economies' share in world exports of goods has plateaued at just above 44 per cent since 2012 (see figure 1). In the developing economies of Africa, the 2017 upswing in world trade manifested itself

in export growth; African exports increased by 18 per cent compared with the previous year, and by 14 per cent in 2018.

As shown in figure 1, in 2018, developing economies' share of world services exports (US\$5.8 trillion) was 29.7 per cent (US\$1.7 trillion), while exports from developed economies were valued at US\$4.0 trillion. Since 2000, growth has been significant when they accounted for 21 per cent (US\$0.35 trillion). The top five services exporters, China, India, Singapore, Hong Kong SAR and the Republic of Korea, account for half of developing economies' services exports.

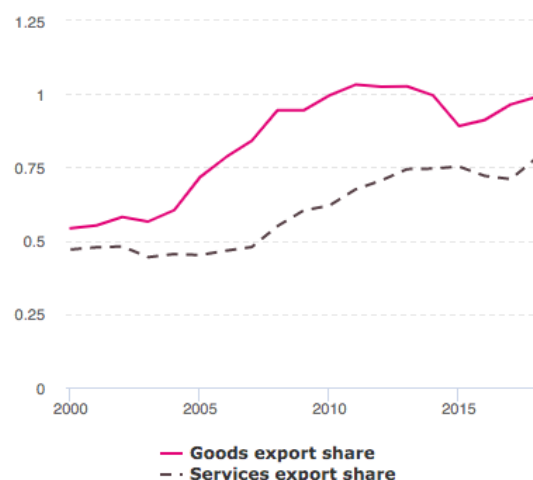
Figure 1 Developing economies' shares of global exports (SDG 17.11.1) of goods and services (Percentage)



Source: UNCTAD (2019a).

LDCs' are a small player in world trade with less than a 1 per cent share. The 2030 Agenda sets a target to double LDCs' share in global exports by 2020. Their share in world merchandise exports almost doubled from 0.54 per cent in 2000 (US\$35 billion) to over 1 per cent in 2011-2013. Since then, this trend has reversed slightly. Taking 2015 as a baseline, when their share of global exports was 0.9 per cent, LDCs still have a long way to go before doubling their share. In 2018, the value of merchandise exports from LDCs was US\$193 billion, accounting for 1 per

Figure 2 LDCs' share of global exports (SDG 17.11.1) of goods and services (Percentage)



Source: UNCTAD (2019a).

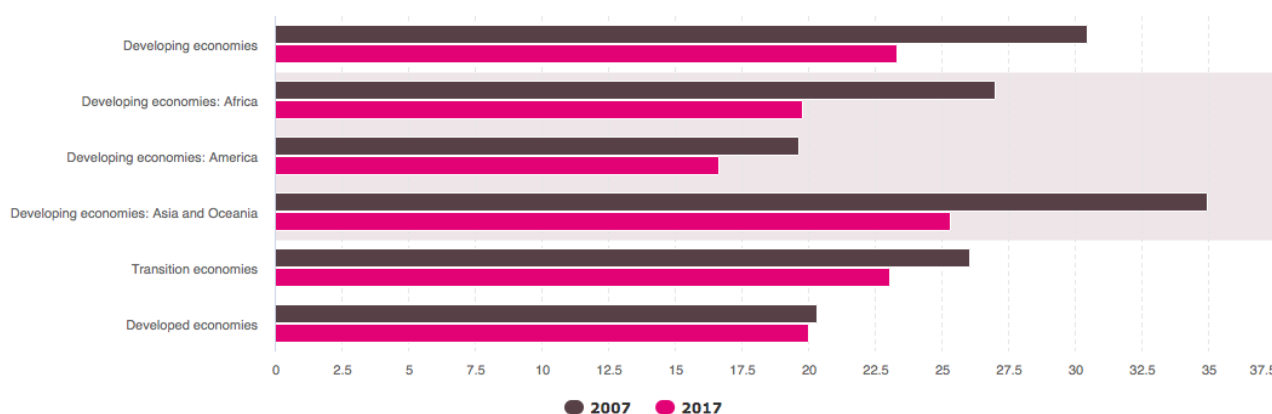
cent of world exports. For services trade, in 2018, the LDCs' share in world services exports (US\$5.8 trillion) was 0.78 per cent (US\$46 billion), showing an increase from under 0.5 per cent (US\$7 billion) in 2000, but a slight decrease from 2015.

Most LDCs (79 per cent) are oriented to commodity exports as a share of their goods exports exceeds 60 per cent.¹ The periods when LDCs' exports declined more strongly than world exports (2008-09 and 2014-16) coincided with a fall in commodity prices.

Trade openness decreasing in developing economies

Over the last ten years, international trade in goods has significantly lost importance in relation to domestic production in developing economies. Developing economies in Asia and Oceania experienced a particularly strong decline in the ratio of exports and imports to GDP, indicated by a fall in the trade openness index from 35 to 25 per cent between 2007 and 2017 (see figure 3). Nevertheless, in 2017 their exposure to trade was still high compared with other groups of developing economies and developed economies.

Figure 3 Trade openness index
(Percentage)



Source: UNCTAD (2019a).

Note: This index measures the relative importance of international trade in goods relative to the domestic economic output of an economy. Exports are given equal weight to imports.

China, EU and the United States are the top trading partners of developing countries

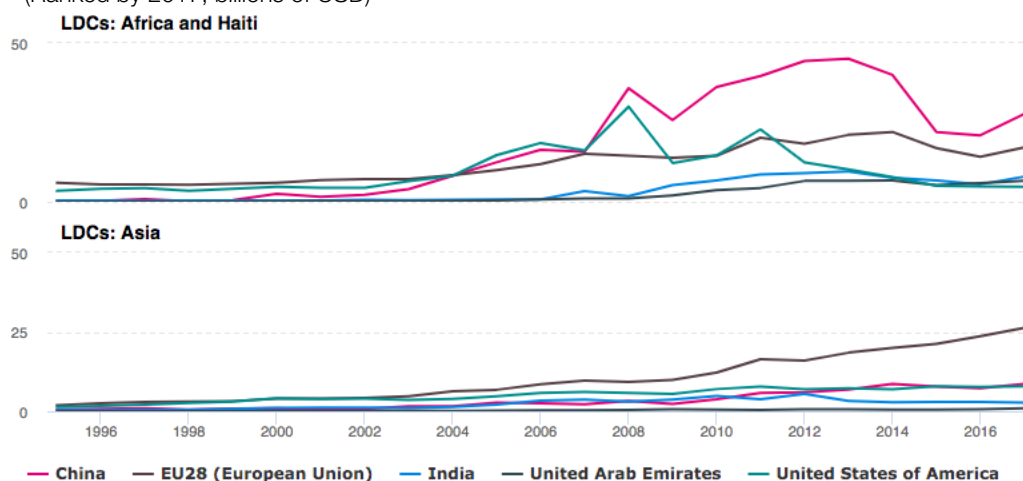
In 2017, developing economies shipped most of their exports to the United States of America (US\$1.3 trillion), China (US\$1.0 trillion) and other Asian economies. For LDCs, the top export destination was China. LDCs in Africa and Haiti delivered goods worth US\$28 billion to China, more than to any other economy in the world (see figure 4). Exports of LDCs in Asia were more oriented towards the European Union and the United States of America. The importance of the

European Union as a trading partner for LDCs in Asia has increased significantly since the turn of the century. China has taken a first position in trade with LDCs in Africa and Haiti, while its trade with the United States' has decreased over the last ten years. Intra-regional trade is also high for LDCs from East Asia and the Pacific, and low but rising for LDCs from most other regions.

LDCs' export product mix becoming more diverse

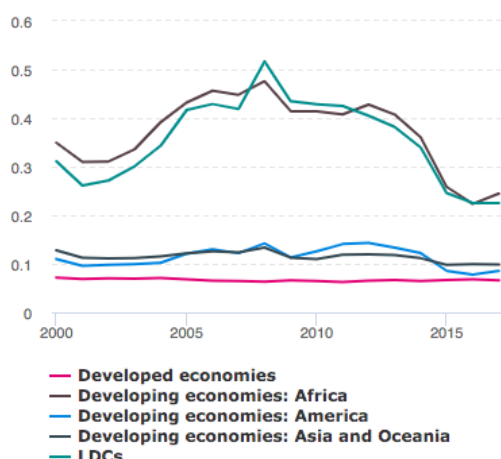
The concentration of LDC exports, as measured by the Herfindahl-Hirschman Index², increased

Figure 4 Top 5 partners for LDCs merchandise exports, 1995-2017
(Ranked by 2017, billions of USD)



Source: UNCTAD (2019a).

Figure 5 Product concentration index of exports in LDCs and developing economies (Percentage)



Source: UNCTAD (2019a).

Note: An index value closer to 1 indicates a country's exports or imports are highly concentrated on a few products. On the contrary, values closer to 0 reflect exports or imports are more homogeneously distributed among a series of products.

from 2000 to 2008. Since then concentration has gradually declined, converging with patterns typical of developing economies (see figure 5). Developing economies in Africa have followed a similar trend. In other words, their export mix is becoming more diverse.

LDCs in the Middle East and North Africa had a relatively high export concentration until 2008. Since then it has declined significantly, following the general trend in LDCs. However, East Asia

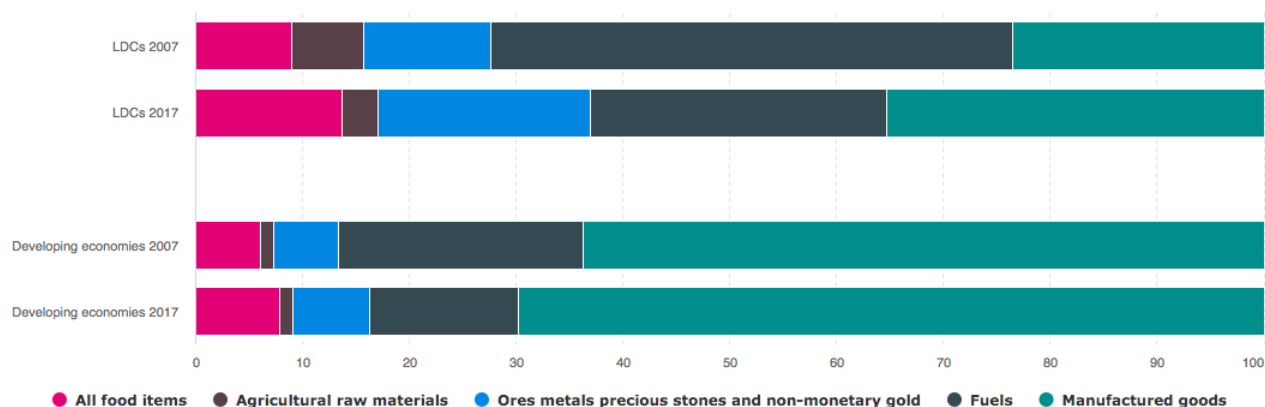
and the Pacific and South Asia have the most diverse export mix.

Among developing economies, the product mix of exports is most concentrated in Africa. The export mix is more varied in the developing economies of America and Asia.

The structure of exports by product group has changed significantly in LDCs and developing economies over the last ten years (see figure 6). In 2017, manufactured goods accounted for 35 per cent of total exports in LDCs – a notable increase from 2007. Fuels formed the second largest product group in 2017 (28 per cent) – in 2007 they accounted for half of the exports. The share of ores, metals, precious stones and non-monetary gold increased from almost 12 per cent to 20 per cent in the ten years from 2007 to 2017. The proportion of food items in exports also increased from 9 to almost 14 per cent during the same period.

Manufactured goods taking a larger share in exports in LDCs (35%) and developing economies (70%)

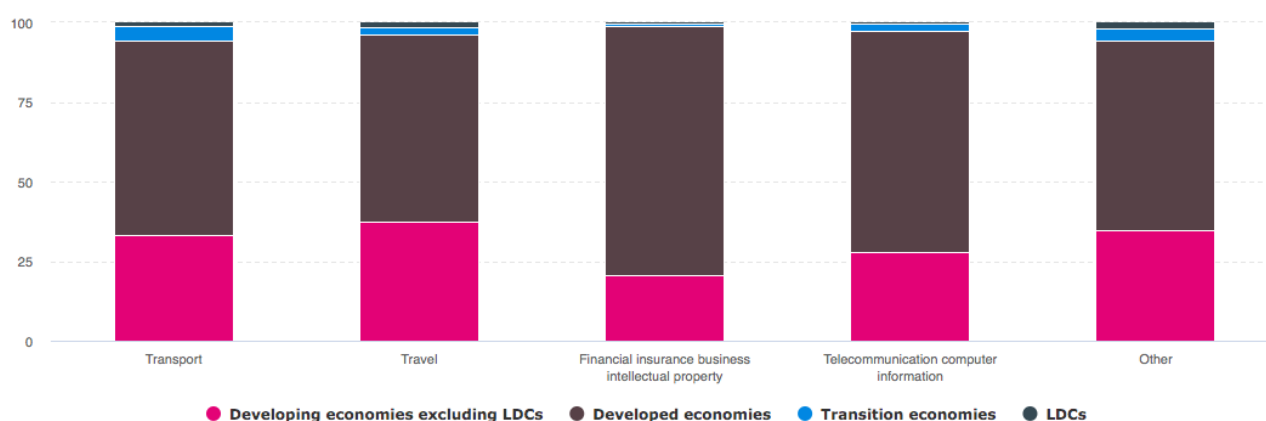
Figure 6 Export structure by product group in LDCs and developing countries (Percentage)



Source: UNCTAD (2019a).

Note: For the composition of product groups please refer to UNCTAD (2019b).

Figure 7 Trade in services by group of economies and by service-categories, 2018
(Percentage)



Source: UNCTAD (2019a).

Note: Other includes goods-related services; construction; personal, cultural and recreational services; government goods and services n.i.e.; and non-allocated services.

In 2017, manufactured goods accounted for 70 per cent of total merchandise exports from developing economies – almost as much as from developed economies. The share of fuels has reduced from almost 23 per cent in 2007 to 14 per cent in 2017. Food continues to be strongly represented in the exports of some economies in South America and Eastern Africa in particular; and ores, metals, precious stones and non-monetary gold in the exports of several Southern and Western African and Central Asian economies.

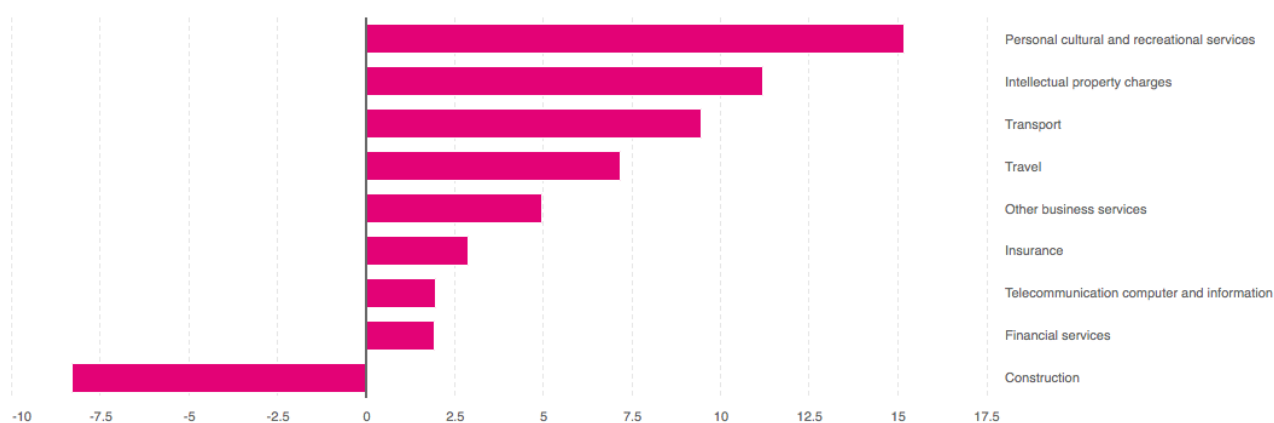
The growth of services exports is a general trend registered across all economic regions, but it has



Travel and transport driving services exports in developing economies

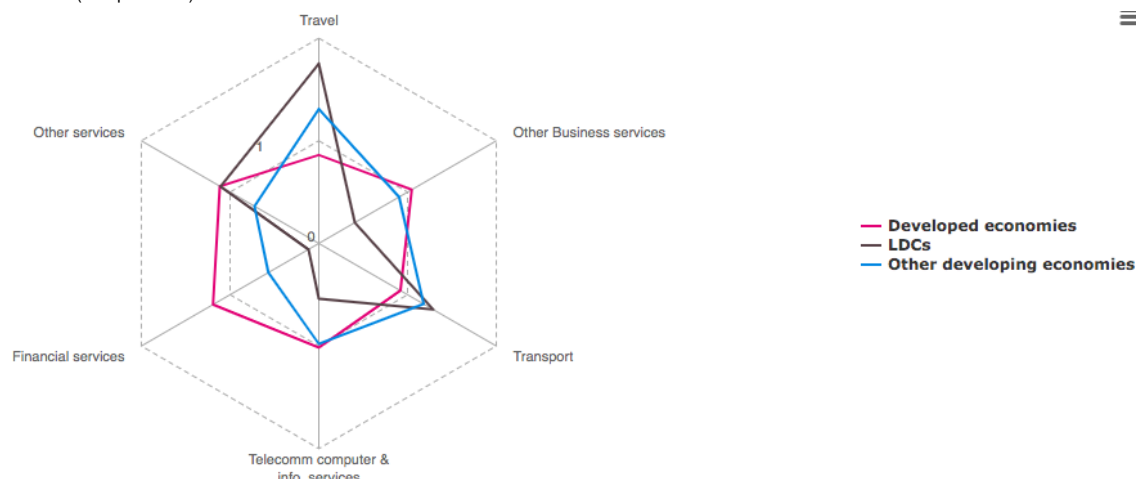
mainly benefited developed economies. In 2018, this group still accounted for 67.9 per cent of all traded services. With US\$1.7 trillion worth of services exported in 2018, developing economies took only 30 per cent of the global services market. LDCs were responsible for 0.8 per cent of

Figure 8 Annual average growth of services exports by LDCs, by service category, 2010-2018
(Percentage)



Source: UNCTAD (2019a).

Figure 9 Revealed comparative advantage in service exports, 2018
(Proportion)



Source: UNCTAD calculations based on data from UNCTAD (2019a).

Note: The revealed comparative advantage is measured as the proportion of a country group's exports by service category, divided by the proportion of world exports in each category. A country or region is considered to have a revealed comparative advantage for a product or sector if the index is greater than one.

total services exports and passed the one per cent mark for travel services (1.4 per cent).

Among broad services categories, travel has the most prominent role in developing economies' exports. At US\$559 billion, it accounted for 40 per cent of the services these economies supplied internationally. Transport is also an important export sector for the developing world, worth US\$346 billion in 2018. Grouped together, insurance and financial services and business and intellectual-property-related services represent US\$483 billion of developing economies' exports.

Smaller in dollar value than transport and travel – but linked to travel – the exports of personal, cultural and recreational services have been the most dynamic sector in LDCs' services exports. They grew, on average, by over 15 per cent annually between 2010 and 2018. In the same period, notable annual average increases were recorded for charges for the use of intellectual property, transport and travel services (11 per cent, 10 per cent, and 7 per cent, respectively). Of the broad services items, only construction has seen a downturn in the same period (-8 per cent).

Travel is the only type of service export where LDCs and other developing economies have a revealed comparative advantage.³ The revealed

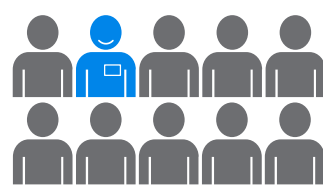
comparative advantage of travel services for LDCs reached 1.8 and was 1.3 for other developing economies, in 2018. The value is also slightly greater than 1.2 for transport services.

Tourism makes a significant contribution to developing economies

One of the most important drivers of trade in travel services is international tourism. In addition to the direct service itself, tourism can create large multiplier effects for the domestic economy. It promotes growth and employment in a multitude of economic sectors such as domestic transportation, hotels and restaurants, financial services, cultural services and many others. It also attracts investment and promotes the development of the private sector. This is the reason why UNCTAD has recognized that touristic services, if properly harnessed, can become an important engine for inclusive growth and sustainable economic growth in developing countries (UNCTAD, 2017).



It has been difficult to measure the contribution of tourism to GDP. The development of the tourism satellite account has been an important step in advancing the measurement of the economic contribution of tourism (see United Nations et al. (2010)). TSA measures direct contributions of tourism consumption to the national economy. However, it does not account for the indirect contributions of tourism to GDP. Tourism's direct contributions to GDP can be calculated by subtracting domestic business travel from tourism expenditures (treating as intermediate purchase), then using the resulting expenditures to calculate the direct contribution of tourism to GDP (Tian et al., 2011). In June 2016, UNWTO launched an initiative *Towards a Statistical Framework for Measuring Sustainable Tourism*, with the support of the United Nations Statistics Division. The final framework is planned to be submitted for global consultation and consideration by the United Nations Statistical Commission.



**1 in 10 jobs
are directly
or indirectly
linked to tourism**

Map 1 shows that tourism has a significant economic contribution in many countries. For example, many SIDS depend on exporting tourism services to a great extent, accounting for more than, on average, 50 per cent of total exports (World Bank, 2019). Other countries in South-East Asia (Cambodia, Thailand), North Africa (Tunisia, Morocco), the Caucasus (Georgia), Latin America (Belize, Mexico), Europe (Malta, Greece, Croatia, Portugal) and Oceania (New Zealand) also benefit from the employment generated by tourism industries. Overall, current estimates place tourism's direct contribution at 3.2 per cent to worldwide GDP and 3.8 per cent to global employment (WTTC, 2019).⁴

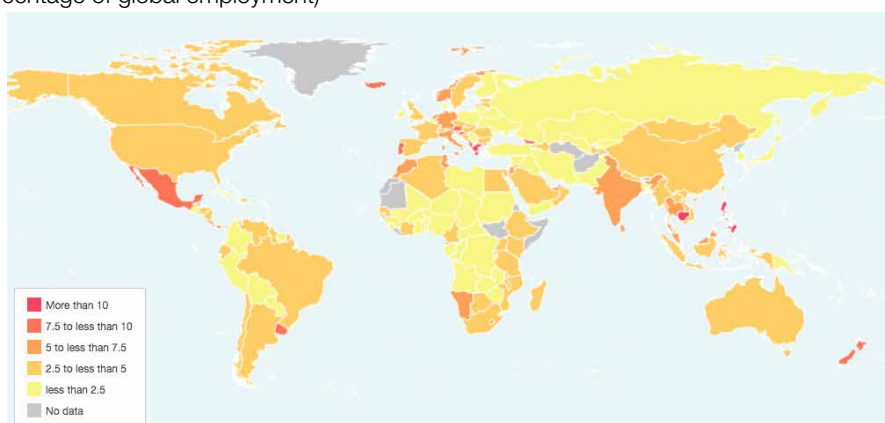
**Tourism's
direct contribution
to world GDP
3.2%**



The contribution of tourism to the global economy is forecast to increase. The annual growth rate of worldwide arrivals of international tourists, a volume indicator for this sector, have been close to 5 per cent or more since 2010. The UNWTO estimates that this indicator increased by 5.6 per cent in 2018 and will continue to grow at 3-4 per cent in 2019 (UNWTO, 2019). A similar evolution is expected over the 2030 horizon (UNWTO, 2011).

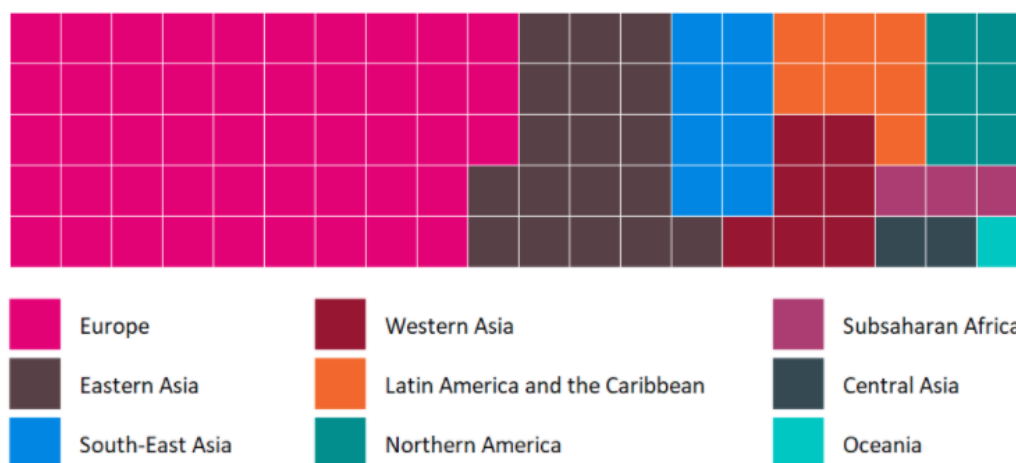
Map 1

Direct contribution of tourism to employment, 2018
(Percentage of global employment)



Source: UNCTAD calculations based on data from (WTTC, 2019).

Figure 10 International tourist arrivals, distribution by region, 2017
(Percentage)



Source: UNCTAD calculations based on UNWTO (2019).

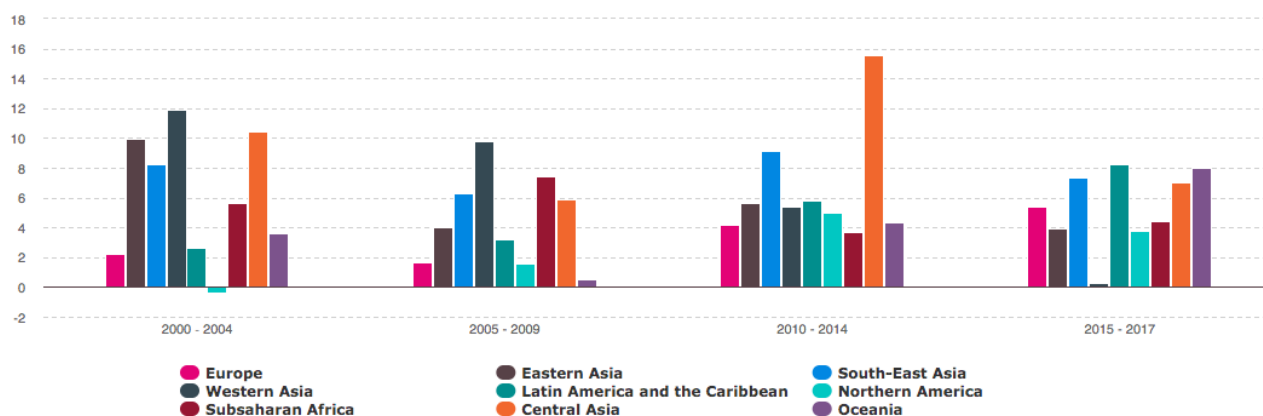
Still, more than half of all tourist arrivals are recorded in Europe and Northern America, two developed regions. As can be seen in figure 10, other regions of the world, mostly developing countries, including LDCs, receive a relatively small share of international tourist arrivals.

However, this is gradually changing. Figure 11 shows that Europe and Northern America are also the two regions with the lowest rate of growth in recent years. Most parts of Asia have shown a remarkable dynamism in tourism, with Western Asia, affected by conflict and political instability, as the only exception.

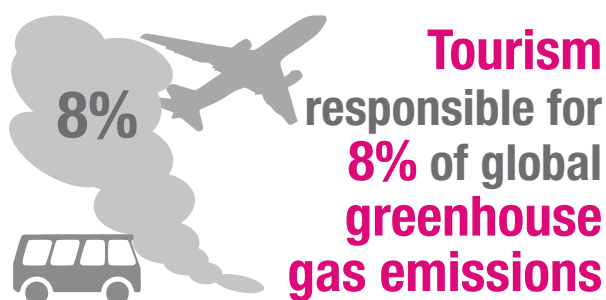
The 2030 Agenda reaching for sustainable tourism

SDG Target 12.b aims to develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products. Although tourism can bring substantial resources and economic opportunities, it can also bring challenges for sustainable development: Tourism can help finance the preservation of historical and environmental treasures, but if poorly managed it will achieve the opposite (UNCTAD, 2016, target 12b). Tourists contribute to climate change in

Figure 11 International tourist arrivals
(average annual growth rate)



Source: UNCTAD calculations based on UNWTO (2018).



many ways – through travel by air, rail, roads and sea, and by consuming goods and services, such as food, accommodation, events and souvenirs.

Gössling and Peeters (2015) estimate that the global tourism system was responsible for 1.12 Gt of CO₂ in 2010. For comparison purposes, this is equivalent to 3.3 per cent of global CO₂ emissions for that year. A country with this amount of emissions would be the 7th most polluting country in the world in terms of CO₂ (Muntean et al., 2018). Comparably large amounts of energy, fresh water, land and food are also consumed by this industry. According to the authors, tourism’s resource consumption is expected to grow by a factor of 2.6 for CO₂ emissions and energy use, and by almost 2 for freshwater use.

Another study, with a more comprehensive scope, that includes upstream supply chains

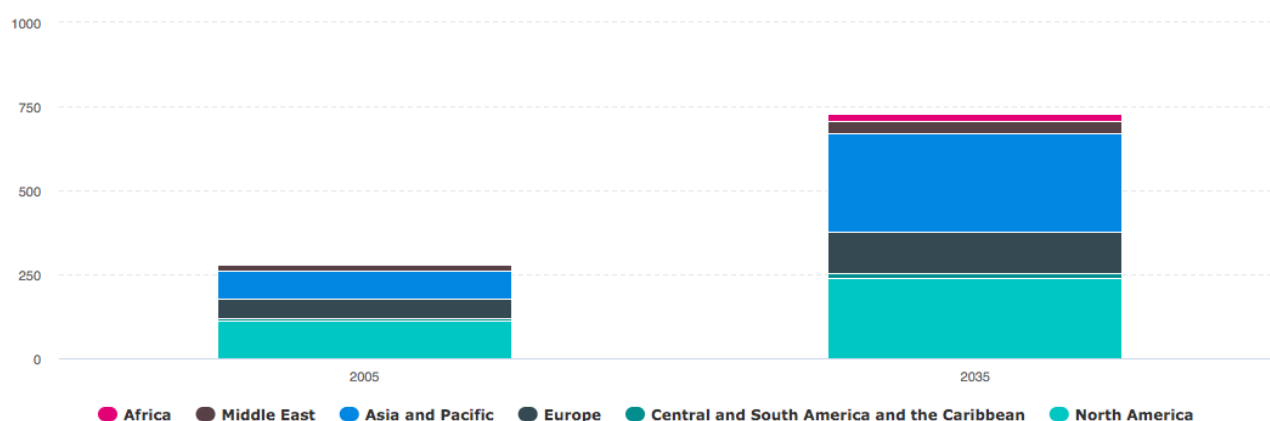
and all greenhouse emissions, (Lenzen et al., 2018) estimate that global tourism had a carbon footprint of 4.5 Gt of CO₂ equivalent in 2013, representing 8 per cent of global greenhouse gas emissions (Lenzen et al., 2018).⁵

When not properly managed, tourism can exploit natural resources in an unsustainable way, harm biodiversity and natural capital, undermine cultural heritage, and exacerbate existing socioeconomic inequality. In this context, the UNWTO has called for policies and other measures to promote “tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities” (UNEP and UNWTO, 2005).

Tourism sector is a major consumer of energy. In countries with generally low household energy consumption rates, large tourist establishments represent major exceptions where energy is used, in particular, for comforts such as air-conditioning, heating and laundry. Tourist and sports infrastructures, such as ski lifts, may also be a significant energy consumer relative to local consumption.

According to the UNWTO, the accommodation sector accounts for approximately 20 per cent of emissions from tourism (Chiesa T and Gautam A, 2009). This involves heating, air-conditioning and

Figure 12 Emissions from accommodation, 2005 and 2035 projections
(Mt CO₂)



Source: UNCTAD calculations based on UNWTO (2018).

the maintenance of bars, restaurants, pools and so on. In 2005, North America accounted for 40 per cent of these emissions, Asia and the Pacific just under 30 per cent, and Africa only 2 per cent. Although tourism is growing rapidly in the Middle East, its share of emissions will continue to be small (around 5 per cent). By contrast, North America and Europe will together contribute to about 50 per cent of global accommodation emissions in 2035 (down by 10 per cent compared to 2005).

Growth in tourism is resulting in increasing amounts of investment in infrastructure: buildings, traffic networks and access to transport services, land take and supply services in destinations. This has a direct impact on the environment in terms of resource use (land and water), biodiversity and waste generation.

Notes

- 1 A country is considered to be export-commodity-dependent when more than 60 per cent of its total merchandise exports are composed of commodities.
- 2 The Herfindahl-Hirschman Index (HHI) is a measure of market concentration. A higher index value indicates a more concentrated export structure.
- 3 The revealed comparative advantage is measured as the proportion of a country group's exports by service category, divided by the proportion of world exports in each category.
- 4 WTTC also calculates that the total contribution of tourism to the economy. This includes, in addition to the direct impacts, the indirect contribution (tourism-related investment spending, government collective spending and domestic supply chain purchases of goods and services) plus the induced contribution (spending of those directly and indirectly employed by the tourism sector). According to these estimates, the total contribution of tourism is 10.4 per cent of

GDP and 9.8 per cent of employment. For details on the methodology of these estimates, see WTTC and Oxford Economics (2018).

- 5 Note that both studies consider the environmental impact of total tourism, including both international and domestic tourists.

References

- Chiesa T and Gautam A (2009). Towards a low carbon travel&tourism sector. World Economic Forum. Available at <http://www.greeningtheblue.org/sites/default/files/Towards%20a%20low%20carbon%20travel%20&%20tourism%20sector.pdf> (accessed 12 June 2019).
- Gössling S and Peeters P (2015). Assessing tourism's global environmental impact 1900–2050. *Journal of Sustainable Tourism*. 23(5):639–659.
- Lenzen M et al. (2018). The carbon footprint of global tourism. *Nature Climate Change*. 8(6):522–528.
- Muntean M et al. (2018). *Fossil CO2 Emissions of All World Countries: 2018 Report*. European Union. Luxembourg.
- Tian E, Mak J and Leung P (2011). The direct and indirect contributions of tourism to regional GDP: Hawaii. Working Paper No. 2011-5. The Economic Research Organization at the University of Hawai'i. Available at https://www.uhero.hawaii.edu/assets/WP_2011-5.pdf (accessed 11 June 2019).
- UNCTAD (2016). Development and globalization: Facts and figures 2016: Sustainable tourism. Available at <https://stats.unctad.org/Dgff2016/> (accessed 11 June 2019).
- UNCTAD (2017). *Tourism for Transformative and Inclusive Growth*. Economic development in Africa report, No. 2017. United Nations publication. Sales No. No E.17.II.D.2. New York and Geneva.
- UNCTAD (2019a). UNCTADStat. See <https://unctadstat.unctad.org/> (accessed 10 April 2019).

- UNCTAD (2019b). UNCTAD product groups and composition (SITC Rev. 3). April. Available at <https://unctadstat.unctad.org/EN/Classifications.html>.
- UNEP and UNWTO (2005). *Making Tourism More Sustainable: A Guide for Policy Makers*. Paris.
- United Nations, European Commission, OECD and UNWTO (2010). *Tourism Satellite Account: Recommended Methodological Framework 2008*. United Nations publication. Sales No. E.08.XVII.27. Luxembourg, Madrid, New York and Paris.
- UNWTO (2011). *Tourism Towards 2030: Global Overview*. Madrid.
- UNWTO (2018). *UNWTO Tourism Highlights: 2018 Edition*. UNWTO. Madrid.
- UNWTO (2019). UNWTO World tourism barometer. Volume 17. Issue 2. May 2019. Excerpt. Available at <http://marketintelligence.unwto.org/content/unwto-world-tourism-barometer> (accessed 6 June 2019).
- UNWTO and ILO (2014). *Measuring Employment in the Tourism Industries: Guide with Best Practices*. Madrid.
- World Bank (2019). World Development Indicators Database. See <http://data.worldbank.org/data-catalog/world-development-indicators> (accessed 6 November 2019).
- WTTC (2019). Economic impact 2019: World. Available at <https://www.wttc.org/economic-impact/country-analysis/> (accessed 11 June 2019).
- WTTC and Oxford Economics (2018). City travel & Tourism impact: Methodology. Available at <https://www.wttc.org/economic-impact/city-analysis/methodology/> (accessed 11 June 2019).



II. New protectionism versus inclusive trade

Target 17.10: Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the World Trade Organization, including through the conclusion of negotiations under its Doha Development Agenda.

- Indicator 17.10.1: Worldwide weighted tariff-average (Tier I)

Target 17.12: Realize timely implementation of duty-free and quota-free market access on a lasting basis for all least developed countries, consistent with World Trade Organization decisions, including by ensuring that preferential rules of origin applicable to imports from least developed countries are transparent and simple, and contribute to facilitating market access.

- Indicator 17.12.1: Average tariffs faced by developing countries, LDCs and SIDS (Tier I)

Target 10.a: Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements

- Indicator 10.a.1: Proportion of tariff lines applied to imports from LDCs and developing countries with zero-tariff (Tier I)

Key messages

- **Africa imposes some of the highest import duties**
- **While 60% of agricultural trade was duty free in 2017, the remaining tariffs are high**
- **Manufacturing tariffs particularly high in the South Asian region**
- **Developed countries still apply tariffs to imports from LDCs at below 2% rates in 2016**
- **South-South trade is burdened by high tariffs**
- **Share of zero tariffs applied to LDCs' exports up to 65.6% in 2017 from 53.6% in 2010**
- **Rising protectionism in 2018–2019 risks damaging world trade**
- **Technical barriers to trade affect almost 70% of world trade**

Trade plays a key role in achieving the ambitious targets of the 2030 Agenda. Target 17.10 is of paramount importance to advancing economic growth and fostering global competitiveness as it promotes a universal, rules-based, open, non-discriminatory and equitable multilateral trading system.

The argument for free trade...

In general, trade theory argues that trade plays an important effect on restructuring economies (De Zwart and Zanden, 2018) as a result of division of labour and specialization. It also argues that gains arising from trade for one country do not imply losses for another. Those gains are mutual (Easterly, 2013). In other words, free trade is not a 'beggar-thy-neighbour' policy (Stiglitz, 2002). As Piketty (2014) has noted 'protectionism does not produce wealth, and free trade and economic openness are ultimately in everyone's interest. The interdependence between trade and peace is also recognised (Polanyi, 1944).

...but only when countries are ready

Economic nationalism and tariff protection can be appropriate policies when there is a need to protect infant industries or sectors that can become

competitive quickly (Radelet, 2015). Landes (1999) has also made this point, noting that 'history's strongest advocates of free trade...were strongly protectionist during their own growing stage.' Piketty (2014) too supports the argument that 'Trade liberalization is not necessarily a bad thing, but only if it is not peremptorily imposed and only if the lost revenue can gradually be replaced by a strong tax authority capable of collecting new taxes and other substitute sources of revenue. Today's developed countries reduced their tariffs over the course of the nineteenth and twentieth centuries at a pace they judge to be reasonable and with clear alternatives in mind. They were fortunate enough not to have anyone tell them what they ought to be doing instead. This illustrates a more general phenomena: the tendency of the rich countries to use the less developed world as a field of experimentation, without really seeking to capitalize on the lessons of their own historical experience.'

Market access conditions are an important factor for the effectiveness of trade, and the scale of tariffs are an important determinant of market access. Revenues accrued from tariffs may constitute a significant portion of a government's public revenue, particularly in low-income countries. In most cases, tariff rates are set with a view to

optimizing a country's welfare gains (Amador and Bagwell, 2012).

Trade agreements

In 1947, the major economies involved in international trade signed the GATT. With GATT, countries entered into reciprocal and mutually advantageous arrangements aimed at the substantial reduction of tariffs and other barriers to trade and to the elimination of discriminatory treatment in international commerce (WTO, 2019a).

Article 1 of the GATT-94 stipulates that members set their tariffs on a most favoured nation (MFN) basis in such a way that any advantage, favour, privilege or immunity granted to any product originated in and destined for other countries becomes immediately and unconditionally applicable to all contracting parties.

The conclusion of the GATT-94 multilateral trade negotiations led to the creation the WTO with a clear mandate to develop an integrated, more viable and durable multilateral trading system. The WTO members set a maximum limit for tariffs levied on all agricultural goods and the majority of non-agricultural goods.¹

Since then, most economies across the world have negotiated bilateral or multilateral trade agreements with the objective of reducing barriers to trade and promoting exchanges among members. Most recently, in September 30, 2018, on the initiative of the United States of America, the United States, Mexico, and Canada renegotiated the terms of NAFTA which governed trade relations between member countries since 1994. The new deal is called the United States-Mexico-Canada Agreement, which must now be ratified by each country's legislature.

The United States has also initiated a review of China's policies and practices that may impact trade between the two countries. While the review

of existing trade agreements could potentially benefit all parties, for example by improving regulatory transparency, and addressing labour and environmental issues, there is a risk that a strong focus on bilateral trade balances may result in rising protectionist measures.

Lowering tariffs could contribute to accrued trade and economic exchange

Even though most developed countries have pushed for lower tariffs in recent years, there are still many parts of the globe where they remain high. Among major global economies, India imposes a weighted average tariff of 5.8 per cent while China's average rate is 3.8 per cent. Some of the highest import duties can be found in Africa, where Gabon stands out with an average 16.9 per cent tariff. The country with the highest weighted average tariff worldwide is Palau at 29.9 per cent.² The United States applies a weighted average tariff of 1.7 per cent on its imports, one of the lowest rates worldwide. The weighted average tariff, applied in the European Union, was 1.8 per cent in 2017.



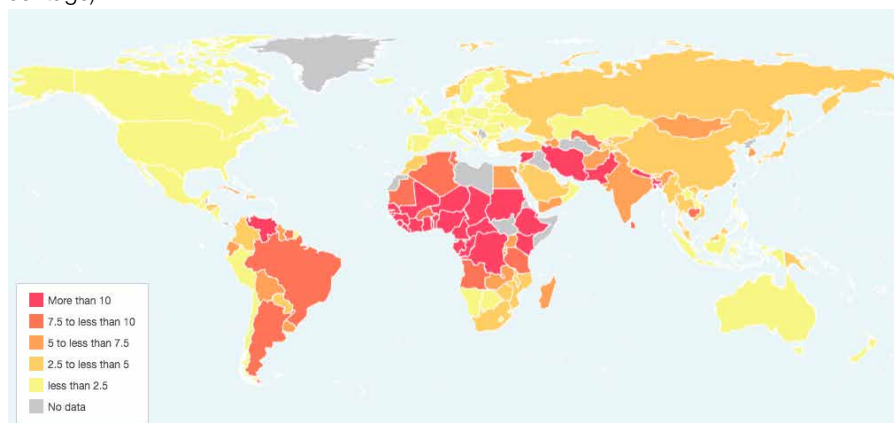
Since 2008, both multilateral and preferential tariffs have been trending downwards. Tariffs on agricultural and natural resources have been reduced through MFN tariffs and preferential liberalization.

According to UNCTAD (2019b), the simple average of the world MFN tariff for agricultural products in 2017 remained relatively high at around 16 per cent, although they have declined by about two percentage points since 2008.

The simple average of the world MFN tariffs for natural resources in 2017 continued to decline and was below three per cent. For manufacturing

Map 1

Worldwide weighted average tariff, latest available data (SDG 17.10.1)
(Percentage)



Source: UNCTAD, ITC and WTO calculations based on UNCTAD (2019c), ITC (2019) and WTO (2019b).

products, liberalization occurred largely through preferential access, resulting in a decline of about one percentage point (see figure 1).

MFN rates are always higher than preferential tariff rates. For example, in 2017, the simple average MFN rates for agricultural products were above 16 per cent, almost twice the rates of its preferential counterpart.

Tariff restrictions in international trade in agricultural products are relatively high in South Asian and East Asian countries, while they are on average much lower in developed economies. Manufacturing tariffs remain high in the South Asian region. According to the World Bank, South Asia, the world's fastest growing region,



could triple its regional trade by reducing trade barriers (Kathuria, 2018).

Tariffs applied to exports of LDCs and developing countries slowly reducing

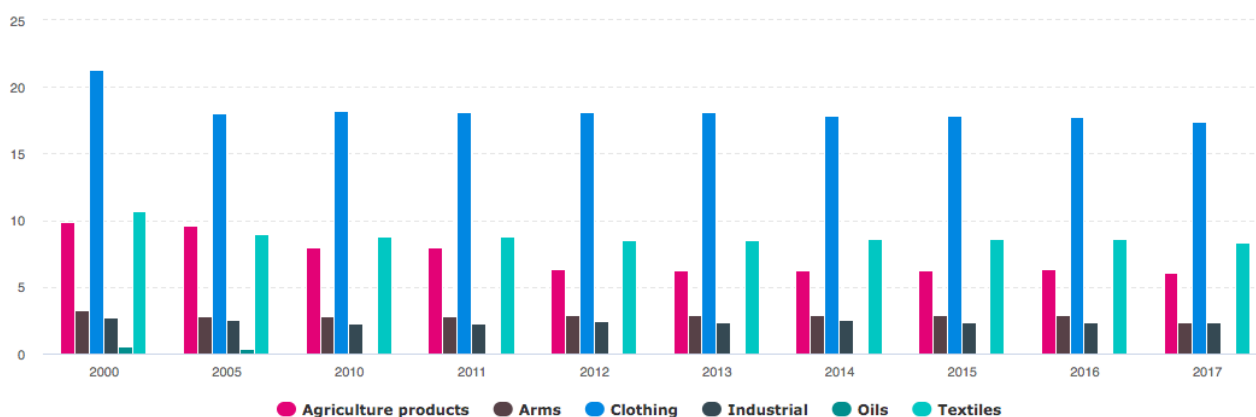
The average level of customs tariff rates (indicator 17.12.1) faced by developing countries and LDCs illustrates the pace at which the multilateral system is advancing toward the implementation

Figure 1 **Multilateral and preferential tariff liberalization**
(Percentage)



Source: UNCTAD, ITC and WTO calculations based on UNCTAD (2019c), ITC (2019) and WTO (2019b).

Figure 2 Average tariffs applied by developed countries to exports of LDCs, by sector (SDG 17.12.1)
(Percentage)



Source: UNCTAD, ITC and WTO calculations based on UNCTAD (2019c), ITC (2019) and WTO (2019b).

of duty-free and quota-free market access.

The objective of the target 17.12 is to “realize timely implementation of duty-free and quota-free market access on a lasting basis for all least developed countries...”. Recognizing LDCs special economic situation, developed countries and other economies in a position to do so³, agreed to grant LDCs duty-free and quota-free preferential market access.

Figure 2 shows that import tariffs applied by developed countries to products from LDCs have been slowly reducing since 2000. Tariffs, however, were much higher for clothing, textiles and agricultural products in 2017.

**Developed countries
still apply tariffs
to imports from LDCs**



at below 2% rates in 2016

Measures have been taken

Preferential market access for developing countries has been initiated by most developed countries since the early 1970s under the aegis of

UNCTAD (UNCTAD, 2019d). These unilateral trade preferences are called the Generalized System of Preferences (GSP). It allows developed countries to apply different tariffs between different groups of trading partners without violating Article I of the GATT requiring non-discriminatory and equal treatment of trading partners.

Trade preferences under the GSP program are granted not only by the so-called QUAD countries, namely the European Union (EU), United States, Japan and Canada but also by Australia, New Zealand, Norway, Belarus, Iceland, Kazakhstan, Russian Federation, Switzerland, and Turkey.

In addition to the GSP scheme and LDCs preferences, many developed countries grant trade preferences to other developing countries, either within the GSP or as separate program (Klasen et al., 2016). For example, the European Commission has a ‘zero’ tariff initiative for LDCs covering all products except the arms trade. This so called “Everything but Arms” (EBA) initiative implements a slightly less preferential (GSP+) tariff for vulnerable countries, respecting international conventions on human and labour rights, environmental protection and good governance (European Commission, 2019). Canada, apart from the GPT applicable to developing nations, grants a non-reciprocal Commonwealth Caribbean Countries tariff to

Table 1 Tariff restrictiveness, matrix by region, 2017
(Percentage)

Importing Region	Exporting Region						
	Developed economies	East Asia	Latin America	South Asia	Sub-Saharan Africa	Transition economies	Western Asia and North Africa
Developed economies	1.6 -0.5	2.6 0.2	1.2 0.3	2.7 -0.3	0.4 -0.1	1.7 0.8	0.6 0.0
East Asia	5.1 -0.7	2.7 -0.6	5.4 -0.2	3.2 -0.9	1.7 -0.2	3.8 1.3	1.8 -0.2
Latin America	3.8 -0.2	8.4 -0.7	1.2 -0.5	11.5 -0.9	2.4 -0.2	2.1 0.4	3.1 -0.4
South Asia	11.0 0.8	11.1 0.4	17.8 -1.9	6.9 -1.0	5.8 -1.1	8.3 1.0	9.2 -1.7
Sub-Saharan Africa	7.5 -0.6	11.6 -0.1	8.9 0.2	8.3 0.8	3.1 -0.8	8.7 2.2	5.5 0.1
Transition economies	3.8 -2.4	2.1 -5.5	2.0 -8.3	5.7 -4.4	0.7 -2.1	0.4 0.3	5.3 -2.0
Western Asia and North Africa	3.2 -0.9	5.6 -0.4	6.4 -0.8	4.0 0.4	2.6 0.0	6.7 2.8	1.9 -0.1

Source: UNCTAD (2019b)

Note: Changes between 2008 and 2017 are shown in smaller font.

certain Caribbean nations. This applies also to the Least Developed Country Tariff.

Import restrictiveness differs substantially across countries, and even within the same region. Preferential schemes allow LDCs to enjoy duty-free access to many developed country markets. However, developing country exports, especially those in Eastern Asia, Latin America and East Africa, still face relatively high tariffs.

Table 1 presents a matrix of the average tariff levels imposed on trade flows between regions in 2017. Intraregional trade is generally subject to lower tariff trade restrictiveness than interregional trade. However, this is not the case for exports from sub-Saharan Africa and South Asian countries, for which market access is often better for interregional trade than for intraregional trade. South Asia and Sub-Saharan Africa face the highest intraregional tariffs, with tariffs of 6.8 per cent and 3.1 per cent respectively, in 2017.

A large number of South–South trade flows are still burdened by relatively high tariffs. For example, exports from Latin American countries to the South Asian region face a tariff of almost 18 per cent (UNCTAD, 2019b).

The objective to improve market access conditions for LDCs exports by giving special and differential treatment to LDCs in accordance with the WTO agreements was not only outlined in SDG Target 17.12, but also in SDG Target 10.a. The following section will cover SDG Target 10.a.



**Share of zero tariffs
applied to LDCs' exports up**

**from 53.6%
in 2010**

**to 65.6%
in 2017**

Tariffs on imports continue to fall

Most developed countries grant some degree of duty-free and quota-free market access to LDCs, and an increasing number of developing countries are in the process of extending similar treatment to most imports from LDCs. SDG indicator 10.a.1 shows the extent to which special and differential treatment has been applied through import tariffs.⁴

LDCs are granted duty-free market access on 65.6 per cent of tariff lines in 2017 (figure 3); the respective share for developing countries is 50.8 per cent. The proportion of duty-free tariff lines to LDCs' exports has risen from 53.6 per cent in 2010, showing the commitment of international community to boost exports from poorest countries.

Between 2010 and 2017, the proportion of

tariff lines⁵ applied to LDCs that are zero-tariff increased by 9.8 percentage points. This increase is twice as big as the corresponding increase for developing countries in general (5.2 per cent). From 2015 to 2016, the increase was 0.8 per cent, which was half of the average yearly increase between 2010 and 2015 (2.0 per cent). It was on a similar level to the latest increases in all developing countries (0.7 per cent).

More than 50 per cent of exports from developing countries are now eligible for duty free treatment

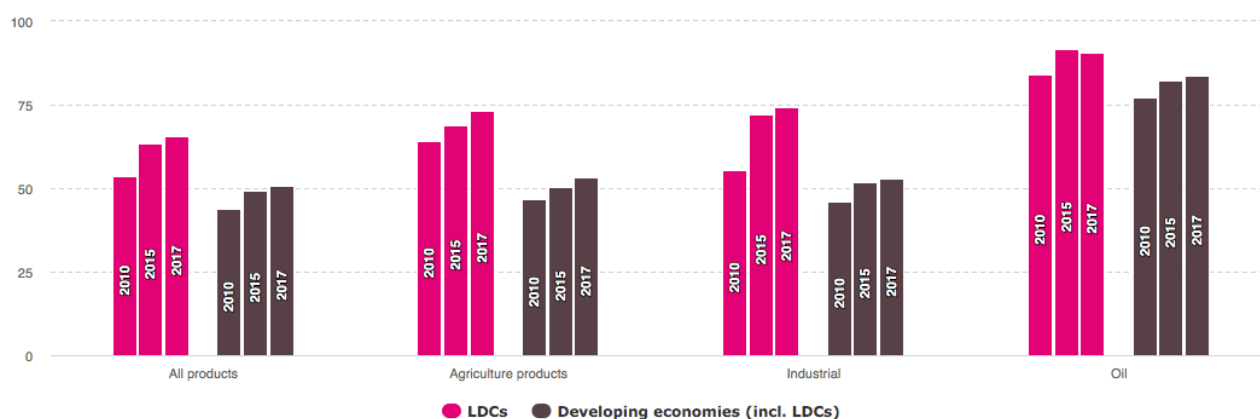
A large increase between 2005 and 2017 was recorded by LDCs countries (see figure 4), as the coverage of duty free treatment reached 65.6 per cent of all the products exported.

At the country level, in 2017, the gains have been noticed for several countries comparing to 2005. The highest increase was recorded by Djibouti, from 20 per cent in 2005 to 74 per cent in 2017.

Few countries recorded nevertheless a decrease, such as Angola (from 55 per cent in 2005 to 46 per cent) in 2017 and Kiribati (from 72 per cent in 2005 to 60 per cent in 2017).

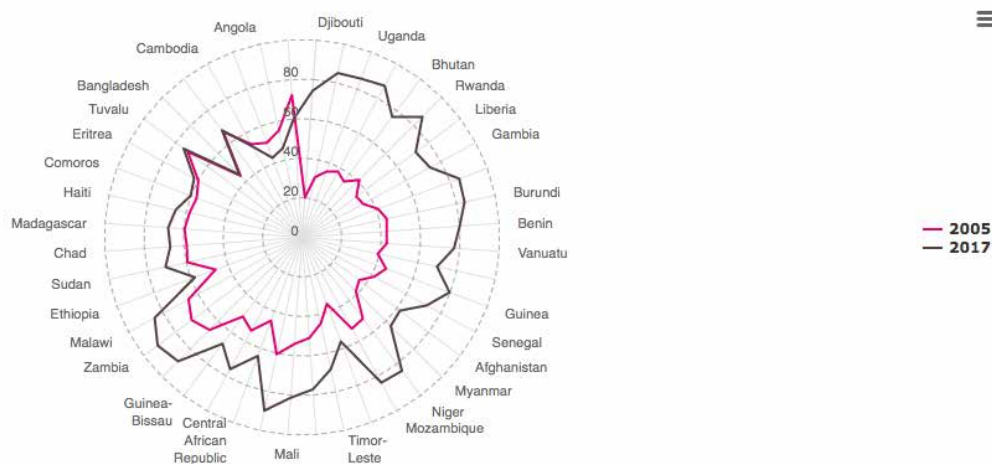
Figure 5 shows that over 60 per cent of agricultural trade in 2016 was duty-free, with 20 per cent of

Figure 3 Proportion of tariff lines worldwide with zero duty applied to products from developing countries and LDCs, by group of products (SDG 10.a.1) (Percentage)



Source: UNCTAD, ITC and WTO calculations based on UNCTAD (2019c), ITC (2019) and WTO (2019b).

Figure 4 Proportion of tariff lines worldwide with zero duty applied to products from LDCs, by country (Percentage)



Source: UNCTAD illustration based on joint UNCTAD, ITC and WTO calculations with data from ITC (2019), UNCTAD (2019c) and WTO (2019b).

While 60% of agricultural trade was duty free in 2017, the remaining tariffs are high



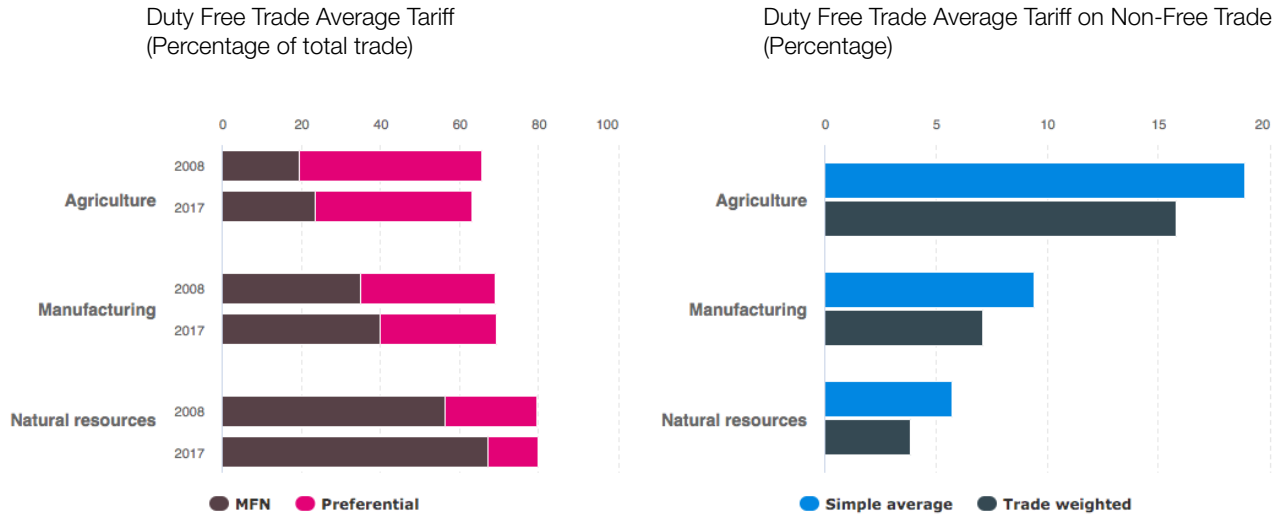
this accounting for duty-free on the MFN basis and the rest under preferential tariffs. The remaining tariffs are fairly high, weighted tariffs averaging to over 15 per cent for agriculture, and around 7 per cent for manufacturing products. For natural resources, preferential access is less important, as trade in these goods is largely tariff-free under

MFN rates. The remaining tariffs are generally very low, with weighted tariffs averaging about four per cent.

Rising trade protectionism and potential trade wars

The situation in which a country unilaterally optimizes tariffs, the beggar-thy-neighbour approach, carries an inherent risk of a “trade war”, where other countries retaliate, by raising their own tariffs, against the tariff barriers imposed by their trading partners. Trade protectionism remains an important risk for global growth.

Figure 5 Free trade and remaining tariffs, by broad category



Source: UNCTAD Secretariat calculations based on COMTRADE data and UNCTAD TRAINS data.



Rising protectionism in 2018-2019 risks **damaging** world trade

“War is war, and trade is war”.

– Landes (1998: 482)

In the aftermath of the global financial crisis, both developed and developing regions introduced a range of trade-restrictive measures, including new or higher tariffs, quantitative restrictions, and stricter customs regulations. According to the WTO Director-General’s 2018, mid-year report, during the review period the value of trade covered by restrictive measures rose, and the value covered by facilitating measures fell. WTO members introduced more trade-restrictive measures between mid-October 2017 and mid-May 2018 compared with the previous year, with an average of 11 new trade-restrictive measures per month. The previous report identified an average of nine measures per month (WTO, 2018).

Since January 2018, the United States imposed trade barriers on many goods. In particular, they imposed trade barriers on solar panels and washing machine imported from China, on steel and aluminium imports from the European Union, Mexico and Canada, and are threatening

to impose a 25 per cent tariff on all imported cars and auto parts (see figure 6).

A tit-for-tat escalation of tariff increases could shave 0.8 per cent off global GDP by 2020 (IMF, 2018). The potential effects of rising protectionism could include the disruption of prevailing global value chains and will probably damage world trade (UNCTAD, 2018).

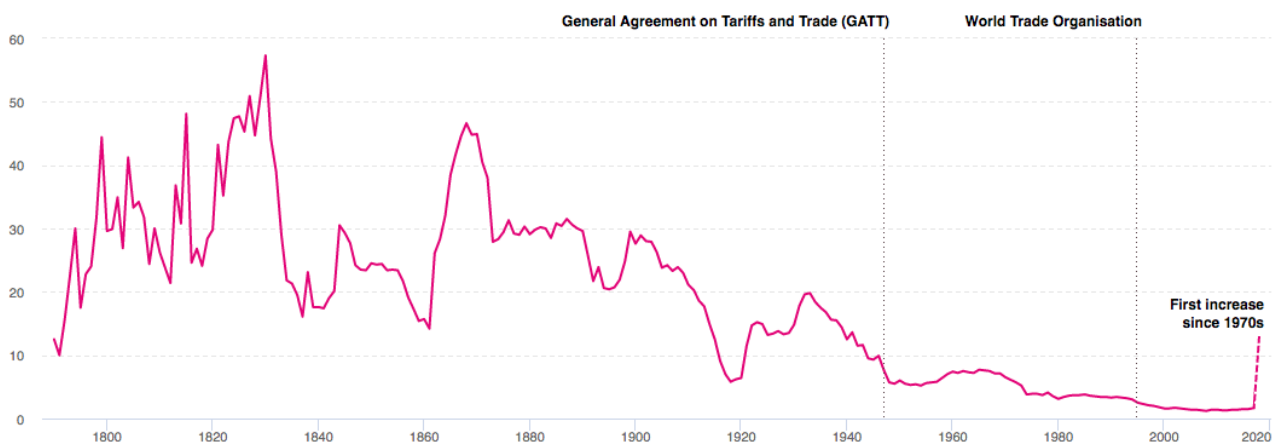
It is worth mentioning that substantial effects relative to the size of their exports are expected for many countries. For example, the approximately US\$27 billion of United States-China trade that would be captured by Mexico represents a non-negligible share of Mexico’s total exports (about six per cent) (UNCTAD, 2019b).

Non-tariff measures – Hidden protectionism?

“Domestic trade politics have become more difficult and trade deals have become more complex because the nature of obstacles to trade has evolved. We are no longer negotiating just the reduction of tariffs, but also of non-tariffs barriers, which have gained enormous importance”.

– Pascal Lamy, Former Director-General of the World Trade Organisation, 24 July, 2013.

Figure 6 Tariffs as a percentage of total American imports



Source: 1790-2016: Kopf (2018); 2017: World Bank (2019b); 2018: Foy (2019).

Figure 7 NTMs in world trade
(Percentage)



Source: UNCTAD calculations based on data from UNCTAD (2019e).

Note: The frequency index is defined as the percentage of 6-digit lines of the Harmonized System covered, while coverage ratio is defined as the percentage of trade affected.

Although tariffs have declined worldwide, non-tariffs measures (NTMs) persist and shape a growing share of modern trade policy instruments.

According to UNCTAD and World Bank (2018), NTMs represent a total cost to trade of approximately US\$325 billion. Today, a large number of NTMs are regulatory measures, while traditional trade policy instruments, such as quotas or trade defense measures, and also considered non-tariff barriers (NTBs), are now less frequent. Technical NTMs, such as Technical Barriers to Trade (TBT), which include standards or obligatory re-quirements on product characteristics or their related production methods, are the most used (which account for 41 per cent of all NTMs), followed by sanitary and phytosanitary measures (SPS) (35 per cent of all NTMs) (UNCTAD, 2019b). Some NTMs are also designed either to stimulate or restrict exports.

TBT are widely used to regulate the trade flows of the vast majority of products. TBT affect more than 30 per cent of product lines and almost 70 per cent of world trade (figure 7). They refer to measures, such as, labelling, standards on technical specifications and quality requirements, as well as all conformity-assessment measures.

SPS are typically prevalent in agriculture and might include, inter alia, measures such

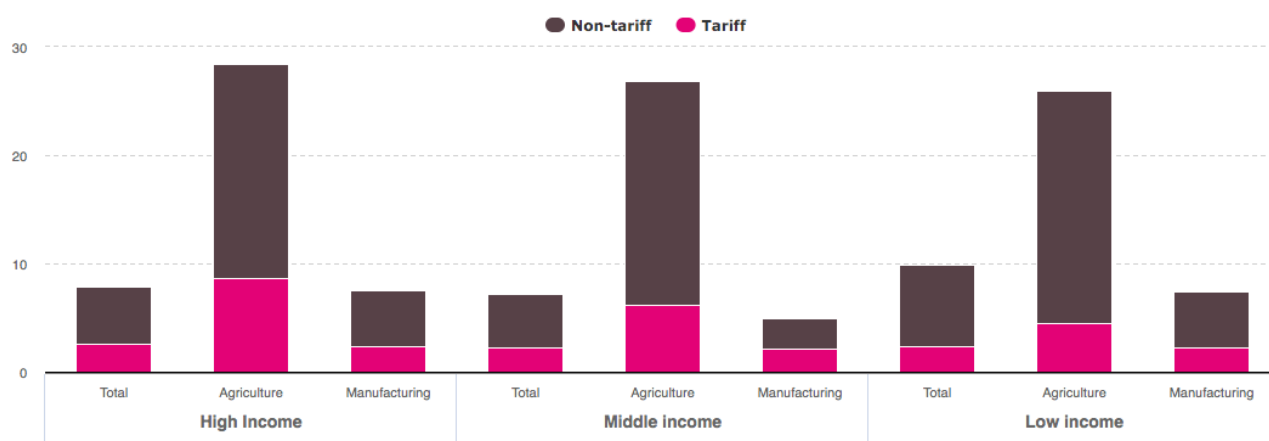
**Technical barriers
to trade affect almost
70% of world trade**



as, restrictions to substances that ensure food safety and prevent dissemination of disease, requirements on packaging and labelling, conformity-assessment measures related to food safety, such as, ignificantly, testing and quarantine. These measures affect almost 20 per cent of world trade and price control measures affect about 15 per cent of world trade (figure 7).

The trade impact of NTMs is significant (UNCTAD, 2019b). NTMs market ignificantly is more than double that of existing tariffs, particularly in agriculture (UNCTAD and World Bank, 2018). Because of the importance of agricultural products to the export composition of developing countries, trade restrictiveness is generally higher in low-income countries (Africa at LSE, 2015). As NTMs vary ignificantly across countries and products, “ad valorem” (AVE) equivalents are calculated for NTMs in order to make the comparison. UNCTAD estimates that AVEs in the agricultural sector of low-income countries and middle-income countries stand at 22 per cent and 21 per cent, respectively. The estimated levels of ad-valorem tariffs, equivalent to NTMs in terms

Figure 8 Trade restrictiveness of non-tariff measures relative to tariffs
(Ad valorem equivalent faced when exporting)



Source: UNCTAD (2015).

of trade restrictiveness (for the same product groups) are five per cent for low-income and seven per cent for middle-income countries (UNCTAD, 2015) (see figure 8).

The majority of NTMs may equally apply to domestic producers and arise from non-trade objectives related to social and environmental issues, helping to achieve sustainable development goals: food security (SDG 2); nutrition and health (SDG 3); protect endangered species and the environment (SDGs 14 and 15); ensure sustainable production and consumption (SDG 12); energy (SDG 7); and combat climate change (SDG 13). Such linkages to sustainable development can be described as direct. On the other hand, non-tariff measures influence trade, which, in turn can restrict economic growth and create negative spillover effects on sustainability objectives. These linkages are referred to as indirect.

For instance, agricultural export subsidies could be designed in a way that restrict trade and distort world agricultural markets. Such NTMs would evidently have a negative impact on food security (SDG target 2.b) – indirect linkage. At the same time, governments can design requirements for plant-growth processes, food and feed processing, or TBT regulations on production processes. These measures should increase productivity and production, and help maintain ecosystems (SDG target 2.4) – direct linkage (UNCTAD, 2019e).

Policy makers face the challenge of finding an optimal trade-off between trade restrictions and sustainable development. In fact, trade costs related to non-tariff measures can be reduced by 15 to 25 per cent through “regulatory convergence and good regulatory practice.” (UNCTAD and World Bank, 2018).

Statistics for NTMs are still incomplete. As of today, the TRAINS database (UNCTAD, 2019e; World Bank, 2019b) database developed by UNCTAD in partnership with several regional and international organisations is the most complete collection of publicly available data on non-tariff measures at the detailed product level. In 2014, to improve data coverage, UNCTAD and the World Bank launched the “Top 25 Markets” project to collect NTMs data for countries that represent a significant share of world trade. Today, the TRAINS database includes NTMs information for 109 countries and covers 90 per cent of world trade (UNCTAD and World Bank, 2018).

Notes

- 1 According to WTO, for non-agricultural products the product coverage of tariff binding by developed country members was 100 per cent, while that of developing country members was around 73 per cent (WTO, 2019c).
- 2 Weighted mean applied tariff is the average

of effectively applied rates weighted by the product import shares corresponding to each partner country. Data are classified using the Harmonized System of trade at the six- or eight-digit level. Tariff line data were matched to Standard International Trade Classification (SITC) revision 3 codes to define commodity groups and import weights. To the extent possible, specific rates have been converted to their ad valorem equivalent rates and have been included in the calculation of weighted mean tariffs. Import weights were calculated using Comtrade database (United Nations, 2019). Effectively applied tariff rates at the six- and eight-digit product level are averaged for products in each commodity group. When the effectively applied rate is unavailable, the most favored nation rate is used instead.

- 3 Following the WTO Hong Kong Ministerial Decision in 2005 (WTO, 2015).
- 4 Limitations of this indicator include the following: (i) Tariff-based measures are only a part of trade limitation factors. (ii) Inability to comply with rules of origin criteria limits the utilization of preferential treatments. (iii) Using data on zero-tariff lines assumes full utilization of benefits. (iii) Low MFN tariffs mean that duty-free treatment is not always preferential (United Nations, 2019).
- 5 Proportion of total number of tariff lines applied to products imported from least developed countries and developing countries is presented in per cent corresponding to a zero per cent tariff rate in HS chapter 01-97. This indicator allows observing on how many products developing countries and LDCs will have free access to Developed countries markets (United Nations, 2019).

References

- Africa at LSE (2015). Direct and indirect linkages between Non-Tariff Measures and the SDGs. September. Available at <https://blogs.lse.ac.uk/africaatlse/2015/09/30/direct-and-indirect-linkages-between-non-tariff-measures-and-the-sdgs/> (accessed 14 June 2019).
- Amador M and Bagwell K (2012). Tariff revenue and tariff caps. *American Economic Review*. 102(3):459–465.
- De Zwart P and Zanden JL van (2018). *The Origins of Globalization: World Trade in the Making of the Global Economy, 1500-1800*. Cambridge University Press. Cambridge.
- Easterly W (2013). *The Tyranny of Experts: Economists, Dictators, and the Forgotten Rights of the Poor*. Basic Books. New York, NY.
- European Commission (2019). GSP+. Available at <https://trade.ec.europa.eu/tradehelp/gsp> (accessed 14 June 2019).
- Foy M (2019). U.S. consumers have borne the brunt of the current trade war. NBER Digest. May. Available at <https://www.nber.org/digest/may19/w25672.shtml> (accessed 20 June 2019).
- IMF (2018). *World Economic Outlook, October 2018: Challenges to Steady Growth*. Washington, DC.
- ITC (2019). Market Access Map. See <https://www.macmap.org/> (accessed 30 July 2019).
- Kathuria S, ed. (2018). *A Glass Half Full: The Promise of Regional Trade in South Asia*. World Bank. Washington, DC.
- Klasen S, Martínez-Zarzoso I, Nowak-Lehman F and Bruckner M (2016). Trade preferences for Least Developed Countries. Are they effective? Preliminary econometric evidence. CDP Policy Review No. 4. United Nations Committee for Development Policy.
- Kopf D (2018). Taxes on US imports as a share of total imports value. Available at <http://www.theatlantic.com/charts/SyXJGvOtf> (accessed 20 June 2019).
- Landes (1999). *The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor*. Norton. New York.
- Piketty T (2014). *Capital in the Twenty-First Century*. Belknap Press. Cambridge, Mass.
- Polanyi K (1944). *The Great Transformation: The*

Political and Economic Origins of Our Time.
Beacon Press. Boston.

Radelet SC (2015). *The Great Surge: The Ascent of the Developing World.* Simon & Schuster. New York.

Stiglitz JE (2002). *Globalization and Its Discontents.* Norton. New York, NY.

UNCTAD (2003). Course on Dispute Settlement – Module 3.9. WTO: SPS Measures. UNCTAD/EDM/Misc.232/Add.13. Available at <https://unctad.org/en/Pages/DITC/TNCD/Dispute-Settlement-in-International-Trade.aspx>.

UNCTAD (2015). *Trading Into Sustainable Development: Trade, Market Access, and the Sustainable Development Goals.* UNCTAD/DITC/TAB/2015/3. Geneva.

UNCTAD, ed. (2018). *Trade and Development Report 2018: Power, Platforms and the Free Trade Delusion.* United Nations publication. Sales No. E.18.II.D.7. New York and Geneva.

UNCTAD (2019a). Classification of Non-Tariff Measures. Available at <https://unctad.org/en/Pages/DITC/Trade-Analysis/Non-Tariff-Measures/NTMs-Classification.aspx> (accessed 14 June 2019).

UNCTAD (2019b). *Key Statistics and Trends in Trade Policy 2018: Trade Tensions, Implications for Developing Countries.* UNCTAD/DITC/TAB/2019/1. Geneva.

UNCTAD (2019c). TRAINS: The global database on Non-Tariff Measures. See <https://trains.unctad.org/> (accessed 14 June 2019).

UNCTAD (2019d). Preferential market access and the Generalized System of Preferences. Available at <https://unctad.org/en/Pages/DITC/GSP/Generalized-System-of-Preferences.aspx> (accessed 14 June 2019).

UNCTAD (2019e). NTMs and SDGs. Available at [https://unctad.org/en/Pages/DITC/Trade-](https://unctad.org/en/Pages/DITC/Trade-Analysis/Non-Tariff-Measures/NTMs-and-)

[SDGs.aspx](https://trains.unctad.org/) (accessed 14 June 2019).

UNCTAD (2019e). TRAINS: The global database on Non-Tariff Measures. See <https://trains.unctad.org/> (accessed 14 June 2019).

UNCTAD and World Bank (2018). *The Unseen Impact of Non-Tariff Measures: Insights from a New Database.* UNCTAD/DITC/TAB/2018/2. Geneva.

United Nations (2019). E-handbook on SDG Indicators. Available at <https://unstats.un.org/wiki/display/SDGeHandbook/Home> (accessed 14 June 2019).

World Bank (2019a). Tariff rate, applied, weighted mean, all products (%). Available at <https://data.worldbank.org/indicator/tm.tax.mrch.wm.ar.zs> (accessed 14 June 2019).

World Bank (2019b). World Integrated Trade Solution. See <https://wits.worldbank.org/> (accessed 14 June 2019).

WTO (2015). Ministerial declaration. WT/MIN(05)/DEC. Hong Kong. 22 December. Available at https://www.wto.org/english/thewto_e/minist_e/min05_e/final_text_e.htm (accessed 14 June 2019).

WTO (2018). Mainstreaming trade to attain the Sustainable Development Goals. Available at https://www.wto.org/english/res_e/publications_e/sdg_e.htm (accessed 13 June 2019).

WTO (2019a). The basic rules for goods. Available at https://www.wto.org/english/tratop_e/region_e/regatt_e.htm (accessed 14 June 2019).

WTO (2019b). WTO Integrated Data Base. See <http://tariffdata.wto.org/> (accessed 30 July 2019).

WTO (2019c). Market access for goods. Available at https://www.wto.org/english/tratop_e/markacc_e/markacc_e.htm (accessed 14 June 2019).



III. Trade, agriculture, food security and biodiversity

Target 2.b: Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round.

- Indicator 2.b.1: Agricultural export subsidies

Target 2.c: Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.

- Indicator 2.c.1: Indicator of (food) price anomalies

Key messages

- Agricultural export subsidies have more than halved in the five years (2010–2015) despite falling food prices.
- Sub-Saharan Africa was the region with the most countries with high levels of food prices (10 countries out of 24) and cereal prices (18 countries).
- BioTrade sales reached \$ 4.8 billion in 2017.

Goal 2 of the 2030 Agenda sets out to “End hunger, achieve food security and improved nutrition and promote sustainable agriculture”. As with other SDGs, realising this goal will require a multifaceted approach. One part of the equation is the necessity for properly functioning food commodity markets. Ensuring that markets around the world have access to all food products requires international trade and cross-border co-operation. In the context of climate change, with growing risks for predictability of harvests and uncertainty regarding the sustainability of many regional crops, the importance of trade in food commodities may well increase rather than diminish.

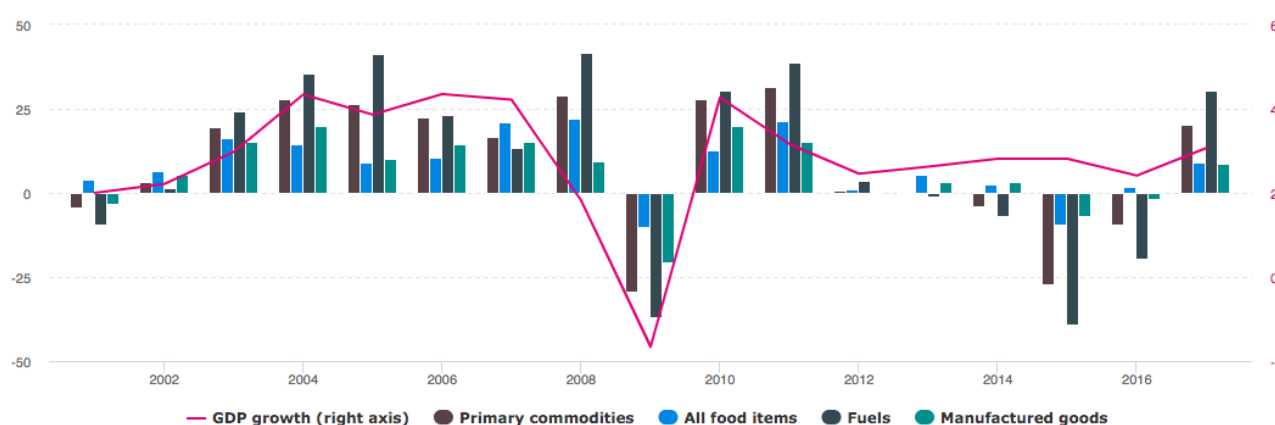
Two targets belonging to SDG 2¹ deal with the proper functioning of food markets. First, target

2.c sets out to limit or reduce price volatility through better access to market information. Second, target 2.b aims to avoid market distortions by eliminating export subsidies and equivalent measures. Co-operation via multilateral trade thus has an important role to play in order to alleviate hunger, and complementing other efforts, such as increasing ODA and OOFs to the agricultural sector (see Official support for sustainable development).

Changing trends in agricultural markets

The value of food trade has more than tripled since 2000, reaching US\$1.5 trillion in 2017, up from US\$426 billion in 2000. Driven by improvements in market access, innovation, economic and population growth, agricultural

Figure 1 Growth of world GDP and merchandise exports by product groups (Percentage)



Source: UNCTAD (2019a).

Note: For more details on the classification of commodities, see UNCTAD product classification.

Table 1 Shares of the 20 major exporters and importers in total agricultural products
(Percentage)

		<i>Major exporters shares in total agricultural products</i>		<i>Change</i>
		2000	2016	
Exports	Developed economies	70.7	60.3	-10.4
	Developing economies	20.2	28.4	8.2
Imports	Developed economies	68.1	58	-10.1
	Developing economies	16.7	24.6	7.9

Source: UNCTAD calculations based on FAO (2018).

Note: Major exporters or importers represent around 90 per cent of total exports or imports of agricultural products in 2000 and 2016.

trade demonstrated stronger resilience than fuel and manufactured goods since the 2008 global financial crisis until 2016. In 2017, the market presents a strong improvement in the different sectors (see figure 1).

Robust demand for food and feed, growth in biofuel production and declining stock-to-use ratios have given rise to structural changes in global agricultural markets. Changing export patterns underscore the increasingly central role of emerging markets in global agricultural trade. While developed economies such as the United States and EU still dominate international trade flows (see table 2 and table 3), developing

economies have increased their prominence in the share of total agricultural exports and imports. Between 2000 and 2016, their share of exports and imports rose by 8.2 and 7.9 percentage points respectively (see table 1). In contrast, developed economies have experienced a significant fall of over 10 percentage points in both imports and exports, illustrating the growing shift in influence towards emerging markets.

Notably, China now ranks as the fourth major exporter of agricultural products with their share of world imports increasing more than threefold – a growth in market share of 8.2 per cent between 2000 and 2016. The dramatic increases in

Table 2 Top 10 importers of agricultural products
(Share in total value of imports)

<i>Economy</i>	<i>2000 Share in total value of imports</i>	<i>Economy</i>	<i>2016 Share in total value of imports</i>
European Union	45.3	European Union	39.1
United States of America	10.1	United States of America	10.1
Japan	8.7	China	8.2
Canada	2.8	Japan	4.2
Mexico	2.3	Canada	2.7
China	2.3	Mexico	2.0
China, Hong Kong SAR	2	China, Hong Kong SAR	1.9
Republic of Korea	2	India	1.9
Russian Federation	1.7	Republic of Korea	1.9
Saudi Arabia	1.2	Russian Federation	1.9

Source: UNCTAD calculations based on FAO (2018).

Table 3 **Top 10 exporters of agricultural products**
(Share in total value of exports)

<i>Economy</i>	<i>2000 Share in total value of imports</i>	<i>Economy</i>	<i>2016 Share in total value of imports</i>
European Union	46.9	European Union	41.1
United States of America	14	United States of America	11
Canada	3.9	Brazil	5.7
Australia	3.7	China	4.2
Brazil	3.2	Canada	3.4
China	3	Argentina	2.8
Argentina	2.7	Australia	2.5
Mexico	1.9	Indonesia	2.4
New Zealand	1.6	Mexico	2.3
Thailand	1.5	India	2.2

Source: UNCTAD calculations based on FAO (2018).

export shares enjoyed by Brazil, India and Indonesia can be attributed to agricultural productivity growth.

Agricultural export subsidies are vanishing

Agricultural export subsidies more than halved in the five years from 2010 to 2015. The 2015 Nairobi package (WTO, 2019a)² has further strengthened WTO members' commitment to abolish trade-distorting subsidies in agricultural markets. The impacts of these policies have led to improved market access for developing economies that have instigated structural changes to access global agricultural markets. Spikes in food prices combined with low agricultural commodity prices have increased governmental pressure to remove trade distorting protectionist policies that may not be captured by traditional export subsidy outlay measures alone. Hence, broader and more comprehensive monitoring of trade barriers may be required to achieve the ambitions of SDG 2.

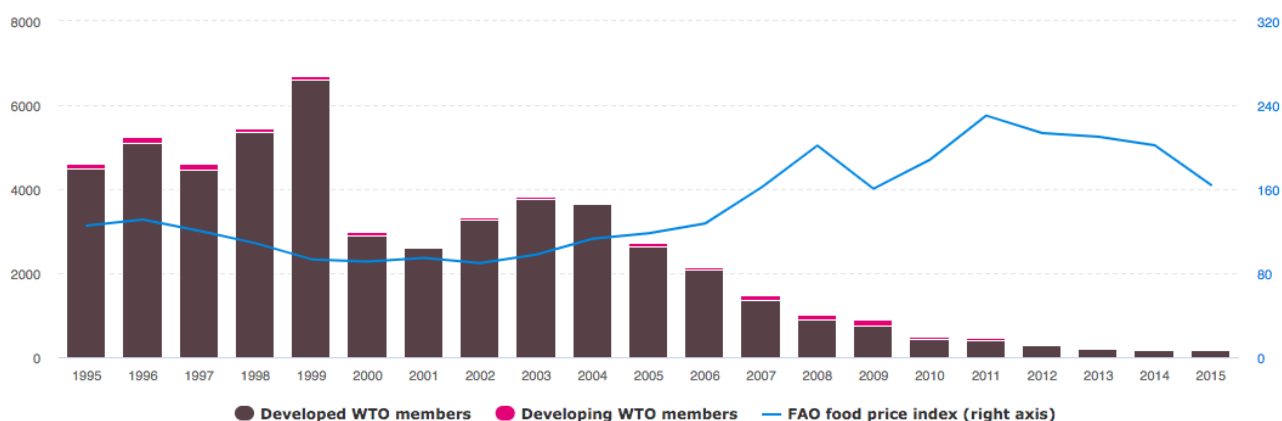
Export subsidies are among the policy instruments that distort trade the most. These subsidies were originally intended to aid domestic producers and farmers in areas where agricultural production

costs were high and to ensure the production of enough food to meet domestic needs. Agricultural export subsidies are a form of government intervention with the purpose of modifying a country's terms of trade. They protect producers from international market competition; i.e., economies where the costs of production, such as labour or land, are cheaper. As such, subsidies may have many spillover effects for the global economy where they can exacerbate price volatility and food price spikes. They allow exporters to gain market share without efficiencies that should accompany such growth.

Since 1999, the Agreement on Agriculture (WTO, 2019b) has placed limits on export subsidies in order to prevent the disposal or dumping of surplus commodities on global agricultural markets. Following the 2015 Nairobi Ministerial Conference, WTO members have taken steps to phase out export subsidy entitlements from their WTO schedule of commitments in order

**Agricultural export subsidies
have more than halved
in the five years (2010 – 2015)
despite falling food prices**

Figure 2 Notifications to WTO of export subsidy outlay (SDG 2.b.1)
(Left axis: Millions of US\$; right axis: index, nominal average 2002-2004=100)



Source: WTO (2019a).

to level the playing field between developed and developing economies. Apart from few selected agricultural products, developed countries have agreed to remove export subsidies with immediate effect, and most developing countries have agreed to do so by 2018.

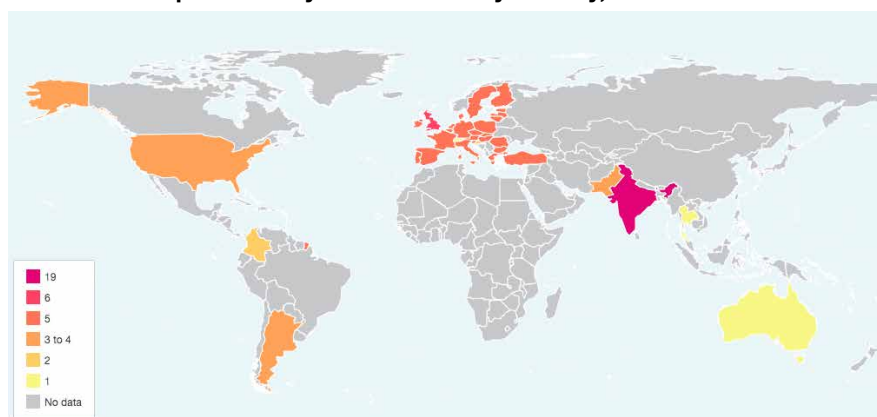
However, developing countries will retain the flexibility to cover marketing and transport costs for agriculture exports until the end of 2023, while the poorest and food-import dependent developing countries will be granted more time to reduce export subsidies (WTO, 2019c). While the Nairobi decision aims to prevent trade distortions using other export policies, such as export finance, international food aid and operations of agricultural exporting state trading enterprises, the sustained fall in global food prices has recently cast doubts over the political feasibility

of implementing agricultural reform at domestic level.

Strengthened by the WTO adoption of Nairobi Package, there has been a sustained downward trend in export subsidy outlays notified to the WTO over the past decade. As shown in figure 2, agricultural export subsidies have more than halved between 2010 and 2015 despite falling food prices. Total subsidy outlays have fallen from US\$434 million in 2010 to less than US\$200 million in 2015, with developed economies accounting for the vast majority of this reduction (US\$179.2 million).

While domestic support in agricultural markets has declined in the more advanced economies since the Agreement on Agriculture in 2000, some emerging and developing economies

Map 1 Trade restrictive export subsidy interventions by country, 2008 - 2018



Source: Global Trade Alert (2019).

experiencing income growth have introduced measures to support their domestic agricultural markets, including the use of trade-distorting measures (FAO, 2018). Map 1 below shows that India implemented the largest number of harmful export subsidy policies, followed by the United Kingdom (UK) and the EU which implemented considerably lower interventions, with six and five, respectively.

Other intervention measures

Figure 3 shows the trend in the number of state interventions implemented in agricultural markets between 2008 and 2018. These data by the Global Trade Alert (2019) systematically document trade-discriminatory and trade liberalizing measures with the former only including measures certain to “discriminate against foreign commercial interests”.³

The number of what are termed harmful interventions implemented, i.e. those that discriminate against foreign commercial interests, peaked at 268 in 2015, of which only 10 were export subsidies. Following the 2015 Nairobi package (WTO, 2019a)2, few trade restrictive export subsidy policies have been implemented in agricultural markets each year. However, in recent years while the number of harmful interventions has reduced somewhat, they remain high,

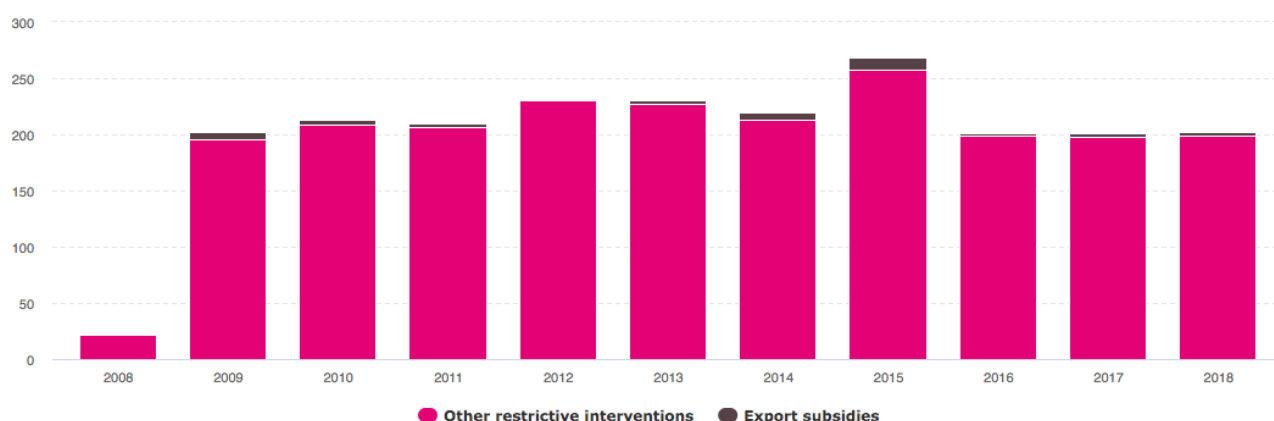
averaging around 200 state enactments per year.

The data presented in figure 3 demonstrate a reduction in the use of export subsidies. However, figure 4 shows that export subsidies only constitute 2 per cent of policy instruments employed in the agricultural market, with import tariffs and export quotas making up 42 and 10 per cent of harmful interventions in agricultural markets, respectively. From mid-October 2015 to mid-May 2016, 154 restrictive trade measures were applied by WTO members – the highest monthly average since 2011 (WTO, 2016). Furthermore, a fifth of all trade measures implemented between 2012 and 2015 targeted agricultural products. These measures have coincided with food price spikes and episodes of volatility in agricultural commodity prices. Research suggests this environment of volatile agricultural prices has created a circularity, leading to a resurgence of isolating trade policies, including a shift towards more government subsidies and market access protection (Bellmann and Hepburn, 2017).

Price information is valuable but lacking

Spikes in food prices are strong indicators of potential threats to food security. Higher food prices can deny low-income families access to sufficient and nutritious food. UNCTAD has long called for increased transparency and tighter

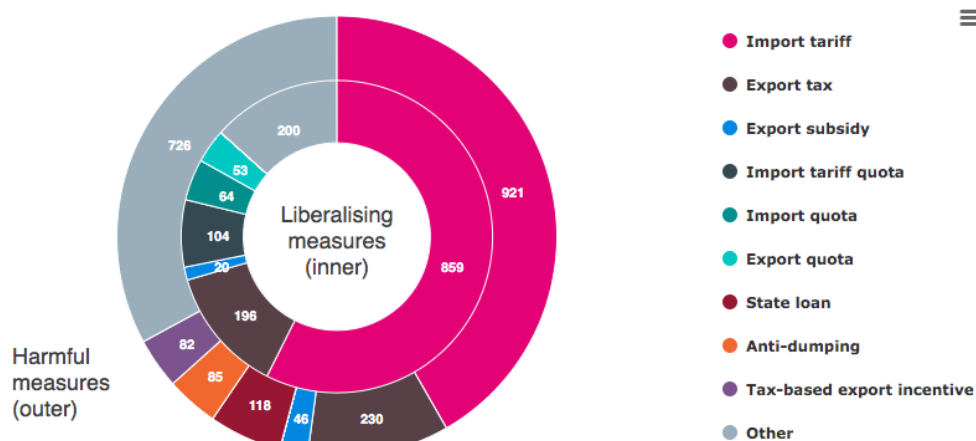
Figure 3 Restrictive measures in agricultural markets



Source: UNCTAD calculations based on data from Global Trade Alert (2019).

Note: ‘Other interventions’ mean ‘Other restrictive interventions’.

Figure 4 Agricultural interventions by policy instrument, 2008–2018



Source: UNCTAD calculations based on data from Global Trade Alert (2019).

regulation of commodity markets to help avoid speculative bubbles (UNCTAD, 2012). Applying these initiatives in commodity food markets can contribute to food security.

At the same time, abnormal food prices are valuable warning signs, signalling the need for action. Prices can be observed, easily and frequently, and carry broad information about recent changes in supply and demand as well as signals about expectations and risks for future food markets (Kalkuhl et al., 2016).

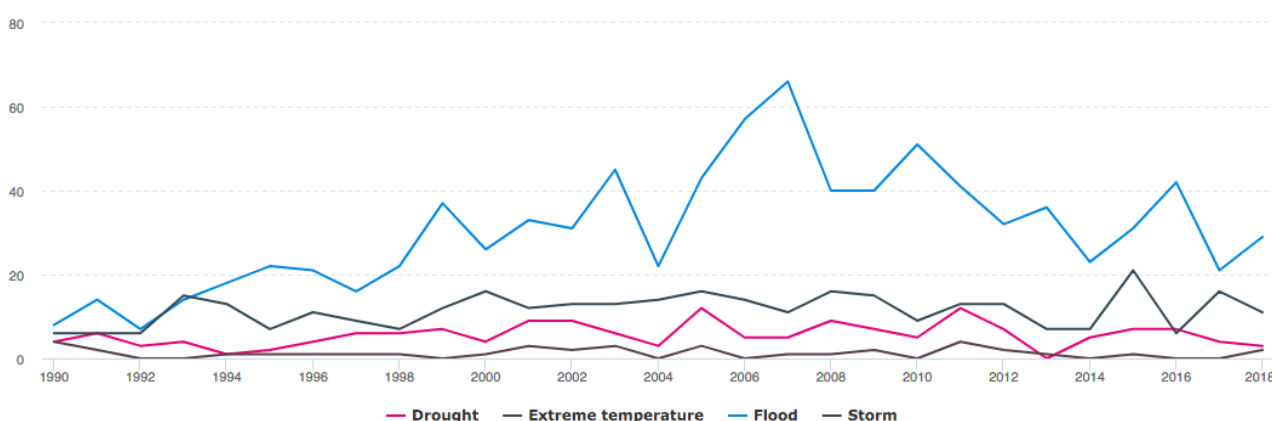
The FAO collects and disseminates food commodity prices via the Food Price Monitoring and Analysis database, including price warnings (FAO,

Sub-Saharan Africa
was the region with the
most countries with
high levels of
food prices and **cereal prices**
10 countries (out of 24) 18 countries

2019a⁴; Baquenado, 2015). Methodologies to identify abnormal prices for five cereal products as part of SDG indicator 2.c.1⁵ have been developed but data is not consistently collected and reported (United Nations, 2019; FAO, 2019b).

Food price anomalies and volatility are often

Figure 5 Number of extreme climate-related disasters in LDCs



Source: UCL-CRED and Guha-Sapir (2019).

Note: Occurrences entered into the Emergency Events Database. An event is entered as a disaster if it meets at least one of the following criteria: 10 or more people dead, 100 or more people affected, the declaration of a state of emergency, or a call for international assistance.

combined with losses in agricultural income, climate extremes, reduced food access and extreme changes in the quantity, quality and diversity of food consumed (FAO, 2018). The episodes of high food price volatility pose a major threat to food access, especially in developing economies, and LDCs. And these episodes are expected to become more frequent, with the rising number of extreme climate-related events (see Figure 5).

In their analysis of the relationships between conflicts, food price and climate across Africa, Raleigh et al. (2015) find that (i) higher rates of conflict are expected in markets with higher food prices; (ii) violence raises the average price of commodities in markets; (iii) anomalously dry conditions are associated with increased frequencies of conflict; and (iv) decreased rainfall exerts an indirect effect on conflict through its impact on commodity prices.

UNCTAD work on trade in biodiversity-related products

As a response to the 2030 Agenda, UNCTAD's BioTrade Initiative – which has been fostering trade as an incentive for biodiversity conservation and improved economic and social welfare, particularly in developing countries for over two decades – has been amplifying its efforts to encourage sustainable trade activities. In 2007, UNCTAD developed the BioTrade Principles and Criteria (UNCTAD, 2007) which encompasses environmental, social and economic sustainability principles and criteria. These P&C are the cornerstone work of BioTrade to guide the collection, production, transformation and commercialization of products and services derived from biodiversity. UNCTAD and BioTrade partners focus on creating an enabling environment for BioTrade businesses to flourish and enhance their capacities for sustainable sourcing, access and benefit sharing and trade in value-added products and services.

BioTrade is being implemented in over 50 countries in Asia, Africa, the Americas and Europe in sectors such as personal care, phytopharma, food,

BioTrade sales reached



**\$4.8 billion
in 2017**

fashion, ornamental flora and fauna, handicrafts, textiles and natural fibres, sustainable tourism, and forestry-based carbon credit activities (UNCTAD, 2016). As of 2017, sales by BioTrade companies and initiatives amounted to US\$4.8 billion showing a very significant increase from US\$40 million in 2003. The UEBT – a spin-off of UNCTAD which promotes private sector engagement in BioTrade and UEBT standards – works with over 300 supply chains, and with almost half of the ingredients sustainably collected in the wild, a number of which are listed under CITES Appendices II and III (CITES Secretariat, 2017; pers.comm. UEBT, 1 April 2019). Megadiverse countries such as Peru, which is home to around 10 per cent of the world's plant species, have great potential to develop activities based on their rich biodiversity (SERNANP, 2019). During 2013-2017, Peruvian exports of its top 14 biodiversity products increased significantly from US\$300 million to more than US\$450 million. Many of these products, such as quinoa, maca, golden berry, achiote, Brazil nut, purple corn, giant maize from Cuzco, lucuma are being promoted by BioTrade (pers.comm. PromPeru 2018).

The growing demand among global consumers for natural and environmentally-friendly products continues to offer growing opportunities for BioTrade. For example, in the United States of America, consumer sales of natural, organic and healthy products are forecasted to expand from US\$153 billion in 2013 to US\$252 billion by 2019 (NEXT et al. 2016). According to a global survey conducted by UEBT, 79 per cent of global consumers also think that companies have a moral obligation to have a positive impact on biodiversity. Against this background, UNCTAD, with the support of the Swiss State Secretariat for Economic Affairs SECO, launched the Global BioTrade programme: Linking trade, biodiversity and sustainable development (2018-2022). The

programme supports stakeholders to seize and capitalize on the trade opportunities arising from linking biodiversity and sustainable development, thereby advancing the implementation of SDGs, particularly SDGs 12, 15 and 17. UNCTAD and partners will also actively contribute to the preparations of the post-2020 global biodiversity framework, particularly by sharing lessons learned, best practices and case studies that demonstrate the positive contribution of BioTrade to the conservation of biodiversity and the livelihoods of rural communities (UNCTAD, 2019c).

Notes

- 1 SDG 2: end hunger, achieve food security and improved nutrition and promote sustainable agriculture.
- 2 The Nairobi package contains a series of six Ministerial Decisions on agriculture, cotton and issues related to LDCs.
- 3 It is important to note that the number of interventions does not necessarily represent the proportional impact of exports affected by them.
- 4 FAO presents the countries where prices of one or more basic food commodity are at abnormally high levels in main markets on this dedicated website.
- 5 SDG indicator 2.c.1: Indicator of food price anomalies.

References

- Baquedano FG (2015). Developing an indicator of price anomalies as an early warning tool: A compound growth approach. FAO. Available at <http://www.fao.org/gIEWS/food-prices/research/detail/en/c/235685/>.
- Bellmann C and Hepburn J (2017). The Decline of Commodity Prices and Global Agricultural Trade Negotiations: A Game Changer? International Development Policy | Revue internationale de politique de développement [Online] 8.1. November. Available at <http://journals.openedition.org/poldev/2384> (accessed 17 June 2019).
- CITES Secretariat (2017). Convention on international trade in endangered species of wild fauna and flora: Appendices I, II and III. Available at <https://www.cites.org/eng/app/index.php> (accessed 20 June 2019).
- FAO (2018). *The State of Agricultural Commodity Markets 2018: Agricultural Trade, Climate Change and Food Security*. FAO. Rome.
- FAO (2019a). FPMA Tool: A web-based tool for analysis and dissemination of price data. Available at <http://www.fao.org/gIEWS/food-prices/price-tool/en/> (accessed 17 June 2019).
- FAO (2019b). SDG Indicator 2.c.1 – Food price volatility. Available at <http://www.fao.org/sustainable-development-goals/indicators/2c1/en/> (accessed 18 June 2019).
- Global Trade Alert (2019). GTA database. See <https://www.globaltradealert.org/> (accessed 22 January 2019).
- Kalkuhl M, von Braun J and Torero M (2016). Volatile and Extreme Food Prices, Food Security, and Policy: An Overview. In: Kalkuhl M., In: von Braun J, and In: Torero M, eds. *Food Price Volatility and Its Implications for Food Security and Policy*. Springer International Publishing. Cham: 3–31.
- NEXT, New Hope Network and Sterling-Rice Group (2016). NEXT Forecast 2016.
- OECD (2019). DAC glossary of key terms and concepts. Available at <http://www.oecd.org/dac/dac-glossary.htm> (accessed 15 May 2019).
- Raleigh C, Choi HJ and Kniveton D (2015). The devil is in the details: An investigation of the relationships between conflict, food price and climate across Africa. *Global Environmental Change*. 32:187–199.
- SERNANP (2019). Nuestra Flora. Available at <http://www.sernanp.gob.pe/nuestra-flora> (accessed 18 June 2019).

- UCL-CRED and Guha-Sapir D (2019). EM-DAT: The Emergency Events Database. Université Catholique de Louvain – Centre for Research on the Epidemiology of Disasters. Brussels, Belgium. Available at www.emdat.be (accessed 18 June 2019).
- UNCTAD (2007). *UNCTAD BioTrade Initiative: BioTrade Principles and Criteria*. UNCTAD/DITC/TED/2007/4. New York and Geneva.
- UNCTAD (2012). Don't blame the physical markets: Financialization is the root cause of oil and commodity price volatility. UNCTAD Policy Brief No. 25. UNCTAD/PRESS/PB/2012/1. Geneva.
- UNCTAD (2016). *20 Years of BioTrade: Connecting People, the Planet and Markets*. UNCTAD/DITC/TED/2016/4. Geneva.
- UNCTAD (2019a). UNCTADStat. See <https://unctadstat.unctad.org/> (accessed 10 April 2019).
- UNCTAD (2019b). BioTrade Initiative – Linking trade, biodiversity and sustainable development. Available at <https://unctad.org/en/Pages/DITC/Trade-and-Environment/BioTrade/BT-Initiative-Linking-programme.aspx> (accessed 18 June 2019).
- UNCTAD (2019c). About BioTrade. Available at <https://unctad.org/en/Pages/DITC/Trade-and-Environment/BioTrade.aspx> (accessed 17 June 2019).
- UEBT (2018). UEBT Biodiversity Barometer. Available at <http://www.biodiversitybarometer.org/>.
- United Nations (2019). SDG indicators: Metadata repository. Available at <https://unstats.un.org/sdgs/metadata/> (accessed 14 May 2019).
- Womach J (2005). Agriculture: A Glossary of Terms, Programs, and Laws, 2005 Edition. Congressional Research Service Reports. The Library of Congress. Order Code 97-905. June. Available at <https://digital.library.unt.edu/ark:/67531/metacrs7246/> (accessed 18 June 2019).
- WTO (2016). *Report to the TPRB from the Director-General on Trade-Related Developments (2016): Mid-October 2015 to Mid-May 2016*. Report to the TPRB from the Director-General on Trade-Related Developments. WT/TPR/OV/W/10. Geneva.
- WTO (2019a). Nairobi Package. Available at https://www.wto.org/english/thewto_e/minist_e/mc10_e/nairobipackage_e.htm (accessed 17 June 2019).
- WTO (2019b). Agreement on Agriculture. Available at https://www.wto.org/english/docs_e/legal_e/14-ag_01_e.htm (accessed 17 June 2019).
- WTO (2019c). Export subsidies and other export support measures. Available at https://www.wto.org/english/tratop_e/agric_e/factsheetagric17_e.htm (accessed 17 June 2019).



IV. Policies to promote trade

Target 8.a: Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade-related Technical Assistance to Least Developed Countries.

- Indicator 8.a.1: Aid for Trade commitments and disbursements (Tier I)

Key messages

- Aid for Trade to developing countries and LDCs more than doubled in 10 years
- Asia receives the largest share of global Aid for Trade, US \$ 22.1 billion in 2017
- 27% of ODA supports trade

What is Aid for Trade?

Aid for Trade helps developing countries achieve economic growth and alleviate poverty through trade. The support is intended to address trade barriers and limitations so that developing countries can more effectively engage in global trade, benefit from trade and reduce trading costs. The Aid for Trade initiative was launched at the 2005 WTO Ministerial Conference in China, Hong Kong (SAR) (WTO, 2015). Aid for Trade also assists countries in analysing, implementing and adjusting to trade agreements and building the supply-side capacity and infrastructure they need to compete internationally. The assistance is targeted at enhancing national trade policy and regulations, developing infrastructure and building productive capacity (UNCTAD, 2016, Target 8.a).

International trade constitutes a powerful source of economic growth that allows countries to concentrate their production of goods and services to where they have a comparative advantage (specialization) and exchange these products on the world market for other goods and services that are more efficiently produced elsewhere. Historically, export growth has been an important driver of economic development (UNCTAD, 2016). International trade can generate export demand for manufactured products, thereby facilitating growth of the manufacturing sector and giving an impetus to structural transformation (see Sustainable industrialization and technology), an important driver for economic development (UNCTAD, 2016). There is also evidence that export orientation induces a selection process, from which the most productive firms tend to survive and remain in the market. Firms with a strong export orientation can



improve productivity by learning from their cross-border connections and activities. Over time, this knowledge and know-how can spill over to other domestic companies (UNCTAD, 2016).

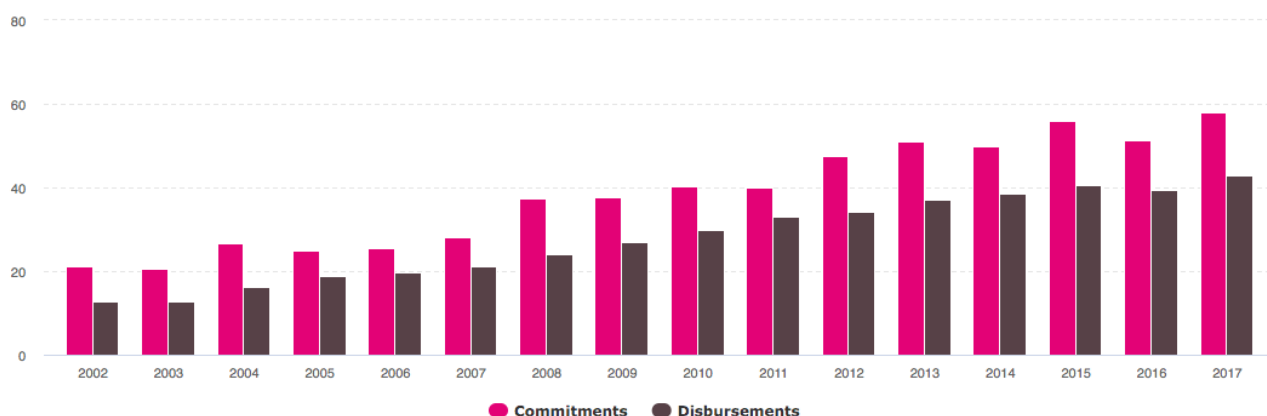
Academic research and donor evaluation of Aid for Trade programmes support the view of their positive impact (OECD and WTO, 2017). Evaluating the exact effect of Aid for Trade is limited by scarcity of useful data and by methodological challenges (Razzaque et al., 2013). However, one attempt to quantify the association between Aid for Trade and the value of exports from developing countries found the relationship to be eight dollars of exports to every dollar of Aid for Trade and twenty to one for the poorest countries (OECD and WTO, 2013). A recent study on the effectiveness of Aid for Trade suggests that a one per cent increase in Aid for Trade policies and regulations (as a percentage of GDP) induces a 0.15 per cent decline in tariff volatility (Gnangnon, 2019). This study continues a pattern of results in the literature showing that Aid for Trade has a more positive impact on countries with higher economic and political stability (OECD and WTO, 2013).

Steady increase in Aid for Trade over the last fifteen years

Both Aid for Trade commitments and disbursements have more than doubled during the last ten years. In 2017, Aid for Trade commitments totalled US\$58.0 billion and disbursements US\$42.0 billion in constant 2017 prices. The corresponding figures in 2007 were US\$28.2 billion and US\$21.2 billion. There has been a stable increase in realised disbursements, with increases every year since 2007 except for



Figure 1 Aid for Trade flows to all developing economies
(Billions of US\$ in constant 2017 prices)



Source: UNCTAD calculations based on data from OECD (2019b).

2016 (see figure 1).

The disbursements to LDCs increased from US\$5.9 billion in 2007 to US\$12.2 billion in 2017 (OECD, 2019b). LDCs' share of Aid for Trade peaked at just over 30 per cent of the total in 2009, after which it gradually declined to 25 per cent in 2016. In 2017, this share ticked back up to about 28 per cent.

Asia and Africa remain the primary recipients of Aid for Trade

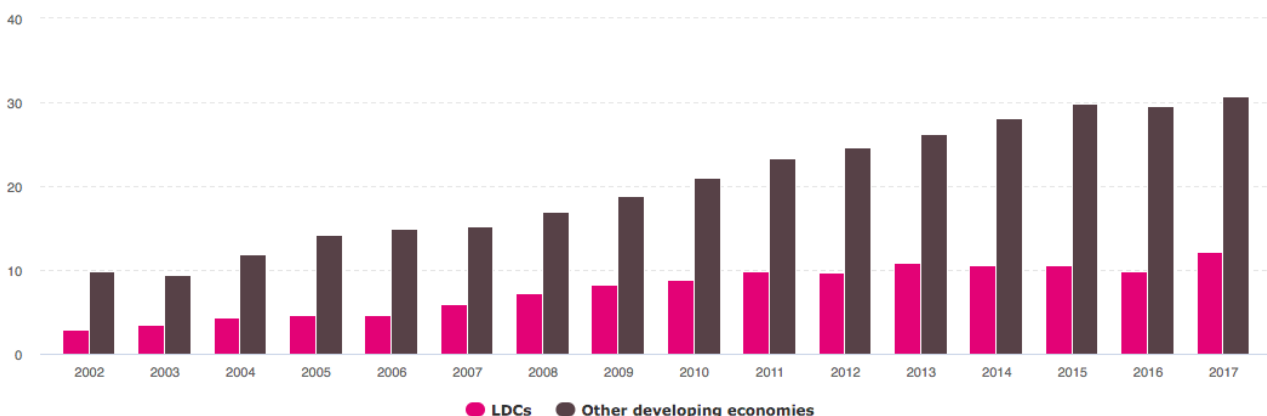
In 2017, total Aid for Trade commitments for developing countries amounted to US\$58 billion. Figure 3 shows the largest Aid for Trade recipient

Asia receives the largest share of global Aid for Trade, US\$22.1 billion in 2017

countries.

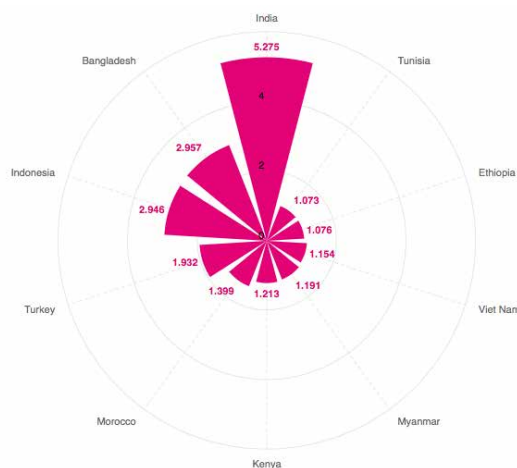
The top ten Aid for Trade recipients share a little over 35 per cent of total country-specific commitments in 2017. They comprise five Asian countries, four African countries (Morocco, Kenya, Ethiopia and Tunisia) and one country in Europe. Among these, three countries are LDCs,

Figure 2 Aid for Trade disbursements by recipient
(Billions of US\$ in constant 2017 prices)



Source: UNCTAD calculations based on data from OECD (2019b).

Figure 3 Top ten recipients of total Aid for Trade commitments, 2017
(Billions of US\$ in constant 2017 prices)



Source: UNCTAD calculations based on data from OECD (2019b).

namely Bangladesh, Myanmar and Ethiopia. To put the 35 per cent in perspective, it should be noted that the total population of these top ten recipients is almost 30 per cent of the total population of developing countries.

Official development assistance targets trade now more often

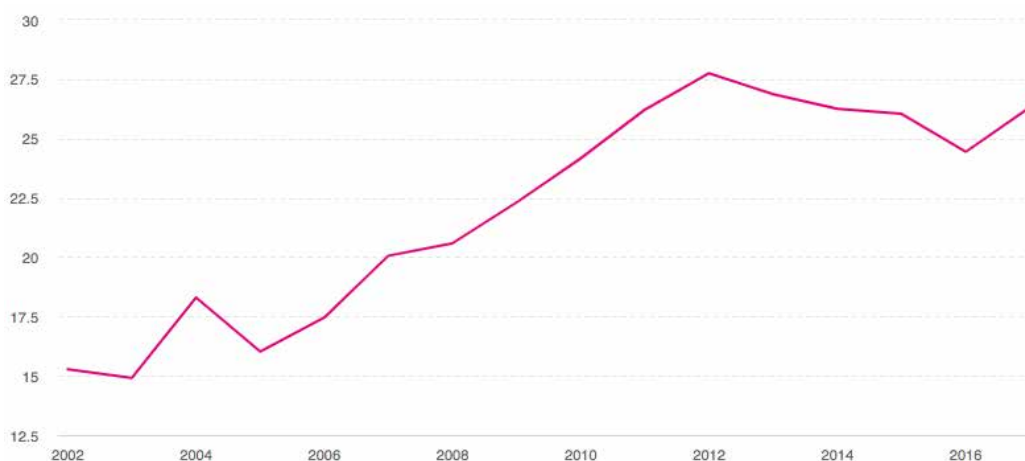
The share of Aid for Trade in total ODA has increased from 20.1 per cent in 2007 to 26.3 per cent in 2017. The share peaked in 2013 at 27.7 per cent but has plateaued since then (see figure 4). It is particularly important for countries whose trade depends on a narrow export basket. For example, LDCs depend, on average, on only

three products for more than 70 per cent of their exports (UNCTAD, 2019).

Transport, energy and agriculture receive the majority of Aid for Trade

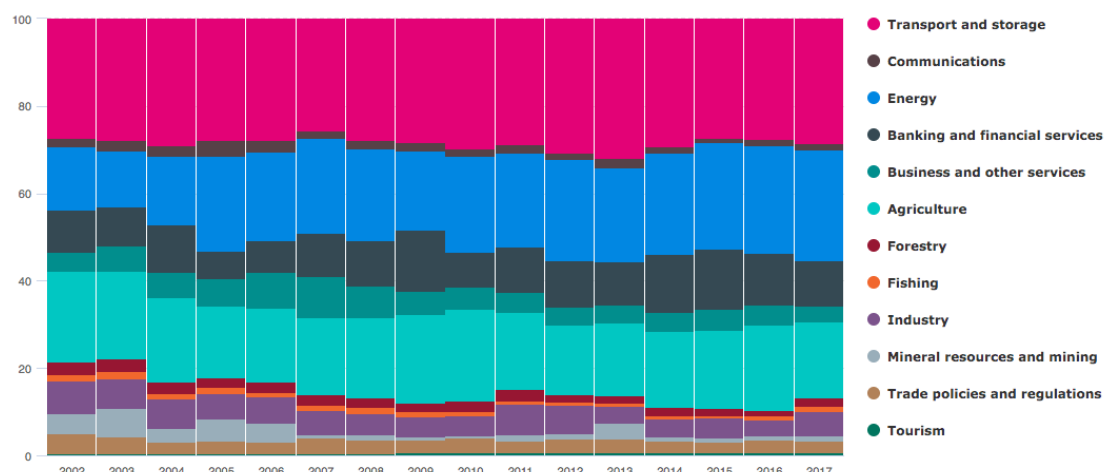
Aid for Trade also provides support to economic infrastructure (56 per cent in 2017), productive capacity building (42 per cent) and trade policies (3 per cent). Economic infrastructure (transport, communication and energy) has constantly received over 50 per cent of Aid for Trade since 2010 (see figure 5). From 2007 to 2017, the share dedicated to transport and storage has increased from 25.8 to 28.7 per cent of all Aid for Trade, and the share targeting energy has increased from 21.6

Figure 4 Aid for Trade, share of net ODA disbursements
(Percent)



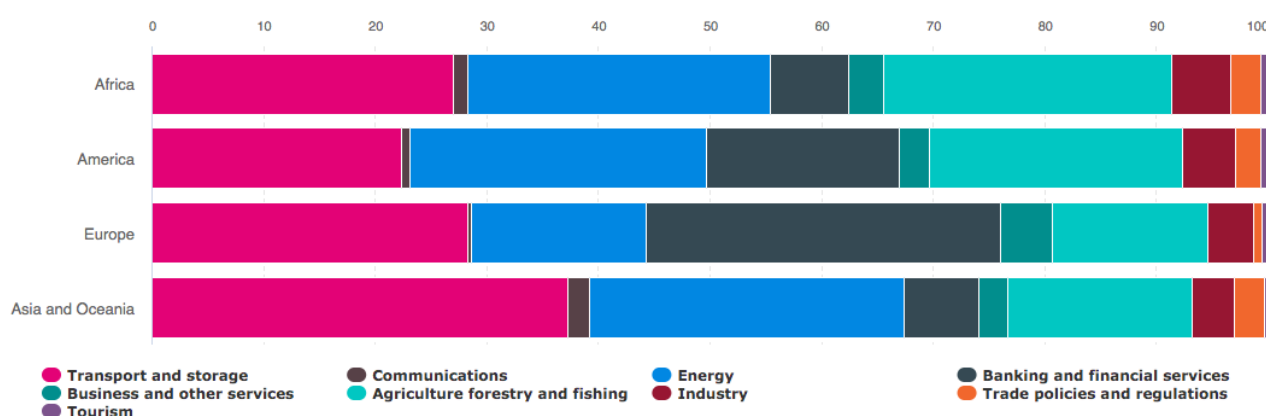
Source: UNCTAD calculations based on data from OECD (2019b).

Figure 5 Distribution between sectors of total Aid for Trade disbursements
(Proportion of total)



Source: UNCTAD calculations based on data from OECD (2019b).

Figure 6 Aid for Trade by sector and region, 2016
(Proportion of total)



Source: UNCTAD calculations based on data from OECD (2019b).

to 25.4 per cent.

Aid for productive capacity targets different economic activities that produce goods and services for trade. Agriculture, forestry and fishing together account for about half of the support for productive capacity, while aid targeting banking and financial services takes up another 25 per cent.

Agriculture receives a notable share of Aid for Trade in Africa

The sectors receiving Aid for Trade disbursements vary across regions. Most of the Aid for Trade disbursements to Asia and Oceania go to transport (37 per cent) and, with energy, these account for

over 65 per cent of Aid for Trade to this region. At 27 per cent, agriculture, forestry and fishing receive the largest share of Aid for Trade in Africa. In Europe, on the other hand, banking and financial services receive the largest share of Aid for Trade disbursements (32 per cent), while in America the largest sector is energy (27 per cent).

References

- AidFlows (2019). Glossary of AidFlows terms. Available at <http://www.aidflows.org/about/> (accessed 17 June 2019).
- Gnangnon SK (2019). Effect of Aid for Trade Policy and Regulations on Tariff Policy Volatility:

- Does Institutional and Governance Quality Matter? *Economies*. 7(1):6.
- Negin J (2014). Understanding Aid for Trade part one. Available at <http://www.devpolicy.org/understanding-aid-for-trade-part-one-a-dummys-guide-20140228/> (accessed 19 June 2019).
- OECD (2019a). DAC glossary of key terms and concepts. Available at <http://www.oecd.org/dac/dac-glossary.htm> (accessed 15 May 2019).
- OECD (2019b). Aid-for-trade statistical queries. See <https://www.oecd.org/dac/aft/aid-for-tradestatisticalqueries.htm> (accessed 19 June 2019).
- OECD and WTO (2013). *Aid for Trade at a Glance 2013: Connecting to Value Chains*. Aid for Trade at a Glance. WTO and OECD Publishing. Geneva and Paris.
- OECD and WTO (2017). *Aid for Trade at a Glance 2017: Promoting Trade, Inclusiveness and Connectivity for Sustainable Development*. Aid for Trade at a Glance. WTO and OECD Publishing. Geneva and Paris.
- Razzaque MA, te Velde DW and te Velde DW, eds. (2013). *Assessing Aid for Trade: Effectiveness, Current Issues and Future Directions*. Commonwealth Secretariat. London.
- UNCTAD (2016). Development and globalization: Facts and figures 2016. Available at <https://stats.unctad.org/Dgff2016/> (accessed 19 April 2019).
- UNCTAD (2019). UNCTADStat. See <https://unctadstat.unctad.org/> (accessed 10 April 2019).
- United Nations (2019). SDG indicators: Metadata repository. Available at <https://unstats.un.org/sdgs/metadata/> (accessed 14 May 2019).
- WTO (2006). Aid for Trade Task Force – Recommendations of the Task Force on Aid for Trade. WT/AFT/1.
- WTO (2015). Ministerial declaration. WT/MIN(05)/DEC. Hong Kong. 22 December. Available at https://www.wto.org/english/thewto_e/minist_e/min05_e/final_text_e.htm (accessed 14 June 2019).

THEME 2

Productive Growth

*“Exploration is the engine that drives innovation.
Innovation drives economic growth”.*

– Edith Widder



**Maritime
trade volumes
expected to double
in the next
two decades**



**Mobile
subscriptions
per capita in
developing countries
x4
in 13 years**



**Two thirds
of global
infrastructure
investment needs
in developing
countries**



**Only 8%
of private funds
mobilized by
development finance
go to LDCs**



**External
debt stocks
in developing and
transition economies
at almost
US\$5 trillion
in 2017**

Productive Growth

Sustained and inclusive economic growth is an essential requisite for poverty eradication and sustainable development. Productive infrastructure, access to ICT and new technologies, and a stable macroeconomic environment are some of the most important determinants of long-term growth. These are some of the topics covered in this theme of SDG Pulse, along with the mechanisms available to finance these policies.

1. We survey Robust and predictable financing sources that are available to finance policies and programmes to achieve progress along the SDGs, with an emphasis on external sources. The following SDG indicators are covered:

- SDG indicator 10.b.1: Total resource flows for development
- SDG indicator 17.3.1: FDI, ODA and South-South Cooperation
- SDG indicator 17.5.1: Implement investment promotion regimes for LDCs

2. We examine in greater details the role of Official support for sustainable development, including ODA and OOF, in financing sustainable development in LDCs and other countries in vulnerable situations. We focus especially on two sectoral areas:

- SDG indicator 2.a.2: Total official flows to the agriculture sector
- SDG indicator 9.a.1: Total official international support to infrastructure

3. We present the essential role of the transport sector in enabling trade and economic growth, along with the important challenges in Adapting transport for sustainable development. We present several information on this sector, including the official data for one indicator:

- SDG indicator 9.1.2: Passenger and freight volumes, by mode of transport

4. We next study the Potential benefits and risks of ICT; while new technologies can bring significant leaps in productivity, they can also create barriers of entry and exacerbate inequalities. The data for the following SDG indicators are presented:

- SDG indicator 9.c.1: Proportion of population covered by a mobile network
- SDG indicator 17.6.2: Fixed Internet broadband subscriptions
- SDG indicator 17.8.1: Proportion of individuals using the Internet

5. We tackle debt as another financing mechanism for development, along with the Growing concerns on debt sustainability in developing countries.

- SDG indicator 17.4.1: Debt service as a share of exports of goods and services

6. We finally present the importance of Tackling illicit financial flows as one of the most pressing aspects in financing for development, one that could derail progress along all SDGs.

- SDG indicator 16.4.1: Total value of inward and outward illicit financial flows

As shown in the statistics and insights presented in SDG Pulse, there are great opportunities to use infrastructure, new technologies, sound economic policy and stable financing mechanisms as enablers of growth. However, these same areas, when not properly managed, could also become obstacles for development. The SDG indicators allow countries to monitor these areas and choose the right policies to achieve high economic growth in a sustained and environmentally friendly manner.



I. Robust and predictable sources of financing for sustainable development

SDG target 10.b: Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes

- **SDG indicator 10.b.1:** Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment, and other flows) (Tier I/II)

SDG target 17.3: Mobilize additional financial resources for developing countries from multiple sources.

- **SDG indicator 17.3.1:** Foreign direct investments (FDI), official development assistance and South-South Cooperation as a proportion of total domestic budget (Tier I)

Target 17.5: Adopt and implement investment promotion regimes for least developed countries.

- **Indicator 17.5.1:** Number of countries that adopt and implement investment promotion regimes for least developed countries (Tier III)

Key messages

- Different sources of financing have different effects on sustainable development
- With US\$ 1.5 billion in 2016, total resource flows to SIDS have almost evaporated
- Less than half of the latest LDCs' BITs refers to investment for sustainable development
- 8% of private funds mobilized by development finance targeted LDCs in 2012–2017
- LDCs received US\$ 0.5 billion of funds through investment guarantees in 2016–2017

The economic flows that support development vary from country to country in terms of source, type and volume. Furthermore, even at an aggregate level, there can be considerable fluctuations in resource flows from one year to the next (United Nations, 2017). They can also have a vastly different impact in effectiveness for short- and long-term sustained development. For this reason, financing strategies for the 2030 Agenda receive a prominent role in all implementation strategies.

There are two crucial challenges when it comes to financing development programmes. First, there is a general need for more resources to achieve the SDGs. Second, it is also important to find the right mix and adequate terms of financing in order to have a lasting effect and reach those individuals, families and communities with the most urgent needs and where the highest impact can be achieved.

Different external financing sources are better as sustaining different aspects of development

The outcome documents of the most recent United Nations International Conferences on Finance for Development (Monterrey Consensus: United Nations, 2003; Addis Ababa Action Agenda: United Nations, 2015) state that the primary responsibility for financing

development belongs to individual countries themselves. The main sources of funding must come from countries, and therefore governments must enhance their domestic resource mobilization so that the financing needs are met in a predictable and sustained manner. However, the international community also has an important role to play. Sources of external financing include international trade, FDI and other private flows (from businesses and individuals), international financial and technical cooperation, and external debt. These different forms of economic flows are, however, not assumed to be equal in their effect on development.



International trade has expanded significantly in previous decades under the existing multilateral trading system, while many new and longstanding challenges remain. These issues are extensively covered in Multilateral Trade & Development. This sector is an important engine for economic growth. With adequate support and fostering mechanisms, trade can encourage long-term investments and higher productivity, create jobs and livelihoods for millions, and provide important

resources to finance public services and policy interventions. However, a high dependence on international markets could increase exposure to global volatility and macroeconomic imbalances, as well as imperil vulnerable or immature domestic industries to excessive competition before they are ready. If not managed properly, trade can create imbalanced development opportunities thus promoting inequality (see *The Many Faces of Inequality*).

Public debt is another essential financing mechanism for development. As long as funds raised by external or domestic borrowing support strategic productive investment, they can foster growth without threatening future financial stability. It is, therefore, important for countries to reach long-term debt sustainability. This topic is covered in depth in *Growing Concerns on Debt Sustainability*.

FDI remains a vital source of financing for development. This can be explained, firstly, by its sheer magnitude. With inflows of US\$718 billion in developing and transition economies during 2017, FDI was the largest source of external financing in these countries, accounting for 39 per cent of total finance for development (UNCTAD, 2018). Moreover, this international economic flow is directly linked to the main drivers of productive growth and employment creation: establishment of new businesses and greenfield investments; expansion of operations; acquisition of machinery and equipment; upgrade of technology, knowledge and innovation; and others. However, FDI flows are not distributed evenly among countries; instead, they are concentrated among countries with higher growth prospects, stronger rule of law and respect for contracts, and stable institutions. This means that some countries with urgent financing needs are often bypassed. For example, FDI represents only 21 per cent of the external financing sources for LDCs (UNCTAD, 2018). In addition, although it is a relatively stable source of external financing, it remains tied to macroeconomic performance and the global macroeconomic climate. It is, therefore, typically a pro-cyclical flow that may be absent in times when sustained financing is most needed. The

promotion of FDI in LDCs will be covered later in this section.

Remittances lack the employment creation potential of FDI because they are managed directly by individuals, and they are mostly directed towards household consumption. Their capacity to raise productive investment is, therefore, limited. However, remittances are an indispensable source of international economic flows for many countries. For example, in LDCs they are the second most important source of external finance, only slightly behind ODA and ahead of FDI (UNCTAD, 2018). Also, remittances are a stable source of income for families, contributing to housing, nutrition, health and education costs. Thus, they act as an important social safety net. In addition, in countries where they have been accompanied by an active support policy, remittances have become a significant source of funds for improving social and economic infrastructure.

Official international support has a uniquely important role when it comes to supporting global development, especially for LDCs and more vulnerable countries. In addition to its concessional nature, official support is the only source of financing available in many cases. Also, in situations of low rentability or high risk, official support can become important for mobilizing additional resources. This source of funding is described in greater detail in *Official Support for Sustainable Development*.

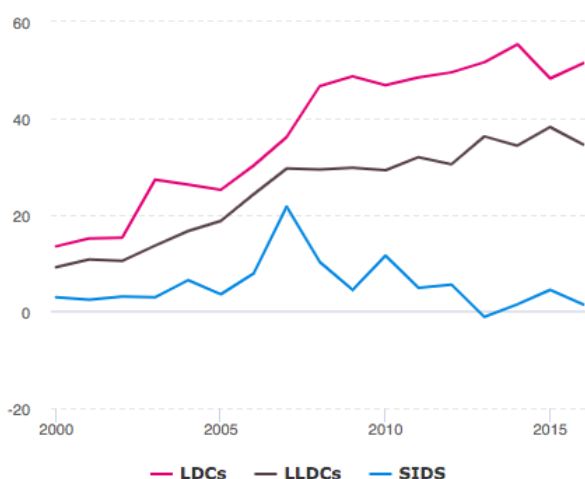
In this context, it is also important to measure South-South Cooperation. Links and connections between countries of the Global South have expanded in volume and scope over the previous decades. This is explained to a certain extent by the increasing political and economic weight of several emerging and developing economies across Asia, Africa and Latin America. This is now recognized as an important source of finance for development and its importance is emphasized in the 2030 Agenda and the Addis Ababa Action Agenda. However, for a variety of reasons, including the lack of a universally accepted definition and opacity regarding its scope and

coverage, South-South Cooperation has proven hard to quantify (Besharati and MacFeely, 2019).

Recent trends in external financing

Financing for development is a crucial element of the 2030 Agenda. SDG target 10.b seeks to “encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest”. To this end, SDG indicator 10.b.1 measures total resource flows for development. Figure 1 presents the recent trends in these flows for three groups of economies that face particular constraints in achieving their development goals.

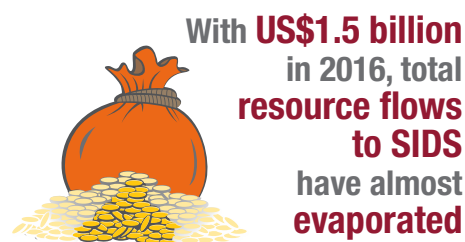
Figure 1 Total resource flows for development (SDG 10.b.1)
(Billions of current US\$)



Source: UNCTAD calculations based on data from United Nations (2019b).

Even expressed in current prices, the trends in external financing have not been homogeneous through time or among country groups. Resource flows to LDCs doubled between 2005 and 2016, the latest year for which data are available. However, most of this increase was registered between 2005 and 2008. Since then, total external funding for LDCs has fluctuated between US\$47 and US\$55 billion, with a downward trend in recent years. Figure 1 shows a more positive evolution for LLDCs, with an upward trend starting in 2010, following several years of stagnation. In contrast, funding for SIDS has shown more

modest volumes and greater volatility. After a peak of US\$22 billion in 2007, external financing effectively dried up, reaching only US\$1.5 billion in 2016.

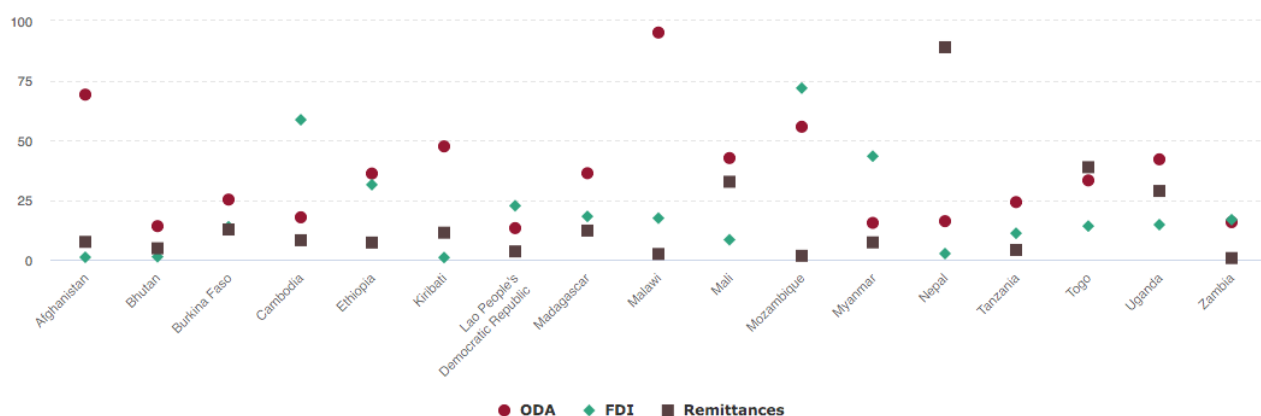


It is important to mention that there have been some critiques about the use of this variable as a measure of external financing for development for SDG indicator 10.b.1. Some important sources of funds are missing. For example, remittances, an important flow in many developing countries, is not included. Furthermore, only the 30 DAC countries plus 17 non-DAC countries are included. The OECD themselves acknowledge that the coverage of private sector flows from non-DAC donors should be expanded (OECD, 2019b). This is a particularly important omission at a time when South-South Cooperation is increasingly important as a source of revenue and collaboration among developing and transition economies. Thus, the official data are likely to be an under-estimation of financial flows for development.

SDG indicator 17.3.1, of which UNCTAD is a co-custodian, also examines financial support for development from multiple sources, but as a proportion to total domestic budget. This transformation puts external financing in context with available public resources. Figure 2 shows the results for some LDCs where the data are available.¹ Figure 2 includes remittances because, although not included in the official SDG indicator itself, they are an important revenue source for some countries.

Figure 2 shows the high diversity of financing mechanisms being used by countries, even within LDCs. In some countries, external resources are very high with respect to domestic resources, while they are relatively lower in other cases.

Figure 2 FDI, ODA and remittances in selected LDCs, 2017
(Percentage of budgetary central government revenue)



Source: UNCTAD calculations based on data from IMF (2019), OECD (2019c) and UNCTAD (2019b).

Note: Only countries with available information are included.

For some countries, such as Nepal or Togo, remittances are the main source of external funds. In Malawi, ODA is almost as high as the central government budget. On the other hand, FDI accounts for around 50 per cent or more of the budget in Mozambique, Cambodia and Myanmar. Depending on factors such as economic structure, investment policies or economic migration outflows, countries receive different financing combinations. There is, however, room for policies to attract investment and other sources of funds to the countries where they are most urgently needed.

National and international investment policies of home countries promote investment in LDCs

SDG target 17.5 encourages countries to promote investment for LDCs. All developed economies have implemented some policies and measures to encourage outward FDI, including investment in LDCs. Emerging economies have also begun to do so. These policies include mainly investment guarantees, financial and fiscal support and – at the international level – ODA as well as the conclusion of IIAs. Furthermore, governments of countries for destination for investment have also put in place investment policies and measures to attract inward FDI to the country.

The intention of SDG indicator 17.5.1 is to

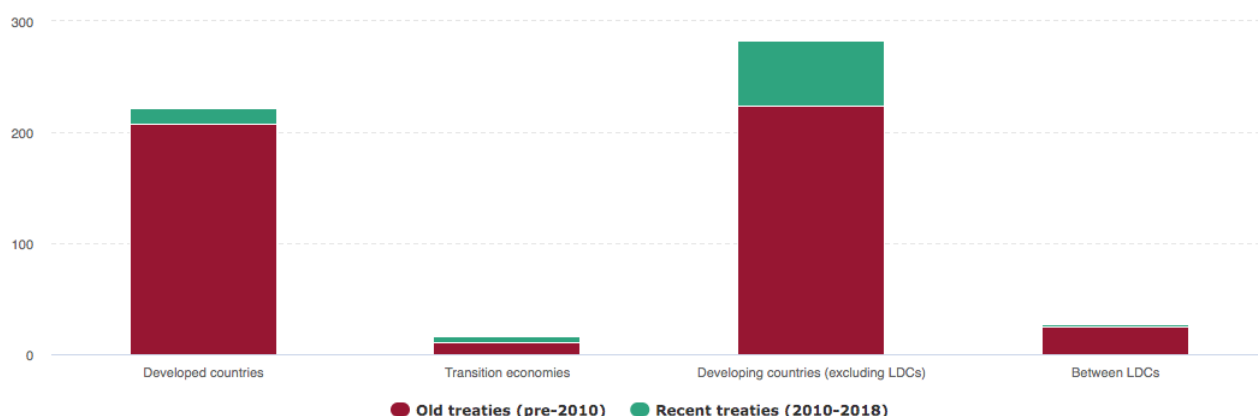
measure the “number of countries that adopt and implement investment promotion regimes for LDCs”. As custodian of this indicator, UNCTAD has held various consultations about policies and measures that home countries (i.e., donor countries) could adopt to promote their FDI outflows to go to LDCs, and how these efforts could be measured in the SDG context.

However, home countries do not currently have investment promotion regimes specifically targeting certain groups of countries, such as LDCs. Instead, one could measure the number and amount of investment guarantees and financial and fiscal support that home countries and international institutions have provided to investors when investing in LDCs. In addition, one can count the number of BITs that were concluded with LDCs – a form of IIAs concluded bilaterally and thus allocable to LDCs. UNCTAD has information on investment treaties readily available. Data on other types of investment promotion for LDCs are also available.

Countries are modernizing international investment agreements

In 2012, UNCTAD launched a policy tool (UNCTAD, 2015) to modernize IIAs, after which over 150 countries have formulated more sustainable, development-oriented IIAs. These modernized IIAs emphasize investment for

Figure 3 Bilateral investment treaties with LDCs by development status



Source: UNCTAD (2019a).

sustainable development and focus on reforming investment policy.

UNCTAD has also presented “Action Packages” for investment to mainstream SDGs into IPAs and strategies (UNCTAD, 2018). Modern industrial policies often directly promote SDG-related industries, such as clean energy, electric cars, ecotourism, health care and education, but the process of modernizing industrial policies is slow. After active years of concluding “new generation” IIAs, investment treaty making reached a turning point in 2017. The number of new IIAs concluded in 2017 was 35, while 56 terminations of “old generation” IIAs entered into effect that year. At the same time, new large regional treaties continued to be established actively in Africa and Asia in particular, also with LDCs (UNCTAD, 2018). To review investment promotion for LDCs, it is possible to look at the bilateral IIAs, namely BITs concluded with LDCs. According to UNCTAD (2019a), developed economies have 222 BITs in place with LDCs. Transition economies have established 16 BITs with LDCs, and developing economies (other than LDCs) about 283 BITs. In addition, LDCs have some 27 BITs in place with other LDCs (see figure 3).

Treaty making with LDCs peaked at the turn of the millennium and reached its lowest point in 2010 when only a couple of new BITs were signed, and one entered in force. Thereafter, the

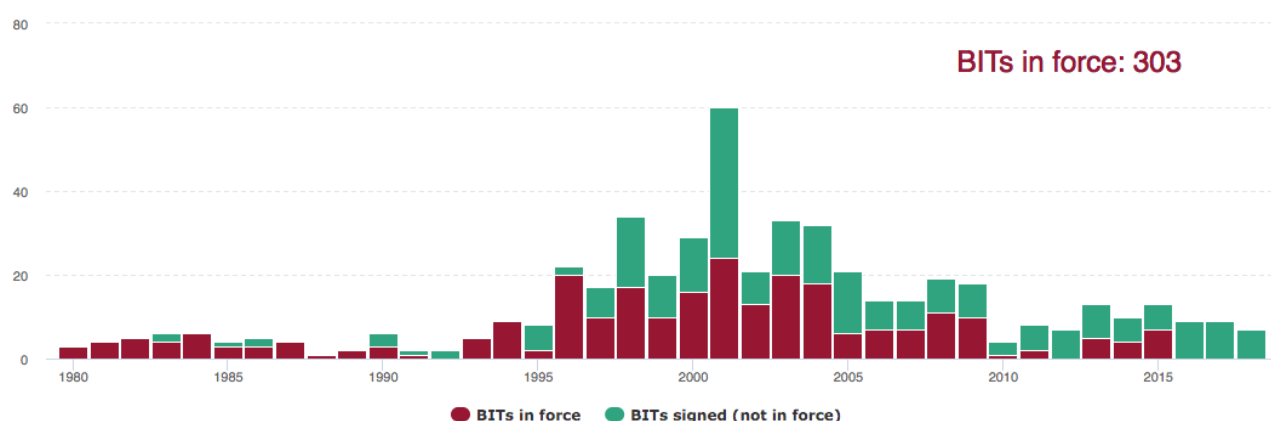
pace of treaty making with LDCs has started to revive slightly. The increase in developing countries’ BITs after 2000 reflected a greater emphasis on investment in development strategies related to South-South cooperation, as well as the emergence of some developing country firms as global players (UNCTAD, 2006) (see figure 4).

**Less than half
of the latest
LDCs’ BITs
refer to investment for
sustainable development**



Typically, LDCs’ BITs with other countries are still “old generation” treaties that are in need of modernization so that they can help to achieve more sustainably oriented development outcomes. BITs and other IIAs are reformed in five areas: (i) Safeguarding the right to regulate, while providing protection; (ii) Reforming investment dispute settlement; (iii) Promoting and facilitating investment; (iv) Ensuring responsible investment; and (v) Enhancing systemic consistency (UNCTAD, 2017). LDCs have established some 80 “new generation” BITs between 2010 and 2019. 468 “old generation” BITs, that were established before 2009, also exist and have not yet been updated.

Figure 4 Trends in new BITs signed and entered in force each year with LDCs



Source: UNCTAD (2019a).

Even recent BITs with LDCs make little reference to investment for sustainable development. For example, out of 30 new LDCs' BITs, analyzed by UNCTAD, just over 50 per cent (17 treaties) have a reference to sustainable development (or a related concept) in the preamble or contain a corporate social responsibility clause.

Developed economies, including many EU member states, have the largest number of BITs with LDCs; for instance, Germany has 33 BITs with LDCs. These economies listed in table 1 are also well placed to contribute to the modernization of trade agreements with LDCs so as to consider sustainable development and social responsibility.

Table 1 Economies with the most bilateral investment treaties with LDCs, as of end-2018

Top 10 developed countries with most BITs with LDCs

Top 10 LDCs with BITs

Developed country	Number of BITs	LDC country	Number of BITs
Germany	33	Yemen	37
Switzerland	26	Ethiopia	32
Belgium and Luxembourg	19	Sudan	32
France	19	Bangladesh	30
The Netherlands	18	Senegal	29
The United Kingdom	18	Mozambique	27
Italy	15	Cambodia	26
Portugal	9	Guinea	24
Spain	8	Laos	23
Sweden	7	Mali	22
		Mauritania	22

Source: UNCTAD (2019a).

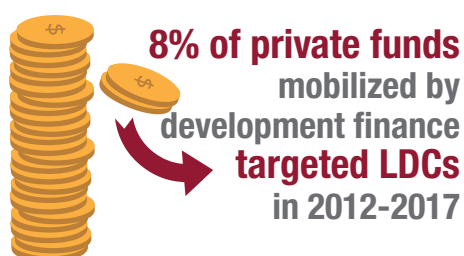
Note: Belgium/Luxembourg are included as a group because they negotiate treaties together as an economic union (Ministry of Foreign and European Affairs, Luxembourg, 2018).

Some LDCs have a large number of BITs with other economies, such as Yemen, Ethiopia and Sudan among others (see table 1). Efforts to modernize investment treaties would have a potentially large effect on these LDCs to promote investment for development.

Africa was the main recipient for development finance

OECD (2019d) carried out a pilot data collection on funds mobilized from the private sector by development finance interventions, such as investment guarantees, syndicated loans, credit lines and direct investment in companies. A total of US\$152.1 billion was mobilized globally in 2012-2017. According to preliminary figures, 8 per cent of the amounts mobilized supported projects in LDCs, amounting up to US\$12.2 billion.

The main beneficiary region, receiving 27 per cent of global funds, was Africa. Of that amount, half went to projects in five recipient countries: Nigeria, South Africa, Ghana, Egypt and Kenya. Almost one quarter of funds supported projects



LDCs received US\$0.5 billion of funds through investment guarantees in 2016-2017

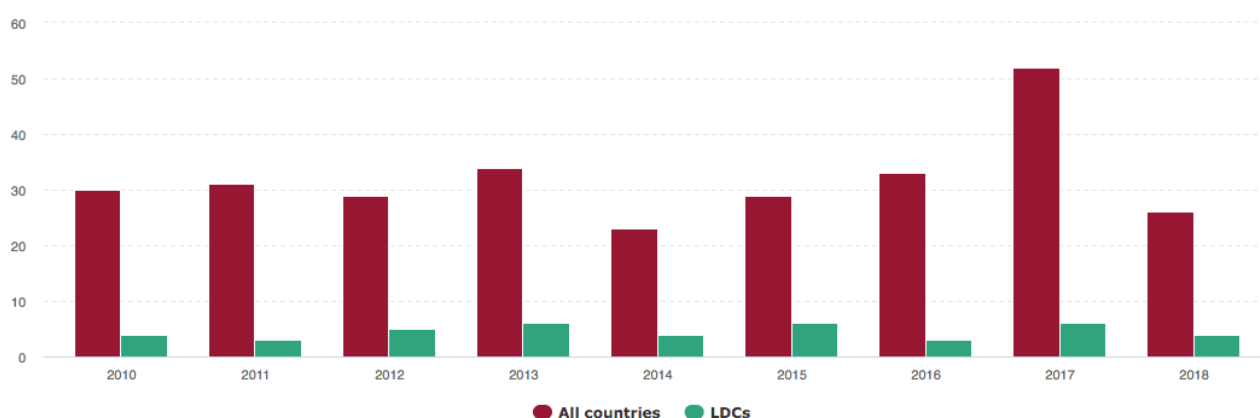
in Asia, and one fifth went to projects in Eastern Europe. 17 per cent of funds supported projects in America, with Argentina, Brazil, Mexico, Colombia and Chile the top five recipients.

Overall, investment guarantees were the instrument that mobilized the most funds (US\$26.6 billion) in 2012-2017, accounting for about 42 per cent of total funds mobilized globally. The latest data collection focused on investment guarantees and noted that, in 2016-2017, LDCs received 2 per cent of funds obtained by investment guarantees (US\$26.6 billion globally), equaling about US\$0.5 billion. One of the LDCs, Myanmar, was among the top 10 recipient countries, receiving about 0.6 per cent of funds mobilized by investment guarantees.

LDCs' own measures help to attract investment

A direct measure of the current SDG indicator is not yet possible. Instead, in addition to the data presented above, investment promotion regimes put in place by LDCs themselves, or other

Figure 5 Number of new national investment promotion and facilitation measures



Source: UNCTAD (2019c).

Note: This graph depicts data on positive investment measures; i.e., those that introduce new investment promotion or facilitation schemes.

outward investment promotion measures directed to LDCs, can be examined. LDCs own investment promotion regimes play an important role in attracting FDI (see figure 5).

Between 2010 and 2018, at least 287 new investment promotion and facilitation measures were introduced around the world, of which 41 by LDCs. These measures mainly include investment facilitation, investment incentives and special economic zones. Investment incentives are the most common mechanism, accounting for almost

half of all new measures (45 per cent). Investment facilitation was more common in countries other than LDCs.

Africa (30 per cent) and Asia (36 per cent) accounted for the bulk of new promotion and facilitation measures introduced by all countries between 2010 and 2018. Africa also accounted for 85 per cent of all promotion and facilitation measures introduced by LDCs during this period, with Asia accounting for the rest.

Notes

- 1 The denominator of this indicator, “total domestic budget”, is ambiguous. It could refer to different levels of government and different types of accounts. Many of these variables are not available in the context of LDCs. Figure 2 reports figures using the budgetary central government revenue as denominator. For more details on this and other government finance statistics, see IMF (2014).

References

- Besharati N and MacFeely S (2019). Defining and quantifying South-South Cooperation. UNCTAD Research Paper No. 30. UNCTAD/SER.RP/2019/2. Geneva.
- IMF (2009). *International Transactions in Remittances : Guide for Compilers and Users (RCG)*. IMF. Washington, D.C.
- IMF (2014). *Government Finance Statistics Manual 2014*. IMF. Washington, DC.
- IMF (2019). Government finance statistics (GFS). Available at <https://data.imf.org/GFS> (accessed 7 June 2019).
- Ministry of Foreign and European Affairs, Luxembourg (2018). Regional economic organisations and regional cooperation. Available at <https://maee.gouvernement.lu/en/directions-du-ministere/affaires-europeennes/organisations-economiques-regcoop.html> (accessed 10 June 2019).
- OECD (2019a). DAC glossary of key terms and concepts. Available at <http://www.oecd.org/dac/dac-glossary.htm> (accessed 15 May 2019).
- OECD (2019b). *Geographical Distribution of Financial Flows to Developing Countries 2019: Disbursements, Commitments, Country Indicators*. OECD Publishing. Paris.
- OECD (2019c). Creditor Reporting System (CRS). Available at <https://stats.oecd.org/Index.aspx?DataSetCode=CRS1> (accessed 26 April 2019).
- OECD (2019d). *Amounts Mobilized from the Private Sector by Development Finance Interventions in 2012-17, Preliminary Insights from the Data*.
- UNCTAD (2006). *Recent Developments in International Investment Agreements*. IIA Monitor No. 2, No. UNCTAD/WEB/ITE/IIT/2005/1. UN. Geneva.
- UNCTAD (2015). *Investment Policy Framework for Sustainable Development*. UNCTAD/DIAE/PCB/2015/5. Geneva.
- UNCTAD (2016). *World Investment Report 2016: Investor Nationality: Policy Challenges*. United Nations publication. Sales No. E.16.II.D.4. Geneva.
- UNCTAD (2017). *World Investment Report 2017: Investment and the Digital Economy*. United Nations publication. Sales No. E.17.II.D.3. Geneva.

- UNCTAD (2018). *World Investment Report 2018: Investment and New Industrial Policies*. United Nations publication. Sales No. E.18.II.D.4. Geneva.
- UNCTAD (2019a). International Investment Agreements Navigator. Available at <https://investmentpolicy.unctad.org/international-investment-agreements> (accessed 15 May 2019).
- UNCTAD (2019b). UNCTADStat. See <https://unctadstat.unctad.org/> (accessed 10 April 2019).
- UNCTAD (2019c). Investment Policy Hub. Available at <https://investmentpolicy.unctad.org/> (accessed 15 May 2019).
- United Nations (2003). Monterrey Consensus of the International Conference on Financing for Development. United Nations. A/CONF.198/11. Monterrey.
- United Nations (2015). Addis Ababa Action Agenda of the third International Conference on Financing for Development. Available at https://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA_Outcome.pdf.
- United Nations (2017). *The Sustainable Development Goals Report 2017*. United Nations publication. Sales No. E.17.I.7. New York.
- United Nations (2019a). SDG indicators: Metadata repository. Available at <https://unstats.un.org/sdgs/metadata/> (accessed 14 May 2019).
- United Nations (2019b). Global SDG Indicators Database. See <https://unstats.un.org/sdgs/indicators/database/> (accessed 12 June 2019).
- UNOSSC (2019). About South-South and Triangular Cooperation. Available at <https://www.unsouthsouth.org/about/about-sstc/> (accessed 10 June 2019).



II. Official international assistance has a special role in financing sustainable development

SDG target 2.a: Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries

- **SDG indicator 2.a.2:** Total official flows (official development assistance plus other official flows) to the agriculture sector (Tier I)

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

- **SDG indicator 9.a.1:** Total official international support (official development assistance plus other official flows) to infrastructure (Tier I)

Key messages

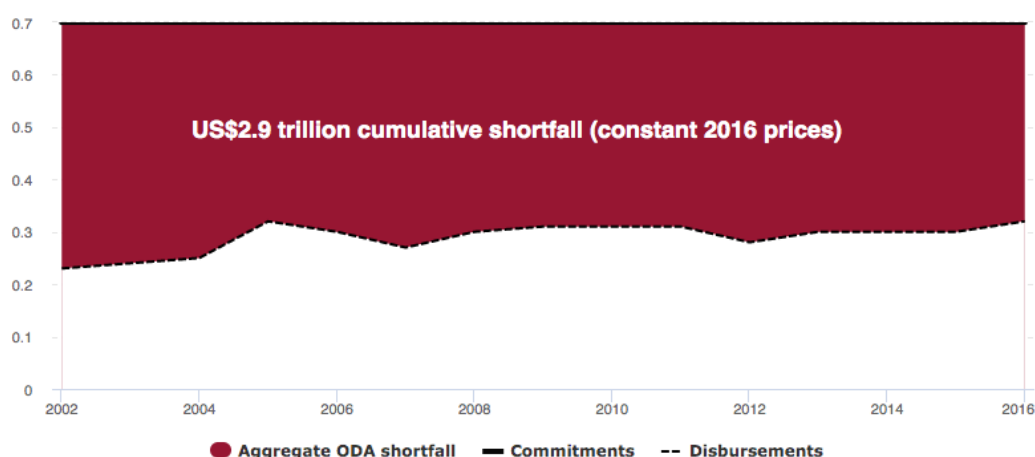
- **Developing countries will account for two thirds of investment needs in economic infrastructure over the next 15 years**
- **In 2017, 24% of total official international support was directed to infrastructure in economic sectors**
- **Ten countries received half of all official flows to infrastructure**
- **The agricultural sector receives 3.7% of global official international support**

The Addis Ababa Action Agenda on Financing for Development (United Nations, 2015) clearly identifies ODA and OOFs as a relevant element in the financing of sustainable development programmes. As shown in Robust and predictable financing sources, these flows are relatively small when compared to domestic public resources or private flows. However, they are still essential since they frequently function as “seed funds” or catalysers of additional resource mobilization in sectors or projects where other funding options are limited, or where other investors are reluctant to participate. Furthermore, for some countries in vulnerable situations, official funds are frequently the only source of financing available.

For these reasons, the importance of official flows is often highlighted in the 2030 Agenda. In fact, they are referred to in 11 targets, including sector-specific official support to agriculture¹, health², water and sanitation³, clean energy⁴, biodiversity⁵ and others.

It is important to highlight the commitment of developed economies under SDG target 17.2 to dedicate 0.7 per cent of their gross national income to ODA to developing countries and 0.15 to 0.20 per cent to LDCs. As shown in figure 1, there is a significant gap between this commitment and actual ODA funds made available for development. This cumulative shortfall could compromise the financing of the 2030 Agenda.

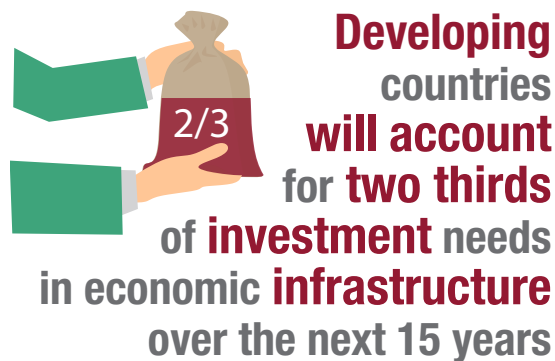
Figure 1 Net ODA as percentage of GNI commitments and actual disbursements



Source: UNCTAD calculations based on OECD (2019b).

This chapter covers concessional resources to two sectors: infrastructure in economic sectors and agriculture. Although the role of this source of financing is essential everywhere, these two areas are directly related to productive growth and its impact on sustainable development.

Official flows remain supportive of infrastructure projects



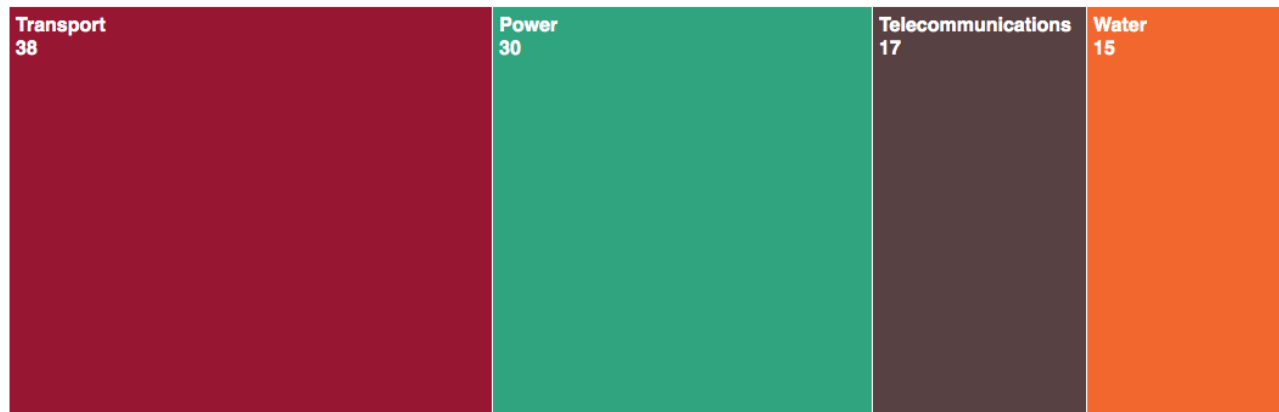
Investment in modern and efficient economic infrastructure (roads, information and communication technologies, water supply, electrical power) is essential to achieving sustainable development objectives. Long-term strategies for economic growth, poverty reduction and environmental sustainability all have infrastructure development as a common element. A recent report (Bhattacharya, 2015) estimates that the global economy needs to invest between US\$5 and 6 trillion (in constant

2010 prices) in economic infrastructure every year over the period from 2015 to 2030. Additional funds equivalent to US\$600 to 800 billion per year would be necessary to make this investment sustainable. Developing countries will account for about two thirds of the investments required to accommodate higher growth and structural change. These figures do not take into account soft infrastructure and its important role in economic development, including, for example, national data infrastructure (UNCTAD, 2016).

Figure 2 shows the global infrastructure needs by sector with a 2030 horizon, as estimated by Woetzel et al. (2016). Given these needs and the current and expected investment trends, the largest infrastructure investment gaps will be concentrated in the generation and distribution of electricity, followed by transport infrastructure.⁶ In addition, significant additional resources are needed across all sectors for climate change mitigation and adaptation (UNCTAD, 2014).

Even if most of the funds for infrastructure investment will come from the public sector and private actors, including through public-private partnerships and other forms of blended finance, ODA will play a significant role, particularly for LDCs and countries in vulnerable situations. For this reason, SDG indicator 9.a.1 monitors “total official international support (official

Figure 2 Distribution of economic infrastructure needs by sector, 2016-2030 (Percentage)



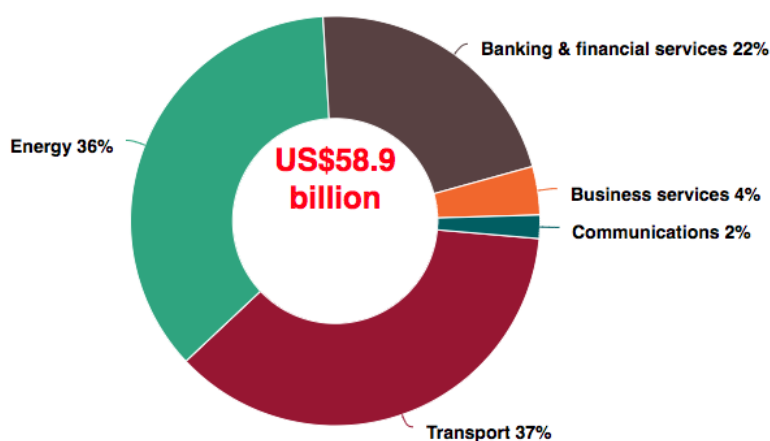
Source: UNCTAD calculations based on Woetzel et al. (2016).

Figure 3 Official international support, total and to infrastructure (SDG 9.a.1)
(Billions of constant 2017 US\$)



Source: UNCTAD calculations based on OECD (2019b).

Figure 4 Distribution of official international support to infrastructure, 2017



Source: UNCTAD calculations based on OECD (2019b).

Note: As specified in its metadata (see Note 7), official international support to infrastructure includes sector codes in the 200 series of the DAC classification.

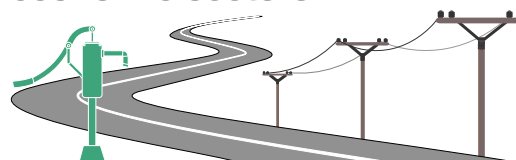
development assistance plus other official flows) to infrastructure”.⁷

Figure 3 shows total official flows and those directed to economic infrastructure, in constant prices. While the global financial crisis of 2007/2008 had a profound impact on overall concessional financing flows, those targeting infrastructure projects were sustained. In recent years, after a marked increase in 2015, official support flows have remained constant. ODA and OOFs in support of infrastructure reached US\$58.9 billion in 2017, accounting for about 24 per cent of the total flows.

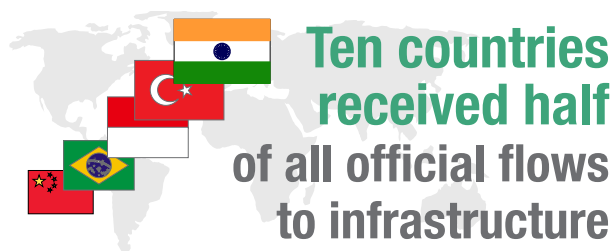
Of this, almost equal shares were assigned to

energy and transportation projects (see figure 4). The low share for communications can be explained by the role of private companies as a source of financing in this sector.

In 2017, 24% of total official international support was directed to infrastructure in economic sectors



Official support – a significant source of funding for infrastructure in LDCs, LLDCs and SIDS



Just ten countries received half of all official international support to infrastructure. The largest recipients were India (11.5 per cent of the total), Turkey (6.0 per cent), Indonesia (4.6 per cent), Brazil (4.5 per cent) and China (4.4 per cent). However, these are also some of the largest developing economies and official support represents only a small share of their total sources of domestic and external financing.

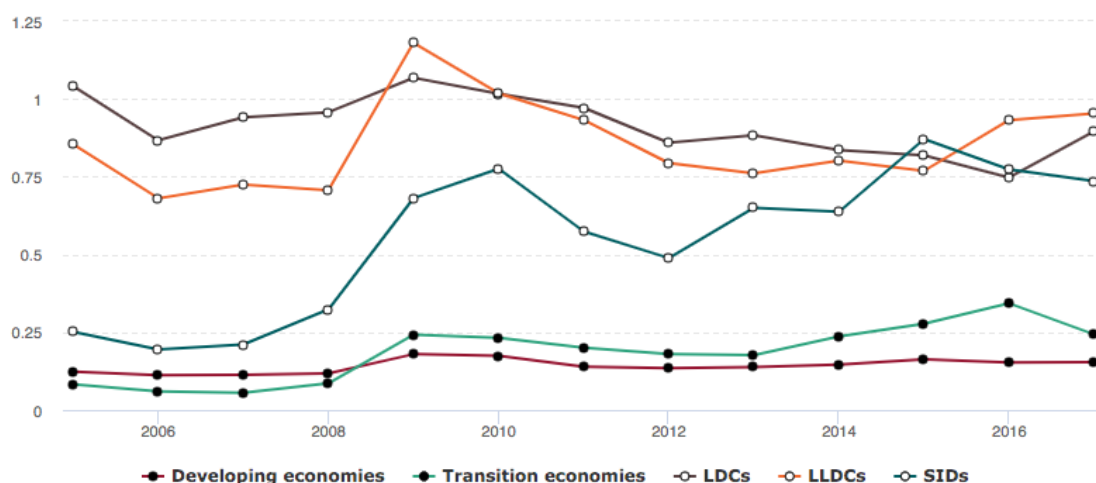
For other countries, official international support has a higher weight relative to the size of their economies. In some cases, because of special needs in terms of economic infrastructure or lack of access to other sources of development financing, official support is fundamental. Figure 5 shows the international support to infrastructure relative to GDP for developing economies and countries in

transition, as well as for three other groups: LDCs, LLDCs and SIDS. These three groups receive a higher share of funds from ODA compared to other developing or transition economies.

The need for infrastructure development, particularly transport, is of central importance for economic development in LLDCs due to their isolation from international markets. For LLDCs, to reach the global average road and rail network density, they would need to build almost 200,000 km of paved roads and 46,000 km of rail lines at a cost of about 2 per cent of their GDP. This means that there is an important investment gap at current investment levels (UN-OHRLLS, 2018). This points to the importance of all sources of funding for infrastructure projects. LLDCs were recipients of US\$6.9 billion in development assistance to economic infrastructure in 2017, equivalent to almost one per cent of GDP. In fact, ODA is the most important source of non-national funding for LLDCs, particularly for lower-income economies.

Due to their structural characteristics, such as small populations and geographic remoteness, an economic reliance on trade and tourism, and a high vulnerability to natural disasters and climate change, SIDS have significant infrastructure requirements, both in terms of building new

Figure 5 International support to infrastructure by group of economies
(Percentage of GDP)



Source: UNCTAD calculations based on OECD (2019b) and UNCTAD (2019).

Note: As specified in the metadata for SDG indicator 9.a.1 (see Note 7), official international support to infrastructure includes sector codes in the 200 series of the DAC classification.

facilities and maintaining and adapting existing ones (OECD, 2018). As seen in figure 5, the importance of official international support to economic infrastructure in these economies has grown in recent years, increasing from about 0.20 per cent of GDP in 2006 to 0.74 per cent in 2017. Long-term investment in infrastructure for sustainable development, especially in developing countries with special needs (LDCs, LLDCs and SIDS) remains insufficient, despite the growing infrastructure challenges. Stronger consideration should be given to the positive impact of infrastructure, as developing countries will require large-scale investment to build high quality, resilient and inclusive infrastructure (United Nations, 2018). Official international support will remain a key component in the financing of the infrastructure investments required to achieve the SDGs.

Agriculture no longer a priority for ODA, even when challenges keep mounting

The agricultural sector employs a large share of the labour force, and it also plays an essential role in food security and rural development. In many countries, agricultural products are traded internationally and constitute an important source of revenue. However, even if agriculture

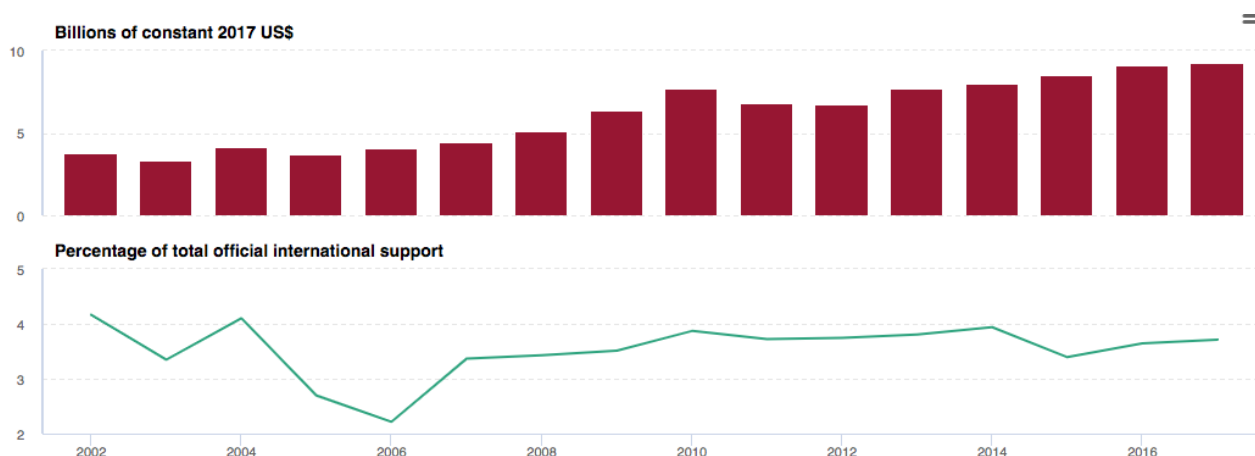
The agricultural sector receives 3.7% of global official international support



remains a crucial economic sector in many developing economies, agricultural productivity remained stagnant during the 1960s to 1980s and it has only increased gradually since then. This could be attributed to several factors, including unsupportive policies and insufficient resources to develop this sector (Chimhowu, 2013).

In addition to the urgent need for increases in productivity, agriculture must also embrace sustainable practices and adapt to climate change. On one hand, the sector contributes to greenhouse gas emissions, natural habitat loss and unsustainable use of water resources, among others (see Signs of a greening economy?). Reducing the environmental impact would require important investments. On the other hand, agriculture is especially affected by climate change, extreme climatological events, such as drought and fires, and meteorological disasters, such as floods, storms, heat waves or sandstorms. Significant resources are needed for adaptation and mitigation. In many countries, official flows

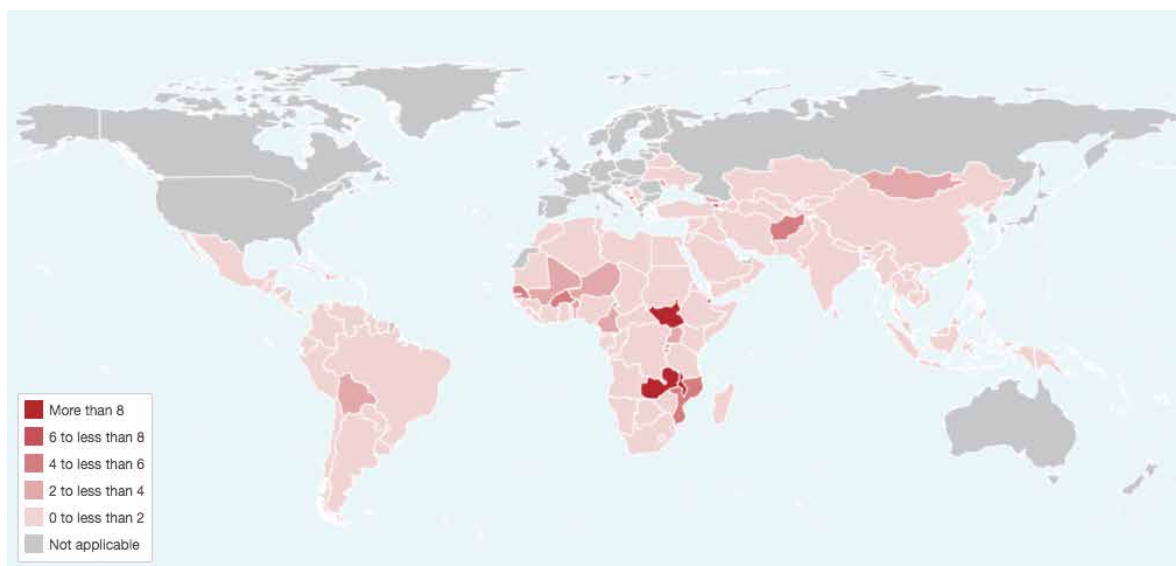
Figure 6 Total official international support to agriculture (SDG 2.a.2)



Source: UNCTAD calculations based on OECD (2019b).

Note: As specified in the metadata for SDG indicator 2.a.2 (see Note 8), official international support to infrastructure includes sector codes in the 311 series of the DAC classification.

Map 1 Official international support to agriculture as a percentage of primary sector GDP, 2017



Source: UNCTAD calculations based on OECD (2019b) and UNCTAD (2019).

Note: As specified in the metadata for SDG indicator 2.a.2 (see Note 8), official international support to infrastructure includes sector codes in the 311 series of the DAC classification. Countries in gray: developed economies or countries not included in the CRS database.

in the form of ODA and OOFs play a key role in financing agricultural development. In this sense, SDG indicator 2.a.2 measures “total official flows (official development assistance plus other official flows) to the agriculture sector”.⁸

During the 1970s and 1980s, agriculture was a major recipient of international assistance, accounting for 15 to 20 per cent of total ODA (Cabral and Howell, 2012). However, the relative importance of agriculture as a beneficiary of ODA has declined since then. Several factors are behind this shift, including changing donor priorities, pressure from environmental groups and evidence of insufficient improvements in productivity (Chimhowu, 2013).⁹

As shown in figure 6, while ODA to agriculture has continued to increase in absolute terms, it has remained stable, at a low level, when expressed as a share of total concessional resources. Indeed, since 2005 the four-per-cent mark has not been exceeded. In 2017, these flows reached US\$9.3 billion, equivalent to 3.7 per cent of global official international support.

Even if ODA to agriculture has declined relative to other sectors, it still represents an important source of funding for many developing economies.

Map 1 shows the weight of these flows relative to the value added of the primary sector.¹⁰ It can be seen that several economies in Central and West Africa, Central Asia and the Caucasus still rely on ODA as an important source of financing for the development of the agricultural sector.

Do official international flows contribute to developing the agricultural sector? A recent study on the effectiveness of agricultural ODA in Sub-Saharan Africa found that development assistance does have a positive relationship with agricultural productivity, in general terms. However, the specific effects vary according to the destination of the funds and the characteristics of the recipient economies. For example, it has been argued that ODA creates a substitution effect towards agricultural production activities related to the industrial or export sectors, and away from food crop production. Furthermore, institutional factors such as government effectiveness, property rights and business freedom strengthen the positive impact of international support on agricultural productivity (Ssozi et al., 2019). For policymakers in both donor and recipient economies, it is important to consider the right mix of funds and ensure supporting institutional reform in order to maximize the positive impact of ODA in agriculture.

Notes

- 1 SDG indicator 2.a.2: Total official flows (official development assistance plus other official flows) to the agriculture sector.
- 2 SDG indicator 3.b.2: Total net official development assistance to medical research and basic health sectors.
- 3 SDG indicator 6.a.1: Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan.
- 4 SDG indicator 7.a.1: International financial flows to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems.
- 5 SDG indicator 15.a.1: Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems.
- 6 For more information on investment needs specific to transport infrastructure, see chapter Adapting transport for sustainable development.
- 7 Note that the definition of infrastructure for the purpose of this indicator could vary from other classifications. According to the DAC classification, official flows to infrastructure can be divided into infrastructure in social and economic sectors. The former includes education, health, population policies, water supply and sanitation, and government and civil society; the latter comprises transportation and storage, communications, energy, banking and financial services, and business services (OECD, 2019c). As specified in its official metadata, funding from all official international donors directed to infrastructure in economic sectors in developing countries is considered for SDG indicator 9.a.1 (United Nations Statistics Division, 2019).
- 8 According to the official metadata, this indicator measures funding from all official

international donors to the agricultural sector in developing countries (United Nations Statistics Division, 2019). This corresponds to sector code 311 of the DAC classification, including sub-sectors such as agricultural development, agricultural policy, agricultural water and land resources, food crop production, livestock, industrial/exports crops, rural co-operatives, agricultural inputs, agrarian reforms, among others (OECD, 2019c).

- 9 In order to reflect current practices in terms of ODA to the primary sector, a broader definition could also include other relevant sectors, such as rural livelihoods, rural development and food security, and take into account the spread of ODA-financed projects over multiple sectors (Cabral and Howell, 2012). However, even with this definition, ODA directed to agricultural projects still shows a decline in relative terms, although at a slower rate.
- 10 The primary sector is broader than agriculture (it also includes hunting, forestry and fishing.) It is used in Map 1 as a denominator since data on value added for agriculture is not available for all countries.

References

- Bhattacharya A, Oppenheim J and Stern N (2015). Driving sustainable development through better infrastructure: Key elements of a transformation program. Global Economy & Development Working Paper No. 91. Brookings Institute.
- Cabral L and Howell J (2012). Measuring aid to agriculture and food security. Briefing Paper No. 72. Overseas Development Institute.
- Chimhowu A (2013). Aid for agriculture and rural development: A changing landscape with new players and challenges. WIDER Working Paper No. 2013/014. UNU-WIDER.
- FutureStructure* (2013). What is soft infrastructure? November.

- OECD (2018). *Making Development Co-Operation Work for Small Island Developing States*. OECD Publishing. Paris.
- OECD (2019a). DAC glossary of key terms and concepts. Available at <http://www.oecd.org/dac/dac-glossary.htm> (accessed 15 May 2019).
- OECD (2019b). Creditor Reporting System (CRS). Available at <https://stats.oecd.org/Index.aspx?DataSetCode=CRS1> (accessed 26 April 2019).
- OECD (2019c). DAC and CRS code lists. Available at <http://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/dacandcrscodelists.htm> (accessed 14 May 2019).
- Ssozi J, Asongu S and Amavilah V (2019). The effectiveness of development aid for agriculture in Sub-Saharan Africa. *Journal of Economic Studies*. 46(2):284–305.
- UNCTAD (2014). *World Investment Report 2014: Investing in the SDGs, an Action Plan*. United Nations publication. Sales No. E.14.II.D.1. Geneva.
- UNCTAD (2016). Development and globalization: Facts and figures 2016. Available at <https://stats.unctad.org/Dgff2016/> (accessed 19 April 2019).
- UNCTAD (2019). UNCTADStat. See <https://unctadstat.unctad.org/> (accessed 10 April 2019).
- United Nations (2015). Report of the third international conference on financing for development. A/CONF.227/20. Addis Ababa. 3 August.
- United Nations (2018). *Financing for Development: Progress and Prospects 2018*. United Nations publication. Sales No. E.18.I.5. New York.
- United Nations Statistics Division (2019). SDG indicators: Metadata repository. See <https://unstats.un.org/sdgs/metadata/> (accessed 14 May 2019).
- UN-OHRLLS (2018). Financing infrastructure in the transport sector in landlocked developing countries: Trends, challenges & opportunities. Available at <http://unohrlls.org/about-lllcs/publications/> (accessed 4 June 2019).
- Woetzel J, Garemo N, Mischke J, Hjerpe M and Palter R (2016). Bridging global infrastructure gaps. McKinsey Global Institute. Available at <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/bridging-global-infrastructure-gaps> (accessed 26 April 2019).



III. Sustainable transport infrastructure in a world of growing trade and climate change development

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

- SDG indicator 9.1.2: Passenger and freight volumes, by mode of transport (Tier I)

Key messages

- **Developing countries account for more than 60% of international seaborne cargo flows**
- **Maritime trade volumes are expected to double within the next two decades**
- **Singapore, Netherlands and Hong Kong have the best conditions for maritime transport services**
- **Significant global investment needs for transport infrastructure in the coming decades**
- **Worldwide damages related to sea-level rise expected to reach 1.8% of global GDP every year**

Transport infrastructure links the world economy and is an important determinant of growth for business opportunities, employment, industrialization and rural-urban linkages. Road networks, railways, airports, inland and sea ports, cross-border and other facilities are critical elements for trade competitiveness and integration into the world economy. They enable market access by bringing together consumers and producers, connecting global supply chains, increasing market size, promoting regional integration and attracting investment (African Development Bank et al., 2014).

But not all transport infrastructure brings equal benefits. In this context, building more sustainable and resilient transport infrastructure is vital. There is growing pressure to promote economic efficiency, resource conservation, social inclusiveness and environmentally-friendly solutions when building transport infrastructure. There should be a shift to sustainable maritime and inland transport infrastructure that minimizes negative externalities and support low-carbon activities (see Signs of a greening economy?) while staying resilient to disruption, including from climatic factors, weather events and security threats.

For this reason, SDG target 9.1 seeks to improve infrastructure that supports economic activity and human well-being while promoting sustainability.

Specific to transport infrastructure, SDG indicator 9.1.2 measures “passenger and freight transport, by mode of transport.”

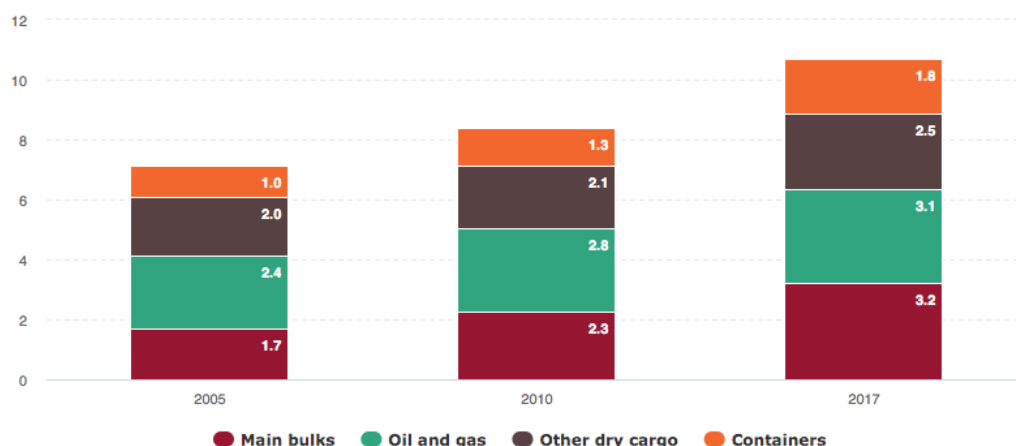
Maritime freight keeps expanding, driven by global trade

Transport services handle passengers and freight domestically and across borders. There are several major modes of transport (road, rail, air, sea and other waterways) and they all have important interactions with other sectors, contributing to economic activity and human well-being.

This section covers seaborne freight transport as one of the main supports of international value chains and global trade. Indeed, maritime transport handles over 80 per cent of global trade by volume (UNCTAD, 2018a). This mode of transport can be seen as the network that meets the world’s consumption and production needs by delivering energy, intermediate inputs and final products.



Figure 1 Volume of international maritime cargo
(Billions of tons loaded)



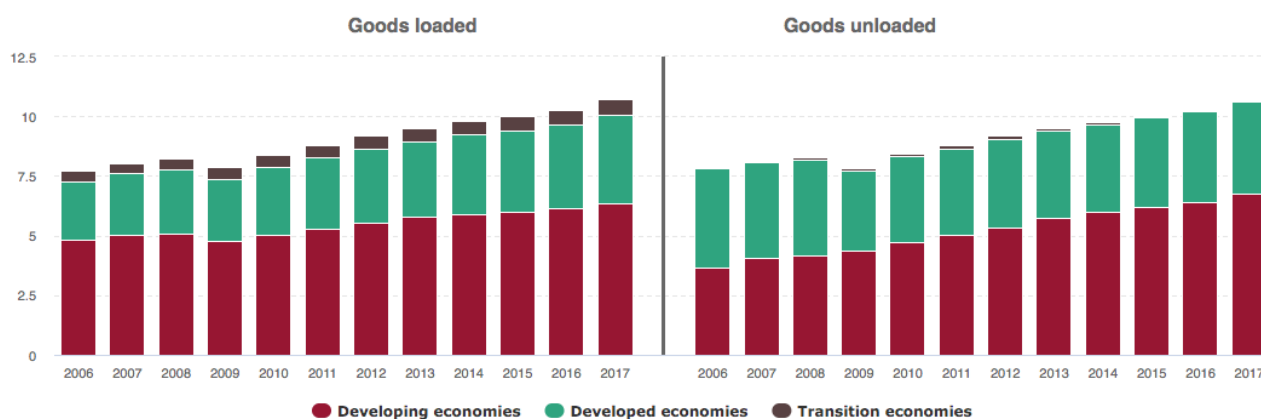
Source: UNCTAD (2018a), figure 1.1.

According to UNCTAD estimates, the volume of international maritime trade grew by four per cent in the year 2017, taking the total to almost 10.7 billion tons (UNCTAD, 2018a). As shown in figure 1, this represents a 50 per cent increase on the volumes transported in 2005. Major dry bulk commodities accounted for the largest share, almost reaching one third of total cargo. This was closely followed by fuels.

Containerized trade volumes reached 1.8 billion tons in 2017, accounting for 17 per cent of total maritime trade. This segment, closely associated with the globalization and fragmentation of global production, has been the most dynamic sector, registering a growth of 5.8 per cent in 2017.

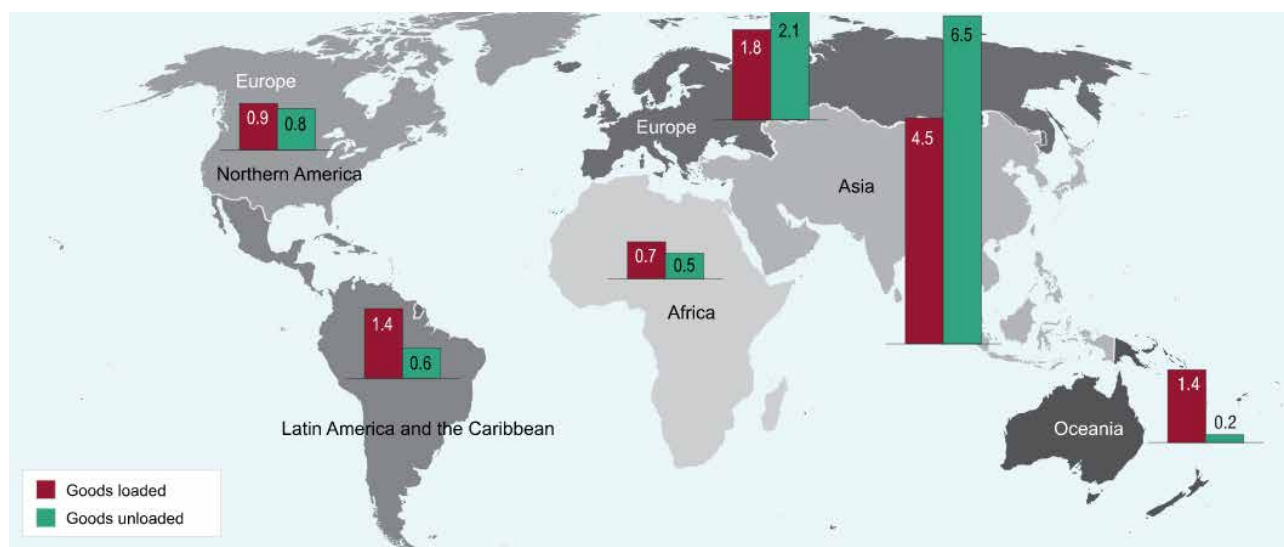
Developing economies continue to account for most international seaborne cargo flows, as shown in figure 2. In 2017, this group of economies was responsible for 60 and 63 per cent of total goods loaded (export volumes) and goods unloaded (import volumes), respectively. Developed economies, by contrast, saw their share of both flows decline over recent years, so that they now only represent about one third of world seaborne imports and exports. Transition economies continue to be reliant on the export of bulky raw materials and commodities (about six per cent of total goods loaded), but they only hold a marginal share of global seaborne imports (less than one per cent of total goods unloaded in 2017).

Figure 2 World seaborne trade by direction and group of economies
(Billions of tons)



Source: UNCTAD (2019a).

Map 1 International maritime cargo flows by region, 2017
(Billions of tons)

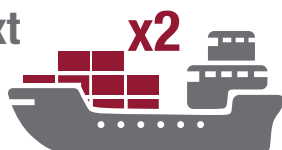


Source: UNCTAD (2018b).

Note: Europe includes the Russian Federation and French overseas departments.

Map 1 highlights the leading influence of Asia in maritime transport. In 2017, this region shipped 42 per cent and received 61 per cent of world maritime cargo. Corresponding figures for Europe were 17 per cent of total goods loaded and 20 per cent of total goods unloaded. The other regions were responsible for smaller shares of worldwide maritime cargo flows.

**Maritime trade volumes
are expected to double
within the next
two decades**



Demand for maritime transport infrastructure and services is a derived demand, impacted by demographic factors, consumption needs, industrial activity, trade and economic growth. Maritime cargo volume is, therefore, expected to rise in line with expanding economic activity. UNCTAD projects maritime freight to increase at an annual growth rate of 3.8 per cent over the next five years (UNCTAD, 2018a). At this pace, global seaborne trade volumes are expected to double in less than two decades. Large infrastructure projects, such as China's Belt and Road Initiative,

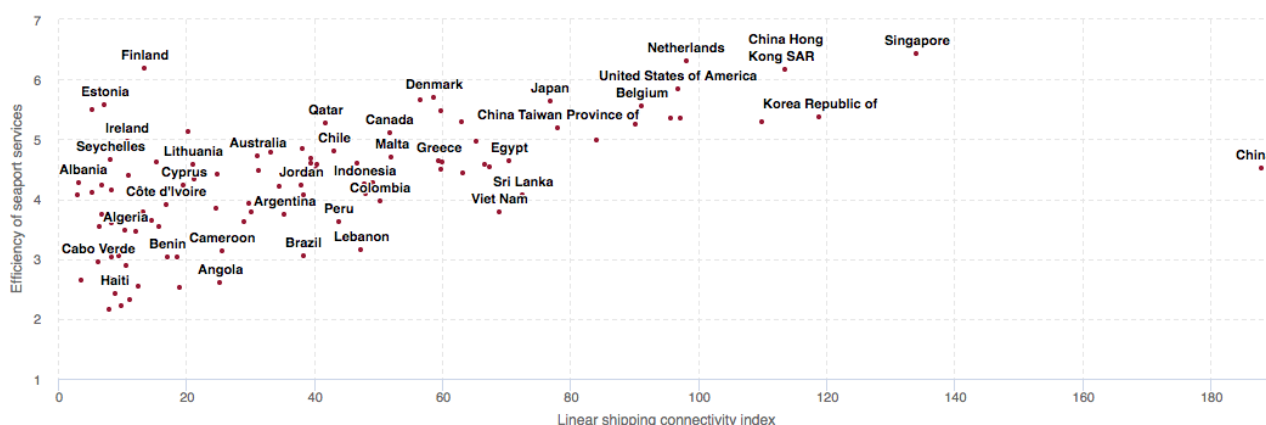
are expected to further boost maritime cargo flows.¹

Efficiency goes hand in hand with connectivity

The projected expansion of maritime cargo volumes and the growing role of developing countries in seaborne activities will test the capacity of existing infrastructure and services. To support increased cargo flows, countries must continue to develop new infrastructure and optimize the use of existing networks. To remain competitive and avoid the risk of marginalization, ports and terminals must find effective ways to embrace sustainability and resilience.

Enhancing port infrastructure and service quality is crucial for reducing transport costs, and this in turn can increase connectivity, facilitate trade and boost trade flows. Figure 3 shows country scores for efficiency of seaport services and linear shipping connectivity in 2018. The two variables are positively correlated, with some of the more connected countries also registering high port efficiency, namely Singapore, the Netherlands, Hong Kong, Special Administrative Region, the United States and the Republic of Korea. Some

Figure 3 Characteristics of maritime transport services, 2018



Source: Efficiency of seaport services is obtained from World Economic Forum (2018); linear shipping connectivity from UNCTAD (2019a).

Note: The score for efficiency of seaport services ranges from one to seven. The linear shipping connectivity index takes the value of 100 for the maximum of 2004. For both variables, a higher value indicates a better result.



exceptions include countries with very efficient ports but that, being located away from the main maritime trading routes, are relatively weakly connected, such as Finland, Estonia, Iceland, Norway and New Zealand. China's maritime transport sector is a special case: it is by far the most well-connected country, but its port efficiency is close to the world average. With an average efficiency of 3.0 and an average connectivity reaching only 11.0, LDCs lie at the bottom of the table in both measures. With average scores of 3.8 and 18.5 on efficiency and connectivity, respectively, SIDS perform relatively better, but still significantly below the world average (4.3 and 39.8 for each measure, respectively). Thus, not all countries are equal from the perspective of efficiency and connectivity in maritime transport infrastructure.

Logistical bottlenecks and insufficient investment are some of the key challenges in maritime

transport infrastructure. They raise costs, extend delays, reduce access, constrain connectivity and undermine effective participation in regional global supply chains and transport networks. Beyond ports, road and rail networks are necessary for the door-to-door transport of goods. These additional services can render transportation costly, especially for LLDCs. According to UNCTAD estimates for the period from 2005 to 2014, total freight costs (including all modes of transport) in Africa reached 11.4 per cent of the value of imports. These costs amounted to 9.6, 9.0 and 8.0 per cent of the import value in developing economies in Oceania, Asia and the Americas, respectively. The equivalent rate for developed economies was only 6.8 per cent (UNCTAD, 2015).

Investment requirements in the transport sector will likely accelerate

According to recent projections, global infrastructure investment needs up to 2040 could reach US\$94 trillion, in 2015 prices. A scenario in which current investment trends are maintained implies that only US\$79 trillion will be invested, leaving a global infrastructure investment gap of US\$15 trillion (Oxford Economics and Global Infrastructure Hub, 2017). This estimate is based on data from seven sectors in 50 countries. Available estimates specific to the transport sector

also reveal high investment needs over the coming decades.²

The public sector has traditionally played a key role in financing transport infrastructure. However, investment requirements are large and there is a growing gap between needs and actual investment. In many countries, financing transport infrastructure needs is challenged by competition with other high-priority areas for public funds, by constrained opportunities for domestic resource mobilization and by limited ability to borrow domestically or internationally. Alleviating the persistent transport infrastructure gap and ensuring proper service delivery require further mobilization of domestic resources (public and private), and complementing them with additional sources, including foreign direct investment, international debt finance, development aid, as well as public-private sector solutions in the form of public-private partnerships (PPPs), among others.

Significant global investment needs for transport infrastructure in the coming decades



Adapting transport infrastructure in times of climate change

UNCTAD has worked on the implications of climate change for maritime transportation since 2008, with increasing focus on climate change adaptation and resilience building for seaports and other key coastal transport infrastructure. In keeping with the global momentum of the 2030 Agenda for Sustainable Development and the Paris Agreement on climate change, UNCTAD is intensifying its efforts to promote sustainable and resilient freight transport infrastructure and

Worldwide damages related to sea-level rise expected to reach 1.8% of global GDP every year



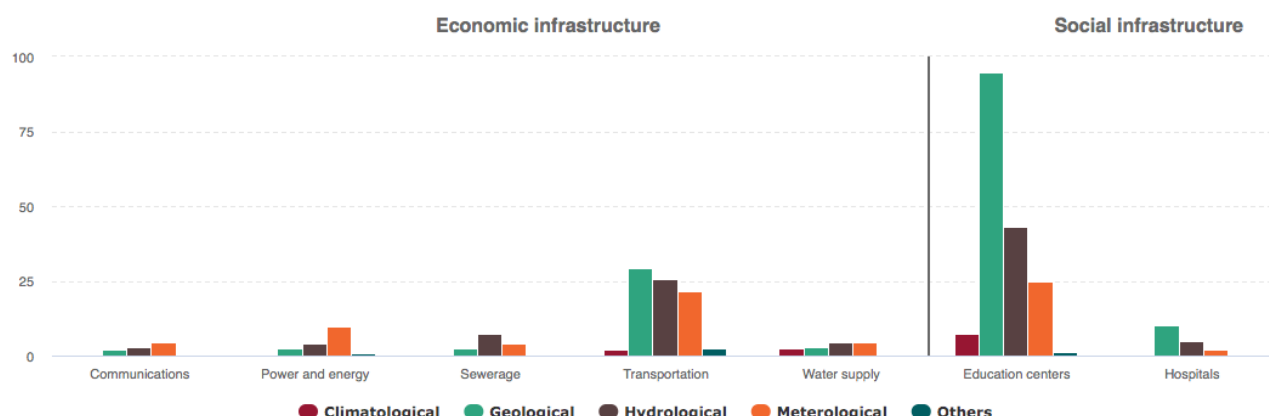
services.³

Transport infrastructure is affected directly and indirectly by climate change, with broader consequences for international trade and the development prospects of the most vulnerable nations.⁴ Climate-related extreme events and disasters can result in significant economic costs. They are considered among the top global economic risks, with implications for additional infrastructure investment needs and climate adaptation (World Economic Forum, 2019).

Figure 4 illustrates the potential probability that a disaster leads to damage on infrastructure, based on occurrences in the past. The figure suggests that, within economic infrastructure, transport is the sector that is most vulnerable to disasters. On average, transport facilities have a 20-30 per cent probability to be impacted by geological, hydrological and meteorological events. Some of these events are expected to increase in frequency and intensity as a result of climate change, with severe consequences for infrastructure. Indeed, a recent study estimated that global damage due to sea-level rise and related extreme events might amount to US\$10.8 trillion per year, about 1.8 per cent of global GDP, for a scenario of 1.5°C warming by 2100. For a scenario of 2°C or more, the costs could reach considerably higher levels (Jevrejeva et al., 2018).

Adaptation and resilience measures are essential since they contribute to reducing the negative impacts of climate change. However, a recent UNCTAD port-industry survey on climate change impacts and adaptation for ports shows important gaps in data on resilience and preparedness among seaports worldwide (UNCTAD, 2017). Relevant information and adequate climate

Figure 4 What is the probability that a natural disaster affects infrastructure?
(Percentage)



Source: UNCTAD calculations based on data from UNDRR (2019).

Note: The probability shown in this chart is calculated as the number of disasters that damaged infrastructure, divided by the total number of disasters. It is calculated for each infrastructure sector and type of disasters. The source database provides an inventory of disasters and their effects for 82 economies during the period 2000-2013. For more information on the database, including the classification of disasters, see UNDRR (2019).

adaptation efforts are urgently needed for effective climate risk-assessment and adaptation planning of coastal transport infrastructure, especially for ports in developing (UNCTAD 2011, 2019f).

Adaptation is a particularly urgent imperative for SIDS. These countries are often particularly exposed and vulnerable to the impacts of climate change while, at the same time, they are more dependent than other countries on coastal infrastructure for external trade, food, energy and tourism. Climate-related extreme events, that are expected to increase in frequency and severity, may cause major disruptions to the connectivity of SIDS to international markets as well as to related economic sectors, such as tourism (UNCTAD, 2014; IPCC, 2018). UNCTAD has recently conducted vulnerability assessments for eight seaports and coastal airports in two SIDS in the Caribbean, Saint Lucia and Jamaica (UNCTAD, 2018c, 2018d) as part of a wider technical assistance project on climate change adaptation for coastal transport infrastructure in SIDS (UNCTAD, 2019d). The results of the assessment, which focused on operational disruptions and marine inundation risk under different climate scenarios, suggest severe climate change impacts on coastal transport infrastructure

and operations from as early as the 2030s, unless further climate change adaptation is undertaken (Monioudi et. al., 2018; IPCC, 2018).

While central to development, transport can also have detrimental effects on the environment through air pollution, greenhouse gas emissions, soil contamination, waste, noise, threats to land and water ecosystems and biodiversity, and others. Each mode of transport may entail a different combination of negative impacts on the environment. While maritime transport is the most CO₂-efficient mode of freight transport, the large volumes handled by this sector and its projected expansion in the coming decades make it priority. For instance, according to different scenarios, CO₂ emissions from maritime transport are expected to increase by 50-250 per cent in the period to 2050 (International Maritime Organization, 2015; OECD, 2010).

Promoting sustainable transport involves balancing the economic, social and environmental dimensions of the sector. More specifically, it involves transport infrastructure, services and operations that are efficient, safe, socially acceptable, universally accessible, reliable, affordable, fuel-efficient, environmentally-friendly, low-carbon, and climate-resilient (OECD,

2011; UNCTAD, 2018e).⁵

Notes

- 1 This initiative pursues infrastructure development within and outside China and seeks to improve physical connectivity through enhanced transport networks. It will require large amounts of materials in the form of dry bulk commodities, steel products, cement, heavy machinery and equipment. The resulting infrastructure improvements could increase total trade among partner economies by between 2.5 and 4.1 per cent (Baniya et al., 2019).
- 2 For example, OECD (2012) forecasts global investment needs (for airports, ports, rails and energy transportation) of US\$585 billion per year from 2015 to 2030. PwC and Oxford Economics (2015) estimate that investment requirements in transport infrastructure will increase from US\$557 billion in 2014 to US\$900 billion in 2025 globally. Finally, Woetzel et al. (2016) projects cumulative investment needs in the sector over the period from 2016 to 2030 to amount to US\$18.7 trillion.
- 3 For additional information, see UNCTAD (2019b, 2019c).
- 4 For some recent studies on these topics, see Asariotis and Benamara (2012); Becker et al. (2013) and UNECE (2013).
- 5 For more information on UNCTAD's current work on sustainable freight transport, see UNCTAD (2019e).

References

- African Development Bank, OECD and UNDP (2014). *African Economic Outlook 2014: Global Value Chains and Africa's Industrialisation*. OECD Publishing, Paris.
- Asariotis R and Benamara H, eds. (2012). *Maritime Transport and the Climate Change Challenge*. Routledge, United Kingdom.
- Baniya S, Rocha N and Ruta M (2019). Trade effects of the New Silk Road: A gravity analysis. Policy Research Working Paper No. 8694. World Bank.
- Becker AH et al. (2013). A note on climate change adaptation for seaports: A challenge for global ports, a challenge for global society. *Climatic Change*. 120(4):683–695.
- International Maritime Organization (2015). *Third IMO Greenhouse Gas Study 2014*. International Maritime Organization. London, United Kingdom.
- IPCC (2018). Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Available at <https://www.ipcc.ch/sr15>.
- Jevrejeva S, Jackson LP, Grinsted A, Lincke D and Marzeion B (2018). Flood damage costs under the sea level rise with warming of 1.5°C and 2°C. *Environmental Research Letters*. 13(7):074014.
- Monioudi IN et al. (2018). Climate change impacts on critical international transportation assets of Caribbean Small Island Developing States (SIDS): the case of Jamaica and Saint Lucia. *Regional Environmental Change*. 18(8):2211–2225.
- OECD (2010). *Globalisation, Transport and the Environment*. OECD Publishing, Paris.
- OECD (2011). *Environmental Impacts of International Shipping: The Role of Ports*. OECD Publishing, Paris.
- OECD (2012). *Strategic Transport Infrastructure Needs to 2030: Main Findings*. OECD Publishing, Paris.
- Oxford Economics and Global Infrastructure Hub (2017). Global infrastructure outlook. Available at <https://www.oxfordeconomics.com/recent-releases/Global-Infrastructure-Outlook> (accessed 5 June 2019).

- PwC and Oxford Economics (2015). Assessing the global transport infrastructure market: Outlook to 2025. Available at <https://www.pwc.com/sg/en/publications/cpi-assessing-global-transportation-infrastructure-market-outlook-to-2025.html> (accessed 4 June 2019).
- UNCTAD (2011). Ad hoc expert meeting on climate change impacts and adaptation: A challenge for global ports. Information note by the UNCTAD Secretariat. UNCTAD/DTL/TLB/2011/2. Geneva.
- UNCTAD (2014). Small island developing states: Challenges in transport and trade logistics. TD/B/C.I/MEM.7/8. Geneva. 15 September.
- UNCTAD (2015). *Review of Maritime Transport 2015*. United Nations publication. Sales No. E.15.II.D.6. New York and Geneva.
- UNCTAD (2017). Port industry survey on climate change impacts and adaptation. UNCTAD Research Paper No. 2017/18. UNCTAD/SER.RP/2017/18. Geneva. December.
- UNCTAD (2018a). *Review of Maritime Transport 2018*. United Nations publication. Sales No. E.18.II.D.5. New York and Geneva.
- UNCTAD (2018b). *Handbook of Statistics 2018*. United Nations publication. Sales No. E.19.II.D.1. Geneva.
- UNCTAD (2018c). *Climate Change Impacts on Coastal Transport Infrastructure in the Caribbean: Enhancing the Adaptive Capacity of Small Island Developing States (SIDS)*. Saint Lucia: A Case Study. UNCTAD/DTL/TLB/2018/3. New York and Geneva.
- UNCTAD (2018d). *Climate Change Impacts on Coastal Transport Infrastructure in the Caribbean: Enhancing the Adaptive Capacity of Small Island Developing States (SIDS)*. Jamaica: A Case Study. UNCTAD/DTL/TLB/2018/2. New York and Geneva.
- UNCTAD (2018e). Sustainable freight transport in support of the 2030 Agenda for Sustainable Development. TD/B/C.I/MEM.7/17. Geneva. 12 September.
- UNCTAD (2019a). UNCTADStat. See <https://unctadstat.unctad.org/> (accessed 10 April 2019).
- UNCTAD (2019b). Climate change and maritime transport. Available at <https://unctad.org/en/Pages/DTL/TTL/Legal/Climate-Change-and-Maritime-Transport.aspx> (accessed 19 April 2019).
- UNCTAD (2019c). Transport infrastructure and services. Available at <https://unctad.org/en/Pages/DTL/TTL/Infrastructure-and-Services.aspx> (accessed 19 April 2019).
- UNCTAD (2019d). Climate change impacts and adaptation for coastal transport infrastructure in the Caribbean. Available at <https://sidsport-climateadapt.unctad.org/> (accessed 19 April 2019).
- UNCTAD (2019e). UNCTAD Framework for Sustainable Freight Transport. Available at <https://www.sft-framework.org> (accessed 24 June 2019).
- UNCTAD (2019f). Ad Hoc expert meeting on climate change adaptation for international transport: Preparing for the future. Available at <https://unctad.org/en/pages/MeetingDetails.aspx?meetingid=2092> (accessed 24 June 2019).
- UNDRR (2019). DesInventar Sendai. See <https://www.desinventar.net> (accessed 7 May 2019).
- UNECE (2013). *Climate Change Impacts and Adaptation for International Transport Networks*. UNECE. ECE/TRANS/238. New York and Geneva.
- Woetzel J, Garemo N, Mischke J, Hjerpe M and Palter R (2016). Bridging global infrastructure gaps. McKinsey Global Institute. Available at <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/bridging-global-infrastructure-gaps> (accessed 26 April 2019).
- World Economic Forum (2018). *The Global Competitiveness Report 2018*. WEF. Geneva.
- World Economic Forum (2019). *The Global Risks Report 2019*. World Economic Forum. Geneva.

World Shipping Council (2019). About the industry.
Available at [http://www.worldshipping.org/
about-the-industry/containers](http://www.worldshipping.org/about-the-industry/containers) (accessed 19
April 2019).



IV. ICT offers great potential for development, but also risks

SDG target 9.c: Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in LDCs by 2020

- SDG indicator 9.c.1: Proportion of population covered by a mobile network, by technology (Tier I)

SDG target 17.6: Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge-sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism

- SDG indicator 17.6.1: Fixed Internet broadband subscriptions per 100 inhabitants, by speed (Tier I)

SDG target 17.8: Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for LDCs by 2017 and enhance the use of enabling technology, in particular information and communications technology

- SDG indicator 17.8.1: Proportion of individuals using the Internet (Tier I)

Key messages

- In developing countries, the number of mobile subscriptions per capita multiplied by four between 2006 and 2018
- High regional variability in the access and quality of broadband connections
- A fixed broadband subscription costs, on average an equivalent of 50.5% of per capita GNI in LDCs
- In developing countries, Internet use among women and in rural areas is lower than average
- Online shoppers doubled between 2010 and 2016

ICT has led to important economic changes over recent decades. It has also become an important economic sector in itself, comprised of many goods and services produced and traded all over the world. But, more significantly, ICT has also transformed the methods of production across all industries. ICT has become an increasingly important tool for development, providing access to information for science, technology and innovation, fostering and enhancing regional and international cooperation and knowledge-sharing. While this has led to substantial improvements in productivity, it has also created new barriers to entry. Only those individuals with the requisite skills and those firms with access to the right tools can reap benefits from this technological revolution. Moreover, this sector is characterised by constant and rapid changes. The ICT sector has the potential to bring large benefits in terms of productivity and economic development, but it can also risk exacerbating the conditions that lead to inequality and exclusion.

Access to ICT surged globally

While SDG 9 encourages innovation and infrastructural improvements, including through ICT, it also recognises the risk that many people and businesses could be left behind. To address this, SDG target 9.c calls for increased access to ICT, striving to achieve universality and affordability.

To this end, SDG indicator 9.c.1 proposes to measure the proportion of the population covered by a mobile network, broken down by technology.

Figure 1 illustrates how mobile networks now cover most of the population all over the world. Except for Sub-Saharan Africa, the share of the population lacking mobile telephony coverage does not exceed five per cent in any region. For many people in developing countries, mobile phones are often the only way of accessing the Internet and they have allowed the poorest to become connected. Increasingly, they are being directly used for economic purposes, supporting entrepreneurship, empowerment and financial inclusion. For example, the number of registered mobile money accounts worldwide reached 690 million in 2017, an increase of 25 per cent from 2016 (GSMA, 2017).

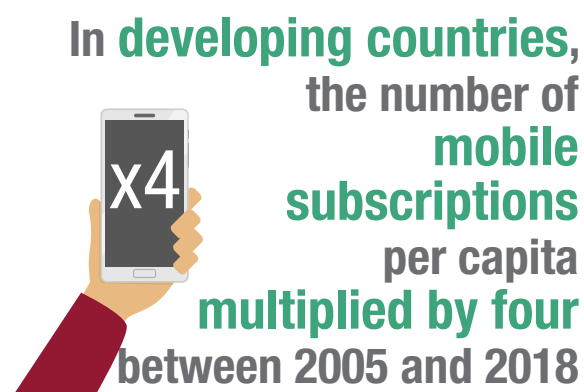
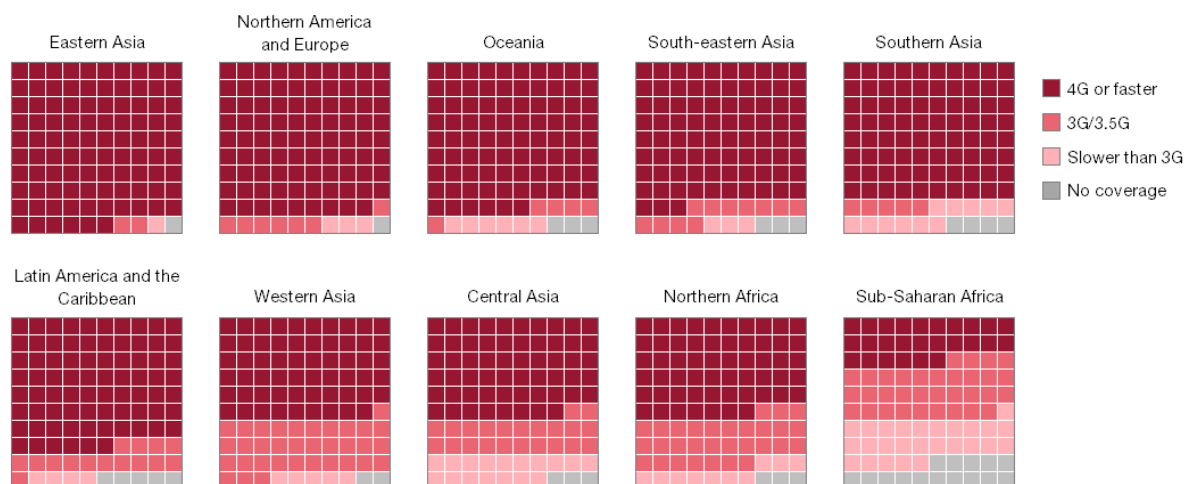


Figure 1 Distribution of population by mobile network coverage, by technology, 2017 (SDG 9.c.1)



Source: UNCTAD calculations based on ITU (2018a).

Note: Geographic regions follow M49 classification. Some missing values estimated by logistic regression models by mobile technology.

Faster and more reliable Internet and mobile services are important for allowing access to more sophisticated content that can add more value for the business sector. While 4G or newer wireless systems are prevalent in most regions, older systems are still widespread in Africa and other regions.

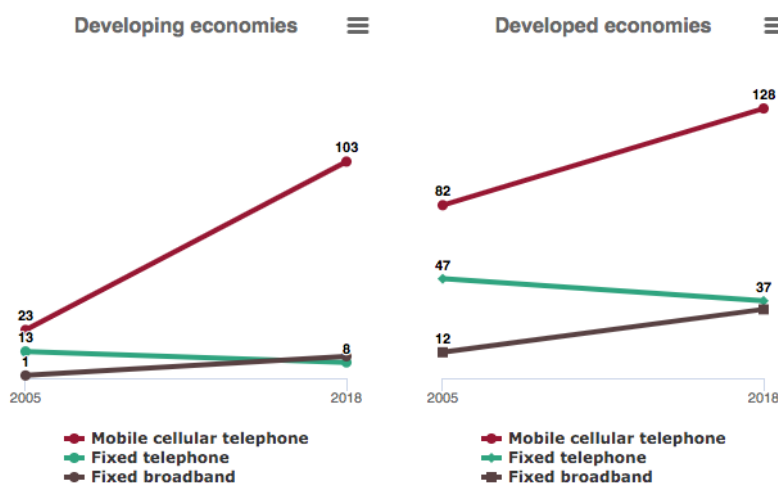
This indicator, however, only reflects a minimum requirement for ICT access, since population coverage does not necessarily mean that those covered are actually able to use the services. A more complete picture can be obtained by the number of subscribers to ICT services relative to

the population, and this is shown in the graph below.

Mobile cellular networks have expanded rapidly in recent years and this has helped to overcome the infrastructure barriers to fixed telephony (United Nations, 2015). Figure 2 shows that, in contrast to the global decline in the number of fixed telephone subscriptions, mobile telephony is booming, especially in developing countries, where the number of subscriptions per 100 inhabitants increased from 23 in 2005 to 103 in 2018.

High-speed Internet access plays an important

Figure 2 ICT access indicators
(Subscriptions per 100 inhabitants)



Source: UNCTAD calculations based on ITU (2018b).

Note: Developing and developed regions follow M49 classification.

High regional variability in the access and quality of broadband connections



enabling role in the digital economy. The rapid development of broadband networks is widely considered essential if developing countries are to leverage the benefits available through ICT and avoid the widening of the digital gaps (UNCTAD, 2015). Therefore, the number of individuals and businesses using broadband technology is a good indicator of the extent to which the private sector is leveraging the Internet. As shown in figure 2, while the number of fixed broadband subscriptions relative to the population has increased globally, developing countries are lagging behind in the adoption of this technology.

Furthermore, these global averages hide large variations across regions. Figure 3 presents the number of fixed broadband subscriptions relative to the population disaggregated by speed, as specified in SDG indicator 17.6.1. While broadband, in general, is widespread in Oceania, Northern America, Europe and Eastern Asia, other regions have much lower subscription rates. For example, Southern Asian countries had, on average, only 2.1 subscriptions per 100

inhabitants in 2017, and Sub-Saharan African countries only 0.5.

There is also some variability in terms of speed, influencing the quality and functionality. While in some regions most of the broadband connections provide high-speed access, in others the problem of limited fixed broadband subscriptions is compounded by lower broadband speeds, which constrain the potential benefits of ICT use. This is the case, for instance, in Northern Africa or Central Asia.

It is useful to examine the cost of broadband in different country groups, as a possible determinant of the extent of its uptake. Although the monthly subscription charge for fixed broadband has fallen considerably all over the world, it remains high in many developing countries, including LDCs. Indeed, the average annual cost of a fixed

A fixed broadband subscription costs, on average, an equivalent of 50.5% of per capita GNI in LDCs


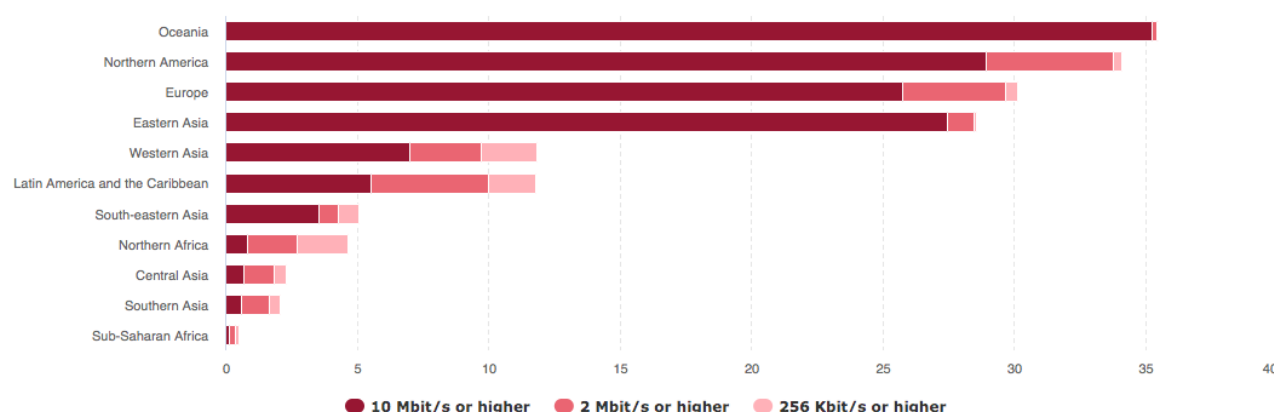


Figure 3 Fixed broadband subscriptions by speed, 2017 (SDG 17.6.1)
(Subscriptions per 100 inhabitants)



Source: UNCTAD calculations based on ITU (2018a).

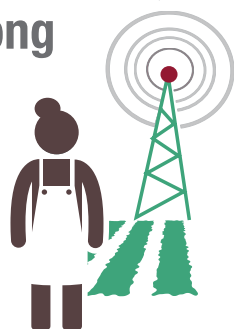
Note: Geographic regions follow M49 classification. Some missing values estimated by regression models by speed and region.

broadband subscription in 2017 in developed countries is equivalent to only 1.3 per cent of per capita GNI, while it reaches 50.5 per cent of GNI per capita in LDCs.¹ Fixed broadband, therefore, remains unaffordable for most people in LDCs.

It is important to set these developments in the context of broadband delivered via mobile-cellular networks, which represents a rapidly increasing share of total broadband subscriptions. According to 2018 estimates, fixed broadband represents 23 per cent of total broadband subscriptions in developed economies, and only 15 per cent in developing countries.²

More people are using Internet, but access is unequal

In developing countries, Internet use among women and in rural areas is lower than the average



UNCTAD has drawn attention to the importance of the digital divide in broadband capacity and quality, noting that it creates new divisions in terms of the extent to which individuals, businesses, economies and societies are able to take advantage of new ICT innovations and applications (UNCTAD, 2013). Ideally, there should be universal coverage of high-speed broadband, with regular upgrading of infrastructure, and reduced regulatory barriers to service providers. In addition, the international regulatory environment for ICT infrastructure and related services should be open, competitive and transparent (UNCTAD, 2016).

As a way to monitor the use of ICT, SDG indicator 17.8.1 measures the proportion of individuals that actually use Internet, rather than just have access to it. ITU estimates that 81 per cent of the population in developed economies were

using Internet in 2018, compared to 45 per cent in developing economies and 20 per cent in LDCs. Although Internet use in LDCs is growing rapidly, multiplying by four since 2011, the percentage is still low compared to other developing regions. In addition, important disparities still exist between different population groups. In developing countries, the percentage of women using Internet is five per cent lower than that of men. A gap almost three times larger is observed between individuals living in urban and rural areas.³

ICT is now an essential element of business

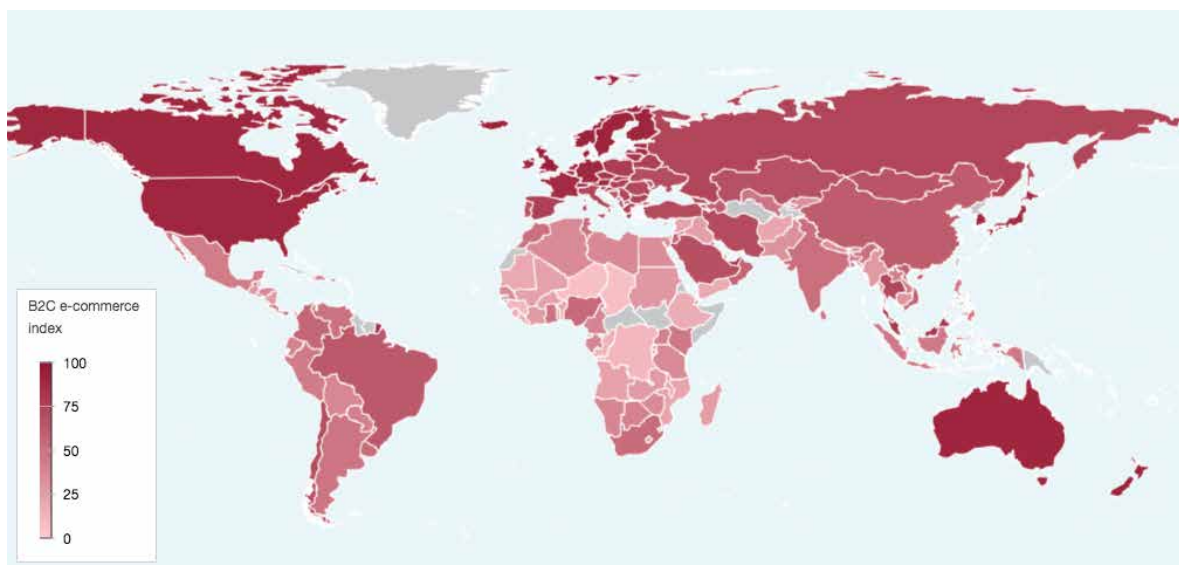
Disparities also exist between countries in the proportion in which businesses use the Internet. Official data on ICT use in business is limited, particularly in LDCs. But available figures show that most firms in developed economies use Internet, while this proportion varies considerably for developing countries. Within countries, there is a persistent gap in Internet use between small and large enterprises, and between enterprises in rural and urban locations.⁴

Internet use by employees has been positively correlated with productivity (World Bank, 2016). It is also a condition for e-commerce, which could contribute to poverty reduction, innovation and financial inclusion. It also facilitates the participation in global value chains and, in this way, promotes exports (ITU, 2015).

E-commerce was estimated to be worth US\$25 trillion in 2015 (UNCTAD, 2017a) and it has continued to increase since then. An indication of the rapid expansion of e-commerce is the number of online shoppers in the world, which rose from less than 600 million in 2010 to about 1.2 billion in 2016 (Fredriksson, 2017). However, in most LDCs, the share of Internet shoppers in the population is two per cent or less, whilst in most developed countries it is around 55 to 88 per cent (UNCTAD, 2017b).

In order to help countries gain insight into their preparedness for e-commerce, UNCTAD has developed the B2C e-commerce index. This index

Map 1 International maritime cargo flows by region, 2017
(Billions of tons)



Source: UNCTAD (2018b).

Note: Europe includes the Russian Federation and French overseas departments.

evaluates the prerequisites for the development of e-commerce, such as payment methods, cyber security, postal reliability, and Internet use amongst the population.⁵

Map 1 displays the 2018 values of the B2C e-commerce index. Most developed economies, but also some developing countries such as the United Arab Emirates and Malaysia, have developed all the fundamentals of e-commerce and, therefore, receive a high score in this indicator. Most LDCs are toward the bottom of the ranking: the average index value for the LDCs with available information is 24.3. Clearly, LDCs are still not fully prepared for the adoption of e-commerce and similar development opportunities stemming from ICT.

UNCTAD takes an active role in promoting ICT as a tool for development

The rapid changes taking place as a result of e-commerce and other ICT developments necessitate new approaches to accelerate readiness to adapt to and maximize opportunities from these changes. UNCTAD is implementing several initiatives to respond to this need. An example is the “eTrade for all” program (UNCTAD,



2019b), a global partnership comprising around 30 organizations that work together to support an enabling environment for sustainable development through e-commerce. At the heart of this initiative is an online knowledge-sharing platform that allows countries to navigate the supply of technical and financial assistance from partnering institutions in key policy areas, such as ICT infrastructure and services, payments, trade logistics, regulatory frameworks, skills development and finance.

UNCTAD is also undertaking rapid e-trade readiness assessments for LDCs, providing an analysis of the current e-commerce situation and identifying opportunities and barriers.⁶ UNCTAD also works with a number of developing countries to develop e-commerce strategies and policies, such as the one recently completed for Egypt (UNCTAD, 2017c).

In addition to the B2C e-commerce index, UNCTAD is undertaking several initiatives to improve the measurement of ICT-related contributions to the economy and trade. UNCTAD has responded to the need to boost work in this area by establishing the Intergovernmental Group of Experts on E-commerce and the Digital Economy,⁷ as well as the forthcoming Working Group on Measuring E-commerce and the Digital Economy. The organization is also an active member of the Partnership on Measuring ICT for Development.⁸

Notes

- 1 UNCTAD calculations based on data from ITU (2018a).
- 2 UNCTAD calculations based on data from ITU (2018b).
- 3 UNCTAD estimates based on data from ITU (2018a).
- 4 For additional details, see figures on the information economy available in UNCTAD (2019a).
- 5 This index ranges from zero to 100, with higher values indicating higher readiness for B2C e-commerce. For more details on the methodology of the UNCTAD B2C e-commerce index, see UNCTAD (2017b). The most recent figures, corresponding to 2018, are available in UNCTAD (2018).
- 6 For a list of recent assessments, see UNCTAD (2019c).
- 7 For more information on this group, see UNCTAD (2019d).
- 8 This is an initiative launched in 2004 to improve the availability and quality of ICT-related statistics. It is currently composed of 14 regional and international organisations. Its steering committee is made up of ITU, UNCTAD and UNESCO Institute for Statistics. For more information, see ITU (2019).

References

- Fredriksson T (2017). UNCTAD B2C E-commerce index 2017. Presented at the Intergovernmental Group of Experts on E-commerce and the Digital Economy, first session. Geneva. 4 October. Available at <https://unctad.org/en/pages/MeetingDetails.aspx?meetingid=1437> (accessed 11 April 2019).
- GSMA (2010). Mobile money definitions July. Available at <https://www.gsma.com/mobilefordevelopment/resources/mobile-money-definitions> (accessed 10 April 2019).
- GSMA (2017). State of the industry report on mobile money. Available at <https://www.gsma.com/r/state-of-the-industry-report> (accessed 10 April 2019).
- ITU (2014). *Manual for Measuring ICT Access and Use by Households and Individuals*. International Telecommunication Union. Geneva.
- ITU (2015). WSIS–SDG matrix: Linking WSIS action lines with Sustainable Development Goals. Available at <https://www.itu.int/net4/wsis/sdg> (accessed 10 April 2019).
- ITU (2018a). World telecommunication/ICT indicators database. Available at <https://www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx> (accessed 10 April 2019).
- ITU (2018b). Key ICT indicators for developed and developing countries and the world. Available at See https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2018/ITU_Key_2005-2018_ICT_data_with%20LDCs_rev27Nov2018.xls (accessed 10 April 2019).
- ITU (2019). Partnership on measuring ICT for development. Available at <https://www.itu.int/en/ITU-D/Statistics/Pages/intlcoop/partnership/default.aspx> (accessed 10 April 2019).
- OECD (2019). Glossary of statistical terms. Available at <https://stats.oecd.org/glossary/index.htm> (accessed 19 April 2019).

- UNCTAD (2013). *Information Economy Report 2013: The Cloud Economy and Developing Countries*. United Nations publication. Sales No. E.13.II.D.6. New York and Geneva.
- UNCTAD (2015). *Implementing WSIS Outcomes: A Ten-Year Review*. UNCTAD/DTL/STICT/2015/3. Geneva.
- UNCTAD (2016). Aid for eTrade: Unlocking the potential of e-commerce in developing countries. Draft call for action. UNCTAD/DTL/ICT4D/2016/CFA. Geneva. 18 March.
- UNCTAD (2017a). *Information Economy Report 2017: Digitalization, Trade and Development*. United Nations publication. Sales No. E.17.II.D.8. New York and Geneva.
- UNCTAD (2017b). UNCTAD B2C E-commerce index 2017. UNCTAD Technical Notes on ICT for Development No. 9. TN/UNCTAD/ICT4D/09. Geneva. October.
- UNCTAD (2017c). *ICT Policy Review: National E-Commerce Strategy for Egypt*. UNCTAD/DTL/STICT/2017/3. New York and Geneva.
- UNCTAD (2018). UNCTAD B2C E-commerce index 2018: Focus on Africa. UNCTAD Technical Notes on ICT for Development No. 12. TN/UNCTAD/ICT4D/12. Geneva. 10 December.
- UNCTAD (2019a). UNCTADStat. See <https://unctadstat.unctad.org/> (accessed 10 April 2019).
- UNCTAD (2019b). eTrade for all. See <https://etradeforall.org/> (accessed 10 April 2019).
- UNCTAD (2019c). Rapid eTrade readiness assessment of least developed countries (eT Ready). Available at <https://unctad.org/en/Pages/Publications/E-Trade-Readiness-Assessment.aspx> (accessed 10 April 2019).
- UNCTAD (2019d). Intergovernmental Group of Experts on e-commerce and the digital economy. Available at <https://unctad.org/en/Pages/Meetings/Group-of-Experts-Ecommerce-Digital-Economy.aspx> (accessed 10 April 2019).
- UNESCO Institute for Statistics (2019). Glossary. Available at <http://uis.unesco.org/en/glossary> (accessed 19 April 2019).
- United Nations (2015). Report of the partnership on measuring information and communications technology for development: Information and communications technology statistics. E/CN.3/2016/13. New York. 18 December.
- World Bank (2016). *World Development Report 2016: Digital Dividends*. The World Bank.



V. Growing concerns on debt sustainability in some developing economies and LDCs

SDG target 9.c: SDG target 17.4: Assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress.

- SDG indicator 17.4.1: Debt service as a proportion of exports of goods and services (Tier I)

Key messages

- **Total external debt stocks in developing and transition economies at almost US \$5 trillion in 2017**
- **External private sector debt increased multiple times over the last 15 years**
- **More than 60% of external public debt in the hands of private creditors**
- **Service costs on total debt have surged since 2012 for SIDS**
- **Public debt services costs for developing and transition economies climbed from 2.7% of exports in 2012 to 4.2% of exports in 2017**

Debt is a key component of any financing strategy for governments and private firms, particularly from the point of view of long-term financing strategies for sustainable development and structural transformation. The most important criterion for the long-term sustainability of debt obligations is that borrowing serves the purpose of increasing productive investment. If this is the case, increases in domestic income and export earnings are expected to cover the servicing of outstanding debt obligations, given the average interest rate and maturity of the debt stock. A second key criterion for long and short-term debt sustainability concerns the contractual conditions of (re-)financing such debt. The more closely lending conditionalities are aligned to the objective of mobilizing debt finance for structural transformation in developing countries, the higher the chances the debt can be serviced promptly.

However, there is growing concern about debt sustainability in some situations, including in developing economies. A common denominator of rising debt vulnerabilities across developing countries is that, with insufficient international public finance flows and limited access to concessional resources,¹ developing countries have increasingly raised development finance on commercial terms in financial markets; they have opened their domestic financial markets to non-

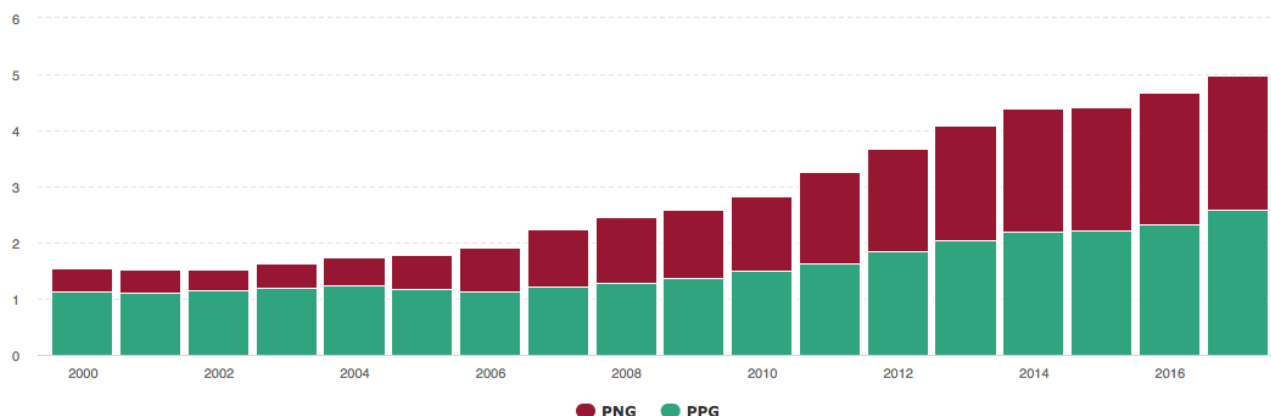


resident investors; and they have allowed their citizens and firms to borrow and invest abroad. While increased access to international financial markets can help capital-scarce countries to quickly raise much-needed funds, it also exposes them to the volatility of private financial markets, including to sudden reversals of capital inflows and other risks. In conjunction with other exogenous shocks, such as natural disasters, episodes of political instability or sudden downturns in commodity prices, debt burdens can quickly become unsustainable.

**External debt has increased in
developing and transition economies,
with a growing weight of the private
sector**

Figure 1 illustrates the upward trend in external long-term debt stocks in developing and transition

Figure 1 Public (PPG) and private (PNG) long-term external debt stocks, developing and transition economies (Trillions of US\$)

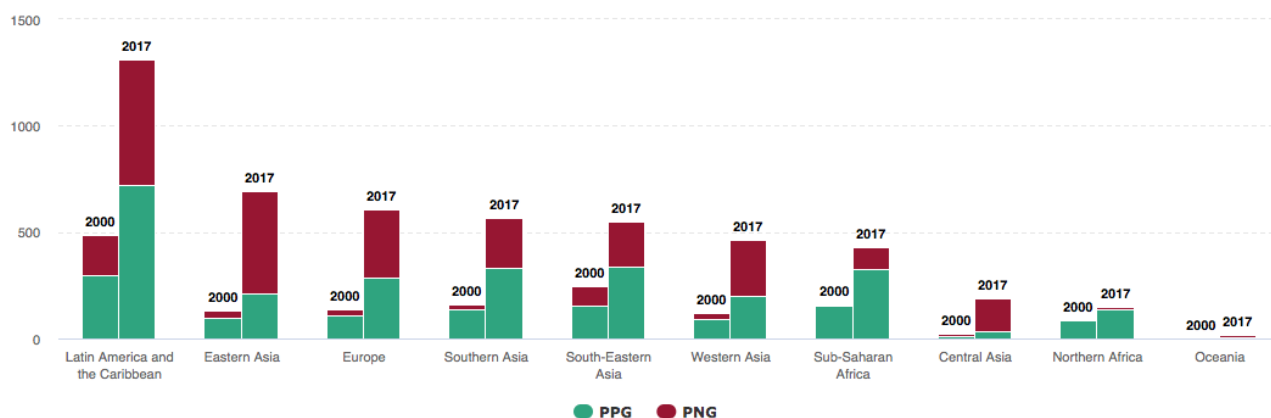


Source: UNCTAD calculations based on World Bank (2019).

economies, as well as a marked shift in composition towards private sector debt. Total external long-term debt stocks in these countries almost reached US\$5 trillion in 2017, up from US\$1.5 trillion in 2000. From 2010, they grew at an average annual rate of 8.4 per cent, outpacing average economic growth in developing countries. Public external debt stocks show an upward trend from 2007, but most of the increase in total external debt stocks is explained by the rapid growth of private sector external debt. While the share of private external long-term debt in developing and transition economies was 27 per cent of total debt in 2000, it increased to around half of total debt since 2008.

As seen in figure 2, this pattern of debt composition has been evident in developing South-East Asia and Latin America since 2000, and it has quickly spread to other regions. In most regions, the share of PNG debt in total long-term external debt stocks increased multiple times in the covered period.² By 2017, non-financial corporate debt in emerging market economies had risen to over US\$30 trillion, almost 95 per cent of their combined GDP, surpassing comparable levels for developed markets (*Financial Times*, 2018). It is difficult for large corporations in developing countries to sufficiently hedge their foreign-currency debt exposure. Their liabilities are,

Figure 2 PPG and PNG long-term external debt stocks, developing and transition economies, by region (Billions of US\$)



Source: UNCTAD calculations based on World Bank (2019).

External private sector debt increased multiple times over the last 15 years

therefore, ultimately backed by foreign currency reserves in their domestic economy. If private sector external debt becomes unsustainable, governments often have no choice but to transfer the bulk of this debt onto public balance sheets.

Increased reliance on commercial finance is not limited to the growing share of private debt stocks. Between 2000 and 2017, the share of PPG external debt in the hands of private creditors rose from just over 40 per cent to above 60 per cent (United Nations, 2018). Also, bond debt now constitutes a large share of PPG developing country debt, having increased from 24 per cent in 2000 to 43 per cent in 2014 (United Nations, 2016). Already by 2016, 46 per cent of all PPG debt of low-income developing countries, twice the rate of 2007, had been financed through non-concessional channels with external borrowing from commercial creditors growing rapidly (IMF, 2018).

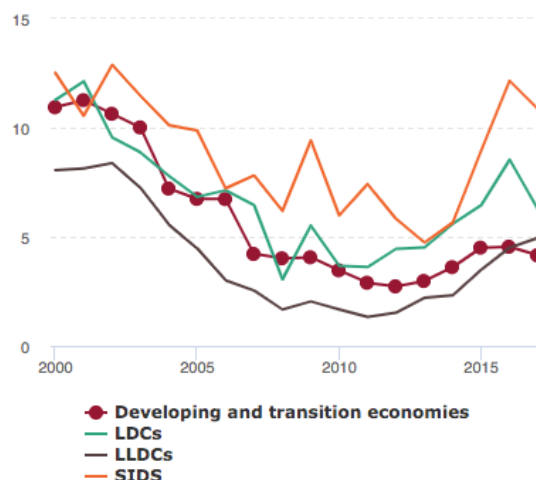


More than 60% of external public debt in the hands of private creditors

Service costs on external debt remains an important challenge for financing sustainable development

Even under favourable financing conditions, an immediate implication of rising debt stocks are higher debt service burdens. Debt service ratios are considered important indicators of a country's debt sustainability. In this sense, SDG indicator 17.4.1 measures "debt service as a proportion of

Figure 3 Debt service on PPG external long-term debt in developing and transition economies (SDG 17.4.1) (Percentage of exports of goods and services)




Source: UNCTAD calculations based on World Bank (2019).

Note: Averages by group of economies. Only countries with available data were included.

exports of goods and services".³ This indicator reflects a government's ability to meet external creditor claims on the public sector through export revenues. A fall (increase) in this ratio can result from increased (reduced) export earnings, a reduction (increase) in debt servicing costs, or a combination of both. A persistent deterioration of this ratio signals an inability to generate enough foreign exchange to meet obligations on a country's PPG debt, and thus potential debt distress in the absence of external support or debt restructuring.

By this measure, debt service burdens fell for all developing and transition economies from high levels at the start of the millennium until 2012, when debt service reached 2.7 per cent of exports, before climbing again to 4.2 per cent by 2017 (figure 3). This overall decline can be explained by the rising share of domestic public debt in many economies, as countries sought to address rising costs of sovereign bonds issued in international currencies by shifting to domestic debt in local currency (Micic, 2017). While this reduces the vulnerability to exchange rate volatility, exposure to sudden reversals of capital inflows remains if foreign holding of domestic debt is high. Moreover, this switch frequently creates maturity

Public debt service costs for developing and transition economies climbed from

2.7% of exports in 2012  **to 4.2% in 2017**

mismatches, since countries are unable to issue long-term government securities at a sustainable rate of interest, yet need to be able to pay off or roll over maturing and short-term obligations.

As figure 3 also illustrates, the average calculated over all transition and developing economies masks different trends across groups of countries. LDCs dedicated an equivalent of 11.3 per cent of their export revenues to service sovereign external debt in 2000, this figure fell to 3.6 per cent in 2011, but rose to 8.5 per cent in 2016, before falling again to 6.3 per cent in 2017. This reflects rising external public debt stocks since 2012, in a context of volatile commodity prices and high yield increases on international sovereign bonds for some economies in this group. A similarly upward trend in recent debt servicing costs has been observed in SIDS, where this figure increased sharply from 4.7 per cent in 2013 to 10.9 per cent in 2017. In this case, their exposure to natural disasters and the volatility of their main revenue sources are the main explanatory factors. LLDCs, while in general having lower debt servicing costs than the average developing and transition economies, also experienced a marked rise since 2011.

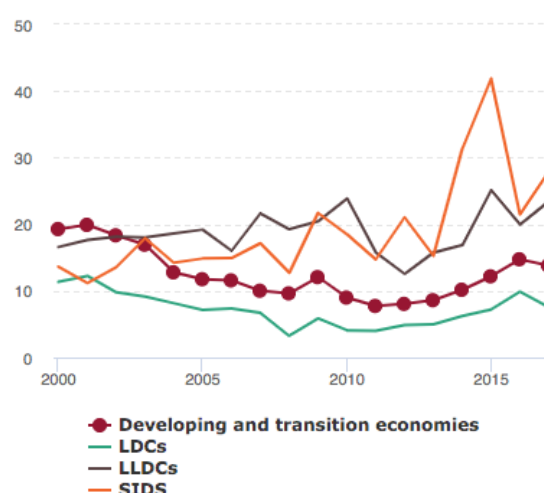
A more worrying picture emerges when the analysis is extended beyond SDG 17.4.1 so that total external long-term debt, including from the private sector, is considered. This provides a more comprehensive picture of debt sustainability. According to this broader measure, shown in figure 4, external debt service burdens for all developing and transition economies fell between 2001 and 2011 from levels close to 20 per cent to 7.7 per cent of exports (except for a one-year increase in

2009 after the global financial crisis). This reflects a combination of factors, including a solid growth performance and growing access to international credit. By contrast, sluggish economic growth following the global financial crisis, rising exposure to market risks and commodity price volatility since 2011, have translated into an upward trend in external debt service. This variable reached 14.7 per cent by 2016. The slight improvement in 2017 can be largely attributed to an upturn in commodity prices.

Parallel trends were observed for LDCs. In this case, the faster decline in debt servicing can be attributed to debt relief initiatives by many economies from this group during the late 1990s and early 2000s. While service costs on PPG debts in LLDCs were significantly lower than in the rest of the groups, they become higher when PNG debt is included; this reflects the higher importance of private debt in this group of economies.

For SIDS, external debt service costs remained relatively high throughout the entire period. These costs increased significantly since 2013, highlighting a vicious cycle of high environmental vulnerability and growing structural debt. Many SIDS have recorded a marked increase in their

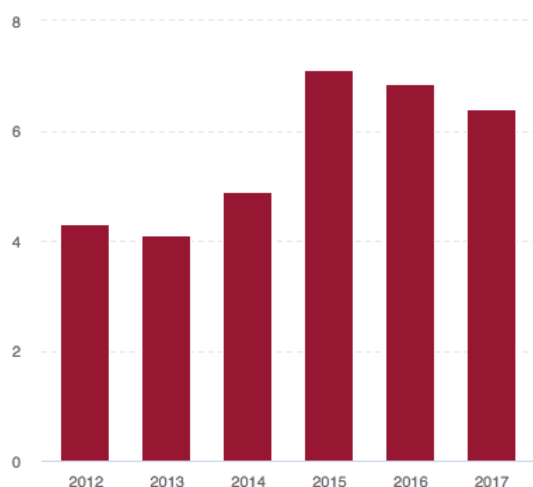
Figure 4 Debt service on total external long-term debt in developing and transition economies
(Percentage of exports of goods and services)



Source: UNCTAD calculations based on World Bank (2019).

Note: Averages by group of economies. Only countries with available data were included.

Figure 5 Median ratio of PPG debt service to government revenue in LDCs
(Percentage of government revenues)



Source: UNCTAD calculations based on IMF (2019).

Note: Only countries with available data are considered.

total external debt stocks in recent years, and with this debt service ratios have also surged.

The debt burden in LDCs is of growing concern, since they face the most serious challenges in financing progress along the SDGs. Even if private external debt is also on the increase, these economies still rely predominantly on public debt financing to mobilize resources for long-term structural transformation. Given that these economies are characterized by shallow domestic financial systems and limited access to international financial markets, their options to re-finance maturing debt obligations are limited. Consequently, debt service competes directly for resources with other areas of public expenditure, such as health, education and infrastructure. This risk is presented in figure 5, which shows the median PPG service-to-government revenues ratio in LDCs. The recent upward trend in external public debt stocks induced an increase in debt servicing costs, which increased from 4.1

Service costs on total debt have surged since 2012 for SIDS



per cent in 2013 to 7.1 per cent in 2015. Although a gradual decline has been observed in recent years, the service burdens remain high. Further deteriorations could signal unsustainable levels of public debt in these economies. This is a crucial challenge for the timely implementation of the 2030 Agenda in LDCs.

Notes

- 1 For more information on this topic, see Robust and predictable financing sources and Official support for sustainable development.
- 2 For additional analysis of external debt stocks trends in developing and transition economies, see United Nations (2018).
- 3 According to its official metadata (United Nations, 2019), this indicator includes only service on PPG external long-term debt.

References

- Financial Times* (2018). Upturn in global debt to pile pressure on emerging markets. 11 July.
- IMF (2014). *External Debt Statistics: Guide for Compilers and Users*. IMF. Washington, D.C.
- IMF (2018). *Fiscal Monitor April 2018: Capitalizing on Good Times*. IMF. Washington, D.C.
- IMF (2019). Debt sustainability analysis for low-income countries. Available at <https://www.imf.org/external/pubs/ft/dsa/lic.aspx> (accessed 22 May 2019).
- Micic K (2017). Recent trends in EME government debt volume and composition. BIS Quarterly Review. September.
- UNCTAD (2017). *Debt Vulnerabilities in Developing Countries: A New Debt Trap? Volume I: Regional and Thematic Analyses*. UNCTAD/GDS/MDP/2017/4 (Vol I). Geneva.
- United Nations (2016). Report of the Secretary-General on external debt sustainability and development. A/71/276. New York. 2 August.
- United Nations (2018). Report of the Secretary-

General on external debt sustainability and development. A/73/180. New York. 16 July.

United Nations (2019). SDG indicators: Metadata repository. Available at <https://unstats.un.org/sdgs/metadata/> (accessed 14 May 2019).

World Bank (2019). International debt statistics. Available at <https://databank.worldbank.org/data/source/international-debt-statistics> (accessed 22 May 2019).



VI. Tackling illicit financial flows to unleash funds for development

SDG target 16.4: By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime

- **SDG indicator 16.4.1:** Total value of inward and outward illicit financial flows (in current United States dollars) (Tier III)

Key messages

- **IFFs cause a significant loss of resources for sustainable development**
- **SDG indicator on IFFs is a Tier III indicator**
- **Misinvoicing equivalent to 18% of total trade from developing and transition economies (Global Financial Integrity 2019)**
- **40% of MNE profits are shifted to low-tax countries each year (Tørsløv et al. (2018))**
- **Low income countries lose more tax revenue through the FDI channel in relative terms, than high income countries (Janský and Palanský (2018))**

Countries lose substantial resources through IFFs. These flows pose a direct threat to sustainable and inclusive development by draining domestic resources that could be used for social spending and productive investment. They also weaken political and institutional legitimacy and taxpayer compliance, therefore affecting overall economic activity.

The ability to achieve the SDGs remains fragile when undermined by IFFs. Indeed, the 2030 Agenda underscores the need for an increased mobilization of financial resources dedicated to sustainable development, including through an improved capacity for revenue collection, and repeatedly calls for more resources dedicated to investment. This call could be jeopardized by IFFs. For this reason, SDG target 16.4 aims to “significantly reduce illicit financial flows and arms flow, strengthen the recovery and return of stolen assets and combat all forms of organised crime” by 2030. The Addis Ababa Action Agenda on financing for development also calls for a redoubling of efforts to substantially reduce IFFs, with a view to eventually eliminating them (United Nations, 2015).

IFFs differ across countries and regions, and may originate from several sources, such as criminal activities, tax practices, trade misinvoicing, and other activities. A broad categorization distinguishes between three types of IFFs, depending on the transactions at the source of the illicit flow: (1) IFFs from illegal activities,

(2) IFFs from corruption, and (3) IFFs from tax and commercial practices. It is important to note that the transactions and illicit transfers behind the IFFs can be but need not necessarily be illegal under the jurisdictions involved.



IFFs cause a significant loss of resources for sustainable development

We need to measure IFFs to understand and tackle the problem

Considering the potentially large illicit flows draining resources for development, it is particularly important to quantify the total value of IFFs. The Action Agenda invites the “appropriate international institutions and regional organizations to publish estimates of the volume and composition of illicit financial flows” (United Nations, 2015, paragraph 24). UNODC and UNCTAD have been jointly mandated to address this task.

SDG indicator 16.4.1, “total value of inward and outward illicit financial flows”, is currently categorized as a Tier III indicator, meaning that its concepts, definitions and methodology still need to be developed and agreed upon (United Nations Statistics Division, 2019a). A further



SDG indicator on IFFs is a Tier III indicator

complication relates to the very nature of IFFs: they are intended to be hidden, making their measurement extremely difficult.

There is still no universally accepted definition of IFFs. Different studies rely on definitions varying on scope, coverage and terminology. A working definition of IFFs currently used by the custodian agencies is “value illicitly generated, transferred or utilized that is moved from one country to another” (UNCTAD and UNODC, 2017). According to United Nations (2016), IFFs may include: profits from illegal activities; funds from legitimate sources that are transferred abroad in contravention of domestic laws; legitimate funds that are used for unlawful purposes; and funds that, through legal loopholes or other arrangements, circumvent the spirit of the law. In a similar way, there is no globally approved methodology for measuring IFFs in a comprehensive and consistent manner. During the development process for SDG indicator 16.4.1, the definition and measurement methodologies for IFFs will be debated and agreed upon by the membership of the United Nations Statistical Commission.

In spite of this, a range of aggregate estimates, as well as a number of country-specific case studies, are already available in the literature.¹ However, there is little global agreement on an empirical methodology to measure IFFs and some of the methods applied in the recent literature have proven controversial. In addition, existing estimates only cover some of the sources of these flows and they lack the granularity required to closely and comprehensively monitor the problem.

The lack of statistical indicators on IFFs reduces clarity regarding the size of these flows, where they originate and their consequences for institutions

and economic activity. The absence of reliable, objective information undermines the ability to tackle the problems caused by these flows. This gap in evidence can also weaken efforts to develop and implement interventions targeted at curbing IFFs and eventually freeing up resources for financing development.

IFFs are multi-dimensional, comprising on one hand flows originating from illegal activities and on the other hand tax- and trade-related illicit transactions. Reflecting this complexity, the indicator has two custodians: UNODC leading the work on crime-related IFFs and UNCTAD leading the development of methods to measure IFFs related to taxes and trade. To progress with the challenging measurement task, the co-custodians are undertaking a series of coordinated actions to develop and test a statistical methodology to measure IFFs. UNODC and UNCTAD have held several expert consultations, covering different types of IFFs, to take stock of current research findings and knowledge regarding different types of IFFs. They have also formed a technical task force comprised of national and international compilers of official statistics to discuss practical steps towards adopting a set of statistical concepts and implementing a set of measurement tools. In the coming months, these preliminary methodologies will be applied and evaluated in pilot tests in several developing countries across Latin America and Africa.²

Estimates show large illicit financial flows across countries

IFFs are markedly difficult to measure. In addition to the lack of clarity as to what should be measured, these flows are deliberately hidden so that only traces can be detected in traditional data sources available to statistical authorities. However, this is an active field in the literature and, as mentioned above (see Note 1), there are many recent studies attempting to quantify the volume of IFFs.

Research mostly focuses on a single type or source of IFF at a time. Studies rely on what data are available to researchers, with the result

that analyses are usually restricted to only a few countries, typically developed countries, where more and better-quality statistics are available. To compute estimates of IFFs, researchers have relied on assumptions and interpolations that have been debated and even debunked by other authors. Nevertheless, in one way or another, these studies all shed light on the main trends and significance of illicit flows and, given their size, help assess their potential impact on affected economies.



**Misinvoicing
equivalent to
18% of total trade
from developing and
transition economies**

Global Financial Integrity (2019)

This chapter presents three recent estimates available from this body of research. Their inclusion here does not suggest that UNCTAD endorses any particular methodology, but rather recognizes their contribution to studying the IFF puzzle while official statistical methodologies are being developed and agreed upon.

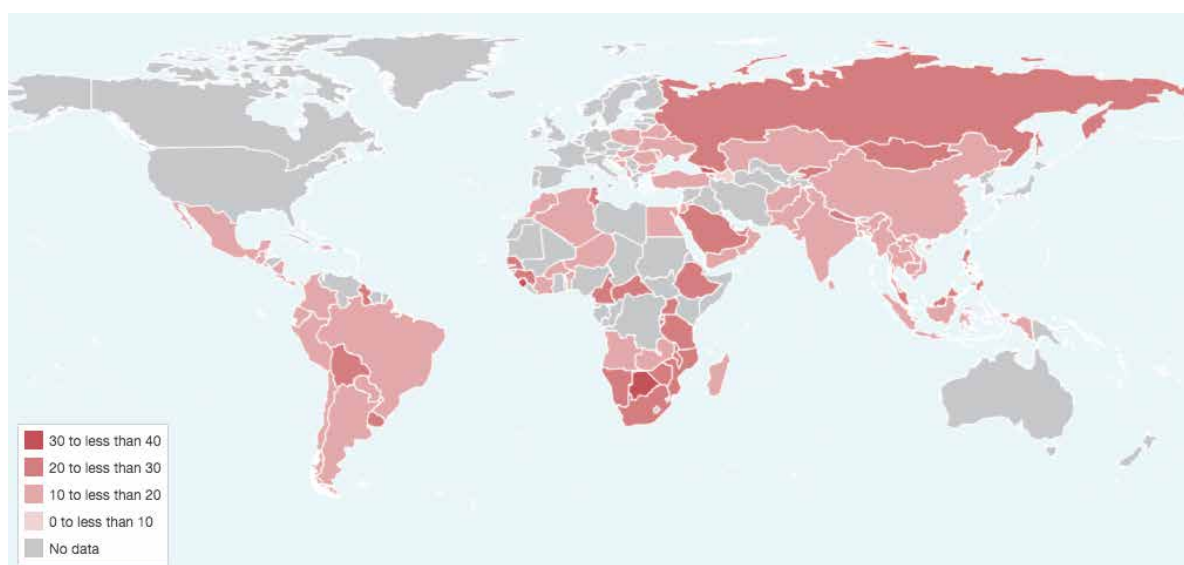
Trade misinvoicing is a significant channel for IFFs

Trade misinvoicing occurs when the value of an export or import transaction is different from the arm's length value of such transaction. This can refer to transfer pricing within affiliated

enterprises, but also between seemingly unrelated parties. This type of IFF can serve many purposes. For example, overpricing imports can lead to artificially deflated revenues and reduced profits, making it possible to shift undeclared profits out of the country. Also, underpricing imports can be used as a mechanism to evade import tariffs or currency controls.

One solution for estimating trade misinvoicing is to compare mirror statistics from trading partners. In other words, compare the exports from one country with the imports of another. For example, if country A reports exports to country B of a certain amount, but country B reports imports

Map 1 IFFs from trade misinvoicing in developing and transition economies, 2015, estimates from Global Financial Integrity (2019)
(Percentage of total trade)



Source: Global Financial Integrity (2019).

Note: Only developing and transition economies according to UNCTAD classification are represented here. For each country, the figure represents total estimates for trade over- and under-invoicing from exports and imports as a percentage of the country's total trade (exports plus imports). Estimates calculated by comparing adjusted mirror statistics for exports and imports, as reported in Comtrade database. This figure includes data as reported in the original source, its reproduction in this report does not imply endorsement by UNCTAD or its partners.

from A of a different amount, a potential case of trade misinvoicing is flagged. The comparison is usually done at the most detailed product level available in the merchandise trade statistics. Because this approach uses readily available data, it is one of the first and most exploited solutions for estimating IFFs.

Map 1 shows a recent estimate compiled by Global Financial Integrity (2019), using United Nations Comtrade data for export and import transactions between, on one hand, developing and transition economies, and, on the other hand, developed countries. The figures show potentially large amounts of misinvoicing, sometimes reaching one quarter of total trade or more, in some economies in Africa, Latin America, the Caucasus and Central Asia. Overall, the authors estimate that total misinvoicing from developing and transition countries reached US\$940 billion in 2015, 18 per cent of their total trade (exports plus imports).

This methodology has been questioned by many authors and statisticians, remarking that an asymmetry or discrepancy between reported values in bilateral trade statistics could be explained by a variety of other reasons beyond illicitly motivated flows (Hong and Pak, 2017; Nitsch, 2016; United Nations Statistics Division, 2019b). For instance:

- CIF/FOB differences between reported exports and imports;
- different country of allocation by exporter and importer;
- reporting of transit or entrepôt trade;
- products shipped for processing not accounted for by one country but reported by the partner;
- use of different product classifications or different application of the same classification;
- confidential trade, which could be included as unallocated trade by one partner;
- reported values might include trade margins if the exporting party is an affiliate of an MNE group;
- shipment time lags, as the date reported by partners may fall under different reporting periods; and

- statistical errors and differences in measurement between countries.

While trade statistics are constantly improving³ and methodological development address some of their deficiencies, for example, by explicitly estimating CIF/FOB ratios or correcting for known cases of entrepôt trade, it remains a real challenge to isolate illicit misinvoicing from other statistical noise. Nevertheless, comparing asymmetries at the most disaggregated level can still be a useful approach for detecting irregular transactions and flagging them as potential cases of misinvoicing for further scrutiny (UNECA, 2019).

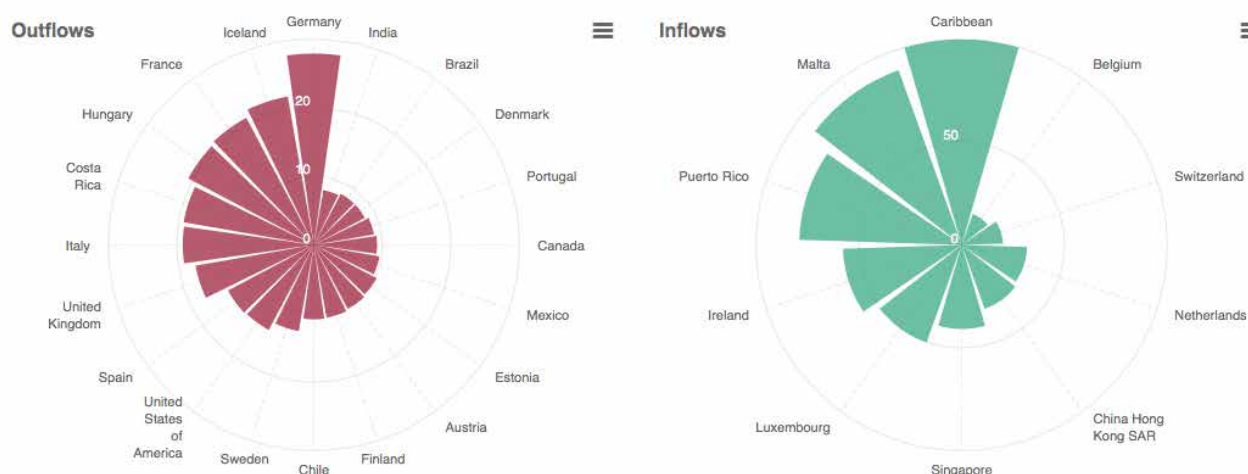
Large scale of MNEs' profit shifting

It has become increasingly common for businesses to spread their value chains across countries. International cost differences, such as lower relative wage costs and lower trade and transport costs, improved logistics, less expensive and faster communication systems, differences in taxation, and improved intellectual property rights protection and contract enforcement have motivated the creation of these global value chains (United States International Trade Commission, 2011). According to UNECE (2015), global production arrangements within MNEs may be tax-driven rather than driven by the competitive advantages of countries. These global production arrangements pose many challenges for statisticians and national accountants, as not all MNE transactions reflect real economic activity. They also pose real challenges for policy makers as their activities could result in a redistribution of tax revenues between countries, thus influencing countries' development capability.

MNEs may employ several schemes to shift profits from high-tax to low-tax jurisdictions: transfer pricing, merchanting, strategic stationing of intangible assets and intellectual property, and inter-company loans (or debt shifting), among others. Given this potential, many recent studies have focused on tax avoidance by MNEs.

Tørsløv et al. (2018) compare the profitability

Figure 1 MNE profit shifting, 2015, estimates from Tørsløv et al. (2018)
(Percentage of corporate tax collected)



Source: Tørsløv et al. (2018).

Note: Only selected jurisdictions with available data are reported by the authors. Estimates calculated through a comparison of profitability of domestic vs foreign affiliates. In panel (a), for readability, only the first 20 countries are shown. This figure includes data as reported in the original source, its reproduction in this report does not imply endorsement by UNCTAD or its partners.

(measured by the profits-to-wage ratio; i.e., pre-tax profits divided by total wages paid) of foreign affiliates in different countries. They find out that affiliates of foreign firms are less profitable than local firms in high-tax jurisdictions, while the opposite is observed in low-tax countries. By assuming that profit shifting is behind this difference in profitability, they estimate that about 40 per cent of profits are shifted between countries by MNEs to minimize tax burden.

This type of analysis requires detailed data that are not available for all countries. The authors, therefore, report results only for OECD countries and a few developing countries. The first panel of figure 1 shows those economies that are most affected by profit misalignment. It highlights the estimated gap in tax revenues due to profits loosened out of the country. This MNE tax gap is measured as a percentage of corporate tax collected. The second panel shows matching figures for those countries that receive the profits that MNEs transferred out of higher-tax countries.



This methodology is only an indicator of tax planning and profit misalignment. It risks confounding profit shifting with other factors that could also explain differences in profitability between local and foreign firms. In addition, the heavy data requirements of this methodology make it unsuitable for many developing countries. However, this approach nevertheless makes a significant contribution to the literature on the measurement of profit shifting and a good indication of the type of methodologies that could be implemented to measure the size of these flows.

Measuring FDI-related profit shifting

Debt shifting is an important channel by which MNEs move profits from one country to another. In this case, an affiliate of an MNE group located in a low-tax jurisdiction makes a loan at artificially high interest rates to a profitable affiliate of the same group located in a high-tax country. In this way, the profits of the affiliate receiving the loan are reduced, while those of the affiliate making the loan are inflated. Inter-company loans appear in official statistics as part of FDI. Because of this and other channels, FDI statistics could potentially be used to monitor profit shifting.

This approach was pioneered by UNCTAD

(2015). A recent study by Janský and Palanský (2018) made available the first country-level estimates calculated with this methodology. The authors calculate the FDI rate of return (calculated as the share of FDI income over FDI stocks) and estimate its relationship with bilateral FDI stocks. They find a negative association between FDI from low-tax countries and the rate of return on investment. In other words, the data suggest that companies are using the FDI channel to reduce their profits in high-tax economies and transfer it to low-tax economies. According to this study, between US\$67 and US\$82 billion worth of tax revenues were lost through this mechanism.

The authors then used the results to calculate country-level estimates through this channel. They first include all countries, both developing and developed, in their panel, but data availability limits the sample. The 2015 results for the countries with sufficient data are presented in figure 2, which shows these estimate of tax losses as a share of GDP. Even if not all countries are covered, the authors find sufficient evidence to support the hypothesis that low income countries lose more tax revenue through this channel of profit shifting, in relative terms, than high income countries.

The figures reported in this study are modelled

Low income countries lose more tax revenue through the FDI channel, in relative terms, than high income countries



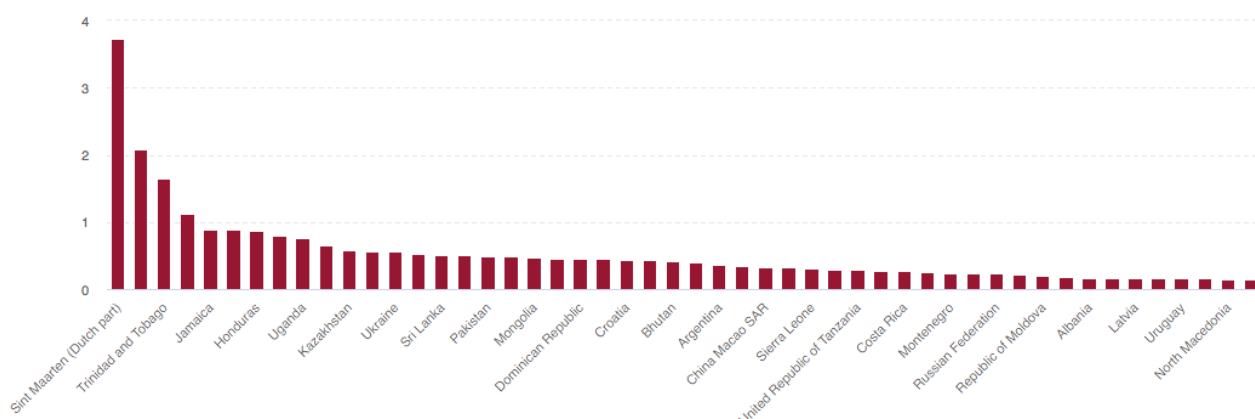
Janský and Palanský (2018)

estimates, derived from FDI data, rather than an observed measurement. Similar to the other approaches illustrated above, these estimates can confound profit shifting with many other determinants that could also explain why rates of return on FDI differ from country to country. However, they present some interesting conclusions and highlight some cases that call for more in-depth study.

Conclusion

As shown in the three examples above, there are already several proposals to measure the different components or channels of IFFs. Each approach has advantages and disadvantages, and some require data at a level that is unavailable in most developing countries. Furthermore, if used simultaneously, there is a risk of double-counting, since these indicators in fact measure similar

Figure 2 MNE profit shifting, 2015, estimates from Janský and Palanský (2018)
(Tax loss as a percentage of GDP)



Source: Janský and Palanský (2018).

Note: Only selected jurisdictions with available data are reported by the authors. Estimates calculated through a regression model of the rate of return of foreign direct investment. For readability, only the first 50 countries are shown. This figure includes data as reported in the original source, its reproduction in this report does not imply endorsement by UNCTAD or its partners.

concepts using different methods and sources of information. UNCTAD and UNODC are working on a unified conceptualization of IFFs and a first set of statistical measurement methodologies to be tested in developing countries, where the effects of IFFs on resources for development are most damaging. The objective of this work is to provide the affected countries with evidence detailed enough to inform their policies to fight IFFs.

Notes

- 1 For some recent volume estimates of IFFs, see African Union and UNECA (2015); Cobham and Janský (2015, 2018); UNCTAD (2015); Crivelli et al. (2016); Institute for Advanced Studies (2017); Johansson et al. (2017); Janský and Palanský (2018); Tørsløv et al. (2018); and Global Financial Integrity (2019).
- 2 For more details on this work, see UNCTAD (2019).
- 3 For instance, in 2016 the statistical authorities of Canada and China made a special effort to reconcile their trade statistics due to a large asymmetry of US\$21.3 billion. 4 There were many reasons for this difference, with indirect trade as the main contributor. After this exercise, the trade asymmetry between the two countries was reduced to only US\$1.0 billion (Statistics Canada, 2018). As statisticians develop new methods to identify different treatments of trade flows between countries and correct asymmetries, the analysis of IFFs based on remaining asymmetries could become more reliable.

References

- African Union and UNECA (2015). *Illicit Financial Flow: Report of the High Level Panel on Illicit Financial Flows from Africa*. AU/ECA.
- Cobham A and Janský P (2015). Measuring misalignment: The location of US multinationals' economic activity versus the location of their profits. ICTD Working Paper No. 42. International Centre for Tax and Development.
- Cobham A and Janský P (2018). Global distribution of revenue loss from corporate tax avoidance: Re-estimation and country results. *Journal of International Development*. 30(2):206–232.
- Crivelli E, De Mooij R and Keen M (2016). Base erosion, profit shifting and developing countries. *FinanzArchiv: Public Finance Analysis*. 72(3):268–301.
- Global Financial Integrity (2019). *Illicit Financial Flows to and from 148 Developing Countries: 2006-2015*. Global Financial Integrity.
- Hong KP and Pak SJ (2017). Estimating trade misinvoicing from bilateral trade statistics: The devil is in the details. *The International Trade Journal*. 31(1):3–28.
- Institute for Advanced Studies (2017). Aggressive tax planning indicators: Final report. Taxation Papers No. 71–2017. European Commission.
- Janský P and Palanský M (2018). Estimating the scale of profit shifting and tax revenue losses related to foreign direct investment. WIDER Working Paper No. 21/2018. UNU-WIDER.
- Johansson Å, Skeie ØB, Sorbe S and Menon C (2017). Tax planning by multinational firms: Firm-level evidence from a cross-country database. OECD Economics Department Working Papers No. 1355. OECD.
- Nitsch V (2016). Trillion dollar estimate: Illicit financial flows from developing countries. Darmstadt Discussion Papers in Economics No. 227. Darmstadt University of Technology, Department of Law and Economics.
- Statistics Canada (2018). Comparing Canada's and China's bilateral trade data August. Available at <https://www150.statcan.gc.ca/n1/pub/13-605-x/2018001/article/54962-eng.htm> (accessed 10 June 2019).
- Tørsløv T, Wier L and Zucman G (2018). The missing profits of nations. NBER Working Paper

No. 24701. National Bureau of Economic Research.

UNCTAD (2015). *World Investment Report 2015: Reforming International Investment Governance*. United Nations publication. Sales No. E.15.II.D. Geneva.

UNCTAD (2019). Defining, estimating and disseminating statistics on illicit financial flows in Africa. Available at <https://unctad.org/en/Pages/Statistics/UNDA-Project-1819Y.aspx> (accessed 10 June 2019).

UNCTAD and UNODC (2017). Expert consultation on the SDG indicator on illicit financial flows (IFFs). Available at <https://unctad.org/en/pages/MeetingDetails.aspx?meetingid=1879> (accessed 10 June 2019).

UNECA (2019). ECA hosts meeting on strengthening Africa's capacities to deal with trade misinvoicing April. Available at <https://www.uneca.org/stories/eca-hosts-meeting-strengthening-africa%E2%80%99s-capacities-deal-trade-misinvoicing> (accessed 10 June 2019).

UNECE (2015). *Guide to Measuring Global Production*. ECE/CES/38. New York and Geneva.

United Nations (2015). Report of the third international conference on financing for development. A/CONF.227/20. Addis Ababa. 3 August.

United Nations (2016). Final study on illicit financial flows, human rights and the 2030 Agenda for Sustainable Development of the Independent Expert on the effects of foreign debt and other related international financial obligations of States on the full enjoyment of all human rights, particularly economic, social and cultural rights. A/HRC/31/61. Geneva. 15 January.

United Nations (2017). *Practical Manual on Transfer Pricing for Developing Countries 2017*. United Nations publication. Sales No. E.17.XVI.2. New York.

United Nations Statistics Division (2019a). Tier classification for global SDG indicators. Available at <https://unstats.un.org/sdgs/iaeg-sdgs/tier-classification/> (accessed 14 May 2019).

United Nations Statistics Division (2019b). Bilateral asymmetries. Available at <https://unstats.un.org/unsd/tradekb/Knowledgebase/50657/Bilateral-asymmetries> (accessed 10 June 2019).

United States International Trade Commission (2011). The economic effects of significant U.S. import restraints. Special topic: Global supply chains. Available at https://www.usitc.gov/publications/industry_econ_analysis_332/2011/economic_effects_significant_us_import_restraints.htm (accessed 10 June 2019).



THEME 3

Structural Transformation

“Climate change is one of the great dangers we face and it’s one we can prevent”.


– Stephen Hawking

Asia's
manufacturing
value added
per head
 X 3
in 10 years

LDCs'
work force
in manufacturing
 X 2 
in 20 years

90% of
CO₂ emissions
from energy




Greenhouse
gas emissions
back to growth
+1.3%
in 2017

Structural Transformation

Sustainable long-term growth that provides economies opportunities for everyone can only be achieved through a shift to higher value-added productive activities. This requires investment, the adoption of technological advancements, and a better prepared workforce. To avoid further ecological degradation and climate change, this also means a shift to more efficient and less environmentally damaging economic activities.

Transforming to more sustainable consumption and production patterns, will not only be good for the economy, but also a necessity for the environment. This theme of SDG Pulse looks at two aspects of structural transformation:

1. We look for evidence of a shift towards Sustainable industrialization and higher technology and more skills-intensive economic activities, and review the following SDG indicators and related data and statistics:

- SDG indicator 9.2.1: Manufacturing value added as a proportion of GDP and per capita
- SDG indicator 9.2.2: Manufacturing employment as a proportion of total employment
- SDG indicator 9.b.1: Proportion of medium

and high-tech industry value added in total manufacturing value added

- SDG indicator 9.5.1: Research and development expenditure as a proportion of GDP
- SDG indicator 9.5.2: Researchers (in full-time equivalent) per million inhabitants

2. We search for Signs of a greening economy in the face of serious climate concerns, and review the following SDG indicators and related data and statistics:

- SDG 9.4.1: Carbon dioxide emissions per unit of value added
- SDG 7.3.1: Energy intensity measured in terms of primary energy and GDP
- SDG 12.6.1: Companies publishing sustainability reports

According to UNFCCC, to achieve the objectives of the Paris Climate Agreement, the world needs to deploy climate technologies on a much greater scale, and innovation plays a key role. The climate challenge is immediate, and as statistics in the SDG Pulse demonstrate, we can reduce carbon intensity of the economy through technological and economic transformation.



I. Towards sustainable industrialization and higher technologies

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

- Indicator 9.2.1: Manufacturing value added as a proportion of GDP and per capita (Tier I)
- Indicator 9.2.2: Manufacturing employment as a proportion of total employment (Tier I)

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

- Indicator 9.b.1: Proportion of medium and high-tech industry value added in total manufacturing value added (Tier I)

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

- Indicator 9.5.1: Research and development expenditure as a proportion of GDP (Tier I)
- Indicator 9.5.2: Researchers (in full-time equivalent) per million inhabitants (Tier I)

Key messages

- In developing Asia and Oceania, real manufacturing value added per head more than doubled from 1997 to 2017
- Proportion of medium and high-tech manufacturing declining in African and American developing economies
- In LDCs, the proportion of people working in manufacturing doubled over 20 years
- Africa's medium and high-tech share in manufactured exports rose by almost 10 percentage points over 10 years
- 10 economies account for over 80% of total R&D spending in the world
- Eastern and South-Eastern Asia witnessed the highest increase in R&D per GDP in 2016
- With 1.8% of GDP devoted to R&D, EU far behind its official 3% goal exports
- On average, 37% of R&D employees are women

Structural transformation has been an important driving force of economic development over the last decades. According to classic economic theory (such as Kuznets (1957), Chenery (1960) and Fourastié (1963)), development is driven by a shift from the extraction of raw materials and primary sector activities to increasingly complex technical transformation processes, commonly referred to as manufacturing. The sources of that transition include, on the supply side, the development of know-how, increase in high-skilled labour and technological advancement, enabling application of new production methods. On the demand side, the rising standard of living induces a shift from the consumption of food and other primary commodities towards consumer goods, that are usually manufactured. This transformation leads to higher value added and greater economic welfare. In line with this thinking, SDG target 9.2 promotes inclusive and sustainable industrialization and aims to significantly raise industry's share of employment and GDP by 2030.

In recent years, we have seen a sectoral shift from manufacturing to services. Once a certain

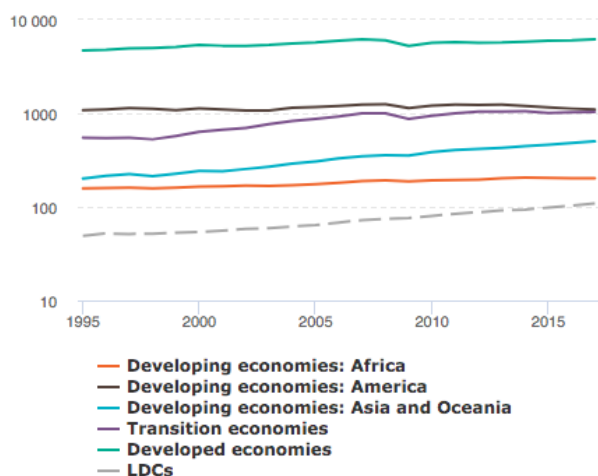
standard of living is reached, the demand for services increases relative to the demand for physically produced goods. According to Haraguchi and Rezonja (2010), this level is reached when GDP per capita amounts to around US\$13,000 (in 2005 prices). At that stage, manufacturing usually accounts for around one fifth of value added. Based on these estimates, UNIDO (2017) considers countries industrialized when their manufacturing value added, adjusted to purchasing power parities, exceeds US\$2,500 per capita.

Rapid industrialization in developing economies of Asia and Oceania

In 2017, manufacturing value added per capita amounted to US\$6,167 (in 2010 prices) in developed economies (see figure 1). It was around twelve times as high as in developing Asia and



Figure 1 Trends in manufacturing value added per capita (SDG 9.2.1)
(US\$ in constant 2010 prices)



Source: UNCTAD (2019).
Note: Logarithmic scale.

Oceania (US\$502) and almost six times the level of the developing economies of America (US\$1,098) and transition economies (US\$1,036). It exceeded the value in Africa (US\$202) by 30 times.

Over the last 20 years, the region of developing Asia and Oceania has been steadily catching up – its manufacturing value added more than doubled between 1997 and 2017 – while in Africa and the developing economies of America it remained almost constant. In developed economies manufacturing value added per

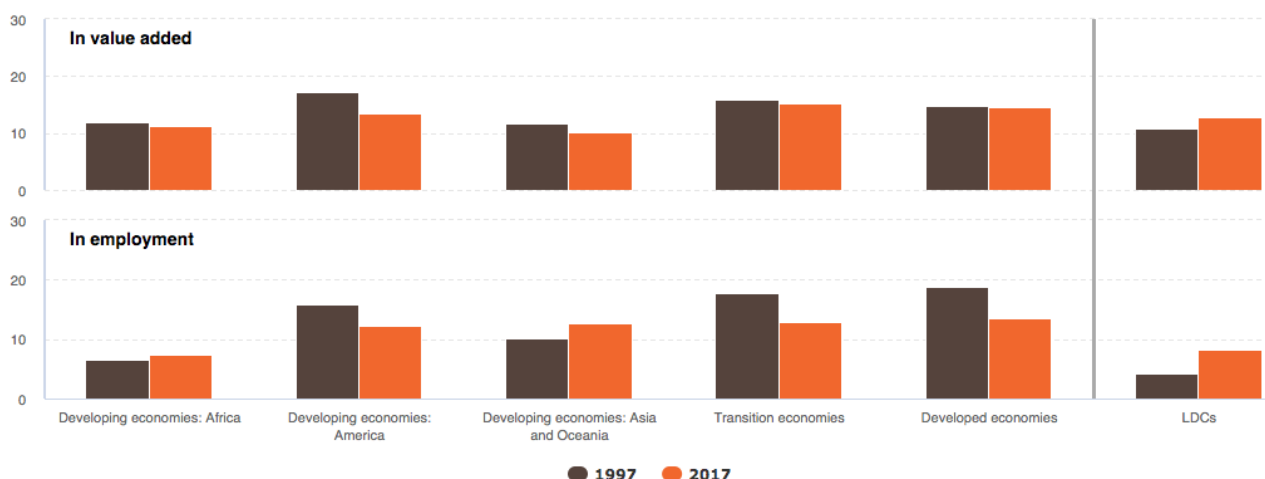
capita has not significantly increased either.

Changing structure of value added and employment

In addition to manufacturing value added per capita, the 2030 Agenda measures progress in industrialization by the share of manufacturing in total value added and employment. As these indicators show, over the last 20 years, structural change is evident in employment, but less so in value added. Most developing regions, as well as transition and developed economies, witnessed a decreasing proportion of manufacturing value added (see figure 2).

Africa and Asia and Oceania are the only regions, over the past 20 years, where developing economies have experienced higher growth in manufacturing than in total employment. As outlined above (figure 1), Asia and Oceania has recorded a substantial increase in the level of manufacturing value added per capita. This highlights a growing disparity in average productivity growth between it and Africa. Apparently, productivity in Asian and Oceanian developing economies has boosted not only within the manufacturing sector, but for the economy as a whole. In developed economies, the manufacturing value added per capita has been increasing slightly, accompanied by stagnating shares of

Figure 2 Share of manufacturing in value added (SDG 9.2.1) and employment (SDG 9.2.2)
(Percentage)



Source: UNCTAD calculations based on UNCTAD (2019), UNIDO (2019) and ILO (2019).
Note: Logarithmic scale.

manufacturing in value added and employment.¹

Does structural transformation advance in LDCs?

Figure 1 shows that LDCs registered particularly low manufacturing value added per capita. In 2017, their manufacturing sector produced on average US\$109 per head in constant prices, about half of the average produced in Africa. The manufacturing value added per capita has steadily increased over the last 20 years, at a pace almost as fast as developing Asia and Oceania. Nevertheless, LDCs' value added remains below the levels, in per capita terms, produced by other groups of economies.

Figure 2 suggests that the increase in manufacturing value added per capita was strongly employment driven. The share of manufacturing in employment increased from 4.3 to 8.3 per cent between 1997 and 2017. By contrast, the manufacturing share in value



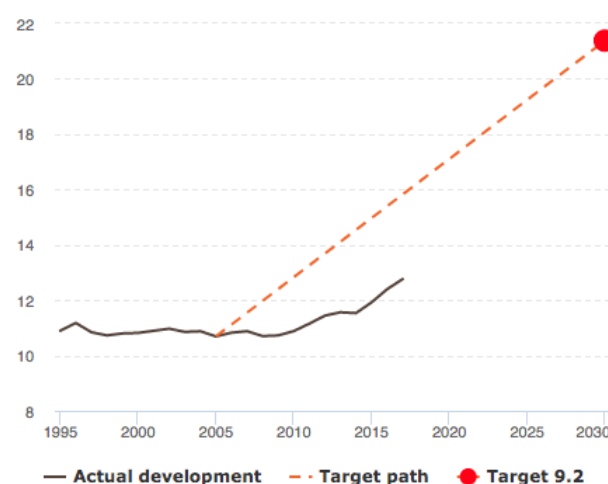
**In LDCs,
the proportion of
people working
in manufacturing
doubled
over 20 years**

added, which is in the focus of target 9.2 for LDCs, did not rise much. From 1997 to 2010, the share remained constant at slightly less than 11 per cent. Since then, it has been rising almost continuously, reaching 12.8 per cent in 2017 (see figure 3).

Extrapolating the growth after 2005 into the future, the pace appears to be too slow to achieve the SDG target of doubling the manufacturing share in value added by 2030. Since 2005 onwards, an increase of 0.43 percentage points would have been required on average each year to reach the target. Increases of that amount were indeed achieved over the last three years. However, during

the period from 2005 to 2017, the actual average increase was 0.17 percentage points per year. The findings above suggest that new innovations and policies towards industrialization are needed in LDCs to accelerate structural transformation.

Figure 3 Trend of the manufacturing share of value added (SDG 9.2.1) in LDCs compared to the target (Percentage)



Source: UNCTAD (2019).

Technology gap in manufacturing widening

In the process of economic development, structural transformation happens not only across broad economic sectors, such as primary production, manufacturing and services, but also at the more detailed industry level and within industries. Within manufacturing, we can observe diversification and a shift from low-productivity to high-productivity activities, raising the average value added per worker. Research and innovation play a crucial role in this transformation by providing the grounds for the use of new and more efficient technologies. The 2030 Agenda promotes technological development through research and innovation, especially in developing economies. Progress towards the achievement of that target is measured by the proportion of medium and high-tech industry value added over

total manufacturing value added.

This indicator shows that, in the developed world, medium and high-tech industry accounts for higher shares of manufacturing value added than in developing and transition economies (see figure 4). When looking at weighted regional averages, around half of developed economies' manufacturing output is obtained in medium and high-tech industries. Among developing countries, the weighted rate varies considerably across regions. In developing Asia and Oceania, it is almost as high as in developed economies (50 per cent), while the rate reaches 32 per cent in developing America, but only 21 per cent in Africa. For transition economies the level is only slightly above that of Africa.

Over the last 15 years, the gap between developing and developed economies has widened slightly. While developed economies managed to increase the proportion of medium and high-tech manufacturing, from 48 per cent in 2001 to 50 per cent in 2016, the rate fell slightly for developing America (from 35 to 32 per cent) and in Africa (from 23 to 21 per cent). Only in the developing economies of Asia and Oceania has it remained

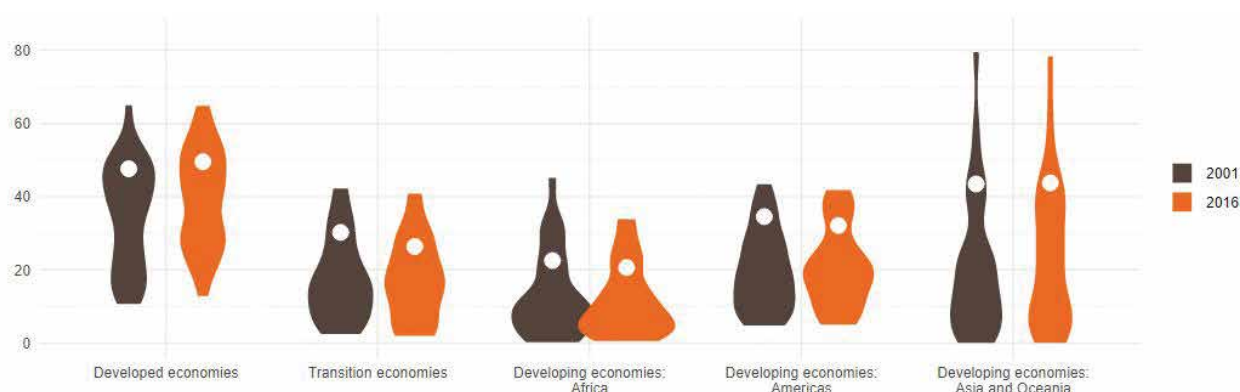
Proportion of medium and high-tech manufacturing declining in African and American developing economies



constant, at around 43 or 44 per cent. Transition economies have experienced a relatively strong reduction: from 30 to 26 per cent. These figures suggest that developed countries have cemented their lead somewhat in the development and application of new technologies, while in developing and transition countries, except for Asia and Oceania, manufacturing is shifting further towards lower-technology sectors.

Figure 4 highlights the considerable variation across individual economies, especially in Asia. This region encompasses, on one hand, the two economies with the world's most innovative manufacturing sectors, namely Singapore (78 per cent) and Taiwan, Province of China (69 per cent); on the other hand, it includes several countries, primarily LDCs and SIDS, in which the share of

Figure 4 Proportion of medium and high-tech industry in manufacturing value added (SDG 9.b.1), by development status and region (Percentage)



Source: UNCTAD calculations based on UNIDO (2019).

Note: A violin plot illustrates the distribution of individual countries' medium and high-tech industry shares in manufacturing value added within each country group and year. The coloured areas depict the distribution of countries' rates smoothed by kernel density estimates. Kernel density estimation is a non-parametric way to estimate the probability density function of a random variable. It can be useful for visualizing the "shape" of data, as it estimates the probability of seeing an observation in each point. The wider the shape, the higher the possibility to find an observation in that location. The dots within the violin shapes represent the regional weighted average of countries' medium and high-tech industry shares in manufacturing value added. Their location shows that typically larger economies have higher medium and high-tech industry shares.

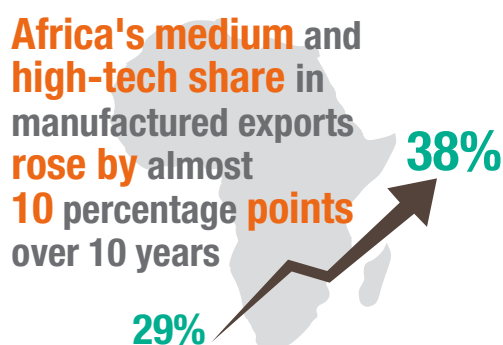
medium and high-tech industries in value added has persistently remained below three percent.

Considerable spread in the medium and high-tech industry share of manufacturing value added is also found within the group of developed economies. Some developed countries reach less than one third of the rates recorded by countries such as Switzerland and Germany that belong to the top medium and high-tech developed countries.

Many LDCs and SIDS are characterized by low shares of medium and high-tech manufacturing. However, this is changing. Noteworthy development, among SIDS, include Trinidad and Tobago, where the medium and high-tech share in manufacturing value added increased from 29 per cent in 2001 to 40 per cent in 2016. In addition, in Barbados the rate has remained high, at 38 per cent, over the last 15 years. (See UNIDO (2019)).

Convergence in medium and high-tech manufactured exports

Contrary to the changes observed in domestic productive activities, the share of medium and high-tech products exported by developing countries has been increasing in recent years, while it remained constant in the developed world (see figure 5). Developing economies in America and in Asia and Oceania reached a share of almost

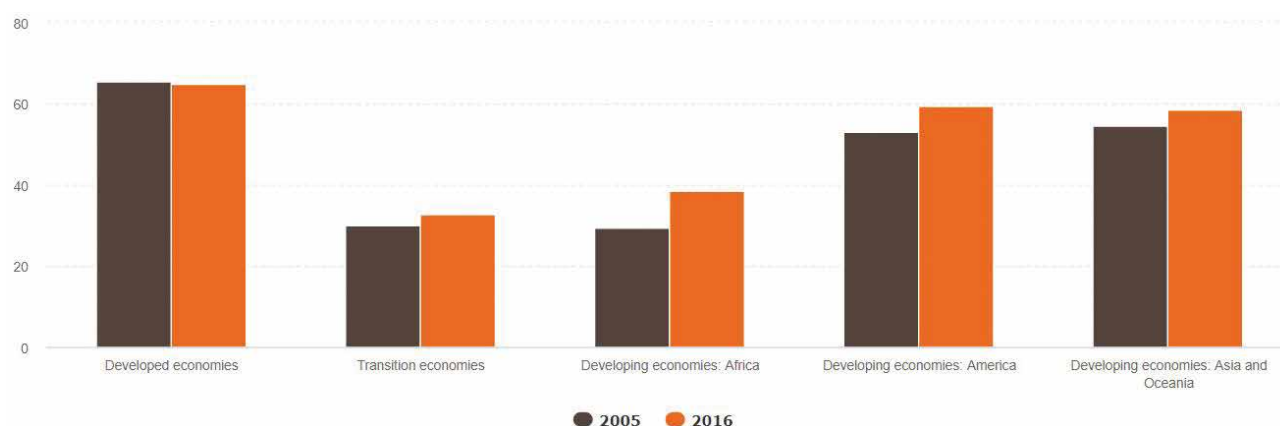


60 per cent in 2016, three to five percentage points more than in 2005. Africa recorded an increase from 29 to 38 per cent over the same period of time. As a result, Africa has been catching up in the structural transformation of manufactured exports, and the gap between the developing and developed world has narrowed. However, transition economies are lagging behind. In 2001, they exported the same proportion of high-tech manufactured goods as Africa; but by 2016, their relative share had fallen behind.

Modest growth in R&D intensity across the world

In the 2030 Agenda, governments pledged to substantially increase public and private spending on research and development (R&D). This is an essential determinant of structural transformation and a shift to high-tech manufacturing, as described above. Since the turn of the millennium, the global gross expenditure

Figure 5 Share of medium and high-tech manufactured exports in total manufacturing exports (Percentage)



Source: UNIDO databases, 2019, available at <http://stat.unido.org/>.

Note: UNCTAD calculations based on UNIDO (2019).

on R&D has increased from US\$730 billion to an estimated US\$1.9 trillion in 2016, adjusted to PPP (see table 1). Over 80 per cent of world R&D spending is taking place in the ten leading economies. In PPP-adjusted value terms, the leading countries are the United States (US\$511 billion), China (US\$451 billion), Japan (US\$169 billion), and Germany (US\$118 billion).



From 2010 to 2016, world R&D investment rose by an estimated 5.8 per cent annually, on average. China's R&D expenditure has grown more rapidly than that of the other leaders over recent years: between 2010 and 2016 the expenditures increased in China by 12.8 per cent on average, annually. Since 2010, among the economies with high spending on R&D, particularly strong growth was observed in Turkey, Poland, Egypt and the United Arab Emirates.

Global R&D investments have grown in absolute terms over the recent years. However, R&D intensity – one of the SDG indicators – saw only modest increases. In 2016, global gross expenditure on R&D stood at 1.7 per cent of GDP, marking a slight increase compared to 1.5 per cent observed in 2000 (see figure 6). Among countries, Israel (4.3 per cent) and the Republic of Korea (4.2 per cent) are the most prominent R&D investors relative to GDP, followed by Switzerland (3.4 per cent) and Sweden (3.3 per cent). The United States invested 2.7 per cent of its GDP in R&D. Only two developing economies, the Republic of Korea and China, reported R&D intensity above the world average (see table 2).

Northern America is investing more of its GDP in R&D than any other region, but it is Eastern and South-Eastern Asia where the increase in R&D spending relative to GDP has been largest, growing from 1.5 per cent in 2000 to 2.1 per cent in 2016. Europe, on the other hand, has consistently been investing 1.8 per cent of its GDP in R&D since 2010, remaining well below the 3 per cent goal set by the EU. Among the EU member states, only Sweden and Austria are surpassing the three-

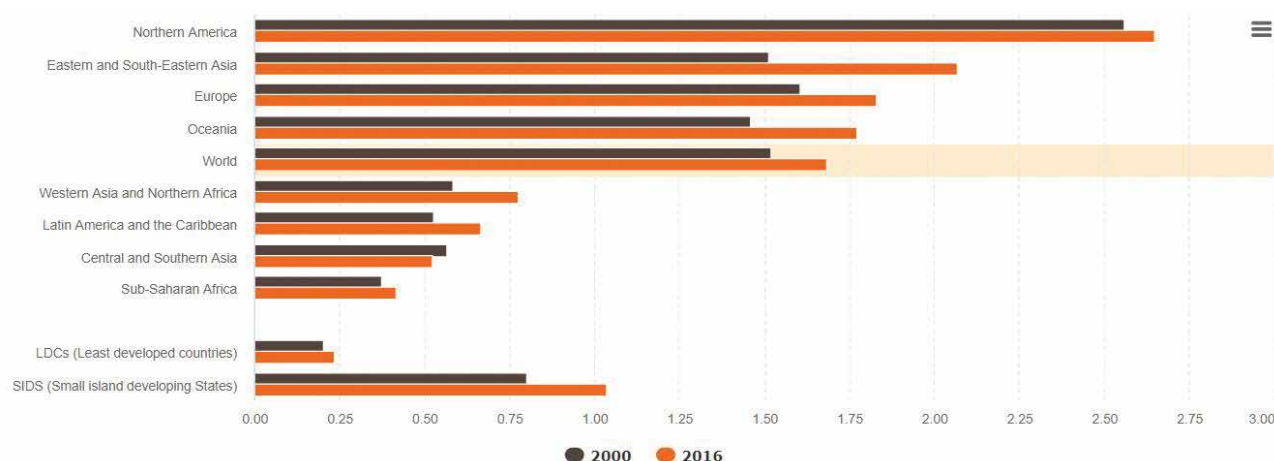
Table 1 Leading ten investors in R&D, ranked by PPP US\$, 2016 (SDG 9.5.1)
(Countries ranked by GERD)

Investors	PPP US\$ billions	Annual average growth percentage 2010–2016	Percentage of GDP	Percentage of world total
World total	1927	5.8	1.7	-
Brazil	40	4.5	1.3	2.1
Russian Federation	40	2.3	1.1	2.1
United Kingdom	47	4.5	1.7	2.5
India	50	-	0.6	2.6
France	62	3.2	2.2	3.2
Republic of Korea	79	6.1	4.2	4.1
Germany	118	4.4	2.9	6.1
Japan	169	2.9	3.1	8.8
China	451	12.4	2.1	23.4
United States	511	3.8	2.7	26.5

Source: UNCTAD calculations based on UNESCO Institute for Statistics (2019).

Note: World total is an estimate. The figure for India refers to 2015.

Figure 6 R&D expenditure as a proportion of GDP (SDG 9.5.1)
(Percentage of GDP)



Source: UNCTAD calculations based on UNESCO Institute for Statistics (2019).

per-cent target; Germany and Denmark are close, at 2.9 per cent. Regional blocks, like the AU and the EU, frequently promote R&D initiatives by endorsing assessable targets for member states (see European Commission, 2010; UNECA, 2018). However, it remains difficult for countries to follow up on their R&D aspirations, owing to budgetary, socio-economic, and infrastructure constraints. The AU set the R&D intensity target for its member states at one per cent (UNECA, 2018). Available data indicate that three Sub-Saharan economies are close to that objective: Kenya, Senegal, and South Africa, with about 0.8 per cent of GDP each.

For Sub-Saharan Africa as a whole, R&D received an estimated 0.4 per cent of GDP, while Northern Africa and Western Asia invested around 0.8 per cent of GDP in R&D. The developing economies of America advanced from 0.5 per cent in 2000 to 0.7 per cent of GDP in 2016. The figure of 1.3 per cent, reported by Brazil in 2016, represents an R&D intensity twice as high as any other country

in the region. According to UNESCO Institute for Statistics (2019), Oceania's R&D stood at 1.8 per cent of GDP in 2016, dropping from a peak of 2.2 per cent observed between 2008 and 2011. In LDCs, an estimated 0.2 per cent of GDP were allocated to R&D.

Looking at the number of persons directly employed in R&D in FTE per million inhabitants,

Table 2 Leading ten developing-country investors in R&D, 2016 (SDG 9.5.1)
(Percentage of GDP, countries ranked by GERD)

Investors	GERD as a percentage of GDP
World total	1.7
Republic of Korea	4.2
China	2.1
Brazil	1.3
United Arab Emirates	1.0
China, Hong Kong SAR	0.8
Thailand	0.8
Egypt	0.7
Tunisia	0.6
Argentina	0.5
Mexico	0.5

Source: UNCTAD calculations based on UNESCO Institute for Statistics (2019).

Note: World total is an estimate.

Eastern and South-Eastern Asia witnessed the highest increase in R&D per GDP in 2016



which is measured by SDG indicator 9.5.2, the top rankings were dominated by European countries, in particular Denmark, Switzerland, Iceland, Sweden, and by Israel and the Republic of Korea. These economies reported over 9,000 persons per million employed on R&D. It should be noted that these figures included not only researchers, but also technical and supporting staff. According to data available for 90 economies, on average, 37 per cent of the persons employed in R&D were female, but with significant variation among economies.



With 1.8% of GDP devoted to R&D, EU far behind its official 3% goal

With the spread of multinational enterprises and globalized production chains, R&D services are increasingly traded across countries. World R&D services exports expanded by an estimated 7.1 per cent annually between 2010 and 2016. Hence, when comparing to data from UNCTAD (2019), R&D exports growth clearly outpaced the total services trade, the latter scoring only a 2.6 per cent expansion in the same period. In 2016, world exports of R&D services amounted

to US\$150 billion. The top-ten R&D exporters accounted for 75 per cent of R&D exports, led by the United States and followed by Germany and France (see table 3). Seven out of ten leading R&D services exporters also belonged to the top-ten R&D services importers, as well as to world leading recipients (exporters) of charges for the use of intellectual property.

On average, 37% of R&D employees are women



R&D is financed by public and private (mainly corporate) funds. According to OECD, public spending on R&D has decreased since 2010 in the OECD member states, not only as percentage of GDP, but also as a share of total government expenditure. With increased private R&D funding and wider use of competitive funding instruments, R&D gets steered towards more narrowly defined purposes, where advances are directly measurable, but tend to be incremental. Public and non-competitive funds are needed to support riskier, potentially transformative R&D projects and long-term undertakings where the expected results would benefit societies at large, especially in the social and environmental fields (OECD, 2018).

Table 3 Leading ten R&D services exporters, 2016
(Countries ranked by exports value)

<i>Investors</i>	<i>Exports US\$ billions</i>	<i>Annual average growth of exports, percentage, 2010-2016</i>	<i>Imports US\$ billions</i>	<i>Ranking in GERD, PPP US\$</i>
United States	43	7.7	34	1
Germany	25	7.5	21	4
France	12	8.0	14	6
United Kingdom	10	1.6	6	8
Japan	6	13.3	19	3
Israel	8	7.5	1	20
Belgium	5	3.4	5	21
China	4	13.1	3	2
Netherlands	4	-1.1	5	15
Ireland	5	38.4	52	37

Source: UNCTAD (2019).

Notes

- 1 The share of services in value added increased in developed economies from 70.3 per cent in 1997 to 76.1 per cent in 2017 (UNCTAD, 2019).

References

- Chenery HB (1960). Patterns of industrial growth. *American Economic Review*. 50:624–654.
- European Commission (2010). *Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth*. European Commission, No. COM(2010) 2020.
- Fourastié J (1963). *Le Grand Espoir Du XXe Siècle*. Gallimard. Paris.
- Haraguchi N and Rezonja G (2010). Search of general patterns of manufacturing development. Development Policy and Strategic Research Branch Working Paper No. 02/2010. UNIDO.
- ILO (2019). ILOStat database. Available at <https://www.ilo.org/ilostat> (accessed 15 April 2019).
- Kuznets S (1957). Quantitative aspects of the economic growth of nations: II. Industrial distribution of national product and labor force. *Economic Development and Cultural Change*. 5(4):1–111.
- OECD (2015). *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development*. The Measurement of Scientific, Technological and Innovation Activities. OECD Publishing. Paris.
- OECD (2018). *OECD Science, Technology and Innovation Outlook 2018: Adapting to Technological and Societal Disruption*.
- UNCTAD (2019). UNCTADStat. See <https://unctad-stat.unctad.org/> (accessed 10 April 2019).
- UNECA (2018). Towards achieving the African Union's recommendation of expenditure of 1% of GDP on research and development. ECA Policy Brief. ECA/18/004. Addis Ababa.
- UNESCO Institute for Statistics (2019). UNESCO Institute for Statistics database. Available at <http://uis.unesco.org/> (accessed 15 April 2019).
- UNIDO (2017). *Industrial Development Report 2018, Demand for Manufacturing: Driving Inclusive and Sustainable Industrial Development*. United Nations publication. Sales No. E.18.II.B.48. Vienna.
- UNIDO (2019). UNIDO databases. Available at <http://stat.unido.org> (accessed 4 May 2019).
- United Nations (2008). *International Standard Industrial Classification of All Economic Activities (ISIC)*. Statistical papers / Department of International Economic and Social Affairs, Statistical Office of the United Nations Series M, No. 4, Rev. 4. United Nations publication. Sales No. E.08.XVII.25. New York, NY.
- United Nations et al. (2012). *Manual on Statistics of International Trade in Services 2010*. United Nations publication. Sales No. E.10.XVII.14. Geneva.
- United Nations (2019). SDG indicators: Metadata repository. Available at <https://unstats.un.org/sdgs/metadata/> (accessed 14 May 2019).
- United Nations, European Commission, IMF, OECD and World Bank (2009). *System of National Accounts 2008*. Studies in methods, No. 2. United Nations publication. Sales No. E.08.XVII.29. New York.



II. Signs of a greening economy?

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

- Indicator 9.4.1: CO₂ emission per unit of value added (Tier I)

Target 7.3: By 2030, double the global rate of improvement in energy efficiency

- Indicator 7.3.1: Energy intensity measured in terms of primary energy and GDP

Target SDG 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

- Indicator SDG 12.6.1: Number of companies publishing sustainability reports (Tier III)

Key messages

- Greenhouse gas emissions grew in 2017 by 1.3% after two years of stagnation
- Annual CO₂ emissions increased from 21 Gt in 1990 to 33 Gt in 2018
- Carbon intensity of GDP cut down by one third since the beginning of the 1990s
- CO₂ emissions in Northern America and Europe down by around 15% from 2005 to 2016
- Since 1990, energy intensity reduced by 1.6% each year on average
- Private business sector mentioned in only one SDG target: 12.6
- 33 indicators for sustainability reporting in UNCTAD Guidance
- Reporting in Eastern Asia and Northern America in higher alignment with reporting guidance

“There is no planet B”, was the message of thousands of young people in the series of demonstrations for climate across the world in March 2019. According to the Intergovernmental Panel on Climate Change (2014, p. 6), changes in climate have already “caused impacts on natural and human systems on all continents and across the oceans”. Today, the world is 1°C warmer than pre-industrial levels. We are already experiencing more frequent natural disasters and extreme weather events, rising sea levels and diminishing Arctic sea ice, among other changes (IPCC, 2018).

+1.3%
Greenhouse gas emissions grew in 2017 by 1.3% after two years of stagnation

The 2015 Paris Climate agreement aims to limit global warming to well below 2°C above pre-industrial levels, and to pursue “efforts to limit the temperature increase to 1.5°C” (UNFCCC, 2016). To this end, signature countries committed to communicating their nationally determined contributions to post-2020 climate actions¹. In 2018, climate scientists warned that the impacts of even a 1.5°C warming above pre-industrial levels will be far greater than originally expected, including extinction of coral reefs, many plants, insects and animals (IPCC, 2018).

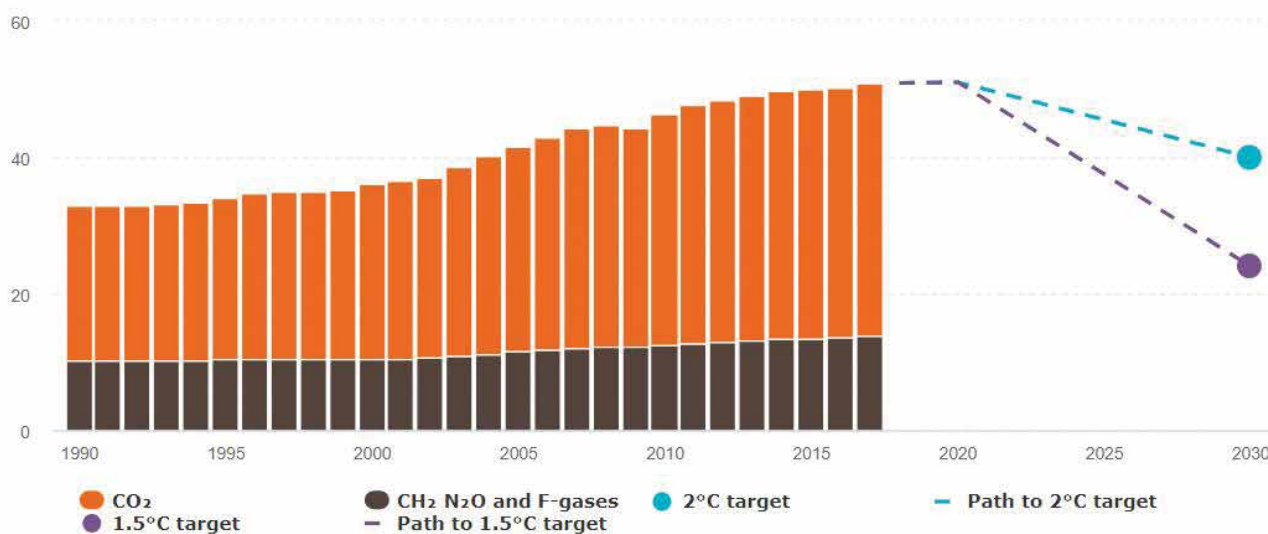
Growth in greenhouse gas emissions paused around 2015, but resumed in 2017

A growing concentration of greenhouse gases, mainly of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and fluorinated gases (F-gases), in the atmosphere has been identified as the main cause of increased temperatures on the planet. Greenhouse gases let solar radiation reach the Earth’s surface, but absorb infrared radiation emitted by the Earth. They thereby heat the surface of the planet, an effect known as the “greenhouse effect” (WMO, 2019).

In 2017, emissions of CO₂, CH₄, N₂O and F-gases, the ‘critical’ greenhouse gases, amounted to 50.9Gt of CO₂e. They increased by 1.3 per cent compared to the previous year, after a period of little or no growth during the previous two years. When including emissions from land-use change, which are difficult to measure, the total emissions are estimated to have reached 55.1 Gt in 2017. This level was about 55 per cent higher than in 1990 and 40 per cent higher than in 2000 (see figure 1).

According to simulations, reaching the Paris target of keeping global warming below 2°C will require emissions of critical greenhouse gases

Figure 1 Greenhouse gas emissions and target reductions (SDG 9.4.1)
(Gt of CO₂e)



Source: UNCTAD calculations based on Netherlands PBL (2018) and UNEP (2018).

Note: Emission targets are shown as released by UNEP (2018). Emissions from land-use change are not included.

to peak by 2020, and decline sharply thereafter. To remain below 2°C warming by 2100, global emissions should not exceed 40 Gt of CO₂e in 2030, and to achieve the below 1.5°C warming target, total emissions should remain below 24 Gt of CO₂e by 2030. This requires a reduction of nearly 25 per cent and 55 per cent in greenhouse gases, respectively, from 2017 levels (UNEP, 2018).

Most carbon dioxide emitted in Asia – per unit GDP and in total

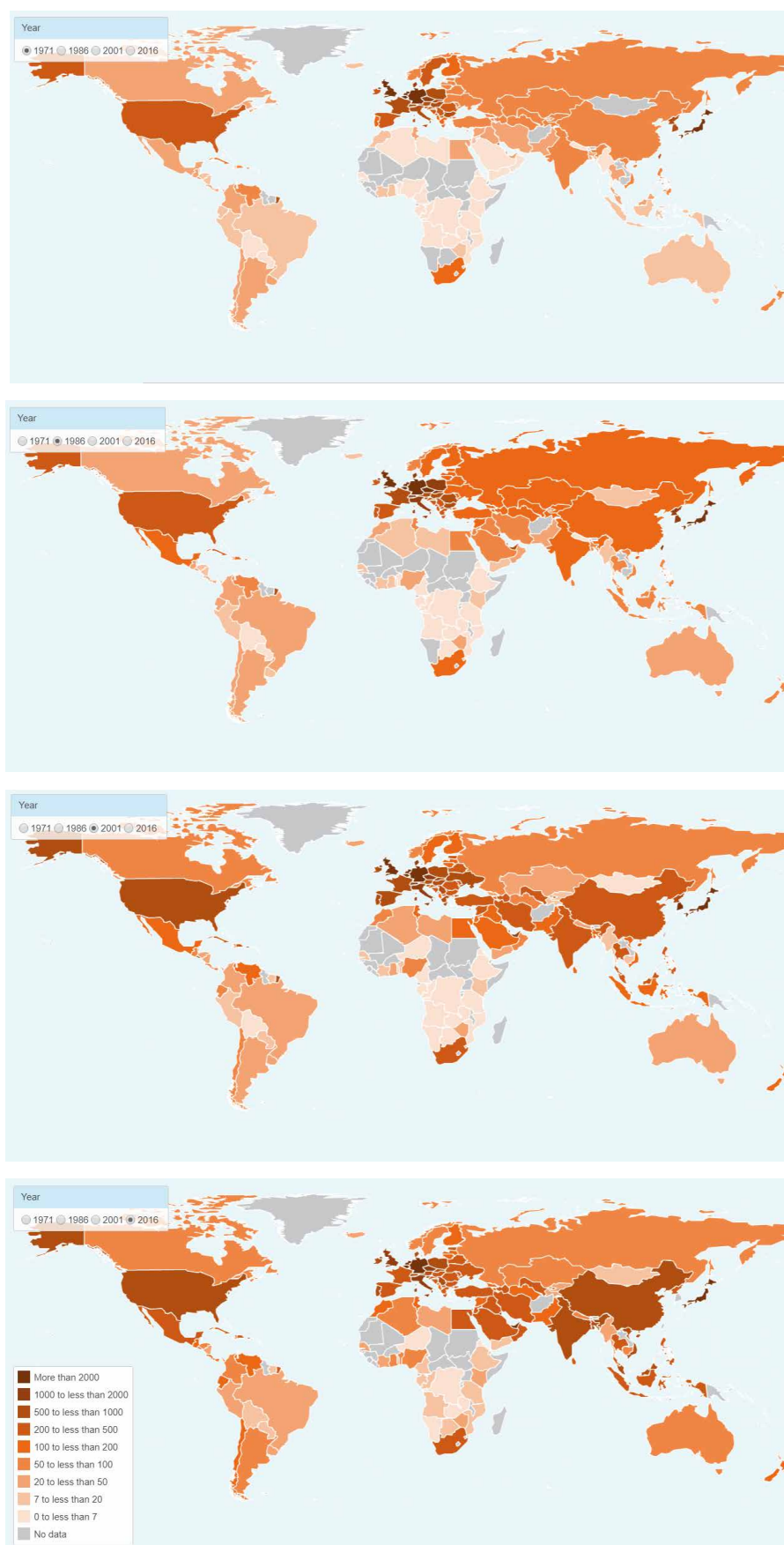
As figure 1 reveals, CO₂ is the most important of the critical greenhouse gases. It is a gas, released through human activities, such as deforestation and burning of fossil fuels, and through natural processes, such as respiration and volcanic eruptions. Around 90 per cent of CO₂ emissions are generated by burning of fossil fuels in the form of coal, oil and natural gas. However, CO₂ concentrations in the atmosphere are also influenced by deforestation and other types of land-cover or land-use change, due to their impact on the land's potential to absorb or generate CO₂.

In 2017, CO₂ accounted for almost three quarters of total greenhouse gas emissions. Thus, by focusing on CO₂, SDG indicator 9.4.1 helps monitoring the largest part, however not the full

amount of global greenhouse gas emissions.

The regional concentration of CO₂ emissions varies considerably across the globe. In 2016, most countries in Africa recorded emissions of less than 20 kg/km². In Latin American countries and in Australia, emissions remained below 50 kg/km². Much higher CO₂ emissions, typically more than 200 kg/km² and sometimes even higher than 2 000 kg/km², were common for countries located in a band that ranges from the United States of America and Central America over to Europe, excluding Iceland and Scandinavia, and the Near East, to Southern, Eastern and South-Eastern Asia. Within that band, particularly high emission levels were recorded in Central Europe and Eastern Asia. Farther to the North, in Canada, Northern Europe and in Northern and Central Asia, emission levels were lower, usually ranging between 50 and 100 kg/km² on average per country.

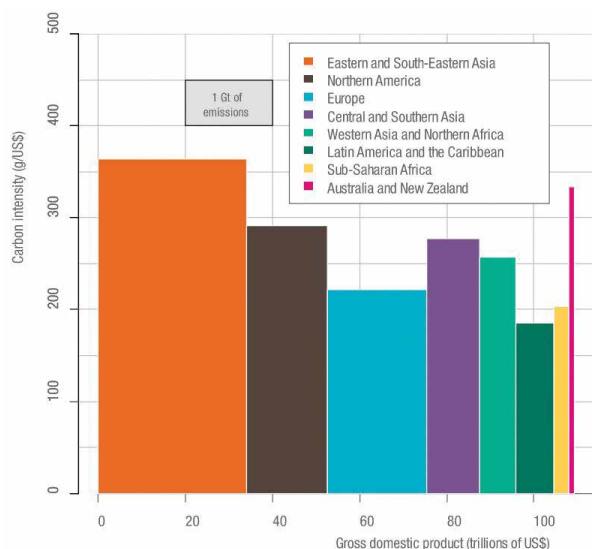
As figure 2 shows, three regions of the world emitted most of the CO₂ from fuel combustion: Eastern and South-Eastern Asia (12.4 Gt in 2016), Northern America (5.3 Gt) and Europe (5.0 Gt). Together, they accounted for almost three quarters of global CO₂ emissions in 2016. While Europe has a larger economy, measured in terms of

Map 1**Geographic concentration of carbon dioxide emissions, in 1971, 1986, 2001 and 2016**
(kg/km² per year)

Source: UNCTAD calculations based on UNCTAD (2019) and IEA (2018a).

Note: Emissions not caused by fuel combustion and emissions from fuels burned on ships and aircrafts in international transport are not included.

Figure 2 Carbon dioxide emissions, emissions intensity and GDP, by region, 2016 (SDG 9.4.1)



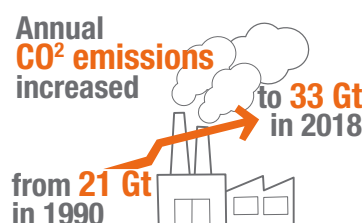
Source: UNCTAD calculations based on IEA (2018b).

Note: The area of bars measures carbon dioxide emissions. Regions are arranged in the order of the amount of emissions. Emissions not caused by fuel combustion and emissions from fuels burned on ships and aircrafts in international transport are not included. US\$ values are in constant 2010 prices, adjusted to purchasing power parities based on the United States of America. Central and Southern Asia includes developing economies in Oceania.

GDP, in Northern America, on average one third more emissions were associated with each unit of production than in Europe. Eastern and South-Eastern Asia was characterized by both higher GDP and higher carbon intensity than the other world regions shown in figure 2. The economies of Latin America and the Caribbean and of Sub-Saharan Africa caused less CO₂ emissions per unit of production than the economies of Asia. Jointly, they contributed 7 per cent to the world total CO₂ emissions. Fuels burned on ships and aircrafts involved in international transport, which cannot be distributed to economies, add another 4 per cent to global CO₂ emissions from fuel combustion (IEA, 2018b).

Population growth and rising prosperity drive carbon dioxide emissions

Since 1990, global CO₂ emissions have increased by almost two thirds: from 20.5 Gt in 1990 to 33.1 Gt in 2018. This means they grew on average by 1.9 per cent each year. Between 2014 and 2016 CO₂ emissions remained almost constant. But in

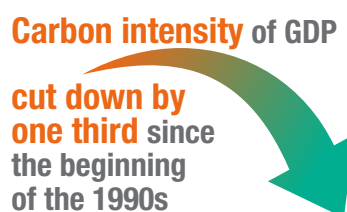


the following year growth resumed, and by 2018 the annual growth had returned to 1.8 per cent (IEA, 2018b).

Much of the increase in CO₂ emissions observed over the last decades relates to world population growth and increased consumption per capita, since consumption relies on the production of goods and services. In fact, CO₂ emissions can be displayed as the product of population size, GDP per capita, and the carbon intensity of production:

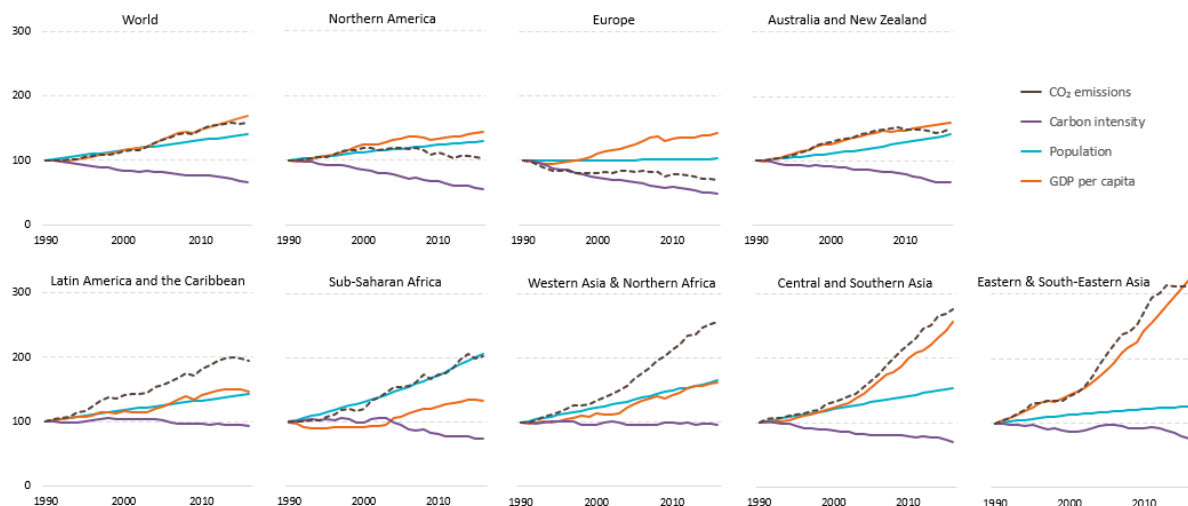
$$CO_2 = Population \left[\frac{GDP}{Population} \right] \left[\frac{CO_2}{GDP} \right]$$

An increase in GDP, the product of the first two factors in the equation, leads to rising CO₂ emissions, unless carbon intensity, the third factor, decreases at a higher rate than the growth of GDP. Such decoupling of CO₂ emissions from GDP growth is an important precondition for the achievement of the targets set in the Paris Agreement (see above) without counteracting target 8.1 in the 2030 Agenda to sustain per-capita economic growth.



Some studies suggest that carbon intensity decreases as a country's level of development rises, to the extent that GDP growth can be offset. This would result in a bell-shaped relationship between GDP and emissions – the so-called “environmental Kuznets curve”. So far, research has provided mixed empirical evidence for the validity of this curve (see Stern, 2004; Victor, 2010; Hoffmeister, 2013; Pacini and Silveira, 2014).

Figure 3 Development of carbon dioxide emissions and their determinants, by region
(1990=100)



Source: UNCTAD calculations based on IEA (2018a).

Note: Emissions not caused by fuel combustion are not included. US\$ values are in constant 2010 prices, adjusted to purchasing power parities based on the United States of America. Central and Southern Asia includes developing economies in Oceania.

At the world level real GDP has more than doubled over the last quarter century – from US\$46 trillion in 1990 to US\$109 trillion². This is the result of a 41 per cent increase of the world population (1971: 5.3 billion, 2016: 7.4 billion) and a two thirds increase in real GDP per capita (1990: US\$8 7230, 2016: US\$ 14 703) (see figure 3). Carbon intensity reduced by one third (1990: 445 g/US\$, 2016: 296 g/US\$). Therefore, CO₂ emissions have grown at a slower pace than GDP (see above).

Decreasing carbon intensity cannot offset GDP growth in the less developed regions

Figure 3 highlights that in regions mainly consisting of developing economies, carbon intensity decreased less than in others over the past 26 years. Population growth combined with rising GDP per capita, especially after the turn of the millennium, led to high growth in CO₂ emissions, particularly in Asia. The economies of Eastern and South-Eastern Asia released more than three times as much CO₂ in 2016 as in 1990.

In Europe and Northern America, on average, half the amount of CO₂ was emitted per unit of GDP in 2016 compared with 1990. After 2005,

also the overall amount of CO₂ emissions has been reducing, so that, by 2016, they were by around 15 per cent lower. Between 1990 and 2016, in Australia and New Zealand, carbon intensity decreased by one third, in Eastern and South-Eastern Asia by around one quarter. The reduction in carbon intensity in Eastern and South-Eastern Asia could not compensate for the extraordinary increase in GDP per capita. It has just been sufficient to offset population growth.

As countries are connected by global value chains and trade relations, the observed growth in carbon intensity of GDP in developing regions may be driven by demand for carbon-intensive final products in other regions. In fact, studies based on inter-country input-output tables prepared by OECD (2018) find that demand-based CO₂ emissions of developed economies are generally higher than their production-based emissions, while most developing economies are net-exporters of CO₂ emissions embodied in final products (Wiebe and Yamano, 2016). As environmental policy is more stringent in some regions than in others, companies can save production costs by relocating carbon intensive production processes globally, a process described as “carbon leakage” (Lanzi et al., 2013).

Energy efficiency an important factor in cutting emissions

Fuels are mostly burned to produce energy. For that reason, CO₂ emissions and energy supply are closely interlinked. According to the IEA (2018a), energy-related CO₂ emissions account for 88 per cent of CO₂ emissions globally. Energy is an indispensable input for most processes generating value added in an economy. This means that energy intensity is an important determinant of the carbon intensity of GDP. The other determinant is the carbon intensity of energy supply, as the decomposition below reveals:

$$\left[\frac{CO_2}{GDP} \right] = \left[\frac{Energy}{GDP} \right] \left[\frac{CO_2}{Energy} \right]$$

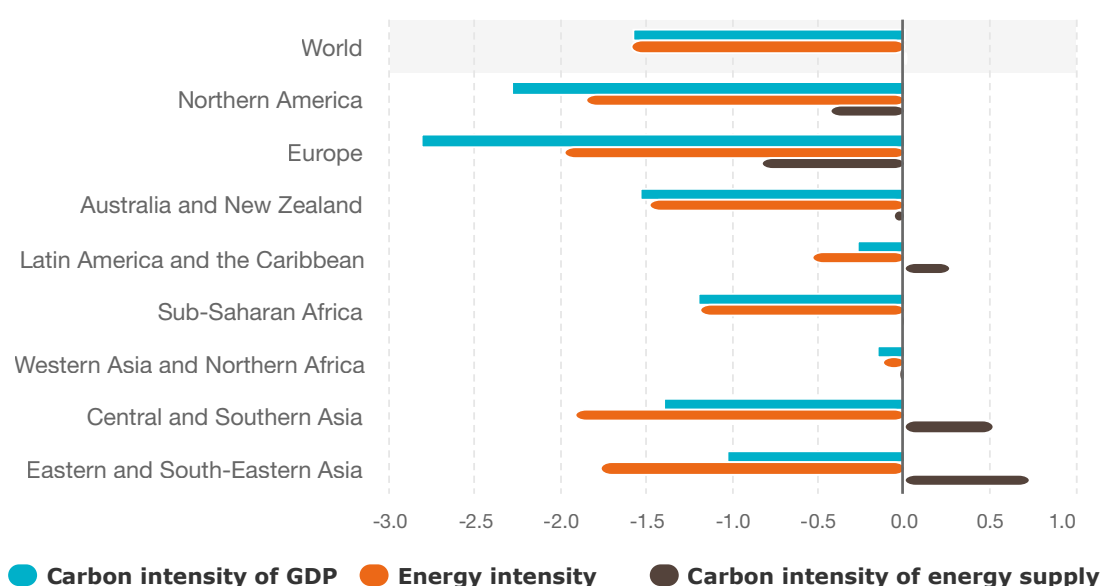
Figure 4 demonstrates the important role of efficient use of energy in reducing the carbon intensity of GDP. From 1990 to 2016, energy intensity reduced on average by 1.6 per cent each year. In Europe (-2.0%), Central and Southern Asia (-1.9%), Northern America (-1.9%) and Eastern and South-Eastern Asia (-1.8%), that rate was close to two per cent. In Central and

Southern and in Eastern and South-Eastern Asia, as well as in Latin America and the Caribbean, diminishing energy intensity has been the sole reason for the observed decrease in carbon intensity of GDP. In the absence of that effect, CO₂ emissions per unit of GDP would have risen, due to increasing carbon intensity of the energy supply. By contrast, in Europe and Northern America, the effect of rising energy efficiency has been complemented by a significant reduction in emissions per unit of supplied energy.

A mixture of positive and negative trends

Climate change is a development issue, demonstrated particularly by the trends in Asia, where CO₂ emissions have dramatically increased in tandem with the rapid growth of GDP per capita. This is a sobering message, considering the urgent need to limit the concentration of greenhouse gases in the atmosphere. At the same time, some statistics give hope: in the most developed regions, CO₂ emissions have been diminishing for more than ten years, despite continuous GDP growth. This provides signs that a decoupling of emissions from the economic development is feasible.

Figure 4 Changes in energy intensity (SDG 7.3.1) and their impacts on carbon intensity, by region, 1990-2016 (Gt of CO₂e)



Source: UNCTAD calculations based on IEA (2018a).

Note: Emissions not caused by fuel combustion are not included. US\$ values are in constant 2010 prices, adjusted to purchasing power parities based on the United States of America. Central and Southern Asia includes developing economies in Oceania.

More effective efforts are needed to reduce CO₂ emissions and other greenhouse gases to limit global warming to below 2°C or even 1.5°C by 2100. As populations and GDP per capita continue growing, a drastic reduction in carbon intensity will be required. Rising energy efficiency is serving as an important means to that end worldwide, the same as cleaner energy generation in Europe and Northern America.

International trade causes particular challenges, as freight transport is a direct source of emissions (see Adapting transport for sustainable development), and free exchange of goods increases the possibilities for carbon leakage. At the same time, international trade can help improve access to new technologies to make local production processes more resource efficient and contribute to a greater capacity for environmental management. Good governance can influence the way in which trade affects the environment: Analyses show that countries having stringent environmental regulations tend to be larger exporters of environmental products (Sauvage, 2014).

Governments can make an important contribution to reducing emissions, not only through trade policy but also more generally by adapting national legal frameworks with a view to applying strict climate policies, generating incentives for emission-free production and consumption and providing tailored support for research and development. Consumers make important choices daily when purchasing goods and services produced and supplied with lower emissions. Finally, also the business sector plays a central role by developing new technologies and achieving higher energy efficiency. As the world will inevitably depend on new green technologies, investments in that area are likely to pay off, and the front-runners will gain the advantage.

Involving the private sector in the sustainable development agenda

Businesses play a critical role to play in promoting human, environmental, economic and institutional development. They support

livelihoods, generate significant domestic and international financial flows, consume natural resources, shape institutions, create positive or negative externalities for other sectors and pave the way for the future through investment in physical capital and research and development. Enterprises are also instrumental in promoting responsible consumption and production practices.



The business sector is identified in the Addis Ababa Action Agenda as a significant player in the financing of sustainable development (United Nations, 2015). Their actions contribute directly or indirectly to the attainment of all SDGs. Nonetheless, the business sector is mostly absent from the SDGs targets and is explicitly mentioned in only one of them: target 12.6, which calls for a greater integration of sustainability information in the regular reporting cycle of firms.

More comprehensive reporting is important for making companies' contribution to the 2030 Agenda visible and for encouraging them to review how their operations affect all stakeholders and assess their direct and indirect impacts on the environment. Sustainability reporting promotes transparency in the business sector and increases business accountability to society.



SDG indicator 12.6.1 aims to measure the number of companies that publish sustainability reports. However, a count of reports may not be enough since reporting practices vary in terms of quality, coverage and comprehensiveness. There are multiple reporting frameworks that need to be aligned so that the concept of sustainability

for businesses and the way to report on it can be agreed. These frameworks include the International Integrated Reporting Council (IIRC, 2013) framework, the Global Reporting Initiative (GRI, 2019) standards, the standards proposed by the Sustainability Accounting Standards Board (SASB, 2018), and the UNCTAD (2018) Guidance on Core Indicators³.

The inclusion of this item in the 2030 Agenda is a unique opportunity to promote sustainability reporting among firms, but especially high-quality, reliable reporting as part of annual reporting cycles. UNCTAD and UNEP, as custodians of SDG indicator 12.6.1, have been actively working in this area. They propose sustainability reports covering four themes: economic, environmental, social and institutional and governance. As a “minimum reporting requirement”, only reports that cover certain elements in a meaningful way will be counted as sustainability reports contributing to the SDG indicator. To further strengthen sustainable practices and accountability, the agencies also identified an “advanced reporting requirement” with more comprehensive reporting rules.

The sustainability reporting framework does

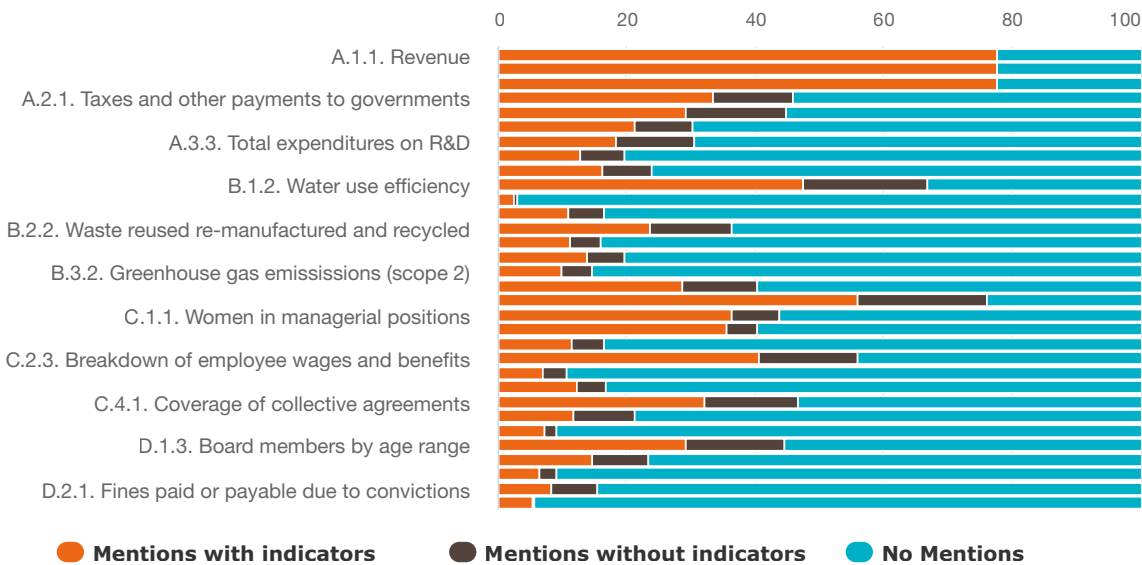
not add a new reporting requirement, instead it suggests a way to reconcile the existing frameworks and identify minimum and advanced reporting levels. UNCTAD and UNEP have also prepared correspondence tables so that firms choosing to report according to different standards can still be assessed against the minimum and advanced requirements relevant for SDG indicator 12.6.1.

Not all disclosure elements apply to every firm, since activities vary by sector and country. To account for this, businesses can apply a “comply-or-explain” approach. This would facilitate reporting, especially for small and medium enterprises. Special rules are also applied to multinational enterprise groups which have operations in several countries, sometimes in different sectors.

Businesses striving to close large gaps in sustainability reporting

UNCTAD regularly convenes a Group of Experts on ISAR to discuss international accounting and reporting standards in order to improve the availability, reliability and comparability of enterprise reporting of financial and non-financial aspects of their performance, and especially to

Figure 5 Compliance with sustainability reporting by UNCTAD Core Indicators (Percentage)



Source: Global AI Corporation with data from United Nations Global Compact (2019) and UNCTAD (2018).

integrate sustainability information into the business reporting cycle.

Although official statistics for SDG 12.6.1 are not yet available, an initial assessment is possible by looking at company sustainability reports published by the United Nations Global Compact and their alignment with the UNCTAD Core Indicators. The UN Global Compact database compiles CoPs reports submitted voluntarily by companies.

In March 2019, the database included 2,894 sustainability reports prepared by companies of different sizes from 111 countries and 41 sectors of economic activity. Although this is a collection of voluntary reports and not representative of the world population of firms, the exercise still provides a first glimpse of current sustainability reporting practices and reveals some tentative regional patterns.

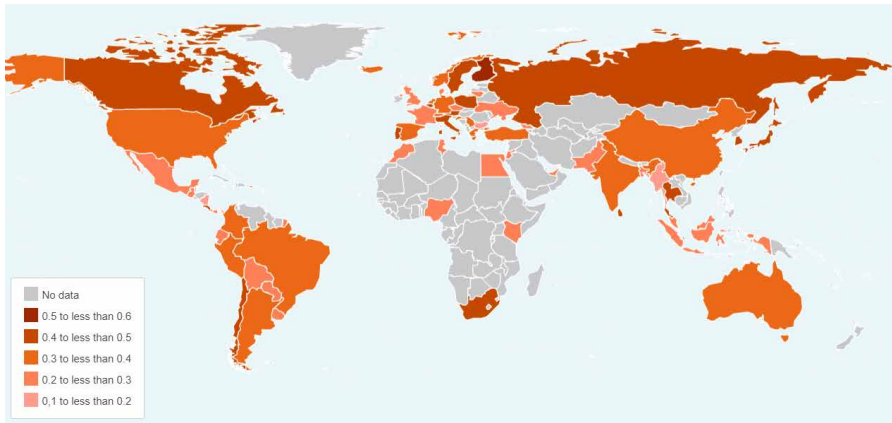
Studying every single report would be time consuming. Instead, machine learning and natural language processing techniques have been used to analyse text syntax structures in the CoPs and identify keywords based on the 33 core elements listed in the UNCTAD Guidance, organised according to the four themes listed above: economic (A), environmental (B), social (C) and institutional (D).⁴ Every report then received a score for each of the indicators: (0) if there was no mention of the indicator; (1) if

the indicator was mentioned but with no quantitative information; or (2) if the report covered the indicator including quantitative information.⁵

Figure 5 shows the estimates from this exercise for 32 UNCTAD Core Indicators. Basic economic outcomes (revenue, value added and net value added) were routinely made available as well as “traditional” resource-related measures of productivity (water use and energy efficiency). Apart from that, there were large gaps in all four themes of sustainability reporting. Some disclosure elements, particularly in the institutional, environmental and social domains, were hardly reported at all. This was the case, for example, for indicators such as water stress (B.1.3), training on anti-corruption issues (D.2.2), compensation of board members (D.1.5), the representation of women as board members (D.1.2) and the expenditure on employee health and safety (C.3.1). It is noteworthy that, whenever an element was included in the report, it was in most cases supported by quantitative indicators. This was evidenced by the few occurrences of brown areas in figure 5.

There are, however, large disparities across countries. Map 2 shows the average compliance rate with sustainability reporting. To obtain country-level figures, the average percentage of elements reported by firms registered in the different countries was calculated, including

Map 2 Compliance with sustainability reporting, country averages, March 2019
(Percentage)



Source: Global AI Corporation with data from United Nations Global Compact (2019) and UNCTAD (2018).
Note: Countries with less than five reports available in the United Nations Global Compact database were excluded.

elements reported with and without indicators. For example, a value of 50 per cent for country A means that firms from country A mentioned in their reports, on average, half of the elements included in the Guidance.



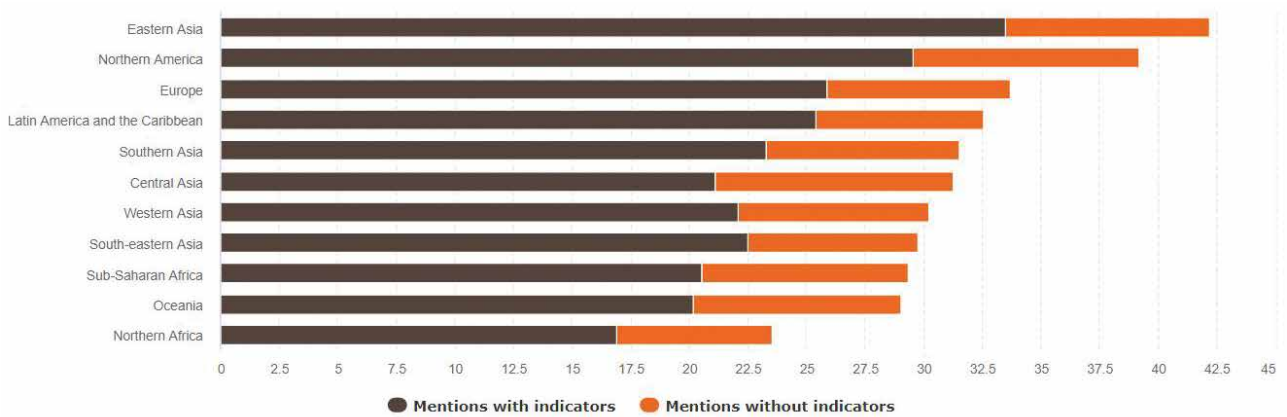
Countries like Costa Rica, the Russian Federation, the Republic of Korea, Finland and Chile had the highest rates of reporting compliance with the UNCTAD Guidance. However, in no country did the average rate of compliance reach 50 per cent. Large gaps in reporting in some regions were evident, especially in Africa, the Middle East and Central Asia, for which few or no reports were

available in the database.

Figure 6 aggregates this information by region. The results should be interpreted with caution, however, due to the large gaps in some regions. Still, they can be taken as an indication of the regional differences in voluntary reporting. Apparently, in certain regions, such as Eastern Asia and Northern America, firms demonstrate a higher compliance with the UNCTAD Guidance than in others.

All in all, the 2030 Agenda has increased sustainability reporting among businesses and led to closer engagement of international organizations and businesses to develop a commonly agreed and harmonized set of indicators. The coming years will show if sustainability reporting will be used by an increasing number of firms to demonstrate commitment to sustainable development.

Figure 6 Compliance with sustainability reporting, regional averages (Percentage)



Source: Global AI Corporation with data from United Nations Global Compact (2019) and UNCTAD (2018).

Notes

- 1 The Paris Agreement sets up a five-year cycle of updates and specifies that in 2020 nations should revise their pledges for 2030, increasing ambition if possible.
- 2 In constant 2010 prices adjusted to purchasing power parity based on the United States of America.
- 3 The Guidance on Core Indicators, developed by UNCTAD upon request by the 34th session of the Intergovernmental Working Group of Experts on ISAR, lists the main elements for entity reporting to monitor company-level contributions towards SDGs (UNCTAD, 2018).
- 4 Additional complexity is caused by the fact that the CoPs are reported in over 20 different languages and in different formats. Therefore, the algorithms use multiple data cleaning, noise reduction, image recognition and filtering methods to better identify relevant content for each indicator.
- 5 The calculations were performed by Global AI Corporation, based mainly on CoPs available in United Nations Global Compact. However, some reports were obtained directly from companies' websites, and other sources were used in some cases for additional data on revenue, value added and net value added.

References

GRI (2019). About sustainability reporting. Available at <https://www.globalreporting.org/information/sustainability-reporting/Pages/default.aspx> (accessed 19 April 2019).

Hoffmeister, O. (2013). Europäische Umweltpolitik im Zeichen der Finanz- und Wirtschaftskrise. *Umweltökonomische Probleme in Gesellschaft und Betrieb*. Merseburger Schriften zur Unternehmensführung (14):17–33.

IEA (2018a). CO₂ Emissions from Fuel Combustion 2018. Available at https://doi.org/10.1787/co2_fuel-2018-en. (accessed 1 June 2019).

IEA (2018b). *World Energy Outlook*.

IIRC (2013). The international <IR> framework. Available at <http://integratedreporting.org/resource/international-ir-framework/> (accessed 4 June 2019).

IPCC (2014). *Climate Change 2014, Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report (5AR) of the Intergovernmental Panel on Climate Change*. IPCC.

IPCC (2018). Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Available at <https://www.ipcc.ch/sr15>.

Lanzi E., Damian M., Chateau J. and Dellink R. (2013). *Addressing Competitiveness and Carbon Leakage Impacts Arising from Multiple Carbon Markets: A Modelling Assessment*. OECD Environmental Working Papers, No. 58. OECD Publishing.

Netherlands PBL (2018). *Trends in Global CO₂ and Total Greenhouse Gas Emissions: 2018 Report*. PBL Netherlands Environmental Assessment Agency.

OECD (2019). Glossary of statistical terms. Available at <https://stats.oecd.org/glossary/index.htm> (accessed 19 April 2019).

Pacini, H. and Silveira, S. (2014). Carbon Intensities of Economies from the Perspective of Learning Curves. *Challenges in Sustainability*.

SASB (2018). SASB standards application guidance. itemKey/Z5Y7LCYD. Available at <https://www.sasb.org/company-use/key-resources-for-companies/> (accessed 4 June 2019).

Sauvage, J. (2014). *The Stringency of Environmental Regulations and Trade in Environmental Goods*. OECD Trade and Environment Working Papers, No. 2014/03. OECD Publishing. Paris.

- Stern, D.I. (2004). *The Rise and Fall of the Environmental Kuznets Curve*. World Development. 32(8):1419–1439.
- UNCTAD (2013). Best practice guidance for policymakers and stock exchanges on sustainability reporting initiatives. TD/B/C.II/ISAR/67. Geneva. 28 August.
- UNCTAD (2017). Enhancing comparability of sustainability reporting: Selection of core indicators for company reporting on the contribution towards the attainment of the Sustainable Development Goals. TD/B/C.II/ISAR/81. Geneva. 11 September.
- UNCTAD (2018). *Guidance on Core Indicators for Entity Reporting on the Contribution Towards the Attainment of the Sustainable Development Goals*. United Nations publication. Sales No. E.19.II.D.11.
- UNCTAD (2019). UNCTADStat. See <https://unctadstat.unctad.org/> (accessed 10 April 2019).
- UNEP (2018). *Emissions Gap Report 2018*. UNEP. Nairobi.
- UNFCCC (2016). Paris Agreement. FCCC/CP/2015/10/Add.1. Paris. 29 January.
- United Nations (2015). Report of the third international conference on financing for development. A/CONF.227/20. Addis Ababa. 3 August.
- United Nations Global Compact (2013). UN Global Compact policy on communicating progress. Available at <https://www.unglobalcompact.org/library/1851> (accessed 6 March 2019).
- United Nations Global Compact (2019). See <https://www.unglobalcompact.org> (accessed 6 March 2019).
- Victor, P. A. (2010). Ecological Economics and Economic Growth, Annals of the New York Academy of Sciences. *Annals of the New York Academy of Sciences*. (1185):237–245.
- Wiebe, K. S. and N. Yamano (2016). *Estimating CO₂ Emissions Embodied in Final Demand and Trade Using the OECD ICIO 2015: Methodology and Results*. OECD Science, Technology and Industry Working Papers, No. 2016/5. OECD Publishing. Paris.
- WMO (2019). Greenhouse gases. Available at <https://public.wmo.int/en/our-mandate/focus-areas/environment/greenhouse%20gases> (accessed 11 June 2019).
- OECD (2018). Inter-Country Input-Output (ICIO) Tables. Available at <https://www.oecd.org/sti/ind/inter-country-input-output-tables.htm> (accessed 18 June 2019).

UNCTAD IN ACTION

UNCTAD technical cooperation in support of SDGs



UNCTAD technical cooperation in support of SDGs

One of the many ways by which UNCTAD contributes to implementing the 2030 Agenda and achieving the SDGs is through technical cooperation. UNCTAD's technical cooperation projects are delivered at an interregional, regional and country level (see figure 1).

UNCTAD gears its technical cooperation towards contributing to the achievement of the 2030 Agenda. The UNCTAD Toolbox (UNCTAD, 2015) has been developed to better align technical cooperation with the SDGs.

The UNCTAD toolbox currently features 28 technical cooperation projects, categorized into four overarching

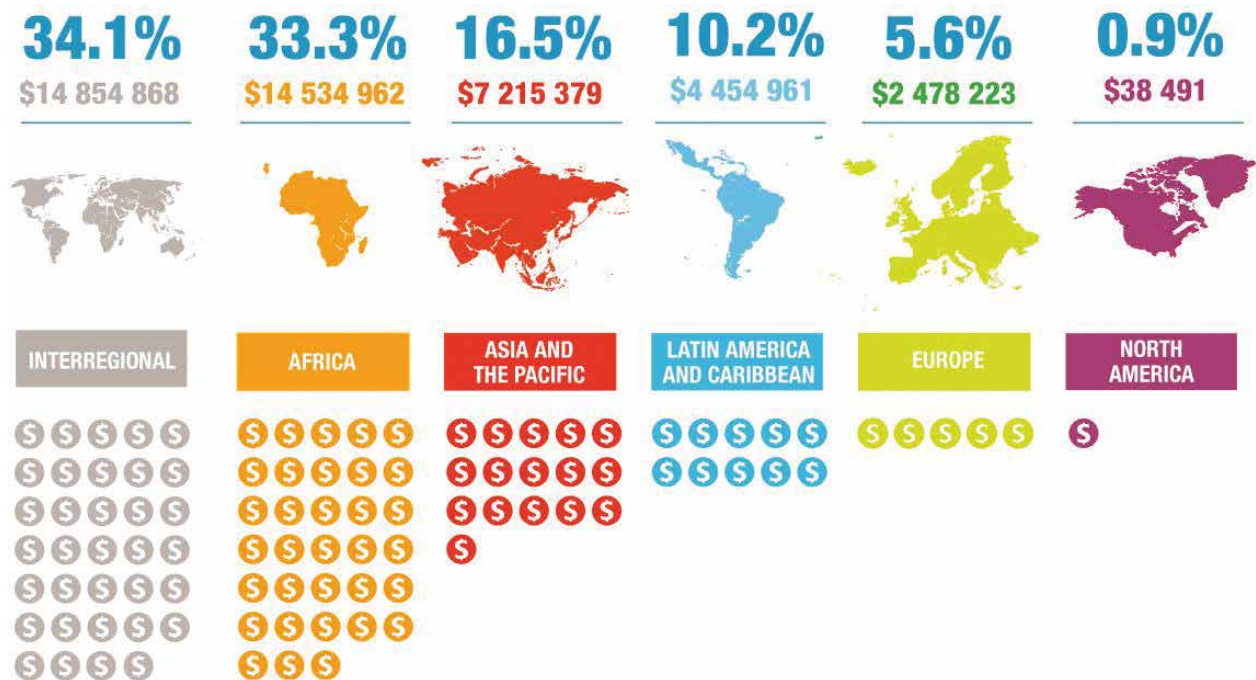
themes. In 2018, 249 projects, accounting for US\$43.7 million were undertaken (see table 1).

UNCTAD technical cooperation expenditure has been mapped to the SDGs, allowing readers to understand how each theme contributes to each SDG. Activities are also cross-classified by region to see where technical cooperation expenditure by SDG has occurred (see tables 2 and 3).

This year's edition of the SDG Pulse features three case studies, providing a more detailed overview of some of UNCTAD's technical capacity projects. The products featured are: TrainForTrade, DMFAS and EMPRETEC training programme for entrepreneurs.¹ Together these products account for approximately 14 per cent of total technical capacity expenditure in 2018. The case studies presented provide results-based management type statistics, illustrating both the activities of these programmes and their impacts in support of sustainable development.

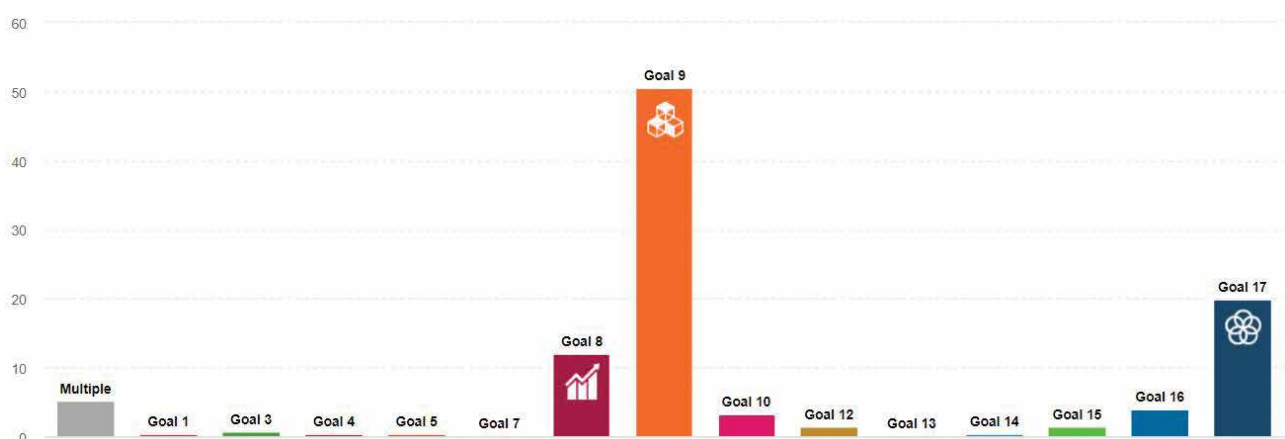


Figure 1 Distribution of project expenditures by region, 2018



Source: UNCTAD (2019).

Figure 2 Percentage distribution of project expenditures by SDG, 2018
(In percentage of total expenditure)



Source: UNCTAD (forthcoming).

Table 1 UNCTAD technical cooperation, by theme and product

<i>Cluster</i>	<i>Theme</i>	<i>Product</i>	<i>SDGs</i>
A Transforming economies, fostering sustainable development			
VII	A1	Investment policy reviews	8, 17
I	A2	Services policy reviews	8, 9
I	A3	Trade policy framework reviews	17
XIV	A4	Science, technology and innovation policy reviews	9
XIII	A5	E-commerce and the digital economy	8, 9, 17
VIII	A6	Investment guides	9, 17
II	A7	Non-tariff measures	8, 17
I	A9	Trade negotiations	10
III	A10	Sustainable Trade and the Environment	8, 17
VIII	A11	Investment Promotion and Facilitation	9, 17
All	A99	Other	
B Tackling vulnerabilities, building resilience			
XVI	B1	Support to graduation from least developed country status	8
XI	B2	DMFAS - Debt Management and Financial Analysis System	17
XVII	B4	UNCTAD contribution to the Enhanced Integrated Framework	9, 17
XVII	B5	Market Access, Rules of Origin and Geographical Indications for the Least Developed Countries	8, 10, 17
V	B6	Breaking the Chains of Commodity Dependence	8, 9
XII	B9	Sustainable and Resilient Transport	8, 9
All	B99	Other	
C Fostering economic efficiency, improving governance			
IV	C1	Voluntary Peer Reviews of Competition and Consumer Protection Laws and Policies	8, 10
VIII	C2	Business Facilitation	8, 16
XII	C3	Trade Facilitation	10, 16
XII	C4	ASYCUDA Automated System for Customs Data	9
X	C5	Statistics	17
IX	C7	Corporate accounting and reporting	12, 17
VI	C8	Investment and Public Health	3, 9
VII	C9	International Investment Agreements	17
IV	C10	Competition and Consumer Protection Policies and Frameworks	8, 10
All	C99	Other	
D Empowering people, investing in their future			
II	D1	Trade, Gender and Development	5, 8
IX	D3	Entrepreneurship Development	4, 8
XIV	D6	TrainForTrade	8, 9
All	D99	Other	
All	E	Other	

Source: UNCTAD (forthcoming).

Table 2 Technical cooperation expenditure by theme, product and SDG, 2018

Theme	Product	Multiple	1	3	4	5	7	8	9	10	12	13	14	15	16	17	Total
US\$ thousands																	
A	Transforming economies, fostering sustainable development	250	31	-	10	-	40	2 506	353	273	5	109	44	341	27	912	4 900
B	Tackling vulnerabilities, building resilience	396	117	-	-	-	-	322	248	-	-	-	90	-	27	5 740	6 941
C	Fostering economic efficiency, improving governance	-	-	286	-	-	17	1 989	20 894	1 162	590	-	-	264	1 651	1 940	28 793
D	Empowering people, investing in their future	-	14	-	175	194	-	433	604	-	-	-	-	-	-	69	1 489
E	Others	1 610	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1 610
		2 257	162	286	185	194	57	5 250	22 099	1 435	595	109	134	605	1 705	8 660	43 733
Percentage																	
A	Transforming economies, fostering sustainable development	0.6	0.1	-	0.0	-	0.1	5.7	0.8	0.6	0.0	0.2	0.1	0.8	0.1	2.1	11.2
B	Tackling vulnerabilities, building resilience	0.9	0.3	0.0	-	-	-	0.7	0.6	-	-	-	0.2	-	0.1	13.1	15.9
C	Fostering economic efficiency, improving governance	-	-	0.7	-	-	0.04	4.5	47.8	2.7	1.3	-	-	0.6	3.8	4.4	65.8
D	Empowering people, investing in their future	0.0	0.03	-	0.4	0.4	-	1.0	1.4	-	-	-	-	-	-	0.2	3.4
E	Others	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.7
		5.2	0.4	0.7	0.4	0.4	0.1	12.0	50.5	3.3	1.4	0.2	0.3	1.4	3.9	19.8	100.0

Source: UNCTAD (forthcoming).

Notes: "Multiple" means that some technical cooperation cannot be mapped to a single SDG.

Table 3 Technical cooperation expenditure by region and SDG, 2018

Region	Multiple	1	3	4	5	7	8	9	10	12	13	14	15	16	17	Total
US\$ thousands																
Africa	362	-	7	140	48	-	1 814	8 186	460	142	51	-	-	924	2 441	14 575
Asia & Pacific	-	144	-	12	46	-	618	5 752	66	4	-	90	-	268	805	7 802
Latin America & Caribbean	-	-	-	-	-	-	329	3 402	89	81	-	44	-	118	430	4 493
Europe	-	-	-	-	-	-	34	2 364	7	-	-	-	-	27	44	2 476
North America	-	-	-	-	-	-	-	38	-	-	-	-	-	-	-	38
Interregional	1 895	17	279	33	100	57	2 457	2 357	814	369	57	-	605	369	4 940	14 348
Total	2 257	162	286	185	194	57	5 250	22 099	1 435	595	109	134	605	1 705	8 660	43 733
Percentage																
Africa	0.8	-	0.02	0.3	0.1	-	4.1	18.7	1.1	0.3	0.1	-	-	2.1	5.6	33.3
Asia & Pacific	-	0.3	-	0.03	0.1	-	1.4	13.2	0.2	0.0	-	0.2	-	0.6	1.8	17.8
Latin America & Caribbean	-	-	-	-	-	-	0.8	7.8	0.2	0.2	-	0.1	-	0.3	1.0	10.3
Europe	-	-	-	-	-	-	0.1	5.4	0.0	-	-	-	-	0.1	0.1	5.7
North America	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	0.1
Interregional	4.3	0.04	0.6	0.1	0.2	0.1	5.6	5.4	1.9	0.8	0.1	-	1.4	0.8	11.3	32.8
Total	5.2	0.4	0.7	0.4	0.4	0.1	12.0	50.5	3.3	1.4	0.2	0.3	1.4	3.9	19.8	100.0

Source: UNCTAD (forthcoming).

Notes: "Multiple" means that some technical cooperation cannot be mapped to a single SDG.

Table 4 Technical cooperation expenditure by theme, product and region, 2018

Theme	Product	SDGs	Africa	Asia & Pacific	Latin America & Caribbean	Europe	North America	Inter Regional	Total
US\$ thousands									
A	Transforming economies, fostering sustainable development	8, 9, 10, 17	938	499	151	-	-	3 312	4 900
B	Tackling vulnerabilities, building resilience	8, 9, 10, 17	2 007	905	463	44	-	3 523	6 941
C	Fostering economic efficiency, improving governance	3, 8, 9, 10, 12, 16, 17	11 254	6 220	3 842	2 432	38	5 006	28 793
D	Empowering people, investing in their future	4, 5, 8	377	178	38	-	-	897	1 489
E	Other		-	-	-	-	-	1 610	1 610
Total			14 575	7 802	4 493	2 476	38	14 348	43 733
Percentage									
A	Transforming economies, fostering sustainable development	8, 9, 10, 17	2.1	1.1	0.3	-	-	7.6	11.2
B	Tackling vulnerabilities, building resilience	8, 9, 10, 17	4.6	2.1	1.1	0.1	-	8.1	15.9
C	Fostering economic efficiency, improving governance	3, 8, 9, 10, 12, 16, 17	25.7	14.2	8.8	5.6	0.1	11.4	65.8
D	Empowering people, investing in their future	4, 5, 8	0.9	0.4	0.1	-	-	2.1	3.4
E	Other		-	-	-	-	-	3.7	3.7
Total			33.3	17.8	10.3	5.7	0.1	32.8	100.0

Source: UNCTAD (forthcoming).

Notes

- 1 TrainForTrade and DMFAS map to product D6 and B2 of table 1. Empretec is part of product D3.

References

UNCTAD (forthcoming). Review of the technical cooperation activities of UNCTAD and their

financing. Report by the Secretary-General of UNCTAD. Annex II: Statistical table.

UNCTAD (2015). UNCTAD Toolbox: Delivering results. UNCTAD/TC/2015/1/iPub. Available at <https://unctad.org/en/Pages/TC/TC-Products-in-the-Toolbox.aspx> (accessed 7 June 2019).

UNCTAD (2019). *UNCTAD Annual Report 2018*. UNCTAD/DOM/2019. Geneva.

IN FOCUS: INEQUALITY

The many faces of inequality

MIND THE GAP

The many faces of inequality

This chapter provides some discussion and analyses on a few of the many dimensions of inequality that exist. The chapter begins by outlining some of the typical approaches to measuring inequality before discussing inequality from the specific context of the 2030 Agenda. Some analyses are then presented for global economic and income inequality. Further analyses are presented regarding gender inequalities in the field of international trade and access to banking. The chapter concludes by highlighting an emerging but very important dimension of inequality – access to data and information.

Reducing inequality

Inequality, and how it affects economies and societies, is a growing concern shared by politicians, economists and the global community. There is an emerging consensus that existing levels of inequality are not only morally unacceptable, but also economically and politically damaging and corrosive (Deaton, 2013; UNCTAD, 2013, 2014; Stiglitz, 2012).

Hence the growing interest in trying to assess whether globalization and the emergence of new technologies have exacerbated or improved the situation. Inequality has implications far beyond simple economic development, as it is recognized that it can be damaging to society, even threatening peace and security. Resentment over injustice, unequal access to public goods or social services, or political or social exclusion may all trigger unrest, hostility and violence (Brinkman et al., 2013). From a social justice perspective, discrimination of civil or political rights, of race, ethnicity, language, religion or of legal, political, social freedoms are all sources of inequality. The International Bill of Rights (United Nations

and OHCHR, 2003), composed of the 1948 Universal Declaration on Human Rights; the 1966 International Covenant on Economic, Social and Cultural Rights and the 1966 International Covenant on Civil and Political Rights reaffirm the fundamental equality of all human beings. An issue that is also addressed in this chapter is unequal access to data – ‘Unequal access to knowledge and information leads to inequities in the uptake of social protection’ (Roelen et al., 2016, p. 235).

For this reason, the 2030 Agenda, and specifically SDG 10, sets out to reduce inequality within and among countries. In addition to Goal 10, the ambition to reduce inequality is also evident in several other goals. For example, some targets within SDG 4 (equal access to education) and all SDG 5 (gender equality) targets are essentially focusing on inequality. Furthermore, the Global SDG Indicator Framework requires that many of the SDG indicators are disaggregated by sex, age groups, urban/rural or persons with disabilities, thus implicitly targeting inequality.

Definitions of inequality typically refer to an absence of equal dignity, status, rank, privileges, rights or opportunities with others. They often also refer to lack of equal chance and rights to seek success in one’s chosen sphere regardless of social factors such as class, race, religion and sex. Inequality is often a complex amalgam of social, political and economic factors. Goal 10 reflects this broad spectrum, setting a series of targets promoting income growth, social and economic inclusion, equal opportunity, wage and social protection, improved financial regulation, safe migration of people and an improved representation for developing countries in decision-making and global international institutions.

Furthermore, Target 10.2¹ explicitly demands equality irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status.

Measuring inequality

Measuring inequality is typically done by placing specific values along a specific distribution in order to facilitate comparisons with different distributions. While most measures of inequality achieve this to some extent or other, all measures or indices have strengths and weaknesses. For a more detailed discussion, see Deaton (2004) and Milanović (2012). No single measure satisfies all desirable properties, and so the choice of one measure over another involves trade-offs as many of the measurement instruments are not without limitations, problems and biases.² This section outlines some of the indices available and describes briefly their strengths and weaknesses. None can be considered superior, as all are useful given certain contexts. A well-balanced analysis of inequality should look at several measures (United Nations, 2015).

Inequality is often measured using indices. Both the Atkinson's index³ and the Schultz (Hoover)⁴ index are popular measures. However, perhaps best known of the indices is the Gini index. Named after Italian statistician Corrado Gini, the Gini index or coefficient is a measure of statistical dispersion used to determine inequality among values of a frequency distribution. It can be used to measure the inequality of any distribution. A Gini index of 1 indicates perfect inequality, and 0 (zero) indicates perfect equality. It is a widely used indicator of income inequality or wealth concentration within an economy or society. It indicates how far the distribution of income among individuals (or households) deviates from a perfectly egalitarian distribution.⁵ The Gini index is not a perfect measure of inequality, however. It has been criticized for being more sensitive to movements or changes in the middle of the distribution, rather than the tails where the focus should be placed. It has also been criticized for being difficult to interpret as very different income distributions can have the same Gini index.

Inequality can also be expressed in ratio form. The decile dispersion ratio (or inter-decile ratio)⁶ or the 20/20 ratio⁷ are ratios in common use. Perhaps the best known of the inequality ratios is the Palma ratio of inequality, proposed by Alex Cobham and Andy Sumner (2013). It is based on the proposition by Jose Gabriel Palma that changes in income inequality are almost exclusively due to changes in the share of the richest 10 per cent and poorest 40 per cent. It is the ratio of household incomes of the two tails of an income distribution and it compares the income inequality between the two groups. This index is defined as the ratio of average income per capita of the richest 10 per cent of households to that of the poorest 40 per cent.⁸ The Palma ratio too has its critics, who argue that an increase in the bottom share and an even greater increase at the top would raise the index, despite the poor being better off (Murawski, 2013).

Inequality can also be measured using a variety of statistical units. The various indices and ratios can be calculated at the individual, household, regional, national or even global level. Inequality can also be expressed as within or between comparators. For example, it is not unusual to examine inequality within countries but also between countries.

Measuring inequality in the SDGs

Setting a goal for inequality is conceptually complex as there are many types of inequality and there are many and varied perspectives on inequality as a social and economic problem. Furthermore, there is no consensus among economists as to what level of inequality is acceptable or tolerated (Fukuda-Parr, 2019). This will most likely change from society to society, from culture to culture. Although there is an emerging consensus that inequality is damaging, there remains a counter perspective that 'inequality is not always bad. Progress depends on it since society never moves in lockstep' (Pilling, 2018, p. 117).

Although quite contested during the 2030 Agenda negotiations, inequality was finally recognised as being sufficiently important to deserve a full goal

(10). Curiously however, none of the goal 10 targets actually addresses economic, income or wealth inequality directly. Target 10.3⁹, for instance, looks at equality of opportunities by proposing a measure of personally felt discrimination, but there is no data yet. Hence, the IAEG-SDG adopted growth rates of household expenditure or income per capita among the bottom 40 per cent of the population and the proportion of people living below 50 per cent of national median income as the indicator for targets 10.1 and 10.2 respectively. Fukuda-Parr (2019) and Adams and Judd (2019) have highlighted this issue, asking what are the policy questions being addressed by the targets in Goal 10.

Target 10.4¹⁰, measured by the labour share of GDP¹¹, provides information on the relative share of GDP accruing to workers relative to the share accruing to capital. In 2018, the simple average of labour share in GDP was 53.3 per cent for developed economies, down slightly from 54.3 per cent in 2000. In developing economies, the share fell from 49.8 per cent in 2000 to 33.9 per cent in 2014, when it resumed growth, increasing to 47 per cent in 2018 (United Nations, 2019). To analyse the underlying inequalities, more disaggregated data are required. A more detailed analysis by Schweltnus et al. (2018) found that technological change and greater global value chain participation have reduced labour shares, including by strengthening “winner-takes-most” dynamics among businesses. But this capital-labour substitution has been less pronounced for high-skilled workers, suggesting that policies that raise human capital through education and training will be crucial for better equality and broader sharing of productivity gains.

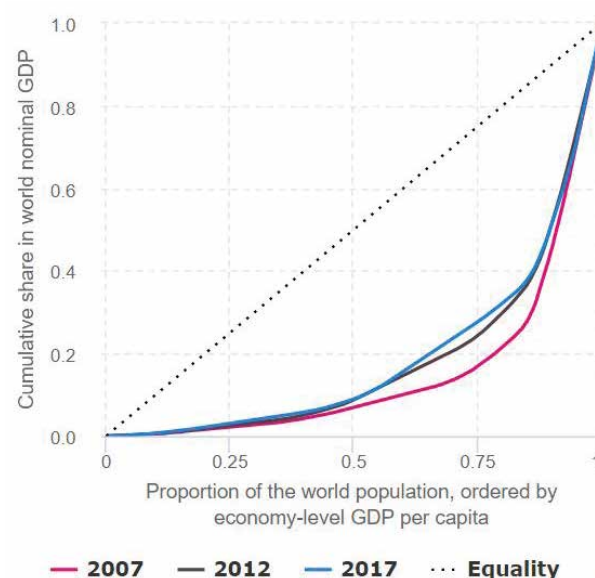
Global economic inequality

Trying to assess whether global inequality is increasing or decreasing is not a straightforward task. There are myriad forms of inequality. Measuring each type may yield a different answer. If the aim is to determine whether economic inequality is improving or not, then some internationally comparable measures must be agreed upon. These measures must facilitate both

spatial and temporal comparison.

Figure 1 shows that over the last 10 years, the global distribution of GDP per capita has become more equal. For example, in 2007, the poorest economies, accounting for 80 per cent of the world’s population, contributed 22 per cent to world GDP. By 2017, their share of GDP rose to 32 per cent. Between 2012 and 2017, however, inequalities in GDP per capita reduced mainly among economies with moderately high income. The relative distance between the richest and poorest economies in the world remained almost unchanged.

Figure 1 Distribution of world GDP, 2007-2017 (Percentage)



Source: UNCTAD (2018a).

Note: Inequality within economies is not considered.

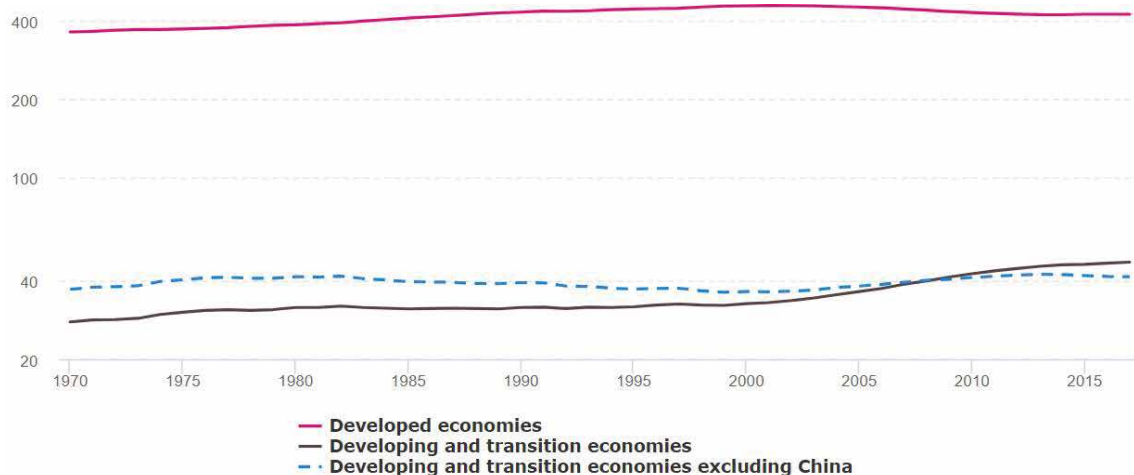
Figure 2.a presents a comparison of GDP per capita at constant (2010) prices over a longer time horizon. Here, the contribution of developing¹² and developed economies is benchmarked against a baseline of average world per capita GDP. From this narrow perspective, inequality between developing and developed countries increased steadily between 1970 and 2001, when global economic inequality peaked. This inequality has been driven mainly by changes in GDP per capita of the developed countries. Since 2001 and until 2014, economic inequality between developed and developing countries fell back to levels experienced in the mid 1980’s.

Global economic inequality fell throughout the period of the MDGs. Since 2015 that trend has slowed, almost to a halt.

Figure 2.a also illustrates that the fall in economic inequality slowed very considerably around 2015. This pattern is more pronounced if mainland China is excluded. In fact, when China is excluded, the recent trend reverses and economic inequality after 2015 begins to increase again markedly and consistently.

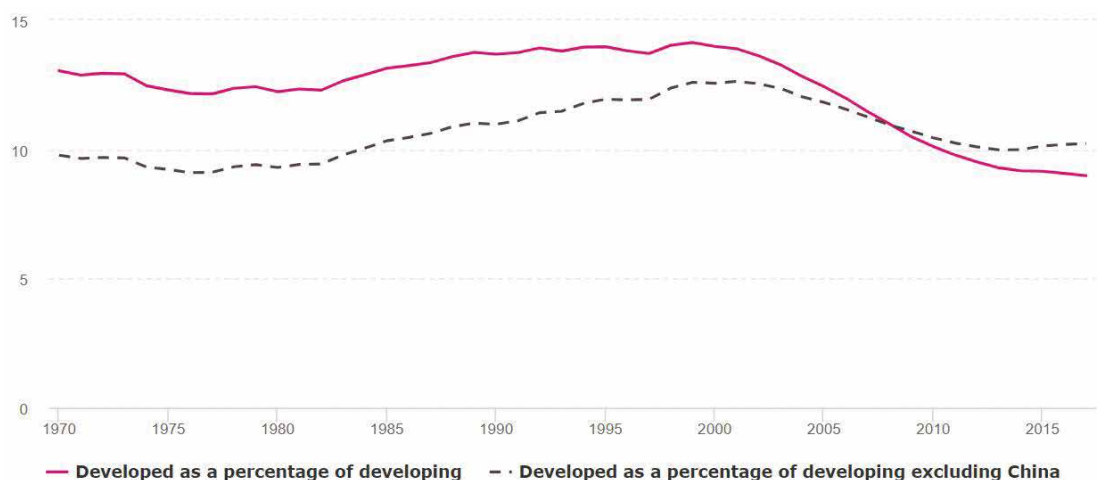
Figure 2.b illustrates the same analysis from a slightly different perspective. GDP per capita in developed economies was between 12 and 13 times higher than that of developing economies in the 1970's and 1980's. This ratio rose to 14 times, peaking around the turn of the century, before falling since. In this analysis, the rate of convergence between developed and developing economies has slowed quite considerably since 2014 but has not been arrested. Developments in China had a significant impact on these developments. Excluding China, the ratio between per capita GDP for developed and developing economies was about 10:1 in the early 1970's. Economic inequality reduced to roughly 9:1 in the mid

Figure 2a Real GDP per capita relative to world average, by development status, 1970-2017
(Percentage of world average)



Source: UNCTAD calculations, based on UNCTAD (2019).
Note: Real GDP is measured in constant prices of 2010.

Figure 2b Real GDP of developed relative to developing economies, 1970-2017
(Percentage)



Source: UNCTAD calculations, based on UNCTAD (2019).
Note: Real GDP is measured in constant prices of 2010.

1970's but then began to increase quite steadily until 1999. Thereafter, per capita GDP converged between developed and developing economies excluding China until 2015. Since then economic inequality between the developed and developing economies excluding China has begun to very slowly rise again.

Global income inequality

“Intellectual and political debate about the distribution of wealth has long been based on an abundance of prejudice and a paucity of fact”.

– Piketty (2014)

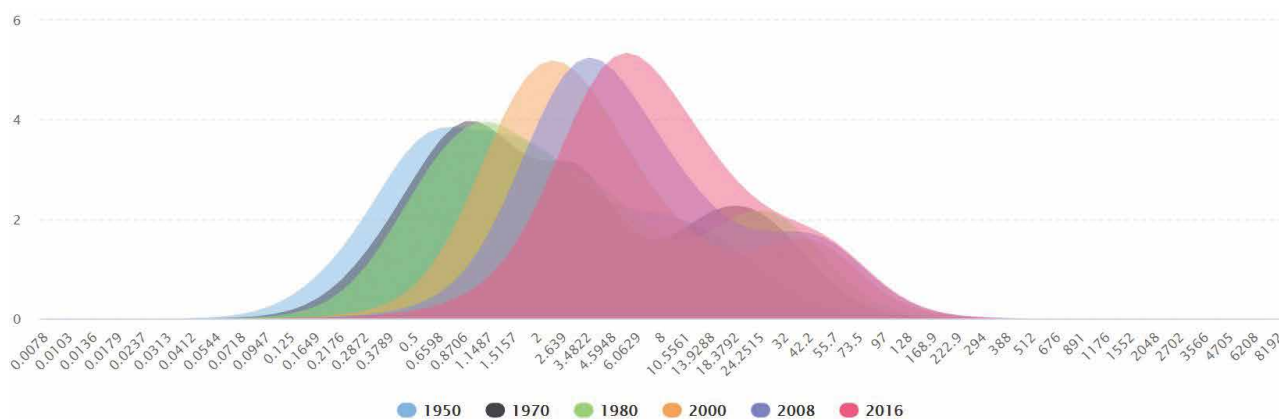
Considering the prominence of inequality in economic debate at the moment, it is surprising how difficult it was to source and assemble the data presented in figure 3. No globally comparable data exist. Figure 3 below has been assembled carefully from a variety of data sources, but only by making several assumptions, including for example, log normal distributions. Hence the continued importance of GDP per capita for historic international comparisons of inequality – it is one of the only comparable time series that exist (and it should be noted that global GDP estimates are not free of problems). Lakner and Milanovic (2016) have highlighted the need for a globally comparable income survey.

Figure 3 shows how the income distribution has shifted steadily to the right between 1950 and 2016, illustrating a general improvement in global income. But the evolution of the global income distribution over the past 66 years or so has not been linear. A striking feature of figure 3 is the disappearance of the distinctive camel shaped, two peaked, distribution of the 1970's and 1980's that begins to merge back into a single peaked distribution from 2000. The 1980 distribution had two peaks, one centred close to PPP US\$1 per day and another close to PPP US\$30 per day. By 2008, the second peak had begun to flatten, with the distribution centring around PPP US\$4.6 per day, had broadened to include more of the population.

During this period a very large, richer minority emerges, reflecting incomes in the advanced economies of the world pulling further away from the rest. By the turn of the century this extreme divide is less evident, but nevertheless still persists. By 2016, the LHS of the distribution has flattened, pulling more of the population towards the centre of the distribution, and suggesting greater equity. Nevertheless, the steeper RHS still shows a large minority with relatively high incomes, signifying persistent global income inequality.

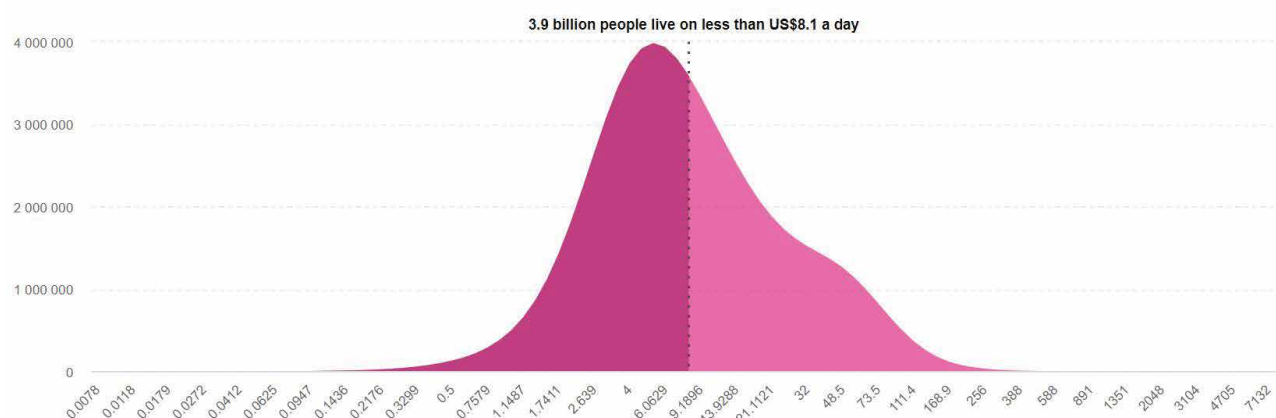
Today, the top percentile (top 1 per cent of the population, accounting for approximately 76 million people) live on an average income of US\$172 per day. In contrast, the poorest 50

Figure 3 Global income distribution, 1950-2016
(Proportion of global population at given level of income, per day, in US\$ at 2011 PPP)



Source: UNCTAD calculations based on van Zanden et al. (2014), Lakner and Milanovic (2016) and Gapminder (2015).

Figure 4 Global income distribution, 2016
(Proportion of global population at given level of income, per day, in US\$ at 2011 PPP)



Source: UNCTAD calculations based on van Zanden et al. (2014), Lakner and Milanovic (2016) and Gapminder (2015).

Note: Living wage for developing countries derived by secretariat data sourced from Global Living Wage Coalition (2019).

per cent of the population (approximately 3.8 billion people) live on an average income of only US\$4 a day. Comparing 2016 with 1950, the average income of the bottom 50 per cent of the population, slightly more than doubled, from PPP US\$1.75 to 3.85. For the top 1 per cent, average income trebled, from PPP US\$57 to 172.

In recent years, the idea of a living wage has gained some prominence. The Global Living Wage Coalition have published living wages for several developing countries.¹³ By taking an average of these living wages¹⁴, weighted by country population, an average living wage of US\$8.1 per day for developing countries is calculated. While this is a crude measure, it provides a threshold with which we can divide the global income distribution (see figure 4).

Figure 4 shows that 3.9 billion people or 52 per cent of the world's population lived below the average living wage for developing countries or US\$8.1 a day in 2016.

The top 1% of the world's population have an average income of \$172 per day



The bottom 50% live on less than \$4



Inequality in gender and international trade

While many countries, businesses and socio-economic groups have reaped gains from international trade, billions have been marginalized or excluded. Trade reforms may have contributed to reducing income inequality between countries, but at times these measures have also coincided with widening income inequality within countries. Context-specific factors influence the impact trade has on inequality. For instance, trade affects women and men differently depending on existing gender disparities in production and consumption, through labour market structures, and disparities in access to resources and opportunities (UNCTAD, 2014).

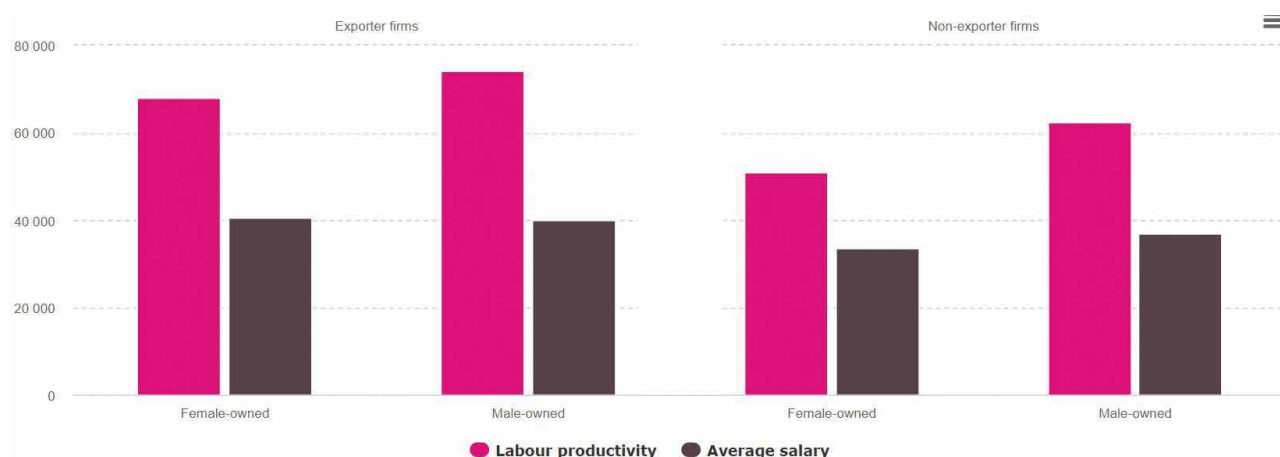
UNCTAD (2018b) has proposed a conceptual framework to measure the gender and trade nexus within official statistics. Subsequently, in 2019, Statistics Finland carried out the first ever study on gender and trade by linking statistical micro-data from various business and social surveys and registers. This study suggests that the benefits from international trade are not distributed equally between women and men in Finland (Lindroos et al., 2019). In 2016, only 18 per cent of entrepreneurs in exporting firms were women, and women accounted for 27 per cent of the labour input of exporting firms on an FTE basis.¹⁵

While trading enterprises are, on average, more productive and generally pay higher salaries compared with other firms in Finland, they employ less women and have a higher gender wage gap. The results show that female business owners hire more women and more highly skilled women than male business owners. Productivity is higher in male-owned exporting firms but wages are higher in female-owned exporting firms (see figure 5). These preliminary results suggest that lower female participation in international trade may also exacerbate differences in capital and salary incomes between women and men.

The 2030 Agenda includes several targets relating to inclusive trade, such as aid for trade (target 8.a), special treatment for developing countries (target 10.a), open and non-discriminatory trade (target 17.10) in addition to targets relating to empowering women (targets 5.b, 5.c and 10.2) etc. More data and statistics are needed to monitor the transformation towards inclusive trade that provides greater and more equitable access to the benefits of global markets.

The 2030 Agenda also addresses financial inequality through Target 8.10¹⁶, which aims to

Figure 5 Labour productivity and salaries in exporter firms by the gender of the owner, 2016
(in constant €)



Source: Statistics Finland.

Note: Labour productivity is measured in terms of value added per FTE. The Finnish tax administration requests limited liability enterprises to provide a list of owners who have at least 10 per cent of the shares. Here, female or male-owned limited liability enterprises include those where either females or males own more than 60 per cent of the shares. Balanced ownership (8 per cent of limited liability enterprises) refers to cases where females and males own from 40 to 60 per cent of shares. Enterprises with highly distributed ownership, often large enterprises, have been classified to an unknown person owner group (21 per cent of firms). The figure focuses on differences between female and male-owned enterprises only. In total, less than 5 per cent of these male-owned firms are exporters and about 2 per cent of female-owned firms.

improve access to formal banking and financial services. Although indicator 8.10.2¹⁷ has been classified by the IAEG-SDG as Tier I, for many countries, statistics are only available for 2017 and in many cases with no sex disaggregation. However, other statistics on individuals' and businesses' access to finance are available.

According to the Global Findex database (World Bank, 2016), in 2017 about 1.7 billion adults remained 'unbanked', i.e. without an account at a financial institution or through a mobile money provider. In 2014, that number was 2 billion. Regardless of the increasing share of adults who

have an account, inequalities persist as women are still less likely to have an account. In developed economies, 92 per cent of women and 93 per cent of men have an account (see figure 6). The gender gap is also relatively small in transition economies (about 3 percentage points), and largest in Africa where 47 per cent of men, but only 36 per cent



**1.7 billion adults
do not have
a bank account**

Figure 6 The gender gap in account ownership across regions, 2011 and 2017
(Proportion of account owners by gender)



Source: UNCTAD calculations based on based on Global Findex database (World Bank, 2016).

of women, have an account. In the developing countries of America and Asia, the gender gap is about 8 percentage points. While the overall proportion of account owners increased between 2011 and 2017, the gender gap in account ownership also increased in all regions, other than developing Asia.

Recently, the spread of mobile money accounts has created new opportunities to close gender gaps especially in African countries where these accounts are becoming common. Mobile accounts appear to be more accessible for women and men alike and for the poorest that may otherwise be excluded from formal financial systems.

Financial inequalities can also be assessed by looking at businesses' access to and use of funding, e.g. by firm size, industry or gender of the owner. In OECD countries, women-owned or managed businesses used bank loans as a source of financing at significantly lower rates than men in 2018 – 14.5 and 19.5 per cent respectively. This may reflect both gender bias in lending but also the different types of business activities in which women and men engage. Some countries do not have a notable gender gap in businesses' use of bank loans. This is the case for the Russian Federation, South Africa, Spain, Sweden and Turkey, while a large gap was observed in Germany, Greece and Israel (OECD, 2018).

New dimensions of inequality

“Major gaps are already opening up between the data haves and have-nots. Without action, a whole new inequality frontier will open up, splitting the world between those who know, and those who do not. Many people are excluded from the new world of data and information by language, poverty, lack of education, lack of technology infrastructure, remoteness or prejudice and discrimination”.

– United Nations Secretary-General's Independent Expert Advisory Group on a Data Revolution (2014)

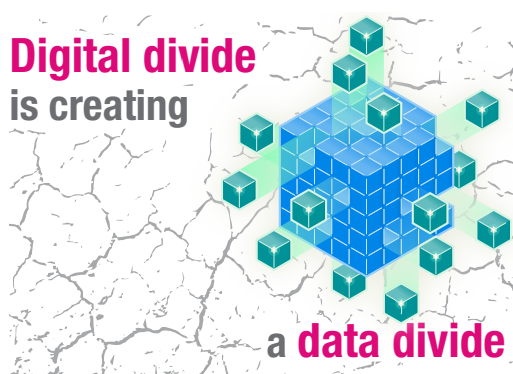
In a data driven world, access to data and information is essential. Barriers to access are creating a new dimension of inequality. With the data revolution, a new cold war has begun – a war between individuals, corporations and States for control of our personal data (*Wired*, 2018). At stake in this war is individual privacy; sovereignty of data ownership; weaponization of data; and the use of algorithms.

While there are a wide variety of elements that contribute to 'data inequality', such as language

or literacy, this section concentrates on two: (1) lack of access to technology to access data; and (2) lack of access to data itself.

Lack of access to technology

In 2018, the International Telecommunication Union estimated that global Internet penetration was only 51 per cent, although it was as high as 81 per cent in the developed world. Notwithstanding that global coverage is improving rapidly, it still means that in 2018 almost half of the world's population did not use the web or web-based services. Digital divides exist because a wide range of access barriers exist, such as: gender; social; educational; geographic; or economic. As discussed in section “The potential benefits and risks from ICT”, the offline population is disproportionately comprised of women, elderly, less educated, people with lower income and those living in rural areas. In developing economies, the proportion of women using the Internet is five per cent lower than for men. A gap almost three times larger is observed between individuals living in urban and rural areas.



While SDG indicators 17.6.2¹⁸ and 17.8.1¹⁹ measure the availability of fixed Internet broadband subscriptions and the use of Internet, more information is needed to understand how people use Internet and what kind of skills they need to maximise the benefits of using it. These data would help policymakers address the related socio-economic inequalities and provide education addressing the skills gaps to avoid exclusion.

The digital divide – limited or no access and connectivity to the web or mobile phones – is creating a data divide. To quote William Gibson:

‘The future is already here – it’s just not very evenly distributed’ (*The Economist*, 2001). In an increasingly digitized world, anyone who is not connected to the web or using a mobile phone will not only find it increasingly difficult to access data and information, but furthermore, as they will not create a digital footprint, they may also find themselves effectively excluded from many new statistical indicators which increasingly rely on digital data as their source.

Lack of access to and use of data

One of the biggest contributing factors to data inequality is the lack of access to it. Many data are proprietary – typically commercially or privately-owned data are unavailable to the public. For example, data generated from the use of credit cards, search engines, social media, mobile phones and store loyalty cards are all proprietary and are not publicly accessible. While there are sound commercial and privacy reasons for this, the growth in proprietary data is exacerbating the split between ‘the data haves and have-nots’.

This poses some challenging questions for the open data movement as the asymmetry in openness expected of private and public sector data may be inadvertently contributing to the growth in inequality. Many ‘open data’ initiatives are in fact drives to open government data.²⁰ This of course makes sense, in that tax payers should own the data they have paid for with their taxes, and so those data should be public, within sensible limits. But arguably people also ‘own’ much of the data being held by search engines, payments systems and telecommunication providers too. After all, these data were created through their labour and activities, and so they can legitimately lay some claim to their ownership. Hence the exclusive focus on public or government data is somewhat problematic. The philosophy of open data should be more evenly applied to avoid creating asymmetrical conditions.

This is important as the availability and use of data and statistics contribute to societies with more empowered people, better policies, more effective and accountable decision-making,

greater participation and stronger democratic mechanisms (UNECE, 2018).



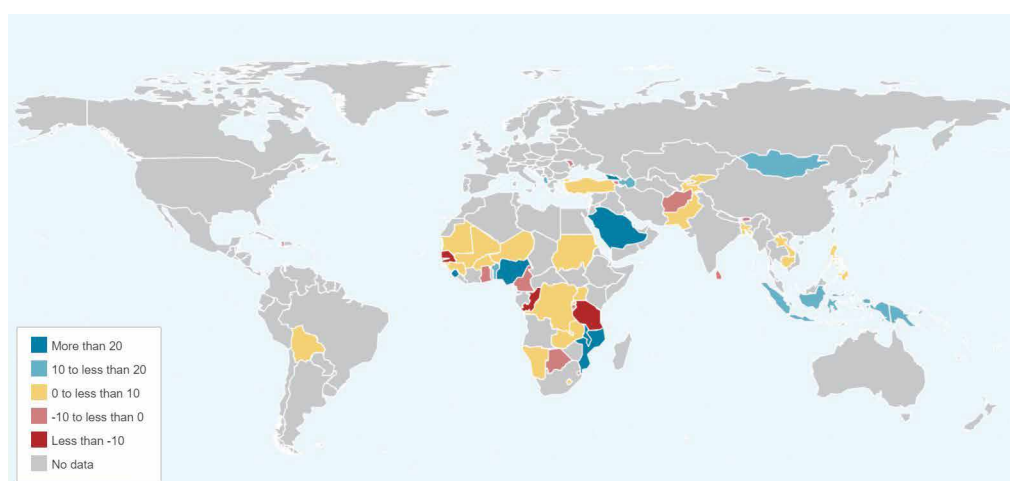
Data, statistics and information have a central role in 2030 Agenda (United Nations, 2015). The importance of having access to information is clearly recognized. For example, Targets 12.8²² and 16.10²³ set out the aspiration that people should have access to information to help live a sustainable life and to protect fundamental freedoms. Arguably, data are even more central to 2030 Agenda than is immediately obvious. For example, Target 1.4²⁴ aims to give men and women equal rights to economic resources and access to basic services. In a data driven world, data must be considered both an economic resource and a basic service. Furthermore, data should be considered as an integral part of a State's infrastructure. SDG Target 9.1²⁵, which deals with reliable and sustainable infrastructure, although presumably not drafted with data in mind, nevertheless summarises perfectly the requirements of a global statistical system. It should consist of quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure. In other words,

a global statistical system not only contains high quality data and statistics, but well designed and robust codes, identifiers, classifications and mechanisms for transmitting and disseminating those data (MacFeely and Barnat, 2017). Equitable and affordable access to data and statistics is fundamental to supporting economic development and human well-being.

To achieve the ambitions of 2030 Agenda, Governments need access to more statistics, and the capacity to use them, to inform policy formulation and evaluation. Avendaño et al. (2018) use text mining to evaluate the use of statistics in national development plans and poverty reduction strategies by identifying 572 keywords. Their assessment covers 102 developing countries and 199 documents from across Africa, America, Asia, Europe and Oceania, spanning the years 2000 to 2017. Figure 6 shows the increased use of data and statistics between two waves of national development planning to advance progress towards the 2030 Agenda.

While it is difficult to define the monetary value of having reliable statistics, some attempts have been made. Bakker et al. (2014) estimated that each New Zealand dollar invested in the census in New Zealand generated a net benefit of five dollars in the economy. Benefits of a similar magnitude were estimated for the 2011 population census in the United Kingdom. Further, a study comparing

Map 1 Change in scores for the use of statistics in policy making for plans published in 2000-2008 compared with 2009-2017



Source: Avendaño et al. (2018).

developments in Wales and England, after Wales ceased publishing school performance statistics, in 2001, while England continued, estimated a return of US\$17 for every dollar invested in school statistics (UNECE, 2018). Manyika et al. (2013) have estimated the potential global economic benefits of open government data and shared private data to be about three trillion dollars annually.



A concluding caution

There are many faces to inequality. Such a complex issue can be difficult to understand. Depending on the variable selected, or the time horizon analysed, global inequality may be said to be falling or rising. For example, looking at global economic inequality over a ten year horizon, inequality can be said to be falling. From a shorter time horizon, say the last three years, the picture is less clear. Furthermore, global economic inequality may be falling while simultaneously economic inequality within

countries may be increasing. There are also many faces to data quality. Caution should be exercised when discussing economic inequality in general as the quality of GDP estimates vary enormously, particularly in developing countries with large informal economies (Jerven, 2015; Pilling, 2018). It is quite possible that current estimates of GDP in many developing countries are underestimated, thus overstating global economic inequality. In other countries, particularly those where MNEs dominate the domestic economy, GDP may be a particularly uninformative indicator of economic development and may serve to only distort international comparisons. For global income inequality the converse may be true, as often the highest incomes prove very difficult to measure using traditional survey instruments, thus introducing the risk of understating global income inequality. The same is true of every other measure – caution should always be exercised. As Muller (2018) wisely counsels “measurement is not an alternative to judgement: measurement demands judgement” (p. 176). Rosling et al. (2018) have also highlighted the need to be skeptical about conclusions derived purely from number crunching.

Caution should also be exercised regarding the ownership of, and access to data. The concentration of power in this field, must surely be a cause of growing concern (Reich, 2015; Lagarde in *Reuters*, 2019).

Notes

- 1 Target 10.2 – By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status.
- 2 For example, household surveys may exclude households of linguistic minorities, those without telephones or fixed addresses, nomadic households, and households in distant or difficult-to-reach locations. They typically exclude the homeless or those without a fixed address.
- 3 A popular welfare-based measure of inequality. It presents the percentage of total income that a society would have to forego in order to have more equal shares of income between its citizens.
- 4 It shows the proportion of all income which would have to be redistributed to achieve a state of perfect equality. In other words, the value of the index approximates the share of total income that has to be transferred from households above the mean to those below the mean to achieve equality in the distribution of incomes.
- 5 This is typically done using the Lorenz curve. Developed by American economist Max Lorenz, the Lorenz curve is a graphical representation of the distribution of income or wealth. It shows the proportion of overall income or wealth held by the bottom x per cent of households. Many economists consider it to be a good measure of social inequality.
- 6 It is the ratio of the average income of the richest decile of the population to the average income of the poorest decile.
- 7 It compares the ratio of the average income of the richest 20 per cent of the population to the average income of the poorest 20 per cent of the population. Used by the United Nations Development Programme Human Development Report (called “income quintile ratio”).
- 8
$$\text{Palma index (per capita)} = [(\text{Income share held by the highest 10 per cent})/10] / [(\text{Income share held by lowest 40 per cent})/40].$$
- 9 Indicator 10.3.1 – Percentage of the population reporting having personally felt discriminated against or harassed within the last 12 months on the basis of a ground of discrimination prohibited under international human rights law.
- 10 Target 10.4 – Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality.
- 11 Indicator 10.4.1 – Labour share of GDP, comprising wages and social protection transfers.
- 12 Including UNCTAD transition economies.
- 13 Bangladesh, Brazil, China, Colombia, Dominican Republic, Ghana, Guatemala, India, Kenya, Malawi, Nicaragua, Pakistan, South Africa and Vietnam.
- 14 In countries where one or more living wages are published per country, the lowest living wage was taken.
- 15 These figures are based on the FOLK data on occupational status that also include detailed data on employees’ earnings and their formation as well as background information on the employer.
- 16 Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all.
- 17 Indicator 8.10.2 – Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile-money-service provider.
- 18 Indicator 17.6.2 – Fixed Internet broadband subscriptions, by speed.
- 19 Indicator 17.8.1 – Proportion of individual using the internet.
- 20 For example: the OECD Open Government Data (OECD, 2019) is a philosophy, and

increasingly a set of policies, that promotes transparency, accountability and value creation by making government data available to all. In the United States, Data.gov (2019) aims to make government more open and accountable. Opening government data increases citizen participation in government, creates opportunities for economic development, and informs decision making in both the private and public sectors. In the European Union, there is a legal framework promoting the re-use of public sector information (EU, 2013).

- 21 The HDI includes three components: income (gross national income per capita), education (years of schooling) and health (life expectancy at birth).
- 22 Target 12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.
- 23 Target 16.10: Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements.
- 24 Target 1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of.
- 25 Target 9.1: Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.

References

- Adams B and Judd K (2019). Who influences whom in the policy arena? Statisticians seek greater voice. Global Policy Watch Briefing 29. March. Available at <https://www.globalpolicywatch.org/blog/2019/03/25/policy-arena-statisticians> (accessed 12 June 2019).
- Avendaño R, Baredes BY and Tian Y (2018). Proposing a use of statistics indicator for national development plans. Paper prepared for the 16th Conference of IAOS. Paris. 20 September. PARIS21. Available at <https://www.oecd.org/iaos2018/> (accessed 12 June 2019).
- Bakker C, Taylor Duignan Barry, New Zealand and Statistics New Zealand (2014). *Valuing the Census*. Statistics New Zealand. Wellington.
- Brinkman H-J, Attree L and Hezir S (2013). Addressing horizontal inequalities as drivers of conflict in the post-2015 development agenda. Saferworld. February. Available at <https://www.saferworld.org.uk/resources/publications/725-addressing-horizontal-inequalities-as-drivers-of-conflict-in-the-post-2015-development-agenda> (accessed 30 May 2019).
- Cobham A and Sumner A (2013). Is it all about the tails? The Palma measure of income inequality. Working Paper No. 343. Center for Global Development.
- Data.gov (2019). Open government. See <https://www.data.gov/open-gov/> (accessed 13 June 2019).
- Deaton A (2004). Measuring poverty in a growing world (or measuring growth in a poor world). NBER Working Paper No. 9822. National Bureau of Economic Research.
- Deaton A (2013). *The Great Escape: Health, Wealth, and the Origins of Inequality*. Princeton University Press. Princeton, New Jersey.
- EU (2013). Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information June. Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013L0037&from=FR> (accessed 13 June 2019).
- Fukuda-Parr S (2019). Keeping out extreme inequality from the SDG Agenda: The politics of indicators. *Global Policy*. 10(S1):61–69.

- Gapminder (2015). Data sources used in Don't Panic — End Poverty. September. Available at <https://www.gapminder.org/news/data-sources-dont-panic-end-poverty/> (accessed 13 June 2019).
- Global Living Wage Coalition (2019). See <https://www.globallivingwage.org/> (accessed 13 June 2019).
- Jerven M (2015). *Africa: Why Economists Get It Wrong*. African arguments. Zed Books. London.
- Lakner C and Milanovic B (2016). Global income distribution: From the fall of the Berlin Wall to the Great Recession. *The World Bank Economic Review*. 30(2):203–232.
- Lindroos P, Luomaranta H and Nurmi S (2019). The role of gender in trade – evidence from linking Finnish microdata on employees and entrepreneurs. Presented at the Work Session on Gender Statistics. Neuchâtel, Switzerland. 15 May. Available at <http://www.unece.org/index.php?id=50364> (accessed 13 June 2019).
- MacFeely S and Barnat N (2017). Statistical capacity building for sustainable development: Developing the fundamental pillars necessary for modern national statistical systems. *Statistical Journal of the IAOS*. 33(26):1–15.
- Manyika J et al. (2013). Open data: Unlocking innovation and performance with liquid information. Available at <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/open-data-unlocking-innovation-and-performance-with-liquid-information> (accessed 13 June 2019).
- Milanović B (2012). *The Haves and the Have-Nots: A Brief and Idiosyncratic History of Global Inequality*. Basic Books. New York.
- Muller JZ (2018). *The Tyranny of Metrics*. Princeton University Press. Princeton, New Jersey.
- Murawski S (2013). Gini, Palma and the median inequality indicator: Sub-debate on measuring inequality. December. Available at <http://www.thebrokeronline.eu/Articles/Gini-Palma-and-the-median-inequality-indicator> (accessed 30 May 2019).
- OECD (2018). Entrepreneurship at a Glance 2018 Highlights. October. Available at <http://www.oecd.org/sdd/business-stats/> (accessed 13 June 2019).
- OECD (2019). Open government data. See <http://www.oecd.org/gov/digital-government/open-government-data.htm> (accessed 13 June 2019).
- Piketty T (2014). *Capital in the Twenty-First Century*. Belknap Press. Cambridge, Mass.
- Pilling D (2018). *The Growth Delusion: The Wealth and Well-Being of Nations*. Bloomsbury. London.
- Reich RB (2015). *Saving Capitalism: For the Many, Not the Few*. Alfred A. Knopf. New York.
- Reuters (2019). IMF's Lagarde highlights potential disruptive nature of fintech. 8 June.
- Roelen K, Sabates-Wheeler R and Devereux S (2016). Social protection, inequality and social justice. *World Social Science Report 2016: Challenging Inequalities: Pathways to a Just World*. UNESCO Publishing. Paris: 231–236.
- Rosling H, Rosling O and Rosling-Rönnlund A (2018). *Factfulness: Ten Reasons We're Wrong about the World and Why Things Are Better than You Think*. Flatiron Books. London.
- Schwellnus C, Pak M, Pionnier P-A and Crivellaro E (2018). Labour share developments over the past two decades: The role of technological progress, globalisation and “winner-takes-most” dynamics. OECD Economics Department Working Papers No. 1503.
- Stiglitz JE (2012). *The Price of Inequality: How Today's Divided Society Endangers Our Future*. Norton. New York.
- The Economist* (2001). Broadband blues – Why has broadband internet access taken off in some countries but not in others? 21 June.
- UNCTAD (2013). Growth and poverty eradication: Why addressing inequality matters. UNCTAD Post-2015 Policy Brief Series No. 2. UNCTAD/PRESS/PB/2013/4. Geneva.
- UNCTAD (2014). Tackling inequality through trade and development in the post-2015

- development agenda. TD/B/61/7. Geneva. 4 August.
- UNCTAD (2018a). *Handbook of Statistics 2018*. United Nations publication. Sales No. E.19.II.D.1. Geneva.
- UNCTAD (2018b). Better data and statistics for gender responsive trade policy. UNCTAD Policy Brief No. 70. UNCTAD/PRESS/PB/2018/7. Geneva.
- UNCTAD (2019). UNCTADStat. See <https://unctadstat.unctad.org/> (accessed 10 April 2019).
- UNECE (2018). *Recommendations for Promoting, Measuring and Communicating the Value of Official Statistics*. United Nations. ECE/CES/STAT/2018/2. New York and Geneva.
- United Nations (2015). Inequality measurement. Development Issues No. 2. Department of Economic and Social Affairs. Available at https://www.un.org/development/desa/dpad/document_gem/development-issues-series/.
- United Nations (2019). Global SDG Indicators Database. See <https://unstats.un.org/sdgs/indicators/database/> (accessed 12 June 2019).
- United Nations and OHCHR (2003). *Human Rights A Compilation of International Instruments – Universal Instruments*. United Nations publication. Sales No. 02.XIV.4. New York.
- United Nations Secretary-General's Independent Expert Advisory Group on a Data Revolution (2014). A world that counts: Mobilising the data revolution for sustainable development. Available at <http://www.undatarevolution.org/report> (accessed 4 June 2019).
- Wired (2018). The next cold war Is here, and it's all about data. March.
- World Bank (2016). The Global Findex Database. See <https://globalfindex.worldbank.org/> (accessed 6 December 2016).
- van Zanden JL, Baten J, Foldvari P and van Leeuwen B (2014). The changing shape of global inequality 1820-2000; Exploring a new dataset. *Review of Income and Wealth*. 60(2):279–297.