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UNCTAD/SER.RP/2020/5**Onno  
Hoffmeister**

Chief, Statistics  
Production Unit,  
Development  
Statistics and  
Information Branch,  
Division on  
Globalization and  
Development  
Strategies, UNCTAD  
onno.hoffmeister@un.org

# Development Status as a Measure of Development

## Abstract

This study analyses to which extent the classification of countries as developing corresponds with their actual development level. Development status classification schemes (DSCs) differ across international organizations, yielding heterogeneous outcomes. In the literature, different concepts of a developing country focus on different indicators of development levels. All analysed indicators have a highly significant effect on the countries' probability to be classified as developing, and discerning developing countries from others leads to a reduction of heterogeneity with all DSCs for most indicators. Schemes which nominate countries for classes correspond mainly with concepts focusing on difficult starting points or an early stage in systemic transition. Schemes which classify countries based on specified criteria typically reflect a welfare-based concept. The hypothesis of a weakening correspondence over the last four decades cannot be confirmed for all indicators.

**Key words:** Economic development, classification, logistic regression, cluster analysis



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## 1. Introduction

For more than half a century, international organizations have been classifying countries into developing and developed and disseminating data grouped or aggregated by these categories. Contrarily to the classification of goods, of economic activity, financial flows or consumption purposes, the classification of countries by development status is not based on a universal objective definition. Rather, each international organization classifies countries by development status in a different way. Only some base their development status classification schemes (DSCSs) on specified criteria, and among these the criteria differ.

In the absence of commonly shared criteria, a preference for one grouping over another cannot be justified on purely objective grounds. To cope with this subjectivity, the following, or a similar, disclaimer is made in many reports on that topic published by United Nations agencies: "The designations 'developed' and 'developing' are intended for statistical convenience and do not necessarily express a judgement about the stage reached by a particular country or area in the development process" (United Nations, 1996).

Yet, development status can be expected to be in some way objectively related with levels of development, even if different concepts of development may exist. Otherwise, the wide use of country data, aggregated and grouped by development status classes, is difficult to explain. The aim of the present study is to test the actual strength of the relation between development status and development level and whether some DSCSs offer a more convincing reflection of a country's development level than others.

This research question has gained relevance in the light of recent criticism of classifying countries by development status. Hoeschele (2002) argues, the fact that common DSCSs provide only vague definitions for the categories "developing" and "developed", but at the same time establish a consensus about which the developing countries are, is a reflection of "prejudice", which is further "perpetuated" by repeated use of the DSCSs. Nielsen (2011) warns that the lack of generally accepted classification criteria and the "plethora" of DSCSs in use obstruct productive discourse, and hence scientific progress, as they impede people's common understanding of terms. Bill Gates (2014) calls into question the validity of a continued distinction between developing and developed countries at all, pointing to developments in absolute poverty and income-per-capita levels as well as to changes in the sheer appearance of cities in the developing world. He argues, considering the progress observed over the last decades in many developing countries and the growing heterogeneity among them, the terms "developing" and "developed countries" have "outlived their usefulness", and "any category that lumps China and the Democratic Republic of Congo" would confuse more than it clarifies. On the same grounds, Khokhar and Serajuddin (2015), data scientists at the World Bank, conclude, based on a review of developments in income per capita, poverty, fertility and mortality rates: "if the 'developing world' classification is being used to group countries with similar attributes, where people experience similar lives, its use seems increasingly inappropriate." By contrast, UNCTAD's Division on Globalization and Development Strategy (2019) demonstrates that large differences in welfare between the developing and developed world persist and that the bulk of developing countries still – and for some indicators increasingly – lag behind the developed world in terms of industrialization, infrastructure development, collection of public revenues, conditions of work and digitization. They conclude, "the fact that some gaps have closed (and some widened) more than others does not provide the basis for removing the designation 'developing'" in analyses in that field.

The World Bank (2016) declared in the World Development Indicators (WDI) report of 2016 they would no longer make a distinction between developing and developed countries. In a similar vein, the Development Data and Dissemination Section (2016) of the United Nations Statistics Division (UNSD) proposed abandoning development status as the main criterion for the grouping of countries for the purpose of the 2030 Agenda for Sustainable Development global indicator framework and using it, if at all, to complement purely geographic groupings. This proposal was motivated by perceived "major drawbacks" of the DSCS previously used for measuring progress towards the Millennium Development Goals. The main drawback was seen in their limited congruence with geographic regions and income classes, as this would impede comparative analysis.

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Despite evidence of fading explicit support for classifying countries by development status, the category 'developing countries' is not likely to disappear soon. International organizations, including the World Bank, still use it in their public statements and reports. In the 2019 World Development Report, the term appeared 37 times (World Bank, 2019a). Thirty eight out of the 232 targets of the 2030 Agenda for Sustainable Development are defined with reference to developing countries (United Nations, 2018a). Thus, sustainable development indicators will still have to be aggregated by development status groups, at least until 2030. The developing countries category is also embedded in academic textbooks, policy parlance, colloquial language and international agreements, and, above all, it is an important element of many countries' identity. For these reasons, Farias (2019) sees the developing countries category "far from disappearing".

While classification by development status is still widely applied, the utility of developing countries as an analytical category certainly suffers from rising uncertainty among the users of statistics about its actual significance and meaning. In the absence of generally accepted classification criteria and changing economic realities, users are increasingly left in the dark about the properties and rationales of the different DSCs in use. This paper aims to shed some light on this issue and to contribute to an efficient use and interpretation of data grouped or aggregated by development status in statistics. The results of this study help evaluating the advantages and shortcomings of different classification schemes in a given context and selecting the scheme that best fits to a specific topic of research.

The remainder of this paper is organized as follows. Section 2 deals with DSCs, outlining what they are and which role they play for data quality. It traces the emergence of the seven most common DSCs over last 50 years and compares their resulting groupings to developing countries in the past and present. Section 3 deals with common concepts of a developing country, i.e. what people typically mean when they use the term "developing". Section 4 explains the methods applied in this study. Section 4 presents the empirical results. Section 6 concludes by summarizing the main findings, discussing quality aspects of development status classification, and spelling out ideas concerning the application of DSCs in the future.

## 2. Development status classification schemes

### 2.1. Classification schemes and their implications for data quality

A classification scheme can be understood as the descriptive information about the way observation units are arranged into groups, based on common characteristics (ISO and IEC 2015). This arrangement into groups can reduce complexity and thereby facilitate the interpretation and processing of larger bundles of data. A DSCS can be understood as a classification scheme for the arrangement of countries into groups defined by development status. For the purpose of this study, this definition is slightly broadened. A DSCS will be referred to as the descriptive information about the way countries are arranged into development status groups, with or without the application of common characteristics. To facilitate comparison across schemes, only two different development status groups will be distinguished: developing countries and all others.

Looking into the question what characterizes a good classification scheme, the Expert Group on International Economic and Social Classifications (OECD, 2013) proposes the following criteria:

- (1) the categories should be exhaustive and mutually exclusive;
- (2) the classification should be comparable to other related standard classifications;
- (3) the categories should be stable, i.e. they should not be changed too frequently, or without proper review, justification and documentation;
- (4) the categories should be well described and backed up by explanatory notes, coding indexes, coders and correspondence tables to related classifications;
- (5) the number of the categories should be well balanced, i.e. they should not be too many or too few;
- (6) the categories should reflect the realities of the field to which they relate;
- (7) the classification should be backed up by the availability of manuals, coding indexes, handbooks and training.

Further criteria are identified by Shorrocks (2018), an Ergonomist, including: (8) "face validity", by which he means that a classification system should "look valid" to people who use it. He recommends to "stick with what is well understood and accepted".

Finally, it should be considered that the arrangement into groups based on common characteristics necessarily leads to a certain loss of information. The various attributes characterizing the classified objects are transformed into only one (categorical) variable, where the differences between objects assigned to the same group are suppressed, and the differences between objects assigned to different groups are treated the same way regardless of their amount. The information loss caused by a classification scheme can be considered to be the smaller the more similar the objects of the same categories and the more dissimilar the objects of different categories. On these grounds, Farias (2019) argues that (9) low intra-class heterogeneity and (10) high inter-class heterogeneity are also useful quality criteria of classification schemes.

The design of a classification scheme is important for data quality, as the criteria above are causally linked with widely recognized quality aspects of statistical output, in particular with comparability and coherence, clarity and interpretability, and relevance (United Nations, 2018b; European Statistical System, 2019; UNCTAD, 2019a). The criteria 1, 2 and 3 above are linked with comparability and coherence. If the categories defined by a classification scheme are not mutually exclusive (criterion 1) then an observation unit may be assigned to one category in one dataset and to a different category in another. If the classification is not fully comparable to other related classifications (criterion 2) then opportunities to compare groupings and aggregates across datasets and to combine them for further analyses are limited. If a classification is changed too frequently (criterion 3) then the risk increases that data published in one release cannot be compared or reasonably combined with data from an earlier release, thus comparability over time is reduced.

Criteria 1, 4, 7, 9 and 10 are linked with the clarity and interpretability of data. If the categories are not mutually exclusive or too narrowly defined (criterion 1) then the actual significance of the categories becomes blurred. If dissimilar objects are united in same categories (criterion 9) or if categories are too similar to each other (criterion 10) then data aggregated at category level cannot be interpreted as being representative of and specific to the objects covered by these categories. If the classification scheme or its resulting categories are not well described and documented (properties 4 and 7) then users may be unclear about their actual meanings and falsely interpret them according to their subjective ideas about the objects described by the category labels.

Criteria 6 and 8 above are linked with the relevance of statistical output. If categories are defined in a way that they have not much to do with reality (criterion 6) or if they do not "look valid" to users (criterion 8) then the aggregates and groupings produced will be – or be perceived as being – of limited utility for users. Table 1 sketches the just described links between quality criteria of classification schemes and quality dimensions of statistical output.

For a proper understanding of a classification scheme and for users' evaluation of its relevance, concepts play an important role. A concept can be understood as a "unit of knowledge created by a unique combination of characteristics" (ISO and IEC, 2015). In Cognitive Psychology, concepts occurring as mental representations have been found to be crucial for people's ability to understand their environment, as they are used for categorization. If we can assign new cases to categories then we do not need to explore them in detail and we save time and energy (Goldstein, 2005). In principle, everyone develops their own concept of a developing country. The more this concept matches the concept used in a DSCS, the clearer the meaning of the grouped or aggregated data will be, and the easier it will be for users to interpret those data, and the more relevant the data will appear to them. In turn, classification schemes also shape people's understanding of categories. This is the reason why high incongruence between DSCSs can hamper productive discourse and scientific progress, as pointed out by Nielsen (2011) above. To summarize, the match between classifications applied in statistics and concepts formed in people's minds constitutes an important determinant of the clarity, interpretability and relevance of aggregated or grouped data. Analysing this match, for the case of development status classifications, is the primary objective of the present study.

**Table 1.** Links between quality criteria of classification schemes and of the statistical output

Classification scheme	Statistical output	
Comparability to related classifications	comparability and coherence	
Stability over time		
Exhaustive and mutually exclusive categories		clarity and interpretability
Intra-class homogeneity		
Inter-class heterogeneity		
Good description and explanation of categories		
Good documentation of the classification		
Categories reflecting the realities of the field		relevance
Face validity		

## 2.2. First development status classification schemes

The history of DSCSs begins in the 1960s. In the first global cross-national datasets of economic indicators, the Statistical Yearbook of the League of Nations (1973) published since 1919 and the International Financial Statistics (IFS) published by the International Monetary Fund (IMF, 2019a) since 1948, the disseminated data were, if at all, grouped and aggregated by continents, not by development status. After World War II, a need for other types of groupings and aggregations emerged, as the divide between the richer industrialized countries in the 'North' and the poorer countries in the 'South', that had recently achieved independence from colonialism, became a focus of public discourse. The poverty in the regions of the South increasingly caused concern all over the world. Meanwhile, the affected countries identified common problems and began jointly defending their interests within the United Nations system. A group of 75 countries which considered themselves as "developing countries" successfully struggled for the organization of the first United Nations Conference on Trade and Development (UNCTAD), at which specific problems of the developing world were addressed and changes in the "international economic order" discussed. They signed a document, titled "Joint Declaration of the Developing Countries" in which their common position was articulated (United Nations, 1963). After the conference most of these countries, reinforced by a few others, established the Group of 77 (G77) (Whalley, 1989; Jolly et al., 2004; UNCTAD, 2014). Today, the G77 comprises 134 member states and considers itself as "the largest intergovernmental organization of developing countries in the United Nations" which provides "the means for the countries of the South to articulate and promote their collective economic interests" (Group of 77, 2018).

The discussions at the UNCTAD I were shaped by the divide between the G77 members, the member countries of the Organization for Economic Co-operation and Development (OECD) and the socialist countries, accentuated by the voting system applied at the conference, according to which, in a first round, consensus had to be reached within four groups: Group A comprising the countries of Africa and Asia, Group B comprising the industrial countries, Group C comprising the countries in Latin America and the Caribbean, and Group D comprising the so-called "state-trading countries". This divide was mirrored in a statistical background document prepared for the conference - filed under the reference number "E.CONF.46/12/Add.1" - as in the contained data tables countries were grouped into the following classes:

- "Economic Class I" comprising whole Northern America and Europe, as well as South Africa, Japan, Australia and New Zealand;
- "Economic Class III" comprising, in Eastern Europe, Albania, Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Romania and the Union of Soviet Socialist Republics, and, in Asia, China, Mongolia, the Democratic People's Republic of Korea and Viet Nam;
- "Economic Class II" comprising all other countries and territories.

After the conference, an updated and revised version of document E.CONF.46/12/Add.1 was published as the first edition of UNCTAD's Handbook of International Trade and Development Statistics (UNCTAD, 1967), today known as the UNCTAD Handbook of Statistics and released annually (UNCTAD, 2019b). In the second edition of the Handbook, it was established that the classes I, II and III can be interpreted as "developed countries", "developing countries" and "socialist countries", respectively (UNCTAD, 1969). UNCTAD's DSCS was born. Over time, almost all countries in class II became members of G77.

Other international organizations followed UNCTAD in introducing DSCSs into the global cross-country datasets they published. In 1964, in parallel to UNCTAD, IMF set up a classification scheme for the IFS which distinguished between "industrial countries", "other high income countries" and "less developed countries" (Nielsen, 2011). In 1970, UNSD published a standard for the naming and groupings of countries, known as "M49", which established development status groups similar to the classes of the UNCTAD scheme (United Nations, 1970). Over time, the M49 standard has become a key reference for the definition of country codes, names and groupings within the United Nations system and beyond. In the late 1970s, the World Bank (1978) published the first edition of its WDI, as a statistical annex to the World Development Report, in which countries were divided up into "developing countries", "capital surplus oil exporters", "industrialized countries" and "centrally planned economies", thereby taking account of the particularities of oil-exporting countries that had come to the fore during the oil crisis. In 1981, the United Nations Industrial Development Organization (UNIDO) began compiling cross-country data and in that context introduced a classification scheme which split countries up into "developing countries", "centrally planned economies", "developed market economies", and China representing a class of its own (Upadhyaya, 2013).

UNSD, IMF and UNIDO have not provided any explanation regarding the way their development status classes were formed (Nielsen, 2011). IMF (2019b) states, in the Statistical Annex to the World Economic Outlook, that their country classification "is not based on strict criteria, economic or otherwise" and "has evolved over time". Its objective would be "to facilitate analysis by providing a reasonably meaningful method of organizing data." UNIDO's classification, according to Updadyaya (2013), "evolved historically with no particular statistical measure being used" and was "occasionally based on a country's preference for one designation over another".

UNCTAD (2019c) provides an explanatory note on the UNCTADstat website, pointing out that the applied development status classification "has its origin in the coalitions formed during the preparation of the first United Nations Conference on Trade and Development" and "primarily reflects historically formed common interests and identities of economies". The World Bank explained they used the criteria gross national income per capita, OECD membership, net exports of oil and the capital account balance as input for establishing their development status classes (World Bank, 1978). However, as Nielsen (2011) points out, the application of these criteria was not fully consistent.

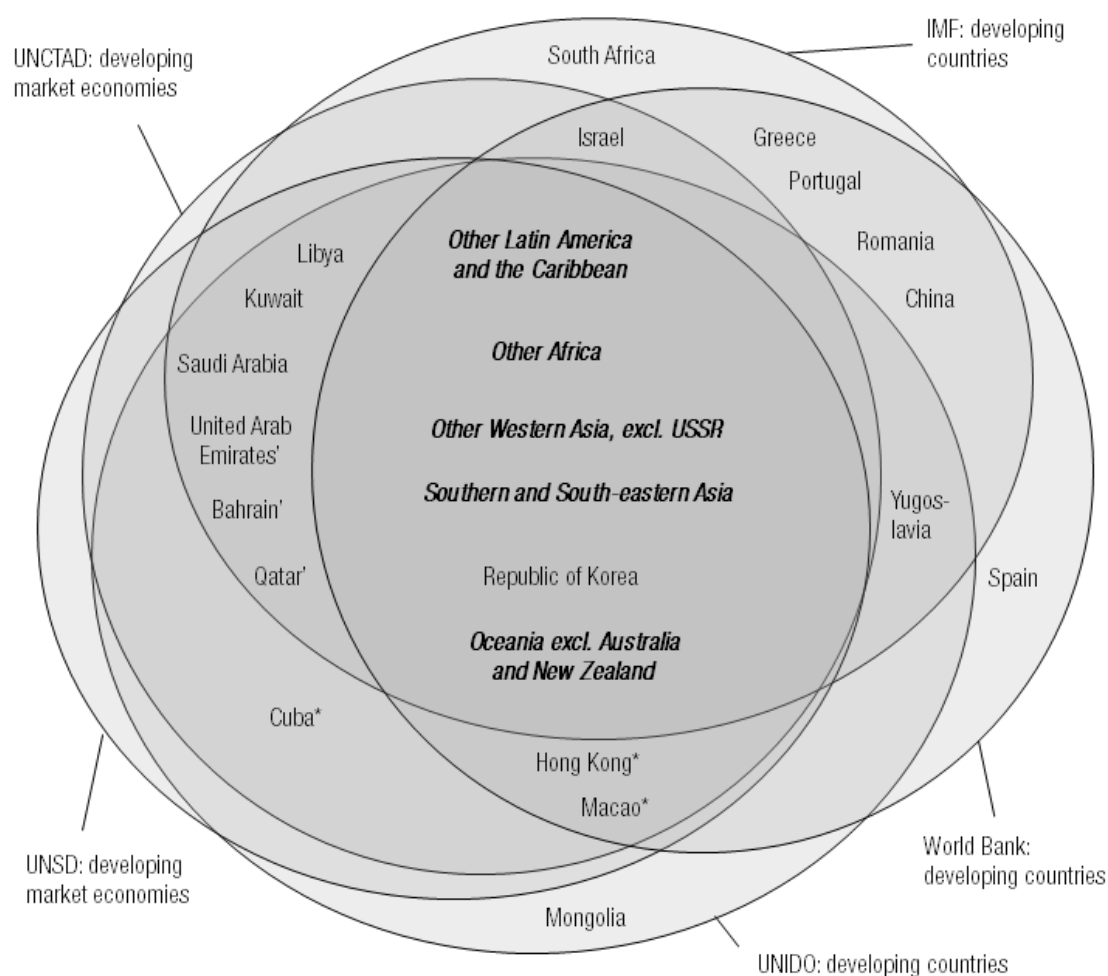
All in all, it appears that until the 1980s the formation of development status groups was rather an outcome of countries' self-identification, political considerations and expert judgement than of an objective application of specified criteria. Strictly speaking, these DSCSs of the first generation comply with only one of the two conditions established in the definition of a classification scheme given above (section 2.1). They do provide descriptive information about the way observation units are arranged into groups, but they do not specify any common characteristics applied in that arrangement.

During this early phase, international organization revised their DSCSs to different extents. The UNSD scheme remained unchanged; UNCTAD and the World Bank re-classified a few countries in the 1980s; and IMF entirely reorganized its scheme for three times by redefining, merging and splitting categories (Nielsen, 2011).

The Venn diagram in figure 1 shows the commonalities and differences in the group of developing countries defined by the DSCSs above at the beginning of the 1980s. The five schemes had in common that most parts of Africa, Latin America and the Caribbean, and Asia were considered as developing. The World Bank and IMF, unlike UNCTAD and UNSD, also included several Southern European countries in their definitions. The World Bank was the only organization which excluded Libya and several countries on the Arabian

Peninsula from the developing countries group, as these were given the status “capital surplus oil exporting countries”. The World Bank also deviated from the UNCTAD, UNSD, and UNIDO classifications by not treating Cuba as developing, but as “centrally planned”. Similarly, Mongolia was considered as developing by UNIDO, but as “centrally planned” or “socialist” by the other organizations. IMF was the only organization at that time which classified South Africa as developing, thereby applying the same development status to all countries in Africa. Israel was classified as developing by UNCTAD, IMF and the World Bank, but not by UNSD and UNIDO.

**Figure 1.** Groups of developing countries formed in the early 1980s



\* Not classified by IMF.

Sources: see appendix, table A1.

Despite these differences, the large majority of countries were classified in the same way by all five organizations, in the early 1980s. This high concordance is confirmed by the rank correlation coefficients depicted in table 2. The DSCSs of UNCTAD and UNSD yield the most similar groupings, as illustrated by a high overlap between the corresponding circles in figure 1. The scheme of UNIDO appears to be generally the most closely correlated with other schemes.



**Table 2. Concordance between developing countries groups in the 1980s (Kendall's tau)**

	UNSD	IMF	World Bank	UNIDO
UNCTAD	0.96	0.73	0.77	0.89
UNSD		0.72	0.77	0.90
IMF			0.84	0.82
World Bank				0.82

*Note:* Kendall's tau is the ratio of the number of concordant pairs of observations to the number of all possible pairs of observations.

*Sources:* See appendix, table A1.

### 2.3. Development status classification after the 1980s

In the late 1980s, the breakdown of socialism created a need for a fundamental rethinking of the development status classification practice, as the category of the socialist countries had become obsolete. In the absence of objective classification criteria, reallocating the members of that category to other categories was not straightforward.

UNCTAD (1994), in a revision of 1994, reclassified the Asian countries previously classified as "socialist", comprising China, Mongolia, the Democratic People's Republic of Korea, and Viet Nam, as well as the former Asian Republics of the Soviet Union, to developing economies, while the former socialist countries in Europe, except Yugoslavia, and the former European Republics of the Soviet Union, were kept in a group called "countries in Eastern Europe". By a revision in 2004, countries that had joined the European Union were removed from "countries in Eastern Europe" and added to developed economies. The remainder of this group was merged with Asian former Republics of the Soviet Union and with the successor states of Yugoslavia, previously a "developing economy". The new group was given the name "South East Europe and the Commonwealth of Independent States" (UNCTAD, 2004). In 2007, this group was renamed into "economies in transition" (UNCTAD, 2007). It has kept its composition until today, except that Bulgaria, Romania and Croatia were reassigned to the developed economies after their accession to the European Union. Other revisions since the 1990s comprised a reclassification of South Africa from developed to developing, after it joined the G77 in 1994, and of Cyprus from developing to developed, following its accession to the European Union in 2004 (ibid.; G77, 2018).

UNSD revised the M49 standard in 1996. The changes made reflected an aim to maintain congruence with broad geographic regions. Unlike UNCTAD, UNSD allocated the former centrally planned economies to either developing or developed economies – those in Asia to developing and those in Europe to developed countries. Similar to the UNCTAD scheme, South Africa was reclassified from developed to developing (United Nations, 1996) and, in a recent 2018 revision, the statuses of Cyprus and Israel were updated from "developing" to "developed" (United Nations, 2019).

IMF initially kept the former socialist countries in a separate group, in 1993 named "countries in transition". After the first eastward enlargement of the European Union, in 2004, this group was dissolved by reassigning the new European Union member states to developed and the rest of the group to the developing. The latter group was given the new name "emerging and developing economies" (Nielsen, 2011).

The World Bank (1989) followed an entirely different approach from UNCTAD and UNSD, by introducing average income per capita as an objective classification criterion. Income is measured as gross national income multiplied by an adjustment factor too smooth out the impact of exchange rate fluctuations. The cut-off between developing and developed countries was set at a gross national income per capita of US\$6,000 in 1987 prices, the income threshold previously set up to differentiate high-income from middle- and low-income countries. This threshold is revised each year to adjust for movements in prices and currencies, and the compositions of the groups are updated accordingly (Fantom and Serajudin, 2016; World Bank, 2019b).



As a result of the revisions above, the groups of developing countries applied by international organizations, now sometimes with slightly different labels, have become increasingly heterogeneous, as figure 2 reveals. For example, many former socialist countries in Europe (on the right side of the Venn diagram) are now classified in different ways. They are treated as developing by IMF, the World Bank, UNIDO and UNDP, but not by UNCTAD and UNSD. UNCTAD does not consider the Asian former Republics of the Soviet Union as developing either, classifying them as "transition economies". In turn, several countries in Asia and Latin America and the Caribbean (on the left side of the diagram) are still classified as developing by UNCTAD and UNSD, but not (anymore) by the other four organizations. This applies for example to the Asian 'tiger states' Hong Kong, Macao, the Republic of Korea and Singapore, which are classified as developing by UNCTAD and UNSD only. Brunei Darussalam and several Western Asian oil-producing countries are considered as developing also by IMF, Brunei Darussalam and Saudi Arabia additionally by UNIDO, and Oman also by UNDP. The World Bank has a high propensity to exclude countries in the Latin America and the Caribbean (in the left centre of the diagram) from the developing countries. Chile and Argentina are not given developing status by UNDP either, while UNIDO does not classify Trinidad and Tobago as developing. Further particularities include that UNIDO is the only organization that considers Cyprus, Spain and Latvia as developing countries; WTO is the only organization which classifies Israel as developing; and IMF represents an exception by giving Hungary the status of a developing country.

**Table 3. Concordance between developing countries groups, in 2018**  
(Kendall's tau)

	UNSD	IMF	WTO	World Bank	UNIDO	UNDP
UNCTAD	0.89	0.66	0.76	0.48	0.55	0.63
UNSD		0.74	0.85	0.58	0.62	0.73
WTO				0.69	0.66	0.78
IMF				0.74	0.78	0.80
World Bank					0.77	0.85
UNIDO						0.79

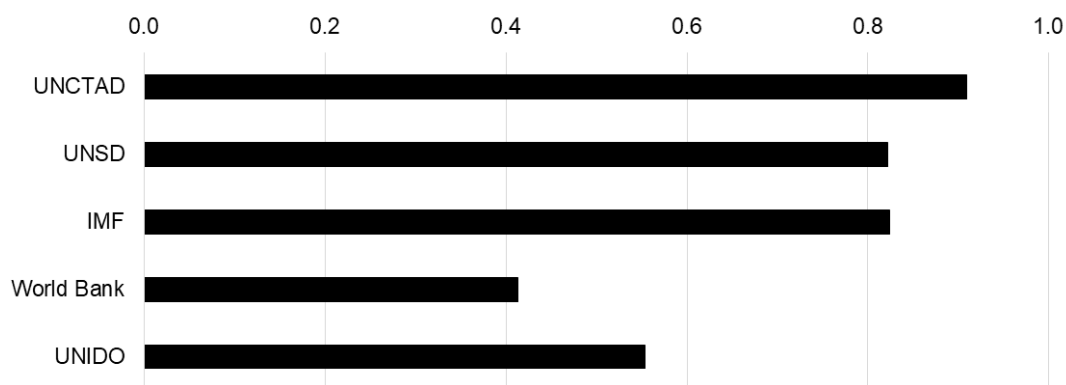
*Note:* Kendall's tau is the ratio of the number of concordant pairs of observations to the number of all possible pairs of observations.

*Sources:* see appendix, table A1.

The increase in heterogeneity of development status classification is confirmed by the rank correlation coefficients presented in table 3. In 2018, unlike the early 1980s, for several pairs of DSCSs the correlation coefficient is below 0.6. In only a few cases it exceeds 0.8 (compare table 2). Correlation is in general lower between schemes of the first and second generation than between schemes of the same generation.

Figure 3 displays the stability of the groups of developing countries defined by the different schemes, between the 1980s and today. The bars measure the concordance between the former and the present versions of each scheme, based on Kendall's tau, a rank correlation coefficient. The UNCTAD scheme turns out to be the most stable among the five DSCSs, followed by the schemes of UNSD and IMF, which were subjected to far-reaching revisions after the dissolution of the socialist countries group. The schemes of UNIDO and the World Bank have changed most over the last 30 years. This is not surprising, given that in those cases not only the composition of the groups but also the criteria for their formation have been revised, and considering that the groups of the World Bank scheme are updated each year.

**Figure 3.** Constancy of developing countries groups since the 1980s (Kendall's tau)



*Note:* Kendall's tau is the ratio of the number of concordant pairs of observations to the number of all possible pairs of observations.

*Source:* see appendix, table A1.

### 3. Concepts of a developing country

The discussion so far has revealed the substantial and growing differences in the DSCs applied by international organizations. But what are the main characteristics ascribed to developing countries in the academic sphere that shape the common understanding of the term in social sciences? Based on a review of social science literature, not just one but three broad concepts of a developing country have been found to exist: one that focuses on difficult starting points that developing countries faced in the post-World-War-II period; a second that focuses on their low levels of welfare; and a third that focuses on their early stage in a process of systemic transition.

#### 3.1. Difficult starting points

An early school of thought which influenced discussions on development in the 1960s and 1970s, the Dependency theory, sees developing countries mainly as countries which have inherited from their colonial past an ineluctable dependence from the developed world. As former colonies, they had been exploited by European empires for extraction of raw materials and slave trade and subjected to autocratic and coercive governance systems. On achieving independence, this theory suggests that the old imperialistic structures were transformed into new dependencies, now driven by liberal markets, monopoly power, foreign direct investment and conditions linked to development aid. These dependencies would be facilitated by a growing penetration of the developing world with "satellites" of decision centres established in the developed world (Frank, 1966; Dos Santos, 1970; Cardoso and Faletto, 1979).

A number of other studies carried out after the 1970s make reference to the negative long-term effects of the colonial past on economic growth, demonstrating, for example, that the extraction of resources by the metropolitan countries have hampered capital accumulation ("drain of wealth" hypothesis), that forced labor, enslavement of the indigenous population and the distortion of educational policies have created disincentives for human capital formation, and that the colonial governance structures have promoted dysfunctional institutions, rent-seeking elites and ethnic conflict. Studies by Hanson (1989), Grier (1999), Acemoglu et al. (2001) and Bertocchi and Canova (2002) prove a significantly negative statistical effect of having been a colony on long-term economic growth, where the colonies in Northern America, as well as

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Australia and New Zealand are considered as exceptions, as in these cases large-scale European settlement supported the development of democratic institutions and free market exchange at a relatively early stage.

Apart from being affected by the consequences of colonialism, location in the tropics is identified in the literature as another obstacle for economic growth, characteristic for developing countries. Kamarck (1976) describes the challenges which tropical conditions impose on agricultural activity, on the treatment of raw materials and on transport, as well as on people's health and physiology. Gallup et al. (1998) find, in an econometric study, that tropical regions are hindered in economic growth relative to temperate regions, "probably because of higher disease burdens and limitations in agricultural productivity". Bloom et al. (1998) also prove a statistical effect of location in the tropics on economic growth, also when other potential explanatory factors are controlled for.

Difficult starting points, as they arise from the colonial past and geographic conditions, have been found not only to represent a burden of their own, but also to have a tendency to reinforce themselves. Neo-institutionalism (North 1990) points out the strong persistence of sub-optimal hierarchic institutional structures inherited from colonial times, as these prevent formation of social trust among citizens. The approach of the New Economic Geography (Krugman 1991) provides evidence for diverging paths of economic growth between central and peripheral regions, caused by self-reinforcing effects of access to skilled labour, availability of physical factors of production and proximity to markets. In the post-World-War-II period, Prebisch (1950) and Singer (1950) showed that a continuous devaluation of primary relative to manufactured goods on the world market widened the productivity gap between the developed and the developing world. These findings, refined by Prebisch (1964) in a preparatory report for the UNCTAD 1 conference, provided the basis for the joint position of the G77 countries at that conference (UNCTAD, 2014).

### 3.2. Low welfare

Another strand of the development literature treats low levels of welfare as the main distinguishing characteristic between developing and developed countries. Development economists of the post-war era, such as Albert Hirschman, W. Arthur Lewis, Harvey Liebenstein, Gunnar Myrdal, Ragnar Nurkse and Paul Rosenstein-Rodan, focused mainly on average GDP and national income per capita as indicators of welfare, as GDP was seen as a key factor for the achievement of the various other determinants of people's wellbeing (see, for an overview, Meier, 1985). Over time, other aspects of welfare were taken into account, such as poverty, undernutrition, health, education, inequality and access to public services (de Janvry and Sadoulet, 2016). Easterly (2013) emphasizes the protection of individual rights, democratic participation, political stability and peace as important aspects of welfare. Sen (2000) developed an overarching approach, defining development as a process of expanding freedoms, where freedom represents the totality of people's capabilities, with capabilities meaning the various things which people want and are able to achieve within the constraints of their economic, legal, cultural, social and political environment.

The perception of developing countries as countries with low welfare is prominently reflected in the Millennium Development Goals (United Nations 2000, 2018). The World Bank uses income as the underlying criterion for the classification of countries by development status (see above); and Sen's capability approach serves as the conceptual basis for the Human Development Index and hence for the DSCS of UNDP presented above (UNDP, 2016).

### 3.3. Early system stage

A third strand of literature views developing countries as countries which lag behind in a fundamental transition process from a pre-modern, agrarian, autocratic society towards a modern, industrial, services oriented and democratic one. A first example of this transition process was observed in the United Kingdom in the 18<sup>th</sup> century. Other examples followed in the rest of Europe, in Northern America, in Australia, New Zealand, and later in Japan (Gerschenkron, 1962; de Janvry and Sadoulet, 2016).

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Rostow (1959) describes in detail the substantial changes taking place in the course of this transition in the demographic, social and economic spheres. In the early stages, secularism leads to a growing importance of science in people's world view and accelerated scientific progress enabling technological innovations and thereby paving the way for a rapid increase of productivity. Entrepreneurial activity increases and people accumulate savings that become available for large-scale investments in infrastructure and machinery. Consumption patterns change, and production shifts from agriculture to manufacture, accompanied by a growing differentiation of products. In the demographic sphere, life expectancy rises, people increasingly live in cities and become more engaged in the public affairs. In a similar vein, Kuznets (1966) describes the drivers and effects of what he refers to as "modern economic growth", a type of persistent high growth which emerged as a result of "epochal changes" in Europe, leading to a resolute application of science to problems of economic production. He traces in detail the effects of that growth on the population structure, the structure of production and the distribution of income.

Different theories deal with the different transition processes observed in different domains. Classical Growth Theory, particularly the models of Solow (1956) and Swan (1956) and the Ramsey Model, show how a rising propensity to save as well as the development of technological innovations foster long-term economic growth (Barro and Sala-i-Martin, 1995). The New Growth Theories (Romer, 1986; Lucas, 1988; Rebelo, 1991) point out the self-reinforcing positive effects of increases in output, fueled by spillovers in investment into knowledge and know-how.

Theories of structural transformation (Kuznets, 1957, 1966; Chenery, 1960; Fourastié, 1963) show how economic growth is accompanied and reinforced by changes in the structure of consumption and production. These changes consist of a shift from the primary sector first towards manufacturing and later towards services as well as of a rising differentiation within economic sectors (see also Haraguchi and Rezonja 2010; Herrendorf et al., 2014). Those theories of structural transformation have provided the basis for the current DSCS of UNIDO (see section 2.3).

In the demographic sphere, development reflects a demographic transition characterized, in an early phase, by rising life expectancy, mainly due to improved medical and nutritional conditions, and, in a later phase, by a decreasing birth rate, presumably as a result of changing cultural factors. Between these phases, population growth surges (Notestein, 1945; Davis, 1945; Dyson, 2010).

Parsons (1964) deals with changes in social organization and culture, presumably resulting from an evolutionary process of copying and improving. In his view, the social systems of countries face pressure to adapt to changes in their environment, like organisms in nature. Certain modes of social organization, proven efficient in some countries, are copied by others and developed further, so that standard modes of social organization emerge which Parsons refers to as "evolutionary universals". These comprise, in the earlier phases of development, social stratification, i.e. a growing differentiation of status across socio-demographic groups, and cultural legitimization, i.e. an institutionalized cultural self-definition of a country's society as a we-group. In the later phases, countries also develop bureaucratic organizations, money and markets, generalized universalistic norms, for example in the form, of laws and formal rules equally applicable to all community members, and democratic association, ensuring that governance is carried out by elected leaders and that policies are supported by the large majority of society.

Barder (2012) proposes a less deterministic view, seeing development as a process of continuous systemic adaptation and coevolution of the agents in a country. He suggests dealing with countries as cases of "complex adaptive system" explored recently in Physics and Biology. Those systems are characterized by a multitude of interactions taking place among a high number of agents, where each agent continuously adapts their behaviour to that of the others. With each round of adaptation, the system produces a new outcome. The form of this outcome is difficult predict, due to the complexity and high number of the interactions. For Barder, this process of iterative optimization is "development". He thus refers to development as an "emergent property" of a country's society. He claims, "the countries we call 'developed' have experienced a largely spontaneous rapid change to a more complex, self-organized system which does a better job of supporting the capabilities of their citizens" than the systems of less developed countries.

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## 4. Methods applied in this study

### 4.1. Indicators

Above, three broad concepts have been found to exist in social science literature which define the category 'developing country' by different attributes. One focuses on difficult starting points in the post-World-War II, one on low welfare, and one an early stage in systemic transition. These three concepts are certainly not independent from one another. For example, starting points refer to the origins, early system stage to the means, and welfare to the outcome of development. One might take a broad perspective and combine different concepts of a developing country, while others may consider only selected attributes.

Out of the numerous attributes associated with the three concepts above, for the purpose of this study the focus is restricted to those measurable for a respective number of countries in the late 1970s and today, based on available data. Table 4 presents the indicators selected and the sources from which their observations have been retrieved.

"Extractive colonialism" and "location in tropics" have been chosen as indicators of *difficult starting points*, as these have been mentioned in the literature as major external factors that hinder development. 'Extractive colonialism' is a dummy variable which identifies countries colonized by a Western European empire in their past, as recorded by CEPII (2019), except the United States of America, Canada, Australia and New Zealand, as in these countries colonialism was more characterized by European settlement and less by resource extraction than in the other colonies (see above, section 3.3). 'Location in tropics' is a dummy variable which identifies countries located between the Tropics of the Cancer and the Tropics of the Capricorn, at least with a part of their territory.

**Table 4.** Development indicators used in this study

Concept	Indicator	Rescaling	Data source
Difficult starting points	Extractive colonialism	-	GeoDist (CEPII, 2019)
	Location in tropics	-	World Atlas (Westermann, 2015)
Early system stage	Primary sector share	logit	UNCTADstat (UNCTAD, 2019c)
	Fertility rate	-	WDI (World Bank, 2019c)
	Representative government index	logit	Global State of Democracy Indices (International IDEA, 2019)
Low welfare	Income per capita	log	UNCTADstat (UNCTAD, 2019c)
	Life expectancy	-	WDI (World Bank, 2019c)
	Fundamental rights index	logit	Global State of Democracy Indices (International IDEA, 2019)

The "primary sector share", the "fertility rate" and a "representative government index" have been chosen as indicators for being in an *early system stage*. The "primary sector share" serves as an indicator for the advancement in structural transformation. It measures the proportion in value added not generated by the services or manufacturing sector, according to the International Standard Industrial Classification of All Economic Activities, Revision 3 (divisions 15 to 37 and 50 to 99). The data for that indicator have been taken from UNCTADstat (UNCTAD, 2019c). The "fertility rate", an indicator of the stage reached in the demographic transition, is defined as the number of children who would be born per women if these live until the end of

their child-bearing years. The data have been taken from the WDI database (World Bank, 2019c). The "representative government index" indicates to which extent a country's social system relies on democratic association, one of the evolutionary universals emerging during the modernization process, according to Parsons (1964). It is a composite index constructed by International IDEA (2018) based on valuations of the following features: clean elections; equal and universal voting rights; existence for free political parties; national representative government offices being filled through elections.

"Income per capita", "life expectancy" and a "fundamental rights index" have been used as indicators for welfare. "Income per capita" is widely recognized as a basic, yet imperfect, indicator of welfare, as it serves as an important means for the satisfaction of people's needs. It is measured as gross national income per capita in current United States dollars.<sup>1</sup> The data are taken from UNCTADstat (UNCTAD, 2019c). "Life expectancy" depicts an important dimension of welfare, namely the ability to lead a long and healthy life (UNDP, 2016). It is measured as life expectancy at birth, as recorded in the WDI database (World Bank, 2019c). The "fundamental rights index" refers to another dimension of welfare, namely the enjoyment of civil rights and respect of dignity, emphasized for example by Easterly. It is a composite index constructed by International IDEA (2018) from information about access to justice, civil liberties and social rights guaranteed in the form of basic welfare provisions.

## 4.2. Data

From the five sources above we construct a development indicators dataset with observations of 153 countries in the eight indicators at two different points in time: 1977 and 2017. To reduce skewness in the distributions, income per capita is measured in logarithms, and the primary sector share, the representative government index and the fundamental rights index are transformed into logits<sup>2</sup>. The countries included in the dataset make up for 99.6 percent of the world population in 2017. They represent more than 98 percent of the population of each world region, except Oceania the data account for 94 percent (see table 5).

**Table 5. Regional coverage of the indicator dataset**

Region	Number of countries	Percentage of the total population
Northern America and Europe	36 (41)	99.2
Latin America and the Caribbean	22 (35)	99.5
Sub-Saharan Africa	43 (48)	99.7
Western Asia and Northern Africa	22 (24)	98.8
Central and Southern Asia	12 (14)	99.9
Eastern and South-Eastern Asia	15 (18)	99.6
Oceania	3 (14)	94.0
<i>World</i>	<i>153 (194)</i>	<i>99.6</i>

*Note:* Size of the universe in parentheses.

The unit of analysis is a country as it exists today, *i.e.* 2017. Some countries did not exist in their present form in the 1970s. They formed part of a larger state which later split, such as the former Republics of the Soviet Union, or they were autonomous parts which later unified, such as the former German Democratic Republic and the Federal Republic of Germany. To assign a single value to each unit of analysis in 1977, in the first case, the observation of the former state has been applied to each single country existing today, and, in the second case, only the largest of the unified countries has been considered.

<sup>1</sup> Gross national income is valued in nominal terms, as purchasing power parities are not available for the 1970s.

<sup>2</sup> The logit of  $x$  is given by  $\log(x/(1-x))$ .



### 4.3. Aggregating indicators by concept

As outlined above, each concept is represented by several indicators (table 4). To aggregate them into a single measure, a composite index, or "factor", has been constructed by computing the linear combination of the associated indicators which drives the maximum of their pairwise correlations, using principle component analysis<sup>3</sup> In 2017, the factor of the starting-point concept accounted for 85 percent of the total indicator variance; the factor of the welfare concept for 79 percent, and the index of the system stage concept 66 percent (see table 6). In 1977, the welfare and the system stage factors were equally strong, both accounting for slightly more than 70 percent of the variance of their related indicators. Apparently, over time, the system-stage indicators have become more independent from one another, whereas the correlation among the welfare indicators has increased.

**Table 6.** Factors extracted with Principal Component Analysis  
(Factor loadings)

Concept	Indicator	1977				2017			
Starting points	Location in tropics	0.71	/	/	0.36	0.71	/	/	0.34
	Extractive colonialism	0.71	/	/	0.30	0.71	/	/	0.27
System stage	Primary sector share	/	0.60	/	0.35	/	0.65	/	0.38
	Fertility rate	/	0.59	/	0.41	/	0.59	/	0.38
	Representative government	/	-0.54	/	-0.31	/	-0.49	/	-0.26
Welfare	Income per capita	/	/	-0.61	-0.38	/	/	-0.61	-0.41
	Life expectancy	/	/	-0.60	-0.40	/	/	-0.59	-0.40
	Fundamental rights	/	/	-0.52	-0.30	/	/	-0.53	-0.35
<i>Eigenvalue (% of variance)</i>		<i>0.85</i>	<i>0.72</i>	<i>0.74</i>	<i>0.59</i>	<i>0.85</i>	<i>0.66</i>	<i>0.79</i>	<i>0.59</i>

N=153

It is noteworthy that in both years the factor constructed from all indicators combined has a smaller eigenvalue than any of the factors constructed from a subset of these indicators representing an individual concept. Correlation is thus higher within concepts than between them. This confirms the validity of the identified concepts.

### 4.4. Measuring correspondence and heterogeneity

Correspondence between development status and development levels can be thought of as the degree to which the level of development determines a country's probability to be classified as developing. The statistical effect of a development indicator on that classification probability can be evaluated based on a logistic regression of the form:

$$\log\left(\frac{p_i}{1-p_i}\right) = \alpha + \beta x_i \quad (1)$$

<sup>3</sup> The indicators of the starting point dimension are binomial. By using them in PCA we interpret them as principally continuous variables for which only two different numerical outcomes have been observed. Note that the numerical representations of these outcomes do not matter for the results of the PCA, as their normalized form, in which they enter the PCA, is solely a function of the relative frequencies of the two different outcomes. By distinguishing only between false and true in the measurement of the attribute, we do not consider any latent continuously distributed variable which might be the cause of the observed discrete outcome, a method often made in response theory (Kolenikov and Angeles, 2009; de Leeuw *et al.*, 2017; Landgraf and Lee, 2019). In the present study, in line with the concept identified above, the obtained factor is aimed to reflect the broad categorization of countries into tropical versus non-tropical and former colony versus no former colony, independently from any assumption about the causes behind.

where  $p_i$  is the probability for country  $i$  to be classified as developing, and  $x_i$  is the development indicator, normalized to zero mean and unit variance. The significance of this model is represented by the log likelihood ratio (LLR). The LLR depicts the relative gain in likelihood when classification probabilities are predicted using the maximum likelihood estimator of  $\theta$  rather than assuming  $\theta$  to be zero. It follows a chi-square distribution. With one degree of freedom, in probability theory, the model above is considered significant at the 0.1 percent level when the LLR exceeds 10.8.

Another interesting property of a classification scheme is the degree to which it splits observation units into homogeneous classes (see section 2.1 above). Thus, below, the *within-class heterogeneity* of the developing countries is also reported. *Heterogeneity* is measured by the mean squared Eukclidean distance (MSED), known from cluster analysis, which represents the average distance of countries from their centroid in a coordinate system of indicators, where the centroid marks the point of a virtual country with average values in all indicators. The greater the MSED the more the countries are spread throughout the coordinate system; the smaller the MSED the more they are clustered around the centroid. The MSED of the entire set of countries is given by

$$D = \frac{1}{n} \sum_{i=1}^n \sum_k (x_{k,i} - \mu_k)^2 \quad \text{with } \mu_k = \frac{1}{n} \sum_{i=1}^n x_{k,i} \quad (2)$$

and the MSED of a subgroup  $c$  by

$$D_c = \frac{1}{n_c} \sum_{i=1}^{n_c} \sum_k (x_{k,i} - \mu_{k,c})^2 \quad \text{with } \mu_{k,c} = \frac{1}{n_c} \sum_{i=1}^{n_c} x_{k,i} \quad (3)$$

where  $k$  is the identifier of the indicators. Note that with only one indicator the MSED is equivalent to the variance. Like with the variance, the within-group MSEDs of all groups, weighted by their respective group size, add up with the between-group MSED to the overall MSED, regardless of the number of indicators considered:

$$D = D^{bw} + \sum_c \frac{n_c}{n} D_c \quad \text{where } D^{bw} = \sum_c \frac{n_c}{n} \sum_k (\mu_{k,c} - \mu_k)^2 \quad (4)$$

Below, the within-group MSED ( $D_c$ ) of developing countries is presented as a ratio to the total MSED ( $D$ ) calculated for the world as a whole.

## 5. Empirical results

### 5.1. Overall patterns

Table 7 shows the degree of correspondence, as measured by the LLR, between development level and development status for the seven DSCSs of international organizations reviewed above, in 1977 and 2017, where development levels are measured by different indicators, including composite indices (factors) for entire concepts. To help distinguish the effect of changes in indicators from the effect of revisions in classification schemes, the current version of each classification scheme is applied to data observed in the past and present. As outlined above, a high LLR indicates a strong statistical effect of an indicator on the countries' probability to be classified as developing. In probability theory, values above 10.8 are associated with a significance level of less than 0.1 percent.

All in all, the numbers in table 7 show a high correspondence between development levels and classification as developing, for all indicators considered and under all analyzed DSCSs. The LLR is never below the critical value of 10.8. In most cases, it reaches levels even higher than 50. It is striking that correspondence is often higher when measured for factors representing an entire concept than for individual indicators. This indicates that the assumed latent variable that drives the correlations between a bundle of indicators, jointly representing a concept, can explain better the classification than the individual indicators on their own. This incidence is in line with a view that development is multidimensional.

**Table 7.** Correspondence between development status and level  
(Log likelihood ratio)

Factor / indicator	UNCTAD			UNSD			IMF			WTO	World Bank			UNIDO			UNDP
	First	Present		First	Present		First	Present		Present	First	Present		First	Present		Present
	1977	1977	2017	1977	1977	2017	1977	1977	2017	2017	1977	1977	2017	1977	1977	2017	2017
<i>Starting points</i>	122	117	117	116	80	80	58	50	50	60	90	33	33	103	37	37	43
- Location in tropics	107	121	121	107	90	90	44	52	52	66	71	38	38	87	38	38	48
- Extractive colonialism	87	72	72	79	47	47	47	33	33	37	76	19	19	79	24	24	26
<i>System stage</i>	81	102	72	83	96	98	85	112	106	106	52	53	75	90	57	57	76
- Primary sector share	50	69	57	55	51	74	56	70	93	80	36	30	65	59	27	51	68
- Fertility rate	96	114	66	99	132	87	75	95	56	67	58	71	65	85	64	52	72
- Representative government	28	32	33	26	35	58	79	61	74	86	20	19	32	40	33	20	26
<i>Welfare</i>	67	91	70	70	95	95	92	97	135	109	62	116	150	67	98	100	129
- Income per capita	58	80	55	62	65	75	57	62	109	88	88	96	184	63	80	113	149
- Life expectancy	76	101	62	83	120	77	84	106	107	81	63	99	116	75	83	78	104
- Fundamental rights	21	31	57	20	48	86	84	72	116	107	12	55	89	21	56	65	78
<i>All</i>	120	156	113	123	132	131	94	119	143	132	85	83	111	117	82	88	113
N	153	153	153	153	153	153	128	151	151	153	150	153	153	149	140	140	149

**Table 8. Within-class heterogeneity**  
(Mean squared Eukclidean distance among developing countries as a percentage of total)

Factor / indicator	UNCTAD			UNSD			IMF			WTO	World Bank			UNIDO			UNDP
	First	Present		First	Present		First	Present		Present	First	Present		First	Present		Present
	1977	1977	2017	1977	1977	2017	1977	1977	2017	2017	1977	1977	2017	1977	1977	2017	2017
<i>Starting points</i>	42	48	48	43	66	66	61	80	80	77	58	79	79	52	82	82	76
- Location in tropics	41	43	43	41	62	62	63	79	79	75	63	76	76	53	81	81	73
- Extractive colonialism	42	53	53	46	70	70	60	81	81	79	53	82	82	51	83	83	79
<i>System stage</i>	74	71	95	73	72	91	79	75	88	90	76	69	84	76	77	89	79
- Primary sector share	84	80	74	81	85	71	81	81	65	72	70	72	65	79	77	71	63
- Fertility rate	50	48	100	49	52	96	65	67	100	99	65	62	100	60	74	92	92
- Representative government	88	86	112	89	81	106	92	77	101	100	93	74	86	90	82	105	82
<i>Welfare</i>	73	69	71	71	69	68	75	70	62	67	70	63	56	72	62	60	53
- Income per capita	80	76	73	79	80	69	81	80	63	69	58	62	47	76	67	57	46
- Life expectancy	86	79	89	83	79	84	88	83	79	84	91	81	75	87	82	74	70
- Fundamental rights	52	52	52	52	49	50	57	46	44	49	60	48	45	53	37	49	43
<i>All</i>	66	65	74	65	70	76	73	74	76	78	69	70	72	68	73	76	69
N	153	153	153	153	153	153	128	151	151	153	150	153	153	149	140	140	149

The numbers in table 8 display the observed heterogeneity within the group of countries classified as developing under the different schemes. Heterogeneity is measured by the MSED (see above). To provide a benchmark, the heterogeneity among developing countries is expressed as a ratio to the heterogeneity measured in the world as a whole. The smaller the MSED the more developing countries are clustered around their indicator means. A value smaller than 100 signifies that they form a closer cluster than the countries of the world altogether. This can be caused by two effects: a within-class heterogeneity of developing countries smaller than that of the group of the other countries, as well as by the difference in indicator means between the two groups. A value greater than 100 signifies that the spread among developing countries is larger than among the countries of the world as a whole.

The figures in table 8 suggest that in general developing countries form a more homogeneous group than the world as a whole. Only for the fertility rate and the representative government index in 2017, the heterogeneity among developing countries was higher than the heterogeneity throughout the entire world, under most analyzed classification schemes. This had not been the case in 1977.

Let us in the following look at the characteristics of the individual DSCSs in more detail, beginning with the classification scheme of UNCTAD.

## 5.2. Development as reflected by the UNCTAD classification

As table 7 shows, the DSCS of UNCTAD stands out as having a relatively close correspondence with the difficult starting points concept. None of the other assessed DSCSs of international organizations reflects better location in the tropics and colonial past than the UNCTAD DSCS. The correspondence of UNCTAD's scheme with difficult starting points is much higher than its correspondence to indicators of the early-system-stage and low-welfare concepts. Developing countries as defined by that scheme also form a relatively homogeneous group with reference to different starting-points, as evidenced by an MSED half as high as in the entire world.

Indeed, 92 out of the 104 countries classified by UNCTAD as developing (88 percent) are located in the tropics, while only one out of the 49 other countries, Australia, (2 percent) lays in that region (see table 9). Correspondence is slightly weaker for the indicator 'extractive colonialism' than for location in the tropics, mainly because eight of the 49 countries not classified as developing were colonies of European empires in the past. These comprise the former British colonies Cyprus, Ireland and Israel, and five Eastern European countries which once formed parts of the Austrian or German empires.

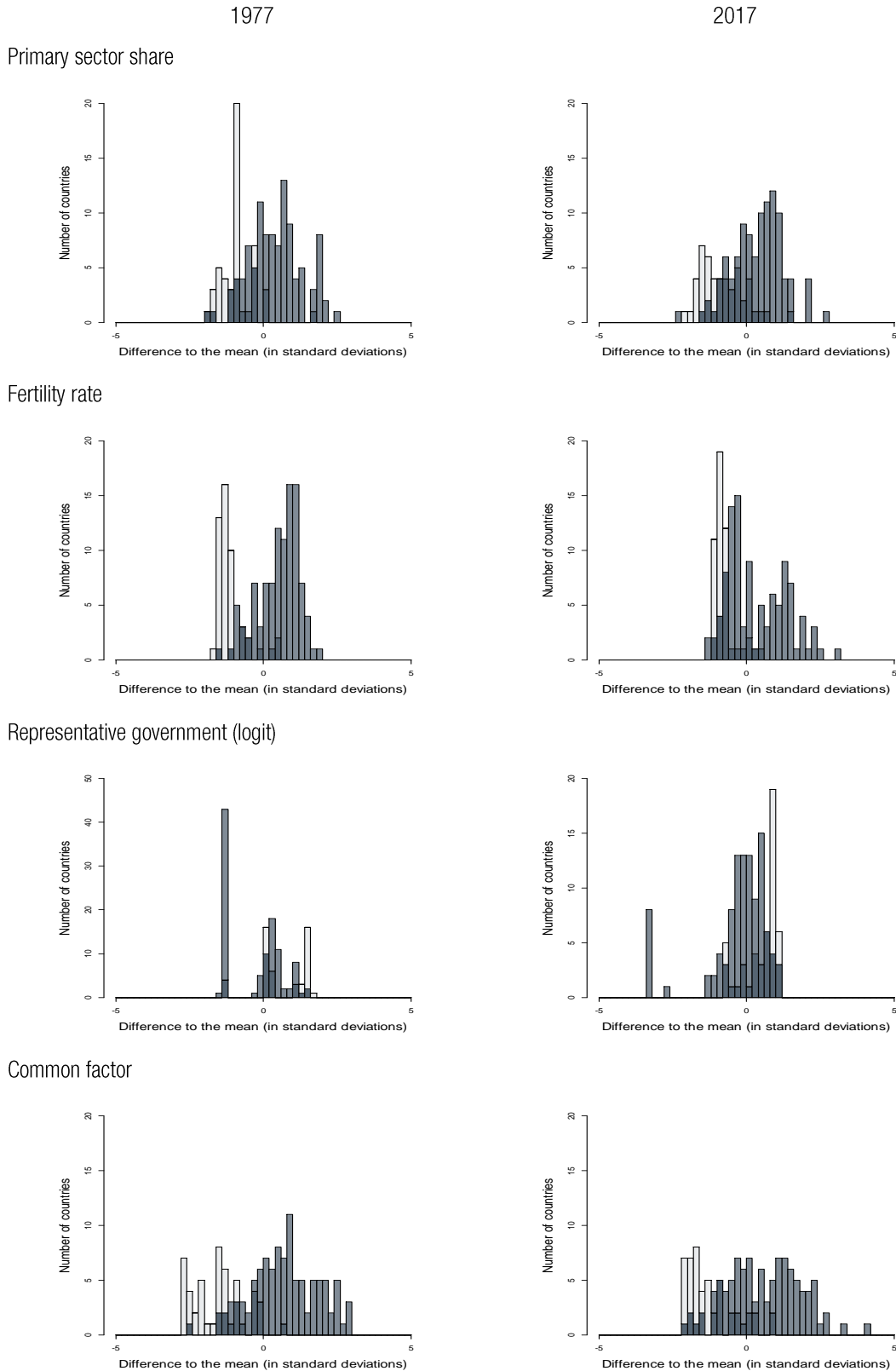
**Table 9.** Development status by indicators related with difficult starting points, 2017  
(Number of countries)

		Developing		<i>Sum</i>			Developing		<i>Sum</i>
		No	Yes		No	Yes	No	Yes	
Location in tropics	No	48	12	60	Extractive colonialism	No	41	10	31
	Yes	1	92	93		Yes	8	94	122
<i>Sum</i>		49	104	153	<i>Sum</i>		49	104	153

Correspondence of the UNCTAD DSCS with the early system stage and the welfare-based concepts is more or less equally weak in comparison to the difficult starting points concept. The factors representing these concepts record an LLR of around 70, as compared to 117 for the starting-point factor (see table 7). Developing countries' relative within-class heterogeneity is higher under the system stage than under the welfare concept, apparently due to a high variance of the fertility rate and the representative government index among developing countries relative to the world as a whole (see table 8).

**Figure 4.** Distribution of development indicators over countries, by development status (UNCTAD-2018 definition)

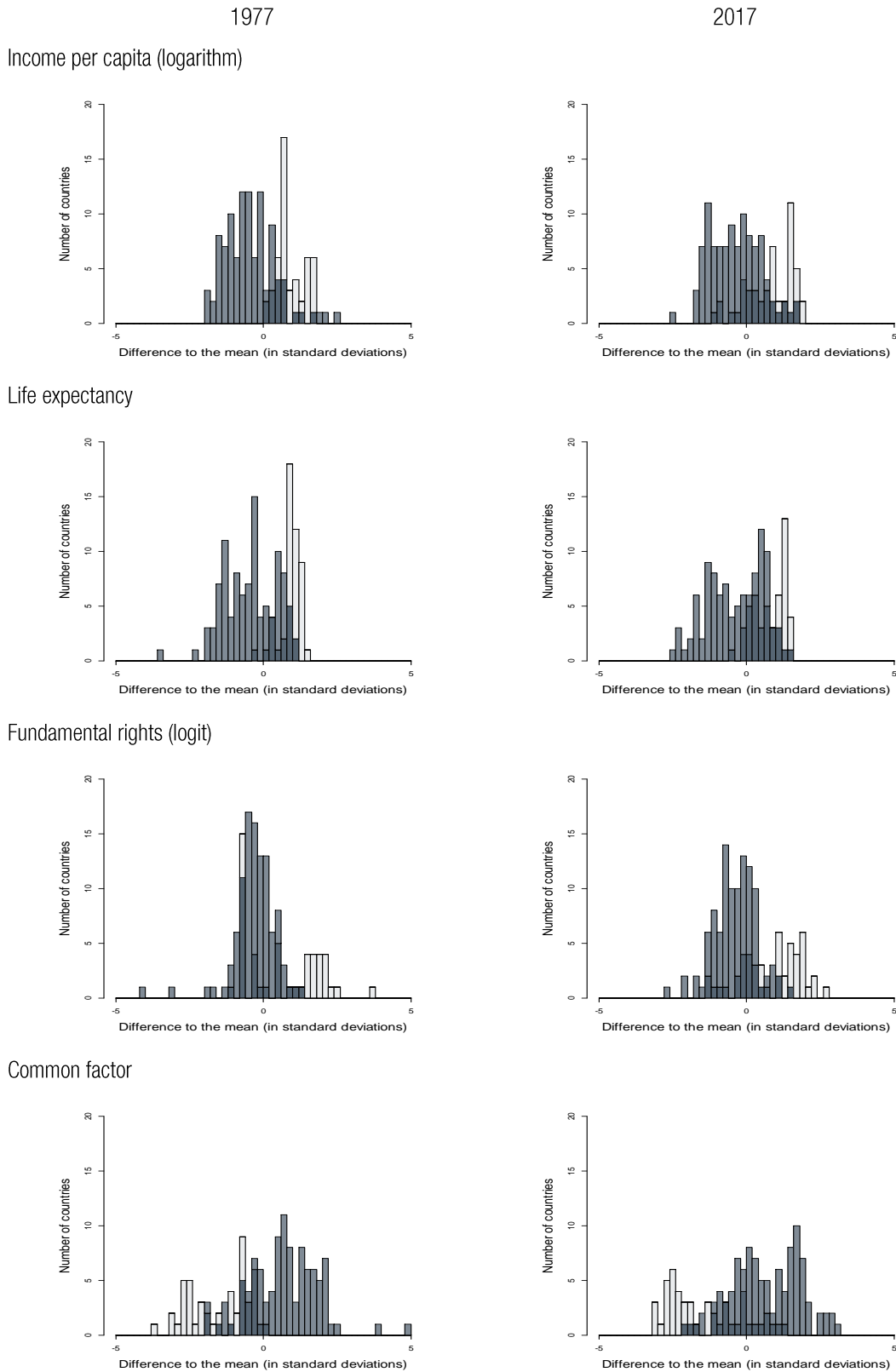
*Early system stage concepts*



Note: Size of the universe in parentheses.

Figure 4 continued

Welfare concept



The histograms in figure 4 provide more insight about the distribution of developing and non-developing countries over the different development indicators analyzed. For each indicator, they show that at least one tail of the distribution is entirely or almost entirely made up of developing countries, while it is difficult to discern any stratum fully consisting of non-developing countries, except for the fundamental rights index. In other words, many features remain characteristic of developing countries only, regardless of the fact that some developing countries share certain characteristics of non-developing ones. Singapore (for the primary sector share, the fertility rate, income per capita, and life expectancy), the Republic of Korea (for the fertility rate, government representativeness, and life expectancy) and Mauritius (for the fertility rate and government representativeness) are examples of developing countries that can compare with non-developing countries in several dimensions. Furthermore, Costa Rica, Uruguay and Chile show exceptionally high government representativeness; Qatar and the United Arab Emirates, alongside Singapore, record higher income per capita than the majority of the developed countries.

### 5.3. Changes over time

Looking at changes over time, table 7 shows that the DSCS of UNCTAD reflected better cross-country differences in development levels in 1977 than today. This applies especially to the fertility rate and life expectancy. For these indicators, the LLR reached values greater than 100 in 1977, but only between 60 and 70 in 2017. The LLR has also reduced for the primary sector share and income per capita, though to a lesser extent. By contrast, differences in the protection of fundamental rights are better reflected in UNCTAD's classification today than in the past; correspondence with the representative government index has remained almost constant.

The observed reduction in correspondence with fertility rates and life expectancy goes hand in hand with a considerable rise of within-class heterogeneity among developing countries for those attributes (see table 8). In 1977, the variance of the fertility rate among developing countries was only half as high as the variance throughout the entire world, whereas today it is comparable to the world level. Life expectancy has seen a slight increase in relative heterogeneity among developing countries, while for the primary sector share, income per capita and the fundamental rights index, heterogeneity has remained constant or slightly decreased.

The overall loss in correspondence between development status and development levels over the last 40 years is generally reflected in an increasing overlap between the histograms of developing and non-developing countries depicted in figure 4. The distribution of the fertility rate shows a particularly prominent change: in 1977, developing countries represented a distinct class, almost entirely characterized by higher fertility than the other countries. Over time, their distribution has widened and expanded towards the lower indicator ranges formerly exclusively reserved to non-developing countries. All in all, over time, the distributions of development levels have become less stratified. Several developing countries have caught up with developed and transition economies regarding some attributes, especially in terms of fertility rates. Still, few developing countries share all features characteristic for developing and transition countries, and many of them still cannot compare with developing and transition countries in any of the analyzed indicators.

What impact had the revisions of the UNCTAD DSCS on the match between development status and development levels? Table 7 suggests that few revisions had an overall positive impact. Except for extractive colonialism, all indicators measured in 1977, can match the UNCTAD classification of 2017 more than the classification of 1964. In the case of the primary sector share, this positive effect on correspondence has even offset the negative effect of changing development levels. As outlined above (section 2.2), the revisions consisted, on one hand, of a reclassification of Cyprus, Israel and Malta from developing to developed countries and, on the other hand, of a reclassification of China, Mongolia, the People's Democratic Republic of Korea, Turkey, South Africa and Botswana from transition or developed to developing countries. With Cyprus and Israel, two non-tropical countries, featured in 1977 by relatively high life expectancy and government representativeness, left the group of developing countries. Cyprus also had a low fertility rate and Israel a relatively small share of the primary sector in value added. The re-assignment of these two



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countries should thus have had a positive effect on the correspondence between development status and development level. In turn, the reclassification of China, characterized by a high primary sector share, low government representativeness and low income per capita, as well as of South Africa and Botswana, two former colonies located in the tropics, as developing countries can be expected to have further contributed to the observed increase in correspondence attributed to revisions.

#### 5.4. Comparison with other classification schemes

Turning to the analysis of the DSCSs of other international organizations, the *UNSD* scheme, not surprisingly, initially showed similar characteristics as the UNCTAD scheme: a relatively close correspondence with the difficult-starting-points concept and a relatively loose correspondence with indicators associated with the early-system-stage and the low-welfare concepts. This has changed over time. The revisions of 1996 and 2018 have considerably weakened the correspondence with location in the tropics and extractive colonialism and strengthened the correspondence with most other development indicators observed in the 1970s. This is not surprising, given that the former socialist countries in Asia were added to the developing countries, and considering that these are located far in the North, were not colonized by European empires, and for many indicators showed values relatively close to the majority of developing countries. For life expectancy and the fertility rate, over time, the gains in correspondence due to revisions have been more than offset by changes in the indicator values, resulting in a certain assimilation between developing and developed countries. The changes in all other indicators, however, made correspondence increase. In 2017, the *UNSD* DSCS matches all three identified development concepts to a certain degree. The within-class heterogeneity of developing countries is in general relatively high for all three concepts applied (see figure 5).

The *IMF* and *WTO* DSCSs are the ones showing the closest correspondence with the system-stage concept among the analyzed schemes. With an LLR of 106, measured for both schemes, the factor representing system stage is a strong predictor of classification probability. Correspondence is even higher to the welfare-based concept, especially under the scheme of *IMF*. However, this cannot compare with the exceptionally high correspondence of the World Bank scheme in the welfare domain. All in all, the *IMF* DSCS can be considered as the one, out of the seven, that reflects best the entirety of the identified concepts of a developing country. If we base our understanding of a developing country on the common factor that drives the indicators associated with all three concepts, the *IMF* DSCS reflects that factor best (see table 7). Nevertheless, the *IMF* scheme, like the *WTO* scheme, does not lead to particularly low within-class heterogeneity of developing countries (see figure 5). Looking at changes over time, the relatively far-reaching revisions implemented by *IMF* (see section 2.2) have led to an increasing correspondence with the starting-points indicators, but not for the representative government and the fundamental rights indices.

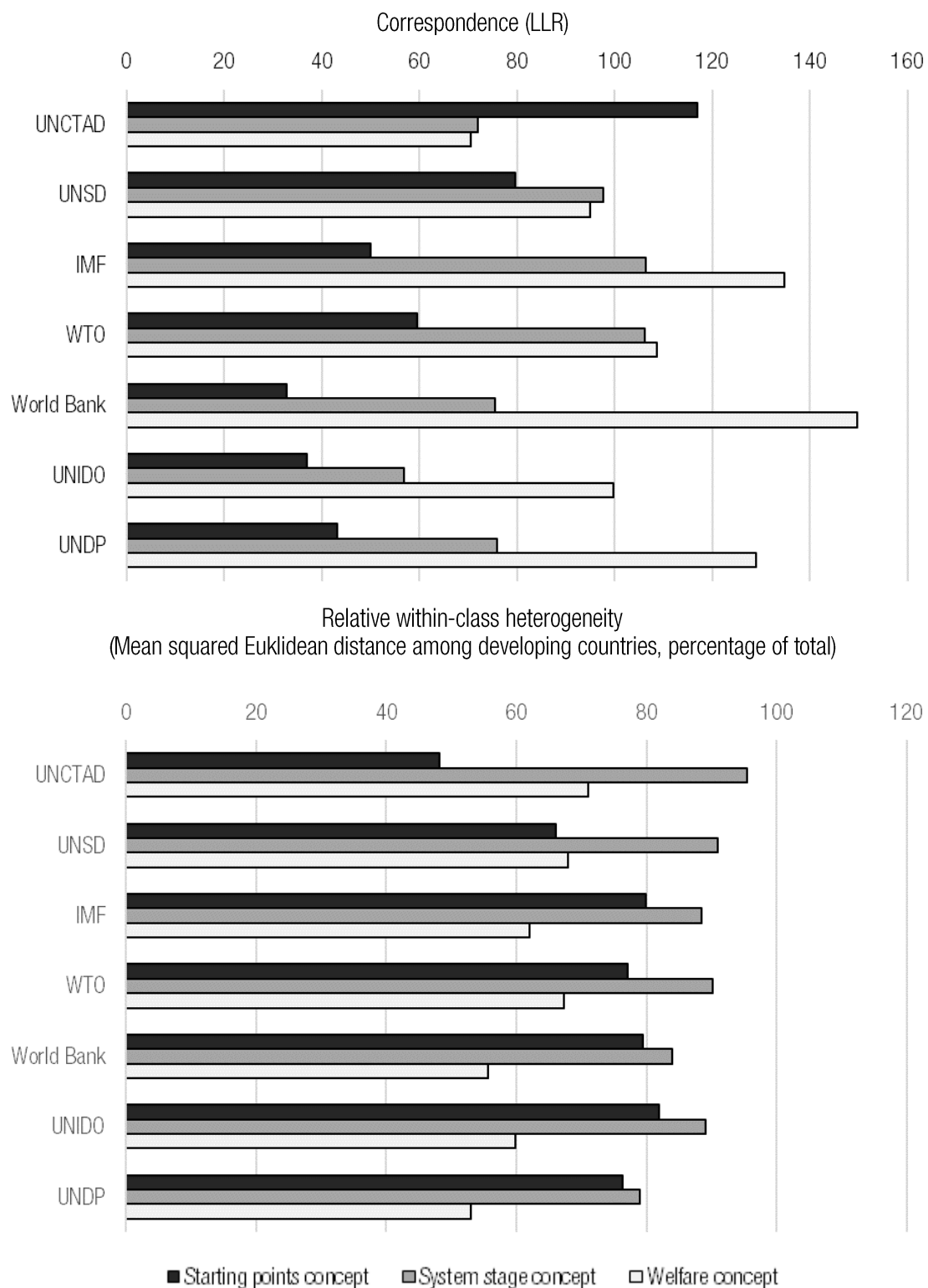
The *World Bank* DSCS is the one most closely linked with the welfare-based concept, especially with income per capita. Its correspondence with the system-stage concept is much weaker than the *IMF*'s, despite a stronger correspondence with the fertility rate. Difficult starting points are reflected by the World Bank scheme less than by any other scheme (see table 7 and figure 5). Its strong correspondence with income per capita could be expected considering that this variable, measured in almost the same way as in this study, constitutes the underlying classification criteria. The fact that it is also highly correlated with other welfare indicators supports the view, taken by the early development economists, that income is a key determinant of the various other dimensions of welfare (see section 3.2). The correspondence of the World Bank scheme with development levels has not always been that high. The initial classification from 1978 less powerfully reflected the various concepts of development, also in comparison to the other schemes in place at that time (see table 7).

The *UNDP* DSCS represents a fourth scheme which is more strongly related with the welfare-based concept than with the other identified concepts of underdevelopment. This is not surprising, given that it is grounded in the Human Development Index, thus on a composite welfare indicator (section 2.3). By including years of schooling and excluding the fundamental rights index, the welfare indicators represented in that index are slightly different from those applied in this study. It is noteworthy that the *UNDP* classification schemes reflects cross-country differences in income per capita better than differences in the other considered

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welfare indicators. Its correspondence with other welfare dimensions, such as life expectancy and protection of fundamental rights, is even weaker than that of the World Bank scheme.

**Figure 5.** Characteristics of classification schemes with respect to different concepts, 2017



Like the schemes of the World Bank and IMF, the *UNIDO* DSCS also shows a stronger correspondence with the welfare-based than with the system-stage concept. This finding may appear counterintuitive, considering that reflecting disparities in industrialization, a system-stage attribute, has been the underlying aim of that scheme. The scheme's limited correspondence with the primary sector share can be explained by the fact that countries with relatively small primary sectors have not necessarily developed relatively large manufacturing sectors. Their economies may be dominated by services. Examining the data, this is often the case, for example, in Lebanon, Cyprus, Greece, Mauritius and Costa Rica; all countries classified as "emerging industrialized or other developing economies" by UNIDO. The low correspondence of UNIDO's DSCS with the other system stage indicators casts doubt on whether industrialization, in the way measured by UNIDO, effectively forms part of the transition process from developing to developed countries as the literature suggests. It is striking that UNIDO's initial DSCS from 1988, applied to data from 1977, showed a stronger correspondence with system-stage indicators than UNIDO's current classification scheme applied to data from 2017.

## 6. Conclusions

The results above show that development status does measure development to a considerable degree. Cross-country differences in the level of development, measured with reference to all identified concepts, have a highly significant effect on a country's estimated probability to be classified as developing. For factors representing an entire concept of development, this effect is even stronger than for individual indicators, in line with the common view that development is multidimensional. The results above also show that in most cases the classes of developing countries obtained with the different schemes form more homogeneous groups than the world as a whole.

### 6.1 Different classification schemes fitting different concepts

The analyses above have revealed substantial differences between the DSCSs applied by international organizations in the past and today. They show that over time two different generations of schemes have evolved. Under the DSCSs of the first generation, development status classes are formed by nomination of countries rather than by application of specified criteria. Presumably, political considerations, expert judgement and countries' self-identification play a role in that nomination. In the case of UNCTAD, the genesis of the developing countries class has primarily been an outcome of countries' self-nomination, by signing the "Joint Declaration of the Developing Countries", in the preparatory phase of the UNCTAD 1 conference. The lack of grounding on specified criteria characterizing the first generation has been addressed in the DSCSs of the second generation introduced by the World Bank, UNIDO and UNDP after the late 1980s. Over time, the classification of countries into developing and other countries has become increasingly heterogeneous throughout international organizations.

The different DSCSs of international organizations have their individual characteristics, in the sense that each scheme fits better some concepts of a developing country than others. The schemes of the first generation, still applied by UNCTAD, UNSD and IMF, show a relatively strong correspondence with a concept that sees developing countries as countries faced with difficult starting points, as a consequence of their colonial history and their location in the tropics. Correspondence with difficult starting points is especially strong for the UNCTAD DSCS. By contrast, the schemes of the second generation match best with a concept which sees developing countries as countries with low welfare. A third concept identified in this study, which focuses on the developing countries' early stage in systemic transition, is best reflected by the IMF DSCS, among the seven schemes compared. The DSCS of IMF is also the one which matches best a broad concept encompassing all attributes of a developing country measured in this study. The UNSD classification can be regarded as a common denominator which takes account of all three identified concepts to a certain degree.

## 6.2. Quality aspects of development status classification

Contrasting the analysed DSCSs with suggested quality criteria for classification schemes (see section 2.1) reveals some points which deserve attention. Firstly, while classification schemes are recommended to be comparable, the DSCSs used by international organizations today differ considerably in the way the classes have been formed. Some are based on specified criteria, others not. Among the former, the applied criteria are different. As a result, the composition of development status classes differs across schemes, and these differences have increased over time (see section 2). This heterogeneity negatively impacts on the comparability of disseminated statistics. The figures in a dataset which are based on one DSCS cannot be fully compared with the figures in a dataset which are based on another. Using similar labels for categories defined in different ways may cause misunderstanding and false interpretation of the data. The negative consequences of these differences for productive discourse and scientific progress have been pointed out by Nielson (2011). A harmonization of the DSCSs would enhance users' possibilities to combine data from different sources for the purpose of their analyses.

Secondly, while it is recommended that DSCSs are well described, among other materials by explanatory notes, coding indexes, manuals and correspondence tables, the documentation supporting the first generation of DSCSs appears sparse. It is usually limited to country lists and coding indexes, while explanations of the motivation, let alone of the applied criteria, for the nomination of countries for categories cannot be found. The DSCSs of the second generation are more comprehensively explained than those of the first, by notes on the organisations' websites alongside the data, by statistical annexes and by dedicated papers. However, information on the correspondence between the categories of different DSCSs is scarce, although this information is essential for interoperability. Apart from a sketch of the linkages between broadly defined country groups, once developed by the World Bank (1989), to the best of the author's knowledge, the correspondence table A1 in the appendix, which shows the assignment of individual countries to categories under the different schemes, is the first of its kind.

Thirdly, it is recommended that classification schemes "reflect the realities of the field" to which they relate and "look valid" to users. In the case of DSCSs, this condition is complicated by the fact that development, and thus development status, is not unambiguously defined, and people have different ideas about its meaning. Different users of data may thus expect from a DSCS to reflect different aspects of reality. A DSCS will look the more valid to users the more its classification criteria match their concept of a developing country. Recalling the discourse in the introduction, we note that writers to whom DSCSs do not anymore look as valid today as in the past, such as Gates (2014) and Khokhar and Serajuddin (2015), point to developments in different indicators than those who argue in favour of a continued validity of DSCSs, such as the Division on Globalization and Development Strategy (2019). The former put the main focus on income per capita, poverty and fertility rates, the latter on indicators of industrialization, infrastructure development, conditions of work and digitization. The findings above suggest that all analysed DSCSs are empirically linked with development levels. They can therefore be considered to reflect the realities in the field, with each DSCSs emphasising different aspects of that reality. A decrease in correspondence and within-class homogeneity can be observed for some indicators under some DSCSs, while in other cases an increase can be observed.

To cope with cases in which within-class heterogeneity has become high, users of statistics may sometimes require finer granularity than the distinction between developing and other development status classes. Several more narrowly defined categories than developing countries are already widely used, such as least developed countries (UN-OHRLS, 2019), landlocked developing countries (*ibid.*), small island developing States (UNCTAD, 2019c; UN-OHRLS, 2019) and highly indebted poor countries (IMF, 2019c). However, these have not been formally incorporated into existing DSCSs.

Fourthly, it is recommended not to change classification schemes too frequently. The second generation DSCSs show a high stability in the sense that the underlying classification criteria have not been revised. However, as the characteristics of countries do not remain the same, inevitably, the composition of the classes changes relatively often. In a user survey carried out by the World Bank, frequent changes in the composition of the classes of the Bank's scheme have in fact been raised as a point of concern (Fantom and

Serajuddin, 2016). By contrast, the first generation DSCSs have been subjected to only occasional revisions in the composition of the groups. They have thus proven more stable than the schemes of the second generation (see figure 3). However, the imposed constancy in the composition of the classes implies that the average characteristics represented by the classes have changed over time, in tandem with countries' progress in development. Only the characteristics associated with difficult starting points have remained stable, by definition. This is the primary reason for the continued high correspondence of UNCTAD's DSCS with the starting-points concept.

Fifthly, "statistical convenience" has been established as a desirable criterion of DSCS in disclaimers made in United Nations documents (see the introduction). Statistical convenience may consist, for example, of a high congruence between development status groups and geographic regions or associations of states, such as the European Union, the OECD or G77, as this may facilitate the representation of grouped and aggregated data in disseminated tables. Spelling out the specific aspects to make a DSCS "statistically convenient" would likely increase the credibility of that scheme from the viewpoint of users.

### 6.3. Outlook

Based on the findings of this study, DSCSs do not appear obsolete. Development status classes still appear useful as yardsticks of cross-country differences in attributes widely recognized as characteristics of a developing country. Different schemes emphasize different attributes in that measurement. The study has also revealed deficiencies in development status classification. DSCSs would arguably do a better job if they were harmonized, or if at least their interlinkages were better documented and communicated than they currently are. The DSCSs of the first generation lack sufficiently comprehensive metadata explaining the methods applied in the formation of classes. This reduces clarity and interpretability of the statistical output.

By introducing appropriately documented objective classification criteria, the appearance of the second generation of DSCSs can be considered as a favourable development for statistical quality. It is striking that these schemes reflect development mainly from the welfare-based perspective, whereas the system-stage and starting-points concepts are better reflected by the DSCSs of the first generation. A DSCS that is based on objective characteristics and at the same time takes full account of other dimensions of development than welfare appears as a gap which calls for being filled. Welfare is not the most relevant or the only relevant aspect for all topics of research related to development. For many types of analysis, the countries' historic and geographic preconditions and the advancement in the transformation of the economy and society play a role for the needed categorization of countries. If these studies could rely on a more objective differentiation of countries by development status than today, this would enhance the clarity and interpretability of their findings.

The United Nations' 2030 Agenda for Sustainable Development (United Nations, 2015) has opened a new chapter in the evaluation of progress in development. A striking difference to its predecessor framework, the Millennium Development Goals (United Nations, 2000), is the fact that the Sustainable Development Goals are meant to apply to all countries of the world, not just to the developing countries – how ever defined. By considering a wide range of goals, encompassing social justice, peace, ecology, global partnership and other domains, the 2030 Agenda takes a broader focus than the Millennium Development Goals most of which were welfare targets. The setup of the 2030 Agenda may be taken as an occasion to consider new classification schemes for development status that would incorporate other concepts associated with development than those identified in this study. Development could then be seen not only as a matter of raising welfare or making progress in the transformation of the production structure, demographic reproduction patterns or social organization. Development that deserves the attribute "sustainable" should then rather encompass characteristics like the degree to which human activity causes depletion of natural resources. Accordingly, the system-stage concept proposed above could be broadened to cover the transition to a greener economy, and the welfare-based concept be extended to cover indicators of exposure to environmental degradation and natural disasters. Theoretical foundations for such broader concepts of development have already been laid, for example with the writings about the environmental Kuznets curve (Stern, 2004; Victor, 2010; Pacini and Silveira, 2014). New indicator frameworks, adapted to that broader focus, have also already been proposed, such as the "Happy Planet Index" (Jeffrey et al., 2016) and different

types of "Sustainable Development Indices" (Sachs et al., 2019; Hickel, 2020). To conclude, fifty years after their introduction, DSCSs remain a valid element of international statistics, worth being adapted to changing economic realities and changing statistical needs.

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Continent	Region	Country		UNCTAD			UNSD		IMF		WTO	World Bank		UNIDO		UNDP	
		Former	Current	1964	1981	2004	1970	2018	1984	2018	2014	1978	2018	1988	2015	2016	
		Saint Vincent and the Grenad.		X	X	X	X	X	X	X	X	X	-	X	-	X	
		Trinidad and Tobago		X	X	X	X	X	X	X	X	X	X	0	0	X	
	South America	Argentina		X	X	X	X	X	X	X	X	X	0	X	X	0	
		Bolivia		X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Brazil		X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Chile		X	X	X	X	X	X	X	X	X	0	X	X	0	X
		Colombia		X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Ecuador		X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Guyana		X	X	X	X	X	X	X	X	X	X	X	X	-	X
		Paraguay		X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Peru		X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Suriname		X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Uruguay		X	X	X	X	X	X	X	X	X	0	X	X	X	X
	Venezuela		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Europe	Northern Europe	Denmark		0	0	0	0	0	0	0	0	0	0	0	0	0	
		Finland		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Iceland		0	0	0	0	0	0	0	0	0	-	0	0	0	0
		Ireland		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Norway		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Sweden		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		United Kingdom		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Western Europe	Austria		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Belgium		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		France		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Germany		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Luxembourg		0	0	0	0	0	0	0	0	0	0	-	0	0	0

Continent	Region	Country		UNCTAD			UNSD		IMF		WTO	World Bank		UNIDO		UNDP	
		Former	Current	1964	1981	2004	1970	2018	1984	2018	2014	1978	2018	1988	2015	2016	
		Netherlands		0	0	0	0	0	0	0	0	0	0	0	0	0	
		Switzerland		0	0	0	0	0	0	0	0	0	0	0	0	0	
	Southern Europe	Albania		0	0	0	0	0	-	X	X	0	X	0	X	X	
		Greece		0	0	0	0	0	X	0	0	X	0	0	X	0	0
		Italy		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Malta		X	X	0	0	0	X	0	0	-	0	X	0	0	0
		Portugal		0	0	0	0	0	X	0	0	X	0	0	0	0	0
		Spain		0	0	0	0	0	0	0	0	X	0	0	0	0	0
		Yugoslavia		0	0	0	0	0	X	X	X	X	X	X	X	X	X
		Croatia		0	0	0	0	0	X	X	0	X	0	X	X	0	0
		Montenegro		0	0	0	0	0	X	X	X	X	X	X	X	0	0
		North Maced.		0	0	0	0	0	X	X	X	X	X	X	X	X	X
		Serbia		0	0	0	0	0	X	X	X	X	X	X	X	X	X
	Slovenia		0	0	0	0	0	X	0	X	X	0	X	0	0	0	
	Eastern Europe	Bulgaria		0	0	0	0	0	-	X	X	0	X	0	X	X	
		Czechoslovakia		0	0	0	0	0	-	0	0	0	0	0	0	0	0
		Czechia		0	0	0	0	0	-	0	0	0	0	0	0	0	0
		Slovakia		0	0	0	0	0	-	0	0	0	0	0	0	0	0
		Hungary		0	0	0	0	0	X	X	0	0	0	0	0	0	0
		Poland		0	0	0	0	0	-	X	0	0	0	0	X	0	0
		Romania		0	0	0	0	0	X	X	0	X	X	0	X	0	0
		USSR		0	0	0	0	0	-	X	X	0	X	0	0	0	X
		Belarus		0	0	0	0	0	-	X	X	0	X	0	X	0	X
		Moldova		0	0	0	0	0	-	X	X	0	X	0	X	0	X
		Russia		0	0	0	0	0	-	X	X	0	X	0	0	0	0
	Ukraine		0	0	0	0	0	-	X	X	0	X	0	X	X	X	
	Estonia		0	0	0	0	0	-	0	0	0	0	0	0	0	0	
	Latvia		0	0	0	0	0	-	0	0	0	0	0	X	0	0	

Continent	Region	Country		UNCTAD			UNSD		IMF		WTO	World Bank		UNIDO		UNDP	
		Former	Current	1964	1981	2004	1970	2018	1984	2018	2014	1978	2018	1988	2015	2016	
			Lithuania	0	0	0	0	0	-	0	0	0	0	0	0	0	
Asia	Central Asia		Kazakhstan	0	0	0	0	X	-	X	X	0	X	0	X	X	
			Kyrgyzstan	0	0	0	0	X	-	X	X	0	X	0	X	X	
			Tajikistan	0	0	0	0	X	-	X	X	0	X	0	X	X	
			Turkmenistan	0	0	0	0	X	-	X	X	0	X	0	-	X	
			Uzbekistan	0	0	0	0	X	-	X	X	0	X	0	-	X	
	Western Asia		Armenia	0	0	0	0	X	-	X	X	0	X	0	X	X	
			Azerbaijan	0	0	0	0	X	-	X	X	0	X	0	X	X	
			Georgia	0	0	0	0	X	-	X	X	0	X	0	X	X	
			Bahrain	X	X	X	X	X	X	X	X	-	0	X	0	0	
			Cyprus	X	X	0	X	0	X	0	0	X	0	X	X	0	
			Iraq	X	X	X	X	X	X	X	X	X	X	X	X	X	
			Israel	X	0	0	0	0	X	0	X	X	0	0	0	0	
			Jordan	X	X	X	X	X	X	X	X	X	X	X	X	X	
			Kuwait	X	X	X	X	X	X	X	X	0	0	X	0	0	
			Lebanon	X	X	X	X	X	X	X	X	X	X		X	X	
			Oman	X	X	X	X	X	X	X	X	X	-	0	X	X	X
			Qatar	X	X	X	X	X	X	X	X	X	-	0	X	0	0
			Saudi Arabia	X	X	X	X	X	X	X	X	X	0	0	0	X	0
			Syrian Arab Republic	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			Turkey	0	X	X	X	X	X	X	X	X	X	X	X	X	X
	United Arab Emirates	X	X	X	X	X	X	X	X	X	X	0	0	0	0		
	Yemen	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Eastern Asia			China	0	0	X	0	X	X	X	X	X	0	X	X		
			Hong Kong	X	X	X	X	X	X	-	X	0	0	0	0	0	
			Dem. People's Rep. of Korea	0	0	X	0	X	-	-	X	-	-	X	-	-	



Continent	Region	Country		UNCTAD			UNSD		IMF		WTO	World Bank		UNIDO		UNDP
		Former	Current	1964	1981	2004	1970	2018	1984	2018	2014	1978	2018	1988	2015	2016
		Japan		0	0	0	0	0	0	0	0	0	0	0	0	0
		Mongolia		0	0	X	0	X	-	X	X	0	X	X	X	X
		Republic of Korea		X	X	X	X	X	X	X	X	0	X	0	0	0
	South-eastern Asia	Brunei Darussalam		X	X	X	X	X	X	X	X	X	-	0	X	0
		Cambodia		X	X	X	X	X	X	X	X	X	X	X	X	X
		Indonesia		X	X	X	X	X	X	X	X	X	X	X	X	X
		Timor-Leste		.	.	X	.	X	.	X	X	.	X	.	.	X
		Lao People's Dem. Rep.		X	X	X	X	X	-	X	X	X	X	X	X	X
		Malaysia		X	X	X	X	X	X	X	X	X	X	X	0	X
		Myanmar		X	X	X	X	X	X	X	X	X	X	X	X	X
		Philippines		X	X	X	X	X	X	X	X	X	X	X	X	X
		Singapore		X	X	X	X	X	X	0	X	X	0	X	0	0
		Thailand		X	X	X	X	X	X	X	X	X	X	X	X	X
	Viet Nam		X	0	X	X	X	X	X	X	X	X	X	-	X	
	Southern Asia	Afghanistan		X	X	X	X	X	X	X	X	X	X	X	X	X
		Bangladesh		X	X	X	X	X	X	X	X	X	X	X	X	X
		Bhutan		X	X	X	X	X	X	X	X	X	X	X	-	X
		India		X	X	X	X	X	X	X	X	X	X	X	X	X
		Iran		X	X	X	X	X	X	X	X	X	X	X	X	X
		Maldives		X	X	X	X	X	X	X	X	X	X	X	X	X
Nepal			X	X	X	X	X	X	X	X	X	X	X	X	X	
Pakistan			X	X	X	X	X	X	X	X	X	X	X	X	X	
Sri Lanka		X	X	X	X	X	X	X	X	X	X	X	X	X		
Africa	Northern Africa	Algeria		X	X	X	X	X	X	X	X	X	X	X	X	
		Egypt		X	X	X	X	X	X	X	X	X	X	X	X	
		Libya		X	X	X	X	X	X	X	X	0	X	X	X	





Continent	Region	Country		UNCTAD			UNSD		IMF		WTO	World Bank		UNIDO		UNDP
		Former	Current	1964	1981	2004	1970	2018	1984	2018	2014	1978	2018	1988	2015	2016
		New Zealand		0	0	0	0	0	0	0	0	0	0	0	0	0
		Papua New Guinea		X	X	X	X	X	X	X	X	X	X	X	X	X

Notes: "X" - classified as developing country, "0" - otherwise classified; "-" - not classified, "." - country did not exist.

Sources: IMF (1984, 2019); UNDP (2016); UNIDO (1988, 2013); United Nations (1967, 1970, 1982, 1996, 2019a, 2019b); World Bank (1978, 1990, 2019a); WTO (2014)