Statistical Methods

Aggregation and imputation

The tables in this *Yearbook* contain country group composites for all indicators for which aggregates can be calculated. To facilitate comparison between the Asian and the Pacific region and the rest of the world, aggregates are included for Asia and the Pacific, Africa, Latin America and the Caribbean, North America, Europe and the World. In addition, aggregates appear for countries within Asia and the Pacific included in several classifications. These classifications comprise countries with special needs, i.e. the least developed countries, landlocked developing countries and small island developing States, the regional associations ASEAN and SAARC, the Central Asian subregion, and the three levels (low, middle and high) of the World Bank income classification of countries.

For a large number of indicators, some values are missing from country time series. Aggregates should therefore be treated as approximations of actual, unknown totals or averages. In the calculation of aggregates, missing values have been dealt with in the following way.

First, aggregates are not reported for a given year if the population (for social and environmental indicators) or the GDP (for economic indicators) of countries with available values for that year covers less than two thirds of the total population or GDP of the country group under consideration.

Second, missing country values have been imputed by applying the following methodology. If values are available for both an earlier and a later year than the aggregate is calculated for, the missing value has been imputed using linear interpolation. A missing country value for a year preceding the earliest year for which a value is available has been imputed using the value from the earliest year. Similarly, a missing country value for a year following the latest year for which a value is available has been imputed by using the value of the latest year. For countries with only one data point for the whole period, this value has been used for all missing years. No information is used from other countries for imputing the missing values. If imputation has been used to derive aggregates, information is given as part of the metadata at the end of each chapter.

There are two types of aggregates. The first type is straights sums of actual country values and, in some cases, imputed country values where actual values are missing for that particular year. The second type is weighted averages of actual country values and again, in some cases, imputed country values. The weights are chosen for each indicator separately and are mentioned in the metadata description of each indicator. For ratios, for example, denominators are used as weights. In the case of growth rates, either the weighted average of country growth rates or the growth rate from the time series of group totals is calculated.

Growth rates

Growth rates are presented as percentages. Rates of change from one period to the next are calculated as proportional changes from the earlier period. Rates of change over several periods are calculated as annual averages using the geometric growth model. The geometric growth rate uses discrete compounding. Although continuous growth, as modelled by the exponential growth rate, may be more realistic, many economic phenomena are measured only on an annual basis, in which case the annual compound model is appropriate. If the underlying data are measured as indicator levels, the formula for the average annual percentage change in indicator P over n periods is

$$r = \left[(P_n / P_1)^{1/n} - 1 \right] \cdot 100.$$

Note that it does not take into account the intermediate values of the series. However, if the underlying data are measured as annual changes, the formula becomes

$$r = \left\{ \left[(1 + g_0)(1 + g_1) \dots (1 + g_n) \right]^{1/n} - 1 \right\} \cdot 100,$$

where $g_0, g_1, ..., g_n$ denote the annual changes from the year 1 to *n*.

List of countries and groupings

Time series data are presented for the 58 members and associate members of ESCAP according to geographical classification, with the exception of developed economies, which are grouped separately. Throughout the *Yearbook*, countries and territories are referred to by a shortened version of their official name or, for some of the graphs presented, their ISO code.

List of ESCAP members and associate members (ISO and shortened version of names are indicated between parentheses). East and North-East Asia: China (CHN); Democratic People's Republic of Korea (DPR Korea, PRK); Hong Kong, China (HKG); Macao, China (MAC); Mongolia (MNG); Republic of Korea (KOR).

South-East Asia: Brunei Darussalam (BRN); Cambodia (KHM); Indonesia (IDN); Lao People's Democratic Republic (Lao PDR, LAO); Malaysia (MYS); Myanmar (MMR); Philippines (PHL); Singapore (SGP); Thailand (THA); Timor-Leste (TML); Viet Nam (VNM).

South and South-West Asia: Afghanistan (AFG); Bangladesh (BGD); Bhutan (BTN); India (IND); Iran (Islamic Republic of) (IRN); Maldives (MDV); Nepal (NPL); Pakistan (PAK); Sri Lanka (LKA); Turkey (TUR).

North and Central Asia: Armenia (ARM); Azerbaijan (AZE); Georgia (GEO); Kazakhstan (KAZ); Kyrgyzstan (KGZ); Russian Federation (RUS); Tajikistan (TJK); Turkmenistan (TKM); Uzbekistan (UZB).

Pacific: American Samoa (ASM); Cook Islands (COK); Fiji (FJI); French Polynesia (PYF); Guam (GUM); Kiribati (KIR); Marshal Islands (MHL); Micronesia (Federated States of) (Micronesia (F.S.), FSM); Nauru (NRU); New Caledonia (NCL); Niue (NIU); Northern Mariana Islands (Northern Mariana Is., MNP); Palau (PLW); Papua New Guinea (PNG): Samoa (WSM); Solomon Islands (SLB); Tonga (TON); Tuvalu (TUV); Vanuatu (VUT).

ESCAP Developed Economies: Australia (AUS); Japan (JPN); New Zealand (NZL).

Country groupings

Shortened names for country groupings are indicated between parentheses.

ESCAP: Members and associate members of ESCAP as per the list above.

Landlocked developing countries (LLDC): Afghanistan; Armenia; Azerbaijan; Bhutan; Kazakhstan; Kyrgyzstan; Lao PDR; Mongolia; Nepal; Tajikistan; Turkmenistan; Uzbekistan.

Least developed countries (LDC): Afghanistan; Bangladesh; Bhutan; Cambodia; Kiribati; Lao PDR; Maldives; Myanmar; Nepal; Samoa; Solomon Islands; Timor-Leste; Tuvalu; Vanuatu.

Small Island Developing States (SIDS): American Samoa; Cook Islands; Fiji; French Polynesia; Guam; Kiribati; Maldives; Marshall Islands; Micronesia (E.S.); Nauru; New Caledonia; Niue; Northern Mariana Is.; Palau; Papua New Guinea; Samoa; Singapore; Solomon Islands; Timor-Leste; Tonga; Tuvalu; Vanuatu.

Association of Southeast Asian Nations (ASEAN): Brunei Darussalam; Cambodia; Indonesia; Lao People's Democratic Republic; Malaysia; Myanmar; Philippines; Singapore; Thailand; Viet Nam.

South Asian Association for Regional Cooperation (SAARC): Afghanistan; Bangladesh; Bhutan; India; Maldives; Nepal; Pakistan; Sri Lanka.

Central Asia (C Asia): Armenia; Azerbaijan; Georgia; Kazakhstan; Kyrgyzstan; Tajikistan; Turkmenistan; Uzbekistan.

The classification by income group follows the definition of the World Bank: Economies are divided according to 2006 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income, \$905 or less; lower middle income, \$906-\$3,595; upper middle income, \$3,596-\$11,115; and high income, \$11,116 or more. Aggregates are calculated for ESCAP countries for the three income groups:

Low-income economies (Low-inc): Afghanistan; Bangladesh; Cambodia; Democratic People's Republic of Korea; India; Kyrgyzstan; Lao People's Democratic Republic; Mongolia; Myanmar; Nepal; Pakistan; Papua New Guinea; Solomon Islands; Tajikistan; Timor-Leste; Uzbekistan; Viet Nam

Middle-income economies (Middle-inc): American Samoa; Armenia; Azerbaijan; Bhutan; China; Fiji; Georgia; Indonesia; Iran (Islamic Republic of); Kazakhstan; Kiribati; Malaysia; Maldives; Marshall Islands; Micronesia (Federated States of); Northern Mariana Islands; Palau; Philippines; Russian Federation; Samoa; Sri Lanka; Thailand; Tonga; Turkey; Turkmenistan; Vanuatu.

High-income economies (High-inc): Australia; Brunei Darussalam; French Polynesia; Guam; Hong Kong, China; Japan; Macao, China; New Caledonia; New Zealand; Republic of Korea; Singapore.

For comparative purposes, aggregates are also presented for the world major regions as follows:

Africa: Algeria; Angola; Benin; Botswana; Burkina Faso; Burundi; Cameroon; Cape Verde; Central African; Republic; Chad; Comoros; Congo; Cote d'Ivoire; Democratic Republic of the Congo; Djibouti; Egypt; Equatorial Guinea; Eritrea; Ethiopia; Former Ethiopia; Gabon, Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Liberia: Libyan Arab Jamahiriya; Madagascar; Malawi; Mali; Mauritania; Mauritius; Mayotte; Morocco; Mozambique; Namibia; Niger; Nigeria; Réunion; Rwanda; Saint Helena; Sao Tome and Principe; Senegal; Seychelles; Sierra Leone; Somalia; South Africa; Sudan; Swaziland; Tanzania (United Republic of); Togo; Tunisia; Uganda; Western Sahara; Zambia; Zimbabwe.

Latin America and Caribbean (LAC): Anguilla; Antigua and Barbuda; Argentina; Aruba; Bahamas; Barbados; Belize; Bolivia; Brazil; British Virgin Islands; Cayman Islands; Chile; Colombia; Costa Rica; Cuba; Dominica; Dominican Republic; Ecuador; El Salvador; Falkland Islands (Malvinas); French Guiana; Grenada; Guadeloupe; Guatemala; Guyana; Haiti; Honduras; Jamaica; Martinique; Mexico; Montserrat; Netherlands Antilles; Nicaragua; Panama; Paraguay; Peru; Puerto Rico; Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Suriname; Trinidad and Tobago; Turks and Caicos Islands; United States Virgin Islands; Uruguay; Venezuela (Bolivarian Republic of).

North America (N Am): Bermuda; Canada; Greenland; Saint Pierre and Miquelon; United States. **Europe**: Albania; Andorra; Austria; Belarus; Belgium; Bosnia and Herzegovina; Bulgaria; Channel Islands; Croatia; Czech Republic; Denmark; Estonia; Faeroe Islands; Finland; France; Germany; Gibraltar; Greece; Guernsey; Holy See; Hungary; Iceland; Ireland; Isle of Man; Italy; Jersey; Kosovo; Latvia; Liechtenstein; Lithuania; Luxembourg; Malta; Monaco; Montenegro; Netherlands; Norway; Poland; Portugal; Republic of Moldova; Romania; San Marino; Serbia; Slovakia; Slovenia; Spain; Svalbard and Jan Mayen Islands; Sweden; Switzerland; The former Yugoslav Republic of Macedonia; Ukraine; United Kingdom of Great Britain and Northern Island.

Other Asia-Pacific: Bahrain; Cyprus; Iraq; Israel; Jordan; Kuwait; Lebanon; Norfolk Island; Occupied Palestinian Territories; Oman; Pitcairn; Qatar; Saudi Arabia; Syrian Arab Republic; Taiwan Province of China; Tokelau; United Arab Emirates; Wallis and Futuna Islands; Yemen.