07

Asia-Pacific Regional Cooperation and Integration Index

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This year's *Asian Economic Integration Report* introduces a new composite index to measure the progress of regional cooperation and integration in Asia and the Pacific.

Regional cooperation and integration (RCI) plays a pivotal role in accelerating economic growth and development, reducing poverty and economic disparity, raising productivity and employment, and strengthening institutions (ADB 2015). Deeper regional integration expands markets, helps maximize the efficiency of resource allocation, and boosts productivity and investment opportunities—all helping narrow development gaps between ADB's developing member economies. RCI can also generate considerable noneconomic benefits such as greater security and political stability. Recognizing its importance and its economic and noneconomic benefits, ADB adopted RCI as a key strategic priority for development assistance in Asia.

The Asia-Pacific Regional Cooperation and Integration Index allows Asian economies to track and monitor the progress of their regional integration efforts.

Understanding where the region stands on RCI is important to unlock its economic potential and maximize its benefits. Policy makers need mechanisms to monitor and evaluate progress against set goals. Against this backdrop, the *Asian Economic Integration Report* offers a new measure of RCI for Asia—using composite indexes constructed from 26 indicators categorized into six different socioeconomic dimensions. The weights of the composite indexes are obtained from a two-stage principal component analysis (PCA). In the first stage, the PCA is applied to the indicators in each dimension to create a dimensional composite index for the specific dimension. In the second stage, the PCA estimates weights for these six dimensional indexes to create an overall index of regional integration. The

detailed methodology for constructing these indexes is in Box 7.1.

The new index also builds on six dimensional indexes.

Regional integration is a multidimensional process. The index allows comparative analysis on multiple dimensions across different subregional groups and countries to capture the diversity in Asia's RCI process.[29] The six dimensional indexes are designed to reflect the core socioeconomic dimensions integral to the dynamic RCI process. These include: (i) trade and investment, (ii) money and finance, (iii) regional value chains, (iv) infrastructure and connectivity, (v) movement of people, and (vi) institutional and social integration. In turn, the Asia-Pacific Regional Cooperation and Integration Index (ARCII) will allow each subregional group and economy to identify its strengths and weaknesses across these six different socioeconomic dimensions.

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[29] The Asia-Pacific Regional Cooperation and Integration Index covers 48 Asian economies following the ADB classification (number of economies in parentheses): Central Asia (8)—Armenia, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan. East Asia (6)—Hong Kong, China; Japan; the People's Republic of China; the Republic of Korea; Mongolia; and Taipei,China. Southeast Asia (10)—Brunei Darussalam, Cambodia, Indonesia, the Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam. South Asia (8)—Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. The Pacific (14)—the Cook Islands, the Federated States of Micronesia, Fiji, Kiribati, the Marshall Islands, Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu, and Vanuatu. Oceania (2)—Australia and New Zealand.

Box 7.1: Constructing the Asia-Pacific Regional Cooperation and Integration Index

The Asia-Pacific Regional Cooperation and Integration Index (ARCII) makes use of 26 socioeconomic indicators categorized into six different dimensions to measure the diversity of regional cooperation and integration efforts. The box table lists these indicators in each of the six dimensions. All indicators are based on bilateral data, as regional integration is expressed as a ratio of the intraregional sum (or average) to total sum (or average) of cross-border economic activity. There are three exceptions: R24 takes the difference between intraregional and total averages, whereas R43 and R44 only reflect national levels due to data availability. The indicators are drawn from the annual data for 2013, which have the most complete data for the composite indexes.

Design of the Asia-Pacific Regional Cooperation and Integration Index

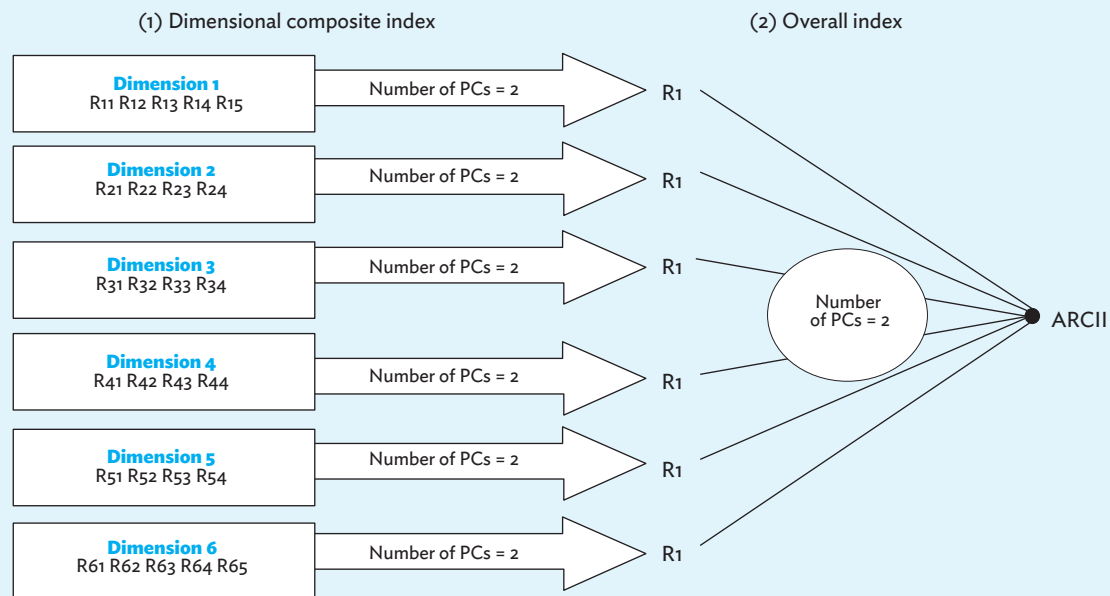| R1. Trade and Investment	R11	Proportion of intraregional goods exports to total goods exports
	R12	Proportion of intraregional goods imports to total goods imports
	R13	Intraregional trade intensity index
	R14	Proportion of intraregional foreign domestic investment (FDI) inflows to total FDI inflows
	R15	Proportion of intraregional FDI inflows plus outflows to total FDI inflows plus outflows
R2. Money and Finance	R21	Proportion of intraregional cross-border equity liabilities to total cross-border equity liabilities
	R22	Proportion of intraregional cross-border bond liabilities to total cross-border bond liabilities
	R23	Pairwise dispersion of deposit rates average regionally relative to that averaged globally
	R24	Pairwise correlation of equity returns average regionally minus that averaged globally
R3. Regional Value Chain	R31	Ratio between the average trade complementarity index over regional trading partners and the averaged trade complementarity index over all trading partners
	R32	Ratio between the average trade concentration index over regional trading partners and the averaged trade concentration index over all trading partners
	R33	Proportion of intraregional intermediate goods exports to total intraregional goods exports
	R34	Proportion of intraregional intermediate goods imports to total intraregional goods imports
R4. Infrastructure and Connectivity	R41	Ratio between the average trade cost over regional trading partners and the average trade cost over all trading partners
	R42	Ratio between the average liner shipping connectivity index over regional trading partners and the average liner shipping connectivity index over all trading partners
	R43	Logistics performance index (overall)
	R44	Doing Business Index (overall)
R5. Movement of People	R51	Proportion of intraregional outbound migration to total outbound migration
	R52	Proportion of intraregional tourists to total tourists (inbound plus outbound)
	R53	Proportion of intraregional remittances to total remittances
	R54	Proportion of other Asian economies that do not require an entry visa
R6. Institutional and Social Integration	R61	Proportion of other Asian economies with which there is a signed free trade agreement
	R62	Proportion of other Asian economies that have an embassy
	R63	Proportion of other Asian economies with which there is a signed business investment treaty
	R64	Proportion of other Asian economies with which there is a signed double taxation treaty
	R65	Cultural proximity with other Asian economies relative to that with all other economies

Source: Huh and Park (2017).

Box 7.1 continued

The ARCII was constructed using the following steps and procedures. First, minimum-maximum scaling is used to normalize all indicators which convey quantitatively different information in different measurement units. The normalized indicators range between 0 and 1, with higher values denoting greater regional integration. Second, principal component analysis (PCA) is performed to calculate the weights for each component to aggregate them into a single composite index. A two-step procedure is used for the ARCII: (i) to perform PCA on the indicators in each dimension to construct a composite index for each of the six dimensions; and (ii) to use PCA again to combine the six composite indexes into an overall ARCII index. The box figure describes the two-step procedure.

Computing for ARCII

(1) Dimensional composite index

| Dimension 1 | Number of PCs = 2 | R1 |
| R11 R12 R13 R14 R15 | | |

| Dimension 2 | Number of PCs = 2 | R1 |
| R21 R22 R23 R24 | | |

| Dimension 3 | Number of PCs = 2 | R1 |
| R31 R32 R33 R34 | | |

| Dimension 4 | Number of PCs = 2 | R1 |
| R41 R42 R43 R44 | | |

| Dimension 5 | Number of PCs = 2 | R1 |
| R51 R52 R53 R54 | | |

| Dimension 6 | Number of PCs = 2 | R1 |
| R61 R62 R63 R64 R65 | | |

(2) Overall index

Number of PCs = 2 → ARCII

ARCII = Asia-Pacific Regional Cooperation and Integration Index, PCs = principal components.
Source: Huh and Park (2017).

Asia has made impressive progress in regional economic integration over the past few decades; however, significant variations remain across different subregions and economies.

The overall RCI index was estimated for 23 Asian economies in five subregions where data is available. Figure 7.1 presents the summary of the ARCII indexes for selected subregions in Asia. Southeast Asia ranks highest, with an average of 0.590, with its maximum and minimum values at 0.654 and 0.513, respectively. Five out of the top 10 countries in the overall ranking are from Southeast Asia.[30] The second and third go to East Asia and Oceania, with respective averages of 0.553 and 0.531. South Asia follows, with Central Asia

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[30] Individual economy results for the ARCII are available upon request.

Figure 7.1: Overall Asia-Pacific Regional Cooperation and Integration Index by Subregion
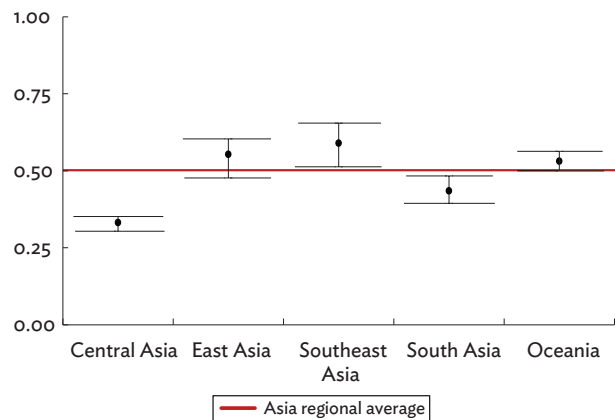
Notes: For each subregion, maximum (upper line), average (thick dot), and minimum (lower line) values of the overall index are reported. The horizontal line denotes Asia's regional average of 0.503. See Annex Table A7.1 for the list of economies covered.
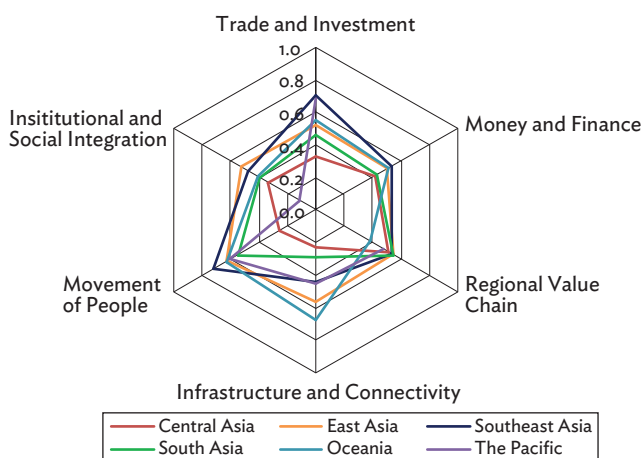Source: ADB calculations using updated data from Huh and Park (2017).

last—its maximum value of 0.351 is far below Asia's regional average of 0.503. The overall index could not be estimated for the Pacific due to lack of data.

Southeast Asia made major advances in regional integration, particularly in trade and investment and movement of people.

Figure 7.2 presents the six dimensional composite indexes for all six subregions, including the Pacific. Southeast Asia is the most regionally integrated, with the highest overall ARCII score among the six subregions. Its integration is driven largely by trade and investment and movement of people. East Asia comes second with its overall balanced and relatively high scores in all six dimensions. By contrast, inadequate infrastructure and connectivity keeps South Asia and Central Asia's regional integration low, while the Pacific subregion shows weak institutional and social integration.

**Figure 7.2: Summary of Asia-Pacific Regional Cooperation and Integration Index by Subregion**

Note: See Annex Table A7.1 for the list of economies covered for each subregion and dimension.
Source: ADB calculations using updated data from Huh and Park (2017).

The ASEAN exhibits the highest degree of regional cooperation and integration among subregional initiatives; while weak infrastructure and connectivity keeps regional integration low in SASEC and CAREC.

The ARCII likewise shows the degrees of regional cooperation and integration in Asia's subregional initiatives across the six RCI dimensions. The

Figure 7.3: Asia-Pacific Regional Cooperation and Integration Index by Subregional Initiatives
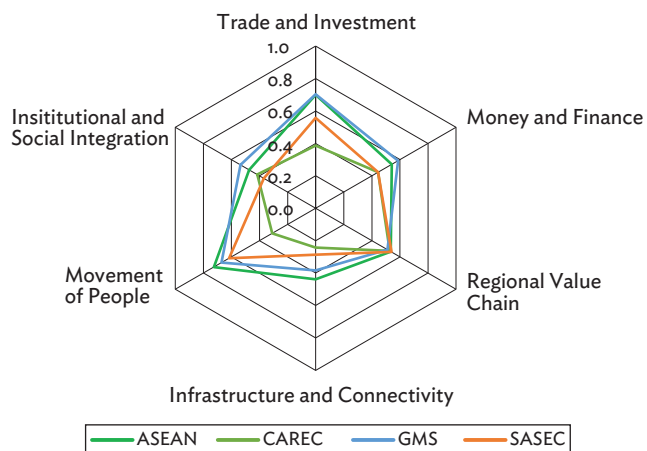
ASEAN = Association of Southeast Asian Nations, CAREC = Central Asia Regional Economic Cooperation, GMS = Greater Mekong Subregion, SASEC = South Asia Subregional Economic Cooperation.
Source: ADB calculations using updated data from Huh and Park (2017).

Association of Southeast Asian Nations (ASEAN) exhibits the highest degree of subregional cooperation and integration with an overall ARCII score of 0.569, particularly strong in the areas of trade and investment and movement of people (Figure 7.3). The Greater Mekong Subregion (GMS) is a very close second, with main contributors almost identical given the similarity of the member economies. The South Asia Subregional Economic Cooperation (SASEC), driven mainly by movement of people, trade and investment, and regional value chain, comes third. Finally, the Central Asia Regional Economic Cooperation (CAREC) appears to be the least regionally integrated. Meanwhile, weak infrastructure and connectivity keeps regional integration low in SASEC and CAREC.

The degree of RCI in Asia favorably compares to other regions of the world.

Regional integration indexes are also estimated for the European Union (EU), Latin America, and Africa. International comparisons can provide a more objective assessment of the degree of Asia's regional integration and help prioritize areas where progress may need to be accelerated. For compatibility, the same methodology was applied as ARCII in the makeup of the composite indexes and statistical procedures. Figure 7.4 shows the average overall regional integration index for the EU, Latin America and Africa, alongside Asia. The EU
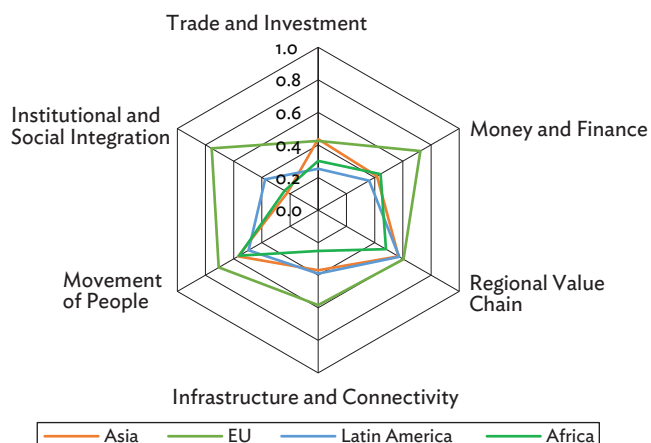
Figure 7.4: Regional Integration Indexes Normalized Worldwide
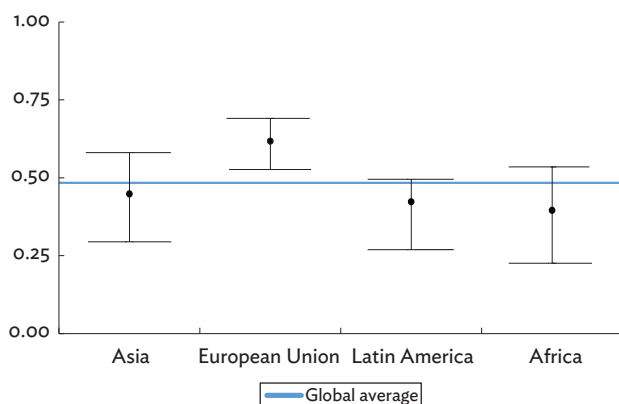
Notes: For each region, maximum (upper line), average (dot), and minimum (lower line) values of the overall index are reported. The horizontal line denotes global average of 0.484. See Annex Table A7.1 for the list of economies covered.
Source: ADB calculations using updated data from Huh and Park (2017).

Figure 7.5: Summary of Regional Integration Indexes Normalized Worldwide

EU = European Union.
Note: See Annex Table A7.2 for the list of economies covered.
Source: ADB calculations using updated data from Huh and Park (2017).

outperforms all other regions, with an average of 0.617.[31] Asia comes second, where the overall index averages 0.448 but is 27% below the EU. Latin America performs slightly weaker than Asia, with an average of 0.423, and Africa closely follows, with an average of 0.395.

The EU has the highest scores on all but one dimensional indexes; but Asia outranks both Africa and Latin America.

Figure 7.5 summarizes the six dimensional composite indexes for four regions. The EU has the highest scores on all but one dimensional indexes. Its dominance is most pronounced in institutional and social as well as money and finance integration given its institutions of economic and monetary union. Only Asia's trade and investment integration is comparable in magnitude to the EU's. Asia also ranks second in movement of people. Regional value chain and movement of people are Asia's most regionally integrated components, while institutional and social integration is least. Latin America beats Asia as well as Africa for the remaining dimensions of regional value chain, infrastructure and connectivity, and institutional and social integration.

Overall, economic integration in East Asia and Southeast Asia is most advanced, driven by growing trade and FDI networks linked to global supply chains.

Trade and FDI liberalization accelerated in the 1980s and 1990s around Asia, with many economies entering free trade agreements (FTAs). As of July 2017, 147 FTAs were in effect with another 168 under negotiation or proposed in ADB's 48 regional member economies. However, regional integration in Asia has been largely market-led and bottom-up, lacking strong regional institutions and governance.

Southeast Asia is the most regionally integrated among the six subregions in Asia.

The region includes all members of the ASEAN, which was established in 1969 to promote intergovernmental cooperation and facilitates economic integration among its members. The region shows particularly strong integration in trade and investment and movement of people. East Asia ranks second overall for regional integration, closely followed by Oceania. Central Asia comes last, with all dimensional and overall indexes scoring below corresponding averages for other subregions.

[31] Nearly all EU countries stand on top in world rankings. Malaysia, ranking 23rd, scores highest (0.585) among non-EU economies. Other top-ten performers in Asia attain high scores, with ranks between 26 and 43.

Trade and investment integration leads Asia's regional integration, while the institutional and social dimension is particularly weak.

Compared with the EU—which broadly outperforms Asia across all regional integration dimensions—Asia's trade and investment integration is the only one comparable in magnitude. Institutional and social integration is particularly weak in Asia. The empirical results suggest that other dimensions should be given as much, if not more, attention as trade and investment integration in advancing Asia's regional integration.

Collective actions can improve regional integration, particularly in the institutional and social dimension, including efforts to remove national barriers to regional integration, adopt regional standards, and institutionalize regional frameworks.

Regional integration is a dynamic, evolutionary process that offers everyone access to markets and resources, allows goods and services to move easily across borders, and lets citizens travel freely for leisure and work. It is also about unlocking the region's potential by encouraging capital and production to move and grow beyond national limits. The region's authorities need to: (i) progressively eliminate national obstacles to the movement of goods, services, capital, and labor; (ii) harmonize and coordinate national and regional policies; and (iii) institutionalize the regional framework, mechanisms and standards to promote regional integration. Greater collaboration among the region's economies—underpinned by a strong regional institutional framework—would further deepen regional integration across all dimensions.

References

ADB. 2015. *Thematic Evaluation Study: Asian Development Bank Support for Regional Cooperation and Integration.* Manila.

H. Huh and C.Y. Park. 2017. Asia-Pacific Regional Integration Index: Construction, Interpretation, and Comparison. *ADB Economics Working Papers.* No. 511. Manila: Asian Development Bank.

Annexes: List of Economies Covered

Table A7.1: Dimensional Indexes—Asia

	R1	R2	R3	R4	R5	R6
	Trade and Investment	**Money and Finance**	**Regional Value Chain**	**Infrastructure and Connectivity**	**Movement of People**	**Institutional and Social Integration**
Central Asia						
Armenia	✓		✓	✓	✓	✓
Azerbaijan	✓		✓	✓	✓	✓
Georgia	✓	✓	✓	✓	✓	✓
Kazakhstan	✓	✓	✓	✓	✓	✓
Kyrgyz Republic	✓	✓	✓	✓	✓	✓
Tajikistan	✓		✓	✓	✓	✓
Turkmenistan			✓	✓	✓	✓
Uzbekistan	✓		✓	✓	✓	✓
East Asia						
China, People's Republic of	✓	✓	✓	✓	✓	✓
Hong Kong, China	✓	✓	✓	✓	✓	✓
Japan	✓	✓	✓	✓	✓	✓
Korea, Republic of	✓	✓	✓	✓	✓	✓
Mongolia	✓	✓	✓	✓	✓	✓
Taipei,China	✓	✓		✓		✓
Southeast Asia						
Brunei Darussalam	✓		✓	✓	✓	✓
Cambodia	✓	✓	✓	✓	✓	✓
Indonesia	✓	✓	✓	✓	✓	✓
Lao People's Democratic Republic	✓	✓	✓	✓	✓	✓
Malaysia	✓	✓	✓	✓	✓	✓
Myanmar	✓		✓	✓	✓	✓
Philippines	✓	✓	✓	✓	✓	✓
Singapore	✓	✓	✓	✓	✓	✓
Thailand	✓	✓	✓	✓	✓	✓
Viet Nam	✓		✓	✓	✓	✓
South Asia						
Afghanistan	✓		✓	✓	✓	✓
Bangladesh	✓	✓	✓	✓	✓	✓
Bhutan	✓		✓	✓	✓	✓
India	✓	✓	✓	✓	✓	✓
Maldives	✓	✓	✓	✓	✓	✓
Nepal	✓	✓	✓	✓	✓	✓
Pakistan	✓	✓	✓	✓	✓	✓
Sri Lanka	✓	✓	✓	✓	✓	✓
Pacific						
Cook Islands			✓			✓
Fiji	✓		✓	✓	✓	✓
Kiribati			✓	✓	✓	✓
Marshall Islands	✓		✓	✓	✓	✓
Micronesia, Federated States of					✓	✓
Nauru						✓
Palau			✓	✓	✓	✓
Papua New Guinea	✓		✓	✓	✓	✓
Samoa	✓		✓	✓	✓	✓
Solomon Islands			✓	✓	✓	✓
Timor-Leste	✓		✓		✓	✓
Tonga			✓	✓	✓	✓
Tuvalu			✓		✓	✓
Vanuatu	✓		✓	✓	✓	✓
Oceania						
Australia	✓	✓	✓	✓	✓	✓
New Zealand	✓	✓	✓	✓	✓	✓

Source: ADB compilation.

Table A7.2: Overall Regional Cooperation and Integration Indexes

Asia (23)	European Union (26)	Latin America (16)	Africa (19)
Central Asia	Austria	Argentina	Algeria
Georgia	Belgium	The Bahamas	Benin
Kazakhstan	Bulgaria	Brazil	Botswana
Kyrgyz Republic	Cyprus	Chile	Ghana
East Asia	Czech Republic	Colombia	Kenya
China, People's Republic of	Denmark	Costa Rica	Malawi
Hong Kong, China	Estonia	Ecuador	Mauritius
Japan	Finland	Jamaica	Morocco
Korea, Republic of	France	Mexico	Mozambique
Mongolia	Germany	Nicaragua	Namibia
Southeast Asia	Greece	Panama	Nigeria
Cambodia	Hungary	Paraguay	Rwanda
Indonesia	Ireland	Peru	Seychelles
Lao People's Democratic Republic	Italy	Trinidad and Tobago	South Africa
Malaysia	Latvia	Uruguay	Sudan
Philippines	Lithuania	Venezuela	Swaziland
Singapore	Luxembourg		Tanzania
Thailand	Malta		Uganda
South Asia	Netherlands		Zambia
Bangladesh	Poland		
India	Portugal		
Maldives	Romania		
Nepal	Slovenia		
Pakistan	Spain		
Sri Lanka	Sweden		
Oceania	United Kingdom		
Australia			
New Zealand			

Source: ADB compilation.