World Openness Index 2022

The world economy thrives in openness and withers in seclusion. At present, the world is facing unprecedented changes, which continue to accelerate. The human society is once again standing at the "crossroads" of choice. The World Openness Index indicates that the world's openness has been in the doldrums in recent years, but we can also see hope for expansion.

In terms of the calculation of the openness index, two points need to be explained. First, in order to provide timely statistics from 2022, the Openness Index is compiled once a year. The index of the most recent year is mainly based on the evaluation with standard methods on the part of the available basic data of the year. Subsequent adjustments will be made based on the latest data, and subsequent *World Openness Report* will be updated accordingly.[1] Second, the data for GDP, which is used to weight economies in the regional and world openness index, had changed (from constant 2010 prices to constant 2015 prices). In this chapter, the indexes of 2021 to 2022 are calculated according to the updated scope, and the historical data for 2008 to 2020 are adjusted accordingly.

1. World Openness Index

(1) World opening-up continued to slow down

The 2022 World Openness Index was at 0.7542, down 0.4 percent from 2021, 0.4 percent from 2019 and 5.4 percent from 2008.

The 2021 World Openness Index was 0.7573, up 0.6 percent from 2020, slightly exceeding that in 2019, but a decrease of 5.0 percent from 2008.

For details of the World Openness Index during the period 2008–2022, see Fig. 1.1.

The 2022 World Openness Index was 0.0031 units lower than in 2021, which is the combined result of the expansion or tightening of openness in 129 economies.

—The main factors for expanding openness include the increase in international trade, the recovery of international tourism and studying abroad, the re-opening of cross-border entry

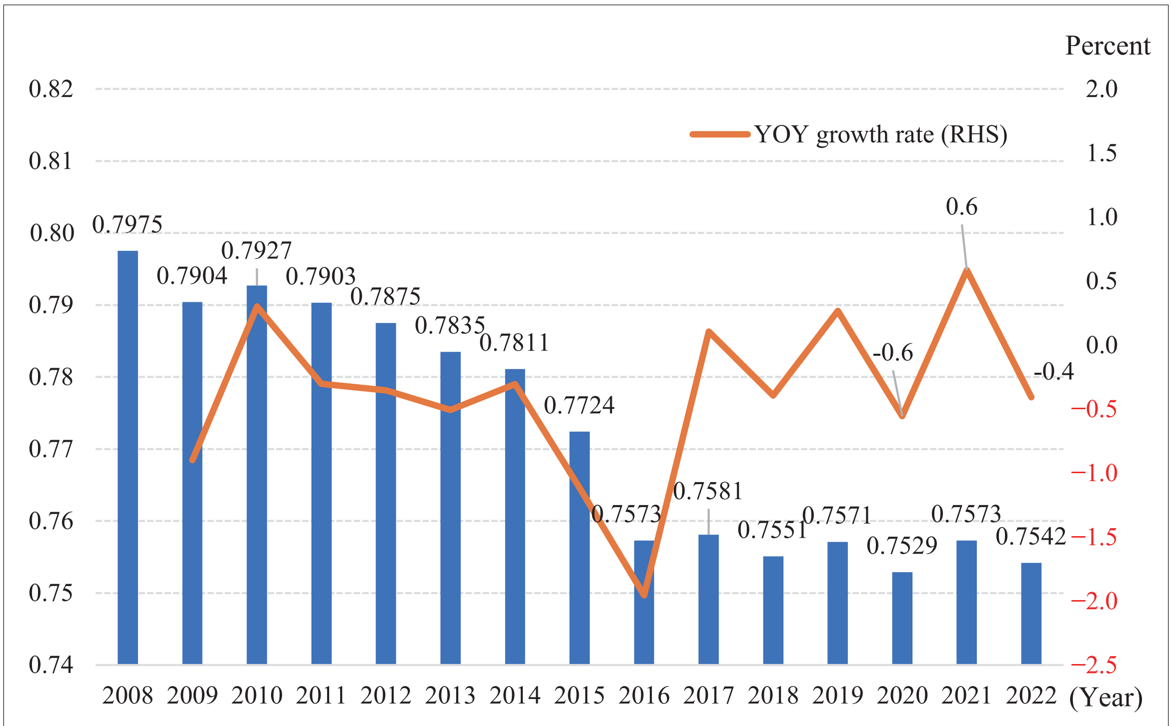

Fig. 1.1 World openness indexes: 2008–2022

and exit policies, and the signing of international investment agreements. The contribution to the World Openness Index has increased by 0.00388, 0.00028, 0.00015, and 0.00008 units, respectively, from 2021, a total increase of 0.00439 units.

—The main factors for tightening of openness include an increase in non-tariff measures, a decrease in cross-border direct investment, a decrease in the international citation of scientific literature, and a tightening of financial openness policies, resulting in a decrease of 0.00488, 0.00104, 0.00059, and 0.00014 units in their contributions to the World Openness Index from 2021, with a total decrease of 0.00665 units.

—The contribution of 78 economies to the World Openness Index in 2022 exceeded their contribution in 2021, with a total increase of 0.0043 units. In this increment, India accounted for 16.3 percent, Ireland for 7.1 percent, and Spain for 6.4 percent.

—The contribution of 51 economies to the World Openness Index in 2022 was smaller than that in 2021, with a total decrease of 0.00738 units. In this reduction, the United States accounted for 23.6 percent, Japan for 16.6 percent, and Germany for 11.2 percent.

The World Openness Index in 2022 decreased by 0.0433 units compared to 2008, and the overall level of world openness has shown a tightening trend over the past 15 years.

From 2008 to 2022, economies such as Nepal, Cabo Verde, Iceland, Rep. of Korea, and China saw the largest increase in their openness index. China has achieved significant progress in expanding its opening up to the outside world, with its openness index rising from 0.6789 to 0.7517, ranking among the top areas in the world.

(2) Top 20 most open economies

Singapore is the most open economy in 2022, whose openness index ranks first among the 129 economies. In the fifteen years since 2008, Singapore has consistently been the world's most open economy for the last eight years (2015–2022) and ranked second in the world in the seven years before that (2008–2014).

Germany and China's Hong Kong Special Administrative Region (SAR) continue to rank second and third, respectively, in the list of the World Openness Index in 2022. Both economies have been in second to fourth place in the world for the past 15 years.

Ireland, Malta, the Netherlands, Australia, Switzerland, Cyprus, and the United Kingdom ranked fourth to tenth, respectively.

Belgium, Canada, France, the Rep. of Korea, Austria, New Zealand, Luxembourg, Sweden, Greece, and Denmark ranked eleventh to twentieth respectively.

Six members of the G20, including Germany, Australia, the United Kingdom, Canada, France, and the Rep. of Korea, are among the twenty most open economies.

Details of the rankings of the aforementioned economies in the Openness Index of 2008 and 2019 to 2022 are shown in Table 1.1.

Table 1.1 The 20 most open economies in 2022

Economy	2022	2021	2020	2019	2008
Singapore	1	1	1	1	2
Germany	2	2	2	3	3
Hong Kong, China	3	4	3	2	4
Ireland	4	3	4	4	11
Malta	5	6	9	9	7
Netherlands	6	10	11	7	9
Australia	7	8	6	6	25
Switzerland	8	9	8	8	12
Cyprus	9	12	15	15	16
United Kingdom	10	11	7	5	5
Belgium	11	14	14	14	13
Canada	12	7	5	11	8
France	13	15	13	13	10
Korea, Rep. of	14	13	10	10	55

(Continued)

Economy	2022	2021	2020	2019	2008
Austria	15	18	21	20	19
New Zealand	16	17	17	17	21
Luxembourg	17	5	12	16	49
Sweden	18	22	24	25	20
Greece	19	24	30	34	36
Denmark	20	20	25	23	26

Note: Sorted by the 2022 ranking, G20 members in bold.

The data and rankings of the 129 economies on the list of World Openness Index since 2008 can be found in parts I and II of the Appendix of this report.

2. Openness Index on Certain Subjects

The openness in relevant areas (economy, society, culture[2]), policies, and performance[3] in recent years is demonstrated as follows.

(1) World economic and cultural openness tightened, and social openness slightly increased

The Economic Openness Index has slipped. The World Economic Openness Index was 0.8948 in 2022 (see Fig. 1.2), both down 0.4 percent from 2021 and 6.7 percent from 2008 but up 1.2 percent from 2019.

The top 10 economies on the 2022 Economic Openness Index list are as follows: Singapore, China's Hong Kong SAR, Germany, Ireland, Malta, Switzerland, Belgium, the Netherlands, France, and Lithuania.

From 2008 to 2022, the economies with a significant increase in economic openness index were Nepal (89.4 percent), Cabo Verde (13.6 percent), Iceland (13 percent), Rep. of Korea (11.7 percent), and Cambodia (9 percent).

Cultural openness index has significantly decreased. The World Cultural Openness Index in 2022 was 0.3184 (see Fig. 1.2), a year-on-year decrease of 2.9 percent, a decrease of 2.7 percent from 2019, and a decrease of 21.7 percent from 2008. Over the past 15 years, the index has continued to fluctuate and decline.

—In the year-on-year decline of the World Cultural Opening Index in 2022, international citation of scientific and technological literature accounted for 54.8 percent, cultural goods trade for 21.6 percent, and trade in intellectual property for 19.6 percent.

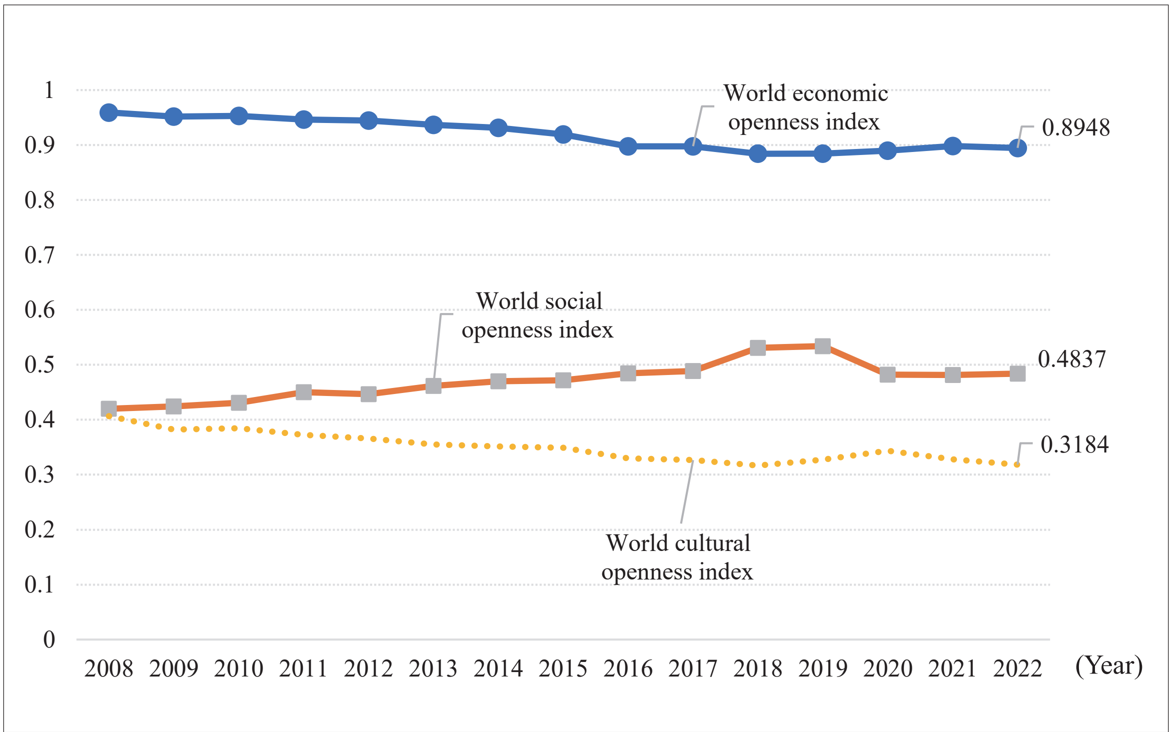

Fig. 1.2 World economic, social, and cultural openness indexes: 2008–2022

—In 2022, the top ten economies with the highest cultural openness index were the United States, Ireland, Luxembourg, China's Hong Kong SAR, Singapore, Germany, China, Cambodia, Japan, and Canada.

—From 2008 to 2022, the economies with a significant increase in the cultural openness index were Greece (355.2 percent), Luxembourg (224.8 percent), Sudan (173.2 percent), Azerbaijan (125.3 percent), and Armenia (121.5 percent).

Social openness index slightly rebounded. The World Social Openness Index in 2022 was 0.4837 (see Fig. 1.2), with a YOY growth rate of 0.46 percent, a decrease of 9.4 percent from 2019, and an increase of 15.2 percent from 2008. In the past 15 years, the index has been on the rise for most of the time, but due to factors such as the pandemic, it significantly decreased by 9.8 percent in 2020 and further decreased by 0.1 percent in 2021.

—In 2022, the top ten economies with the highest social openness index were China's Macau SAR, Germany, Australia, Singapore, Cyprus, the United Kingdom, Luxembourg, Austria, Canada, and New Zealand.

—From 2008 to 2022, the economies with a significant increase in social openness index were Albania (196.5 percent), Bosnia and Herzegovina (161.3 percent), Georgia (159.5 percent), Colombia (154.7 percent), and Mauritius (118.4 percent).

(2) Small differentiation was seen between World Openness Policies and Openness Performance in 2022

The openness policy index has declined. In 2022, the World Openness Policy Index was 0.7469 (see Fig. 1.3), a YOY decrease of 0.9 percent, and both decreased of 0.1 percent from 2019 and 7.7 percent from 2008.

—In 2022, the top ten economies with the highest openness policy index were Singapore, Switzerland, Australia, Lithuania, Rep. of Korea, Latvia, Estonia, Germany, Italy, and Spain.

—From 2008 to 2022, the economies with significant increases in the openness policy index were Nepal (109.3 percent), Cabo Verde (16.1 percent), Rep. of Korea (15.31 percent), Iceland (15.26 percent), and Costa Rica (12.7 percent).

The open performance index slightly increased. In 2022, the World Openness Performance Index was 0.7618 (see Fig. 1.3), a YOY increase of 0.1 percent, a decrease of 0.73 percent compared to 2019, and a decrease of 2.9 percent compared to 2008.

—In 2022, the top ten economies with the highest open performance index were the US, Singapore, China's Hong Kong SAR, Germany, China, Ireland, China's Macau SAR, Malta, Luxembourg, and the Netherlands.

—From 2008 to 2022, the economies with a significant increase in the open performance index were Nepal (54.4 percent), China (18.2 percent), Luxembourg (14.8 percent), Cambodia (12.3 percent), and Ireland (11.9 percent).

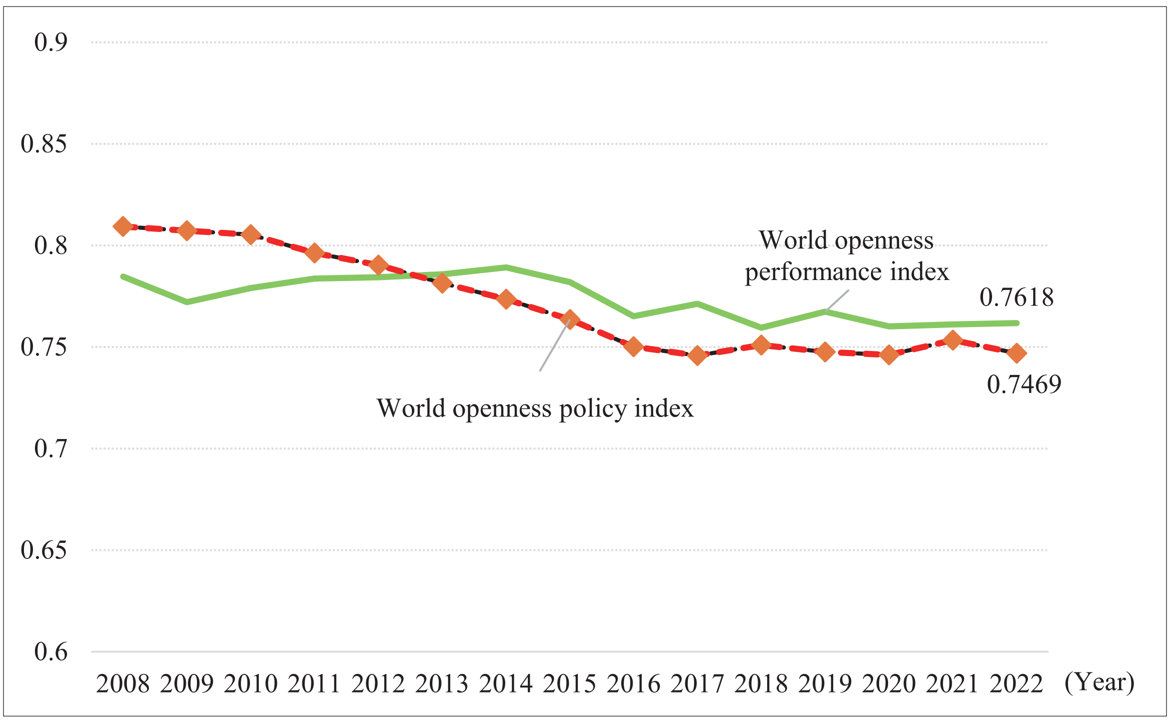

Fig. 1.3 World openness policy and performance indexes: 2008–2022

3. Openness Index by Different Groups of Economies

The 129 economies covered by the World Openness Index can be grouped according to geographic locations, income level, and development level. In addition, there are Belt and Road countries, G20,[4] and the BRICS countries.[5] The World Bank was used as a reference for groupings of geographic location and income level, while the International Monetary Fund (IMF) was used as a reference for the grouping of the development level. For details of the economies in each group, see part IV of the Appendix.

(1) Openness of South Asia, East Asia and the Pacific Ocean region expanded slightly, and others tightened up in 2022

The 2022 Openness indexes of different geographic regions are as follows, in descending order: Europe and Central Asia ranked first, with an openness index of 0.7788; North America and East Asia and the Pacific Ocean region ranked second and third, respectively, with openness indexes of 0.7763 and 0.7592 respectively; and Latin America and the Caribbean Area, the Middle East and North Africa, South Asia, and Sub-Saharan Africa ranked fourth to seventh respectively. Their openness indexes were 0.6918, 0.6811, 0.6453 and 0.6203 respectively.

There were only two regions whose openness index increased in 2022: South Asia and East Asia and the Pacific Ocean region. Their openness indexes increased by 0.22 percent and 0.01 percent, respectively. The remaining five regions experienced declines in openness, with the Middle East and North Africa experiencing the largest decline of 0.82 percent. The other four experienced declines of between 0.1 percent and 0.6 percent.

Compared to 2019, openness indexes of Latin America and the Caribbean Area saw the biggest declines in 2022, falling by 1.54 percent; the Middle East and North Africa declined by 1.1 percent, South Asia down by 0.58 percent, East Asia and the Pacific Ocean region down by 0.5 percent.

The movement of openness from 2008 to 2022 in the above regions falls into two categories: three regions with expanding openness, namely East Asia and the Pacific Ocean region, South Asia, and Europe and Central Asia, with openness indexes increasing by 4.6 percent, 2.7 percent, and 1.8 percent respectively; four regions with tightening openness, in which North America showed the largest decline of 18.4 percent, the Middle East and North Africa experienced a decrease of 1.15 percent.

Details of the openness index of each region since 2008 are shown in Fig. 1.4.

(2) Openness of lower-middle-income economies declined significantly in 2022

The 2022 openness indexes of high-income, upper-middle-income, lower-middle-income, and low-income economies are 0.7853, 0.7232, 0.6056, and 0.6489, respectively. Openness indexes

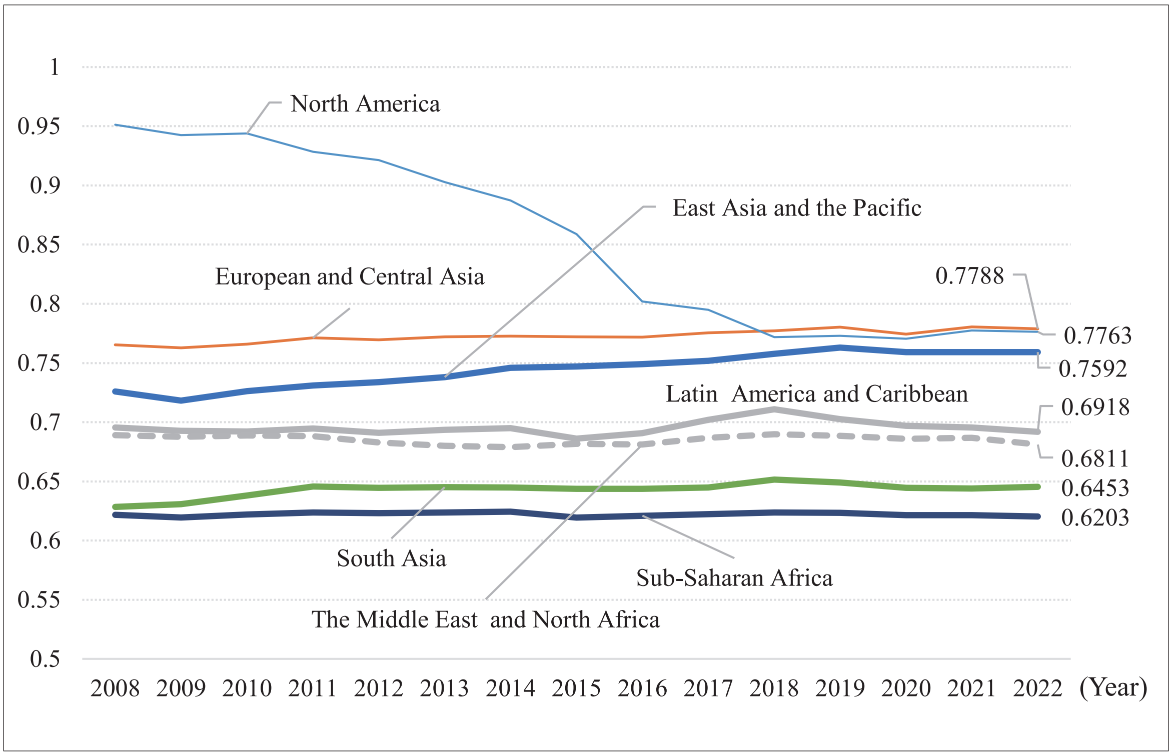

Fig. 1.4 Openness indexes of seven regions: 2008–2022

of the first two groups of economies are the highest, while that of the lower-middle-income economies is the lowest.

Compared to 2021, except for low-income economies, the openness of the other three groups of economies in 2022 has tightened. The openness index of high-income economies decreased by 0.37 percent, upper-middle-income economies decreased by 0.5 percent, and lower-middle-income economies decreased by 0.54 percent. Low-income economies saw a slight increase of 0.1 percent.

Compared to 2019, all four groups of economies experienced a tightening in openness in 2022. Among them, the openness index of high-income economies decreased by 0.24 percent, upper-middle-income economies decreased by 0.32 percent, lower-middle-income economies decreased by 0.57 percent, and low-income economies decreased by 0.23 percent.

From 2008 to 2022, openness tightened only in high-income economies, with the openness index declining by 7.5 percent; it widened in the remaining three groups of economies, with the openness indexes of upper-middle-income, lower-middle-income, and low-income economies increasing by 6.3 percent, 5.1 percent, and 0.6 percent, respectively.

Fig. 1.5 demonstrates the details of the openness index by different income groups since 2008.

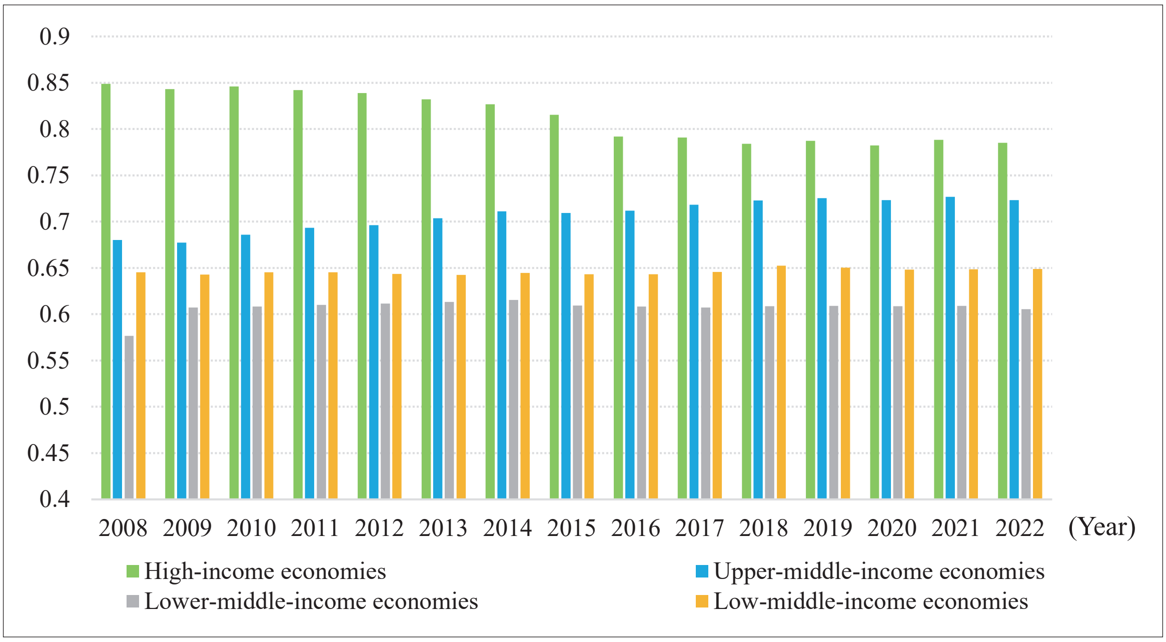

Fig. 1.5 Openness indexes of economies by income groups: 2008–2022

(3) Openness tightened in emerging market and developing economies as well as advanced economies in 2022

The IMF categorizes global economies into advanced economies, emerging markets, and developing economies. Currently, there are 41 advanced economies and 156 emerging market and developing economies, of which 36 and 93, respectively, are samples of the World Openness Index.

Both groups slightly tightened openness in 2022. The openness index of advanced economies was 0.7882, and that of emerging market and developing economies was 0.7067, down 0.34 percent and 0.44 percent, respectively, over 2021.

Compared to 2019, the openness of both groups tightened slightly. The openness index of advanced economies fell by 0.2 percent, while that of emerging market and developing economies fell by 0.3 percent.

From 2008 to 2022, the openness index of advanced economies fell by 7.7 percent, while that of emerging market and developing economies increased by 4.8 percent. Over the past fifteen years, openness has been predominantly tightened in advanced economies and widened in emerging markets and developing economies, and the decline in the former has outpaced the rise in the latter.

The openness trends of the two economic groups since 2008 are shown in Fig. 1.6.

Among the advanced economies, the openness indexes of the EU, particularly the Euro Area and the G7, are shown in Fig. 1.7.

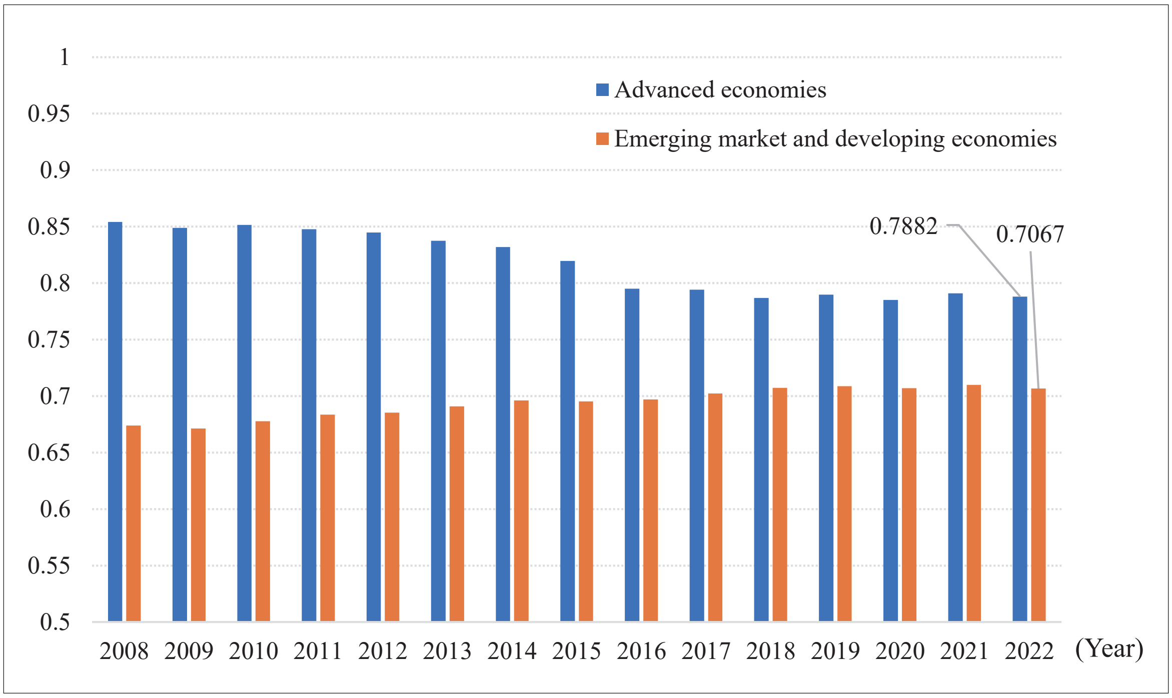

Fig. 1.6 Openness indexes of advanced economies and the emerging market and developing economies: 2008–2022

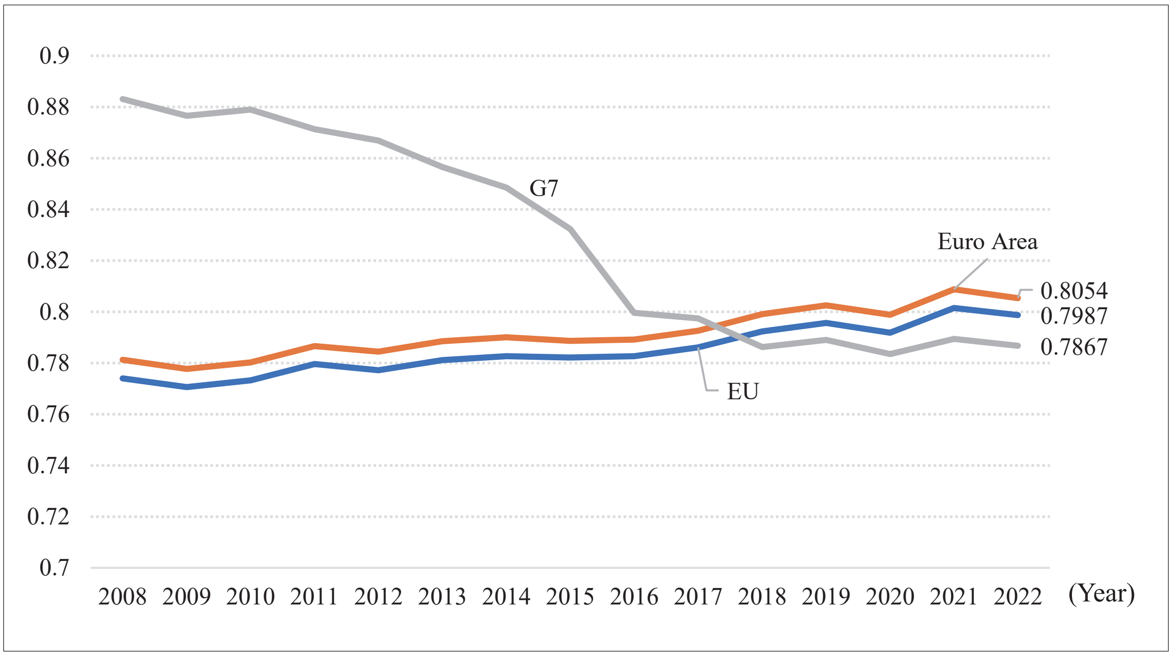

Fig. 1.7 Openness indexes of the EU, Euro Area, and G7: 2008–2022

Since 2008, especially after 2020, the EU has been an important force in widening world openness:

The openness index of the EU was 0.7987 in 2022, down 0.35 percent from 2021, up 0.4 percent from 2019, and up 3.2 percent from 2008.

The openness index of the Euro Area was 0.8054 in 2022, down 0.42 percent from 2021, up 0.36 percent from 2019, and up 3.1 percent from 2008.

In contrast to the EU or the Euro Area, the G7's openness index has been declining from 2008 to the present. In addition, the decline is much greater than that of the World Openness Index. The group's openness index was 0.7867 in 2022, down 0.3 percent from 2021, 0.3 percent from 2019, and 10.9 percent from 2008. Prior to 2018, the G7's openness index exceeded those of the Euro Area and the EU, but the gap between them narrowed rapidly. Since 2018, the G7's openness index has been lower than those of the other two.

(4) Openness of the G20 declined

The G20 comprises 19 member states and the EU, of which 19 states are in a sample of the World Openness Index. The openness index for the group as a whole is shown in Fig. 1.8.

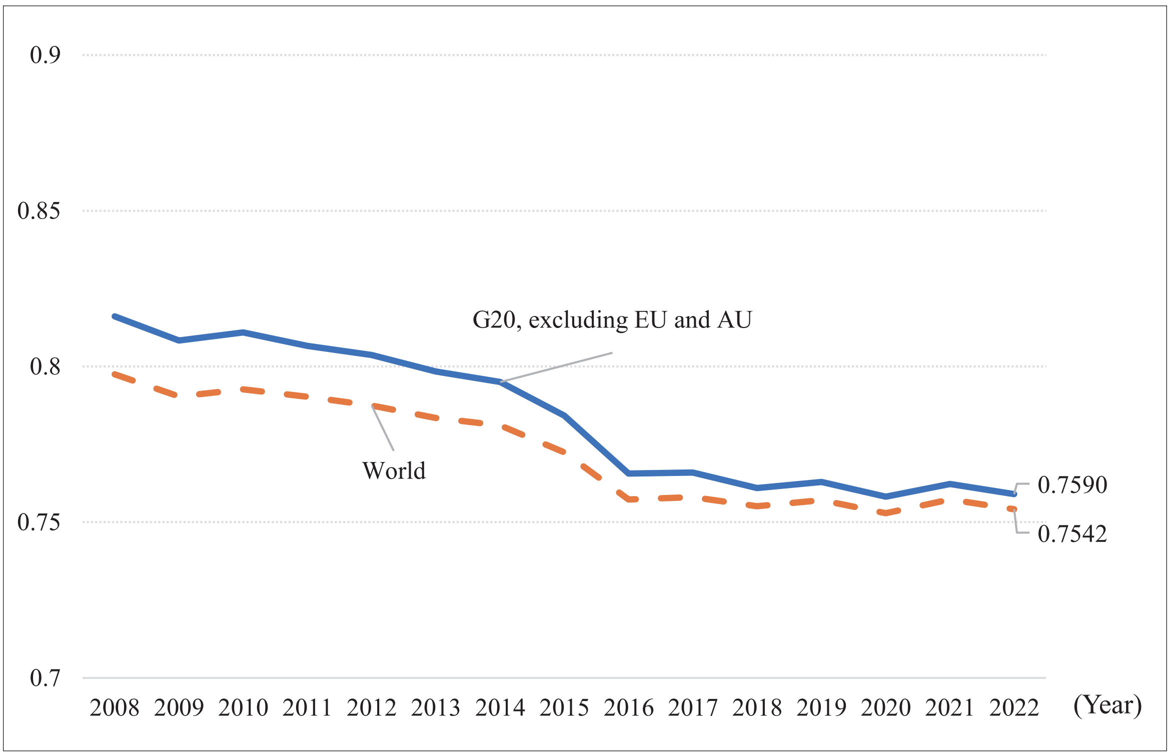

Fig. 1.8 Openness indexes of the G20 (excluding the EU and AU): 2008–2022

In 2022, the openness index of the G20 was 0.7590, down 0.4 percent from 2021, 0.5 percent from 2019, and 7 percent from 2008.

From 2008 to 2016, the G20's openness tightened quickly, with the openness index falling from 0.8161 to 0.7656. Since 2017, the G20's openness index has been fluctuating slightly between 0.7580 and 0.7660.

The gap between the G20's openness index and that of the world continues to narrow. The ratio of the two openness indexes ranged between 1.023 and 1.018 from 2008 to 2014, declining rapidly since 2015, down to around 1.006 in 2022. The continued tightening of openness of the G20 in recent years is worth particular attention.

(5) Opening-up of the countries involved in the BRI decreased slightly

There are more than 150 countries involved in the BRI, 99 of which are in the sample of the World Openness Index. The overall openness index is shown in Fig. 1.9.

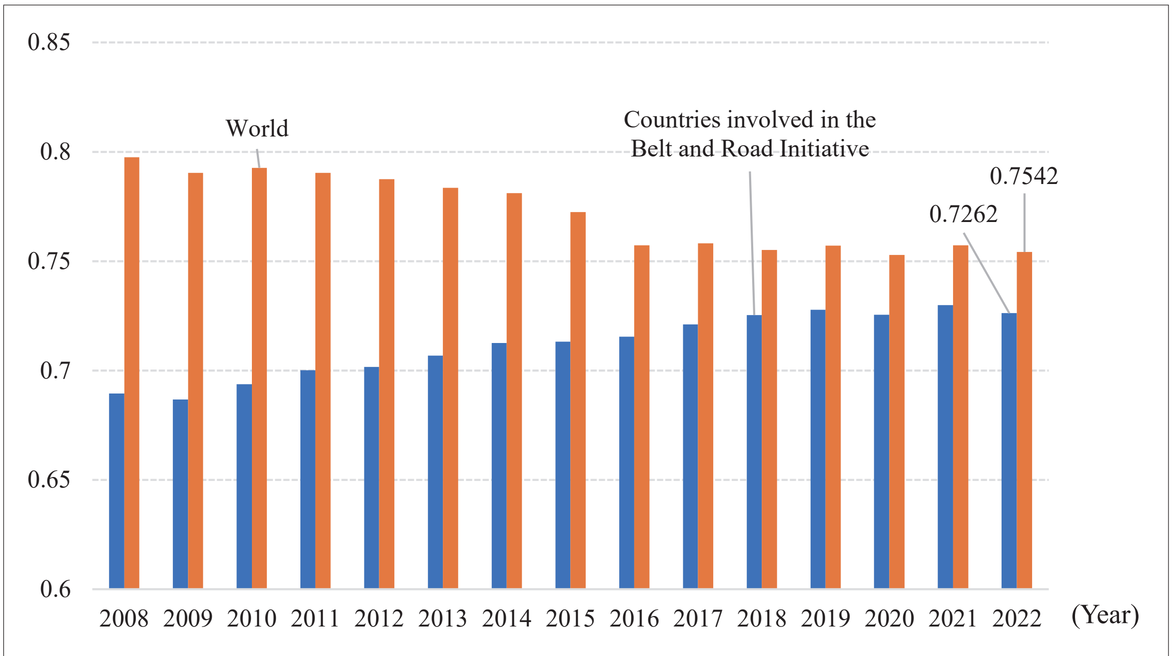

Fig. 1.9 Openness indexes of countries involved in the BRI: 2008–2022

In 2022, the openness index of countries involved in the BRI was 0.7262, down 0.5 percent from 2021, down 0.2 percent from 2019, and up 5.3 percent from 2008.

The ratio of the openness index of the countries involved in the BRI to that of the world stood at 0.86 in 2008, gradually climbed to 0.96 in 2018, and has remained stable ever since.

(6) Openness of the BRICS countries decreased

The openness index of the BRICS countries as a whole is shown in Fig. 1.10.

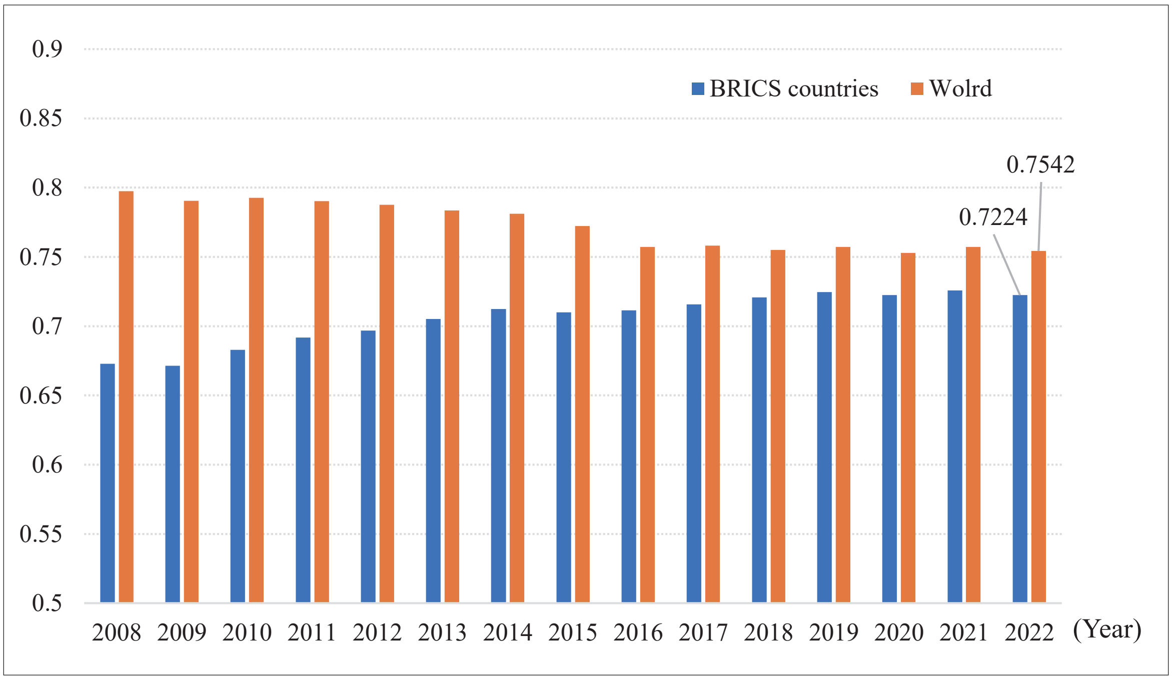

Fig. 1.10 Openness indexes of BRICS countries: 2008–2022

In 2022, the openness index of the BRICS stood at 0.7224, down 0.5 percent from 2021 and 0.3 percent from 2019; however, up 7.4 percent from 2008.

Since 2008, the openness index of the BRICS has continued to rise from 0.6728. In 2013, it surpassed 0.7 and rose to 0.7051, and reached a new high of 0.7257 in 2021.

The gap in openness between the BRICS countries and the world has been narrowing. The ratio of the openness index of the BRICS countries to that of the world was 0.844 in 2008 and 0.958 in 2022.

In general, the trend of world openness has continued to descend since 2008. In 2022, world openness remained sluggish. The forces of tightening and expanding opening-up are intertwined, leading to an increasingly complex landscape. Openness has tightened in high-income economies together with the G20 and the BRICS countries, which deserves high concern.

NOTES

1. This calculation method is an internationally accepted practice. The *World Openness Report 2022* updated the World Openness Index to 2020, and this report updates it to 2022.
2. The economic openness index covers basic indicators such as international trade in goods and services, international direct investment, and international securities investment. The social openness index covers basic indicators such as international tourists, international students, and immigrants. The cultural openness index covers basic indicators such as international trade in intellectual property, cross-border patent applications, international scientific literature citation, and international trade in cultural goods.
3. The openness policy refers to cross-border opening-up policies in economic, social, and other dimension. The openness performance refers to the flow of cross-border economic, social, and cultural open carriers, reflecting the immediate results of openness. For the concept, theory, methods, and data of the World Openness Index, please refer to the part III of the Appendix of this report.
4. The openness index here only covers the 19 member countries of the G20, excluding the EU and the African Union. On September 9, 2023, the African Union officially joined, and the number of G20 members increased to 21.
5. "The BRICS countries" in this report refers to Brazil, Russia, India, China, and South Africa. On August 24, 2023, BRICS expanded to 11 countries.

CHAPTER 2

Openness Capacity and Warranted Openness

The key variable in determining whether a country's openness is warranted or not is its state capacity to open up. This chapter focuses on the connotation and extension of state capacity to open up, introduces measurement methods for openness capacity, and takes the G20 members as the sample to measure their openness capacity, evaluate the general quantitative relationship between openness and the capacity to open up, and assess the warrantedness of openness of these countries during specific periods.

1. Openness Capacity from the Perspective of Warranted Openness

The warranted openness of a country refers to the openness level warranted by the country's state capacity to open up.[1] Openness capacity is the key factor in determining the warrantedness of openness.[2]

(1) The connotation of state capacity to open up

State capacity to open up refers to the strength, skills, qualities, attributes, or attitudes of an economy to gain the benefits of openness while assuming corresponding responsibilities. Guided by specific ideologies and within a particular institutional environment, an economy engages in economic, social, and cultural interactions with other economies. Through both competition and cooperation, they mutually conduct cross-border exchanges and allocation of goods, services, personnel, capital, technology, knowledge, information, and data, facilitating production, exchange, and consumption.

Box 2.1 What are ability and relevant terms?

The term "ability" in Chinese has a clear meaning: the comprehensive quality manifested in achieving a goal or completing a task, or "energy and strength."[3] The ability of any actor mainly comprises three layers of meaning: the comprehensive quality or resource elements mastered in certain tasks, the actual efficacy achieved in practice, and comparatively positive psychological traits displayed in completing tasks.[4]

In English, there are multiple terms related to the Chinese concept of "ability," such as:

—Ability: A general word for power or skills to do or act physically, intellectually, mentally, legally, morally, or financially, or the quality, attribute, and state of being capable. It broadly refers to all kinds of abilities, including actual and potential abilities, either innate or acquired.

—Capacity: More formal than ability. It refers to the current existing ability and usually signifies the maximum actual ability. Most of the existing literature on "state capacity" uses this term.

—Capability: Often refers to the maximum ability that can be developed under appropriate conditions, namely potential ability. It emphasizes both quantity and quality and is usually higher in quantity than "capacity." Literature using "state capability."[5]

—Competence: Often refers to the professional ability that is sufficient to meet the quality and performance requirements of a particular practice.

The above summary is mainly based on search results from the website thefreedictionary.com, which integrates contents from classic English dictionaries, including *Collins English Dictionary*, *Dictionary of the English Language* (American Heritage), *Kernerman English Multilingual Dictionary*, *Random House Kernerman Webster's College Dictionary* and *WordNet 3.0*.

(2) The extension of state capacity to open up

The extension of state capacity to open up can be understood through the "Concept–Institution–Resource" framework. Accordingly, it can be assessed at three levels: National Openness Concept, National Openness Institutions, and National Resources for Openness.

National Openness Concept. The national openness concept should base itself on a country's national conditions, including cultural and historical traditions, natural geographical environment, socio-economic development, and international relations. It should also align with global trends of development in science, technology, economy, and civilization. Major openness concepts include the Openness Concept of Win-Win Cooperation, the Openness Concept of Zero-Sum Confrontation, the Openness Concept of Isolation, and the Openness Concept of Isolation Before Opening Up.

—Openness Concept of Win-Win Cooperation. A country's cross-border openness not only safeguards its sovereignty, security, and development interests but also maintains and enhances the well-being of its people. It also advances global peace and development and promotes the building of a community with a shared future for mankind. National openness must be independent, and international interactions should be based on the principles of mutual respect for sovereignty and territorial integrity, non-aggression, non-interference in internal affairs, equality and mutual benefit, and peaceful coexistence. Global governance should be based on extensive consultation, joint contribution, and shared benefits. Global security should be common, comprehensive, cooperative, and sustainable. Global development should be equitable, inclusive, open, coordinated, innovative, and interconnected. Interactions between different civilizations should be based on equality, mutual learning, dialogue, and inclusiveness.

—Openness Concept of Zero-Sum Confrontation. As countries open up to each other, international relations are primarily competitive rather than cooperative, with the all-round relations between nations defined by local competitions. In the opening up of the global economy, society, culture, and other fields, countries or groups of countries engage in exclusive competition. The strongest nations establish global hegemony, dominate the world order in various fields, and reap most of the benefits of openness, while the weaker nations receive a small part of the benefits, and their long-term development is hindered.

—Openness Concept of Isolation. A country strictly limits or even completely prohibits economic, political, social, and cultural exchanges with other nations. It neither directly benefits from international openness nor assumes the responsibilities that come with international openness.

—Openness Concept of Isolation Before Opening Up. If a country has no evident comparative advantages on the global stage, it should first cultivate its capabilities in an absolutely or relatively closed environment. After forming distinct international comparative advantages through isolation, it can open its doors to compete and cooperate with other nations, thereby obtaining corresponding benefits of openness and fulfilling its due international responsibilities.

Overall, the Openness Concept of Win-Win Cooperation is ideal, while the Openness Concept of Isolation is relatively extreme. The Openness Concept of Zero-Sum Confrontation and the Openness Concept of Isolation Before Opening Up represent specific combinations of openness and isolation. In human practice, a particular country may adhere to one of these four openness concepts or may follow different concepts at different times. The more a country's openness concept aligns with its own national conditions and global trends, the more widely it will be accepted and actively participated in by both domestic and international communities, and the stronger its openness capacity will be.

National Openness Institutions. National openness institutions are symbols and integral components of the state capacity to open up. They form an integrated system of interaction rules among open entities and between open and non-open entities, including both formal and informal openness institutions.[6] Formal openness institutions include strategies, laws or acts, regulations, provisions, agreements, treaties, initiatives, declarations, statements, notifications, notes, policies, measures, decisions, proposals, frameworks, and standards related to openness. Informal openness institutions include customs, ethical and moral norms, and religious beliefs.

Most openness institutions clearly have openness as the theme (for example, Foreign Relations Law, Foreign Investment Law, Foreign Trade Law, Tariff Law, Entry-Exit Animal and Plant Quarantine Law, Customs Law, International Economic and Agreement, and so on) or explicitly include contents regarding openness although not having it as the theme (for example, Constitution, Intellectual Property Law, Financial Law, Anti-monopoly Law, Statistical Law, and relevant international treaties).

By clarifying the rights and obligations of open entities, effective openness institutions establish a well-organized and flourishing environment for openness.

Box 2.2 Most new WTO members have benefited significantly after their accesses

The WTO brings "open institutional dividends" to its members and promotes the development of an open world economy by constructing a binding trade rule system and a predictable international economic environment. Since the establishment of the WTO in 1995, 36 new members have been accessed. Quantitative analysis was conducted on indicators such as GDP growth rate, share in global GDP, growth rate of import and export, and foreign investment before and after the accession. The results showed that 24 new members, including China and Vietnam, benefited significantly after access, accounting for two-thirds of the total.

Members who benefit more have the following common characteristics. One is the stable political environment, which provides a stable and predictable business environment for multinational corporations to lay out international production. The second is that the industrial system is relatively complete, or positive progress has been made in the transformation of the industry towards diversification. The third is to strictly fulfill the accession commitments, significantly reduce tariffs and non-tariff barriers, actively carry out supporting reforms, actively adjust economic structure, and strive to integrate into the GVCs.

National Resources for Openness. The national resources for openness are the source and foundation of the state capacity to open up, which include Natural Resources, Human Resources, and Production Resources.

—Natural Resources. Natural resources comprise renewable and non-renewable resources. Renewable resources include land, forests, conservation areas, mangroves, and fisheries. Non-renewable resources include fossil fuel energy, minerals, and location. A country's natural resources reflect its current and future capacity to support a specific population and economy.

—Human Resources. Human resources refer to the quantity and quality of a country's labor force. These not only enhance human capital in the cross-border openness of ideas, knowledge, and technology but also provide human capital with international competitive advantages for cross-border production activities. The resulting consumer market cultivates the international competitiveness of domestic suppliers and attracts foreign goods and service supply.

—Production Resources. Production resources include tangible resources like machinery, buildings, equipment, residential and non-residential urban land, as well as intangible intellectual resources (such as education and R&D) and financial resources. These serve to provide essential infrastructure like water, electricity, gas, transportation, and information communication for the functioning of the state and also facilitate market entities in allocating resources to produce goods with international comparative advantages or participate in cross-border industrial chains, supply chains, and value chains to contribute value with international comparative advantages.

—Net Foreign Assets. Net foreign assets refer to the balance between a country's claims on other countries and regions and its liabilities to them, serving as a direct indicator of a country's openness capacity.

The more abundant the resources a country has that are suitable for openness, the stronger its capacity to open up.

Box 2.3 Classification of capacities

Any actor requires capacity as a foundation to do anything. The connotation and extension of capacity are extremely rich, and the corresponding classification is diversified.

Capacity can roughly be divided into general capacity and special capacity. General capacity refers to the abilities that must be possessed to perform any activity. Special capacity, also known as specialized capacity, refers to the necessary abilities to complete a specific activity.

Capacities can be categorized into functional capacity, technical capacity,[7] and behavioral capacity.[8]

—Functional capacity. This refers to the essential abilities that an actor must possess to fulfill their responsibilities. It is related to all levels and is not specific to any field or topic.[9] Borrowing from Nobel laureate Amartya Sen's perspective, the capability to function can also be defined as what an actor can do or what they can become. It is a key factor in evaluating the welfare and advantages of that actor, especially at the individual level.[10]

—Technical capacity. This refers to abilities related to specific professional knowledge and practice, often derived from formal education and practice. Actors possessing this capacity are generally limited.[11] In management and engineering, technical capability refers to an enterprise's ability to integrate technical knowledge and skills.[12] In economics, technical capability refers to an enterprise's ability to acquire technology from external sources, combine it with internal knowledge for technical innovation, and then disseminate the new technology, ultimately forming its own technology accumulation.[13]

—Behavioral capacity. This refers to an actor's ability to implement specific actions through the necessary knowledge and skills. To successfully perform this action, the actor must know what to do and how to do it. The actor learns from the consequences of their actions, which will impact the environment in which they operate. Particularly in environments with multiple stakeholders, an actor's behavioral capacity will influence the attitudes and actions of other actors.[14] In law, behavioral capacity refers to an actor's qualification to express their independent awareness, act in their own name, acquire rights, and undertake obligations (*Encyclopedia of China*).

The areas, regions, and actors involved in national openness are incredibly diverse and therefore require a wide range of capacities.

State capacity to open up is a part of national capacity and needs to collaborate efficiently with the non-openness capacities to jointly maintain national sovereignty, security, and developmental interests.

Box 2.4 What is state capacity?

"State Capacity" is a topic of concern in political science, history, sociology, and increasingly in economics, particularly in the field of development economics.

Political scientists often study state capacity from the perspectives of state, social, and international systems as well as the interconnections among them, forming three viewpoints centered respectively on the state, social, and international systems. Economists tend to study the relationship between state capacity and economic development from the perspective of resource extraction.

State capacity is not just a domestic political concept;[15] it is also considered a kind of efficacy in dealing with competition and challenges from other countries in the international system.[16] Existing literature offers multiple definitions for the concept of state capacity, among which some representative definitions or meanings include as follows.

—State capacity is the ability of state actors to execute official goals and policies.[17]

—State capacity is the ability of a state to achieve societal changes sought by its leaders through various plans, policies, and actions, mainly manifested as influencing social organization, regulating social relations, and effectively allocating and using national resources.[18]

—The key to state capacity is bureaucratic culture, that is, the motivations, beliefs, and expectations or norms among state functionaries to each other's actions.[19] It ensures high transparency of state actors to improve the quality of public political participation and promote the smooth functioning of the national public sectors.[20]

—State capacity is the ability of the state to realize its will and objectives.[21]

—State capacity is a combination of state resources and specific capabilities. Here, "state resources" refer to the material and ideological resources controlled by the state, while "specific capabilities" refer to coercive, extractive, and administrative abilities.[22]

—State capacity is the ability to develop policies[23] and implement policies.[24].

—State capacity includes institutional capacity, which is the ability of bureaucratic machinery and the ability to establish and implement institutions.[25]

—State capacity is fiscal capacity, i.e., the ability to collect taxes.[26] More broadly, state capacity is the strength of a state in accumulating resources.[27] From the perspective of the primary use of resources, state capacity can also be defined as the ability to provide public goods and services.[28]

—State capacity is the ability to enforce laws;[29] it is also called "legal capacity," i.e., the ability to enforce contracts and support markets through regulation or other means.[30]

—State capacity is the function of national political governance and management, the energy and power to rule the state and govern society,[31] and the efficacy in social governance and management.[32] Since the main actors are the state organs, state capacity can be conceptualized as the existence of state functionaries and institutions.[33] "Governance," "administration," or "management" actions can be concretized into mobilization, organization, transformation, development, and integration actions.[34]

2. Assessment of State Capacity to Open Up of G20 Countries

G20 members include 19 countries, the EU, and the African Union. This chapter assesses the 19 member countries: Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Rep. of Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkiye, United Kingdom, and the US.[35]

(1) Measurement indicators and data

The measurement of openness capacity consists of three parts: National Openness Concept, National Openness Institutions, and National Resources for Openness.[36]

—Does the National Openness Concept contribute at a high level to the building of a community with a shared future for mankind?

In an increasingly globalized world, a country's opening up not only affects the overall gains and losses of all humankind but also affects the distribution of these gains and losses between the country and the rest of the world. Therefore, the evaluation of a country's national openness concept can be based on whether it increases the overall benefits to humanity and the extent to which the international distribution of these benefits is balanced.

If a country's openness concept can balance the duties, benefits, and losses between itself and most other countries in the world at a high level, it is an advanced openness concept, such as the openness concept of win-win cooperation.

If a country adheres to the openness concept of isolation, aiming to maintain its national sovereignty and territorial security, it may lead to a decrease in overall opportunity gains for humanity or an increase in opportunity costs, ultimately harming the country's sovereignty, security, and developmental interests.

A certain country or some countries may form exclusive groups. Relying on their comparative advantages or even hegemony, they might minimize their openness losses and maximize their benefits in the short-to-medium term. However, this could minimize the benefits and maximize the losses for other countries, ultimately minimizing the long-term and overall security and development interests of all humanity.

In the long run, if specific countries adopt the openness concept of isolation before opening up, they may not particularly harm the overall openness gains for all humanity but may significantly slow down the growth rate of their openness capacity, ultimately harming their national sovereignty, security, and development prospects.

The *Policy Statements* issued by WTO members can be used to identify the openness concepts of G20 members. These statements elaborate on their own openness policies, including the formation process and content changes of policies on goods trade, service trade, direct investment, and trade-related intellectual property rights, and serve as the main basis for determining the types of their national openness concepts. The assigned values of the four types of openness concepts are shown in Table 2.1.

Table 2.1 Assigned values of national openness concepts

	Win-Win Cooperation	Isolation Before Opening Up	Zero-Sum Confrontation	Isolation
Assigned value (score)	100	70	50	20

—Can the National Openness Institutions adequately adapt to and meet the needs of domestic and global situations?

The openness institutions serve as the regulation on openness governance. The purpose of openness governance is to address coordination and cooperation issues among all parties involved, including the systems and mechanisms at various levels and for various actors in openness activities. The aim is to balance national openness with security and development, ultimately ensuring the sustainability of both open and non-open activities on a national scale.

Specifically, in the absence of a world government, each country needs to have the necessary capacities to manage its own openness initiatives and engage in global governance. This aims both to create a favorable international environment for the nation's openness activities to expand development space and to fulfill specific international responsibilities to maintain the common values of humanity.

National openness institutions need to adapt to and meet the needs of domestic and global conditions. The more complex these conditions are, the more comprehensive and meticulous the openness institutions need to be, and the higher national capacity of openness governance can be reflected.

Based on the *Trade Policy Review* reports[37] (see Box 2.5 for the characteristics) released by the WTO, this chapter measures national openness institutions utilizing the text analysis method.[38]

Box 2.5 Measurement of national openness institutions based on *Trade Policy Review* reports

The *Trade Policy Review* series of reports published by the WTO is suitable for measuring the openness institutions of each member with the following characteristics.

—The definition of "trade policy" in the *Trade Policy Review* is very close to the regulation regarding openness in the *World Openness Report*. The former reviews policies related to goods trade, services trade, and trade-related intellectual property rights, while the latter focuses on cross-border openness covering economic, social, and cultural dimensions, mainly targeting economic openness, especially trade openness.

—The reports have a neutral stance with objective content. The Trade Policy Review Body conducts reviews based on *Policy Statements* from the reviewed members and reports written by economists from the Trade Policy Review Division of the WTO Secretariat. During the report-writing process, the Secretariat seeks cooperation from members but bears sole responsibility for the facts presented and opinions expressed. Before finalizing the *Trade Policy Review* report, the Trade Policy Review Body will hold a thematic debate session on the content of the report, where the reviewed member will answer all inquiries from other members. The *Trade Policy Review* report is detailed, including the trade decision-making bodies of the reviewed member and the trade policies and practices during the review period.

—The *Trade Policy Review* reports of all members have a consistent theme and narrative style. In the reports for WTO members, the primary themes all consist of the following six sections: Summary, Economic Environment, Trade and Investment Regimes, Trade Policies and Practices by Measure, Trade Policies by Sector, and Appendix Tables. Secondary themes are also the same, with tertiary themes largely consistent. Each member's *Trade Policy Review* report follows the same narrative style, and the writing is clear and concise.

The text analysis method focuses on the policy-related content of the *Trade Policy Review* reports. The content relevant to trade policy is concentrated in the following sections: Trade and Investment Regimes (Part II), Trade Policies and Practices by Measure (Part III), and Trade Policies by Sector (Part IV). The Summary, Economic Environment (Part I), and Appendix Tables are not included in the text analysis.

This chapter takes the most recent three editions of the *Trade Policy Review* reports as the objects of analysis to reduce the bias that may result from relying solely on a single edition. According to the WTO's latest requirements (2017), starting from January 1, 2019, the four members with the largest shares of world trade (currently the EU, the US, Japan, and China) undergo a review every three years. The next 16 largest members are reviewed every five years, while other members are reviewed every seven years. The review cycle for the least developed members can be even longer.[39]

Based on the latest three editions of the *Trade Policy Review* reports, values of the recent openness institutions for G20 members can be gained, as shown in Fig. 2.1.

Among G20 members, the US has the highest level of openness institutions (with a measurement value of 181, same as below), followed by France, Germany, Italy, and the United Kingdom (assigned based on the EU, 178). The measurement values and rankings of other developed members are Canada (148, 7th), Rep. of Korea (138, 9th), Japan (121, 13th), and Australia (101, 16th).

For emerging market and developing members, the levels of openness institutions are as follows: Argentina (175, 6th), Brazil (141, 8th), China (134, 10th), India (132, 11th), Mexico (129, 12th), Turkiye (120, 14th); Indonesia (113, 15th), Russia (105, 17th), Saudi Arabia (80, 18th), South Africa (53, 19th).

Fig. 2.1 Measurement of national openness institutions: G20 members, 2016–2018 average

Note: The unit on the vertical axis is the number of standard pages in the *Trade Policy Review* report. The EU is reviewed as a whole for trade policy, and France, Germany, Italy, and the United Kingdom are assigned values based on the EU's measurement value. For specific review dates for members, see the footnote;* the review results generally reflect the situation around 2016–2018.

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* Argentina: September 15 and 17, 2021; March 20 and 22, 2013; February 12 and 14, 2007.
Australia: March 11 and 13, 2020; April 21 and 23, 2015; April 5 and 7, 2011.
Brazil: November 23 and 25, 2022; July 17 and 19, 2017; June 24 and 26, 2013.
Canada: June 12 and 14, 2019; June 15 and 17, 2015; June 20 and 22, 2011.
China: October 20 and 22, 2021; July 11 and 13, 2018; July 20 and 22, 2016.
EU: June 5 and 7, 2023; February 18 and 20, 2020; July 5 and 7, 2017.
India: January 6 and 8, 2021; June 2 and 4, 2015; September 14 and 16, 2011.
Indonesia: December 9 and 11, 2020; April 10 and 12, 2013; June 27 and 29, 2007.
Japan: March 1 and 3, 2023; July 6 and 8, 2020; March 8 and 10, 2017.
Rep. of Korea: October 13 and 15, 2021; October 11 and 13, 2016; September 19 and 21, 2012.
Mexico: October 5 and 7, 2022; April 5 and 7, 2017; April 17 and 19, 2013.
Russia: October 27 and 29, 2021; September 28 and 30, 2016; February 10 and 12, 2015.
Saudi Arabia: March 3 and 5, 2021; June 21, 2016; February 14, 2012.
South Africa: November 4 and 6, 2015; November 6, 2009; April 23 and 25, 2003.
Turkiye: March 15, 2016; February 21, 2012; December 17, 2003.
US: December 14 and 16, 2022; December 17 and 19, 2018; December 19 and 21, 2016.

—Are the National Resources for Openness Abundant and of High Quality?

The existing resources for the openness of a country can be measured using the World Bank's "Wealth Account."[40] The World Bank has released Wealth Accounts data for 146 economies from 1995 to 2018, covering G20 members.[41]

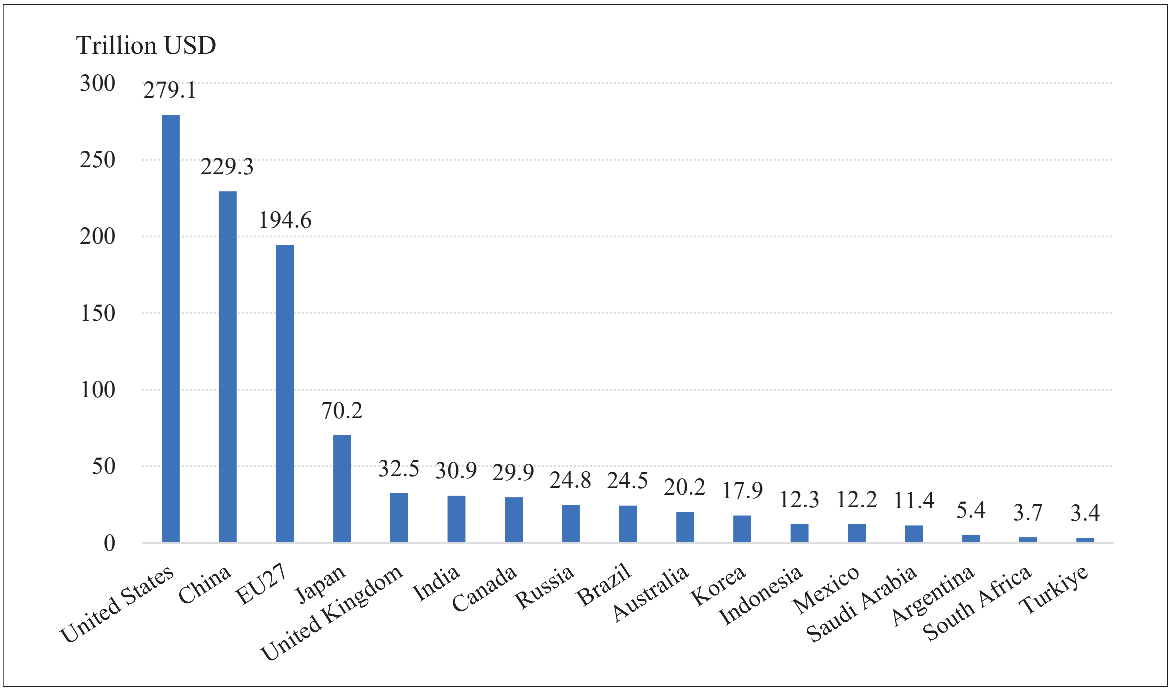

Fig. 2.2 National wealth: G20 members, 2016–2018 average

Source: World Bank Database, Wealth Accounts Data (in constant 2018 US dollars).*

From 2016 to 2018, the US, China, and the EU ranked in the top three among G20 members in terms of national wealth with figures of US$279 trillion, US$229 trillion, and US$195 trillion, respectively, marking the only three economies that have exceeded US$100 trillion. Japan ranked fourth, with a national wealth of US$70 trillion. The United Kingdom, India, Canada, Russia, Brazil, and Australia had national wealth between US$20 trillion and US$33 trillion, ranking fifth to tenth. Rep. of Korea, Indonesia, Mexico, and Saudi Arabia had national wealth between 10 trillion and US$20 trillion, ranking eleventh to fourteenth. Argentina, South Africa, and Turkiye ranked fifteenth to seventeenth respectively.

(2) Index of state capacity to open up

The Index of State Capacity to Open Up is a weighted composite value of National Openness Concept, National Openness Institutions, and National Resources for Openness.

* Databank on Wealth Accounts: https://databank.worldbank.org/source/wealth-accounts#.

Box 2.6 Calculation of the index of state capacity to open up

This chapter calculates the indices of state capacity to open up for G20 members from 2016 to 2018.

According to the *Trade Policy Reviews*, which are used to measure national openness concepts and openness institutions, the trade policies of the members reviewed date as far back as 2003 and as recently as 2023. Most of these reviews took place in or around the years 2016–2018, as detailed in the footnote of Fig. 2.1.

The measurement values for each country's openness concept, openness institutions, and resources for openness are converted into numerical values between 0 and 1. The weights of these three components in the Index of State Capacity to Open Up are 0.1, 0.25, and 0.65, respectively.

Other combinations of weights (such as 0.2, 0.4, and 0.4) have also been employed for trial calculations to test the sensitivity of the weighted results and their rankings to the weight settings. The results showed no significant differences from the measurement values initially presented.

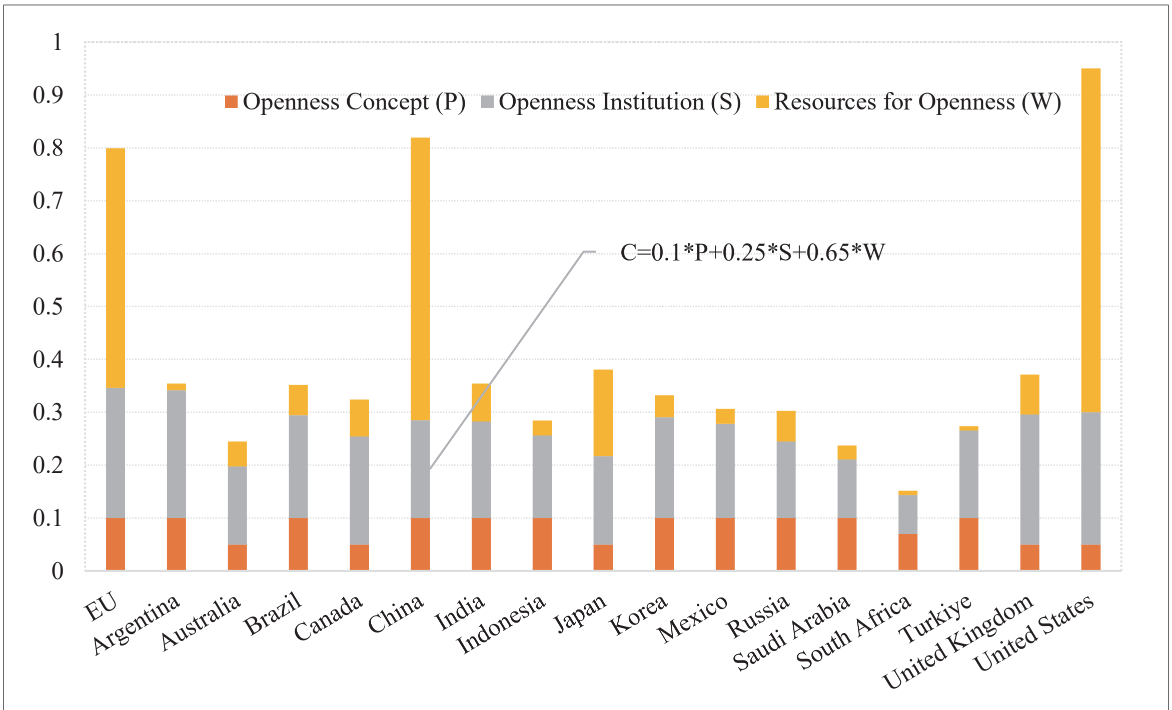

Fig. 2.3 Indexes of state capacity to open up: G20 members, 2016–2018 average

Note: (1) The bar chart represents the contributions of National Openness Concept (P), Openness Institutions (S), and Resources for Openness (W) to the Index of State Capacity to Open Up (C); (2) The UK, which exited the EU on January 13, 2020, has not yet undergone a WTO Trade Policy Review; therefore, its value for Openness Institutions is assigned the same as that of the EU.

The US, China, and the EU are the economies with the strongest openness capacity among the G20 members. Fig. 2.3 shows that for the years 2016–2018, the Index of State Capacity to Open Up for the US, China, and the EU was 0.95, 0.819, and 0.799, respectively, ranking them in the top three among the G20 members.

Japan, the United Kingdom, India, Argentina, Brazil, Rep. of Korea, Canada, Mexico, and Russia rank from fourth to twelfth in terms of their state capacity to open up, with corresponding indices ranging from 0.381 to 0.303.

The indices for Indonesia, Turkiye, Australia, Saudi Arabia, and South Africa range between 0.285 and 0.152.

(3) State capacity to open up and warranted openness

Openness is a result of the combined influence of supply and demand for openness. Quantitative methods are employed to investigate the relationship between openness and the state capacity to open up. Using the Openness Index as the dependent variable and the Index of State Capacity to Open Up as the independent variable, linear models are estimated through the least squares method for both G20 developed countries and G20 emerging markets and developing countries. Based on the estimated quantitative relationships, the Openness Index is fitted[42] and compared with the actual level of openness to evaluate whether the actual openness aligns with the state capacity to open up. See Fig. 2.4 for the actual and fitted openness indices, with the following conclusions.

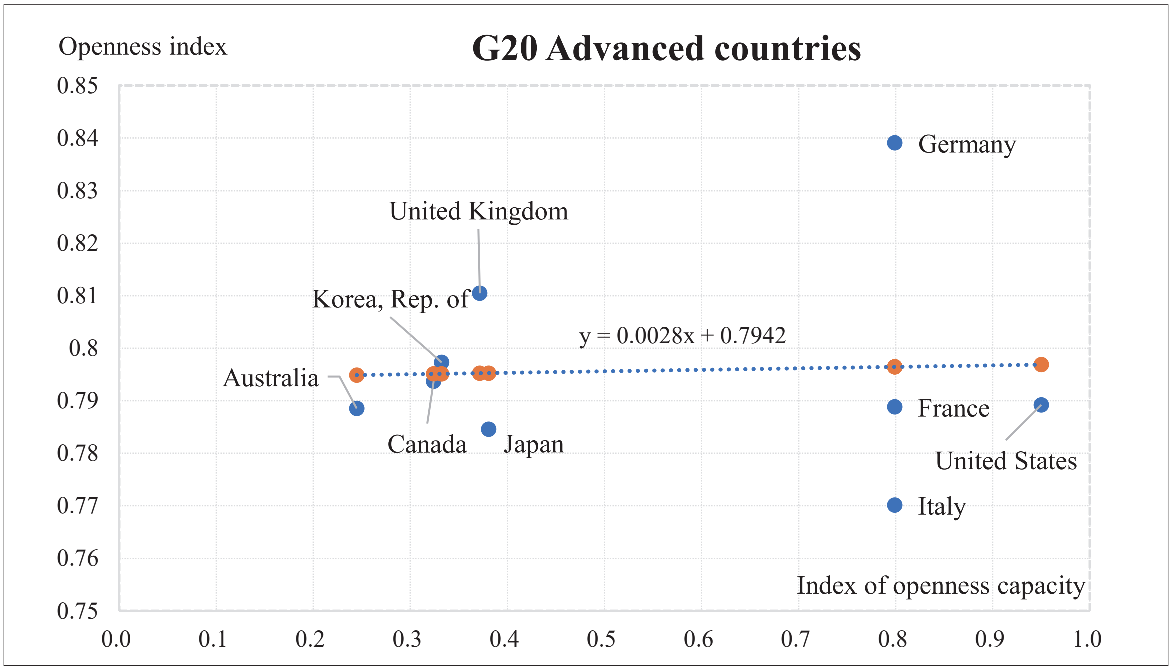

Fig. 2.4 Openness indexes and indexes of state capacity to open up: G20 members, 2016–2018

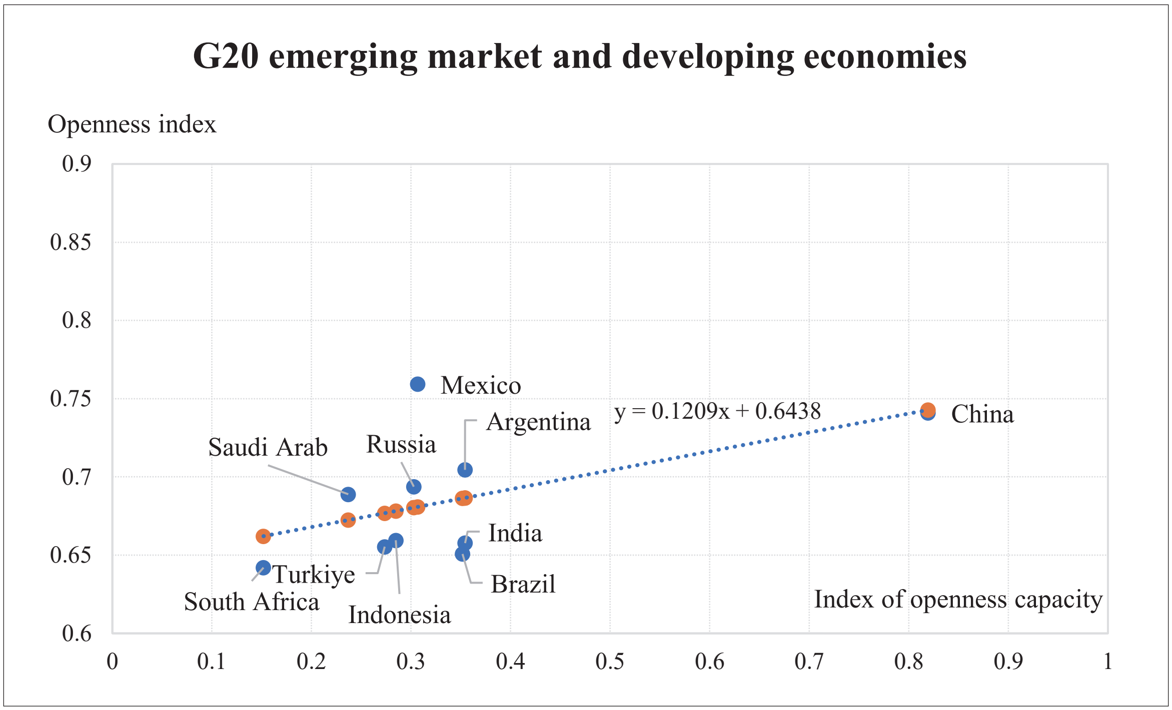

Fig. 2.4 (Continued)

Note: (1) The Indices of State Capacity to Open Up for France, Germany, and Italy are assigned according to EU values; (2) Orange dots represent the fitted values of the Openness Index.

—Enhancing the capacity to open up can increase openness, and this effect is more significant in emerging market and developing countries than in developed countries. For every one-unit increase in the capacity to open up among developed countries, the Openness Index increases by 0.0028 units. For emerging markets and developing countries, each one-unit increase in the capacity to open up leads to a 0.1209-unit increase in the Openness Index.

—The baseline level of openness in developed countries surpasses that in emerging market and developing countries. In the fitted model for the "Capacity to Open Up-Openness" relationship, even when the capacity to open up is zero, the openness level in developed countries is as high as 0.7942, exceeding the figure of 0.6438 in emerging market and developing countries.

—Among the nine G20 developed countries, those with warranted openness (i.e., the actual openness is lower than the fitted value and is supported by their state capacity to open up) include Australia, Canada, France, Italy, Japan, and the US. Specifically, in France, Italy, Japan, and the US, the openness index is lower than the capacity to open up, indicating room for more openness. Countries with nearly warranted openness (i.e., the actual openness is slightly higher than the fitted value) include Rep. of Korea. The openness of Germany and the United Kingdom is not warranted.

——Among the ten G20 emerging market and developing countries, countries with warranted openness include Brazil, China, India, Indonesia, South Africa, and Turkiye. Countries with nearly warranted openness include Argentina, Russia, and Saudi Arabia. The openness of Mexico is not warranted, as it deviates significantly from the fitted value.

3. Insights on Capacity to Open Up and Warranted Openness

The state capacity to open up is a foundational force determining a country's openness and serves as an important basis for evaluating whether the level of openness is warranted. This chapter makes a preliminary exploration of the connotation and extension of state capacity to open up and its measurement methods. For the first time, we conducted empirical tests on G20 members, and the results fully confirmed the theory of warranted openness. The following insights can be drawn.

(1) High importance should be given to state capacity to open up

In the context of economic globalization, opening up to the outside world is crucial for any country. For a country, having the necessary capacity to open up helps to effectively coordinate international and domestic systems and fully utilize global resources to promote the development of productivity and progress in production relations. It also helps in maintaining world peace, development, justice, equity, democracy, and freedom at a high level, contributing to the building of a community with a shared future for mankind.

(2) The building of state capacity to open up should be strengthened

A country should approach from three layers: openness concept, openness institutions, and resources for openness to build and improve the openness capacity system. It should adhere to the openness concept of win-win cooperation that fully adapts to and meets the needs of both domestic and global situations, independently explore and establish openness institutions that suit its own characteristics, and promote the modernization of its governance capacity. The reform, optimization, and improvement of a nation's openness institutions are an ongoing process. Cultivating resources for openness should involve advancing the transformation of resource structures and the upgrading of international comparative advantages. In the participation of global openness, countries, especially emerging market and developing countries, should give priority to the cultivation of human resources to serve their opening up.

(3) The capacity to open up must be nurtured by opening-up

The capacity to open up should be cultivated through global competition and cooperation. In an increasingly interconnected world, countries open up to each other and engage with each other based on their individual capacities. The fields of openness, the content of interaction, and the subjects of cooperation often differ among countries, requiring the relevant countries to have diversified capabilities to manage.

The network formed by numerous countries interacting with each other globally becomes an important vehicle for shaping the capacity to open up. Within a relatively closed system of one country or a few countries, it is difficult to improve the state capacity to open up.

(4) Maximizing the utilization of capacity to open up to explore optimal openness

Some countries have actual levels of openness that are lower than their fitted levels of openness, indicating that their capacity to open up has not been fully utilized. A country should maximize the use of its own capacity to open up, striving for the highest level of warranted openness, i.e., optimal openness, in order to gain greater net benefits from openness.

Countries that rank high in capacity to open up should make full use of their strong capacity to open up, enhance the level of global openness, and promote themselves and other countries to achieve optimal openness. This concerted effort can drive the building of a community with a shared future for mankind at higher levels of openness.

NOTES

1. The Institute of World Economics and Politics of Chinese Academy of Social Sciences & Research Center for Hongqiao International Economic Forum, *World Openness Report 2022* (China Social Sciences Press, 2022), 26–28.
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35. Due to the lack of basic data, the institution on and resources for opening up of France, Germany, Italy, and the United Kingdom (which were EU members) cannot be directly measured, but the EU as a whole has these basic data, and the corresponding openness capabilities can be measured. This chapter uses the European Union as a bridge, first measuring the EU's index on openness capacity, and then assigning its values to France, Germany, Italy, and the United Kingdom.
36. The state capacity to open up, whether actual or potential, is difficult to directly observe and measure and is often evaluated through indirect methods. This chapter sets evaluation indicators based on the connotation and extension of national capacity and selects G20 members. Mainly collects publicly available data published by international organizations, this chapter calculates the state capacity to open up and determines whether the actual openness is warranted.
37. Trade Policy Review Reports of WTO members: https://www.wto.org/english/tratop_e/tpr_e/tp_rep_e.htm#bycountry.
38. The text analysis method focuses on textual information. By defining or identifying specific categories of topics, it converts the distribution of qualitative information into quantitative metrics (such as frequency) to highlight the key features of specific topics.
39. WTO (2023), *Trade Policy Reviews*: *Brief introduction*, accessed on July 25, 2023, https://www.wto.org/english/tratop_e/tpr_e/tp_int_e.htm.
40. The World Bank, *The Changing Wealth of Nations 2021: Managing Assets for the Future* (Washington, DC: World Bank, 2021), http://hdl.handle.net/10986/36400 License: CC BY 3.0 IGO.
41. The construction of the National Wealth Accounts is based on the System of National Accounts (SNA) compiled by the United Nations Statistical Commission. The valuation of production capital and net foreign assets is generally based on the transaction value of the respective assets, while the valuation of natural capital and human capital is typically based on their expected net returns (resource rents or wages) over their useful lifespan, discounted. The World Bank does not separately estimate the EU and its member state, Cyprus, in National Wealth Accounts.
42. The sample countries in this estimation are 19 in total, and they are divided into two sample groups: developed countries (nine) and emerging market and developing countries (ten). The sample period is short, covering only from 2016 to 2018. To obtain better estimation results, future studies could include more sample countries and utilize data from longer time series.