

Belt and Road

China Connectivity Index

Deepening, Diversifying, Decarbonising

October 2018



Contents

Executive Summary	4
1. Introduction	5
2. Latest developments in china connectivity	7
3. Connectivity deepening	9
4. Connectivity diversifying	13
5. Connectivity decarbonising	18
6. Focus: Sub-saharan africa	22
Annex 1 - Methodological	27
Annex 2 - Connectivity tables	29

ICBC Standard Bank

ICBC Standard Bank is a leading financial markets and commodities bank operating across both developed and emerging economies. ICBC Standard Bank Plc was formed in February 2015 when Industrial and Commercial Bank of China Limited (ICBC) acquired a 60% stake in Standard Bank Plc Global Markets division. As a result, a compelling strategic platform was formed, one that benefits from a unique Chinese and African parentage and an unrivalled global network and level of expertise.

ICBC Standard Bank Plc is a strategic platform for serving the growing demands of our clients in Global Markets products, as well as distributing African risk. We specialise in global commodities, fixed income, currencies and equities.

Headquartered in London, ICBC Standard Bank Plc also has operations in Dubai, Hong Kong, Shanghai, Singapore, New York, and Tokyo.

For more information please visit icbcstandard.com.

Oxford Economics

Oxford Economics was founded in 1981 as a commercial venture with Oxford University's business college to provide economic forecasting and modelling to UK companies and financial institutions expanding abroad. Since then, we have become one of the world's foremost independent global advisory firms, providing reports, forecasts and analytical tools on 200 countries, 100 industrial sectors and over 3,000 cities. Our best-of-class global economic and industry models and analytical tools give us an unparalleled ability to forecast external market trends and assess their economic, social and business impact.

Headquartered in Oxford, England, with regional centres in London, New York, and Singapore, Oxford Economics has offices across the globe in Belfast, Chicago, Dubai, Miami, Milan, Paris, Philadelphia, San Francisco, and Washington DC. We employ over 300 full-time people, including more than 200 professional economists, industry experts and business editors—one of the largest teams of macroeconomists and thought leadership specialists. Our global team is highly skilled in a full range of research techniques and thought leadership capabilities, from econometric modelling, scenario framing, and economic impact analysis to market surveys, case studies, expert panels, and web analytics. Underpinning our in-house expertise is a contributor network of over 500 economists, analysts and journalists around the world.

Oxford Economics is a key adviser to corporate, financial and government decision-makers and thought leaders. Our worldwide client base now comprises over 1,500 international organisations, including leading multinational companies and financial institutions; key government bodies and trade associations; and top universities, consultancies, and think tanks.

October 2018

All data shown in tables and charts are Oxford Economics' own data, except where otherwise stated and cited in footnotes, and are copyright © Oxford Economics Ltd.

This report may not be published or distributed without ICBC Standard Bank's permission.

The modelling and results presented here are based on information provided by third parties, upon which Oxford Economics has relied in producing its report and forecasts in good faith. Any subsequent revision or update of those data will affect the assessments and projections shown.

We would like to thank Courtney Lowrance at Asia Infrastructure Investment Bank and Karthik Iyer at Climate Bonds Initiative for their expert reviews on sustainability and environmental issues in this report.

To discuss the report further please contact:

Tom Rogers:
trogers@oxfordeconomics.com
 Oxford Economics
 Broadwall House,
 21 Broadwall,
 London, SE1 9PL, UK
 Tel: +44 207 803 1444

Gary Licht:
gary.licht@icbcstandard.com
 ICBC Standard Bank Plc
 20 Gresham street
 London, EC2V 7JE, UK
 Tel: +44 203 145 6704

Jinny Yan:
jinny.yan@icbcstandard.com
 ICBC Standard Bank Plc
 20 Gresham street
 London, EC2V 7JE, UK
 Tel: +44 203 145 6783

Helena Huang:
helena.huang@icbcstandard.com
 ICBC Standard Bank Plc
 20 Gresham street, London
 EC2V 7JE, UK
 Tel: +44 203 145 6511

The use of 'we', 'our' throughout this document refers to ICBC Standard Bank and Oxford Economics jointly

Executive Summary

The Belt and Road Initiative (BRI) continues to evolve, drawing in partners from new regions, and building greater connectivity between China and the rest of the world. Having encompassed 64 countries at the time of publication of our inaugural paper in 2017, our China Connectivity Index (CCI) has now expanded to an additional 22 economies, reflecting these countries' engagement in BRI over the past 12 months. These additions incorporate new partners in Latin America, Africa and Oceania. Six of the economies added (Australia, Angola, Ethiopia, Peru, Democratic Republic of Congo, and Brazil) are amongst the 25 most-connected economies with China according to the CCI, despite their geographical distance, underlining China's global reach.

Connectivity between China and its BRI partners continues to deepen. Using the same methodology as our inaugural paper for our expanded set of 86 partner economies, our estimate of overall aggregate China connectivity across the BRI geographies has risen again. Moreover, connectivity rose across all three pillars (trade, investment and people connectivity) for the first time since 2010. Higher commodity prices played a role in increasing trade connectivity, which is measured in nominal terms - but more tellingly, China's role in providing supply-chain support (in the form of machinery, intermediate industrial goods, and other inputs to economic activity) deepened in five out of the seven global regions. This deepening of connectivity between China and its BRI partners is particularly impressive when set in the context of a slowing world economy, and cooling world trade growth.

Connectivity continues to diversify, with "people connectivity" surging. An increasingly outward-looking Chinese population in search of education and tourism, plus a growing global appetite to visit China, have been key drivers in this respect. Neighbouring countries in Asia-Pacific continue to demonstrate the strongest people connectivity with China, with deeper trade links increasing cross-border worker flows with key trade partners. Underlying drivers of people connectivity suggest this will be an increasingly important channel for connectivity in the years ahead.

Belt and Road connectivity is also playing a key role in China's quest to decarbonise. The most eye-catching example of this is via the Power of Siberia pipeline, which has the potential to supply a fifth of China's gas requirements. But other BRI partners are also crucial in this respect, with different BRI partners supporting the energy needs of households and businesses in different regions of China. Perhaps less positively for connectivity, China's quest for cleaner energy is likely to mean lower connectivity in future for those countries whose exports are most concentrated in more carbon-intensive fuels, with Indonesia, Saudi Arabia, and some African economies particularly at risk.

Africa's connectivity with China is evolving, reflecting both China's and Africa's economic needs. China's investment surge in sub-Saharan Africa in the first decade of this millennium has slowed notably. In its place has come deeper trade connectivity, as commodity resources from Chinese investments in Africa flow east, and supply-chain goods (machinery in particular) flow west. Trade connectivity will deepen further in the years ahead, with African manufacturing sectors continuing to develop, and China demanding new mineral resources from African partners to achieve its goals in energy and industry. To make these flows more efficient, China's Belt and Road funds may focus on upgrading infrastructure in Africa, reinvigorating this region's degree of capital connectivity.

1. Introduction

“We believe that to sustain economic growth, there must be open and inclusive institutional arrangements as well as orderly and free flow of production factors. We will encourage both inbound and outbound investment and business activities, as we seek greater economic and trade interactions with other countries and work with them toward an open world economy”

Liu He’s speech at World Economic Forum 2018, 24 January 2018

1.1 The China connectivity index

This paper sets out the key findings of the second edition of the China Connectivity Index (CCI). We examine the deepening and diversifying nature of economic connectivity between China and its partners across the Belt and Road region, using the same methodology as developed in 2017 (discussed in detail in Appendix A), updated data sources across the dimensions and pillars of connectivity, and expanded countries reflecting the initiative’s global appeal.

1.2 A broader belt and road

The Belt and Road Initiative has become increasingly global, with the CCI expanding to 22 new economies. As highlighted by Liu He’s address to the World Economic Forum in 2018, China’s vision is for greater trade and investment interactions with economies across the globe, and this is increasingly reflected in the Belt and Road Initiative (BRI). In our 2017 report, we focussed our analysis on the 65 countries which had at that time been identified by China as part of BRI. But in this edition, we include 22 new partner countries whilst retaining all the original countries.

These new economies reflect the broadening scope of BRI. As we discussed in our 2017 CCI report, BRI is very much a shared global endeavour, and China has remained very active in promoting bilateral and multilateral cooperation. To this end, China has signed several new Memoranda of Understanding (MoU) over the principles for BRI cooperation, including with Australia and Brazil late 2017. The membership of the Asia Infrastructure Investment Bank (AIIB) has also been expanding, reflecting a broader range of countries with an economic stake in the region’s success.

The new composition of CCI is set out in Fig. 1 and Fig. 2 (see overleaf). In Fig. 1 we highlight that the new countries are primarily located in Africa, Oceania, and Latin America. This reflects the increasingly global scale of BRI, and the reality that China’s connectivity is now a global phenomenon. Fig. 2 presents a full list of our original and extended country coverage, for reference.

1.3 The 2018 China connectivity index report

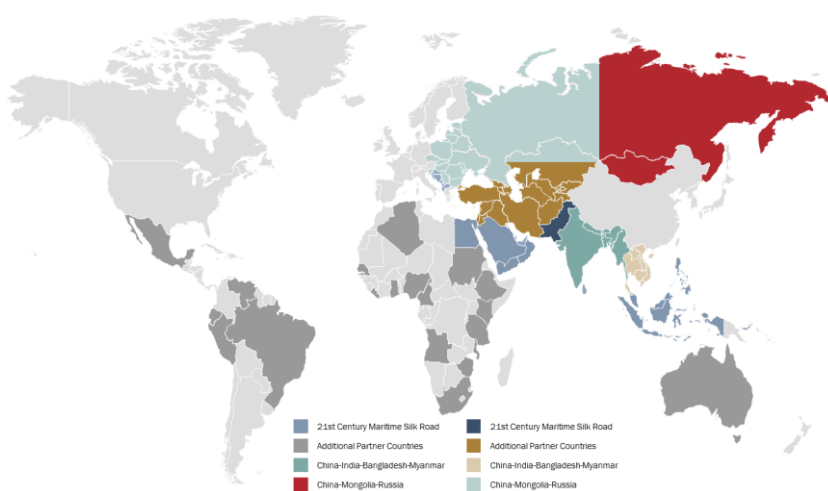
The rest of this report is set out as follows:

- **Chapter 2 presents the high-level findings of the updated CCI**, including an assessment of how the expansion countries rank in connectivity to China, and which channels were key drivers of greater connectivity through 2016, the latest year for which data is available across our pillars.
- **Chapter 3 focuses in depth on how connectivity is deepening across Belt and Road economies.** Within this we identify two key trade routes for China,

and also discuss China's increasing contribution to economic development via supply-chain linkages.

- **Chapter 4 looks at the role that “people connectivity” is playing in diversifying connectivity between China and BRI countries.** We also look at the outlook for some of the key drivers of people connectivity in future.
- **Chapter 5 assesses the impact of decarbonisation in China on BRI connectivity,** and the potential role key BRI economies might play in driving forward China's shift to clean energy.
- **Chapter 6 offers a special focus on connectivity between China and Sub-Saharan Africa,** including the emergence of a key East-West trade channel, the evolving nature of Africa-China connectivity, and Africa's key role in the manufacturing sectors of the future.

Fig.1. Dated global composition of the China Connectivity Index



Source: Oxford Economics

Fig. 2. Expanded list of countries in 2018 CCI

Original 65 countries plus China in B&R			New 22 partner countries
Afghanistan	Iran	Palestine	Algeria
Albania	Iraq	Philippines	Angola
Armenia	Israel	Poland	Australia
Azerbaijan	Jordan	Qatar	Brazil
Bahrain	Kazakhstan	Romania	Cameroon
Bangladesh	Kenya	Russia	Dem. Rep. Congo
Belarus	Kuwait	Saudi Arabia	Ecuador
Bhutan	Kyrgyz Republic	Serbia	Ethiopia
Bosnia & Herzegovina	Laos	Singapore	Ghana
Brunei	Latvia	Slovakia	Jamaica
Bulgaria	Lebanon	Slovenia	Liberia
Cambodia	Lithuania	Sri Lanka	Mexico
China	Macedonia	Syria	Mozambique
Croatia	Malaysia	Tajikistan	Nigeria
Czech Republic	Maldives	Thailand	Peru
East Timor	Moldova	Turkey	Senegal
Egypt	Mongolia	Turkmenistan	South Africa
Estonia	Montenegro	Ukraine	Sudan
Georgia	Myanmar	UAE	Tanzania
Hungary	Nepal	Uzbekistan	Uganda
India	Oman	Vietnam	Venezuela
Indonesia	Pakistan	Yemen	Zimbabwe

Source: Oxford Economics

2. Latest developments in china connectivity

2.1 Strong showing from expansion economies

The most-connected economies to China are a combination of familiar names and expansion economies. In Fig. 3 we set out the top 25 most-connected economies in our updated China Connectivity Index. Many of the top-performers in our Index are familiar from our inaugural CCI report: there are strong showings from China's key supply-chain partners in South East Asia, from its northern neighbour Mongolia, and from top tourism destinations for Chinese visitors – particularly the Maldives. But there are several important developments in the Index, including the strong showing of a key set of expansion economies.

Fig. 3. Several expansion economies are key performers in new CCI

China Connectivity Index results summary - 2016									
Overall rank	Change vs 2015	Country	Overall score	Trade score	Capital score	People score	Trade rank	Capital rank	People rank
1	— 0	Mongolia	69.0	72.4	58.1	80.9	1	1	2
2	— 0	Singapore	55.5	55.5	45.7	84.9	6	4	1
3	↑ 1	Cambodia	41.1	58.2	19.3	3.9	4	6	39
4	↓ -1	Thailand	41.0	57.0	11.7	33.2	5	16	8
5	↑ 3	Vietnam	40.4	58.5	4.9	38.1	2	77	6
6	— 0	Maldives	38.7	58.3	9.4	8.7	3	22	18
7	↓ -2	Malaysia	38.2	50.4	11.5	44.6	8	17	5
8	↑ 2	Myanmar	38.0	54.6	7.8	28.7	7	38	11
9	↓ -2	Australia	34.1	39.0	15.0	61.5	12	10	3
10	↑ 4	Kyrgyz Republic	32.0	48.4	7.9	5.5	10	37	32
11	↓ -2	Lao PDR	31.5	50.3	1.6	8.6	9	86	19
12	↓ -1	Philippines	28.2	31.1	15.0	50.5	17	9	4
13	↓ -1	Angola	27.7	41.9	8.6	0.4	11	29	79
14	↓ -1	Oman	26.0	38.2	9.9	1.1	13	21	69
15	— 0	Ethiopia	25.0	36.2	4.8	17.9	14	78	14
16	↑ 5	Brunei	24.0	14.7	46.1	13.0	42	3	15
17	↓ -1	Peru	23.3	31.2	5.1	30.9	16	74	9
18	— 0	Indonesia	22.2	28.1	11.1	20.0	19	18	13
19	↓ -2	Dem. Rep. Congo	22.1	32.6	8.4	0.5	15	32	77
20	↓ -1	Kazakhstan	21.0	28.9	9.3	8.5	18	25	20
21	↓ -1	Sri Lanka	21.0	26.2	4.9	37.9	21	76	7
22	↑ 10	Russian Federation	20.6	21.7	23.2	6.9	24	5	25
23	— 0	Pakistan	19.3	27.5	6.9	7.8	20	55	23
24	↑ 1	Brazil	17.7	20.4	8.2	30.1	25	34	10
25	↓ -1	Czech Republic	16.6	23.6	7.2	2.5	22	47	51

Source: Oxford Economics

Expansion economies take up six of the top 25 spots in our updated Index, thanks to a range of connectivity channels including commodities, supply-chain, capital and people. Australia is the top performer amongst new members of CCI, scoring impressively across all three pillars of our index. An estimated 112,000 Chinese students studying in Australia and 13,000 Australian workers employed in China mean Australia ranks especially-highly on people connectivity. Angola's trade links (primarily in oil) make it the 13th most-connected economy in our index. A combination of high people connectivity and trade connectivity means both Ethiopia and Peru also make the top 20, alongside the Democratic Republic of Congo, which has especially-deep commodity trade connectivity to China.

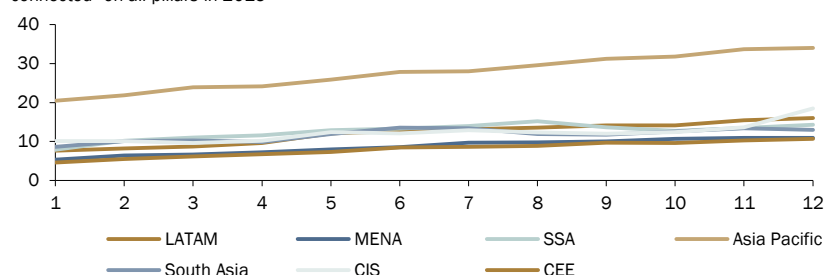
2.2 China's connectivity: broader and deeper

Connectivity levels are rising across all BRI regions. As indicated in Fig. 3, economies in the Asia-Pacific region remain the most-connected to China, claiming the top eight spots in our updated index. The pattern of connectivity across regions has remained stable, with five regions showing modestly increased connectivity, and one (South Asia) seeing a modest fall. The standout performer from a regional perspective has been the Commonwealth of Independent States region (CIS), which saw a sharp increase in connectivity, largely thanks to deepening capital connectivity between Russia and China. This is discussed in more depth in chapter 5.

Fig.4. Asia-Pacific leads the way, but connectivity is rising in all regions

China Connectivity Score by region

0=100, 100 = "most connected" on all pillars in 2015 0=100, 100 = "most connected" on all pillars in 2015



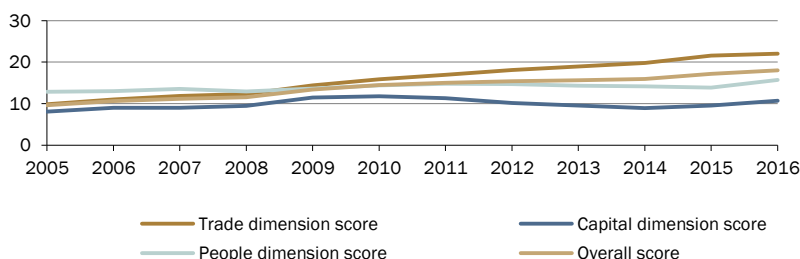
Source: Oxford Economics / Haver Analytics

Connectivity has deepened across channels. For the first time since 2010, connectivity rose on all three dimensions of our index: trade, capital and people connectivity (Fig. 5). Trade remains the dominant channel of connectivity in CCI, but with both people connectivity and capital connectivity having risen faster in 2016 than the trade channel, the nature of China's connectivity is becoming more broadly-balanced across the three dimensions.

Connectivity has risen across BRI economies and across dimensions. 54 of the 86 economies deepened their overall connectivity with China Trade connectivity (which has a weighting of 60% in our overall Connectivity Index) deepened in 45 out of 86 economies, with marginally more economies (46) deepening capital connectivity (which has a 30% weighting). The key driver of deeper connectivity across our sample, however, was people connectivity, with an estimated 69 out of 86 economies seeing this form of connectivity to China deepen in 2016. Over half of our sample (45 economies) deepened connectivity on two of our three dimensions, although none deepened connectivity on all three dimensions.

Fig.5. All three pillars of connectivity are rising for first time since 2010

Average connectivity across Belt and Road economies by dimension



Source: Oxford Economics / Haver Analytics

3. Connectivity deepening

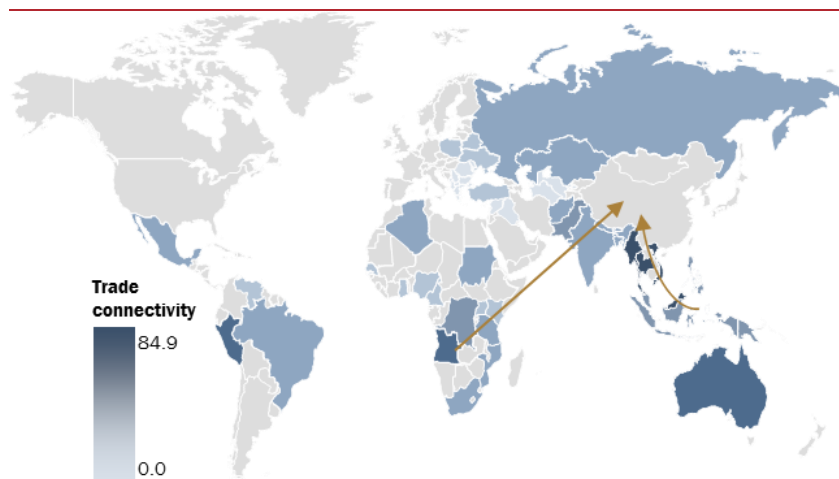
Trade remains the principal channel of connectivity, driving policy efforts to make trade freer and more efficient. Unblocking trade flows with BRI economies has long been a key policy priority for China's government, and recent years have seen further important efforts in this respect. In trade policy, Free Trade Agreements (FTA) have come into effect between China and Australia (2015), China and the Maldives (2017), and China and Georgia (2018). China and Peru have had an FTA in effect since 2010, but in 2016 the start of discussions on how to enhance and broaden this agreement were announced, and a similar discussion between China and Singapore on how to extend their 2008 deal was announced in 2018.

In this section, we look at the impact China's efforts have had in the deepening of trade connectivity with BRI countries. Two key findings stand out. Firstly, we find that deepening trade connectivity is especially notable along two key trading corridors - from China's west, through Pakistan and Oman into Africa, and from China's key manufacturing regions in the south-east, down through ASEAN economies. Secondly, foremost amongst channels of trade connectivity with BRI is China's role as a supply-chain provider – providing materials, inputs and machinery to facilitate manufacturing and service-sector activities. This reflects a deepening role for China in supporting growth potential across BRI economies.

3.1 Trade connectivity is deepening along key routes

The latest data highlight the emergence of two key channels of trade connectivity. Looking at the depth of overall trade connectivity across BRI economies (Fig. 6) suggests two key trading routes enjoy particularly-strong trade connectivity with China. Between them, these two key trade routes account for 14 of the 20 economies with deepest trade connectivity to China, and eight of the 10 countries where trade connectivity deepened most in the updated CCI.

Fig.6. Trade connectivity deepest along ASEAN and Africa supply routes



Source: Oxford Economics

And perhaps most obviously, China has continued to deepen trading relations with partner economies in South East Asia. The FTA with ASEAN was the first China signed, and trade and investment flows have accelerated since this upgraded agreement came into effect in 2016. Several underlying dynamics are key in this respect.

For particularly low-cost economies, outsourcing from China has been key.

Growth in Chinese trade with Vietnam (up an impressive 25% in nominal US dollars in 2016) has been driven by outsourcing the most cost-sensitive parts of electrical and machinery assembly, while food processing is a key sector for Cambodian trade with China, and Myanmar is cooperating (and indeed competing) with Chinese clothing manufacturers. China's increasingly-challenging demographics, and ever-rising wage costs, mean that these channels of trade connectivity are likely to deepen in the years ahead.

Higher-income economies in the region act as key inputs to China's manufacturing itself.

For example, Malaysia's position at the cutting edge of microchip production means it supplied China with \$16bn worth of integrated circuits in 2016, second-only to Korea in this respect. Singapore's role as a global trade hub slightly complicates an assessment of the role domestic production plays in its exports to China, but again inputs to Chinese manufacturing predominate, including around \$7bn in chemicals, plastics, and rubber products. Both Malaysia and Singapore will likely become increasingly important as China's manufacturing shifts into higher value-added sectors.

Fig. 7. Two corridors account for 14 of 20 top trade-connected economies

Trade connectivity summary - 2016										
Overall rank	Country	Overall trade connectivity	Non-commodity goods exports to China % GDP	Commodity exports to China % GDP	Supply chain imports from China % GDP	Tourism spending from China % GDP	Non-commodity goods exports to China % GDP	Commodity exports to China % GDP	Supply chain imports from China % GDP	Tourism spending from China % GDP
0-100							Rank	Rank	Rank	Rank
1	Mongolia	72.4	1.66%	32.44%	7.22%	1.32%	11	1	8	6
2	Vietnam	58.5	8.23%	2.67%	22.66%	1.07%	2	10	1	9
3	Maldives	58.3	0.00%	0.00%	5.07%	33.14%	78	78	13	1
4	Cambodia	58.2	2.92%	0.13%	21.18%	3.37%	6	41	2	3
5	Thailand	57.0	4.63%	1.09%	8.84%	5.19%	5	20	6	2
6	Singapore	55.5	13.77%	0.06%	10.13%	1.15%	1	50	4	8
7	Myanmar	54.6	4.65%	2.61%	2.05%	1.54%	4	11	59	4
8	Malaysia	50.4	7.37%	0.64%	9.14%	0.72%	3	27	5	11
9	Lao PDR	50.3	2.34%	4.80%	3.80%	1.03%	8	6	22	10
10	Kyrgyz Republic	48.4	0.46%	0.71%	12.15%	0.24%	34	24	3	17
11	Angola	41.9	0.04%	12.36%	1.36%	0.14%	69	4	73	28
12	Australia	39.0	1.03%	3.71%	2.09%	0.22%	15	8	57	19
13	Oman	38.2	0.73%	15.23%	1.42%	0.08%	25	3	71	36
14	Ethiopia	36.2	0.10%	0.03%	6.62%	0.08%	58	58	9	40
15	Dem. Rep. Congo	32.6	0.04%	6.69%	1.18%	0.00%	70	5	78	73
16	Peru	31.2	0.91%	3.44%	3.04%	0.10%	20	9	31	34
17	Philippines	31.1	1.64%	0.39%	3.95%	0.20%	12	33	20	20
18	Kazakhstan	28.9	2.01%	1.14%	2.12%	0.07%	9	18	56	44
19	Indonesia	28.1	1.14%	0.66%	2.91%	0.13%	14	26	35	31
20	Pakistan	27.5	0.50%	0.07%	4.40%	0.01%	32	49	16	68

Source: Oxford Economics

To the west, the Pakistan-Angola corridor is emerging as the second key channel of trade connectivity.

We focus in-depth on the evolving economic relationship between Africa and China in Chapter 6, but for now briefly discuss the deepening of trade connectivity along the Pakistan-Angola corridor. This corridor of just six countries (incorporating Pakistan, Oman, Ethiopia, Tanzania, DRC, and Angola) contains five of the most trade-connected economies with China in 2016, and three (Oman, DRC and Ethiopia) of eight economies where trade connectivity increased most during that year.

Maritime flexibility, raw material demand, and supply-chain linkages are all key to growth in the Pakistan-Angola trade corridor.

One of the most important planks of the 21st-Century Maritime Silk Road is enabling China to access ports

west of the Malacca Straits, to provide an alternative route to Western markets in the event this key shipping channel is disrupted. Investment in Myanmar is one part of this strategy, but because developing western Chinese provinces is also a key goal for the government, it has also invested heavily in rail links through Pakistan, and in Gwadar port in Pakistan's Baluchistan province (jointly, the China-Pakistan Economic Corridor, CPEC). Further west, as we shall see in Chapter 6, China's demand for raw materials and its role in supplying crucial inputs for the development of Africa's manufacturing and service sectors are both deepening China's trade connectivity with Africa.

Looking ahead, the Pakistan-Angola corridor has substantial scope for further trade deepening. China's investment in Pakistan has some way to go yet, with the next phase of CPEC consisting of a free-trade area near Gwadar, modelled on China's own Special Economic Zones. When complete (in 2025), the zone is expected to employ around 40,000 people, most likely in high-value added sectors compared with Pakistan's existing manufacturing base. Further west, as discussed in Chapter 6, the importance of African reserves of minerals crucial for the next phase of China's industrial development will deepen trade links with several economies on the Pakistan-Angola corridor.

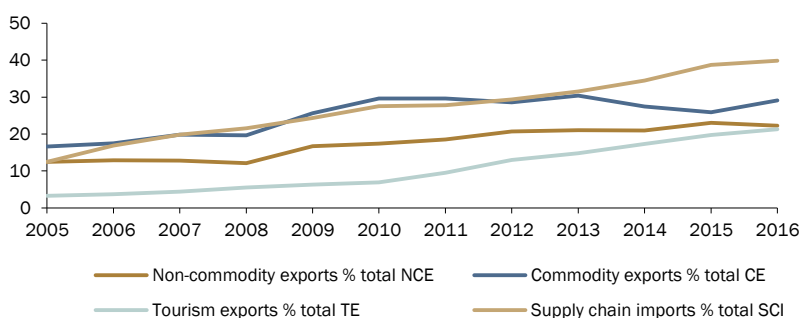
3.2 Supply-chain is key channel of trade deepening

Supply-chain connectivity tracks China's role as an input to economic activity around the Belt and Road. More specifically, supply-chain connectivity quantifies the extent to which China's exports of capital goods (i.e. machinery and vehicles), and intermediate goods (such as electronic components, processed raw materials, or fabricated metals products) are used as inputs to manufacturing and service sector activities across BRI economies. In this respect, China's exports to BRI economies help make domestic production more efficient, boosting growth potential.

Supply-chain connectivity is deepening faster than "demand-side" connectivity drivers. At the aggregate level, supply-chain connectivity between Belt and Road and China has more than doubled over the past decade, with a notable acceleration since 2013. In contrast, China's demand-side contribution to visible trade growth (i.e. its imports from BRI countries), although still growing, has failed to keep pace with supply connectivity. Given slower Chinese demand growth for commodities and other industrial inputs, it seems likely that this pattern of trade connectivity may well continue.

Fig. 8. Supply-chain connectivity is increasingly key to overall trade

World: Trade-connectivity by selected component
0-100, 100=most-connected on each pillar in 2015



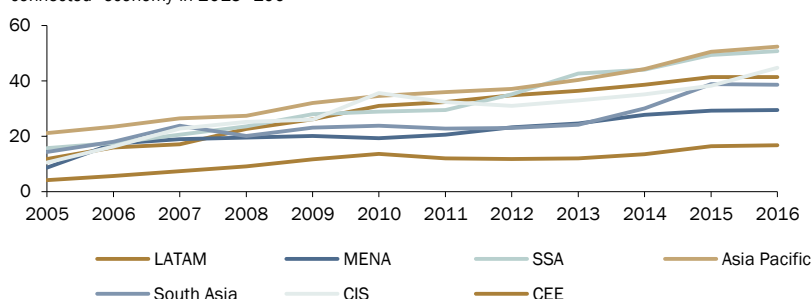
Source: Oxford Economics / Various primary sources

Supply-chain connectivity is deepening across all regions, but gains in Africa and CIS are particularly notable. Given the interconnection of supply chains across Asia (see previous section) it is unsurprising that supply-chain connectivity is deepest between China and Asia-Pacific. But other regions also stand out: for example, Africa has deepened supply-chain linkages to China faster than any other region--having been broadly as connected to China on this metric as was South Asia in 2005, it is now second only to Asia-Pacific in terms of its supply-chain connectivity. Of course, these two regions have very different types of connectivity to China - whereas in Asia-Pacific, manufactured inputs flow across borders several times during the manufacturing process, in Africa this mainly reflects imports of goods from China for supply-chain use by African firms. Also of note is the uptick in supply-chain connectivity to CIS regions - this likely reflects trade flows complementary to the development of the Power of Siberia pipeline, discussed in more detail in Chapter 5.

Fig. 9. Supply-chain connectivity is deepening across BRI regions

Supply Chain Connectivity

Supply chain imports from China relative to all supply chain imports, "Most-connected" economy in 2015=100



Source : Oxford Economics/Haver Analytics

Supply-chain connectivity has deepened even against the backdrop of a less-favourable macroeconomic climate. China's increased presence in supply chains in 2016 is particularly impressive in the context of less favourable global economic developments. World GDP growth slowed from 2.9% in 2015 to 2.4% in 2016, and world trade growth eased from 2.9% to 2.1%. To put it another way, even as the pace of opportunity slowed (measured by rate of growth and trade-intensity of growth), China continued to develop stronger connectivity and economic importance for BRI economies.

Trade connectivity is likely to have deepened further through 2017-18, but the outlook is less certain. Both world GDP growth and world trade growth rebounded in 2017, and 2018 seems likely to mark the peak of the global economic cycle. As such, we can expect further deepening of trade connectivity between China and Belt and Road economies in data pertaining to the last year or so. But a more hostile political environment in major advanced economies means the outlook for free trade at the global level is increasingly uncertain. How much this impacts on China's trade connectivity with BRI economies will depend on the extent to which these economies themselves trade with countries erecting trade barriers. Perhaps more positively, however, it could be that BRI countries find new opportunities to export to China as a result of Chinese tariffs on US goods.

4. Connectivity diversifying

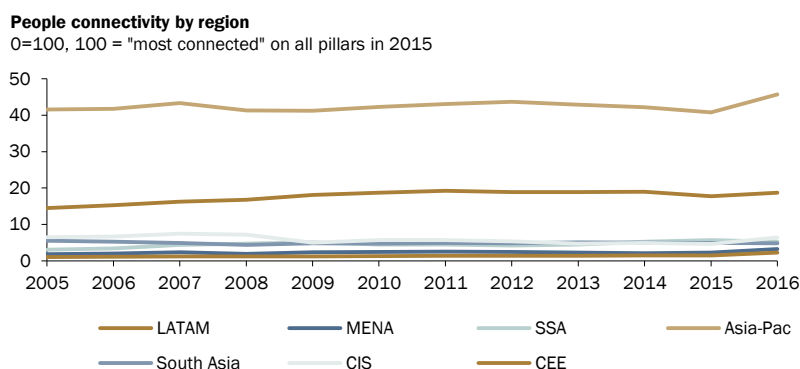
People connectivity can be regarded as the “third leg” of China’s global opening. China’s connectivity with the world economy can be thought of in three phases. First came accession to the WTO in 2001, and China’s growing presence in global trade in the decade that followed. Since 2008, when China’s outbound investment more than doubled from \$27bn to \$57bn, it has been increasingly active as a global investor (first to secure access to resources; then, more recently, to the technologies to move up the value chain). Thirdly, in recent years, a more liberal attitude to the movement of people into and out of China has led to rapid growth in visitor numbers in both directions, as well as more permanent moves such as those made by workers and students.

In this chapter, we examine the role that people connectivity plays in China’s economy and those of the Belt and Road, and look forward to the prospects for people connectivity in the years ahead.

4.1 The growing importance of people connectivity

People connectivity can play a key role in helping China achieve its future economic goals. Greater people connectivity is complementary to several of China’s development objectives in the years ahead. A more consumer-driven economy will facilitate continued growth in outbound tourism, while hosting inbound visitors will provide an additional means of diversifying domestic economic growth. At the same time, to attract the best global talent to drive new industries and offset increasingly-challenging demographic trends, China’s labour market is becoming more open to overseas workers. The visa regime for highly-skilled workers has been liberalised to permit long-term (10-year) residencies. Finally, although China has invested substantially in boosting higher education provision in recent years, the sheer volume of undergraduates requiring education means an estimated 813,000 Chinese students took courses overseas in 2015, according to the UN.

Fig. 10. Surge in People Connectivity with APAC region in 2016



Source : Oxford Economics/Haver Analytics

People connectivity typically remains lower than other forms of connectivity, but it is the dimension where connectivity has been growing most broadly in recent years. 65 out of 86 economies in CCI saw people connectivity rise in 2016, around 20 more than those seeing greater connectivity on the trade or capital channels.

4.2 People connectivity strongest with neighbours

Asia-Pacific economies enjoy strongest people connectivity to China. Perhaps unsurprisingly, the most-connected economies via people connectivity are typically found in China's immediate neighbourhood. People connectivity between China and Asia-Pacific (APAC) is more than twice as deep as with the next most-connected region (Latin America and the Caribbean), and the APAC region is where people connectivity has accelerated most in our updated CCI (see Fig. 10). The top eight slots in our people connectivity dimension are all filled by Asia-Pacific economies (Fig. 11).

Fig. 11. People connectivity is strongest with Asian neighbours

People connectivity summary - 2016										
Overall rank	Country	Overall people connectivity	Visitors to China % population	Visitors to China % total outbound tourists	Migrants from China % national employment	Migrants to China % national employment	Visitors to China % population	Visitors to China % total outbound tourists	Migrants from China % national employment	Migrants to China % national employment
0-100							Rank	Rank	Rank	Rank
1	Singapore	84.9	17.27%	10.22%	12.04%	0.08%	1	9	1	5
2	Mongolia	80.9	11.45%	48.13%	0.82%	0.10%	2	1	5	2
3	Australia	61.5	2.82%	6.59%	4.23%	0.06%	4	13	2	7
4	Philippines	50.5	0.99%	20.68%	0.09%	0.21%	10	2	19	1
5	Malaysia	44.6	3.64%	12.55%	0.39%	0.05%	3	6	7	9
6	Vietnam	38.1	0.48%	17.69%	0.02%	0.06%	12	4	40	8
7	Sri Lanka	37.9	0.29%	7.30%	0.02%	0.07%	25	12	35	6
8	Thailand	33.2	1.22%	11.06%	0.40%	0.05%	9	8	6	10
9	Peru	30.9	0.07%	1.59%	0.03%	0.10%	55	37	31	3
10	Brazil	30.1	0.03%	0.81%	0.03%	0.09%	66	49	34	4
11	Myanmar	28.7	0.18%	11.13%	0.22%	0.05%	37	7	12	11
12	Jordan	23.4	0.31%	3.05%	1.63%	0.02%	23	28	3	13
13	Indonesia	20.0	0.20%	5.93%	0.06%	0.04%	36	15	23	12
14	Ethiopia	17.9	0.04%	20.67%	0.00%	0.00%	63	3	58	65
15	Brunei	13.0	1.91%	0.59%	0.93%	0.00%	5	55	4	68
16	Ghana	12.9	0.09%	13.71%	0.00%	0.00%	47	5	54	37
17	Israel	10.0	1.49%	3.32%	0.03%	0.01%	7	24	32	23
18	Maldives	8.7	1.54%	3.44%	0.00%	0.00%	6	23	58	68
19	Lao PDR	8.6	0.14%	0.54%	0.35%	0.01%	42	57	9	15
20	Kazakhstan	8.5	0.46%	1.38%	0.06%	0.01%	13	39	22	14
21	Bangladesh	8.2	0.04%	3.79%	0.28%	0.01%	61	20	10	20
22	Uganda	8.0	0.04%	8.75%	0.01%	0.00%	62	10	51	60
23	Pakistan	7.8	0.06%	4.95%	0.00%	0.01%	56	18	57	19
24	Tanzania	7.4	0.04%	5.58%	0.18%	0.00%	65	17	13	58
25	Russian Federation	6.9	0.38%	3.25%	0.08%	0.01%	15	27	20	21

Source: Oxford Economics

Chinese workers provide key resource for several ASEAN economies. For

Singapore, Malaysia and Thailand, the contribution of Chinese workers to the local labour force is key. At 442,000 in 2016, Singapore hosted the largest number of Chinese workers, up around 100,000 over the previous decade. Thailand's 149,000 Chinese workers place it second in terms of headcount, but Malaysia's 55,000 form a greater share of its domestic labour force, and as such connectivity is greater on this measure.

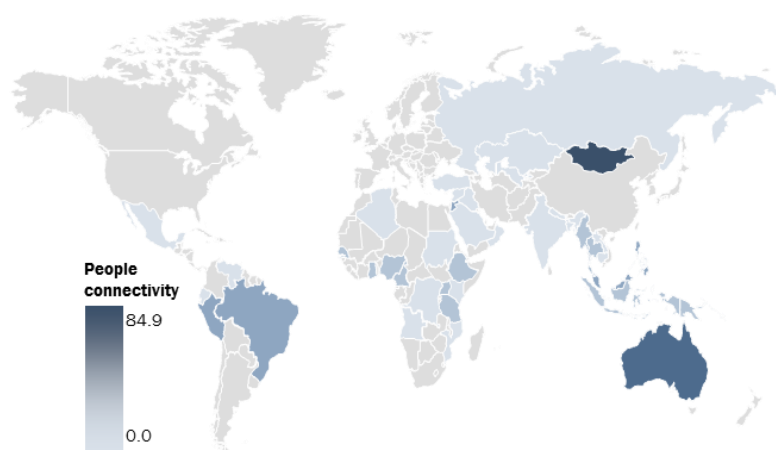
Philippines, Singapore and Mongolia all have sizeable labour presences in

China. Labour is also increasingly flowing in the other direction, from Belt and Road economies into China, thanks to a more liberal inward migration policy, the streamlining of visa processes, and easier paths to permanent residency. In volumes terms, Filipino and Indonesian workers form the largest overseas contingents in China, at 86,000 and 45,000 respectively – both up around a third over the previous decade.

Education linkages are the key to people connectivity with Australia. People connectivity with Australia takes a rather different form, specifically via the third-largest cohort of outbound Chinese students of any country around the world (after the US and UK). As of 2016, there were 112,000 Chinese students in Australia, around 15% percent of the global outbound total, and double the number hosted in 2008. Most research suggests that Chinese parents and students particularly value the opportunity to develop English language skills while studying, making Australia the prime destination for Chinese students amongst BRI countries.

People connectivity is rising more broadly across BRI regions, but particularly in Latin America. As shown in Fig. 12, two Latin American economies; Peru and Brazil, also rank strongly on people connectivity. In both cases this reflects workers from these economies working in China – an estimated 86,000 from Brazil in 2016 (up from 61,000 a decade earlier) and 16,000 Peruvians (up 50% over the previous decade). However, other forms of people connectivity between the continent and China are much weaker than elsewhere in the Belt and Road.

Fig. 12. Selected LatAm economies also key for People Connectivity



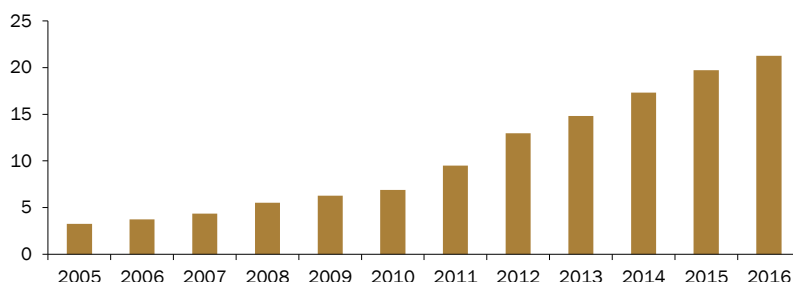
Source: GeoNames, MSFT, Microsoft, Navinfo, Navteq, Thinkware Extract, Wikipedia

4.3 Growing importance of outbound tourism

Chinese visitors are increasingly crucial for tourism sectors across the Belt and Road. Although part of our trade dimension, it is also interesting to think of people connectivity through the lens of the contribution of Chinese outbound visitors to tourism in Belt and Road economies. As shown in Fig. 13 (overleaf), the overall contribution of Chinese outbound visitors to GDP across the Belt and Road has increased every year in our index, but the acceleration from 2011 is particularly notable. Key destinations for China amongst Belt and Road include Thailand (where Chinese tourists spent an estimated \$24bn in 2017, up 15% from 2016), Singapore (\$4.1bn and 14% respectively), and Australia \$3.5bn and 25%).

Fig. 13. Chinese tourism increasingly important to BRI economies**Overall China Tourism Connectivity**

Aggregate of all BRI countries, weighted by GDP, most connected economy in 2015=100

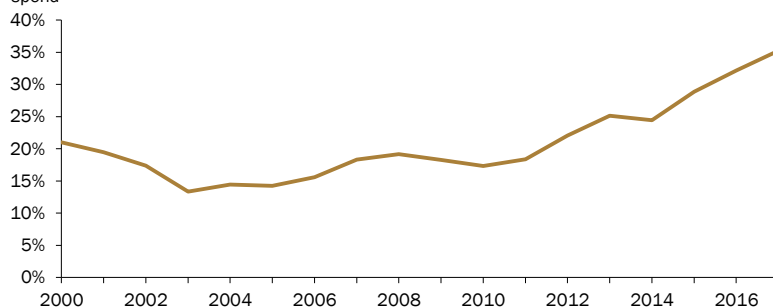


Source: Oxford Economics/Haver Analytics

Belt and Road economies are taking an ever-greater share of outbound Chinese tourism spend. While Chinese tourism has become an increasingly-important driver of economic growth and activity for BRI countries, BRI countries themselves have also increased their market share amongst overall Chinese outbound tourism. The proportion of outbound Chinese tourism spend taking place in BRI economies rose from below 15% in 2004 to more than 35% in 2016.

Fig. 14. BRI economies take ever-greater share of Chinese tourist spend**Belt and Road share of Chinese tourist spend**

Chinese tourists' spending in BRI countries as % of total outbound Chinese tourist spend



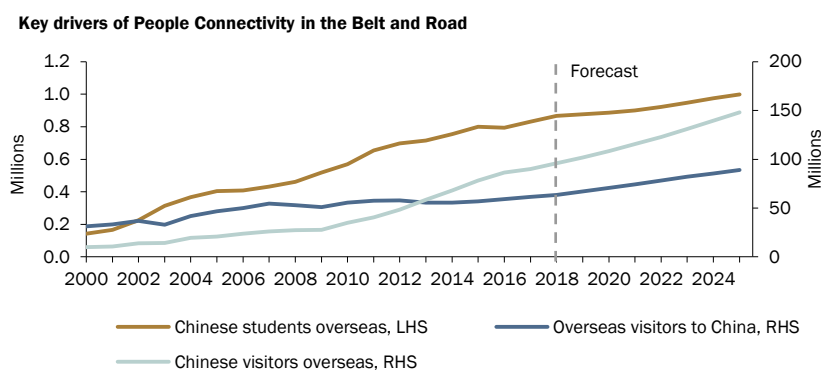
Source : Oxford Economics/Haver Analytics

4.4 The outlook for people connectivity

Key drivers of people connectivity are set for continued solid growth in the years ahead. We expect people connectivity to become an increasingly-important channel of overall connectivity between China and Belt and Road economies. In Fig. 14 we set out three key metrics in this respect. Firstly, from an inbound perspective, Oxford Economics' forecasts indicate overseas visitors to China will rise from 61 million in 2017 to 89 million by 2025 - a rise of almost 50%. Outbound tourism flows are forecast to grow even more rapidly - our forecasts suggest Chinese outbound visitors will rise from 90 million in 2017 to 148 million by 2025 (an increase of almost two-thirds). Meanwhile although demographic trends mean that outbound student numbers will grow rather slower looking ahead, nevertheless Oxford Economics' forecasts suggest further growth from 831,000 in 2017 to just short of 1m by 2025 - an impressive 23% increase.

ASEAN markets are set to see people connectivity grow fastest, thanks to tourism and favourable demographics. Economies most-connected to China via Chinese tourism flows are likely to see the fastest people connectivity growth in the years ahead, thanks to the particularly strong outlook in this sector. Economies such as Cambodia and Thailand, where spending from Chinese visitors was the equivalent of 3.4% of GDP and 5.2% of GDP respectively in 2016, stand to be key winners. However, sustainability and capacity concerns are likely to become an increasingly worry, particularly in smaller countries such as the Maldives. ASEAN countries with the strongest demographics may also be well-placed to deepen links with China via their expatriate workforces.

Fig. 15. People connectivity is set to be key future driver



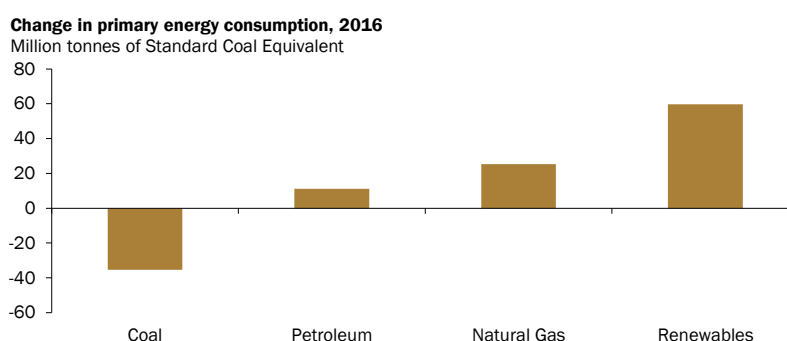
Source: Oxford Economics/British Council

5. Connectivity decarbonising

5.1 China's quest for cleaner energy

China's shift to cleaner energy will change what it demands from trade partners. One of the key planks of China's development strategy for the coming decades is to reduce the carbon-intensity of the economy. The 13th five-year plan targets a 60-65% reduction in carbon intensity per unit of GDP from 2005 to 2030. A key part of this is making further progress in decarbonising energy generation. China is already the world's largest producer of renewable energy according to the US Energy Information Administration, and the latest five-year plan sets out a range of measures to incentivise an ongoing shift away from coal and towards cleaner and renewable fuels.

Fig. 16. China's shift from dirty fuels to low and zero carbon underway

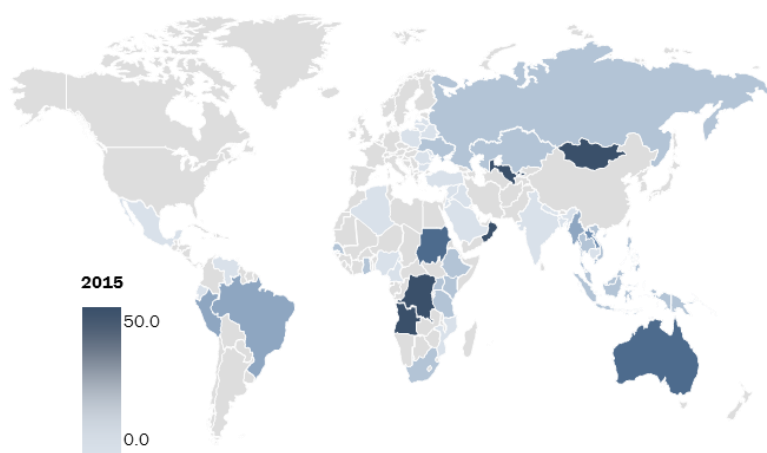


Source: Oxford Economics/Haver Analytics

5.2 Where might decarbonisation cut connectivity?

Mongolia, Angola and Oman stand out as at-risk from China's push to decarbonise. Several countries may well lose out from China's push for cleaner growth. At most risk will be those where connectivity is most-concentrated in commodity exports, and particularly crude oil and coal. In this respect, Angola stands out at the most-exposed, with crude oil exports to China accounting for more than half of total export revenues. Mongolia's coal exports to China (34m tonnes in 2017 according to industry media) mean it is also exposed to a concerted push to decarbonise, while Oman's dependence on Chinese demand for its oil (exporting \$10bn in crude to China in 2016) means it is more exposed than other GCC economies to slower Chinese demand.

Other economies are insulated by cleaner commodities or more-diverse connectivity. Mongolia, Angola and Oman are far from the only economies with deep connectivity trade with China. Australia, Peru, Democratic Republic of Congo and several Central Asian economies all also score highly on this metric. But the type of commodities traded is clearly crucial - as we shall see in Chapter 6, China's interest in commodities in Africa is increasingly focussed on what it needs for the next stage of its industrial evolution. Peru's copper reserves (the second largest in the world) will also mean it is likely to be protected from the impacts of decarbonisation. Meanwhile although Australia's coal-mining sector will certainly feel the impact of slower Chinese coal demand, tourism and education links are likely to continue growing in importance. and as we shall see in the next section, key gas exporters (including Australia) are likely to benefit from decarbonisation very substantially.

Fig. 17. Can key commodity-suppliers diversify to avoid losing out?

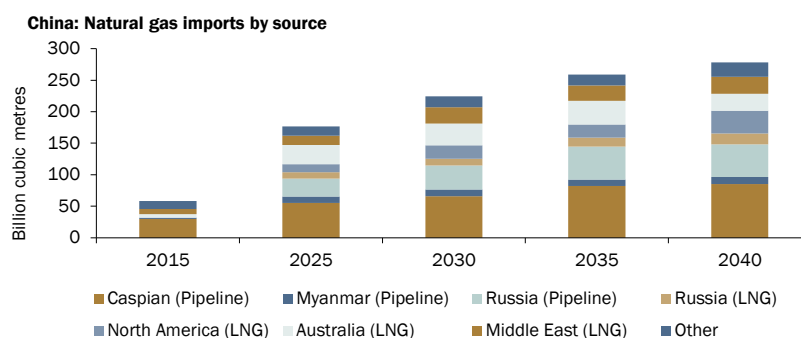
Source: GeoNames, MSFT, Microsoft, Navinfo, Navteq, Thinkware Extract, Wikipedia

5.3 Where can connectivity aid china's decarbonisation?

Belt and Road connectivity is performing an important role in aiding the decarbonisation of China's economy. This is mainly by helping China substitute coal-fired power for gas-fired. Admittedly, gas-fired power is far from carbon-free. But according to the US Energy Information Administration, gas-fired power emits half as much carbon as coal for the same energy output, meaning a shift to gas can make a major contribution to the government's aim to reduce the carbon-intensity of GDP (if not the overall level of emissions).

Power of Siberia is a flagship initiative in this respect, and will spur future trade connectivity. One of the most eye-catching developments across the BRI in 2016 was the investment made by Russia and China in the Power of Siberia pipeline, a \$55bn link from gas fields in Siberia to industrial users in China's north-east. When fully operational (gas expected to start flowing in December 2019) this pipeline will supply up to 61bn cubic metres of gas per year, and substantially reduce demand for coal in one of China's industrial heartlands. The development of the pipeline is reflected in a sharp increase in capital connectivity between Russia and China in this edition of CCI (pushing Russia ten places up our overall connectivity ranking), and we expect trade connectivity to follow suit as the gas starts to flow.

Gas supply from other BRI partners can help further accelerate switch from coal to gas. China's push for cleaner energy and the relative paucity of cross-country gas pipelines mean it requires a range of new supply routes for gas. To boost gas supply to western provinces, China is investing in a new pipeline to Kazakhstan-Uzbekistan-Turkmenistan (complementing three existing linkages) with an annual capacity of around 55bn cubic metres per year. Meanwhile substantial investment is being made in liquified natural gas (LNG) terminals and regasification plants on China's east and south-east coasts – Sinopec announced in April 2018 that it would double its capacity to receive LNG within the coming six years. These facilities will remove bottlenecks faced by producers in Qatar and Australia in getting their gas to Chinese consumers.

Fig. 18. Russia and Central Asia set to treble gas to China by 2035

Source: Oxford Economics/International Energy Agency

5.4 China's role in decarbonisation across belt and road

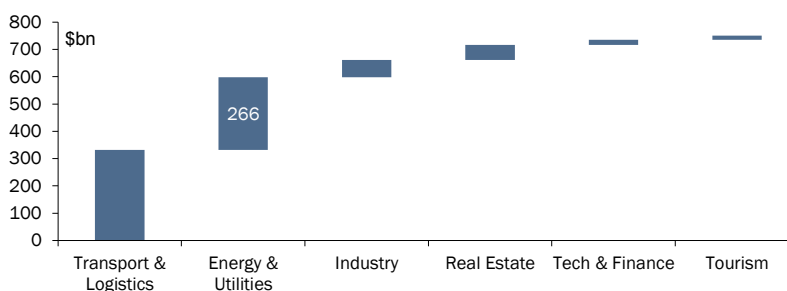
It is important not only to consider the potential impacts on BRI connectivity of China's domestic energy and environmental agenda, but also to understand the role BRI itself can play in supporting decarbonisation across partner economies. BRI is an infrastructure development project without precedent – it therefore has the potential to make a major contribution to decarbonisation efforts across large parts of the emerging world.

Part of this is related to how China undertakes infrastructure development. To help compare the sustainability impact of infrastructure projects, the China International Contractor Associations (CHINCA) has issued its Guidelines of Sustainable Infrastructure for Chinese International Contractors. The guidelines set out 68 sustainability metrics across which projects can be benchmarked. Complementary to this are initiatives launched by other organisations, such as the Green Finance Initiative (GFI) – a collaboration between infrastructure investors, developers, and relevant industry bodies. The GFI's Greening the Belt and Road sets out a range of recommendations for how China and its BRI partners can ensure BRI is complementary to global climate goals.

But equally as important from a decarbonisation perspective as how China invests, is what it invests in. As we examined in our interim paper published earlier this year, a large part of China's spend so far in BRI - more than a third of the total - has been committed to the energy and utilities sector. This reflects the complementarity between the development and operation of major transportation infrastructure assets, and the energy and utilities which are needed to power them

Fig. 19. Energy a key sector for Belt and Road investment so far

Belt and Road: Projects announced, in progress, or completed, since 2013

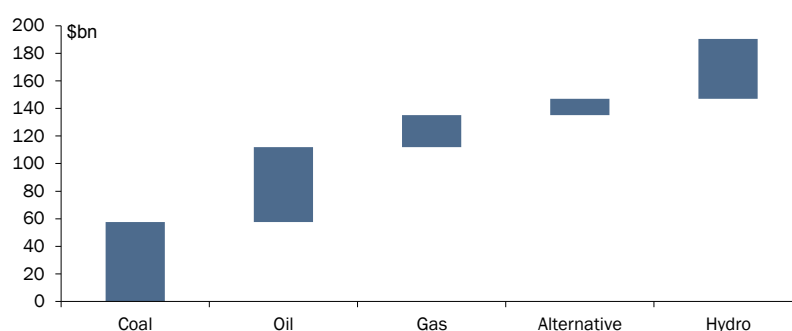


Source: Oxford Economics

At home, China has suspended construction on around 150 coal-fired power stations, to speed progress towards domestic emissions and environmental targets. But partner governments across BRI must make their own decisions about how to balance environmental, economic and political considerations in future energy capacity. And many governments across BRI regions still see coal as a key driver of future capacity growth. Although China is not expected to become a major exporter of coal, given it is aggressively cutting domestic output, China's historic expertise in the sector makes it a natural partner to invest in and develop new coal-fired capacity. In 2017 alone, China reached agreements to develop new coal-fired power generation in Pakistan, Turkey, Georgia and Bosnia. Because of these economic and financial realities, more than half the total BRI investment committed in energy sectors since 2013 has been in carbon-intensive sectors.

Fig. 20. Less than half of BRI energy investment is in clean sectors

Belt & Road: projects announced, in progress or completed, since 2013



Source: Oxford Economics

More positively, China has also been a key partner for renewables investment across the Belt and Road. China is taking a lead on the installation of solar capacity, installing more domestic capacity in 2017 alone than the cumulative historical total of any other country up to that point according to the Institute for Energy Economics and Financial Affairs (IEEFA). Generous government support for electricity fed into the grid has spurred investment in the sector and helped achieve domestic generation targets well in advance. The sector has cooled more recently though, with reforms to the feed-in tariff substantially slowing investment in panel manufacturing.

Chinese manufacturers of renewable energy equipment are therefore looking for opportunities to support energy transitions overseas. According to IEEFA, in 2017 deals were concluded between China and partners in Morocco, Australia, Bangladesh, Malaysia and Vietnam to support expansion of solar capacity. Looking ahead, the particularly ambitious plans of GCC governments (especially Saudi Arabia's proposed 200 GW plant – 100 times bigger than any currently in operation, but also those in UAE, Qatar and Kuwait), make the Middle East a key area where China can support transition to green energy. More broadly, several regions of the BRI have the climatic and geographical potential to tap into Chinese expertise in solar, wind and hydro. China has a role in facilitating this, but its ability to drive decarbonisation across BRI will depend heavily on the level of ambition demonstrated by partner governments.

6. Focus: Sub-saharan africa

Sino-African economic connectivity has come a long way in the 600 years since Admiral Zheng made ground-breaking voyages from China to Africa during the Ming period. Most recently, attention has focused on the role Africa has played in fuelling China's rapid economic growth and investment boom, particularly through exports of natural resources. But as we shall see in this chapter, China's economic connectivity to Africa is evolving, with some countries likely to become increasingly important to China as it develops into higher-tech manufacturing sectors, and some less important.

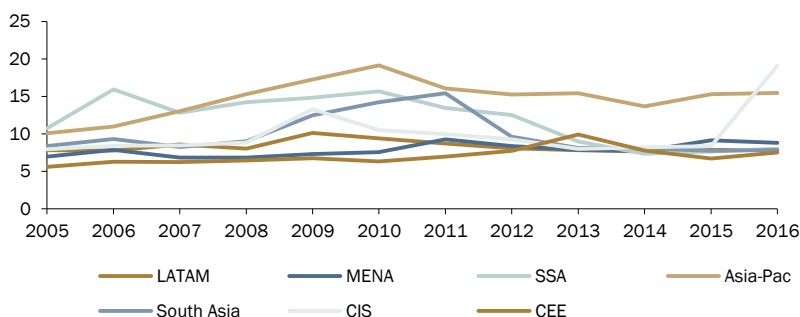
6.1 Africa's connectivity evolution

Africa has slipped from investment hotspot to secondary target. The story of China's connectivity with Africa over the past decade indeed started with the demand for Africa's natural resources, and Chinese investment to secure access to commodities for long-run growth. This dynamic was key to the gradual increase in capital connectivity between Africa and China from 2005 to 2011, when it was second only to that between China and its neighbours in Asia. However, with key resources supplies seemingly secured (and a partial re-evaluation of China's growth model in light of the global crisis of 2008-09), Chinese investment into Africa has slowed markedly in recent years. Of the 14 African economies covered in CCI, only three saw their capital connectivity to China rise over the 2005-2016 period.

Fig. 21. Capital connectivity to Africa slows markedly post-2010

Capital connectivity by region

0=100, 100 = "most connected" on all pillars in 2015

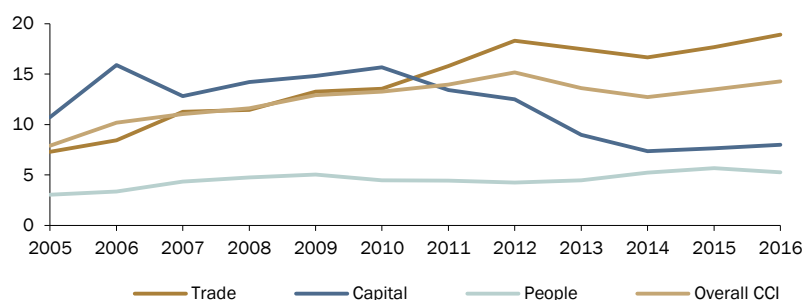


Source: Oxford Economics/Haver Analytics

However, trade flows are taking up the reins of China-Africa connectivity. Over the same period, trade connectivity (including commodities) has more than doubled. Sub-Saharan Africa's trade connectivity score in 2016 is higher than China's neighbours in South Asia, and the more economically-advanced economies in Central & Eastern Europe, or Middle East & North Africa. Of course, in absolute terms, trade volumes may be higher between China and other economies - but in relative terms (i.e. relative to overall trade with the world), Africa's trade connectivity to China stands out amongst BRI regions.

Fig. 22. Capital investment yields trade connectivity
Connectivity Dimensions: Sub-Saharan Africa

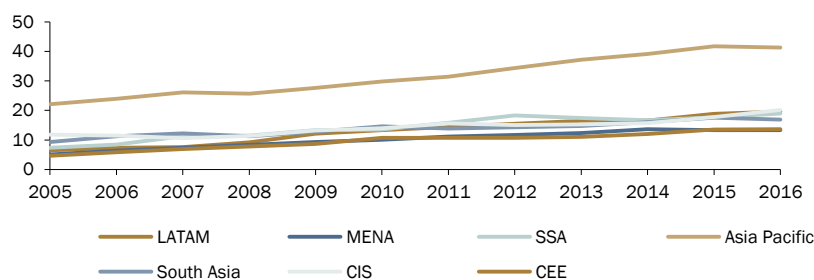
0=100, 100 = "most connected" on all pillars in 2015



Source: Oxford Economics/Haver Analytics

Fig. 23. Africa has deepened trade connectivity faster than other regions
Trade Connectivity

Overall Trade Connectivity score by region. 100=most connected on each pillar of trade connectivity in 2015

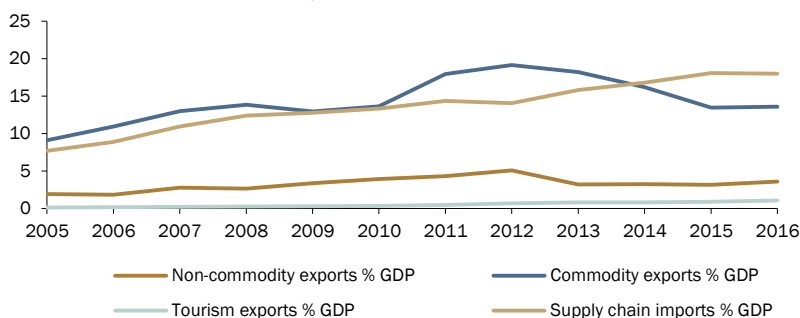


Source: Oxford Economics/Haver Analytics

Commodities remain important for Africa-China connectivity, but supply chain linkages are now the key driver. China's investment in key mineral-producing economies across Africa (as well as more generally its rising demand for these resources) spurred a rapid increase in the exports of commodities from Africa to China. Since 2013 though the importance of commodity connectivity has waned a little, while supply-chain connectivity has continued to deepen. Chinese firms are playing an ever-greater role in supplying African firms with the goods required to upgrade their productive potential. In Nigeria, Ethiopia and Kenya for example, the single-largest category of goods imported is machinery, which accounts for 30-40% of total imports from China, and transport machinery contributes another 5-10% of Chinese exports to these key African economies. Perhaps less encouragingly though, trade flows in the opposite direction have grown far less rapidly - with Africa scoring very poorly by global standards for both non-commodity and tourism exports to China.

Fig. 24. Trade connectivity evolving to serve Africa

Africa: Trade-connectivity by selected component
0-100, 100=most-connected on each pillar in 2015

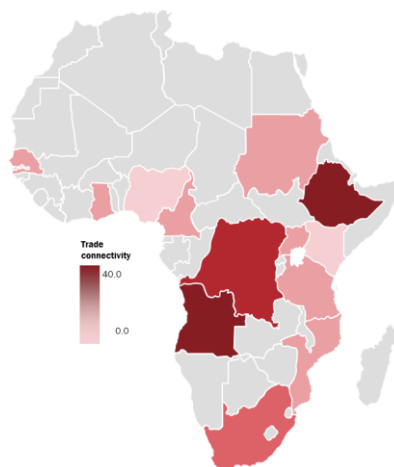


Source: Oxford Economics/Haver Analytics

6.2 The key east-west trade channel

Trade connectivity is strengthening through the key channel from Pakistan to Angola. Perhaps unsurprisingly given Africa's impressive regional showing on trade connectivity, several African economies rank amongst the most-connected economies to China in our CCI. Moreover, the most-connected economies form a clear channel of trade from the west coast up to the east coast, and on to China, with Angola 11th most-connected, Ethiopia 14th, and the Democratic Republic of Congo (DRC) 15th (see Fig. 23, overleaf). In the case of Angola and DRC, natural resources are clearly crucial, while Ethiopia's supply-chain connectivity with China (ranked 9th out of all CCI economies) is the key driver of China-Ethiopia trade connectivity.

Trade connectivity is lower outside the channel, but nevertheless rising across the continent. Trade connectivity outside of this East-West corridor is notably lower – other major African economies rank well outside the top-20 most connected economies to China in CCI. However, as shown in Fig. 21 and Fig. 22, trade connectivity has been growing across the continent. Only one of the fourteen African economies in CCI has become less-connected in trade linkages with China over this period, and this country (DRC) nevertheless remains amongst the most-connected of all BRI economies

Fig. 25. Trade connectivity surging in the Pakistan-Angola corridor

Source: GeoNames, MSFT, Microsoft, Navteq

6.3 Africa's role in china's manufacturing upgrade

China's commodity demand is shifting from crude materials to those key for clean energy. China's demand for commodities is evolving in line with its shift up the manufacturing value chain. Technological developments in automotive and consumer electronics sectors have particularly driven a surge in demand for lithium (used in lithium-ion batteries which power everything from smartphones to electric vehicles), cobalt (also used in batteries, but with a range of other industrial and military applications), nickel and manganese (used in higher-end steel and metals products as well as in batteries again).

China's shift to cleaner energy is also driving demand for different raw materials. As China aims to increase the role of wind power in domestic electricity generation, the excellent conductivity of copper, and its ability to conduct electricity over long distances make this metal a crucial element of China's energy future. And with 38 nuclear reactors already active in China, and 19 more under construction, imported uranium is also an increasingly important raw material for Chinese clean energy.

Recent trade data underline the growing importance of "new" metals, and the waning importance of energy and basic metals. Data for imports of lithium, nickel and cobalt are not easily available, but figures from China Customs indicates that China's imports of copper rose 30% between 2015 and 2017, with manganese up 34% over the same period. By contrast imports of refined petroleum products were flat over the same period and iron ore (a key ingredient of steelmaking) was up by just 13%.

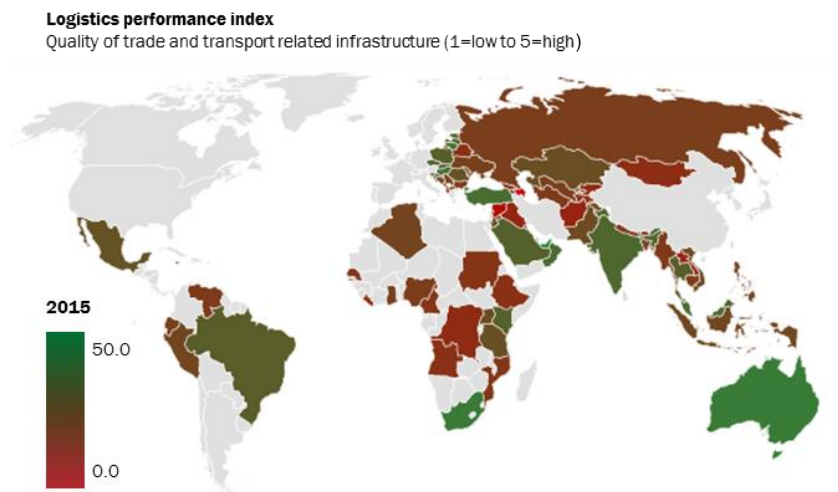
Changing commodity demand is a key driver of deeper trade connectivity to Africa. Traditionally Africa has been a source of agricultural commodities, crude oil, and basic metal ores for exporting to China. However, several African economies are also key in producing the metals required for China's new sectors. For example, although copper reserves in DRC are not especially large by global standards (at an estimated 20 billion tonnes, around a quarter of those in Peru and an eighth of Chile's), its copper deposits are of very high grade, making it especially economic to refine. Copper ore in the DRC also contains a high concentration of Cobalt, making extraction even more potentially lucrative. Elsewhere in the continent, Tanzania's nickel resources, Angola's uranium (albeit secondary to oil in current trade flows), and Ethiopia's gold are all key potential drivers of trade connectivity, and important to China's industrial and energy future.

6.4 The next wave of capital connectivity?

Trade connectivity set for further growth in coming decades. Looking ahead, China's connectivity with Africa will continue to grow, both to supply the materials for China's industrial and energy upgrades, and to support the supply-chain imports Africa needs to develop its own manufacturing and services sectors. Oxford Economics' forecasts suggests bilateral trade (imports and exports) between Africa and China will grow from \$117bn in 2016 to \$331bn by 2030. By this point, Africa is expected to account for 3.5% of China's total exports, up from just 3% in 2016.

Growing trade links will require major improvements to infrastructure. China has so far completed two flagship infrastructure projects in Africa: the \$4bn Nairobi-Mombasa railway in Kenya, which opened 18 months ahead of schedule in 2017, and the Addis Ababa-Djibouti line, which cost a similar amount to develop. Both are being operated on an arrangement whereby China Railway Construction Corporation develops the line using funding from China Export-Import Bank, before operational control is passed to the respective governments. Discussions are ongoing over potential extensions of the Kenya line to Tanzania, Uganda, and northwards to Ethiopia. All would provide a substantial boost to infrastructure quality in a region with relatively-poor logistics connectivity (Fig. 24).

Fig. 26. African infrastructure has plenty of room for improvement



Source: GeoNames, MSFT, Microsoft, Navinfo, Navteq, Thinkware Extract, Wikipedia

Methodological appendix

One index, three dimensions, ten pillars

The China Connectivity Index comprises of three dimensions of bilateral economic connectivity, and within each of these dimensions there are several distinct pillars. Dimensions of connectivity can be thought of as a factor of production or output being exchanged between China and the respective Belt and Road economy, while a pillar reflects specific types of that factor or output. To gauge how bilateral connectivity between China and Belt and Road economies has evolved over time and across countries, we have benchmarked each country against a median value for all Belt and Road economies in 2005, on each pillar within each dimension. For example, in the trade dimension, we have calculated the share of each country's exports bound for China from 2005 to 2016, and benchmarked this against the median for all countries in 2005.

We have then weighted together scores across pillars using their relative importance to GDP in each country. This enables connectivity to be calculated in each dimension depending on what matters to that specific economy. For example, tourism flows are clearly crucial for the economy of the Maldives and tourism spending is therefore a much greater share of GDP than commodity or non-commodity goods exports. This method allows the China Connectivity Index to more accurately reflect connectivity as relevant to specific economies. To compare connectivity across countries on metrics with different units we use the "z-score" methodology, which tracks a score's deviation from a sample mean, benchmarked in our case to 2005 to track connectivity over time.

Finally, we have weighted together connectivity across the three dimensions to an overall index score using a 60-30-10 weighting for trade, capital and people connectivity, respectively. This reflects the fact that in aggregate, trade typically accounts for a far greater proportion of GDP than does capital investment.

Trade dimension

Non-commodity goods exports: China's economic growth has propelled it from being the world's 10th-largest importer of non-commodity goods in 2000 to 2nd-largest in 2016. China is a key market for Belt and Road manufacturers.

Commodity exports: Thanks to rapid economic growth and investment in recent decades, China accounted for almost half of global consumption of all major base metals in 2015. This pillar tracks how important commodity trade with China has become for Belt and Road economies.

Tourism exports: Chinese outbound tourism totalled 122 million visitors in 2016, with a total outbound spend of US \$108 billion. This pillar tracks how important these Chinese tourists are to Belt and Road economies.

Supply chain: China's reputation as "workshop of the world" is well-deserved, as the country makes an ever-increasing contribution to the manufacturing and service sector output in other economies. This pillar tracks intermediate imports from China to Belt and Road economies.

Capital dimension

Direct investment: China's early growth phase typically consisted of inbound direct investment as major global corporations sought to take advantage of China's competitive advantage. But China's role as an outbound investor has become increasingly important, and indications are that Chinese outbound investment surpassed inbound investment for the first year in 2016.

Portfolio investment: China's portfolio assets overseas have risen from US \$92 billion in 2004 to over US \$500 billion by the start of 2018. This pillar tracks the importance of inward portfolio flows from China to Belt and Road economies.

Official investment: China's overseas aid finance has grown from close to zero in 2000 to US \$9 billion in 2016, with the promise of a US \$20 billion package for Africa in the coming three years. This pillar tracks how crucial these flows are to Belt and Road economies.

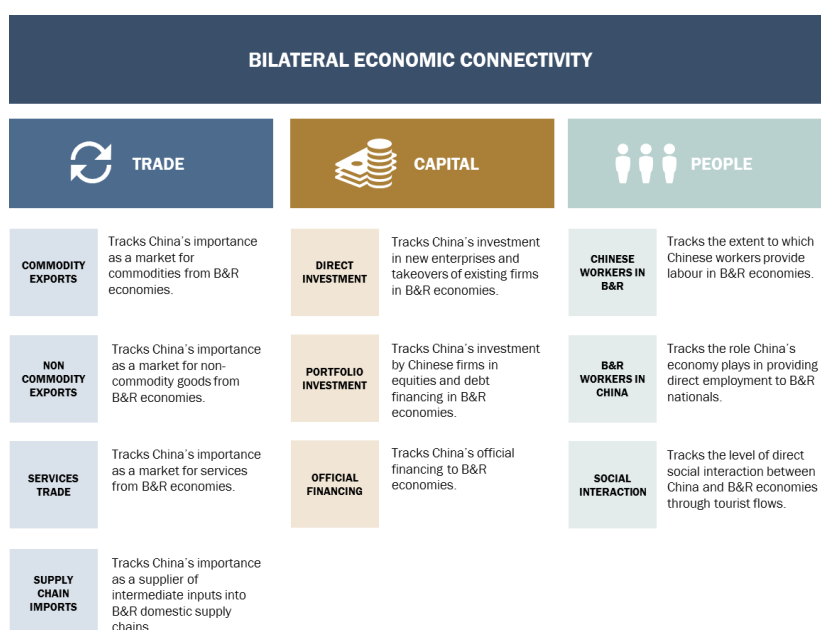
People dimension

Chinese workers in Belt and Road: Chinese workers form a key part of the workforce in several Belt and Road economies. This pillar tracks which countries rely most heavily on Chinese workers to support growth.

Belt and Road workers in China: Several other economies have a large expatriate workforce in China, with remittances growing ten-fold between 2000 and 2015. This pillar tracks which countries gain most from their citizens working in China.

Social connectivity: Around 61 million overseas citizens visited China in 2017. While not directly a driver of economic prospects in Belt and Road countries, we include the importance of China as a tourist destination given the potential longer-term spill over benefits from trade and investment that are linked to tourism.

Fig. 27. Dimensions and pillars of economic connectivity



Source: Oxford Economics

Annex tables

China Connectivity Index results summary - 2016

Overall rank	Change 2015	vs	Country	Overall score	Trade score	Capital score	People score	Trade rank	Capital rank	People rank
1	— 0		Mongolia	69.0	72.4	58.1	80.9	1	1	2
2	— 0		Singapore	55.5	55.5	45.7	84.9	6	4	1
3	↑ 1		Cambodia	41.1	58.2	19.3	3.9	4	6	39
4	↓ -1		Thailand	41.0	57.0	11.7	33.2	5	16	8
5	↑ 3		Vietnam	40.4	58.5	4.9	38.1	2	77	6
6	— 0		Maldives	38.7	58.3	9.4	8.7	3	22	18
7	↓ -2		Malaysia	38.2	50.4	11.5	44.6	8	17	5
8	↑ 2		Myanmar	38.0	54.6	7.8	28.7	7	38	11
9	↓ -2		Australia	34.1	39.0	15.0	61.5	12	10	3
10	↑ 4		Kyrgyz Republic	32.0	48.4	7.9	5.5	10	37	32
11	↓ -2		Lao PDR	31.5	50.3	1.6	8.6	9	86	19
12	↓ -1		Philippines	28.2	31.1	15.0	50.5	17	9	4
13	↓ -1		Angola	27.7	41.9	8.6	0.4	11	29	79
14	↓ -1		Oman	26.0	38.2	9.9	1.1	13	21	69
15	— 0		Ethiopia	25.0	36.2	4.8	17.9	14	78	14
16	↑ 5		Brunei	24.0	14.7	46.1	13.0	42	3	15
17	↓ -1		Peru	23.3	31.2	5.1	30.9	16	74	9
18	— 0		Indonesia	22.2	28.1	11.1	20.0	19	18	13
19	↓ -2		Dem. Rep. Congo	22.1	32.6	8.4	0.5	15	32	77
20	↓ -1		Kazakhstan	21.0	28.9	9.3	8.5	18	25	20
21	↓ -1		Sri Lanka	21.0	26.2	4.9	37.9	21	76	7
22	↑ 10		Russian Federation	20.6	21.7	23.2	6.9	24	5	25
23	— 0		Pakistan	19.3	27.5	6.9	7.8	20	55	23
24	↑ 1		Brazil	17.7	20.4	8.2	30.1	25	34	10
25	↓ -1		Czech Republic	16.6	23.6	7.2	2.5	22	47	51
26	↑ 3		South Africa	16.5	22.5	8.6	4.1	23	28	38
27	↓ -1		Liberia	15.6	0.0	52.0	0.0	84	2	82
28	↑ 3		Jordan	15.3	18.0	7.1	23.4	31	49	12
29	↑ 9		Sudan	14.6	14.7	18.6	2.2	43	8	55
30	↑ 3		Slovak Republic	13.5	18.8	6.9	1.8	26	54	61
31	↑ 6		Mexico	13.4	18.3	7.9	0.8	29	36	73
32	↑ 2		Qatar	13.4	18.3	7.7	0.7	27	40	75
33	↑ 8		Ghana	13.4	17.8	4.6	12.9	35	79	16
34	↑ 2		Iran, Islamic Rep.	13.1	18.3	5.5	4.3	28	66	36
35	↓ -13		Nepal	13.1	17.9	5.7	5.8	32	65	28
36	↓ -1		Cameroon	12.8	18.1	4.5	5.7	30	80	29
37	↑ 11		United Arab Emirates	12.8	16.1	10.0	0.7	36	20	74
38	↑ 5		Ukraine	12.6	17.8	5.2	3.2	34	73	44
39	↑ 3		Algeria	12.5	17.9	5.4	1.5	33	71	65
40	↑ 5		Hungary	12.4	15.6	8.5	4.9	39	31	33
41	↓ -2		India	12.1	15.8	7.9	2.9	38	35	45
42	↑ 8		Poland	12.0	15.2	9.0	1.6	40	27	64
43	↓ -15		Tanzania	11.9	15.9	5.4	7.4	37	68	24
44	↑ 2		Senegal	11.5	15.1	6.0	6.2	41	61	26
45	↑ 2		Israel	11.3	13.0	8.3	10.0	50	33	17
46	↓ -6		Belarus	11.0	14.2	7.3	3.4	45	43	42
47	↓ -3		Saudi Arabia	10.9	11.5	12.9	1.3	56	14	66
48	↓ -21		Bangladesh	10.7	11.8	9.3	8.2	55	24	21
49	— 0		Ecuador	10.6	14.5	5.8	1.7	44	63	63
50	↑ 3		Egypt, Arab Rep.	10.4	12.3	8.5	4.3	52	30	37
51	↑ 9		Mozambique	10.3	14.0	6.1	0.5	46	60	78
52	— 0		Estonia	10.2	13.3	7.5	0.5	47	41	76
53	↑ 2		Bahrain	10.1	13.1	7.0	1.2	48	53	68
54	↓ -24		Montenegro	9.7	12.0	7.3	3.8	54	45	40
55	↓ -1		Uganda	9.6	12.2	5.1	8.0	53	75	22
56	↑ 14		Afghanistan	9.4	12.5	5.8	0.8	51	62	72
57	↓ -6		Kuwait	9.3	9.5	11.8	1.0	63	15	71
58	↑ 3		Moldova	9.3	13.1	4.1	2.1	49	81	56
59	↑ 4		Nigeria	9.2	11.1	6.6	5.6	59	58	30
60	↓ -3		Serbia	9.1	11.2	7.1	2.3	58	51	54

China Connectivity Index results summary - 2016

Overall rank	Change vs 2015	Country	Overall score	Trade score	Capital score	People score	Trade rank	Capital rank	People rank
61	↓ -3	Turkey	9.0	11.2	6.8	2.4	57	56	53
62	↓ -3	East Timor	8.9	5.5	18.6	0.0	74	7	82
63	↑ 2	Slovenia	8.6	10.2	7.8	1.7	61	39	62
64	↓ -2	Lebanon	7.8	8.4	7.4	5.5	65	42	31
65	↑ 1	Armenia	7.5	10.4	3.6	1.1	60	84	70
66	↓ -10	Macedonia, FYR	7.3	9.4	5.4	0.0	64	70	82
67	↓ -3	Jamaica	7.2	6.8	9.4	2.6	70	23	49
68	↑ 1	Georgia	7.1	9.9	3.4	1.2	62	85	67
69	↓ -2	Palestine	7.1	5.2	13.2	0.0	76	12	82
70	↑ 4	Yemen, Rep.	6.9	5.7	10.2	4.9	73	19	34
71	↑ 9	Azerbaijan	6.8	6.3	9.2	2.9	71	26	47
72	↓ -4	Bulgaria	6.5	6.9	7.1	2.5	68	48	52
73	↓ -2	Albania	6.5	7.5	6.4	0.3	66	59	80
74	↓ -2	Venezuela	6.1	6.0	7.1	3.3	72	50	43
75	↑ 1	Romania	6.0	7.1	5.2	2.0	67	72	159
76	↓ -3	Iraq	5.8	2.7	12.9	2.8	79	13	48
77	↑ 1	Bhutan	5.6	2.1	14.4	0.0	82	11	82
78	↓ -3	Kenya	5.6	5.3	7.3	2.1	75	44	58
79	↓ -2	Bosnia and Herzegovina	5.3	6.9	4.1	0.0	69	82	81
80	↓ -1	Latvia	5.2	4.9	6.7	2.9	77	57	46
81	— 0	Lithuania	4.1	3.0	7.0	2.1	78	52	57
82	— 0	Croatia	4.0	2.3	7.2	4.5	80	46	35
83	— 0	Syrian Arab Republic	3.6	2.2	5.8	6.0	81	64	27
84	— 0	Turkmenistan	2.1	0.4	5.5	2.0	83	67	60
85	— 0	Uzbekistan	2.0	0.0	5.4	3.6	84	69	41
86	— 0	Tajikistan	1.4	0.0	3.8	2.6	84	83	50

Source: Oxford Economics

Trade connectivity summary - 2016

Overall rank	Country	Overall trade connectivity	Non-commodity goods exports to China % GDP	Commodity exports to China % GDP	Supply chain imports from China % GDP	Tourism spending from China % GDP	Non-commodity goods exports to China % GDP	Commodity exports to China % GDP	Supply chain imports from China % GDP	Tourism spending from China % GDP
		0-100					Rank	Rank	Rank	Rank
1	Mongolia	72.4	1.66%	32.44%	7.22%	1.32%	11	1	8	6
2	Vietnam	58.5	8.23%	2.67%	22.66%	1.07%	2	10	1	9
3	Maldives	58.3	0.00%	0.00%	5.07%	33.14%	78	78	13	1
4	Cambodia	58.2	2.92%	0.13%	21.18%	3.37%	6	41	2	3
5	Thailand	57.0	4.63%	1.09%	8.84%	5.19%	5	20	6	2
6	Singapore	55.5	13.77%	0.06%	10.13%	1.15%	1	50	4	8
7	Myanmar	54.6	4.65%	2.61%	2.05%	1.54%	4	11	59	4
8	Malaysia	50.4	7.37%	0.64%	9.14%	0.72%	3	27	5	11
9	Lao PDR	50.3	2.34%	4.80%	3.80%	1.03%	8	6	22	10
10	Kyrgyz Republic	48.4	0.46%	0.71%	12.15%	0.24%	34	24	3	17
11	Angola	41.9	0.04%	12.36%	1.36%	0.14%	69	4	73	28
12	Australia	39.0	1.03%	3.71%	2.09%	0.22%	15	8	57	19
13	Oman	38.2	0.73%	15.23%	1.42%	0.08%	25	3	71	36
14	Ethiopia	36.2	0.10%	0.03%	6.62%	0.08%	58	58	9	40
15	Dem. Rep. Congo	32.6	0.04%	6.69%	1.18%	0.00%	70	5	78	73
16	Peru	31.2	0.91%	3.44%	3.04%	0.10%	20	9	31	34
17	Philippines	31.1	1.64%	0.39%	3.95%	0.20%	12	33	20	20
18	Kazakhstan	28.9	2.01%	1.14%	2.12%	0.07%	9	18	56	44
19	Indonesia	28.1	1.14%	0.66%	2.91%	0.13%	14	26	35	31
20	Pakistan	27.5	0.50%	0.07%	4.40%	0.01%	32	49	16	68
21	Sri Lanka	26.2	0.18%	0.08%	4.37%	1.46%	49	46	17	5
22	Czech Republic	23.6	0.96%	0.02%	7.27%	0.17%	19	62	7	24
23	South Africa	22.5	0.80%	1.49%	3.32%	0.18%	22	13	29	23
24	Russian Federation	21.7	0.78%	1.38%	2.17%	0.09%	23	15	55	35
25	Brazil	20.4	0.46%	1.48%	1.09%	0.02%	35	14	80	62
26	Slovak Republic	18.8	1.40%	0.01%	5.57%	0.06%	13	69	10	49
27	Qatar	18.3	2.82%	0.13%	1.51%	0.08%	7	42	69	39
28	Iran, Islamic Rep.	18.3	0.70%	0.00%	0.92%	0.05%	26	81	81	54
29	Mexico	18.3	0.32%	0.19%	5.43%	0.02%	42	37	11	61
30	Cameroon	18.1	0.12%	0.35%	2.58%	0.00%	55	34	42	73
31	Jordan	18.0	0.33%	0.00%	5.12%	0.14%	40	77	12	27
32	Nepal	17.9	0.05%	0.01%	3.55%	0.36%	67	70	26	15
33	Algeria	17.9	0.21%	0.00%	3.86%	0.06%	47	79	21	51
34	Ukraine	17.8	0.74%	1.22%	3.78%	0.01%	24	17	24	66
35	Ghana	17.8	0.15%	2.05%	3.12%	0.38%	52	12	30	14
36	United Arab Emirates	16.1	1.03%	0.02%	4.84%	0.44%	16	60	14	12
37	Tanzania	15.9	0.07%	0.68%	2.38%	0.38%	61	25	50	13
38	India	15.8	0.30%	0.10%	2.45%	0.02%	43	44	46	64
39	Hungary	15.6	1.77%	0.01%	3.45%	0.00%	10	63	28	73
40	Poland	15.2	0.38%	0.02%	3.54%	0.03%	39	59	27	57
41	Senegal	15.1	0.40%	0.47%	2.72%	0.00%	38	31	39	73
42	Brunei	14.7	0.65%	1.34%	2.41%	0.20%	27	16	47	21
43	Sudan	14.7	0.03%	3.93%	1.57%	0.25%	71	7	67	16
44	Ecuador	14.5	0.16%	0.50%	2.39%	0.15%	50	29	49	26
45	Belarus	14.2	0.83%	0.01%	3.63%	0.04%	21	64	25	56
46	Mozambique	14.0	0.47%	0.84%	2.87%	0.00%	33	23	37	73
47	Estonia	13.3	0.63%	0.18%	3.80%	0.08%	30	38	23	42
48	Bahrain	13.1	0.52%	1.14%	3.02%	0.06%	31	19	33	48
49	Moldova	13.1	0.21%	0.00%	3.99%	0.02%	48	73	19	63
50	Israel	13.0	1.01%	0.03%	1.10%	0.06%	18	55	79	47
51	Afghanistan	12.5	0.02%	0.01%	2.64%	-	73	72	41	-
52	Egypt, Arab Rep.	12.3	0.06%	0.13%	2.34%	0.08%	64	40	52	41
53	Uganda	12.2	0.05%	0.06%	2.46%	0.20%	66	51	45	22
54	Montenegro	12.0	0.07%	0.41%	2.70%	0.00%	62	32	40	73
55	Bangladesh	11.8	0.23%	0.00%	4.80%	0.01%	45	81	15	69
56	Saudi Arabia	11.5	0.63%	0.01%	1.88%	0.01%	29	68	63	67
57	Turkey	11.2	0.11%	0.16%	2.49%	0.04%	56	39	43	55

Trade connectivity summary - 2016

Overall rank	Country	Overall trade connectivity	Non-commodity goods exports to China % GDP	Commodity exports to China % GDP	Supply chain imports from China % GDP	Tourism spending from China % GDP	Non-commodity goods exports to China % GDP	Commodity exports to China % GDP	Supply chain imports from China % GDP	Tourism spending from China % GDP
		0-100					Rank	Rank	Rank	Rank
58	Serbia	11.2	0.05%	0.01%	2.34%	1.18%	65	65	53	7
59	Nigeria	11.1	0.06%	0.05%	1.39%	0.06%	63	52	72	50
60	Armenia	10.4	0.00%	0.94%	2.26%	0.14%	76	22	54	29
61	Slovenia	10.2	1.03%	0.12%	2.48%	0.11%	17	43	44	32
62	Georgia	9.9	0.12%	1.06%	2.39%	0.16%	54	21	48	25
63	Kuwait	9.5	0.44%	0.01%	2.92%	0.01%	36	66	34	70
64	Macedonia, FYR	9.4	0.41%	0.03%	2.88%	0.06%	37	56	36	53
65	Lebanon	8.4	0.01%	0.01%	2.72%	0.06%	75	71	38	52
66	Albania	7.5	0.02%	0.48%	1.96%	0.10%	72	30	61	33
67	Romania	7.1	0.33%	0.03%	1.65%	0.02%	41	54	65	65
68	Bulgaria	6.9	0.63%	0.27%	1.63%	0.07%	28	35	66	45
69	Bosnia and Herzegovina	6.9	0.08%	0.00%	2.08%	0.08%	59	75	58	37
70	Jamaica	6.8	0.16%	0.05%	1.44%	0.24%	51	53	70	18
71	Azerbaijan	6.3	0.08%	0.64%	1.29%	0.03%	60	28	75	60
72	Venezuela	6.0	0.00%	0.09%	2.02%	0.08%	77	45	60	38
73	Yemen, Rep.	5.7	0.02%	0.01%	1.51%	0.00%	74	67	68	71
74	East Timor	5.5	0.00%	0.00%	0.48%	-	80	74	83	-
75	Kenya	5.3	0.00%	0.07%	3.03%	0.08%	82	48	32	43
76	Palestine	5.2	0.00%	0.00%	1.78%	-	81	80	64	-
77	Latvia	4.9	0.23%	0.25%	1.25%	0.07%	46	36	76	46
78	Lithuania	3.0	0.24%	0.08%	1.32%	0.03%	44	47	74	58
79	Iraq	2.7	0.00%	0.00%	4.36%	0.00%	82	81	18	72
80	Croatia	2.3	0.14%	0.02%	0.78%	0.13%	53	61	82	30
81	Syrian Arab Republic	2.2	0.11%	0.03%	2.37%	0.03%	57	57	51	59
82	Bhutan	2.1	0.00%	0.00%	1.21%	-	79	76	77	-
83	Turkmenistan	0.4	0.04%	21.69%	1.93%	-	68	2	62	-
84	Tajikistan	0.0	0.00%	0.00%	0.00%	-	82	81	84	-
85	Uzbekistan	0.0	0.00%	0.00%	0.00%	-	82	81	84	-
86	Liberia	0.0	0.00%	0.00%	0.00%	-	82	81	84	-

Source: Oxford Economics

Capital connectivity summary - 2016

Overall rank	Country	Overall capital connectivity	Inward direct investment from China % GDP	Total portfolio investment from China % GDP	Official financing from China % GDP	Inward direct investment from China % GDP	Total portfolio investment from China % GDP	Official financing from China % GDP
		0-100				Rank	Rank	Rank
1	Mongolia	58.1	0.29%	7.32%	0.00%	10	1	2
2	Liberia	52.0	165.97%	1.77%	0.00%	1	3	2
3	Brunei	46.1	27.03%	0.00%	0.00%	3	63	2
4	Singapore	45.7	33.89%	1.86%	0.00%	2	2	2
5	Russian Federation	23.2	0.03%	0.03%	0.46%	46	25	1
6	Cambodia	19.3	0.52%	0.00%	0.00%	9	55	2
7	East Timor	18.6	0.03%	0.00%	0.00%	38	63	2
8	Sudan	18.6	0.00%	0.00%	0.00%	75	63	2
9	Philippines	15.0	0.66%	0.07%	0.00%	8	13	2
10	Australia	15.0	0.78%	0.58%	0.00%	6	4	2
11	Bhutan	14.4	0.17%	0.00%	0.00%	14	63	2
12	Palestine	13.2	0.03%	0.00%	0.00%	40	63	2
13	Iraq	12.9	0.01%	0.00%	0.00%	59	50	2
14	Saudi Arabia	12.9	0.23%	0.01%	0.00%	12	42	2
15	Kuwait	11.8	0.71%	0.00%	0.00%	7	59	2
16	Thailand	11.7	0.86%	0.12%	0.00%	5	10	2
17	Malaysia	11.5	2.33%	0.09%	0.00%	4	11	2
18	Indonesia	11.1	0.09%	0.18%	0.00%	23	5	2
19	Yemen, Rep.	10.2	0.04%	0.00%	0.00%	33	63	2
20	United Arab Emirates	10.0	0.14%	0.17%	0.00%	17	6	2
21	Oman	9.9	0.13%	0.01%	0.00%	18	45	2
22	Maldives	9.4	0.06%	0.00%	0.00%	27	63	2
23	Jamaica	9.4	0.02%	0.07%	0.00%	52	14	2
24	Bangladesh	9.3	0.00%	0.02%	0.00%	73	35	2
25	Kazakhstan	9.3	0.05%	0.02%	0.00%	28	38	2
26	Azerbaijan	9.2	0.01%	0.03%	0.00%	66	29	2
27	Poland	9.0	0.04%	0.13%	0.00%	32	8	2
28	South Africa	8.6	0.15%	0.12%	0.00%	16	9	2
29	Angola	8.6	0.01%	0.00%	0.00%	58	53	2
30	Egypt, Arab Rep.	8.5	0.02%	0.03%	0.00%	49	23	2
31	Hungary	8.5	0.16%	0.13%	0.00%	15	7	2
32	Dem. Rep. Congo	8.4	0.00%	0.00%	0.00%	84	63	2
33	Israel	8.3	0.23%	0.08%	0.00%	13	12	2
34	Brazil	8.2	0.03%	0.06%	0.00%	44	16	2
35	India	7.9	0.03%	0.04%	0.00%	36	21	2
36	Mexico	7.9	0.01%	0.06%	0.00%	60	15	2
37	Kyrgyz Republic	7.9	0.13%	0.00%	0.00%	19	63	2
38	Myanmar	7.8	0.11%	0.00%	0.00%	20	63	2
39	Slovenia	7.8	0.09%	0.06%	0.00%	24	17	2
40	Qatar	7.7	0.01%	0.06%	0.00%	64	18	2
41	Estonia	7.5	0.00%	0.00%	0.00%	72	58	2
42	Lebanon	7.4	0.01%	0.04%	0.00%	57	19	2
43	Belarus	7.3	0.03%	0.00%	0.00%	41	60	2
44	Kenya	7.3	0.01%	0.01%	0.00%	55	41	2
45	Montenegro	7.3	0.28%	0.00%	0.00%	11	63	2
46	Croatia	7.2	0.01%	0.02%	0.00%	65	34	2
47	Czech Republic	7.2	0.08%	0.01%	0.00%	25	43	2
48	Bulgaria	7.1	0.10%	0.01%	0.00%	22	46	2
49	Jordan	7.1	0.10%	0.02%	0.00%	21	32	2
50	Venezuela	7.1	0.01%	0.02%	0.00%	53	37	2
51	Serbia	7.1	0.03%	0.01%	0.00%	39	40	2
52	Lithuania	7.0	0.03%	0.01%	0.00%	43	44	2
53	Bahrain	7.0	0.02%	0.02%	0.00%	51	39	2
54	Slovak Republic	6.9	0.03%	0.00%	0.00%	45	56	2
55	Pakistan	6.9	0.01%	0.01%	0.00%	62	47	2
56	Turkey	6.8	0.02%	0.03%	0.00%	48	26	2
57	Latvia	6.7	0.00%	0.00%	0.00%	76	63	2
58	Nigeria	6.6	0.02%	0.00%	0.00%	50	57	2
59	Albania	6.4	0.00%	0.00%	0.00%	74	63	2
60	Mozambique	6.1	0.00%	0.00%	0.00%	80	52	2
61	Senegal	6.0	0.03%	0.03%	0.00%	42	27	2

Capital connectivity summary - 2016

Overall rank	Country	Overall capital connectivity	Inward direct investment from China % GDP	Total portfolio investment from China % GDP	Official financing from China % GDP	Inward direct investment from China % GDP	Total portfolio investment from China % GDP	Official financing from China % GDP
		0-100				Rank	Rank	Rank
62	Afghanistan	5.8	0.04%	0.00%	0.00%	30	63	2
63	Ecuador	5.6	0.00%	0.02%	0.00%	78	36	2
64	Syrian Arab Republic	5.8	0.04%	0.00%	0.00%	31	63	2
65	Nepal	5.7	0.03%	0.00%	0.00%	37	61	2
66	Iran, Islamic Rep.	5.5	0.01%	0.00%	0.00%	54	62	2
67	Turkmenistan	5.5	0.00%	0.00%	0.00%	81	63	2
68	Tanzania	5.4	0.07%	0.00%	0.00%	26	63	2
69	Uzbekistan	5.4	0.00%	0.00%	0.00%	79	63	2
70	Macedonia, FYR	5.4	0.02%	0.00%	0.00%	47	63	2
71	Algeria	5.4	0.00%	0.00%	0.00%	68	63	2
72	Romania	5.2	0.05%	0.01%	0.00%	29	48	2
73	Ukraine	5.2	0.03%	0.03%	0.00%	35	28	2
74	Peru	5.1	0.01%	0.04%	0.00%	61	20	2
75	Uganda	5.1	0.01%	0.01%	0.00%	56	49	2
76	Sri Lanka	4.9	0.01%	0.03%	0.00%	67	22	2
77	Vietnam	4.9	0.00%	0.02%	0.00%	70	33	2
78	Ethiopia	4.8	0.01%	0.00%	0.00%	63	54	2
79	Ghana	4.6	0.00%	0.03%	0.00%	85	24	2
80	Cameroon	4.5	0.00%	0.00%	0.00%	82	51	2
81	Moldova	4.1	0.00%	0.00%	0.00%	69	63	2
82	Bosnia and Herzegovina	4.1	0.00%	0.00%	0.00%	83	63	2
83	Tajikistan	3.8	0.00%	0.00%	0.00%	77	63	2
84	Armenia	3.6	-0.25%	0.03%	0.00%	86	30	2
85	Georgia	3.4	0.00%	0.03%	0.00%	71	31	2
86	Lao PDR	1.6	0.04%	0.00%	0.00%	34	63	2

Source: Oxford Economics

People connectivity summary - 2016

Overall rank	Country	Overall people connectivity	Visitors to China % population	Visitors to China % total outbound tourists	Migrants from China % national employment	Migrants to China % national employment	Visitors to China % population	Visitors to China % total outbound tourists	Migrants from China % national employment	Migrants to China % national employment
0-100							Rank	Rank	Rank	Rank
1	Singapore	84.9	17.27%	10.22%	12.04%	0.08%	1	9	1	5
2	Mongolia	80.9	11.45%	48.13%	0.82%	0.10%	2	1	5	2
3	Australia	61.5	2.82%	6.59%	4.23%	0.06%	4	13	2	7
4	Philippines	50.5	0.99%	20.68%	0.09%	0.21%	10	2	19	1
5	Malaysia	44.6	3.64%	12.55%	0.39%	0.05%	3	6	7	9
6	Vietnam	38.1	0.48%	17.69%	0.02%	0.06%	12	4	40	8
7	Sri Lanka	37.9	0.29%	7.30%	0.02%	0.07%	25	12	35	6
8	Thailand	33.2	1.22%	11.06%	0.40%	0.05%	9	8	6	10
9	Peru	30.9	0.07%	1.59%	0.03%	0.10%	55	37	31	3
10	Brazil	30.1	0.03%	0.81%	0.03%	0.09%	66	49	34	4
11	Myanmar	28.7	0.18%	11.13%	0.22%	0.05%	37	7	12	11
12	Jordan	23.4	0.31%	3.05%	1.63%	0.02%	23	28	3	13
13	Indonesia	20.0	0.20%	5.93%	0.06%	0.04%	36	15	23	12
14	Ethiopia	17.9	0.04%	20.67%	0.00%	0.00%	63	3	58	65
15	Brunei	13.0	1.91%	0.59%	0.93%	0.00%	5	55	4	68
16	Ghana	12.9	0.09%	13.71%	0.00%	0.00%	47	5	54	37
17	Israel	10.0	1.49%	3.32%	0.03%	0.01%	7	24	32	23
18	Maldives	8.7	1.54%	3.44%	0.00%	0.00%	6	23	58	68
19	Lao PDR	8.6	0.14%	0.54%	0.35%	0.01%	42	57	9	15
20	Kazakhstan	8.5	0.46%	1.38%	0.06%	0.01%	13	39	22	14
21	Bangladesh	8.2	0.04%	3.79%	0.28%	0.01%	61	20	10	20
22	Uganda	8.0	0.04%	8.75%	0.01%	0.00%	62	10	51	60
23	Pakistan	7.8	0.06%	4.95%	0.00%	0.01%	56	18	57	19
24	Tanzania	7.4	0.04%	5.58%	0.18%	0.00%	65	17	13	58
25	Russian Federation	6.9	0.38%	3.25%	0.08%	0.01%	15	27	20	21
26	Senegal	6.2	0.07%	7.94%	0.00%	0.00%	54	11	58	61
27	Syrian Arab Republic	6.0	0.08%	1.93%	0.00%	0.01%	52	31	58	16
28	Nepal	5.8	0.05%	3.59%	0.16%	0.00%	59	22	14	29
29	Cameroon	5.7	0.04%	5.64%	0.00%	0.00%	64	16	58	50
30	Nigeria	5.6	0.02%	6.29%	0.00%	0.00%	68	14	58	64
31	Lebanon	5.5	0.35%	1.90%	0.15%	0.00%	16	32	15	25
32	Kyrgyz Republic	5.5	0.26%	1.02%	0.01%	0.01%	27	44	44	17
33	Hungary	4.9	0.26%	0.50%	0.38%	0.00%	28	61	8	39
34	Yemen, Rep.	4.9	0.01%	1.01%	0.00%	0.01%	72	45	58	18
35	Croatia	4.5	0.54%	2.99%	0.02%	0.00%	11	29	36	36
36	Iran, Islamic Rep.	4.3	0.12%	3.29%	0.00%	0.00%	45	25	58	57
37	Egypt, Arab Rep.	4.3	0.13%	4.75%	0.00%	0.00%	43	19	52	56
38	South Africa	4.1	0.12%	1.21%	0.22%	0.00%	44	40	11	31
39	Cambodia	3.9	0.30%	3.28%	0.02%	0.00%	24	26	38	54
40	Montenegro	3.8	1.26%	1.69%	0.00%	0.00%	8	34	58	68
41	Uzbekistan	3.6	0.22%	3.61%	0.02%	0.00%	32	21	41	49
42	Belarus	3.4	0.32%	1.10%	0.00%	0.00%	21	43	58	26
43	Venezuela	3.3	0.05%	0.97%	0.10%	0.00%	60	47	18	28
44	Ukraine	3.2	0.32%	1.44%	0.04%	0.00%	20	38	29	38
45	India	2.9	0.02%	2.46%	0.00%	0.00%	70	30	56	40
46	Latvia	2.9	0.41%	0.58%	0.03%	0.00%	14	56	33	33
47	Azerbaijan	2.9	0.34%	0.96%	0.01%	0.00%	18	48	47	34
48	Iraq	2.8	0.09%	1.18%	0.00%	0.00%	48	41	58	27
49	Jamaica	2.6	0.16%	1.62%	0.00%	0.00%	39	35	58	32
50	Tajikistan	2.6	-	-	0.00%	0.01%	-	-	55	22
51	Czech Republic	2.5	0.24%	0.43%	0.10%	0.00%	29	64	17	46
52	Bulgaria	2.5	0.34%	0.54%	0.04%	0.00%	17	58	26	41
53	Turkey	2.4	0.14%	1.75%	0.01%	0.00%	41	33	48	48
54	Serbia	2.3	0.21%	0.51%	0.07%	0.00%	35	60	21	44
55	Sudan	2.2	0.01%	0.70%	0.01%	0.00%	73	51	42	30
56	Moldova	2.1	0.00%	0.00%	0.03%	0.00%	74	74	30	35
57	Lithuania	2.1	0.31%	0.45%	0.02%	0.00%	22	62	37	45
58	Kenya	2.1	0.03%	1.62%	0.01%	0.00%	67	36	46	52

People connectivity summary - 2016

Overall rank	Country	Overall people connectivity	Visitors to China % population	Visitors to China % total outbound tourists	Migrants from China % national employment	Migrants to China % national employment	Visitors to China % population	Visitors to China % total outbound tourists	Migrants from China % national employment	Migrants to China % national employment
		0-100					Rank	Rank	Rank	Rank
59	Romania	2.0	0.22%	0.65%	0.06%	0.00%	30	52	25	51
60	Turkmenistan	2.0	-	-	0.01%	0.01%	-	-	45	24
61	Slovak Republic	1.8	0.18%	0.19%	0.04%	0.00%	38	71	28	42
62	Slovenia	1.7	0.00%	0.00%	0.14%	0.00%	74	74	16	68
63	Ecuador	1.7	0.05%	0.97%	0.06%	0.00%	58	46	24	59
64	Poland	1.6	0.22%	0.76%	0.01%	0.00%	31	50	49	55
65	Algeria	1.5	0.08%	1.12%	0.01%	0.00%	51	42	50	53
66	Saudi Arabia	1.3	0.08%	0.39%	0.00%	0.00%	53	65	58	43
67	Georgia	1.2	0.33%	0.63%	0.01%	0.00%	19	53	43	68
68	Bahrain	1.2	0.26%	0.18%	0.00%	0.00%	26	72	58	68
69	Oman	1.1	0.15%	0.54%	0.00%	0.00%	40	59	58	68
70	Armenia	1.1	0.22%	0.62%	0.00%	0.00%	33	54	58	68
71	Kuwait	1.0	0.22%	0.22%	0.00%	0.00%	34	70	58	68
72	Afghanistan	0.8	-	-	0.00%	0.00%	-	-	58	47
73	Mexico	0.8	0.06%	0.38%	0.02%	0.00%	57	66	39	62
74	United Arab Emirates	0.7	0.09%	0.37%	0.00%	0.00%	50	67	58	68
75	Qatar	0.7	0.11%	0.24%	0.00%	0.00%	46	69	58	68
76	Estonia	0.5	0.00%	0.00%	0.04%	0.00%	74	74	27	68
77	Dem. Rep. Congo	0.5	0.02%	0.44%	0.00%	0.00%	71	63	58	67
78	Mozambique	0.5	0.02%	0.35%	0.00%	0.00%	69	68	58	66
79	Angola	0.4	0.00%	0.00%	0.00%	0.00%	74	74	58	63
80	Albania	0.3	0.09%	0.05%	0.00%	0.00%	49	73	58	68
81	Bosnia & Herzegovina	0.0	0.00%	0.00%	0.00%	0.00%	74	74	53	68
82	Palestine	0.0	-	-	0.00%	0.00%	-	-	58	68
83	Bhutan	0.0	-	-	0.00%	0.00%	-	-	58	68
84	Liberia	0.0	-	-	0.00%	0.00%	-	-	58	68
85	Macedonia, FYR	0.0	0.00%	0.00%	0.00%	0.00%	74	74	58	68
86	East Timor	0.0	-	-	0.00%	0.00%	-	-	58	68

Source: Oxford Economics

Notes

[illegible]

Notes

[illegible]

Disclaimer

This is a marketing communication which has been prepared by ICBC Standard Bank Plc (ICBCS) working in conjunction with Oxford Economics, and is provided for informational purposes only.

The Belt and Road Economic Health Index and China Connectivity Index ("Indexes") are non-financial custom indexes designed and calculated by Oxford Economics for, and as requested by ICBCS. None of the material, nor its content, nor any copy of it, may be altered in any way, transmitted to, copied or distributed to any other party, without the prior express written permission of ICBCS, and in particular may not be used as a basis for or a component of any financial instruments or products or indices. The material does not constitute, nor should it be regarded as, investment research. It has not been prepared in accordance with the full legal requirements designed to promote independence of research and is not subject to any prohibition on dealing ahead of the dissemination of investment research.

Additional information with respect to any data modelling or analysis referred to herein may be made available on request. This material is for the general information of institutional and market professional clients of ICBCS and should not be considered to be investment advice. The information, tools and material presented in this marketing communication are provided to you for information purposes only and are not to be used or considered as an offer or the solicitation of an offer to sell or to buy or subscribe for securities, commodities or other financial instruments, or to participate in any particular trading strategy, nor shall it, or the fact of its distribution, form the basis of, or be relied upon in connection with, any contract relating to such action. This material is based on information that we consider reliable, but ICBCS does not warrant or represent (expressly or impliedly) that it is accurate, complete, not misleading or as to its fitness for the purpose intended and it should not be relied upon as such. ICBCS accepts no liability for loss, either directly or indirectly, arising from the use of the material presented in this communication, except that this exclusion of liability does not apply to the extent that liability arises under specific statutes or regulations applicable to ICBCS. The information and opinions contained in this document were produced by ICBCS as per the date stated and may be subject to change without prior notification. Opinions expressed are our current opinions as of the date appearing on this material only. We endeavour to update the material in this report on a timely basis, but regulatory compliance or other reasons may prevent us from doing so.

All trademarks, service marks and logos used in this communication are trademarks or service marks or registered trademarks or service marks of ICBCS or Oxford Economics.

This communication is distributed by ICBC Standard Bank Plc, 20 Gresham Street, London EC2V 7JE which is authorised by the Prudential Regulation Authority ("PRA") and regulated by the PRA and the Financial Conduct Authority ("FCA").

Copyright 2016 ICBC Standard. All rights reserved.



ICBC Standard Bank | Financial Markets and Commodities
20 Gresham Street | London EC2V 7JE, United Kingdom

20180907-10139-HH-ICBC