The background features a complex digital aesthetic. The top half is white with a network of light blue and pink circuit-like lines. A large, dark blue triangular shape on the left side contains a white network mesh. The bottom right corner is dominated by a large, bold, blue number '01'.

**DIGITAL  
TRANSFORMATION  
IN THE  
COMMONWEALTH:  
STATE OF PLAY**

**01**

This chapter aims to provide a picture of global developments in the digital economy, vis-à-vis digital transformation among Commonwealth countries. There is no global consensus on the definition of the digital economy: the Organisation for Economic Co-operation and Development (OECD) (2012) notes that the digital economy covers 'markets based on digital technologies that facilitate the trade of goods and services through e-commerce', while the International Monetary Fund (2018) argues that 'all activities that use digitised data are part of the digital economy: in modern economies, the entire economy'. In this study, we conceptually define the digital economy as economic activities enabled by the interaction of digital technologies and ICT physical infrastructure (following Banga and te Velde 2018). The first sub-section presents the structure and sophistication of trade in the Commonwealth, with the second sub-section discussing the changing nature of trade in the digital economy. The third sub-section sheds light on the progress of digital transformation in the Commonwealth. Drawing from stylised evidence

in prior sub-sections, the chapter concludes by identifying the bottlenecks to digital transformation faced by Commonwealth countries, and proposes approaches moving forward.

## 1.1 Overview of trade trends in the Commonwealth

After recovering from the global financial crisis in the period following 2008–2009, growth in world trade recorded a further decrease from 2012 to 2014, and the value of trade contracted in 2015 and 2016, followed by a recovery of 11 per cent and 10 per cent annual growth in 2017 and 2018, respectively (Figure 1.1). The Commonwealth has historically followed global trade trends, reflecting the importance of external demand in driving export production in Commonwealth member states. Thus, the Commonwealth's total trade in goods and services also recovered from the contractions associated with the global trade slowdown, experiencing annual growth of 9 per cent and 8 per cent in 2017 and 2018, respectively.

**Figure 1.1 Goods and services trade (annual % growth), 2006–2018**



Source: Authors' calculations, UNCTAD data.

Note: Commonwealth services trade excludes Nauru (nil data).

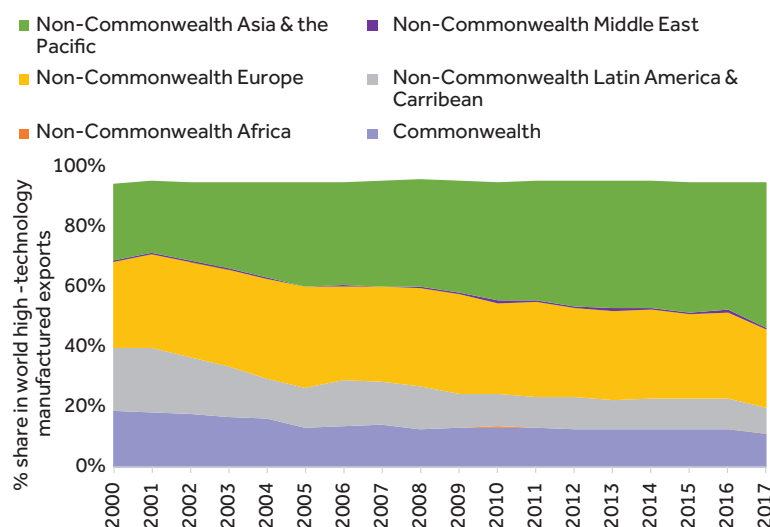
In the period from 2014 to 2018, the Commonwealth's annual average contribution to global trade in goods and services was 15 per cent. Commonwealth manufacturing exports are dominated by resource-based exports<sup>1</sup> (equivalent to 5.3% of the Commonwealth's total GDP), followed by medium-technology exports (4%), and primary product exports (3.5%) (see Figure A1). Figure 1.2 reveals that the Commonwealth's share in high-tech world exports has declined in the last decade, as the share of non-Commonwealth Asia and the Pacific countries has increased. Existing high-tech exports are also dominated by just six Commonwealth countries, which together make up 98.8 per cent of the Commonwealth's total high-tech exports (see Figure A2).

The Commonwealth consists of 53 states, of which 31 are small states. Commonwealth small states, and those in the Caribbean and Pacific in particular, have experienced weaker growth (GDP and GDP per capita growth, in constant purchasing power parity terms) than other states over the past two decades (Figure 1.3). Commonwealth small states' high-technology exports are equivalent to only about 0.6 per cent of the Commonwealth small states' GDP,

lower than the overall Commonwealth average of high-technology exports, the value of which is equivalent to 3.2 per cent of Commonwealth GDP. Primary products and resource-based manufactured exports have been more significant among Commonwealth small states, albeit declining more recently (Figure 1.4). We further note that high technology exports generally comprise electronic and electrical products<sup>2</sup> and have a relatively high share in the export portfolios of some small states in the Commonwealth, particularly Seychelles, Saint Lucia and Saint Kitts and Nevis (17%, 9% and 35%, respectively) (see Figure A2).

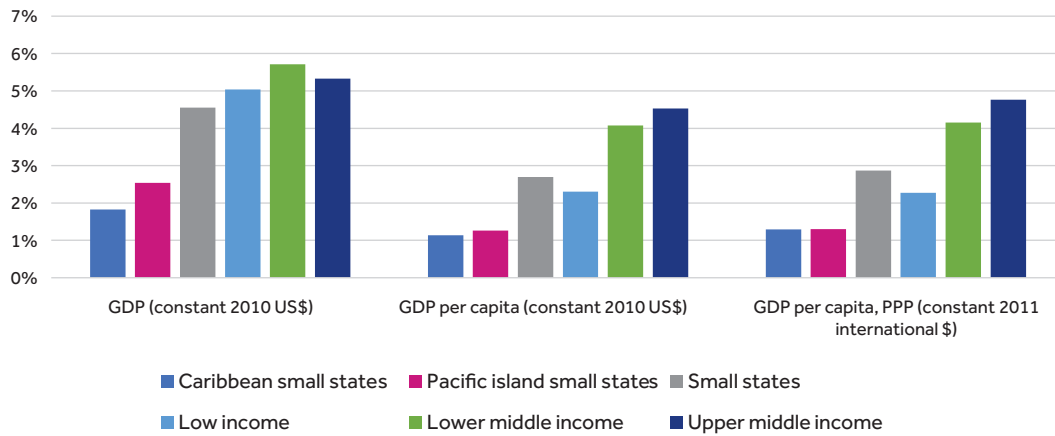
Intra-Commonwealth trade in goods has become more important to Commonwealth countries since 2004 (Figure 1.5). This is largely driven by the Commonwealth's declining share in global trade due to higher participation of large non-Commonwealth countries such as China (Commonwealth Secretariat 2018), which may also indicate that Commonwealth countries are turning inwards in the face of increasing external competition. In addition, Figure 1.6 shows that intra-Commonwealth trade has become relatively more important in small states across regions and income levels (except in

**Figure 1.2 High-technology manufacturing exports (shares, in percentages), 2000–2017**



Source: Authors' calculations, World Integrated Trade Solution (WITS) data.

**Figure 1.3 Small (Caribbean/Pacific) states have grown more slowly than the average of LICs and MICs (average annual % change), 2000–2018**



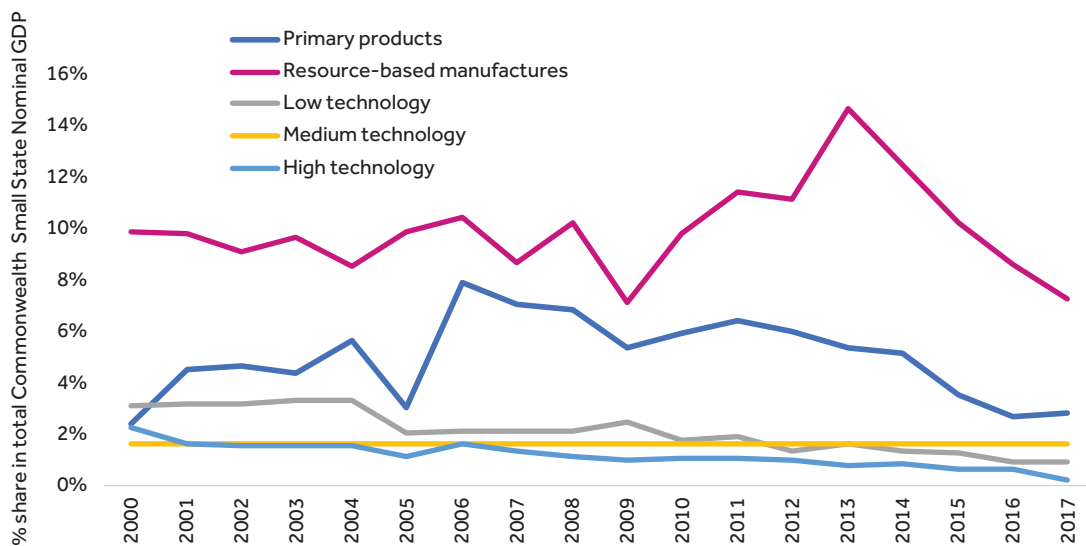
Source: World Bank (2019).

small state LICs) in recent years. From 2014 to 2018, small states in Africa and the Pacific, and those within the lower middle-income level, tended to have more than 50 per cent of their total trade in goods dependent on Commonwealth trading partners. For small states such as Eswatini, Botswana, Lesotho and Namibia, intra-Commonwealth trade makes up

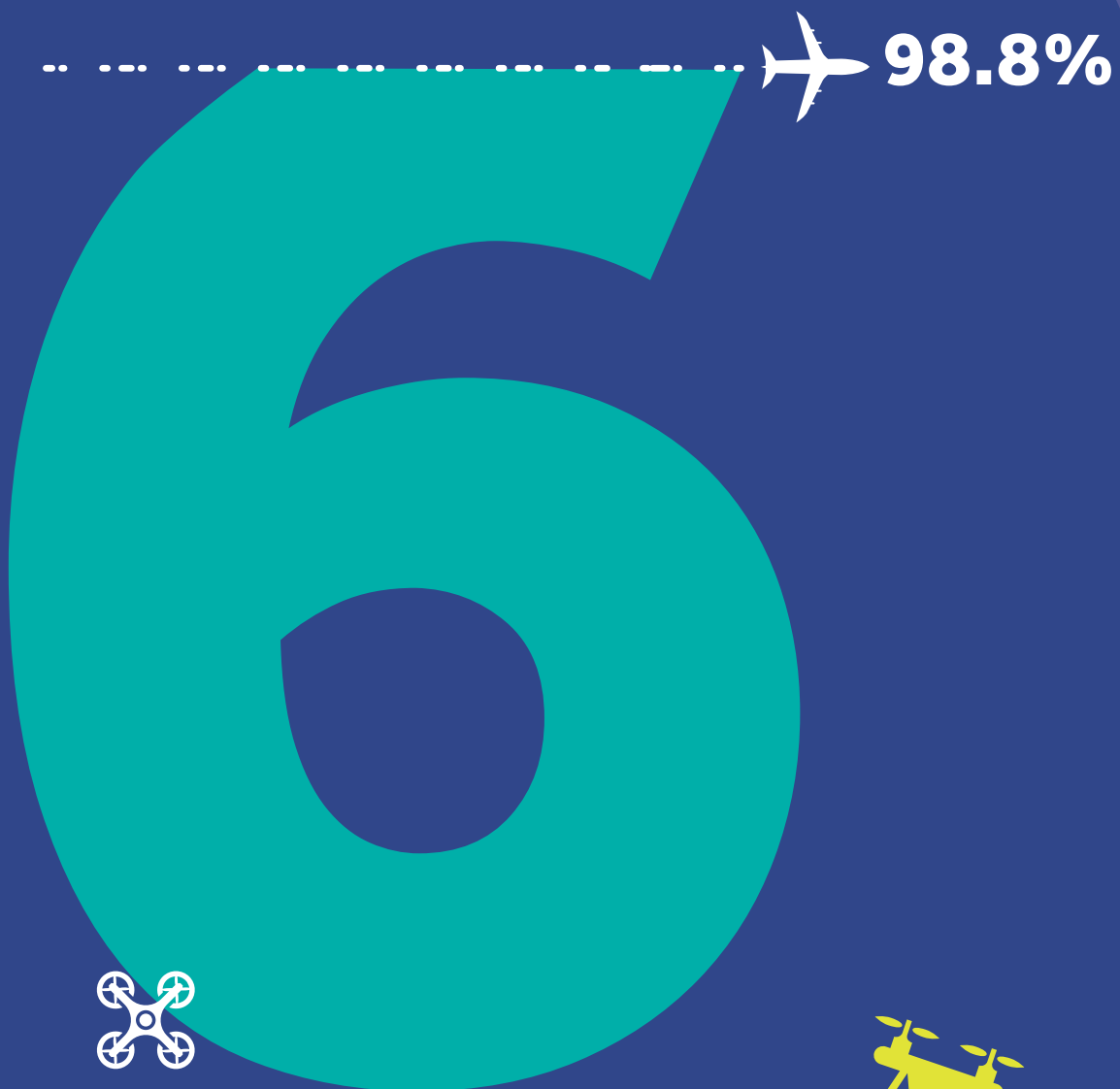
more than 50 per cent of their respective nominal GDP (see Figure A3).

Comparing the export sophistication of Commonwealth countries can also provide important insights into trade patterns in the digital economy. On the one hand, the ability to

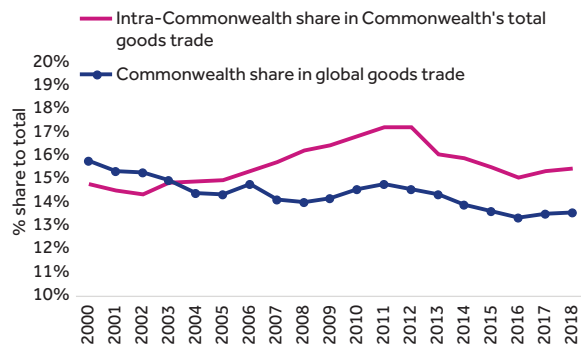
**Figure 1.4 Commonwealth small states' exports (% share in total Commonwealth small states GDP), 2000–2017**



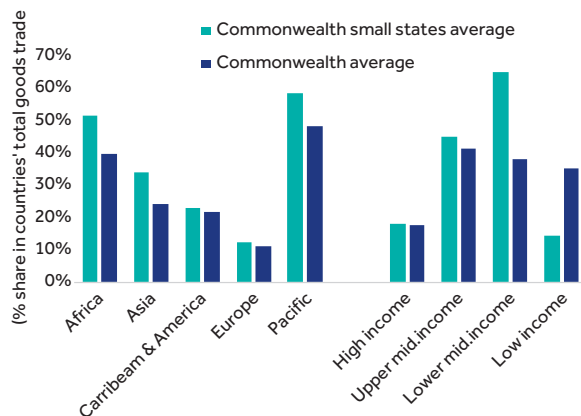
Source: Authors' calculations based on World Integrated Trade Solutions (WITS) data.



Just six Commonwealth countries (**Singapore, Malaysia, United Kingdom, Canada, India and Australia**) made up 98.8 per cent of the Commonwealth's total high-technology goods exports in 2017

**Figure 1.5 Commonwealth trade in goods**

Source: Authors' calculations based on UNCTAD data.

**Figure 1.6 Intra-Commonwealth trade in goods**

Source: Authors' calculations based on WITS data. Note: Average excludes Dominica, Grenada, Nauru, Papua New Guinea, Tuvalu and Vanuatu (nil data). (Shares represent 2014–2018 average.)

export sophisticated products, and the productive sophistication of major trading partners, may shape the type of digital knowledge and technological transfers that can be gained from trade. This is aligned with some recent evidence that exporting improves firms' technical efficiency through higher quality and productivity in production ('learning by exporting') (Atkin et al. 2017). On the other hand, investments into digital technologies by countries and firms can also have a positive impact on the sophistication level of their product basket (Banga 2019).

The export sophistication index (EXPY), which allocates weights for revealed comparative advantage and a country's income per capita,<sup>3</sup> estimates the level of technological sophistication embodied in a country's export portfolio (World Bank 2013). As of 2017, the Commonwealth's average EXPY index of 9.5 lagged behind its major external trading partners such as Japan (10.1), Germany (10.1), the United States (US) (10) and China (9.9) (Figure 1.7). Taking the sample of Commonwealth small states, where intra-Commonwealth trade has become more important, two of the top-three export partners are India and South Africa, which have relatively lower scores on the EXPY than non-Commonwealth trading partners (based on WITS data). Only 4 per cent of Commonwealth small states' total exports go to the US, compared with the 21 per cent share of Commonwealth non-small states' exports to that country.

The Commonwealth is faring better in the services sector. Based on United Nations Conference on Trade and Development (UNCTAD) data from 2014 to 2018, the Commonwealth alone contributes an annual average of 18 per cent to global services trade, compared to the Commonwealth's 14 per cent share in global goods trade. While the Commonwealth is an overall net trade importer, driven by the trade in goods deficit, surpluses have been recorded in services trade in the past decade (Figure 1.8). However, this trade in services has been dominated by five Commonwealth countries (the UK, Singapore, India, Canada and Malaysia) in the last five years. In 2018, these countries contributed more than 85 per cent of the Commonwealth's total trade in services (Figure 1.9).

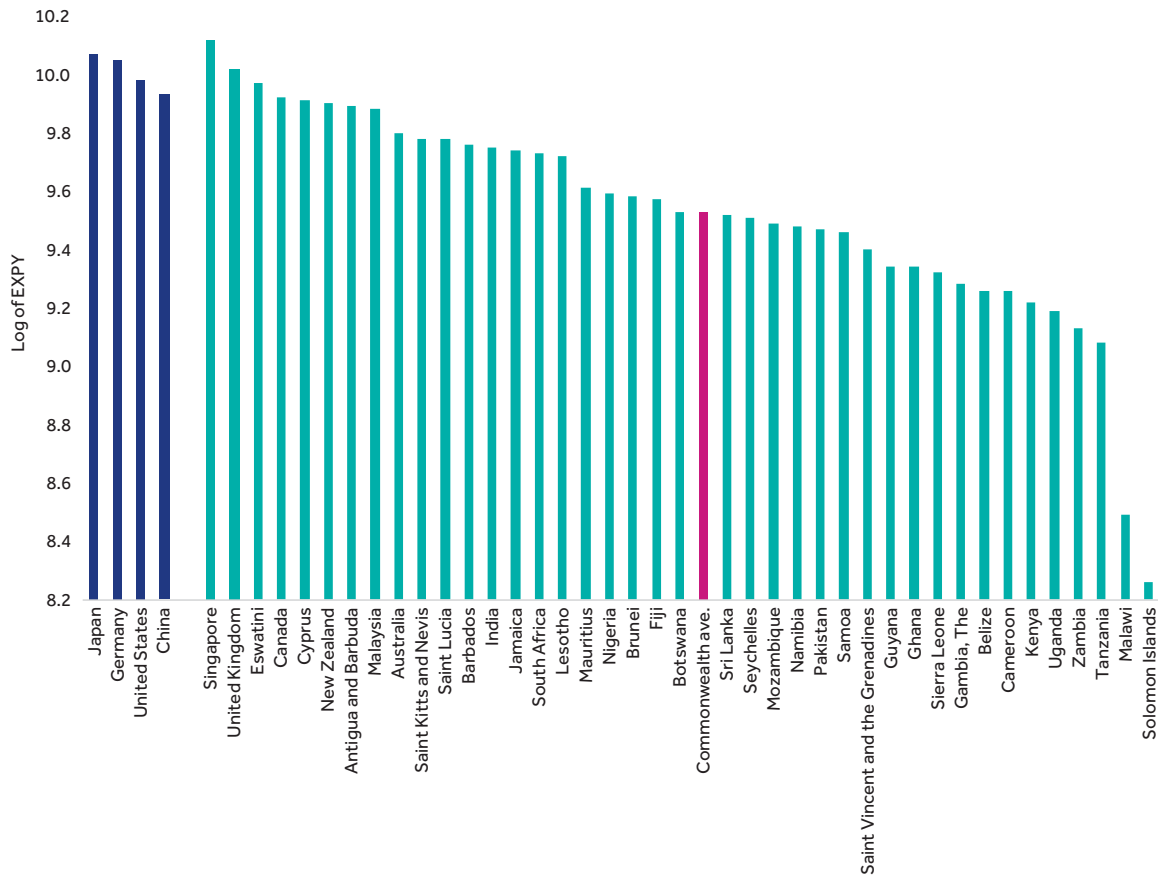
## 1.2 Digital progress and changing trade in the Commonwealth

In recent years, the digital economy has experienced unprecedented growth with the internet becoming accessible to more than half of the global population in 2018, a remarkable increase from the less than 10 per cent penetration rate in 2000 (World Bank 2019; ITU 2018). The value of business-to-



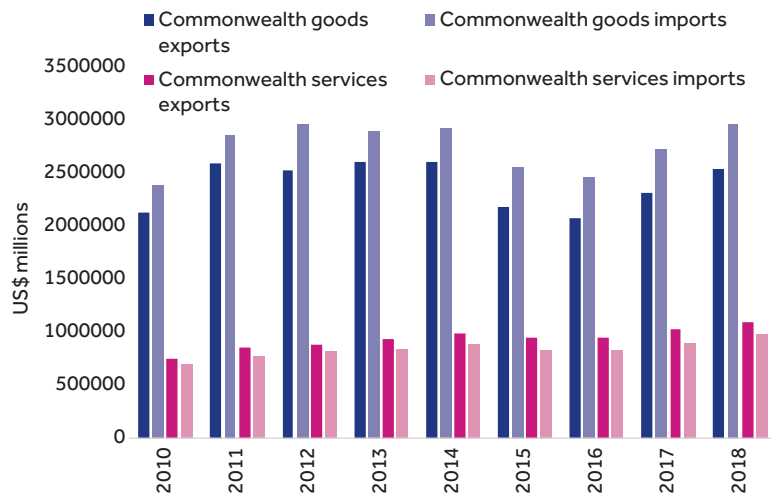
Six Commonwealth countries account for 98.8% of the Commonwealth's total high-tech exports as of 2017

**Figure 1.7 Export sophistication index, 2017**



Source: Authors; graph constructed based on WITS data.

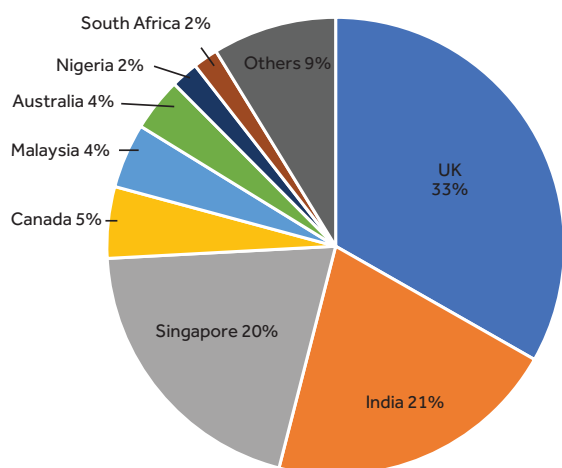
**Figure 1.8 Commonwealth trade**



Source: Authors' calculations based on UNCTAD data; Commonwealth services trade excludes Nauru (nil data).

Note: In US\$ millions.

**Figure 1.9 Commonwealth services trade share**

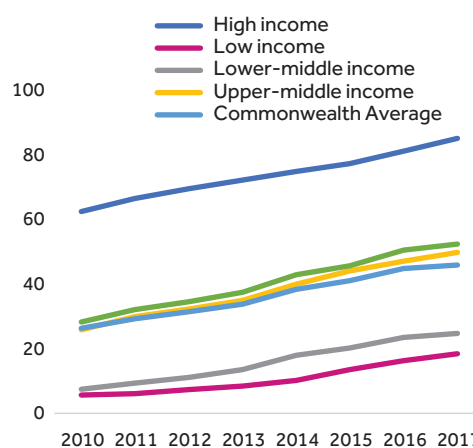


Source: Authors' calculations based on UNCTAD 2018 data; excludes Cameroon, The Gambia, Guyana, Kiribati, Nauru, Samoa, Sierra Leone and Vanuatu (nil data).

consumer online transactions tripled from 0.5 per cent of global GDP in 2010 to 1.5 per cent in 2017 (UNCTAD 2017). ICT services exports grew by 40 per cent between 2010 and 2015 (IER 2017) and, from 2016 to 2017 alone, sales of industrial robots and professional service robots grew by 30 per cent and 85 per cent, respectively (IFR 2018). In recognition of this fourth revolution – ‘a transition to a new set of systems that bring together digital, biological, and physical technologies in new and powerful combinations’ (Baller et al. 2016) – the top three research and development (R&D) investments in 2018 worth US\$67 billion were made in the technology and digital industries (Amazon.com, Alphabet and Samsung electronics) (UNCTAD 2019a). The government sector is also catching up, with the latest e-government survey showing that all of the 140 members of the United Nations are now providing at least one transactional service online, mostly in the areas of utilities payment, submission of income taxes and registration of new businesses (UNDESA 2018).

Using International Telecommunications Union (ITU 2018) data, we plot digital progress in the Commonwealth in the period 2010–2017. In terms

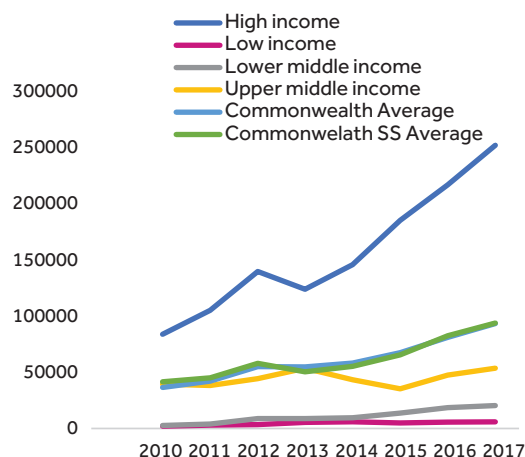
**Figure 1.10 Internet users (% of population)**



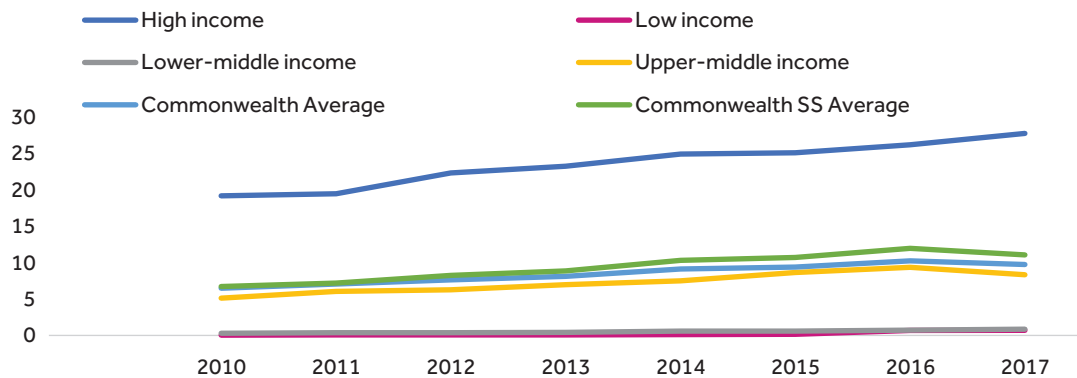
Source: ITU (2018).

of internet-penetration (measured as internet users as a percentage of the population), we observe that, on average, 85 per cent of the population in high-income Commonwealth countries has access to the internet, compared to just 18 per cent in low-income countries (Figure 1.10). While internet penetration has increased across all income levels, the digital divide is stark when we compare international bandwidth per internet user. Figure 1.11 shows that the digital divide in terms of international bandwidth drastically increased between 2010 and 2017, with international bandwidth being roughly 40 times lower in low-income

**Figure 1.11 Internet bandwidth (Mbit/s)**





**Figure 1.12 Fixed broadband subscriptions, per 100 people**

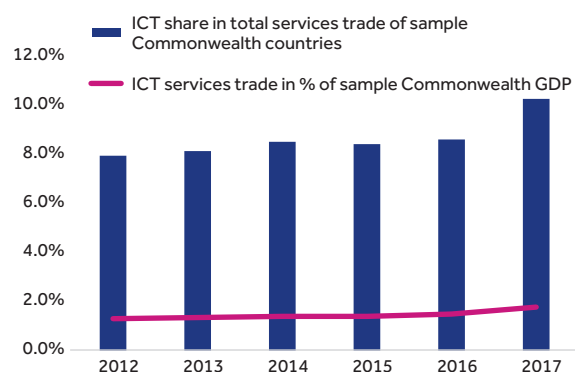
Source: ITU (2018).

Commonwealth countries compared to high-income countries in the Commonwealth in 2017. Similarly, the share of fixed broadband subscriptions per 100 people has increased from 19 per cent to 27 per cent in high-income Commonwealth countries, while there has been a negligible increase in low-income Commonwealth member states (Figure 1.12).

The above discussion clearly highlights growing digitalisation of the Commonwealth. However, this is occurring at different rates, leading to an increasing digital divide between high- and low-income Commonwealth countries. This divide may have adverse implications for intra-Commonwealth trade in the digital era.

One indicator of digital transformation of global production is the rising importance of trade in ICT goods and services. The UNCTAD's ICT product classification<sup>4</sup> follows the OECD's guide wherein, 'ICT products must primarily be intended to fulfil the function of information processing and communication by electronic means, including transmission and display' (OECD 2011). Within the Commonwealth, the contribution of ICT services to the Commonwealth's total services trade, and in terms of GDP, has been gradually increasing since 2012 (Figure 1.13).

Beyond ICT services, UNCTAD identifies 'digitally deliverable services' which directly capture transactions made in digital platforms. Digitally

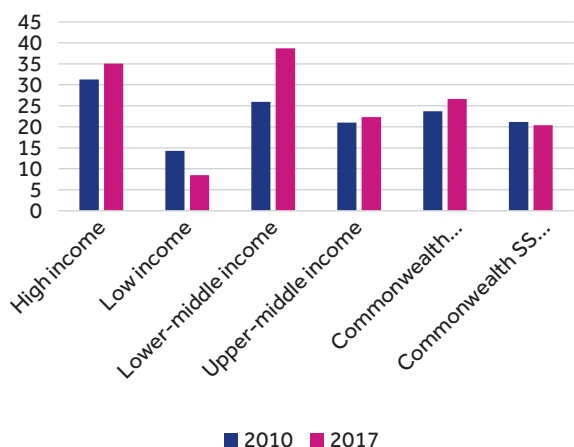
**Figure 1.13 Commonwealth ICT services trade**

Source: Authors' calculations based on UNCTAD data.

Notes: Number of Commonwealth sample countries per year: 2012–39; 2013–40; 2014–39; 2015–38; 2016–33; 2017–18.

deliverable services are an aggregation of insurance, financial, intellectual property charges, telecommunication, computer and information, other business and audio-visual and related services (UNCTAD, 2019b). Figure 1.14 reports that the share of digitally deliverable export services (DDES) in total services trade has increased in high-, upper- and lower- middle income countries (UMICs, LMICs), but decreased in Commonwealth small states and low-income countries. Among Commonwealth countries, the share of DDES in countries' total trade in services varies from more than 70 per cent

**Figure 1.14 Share of digitally deliverable export services**

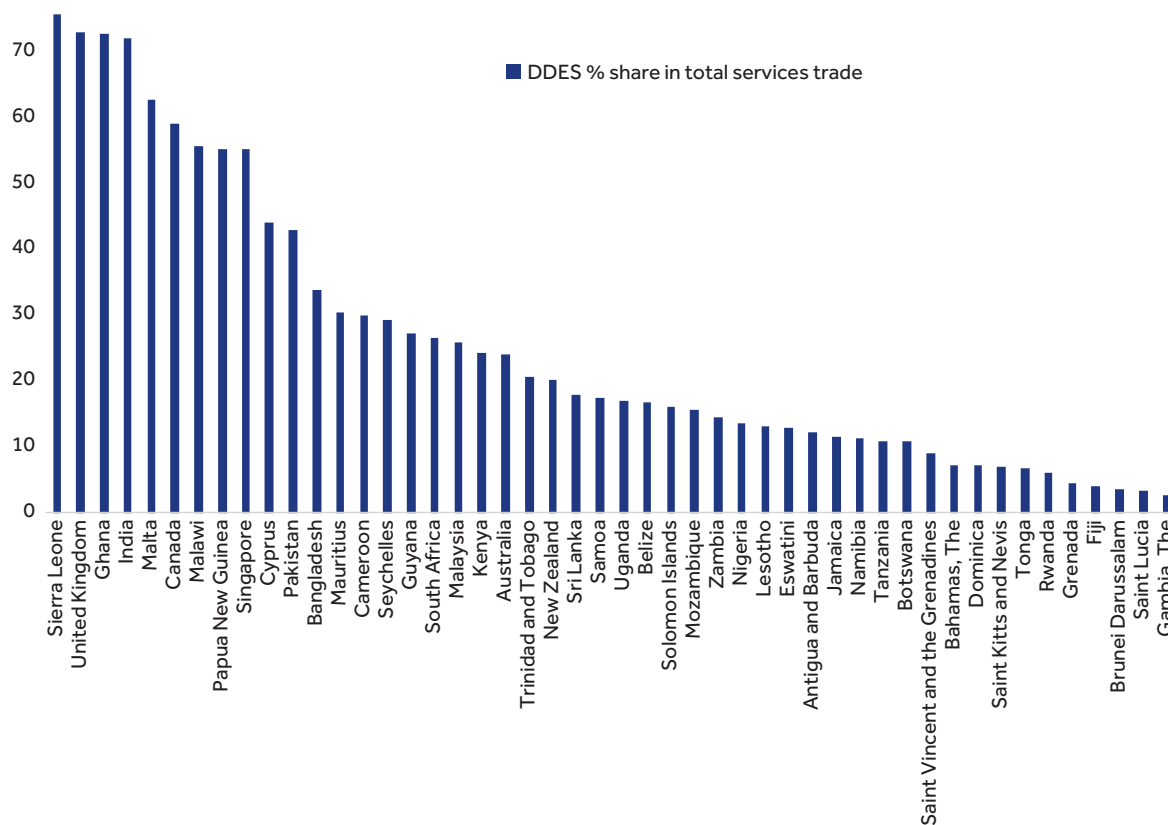


in the UK, India and Ghana to less than 10 per cent in some small states (Figure 1.15).

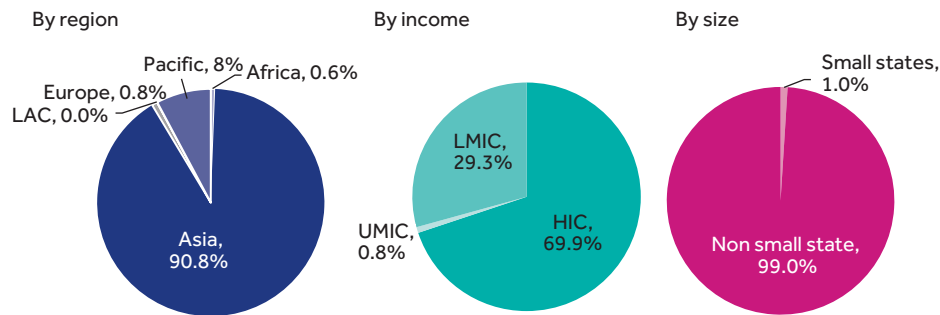
It is also important to note that among Commonwealth countries, ICT trade is dominated by Asian economies (Figure 1.16), with Singapore alone contributing 61 per cent of overall Commonwealth ICT trade in 2017. The disparity in ICT trade participation among Commonwealth countries is also evident by income level and size, with LICs and small states contributing minimally to overall Commonwealth ICT trade.

Outside of the information presented above on ICT trade in the Commonwealth, the availability of actual data on existing digital trade flows *within* the Commonwealth is generally very limited. This makes it difficult to generate an accurate picture

**Figure 1.15 Commonwealth countries' digitally deliverable export services, 2016**



Source: Authors' calculations based on UNCTAD and World Bank data.

**Figure 1.16 Percentage (%) share in total Commonwealth ICT trade, 2017**

Source: Authors' calculations based on UNCTAD 2017 ICT goods and services data.

Notes: 2017 data available for only 13 Commonwealth countries. Number of Commonwealth countries by income: Africa (3), Asia (4), Europe (1), LAC (2), Pacific (3); by income: HIC (4); UMIC (5), LMIC (4), LIC (0); by size: small states (7), non-small states (6).

of existing intra-Commonwealth trade in digital goods and services. Nevertheless, data are available with relatively wide country coverage on digitalised products traded through electronic transmissions (ET products). UNCTAD defines four categories of digitalised products as ET products: films (HS 37), printed matter (HS 49), sounds, media and software (HS 8524) and videogames (HS 9504). Trade in these products is significant across the Commonwealth (see summary Table 1.1 and Table A1). Based on the most recent available data, annual intra-Commonwealth trade (exports plus imports) in ET products is worth more than US\$4.6 billion. For many Commonwealth countries, exports to other Commonwealth members constitute major shares of their total exports of these products. This was the case for all of Mozambique's exports of ET products in 2017 and more than 90 per cent of these products exported by Botswana, Eswatini, Fiji, The Gambia, Kiribati, Saint Vincent and the Grenadines, Solomon Islands, Trinidad and Tobago, and Zambia in that year (2016 in the case of Kiribati).

Likewise, many Commonwealth countries import the bulk of ET products from fellow Commonwealth members. Ghana, Samoa and Solomon Islands sourced more than 90 per cent of their imports of these products from the rest of the Commonwealth,

while Botswana, Fiji, Malawi and Namibia relied on the Commonwealth for more than 80 per cent of their imports of these products.

In many respects, the disparities highlighted above in internet penetration rates, in levels of engagement in trade in ICT goods and services, and in other aspects of digital trade between Commonwealth countries are a product of variation in levels of readiness for digitalisation across the Commonwealth. This variation is evident in composite measures of digital readiness. Cisco's country-specific digital readiness scores, for instance, measure a country's digital readiness along seven components: (i) technology infrastructure (fixed telephone subscriptions, fixed broadband subscriptions, internet services, networking services); (ii) technology adoption (mobile device penetration, internet usage, cloud services); (iii) human capital (quality of math and science education, adult literacy rate, years of schooling, population aged less than 14 years); (iv) basic needs (life expectancy, mortality rate for those under five years, sanitation, access to electricity); (v) ease of doing business (overall ranking, rule of law, logistics performance, time to get electricity); (vi) business and government investment (foreign direct investment [FDI], high-technology exports, government success in ICT promotion); and (vii)

**Table 1.1 Summary of selected Commonwealth countries' trade in digitalised products through electronic transmissions, 2017 (unless otherwise stated)**

Largest intra-Commonwealth exporters of digitalised (ET) products (US\$ value of intra-Commonwealth exports, millions)	Most reliant on Commonwealth markets for exports of digitalised (ET) products (Commonwealth share of total ET exports, %)	Largest intra-Commonwealth importers of digitalised (ET) products (US\$ value of intra-Commonwealth imports, millions)	Most reliant on Commonwealth members for imports of digitalised (ET) products (Commonwealth share of total ET imports, %)
United Kingdom (\$761.1)	Mozambique (100)	Australia (\$340.3)	Solomon Islands (94.8)
Singapore (\$309.1)	Eswatini (99.9)	South Africa (\$288)	Ghana (93.6)
Australia (\$215.1)	The Gambia (99.8)	Ghana (\$267.9)	Samoa (91)
Malaysia (\$175.7)	Solomon Islands (99.8)	Singapore (\$202.9)	Botswana (88.4)
India (\$118.9)	Kiribati ** (99.3)	New Zealand (\$194.9)	Namibia (84.5)
Zambia (\$116.3)	Fiji (96.5)	United Kingdom (\$185.8)	Malawi (83.7)
South Africa (\$82.6)	Zambia (96.2)	Malawi (\$173.0)	Fiji (83.2)
Canada (\$65.9)	Trinidad and Tobago * (95.5)	Canada (\$148.2)	Brunei Darussalam (77.9)
Malta ** (\$63.7)	Saint Vincent and the Grenadines (94.9)	Malaysia (\$106.9)	Kiribati ** (75.4)
Mozambique (\$55.2)	Botswana (92.4)	India (\$97.0)	Seychelles (70.5)

Source: Commonwealth Secretariat calculations using UN Comtrade data.

Notes: Products included in this category are films (HS 37), printed matter (HS 49), sounds, media and software (HS 8524) and videogames (HS 9504). \* Data used is for 2015; \*\* Data used is for 2016.

start-up (strength of legal rights, time to start a business, availability of venture capital). Digital readiness scores for the 23 Commonwealth countries for which data were available are compared in Table 1.2. The most digitally ready countries are predominantly developed and emerging market Commonwealth member states (the UK, Australia, Canada, Malaysia, New Zealand, Singapore and South Africa).

### 1.3 Conclusion

The above trends suggest that while digitalisation has expanded globally, only a few Commonwealth

countries have been able to transform and participate in the digital economy. This is evident in the gaps between mostly higher-income and Asian economies and lower-income economies, predominantly in Africa, in terms of global trade integration, export sophistication, and ICT goods. Gaps are also higher between small and non-small Commonwealth countries. Meanwhile, there is noticeable progress in ICT services and usage of DDES among LIC and LMIC members.

Amid increasing digitalisation in HICs and Asia-Pacific economies, with their relatively higher shares in global trade in goods and services, particularly in ICT

**Table 1.2 Digital readiness scores for selected Commonwealth members**

Commonwealth Country	Score
Singapore	18.30
United Kingdom	17.84
Australia	17.34
Canada	17.11
New Zealand	16.90
Malaysia	15.19
Sri Lanka	11.56
South Africa	11.50
Rwanda	10.96
India	10.54
Ghana	9.97
Kenya	9.82
Zambia	9.61
Pakistan	8.58
Cameroon	8.57
Uganda	8.43
Malawi	8.37
Tanzania	8.26
Bangladesh	8.01
Nigeria	7.91
Papua New Guinea	7.80
Mozambique	7.19
Sierra Leone	6.40

Source: Yoo et al. (2018).

and high-technology exports, many lower-income countries in the Commonwealth are increasingly focusing on intra-Commonwealth trade. However, these countries continue to have higher shares of primary products in their total export portfolios. This trend has an important implication (especially for Commonwealth LICs) to the extent that it may slow down export sophistication – which affects the speed of technological spillovers and upscaling, and subsequently economic growth and transformation.

Promoting intra-Commonwealth trade requires a greater role for high-technology Commonwealth

exporters (e.g., Singapore, Malaysia and India in Asia; South Africa in Africa) in increasing trade with Commonwealth partners. Meanwhile, we have seen some positive signs of greater participation of lower-income Commonwealth countries in ICT and digitally deliverable services in recent years, such as the more than 70 per cent share of DDES to total trade in services in Ghana, India and Sierra Leone. This is an indication of how LICs can leverage available digital platforms to increase trade in services, if opportunities to grow trade in goods (i.e., ICT, technology exports) remain relatively constrained.

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## End Notes

- 1 According to the technological classification of exports in Lall (2000), primary products are generally composed of fresh fruit, meat, rice, cocoa, tea, coffee, wood, coal, crude petroleum and gas. Resource-based products generally entail simple and labour-intensive processing, such as prepared meats/fruits, beverages, wood products, vegetable oils, ore concentrates, petroleum/rubber products, cement, cut gems and glass. Low technology products tend to have 'stable, well-diffused technologies' with simple skill requirements, such as textile fabrics, clothing, headgear, footwear, leather manufactures, travel goods, pottery, simple metal parts/structures, furniture, jewellery, toys and plastic products. Medium technology products comprise the 'bulk of skill and scale-intensive technologies in capital goods and intermediate products', such as vehicles/motorcycles and



- parts, synthetic fibres, chemicals and paints, fertilisers, plastics, iron, pipes/tubes, engines, motors, industrial machinery, pumps, switchgear, ships and watches. High technology products are described to have 'advanced and fast-changing technologies, with high R&D investments and prime emphasis on product design', such as office/ data processing/telecommunications equipment, TVs, transistors, turbines, power generating equipment, pharmaceuticals, aerospace, optical/measuring instruments and cameras.
- 2 High technology electronic and electrical products are composed of rotating electric plant and parts, other power generating machinery and parts, office machines, automatic data processing machines, parts of accessories for machines of groups, television receivers, telecommunication equipment and parts, electric power machinery and parts, electro-diagnostic apparatus for medical sciences, cathode valves and tubes, electrical machinery and apparatus. Other high-technology products are composed of radio-actives and associated materials, medicinal and pharmaceutical products, medicaments, steam turbines and parts, aircraft and associated equipment; spacecraft, optical instruments and apparatus, measuring, analysing and controlling apparatus, photographic apparatus and equipment (Lall classification, from UNCTAD stat website).
  - 3 EXPY computation steps: (1) summation of all the weighted averages of GDP per capita, with weights derived from revealed comparative advantage of respective products; and (2) summation of values of (1) for all export products, weighted by the respective product's share in total exports. A higher value in (1) indicates a more sophisticated product, while a higher value for (2) (or the EXPY value) indicates a more sophisticated portfolio (full details in World Bank 2013).
  - 4 Broad-level categories of ICT goods are composed of computers and peripheral equipment, communication equipment, consumer electronic equipment, electronic components and miscellaneous ICT goods, while ICT services include manufacturing services for ICT equipment, business and licensing services, IT consultancy and services, telecommunications services, leasing and rental services for ICT equipment and other ICT services (OECD, 2009). Thus, the ICT goods and services characterise production processes that involve digital technology inputs, and product outcomes that contribute to the digital economy.