



UNCTAD B2C E-COMMERCE INDEX 2017

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UNCTAD B2C E-COMMERCE INDEX 2017¹

1 Introduction

This report presents the 2017 edition of the UNCTAD Business-to-Consumer (B2C) E-commerce Index, which was first introduced in the *Information Economy Report 2015: Unlocking the Potential of E-Commerce for Developing Countries* (UNCTAD, 2015) and updated in April 2016 (UNCTAD, 2016).²

The indicators used in the index are explained, a new payment indicator is introduced and the index is updated with the latest available data. The revised index better predicts online shopping, has some notable changes in rankings due to methodological changes and incorporates additional economies.

2 Components of the index

The UNCTAD B2C E-commerce Index reflects the processes involved in an online shopping B2C transaction. Some type of web presence is required by the seller to accept online orders. The process also requires Internet access on the part of users to place an order. A payment method is needed such as credit card, e-wallet, mobile payment, bank transfer or cash on delivery. Finally, the product must be delivered to the customer's home or at a pick up point (or directly to the purchaser online for digital products).

¹ This technical note was prepared by Michael Minges, with contributions and guidance from Torbjörn Fredriksson and Diana Korke of UNCTAD. Financial contribution from the Government of Finland is gratefully acknowledged for this project.

² See *UNCTAD Information Economy Report 2015, Unlocking the Potential of E-commerce for Developing Countries*, at: http://unctad.org/en/PublicationsLibrary/ier2015_en.pdf and *UNCTAD B2C E-commerce Index 2016*, ICT4D Technical Note 7, at: http://unctad.org/en/PublicationsLibrary/tn_unctad_ict4d07_en.pdf.

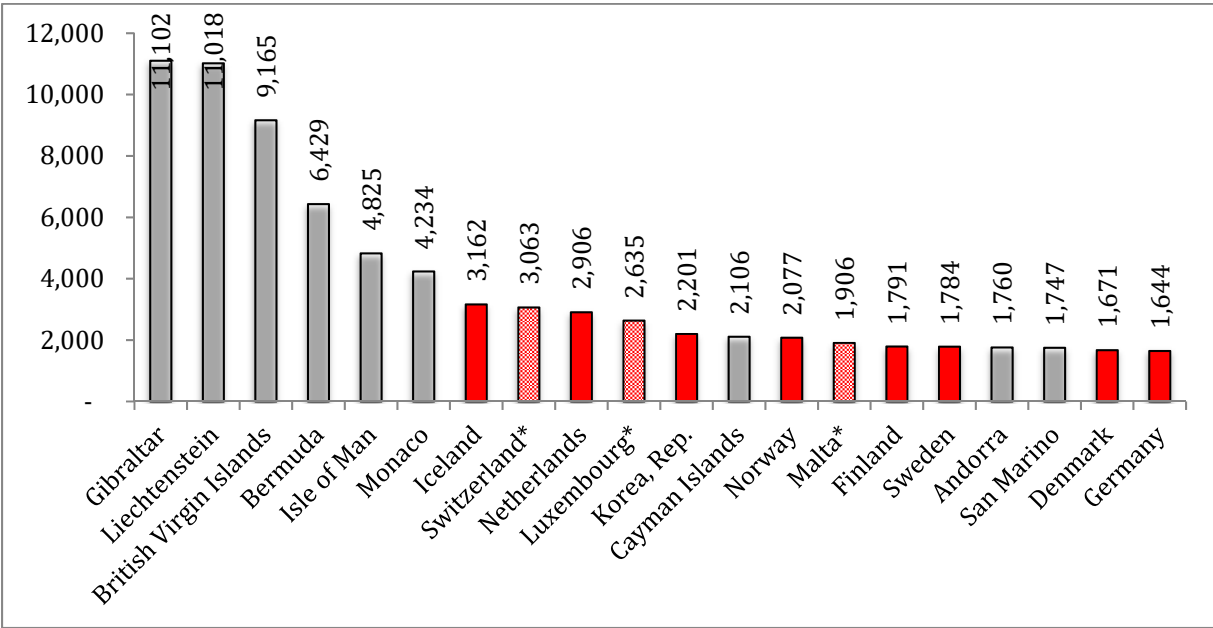
2.1 Internet users

The starting point is that consumers need Internet access to order a product online. The International Telecommunication Union (ITU) publishes statistics on the share of people using the Internet.³

2.2 B2C web presence

The availability of secure Internet servers is included in the index as a proxy for the readiness of a country to enable secure transactions online. Most e-commerce sites need to employ security protocols to safeguard payment and personal information.⁴ Secure servers use encryption technology in online transactions to protect the transfer of data from unauthorized interception. This indicator is available for most countries from the World Bank. The use of secure servers may allay security concerns, often mentioned as a barrier to online shopping. Secure server penetration tends to be higher in economies identified as offshore financial centers, since banks are major users of security protocols (Figure 1).

Figure 1. Secure Internet servers per million people, top twenty economies, 2016



Note: Economies with white bars are offshore financial centers, as defined by the International Monetary Fund (IMF), not included in the index. *Offshore financial center included in index.

Source: Adapted from World Bank and IMF⁵.

³ For those economies that have not provided ITU with national data, ITU estimates the share. It should be noted that, in 2016, estimates were made for 140 economies (or 68% of those included in the ITU data set).

⁴ For example as far back as 2005, the OECD used the number of Internet subscriptions and secure servers to proxy for e-commerce demand and supply. See: OECD. 2005. *Communications Outlook*. http://www.oecd-ilibrary.org/science-and-technology/oecd-communications-outlook-2005_comms_outlook-2005-en.

⁵ International Monetary Fund (IMF). 2008. *Offshore Financial Centers: Report on the Assessment Program and Proposal for Integration with the Financial Sector Assessment Program*.

The specific indicator used is the *number of secure servers per million people*. Secure servers use encryption technology in Internet transactions. The World Bank sources the data from Netcraft (which carries out surveys to obtain the data), supplemented by World Bank estimates.⁶

2.3 Delivery

Any physical good ordered on line must be delivered. In the original B2C E-commerce Index, the indicator selected was the proportion of the population that received postal delivery at home. Following consultation with the Universal Postal Union (UPU), another indicator was chosen for the 2016 Index: the UPU postal reliability score (UNCTAD, 2016).

The postal reliability score measures operational efficiency based on factors such as quality of service performance, including predictability, across all categories of postal delivery services, with a focus on domestic and inbound of the postal delivery process and operations (UPU, 2017). It is based on UPU's postal big data set, its postal statistics database and surveys.

2.4 Payment

Products ordered over the Internet can be paid for online or offline. Products purchased from online shops can be paid for in different ways. Payment methods vary among countries and are a function of national financial regulations, credit riskiness, vendor strategies and consumer preferences. This makes it difficult to choose a single payment method for measuring e-commerce payment readiness. Credit and debit cards are the most popular payment method worldwide in terms of online transaction purchase value. Therefore, credit card penetration among the population aged 15 years and older, collected as part of the World Bank's Global Findex survey, was used as the payment indicator for the index in previous editions. A new payment indicator is introduced for the 2017 index.

The uptake of debit and credit cards as well as innovative online and mobile payment methods has grown over time. In 2015, such cards accounted for 42 per cent all e-commerce payments in value terms (Figure 2, left). However, the relative share of cards in online payments is expected to drop to 36 per cent by 2020, as e-wallets and other alternative payment methods gain in importance (Figure 2, right). Moreover, the card payment indicator disadvantages many developing countries in the index. While almost half of those aged 15 and older have a credit card in high income economies, the

<https://www.imf.org/en/Publications/Policy-Papers/Issues/2016/12/31/Offshore-Financial-Centers-Report-on-the-Assessment-Program-and-Proposal-for-Integration-PP4271>.

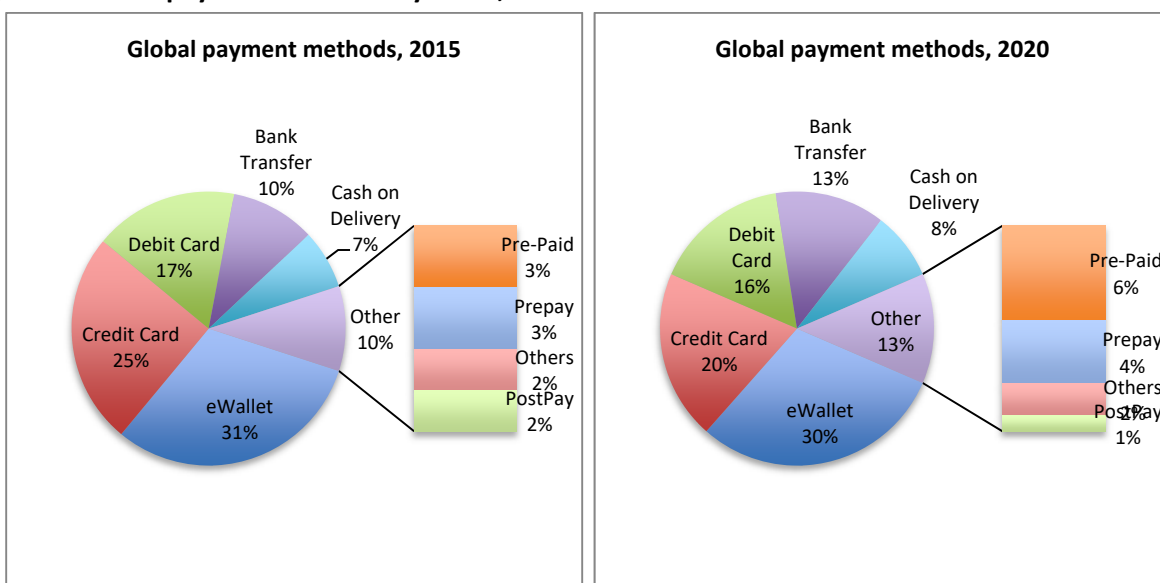
⁶ This is the only indicator in the index that does not have an upper bound (i.e., 100). It is normalized using the formula:

$$(\log(\text{value}) - \log(\text{minimum})) \div (\log(\text{maximum}) - \log(\text{minimum}))$$

The minimum and maximum values are based on the economies included in the index rather than all economies. This ensures that the normalized value is not distorted by data from the smaller offshore financial centers not included in the index.

corresponding figure in developing regions such as South Asia and Sub-Saharan Africa is in the low single digits (Table 1).

Figure 2: Online payment methods by value, 2015 and forecast for 2020



Note: Other includes e-Invoices, postpaid, Prepay, mobile carrier billing, crypto currencies and other emerging technologies.

Source: Worldpay, 2016.

Mobile money has emerged as a popular payment method, particularly in Sub-Saharan Africa where more than four times as many people have a mobile money account than those having credit cards (Table 1). Kenya—home to the world's first mobile money service M-PESA which launched a decade ago—had the highest mobile money penetration in the world at 58 per cent in 2014 (compared to less than five per cent with a credit card). In a 2017 global survey of Internet users, 79 per cent of the Kenyan respondents expressed mobile payment as their preferred method of paying for goods and services bought online (Ipsos, 2017). Mobile money is also popular in some countries in other regions. In China, home-grown Alipay and WeChat Pay mobile financial applications are often considered as the main driver of domestic e-commerce growth.⁷ In Cambodia, for example, 36 per cent of the adult population used mobile money in 2015, compared to only one per cent who had a credit card.⁸

For cross-border purchases, e-wallets appear to be particularly popular as a method of payment. A 2016 survey of cross-border e-commerce shoppers across 26 countries found that e-wallets (such as PayPal) were the preferred choice for 41 per cent of the respondents, followed by credit cards (33 per cent) and debit card/bank transfer (18 per

⁷ See for example: <https://www.mobileworldlive.com/money/news-money/alipay-wechat-pay-lead-china-finance-app-explosion/>.

⁸ FinScope. 2016. *Consumer Survey Cambodia 2015*. <http://www.finmark.org.za/wp-content/uploads/2016/07/finscope-cambodia-pocket-guide.pdf>.

cent).⁹ In China, the preferred payment method for B2C e-commerce is Alipay, an escrow-based system used by 68 per cent of all online shoppers in that country.

Table 1: Different types of accounts, share of individuals, by region and development, 2014, (per cent)

	Mobile money account (% age 15+)	Account at a financial institution (% age 15+)	Credit card (% age 15+)
Developed economies	..	90.6	48.9
Developing economies:			
East Asia & Pacific	0.4	68.8	12.5
Europe & Central Asia	0.3	51.4	18.5
Latin America & Caribbean	1.7	51.1	21.6
Middle East	0.7	14.0	2.1
South Asia	2.6	45.5	3.3
Sub-Saharan Africa	11.5	28.9	2.7
World	2.0	60.7	17.6

Source: World Bank Global FINDEX database.

The FINDEX database has an indicator that combines a bank account as well as mobile money accounts. This "account" indicator is defined as:

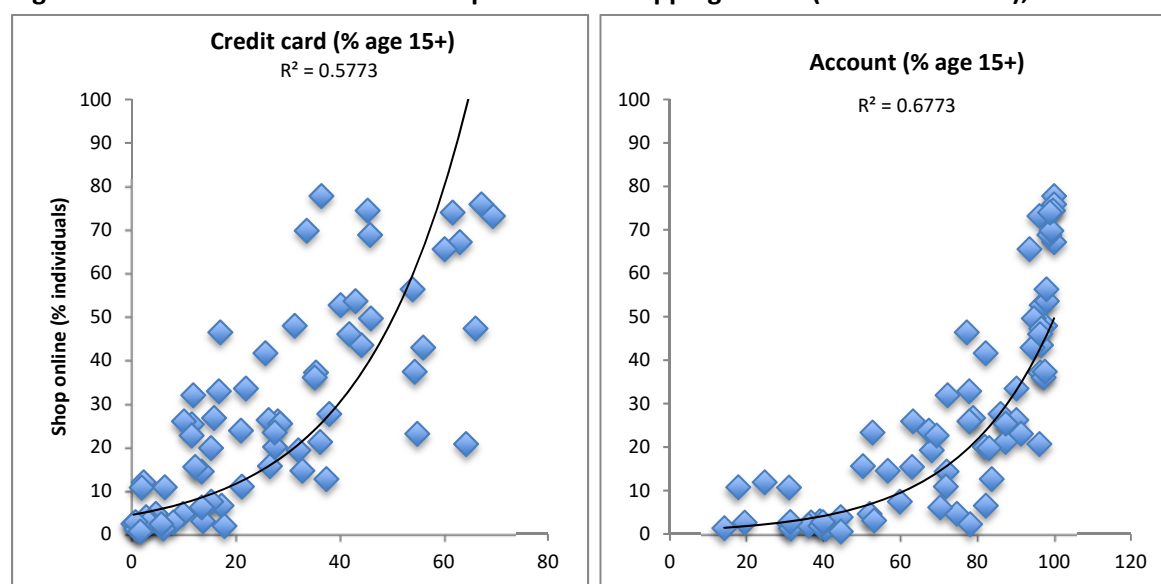
"The percentage of respondents who report having an account (by themselves or together with someone else) at a bank or another type of financial institution (see definition for "account at a financial institution") or personally using a mobile money service in the past 12 months (see definition for "mobile money account")."¹⁰

Having an account (including mobile money) shows a higher correlation with online shopping ($R^2=0.68$) (Figure 3, left) than the credit card indicator that has so far been included in the index ($R^2=0.58$). This is a strong reason for replacing the old indicator with the use of accounts.

⁹ International Post Corporation, 2017. *Cross-Border E-Commerce Shopper Survey 2016*. https://www.ipc.be/en/reports-library/publications/ipcreports_brochures/cross-border-e-commerce-shopper-survey-2016.

¹⁰ See the "Global Findex Glossary" at: <http://pubdocs.worldbank.org/en/205721483566285748/Glossary-2014.pdf>.

Figure 3. Credit card and account compared with shopping online (% of individuals), 2014



Source: Adapted from FINDEX and UNCTAD.

Having a bank account is also a potentially more relevant payment indicator because of its spillover effects. A bank account is usually required to obtain a credit or debit card (and sometimes an e-money account). Also, bank transfers (which accounted for ten per cent of global online payments in 2016 and are forecast to rise further) can be used to pay online (Worldpay, 2016).

An example from Africa illustrates the relevance of the "having an account" indicator as a way to capture various payment scenarios. The Jumia Group in 2017 offered retail sales in seven African countries, whereas its marketplace is available in 14 countries (UNCTAD, 2017). On its Ghanaian platform, Jumia accepts mobile money payments, bank transfers and cash on delivery.¹¹ In Nigeria, the company accepts credit cards, cash on delivery and JumiaPay (an e-money instrument) but not mobile money.¹² And in Kenya, Jumia users can pay with credit or debit cards, mobile money as well as cash on delivery when shopping online.¹³

The introduction of this new indicator affects the index rankings (Figure 4). The share of the population aged 15 and above with an account benefits countries with relatively limited use of credit cards but high incidence of bank and mobile money accounts. As a result, Kenya, which has a high penetration of mobile money, climbs 13 positions in the index. Another example is the Netherlands, which has relatively low credit card penetration compared to other developed economies. However, virtually all people aged 15 and above (99 percent) have a bank account in that country. In 2015, about 60 per cent of all online purchases were paid for using iDEAL – a bank-owned online payment system – compared to 12% for credit cards (The Paypers, 2016). With the new account indicator, the

¹¹ <https://www.jumia.com.gh/help/#Payment>.

¹² <https://www.jumia.com.ng/help/#menuanchor>.

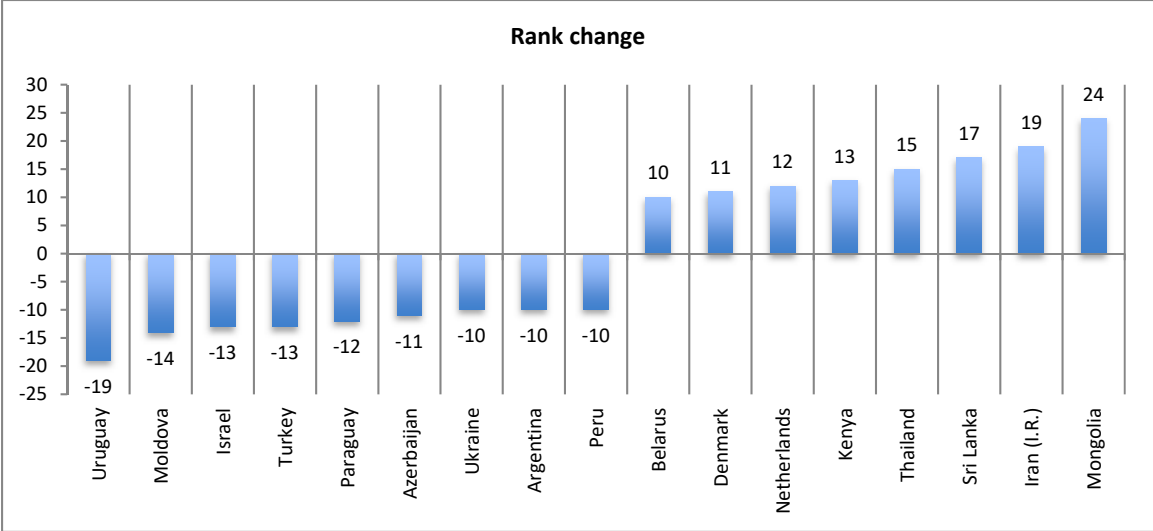
¹³ https://www.jumia.co.ke/payment_policy/.

Netherlands rises in the index. This is appropriate given that 79 per cent of Dutch Internet users made an online purchase in 2016, the sixth highest level in Europe.

Conversely, countries that have above average credit card ownership will rank lower in the revised index (although it raises their score because all countries have a higher level of accounts than credit cards). For example, Turkey has around the same level of credit card penetration as the Netherlands. Turkish credit card ownership is high for its per capita income and in 2015, 74 per cent of e-commerce purchases in the country were paid for by credit cards (Worldpay, 2016). Conversely, Turkey's bank account penetration in 2014 was relatively low at 57 per cent of those aged 15 and older.

Any indicator that is a proxy for online payment affects the index for economies where there is a high incidence of cash used to pay for e-commerce purchases (cash on delivery accounted for 7 per cent of global payments in 2015). For example, in Egypt, around 90 per cent of e-commerce transactions are paid by cash-on-delivery, and in LDCs, the reliance on cash is even more pronounced (UNCTAD, 2017).

Figure 4: Impact of new payment indicator



Note: Economies with a ± 10 change.
 Source: UNCTAD.

One drawback of the account indicator is that the latest figures date from the 2014 survey. However, the World Bank is collecting 2017 FINDEX data over this calendar year and plans to publish the results in April 2018.

3 Data sources and country coverage

The table below shows the sources for the 2017 UNCTAD B2C E-commerce Index indicators.

Table 2: Sources for B2C Index indicators

Indicator	Number of economies with data, 2016	Source
Internet use (% of individuals)	205	International Telecommunication Union (ITU) https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx
Secure Servers per 1 million inhabitants	252	World Bank (http://data.worldbank.org/indicator/IT.NET.SECR.P6)
Account (% of population 15+) (2015)	140	World Bank Global FINDEX Database (http://datatopics.worldbank.org/financialinclusion)
Postal Reliability Score	182	Universal Postal Union (UPU)

Until 2016, the Index was calculated using a different payment indicator. Using the 2017 methodology for the index, the scores for previous years have also been calculated to better illustrate change. The coverage has improved to 144 economies, up by seven from the 2016 edition. The changes introduced in the index are summarized in the table below.

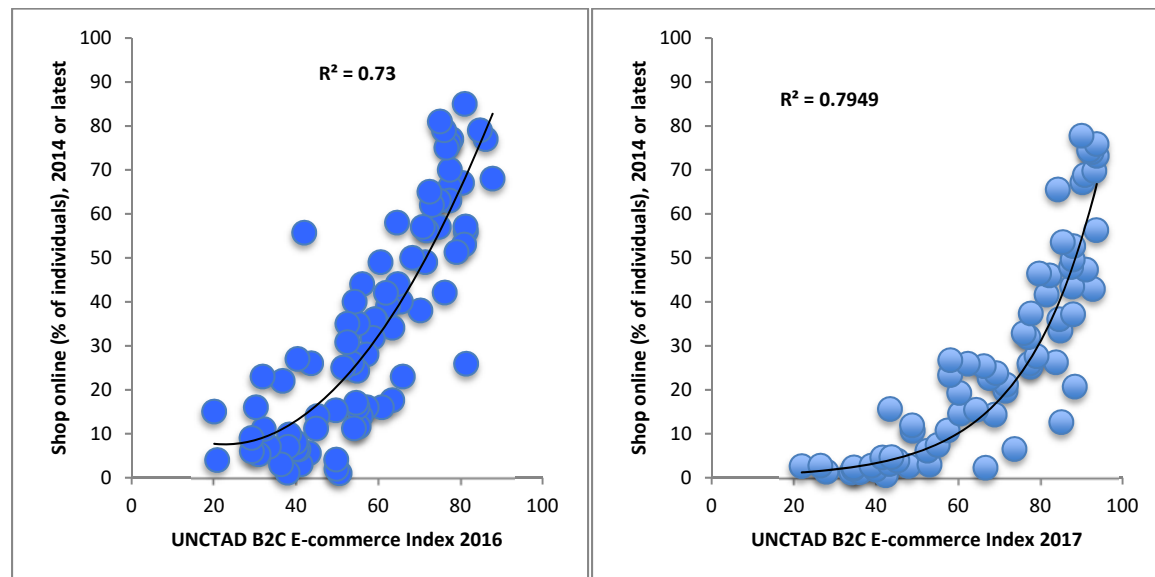
Table 3: Changes in the UNCTAD B2C E-commerce Index

2014 B2C E-commerce Index	2016 B2C E-commerce Index	2017 B2C E-commerce Index
4 indicators: <ul style="list-style-type: none"> ▪ Internet users ▪ Secure servers ▪ Credit card penetration ▪ Postal delivery at home 	4 indicators: <ul style="list-style-type: none"> ▪ Internet users ▪ Secure servers ▪ Credit card penetration ▪ Postal reliability score 	4 indicators: <ul style="list-style-type: none"> ▪ Internet users ▪ Secure servers ▪ Account penetration ▪ Postal reliability score
130 economies	137 economies	144 economies

The index can be used to estimate the proportion of population shopping online. This is compared with official published statistics on the share of online shoppers available in annex table 9.

As a result of the changes made, the 2017 edition shows a higher degree of correlation with the share of the population shopping online (Figure 5). The R² value rose from 0.73 in 2016 to 0.79 in 2017.

Figure 5: Correlation between UNCTAD B2C E-commerce Index 2016 and 2017 and the share of individuals shopping online



Source: UNCTAD.

4 Results

The top ten economies in the UNCTAD B2C E-commerce Index 2017 are shown in the table below. Luxembourg remains the top performer. Six of the top ten economies are also in the top ten of economies with the highest proportion of Internet shoppers. This suggests a generally high explanatory association between the variables contained in the index and online shopping. Among the top ten, the Republic of Korea and Japan stand out by having a lower actual proportion of online shoppers than predicted by the index value. This may reflect factors not contained in the index, such as a preference for shopping in physical stores, lack of trust and other factors (UNCTAD, 2016 and Ipsos, 2017). Notable improvements include Switzerland, which rose from 8th to 2nd, the United Kingdom, which rose from 10th to 6th and Germany, which rose from 14th to 9th. These gains are all largely due to a rise in postal reliability. It should be noted that the top 10 economies are tightly clustered with the difference between first and tenth separated by only four value points.

Table 4: Top 10 economies in the UNCTAD B2C E-commerce Index 2017

2017 Rank	Economy	Share of individuals using Internet (2016)	Share of individuals with an account (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2016)	UPU postal reliability score (2016)	Index Value (2016 data)	Index Value (2015 data)	Index Rank (2015 data)
1	Luxembourg	97	96	98	94	96.5	97	1
2	Switzerland	89	98	100	99	96.4	94	8
3	Norway	97	100	96	93	96.4	95	3
4	Netherlands	90	99	99	95	95.9	96	2
5	Republic of Korea	93	94	96	99	95.5	95	4
6	United Kingdom	95	99	92	95	95.1	93	10
7	Sweden	92	100	94	93	94.6	95	7
8	Japan	92	97	89	97	93.8	94	9
9	Germany	90	99	93	92	93.5	92	14
10	New Zealand	88	100	90	95	93.3	93	11

Source: UNCTAD, based on sources mentioned in table 2.

All but two of the top ten developing economies in the index hail from east or west Asia (Table 5). The Republic of Korea is first (and fifth in the global top 10). The next three—Hong Kong (China), Singapore and the United Arab Emirates—are close in index values. Then there is a significant jump to the next six. There is also a huge gap in actual online shopping between the Republic of Korea and Singapore and the rest. While over half of Internet users shop online in the first two, around one third in Hong Kong (China) and just over a fifth in Saudi Arabia, the rate is under twenty percent in the rest. So, while the enabling factors are present in the top developing economies in the index, efforts need to be devoted to overcoming soft factors such as lack of trust in online transactions. Table 6 shows the top ten developing countries in each region, and figure 6 depicts on a world map the e-commerce readiness as shown by the index.

Table 5: Top 10 developing economies in the UNCTAD B2C E-commerce Index, 2017

2017 Rank	Economy	Share of individuals using Internet (2016)	Share of individuals with an account (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2016)	UPU postal reliability score (2016)	Index Value (2016 data)	Index Value (2015 data)	Index Rank (2015, data)
5	Republic of Korea	93	94	96	99	96	95	4
16	Hong Kong (China)	87	96	88	92	91	92	15
18	Singapore	81	96	87	97	90	90	18
23	United Arab Emirates	91	84	79	96	87	85	26
38	Malaysia	79	81	66	82	77	76	40
39	Mauritius	53	82	71	96	76	64	57
42	Trinidad & Tobago	73	76	67	75	73	63	59
45	Saudi Arabia	74	69	59	75	69	67	46
46	Islamic Republic of Iran	53	92	45	86	69	65	52
48	Thailand	48	78	54	93	68	66	50

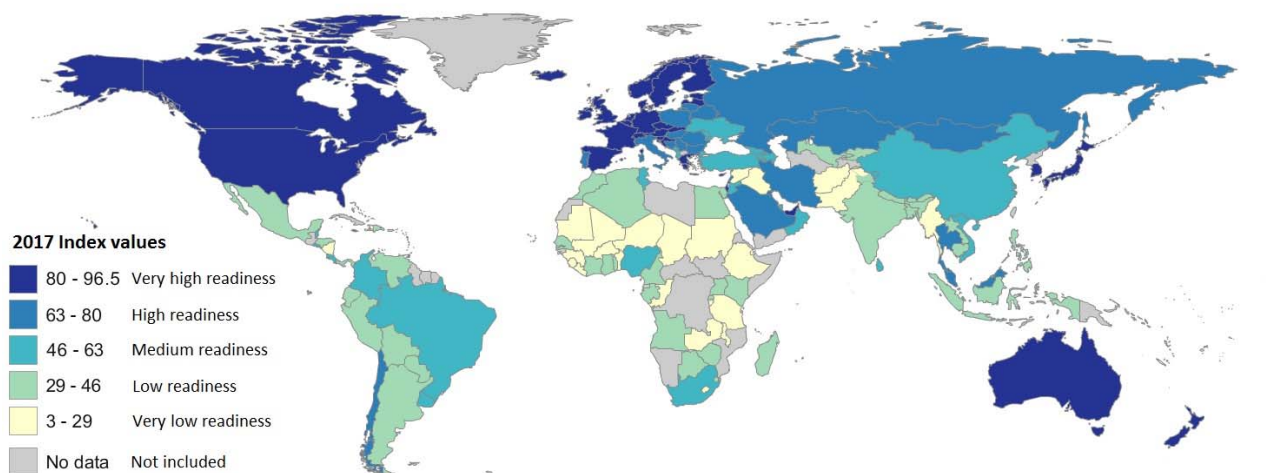
Source: UNCTAD.

Table 6: Top 10 developing and transition economies in the UNCTAD B2C E-commerce Index, 2017, by region

East, South and Southeast Asia	West Asia and North Africa	Sub-Saharan Africa	Latin America and the Caribbean	Transition economies
Republic of Korea	United Arab Emirates	Mauritius	Trinidad & Tobago	Serbia
Hong Kong (China)	Saudi Arabia	South Africa	Jamaica	Russian Federation
Singapore	Islamic Republic of Iran	Nigeria	Chile	Belarus
Malaysia	Lebanon	Kenya	Costa Rica	Kazakhstan
Thailand	Kuwait	Uganda	Brazil	Bosnia and Herzegovina
Mongolia	Qatar	Botswana	Uruguay	Albania
China	Turkey	Namibia	Colombia	Ukraine
Sri Lanka	Oman	Rwanda	El Salvador	Republic of Moldova
Viet Nam	Jordan	Côte d'Ivoire	Belize	Azerbaijan
India	Tunisia	Ghana	Argentina	Montenegro

Source: UNCTAD.

Figure 6: Map of the UNCTAD B2C E-commerce Index 2017



Source: UNCTAD.

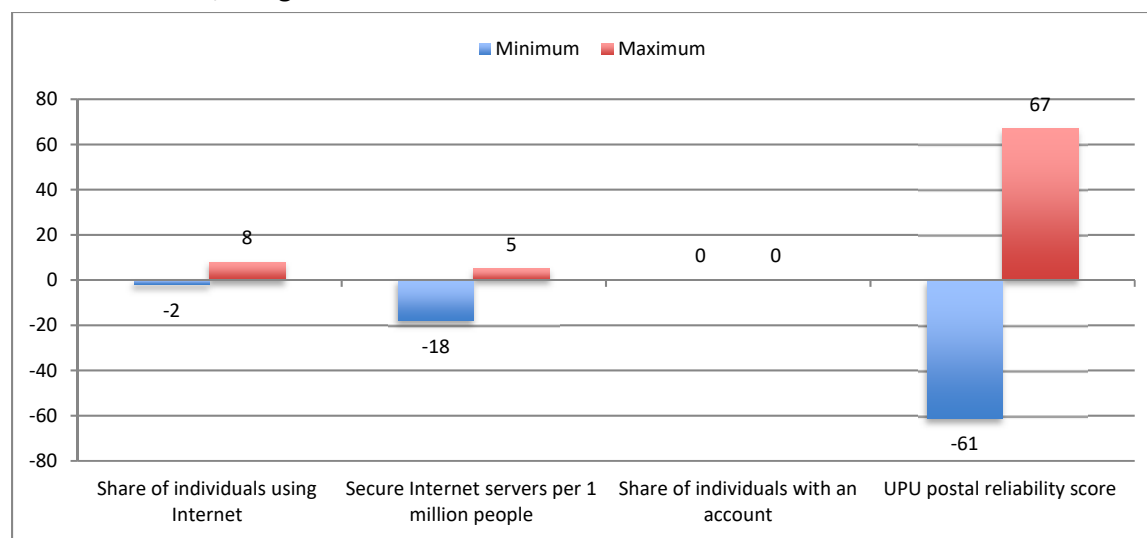
Table 7 shows the average values by geographic region. There are wide regional differences. In the case of Internet access, less than a quarter of the population in Africa uses the Internet compared to two thirds in Western Asia. The relative strengths and weaknesses generally differ. East, South and Southeast Asia needs to boost Internet penetration, which currently stands at below half of the population on average, as well as the number of secure servers, which are also below world average. In Latin America and the Caribbean, Internet penetration is average as are secure servers and the main barriers would appear to be relatively poor postal reliability and relatively few people with financial accounts. To facilitate more inclusive e-commerce, African countries would seek to catch up in all policy areas.

Table 7. Regional values for the UNCTAD B2C E-commerce Index, 2017

Region	Share of individuals using Internet (2016)	Secure Internet servers per 1 million people (normalized, 2016)	UPU postal reliability score (2016)	Share of individuals with an account (15+, 2014 or latest)	UNCTAD B2C e-commerce Index value
Africa	23	31	31	29	28
East, South and Southeast Asia	46	51	63	58	54
Latin America and the Caribbean	51	57	34	46	47
Western Asia	67	59	50	56	58
Transition economies	64	59	66	49	59
Developed	83	88	86	92	87
World	52	56	54	55	54

Significant volatility for some economies in the UPU Reliability Index Score resulted in major changes in the year on year rankings (Figure 7 and Figure 8). As noted, the revised 2017 index has been calculated for two year's values (2015 and 2016). The payment indicator had no impact on annual changes in the new index since data are only available for 2014. Changes in the value of the indicators on Internet usage and secure server penetration have been minimal.

Figure 7: Minimum and maximum changes in value, by indicator included in the UNCTAD B2C E-commerce Index, using 2015 and 2016 data



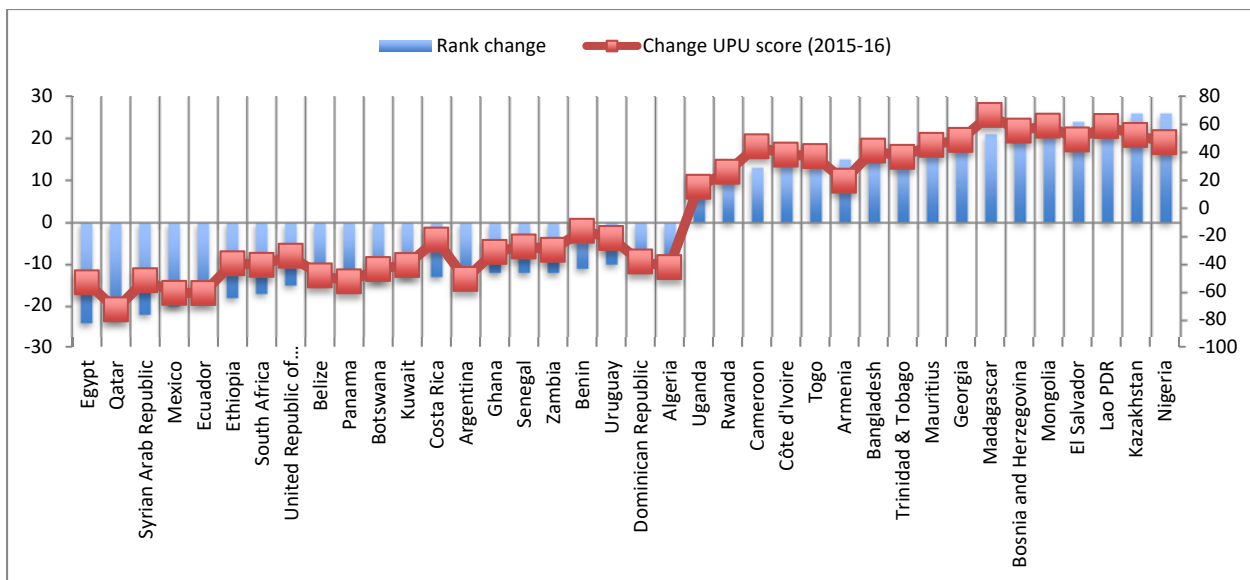
Source: UNCTAD.

According to UPU, the volatility in the Postal Reliability Score has several possible explanations:

- 1) An improved capture of tracking events and data (the trend is usually to a higher quality of tracking data capture over time)
- 2) The introduction of revised postal processes in a number of countries following the huge growth of e-commerce related items
- 3) A number of postal networks could have confronted bottlenecks related to this surge in e-commerce volumes
- 4) The composition of e-commerce flows and postal flows might have changed in a number of countries (for instance transporting and delivering heavier goods and more expensive goods resulting in more delivery delays) so the results might be dependent on the kind of product or service being delivered to the final customer.

E-commerce is evolving in a very dynamic environment with rapid changes in postal customers expectations that are likely to create some volatility in the quality of service provided by the different networks. Some networks might have reacted and adapted quickly while others might be overwhelmed and reaching some network capacity limits. While 26 countries improved their score by more than 10 points, the majority of changes were negative. It would appear that many postal networks are having difficulties coping with increasing levels of parcels traffic.

Figure 8: Biggest annual changes in ranking in the UNCTAD B2C E-commerce Index 2017 and changes in the UPU Postal Reliability Index score



Note: Economies with a ± 10 change.

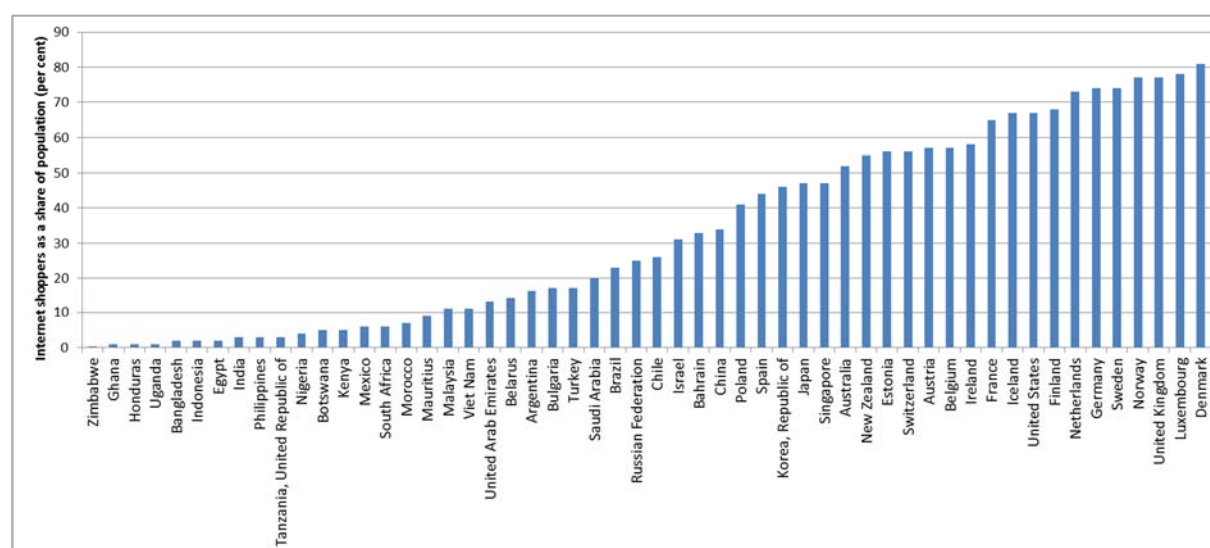
Source: UNCTAD.

5 Conclusions

There are ongoing efforts to improve the *UNCTAD B2C E-commerce Index* and to make it as relevant as possible. Last year, the UPU Reliability Index score was introduced. This year, the availability of a bank or mobile money account replaced credit card penetration. The 2017 edition has a higher predictive capability of online shopping than the previous indexes. Changes in the composition of an index always imply a break in the time series. However, two years of results were calculated for the 2017 index, the beginning of a time series that over time will allow countries to better gauge their progress in the enablers of B2C e-commerce.

Only some of the countries in the *UNCTAD B2C E-commerce Index* have data on the actual share of the population in a country buying online. However, the available data show great variation between countries, ranging from as much as 80 per cent in Denmark to less than 1 per cent in Zimbabwe. In many developing and transition economies, online shoppers continue to represent a small proportion of the population, whereas in most developed economies more than half of the population are buying goods or services online.

Figure 9. Share of individuals purchasing products online, selected economies, 2016



Note: As age ranges and period in which a purchase is made varies across surveys, data are not strictly comparable. See table 10 for the complete data set.

Source: Eurostat, Pew, Nielsen, Caucasus Barometer, and national sources. See also table 9 in the annex.

More research is needed to gauge the evolving B2C E-commerce divide, as well as to link up statistics with policies that can help in bridging the gap. For example the eTrade for all initiative has gathered together a larger set of e-commerce readiness indicators, some of which are limited in geographic coverage. Based on these indicators, individual profiles can be consulted online for all the economies included in the UNCTAD B2C E-commerce Index.¹⁴ Improving data availability and quality will help policy-makers better target policies aimed at enhancing the e-commerce readiness of their countries.

¹⁴ See: <https://etradeforall.org/ressources/data-indicators/>.

References

The Paypers. 2016. *Ecommerce Payment Methods Report 2016*.

https://www.febelfin.be/sites/default/files/InDepth/ecommerce_payment_methods_report_2016_aeu_global_payments_insights.pdf.

Ipsos. 2017. *CIGI-Ipsos-UNCTAD Global Survey on Internet Security and Trust*.

<https://www.cigionline.org/internet-survey>.

UNCTAD. 2015. *Information Economy Report 2015: Unlocking the Potential of E-Commerce for Developing Countries*. <http://unctad.org/ier>.

UNCTAD. 2016. *UNCTAD B2C E-commerce Index 2016*. Technical Notes on ICT for Development 7. http://unctad.org/en/Pages/DTL/STI_and_ICTs/ICT4D-Technical-Notes.aspx.

UNCTAD. 2017. *Information Economy Report 2017: Digitalization, Trade and Development*. <http://unctad.org/ier>.

Universal Postal Union (UPU). 2017. *Integrated Index for Postal Development (2IPD) - 2016 Results*. <http://www.upu.int/en/the-upu/strategy/2ipd.html>.

Worldpay. 2016. *Global Payments Report*.

<https://worldpay.globalpaymentsreport.com/introduction/>.

Annex

Table 8: Calculating the UNCTAD B2C E-commerce Index 2017 for the Republic of Korea

Indicator	2015	2016
<i>A. INTERNET USE</i>		
A1. Users (% of population)	89.7	92.7
<i>B. PAYMENT</i>		
B1. Account (% age 15+)‡	94.4	94.4
<i>C. B2C WEB PRESENCE</i>		
C1. Secure Internet servers (per 1 million people)	2,301	2,201
C2. Secure server sub-Index, normalized to 100 by rescaling the values†	96	96
<i>D. DELIVERY</i>		
D1. Postal reliability score	100	98.7
B2C INDEX (A1 + B1 + C2 + D1) ÷ 4	95.1	95.5

‡ Latest data available is 2014.

† In 2015, of economies included in the index, Iceland had the highest value (3,407) and Chad the lowest (0.214). In 2016, Iceland had the highest value (3,162) and Niger the lowest (0.193). The Republic of Korea's secure Internet servers (per 1 million people) is normalized by the following formula:

2015: $(\text{Log}(2,301) - \text{Log}(0.214)) \div (\text{Log}(3,407) - \text{Log}(0.214))$

2016: $(\text{Log}(2,201) - \text{Log}(0.193)) \div (\text{Log}(3,162) - \text{Log}(0.193))$

Table 9: UNCTAD B2C E-commerce Index, 2017

2017 Rank	Economy	Share of individuals using Internet (2016)	Share of individuals with an account (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2016)	UPU postal reliability score (2016)	Index Value (2016 data)	Index Value (2015 data)	Index Rank (2015 data)
1	Luxembourg	97	96	98	94	96.5	97	1
2	Switzerland	89	98	100	99	96.43	94	8
3	Norway	97	100	96	93	96.39	95	3
4	Netherlands	90	99	99	95	95.9	96	2
5	Republic of Korea	93	94	96	99	95.5	95	4
6	United Kingdom	95	99	92	95	95.1	93	10
7	Sweden	92	100	94	93	94.6	95	7
8	Japan	92	97	89	97	93.6	94	9
9	Germany	90	99	93	92	93.5	92	14
10	New Zealand	88	100	90	95	93	93	11
11	Iceland	98	99	100	75	93	95	6
12	Finland	88	100	94	90	93	92	13
13	Denmark	97	100	94	80	93	95	5
14	Australia	88	99	92	90	92	91	16
15	Canada	90	99	91	89	92	92	12
16	Hong Kong (China)	87	96	88	92	91	92	15
17	Austria	84	97	93	89	91	91	17
18	Singapore	81	96	87	97	90	90	18
19	Ireland	82	95	87	98	90	90	20
20	France	86	97	87	92	90	90	21
21	Estonia	87	98	89	86	90	90	19
22	Belgium	87	98	89	79	88	90	22
23	United Arab Emirates	91	84	79	96	87	85	26
24	Latvia	80	90	80	99	87	84	28
25	Slovenia	76	97	86	90	87	88	23
26	United States	76	94	93	85	87	88	24
27	Cyprus	76	90	86	93	86	81	31
28	Malta	77	96	95	71	85	81	35
29	Czech Republic	76	82	91	86	84	85	27
30	Slovak Republic	80	77	78	92	82	83	29
31	Israel	80	90	76	80	81	81	32
32	Croatia	73	86	77	89	81	82	30
33	Spain	81	98	80	62	80	86	25
34	Greece	69	88	74	89	80	78	37
35	Lithuania	74	78	75	90	79	78	38
36	Hungary	79	72	79	87	79	79	36
37	Poland	73	78	86	77	78	81	33
38	Malaysia	79	81	66	82	77	76	40
39	Mauritius	53	82	71	96	76	64	57
40	Italy	61	87	77	69	74	75	42
41	Serbia	67	83	60	82	73	76	39
42	Trinidad & Tobago	73	76	67	75	73	63	59
43	Russian Federation	76	67	73	69	71	70	44
44	Belarus	71	72	65	75	71	67	48
45	Romania	60	61	70	88	69	68	46
46	Saudi Arabia	74	69	59	75	69	67	47
47	Islamic Republic of Iran	53	92	45	86	69	65	52
48	Portugal	70	87	79	37	68	76	41
49	Thailand	48	78	54	93	68	66	50
50	Bulgaria	60	63	71	72	66	69	45
51	Kazakhstan	77	54	53	79	66	51	76
52	Bosnia and Herzegovina	69	53	55	85	66	52	74
53	Jamaica	45	78	60	77	65	63	58
54	Chile	66	63	69	59	64	67	49

2017 Rank	Economy	Share of individuals using Internet (2016)	Share of individuals with an account (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2016)	UPU postal reliability score (2016)	Index Value (2016 data)	Index Value (2015 data)	Index Rank (2015 data)
55	Mongolia	22	92	53	90	64	50	78
56	Lebanon	76	47	58	70	63	65	51
57	Kuwait	78	73	74	25	63	73	43
58	Qatar	94	66	75	14	62	81	34
59	Albania	66	38	59	87	62	60	63
60	Turkey	58	57	63	71	62	62	60
61	Costa Rica	66	65	66	53	62	67	47
62	Brazil	60	68	63	58	62	65	53
63	Ukraine	52	53	64	70	60	62	61
64	Oman	70	74	65	31	60	59	64
65	China	53	79	49	57	60	65	55
66	Moldova	71	18	63	85	59	58	66
67	Uruguay	66	46	66	57	59	64	56
68	Azerbaijan	78	29	49	75	58	59	65
69	Montenegro	70	60	66	32	57	54	71
70	Georgia	50	40	60	76	57	44	89
71	Colombia	58	39	60	62	55	51	75
72	South Africa	54	70	67	26	54	65	54
73	Sri Lanka	32	83	47	45	52	53	73
74	Viet Nam	47	31	48	76	50	49	81
75	Jordan	62	25	51	63	50	49	80
76	El Salvador	29	37	52	80	49	37	99
77	Belize	45	48	73	28	49	62	62
78	Armenia	62	18	59	51	47	42	92
79	Tunisia	51	27	45	65	47	48	83
80	Nigeria	26	44	29	85	46	35	105
81	Argentina	70	50	60	0	45	58	67
82	Kenya	26	75	43	37	45	48	82
83	India	30	53	39	56	44	47	86
84	Panama	54	44	67	8	43	56	69
85	Morocco	58	39	38	37	43	49	79
86	Uganda	22	44	27	79	43	39	95
87	Botswana	39	52	51	30	43	53	72
88	Dominican Republic	61	54	54	0	42	51	77
89	Namibia	31	59	52	25	42
90	Mexico	60	39	56	11	42	57	68
91	Ecuador	54	46	57	8	41	56	70
92	Lao, Peoples Democratic Republic	22	27	31	84	41	26	115
93	Paraguay	51	22	53	37	41	48	84
94	Peru	45	29	55	33	41	47	87
95	Venezuela (Bolivarian Republic of)	60	57	44	0	40	42	94
96	Philippines	56	31	46	28	40	45	88
97	Algeria	43	50	31	26	38	47	85
98	Honduras	30	31	44	44	37	38	97
99	Rwanda	20	42	36	50	37	31	108
100	Bhutan	42	34	51	18	36	37	100
101	Indonesia	25	36	42	39	36	42	93
102	Bolivia (Plurinational State of)	40	42	48	12	35	38	96
103	Bangladesh	18	31	24	68	35	25	117
104	Côte d'Ivoire	27	34	35	45	35	25	116
105	Ghana	35	41	37	28	35	43	91
106	Uzbekistan	47	41	36	16	35	35	104
107	Cameroon	25	12	26	76	35	24	118
108	Nepal	20	34	33	52	35	28	111
109	Zimbabwe	23	32	39	39	33	36	101

2017 Rank	Economy	Share of individuals using Internet (2016)	Share of individuals with an account (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2016)	UPU postal reliability score (2016)	Index Value (2016 data)	Index Value (2015 data)	Index Rank (2015 data)
110	Gabon	48	33	48	0	32	32	106
111	Togo	11	18	39	60	32	22	123
112	Senegal	26	15	35	45	30	37	98
113	Angola	13	29	34	41	29	24	120
114	Swaziland	29	29	46	13	29	30	109
115	Cambodia	26	22	38	30	29	26	114
116	Egypt	39	14	35	27	29	43	90
117	Kyrgyzstan	35	18	44	18	29	27	112
118	Madagascar	5	9	23	78	29	13	137
119	Tanzania, United Republic of	13	40	26	30	27	36	102
120	Pakistan	16	13	29	39	24	30	110
121	Zambia	26	36	35	0	24	31	107
122	Nicaragua	25	19	45	4	23	24	119
123	Myanmar	25	23	24	20	23	22	124
124	Mali	11	20	24	35	23	17	130
125	Lesotho	27	18	36	7	22	23	121
126	Mauritania	18	23	28	15	21	23	122
127	Syrian Arab Republic	32	23	13	14	21	36	103
128	Burkina Faso	14	14	20	25	18	17	134
129	Djibouti	13	12	39	8	18	20	126
130	Liberia	7	19	32	12	18	18	127
131	Malawi	10	18	25	15	17	18	128
132	Afghanistan	11	10	22	23	17	16	135
133	Ethiopia	15	22	5	23	16	27	113
134	Haiti	12	19	29	4	16	16	136
135	Congo	8	17	26	12	16	17	131
136	Sierra Leone	12	16	14	21	16	17	132
137	Sudan	28	15	4	12	15	17	133
138	Benin	12	17	31	0	15	20	125
139	Iraq	21	11	23	0	14	18	129
140	Burundi	5	7	14	12	10	11	138
141	Comoros	8	22	0	4	8	9	141
142	Guinea	10	7	0	12	7	10	139
143	Chad	5	12	5	0	6	10	140
144	Niger	4	7	2	0	3	7	142

Table 10: Internet shoppers as a share of Internet users and of population, latest year

Economy	As a share of Internet users (%)	As a share of population (%)	Total millions	Latest data	Note
Argentina	26	16	4.76	2014	Buy a product online, 18+, last year, source: Pew.
Armenia	1	1	0.01	2015	Shop, 18+, source: Caucasus Barometer.
Australia	61	52	9.66	2015	Purchase or order goods or services 15+, last 3 month, source: ABS.
Austria	68	57	4.29	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Bahrain	35	33	0.35	2015	Purchasing or ordering goods or services, Nielsen.
Bangladesh	23	2	2.55	2014	Buy a product online, 18+, last year, source: Pew.
Belarus	24	14	1.14	2014	Ordering and purchasing goods and services, Age 6+, source: BelSTAT.
Belgium	65	57	5.32	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Botswana	13	5	0.06	2014	Used e-commerce, Age 10+, source: Statistics Botswana.
Brazil	38	23	37.48	2016	Buy products or services in last year, Age 10+, source: CGI.br
Bulgaria	27	17	1.03	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Chile	35	26	3.66	2014	Buy a product online, 18+, last year, source: Pew.
China	64	34	466.54	2016	Online shopping; last year, Age 6+; source: CNNIC.
Colombia	10	6	2.50	2016	Buy/order products or services, Age 5+, source: DANE.
Croatia	45	33	1.17	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Cyprus	38	29	0.28	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Czech Republic	57	47	4.19	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Denmark	84	81	3.89	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Egypt	5	2	1.59	2016	Bought online in the past 12 months, 15+, last year, source: MCIT.
El Salvador	8	3	0.12	2014	Buy a product online, 18+, last year, source: Pew.
Estonia	64	56	0.61	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Finland	72	68	3.11	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
France	75	65	35.31	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Georgia	3	1	0.04	2015	Shop, 18+, source: Caucasus Barometer.
Germany	82	74	53.02	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Ghana	6	1	0.19	2014	Buy a product online, 18+, last year, source: Pew.
Greece	45	31	2.86	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Honduras	5	1	0.09	2014	Comprar Productos o Servicios, Last 3 months, INE.
Hong Kong (China)	32	28	1.78	2016	Online shopping, Age 15+, last year, C&SD.
Hungary	48	38	3.19	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Iceland	68	67	0.17	2014	Internet purchase, last year, Age 16-74, source: EUROSTAT.
India	22	3	28.24	2014	Buy a product online, 18+, last year, source: Pew.
Indonesia	9	2	3.63	2014	Buy a product online, 18+, last year, source: Pew.
Ireland	71	58	2.18	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Israel	39	31	1.68	2016	Shopping, Age 20+, Source: CBS.
Italy	41	28	14.81	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Japan	57	47	57.20	2014	"buying / exchanging goods and services"; source: MIC.
Jordan	27	12	0.50	2014	Buy a product online, 18+, last year, source: Pew.
Kenya	16	5	1.20	2014	Buy a product online, 18+, last year, source: Pew.
Korea, Republic of	54	46	22.48	2015	Internet shopping users, Age 12+, Source: KISA/ISIS.
Latvia	55	45	0.74	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Lithuania	44	33	0.80	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Luxembourg	80	78	0.38	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Macedonia, TFYR	20	15	0.26	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.

Malaysia	16	11	2.61	2015	Purchasing and ordering goods and services, Age 15+, source: DOS.
Malta	62	48	0.18	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Mauritius	18	9	0.10	2016	Purchase of goods and/or services, Age 12+, Stat Mauritius.
Mexico	10	6	6.06	2015	Purchases via Internet, last year, Age 6+, source: INEGI.
Moldova	16	11	0.32	2014	Purchasing or ordering goods or services from private entities, Age 16+, source: CBS-AXA.
Montenegro	17	12	0.06	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Morocco	12	7	2.16	2016	Purchase or order goods or services, Age 12-65, source: ANRT.
Netherlands	79	73	10.43	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
New Zealand	62	55	2.01	2015	Shop online, 10+, source: Nielsen.
Nicaragua	7	3	0.11	2014	Buy a product online, 18+, last year, source: Pew.
Nigeria	11	4	3.83	2014	Buy a product online, 18+, last year, source: Pew.
Norway	79	77	3.30	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Paraguay	9	4	0.24	2015	Buy or sell products & services, Age 10+, source: DGEEC.
Peru	6	3	0.64	2016	Buy products and/or services, Age 6+, source: INEI.
Philippines	7	3	1.84	2014	Buy a product online, 18+, last year, source: Pew.
Poland	56	41	13.22	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Portugal	43	30	2.68	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Romania	18	12	1.98	2016	Internet purchase, last year, age: 16-74, source: EUROSTAT.
Russian Federation	35	25	30.03	2016	e-Shoppers, 18+, source: Ecommerce Foundation.
Saudi Arabia	22	20	4.70	2015	Purchase or place orders for product(s) and/or service(s), Age 12+, source: CITC.
Singapore	60	47	2.22	2015	Online purchase, 15+, source: IDA.
Slovak Republic	68	54	2.50	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Slovenia	53	40	0.70	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
South Africa	14	6	2.30	2014	Buy a product online, 18+, last year, Pew.
Spain	54	44	17.31	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Sweden	80	74	6.09	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Switzerland	67	56	3.93	2014	Purchase or order something, Age 15+, source: OFS.
Tanzania, United Republic of	15	3	0.77	2014	Buy a product online, 18+, last year, source: Pew.
Thailand	8	4	2.36	2016	Online purchase goods & services, Age 6+, source: TNSO.
Turkey	29	17	9.99	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
Uganda	4	1	0.10	2014	Buy a product online, 18+, last year, source: Pew.
Ukraine	44	23	9.03	2014	Buy a product online, 18+, last year, source: Pew.
United Arab Emirates	14	13	0.99	2014	Purchasing or ordering goods or services, last 3 months, Age 15-74, source: TRA.
United Kingdom	86	77	39.40	2016	Internet purchase, last year, Age 16-74, source: EUROSTAT.
United States	80	67	175.20	2015	Users who purchase online, Age 18+, source: Digital Future Study.
Viet Nam	26	11	7.44	2014	Buy a product online, 18+, last year, source: Pew.
Zambia	6	1	0.05	2015	Online shopping, Age 10+, ZICTA.
Zimbabwe	1	0.2	0.06	2014	Purchase or order goods or service, 3+, source: ZIMSTAT.

Source: UNCTAD, based on sources cited in the table.



UNCTAD Technical Notes on ICT for Development

1. Implications of Applying the New Definition of «ICT Goods», May 2011
2. Updating the Partnership Definition of ICT Goods From HS 2007 to HS 2012, January 2014
3. International Trade in ICT Services and ICT-enabled Services: Proposed Indicators from the Partnership on Measuring ICT for Development, October 2015
4. Global Assessment of Sex-disaggregated ICT Employment Statistics: Data Availability and Challenges on Measurement and Compilation, December 2015
5. Trade in ICT Goods and the 2015 Expansion of the WTO Information Technology Agreement, December 2015
6. In Search of Cross-border E-commerce Trade Data, April 2016
7. UNCTAD B2C E-commerce Index 2016, April 2016
8. The «New» Digital Economy and Development, October 2017
9. UNCTAD B2C E-commerce Index 2017, October 2017

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