



UNCTAD B2C E-COMMERCE INDEX 2016

UNCTAD Technical Notes on ICT for Development

N°7



UNITED NATIONS



UNCTAD B2C E-COMMERCE INDEX 2016

Executive Summary

For the second consecutive year, Luxembourg is the top performer in the *UNCTAD B2C E-commerce Index*, which measures the readiness of countries to engage in online commerce. Among the top 10 economies, six are European, three are from the Asia-Pacific region and one is from North America.

Among developing economies, three high-income economies – Republic of Korea, Hong Kong (China) and Singapore – rank the highest, followed by several Gulf States. Uruguay is the top performer in Latin America and the Caribbean. At 61st place in the Index, South Africa is the front-runner in e-commerce readiness on the African continent.

The greatest improvements compared with the 2014 Index are noted for Qatar (up 47 positions) and the United Arab Emirates (up 41 positions), in large part due to an improved indicator measuring postal efficiency. Conversely, Madagascar and Sierra Leone are negatively affected by the changed methodology and see the largest declines in ranking. The full ranking is contained in Annex table 2.

The *UNCTAD B2C E-commerce Index 2016* is composed of four indicators: Internet use penetration, secure servers per 1 million inhabitants, credit card penetration and a postal reliability score. This year's Index was improved by increasing the geographic coverage (from 130 to 137 economies) and fine-tuning the indicator to measure the delivery aspect of e-commerce. The straightforwardness and transparency of the Index allow countries to compare how they perform in different areas. The 137 economies represent 96% of the world population and 99 % of world GDP.

An increasing number of countries design national policies and strategies to harness the full potential of e-commerce for economic development. The Index helps policy makers assess to what extent their economies are e-commerce ready and what areas are in greatest need of improvement.

E-commerce readiness varies by region. Just over a fifth of the population in Africa uses the Internet compared to two thirds in Western Asia. While Western Asia and transition economies fare well on most indicators, credit card availability is average. Overall, Asia needs to boost Internet penetration, which currently stands at just over a third of the population, as well as the number of secure servers. In Latin America and the Caribbean, the main barriers appear to be low credit card penetration and relatively poor postal reliability. Africa ranks the lowest in all the indicators. Unless there is improvement in the underlying transaction and logistics processes, African online shopping is likely to remain confined to wealthier populations in urban areas.

Aside from methodological changes, as compared to the previous edition of the index, Uruguay and the Russian Federation have seen sizable improvement in their share of individuals with credit card which jumped by as much as 13 percentage points in Uruguay (from 27% to 40%) and by 11 percentage points in the Russian Federation (from 10% to 21%). While improvements in secure Internet servers per 1 million people are slower to take place, this indicator moved up especially for Guinea (+4), Lesotho (+3) and Liberia (+3).

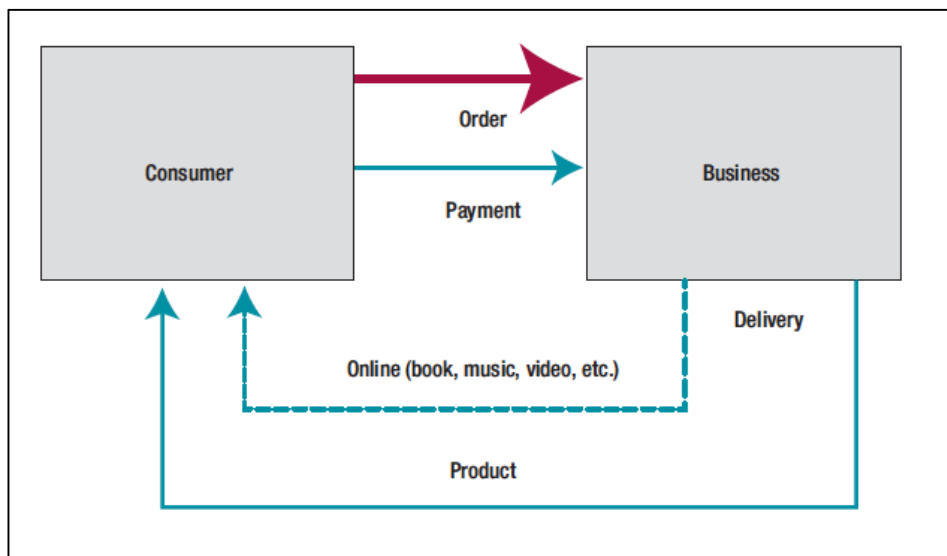
1. INTRODUCTION

This report provides an update on the *UNCTAD Business-to-Consumer (B2C) E-Commerce Index*, first introduced in the *Information Economy Report 2015: Unlocking the Potential of E-commerce for Developing Countries*.¹ It reviews the possibility of incorporating other indicators, tests the robustness of existing indicators and updates the Index with the latest available data.

2. THE INDICATORS

The Index reflects the steps involved in a B2C transaction (figure 1). A form of web presence is required on the part of businesses to accept online orders. The process also requires Internet access on the part of users to review products and place an order. A payment method needs to be specified such as credit card, e-money, bank transfer or cash on delivery. Finally the product must be delivered, either online for digital products or to the customer's home or at a pick up point for goods.

Figure 1. The online purchase process



Source: UNCTAD.

Data sources for the indicators are shown in table 1. In some cases, missing or more recent data for the indicators have been extracted from national sources. In the case of missing data, estimates have been made based on growth rates. No data have been estimated forward. Some credit card data have been updated based on the ratio of credit card ownership to total

¹ unctad.org/ier.



credit cards when the data are available from the central bank. An example of how the Index is calculated for a country is contained in Annex table 1.

Table 1. Data sources

Indicator	Number of economies with data, 2014	Source
Internet use (% of individuals)	208	International Telecommunication Union (ITU) (http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx)
Secure Servers per 1 million inhabitants	200	World Bank (http://data.worldbank.org/indicator/IT.NET.SECR.P6)
Credit card (% of population 15+)	159	World Bank Global Findex Database (http://datatopics.worldbank.org/financialinclusion)
Postal Reliability Score	185 (2013-14)	Universal Postal Union (UPU)

Source: UNCTAD.

2.1 Internet users

Indicators were selected to benchmark the B2C process based on which were the most statistically significant. One of the most straightforward is Internet use penetration. Surveys on Internet use are carried out in a number of countries. Such data are compiled by the International Telecommunication Union (ITU), which also provides estimates. In the previous edition, ITU data had been complemented with other data from national sources. Surveys have been analyzed in order to extract relevant online shopping statistics that are used as a dependent variable for testing the Index.

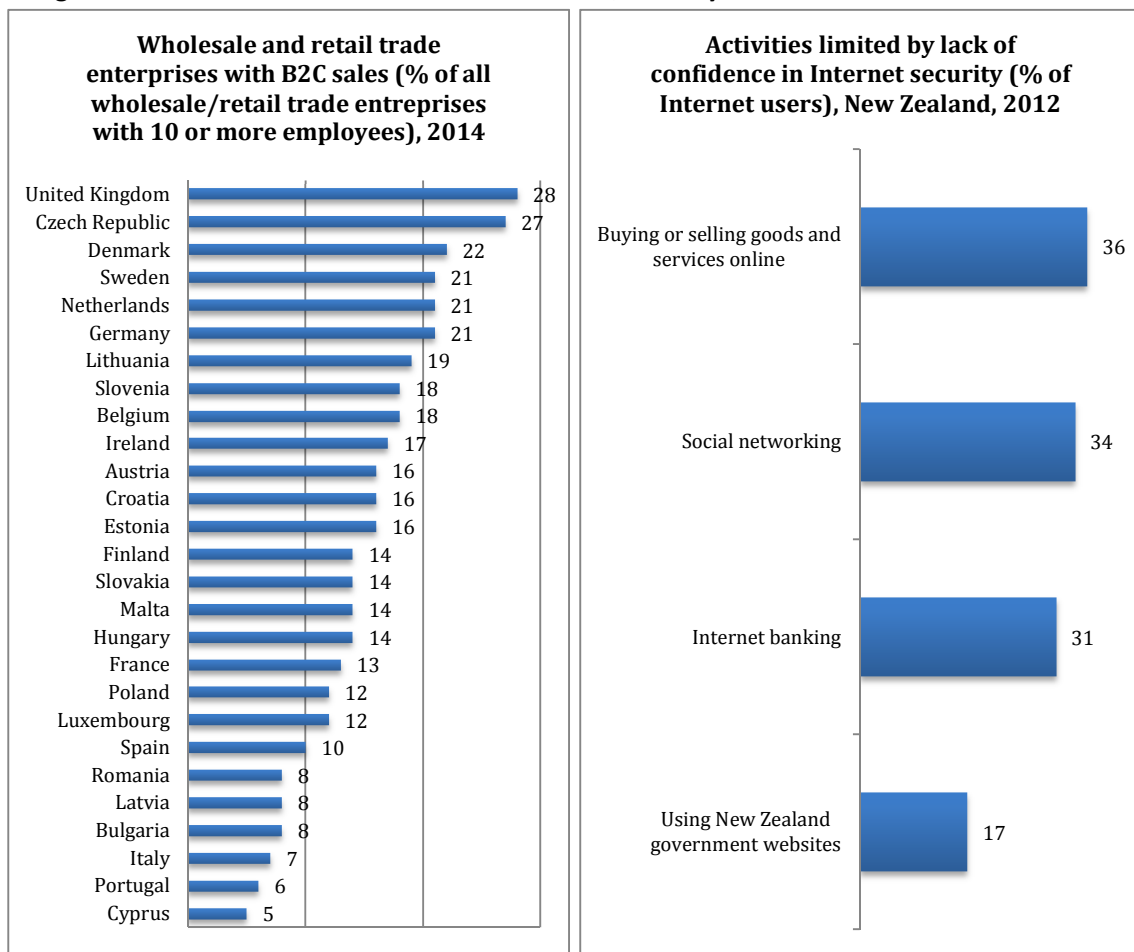
2.2 Secure servers

The online shopping process involves purchasing from an e-commerce web presence. Ideally this would be represented by an indicator such as the percentage of enterprises that sell via a B2C web presence (whether their own website or through a marketplace). A related indicator – the proportion of enterprises with B2C sales – is included in some enterprise surveys such as those used by Eurostat (figure 2, left). However, it is not widely available for many other countries. The number of secure Internet servers was selected as a proxy given that most e-commerce sites need to employ security protocols to safeguard payment and personal information, and it has been used before.² Secure servers use encryption technology in online transactions to protect the transfer of data from unauthorized interception. This indicator is

² 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/content/book/comms_outlook-2005-en.

available for most countries from the World Bank, ensuring high coverage. Secure servers may allay security concerns, often mentioned as a barrier to online shopping (figure 2, right). Secure server penetration tends to be higher in economies with well-developed financial sectors since banks are major users of security protocols.

Figure 2. Share of B2C websites in the EU in 2014; security concerns in New Zealand in 2012



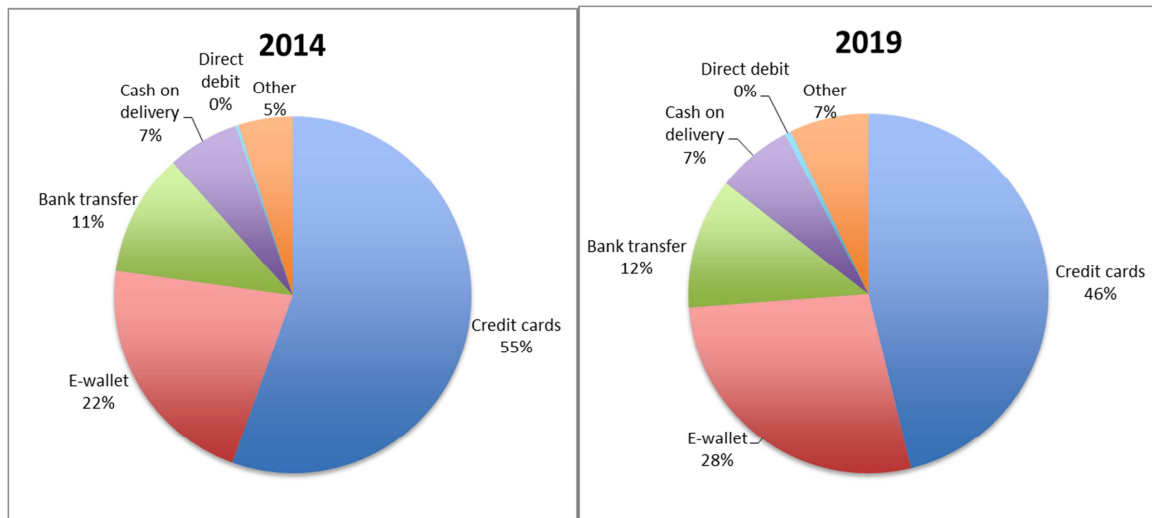
Source: UNCTAD research based on data from Eurostat and Statistics New Zealand.

2.3 Credit card penetration

Products purchased over the Internet can be paid for online or offline. Credit cards are the most prevalent payment method worldwide in terms of online transaction purchase value, a situation forecast to remain the same through 2019 (figure 3). Though other payment options are increasingly used, credit cards are the most widely accepted on virtually any B2C web site.

Therefore, not having a credit card would constrain the ability of a consumer to freely shop and order from any online shop. The indicator used is credit card penetration among the population aged 15 years and older, collected as part of the World Bank's Global Findex survey.

Figure 3. Online payment methods by value, 2014 and forecast for 2019



Note: Other includes e-invoices, postpaid, prepay, mobile carrier billing, crypto currencies (e.g. Bitcoin) and other emerging technologies. E-wallets allows consumers to either use electronically stored money value or take funds from another payment type linked to their e-wallet; examples include Alipay, Tenpay, PayPal, Qiwi, Yandex.Money. Credit cards includes all card payment solutions (credit card, debit card, charge card and pre-paid card).

Source: UNCTAD research based on data from Worldpay, 2015. *Your Global Guide to Alternative Payments.*

2.4 Postal reliability score

A product ordered on line must be delivered. Delivery of physical goods is a key consumer concern. In the 2014 B2C E-Commerce Index, only physical delivery was considered and the indicator that was selected was the proportion of the population that received home postal delivery. For the 2016 Index, another indicator was chosen: the UPU postal reliability score (see next section).

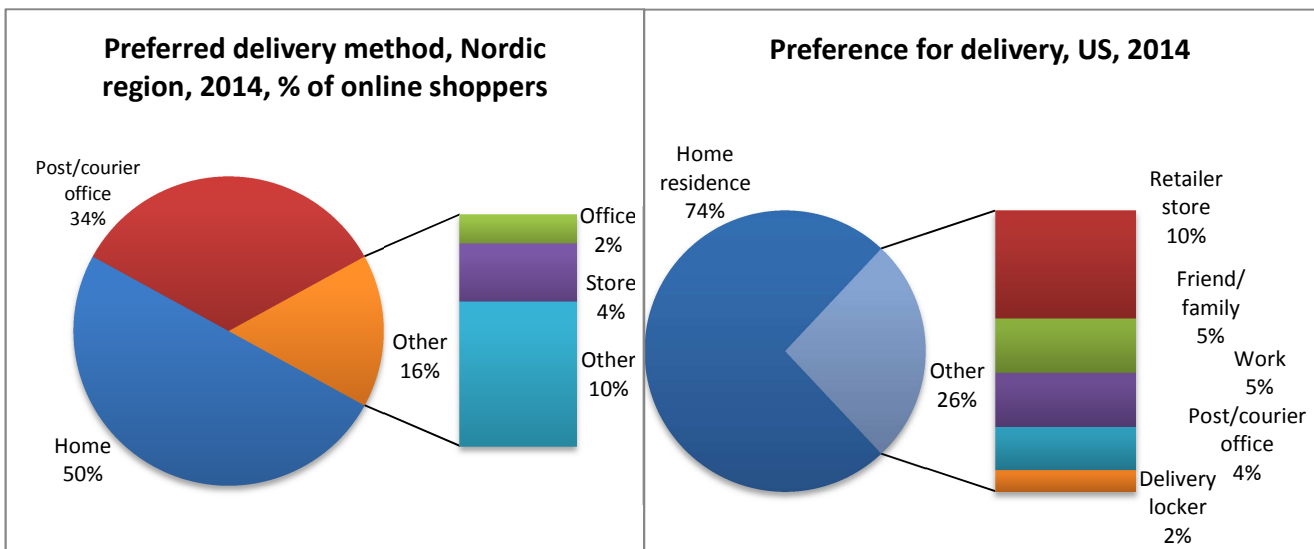
3. REVISITING THE MEASUREMENT OF E-COMMERCE DELIVERY

In revisiting the original Index, questions about the methodology arose particularly with regard to the indicator of delivery, of both physical goods and services and digital products. This section examines options and results of different delivery indicators.

3.1 Delivery of physical products

As noted above, the original Index used the percentage of the population able to receive mail at home as the delivery indicator. Home delivery is the most convenient method for receiving purchases and important for cash on delivery, popular in many developing countries. But even in well-developed e-commerce markets with widespread home delivery, other options are also desired. According to a survey of four Nordic nations, half of online purchasers choose a delivery method other than home (figure 4, left). In a survey carried out in the United States, one fourth of online shoppers preferred to pick up their order someplace besides the home (figure 4, right).

Figure 4. Package delivery options in the Nordic countries and United States, 2014



Source: UNCTAD research based on PostNord. 2015. *E-Commerce in the Nordics* and UPS. 2014. *Pulse of the Online Shopper*.

In some regions, delivery of mail to post office boxes is the most common method. In the Middle East, for example, the lack of street addresses has historically meant that most of the population picked up their mail at the post office. Such countries were penalized with the



previous indicator since they have mail access by going to a postal establishment to retrieve parcels or receiving orders at their place of work.

In search of a better indicator, the following ones were considered and rejected:

- Universal Postal Union (UPU) indicators of how the population receives mail (i.e., at home, at a post office or not at all). They are statistically ideal in that they do not need to be normalized. However, very few postal authorities appear to publish such data. This makes it impossible to check cases of missing or questionable data
- Time to get to a post office. While these indicators are attractive, postal authorities rarely compile them so data availability would be extremely limited.
- Coverage by postal authorities in terms of the average people per post office or average area per post office. The use of average people per post office tends to penalize small urban economies where the area is quite small but there are a large number of people per post office. On the other hand, the area coverage indicator tends to penalize large countries that have relatively good population coverage but statistically poor area coverage.
- Number of post offices. Given that consumers seem to prefer a mix of options besides home delivery or post office retrieval, an indicator based on the number of post offices may be limiting. In some developing countries, courier outlets have been growing and now exceed traditional postal locations. E-commerce companies in Nigeria and the Philippines partner with local courier companies or have their own delivery trucks.³ Quality is important and the ability to receive mail may not be as important as how long it takes to obtain it. Delivery costs are also significant and can shape whether consumers will buy online or purchase from a physical store. There is no clear statistical relationship between the ability to receive parcels at home from the incumbent postal operator and the speed of delivery or the price of sending it.

In view of the limitations of existing stand-alone indicators, the UPU created a reliability score to assess the relative quality of three core services for the delivery of e-commerce goods. The score is derived using tracking data for i) letter-post, ii) parcel-post and iii) express mail service (EMS) delivery, and gives them equal weight. The score itself includes two main components, namely the average domestic delivery shipping time (or how fast an order can be delivered through the domestic postal network of a given country), and the standard deviation of domestic delivery shipping time (or how predictable the domestic delivery service is in a

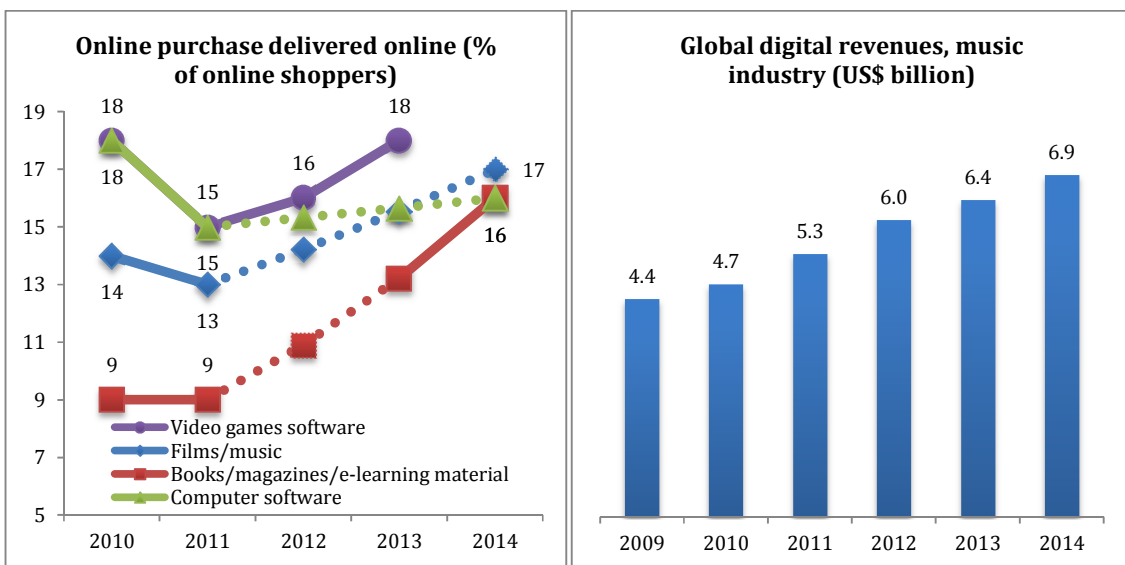
³ In Nigeria, e-commerce site Jumia has a fleet of 500 delivery vehicles. See: https://www.jumia.com.ng/about_us/. In the Philippines, online shopping site Lazada collaborates with courier company LBC Express for deliveries. See: <http://www.lazada.com.ph/shipping/>

given country).⁴ This reliability score is the indicator used for the goods delivery element in the 2016 edition of the *UNCTAD B2C E-commerce Index*.

3.2. Delivery of digital products

B2C includes the purchase of digital products, which are increasingly downloaded or streamed over the Internet. Depending on the product, between 16% and 18% of online shoppers in the European Union download digital purchases (figure 5, left). Digital music sales have been growing steadily and in 2014 accounted for around half the industry's revenue (figure 5, right). However, the *UNCTAD B2C E-Commerce Index* only considers the delivery of physical goods for the reasons explained below.

Figure 5. Online purchases digitally delivered and global digital revenues, music industry



Source: Adapted from Eurostat and International Federation of the Phonographic Industry (IFPI). 2015. *Digital Music Report*.

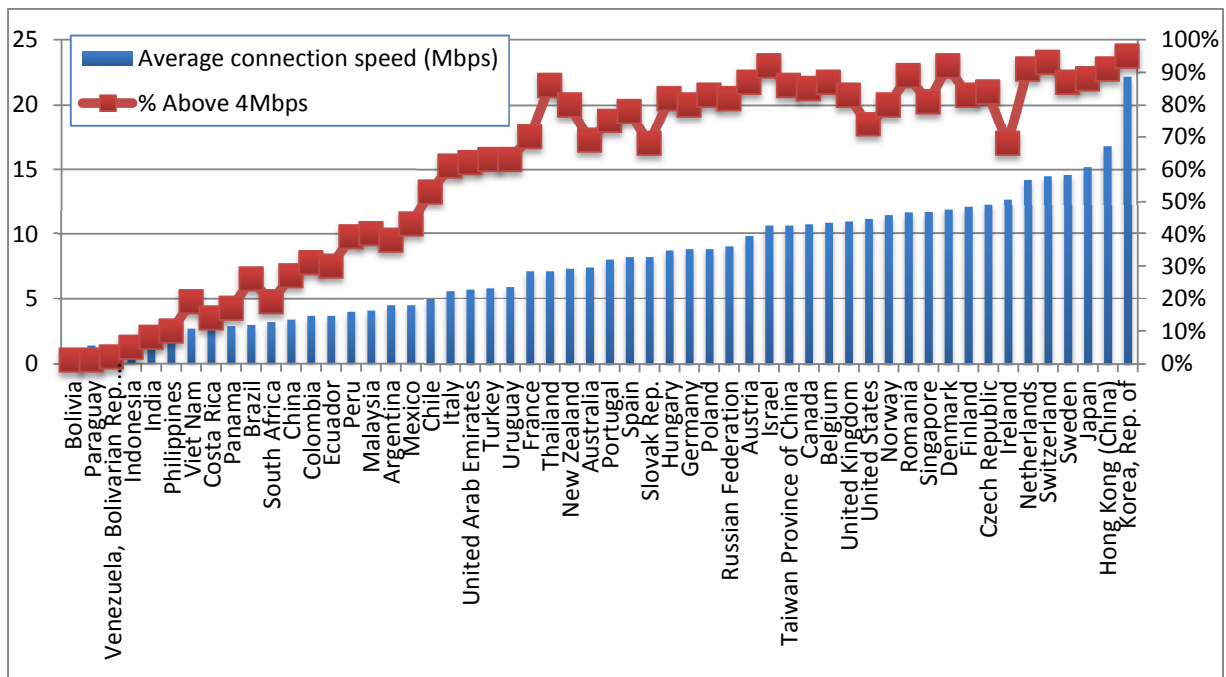
Given the growth of digital online purchases, the ability to efficiently download or stream is also important. According to the video streaming service Netflix, speeds of up to 5 Mbps are required for streaming HD films.⁵ This could be interpreted as the minimum speed that a user needs to enjoy a full range of digitally available products. The Content Delivery

⁴ Both components are normalized between 0 and 1 and then combined linearly with equal weight. The final result is normalized a second time to achieve final reliability scores between 0 and 100. The period covered by the first release of the reliability score are the years 2013 and 2014. Next update will cover 2015 and 2016.

⁵ <https://help.netflix.com/en/node/306>

Network (CDN) provider Akamai publishes quarterly reports featuring two relevant metrics: average user connection speeds and the proportion of user connections that are above 4 Mbps.⁶ There is a close relationship between the two, although the latter is preferred as it is already normalized (figure 6).

Figure 6. Internet speed indicators, Q4 2014



Source: UNCTAD analysis of data from Akamai.

The proportion of user Internet connections above 4 Mbps was tested for its inclusion in the Index. However, the results were unsatisfactory. While it was found to be statistically relevant, the coefficient generated was negative indicating that an increase in the proportion reduced online shopping, which is counterintuitive. A similar result was obtained when using average connection speeds. Therefore, a speed indicator was not included in the Index. The unexpected finding that Internet speed is inversely related to online shopping could be related to the interpretation of Internet purchases where some users might only be reporting physical products purchased (although survey questions usually refer to the purchase of goods or services).

The overall changes from the 2014 *UNCTAD B2C E-Commerce Index* to 2016 are summarized in table 2. This year's Index has increased its geographic coverage. Sixteen

⁶ <https://www.stateoftheinternet.com/resources-report-state-of-the-internet.html>



economies were added while nine were removed due to a lack of data. The net result is seven additional economies, resulting in a total of 137 for the 2016 edition.

Table 2. Changes in the B2C E-Commerce Index

2014 B2C E-Commerce Index	2016 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
130 economies	137 economies

4. RESULTS

The complete ranking of countries according to the *UNCTAD B2C E-Commerce Index 2016* is contained in Annex table 2. The top 10 positions are all filled by upper-income economies: six from Europe, three from Asia-Pacific and one from North America (table 3). As in the previous Index, Luxembourg once again ranks first. It has a well-developed financial sector that boosts its secure server ranking. It is also the European headquarters for global e-commerce players such as Amazon, PayPal and Apple.⁷ A low Valued Added Tax (VAT) on ebooks has also stimulated e-commerce although the EU requires Luxembourg to charge a higher rate beginning in 2015.⁸ Despite being landlocked, Luxembourg has a well-developed logistics network and is the second highest European ranked country on the UPU postal reliability score.

Iceland ranks second due to being the leader in Internet penetration, credit card possession and secure server diffusion. The postal network is also dense and accommodating to e-commerce; one can forward a snapshot of orders from Alibaba's international online store to the post office so they can handle customs clearance.⁹ Norway and Finland make up other Nordic countries in the top ten with much the same characteristics: high Internet and credit card penetration and assumed proliferation of web shops (captured by high secure server values). Like Luxembourg, Switzerland has a strong financial sector, good logistics networks and high postal coverage. The United Kingdom has relatively high Internet penetration. Its B2C Index ranking is reflected by its well-developed e-commerce market (it has the highest proportion of

⁷ <http://ict.investinluxembourg.lu/ict/e-commerce>

⁸ <http://ebiz.pwc.com/2015/03/luxemburg-e-books-are-subject-to-the-standard-vat-rate-as-of-1-may-2015/>

⁹ <http://www.postur.is/en/individuals/shipments-from-abroad/aliexpress/>



wholesale and retail trade enterprises selling over the Internet in Europe), particularly attractive to overseas shoppers; it also has the highest online shopping rate in the world with as much as 85% of Internet users purchasing goods and services over the Internet.

Canada has a high credit card penetration and B2C e-commerce benefits from proximity to the large United States market. Two of the three Asia-Pacific economies in the top ten are notable for having the most reliable postal networks; the Republic of Korea and Japan rank 1st and 2nd respectively in the UPU Postal Reliability Score. New Zealand has good scores on all four dimensions.

Table 3. Top 10 economies in the UNCTAD B2C E-commerce Index 2016

2016 Rank	Economy	Share of individuals using Internet (2014)	Share of individuals with credit card (15+, 2014)	Secure Internet servers per 1 million people (normalized, 2014)	UPU postal reliability score (2013-14)	UNCTAD B2C e-commerce Index value 2016	2014 Rank
1	Luxembourg	95	69	98	97	89.7	1
2	Iceland	98	77	100	81	89.0	#N/A
3	Norway	96	67	96	89	87.1	2
4	Canada	87	77	92	89	86.3	4
5	Japan	91	66	89	99	86.1	12
6	Finland	92	63	95	87	84.3	3
7	Korea, Republic of	84	56	97	100	84.3	8
8	United Kingdom	92	62	92	89	83.7	9
9	Switzerland	87	54	99	93	83.3	14
10	New Zealand	86	61	92	93	82.9	13

Note: The 2014 and 2016 indices have different postal methodologies.

Source: UNCTAD.

The top 10 developing economies in the *UNCTAD B2C E-Commerce Index* are shown in table 4. The top 3 developing economies are Asian Tigers with high Internet penetration and well-developed logistics networks. While Bahrain was already among the top 10 in 2014, newcomers Qatar and the United Arab Emirates had been previously underestimated because the Index did not account for post office retrieval of packages. A full dataset became available for Kuwait for the 2016 edition of the index. Common language has spurred e-commerce in the Gulf with leading Arabic online shop Souq.com available in all of the countries with inexpensive one-day parcel delivery.¹⁰ Uruguay and Chile are again among the top 10, having among the

¹⁰ <http://ems.com.sa/en/services/gulf-express>



highest Internet penetration in the region and relatively high credit card ownership. Malaysia rounds out the top 10 with a notably high score for its postal reliability.

Table 4. Top 10 developing economies in the UNCTAD B2C E-commerce Index, 2016

2016 Rank	Economy	Share of individuals using Internet (2014)	Share of individuals with credit card (15+, 2014)	Secure Internet servers per 1 million people (normalized, 2014)	UPU postal reliability score (2013-14)	UNCTAD B2C e-commerce Index value 2016	2014 Rank
7	Korea, Republic of	84	56	97	100	84.3	8
14	Hong Kong (China)	75	64	88	98	81.1	18
23	Singapore	82	35	88	98	75.8	26
25	United Arab Emirates	90	37	80	86	73.4	66
26	Qatar	91	32	78	88	72.4	73
32	Bahrain	91	28	75	72	66.5	34
39	Uruguay	61	40	70	79	62.6	40
40	Kuwait	79	28	73	68	61.9	#N/A
43	Chile	72	12	64	69	60.3	39
44	Malaysia	68	20	69	84	60.1	45

Note: The 2014 and 2016 indices have different postal methodologies.

Source: UNCTAD.

As compared to the ranking in the previous year a number of changes occurred due to the revised methodology. The greatest improvements compared with the 2014 Index are noted for Qatar (up 47 positions) and the United Arab Emirates (up 41 positions), in large part due to an improved indicator measuring postal efficiency. Conversely, Madagascar and Sierra Leone are negatively affected by the changed methodology with regard to postal delivery and see the largest declines in ranking. The full ranking is contained in Annex table 2. The use of ITU data on Internet users has also impacted on the relative ranking of some countries. This applies in particular to the following economies: Iraq (-17), Trinidad and Tobago (-10) and Egypt (-9).

Aside from methodological changes, Uruguay and the Russian Federation have seen sizable improvement in the share of individuals with credit card. It surged by 13 percentage points in Uruguay (from 27% to 40%) and by 11 percentage points in the Russian Federation (from 10% to 21%). While improvements in secure Internet servers per 1 million people are slower to take place, the values for this indicator moved up especially for Guinea (+4), Lesotho (+3) and Liberia (+3).

Table 5 shows the average values by geographic region. There are wide regional differences. In the case of Internet access, the African region lags significantly behind, with Western Asia ranking highest for this indicator. Relative strengths and weaknesses also differ for



the other indicators included in the index. For example, while Western Asia and transition economies fare well on most dimensions, credit card availability remains average. Eastern, Southern and South-Eastern developing Asia needs to boost Internet penetration, which currently stands at just over a third of the population on average, as well as the reliability of its postal network, and the number of secure servers, which are essential for online shopping sites. In Latin America and the Caribbean, Internet penetration is slightly below the world average as is the density of secure servers. The main barriers would appear to be low credit card penetration and relatively poor postal reliability. Although Africa ranks the lowest on all the indicators, e-commerce is developing on the continent. Mobile money solutions in a growing number of African countries may partly compensate for the lack credit card use. However, unless there is improvement in the underlying transaction and logistics processes, online shopping is likely to remain limited to wealthier populations in urban areas. Table 6 shows the top 10 performers by region.

Table 5. Regional values for the UNCTAD B2C E-commerce Index, 2016

Region	Number of economies	Share of individuals using Internet (2014 or latest)	Share of individuals with credit card (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2014)	UPU postal reliability score (2013-14)	UNCTAD B2C e-commerce Index value
Africa	34	18	3	39	37	24
Southern, Eastern and South-Eastern developing Asia	21	36	14	54	47	38
Western Asia	10	54	17	66	74	53
Latin America and the Caribbean	20	43	11	59	56	42
Transition economies	15	46	12	59	54	43
Developed	37	77	38	84	84	71
World	137	49	19	62	59	47

Source: UNCTAD.

Note: Simple unweighted averages.



Table 6. Top 10 economies in UNCTAD B2C E-commerce Index 2016, by region

Globally	Developing economies	Africa	Developing Asia and Oceania	Latin America and the Caribbean	Transition economies
Luxembourg	Korea, Republic of	South Africa	Korea, Republic of	Uruguay	Macedonia, TFYR
Iceland	Hong Kong (China)	Mauritius	Hong Kong (China)	Chile	Russian Federation
Norway	Singapore	Tunisia	Singapore	Brazil	Serbia
Canada	United Arab Emirates	Morocco	Malaysia	Costa Rica	Ukraine
Japan	Qatar	Egypt	China	Argentina	Moldova
Finland	Bahrain	Botswana	Thailand	Mexico	Albania
Korea, Republic of	Uruguay	Kenya	Viet Nam	Jamaica	Azerbaijan
United Kingdom	Kuwait	Senegal	Iran, Islamic Republic of	Trinidad & Tobago	Belarus
Switzerland	Chile	Algeria	Philippines	Panama	Montenegro
New Zealand	Malaysia	Ghana	India	Ecuador	Bosnia and Herzegovina

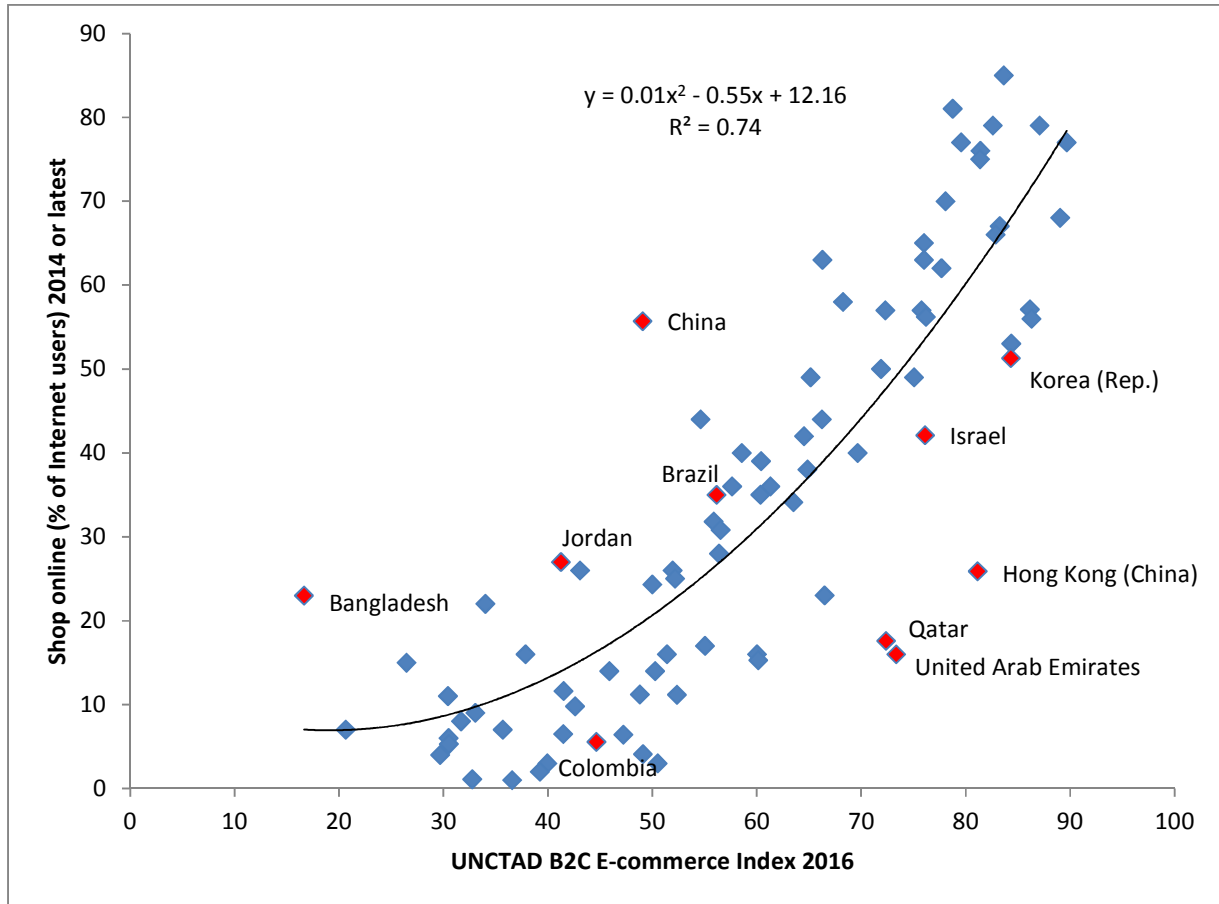
Source: UNCTAD.

Other factors are at play in e-commerce readiness besides the measurable parts of the B2C transaction that the Index captures. The legal and regulatory framework influences the level of trust in online transactions. UNCTAD continuously monitors the availability of laws that are of particular relevance to e-commerce.¹¹ The retail market environment, wealth and consumer preferences also play a role and are not captured. Indeed, among countries that ask Internet users why they do not shop online, payment, lack of online shops or delivery issues are rarely cited as the main reasons. That said, the relationship between the Index and actual online shopping has an R^2 of 0.74, a small improvement from the earlier 2014 edition.

Some economies might be doing better than others due to factors not considered by the Index. Figure 7 shows the relationship between the share of Internet users shopping online and the Index values of economies. Economies above the line are doing better than expected (i.e., their level of online shopping is higher than predicted by the Index). Information on Internet shoppers by country is contained in Annex table 3.

¹¹ See UNCTAD's Global Cyberlaw Tracker: http://unctad.org/en/Pages/DTL/STI_and_ICTs/ICT4D-Legislation/eCom-Global-Legislation.aspx.

Figure 7. Relation between UNCTAD B2C E-commerce Index 2016 and online shopping



Source: UNCTAD.

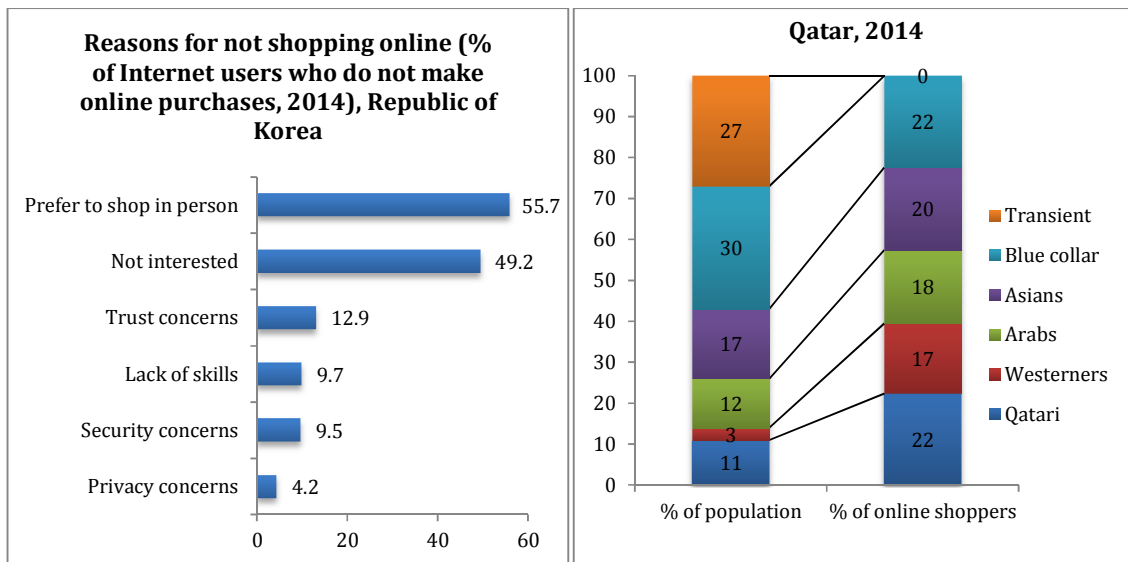
For example, China has many more online shoppers than predicted by its Index value. One reason is payments. Only 16% of the population 15 years and older in China has a credit card so other methods have been introduced to get around this barrier. The Alipay e-money service is reportedly the most popular payment method for online shopping in China (used by 68% of Internet shoppers),¹² and accounted for 75% of e-commerce giant Alibaba's Gross Merchandize Value in the year ending March 2015.¹³ Conversely, the level of online shopping in Hong Kong (China) is lower than predicted. This might be explained by its open economy with abundant choice for consumers spread over a concentrated area. Here, consumers may prefer to shop in person, cited as the main reason for not shopping online in the Republic of Korea (figure 8Figure 7, left), which also has a lower online shopping rate than predicted.

¹² <http://www.worldpay.com/global/global-online-shopper-report>

¹³ Alibaba Group Holding Limited. 2015. *Form 20-F*.

Shopping in person may be impacted by the structure of the retail market; in Israel, prices on online sites are often higher than in physical shops, which might explain why its level of online shopping is lower than predicted.¹⁴ Socio-economic factors are also at play. Take Qatar, which has a lower shopping rate than predicted compared to Jordan despite being much wealthier. One reason may be that a large portion of the population in Qatar is transient labor that does not shop online (figure 8, right). Wealth factors can also explain why Brazil has a much higher online shopping rate than Colombia. Brazil has a greater per capita income than Colombia and around a third of the population has a credit card. In Colombia, only 14% of the population has a credit card, a rate that increased from 10% in the previous year.

Figure 8. Reasons for not shopping online, Republic of Korea and share of online shoppers by demographic group, Qatar, 2014



Source: Adapted from Korea Internet & Security Agency (KISA) and ictQATAR.

Table 7 sheds further light on the difference between predicted and actual levels of online shopping based on the relationship between an economy's Index value and reported level of the share of online buyers. It shows the top and bottom 10 economies by the percentage difference between the predicted and actual share of online shoppers (as a proportion of Internet users). As noted earlier, China is performing much better than expected and indeed has the largest difference between its actual and predicted proportion of Internet users who buy online. Notable are low-income nations from South Asia and East Africa that are doing much better than expected such as Bangladesh, India, Kenya and Tanzania. Conversely, Armenia is performing much worse than expected; only 1% of Internet users shop online

¹⁴ <https://ustr.gov/sites/default/files/files/reports/2015/NTE/2015%20NTE%20Israel.pdf>.

compared to a predicted value of 11%. Three of the bottom 10 are from the Caucasus, possibly reflecting that trust concerns are discouraging online shopping. Also notable are United Arab Emirates and Qatar in the bottom 10. Though they have many of the prerequisites of e-commerce and they are ranked at the 25th and 26th position respectively, their actual level of online shopping is much lower than predicted.

Table 7. Top and bottom 10 economies by difference between predicted and actual share of Internet users buying online, 2016

Top 10					Bottom 10				
Economy	Online buyers as a share of Internet users (%)				Economy	Online buyers as a share of Internet users (%)			
	Predicted value	Actual value	Absolute difference	Relative difference (%)		Predicted value	Actual value	Absolute difference	Difference
1 Bangladesh	7.0	23.0	16.0	228%	Armenia	11.3	1.0	-10.3	-91%
2 China					Venezuela, Bolivarian Republic of	9.6	1.1	-8.5	-89%
3 India	19.8	55.7	35.9	182%	Azerbaijan	21.0	3.0	-18.0	-86%
4 Tanzania, United Republic of	10.1	22.0	11.9	118%	Georgia				
5 Jordan	7.7	15.0	7.3	95%	Mexico	12.7	2.0	-10.7	-84%
6 Ukraine	13.9	27.0	13.1	94%	Egypt	19.8	4.1	-15.7	-79%
7 Viet Nam	24.9	44.0	19.1	77%	United Arab Emirates	13.1	3.0	-10.1	-77%
8 Malta	15.1	26.0	10.9	72%	Colombia	49.0	16.0	-33.0	-67%
9 Denmark	38.7	63.0	24.3	63%	Thailand	16.2	5.6	-10.7	-66%
10 Slovak Republic	57.8	81.0	23.2	40%	Qatar	18.2	6.4	-11.8	-65%
	41.4	58.0	16.6	40%		47.5	17.6	-29.9	-63%

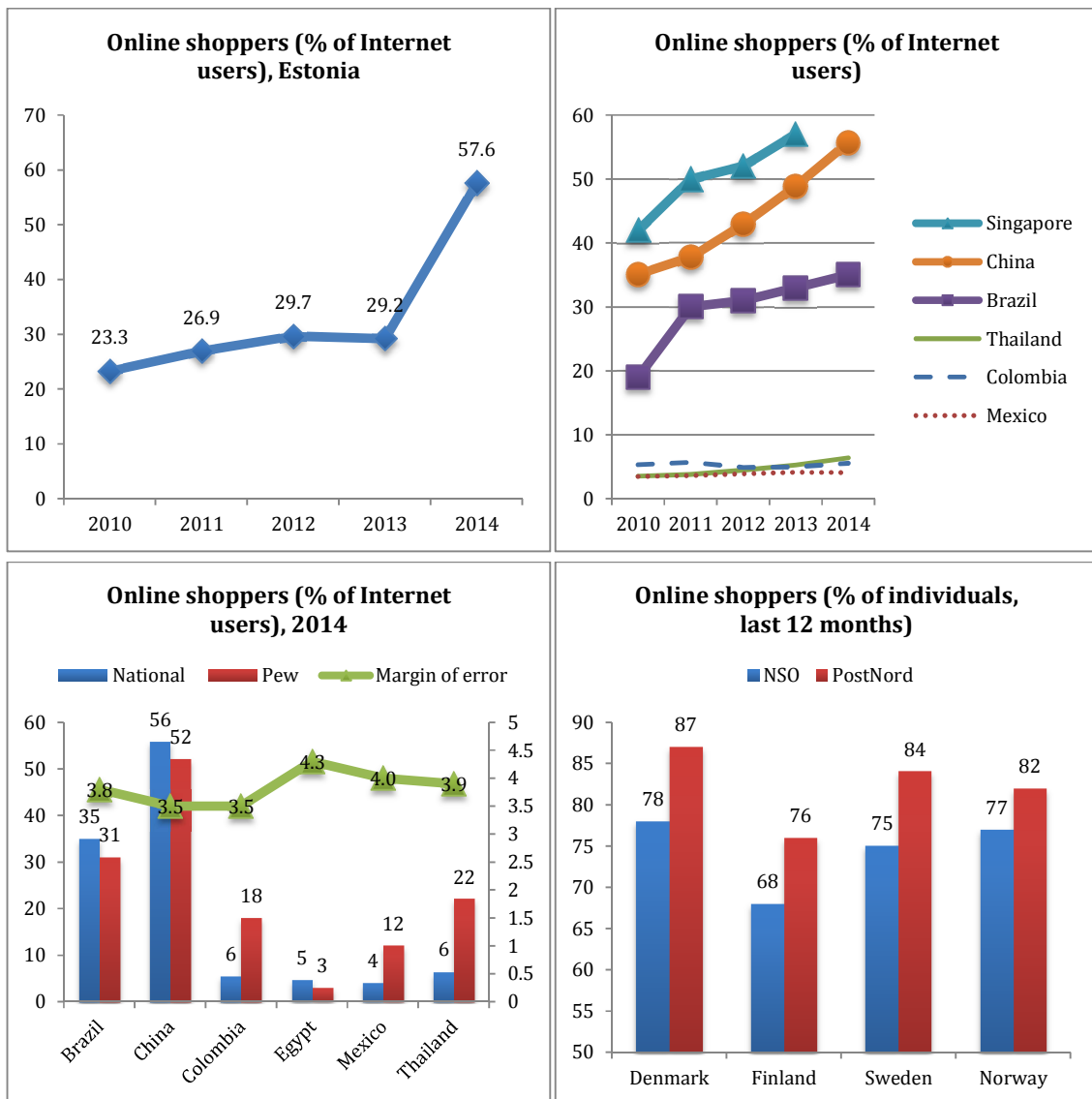
Source: UNCTAD.

The quality of the statistics affects the Index. They are used as input to the construction of the Index and available data on the proportion of online shoppers is used to test the statistical significance of the variables included in the Index. Anomalies are present in the data that can distort the results. In Estonia, questions on ICT use were included in the labor force survey through 2013. From 2014, the data were collected through a dedicated ICT survey. This break in series led to a much higher proportion of Estonian Internet shoppers (figure 9, top left).

In some countries, the proportion of Internet shoppers has barely budged, which seems strange given the growing popularity of e-commerce. In Colombia, Mexico and Thailand, national statistics offices report negligible change in the proportion of online shoppers despite rising Internet usage (figure 9, top right). Perhaps those new to the Internet in those countries are less wealthy than early adopters and hence less likely to shop online. However, data from other sources suggest the rate is much higher, even allowing for the margin of error implicit in surveys (figure 9, bottom left). Even in wealthy countries with high levels of Internet access and where income differences are less likely to play a role in online shopping adoption, there are

differences between surveys. A survey of four Nordic countries found that on average, the online shopping rate was 10 percentage points higher than what was reported by national statistics offices (figure 9, bottom right). Survey methodology and the way questions are asked about making purchases online also influence the comparability of data.

Figure 9. Online shopping statistics



Source: Adapted from Statistics Estonia, InfoComm Development Authority (IDA) of Singapore, Cetic Brazil, China Network Information Center (CNNIC), Thailand National Statistics Office, Instituto Nacional de Estadística, Geografía e Informática (INEGI, Mexico), Departamento Administrativo Nacional de Estadística (DANE, Colombia), Eurostat, Pew 2015 and PostNord 2015.



5. CONCLUSIONS

The Index has been enhanced by a better physical delivery indicator that does not penalize those countries without a high level of home delivery. The straightforwardness and transparency of the Index allow countries to compare how they perform in different areas.

There is inevitably a trade-off between the "best" indicator and data availability. In order to ensure wide coverage for the Index, proxy indicators that are widely available have been selected. Even then, the Index is subject to data supplier coverage. For example, many smaller island nations are not covered in the Global Findex data and hence not included in the Index.

The Index does not explain extraneous factors outside the online purchase process. There are security and knowledge factors that inhibit take up, or personal reasons for people wanting to shop in bricks-and-mortar stores rather than online. Laws can inhibit the development of local web sites, limiting the appeal of online shopping. These factors are apparent when comparing the Index to available data on the share of Internet users who make purchases over the Internet. The Index allows for the identification of objective factors in an online purchase, the extraneous factors influencing why some countries are doing better than others can be explored in more detail. For further discussion on how policies can help improve the e-commerce readiness of countries, see the *Information Economy Report 2015*.¹⁵

¹⁵ unctad.org/ier



ANNEX

Annex table 1: Calculating the UNCTAD B2C e-commerce Index for the Republic of Korea

	2014
A. INTERNET USE	
A1. Users (% of population)	84
B. PAYMENT	
B1. Credit card (% age 15+)	56
C. B2C WEB PRESENCE	
C1. Secure Internet servers (per 1 million people)	2,178
C2. <i>Secure server sub-Index, normalized to 100 by rescaling the values.</i>	97
D. DELIVERY	
D1. Postal reliability score	100
B2C INDEX (A1+B1+C2+D1)÷4	84.3

Annex table 2: UNCTAD B2C E-commerce Index, 2016

2016 Rank	Economy	Share of individuals using Internet (2014 or latest)	Share of individuals with credit card (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2014)	UPU postal reliability score (2013-14)	UNCTAD B2C e-commerce Index value 2015	2014 Rank
1	Luxembourg	95	69	98	97	89.7	1
2	Iceland	98	77	100	81	89.0	N/A
3	Norway	96	67	96	89	87.1	2
4	Canada	87	77	92	89	86.3	4
5	Japan	91	66	89	99	86.1	12
6	Finland	92	63	95	87	84.3	3
7	Korea, Republic of	84	56	97	100	84.3	8
8	United Kingdom	92	62	92	89	83.7	9
9	Switzerland	87	54	99	93	83.3	14
10	New Zealand	86	61	92	93	82.9	13
11	United States	87	60	94	89	82.6	15
12	Australia	85	59	93	89	81.4	6
13	Sweden	93	45	94	94	81.4	5
14	Hong Kong (China)	75	64	88	98	81.1	18
15	Netherlands	93	34	98	93	79.5	11
16	Denmark	96	36	96	87	78.7	7
17	Germany	86	46	93	87	78.0	20
18	Ireland	80	46	88	97	77.7	17
19	France	84	44	87	90	76.2	22
20	Israel	71	76	78	79	76.1	10
21	Austria	81	40	92	91	76.0	21
21	Belgium	85	43	89	87	76.0	16
23	Singapore	82	35	88	98	75.8	26
24	Spain	76	54	80	90	75.0	27
25	United Arab Emirates	90	37	80	86	73.4	66
26	Qatar	91	32	78	88	72.4	73
27	Estonia	84	31	89	85	72.3	24
28	Slovenia	72	35	86	95	71.9	23

2016 Rank	Economy	Share of individuals using Internet (2014 or latest)	Share of individuals with credit card (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2014)	UPU postal reliability score (2013-14)	UNCTAD B2C e-commerce Index value 2015	2014 Rank
29	Czech Republic	80	26	87	94	71.7	28
30	Croatia	69	38	77	95	69.6	37
31	Slovak Republic	80	17	80	96	68.2	29
32	Bahrain	91	28	75	72	66.5	34
33	Malta	73	42	95	55	66.3	19
34	Latvia	76	22	81	86	66.2	30
35	Poland	67	17	83	94	65.2	35
36	Cyprus	69	26	86	78	64.8	25
37	Hungary	76	12	80	90	64.5	33
38	Italy	62	36	78	78	63.5	32
39	Uruguay	61	40	70	79	62.6	40
40	Kuwait	79	26	76	67	61.9	N/A
41	Lithuania	72	10	77	86	61.3	36
42	Portugal	65	29	79	69	60.4	31
43	Chile	72	28	73	68	60.3	39
44	Malaysia	68	20	69	84	60.1	45
45	Macedonia, The Former Yugoslav Republic of	68	21	68	83	60.0	41
46	Greece	63	12	74	85	58.6	42
47	Russian Federation	71	21	69	70	57.6	50
48	Lebanon	75	11	65	79	57.4	51
49	Turkey	51	33	66	76	56.5	38
50	Bulgaria	55	12	75	83	56.4	49
51	Brazil	58	32	67	68	56.2	47
52	Serbia	54	15	63	92	55.9	44
53	Romania	54	12	72	82	55.0	46
54	Ukraine	43	28	64	83	54.6	58
55	Costa Rica	49	14	70	76	52.4	52
56	Saudi Arabia	64	12	64	69	52.2	N/A

2016 Rank	Economy	Share of individuals using Internet (2014 or latest)	Share of individuals with credit card (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2014)	UPU postal reliability score (2013-14)	UNCTAD B2C e-commerce Index value 2015	2014 Rank
57	Argentina	65	27	65	51	51.9	48
58	Moldova	47	6	64	89	51.4	62
59	Albania	60	6	58	80	51.0	55
60	Azerbaijan	61	9	53	79	50.5	N/A
61	South Africa	49	13	72	67	50.3	67
62	Belarus	59	13	64	64	50.0	61
63	Mexico	44	18	61	73	49.1	60
64	China	49	16	48	83	49.1	65
65	Oman	70	27	68	30	48.8	81
66	Jamaica	41	14	66	70	47.6	80
67	Trinidad & Tobago	65	15	71	39	47.5	43
68	Panama	45	10	72	62	47.2	84
69	Thailand	35	6	58	90	47.2	70
70	Mauritius	41	17	74	51	45.9	54
71	Ecuador	43	6	61	70	45.0	76
72	Colombia	53	14	64	48	44.6	71
73	Tunisia	46	7	56	69	44.5	74
74	Paraguay	43	9	58	65	43.8	N/A
75	Viet Nam	48	2	52	70	43.1	90
76	Peru	40	12	60	60	43.1	82
77	Iran, Islamic Republic of	39	11	38	82	42.6	69
78	Montenegro	61	15	66	24	41.5	N/A
79	Morocco	57	4	45	60	41.5	75
80	Jordan	44	2	60	59	41.3	94
81	Bosnia and Herzegovina	61	10	62	30	40.7	53
82	Egypt	32	2	45	81	39.9	68
83	Dominican Republic	50	11	60	39	39.9	57
84	Georgia	49	18	62	28	39.2	56

2016 Rank	Economy	Share of individuals using Internet (2014 or latest)	Share of individuals with credit card (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2014)	UPU postal reliability score (2013-14)	UNCTAD B2C e-commerce Index value 2015	2014 Rank
85	Botswana	19	10	52	74	38.6	109
86	Kenya	43	5	49	54	37.9	112
87	Armenia	46	6	63	31	36.6	59
88	Kazakhstan	55	11	54	26	36.5	64
89	Philippines	40	3	52	48	35.7	N/A
90	India	18	4	46	68	34.0	83
91	Senegal	18	1	42	73	33.4	110
92	Sri Lanka	26	4	52	51	33.2	79
93	Indonesia	17	2	47	66	33.0	88
94	Venezuela, Bolivarian Republic of	57	21	53	0	32.8	63
95	Algeria	18	6	37	68	32.3	N/A
96	El Salvador	30	8	58	31	31.7	72
97	Bolivia	39	6	53	25	30.8	98
98	Honduras	19	6	52	45	30.5	85
99	Ghana	19	1	42	60	30.5	108
100	Nigeria	43	3	38	38	30.4	100
101	Mongolia	27	1	60	31	29.8	102
102	Uganda	18	2	35	64	29.7	114
103	Zimbabwe	20	2	44	49	28.7	96
104	Bhutan	34	0	54	23	27.8	N/A
105	Pakistan	14	0	36	61	27.7	86
106	Swaziland	27	13	51	16	26.8	107
107	Tanzania, United Republic of	5	1	35	65	26.5	120
108	Uzbekistan	44	1	36	24	26.1	78
109	Kyrgyzstan	28	3	50	14	23.8	N/A
110	Zambia	17	2	42	30	22.8	92
111	Guatemala	23	6	56	0	21.4	77
112	Ethiopia	3	0	19	63	21.2	N/A

2016 Rank	Economy	Share of individuals using Internet (2014 or latest)	Share of individuals with credit card (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2014)	UPU postal reliability score (2013-14)	UNCTAD B2C e-commerce Index value 2015	2014 Rank
113	Angola	21	4	44	15	21.1	104
114	Nicaragua	18	4	52	9	20.7	97
115	Lao, People's Democratic Republic	14	3	38	26	20.3	105
116	Cameroon	11	1	36	32	20.0	N/A
117	Rwanda	11	1	43	25	19.9	113
118	Nepal	15	0	41	23	19.9	93
119	Cambodia	9	3	41	25	19.5	91
120	Togo	6	1	44	23	18.4	116
121	Bangladesh	10	0	30	27	16.7	N/A
122	Côte d'Ivoire	15	1	39	7	15.4	N/A
123	Benin	5	1	38	17	15.3	117
124	Liberia	5	3	39	13	15.1	118
125	Burkina Faso	9	3	27	20	14.9	123
126	Lesotho	11	2	34	11	14.5	122
127	Iraq	11	2	28	16	14.3	103
128	Sierra Leone	2	1	31	23	14.3	89
129	Malawi	6	2	32	17	14.2	121
130	Afghanistan	6	1	31	18	14.1	101
131	Mali	7	1	33	13	13.5	99
132	Sudan	25	0	0	25	12.4	119
133	Myanmar	2	0	25	21	12.0	N/A
134	Madagascar	4	0	31	12	11.7	95
135	Burundi	1	0	26	15	10.6	124
136	Guinea	2	2	22	6	7.9	126
137	Niger	2	1	16	7	6.5	125

Sources: UNCTAD analysis of data cited in table 1.

Annex table 3. Internet shoppers

Economy	As % of Internet users	As % 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	[2013]	Shop, 18+, source: Caucasus Barometer.
Australia	76	63	11.67	[2013]	Purchase or order goods or services, last year, Age 15+, source: ABS.
Austria	65	53	3.84	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Azerbaijan	3	1	0.07	[2013]	Shop, 18+, source: Caucasus Barometer.
Bahrain	23	20	0.21	[2014]	Purchasing or ordering goods or services, Age 15+, source: TRA.
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	63	54	4.98	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Brazil	35	19	32.98	[2014]	Buy products or services in last year, Age 10+, source: CGI.br
Bulgaria	28	15	0.96	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Canada	56	47	13.53	[2012]	Ordered goods or services online, 16+, source: Statistics Canada.
Chile	35	26	3.66	[2014]	Buy a product online, 18+, last year, source: Pew.
China	56	27	361.35	[2014]	Online shopping; last year, Age 6+; source: CNNIC.
Colombia	6	3	1.27	[2014]	Buy/order products or services, Age 5+, source: DANE.
Costa Rica	11	5	0.19	[2012]	Buy products or services in last 3 months, Age 5+, source: INEC.
Croatia	40	28	0.99	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Cyprus	38	26	0.25	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Denmark	81	78	3.65	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Egypt	3	1	0.79	[2014]	Buy a product online, 18+, last year, source: Pew.
El Salvador	8	3	0.12	[2014]	Buy a product online, 18+, last year, source: Pew.
Estonia	57	48	0.53	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Finland	53	49	1.22	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
France	56	43	22.76	[2014]	Buy from Internet, last year, Age 15+, source: INSEE.
Georgia	2	1	0.03	[2013]	Shop, 18+, source: Caucasus Barometer.
Germany	70	60	41.02	[2014]	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	40	25	2.36	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Honduras	5	1	0.09	[2014]	Buy products or services, last 3 months, entire population, source: INE.
Hong Kong (China)	26	21	1.31	[2014]	Online shopping, Age 15+, source: Census & Statistics Department.

Economy	As % of Internet users	As % of population	Total, millions	Latest data	Note
Hungary	42	32	2.69	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Iceland	68	67	0.17	[2014]	Internet purchase, last year, Age 16-74; source: Statistics Iceland.
India	22	3	22.00	[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.
Iran, Islamic Republic of	10	3	2.07	[2013]	Purchasing or ordering goods or services, Age 6+, source: SCI.
Ireland	62	50	1.79	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Israel	42	30	1.49	[2013]	Shopping, Age 20+, source: CBS.
Italy	34	20	11.22	[2014]	Bought or ordered goods or services for private use, 14+, last year, ISTAT.
Japan	57	47	57.20	[2014]	Buying / exchanging goods and services; Age 16+; 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	51	43	21.09	[2014]	Internet Shopping users, Age 12+, source: KISA/ISIS.
Latvia	44	33	0.57	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Lithuania	36	26	0.65	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Luxembourg	77	73	0.31	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Macedonia, The Former Yugoslav Republic of	16	11	0.19	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Malaysia	15	9	1.93	[2013]	Purchasing and ordering goods and services, Age 15+, source: DOS.
Malta	63	46	0.17	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Mauritius	14	7	0.07	[2014]	Purchase of goods and/or services, Age 12+, source: Stat Mauritius.
Mexico	4	2	1.95	[2014]	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	12	7	0.04	[2014]	Internet purchase, last year, Age 16-74, source: MONSTAT.
Morocco	7	4	1.12	[2014]	Purchase or order goods or services, Age 12-65, source: ANRT.
Netherlands	77	72	10.40	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
New Zealand	66	54	1.86	[2012]	Online purchases in the last 12 months, Age 15+, source: StatNZ.
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	76	3.16	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Oman	11	8	0.22	[2013]	Purchasing or Ordering Goods or Services, Age 5+, last year, TRA.
Philippines	7	3	1.84	[2014]	Buy a product online, 18+, last year, source: Pew.

Economy	As % of Internet users	As % of population	Total, millions	Latest data	Note
Poland	49	33	9.95	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Portugal	39	25	2.26	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Qatar	18	15	0.26	[2013]	Purchasing or ordering goods or services, Age 15+, source: ictQATAR.
Romania	17	9	1.54	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Russian Federation	36	24	26.03	[2014]	Buy a product online, 18+, last year, source: Pew.
Saudi Arabia	25	23	4.90	[2014]	Purchase or place orders for product(s) and/or service(s), Age 12+, source: CITC.
Serbia	32	20	1.08	[2014]	Bought/ordered goods or services, last year, Age 16-74; source: Statistical Office of the Republic of Serbia.
Singapore	57	46	1.48	[2013]	Online purchase, 15+, IDA.
Slovak Republic	58	46	2.14	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Slovenia	50	36	0.63	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
South Africa	14	6	2.30	[2014]	Buy a product online, 18+, last year, source: Pew.
Spain	49	37	12.86	[2014]	Internet purchase, Last year, Age 16-74; source: INE.
Sweden	75	70	4.93	[2014]	Internet purchase, last year, Age 16-74; source: EUROSTAT.
Switzerland	67	56	3.93	[2014]	Purchase or order something, Age 15+, source: OFS.
Taiwan, Province of China	30	23	4.81	[2014]	Online shopping, broadband Internet users, Age 12+, source: TWNIC
Tanzania, United Republic of	15	3	0.77	[2014]	Buy a product online, 18+, last year, source: Pew.
Thailand	6	2	1.39	[2014]	Online purchase goods & services, Age 6+, source: TNSO.
Turkey	31	17	9.30	[2014]	Bought goods or services over the Internet, Age 16-74, source: Turkstat.
United Arab Emirates	16	14	1.05	[2012]	Purchasing or ordering goods or services, last 3 months, Age 15-74, source: TRA.
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 Kingdom	85	74	36.47	[2014]	Internet purchasing (last 12 months), Age 16+; source: ONS.
United States	79	69	166.85	[2013]	Users who purchase online; Age 18+; source: Digital Future Study.
Venezuela, Bolivarian Republic of	1	1	0.11	[2012]	Purchases or orders of goods or services, Age 7+; source: INE.
Viet Nam	26	11	7.44	[2014]	Buy a product online, 18+, last year, source: Pew.



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