



Policy Brief

Developing E-commerce in CAREC Countries: Current State and Challenges in Infrastructure Development

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Table of Contents

EXECUTIVE SUMMARY	5
1 BACKGROUND	5
2 CONTEXT	6
3 E-COMMERCE INFRASTRUCTURE IN THE CAREC REGION	6
3.1 INTERNET INFRASTRUCTURE.....	6
3.2 PAYMENTS.....	9
3.3 LOGISTICS.....	10
3.4 E-COMMERCE MARKET	12
4 CONCLUSIONS	15
5 REFERENCES	17

Abbreviations and Acronyms

ADB	Asian Development Bank
ATM	automated teller machine
CAREC	Central Asia Regional Economic Cooperation
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
EU	European Union
GSMA	mobile industry trade association
ISP	internet service provider
IXP	internet exchange point
OECD	Organisation for Economic Cooperation and Development
POS	point of sale
PRC	People's Republic of China
SDG	sustainable development goal
UNCTAD	United Nations Conference on Trade and Development

Executive Summary

While numerous studies have measured the benefits of e-commerce, the COVID-19 pandemic has dramatically illustrated its importance. Many countries have imposed quarantine measures and consumers and businesses with access to the internet were able to buy and sell goods in a safe way. This experience highlights the convenience of e-commerce in addition to saving time and money for consumers and reducing barriers to trade for online sellers. E-commerce also creates opportunities for underrepresented and vulnerable groups such as women, people with disabilities, and those living in rural areas.

This policy brief examines the state of the e-commerce infrastructure in the Central Asia Regional Economic Cooperation (CAREC) region. The technical ability to access the internet is generally high in most CAREC countries. However, there is a gap between people with theoretical access and those actually using the internet, owing to barriers such as digital literacy and affordability. The study finds that the number of enterprises engaging in e-commerce is low in the CAREC region, particularly among small and medium-sized enterprises. Core data infrastructure including internet exchange points, data centers, and cloud computing—which are also important for payments and logistics—is underdeveloped in most CAREC countries.

With e-commerce, payment systems need to adapt to near real-time clearance with the capacity to handle a growing number of transactions. While bank account penetration has grown rapidly in the CAREC region over the last decade, there remains a gap in financial inclusion. Most CAREC countries are promoting digital payment since it facilitates government disbursements. Further, COVID-19 has demonstrated how the use of digital payments can reduce physical interaction. Digital payments are increasingly migrating to digital wallets on smartphones. Hence, countries need to ensure that smartphones are made affordable. Some CAREC countries also need to liberalize regulations to allow payment system providers to act as intermediaries for consumers and merchants.

Logistics, particularly fulfillment and delivery, are essential parts of the e-commerce process. Most CAREC members have a high level of home parcel delivery coverage, which has become more relevant during the COVID-19 pandemic. Some are now turning to improving the reliability and speed of package delivery. One weakness in the CAREC region is the lack of fulfillment services, especially integrated warehousing and delivery needed by online merchants. Automation of trade documentation including use of single windows could enhance cross-border e-commerce but has yet to have a notable impact on improving the time and money spent on customs clearance.

One striking observation is the large gap in the CAREC region between the number of internet users that have the potential to buy something online and those that actually do. This is caused by factors such as trust and a lack of e-commerce shops. Another observation is the lack of official information on e-commerce markets in CAREC, hindering the ability for policy makers to design appropriate strategies. Further, very few CAREC countries have dedicated industry associations to promote e-commerce.

1 Background

Numerous studies have quantified the benefits of e-commerce (ADB and ESCAP 2018, UNCTAD 2015, Lendle et al, 2012). For consumers, impacts include lower costs, convenience, and saving time. Barriers to trade are lowered for online sellers. New jobs are created in areas ranging from catalog creation to photography and digital marketing. E-commerce creates opportunities for underrepresented and vulnerable groups such as women, people with disabilities, and those living in rural areas (World Bank and Alibaba 2019). E-commerce also speeds up the transition to a digital economy as participants become familiar with digital payments and ordering over the internet. Shopping online can also be a lifeline during situations such as the COVID-19 pandemic.

The supply and use of infrastructure relevant for e-commerce has developed at a different pace globally across countries as well as for members of the Central Asia Regional Economic Cooperation (CAREC) region. The

different types of e-commerce infrastructure have also grown at a different pace, with some CAREC countries ahead in some aspects of e-commerce infrastructure but behind in others.

This study is part of the CAREC Integrated Trade Agenda 2030's objective to promote e-commerce development (ADB 2019) and builds upon the phase 1 study on Regulatory Frameworks for E-Commerce Development (CAREC Institute [CI] 2020). Key recommendations that can help CAREC countries improve their e-commerce readiness are shown in the concluding chapter and elaborated further in the full report to be jointly published by ADB and the CI.

2 Context

Infrastructure, from both a supply and demand perspective, is fundamental for e-commerce. UNCTAD (2015) elaborates a framework for e-commerce and how the different transactional steps map to different parts of the e-commerce infrastructure relevant for this study. Three factors influence the scope for such transactions: internet access, mechanisms for paying for goods and services ordered online, and effective solutions for their fulfillment (namely, storage and delivery). Internet access has two market perspectives: on the demand side the purchaser needs access to place an order, while on the supply side the merchant selling products also needs access to host their shop.

Infrastructure is not a panacea and other supporting elements must be in place for successful online trading. Supply availability in the form of online shops that provide products that consumers in a country are interested in buying is of critical importance and this needs to be available in local languages. Laws and regulations are also essential. In addition, social and cultural factors such as trust or a preference to shop in a physical store also influence e-commerce and require appropriate strategies to be overcome.

3 E-commerce infrastructure in the CAREC region

This chapter examines the key infrastructure needed for electronic commerce.

3.1 Internet infrastructure

Internet infrastructure is essential for e-commerce. Buyers need to have access to the internet to place an order online and sellers need the internet to host their online shop. Telecommunications infrastructure such as wireless networks, fiber optic backbones, data centers, and cloud computing are also critical for payments and logistics.

Last mile connectivity refers to the infrastructure component providing people and businesses with internet access. Wireless is the most prevalent network for internet connectivity and the population coverage of mobile broadband networks is used as the SDG tracking indicator for measuring universal internet access.¹ The gap concept is a helpful framework for highlighting the relationship between having no access, having access but not using the internet, and those using the internet. The size of the gaps in different countries can highlight the extent to which access or use is a barrier. Globally the coverage gap was judged by GSMA (2020) to be 7% in 2019, the use gap 44%, while those using the internet was 49%. Notably, the use gap is over six times higher than the coverage gap, illustrating that getting those already covered to use the internet is a far bigger challenge than covering the remaining populations.

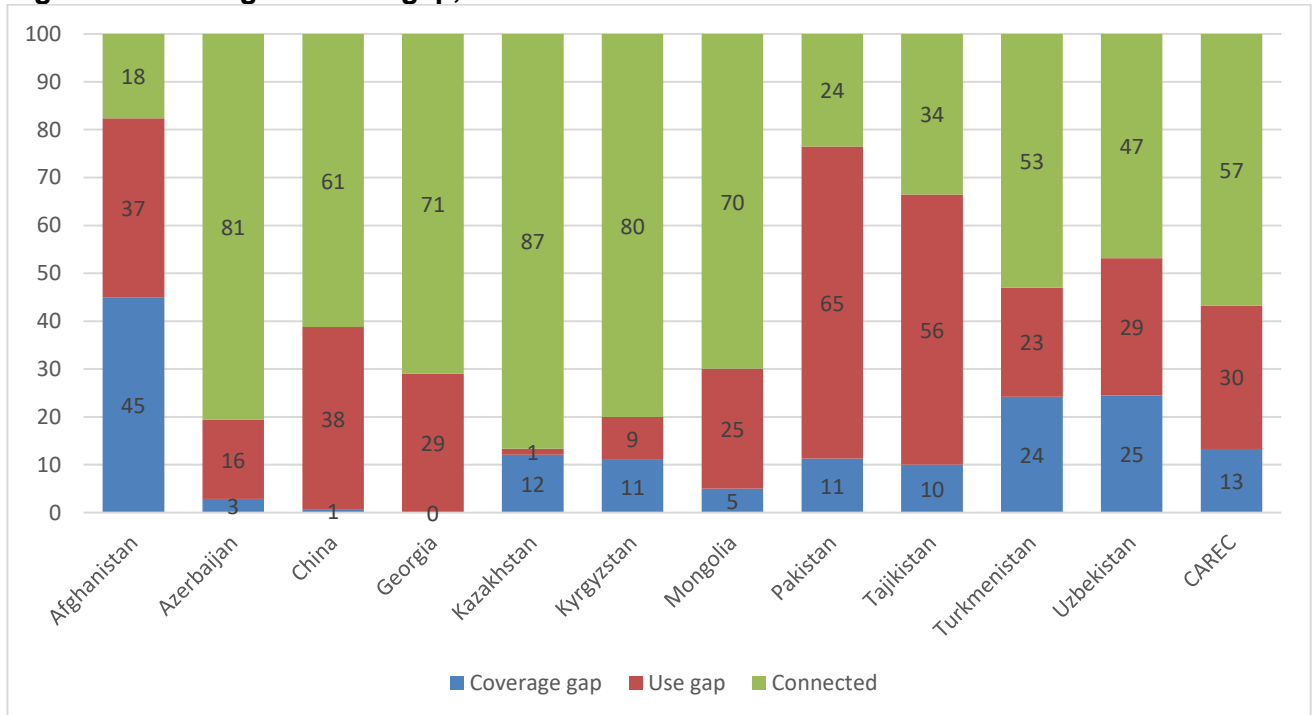
Among CAREC countries there are notable differences in the types of gap. Countries such as Afghanistan, and to a lesser extent Turkmenistan and Uzbekistan, have relatively large mobile broadband coverage gaps that need to be filled to enable greater possibility for public access to the internet. In many of the other CAREC countries, the use gap—having access to the internet but not using it—is more prevalent. For instance, in the

1. Target 9.c calls for 'Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet...' The tracking indicator is the 'Proportion of population covered by a mobile network, by technology.' <https://sdgs.un.org/goals/goal9>

People's Republic of China (PRC), 38% of the population is covered by the internet but do not use it; figures are even higher for Pakistan and Tajikistan.

Kazakhstan is an interesting case where virtually everyone with access to the internet uses it. One reason is the high level of education: 98.6% of the population 25 years and older has at least some secondary education.² In order to reach the remaining uncovered areas, Kazakhstan's three mobile operators are partnering on the 250+ project to extend high-speed internet to all villages with a population of 250 or more, which will raise coverage by 3 percentage points.³ Such initiatives, as well as enabling more competition and the use of universal service funding, can help to lower coverage gaps in the CAREC region.

Figure 1: Coverage and use gap, 2019 or latest available



Note: Coverage based on mobile broadband signal (that is, at least 3G).

Source: UN SDG database, national surveys.

There is a large gap between CAREC countries (with available data) and more developed regions in business use of the internet for e-commerce activities. While 20% of European Union (EU) enterprises sell online, this figure is much lower in CAREC countries. This is detrimental for the supply side of e-commerce in CAREC as it suggests there will be fewer domestic online shops. Another observation is that some CAREC countries have developed their own export-oriented portals for small and medium-sized enterprises (SMEs) to sell online, whereas others train SMEs how to use popular global B2B marketplaces. The latter option might be a better solution since global marketplaces has wider visibility.

International bandwidth is a critical part of data infrastructure, enabling data to be sent to and retrieved from anywhere in the world. For CAREC landlocked countries without access to submarine cables, national backbones that cross borders play the same gateway role into the World Wide Web. There are vast differences in the availability of international bandwidth in the CAREC region. Georgia stands out with the largest relative bandwidth, some three times higher than that of Azerbaijan, which has the second largest bandwidth per capita. Georgia is one of the few CAREC countries with access to submarine cables owing to its location on the

2. <https://hdr.undp.org/en/content/statistical-data-tables-7-15>

3. Veon. 2020. 'Beeline Kazakhstan signs network sharing partnership in support of rural broadband initiative.' *Media Release*, 6 October. <https://www.veon.com/media/media-releases/2020/beeline-kazakhstan-signs-network-sharing-partnership-in-support-of-rural-broadband-initiative/>

Black Sea. While the PRC has the highest absolute amount of international internet bandwidth, it ranks only fifth in the CAREC region in international bits per person. This is because the PRC has a well-developed domestic infrastructure with less need to access international sites, reinforced by government restrictions on access to certain overseas content. The example of the PRC is relevant as it illustrates that a country will not need as much international bandwidth if it has a robust domestic data infrastructure. Central Asian CAREC countries have the lowest relative bandwidth owing to being not far from direct connection to major international transit points and regulatory bottlenecks over access to cross-border connections. A recent analysis of cross-border connectivity in Central Asia found that there are just a few networks for transporting national and international traffic (RIPE 2020). A healthy internet backbone is characterized by dense, deeply interconnected networks with multiple paths and interconnection points. The situation in Central Asia where there are only a handful of backbone networks diminishes internet stability through single points of failure.

Internet exchange points (IXPs) are a core component of data infrastructure. IXPs are facilities where internet service providers (ISPs), content providers, and others come together to exchange their data traffic (peering). This is less costly than using international bandwidth since traffic does not need to be sent over costly international links only to return. In addition, ISPs do not need to make peering agreements with each potential partner. IXPs also improve quality since they are situated closer to the user and hence have less latency. IXPs have not been largely successful in CAREC countries despite their potential to save on international transit, a key expense in landlocked countries. Three do not have an IXP (Azerbaijan, Tajikistan, and Turkmenistan). In CAREC countries with IXPs, they exchange relatively little traffic. Few IXPs in the CAREC region have attracted a diverse blend of participants beyond ISPs such as government agencies, content providers, and cloud services. IXPs in the CAREC region are beset by several challenges such as government operation, which can inhibit international content and cloud providers from participating, and lack of participation by incumbent ISPs to protect their dominant market position. In other regions, IXPs have bloomed as larger operators realize the economic benefits of peering at the IXP to create better and faster connections at lower costs. This, in turn, attracts big content companies and cloud providers, adding even more value to the IXP and enhancing the development of a country's digital economy.

Data centers are a vital part of core internet infrastructure. They host local content, including e-commerce shops. Data centers with IXP participants can lower internet transmission costs and improve quality by reducing delays associated with sending internet traffic overseas. Data centers can also function as an 'on ramp' for accessing cloud services, which lowers costs and improves performance. The lack of local data centers means that e-commerce shops have to use overseas hosting, adding to transmission costs and increasing latency. Outside the PRC, the availability of internet-enabled data centers is limited in CAREC countries. Of the few data centers in the CAREC region, many do not fit the description of carrier-neutral, privately operated colocation centers.

E-commerce merchants can also use the cloud for their online store. The advantage is that storage requirements can be scaled as needed, lowering costs. Also, major cloud providers have high security and redundancy. In addition to storage, cloud providers offer applications including those specific to creating e-commerce shops, as well as for processing and analyzing large amounts of big data. Hence running an e-commerce shop over the cloud can be quicker and cheaper than other solutions. Outside the PRC, there are no native cloud services in the CAREC region. Neither are there direct on ramps to cloud services. While CAREC countries can access public cloud services, speeds will be slower, use more costly, and there are no guarantees that the cloud provider meets compliance requirements in the jurisdiction its services are accessed from.

Cloud services are important not only for hosting e-commerce shops but also for logistics services during the fulfillment process as well as other big data and analytics applications. Notably, Alibaba—one of the PRC's largest e-commerce companies—is also one of the largest cloud providers in the world. The company runs all its e-commerce business from the cloud and uses the cloud extensively for sharing data in its fulfillment and delivery operations.

3.2 Payments

Payment systems enable payment transactions between users and merchants within a country and across national borders. National payment systems process bank transfers between accounts and debit card transactions, while international payment systems process credit cards. From the supply side, the underlying hard infrastructure consists of telecommunication links between web shops and banks and to payment infrastructure such as automated teller machines (ATMs) and point of sale (POS) terminals as well as software to handle the processing and security of transactions. In the case of e-commerce, the seller's online shop is connected to the internet to present the order, whereas the payment details are provided from the buyer's internet connection. From the demand side, the payment 'infrastructure' consists of physical payment cards and increasingly mobile phone-based payment apps.

The most critical aspect for payment systems as a consequence of e-commerce is their ability to handle a growing number of transactions in real time. While payment card processing is typically carried out quickly, bank transfers have been slower, particularly international transfers. The rapidity of bank transfers is becoming more important as users link their bank accounts rather than payment cards to digital wallets on smartphones.

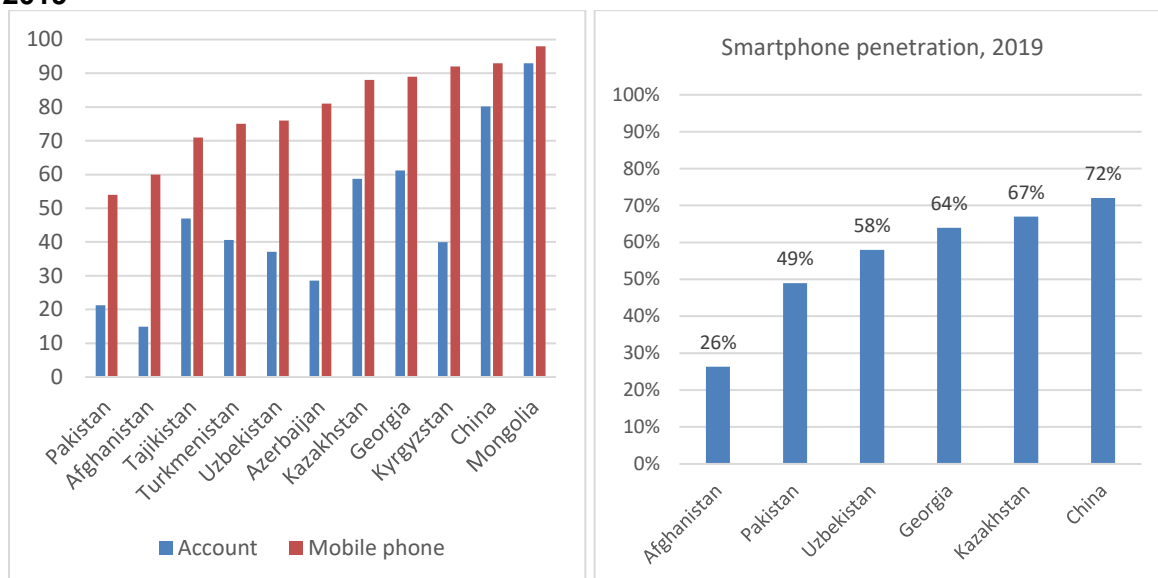
On the demand side, bank accounts have increased sharply across the CAREC region according to the World Bank's FINDEX surveys. In 2011 half the CAREC countries had an account penetration among those 15 years and older of more than 15%; by 2017 half were over 41%. Extrapolation from the annual average growth of 11% between 2011 and 2017 suggests that the average penetration of bank accounts in the CAREC region in 2020 was 64%. There is a considerable difference in the availability of bank accounts throughout the CAREC region. While 93% of Mongolians aged 15 years and older had an account in 2017,⁴ the equivalent figure for Afghanistan was just 15%. It is also notable that although debit cards can be easily linked to an account to enable cashless payments, this was not universally utilized in all CAREC countries in 2017. Nevertheless, debit card ownership is increasing owing to national payment card schemes and the growing disbursement of government salaries and benefits into accounts. Further, COVID-19 has demonstrated the usefulness of making digital payments, which eliminates physical interaction, as a way to reduce the spread of the disease. Other than Mongolia and Pakistan, traditional mobile money schemes have not added to the number of accounts, although mobile banking used on smartphones has been increasing throughout the CAREC region. The availability of mobile phones and smartphones dictates the extent to which mobile payment apps could be made available in the CAREC region. Mobile phone ownership far outweighs account ownership, suggesting that there is considerable scope to use mobiles to increase banking penetration and expand payment options (Figure 2, left). Of the six CAREC countries with data on smartphones, four of them have levels exceeding half the population (Figure 2, right). One challenge with increasing smartphone availability is their affordability.⁵ In Pakistan the price of smartphones is the highest in South Asia, owing to various taxes.⁶

4. Mongolia's high level of financial inclusion dates back a number of years. See: David Wigan. 2014. 'Mongolia: Bringing banking to the steppes.' *Euromoney*, 17 July. <https://www.euromoney.com/article/b12kk01bxjm99r/special-report-mongolia-bringing-banking-to-the-steppes>

5. Alliance for Affordable Internet. 2020. *From luxury to lifeline: Reducing the cost of mobile devices to reach universal internet access*. Web Foundation. https://a4ai.org/wp-content/uploads/2020/08/Alliance-for-Affordable-Internet_Device-Pricing_PUBLIC.pdf

6. Taxes related to smartphones include SIM card taxes, customs duties, activation charges, additional value-added taxes, handset fees, and usage taxes. See: GSMA. 2020. *Pakistan: Progressing Towards a Fully Fledged Digital Economy*. <https://www.gsma.com/asia-pacific/resources/digital-pakistan-report/>

Figure 2: CAREC mobile phone and account penetration, 2017 and smartphone penetration 2019



Source: World Bank, MTN, GSMA.

Many merchants in the CAREC region, particularly SMEs, face problems such as stringent rules and the high costs of opening a business bank account that would allow them to accept online payments. Sellers face another barrier in having to integrate their web shop with different payment systems. In order to overcome these barriers, some CAREC countries allow payment system providers to provide backend payment processing for merchants.

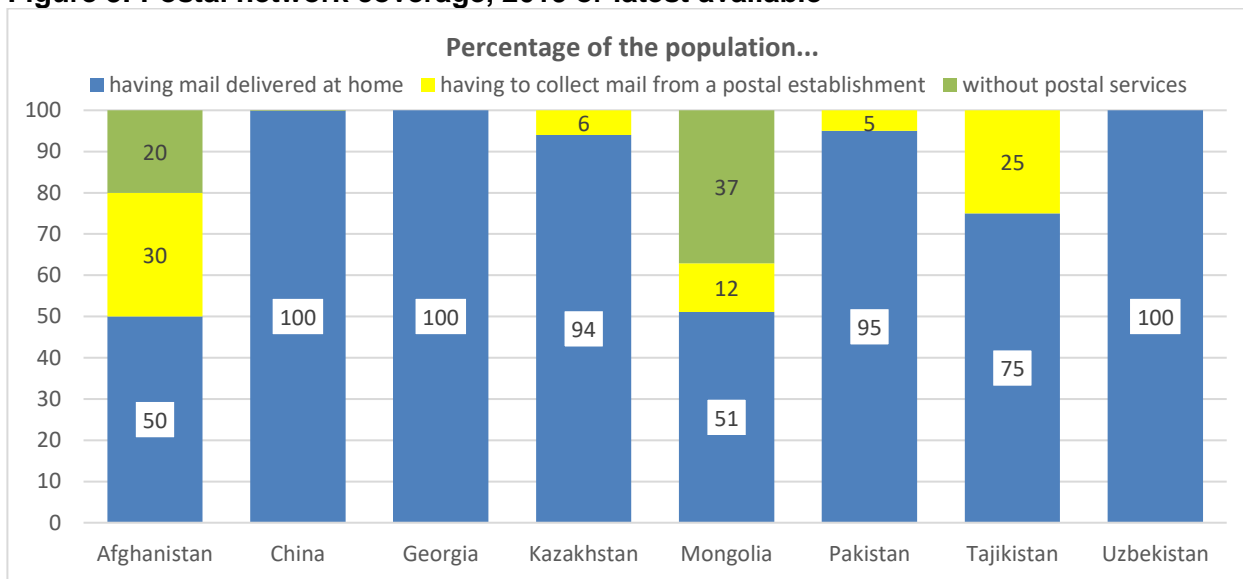
3.3 Logistics

Fulfillment and delivery are critical parts of the e-commerce process. Customers expect to receive the goods they ordered in a timely manner. Merchants need locations to store inventory that is integrated with delivery. Customs procedures need to be efficient and transparent to facilitate cross-border e-commerce.

Postal coverage is generally high in most CAREC countries (Figure 3). The PRC, Georgia, and Uzbekistan report 100% of their population having mail delivered to their home. Kazakhstan and Pakistan also have a high rate of home delivery at 94% and 95% respectively, and Kazpost delivers periodicals to remote settlements using drones.⁷ Postal coverage is ubiquitous except in Afghanistan and Mongolia, where the security situation in the former and the low population density over a large territory in the latter are challenging obstacles.

7. Prime Minister of the Republic of Kazakhstan. 2020. 'In 2019, purchases in online stores in Kazakhstan amounted to 422 billion tenge.' *News*, 18 February. <https://primeminister.kz/en/news/v-2019-godu-obem-pokupok-v-kazahstanskih-internet-magazinah-sostavil-422-mlrd-tenge>

Figure 3: Postal network coverage, 2019 or latest available



Note: No data for Azerbaijan, Kyrgyzstan, or Turkmenistan.

Source: UPU.

In addition to reach, delivery networks need to be reliable, relevant, and resilient. The Integrated Index for Postal Development (2IPD), published by the Universal Postal Union, incorporates these dimensions to provide a comparable view of postal development across countries.⁸ The index provides a benchmark performance score (from 0 to 100) for 170 countries. When it comes to postal development in the CAREC region, the results display a high degree of diversity. Only the PRC, with a score of 66, is listed among the so-called 'Postal Champions.' It means that the country's postal development is among the top 20% in the world. Georgia, Kazakhstan, Azerbaijan, and Pakistan (with scores between 35-60) are in an upper-intermediate level of performance. Kyrgyzstan, Uzbekistan, and Mongolia received scores lower than the global median. Afghanistan's postal development is at a very low level.

Merchants need storage facilities for their products with seamless integration to delivery networks. Leading Chinese e-commerce companies have built their own logistics operations to manage large inventories and meet customer demand for rapid delivery. For instance, Alibaba operates Cainiao Network which provides merchants with real-time access to data to manage their inventory and warehousing, for consumers to track their orders, and for express courier companies to optimize delivery routes. In Pakistan the country's largest online retailer, Daraz, is owned by Alibaba and is drawing on the Chinese e-commerce giant's expertise to enhance logistics.⁹ Daraz's platform offers 15 million products and in order to ensure timely delivery the company optimizes delivery routes and digitized its warehouses in Karachi, Lahore, and Islamabad. JD.com began investing in its nationwide fulfillment infrastructure in 2007 using smart logistics and automation technologies, such as intelligent hardware, robotics, voice recognition, computer vision, and artificial intelligence. Services include warehousing management, storage, long-haul transportation, express and on-demand delivery, and cold-chain and cross-border services.

Few CAREC countries have achieved a high level of warehouse and delivery integration for their e-commerce businesses. Most online shops are small without large inventories and in online marketplaces, logistics and delivery are often the responsibility of the merchant, further fragmenting scale opportunities. Kazakhstan and Pakistan are the only other CAREC countries besides the PRC where there is evidence of logistics as a service

8. Universal Postal Union (UPU). 2020. *Postal Development Report 2020*. <https://upu.int/en/Publications/2IPD/Postal-Development-Report-2020>

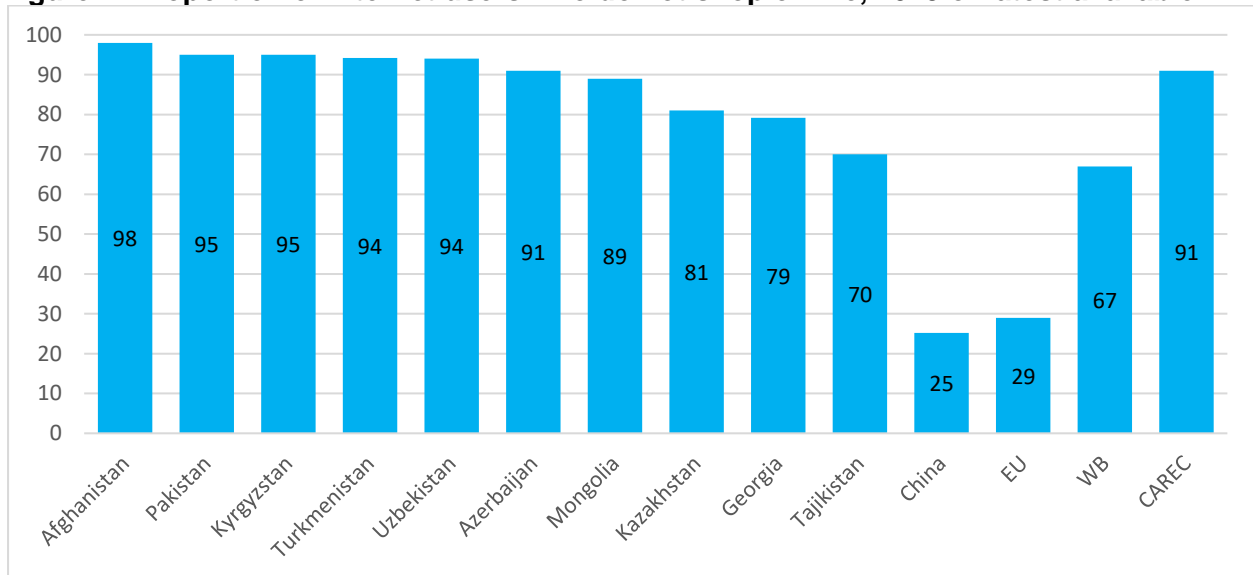
9. 'Daraz's robust logistics and warehousing ecosystem boosts growth of Pakistan's Ecommerce landscape: Introducing Dus Dus Sale.' *The News International*, 20 October 2020. <https://www.thenews.com.pk/latest/728342-daraz-robust-logistics-and-warehousing-ecosystem-boosts-growth-of-pakistans-ecommerce-landscape-introducing-dus-dus-sale>

platform for e-commerce companies. TCS, the largest courier company in Pakistan, offers fulfillment as a service to e-commerce companies, with four warehouses and multiple delivery options.¹⁰ Kazpost has created three fulfillment centers where e-commerce shops can store goods in warehouses and then have them picked up and packed for delivery.¹¹ This lowers logistics costs for online stores, allows them to scale, and reduces delivery time.

3.4 E-commerce market

It is important to link the findings in the other sections (that is, internet infrastructure, payment, and logistics) to the actual use and development of e-commerce in CAREC. One striking observation is the large gap in the CAREC region between the number of internet users that could potentially buy something online and those that actually do. Only 2% of Afghanistan internet users shop online compared to 75% in the PRC. There are only five CAREC countries where more than 10% of internet users shop online. The rate of shopping in the CAREC region is low in comparison to a similar region such as the West Balkans, where a median of one third of internet users shop online compared to just 9% in the CAREC region.

Figure 4: Proportion of internet users who do not shop online, 2019 or latest available



Note: EU=European Union. WB = West Balkan median (Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia). The CAREC average refers to the median country value.

Source: National agencies, World Bank FINDEX, and Eurostat.

It is insightful to compile proxies for the different infrastructure areas discussed into an index to compare country e-commerce readiness. The UNCTAD B2C E-commerce Index measures an economy's preparedness to support online shopping (UNCTAD 2021). It consists of four indicators that are highly related to online shopping: account ownership, share of individuals using the internet, postal reliability, and secure internet servers (Table 1). The index allows countries to identify their strengths and weaknesses in facilitating e-commerce readiness in the country, be it poor delivery, few shopping options,¹² lack of an account, or limited internet access. Overall, CAREC is doing best in internet access with an average of 56% of the population using it. The other three indicators have relatively similar scores and are significantly lower than internet use.

10. https://www.tcscouriers.com/TCS/userfiles/file/ECOM_Flyer_A4_New_KV.pdf

11. <https://ff.post.kz/>

12. The secure server indicator may not be the best proxy for availability of online shops. See: Peña-López, I. 2015. 'A critique to UNCTAD B2C E-commerce Index' *ICTlogy*, 139, April. <https://ictlogy.net/review/?p=4299>

Table 1: UNCTAD B2C E-commerce Index, 2020

2020 Rank	Economy	Share of individuals using the internet (2019 or latest)	Share of individuals with an account (15+, 2017)	Secure internet servers (normalized, 2019)	UPU postal reliability score (2019 or latest)	2020 index value)	Index value change (2018-19 data)
47	Georgia	71	61	64	98	73.6	0.5
55	The PRC	61	80	54	85	70.1	1.3
60	Kazakhstan	87	59	63	64	68.2	-0.4
61	Mongolia	76	93	60	31	65.0	7.6
65	Azerbaijan	81	29	49	82	60.0	-1.8
97	Kyrgyzstan	80	40	47	11	44.3	8.0
107	Uzbekistan	30	37	50	30	37.0	-8.4
116	Pakistan	24	21	35	50	32.5	-1.2
121	Tajikistan	36	47	36	1	30.0	4.3
143	Afghanistan	18	15	29	7	17.1	-1.1
	Median	66	43	49	40	52	0.1
	Average	56	48	49	46	50	0.9

Note: No data available for Turkmenistan.

Source: UNCTAD (2021).

Among CAREC countries, the top performers in respect of their level of e-commerce infrastructure are Georgia, the PRC, Kazakhstan, and Mongolia. Imbalances across the four indicators of the index is stark. The PRC performs particularly well in account ownership and postal reliability but not internet use or secure servers.¹³ For both Kazakhstan and Georgia the share of individuals with an account is around 60% of the population and it is correlated with the share of individuals using the internet per se. Further work needs to be done to increase the share of populations in these indicators to increase e-commerce readiness. Azerbaijan is performing well in internet provision (81% of population use the internet) and in postal reliability, but only 29% own an account. Mongolia has the highest account ownership in CAREC but much lower postal reliability. Among the bottom three countries—Pakistan, Tajikistan, and Afghanistan—fewer than half the population use the internet, and fewer than half have an account and can pay for purchases online. Pakistan's highest value is for postal reliability, but Tajikistan and Afghanistan perform extremely low on that indicator. These imbalances between the different infrastructure components pose a challenge to successful e-commerce.

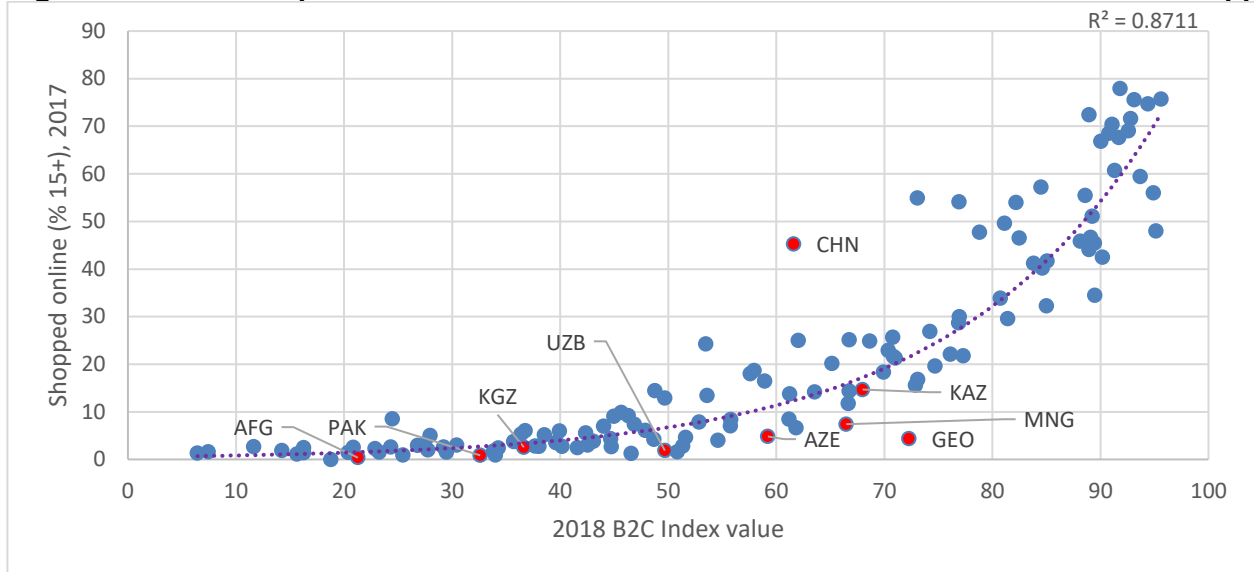
These results indicate that e-commerce related infrastructure—internet use, payments, shops, and logistics—needs to develop in a balanced manner for online shopping to grow. A notable trend in some CAREC countries has been the involvement of private banks in integrating these various components. In order to encourage the use of new payment tools and lending, pioneering banks in Georgia, Kazakhstan, Mongolia, and Tajikistan have created the largest online marketplaces in their countries. They have also developed delivery solutions by making arrangements with courier companies, nurturing delivery startups, and, in the case of Mongolia, purchasing a partial stake in the national postal operator. Integration of payments and delivery with the online shop is critical for success.

Presumably the higher the level of e-commerce infrastructure, the closer the link to online shopping. Globally, there is a close relationship between the UNCTAD B2C Index and the actual level of online shopping with a coefficient of determination (R^2) of 0.803 (Figure 5). However, it is notable that all the CAREC countries except the PRC fall below the regression line, meaning they have a lower level of online shopping than their level of

13. The country's sheer scale reduces the impact of these potential barriers: despite a relatively low proportion of internet users, China has the world's largest number of online shoppers and, although its relatively low penetration of secure servers might suggest scope for more online shops, it has several massive e-commerce companies that offer ample choice. Indeed, market dominance by a few Chinese e-commerce sites is concerning regulators who have launched an anti-monopoly investigation. See: <https://www.theguardian.com/business/2020/dec/24/china-targets-alibaba-with-anti-monopoly-investigation>

e-commerce infrastructure would predict. This suggests that there are other intangibles besides infrastructure not covered by the index affecting online shopping in the CAREC region, such as trust, scale, and availability of online shops.

Figure 5: Relationship between UNCTAD B2C E-commerce Index values and online shopping

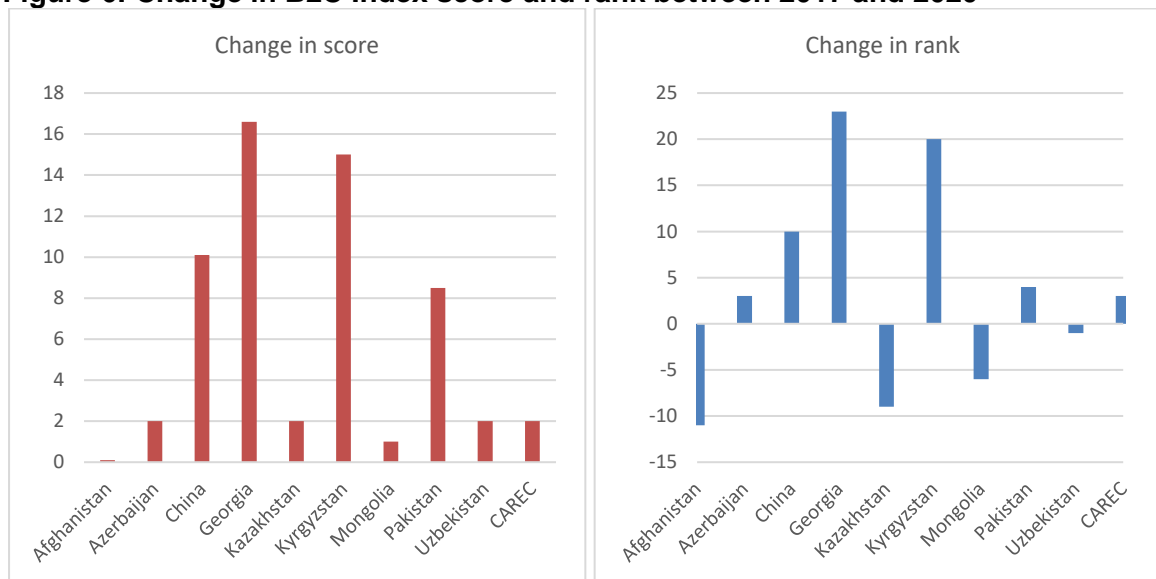


Source: UNCTAD.

E-commerce progress is also related to a country's level of economic development. Wang and Kang (2020) compare country resources to their B2C Index score to determine how efficiently they are performing. On this measure, Mongolia is exactly where it should be given its level of economic development, while Georgia is at 90%. On the other hand, countries such as Uzbekistan, Pakistan, Kyrgyzstan, and Afghanistan are all performing below the global economic average of 65%.

E-commerce infrastructure development in the CAREC region has progressed at a mixed pace over the last few years. Comparing the results of the 2017 and 2020 B2C Index shows that some countries have done extremely well over the period, while others have barely increased their infrastructure score and even declined in rank (Figure 6). Three countries experienced a double digit increase in their score (Georgia, Kyrgyzstan, and the PRC) while four countries saw their rank decline. Overall, the CAREC median increase in score was just 3 points and the change in rank just two positions, indicating the need to accelerate the pace of e-commerce infrastructure deployment in the region.

Figure 6: Change in B2C Index score and rank between 2017 and 2020



Note: CAREC average refers to median. Tajikistan and Turkmenistan are not included in the index for the two periods. Source: UNCTAD.

Official information on e-commerce is lacking in most CAREC countries. Only the PRC, Georgia, Kazakhstan, and Pakistan publish timely data on the number of online shoppers; only the PRC, Kazakhstan, and Pakistan publish information on the value of the e-commerce market; and only Kazakhstan publishes data on the type of products purchased, the means used to pay for the products, and how they are delivered (Committee on Statistics 2020). This lack of official information results in reliance on anecdotal information, which is often contradictory and incomplete. Policymakers cannot design impactful strategies to improve their e-commerce market and infrastructure without solid evidence. Although most CAREC countries have overall digital strategies, only three—Kazakhstan, Pakistan, and Uzbekistan—have specific e-commerce strategies. E-commerce associations can help to raise awareness of e-commerce and lobby government for favorable policies. They can also compile data on the dynamics of the e-commerce market in the absence of government statistics. For instance, while not strictly an e-commerce association, the chamber of commerce of Karachi in Pakistan has published a report on the potential benefits and challenges facing Pakistan's e-commerce market (KCCI 2019). Yet, only two CAREC members have e-commerce associations.

4 Conclusions

Most CAREC countries have made progress in developing the infrastructure needed for e-commerce over the last few years. However, this has evolved at an uneven pace with some further ahead than others. The different infrastructure components have also not always developed at an equal rate, resulting in some countries leading in some areas and lagging in others. For instance, while some are strong in payments and have a high level of financial inclusion, they have a low level of logistics. Successful e-commerce requires all of the different infrastructure components to be in place and integrated. Another challenge CAREC faces is that the supply of e-commerce infrastructure is not always aligned with demand. This is most conspicuous in the low level of online shopping compared to the number of internet users in the region, well below the world average. CAREC must address this mismatch between supply and demand.

Recent developments can provide a boost to e-commerce development in the region. The COVID-19 pandemic has led many new users to shop online. If they can be enticed to continue after the pandemic this would add to scale, making markets more attractive to investment in e-commerce infrastructure. Here, the case of Pakistan is illustrative. Despite having a relatively low number of internet users and shoppers, this nevertheless translates into a large number of online shoppers owing to the country's large population. This scale has attracted foreign investment into e-commerce marketplaces and payments. A second development is the emergence of financial institutions engaging in e-commerce activities. While there are various shortcomings

in the region constraining the takeup of e-commerce, a main one is the lack of online shops, which is inhibiting demand. In order to encourage the use of new payment tools and lending, pioneering banks in Georgia, Kazakhstan, Mongolia, and Tajikistan have created the largest online marketplaces in their countries. They have also developed delivery solutions, by making arrangements with courier companies, nurturing delivery startups and, in the case of Mongolia, purchasing a partial stake in the national postal operator. This integration of payment and delivery with the online shop is critical for e-commerce success.

Some of the recommendations include:

- Improving **internet infrastructure**—such as, expanding last-mile coverage; launching 5G networks; enhancing digital literacy; promoting enterprise e-commerce use; developing business-oriented infrastructure; and establishing backbone networks, internet exchange points, data centers, and cloud.
- There is a need to widen financial inclusion, enhance **payment system** capacity and speed, increase the availability and use of smartphones, and enable merchant accounts or payment procedures and consider regional payment cards to improve payment systems.
- **Logistics** require the expansion of home delivery coverage, increasing the quality of delivery networks, improving logistics services, addressing cross-border trade constraints and, as much as possible, the adoption of a uniform minimum value.
- In developing the **e-commerce market**, it is important to develop an e-commerce strategy, improve the measurement of e-commerce markets, and support the establishment of e-commerce associations and funding for startups and small business ecosystems.

There is significant potential for e-commerce in the CAREC region if governments—with the help of the private sector and development partners such as the CAREC Program and UNCTAD's e-Trade for all—can forge the required policies and strategies to improve their domestic and cross-border e-commerce and promote digital trade.

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