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Benchmarking adoption of e-commerce across the G20 members

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ADB Working Paper Series

**BENCHMARKING ADOPTION
OF E-COMMERCE ACROSS
THE G20 MEMBERS**

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Abstract

The COVID-19 situation has accelerated the adoption of e-commerce across the world. While, globally, there has been an increase in the share of e-commerce in total retail sales, there are variations in e-commerce adoption across countries and the difference is obtrusive when one compares developed countries and emerging market economies. This paper undertakes a comparative assessment of e-commerce adoption by the G20 countries and, in doing so, it benchmarks the G20 members across different indicators that determine e-commerce adoption. Based on secondary data, the paper presents some stylized facts, discusses the regulatory scenario with respect to e-commerce in G20 countries and identifies key constraints to e-commerce adoption in the comparatively poor performers.

It is found that, overall, most emerging market economies are not very well prepared to support e-commerce adoption. Rather, compared to the developed countries, emerging market economies perform poorly on indicators related to access and use of digital technology, financial inclusion, postal reliability, and electronic security. The paper found that the emerging market economies are severely affected by inadequate infrastructure, digital illiteracy, and low use of digital payments by enterprises.

Whereas there is no dearth of regulations on e-commerce business, nevertheless a uniform approach for regulating e-commerce operations is missing in the case of some countries. Moreover, different countries have different positions with respect to data privacy and protection. The paper recommends that G20 members should work together to bridge the adoption gap, enhance micro, small and medium enterprises (MSMEs) participation in e-commerce through enhanced financial assistance, build cooperation for adopting common standards, and encourage countries to adopt national policies with the vision to promote e-commerce.

Keywords: MSME, G20, digital, e-commerce

JEL Classification: F02, F42, F53, G53, L81

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1. INTRODUCTION

Digital transformation of business activities in an economy is reflected in the share of goods and services sold online (Hoekman et al. 2021). In 2021, around 2.14 billion people shopped online.¹ In the same year, electronic commerce (e-commerce) accounted for nearly 20% of the total retail sales worldwide, up from 7.5% in 2015 and 13.8% in 2019.² The COVID-19 situation accelerated the adoption of e-commerce. While, globally, there has been an increase in the share of e-commerce, nevertheless there are variations in e-commerce adoption across countries and the difference is obtrusive when one compares developed countries and emerging market economies. For instance, within the Group of 20 (G20), the share of e-commerce in total retail sales in 2021 in the United Kingdom (UK) was about 24%, while in India it was about 5%.³ This variation culminates from several factors that influence e-commerce adoption and growth. This paper undertakes a comparative assessment of e-commerce adoption by the G20 countries, and in doing so, it benchmarks the G20 members across different indicators that may determine e-commerce adoption. Section 2 of the paper benchmarks e-commerce adoption by the G20 countries by comparing the current size of their e-commerce markets and their capacity to engage in the digital economy. It then discusses indicators affecting the adoption of e-commerce, both at the national level and at firm level. Section 3 introduces the secondary data source and data collected from these sources; Section 4 presents some stylized facts, comparing the G20 members on different indicators that may determine e-commerce adoption. Following the comparison, in Section 5 the paper discusses the regulatory scenario affecting the e-commerce sector across the G20 countries and then in Section 6 it identifies the key constraints to e-commerce adoption in the comparatively poor performers. Finally, in Section 7 the paper makes recommendations on the role of the G20 to promote e-commerce adoption in the G20 countries and Section 8 presents broad conclusions.

2. BENCHMARKING E-COMMERCE ADOPTION

The Organisation for Economic Co-operation and Development's (OECD's) "Guide to Measuring the Information Society"⁴ released in 2011, defines an e-commerce transaction as *the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders*.⁵ It further clarifies that the payment and delivery of the goods and services purchased through such means may not be online. Orders made over the web, extranet or electronic data interchange are included in the definition, while orders made over telephonic calls, facsimile, and manually typed emails are excluded. Thus, for e-commerce transactions to take place, a digital presence, especially access to the Internet, is necessary for both buyers and sellers and a digital divide may affect

¹ For details see <https://www.oberlo.in/statistics/how-many-people-shop-online#:~:text=With%20the%20rise%20of%20ecommerce,billion%20people%20in%20the%20world> [accessed on 20 June 2022].

² Statista database, accessible at <https://www.statista.com/statistics/534123/e-commerce-share-of-retail-sales-worldwide/> [accessed on 20 June 2022].

³ Statista database, accessible at <https://www.statista.com/study/57340/e-commerce-in-argentina/> [accessed on 20 June 2022].

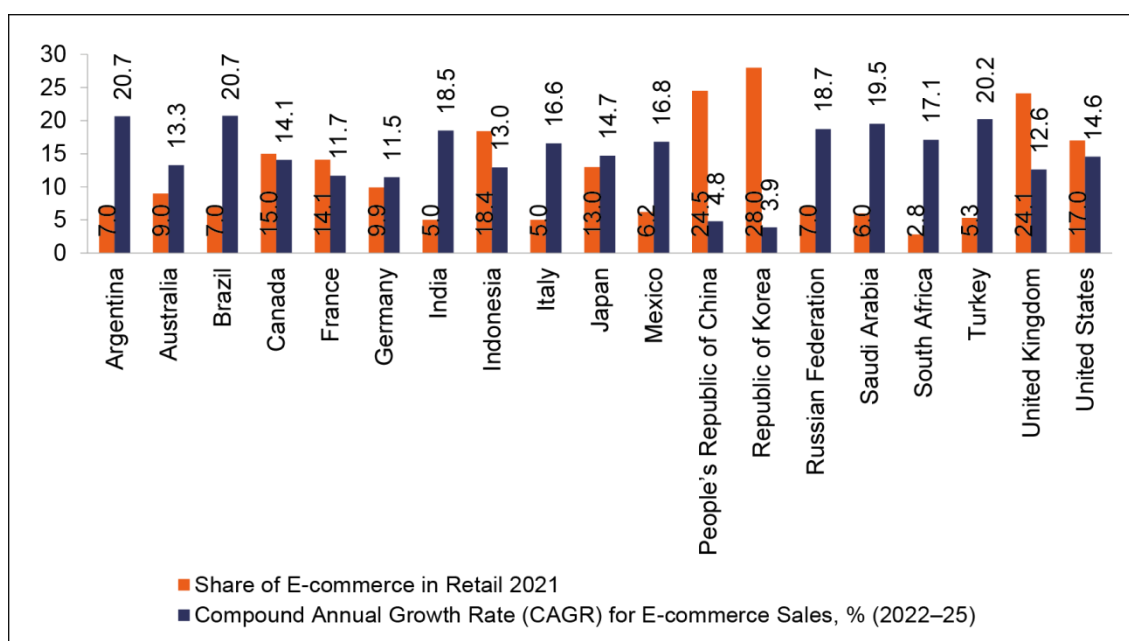
⁴ OECD (2011) accessible at <https://www.oecd.org/sti/economy/oecdguidetomeasuringtheinformation-society2011.htm> (accessed on 16 August 2022).

⁵ For details see <https://stats.oecd.org/glossary/detail.asp?ID=4721> [accessed on 22 June 2022].

e-commerce adoption within and across countries. This paper focuses on national readiness to adopt e-commerce, thereby assessing the indicators affecting e-commerce adoption for both buyers (households) and sellers (enterprises).⁶

Over the last few years, there has been a sharp increase in global e-commerce retail sales.⁷ In 2015, global e-commerce retail sales were valued at USD1.5 trillion. By 2021, there was a threefold increase in the e-commerce retail sales, which were valued at USD4.9 trillion, with a share of nearly 19% of the retail market worldwide.⁸ Over the next three years (2022–25), the global e-commerce market is expected to grow at a compound annual growth rate (CAGR) of 11.35%. Across the G20 countries there are wide variations in the share of e-commerce in total retail sales. The Republic of Korea had the highest share of e-commerce sales in the total retail sales in 2021, followed by the People’s Republic of China (PRC) and the UK. Compared to this, India, Italy, and Saudi Arabia had some of the lowest shares (see Figure 1).

Figure 1: Share of E-commerce in Retail and Growth Prospects for G20 Countries
(in percentage)



Note: The figure presents data for 19 G20 countries, excluding the European Union (EU).

Source: Statista database.

The figure also reflects that most G20 countries (except the Republic of Korea and the People’s Republic of China [PRC]) are expected to exhibit growth higher than the global average.⁹ In particular, the emerging market economies, including South Africa, India, Brazil, and Argentina, that at present have a low share of e-commerce in retail sales have a high growth potential over the next three years.

⁶ The UNCTAD measures e-trade readiness by the status e-commerce ecosystem in a country, which is required to embrace digital transformation. For details see <https://unctad.org/topic/ecommerce-and-digital-economy/etrade-readiness-assessments-of-LDCs> (accessed on 29 July 2022).

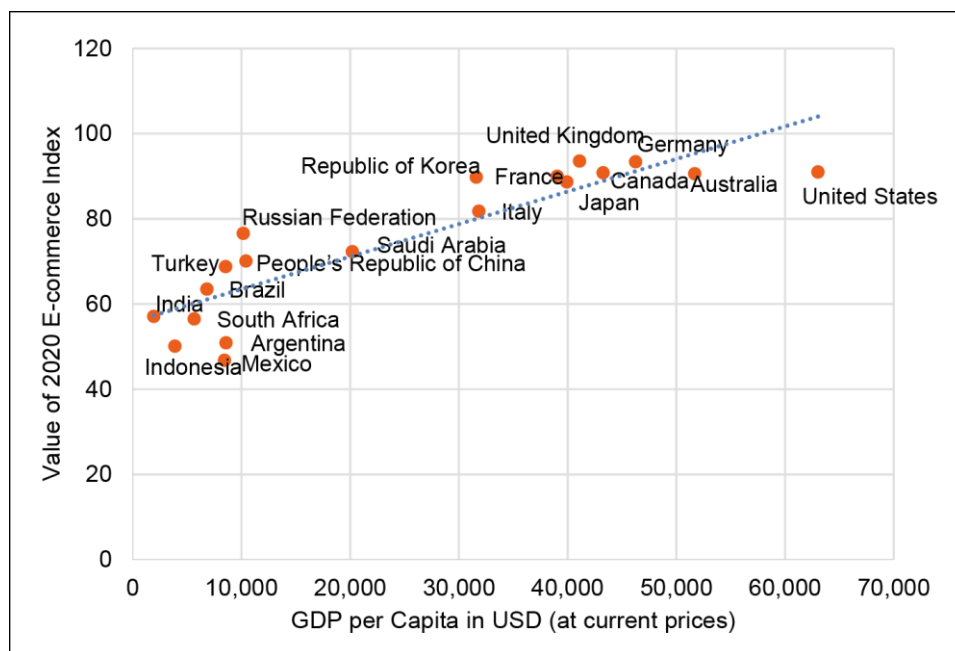
⁷ Refers to business-to-consumer (B2C) sales.

⁸ Statista.

⁹ Data compiled from Statista.

The adoption and development of e-commerce in a country depends on a country's capacity or readiness to engage in the digital economy (United Nations 2021). The United Nations Conference on Trade and Development's (UNCTAD's) B2C e-commerce index measures a country's preparedness to support online shopping (Figure 2).¹⁰

Figure 2: Mapping Score of G20 Countries on UNCTAD's B2C E-commerce Index against their GDP per Capita in USD (2020)



Note: The higher the value of index, the better prepared is a country to support e-commerce.

Source: GDP per Capita data are extracted from the World Development Indicators (2020) of the World Bank and the value of e-commerce index is compiled from UNCTAD (2021).

The figure shows that countries with lower GDP per Capita exhibit a relatively low level of preparedness to support online shopping while countries with higher GDP per Capita, such as the US, the UK, Australia, Germany, and Canada, are better prepared. Thus, the size of the market, as measured by the GDP per Capita, is an important determinant of e-commerce preparedness among the G20 members.

To understand what may drive the growth of e-commerce in these countries, it is critical to dwell deeper into the factors influencing the adoption of e-commerce. Existing studies highlight that e-commerce opportunities depend on several factors, including the access to and quality of the information and communication network in a country, financial inclusion, and digital literacy, among other things.¹¹

E-commerce is a direct result of information and communications technology (ICT) and thus, e-commerce adoption and growth necessitate ICT (ADB 2018; Bozer and Jones 2018). There are various measures of technology adoption. Klaus (2017) identifies broadband Internet subscriptions, Internet bandwidth, and mobile broadband subscriptions as measures of e-commerce adoption. While B2C online commerce is

¹⁰ The latest index available is for 2020, which refers to data available for the years 2019 and 2017.

¹¹ https://www.g20-insights.org/policy_briefs/leveraging-global-digital-trade-opportunities-for-all/ [accessed on 22 June 2022].

usually associated with Internet technology adoption, supporting infrastructure, such as ownership of mobile phones and fixed telephone lines, can also facilitate online transactions (WTO 2020).

In the case of emerging market economies, Internet quality and affordability are also considered as important factors influencing e-commerce adoption. The declining costs of mobile phones have allowed vulnerable groups with low incomes and literacy to experience the convenience and opportunities of telecommunication services (Kang, Wang, and Ramizo 2021). It is further argued that by expanding affordable and quality broadband to rural and remote areas, along with enhanced financial inclusion, trust, and the acquisition of skills to participate in e-commerce, can accelerate its adoption (OECD 2020). The role of digital literacy and skills is important from the perspective of micro, small and medium enterprises (MSMEs). Digital literacy has been found to have a significant positive impact on e-commerce adoption in smaller enterprises (Suryani 2021; Zou and Cheshmehzangi 2022).

Financial inclusion is also considered as an important driver of e-commerce adoption. Indicators such as ownership of an account at a bank or another type of financial institution strongly indicates the ability to pay for online transactions using a credit or debit card, and payment through mobile money (Ayob, Yakob, and Ja'afar 2021). Since e-commerce transactions may also involve financial transactions, trust becomes a crucial determinant of adoption. Existing literature highlights that e-commerce adoption in developing countries is more complex because of the insufficient regulatory measures for related challenges (Titi 2005). Internet security, as measured by the number of secure servers per million people, also reflects the readiness of a country to facilitate secure online transactions (Ayob 2021).

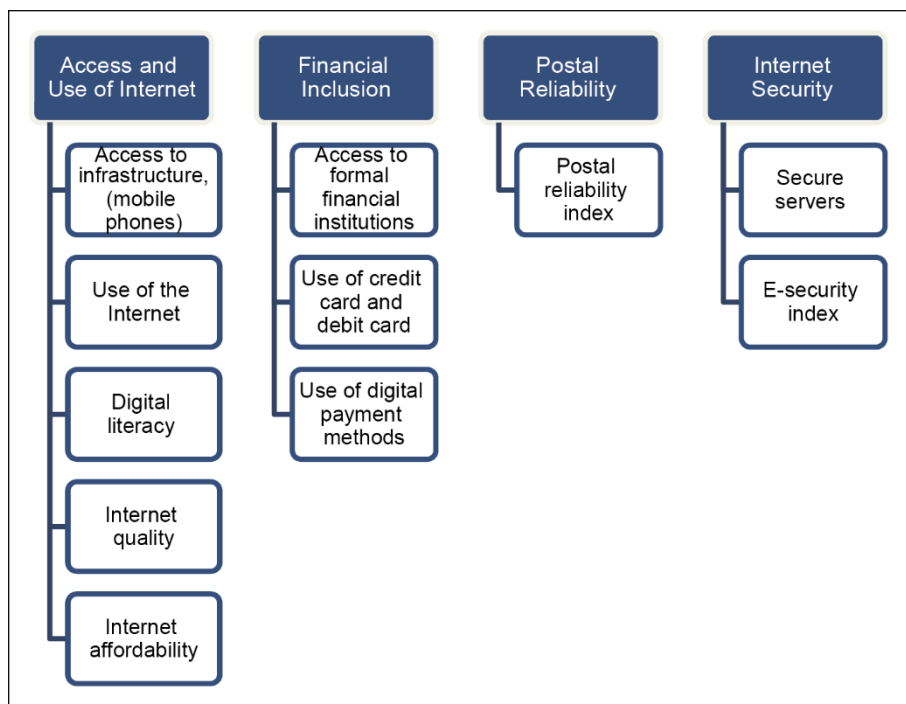
Finally, country studies reflect that the reliability of postal services is also an important factor determining e-commerce adoption (Ray 2011). Country cases, such as that of Saudi Arabia, show that the lack of an adequate postal infrastructure is one of the factors inhibiting e-commerce adoption in the country (Alsharif 2011; Almousa 2013).

The UNCTAD B2C e-commerce index presented above measures preparedness to support online shopping by taking a weighted average of four subindices related to four distinct parameters, including access to and use of the Internet, financial inclusion, postal reliability, and security of the network.¹² It is worth highlighting that the last B2C e-commerce index was released in 2020, which used data from 2017–2019. The COVID-19 situation has accelerated e-commerce adoption globally and it is worth investigating the performance of some of the G20 countries on different parameters determining e-commerce adoption and preparedness. To do so, this paper uses the broad indicators identified by UNCTAD (2021) for calculating e-commerce preparedness and builds on some of the indicators discussed in the existing literature. Below, Infographic 1 gives a list of the indicators considered for benchmarking e-commerce adoption.

Using these indicators, this paper presents some stylized facts on select indicators to benchmark e-commerce adoption among the G20 countries. It also highlights the constraints to adoption, which are discussed later in the paper.

¹² Equal weights are assigned to all parameters.

Figure 3: Framework of Indicators Explaining E-commerce Adoption



Source: Compiled by authors from UNCTAD (2021) and existing literature.

3. DATA SOURCES

The discussion in the forthcoming section is based on secondary data collected from international databases and reports. The sources of data include the International Telecommunication Union (ITU) for data on digital economy indicators, the World Bank for data on financial access indicators and secure Internet servers, the International Monetary Fund database for macro-economic trends; data for ICT access and usage among businesses is extracted from OECD statistics, and the Universal Postal Union (UPU) for postal reliability. The paper also presents insights from data collected through a primary survey of 1500 MSMEs integrated on e-commerce platforms conducted by ICRIER in June 2021. A few privately owned databases, such as the Statista database, the Economist database, and Surf Shark were also referred to while compiling key indicators such as Internet quality and affordability, digital literacy, and e-security, among others. The data are presented in the form of graphs and charts, bringing out a comparative snapshot of 20 countries.

4. STYLIZED FACTS

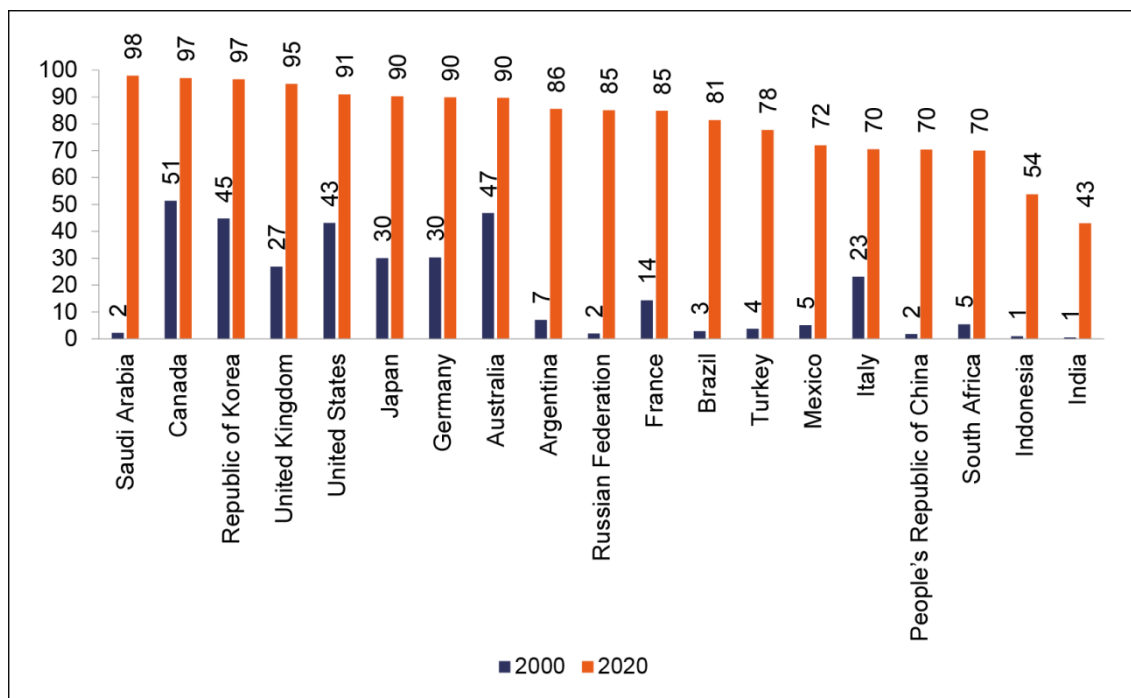
Over the years, there has been an increase in the proportion of people using the Internet.¹³ ICT adoption, as measured by Internet-user penetration, has a direct impact on e-commerce growth in a country (Ho, Kauffman, and Liang 2011). According to the ITU, in 2021 about 4.9 billion people or 63% of the world population used the Internet,

¹³ Source: ITU.

This indicator can include both estimates and survey data corresponding to the proportion of individuals using the Internet, based on the results from national household surveys. The number should reflect the total population of the country; or at least individuals of 5 years and older.

representing an increase of about 17% since 2019.¹⁴ While overall there has been an increase, there are variations across the G20 countries in terms of the proportion of people using the Internet (Figure 4).

Figure 4: Proportion of Individuals Using the Internet (in Percentage)



Source: Compiled by authors from the International Telecommunication Union (ITU).

The figure indicates that among the G20 countries, India and Indonesia had the lowest proportion of individuals using the Internet in 2020. Compared to this, over 90% of the individuals in Saudi Arabia, Canada, the Republic of Korea, the UK, and the United States (US) and Japan were using the Internet in the same year. Moreover, Saudi Arabia, the Russian Federation, Argentina, and Brazil exhibited the largest increase in the proportion of individuals using the Internet in 2020 when compared to the year 2000. In fact, most emerging market economies started with a very low base and many of them have witnessed a sharp increase in the proportion of Internet users. The increase in the cases of India and Indonesia has been much lower than the comparator countries, indicating a slow adoption. Table 1 presents data on ICT use and adoption by businesses, including small and medium enterprises in select countries.

Table 1 reflects that most of the businesses, irrespective of their size, have Internet connection. However, compared to developed economies, a smaller percentage of businesses in the emerging market economies have a website or homepage, and the percentage is even lower for smaller businesses. Moreover, overall, far fewer businesses receive orders online and the share of small businesses is even smaller.

¹⁴ For details see <https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx> [accessed on 29 June 2022].

Table 1: ICT Access and Use by Business in Select G20 Countries
(% of Total in 2019)

| Country | Business with Website or Home Page | | | Businesses Receiving Orders over Computer Networks | | | Businesses with a Fixed and Mobile Broadband Connection | | |
|-------------------|------------------------------------|----------------|-----------------|--|----------------|-----------------|---|----------------|-----------------|
| | All Business | Small Business | Medium Business | All Business | Small Business | Medium Business | All Business | Small Business | Medium Business |
| Australia | 80.37 | 78.83 | 86.56 | 55.54 | 55.97 | 51.31 | 99.05 | 98.94 | 99.56 |
| Canada | 81.80 | 79.40 | 91.60 | 27.80 | 25.80 | 35.10 | 89.30 | 89.00 | 90.00 |
| France | 71.54 | 68.38 | 87.67 | 17.07 | 14.25 | 29.87 | 96.17 | 95.64 | 98.94 |
| Germany | 88.21 | 86.94 | 92.92 | 19.95 | 17.84 | 26.64 | 95.02 | 94.36 | 97.51 |
| Italy | 72.08 | 70.38 | 84.22 | 16.30 | 15.22 | 21.74 | 94.46 | 93.95 | 98.15 |
| Japan | 91.50 | | 88.90 | .. | | .. | 95.80 | | 94.90 |
| Republic of Korea | 67.10 | 65.22 | 75.05 | 19.46 | 19.00 | 20.93 | 99.73 | 99.71 | 99.85 |
| Türkiye | 51.51 | 47.30 | 70.03 | 9.76 | 9.18 | 10.53 | 94.85 | 94.07 | 98.66 |
| United Kingdom | 83.88 | 81.78 | 94.04 | 28.56 | 27.19 | 32.80 | 95.45 | 94.74 | 98.89 |
| Brazil | 52.90 | 49.37 | 76.67 | 21.20 | 20.00 | 29.30 | 97.33 | 97.07 | 99.20 |

Note: Small businesses are those that employ 10–49 employees; medium enterprises are those with 50–249 employees and all businesses include any business that has more than 10 employees. “..” means not available.

Source: Extracted from OECD Statistics.

While data are only available for a few countries, for India, ICRIER conducted a primary survey of 1500 micro, small, and medium enterprises between June and August 2021.¹⁵ It found that COVID led to a massive surge in the share of online sales of MSMEs that are integrated with e-commerce platforms. The survey found that in 2020–21, online sales accounted for 27% of total sales compared to 19% in 2019–20 and barely 12% in 2018–19. There was an 80 to 90% increase in seller registration with some large e-commerce companies in the second half of 2020, almost all of which were MSMEs belonging to smaller cities and remote areas. Yet, the survey suggested that most MSMEs operated in a hybrid model, using both online and offline channels for sales. A majority of MSMEs are dependent on e-commerce platforms for online sales as only 12% of the MSMEs surveyed had their own e-store.

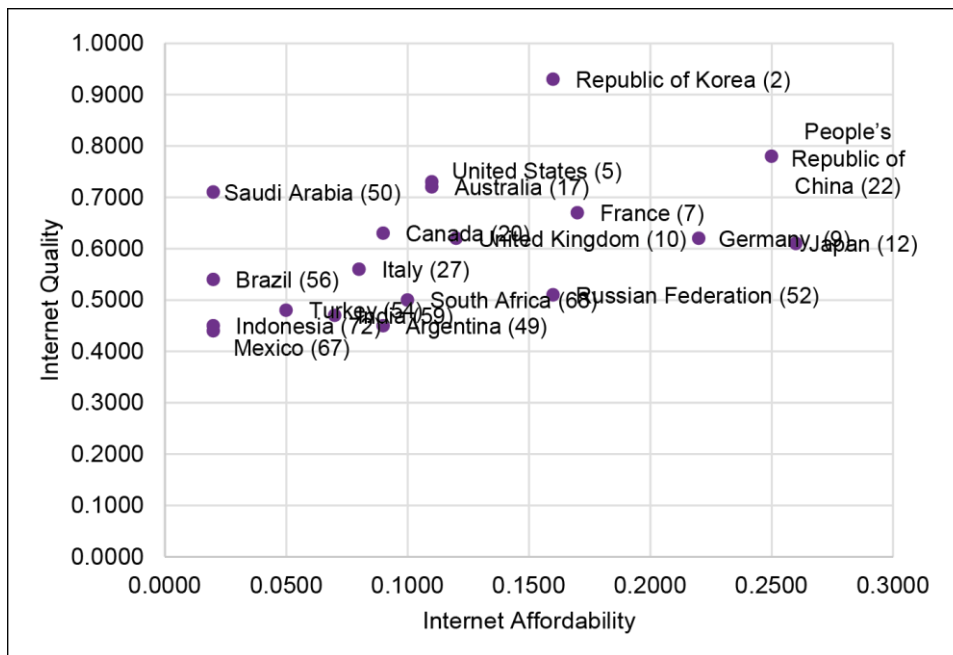
Apart from the access to and use of the Internet, existing studies highlight that quality and affordability of digital services are vital for the digital transformation of businesses and often explain the low adoption in some countries. The Digital Quality of Life Index (DQLI) ranks 110 countries on the different parameters affecting digital quality of life. Internet affordability and Internet quality are two of the five parameters.¹⁶ Internet affordability is calculated using information on the time of work required to afford the cheapest mobile Internet and broadband Internet. Internet quality is calculated as the sum of mobile and broadband speeds, their stability, and growth indices. Among the G20 countries, on the overall DQLI, the Republic of Korea is the best performer on the DQL, while Indonesia is among the worst performers and there are vast variations across the G20 countries with regard to Internet affordability and quality (see Figure 5).

All G20 countries score poorly on the affordability parameter, with Mexico, Indonesia, Brazil and Saudi Arabia being the worst performers. As regards the Internet quality, most emerging market economies (except the PRC and Saudi Arabia), including Mexico, Indonesia, Türkiye, India, and Argentina, are the worst in terms of quality.

¹⁵ For details see ICRIER (2022).

¹⁶ The index is released by a private cybersecurity company – Surf Shark – and it ranks 110 countries, based on their performance on five indicators, namely Internet affordability, Internet quality, electronic infrastructure, electronic security, and electronic government.

Figure 5: Mapping the Performance of G20 Countries on Internet Quality against Internet Affordability Indices of the Digital Quality of Life Index, 2021



Note: The numbers in the parentheses indicate the overall rank of the country on the overall digital quality of life index.

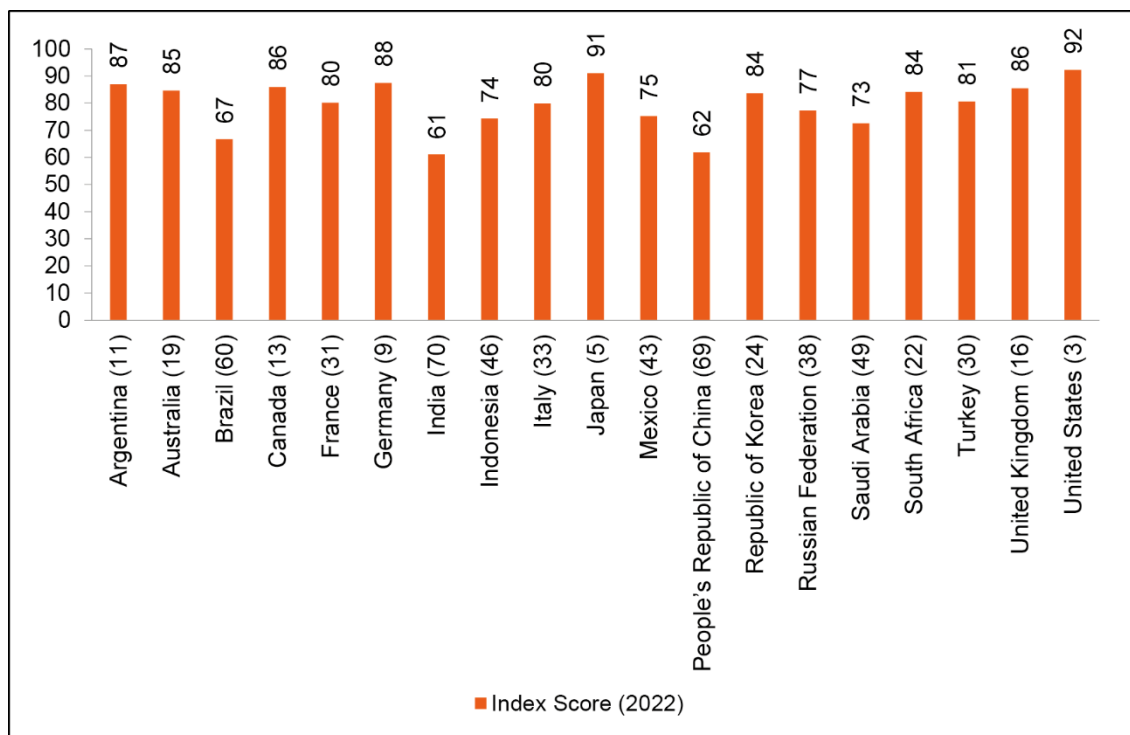
Source: Compiled from the Digital Quality of Life Index database, accessible at <https://surfshark.com/dql2021> [accessed on 30 June 2022].

Internet literacy is another key parameter that influences the use of the Internet, and thus affects e-commerce adoption. *The Economist* releases the Inclusive Internet Index that includes digital literacy as a parameter. It indicates the level of education and preparedness of individuals in a country to use the Internet. It ranks 100 countries based on their level of literacy, educational attainments, support for digital, and level of web accessibility. The comparative performance of G20 countries is presented in Figure 6.

Among the G20 countries, the US, Japan, and Germany are among the best performers in terms of digital literacy, while India, the PRC and Brazil are among the worst.

Apart from the digital infrastructure and literacy, various other factors contribute to e-commerce adoption in a country. Access to and use of formal and informal financial services and digital payments also affect the adoption of e-commerce, given that the sale and purchase takes place on computer networks. Ownership of an account at a bank or another type of financial institution strongly indicates the ability to pay for goods online, and thus has an impact on e-commerce adoption (Ho, Kauffman, and Liang 2011). While the payment may not necessarily be made online, nevertheless access to formal finance or financial instruments—such as a bank or mobile money account and a debit or credit card—works as a guarantee and helps to build trust between the buyer and seller. It is argued that digital payments can help business owners build an alternative credit history and promote formalization (World Bank 2021). It is also often considered as a convenient mode of payment.

Figure 6: Performance of G20 Countries on the Digital Literacy Parameter of the Inclusive Internet Index (2022)



Note: The higher the value on the Index, the better the performance. Numbers in the parentheses reflect the rank of the country on the Digital Literacy Index.

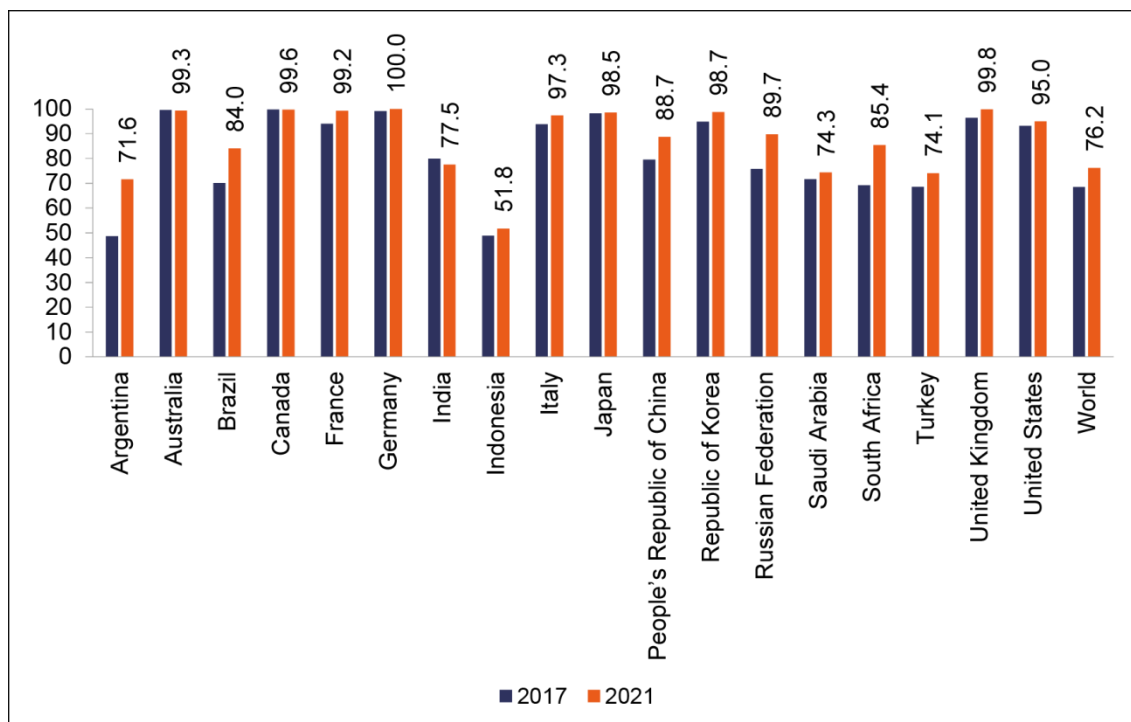
Source: Compiled from Inclusive Internet database of *The Economist*, accessible at <https://impact.economist.com/projects/inclusive-internet-index/2022> [accessed on 3 July 2022].

The World Bank’s Global Findex Database provides data on global access to financial services. Account ownership is the fundamental measure of financial inclusion (World Bank 2021). Kang, Wang, and Ramizo (2021) use debit cards per 1,000 adults and credit cards per 1,000 adults to capture financial environment readiness of B2C online sales. In 2021, on average, 76% of the global population had an account with a financial institution or mobile money. In most G20 countries, except Argentina, Indonesia, Saudi Arabia and Türkiye, the percentage is above the global average (see Figure 7). Thus, there is scope among certain emerging market economies to enhance access to financial services.

The data show that in most G20 countries, the percentage of individuals with an account has increased in 2021, when compared to 2017. Argentina saw the maximum rise during the period. Only in India and Australia was there a marginal decrease (1–2%), perhaps because the rate of growth of the population was higher than the growth of accounts in these countries.

There has also been an increase in the ownership of debit and credit cards among individuals above 15 years of age. Globally, the ownership of debit cards increased from 48% in 2017 to 53% in 2021. The ownership of credit cards increased from 18% to 24% during the same period. While most G20 countries are placed above the global average, Indonesia and India are among the worst performers and lie below the global average (see Table 2).

Figure 7: Ownership of a Financial Institution or Mobile Money Account
(% Individuals 15+ Years Age)



Note: The database does not have data for Mexico and therefore, it had to be omitted.

Source: Extracted from the World Bank Findex.

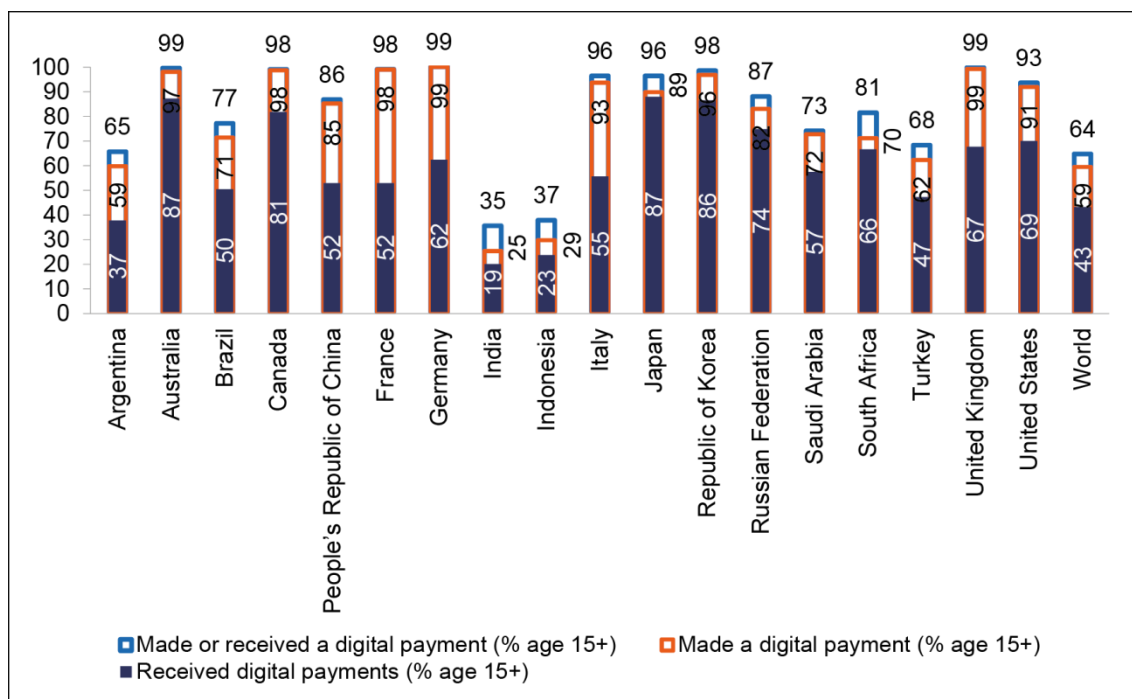
Table 2: Ownership of Credit and Debit Cards across the G20 Countries

| Country | Owns a Credit Card (% age 15+) | | Owns a Debit Card (% age 15+) | |
|----------------------------|--------------------------------|------|-------------------------------|------|
| | 2017 | 2021 | 2017 | 2021 |
| Argentina | 24 | 29 | 41 | 55 |
| Australia | 60 | 51 | 90 | 96 |
| Brazil | 27 | 40 | 59 | 66 |
| Canada | 83 | 83 | 97 | 96 |
| People's Republic of China | 19 | 38 | 66 | 76 |
| France | 41 | 40 | 85 | 86 |
| Germany | 53 | 57 | 91 | 94 |
| India | 3 | 5 | 33 | 27 |
| Indonesia | 2 | 2 | 31 | 35 |
| Italy | 42 | 58 | 85 | 82 |
| Japan | 68 | 70 | 87 | 88 |
| Republic of Korea | 64 | 68 | 75 | 84 |
| Russian Federation | 20 | 25 | 57 | 65 |
| Saudi Arabia | 16 | 25 | 67 | 72 |
| South Africa | 9 | 10 | 34 | 59 |
| Türkiye | 42 | 33 | 63 | 59 |
| United Kingdom | 65 | 62 | 91 | 95 |
| United States | 66 | 67 | 80 | 83 |
| World | 18 | 24 | 48 | 53 |

Source: Extracted from the World Bank Findex.

Receiving payments into an account and making digital payments are also catalysts for using financial services. They provide a gateway to business owners to integrate with buyers and sellers digitally (World Bank 2021). In most developed member countries of the G20, there is almost universal usage of digital payment methods, which is much higher than the global average. In emerging market economies, however, there is still scope for greater adoption (Figure 8).

Figure 8: Use of Digital Payment Methods for Receiving and Sending Payments in 2021



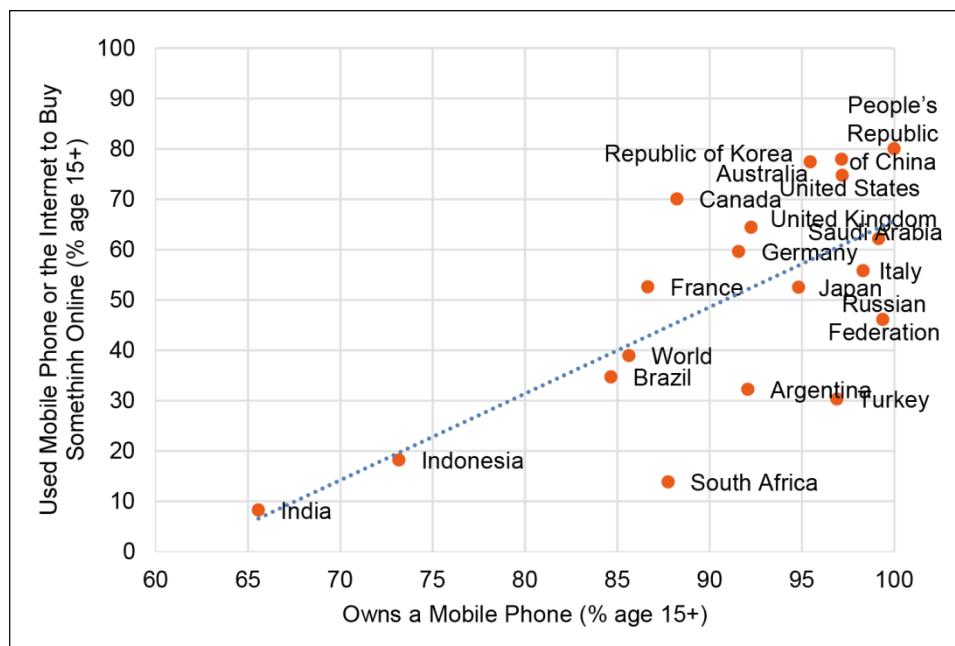
Source: Extracted from the World Bank Global Findex Database.

The figure shows that among the emerging market economies, the PRC has the highest use of digital payment methods, nearly on a par with developed countries. India and Indonesia have the lowest overall use of digital payment methods. Moreover, the share of individuals receiving digital payments is lower compared to the share of individuals making digital payments. This reflects that the use of digital payments is lower for the supplier of goods and services more generally, than that of the receivers.

Access to a smart phone or a mobile phone makes online shopping convenient. The World Bank’s Findex data reflect that while the ownership of mobile phones is very high in most G20 countries, including some emerging market economies, nevertheless the use of a mobile phone for making an online purchase varies significantly (Figure 9).

Most emerging market economies including India, South Africa, and Indonesia, are lagging in terms of the use of mobile phones and the Internet for making online purchases.

Figure 9: Mapping the Use of Mobile Phones or the Internet to Make an Online Purchase against Ownership of Mobile Phones in 2021



Source: Extracted from the World Bank Global Findex Survey.

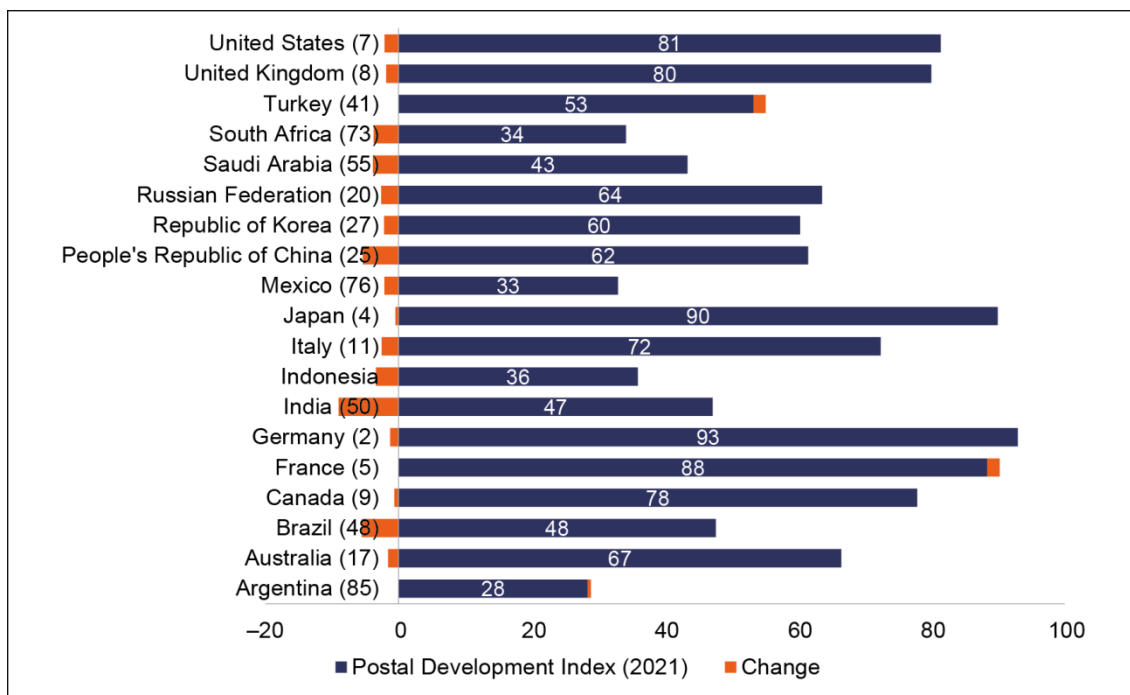
Postal reliability is an important indicator for e-commerce adoption and the lack of it is considered an infrastructural weakness (UNCTAD 2021). Goods that are purchased online are delivered through the post and thus, postal reliability is crucial for the delivery of goods. The UPU releases a periodic Postal Development Index that ranks countries based on postal reliability, reach, relevance, and resilience. The latest index (2021) covers 168 countries (Figure 10).

The index reflects that postal service quality in many emerging market economies is falling behind that of the developed members of the G20. In fact, in the last year, due to the COVID-19 situation, the overall postal development scores for most countries, including developed markets, have fallen, indicating a slackening of postal reliability.

Finally, Internet governance and security are considered as an essential indicator influencing e-commerce adoption and growth in a country. It is an important supply-side driver as it indicates the readiness of a country to facilitate secure online transactions because encryption technology and other security protocols in secure servers are essential for safeguarding payment and personal information (Ayob 2021). The World Bank releases data on secure Internet servers, measured per one million people. Secure servers are servers using encryption technology in Internet transactions.¹⁷ These are web servers that guarantee security of transactions made online. Data for the G20 countries are presented in Table 3.

¹⁷ <https://ourworldindata.org/grapher/secure-internet-servers-per-1-million-people> (accessed on 15 July 2022).

Figure 10: Score of G20 Countries on UPU's Postal Development Index in 2021



Note: Numbers in the parentheses are the ranks of the countries on the index.

Source: Compiled from the UPU's Postal Development Report, 2021 accessible at <https://www.upu.int/UPU/media/upu/publications/Postal-development-report-2021.pdf> [accessed on 2 July 2022].

Table 3: Number of Secure Internet Servers (per 1 million people) in G20 Countries

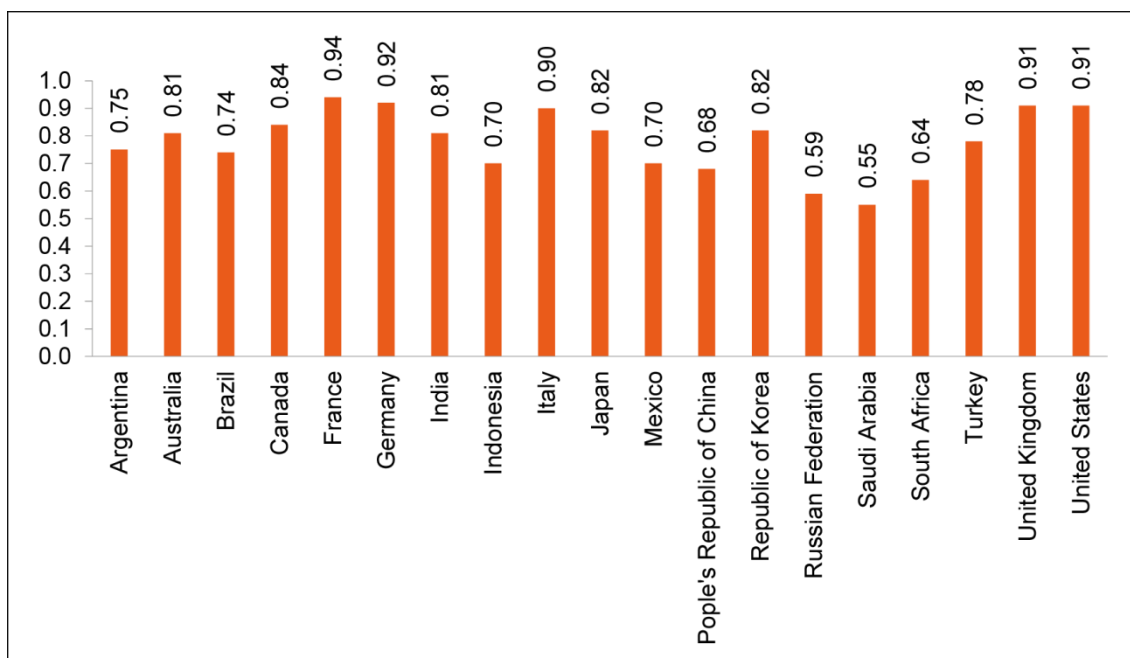
| Country Name | 2020 | 2010 |
|----------------------------|-----------|----------|
| United States | 140,808.3 | 2,481.72 |
| Germany | 97,517.6 | 1,049.32 |
| Canada | 39,849.7 | 1,282.70 |
| Australia | 39,794.4 | 1,402.79 |
| United Kingdom | 36,452.6 | 1,315.40 |
| France | 36,226.4 | 278.05 |
| Japan | 22,848.7 | 552.90 |
| Italy | 20,673.5 | 127.06 |
| South Africa | 14,421.8 | 52.07 |
| Russian Federation | 13,347.6 | 17.09 |
| Türkiye | 6,759.7 | 86.34 |
| Republic of Korea | 5,939.0 | 175.32 |
| Argentina | 3,685.8 | 25.20 |
| Brazil | 3,087.2 | 28.25 |
| Indonesia | 1,877.6 | 1.64 |
| People's Republic of China | 948.5 | 1.20 |
| India | 479.9 | 1.67 |
| Mexico | 322.8 | 13.42 |
| Saudi Arabia | 229.1 | 13.09 |
| World | 11499.1 | 187.3 |

Source: Extracted from World Bank's World Development Indicators database.

Over the last decade, there has been a dramatic increase in the number of secure servers per million people in the world as well as in the G20 countries. Here again, developed countries have outperformed the emerging market economies and, within the G20, Saudi Arabia, Mexico, and India are among the worst performers.

On similar lines, the Digital Quality of Life Index also ranks countries on the basis of their overall performance on electronic security. It shows a country’s preparedness to counter cybercrimes and its commitment to protecting any individual’s online privacy. It is measured by the state of cybersecurity and data protection.¹⁸ Figure 11 maps the performance of G20 countries’ e-security indicator.

Figure 11: Relative Scores of G20 Countries on the E-Security Indicator of Digital Quality of Life Indices, 2021



Source: Compiled by author from Digital Quality of Life index, accessible at <https://surfshark.com/dql2021> [accessed on 18 July 2022].

As illustrated by the map, most developed countries are doing better in terms of electronic security, when compared to emerging market economies in the G20. However, among the emerging market economies, India has scored relatively well on e-security index, indicating a comparatively better state of cybersecurity and data protection.

The role of regulations is significant in driving the adoption of e-commerce across countries by enhancing security. While digital transformation can bring significant benefits, supporting policies and regulations are required to build capabilities for countries to adapt to technological changes (Hoekman et al. 2021). This makes it important understand the status of regulatory policies and importantly, the policy priorities across the G20 countries. The next section discusses the applicable e-commerce regulations in some of the G20 countries, with greater focus on emerging market economies.

¹⁸ For details see <https://surfshark.com/dql2021/methodology> [accessed on 15 July 2022].

5. E-COMMERCE REGULATIONS: CURRENT STATUS AND DIVERGENCES ACROSS SELECT G20 COUNTRIES

While rapid technological progress and the COVID-19 situation are accelerating the adoption of e-commerce in most emerging market economies, it is imperative that supporting regulations keep pace with the advancements in technology, e-commerce adoption, and the growing dependence on online markets.

It is worth mentioning that, globally, there is a divergence on larger policy objectives of e-commerce regulations. Existing literature suggests that there are three large digital domains—the US, the EU, and the PRC.¹⁹ Each of these digital spheres have different priorities, and on the basis of those priorities, e-commerce regulations are drafted in these countries/ regions. For instance, the European system is more human rights- and consumer-centric and thus, issues such as data protection and privacy are reflected in the policy priorities. The EU's General Data Protection Regulation is also an outcome of this priority as it lays down the rules related to personal data protection thereby protecting the fundamental rights and freedom of people.²⁰ The US system is committed to a market-driven architecture and has a business-centric approach, while protecting consumer rights (Malawer 2001). In fact, in the US, e-commerce businesses are treated on a par with traditional retail businesses.²¹ Compared to these two, the Chinese regulatory system is significantly drawn on protecting the sovereignty of the nation.

Thus, broadly, it is observed that three basic principles govern the e-commerce regulations across the world—protecting consumer rights; enabling participation of the private sector; and serving the national interest. Depending on the policy priorities of the country, e-commerce regulations are drafted.

In developed countries such as the US and the EU, actions and developments on e-commerce policy began in the late 1990s; in most emerging market economies, a comprehensive e-commerce policy is still a work-in-progress. However, this does not mean the e-commerce operations are unregulated. There is a myriad of regulations, often with conflicting objectives and without a common goal. Most of these regulations are based on issues and priorities recognized by international organizations.

For instance, the OECD has set out a few recommendations for consumer protection in its “Guidelines for Consumer Protection in the Context of Electronic Commerce,”²² which lays out principles for consumer protection, including: transparent and effective protection; fair business, advertising, and marketing practices; online disclosures, including information about business, goods and services and transactions; confirmation process; payment; dispute resolution and process; privacy; and education and awareness.

¹⁹ For details see Prof. Henry Gao's presentation at the United Nations Economic and Social Commission for Asia and the Pacific, presented on 23 April 2020, accessible at <https://www.unescap.org/sites/default/files/Session%206%20Toward%20a%20%20digital%2C%20Data%20Governance%20in%20Trade%20Agreements%20Three%20Digital%20Kingdoms-Henry%20Gao.pdf> (accessed on 23 July 2022).

²⁰ For details see <https://gdpr-info.eu/art-1-gdpr/> (accessed on 23 July 2022).

²¹ White paper on Advancing the Digital Economy: Shaping the E-commerce Regulatory Landscape by Nishith Desai Associates and The Dialogue, 8 April 2022 accessible at https://www.nishithdesai.com/fileadmin/user_upload/pdfs/Research_Papers/White-Paper-Shaping-the-E-commerce-Regulatory-Landscape.pdf (accessed on 24 July 2022).

²² For details see <https://www.oecd.org/sti/consumer/34023811.pdf> (accessed on 22 July 2022).

UNCTAD has also had an e-commerce and law reform program since the year 2000. The program is targeted to help developing countries develop their legal regime and has initiatives related to electronic transactions and signatures, data protection and privacy, consumer protection, computer crime, intellectual property, competition, taxation, and information security.²³ Examining the legislations across the world, UNCTAD data reflects that 81% of the countries worldwide have adopted e-transaction legislations.²⁴ Nearly 70% of the countries worldwide have adopted data privacy and protection legislation, while 80% have legislation to address cybercrime.²⁵ Of these, a majority are developed countries.

In fact, in some countries, including India, there is no single overarching jurisdiction or an e-commerce law that regulates business operations, but a series of regulations to meet specific objectives. This implies that, in a quasi-federal governance structure such as India, multiple government agencies and departments will govern different aspects of e-commerce operations. This is the case in most emerging market economies, and even in the US, where there exist several governing regulations for regulating e-commerce businesses (see Table A1 in Appendix A).

In India, for instance, the Consumer Protection Act, 2019 and the Consumer Protection (E-commerce) Rules, 2020 governed by the Ministry of Consumer Affairs, Food and Public Distribution, spell out the responsibilities and liabilities of the sellers and e-commerce platforms to protect the consumers in line with the OECD recommendations. The Competition Act, 2000, which was enacted to check anti-competitive practices and abuse of dominant position, also extends to certain areas under e-commerce operations. The Sale of Goods Act, 1930, related to sales and shipping policies and the Legal Metrology Act, 2009 for the packaging and labeling of products, among others. Often this leads to a multiplicity of regulatory bodies and increases regulatory uncertainty and the compliance burden for smaller businesses.

The PRC is one of the few countries with a dedicated e-commerce law, which was adopted in 2018. It is formulated to “safeguard the legitimate rights and interests of e-commerce entities, regulating e-commerce conduct, maintaining market order, and promoting the continuous and sound development of e-commerce”.²⁶ The law requires that the State (government) accords an equal treatment of online and offline business and promotes their integrated development. Thus, as in the case of the US, in the PRC also, online and offline businesses are treated on a par. Indonesia issued the Government Regulation No. 80 of 2019 on Trading Through Electronic Systems, which includes provisions on trade practices of e-commerce businesses, compliance checklists, provisions on electronic contracts, personal data protection, and trade practices, among others. Saudi Arabia also has a dedicated e-commerce law. In India, the Department for Promotion of Industry, and Internal Trade (DPIIT) released the Draft E-commerce Policy in 2018–19, which is intended to fill the gap in the e-commerce regulatory landscape in India. However, the policy is still in draft format. In other countries such as Argentina, Brazil, and South Africa, there is no single e-commerce policy in place, as of date.

²³ For details see <https://unctad.org/topic/ecommerce-and-digital-economy/ecommerce-law-reform> (accessed on 23 July 2022).

²⁴ These legislations recognize the legal equivalence between paper-based and electronic forms of exchange.

²⁵ UNCTAD Global Cyberlaw Tracker, accessible at <https://unctad.org/topic/ecommerce-and-digital-economy/ecommerce-law-reform/summary-adoption-e-commerce-legislation-worldwide> (accessed on 28 July 2022).

²⁶ For details see https://ipkey.eu/sites/default/files/documents/resources/PRC_E-Commerce_Law.pdf (accessed on 27 July 2022).

Thus, while there is no dearth of regulations on e-commerce business, nevertheless a uniform approach for regulating e-commerce operations is missing in the case of some countries. A comprehensive e-commerce regulation or a policy is important for supporting growth of business. In the case of certain emerging market economies in the G20, there has been progress on this front, while in others, a dedicated e-commerce policy or law that supports the growth of e-commerce businesses, is either missing or is still in draft format. Moreover, it is argued that different approaches to internal regulation of e-commerce and diverging regulatory approaches globally create legal uncertainty and constrain investments and market expansion opportunities in the sector.²⁷

The absence of a single law or policy on e-commerce operations has several adverse implications on the ease of doing business, particularly from the perspective of smaller enterprises. The impact of this regulatory patchwork often translates into a higher cost of compliance. Thus, it is important to have a robust e-commerce policy, which follows international markers to enable innovation and investment in digital infrastructure, which may facilitate a higher adoption of e-commerce among the emerging market economies, such as India.

6. CONSTRAINTS TO E-COMMERCE ADOPTION

The stylized facts presented in the previous section and the discussion on regulatory scenario suggest that the G20 countries are placed in distinct positions when compared across the different indicators affecting e-commerce adoption. More importantly, the distinction is inescapable between developed member states and emerging market economies, except for one or two countries. While the graphs and charts above bring out the comparative pictures across the G20 countries, the heatmap presented in Table 4 summarizes the comparative performance of the G20 countries across the different indicators. This summary table also illustrates more clearly some of the key constraints faced by the emerging market economies in the adoption of e-commerce.

The above discussion highlights that e-commerce preparedness is low amongst emerging market economies, as compared to developed countries. Several factors affect the preparedness of emerging market economies for adopting e-commerce. These include low usage of the Internet, digital illiteracy, lower levels of financial inclusion as compared to developed countries, and poor postal reliability, among others. There is a digital divide between the emerging market economies and developed countries within the G20. In most of the emerging market economies, the constraints to adoption are on two levels—the household level and at the micro, small and medium enterprise levels.

²⁷ For details see https://www.wto.org/english/res_e/booksp_e/15_adtera_chapter_11_e.pdf (accessed on 1 August 2022).

Table 4: A Comparative Performance of G20 Countries on Various Indicators Influencing E-commerce Adoption

| Country | 2020 E-commerce Index Value | Proportion of Individuals using the Internet (2020) | Internet Affordability (2021) | Internet Quality (2021) | Own a Mobile Phone (% age 15+ in 2021) | Digital Literacy (2022) | Financial Institution or Mobile Money | | | Credit Card Ownership | | | Used a Mobile Phone or the Internet to Buy Something Online (% age 15+) | | | E-Security Index (2021) |
|--------------------|-----------------------------|---|-------------------------------|-------------------------|--|-------------------------|---------------------------------------|--|--|------------------------------------|--|---|---|---------------------------------|-------|-------------------------|
| | | | | | | | Account Ownership (% age 15+ in 2021) | Debit Card Ownership (% age 15+ in 2021) | Made or Received a Digital Payment (% age 15+, 2021) | Card Ownership (% age 15+ in 2021) | Made a Digital Payment (% age 15+ in 2021) | Received Digital Payments (% age 15+ in 2021) | Used a Mobile Phone or the Internet to Buy Something Online (% age 15+) | Postal Development Index (2021) | | |
| Argentina | 50.9 | 85.5 | 71.82 | 31.82 | 92.1 | 86.9 | 71.6 | 28.9 | 54.9 | 65.0 | 59.1 | 37.1 | 32.2 | 28.4 | 50.00 | |
| Australia | 90.6 | 89.6 | 81.82 | 95.45 | 95.5 | 84.6 | 99.3 | 51.4 | 95.9 | 98.9 | 97.4 | 86.5 | 77.4 | 66.5 | 68.18 | |
| Brazil | 63.5 | 81.3 | 30.00 | 60.91 | 84.7 | 66.7 | 84.0 | 40.4 | 66.0 | 76.5 | 70.7 | 49.8 | 34.7 | 47.6 | 46.36 | |
| Canada | 90.8 | 97.0 | 71.82 | 79.09 | 88.2 | 85.9 | 99.6 | 82.7 | 96.2 | 98.3 | 98.1 | 81.2 | 70.1 | 77.9 | 76.36 | |
| PRC | 70.1 | 70.4 | 94.55 | 98.18 | 100.0 | 61.9 | 88.7 | 37.9 | 75.8 | 86.2 | 84.5 | 52.3 | 80.1 | 61.5 | 35.45 | |
| France | 90.0 | 84.8 | 92.73 | 89.09 | 86.7 | 80.1 | 99.2 | 39.8 | 86.3 | 98.4 | 98.4 | 52.2 | 52.6 | 88.4 | 92.73 | |
| Germany | 93.4 | 89.8 | 93.64 | 78.18 | 91.6 | 87.5 | 100.0 | 56.5 | 94.0 | 99.5 | 99.5 | 61.7 | 59.6 | 93.0 | 88.18 | |
| India | 57.1 | 43.0 | 61.82 | 40.91 | 65.6 | 61.1 | 77.5 | 4.6 | 27.1 | 34.9 | 24.7 | 19.4 | 8.3 | 47.2 | 68.18 | |
| Indonesia | 50.1 | 53.7 | 30.00 | 31.82 | 73.2 | 74.3 | 51.8 | 1.6 | 35.1 | 37.2 | 29.1 | 23.0 | 18.2 | 35.9 | 39.09 | |
| Italy | 81.8 | 70.5 | 69.09 | 67.27 | 98.3 | 79.8 | 97.3 | 57.9 | 82.3 | 95.8 | 93.0 | 55.1 | 55.8 | 72.4 | 83.64 | |
| Japan | 88.7 | 90.2 | 95.45 | 76.36 | 94.8 | 91.0 | 98.5 | 69.7 | 88.3 | 95.8 | 89.2 | 87.3 | 52.5 | 90.0 | 71.82 | |
| Mexico | 46.8 | 72.0 | 30.00 | 28.18 | NA | 75.2 | NA | NA | NA | NA | NA | NA | NA | 33.0 | 39.09 | |
| Russian Federation | 76.6 | 85.0 | 91.82 | 54.55 | 99.4 | 77.2 | 89.7 | 25.1 | 65.3 | 87.4 | 82.4 | 74.1 | 46.1 | 63.6 | 80.91 | |
| Saudi Arabia | 72.3 | 97.9 | 30.00 | 91.82 | 99.2 | 72.6 | 74.3 | 25.4 | 71.9 | 73.5 | 72.1 | 56.8 | 62.2 | 43.4 | 14.55 | |
| South Africa | 56.5 | 70.0 | 78.18 | 50.00 | 87.8 | 84.1 | 85.4 | 10.0 | 58.9 | 80.8 | 70.5 | 66.0 | 13.9 | 34.1 | 23.64 | |
| Republic of Korea | 89.8 | 96.5 | 91.82 | 100.00 | 97.2 | 83.6 | 98.7 | 68.4 | 84.0 | 97.9 | 96.2 | 85.9 | 77.9 | 60.3 | 71.82 | |
| Türkiye | 68.8 | 77.7 | 51.82 | 44.55 | 96.9 | 80.6 | 74.1 | 32.6 | 58.9 | 67.6 | 61.7 | 46.6 | 30.3 | 53.3 | 59.09 | |
| United Kingdom | 93.6 | 94.8 | 83.64 | 78.18 | 92.2 | 85.5 | 99.8 | 62.1 | 95.5 | 99.2 | 98.6 | 67.0 | 64.4 | 80.0 | 86.36 | |
| United States | 91.0 | 90.9 | 81.82 | 97.27 | 97.2 | 92.2 | 95.0 | 66.7 | 82.8 | 93.0 | 91.3 | 69.4 | 74.7 | 81.4 | 86.36 | |

PRC = People's Republic of China.

Notes:

Best performance; Near 100 score; Average performance; Near 50 score; Worst performance

The countries in blue are emerging market economies, as per the latest IMF assessment, accessible here: <https://www.imf.org/external/pubs/ft/fandd/2021/06/the-future-of-emerging-markets-dutttagupta-and-pazarbasiglu.htm#:~:text=This%20approach%20identifies%20the%20following,and%20the%20United%20Arab%20Emirates> (accessed on 16 August 2022). Please note that the index scores for Internet affordability, Internet quality, and e-security were in the range of 0–1, while all the other numbers were in the range of 0–100. For that reason, the scores were recalculated to be presented on the heat map. Countries were ranked on a scale of 110–0 based on their scores and indexed on the scale of 0–100 for a comparative assessment.

Source: UNCTAD, ITU, Surf Shark, the World Bank, *The Economist* and UPU.

The stylized facts presented in the previous section reflect that most emerging market economies perform poorly in terms of *Internet use*. There is inadequate digital infrastructure in most of these countries, including insufficient digital assets and sparse digital technology adoption, especially at the household level. In India, for instance, while 99% of the population is covered by a mobile-cellular network, only 61% of the households have Internet access at home.²⁸ A digital divide also exists, within countries, across rural and urban areas. For instance, in Brazil, 86% of urban households and only 65% of rural households have Internet access at home.²⁹ Inadequate access acts as a barrier to the adoption of new technology and technology-based services, such as e-commerce.

Additionally, the *Internet quality* is average in most developed countries and relatively poorer in most emerging market economies.³⁰ To conduct basic online shopping for 40 minutes a day, it takes a standard of 1.5 gigabyte Internet per month at a speed of 3 megabytes per second.³¹ Most emerging market economies do not have that, which acts as a constraint to e-commerce adoption in these countries.

This is compounded by low *digital literacy*. Emerging market economies have scored relatively low on digital literacy and overcoming this is important for enhancing e-commerce adoption, particularly in these countries. According to the latest Global Competitiveness Report of the ITU, Internet activity linked to e-commerce is strongly related to education. Often the use of Internet is low, not only because individuals and firms do not have access, but also because they do not know how to use it and they fear adverse outcomes of scams and cyberattacks (ITU 2022). This is particularly prevalent in emerging market economies and in the case of firms with low technological capabilities.

Low use of *digital payment* methods is another factor inhibiting higher e-commerce adoption. While credit card ownership is low in both developed and emerging market economies, overall account ownership is lower in emerging market economies, particularly Indonesia, Argentina, Türkiye, and Saudi Arabia. On this front, India is doing relatively better than other comparator countries. Importantly, in most emerging market economies it is observed that sellers or businesses are still not accustomed to receiving payments using digital payment methods as the percentage of individuals receiving digital payments is very low. Thus, low firm-level readiness is a constraint to e-commerce adoption in emerging markets.

The role of trust is crucial. Electronic security is a major concern for businesses, and in most emerging markets data protection laws are still in progress, which adds to regulatory uncertainty. In India, for instance, the Government withdrew the previously proposed Personal Data Protection Bill (2019), to work on a more comprehensive legal framework. Subsequently, in November 2022, the Government of India released a draft bill named 'Digital Data Protection Bill 2022', which builds on global best practices.³² Indonesia has passed the draft Law on Personal Data Protection (PDP Bill), which is based on the European Union's General Data Protection Regulation (GDPR) as this

²⁸ Please note that mobile cellular network coverage data is for 2020 and is from the ITU. Household access data is for 2021 and is from an independent study conducted in India. Findings are accessible here: <https://www.indiatimes.com/technology/news/india-internet-usage-report-554181.html> (accessed on 31 July 2022).

²⁹ Figures are for 2020. Source: ITU.

³⁰ Except the Republic of Korea.

³¹ Source: <https://www.brookings.edu/blog/future-development/2021/07/26/measuring-internet-poverty/> (accessed on 31 July 2022).

³² As of 23 January 2023, the bill is yet to be introduced in the Parliament.

allows for easier data transmission into countries with similar levels of protection. In Argentina, Brazil, and Türkiye, also, the data protection laws are GDPR-compliant. Gradually, the G20 countries must work together to move to adopting common principles for data protection for enhancing investments in the e-commerce sector, thereby facilitating greater innovation and growth.

E-commerce adoption in emerging market economies is also impeded by low *postal reliability*. The logistics sector has a crucial role in e-commerce adoption. The postal sector in developing countries was facing challenges even before the pandemic and the COVID-19 situation further aggravated the challenges (UPU 2021). In these countries, infrastructure and services are still sluggish, and it will take time to diversify to new services. The prospects of the e-commerce sector are adversely affected if the consumers are inconvenienced due to poor deliveries.

7. THE ROLE OF THE G20

E-commerce adoption and the preparedness to adopt e-commerce varies widely across the G20 members and the variation is more prominent in the case of emerging market economies and developed members of the G20. As a forum of both emerging market economies and developed countries, the G20 has a role in enabling collective action and response to bridge the adoption gaps. Given below are a few recommendations:

- **Encourage national e-commerce policies to support the growth and development of the e-commerce sector:** In some countries, particularly emerging market economies, an overarching e-commerce policy that sets out the vision for the e-commerce sector is missing. The G20 should encourage its members to formulate a national e-commerce policy with short-term and long-term strategies to promote the growth and development of the sector, in line with domestic priorities and international best practices. Other regulations affecting e-commerce must also be aligned with the national policies to avoid conflicting regulations.
- **Establish common data collection and reporting mechanisms on parameters related to e-commerce adoption:** It is worth mentioning that data for e-commerce adoption, especially for MSMEs, is not available for many countries. One, there is a definitional issue, as different countries follow different definitions of MSMEs, and two, many countries do not have a data collection mechanism in place. The G20 can set up a framework for collecting data on key indicators determining e-commerce adoption, especially at the firm level through national surveys. This will allow countries to track progress, identify, and fill the gaps.
- **Bridge the adoption gap, especially for enterprises and segments that are vulnerable to digital transformation, such as MSMEs:** The above discussion highlights that emerging market economies are not well prepared and within these, smaller enterprises are most vulnerable often because of a lack of knowledge or fear of competition. To fill the adoption gap, the G20 can formulate an action plan for enhancing adoption for the vulnerable groups, based on global experiences. In India, for instance, the government has soft-launched the Open Network Digital Commerce (ONDC) platform for onboarding MSMEs to sell online. Similar initiatives can be discussed, and learnings can be shared during the meetings of the relevant working groups involved.

- **Enhance digital financial inclusion by promoting digital financial literacy:** The G20 should encourage its members, especially the emerging market economies, to improve knowledge about financial products and services and create awareness about risks and national dispute redressal mechanisms. This can be done in partnership with financial institutions and Fintech companies and national MSME departments and ministries. This will enhance confidence and trust in these products, thereby encouraging digital financial inclusion.
- **Promote harmonized standards for digital infrastructure:** These may include technical Internet standards for Internet infrastructure, such as a Transmission Control Protocol and an Internet Protocol, web standards, standards for network and mobile networks, among others. Harmonization of standards can have a far-reaching socioeconomic impact as they are instrumental in improving the quality of infrastructure, establish a common framework, and improve inter-portability. In practice, these can also be instrumental in setting common security standards.

8. CONCLUSION

While COVID-19 has accelerated e-commerce adoption across the world, the adoption gaps between developed countries and emerging market economies remains obtrusive. Poor access and use of the Internet, limited financial inclusion, and regulatory bottlenecks are some factors constraining the adoption of e-commerce in emerging market economies. As a forum that brings together diverse communities, including leaders, policymakers, the private sector, and civil societies, among others, from developed countries and emerging market economies, the G20 is uniquely placed to bridge the gap in adoption. The paper recommends that the G20 can encourage its members to adopt national e-commerce policies with short-term and long-term vision to: promote e-commerce; establish common data collection and reporting mechanisms to track progress; assist vulnerable groups in achieving higher adoption; enhance financial inclusion; and promote harmonized standards for digital infrastructure.

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APPENDIX A

Table A1: Snapshot of Select Regulations Applicable to E-commerce Operators in Emerging Market Economies

| Issue/Country | Electronic Transaction and Signature | Data Protection and Privacy | Consumer Protection | Computer Crime | Intellectual Property | Competition | Taxation | Information Security |
|----------------------------|--|--|--|--|---|---|--|--|
| Argentina | Digital Signature Law (DSL), Law no. 25:506/2001 | Data Protection Law (PDPL) | Law of Consumer Defense (LDC) | Law 26:388 | Law No. 24,425 and various others | Law No. 27,442 of 2018 (the Competition Law) | Law 27,430/2017. | Data Protection Law (PDPL) |
| Brazil | Provisional Measure no. 2,200-2/2001 | The Brazilian Data Protection Law (" LGPD"), Brazilian Civil Framework of the Internet (Law n. 12.9655/2014) | The Brazilian Consumer Protection Code (Federal Law No. 8,078/1990), Civil Procedure Code – CPC (Law n. 13.105/2015); Law n. 10.962/2004 Law No. 14.155, de 27, 2021 | Law No. 14.155, de 27, 2021 | Brazilian Industrial Property Law (Law No. 9,279/96) | The Brazilian Competition Act (Federal Law No. 12.529/2011) | Law No. 11,196 (" Lei do Berr") and Law No. 8,248 (" Lei da Informática") | Article 154-A of the Brazilian Penal Code (<i>but no specific law</i>) |
| People's Republic of China | PRC Electronic Signature Law | PRC Electronic Commerce Law, protection of personal data. (Id. art. 23). Measures for the Supervision and Administration of Online Transactions, 2021 | Measures for the Supervision and Administration of Online Transactions, 2021. PRC Electronic Commerce Law, 2018 | Article 286 of Chinese Criminal Law | The Patent Law, the Trademark Law and the Copyright Law | The Antimonopoly Law | Tax Policy on Cross-Border E-commerce Retail (Cai Guan Shui (2016) 18) Act | Cybersecurity Law (CSL), Cybersecurity and Encryption Act |
| India | Information Technology Act, 2008 and Indian Contract Act of 1872 (" ICA") and the Electronic Signature or Authentication Technique and Procedure Rules, 2015 (" ESEATPR"); Payments and Settlement Act, 2007 | Information Technology Act, 2000 (" IT Act") Digital Data Protection Bill 2022; Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011) | Consumer Protection Act, 2019 and Consumer Protection (E-Commerce) Rules, 2020, Sale of Goods Act, 1930, Legal Metrology Act, 2009 | Information Technology Act, 2000 and the Indian Penal Code, 1860 | Trademarks Act, 1999. The Patents Act, 1970 (amended in 2005) The Copyright Act, 1957 | Competition Act, 2002 | Section 194-O (introduced by Finance Act, 2020) and Income Tax Act, 1961 Central Goods and Service Act | Information Technology Rules (IT Rules) |

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Table A1 continued

| Issue/ Country | Electronic Transaction and Signature | Data Protection and Privacy | Consumer Protection | Computer Crime | Intellectual Property | Competition | Taxation | Information Security |
|-------------------|---|--|---|--|---|--|--|--|
| Indonesia | Law 11 of 2008 on Electronic Information and Transactions, amended by Law 19 of 2016 and Government Regulation 71 of 2019 on the Application of Electronic Systems and Transactions; GR 80, 2019 on Trading Through Electronic Systems (GR 71/2019) | The Law on Electronic Information and Transactions and various others (no specific law has been implemented, Draft Personal Data Protection Bill, is passed but still in draft format) | Consumer Protection Law, Number 8 of 2020 on Supervision of Drugs and Food Distributed Online | Law on Information and Electronic Transactions, EIT Law and GR 71/2019 (No specific law) | The Trademarks and Geographical Indications Law, The Patent Law, The Copyright Law and others | The Anti-Monopoly Law | Law 30 of 2008, Law No. 1/2020 | EIT Law and GR 71/2019 (no specific law or definition) Plan on drafting Personal Information Protection Law and the Data Security Law in 2020 |
| South Africa | Electronic Communications and Transactions Act (Act no. 25 of 2002) ("ECTA") | General Application of The Protection Of Personal Information Act (POPIA), 2021 | The Consumer Protection Act, 68 Of 2008 (CPA) | The Cybercrimes Act 19 of 2020 | The Patents Act 57 | The Competition Act 89 | Income Tax Act 58 of 1962. | The Cybercrimes Act |
| Saudi Arabia | Law (KSA Cabinet Decision No. 80/1428) on the Approval of The Electronic Transactions Law; M/126, E-Commerce Law, 2019 | Personal Data Protection Law, 2021. DP Law, 2022 | Consumer Protection Law; M/126, E-Commerce Law, 2019 (Draft Law) | Anti-Cyber Crime Law | Berne Convention for the Protection of Literary and Artistic Works, The Paris Convention for the Protection of Industrial Property and various others | Royal Decree No M/75 of 29 Jumada Thani 1440 Hejra | The Zakat, Tax and Customs Authority (ZATCA) guidelines; E-Commerce Law, 2019, Article 7 | The Cybersecurity Law |
| Türkiye | Law on Electronic Signatures (Act No. 5070) | Data Protection Law No. 6698 (PDPL), 2016 | Law on Consumer Protection (Act No. 6502) | Law No. 6698 on Personal Data Protection | Industrial Property Law No. 6769, Law on Intellectual & Artistic Works No. 5846 and international agreements | Competition Act | Corporation Tax Law and the Income Tax Law | Law No. 651 on regulation of Publications on the Internet and Prevention of Crimes Committed by Means of such Publications |