Digital Services
Exports of Bangladesh

Will Data Localisation Propel or Imperil?

Contents

Acknowledgments

Executive Summary

Bangladesh's ICT sector had an impressive annual growth of 40 percent with the current valuation of US$1.54bn, engaging more than 300,000 professionals and 4500 enterprises. Facilitated by cross-border data flows (CBDF), over the past five years, ICT exports have doubled to US$1.4bn in 2019-20, wherein exports were made to as many as 80 countries by 400 enterprises. Notably, Bangladesh envisages achieving US$5bn in ICT exports revenue by employing two million professionals by 2025 and making the ICT industry the next growth engine for the country's economy.

As businesses are increasingly relying on data with increasing digital transformation and easier global digital trade, risks of data misuse, data privacy, and security concerns have increased. Consequently, countries, including Bangladesh, are beginning to consider policies that regulate data privacy, security, and cross-border transfer. Such measures also include the prohibition on CBDF outside the country, called data localisation, or conditions on the flow of data, storage, and processing, called a conditional flow regime. The recently released draft Data Protection Act also restricts the transfer of data outside Bangladesh without prior approval of the government.

Several empirical studies have indicated that such restrictive policy measures could adversely impact digital trade, affecting innovation, economic growth, and foreign direct investments. Given the increasing significance of the ICT sector for Bangladesh's economy, including the prominence of digital trade, this study analysed the impact of CBDF restrictions on Bangladesh's digital services exports.

This study assessed scenarios such as if Bangladesh were to adopt CBDF policies like India and Vietnam, including the impact of CBDF restrictions on digital exports because of retaliatory measures from Bangladesh's trading partners.

Across scenarios, it is estimated that Bangladesh's digital services exports are estimated to decline, ranging from 29 to 44 percent, depending upon the severity of CBDF restrictions and retaliatory measures.

Moreover, analysis of Key Informant Interviews with industry associations, government, experts, and IT companies, among others, highlighted the understanding of the estimated impact of CBDF restrictions on businesses, including compliance costs, non-tariff barriers, etc., is evolving. Although, many stakeholders highlighted that quality of services in Bangladesh could be negatively impacted if CBDF restrictions mandate choosing local service providers, which could also increase operational costs for their businesses and could adversely affect small businesses.

1   Introduction

Background

Over the past decades, Bangladesh has made tremendous socio-economic progress. The rising per capita income had already enabled the country in 2015 to climb up to the ranks of 'lower-middle-income' countries from a 'low-income' category, as classified by the World Bank. In recognition of continuous socio-economic progress, Bangladesh is now set to graduate from the group of least developed countries (LDCs) to a developing country in 2026.

While the COVID-19 pandemic has unleashed its devastating consequences, Bangladesh, unlike many other countries, has been able to demonstrate resilient economic activities. Bangladesh's medium- to long-term plans call for sustaining buoyant economic growth, for which the digital sector would play an important role, especially in the aftermath of COVID-19.

The Government of Bangladesh recognises the Information and Communication Technology (ICT) as a thrust sector capable of creating employment opportunities, especially for the youth, whose high unemployment rate has also been a matter of serious concern. To realise the potential of the ICT sector, it launched the Digital Bangladesh initiative in 2010. The initiative relies on four pillars – human resource development, connecting citizens, digital government, and ICT in business. Specifically, ICT in business entails three broad issues: access to markets, promotion of ICT business to support Digital Bangladesh, and ICT as an export-oriented sector.

Since its launch, according to an E-Trade Readiness Report by the United Nations Conference on Trade and Development (UNCTAD), Bangladesh's ICT sector has shown a significant annual growth rate of 40 percent. The size of the local ICT market is currently valued at US$1.54bn. More than three hundred thousand professionals and about 4,500 enterprises are presently involved. According to the Bangladesh Association of Software & Information Services (BASIS), ICT exports over the past five years doubled to US$1.4bn in 2019-20. More than 400 enterprises have associated with some exporting activities covering around 80 countries globally.

While the Digital Bangladesh vision was initially crafted for up to the year 2021, the initiative has now been extended further under Vision 2041. Increasing ICT use and effective technology for socio-economic development are at the core of Digital Bangladesh's vision. Considering the potential of the ICT sector, Bangladesh envisages achieving US$5bn in export revenue and

employing two million professionals by 2025. It endeavours to make the ICT industry the next engine of growth for the economy of Bangladesh.[1]

Along with its huge export potential, the ICT sector can also help promote the competitiveness of the overall economy. As the country is overwhelmingly dependent on a single product — readymade garments — for its export earnings, digital goods and services can contribute to export diversification. While considerable progress has been made over the past decades, the digital sector remains at its early stage of development. The potential of this sector thus will have to be materialised to boost overall economic growth and export expansion in the coming years.

In the fourth industrial revolution era, digital trade has taken a central role globally and is facilitated by the free flow of cross-border data and digitalisation. The digital trade increased the world's GDP by more than 10 percent between 2004 and 2014. About 75 percent of the value created by cross-border data flows (CBDF) accrued to traditional industries (Mckinsey Global Institute). This signifies that the influence of policies facilitating CBDF is not limited to the technology sector but also impacts traditional sectors.

However, as digital transformation facilitated easier global and digital trade, new business models that increasingly relied on data at their core have come to the fore. This has also led to novel risks of misuse of data. As a result, many countries, including Bangladesh, are beginning to consider data protection and restriction policies. Such policies regulate the use of data, including and providing for data privacy and security. Measures being considered include prohibiting data transfer outside the country, called data localisation, or prescribing conditions on the data flow and its storage and process, called a conditional flow regime.

Moreover, UNCTAD's Digital Economy Report 2021 highlighted that developing countries such as Bangladesh must consider their economic, socio-cultural, and political preferences, domestic regulatory capacities, and the state of technological development to maximise the potential benefits of the digital economy and ensure greater welfare of citizens.[2]

According to various empirical studies, data restriction policies affect the abilities of the companies to choose the most efficient channel for trading services and thus, may disincentivise businesses and investment opportunities, including productivity loss for local companies, which are primarily dependent on data.

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[1]   https://thefinancialexpress.com.bd/views/views/is-data-localisation-economically-pragmatic-for-bangladesh-1632927802

[2]   https://unctad.org/system/files/official-document/der2021_en.pdf

Objectives

This study was conducted in two parts with the twin objectives of understanding and analysing:

i) the impact of restrictions on CBDF on the digital services exports of Bangladesh

ii) the impact of restrictions on CBDF on the economy of Bangladesh, including employment, economic growth, and related indicators.

This report addresses the first objective of understanding the impact of CBDF restrictions on the digital services exports of Bangladesh. In contrast, the subsequent report will analyse the consequent impact of CBDF restrictions on the economy of Bangladesh.

To ***empirically understand the impact of policy measures that restrict CBDF on the digital services exports of Bangladesh,*** this report first tries to understand the IT/ITeS sector in Bangladesh holistically and then map the current and proposed policies of the industry. After that, an economic and econometric exercise has presented that estimates the impact of CBDF restrictions on digital services exports. For a well-rounded understanding of the issue, industry perspective was also gathered via semi-structured interviews.

Methodology

The study adopted a three-pronged approach:

(i) Building an understanding of the IT/ITeS sector and the issue of data localisation through **secondary literature and data review;**

(ii) **Statistical analysis** using descriptive statistics and trends and **econometric analysis[3]** were used for data analysis and model building to gauge the impact of possible restrictions on digital services exports and;

(iii) **Key informant interviews** aided by a semi-structured questionnaire were conducted with key stakeholders in industry, policy, and academia to capture the pulse on the ground.

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[3] Refer to the appendix for a detailed econometric model, data tables, and results.

2 IT/ITES sector in Bangladesh

Information Communication and Technology

Box 1: ICT Sector
The definition of the ICT sector has evolved to include new varieties of services. According to the Organisation for Economic Co-operation and Development (OECD), ICT services must primarily be intended to fulfil or enable the function of information processing and communication via electronic means, including transmission and display. According to OECD, the ICT services sector includes software publishing (ISIC 5820); telecommunication (ISIC 61); computer programming, consultancy, and related services (ISIC 62); data processing, hosting, and related activities (ISIC 6311); web portal (ISIC 6310), and repair of computer and communication equipment (ISIC 951). Under Bangladesh's National Classification, apart from the sectors mentioned above, the ICT sector includes printing and publication. Among several sub-sectors of ICT services, software publishing, telecommunications, computer programming, data processing, hosting, and related services are considered the most promising. Other than these, ICT-enabled services, which are transformed by ICT, i.e., offshoring, freelancing, call centre services, etc., also have prospects.

The domestic ICT and ITES industry has maintained double-digit growth rates over the past decade (USAID, 2019). According to BASIS, the average annual growth rate of the industry has been over 40 percent over the recent five years (BASIS, 2021). The high growth was facilitated by several government initiatives to support the sector (Box 2), usage of IT-based solutions in agriculture, education, health, economy, industry, business and commerce, skills, employment, innovation, etc., and high demand for IT/ITes in the regional and international market, low-cost operations, availability of skilled and semi-skilled workforce, and young talent, etc.

Considering the potential of the ICT sector, Bangladesh envisages achieving US$5bn in export revenue and employing two million professionals by 2025. It endeavours to make the ICT industry the next engine of growth for the economy of Bangladesh.

Box 2: Government Incentives for the Promotion of the IT/ITES Sector
The Government of Bangladesh is providing various incentives to promote the IT/ITES sector. The followings, among others, are most pertinent: 12 years exemption of income tax for park developers.   10 years exemption of income tax for investors.   - Exemption of import duty, regularity duty, and supplementary duty for local production of ATM and CC cameras;   - Exemption of duties on imported capital equipment and construction materials by the investors;   - Hi-Tech parks are declared as bonded warehousing stations;   - Exemption of income tax on dividends, share transfer, royalty, and technical fees for investors;   - Exemptions of income tax for foreign employees;   - Exemption of income tax on the declared dividend by park developers;   - Exemption of VAT during production level of goods by the investors;   - Exemption of duties on imported goods/materials to be used for the development of Hi-Tech Parks by the park developers;   - Exemption of stamp duty on the deed registration/ mortgage deed registration;
Source: Eighth Five Year Plan

There is, however, a lack of credible information on production, revenue/sales, and employment in the ICT sector. According to IT-ITES Industry Statistics of Bangladesh 2019—based on a survey jointly conducted by Bangladesh Computer Council (BCC) and Information & Communication Technology Division (ICTD)—the ICT industry generated revenue of US$1.03bn (including exports) in 2018.[4]

Some other sub-sectors, such as the internet service providers (ISP), hardware development and services, etc., were kept outside the survey. Besides, online freelancers or gig workers and IT-ITES professionals employed in other industries and sectors such as manufacturing, finance, healthcare, government, etc., are not considered. Therefore, the revenue estimate generated in the sector is most likely to be underestimated. According to BASIS, the size of the ICT sector could be around US$2bn, including exports.

The domestic market for IT/ITES is growing exponentially, and IT-based solutions are being used in government offices as part of digitalisation. Besides, the IT industry supports domestic manufacturing industries and services sectors, including but not limited to such sectors as

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[4]   The survey is conducted based on the 1755 member IT/ITES firms of three leading organisations in the industry (1) Bangladesh Association of Software and Information Services (BASIS), (2) Bangladesh Association of Call Center and Outsourcing (BACCO), and (3) e-Commerce Association of Bangladesh (e-CAB).

readymade garments, telecom, bank and non-bank financial institutions (NBFI), healthcare, and education.

According to IT-ITES Industry Statistics of Bangladesh 2019, the estimated local market revenue stood at US$0.23bn in 2018, registering a compound annual growth rate (CAGR) of almost 34 percent (Figures 1 and 2).

However, this does not capture the total industry revenue as some firms are outside the survey coverage. Besides, other subsectors such as internet service providers, IT hardware companies, freelancers, etc., are not included in the estimate. Considering all the sub-sector of the IT/ITES industry, the local market revenue is expected in the range of US$1-1.5bn.[5] A study by Everest Group projected that the domestic industry would grow nearly five-fold to reach US$4.6-4.8bn by 2025 (Karthik et al., 2017).

Figure 1: Local Market Revenue in the ICT Sector (in US$mn)

Figure 2: Growth Rate in Revenue Generated from the Domestic Market (%)
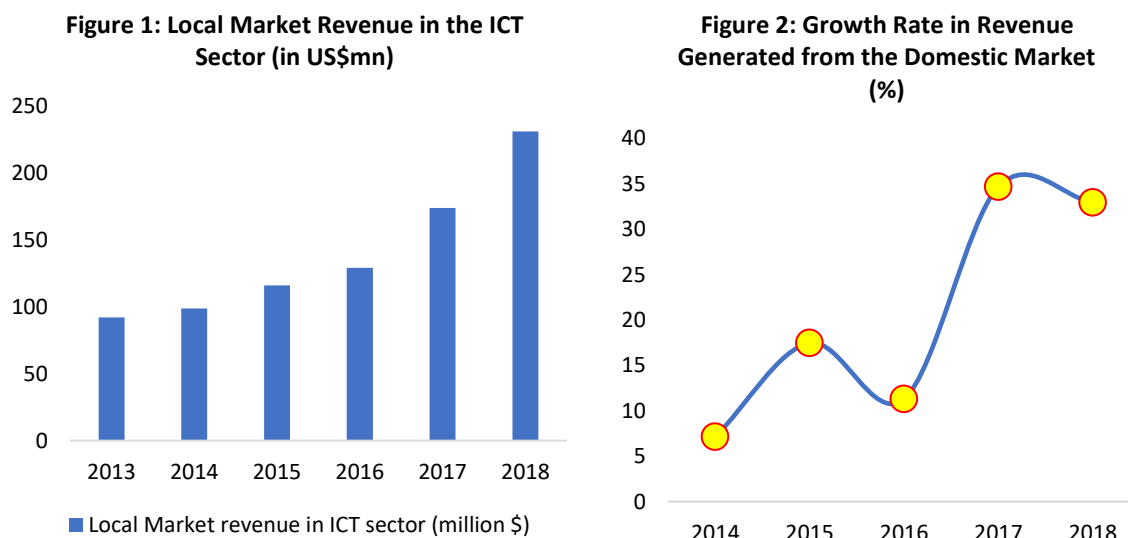
Note: Estimates are based on the revenue generated by 1,755 BASIS, BACCO, and E-cab members. Revenue of non-members and other subsectors such as ISP, IT hardware companies, gig economy, IT workers in manufacturing, finance, healthcare, government, etc., are not included.
Source: IT-ITES Industry Statistics of Bangladesh 2019.

Businesses Process Outsourcing

In Bangladesh, ICT-based outsourcing is growing at a rapid pace. The business process outsourcing (BPO) and contact centre (call centre) sector has seen a massive expansion in the past decade. Starting its journey in the late 2000s with only 300 employees, the BPO sector now employs more than 50,000 people across some 300 firms. The revenue generation of local BPO companies stood at over US$400mn in 2018-19, increasing from just US$4mn in 2008-09 (Figure 3).[6]

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[5]   According to the President of BASIS, local market revenue is around US$1bn.

[6]   https://www.bacco.org.bd/public/uploads/publication/upload_file/5f1e9eb92de1a_1.pdf

The BPO industry is currently enjoying 100 percent tax exemption, 50 percent tax reduction for the first three years for foreign employees, 80 percent vat exemption for rental and utilities, and up to 10 percent cash back on exports are significant incentives. According to Bangladesh's industry estimates, about 20,000 people join this sector every year.

As the country faces the daunting task of creating at least 2 million jobs every year to accommodate new entrants to its labour force, the sector holds the potential to fulfil its employment needs. The Government has also set a target to increase BPO revenues to US$1bn within 2021. The ICT Division is actively promoting the BPO sector to make Bangladesh a major competitive offshore destination for international companies.

Figure 3: Total Market Size of the BPO and Call Centre Industry
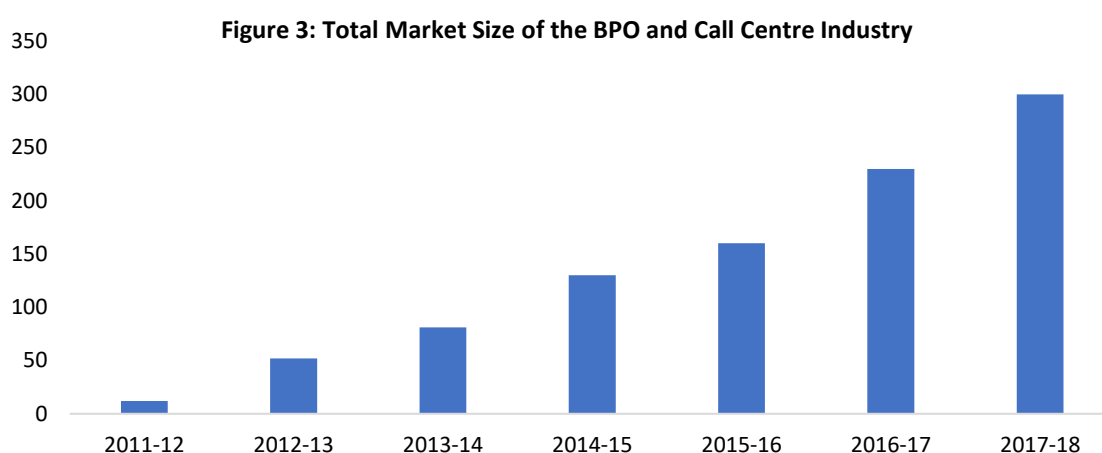
Source: Bangladesh Association of Call Centre and Outsourcing (BACCO)

Establishing a stronger foothold in this large, rapidly evolving, and growing market in the BPO sector would require catering to the complex demands of global clients. Furthermore, newer digital technologies are revamping long-established operations. BPO models are being renewed by adapting intelligent workflows integrating Artificial Intelligence (AI), big data, cloud computing, Internet of Things (IoT), machine learning, and automation to help firms and organisations perform diverse and complex activities more efficiently. Domain-specific skills are becoming dominant factors for growth in the BPO market, experiencing a surge of new digital process models.[7]

To remain relevant in the emerging market trends, BPO service providers in Bangladesh are now required to evolve and embrace the transformation to provide high-end services continuously. There are three types of jobs in this sector – data entry, customer service, and information analysis.[8]

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[7] According to one report, business processes will be reimagined with the advent of new digital process models. See https://www.i-scoop.eu/robotic-process-automation-and-ai-technologies-bpo-market/.

[8] This is based on information obtained from LightCastle Analytics Wing: https://www.lightcastlebd.com/insights/2020/01/ict-outsourcing-catering-to-the-growing-demand.

Bangladesh's BPO industry is primarily focused on call centre-related services considered low-skilled tasks. Currently, more than 80 call centers are operating in Bangladesh, out of which 80-85 percent are providing voice-based services, while the rest 15-20 percent are offering non-voice outsourcing services (Hossain, 2017).[9] The non-voice components are mainly knowledge process outsourcing (KPO) services in accounting, human resources management, and legal services.[10]

E-commerce

Electronic commerce, known as e-commerce, is one of the main components of the digital economy, and it involves digitally deliverable goods and services purchased online.[11] E-commerce is an emerging industry in Bangladesh, and its market size is reported to have increased by 30 times over the last five years to reach around US$2bn in 2020 (Figure 4). According to industry estimates, e-commerce could reach US$3bn by 2023. Bangladesh ranked 46th in terms of e-commerce revenue in the world.[12]

There are a total of 1,300 members of e-Cab engaged with e-commerce activities. Around 2,000 e-commerce sites and 50,000 entrepreneurs operate their e-businesses on Facebook, delivering almost 30,000 products a day.[13] Around 80 percent of e-commerce activities are in Dhaka, Chattogram, and Gazipur. Child, Shohoz, Pathao, food panda, Bdticket, Daraz, Sheba.XYZ and bikroy.com are popular e-commerce sites delivering products and services to consumers.

Figure 4: Mareket Size of E-commerce in Bangladesh (in US$bn)
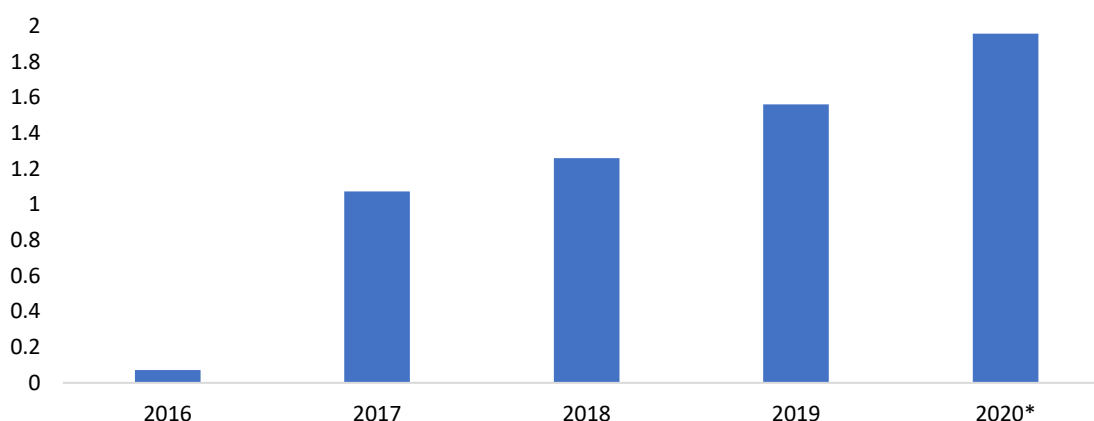
Note : * as of August 2020
Source: Bangladesh Competition Commission.

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9   Hossain, M. (2017). Labor Market and Skills Gap in the ICT Sector in Bangladesh: An Exploratory Study.

10   Hossain, M. (2017). Labor Market and Skills Gap in the ICT Sector in Bangladesh: An Exploratory Study.

11   E-commerce is classified into four categories – business to business (B2B), business to consumer (B2C), consumer to consumer (C2C), and Business-to-Government (B2G).

12   Statista

13   https://thefinancialexpress.com.bd/views/e-commerce-in-bangladesh-where-are-we-headed-1578666791

E-commerce ensures access to new business and markets with diverse customers and products and services, thus contributing to the economy. It further adds to income generation, increases domestic sales and exports, expands the market, and improves the standard of living. The development of e-commerce activities has been facilitated by expanded internet connectivity, high mobile penetration, online payment and banking regulations, availability of a semi-skilled youth labour force, etc. The E-commerce sector generates opportunities for job creation as currently, 40,000 individuals and 30,000 small and medium enterprises are involved in this sector.[14]

More than four lakhs of female entrepreneurs deliver products and services on different online platforms, and around one million individuals are directly or indirectly employed in this sector.

Exports and Imports of IT/ITES Products and Services

Exports of ICT goods and services increased significantly over the past decade. According to BASIS, ICT exports over the past five years doubled to US$1.4bn in 2019-20. However, reliable time-series data on the revenue earned from exporting ICT products and services are still unavailable. According to IT-ITES Industry Statistics of Bangladesh 2019, IT/ITES firms expanded their exports from around US$300 in 2013 to US$800mn in 2018 – experiencing an average annual growth rate of 20 percent.

Our estimates using the UNCTAD database show that the exports of ICT/ITES services stood at US$1.64bn in 2019, increasing from less than US$300mn in 2005 (Figure 5)[15], with an average annual growth rate of 15 percent during this period. The policy effort for export diversification and support for information and communication services, business services, and certain deregulations also contributed to the growth of ICT/ITeS exports. Of these US$1.64bn, around half a billion were ICT services, while the rest are digitally deliverable ITeS services (Figure 5).

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[14]   https://m.theindependentbd.com/post/254295

[15]   Estimation is based on the definition by the Organisation for Economic Co-operation and Development (OECD)

Figure 5: Exports of IT/ITES Services in Bangladesh
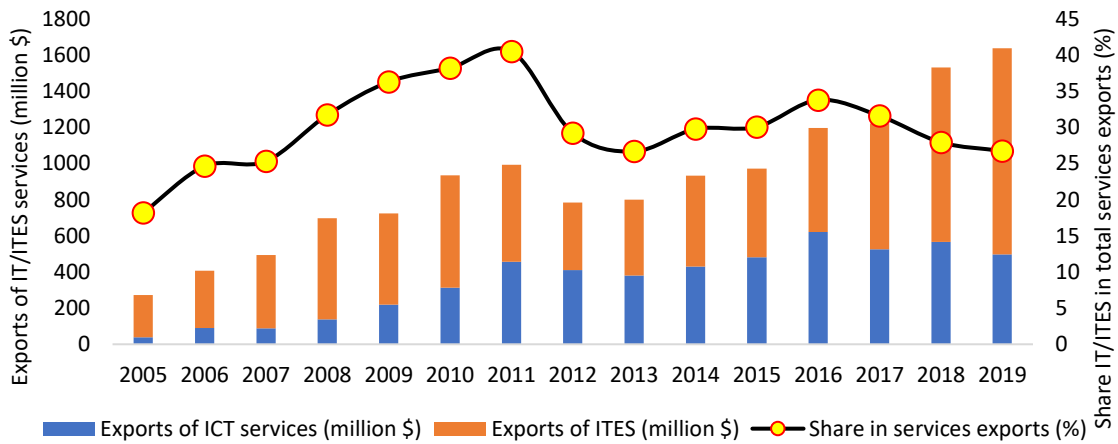
Source: Authors' presentation using UNCTADstat data.

The ICT/ITeS services constitute more than a quarter of total services exports, which shows a slightly declining trend over the past few years. This is mainly attributable to the rise in government goods and services in total services exports. Bangladesh's services exports increased significantly during the past two decades to reach US$6.22bn in 2018-19.

Figure 6: Trend in Services Exports from Bangladesh
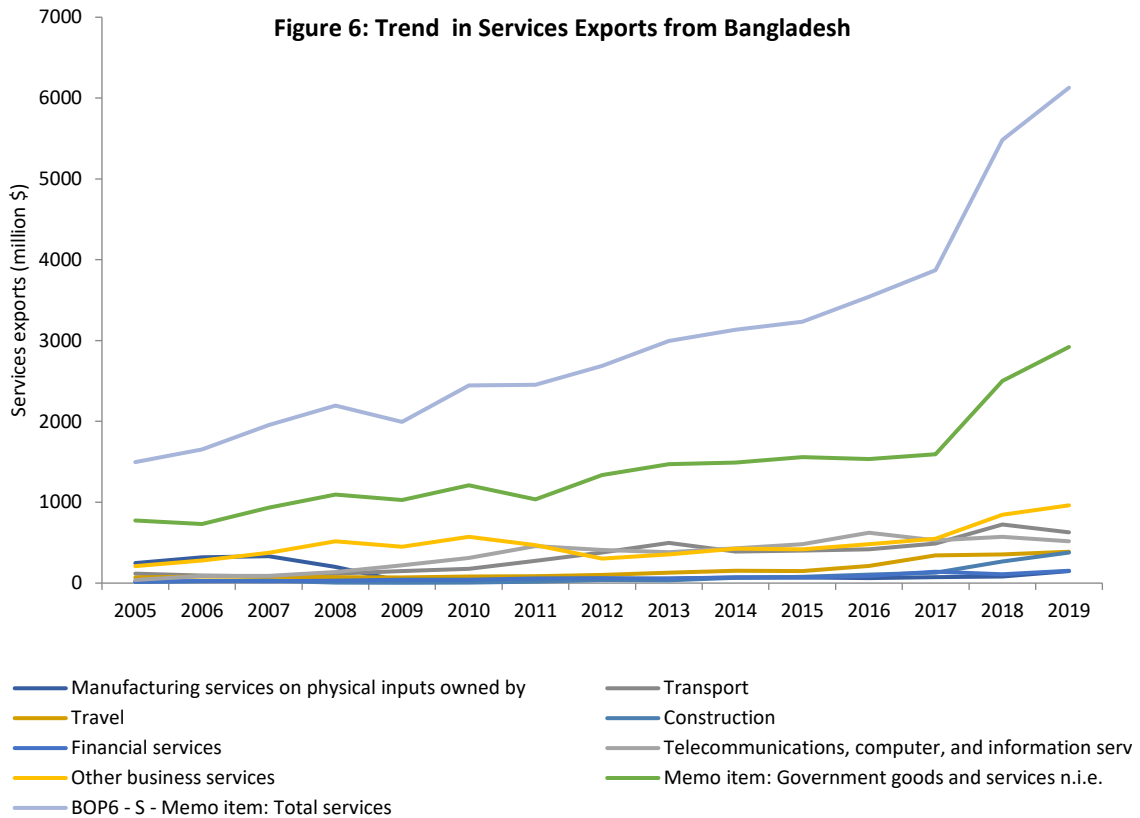
Source: Authors' presentation using ITC Trade Map data.

More than 400 enterprises have managed to associate them with some exporting activities covering around 80 countries globally. Figures 7 depict the major export market destinations of Bangladesh's ICT services.

According to 2018-19 data, Uruguay is the largest export market destination (21.5 percent) of ICT services, followed by Singapore (17.1 percent), the United Arab Emirates (9 percent), the United Kingdom (7.8 percent), Malaysia (7.5 percent), India (6.8 percent), and Hong Kong (6.7 percent). Among European countries, the United Kingdom (before Brexit), Denmark, and Germany have been the main destinations of software exports. At the same time, India, Malaysia, and the UAE are the major Asian destinations for Bangladeshi software.

Figure 8 represents Bangladesh's export market destinations of ITES services.[16] The United States is the largest export market destination (18.3%). Among the other European countries, the United Kingdom, Germany, Switzerland, Netherland, Norway, and Sweden are the main export markets. Singapore, India, China, Hong Kong, Japan, the Philippines, and the UAE are the major Asian countries where Bangladesh's ITES services are exported.

Figure 7: Destinations of Bangladesh's ICT Sevices Exports, 2018-19
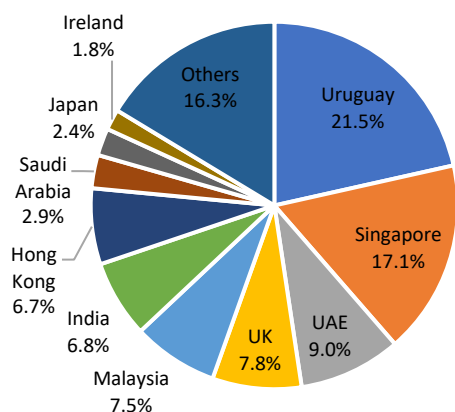
Figure 8: Destinations of Bangladesh's ITES Exports, 2018-19
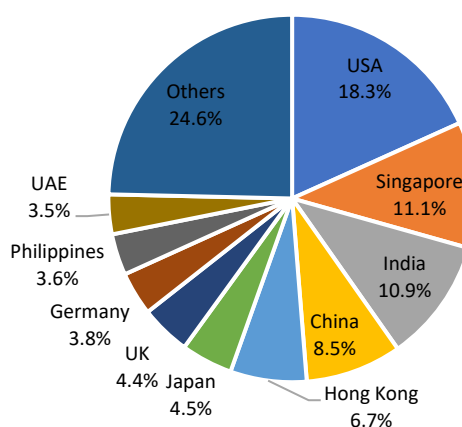
Source: Authors' analysis using Bangladesh Bank data.

Using the OECD definition of ICT products, we attempt to estimate the exports of ICT goods using the ICT Trade Map database.[17] It is found that Bangladesh's ICT goods exports stood at around US$15mn in 2019 (Figure 9). The high yearly fluctuations in these export earnings are attributable to the very small base of these exports. Hong Kong is the largest destination of ICT products exports, followed by Poland, Japan, Malaysia, Singapore, and Indonesia (Figure 10).

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[16] ITES includes services in the call centre, medical transcription, medical billing and coding, back-office operations, revenue claims processing, legal databases, content development, payrolls, logistics management, GIS (Geographical Information System), HR services, web services, etc.

[17] Computed from the ITC Trade Map data at the HS 6-digit level.

Figure 9: ICT Goods Exports from Bangladesh (in US$mn)
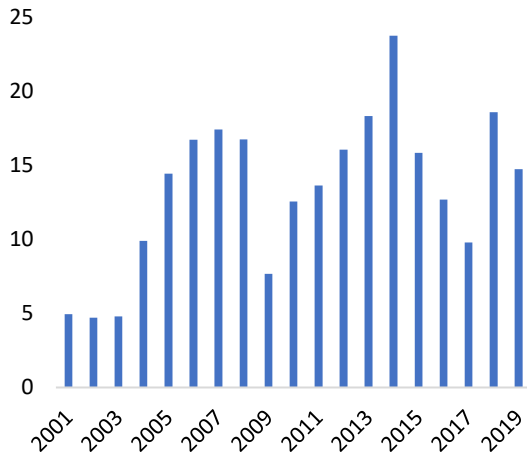
Figure 10: Destinations of Bangladesh's ICT Goods Exports, 2017-19 (%)
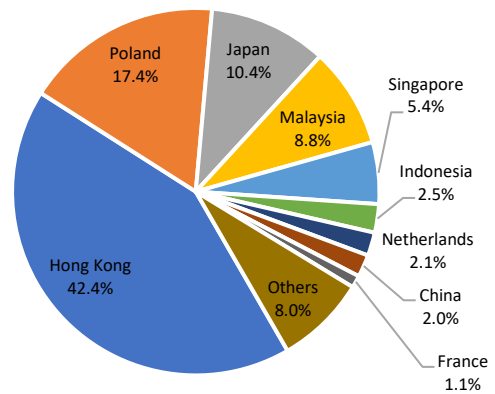
Source: Authors' analysis from the ITC Trademap database.

Imports of IT/ITeS services expanded faster in the past decade, and they stood at US$2.4bn in 2019, increasing from just above 300 in 2005 (Figure 11). More than 95 percent of them comprise IT-enabled services. Of US$2.4bn, ICT services imports were less than US$100mn in 2019. China is the largest source of ICT/ITeS imports in Bangladesh, followed by the United States, the United Kingdom, Singapore, India, Germany, etc. (Figure 12).

The estimations based on OECD definition from the ITC Trade Map database show that the ICT goods imports in Bangladesh increased significantly over the past decade to reach around US$650mn in 2019. China, Singapore, Malaysia, Hong Kong, Taiwan, Vietnam, and the United States are the major ICT products imported to Bangladesh.

Figure 11: Imports of IT/ITES Services in Bangladesh (in US$mn)
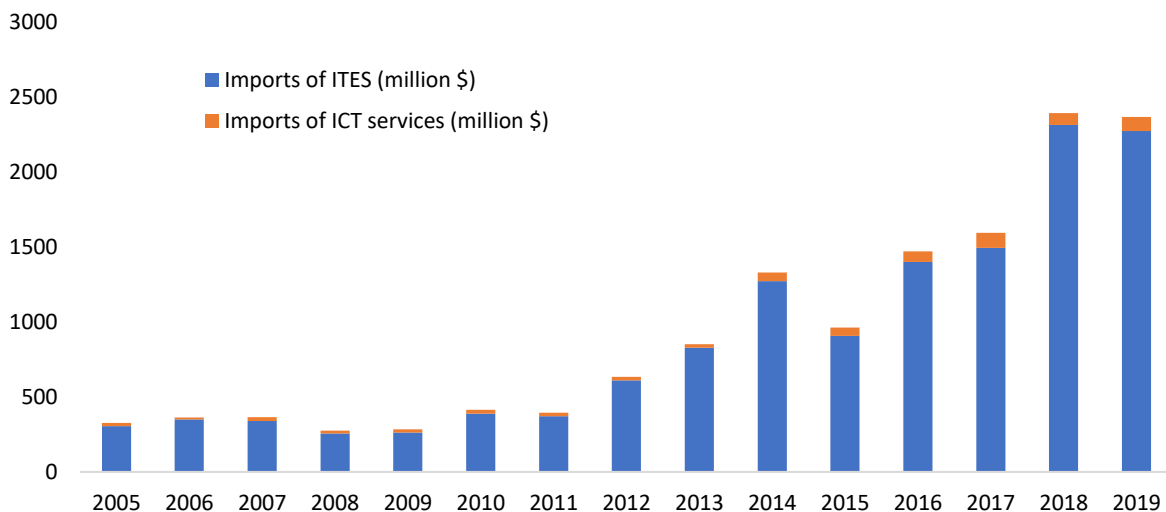
Source: Authors' analysis using UNCTAD data.

Figure 12: Major Sources of ICT/ITeS Imports (%)
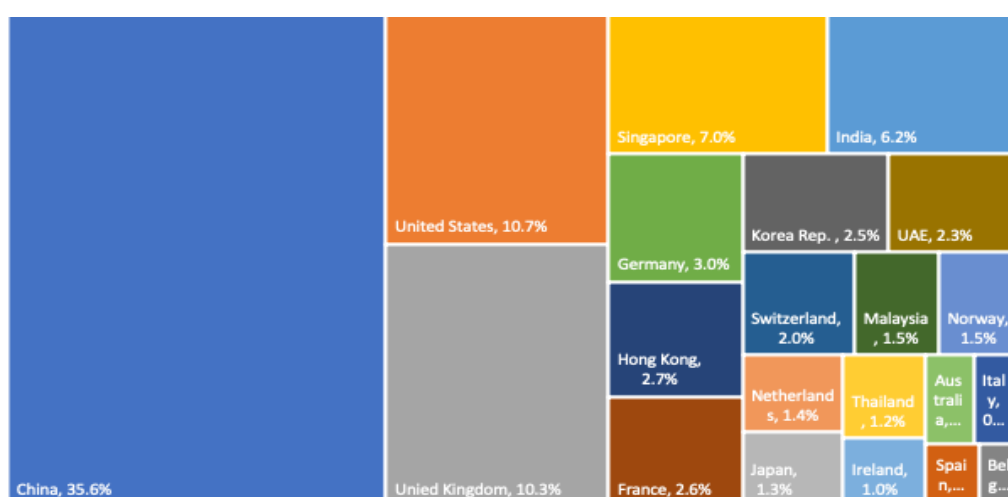
Source: Authors' analysis using Bangladesh Bank data.

Employment in the ICT/ITES Sector

There is no concrete information on employment in the ICT/ITeS sector. According to the IT-ITES Industry Statistics of Bangladesh 2019, the estimated full-time employment in the industry was 64,067 (Table 1). When 62,524 part-time workers were included, the total job in the registered companies was 126,591 (in 2018). The sector's employment growth has reportedly increased at an annual CAGR of 22.3 percent.

However, this reported employment is only a partial picture. Many small companies operating in the sector are not registered members of any organisations that participate in the survey. Besides, many individuals are operating independently. When considering all of these, and according to BASIS, about 400,000 individuals are estimated to be working in his sector, of whom 15-20 percent are female (USAID, 2019).

Table 1: Total Employment of IT-ITES Industry (2013-18)

Year	2013	2014	2015	2016	2017	2018	CAGR
Full-time Employment in the IT/ ITES Industry	23,392	28,615	35,003	42,817	52,375	64,067	**22.32%**
Part-time Employment in the IT/ ITES Industry	22,829	27,925	34,159	41,785	51,113	62,524	**22.32%**
Total Employment of the IT-ITES Industry	46,221	56,540	69,162	84,602	103,488	126,591	**22.32%**

Note: Estimates are based on the revenue generated by 1755 members of BASIS, BACCO, and E-cab. Revenue of non-members and other subsectors such as internet service providers, IT hardware companies, gig economy, IT workers in manufacturing, finance, healthcare, government, etc., are not included.
Source: IT-ITES Industry Statistics of Bangladesh 2019.

Along with the formal and informal employment in the ICT/ITeS sector, many individuals are working as freelancers. The government's digitalisation of Bangladesh initiative, the continuous development of ICT infrastructure, including easy internet access in both urban

areas, and several public and private initiatives to promote freelancing, among others, are facilitating the rapidly growing freelancers in the country. There are about 650,000 registered freelancers in the country. Of them, 500,000 are actively working in the global gig economy. According to the ICT Minister, online workers earn about US$500mn annually.

According to the Online Labour Index 2020, prepared by Oxford Internet Institute (OII), Bangladesh is the second-largest supplier of global online labour (after India), comprising 15 percent of the global online labour force. (Figure 13). The share of female workers in the online gig workforce in Bangladesh was about 17 percent (Stephany et al., 2021).[18]

The new time series estimates of OLI 2020 data show that Bangladesh's share of the global online worker population increased by five percentage points over the past five years. Bangladeshi online gig workers are mainly involved in creative and multimedia, software development, and technology (Figure 13).

Figure 13: Major Suppliers of Global Online Labour
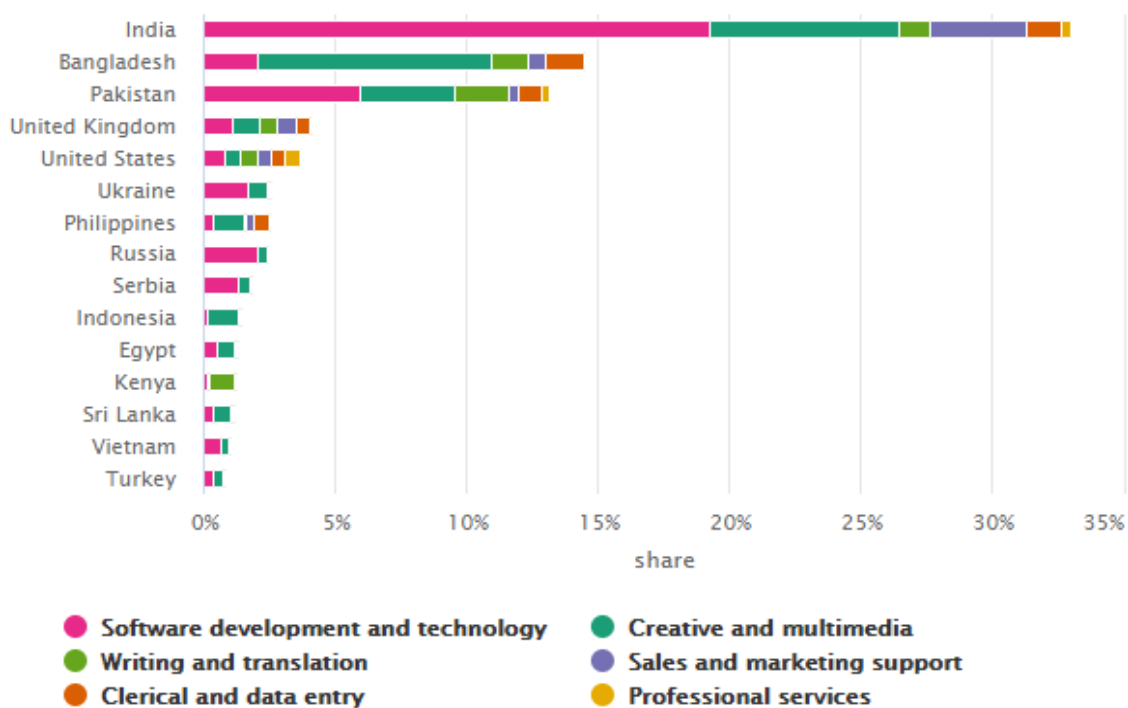
Note: Clerical and data entry - customer service, data entry, transcription, etc.; creative and multimedia – animation, graphic design, photography; professional services – accounting, legal, project management; sales and marketing support – lead generation, posting ads, search engine optimisation; software development and technology – data science, game development, mobile application development, etc.; writing and translation – article writing, copywriting, translation
Source: Online Labour Index 2020, Oxford Internet Institute (OII)

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18   Stephany, F., Kässi, O., Rani, U., Lehdonvirta, V. (2021). Online Labour Index 2020: New ways to measure the world's remote freelancing market.

Policy and Regulatory Scenario of CBDF in Bangladesh

In recent years, it has been observed that Bangladesh, like other countries worldwide, including India, has been gradually hinting towards data protection, including localisation. The arguments in favour of data localisation in Bangladesh point towards a similar set of reasons as has been witnessed across the globe. For example, in Bangladesh, it has been argued that data localisation would ensure the privacy and security of sensitive data of citizens. Thus, CBDF would provide a safe environment for sensitive data and be conducive to developing the local data-oriented industry.[19]

Moreover, data localisation has been increasingly linked to increasing investment and employment opportunities for Bangladesh and improving access to data by law enforcement agencies.[20]

Policies Signaling Restrictions on the Flow of Data outside Bangladesh

Bangladesh does not yet have a broad policy framework restricting cross-border data flows outside the country or mandating data localisation. However, the following are some existing and proposed policies that indicate a regulatory framework prescribing control over data management, leading to a restriction on cross border data flows:

Telecommunication

License Conditions: In Bangladesh, telecommunication licenses are issued by Bangladesh Telecommunication Regulatory Commission (BTRC), which under the telecom license conditions prohibits telecom companies from sharing subscriber information with entities or persons inside or outside Bangladesh. The telecom license also mandates that data aggregators such as controllers and gateways cannot be established outside Bangladesh.

Billing Information: Mobile and internet service providers are also mandated to maintain and keep subscribers' billing information, including electronic metadata, for at least six months.

Power to suspend or prohibit data transmission: According to Section 97 of the Telecommunications Act, the Central Government can empower certain government authorities to suspend or restrict data transmission, including voice calls and records of any

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[19]   https://www.thedailystar.net/business/news/customer-data-be-stored-locally-jabbar-1844377

[20]   https://www.dhakatribune.com/bangladesh/2021/12/30/digital-bangladesh-worlds-7th-largest-data-centre-eyes-foreign-currency

subscriber to any telecommunication service. Moreover, Section 97 may also require the telecommunications operator to keep records relating to subscriber communications.[21]

Finance

Section 12 of the Bank Companies Act, 1991 restricts bank companies from removing documents and records from Bangladesh without prior and written permission from the Bangladesh Bank, the country's central bank.[22]

Ride-Sharing Service Guidelines 2017

The Ride-Sharing Service Guidelines 2017 by the Bangladesh Road Transport Authority mandates that app-based transportation service providers must maintain data servers in Bangladesh.[23] Specifically, the guidelines provide that the ride-sharing providers should strictly procure and preserve all data and information related to drivers and riders within Bangladesh, with a prohibition on the transfer of data outside the country.

Draft Data Protection Act 2022 (DPA)

Section 42 of the Draft DPA provides for data localisation. It prescribes that sensitive data, user-generated data, and classified data shall be stored only in Bangladesh. It shall be outside the jurisdiction of the courts, law enforcement agencies, or authorities of any other state other than Bangladesh's courts and law enforcement agencies or authorities. Suppose the Government, by general or special order, designates any data as classified data from time to time. In that case, such data shall not be transferred to any place or system without the government's prior approval.

Section 43 further provides that if necessary for the data subject, any data, including any sensitive and user-generated data, may be transferred outside Bangladesh with the data subject's consent. If any data is transferred outside Bangladesh, the Director-General shall be informed thereof, in the manner prescribed by the Rules.

Draft Cloud Computing Policy 2021

The draft Cloud Computing Policy 2021 proposes to advance cloud-first policy across Bangladesh and mandates data localisation and transfer restrictions. The policy requires that the cloud service provider preserve data within Bangladesh, except if the information is non-personal and non-sensitive, then the data transfer is allowed only for backup and recovery.

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[21]   http://www.btrc.gov.bd/sites/default/files/telecommunication_act_english_2001.pdf

[22]   https://www.findevgateway.org/sites/default/files/publications/files/mfg-en-paper-the-bank-company-act-bangladesh-1991-1991.pdf

[23]
       http://www.brta.gov.bd/sites/default/files/files/brta.portal.gov.bd/legislative_information/7dca74c7_fe8c_46a3_8053_1ddc646767aa/Ride%20Sharing%20Service%20Guideline%202017%20(Gazette).pdf

Moreover, such information can only be hosted in countries with multilateral or bilateral relations with Bangladesh.

Global Perspective

The pandemic has resulted in the acceleration of digitisation across the globe. This increase in digitalisation has created digital divides among various countries, more evident at national and international levels. Most developing countries are clearly at a disadvantage as they are suppliers of raw data and have limited capacity to turn data into digital intelligence or business opportunities.[24] According to the global trends, there is a diversity of approaches and measures in the regulations by different countries.

The need and validity to regulate and restrict cross-border data flow can be measured from three lenses: citizen protection, national security, and economic development.[25] In the absence of a proper international system to regulate CBDF, countries may have various legitimate public policy reasons to regulate cross-border data flows, like protecting citizens' privacy, human rights, national security, etc. There is no alternative other than restricting the flow of data majorly for developing countries that are merely data providers while paying for digital intelligence obtained from their data.

A few countries have chosen restrictive/conservative approaches concerning the implementation of regulatory frameworks, but most countries with different levels of development have adopted prescriptive regulatory frameworks. In the case of the latter, the regulations depend upon the specific interest and goals of the country. Due to the lack of international consensus on data protection and privacy, many countries are adopting and updating their data protection laws in line with common principles like General Data Protection Rules (GDPR).

Therefore, a comprehensive high-level framework for cross-border data flow could be a solution to guide all the countries according to their socio-cultural and economic needs. A proper framework to facilitate the capacity to process data in developing countries would guarantee that the income gained from data is equitably shared by the countries involved when access is restricted. Such a framework would strike a balance between the country's regulatory framework and its interconnection with the global digital ecosystem.

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[24]   https://unctad.org/system/files/official-document/der2021_en.pdf

[25]   *Ibid.*

4 Impact of CBDF Restrictions on Bangladesh's Digital Services Exports

As established in the preceding sections, the ICT sector in Bangladesh is poised for growth and is envisaged to be a strong pillar of growth for the Bangladeshi economy. Given the strong performance of the ICT sector and equally strong potential to export digital services, an evidence-based approach to policymaking on issues that have a bearing on the sector is required. The ensuing discussion provides an econometrics-based understanding of the possible consequences of restricting CBDF.

Econometric Analysis[26]

We formulated an augmented gravity model based on existing literature to model the impact of CBDF restrictions on digital services exports in Bangladesh. As per the gravity model, trade between two countries depends on their economic size and the distance between them. Put simplistically, the bigger the economies more the trade between them, and the farther the economies lesser the trade between them. In our model, digital services exports have been considered a dependent variable. In contrast, a Data Policy Rank (DPR) interaction variable and the size of economies and other variables have been included in the model as the explanatory variable.

The DPR interaction accounts for CBDF restrictions imposed by both the trading partners. Based on the availability of data, a panel of 25 countries over 11 years from 2007 to 2017 has been compiled from various sources for econometric modelling and estimation of results.

As presented in the appendix, the model estimates show that the coefficient of the DPR interaction variable is positive and significant. This means that CBDF restrictions have a negative impact on digital services exports.

A few scenarios were built on understanding further the consequences of tightening restrictions on CBDF. These scenarios account for changes in Bangladesh's policy scenario and possible retaliatory restrictions imposed by trading partners.

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[26] The details on data sources and econometric models are placed in Annexure.

Scenario Analysis

A few scenarios were built on two possibilities to quantify the impact of CBDF restrictions on Bangladesh's digital services exports, as shown in Figure 14. One is Bangladesh adopting CBDF policies similar to India as they existed at the time of estimation of the DPR, and two is Bangladesh adopting significantly restrictive CBDF policies akin to Vietnam.

Bangladesh's initial DPR was estimated to be 52,[27] which was changed to 19, i.e., India's DPR, for building scenarios if a policy similar to India is adopted. In addition, Bangladesh's DPR was changed from 52 to 9, i.e., Vietnam's DPR, to build scenarios in case Bangladesh adopts considerably stricter policies.

India and Vietnam were chosen to provide a contextual understanding because both countries are from the Asian region and are frequently mentioned in the popular narrative on data localisation and data protection in Bangladesh.

Figure 14: Data Policies Rank and Index [28]

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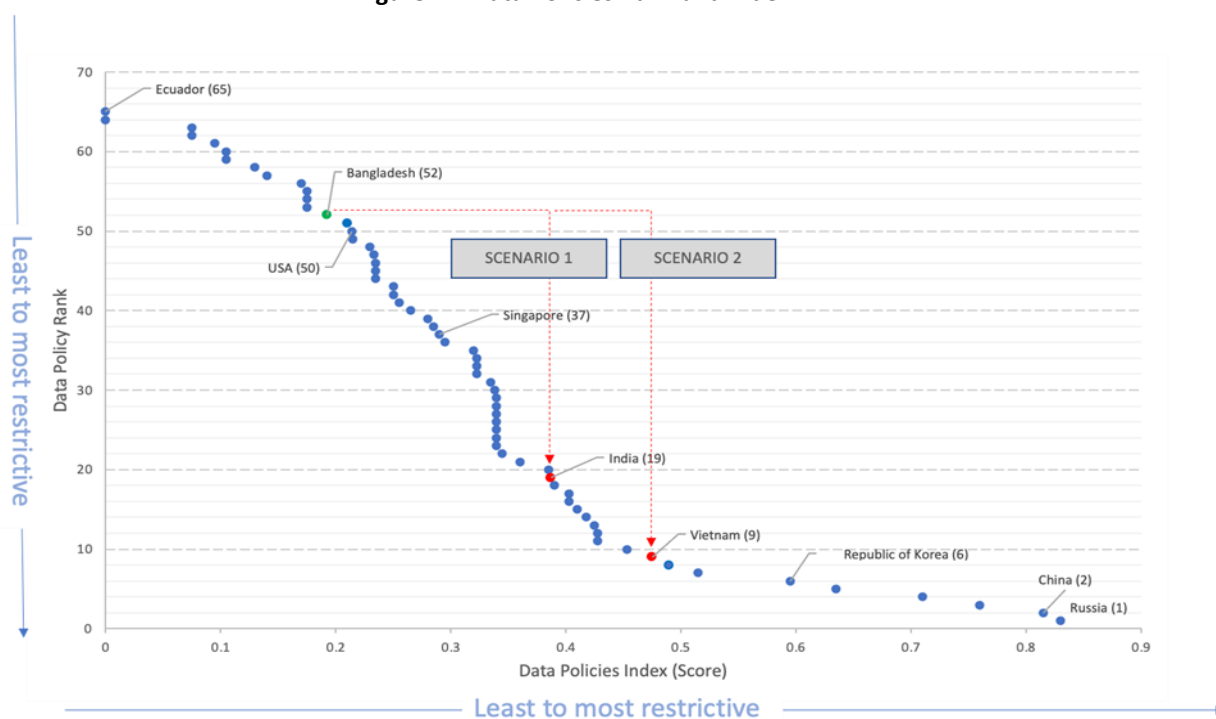
27   See Appendix A2 for details on how Bangladesh's rank was estimated and Appendix Table A3 for mapping Bangladesh's policies used for DPR.

28   As provided by the author (and estimated by CUTS for Bangladesh) based on their paper, Ferracane, M. F. & Marel van der, E., (2019). Do data policy restrictions inhibit trade in services? EUI Working Papers, RSCAS 2019/29.

Further, as indicated in Figure 15, the following three assumptions were made to account for the level of restrictiveness on cross-border data flows from relatively less to increasing – (i) Bangladesh adopts measures restricting cross-border data flows, (ii) Bangladesh's major digital services export destinations, accounting for fifty percent of exports, retaliate, and (iii) All importers of digital services from Bangladesh impose retaliatory restrictions on cross-border data flows.

Figure 15: Scenario Analysis
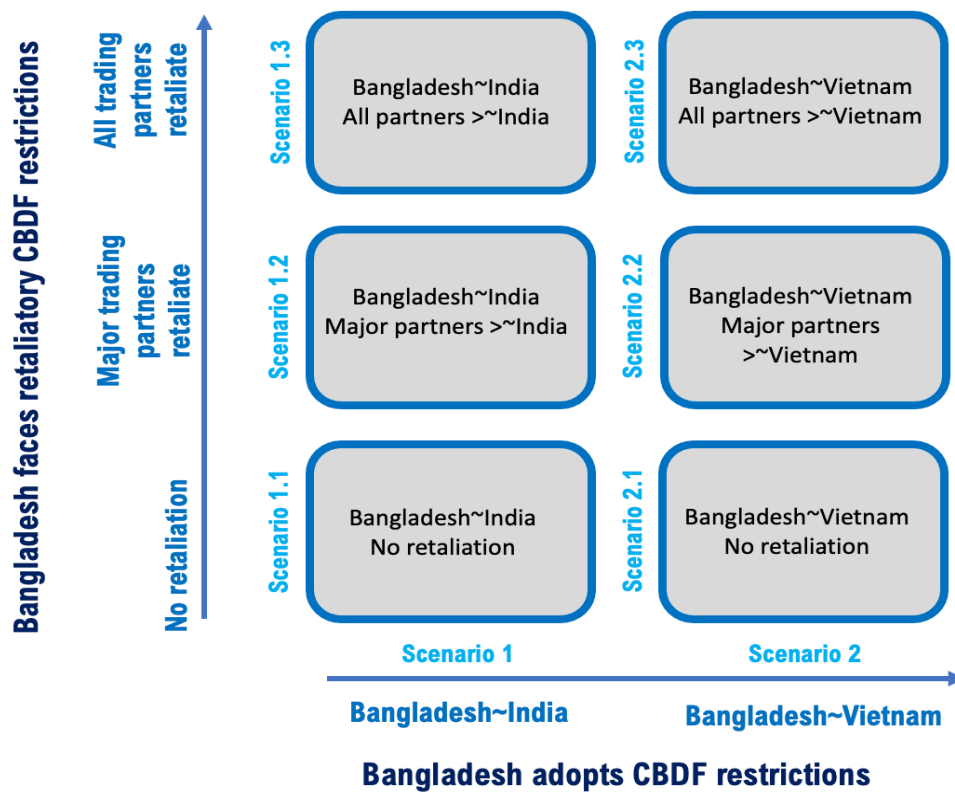
The scenarios analysed were:

1. Bangladesh adopts CBDF restrictions similar to India.

   1.1 Change in Bangladesh's digital services exports when Bangladesh's data policy rank is similar to India.

   1.2 Change in Bangladesh's digital services exports when major export destinations that account for 50 percent of digital services exports from Bangladesh retaliate and impose restrictions similar to India.

   1.3 Change in Bangladesh's digital services exports when all export destinations retaliate and impose restrictions similar to India.

2. Bangladesh adopts CBDF restrictions similar to Vietnam.

   2.1 Change in Bangladesh's digital services exports when Bangladesh's data policy rank is similar to Vietnam.

   2.2 Change in Bangladesh's digital services exports when major export destinations that account for 50 percent of digital services exports from Bangladesh retaliate and impose restrictions similar to Vietnam.

   2.3 Change in Bangladesh's digital services exports when all export destinations retaliate and impose restrictions similar to Vietnam.

Results of Scenario Analysis

Figure 16 summarises the results of the various scenarios. **The scenarios predict a decline in digital services exports of Bangladesh, ranging from 29 percent to 44 percent, depending on the severity of restrictions and retaliatory measures.**

Figure 16: Results of Scenario Analysis
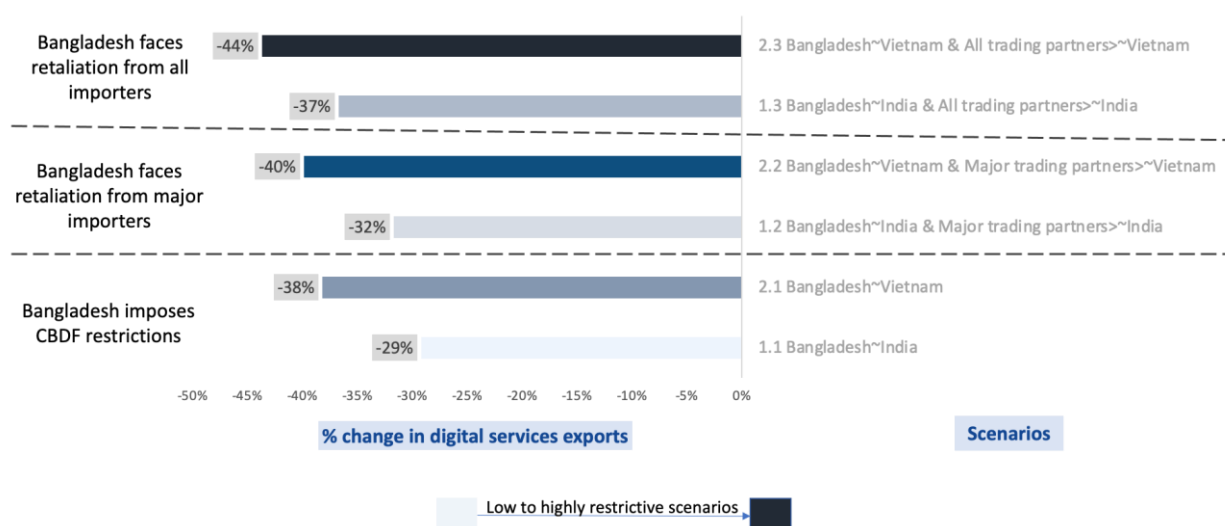
Impact on Digital Services exports if Bangladesh imposes CBDF restrictions equivalent to India

Bangladesh's digital services exports may see a 29 percent decline if it adopts restrictions similar to India. The subsequent scenarios of possible retaliation by major trading partners and all importers predict a 32 percent and 37 percent decline, respectively.

Impact on Digital Services exports if Bangladesh imposes CBDF restrictions equivalent to Vietnam

A more restrictive policy approach by Bangladesh, such as CBDF restrictions similar to Vietnam, could reduce exports by 38 percent. Suppose major trading partners retaliate with an equivalent level of data localisation restrictions. As shown through the empirical analysis of this study, Bangladesh will face a 40 percent decline in digital services export. And lastly, if all the trading partners retaliate, Bangladesh will face a 44 percent decline.

The analysis above clearly indicates a decline in digital services exports of Bangladesh upon the adoption of restrictive CBDF policies. It is pertinent to bear in mind that these scenarios provide a directional understanding, and hence weighing all policy options against the probable outcomes is critical for a balanced outcome.

5 Data Localisation: Industry Experience and Perspective

As data localisation (DL) could increase business compliance, either improving or affecting their processes, among other factors, the Key Informant Interviews (KII) under this study analyses the opportunities and challenges of CBDF restrictions. To this end, interviews were conducted with stakeholders, including technology companies, government officials, experts, and industry associations.

A detailed analysis of the KIIs indicates that stakeholders have a conceptual understanding of data localisation; however, the estimated and prospective impact of CBDF restrictions on their businesses is rudimentary and evolving. DL may restrict the operations and range of global cloud service providers such as Amazon Web Services (AWS) while giving preference to local cloud service providers.

In such a scenario, the stakeholders indicated that the quality of cloud services in Bangladesh could be negatively impacted if such local service providers do not offer a similar range of services at an affordable cost and competitive quality. In choosing the location of data services for their operations, many stakeholders stated that their key considerations are data security and cyber security, followed by the cost of cloud servers like AWS/Google Cloud Platform), disaster recovery (backup), and technological considerations such as availability of services.

However, on the policy framework, stakeholders cautioned that any extreme policy position with CBDF restrictions could be detrimental to the industry as the current infrastructure and human capital are not suited to meet the requirements of DL. Similarly, the stakeholders pointed out that the Bangladesh IT sector lacks a skilled workforce in cyberspace, thus creating vulnerability to cyber-attacks, privacy violations, data breaches, availability of services, etc., on account of data storage within the country. On this, substantive investments in infrastructure are necessary. However, given the likely increase in compliance costs, such financing may not be feasible for businesses, especially small businesses.

On the other hand, the stakeholders noted that storing data in servers outside Bangladesh could limit the government's authority to take legal action when data privacy guidelines are breached by any operator unless there are policies that facilitate the flow of data and trust between countries.

The stakeholders have also indicated that policies facilitating CBDF restrictions could create information asymmetries favouring local companies at the cost of foreign companies. While

some stakeholders believed that data localisation would not affect cross-border trade as the restrictions could be potentially placed on sensitive data. In contrast, the transfer of non-sensitive data could be allowed. Additionally, many stakeholders noted that DL could negatively impact the short term. However, it could be beneficial for individual privacy and national security in the long run, potentially reducing the country's international IP transit charges for data transmission. Most importantly, industry stakeholders noted that the country still lacks the infrastructure required to store data to comply with data localisation norms.

The industry stakeholders suggested data classification into three categories based on their sensitivity nature, upon which data localisation requirements could be suggested. For example, based on data sensitivity, the government could decide upon the data type that could be localised entirely and allowed to be transferred and stored in other countries. To this end, the stakeholders suggested a well-thought policy that safeguards data privacy issues without restricting innovation.

References

Access to Information Programme, Prime Minister's Office. (2011). Bangladesh: Access to Information Programme (A2I) Evaluation Report.

A.T. Kearney. (2017). Global Cities 2017: Leaders in a World of Disruptive Innovation. AT Kearney.

BASIS, (2021). Software & It Services Catalog 2021. Bangladesh Association of Software and Information Services (BASIS)

Mckinsey Global Institute. (2016). "Digital Globalization: The new era of global flows." Mckinsey.

Razzaque, M.A., Ifteakhar, N., and Rahman., J. (2020). Tapping into Services Exports: Issues and Policy Options. In Razzaque M.A. (ed) Navigating New Waters: Unleashing Bangladesh's Export Potential for Smooth LDC Graduation. Bangladesh Enterprise Institute.

Stephany, F., Kässi, O., Rani, U., Lehdonvirta, V. (2021). Online Labour Index 2020: New ways to measure the world's remote freelancing market.

Karthik, H., Kala, P., Jian, P., and Gupta, R. (2017). Betting on the future- The Bangladesh IT-ITes industry is poised for growth. Dhaka: Everest Group

Appendix

Econometric Model

A correlated random effects (CRE) model was run with the below specification. The choice of running a CRE model was based on the fact that it allows us to use panel data techniques in cases where a time-invariant variable, such as DPR in our model, is included as an explanatory variable.

$$ICSE_{ijt} = \alpha + \beta_1 GDP\_O\_D_t + \beta_2 mGDP\_O\_D_t + \beta_3 FDI_{it} + \beta_4 mFDI_{it} + \beta_5 IIB\_O\_D_t + \beta_6 mIIB\_O\_D_t + \beta_7 STRI\_O\_D + \beta_8 DPR\_O\_D + \beta_9 REER_{i(t-1)} + \beta_{10} mREER_{i(t-1)} + \beta_{11} Human\ Cap\_O\_D_t + \beta_{12} mHuman\ Cap\_O\_D_t + \beta_{13} CSL_{ij} + \mu_{ijt} \ ...(i)$$

where,

i represents Bangladesh,

j equals 1 to 25 and represents the digital services trading partner of Bangladesh

t is time period from 2007 to 2017

variables with m as prefix are the mean value of an independent variable for a trading pair over time t.

In the equation above,

$ICSE_{ijt}$ is the dependent variable, Bangladesh's Digital Services services (IT services and ITeS) exports to country j

$GDP\_O\_D_t$ Represents the product of GDPs of Bangladesh and trading partner. As per the gravity model[29], trade between two countries is positively related to their economic mass, represented as the product of the GDP's of the trading partners in this model.

FDI_{it} The net Inflow of Foreign Direct Investment (FDI) in Information Communication and Telecommunication and Information Technology Enabled Services has been taken. FDI inflow has a direct impact of export, employment and income. FDI is to have a positive impact on digital services exports.

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[29]   The gravity model of trade is based on Newton's theory of gravitation, and Jan Tinbergen first proposed it in 1962.

$IIB\_O\_D_t$ This variable is the product of the International Internet Bandwidth of the trading partners. It is used as a proxy for digital infrastructure in exporting and importing country. The variable is expected to have a positive coefficient.

$STRI\_O\_D$ The product of the Service Trade restrictive Index of the trading partners has been used. STRI is negatively related with the export of digital services export. Higher the value of the variable, higher the restriction on trade. It is expected to have a negative coefficient.

DPR_O_D This variable represents the restrictions imposed on cross border flow of data by importing and exporting countries. It is the product of the Data Policy Rank of the trading partners. A lower Data Policy Rank (higher numerical value) means fewer restrictions on cross-border data flow and a higher rank (lower numerical value) means higher restrictions. This variable is expected to have a positive coefficient as the higher the numerical value of this variable, the lower the rank, which means lower restrictions, which could lead to higher digital services exports.

$REER_{i(t-1)}$ is the one-year lagged value of Real Effective Exchange Rate. A higher REER makes imports cheaper and exports expensive and hence this variable is expected to have a negative coefficient in our model.

$Human\ Cap\_O\_D_t$ This variable is the product of tertiary enrolment ratio of the trading partners and is a measure of skilled human capital. Human capital is expected to have positive sign with the export of digital services.

CSL_{ij} It measures linguistic affinity. In this model, greater affinity in language would result in higher services trade between nations.

Table A.1 : Data Source and Definition of Variables used in Model 1

S. No.	Variable name (as in a database)	Variable name (as in the model)	Database	Original Unit	Converted unit	Definition (as in a database)	Years available
1		$ICSE_{ijt}$	World Bank	US Dollars at current prices and current exchange rates in millions	Constant 2007 US$ (in millions)	Bangladesh digital service export with partner countries has been taken from the world bank. As per the definition of BOP6 of world bank, services export has been categorised into 12 categories out of which 6 categories have been taken for the digital service export of Bangladesh. These six categories are divided into two broader categories like ICT/ITES for economic and panel data analysis. ICT includes Telecommunications, computer, and information services, while ITES includes Insurance and pension services, Financial Services, Charges for the use of intellectual property *n.i.e*, Other business services and Personal, cultural, and recreational services	2007-2017
2		FDI_{it}	Bangladesh Bank, Annual data	US Dollars at current prices and current exchange rates in millions	Constant 2007 US$ (in millions)	The net FDI inflow in ICT/ITES sector in Bangladesh	2007-2017
3	Real Effective Exchange Rate based on CPI	$REER_{i(t-1)}$	World Development Indicator(WDI)			Effective exchange rates are indicators of movements in the exchange rates of home currency against a basket of currencies of trade partner countries and are considered to be an indicator of international competitiveness. The base year of REER is 2007 and one lagged year of REER is taken into the model.	2006-2016
4	GDP (Local Currency)	GDP (constant USD Million)	World Bank national accounts data, and OECD National Accounts data files via WDI database	Current US$	Constant 2007 US$ (in millions)	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The data used for the panel data analysis is constant USD in 2007. The data of GDP is extracted in local currency and then	2007-2017

S. No.	Variable name (as in a database)	Variable name (as in the model)	Database	Original Unit	Converted unit	Definition (as in a database)	Years available
						converted into USD by using single-year official exchange rates. After conversion in USD, the value of GDP is changed into constant prices at 2007.	
5		$GDP\_O\_D_t$ (constant USD Million)	World Bank national accounts data, and OECD National Accounts data files via WDI database	Current US\$	Constant 2007 US\$ (in millions)	The interaction variable of GDP is created by multiplying Bangladesh's GDP with its selected major services exporting destination country.	2007-2017
6	Common Spoken Language (CSL)	CSL_{ij}	CAPRI			This is country-pair-wise data. This variable indicates the commonality in at least one spoken language. At least four per cent of people of Bangladesh and each of its services export partners use to communicate. If there is more than one common language between them, and the existence of each common language count as one, then, those countries having more than one common language would have the CSL value greater than one. This would result in dual counting. To overcome this, a change in methodology to compute the value and also some adjustments have been taken into account. First, Common-language specific multiplication of the percentage share of the population spoken in that particular language in Bangladesh and its counterpart percentage share of the population of other countries has been computed. For those country pairs having only one common spoken language, this multiplication value of this particular language is taken as the final value for CSL. Otherwise, one adjustment has been made to restrict the value of CSL, which lies between 0 and 1.	2021
7	International Internet Bandwidth	IIB	ITU	Mbit/s		International Internet bandwidth refers to the total used capacity of international	2007-2017

S. No.	Variable name (as in a database)	Variable name (as in the model)	Database	Original Unit	Converted unit	Definition (as in a database)	Years available
						Internet bandwidth in megabits per second (Mbit/s). Used international Internet bandwidth refers to the average traffic load of international fibre-optic cables and radio links for carrying Internet traffic. The average is calculated over the 12 months of the reference year and considers the traffic of all international Internet links. If the traffic is asymmetric, i.e., if there is more incoming (downlink) than outgoing (uplink) traffic, the average incoming (downlink) traffic load is used. The combined average traffic load of different international Internet links can be reported as the sum of the average traffic loads of the individual links. International Internet bandwidth (bit/s) per Internet user is calculated by converting to bits per second and dividing by the total number of Internet users.	
8		$IIB\_O\_D_t$	ITU	Mbit/s		The interaction IIB is created by multiplying Bangladesh's IIB with its selected major services exporting destination country.	2007-2017
9	Tertiary enrolment ratio	Human Capital	UNESCO Institute for Statistics via World Bank's WDI database	Percentage		Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the age group population that officially corresponds to the level of education shown. Tertiary education, whether or not to an advanced research qualification, normally requires the successful completion of education at the secondary level as a minimum condition of admission.	2007-2017
10		$Human\ Cap\_$	UNESCO Institute for Statistics via World Bank's WDI database	Percentage		The interaction of human capital has been created by multiplying the human capital of Bangladesh with the major trading partner of digital service export	2007-2017
11	Data Policy Rank	D	Ferracane, M. F. & Marel van der, E., (2019). Do	Number		ECPIE had computed a comprehensive index named Digital Trade Restrictiveness Index and under it has four clusters, namely, (A) Fiscal	2017 The ranking is based on policies in

S. No.	Variable name (as in a database)	Variable name (as in the model)	Database	Original Unit	Converted unit	Definition (as in a database)	Years available
			data policy restriction s inhibit trade in services? EUI Working Papers, RSCAS 2019/29.			Restrictions and Market Access; (B) Establishment Restrictions; (C) Restrictions on Data; and (D) Trading Restrictions. Each of these four clusters further covers more than one segment. Data Policy Restrictions are one of the segments under Cluster C. This index has been computed over 64 countries worldwide. An updated version of this index as used in Ferracane and Marel (2019)[30][31] has been used in this report. Rank of these selected destination countries as well as of Bangladesh under data policy has been taken to create this variable.	effect in 2017
12		*DPR_O_D*	European Centre for International Political Economy (ECIPE)	Number		The interaction of DPR has been created by multiplying DPR of Bangladesh with DPR of the trading partner.	2018
13	Services Trade Restrictions Index		World Bank	Number 0 to 100		The World Bank Services Trade Restrictions Index (STRI) measures the restrictiveness of an economy's regulatory and policy framework to trade in services. It builds on the previous World Bank STRI, and is based on the information contained in the Services Trade Policy Database (STPD), a joint World Bank and WTO product that is accessible through the WTO's Integrated Trade Intelligence Portal (I-TIP), http://i-tip.wto.org/services/. The World Bank STRI was produced in cooperation with the WTO Secretariat. Of the broad set of regulations and measures available in the database, around 115 were selected to compute the index. The STRI provides comparable information on	2016 And 2019 for, some countries

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[30] Ferracane, M. F. & Marel van der, E., (2019). Do data policy restrictions inhibit trade in services? EUI Working Papers, RSCAS 2019/29.

[31] CUTS acknowledges the collaboration extended by Martina Ferracane of the European University Institute in sharing the revised data policy index and rankings and providing guidance on placing Bangladesh in the data policy ranking, these have not been presented in their original paper and Bangladesh was not included in their ranking.

S. No.	Variable name (as in a database)	Variable name (as in the model)	Database	Original Unit	Converted unit	Definition (as in a database)	Years available
						services trade policies under three out of the four modes of supply in the GATS, namely cross-border supply (mode 1), commercial presence (mode 3) and presence of natural persons (mode 4).	
		STRI_O_D		Number		The interaction of STRI has been created by multiplying STRI of Bangladesh with STRI of trading partner.	2016

Hypothesis:

H_0: Data flow restrictions do not have a significant impact on digital services exports

H_1: Data flow restrictions have a significant impact on digital services exports

Table A2: Measures covered in data policy index & ranking[32]

Type of measures		Weights
1 Cross-border flow measures		**0.5**
1.1 Ban to transfer or local processing requirement		0.5
1.2 Local storage requirement		0.25
1.3 Conditional flow regime		0.25
2 **Domestic regulatory measures**		**0.5**
2.1 Data retention 0.15		**0.15**
2.1.1 Minimum period		0.7
2.1.2 Maximum period		0.3
2.2 Subject rights on data privacy		**0.1**
2.2.1 Burdensome consent requirement		0.5
2.2.2 Right to be forgotten		0.5
2.3 Administrative requirements on data privacy		**0.15**
2.3.1 Data protection impact assessment (DPIA)		0.3
2.3.2 Data protection officer (DPO)		0.3
2.3.3 Data breach notification 0.1		0.1
2.3.4 Government access to personal data		0.3
2.4 Sanctions for non-compliance		**0.05**
2.4.1 Monetary fine above 250.000 EUR or set as a percentage of revenue		0.5
2.4.2 Jail time		0.5
2.5 Other restrictive practices related to data policies		**0.05**
2.5.1 Other restrictive practices related to data policies		1

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[32] Ferracane, M. F. & Marel van der, E., (2019). Do data policy restrictions inhibit trade in services? EUI Working Papers, RSCAS 2019/29.

Table A3: Bangladesh Policy Map for DPR Score and Ranking[33]

Policy	Details
Restrictions on Cross Border Flow of Data	
The Ride-Sharing Service Guidelines 2017	All ride-sharing providers should procure and preserve all data and info related to drivers and riders strictly within Bangladesh. Data cannot be transferred outside the country under any given circumstances.
Draft Personal Data Protection Act (Unofficial)	(Proposed 1) The data controller could not transfer any personal data of data subjects to any place outside Bangladesh unless the government specifies such place. The minister can notify any place for the transfer of data outside Bangladesh if such place meets an adequate level of protection as provided by the Act. (Proposed 2) The data controller must ensure data storage of one serving copy of personal data on a server or data centre located in Bangladesh. Critical personal data (to be notified by the government) will be only allowed to be processed in a server or data centre located in Bangladesh. The government can exempt (sensitive personal data) from the storage requirement of a serving copy. The draft policy prescribes certain exemptions to the transfer of personal data outside Bangladesh, such as if the transfer is subject to standard contractual clauses, permitted by the government to a particular country, approved by the government due to necessity, etc. The section also listed a few exemptions for transferring sensitive data outside Bangladesh if the transfer is made to a particular person or entity engaged in health or emergency services, where such transfer is necessary for prompt action under the PDPA. Similarly, the exemption is allowed to such country or a particular sector within the country when the government is satisfied that the data transfer is necessary for the data controller or subject and would not hamper enforcement of PDPA.
Information Privacy and Security Rules 2019	The rules mandates that transfer of information outside the country should be made only to the effect that the privacy policy and security standards, as well as the recipient of the information, does not violate the privacy policy.
Draft Cloud Computing Policy 2021	The draft Cloud Computing Policy states that the cloud service provider's primary data storage location must be in Bangladesh. The policy also mandates that information may be allowed to be taken outside Bangladesh only for backup and retrieval purposes and where such information does not have any personal, sensitive, or any information harmful to the security and critical infrastructure of Bangladesh. Moreover, all that information should be hosted in countries with which Bangladesh has multilateral or bilateral relations for unconditional and instantaneous laws can prevail.
Data Retention	
Telecommunication Licenses Issued by the Bangladesh Telecommunication Regulatory Commission	Mobile operators or internet service providers must maintain the subscribers' billing information for at least the last six months. It may be considered a requirement that the electronic metadata of a communication must be preserved for at least the last six months.

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[33] The cutoff of policies under DPR is the year 2017.

Policy	Details
Regulatory and Licensing Guidelines for Internet Service Providers	The licensee shall maintain its user's history records, system failure records, SNMP traffic data, and bandwidth utilisation records of individual users as daily logs for at least 03 (three) months. All these records shall be made available on request by the Commission or LEA. However, for any particular case, ISP will preserve a specific record for 06 (six) months if requested by LEA/Commission.
Draft Cloud Computing Policy 2021	Cloud Service Providers to conserve 90 days' log details for each individual and preserve security-related investigation reports for two years after the investigation.
Digital Security Act 2018	According to Section 44, the Director-General of the Digital Security Agency may require the person or institution in charge of the computer or computer system to preserve such data- information for up to 90 days in an investigation. The Cyber Tribunal (constituted under Information and Communication Technology Act 2008) may extend the time limit of preserving such data information for a period that may not exceed 180 days.
Personal Rights to Data Privacy	
Information and Communication Technology Act 2006	Although there is no explicit mention of the consent requirement, Section 63 of the ICT Act prescribes punishment for disclosure of confidentiality and privacy without the concerned person's consent. Similarly, Section 54 of the ICT Act prescribes a penalty for damage to computer, computer system, etc. if the person acts without permission of the person in charge of the computer, computer system or network.
Information Privacy and Security Rules 2019	Sensitive personal information cannot be collected by letter, fax, or email without individuals' written consent and subsequent self-attestations. While the rules do not prescribe any hard restrictions on the transfer outside Bangladesh, the rules do require written consent of the person and notification to the person about such transfer. Individuals would be able to modify/rectify any errors in case of unclear and/or incomplete personal data within 60 days, upon receiving the incorrect version. Provisions under Section 11(1) clearly state that the data controller agency has the right to erase personal information, if: (a)　　If there is no need to collect or process personal data (b)　　If the individual withdraws his/her consent (c)　　Illegal collection of personal data and (d)　　In case of court orders or legal obligations.
Draft Personal Data Protection Act	The personal and sensitive personal data shall not be processed unless the data subject has given his consent, which must be free, specific, clear, and capable of being withdrawn. To process sensitive personal data, explicit consent of data subjects is a must. Whereas, for personal processing data of children, processing or collection is not allowed without prior consent of the parent or guardian or relevant person having authority to make decisions. The data subject has the right to be forgotten, by erasure of personal data without undue delay.

Policy	Details
Administrative Rights to Data Privacy	
Digital Security Act 2018	The Act establishes an agency called the Digital Security Agency consisting of 1 Director-General and 2 Directors to be appointed by the government.
Draft Personal Data Protection Act	The PDPA proposes to establish a Personal Data Protection Office (PDPO) under the direct control and administration of the Digital Security Agency constituted under the Digital Security Act, 2018. The PDPO is proposed to be headed by the Director-General of the Digital Security Agency. The PDPO is proposed to have investigative, corrective, and authorisation and advisory powers. Prescribes appointment of Data Protection Officer by the data controller In the event of a data breach, the data controller shall notify Director-General without undue delay. (Proposed 1) Prior to processing, the data controller shall carry out an assessment of the impact of envisaged processing operations on the protection of personal data. (Proposed 2) If the data controller intends to process using new technologies, large scale profiling or sensitive personal data, or if processing carries a risk of significant harm to data subjects, processing shall not being unless data controller undertakes data protection impact assessment.
Sanctions on Non-Compliance	
Information Communication and Technology Act 2006	Section 63(1) deals with the disclosure of confidential information without the consent of the concerned person. As per Section 63(2), whoever commits an offence under subsection (1) of this section he shall be punishable with imprisonment for a term which may extend to two years, or with a fine which may extend to Taka two lakhs, or with both
Draft Personal Data Protection Act	The Act prescribes only monetary fines for unlawful processing of personal data, failure to adopt appropriate data security measures, and failure to comply with orders. In contrast, monetary fine and imprisonment were prescribed for obtaining, transferring, or selling sensitive personal data in contravention to the Act and reidentifying and processing anonymised data.
Digital Security Act 2018	Section 26 prescribes punishment for unauthorised collection, use etc. of identity information, to be punished with imprisonment for a term not more than 5 years or fine not exceeding 5 lakh Taka or both. For a repeat offence, the punishment would be for a term not more than 7 years or fine not more than 10 lakh Taka or both

Table A4: Data Policy Map of India under DPR[34]

Policy	Details
Restrictions on Cross Border Flow of Data	
National Data Sharing and Accessibility Policy	India's National Data Sharing and Accessibility Policy requires that "non-sensitive data available either in digital or analog forms but generated using public funds" must be stored within the borders of India. The policy states that data belongs to the "agency/department/ministry/entity which collected them and resides in their IT-enabled facility."
Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules	The Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules provide that cross-border data flows of sensitive personal data or information can be made: - provided that such transfer is necessary for the performance of a lawful contract between the body corporate (or any person acting on its behalf) and the provider of information, or - provided that such transfer has been consented to by the provider of information.
Royal Bank of India Directive	In April 2018, the Royal Bank of India (RBI) issued a one-page directive stating that, within six months, all payment data held by payment companies should be held in local facilities. The Directive noted that this would help the RBI gain "unfettered supervisory access" to transaction data, which it needs to ensure proper monitoring. Following a negative response from international payment companies such as MasterCard, Visa, and American Express, the RBI has proposed to ease this restriction to allow payment firms to store data offshore, as long as a copy was kept in India. It is not clear when the RBI's position will be clarified.
Guidelines for Government Departments On Contractual Terms Related to Cloud Services	In 2015, India's Ministry of Electronics and Information Technology (MEITY) issued guidelines for a cloud computing empanelment process under which cloud computing service providers may be provisionally accredited as eligible for government procurements of cloud services. The guidelines require such providers to store all data in India to qualify for accreditation.
Data Retention	
Rules for Record Keeping and Reporting	Banking information must be stored for 10 years "from the date of cessation of the transactions between the client and the banking company, financial institution or intermediary, as the case may be."
Department of Telecommunications, Ministry of Communications & IT, Government of India, "License Agreement for Provision of Internet	Retention requirements for service providers are found in the Internet Service Provider licence and Unified Access Services Licence (UASL), which are grounded in the Indian Telegraph Act of 1885. Internet Service Providers are required to retain a

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[34]   The cutoff of policies under DPR is the year2017. https://ecipe.org/dte/database/

Policy	Details
Services" Department of Telecommunications, Ministry of Communications & IT, Government of India, "License Agreement for Provision of Unified Access Services after Migration from CMTS	complete audit trail of the remote access activities pertaining to the network operated in India for six months. Moreover, all commercial records about the communications exchanged on the network must be maintained for a year. In addition, the licences identify several categories of records that must be made available and provided for security purposes, which implies that records should be kept. These include: - a log of all users connected and the service they are using, - a log of every outward login or telnet through an Internet Service Providers computer, - copies of all packets originating from the Customer Premises Equipment of the Internet Service Provider, - a complete list of subscribers must be made available on the Internet Service Provider website with password-controlled access, - a complete list of Internet leased line customers and their sub-customers (including, name of customer, IP address allotted, bandwidth provided, address of installation, date of installation/commissioning, and contact person with phone no./email), - the geographical location of any subscriber, - further information.
Administrative Rights to Data Privacy	
Department of Telecommunications, Ministry of Communications & IT, Government of India, "License Agreement for Provision of Internet Services" Department of Telecommunications, Ministry of Communications & IT, Government of India, "License Agreement for Provision of Unified Access Services after Migration from CMTS"	The Internet Service Provider licence and Unified Access Services Licence identify several categories of records that must be made available and provided to the Telecom Authority or authorised Intelligence Agencies for security purposes.

Table A5: Data Policy Map of Vietnam under DPR[35]

Policy	Details
Restrictions on Cross Border Flow of Data	
Law on Cybersecurity	Vietnam's Law on Cybersecurity, which will enter into force in January 2019, requires administrators of information systems critical to national security to store personal data and "critical data" within the national territory of Vietnam. It is unclear when an information system develops to the point that it is critical to national security. Neither is it clear whether the systems cover state-owned systems only or include private systems as well. "Critical data" is also not defined.

A draft of the law issued in 2017 stipulated that the movement of such data outside Vietnam would require an assessment of the level of security according to regulations by the Ministry of Public Security or other existing laws. Since the full text of the law is not yet available, it is unclear whether this provision remains in the final version of the law due to come into force in January 2019. |
Law on Cybersecurity	Vietnam's Law on Cybersecurity, which will enter into force in January 2019, requires that foreign internet services firms open representative offices or branches in Vietnam and store important user data in Vietnam on local servers. It is reported that the government will decide the duration for which such businesses must store users' data in the Vietnamese territory. Still, it is unclear which criteria will be used. "telecom services" and "Internet services" are not yet defined. Suppose the interpretation of "telecom services" and "Internet services" covered by the draft Law were too broad. In that case, the Law could be inconsistent with relevant WTO commitments, as the cross-border supply of certain telecom services has been liberalised under the Vietnam services schedule for WTO accession.
Decree 90/2008/ND-CP dated 13 August 2008 on anti-spam (Decree 90)	According to the Decree 90 of 2008, advertising service providers that use email advertisements and internet-based text messages are required to send emails from a Vietnamese domain name (".vn") website operated from a server located in Vietnam.
Decree No. 72/2013/ND-CP of July 15, 2013, on the Management, Provision and Use of Internet Services and Online Information	Decree No. 72, which entered into force in September 2013, establishes local server requirements for online social networks, general information websites, mobile telecoms, network-based content services and online games services. All these organisations must establish at least one server inside the country "serving the inspection, storage, and provision of information at the request of competent state management agencies".
Data Retention	
Decree No. 72/2013/ND-CP of July 15, 2013, on the Management, Provision and Use of Internet Services and Online	According to Decree No. 72 of 2013, aggregated information websites are required to store the information for at least 90 days from the date it is posted on the website.

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[35]   The cutoff of policies under DPR is the year2017. https://ecipe.org/dte/database/

Policy	Details
Information	
Administrative Rights to Data Privacy	
Decree No. 72/2013/ND-CP of July 15, 2013, on the Management, Provision and Use of Internet Services and Online Information Law on Cybersecurity	Decree No. 72 of 2013 states that "organisations and individuals that use Internet resources shall provide information and cooperate with competent state management agencies at the latter's request". Vietnam's Law on Cybersecurity, which will enter into force in January 2019, also stipulates that businesses have to provide users' data to the Ministry of Public Security upon receiving requests in writing in cases where any infringement of the cybersecurity law is being investigated.
Sanctions on Non-Compliance	
Law No. 67/2006/QH11 on Information Technology	Infringement of privacy laws may lead to fines up to 2,000 USD and criminal penalties of up to two years' imprisonment. In addition, e-commerce activities may be suspended for six to 12 months.
Others	
Decree No. 72/2013/ND-CP of July 15, 2013, on the Management, Provision and Use of Internet Services and Online Information	Decree No.72 of 2013 requires that online social network service suppliers ensure that only individuals who have supplied "accurate and complete personal information as required by law", including the government-issued card number, may create blogs or provide information on online social networks. (Art. 3.16 and 25.9)
Draft Circular Detailing a Number of Articles re Management of Websites and Social Networks under the Government's Decree No. 72/2013/ND-CP of 15 July 2013	The draft circular also requires that any "general information website" or social network have a high-level person responsible for content management who must be a Vietnamese national and reside in Vietnam.

Table A6: Results of Correlated Random Effects Model

S.No.	Variables#	Correlated Random Effects model |**I**| = 25 T = {2007-2017} Dependent variable: (Digital Services Exports) R^2 (overall) = 0.65; R^2 (within) = 0.2; R^2 (between) = 0.67
		Estimate
1.	$IIB\_O\_D_t$	1.17E-10***
2.	$STRI\_O\_D$	-0.00509
3.	DPR_O_D	0.012098***
4.	FDI_{it}	9.03E-04
5.	$GDP\_O\_D_t$	2.52E-12***
6.	$Human\ Cap\_O\_D_t$	0.012722***
7.	CSL_{ij}	964.8597***
8.	$REER_{i(t-1)}$	-0.19768**
9.	$mGDP\_O\_D_t$	1.20E-11***
10.	$mIIB\_O\_D_t$	9.49E-10
11.	$mHuman\ Cap\_O\_D_t$	0.006326
12.	*Intercept*	-4.15992

Level of significance *** (1%), **(5%), *(10%).   # The variables mFDI$_{it}$ and mREER $_{i (t-1)}$ were omitted due to multicollinearity

The results indicate that the model is a good fit with an overall R- squared value of 0.65. This suggests that the dependent variables can explain 65 percent of the independent variable (ICT services export in this model).

The coefficient of the interaction variable of data flow restrictions in the model is positive and statistically significant at 1% significance level. Hence null hypothesis is rejected.

A positive relation between this variable and digital services export means that digital services exports increase as data flow restrictions get lower. This implies that heavier data transfer restrictions have a negative impact on digital services exports.