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# Pakistan

## Economic Policy for Export Competitiveness

### Digital Pakistan: A Business and Trade Assessment

May 2020

MTI



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## **DIGITAL PAKISTAN: A BUSINESS AND TRADE ASSESSMENT <sup>1</sup>**

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## EXECUTIVE SUMMARY

**Digital trade is opening new development opportunities for Pakistan.** Digital technologies transform global trade, the reallocation of factors of production, and eventually increases productivity and growth. Digital technologies also enable industries to produce more sophisticated products and services and tap into new export markets. In turn, digital trade enhances Pakistan's domestic competitiveness as it allows firms to become more productive. In this context, a factor determining digital trade is data. Many digital technologies thrive on data, which often needs to flow across borders. Encouraging digital trade and the cross-border flow of data through open markets will ultimately enhance Pakistan's level of development.

**Pakistan should seize digital trade opportunities as they are becoming increasingly important for the world economy.**<sup>2</sup> Between 2004 and 2017, world ICT services exports as a share of global GDP has more than doubled from 0.30 percent to around 0.66 percent. Equally, expressed as a share of total services exports, world ICT services has more than doubled between 2000 and 2017 from a narrow 5 percent to more than 10 percent. Interestingly, the importance of world ICT services exports has become almost as large as the share of world ICT goods, which currently stands at 11 percent. In short, the ICT trade in goods and, in particular, services has grown significantly over the past 20 years and this trend is expected to continue.

**In addition, cross-border data flows have increased significantly in recent years, thereby contributing substantially to global GDP.** The domestic and cross-border flow of data has grown exponentially over the past 10 years, which indicates that data as a flow, besides goods, services, investment, and people, has become a well-established pillar of today's globalization. The McKinsey Global Institute estimates that, currently, cross-border data flows contribute more to global GDP than the goods trade. Given that data flows underpin the production and trade of services, in particular ICT services, this factor is likely to increase further in importance as the growth of the ICT services trade continues.

**As global value-added of both ICT goods and services is growing, the sector is an important contributor to higher value-added overall.** The current share of ICT value-added in the OECD stands at 6 percent. That share is likely to be lower for poorer countries such as Pakistan. That does not mean, however, that the sector is unimportant for Pakistan's development strategy. For instance, high-productivity firms are generally more likely to use the internet, larger firms are more likely to use the internet more intensively across all income groups, and the internet is helping firms of all types and sizes to reach new markets. The role of platforms increases as these trends continue as they cut search costs, and reduce fixed costs to start a business as well as to export, thereby helping new export markets. All

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<sup>2</sup> This report adopts the OECD definition of digital trade. Digital trade encompasses digitally enabled transactions of trade in goods and services that can either be digitally or physically delivered, and that involve consumers, firms, and governments. Also, while all forms of digital trade are enabled by digital technologies, not all digital trade is digitally delivered. Digital trade also involves digitally enabled but physically delivered trade in goods and services. In this context, underpinning digital trade is the movement of data. Data is not only a means of production, it is also an asset that can itself be traded, and a means through which GVCs are organized and services delivered. Moreover, according to OECD, it also underpins physical trade less directly by enabling implementation of trade facilitation. Data is also at the core of new and rapidly growing service supply models such as cloud computing, the Internet of Things (IoT), and additive manufacturing. For a full discussion see, OECD <https://www.oecd.org/trade/topics/digital-trade/>

these factors help to create higher economy-wide value-added as all sectors use ICT goods and services as inputs.

**This report analyses the recent trends in Pakistani Information Technologies (IT) and Information Technologies enabled Services (ITeS), as well as obstacles confronted by firms.** We assess the importance of trade costs as a barrier to services growth and development in Pakistan’s domestic market and to seizing the opportunities of global trade. The report also aims to understand and examine the impact of obstacles (i.e., trade costs) confronted by firms. These obstacles increase the costs of selling services and may reduce capacity to compete both in the local market (Pakistan) as well as overseas (exports). These obstacles include direct costs generated by policy barriers that limit market entry, but can also include infrastructure deficiencies, geographical location, and institutional capacities, and/or obstacles imposed by regulatory measures. Among the latter obstacles, examples include difficulties in accessing the information necessary to operate in a market, the predictability and stability of the business environment in a particular market, and the quality of the decision-making process and administrative procedures of competent authorities in the domestic and export markets.

**The focus of the report is the trade costs confronted by IT and ITeS firms.** IT and ITeS operations are the backbone to provide digital services, digital goods and depend on digital technologies, conform an integral part of the overall ecosystem. The report relies on a survey conducted on 782 IT and ITeS firms across different cities. The objective of the survey was to examine the importance of these factors for Pakistani firms and to provide advice to policymakers. To complement the survey results, the main findings were discussed in focus group structured interviews. Firms interviewed covered different services activities beyond software companies and included both exporters (534 firms) and non-exporters (248 firms), reflecting the export competitiveness as well as domestic competitiveness of Pakistan's IT services sector. The analysis aims to improve our understanding of Pakistan's IT performance and the obstacles confronted in this field.

### *IT/ITeS and Digital Trade Performance<sup>3</sup>*

**In recent years, there has been significant progress in the IT/digital space in Pakistan.** Internet access for individuals increased from 8 percent in 2010 to 15.5 percent in 2017, the latest available data, while the proportion of households with internet access increased fourfold, reaching 22 percent. However, as measured by the ICT Development Index (IDI), compared to other countries in the world Pakistan ranks low.<sup>4</sup> Although Pakistan’s IT industry has grown into a moderately sized sector, it is comprised of mostly domestically owned firms with very few foreign operations. Of the top 10 exporters, only one is foreign.

**Yet, Pakistan is the second highest exporter of IT services in South Asia behind India, with more than US\$1 billion of exports.** According to the Pakistan Software Houses Association (PASHA) website, about 53.8 percent of the revenue comes from the export market. IT/ITeS services exports have

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<sup>3</sup> **ICT services** are services such as computer and communications services (telecommunications, postal, and courier services) and information services (computer data and news-related service transactions). **Digital goods** is a generic term that refers to ICT goods, commodities, and inputs. In this report digital goods refer in large part to goods covered by the WTO’s International Technology Agreement (ITA). **Digital services** is a generic term that refers to ICT and associated services that are produced and delivered over the internet and/or with the help of ICT and other software. It mainly includes computer, telecoms, some news-related services and information, data services, various technical services, as well as services provided over digital platforms (see annex for additional definitions).

<sup>4</sup> International Telecommunication Union (ITU).

experienced solid growth in recent years with a compound average growth rate (CAGR) of 10.8 percent since 2010, growing from US\$433 million to more than US\$1 billion. Pakistan's IT services exports are primarily in medium to low value-added software activities, such as enterprise planning, application development, and integration. However, while there is limited activity in product development in Pakistan's IT services sector, a small number of firms nonetheless outsource services in the banking, financial, insurance, healthcare, and energy industries, which are likely to be more sophisticated.

### ***Enabling Factors and Policy Environment***

**Pakistan maintains relatively restricted digital trade policies, as measured by the Digital Trade Restrictiveness Index (DTRI).** The DTRI is an indicator that measures applied digital restrictions for ICT goods, digital services and investments, standards in digital sectors, as well as for the cross-border flow and domestic use of data. The DTRI has many categories of restrictions varying from (a) fiscal restrictions such as tariffs and trade defense; (b) establishment restrictions such as Foreign Direct Investment (FDI) restrictions and restrictive intellectual property rights (IPRs) measures; (c) restrictions on data varying from restrictions on the cross-border flow of data to intermediate liability policies; and (d) trading restrictions, such as quantitative trade restrictions and restrictive standards in digital trade.

**Pakistan's main digital trade policy obstacles are found in the area of fiscal restrictions, while the establishment restrictions in digital sectors are relatively low.** Pakistan appears in the top 5 list of countries most restricted for tariffs, trade defense, taxation, and subsidies policies. Pakistan maintains a simple average MFN applied tariff rate of 9.7 percent on digital products, with peaks of 35 percent. Adding up the regulatory and additional customs duties – also applied on imports – brings total customs duties to 13.7 percent on average. The country also has an anti-dumping measure in place on imports of phthalic anhydride (which is an input used to make PVC for cables) from India, Iran, Italy, Thailand, Brazil, China, Indonesia, Republic of Korea, and Hong Kong.

**Taxation remains challenging in Pakistan.** Representatives from the IT sector noted that the lack of tax harmonization for services industries across the provinces creates a heavy burden in terms of duties, as well as in compliance. Dealing with tax authorities is costly for firms in terms of time and financial resources and was identified by the private sector during field interviews as one of the most challenging areas in their business. This is due, in part, to the complex nature of modern business models required by ICT/digital firms, but is also due to existing tax regulatory environment and enforcement approaches.

**Although Pakistan does not have any full data localization requirement, it nonetheless places some restrictions regarding data.** The country has significantly stricter rules regarding content access compared with some of its peers, such as Thailand, Indonesia, India, and Russia. Pakistan appears to control foreign commercial services content to its domestic market, and the government has provided a mandate for filtering legal content. A related concern for Pakistan's IT services exports is the surge of stricter data regulations applied by various countries in the world. Restrictive data policies such as data localization measures, and other services that are produced with the help of advanced software, will discourage the growth of high value-added and content-intensive activities. This also means that Pakistan is likely to suffer if it were to implement these policies itself, as it would reduce services trade between countries. While privacy and data protection are important legitimate policy objectives, they should be achieved in the least restrictive manner to allow for the development of the industry based on internationally recognized principles.<sup>5</sup>

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<sup>5</sup> World Bank (2016).



**Currently, Pakistan’s IT services firms face obstacles in foreign markets while trading.** In most part, these obstacles are of a trade facilitation nature as they relate to the regulatory requirements that exist in export markets. They are an entry barrier for Pakistani firms because they create compliance costs when entering the market, For example work permit regulations or entry visa requirements. The latter is the single most crucial item identified by Pakistani exporters that report this factor as an obstacle. By contrast, regulatory predictability, timeframes, and applicability of regulations in foreign destinations are less of a problem for Pakistani exporters. Engagement with trading partners will be critical for dealing with visa restrictions.

**Pakistan’s IT services firms also face obstacles in the home market.** Survey results showed that the two most important domestic obstacles relate to electricity shortages and IT infrastructure. The latter includes the country's telecom network market as well as IT-goods that are necessary as an input for producing and exporting IT services. The next two most significant obstacles that firms face in Pakistan are of a regulatory nature: insufficient intellectual property right protection and the entry of foreign competitors in export markets. The former is something that Pakistan policymakers can change in the short-term domestically. A change in the latter would also depend on policymakers in the export markets, and last generation trade agreements are an instrument that could help to overcome these challenges.

**For non-exporting firms in Pakistan that rely on the domestic market, reported obstacles relate to the domestic enabling environment.** Furthermore, regulatory requirements, rising wages, skills availability, and labor market regulations are also identified as important obstacles by non-exporting IT firms. While graduates from top universities in Pakistan, such as Lahore University of Management Sciences (LUMS), are fully employable by the industry, firms in Pakistan that produce high value-added products find that only 10 percent of graduates from lower-tier universities are employable. For lower-end software services firms this percentage is 50 percent. This gap signifies the lack of suitable and contemporary programming skills in Pakistan. Also, weak English is identified as a major drawback stemming from lack of qualified teachers and modern curriculum at all levels of education.<sup>6</sup>

**IT and IT-enabled services exports have become one of the most successful international activities in recent years.** The survey explores reasons why there are IT firms in Pakistan that do not yet engage in global operations, despite proven opportunities and real success stories in the country. For instance, 37 percent of non-exporting firms prefer to focus on the domestic market. Thirty-five percent consider their lack of exportable services as a reason for not engaging in international business. For 30 percent of non-exporting firms, access to information on opportunities for exporting, as well as regulatory barriers and complexity of regulations, are two critical explanations for not participating in export activities.

### ***Policy recommendations***

Under the right policy direction, Pakistan is likely to experience fundamental changes in its economy, steering to a more innovation-based, knowledge-intensive way of producing and trading. In addition, the outbreak of the Covid-19 pandemic emphasized the importance of IT and IT-enabled services as crucial inputs to continue producing while preserving social distancing. It is still unknown what the post-Covid-19 business landscape will look like, but IT and IT-enabled services will play an even more prominent role than they do today. In addition, automation and artificial intelligence will play a more significant role in this industry by introducing significant changes in business models and strategies. To ensure Pakistan is ready to embrace that new environment, its IT/ITeS and digital trade policy framework needs to be right. The ingredients for a successful reform strategy should include interventions in three policy areas: a)

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<sup>6</sup> Couto and Fernandez-Stark (2019); State Bank of Pakistan (2018) and Government of Pakistan (2014).

regulatory capabilities and governance; b) sector-specific policies; and c) complementary supporting policies. Also, digital trade policies take place at two levels. At the national level, domestic policies play a critical role in reducing trade costs and enhancing competitiveness. But domestic policies by themselves do not open foreign markets; they need to be complemented by international policies aimed at helping the private sector to thrive in the global economy. In this context, every domestic policy should be complemented by international initiatives at the multilateral, regional (SAR and beyond), and bilateral levels. International initiatives can be based in different instruments: a) seeking technical assistance from trading partners, international organizations, and private sector to address specific challenges; b) cooperation, collaboration, memorandum of understanding, and other flexible instruments to formalize partnership among regulators, public entities, and other agencies; and c) more formal binding agreements to provide a more stable and predictable arrangement to support the country's globalization.

## I. Regulatory capabilities and governance

- i. **Create new institutional capabilities and modernize regulatory arrangements.** For example, while firms' registration processes have improved significantly in recent years (e.g. online registration has been introduced), the licensing process is still difficult. Licenses are also required to be renewed regularly. Procedures for renewals are unnecessarily long and require similar documents as a de novo license. Firms need to work with lawyers and auditors, which increases operating costs and discourages formalization and scaling up of small and medium-size firms. Freelancers face significant challenges in opening bank accounts due to existing regulations and acceding foreign markets. The new business models created by these technologies require training public officials to facilitate their understanding of how businesses are organized and operate and to modernize regulations. It will require transforming existing legal requirements for creating firms and supervising firms' operations, updating the taxation system, and foreign exchange regulations, and using new technologies. The public and private sectors should jointly organize trainings, agree on courses' contents and requirements, and issue certification to public officials that attend. The trainings should aim to increase knowledge and understanding of new business models, discuss international management practices in the context of digital technologies, and adopt modern regulatory approaches.
- ii. **Strengthen regulatory governance.** The report finds that the main challenges in regulatory matters in Pakistan are twofold: on the one hand, there are weak regulatory procedures in place, regulatory requirements are difficult to understand and, in some cases, unpredictable, and regulation enforcement is uneven and subject to discretion. On the other hand, there are significant capacity gaps among agencies responsible for regulatory matters beyond the poor understanding of business models in the context of the digital economy. These problems should be addressed by a gradual adoption and effective implementation of basic internationally recognized regulatory principles such as the OECD good regulatory practices, strengthening capacity at agency levels, including at the provincial level.<sup>7</sup>
- iii. **Invest in data collection.** Policy decisions, incentive programs, and schemes need to be informed and monitored by data. Pakistan needs to establish a more comprehensive framework for data collection at different levels: macro and firm-level data are essential, as well as national and provincial-level data. The data should include domestic variables and precise international transactions to measure the main trends, development, and characteristics of the sector and the firms. Similarly, Pakistan lacks detailed firm-level information. The recent empirical literature on

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<sup>7</sup> OECD (2014).

trade, including the empirical trade policy research, has moved in the direction of using more and more information at firm-level, for which economic information such as productivity can be analysed. Information would not only include standard variables such as value-added, production, sales, input usage (divided over raw materials, goods, and specific services), but also exports, imports, capital stock, employment (i.e. number of workers), wages, and R&D expenses, etc. This data should be sorted by firm ID, year, location of the firm, and/or firm type. Usually, such information is based on a firm's balance sheet, which, in many countries, firms are obliged to provide to national statistical agencies through surveys. It would be essential for Pakistan to set up a team of statisticians and economists to work on collecting such data.

## II. Sector-specific policies

- i. **Accelerate the adoption of digital technologies.** Digital technologies will become more relevant to support governments' services and policies, including during emergencies. The Covid-19 crisis has forced governments to get closer to citizens and firms while delivering solutions from a distance. Physical interactions between people and public officials have been constrained and digital solutions have been designed across the world to reach out remotely to support businesses and households that are immediately affected by policy responses and the economic slowdown. The Government of Pakistan should accelerate the implementation of e-government solutions and move to a process of automation for government-to-business interactions. While progress has been significant in recent years, for instance, connecting farmers to markets, Pakistan is still lagging on government digitalization.<sup>8</sup> Pakistan should develop policies conducive to accelerating adoption of innovative digital solutions, in collaboration with the private sector, to improve service delivery in a post-Covid-19 policy environment.
- ii. **Lower tariffs on digital goods and reduce taxes levied on data.** High duties on imports constrain access to high-quality inputs needed in downstream IT-sectors.<sup>9</sup> Pakistan still applies duties on imports of digital products at an average of 13.7 percent, increasing production costs for all sectors in the economy – particularly in a context in which digital technologies can help the economy function to some extent while preserving social distancing. The reduction should be gradual and focus on products included in the WTO's Information Technology Agreement. On domestic taxation, there are two related issues: a) taxation policies; and b) tax administration and practices (governance). This issue requires urgent attention from the authorities at the central and provincial levels. Pakistan will benefit from simplification and better coordination of tax authorities.
- iii. **Improve human capital related to technology innovations.** The focus should be to fill the skills gaps that are essential for the digital economy and are required by the IT and ITeS industry. First, the Higher Education Commission (HEC) in Pakistan, universities, and other stakeholders should collaborate and agree on a curricular update that aims to tackle the country's professional and technical needs. Second, the IT industry, on the other hand, needs to better identify and communicate the learning requirements and missing skills, including soft skills. Third, a mechanism to improve the integration of lower-tier universities with industry is also required. One option to speed up the process is to facilitate hiring coders from the private sector to teach courses in universities. Finally, HEC and universities need to start recognizing credit from online courses (e.g. online coding courses from Coursera and EdX that have the necessary quality accreditation).

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<sup>8</sup> See World Bank (2016) and UN (2018).

<sup>9</sup> See McKenna, Rocha and Varela, 2020.

This will allow students to accelerate upgrading their skills. In the context of the current Covid-19 crisis this has become even more relevant and urgent. In the case of Pakistan, there are significant specific skill gaps among computer science engineers and professionals which need to be tackled to ensure the future growth of the sector, including: (i) inability to code in contemporary technology platforms; (ii) weak English skills; (iii) poor comprehension readiness to address foreign clients' concerns; (iv) inadequate soft skills, namely communication and teamwork; and (v) poor knowledge of corporate culture, e.g. reporting, compliance, escalations, email etiquette, and protocols.<sup>10</sup>

- iv. **Strengthen promotion activities.** While the role and contribution to the internationalization of Pakistani firms of the Pakistan Software Exports Board (PSEB) is recognized, the institution could be strengthened. PSEB should dedicate more effective efforts to support firms' participation in international promotion activities in close coordination with the Trade Development Authority of Pakistan, while maintaining its efforts to facilitate business activities and streamline procedures and regulations. PSEB is perceived as a relatively weak organization that has not achieved the performance expected from businesses and does not strategically use Pakistani representations abroad. PSEB should learn from and adopt good promotion practices from successful experiences, including in Costa Rica, India, and the Philippines. Strengthening PSEB promotion activities will require to overcome resources constraints and mobilize financial resources from interested private sector. It also requires adopting managerial practices according to promotion activities, establishing and implementing a strategy with clear and measurable indicators and a monitoring and evaluation framework, and hiring staff with the required capabilities.

### III. Complementary supporting policies

- i. **Introduce regulatory changes to personal data protection.** The objective of the regulation should, on the one hand, aim to achieve the legitimate policy objective, i.e., data and consumer protection, and on the other hand, allow data flow to promote high value-added services activities. In other words, these regulations should avoid increasing input costs for firms, ultimately affecting their productivity. This can be achieved by subscribing to general principles broadly accepted internationally, such as the OECD privacy principles guidelines, or from the Asia-Pacific Economic Cooperation (APEC) forum. Ultimately, a strong internationally recognized regulatory regime will be required to allow for constructive cooperation between Pakistan and its main trading partners to allow flow of data. This will require a delicate balance of shared responsibilities from both the data source country and the destination country. It will also require increasing levels of convergence on privacy protection requirements set by data source countries and the protection standards offered by the data destination countries.<sup>11</sup>
- ii. **Improve the intellectual property rights (IPR) framework and create trust in the system for digital companies.** Pakistan is already active primarily in information technology outsourcing (ITO) and business process outsourcing (BPO). These services account for 87 percent and 13 percent of Pakistan's total services exports, respectively. However, to sustain growth in this sector and to encourage firms to come up with innovations in the industry, intellectual property needs to be adequately protected. The private sector pointed out the importance of IPRs for their future growth. Seventy-three percent of exporting firms and 64

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<sup>10</sup> Couto and Fernandez-Stark (2018).

<sup>11</sup> Mattoo and Metzler (2018), World Bank (2016) and (2020).

percent of non-exporting firms surveyed considered that insufficient IPR in Pakistan is an obstacle for their business. The issues identified by the private sector deal with three related aspects: a) improve implementation and enforcement; b) increase capacity to manage IPR-related matters by public entities; and c) improve protections in certain specific aspects such as undisclosed information. To move up in the IT and digital services value chain, both IPRs and access to commercial data are critical pillars. The agenda on IPRs and privacy concerns in trade agreements will be accentuated with cross-border data flows. At the international level, IPR has long been part of the global trade agenda, but a new factor determining digital trade is data. Content providers could restrict the provision of some services to countries where IPRs are inadequately protected. This can increase difficulties in generating exportable content as well as affecting access to imported content.

- iii. **Engage in trade agreements.** Restrictions on cross-border data flow through, for example, data localization requirements, are increasing. Pakistan's entrepreneurs face significant limitations to travel to promote their business and develop opportunities. Provisions related to IPRs and consumer privacy and data protection have increasingly been included in last generation trade agreements, and services trade, including through temporary movement of persons, have also been addressed. Pakistan should evaluate a strategy to engage in trade agreements to address its business interests proactively.<sup>12</sup> Regional and bilateral trade agreements are likely to be central in driving connectedness to markets given the existing challenges at the multilateral level.

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<sup>12</sup> Hofmann, Osnago, and Ruta (2017).

## **DIGITAL PAKISTAN: A BUSINESS AND TRADE ASSESSMENT**

**The increased use of digital technologies in the world economy provides companies and countries with an opportunity to improve trade competitiveness and, ultimately, productivity.** The use of digital technologies makes standard factors such as labor and capital more productive by reinforcing their allocation, which increases aggregate productivity. International trade is a vehicle for reinforcing the allocation of factor resources because open markets generally give countries the opportunity to receive the latest, most up-to-date ideas and technologies from abroad. This makes domestic industries more competitive. Moreover, digital technologies allow countries to sophisticate their products and production technologies, moving into new areas to export to other countries. Further to this, in the context of the Covid-19 pandemic, digital technologies provide – in many cases – a platform to allow the economy to operate while preserving the necessary social distancing for containing the spread of the virus.

**Digital trade provides new opportunities for Pakistan.** Importing digital goods and services in which new technologies are embedded or allowing for foreign investments in digital sectors would only make traditional ways of producing more effective in the country. Furthermore, exporting newly created goods and services that have undergone an upgrade because of new digital technologies typically carry a higher level of value-added that firms, and eventually countries, can reap when exporting. A particular factor concerning digital trade is data. Data flow across borders multiple times to develop new products and services and to optimize production processes across the various international production stages. In all these instances, encouraging digital trade and the cross-border flow of data through open markets would enhance productivity.

**However, not all countries are tapping into digital trade opportunities.** As firms have embedded more and more ICT and internet technologies in their products and services as well as supply chains, there has been an exponential growth of data in the world economy, and countries have reacted in different ways regarding digital policies.<sup>13</sup> For instance, countries such as China, Vietnam, and Indonesia have, over the years, introduced burdensome regulations that restrict the flow of data, investments in digital sectors, and the operations of online platforms. On a global scale, larger and relatively manufacture-oriented middle-income countries are comparatively more restricted in digital trade. Other countries have a more open policy regime regarding digital trade and investments; these are mainly the smaller, open, and more services-oriented economies.

**Pakistan is the second highest exporter of ICT services from South Asia, behind India, with more than US\$1 billion of exports.** Although export growth has been robust in the past few years, Pakistan's world market share of computer services exports has remained low, at around 0.2 percent. With a stable base, low cost of operations, a growing domestic market, and a reasonably strong network of Pakistani

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<sup>13</sup> Manykia et al., (2015)

workers across the world, the industry has the potential for more growth. However, skills mismatch and poor infrastructure problems, high tariffs and inefficient tax regimes, and poor perception as an IT investment destination due to economic and other factors, are holding the industry back.

**This report analyses the recent trends in the Pakistani IT sector and the obstacles confronted by IT firms.** The obstacles faced by firms increase the costs of selling services and may reduce the capacity to compete both in the local market (Pakistan) as well as overseas (exports). These obstacles include direct costs generated by barriers to market entry, such as limits to foreign participation or limits to competition (monopolies). But they can also include obstacles due to infrastructure deficiencies, geographical, cultural, and institutional differences, and/or obstacles imposed by regulatory measures. Among the latter obstacles, examples include difficulties in accessing information necessary to operate in a foreign market, or the predictability and stability of the business environment in a market and may also include the quality of the decision-making process and administrative procedures of competent authorities. This report uses a combination of data analysis, survey results, and private sector focus group discussions to better understand Pakistan's IT performance, bottlenecks in this sector, and the critical factors that may have contributed to this result. The survey was conducted on 782 IT firms located in different provinces. Surveyed firms include both exporters (534 firms) and non-exporters (248 firms), reflecting respectively the export competitiveness as well as domestic competitiveness of Pakistan's IT services sector.

**Pakistan's digital policy regime is relatively restrictive.** According to the DTRI the policy regime is above the average restrictiveness level of the countries that cover the bulk of digital trade in the world. That leaves scope for the country to tap into the opportunities that digital trade provides. Pakistan has been showing an upward trend for digital and digital-intensive services (see Annex for a definition of concepts used in this report), and firms do use and adopt foreign technologies either through licensing or through inward foreign direct investments. However, at present, Pakistan's digital trade is below its potential based on its level of development in comparison to other peer countries, due, in large part, to its restrictive digital policy environment.

**To tap into the full potential of the sector, Pakistani authorities need to implement several policy reforms.** Removing trade obstacles on investments in digital sectors, digital goods, and services, as well as digital technologies, would serve the country's interest by allowing firms to seize digital trade opportunities and create productivity effects. As the World Bank's Pakistan@100 report laid out, the success of Pakistan's future will depend on whether the country can overcome the barriers to adopt the latest technologies made available through growing FDI and increase openness to trade and technology ideas.

**The report is organized as follows.** The following section provides an overview of Pakistan's digital trade and investments performance and opportunities. The second section studies the digital trade policy framework in Pakistan. The third section looks at the enabling environment for digital trade and investment and the perception of the firms surveyed. The last section provides policy recommendations.

# I. DIGITAL TRADE AND INVESTMENT: PERFORMANCE AND OPPORTUNITIES

## A- TRADE AND INVESTMENT PERFORMANCE

**Despite progress in the digital space, there is scope for growth.** The percentage of individuals using the internet almost doubled from 8 percent in 2010 to 15.5 percent in 2017, the latest data available, while the proportion of households with internet access increased fourfold (Table 1). The improvement in access and usage is a recent phenomenon, as 47 percent of the internet users went online for the first time between 2012 and 2015 (UNCTAD 2017), coinciding partly with the introduction of 3G/4G technology. The number of subscribers of mobile broadband has soared from 1.4 million in FY2013-14 to almost 76 million (as of December 2019), which constitutes 97.4 percent of overall broadband (fixed and mobile) subscribers.<sup>14</sup> However, there is still a long way to go. Only 37 percent of Pakistanis aged 15-65 are aware of the internet (LIRNEasia, 2018). Data from the Household Survey (2018/19) show that in urban areas, only 4.7 percent of those in the lowest quintile of income distribution had used the internet in the previous three months. The share climbs to 50 percent among those in the highest quintile – but still hints at a substantial distance to universal access.<sup>15</sup> Over the years, Pakistan’s ranking has worsened in the ICT Development Index (IDI), published by the International Telecommunication Union (ITU), with other countries in the world progressing faster. Pakistan’s rank at 148 is the lowest of the major South Asian economies in terms of IDI (Figure 1 and Table A1).<sup>16</sup>

**Table 1. Comparative ICT Status in Pakistan**

	2010			2017		
	Pakistan	Developing Countries	World	Pakistan	Developing Countries	World
ICT Development index (rank)	123 (out of 152)	NA	NA	148 (out of 176)	NA	NA
International bandwidth per internet user (Kbit/sec)	4.2	NA	NA	20.9	59.6	70.9
Households with internet access (%)	5.7	19.8	32.5	22.1	41.5	52.4
Individuals using the internet (%)	8.0	21.1	29.3	15.5	42.4	49.0

Source: International Telecommunication Union

<sup>14</sup> Calculated from Pakistan Telecommunication Authority, <https://www.pta.gov.pk/en/telecom-indicators>, accessed on November 11, 2019, and Pakistan Telecommunication Annual Report 2016.

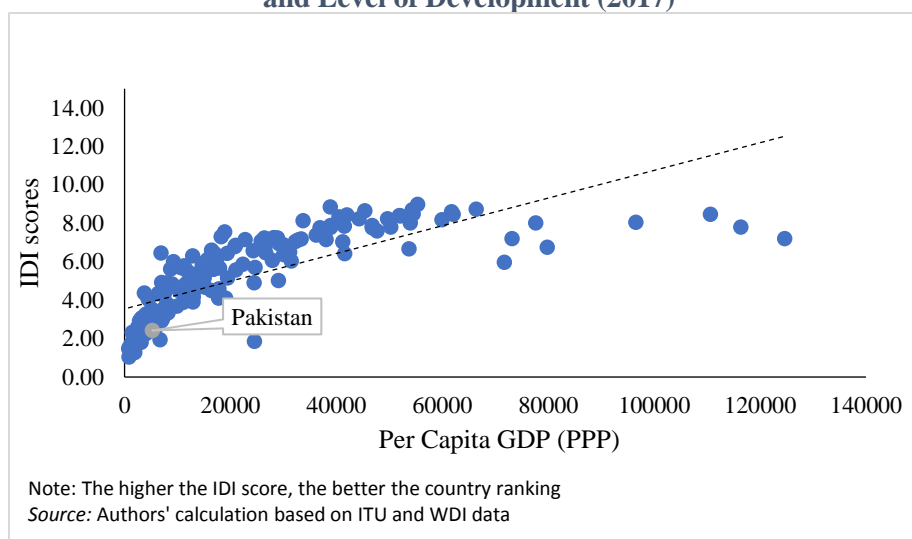
<sup>15</sup> Among internet users, the Household Survey also shows that only 3.5 percent of households in the poorest quintile of income distribution have access to the internet at home, while only 44 percent of those in the richest quintile do.

<sup>16</sup> For the purpose of the compared analysis, South Asia is defined as Bangladesh, India, Nepal, Pakistan, and Sri Lanka. The ICT Development Index (IDI), constructed by the International Telecommunication Union (ITU), is a composite index designed to allow assessing and comparing the state of ICT development within and between countries. The IDI allows monitoring changes in the development of ICTs over time so that forward-looking policy can be informed. The IDI was first released in 2009, and since published annually until 2017. In 2018, the ITU did not publish the IDI due to a number of challenges related to data quality and quantity resulting from the change in the set of indicators included in the IDI that was agreed in 2017. <https://www.itu.int/en/ITU-D/Statistics/Pages/IDI2019consultation/default.aspx>



**IT and ITeS services have grown into a moderately sized industry, comprising mostly locally owned firms.** Official estimates vary regarding the exact size of the industry. The State Bank of Pakistan (2018) reports that the number of IT firms registered at the Securities and Exchange Commission of Pakistan (SECP) was 4,600 in 2017, while the Pakistan Software Export Board (PSEB) website states that there are 4,464 companies and 3,579 call centers registered with them.<sup>17</sup> The industry is primarily spread across three major cities - Karachi, Lahore, and Islamabad (Rahman et al. 2017, and Ignite 2014) and has 300,000 professionals.<sup>18</sup> According to a survey of 300 IT firms by the National ICT R&D fund (presently known as Ignite) under the Ministry of Information Technology and Telecommunications (MOITT), 14 percent of the firms had 50 or more employees, 17 percent had 25-50 employees, and the rest had less than 25 employees (Ignite 2014). The sector comprises mostly domestically owned firms with limited foreign operations. According to Ignite (2014), 13 percent of surveyed firms were foreign, and of the top 10 exporters, only one is foreign. However, there is a multinational presence including IBM, Oracle, and Cisco, among others.

**Figure 1. Information and Communication Technologies Index and Level of Development (2017)**



**The industry is at a growing trajectory.** The number of IT firms more than doubled from less than 2,000 in 2007 (SBP 2018) to more than 4,000 at present (as well as the 3,000-plus call centers). From 2008 to 2017, on average, around 200 call centers registered with the PSEB annually (SBP 2019). There is a significant increase in freelancing activity as Pakistan now has the third largest number of freelancers in the world, right after India and Bangladesh,<sup>19</sup> with their earnings increasing by 47 percent in 2019.<sup>20</sup> The e-commerce market has also been dynamic, as the number of registered merchants increased by more than twofold, from 571 in FY2016-17 to 1,398 in the third quarter of FY2018-19 (Figure 2). The officially recorded transaction (converted to US\$ from Pakistani Rupee) in e-commerce increased from US\$89.8

<sup>17</sup> <https://www.pseb.org.pk/> accessed on November 11, 2019.

<sup>18</sup> According to the IT sector profile available on the Pakistan Board of Investment’s website <https://invest.gov.pk/it-ites#gallery>. Private sector representative estimates that the actual figure is 150,000.

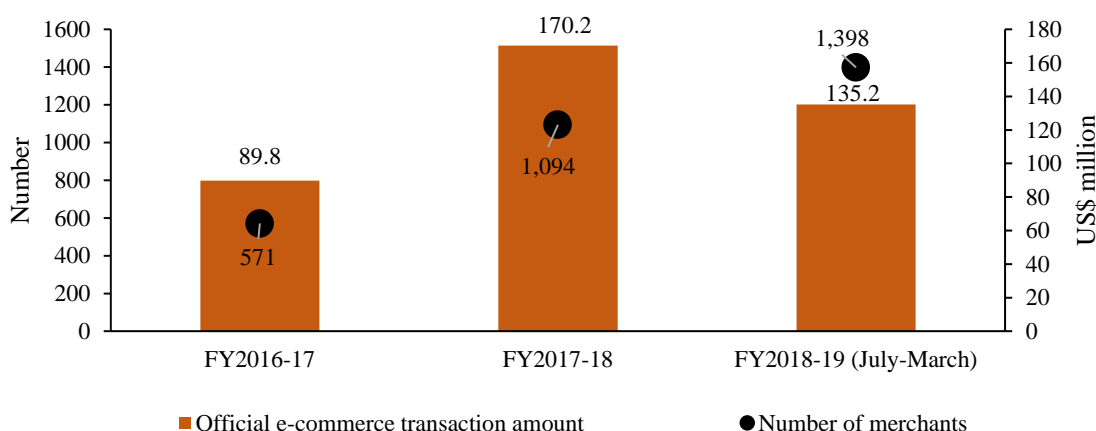
<sup>19</sup> Otto Kässi, Vili Lehdonvirta, [Online labour index: Measuring the online gig economy for policy and research](#), *Technological Forecasting and Social Change*, Volume 137, 2018, Pages 241-248. Data accessed at <https://ilabour.oii.ox.ac.uk/online-labour-index/> on December 12, 2019. Online Labor Index is a live database and is updated frequently. Hence the numbers referred to in this report may not match the latest version of the database.

<sup>20</sup> <https://www.cnbc.com/2019/08/07/the-10-countries-with-the-fastest-growing-earnings-for-freelancers.html>

million in FY2016-17 to US\$170 million in FY2017-18 (Figure 2).<sup>21</sup> However, the official transaction amount would be an underestimate, since cash on delivery is believed to cover 60 percent of the total e-commerce value in Pakistan (SBP 2018). As internet penetration increases in the country, e-commerce activity is expected to expand even more.

**The international and domestic markets are equally important.** According to the Pakistan Software Houses Association (PASHA, the largest private sector association for the IT industry), about 53.8 percent of the revenue comes from the export market and the rest from the domestic market.<sup>22</sup> Among the firms surveyed by Ignite (2014), 30 percent served only in the local market, 25 percent only in the export market, and the rest of the firms operated in both markets. The private sector is the leading consumer of IT services, as 97 percent of firms served the private sector while 66 percent served the public sector. According to the survey estimate, 22 percent of the domestic revenue of the IT industry was generated by serving the domestic IT sector, followed by education (8 percent) and banking (7 percent) (Ignite 2014).

**Figure 2. Officially Registered E-commerce Merchants and Recorded Transactions in Pakistan**



Source: Calculated from various editions of Quarterly Payment Systems Review, State Bank of Pakistan

**The industry is active in mostly low-value segments.** In exports, Pakistan primarily provides medium to low value-added software services, which includes enterprise planning, application development, and integration, while there is limited activity in product development. Low value-added services such as call centers lead the BPO segment with 90 percent of the export revenue in this segment stemming from these services. A small number of firms outsource services in the banking, financial, insurance, healthcare, and energy industries, which may comprise higher value-added services. Around 42.4 percent of freelancers in Pakistan are in software development, which constitutes about 10.5 percent of global freelancers in software development, much higher than Bangladesh, Nepal, and Sri Lanka, but lower than India (Table

<sup>21</sup> The rupee depreciated significantly over the years, with the average nominal exchange rate (rupee/US\$) standing at 104.7, 109.8 and 136.1 in FY2016-17, FY2017-18 and FY2018-19 respectively. Hence, though the e-commerce transactions to FY2018-19 Q3 at Rs. 18.4 billion almost equal the total transaction of Rs.18.7 billion in FY2017-18, when converted to US dollars it is far less. The depreciating exchange rate implied an increased importance (when measured in PKR) of foreign e-commerce transactions, as buyers had to pay more rupees per dollar.

<sup>22</sup> Calculated from the industry size estimates from PASHA <https://www.pasha.org.pk/knowledge-center/industry-stats/>, accessed on November 11, 2019. If the unofficial export estimate that is mentioned later in the report is considered, the revenue from export market stands at around 71 percent.

A1). The other segments in which the freelancing community is most active is in multimedia (31.2 percent), and writing and translation (12.6 percent).<sup>23</sup>

**Exports of IT services have been thriving.** Since FY10, Pakistan’s ICT services exports grew at 10.8 percent per annum from US\$433 million to more than US\$1 billion in FY2018-19. The share of computer services within ICT services exports increased from 44 percent of total ICT exports to 73 percent in FY19, with an annual growth of 17.3 percent. In computer services, software consultancy services grew sharply by almost 32 percent from FY2009-10 to FY2017-18, while the growth of software exports was moderate at 12.6 percent (Table 2). Though call center exports have been growing steadily, the export amount is much less than computer services and stood at US\$104 million in FY2017-18 (Table 2).

**Table 2** Composition of ITeS-BPO Exports in Pakistan (US\$ Million)

	Computer Services			Call centers
	Software export	Software consultancy	Others	
FY2009-10	124.2	31.4	31.7	16.6
FY2010-11	153.6	31.8	30.0	18.2
FY2011-12	178.2	37.1	32.0	26.9
FY2012-13	212.8	42.0	33.5	37.5
FY2013-14	225.1	63.8	39.3	40.1
FY2014-15	322.7	81.5	52.6	60.6
FY2015-16	286.6	139.2	64.2	72.8
FY2016-17	264.4	227.3	76.4	82.9
FY2017-18	320.2	287.7	118.2	104.0
Growth (% , CAGR)	12.6	31.9	17.9	25.8

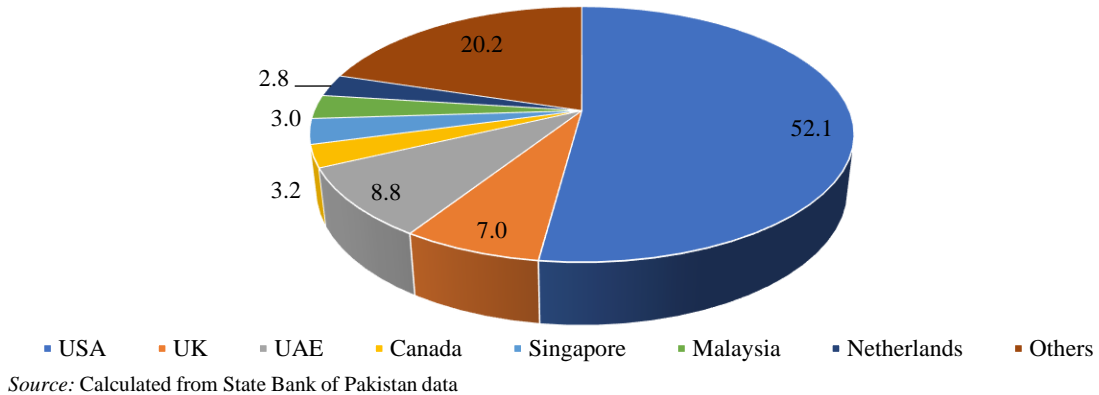
Source: State Bank of Pakistan (2019) and State Bank of Pakistan

**Official statistics do not capture the full export story.** Industry experts believe that there is around US\$1.5 billion worth of exports that are not captured in official statistics - US\$1 billion by SMEs and US\$0.5 billion by freelancers (SBP 2019). More than half (52 percent) of Pakistan’s Telecommunication, Computer and Information Services exports in FY2018-19 went to the United States, followed by the United Arab Emirates (8.8 percent) and the United Kingdom (7 percent) (Figure 3). Among South Asian countries, Pakistan’s ICT services export is second only to India, but by a considerable margin. However, within ICT exports, Pakistan’s exports of computer services are lower than those from Sri Lanka (Table A1).

**There is ample room for exports to grow.** Pakistan’s global market share in computer services has been very small and relatively stagnant. The export of computer services was only 0.2 percent of total computer services exports in the world in 2018. Even if the informal export estimate of US\$1.5 billion is considered, the world market share of Pakistan still stands at just 0.7 percent.

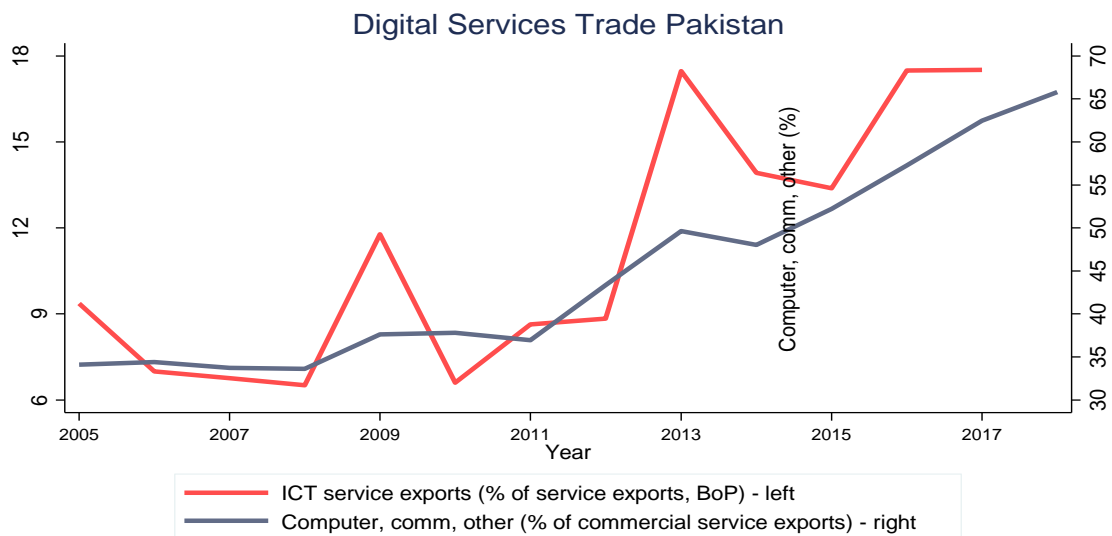
<sup>23</sup> Couto and Fernandez-Stark (2019), State Bank of Pakistan (2019), State Bank of Pakistan (2018) and <https://www.pseb.org.pk/> accessed on November 11, 2019.

**Figure 3. ICT Export Destinations (% of total ICT exports)**



Pakistan’s export of digital services represents an increasing share of its overall export in services performed cross-border. Figure 4 shows that the percentage of ICT services exports as a share of total services exports (left-axis) has been volatile yet increasing. Likewise, looking at the broader definition of digital-enabled services which comprises not only computer and communication services, but also royalties and license fees and various other business services (right-axis), this share has also been increasing.<sup>24</sup> Digital-enabled services are all sorts of services that are digitally delivered through the internet or are produced with the help of internet technologies. They are usually digital-intense but do not necessarily have to be ICT or computer services themselves. Moreover, Pakistan’s per capita exports of computer and communication services have increased by 15 percent since 2005. In contrast, ICT services alone have seen a huge increase of per capita exports of around 80 percent (both numbers based on the log change).

**Figure 4. Pakistan's Digital Services Trade (2005-18)**

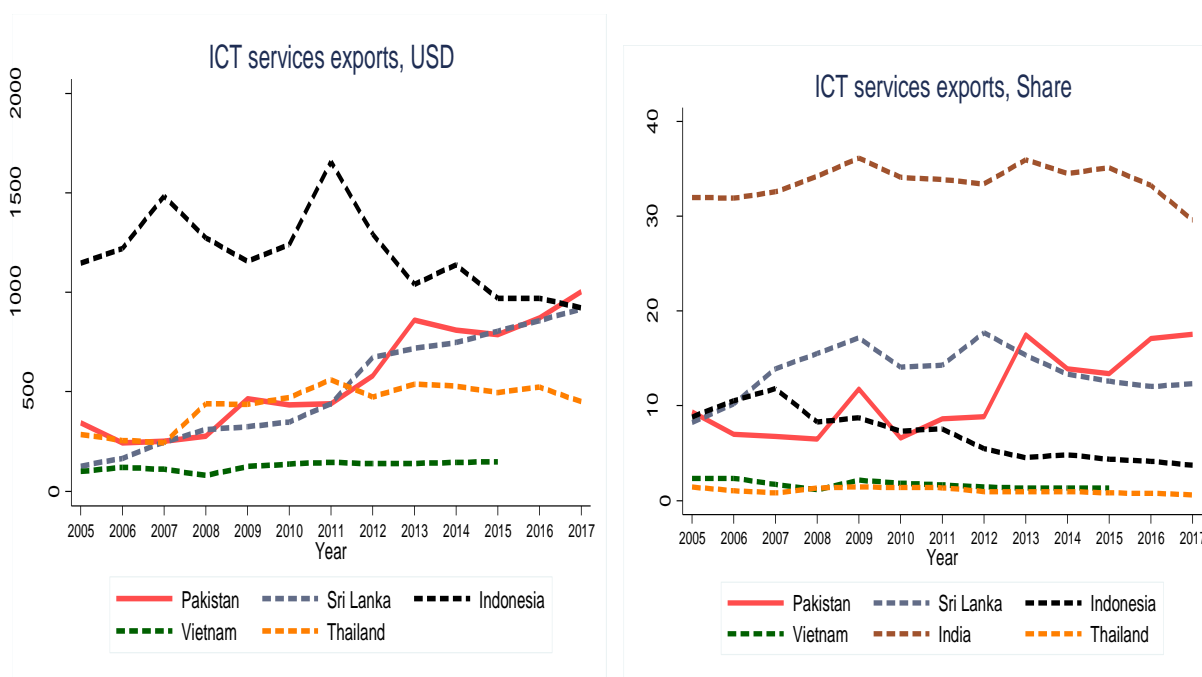


Source: author’s calculations based on WDI.

<sup>24</sup> See Annex for a definition of the two services categories.

**Pakistan’s ICT services exports have also increased in absolute numbers and have also been more successful than some in peer countries.** UNCTAD provides numbers on trade development in ICT services for developing countries. This source confirms Pakistan’s favorable position regarding the exports over time in these services: Pakistan shows an upward pattern (Figure 5, left-hand panel). Moreover, compared to various peers, Pakistan is doing relatively well. Together with Sri Lanka, the country shows a continuous upward movement.<sup>25</sup> Figure 5 (right-hand panel) repeats Pakistan's ICT services exports in shares of total exports and places them with its peers. Here too, Pakistan shows positive developments compared to Sri Lanka, and even compared to India, where ICT services have taken up a lower share over time.<sup>26</sup>

**Figure 5. ICT Services Export: 2005-17 (US\$ million and percentage of total services)**



Source: author’s calculations based on UNCTAD.

**Still, these positive developments need to be nuanced when looking at the broader picture in light of Pakistan’s level of development.** That can be seen in Figure 6, in which the level of development, represented by GDP per capita, for all countries is plotted against the per capita ICT services exports (left-hand panel). Pakistan and its peers are highlighted in red and blue, respectively. Pakistan is slightly below the fitted values line, which means that the country is performing below any prediction and, therefore, still has some scope to increase exports in the sector.<sup>27</sup> India and the Philippines are performing better than expected based on their level of development. Other peer countries are below the fitted values line.

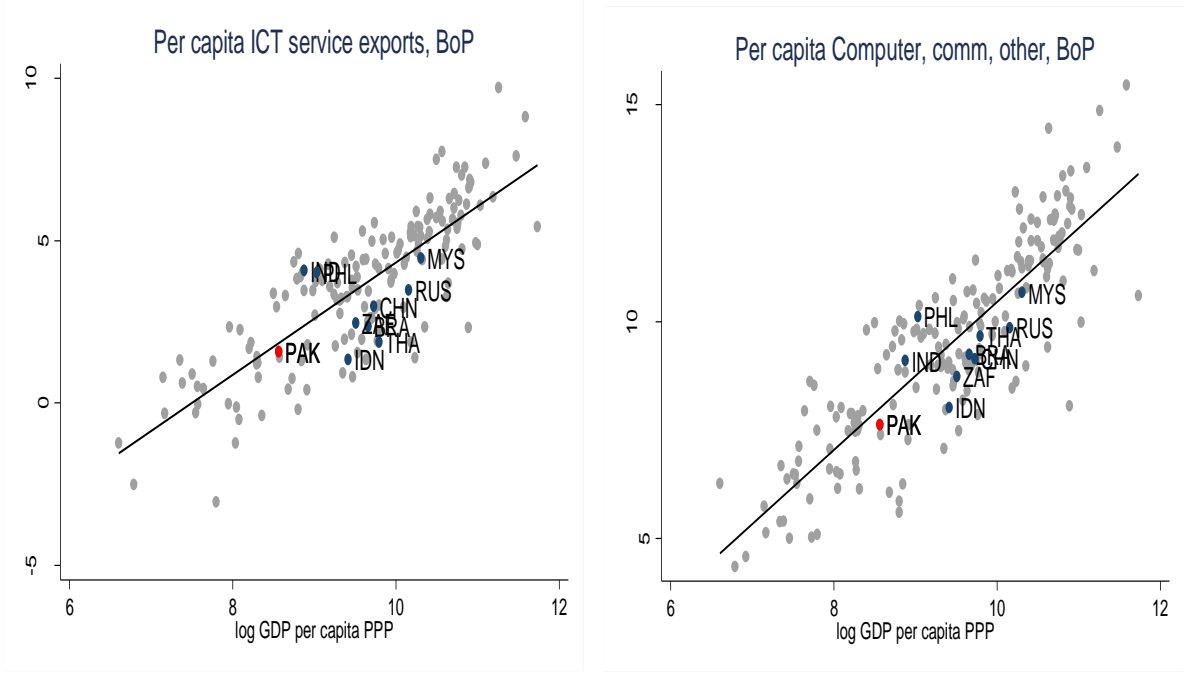
<sup>25</sup> India has been omitted from the figure, as well as the Southern Asian region, because those numbers dwarf any of the numbers presented for each country: India’s ICT exports dominate the overall region’s trade development in the sector.

<sup>26</sup> Note that for both sources (i.e., WDI and UNCTAD), no import data are given.

<sup>27</sup> This analysis is based on the officially reported statistics of balance of payments. As was mentioned before, total exports are higher but are likely registered as “remittances”.

Similarly, Pakistan also underperforms regarding the broader category of digital-enabled services exports (right-hand panel). It illustrates that the country has scope to increase exports in many other services that are digital-intensive and can be traded over the internet.

**Figure 6. Pakistan's Digital Services Trade and Development, 2017**



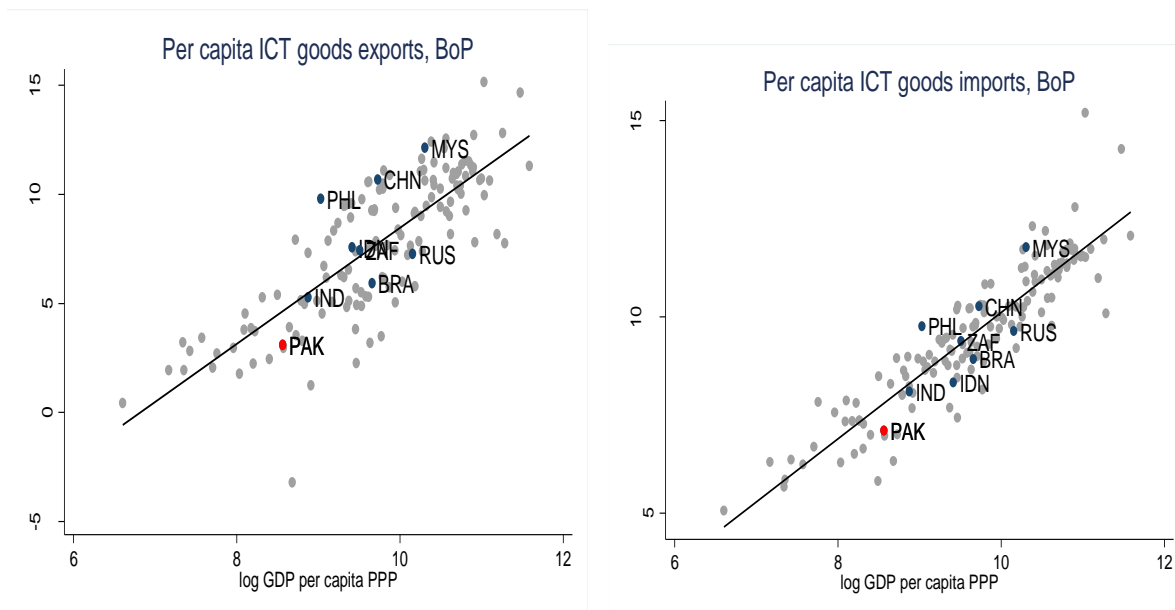
Source:

Source: author’s calculations based on WDI.

Note: extreme outliers such as microstates are excluded.

**Digital trade also covers ICT goods trade in which Pakistan also shows untapped potential.** Digital trade policies affect many digital-intensive sectors, including digital goods. Pakistan exhibits a pattern in which it also underperforms in the exports and imports of ICT goods, as shown in the left-hand and right-hand panel of Figure 7 respectively. In the two panels, Pakistan is placed below the fitted values line. This underperformance is actually greater than its underperformance in ICT services exports. This is demonstrated by the fact that Pakistan is placed further away from the fitted values line in the two panels for ICT goods trade.

**Figure 7. Pakistan's Digital Services Trade and Development, 2017**



Source: author's calculations based on WDI.

**Moreover, Pakistan's market share in digital goods trade has been in decline since 2005.** Pakistan's share of ICT goods exports (as a percentage of total exports) has decreased from 0.51 in 2005 to 0.20 in 2017.<sup>28</sup> Moreover, imports of ICT goods as a percentage of total imports for Pakistan has also been in decline from 8.70 in 2005 to 4.70 in 2017. This significant downward trend gives the impression that Pakistan has been less able to profit from positive spill-over effects that come with the imports of ICT goods and commodities. When expressing Pakistan's ICT goods imports in terms of its per capita rate, the country shows a constant trend. However, the country's per capita ICT goods exports decreased by 80 percent between 2005 and 2017. This negative development warrants attention as it reflects Pakistan's limited trade competitiveness, which prevents the country from having access to up-to-date technologies embodied in goods that are necessary to increase competition and to find new areas of specialization, as outlined in the Pakistan@100 report.

## **B- TRADE AND INVESTMENT OPPORTUNITIES**

**The startup ecosystem is evolving.** Tech entrepreneurship is on the ascendency in Pakistan with a growing number of startups, support organizations, and investors. In South Asia, Pakistan has the highest number of tech hubs (35) after India (Table A1). As of October 2019, there were 24 incubators and accelerators compared to only 2 in 2012, most of which are private sector led (Invest2Innovate 2019). Around 720 startups have been established since 2010, of which 67 percent are active.<sup>29</sup> Investment in startups has been growing.<sup>30</sup> During 2015-19, 82 startups raised funding of more than US\$165 million (Invest2Innovate 2019). However, securing financing remains a significant challenge. Pakistan is ranked

<sup>28</sup> <https://unctadstat.unctad.org/CountryProfile/GeneralProfile/en-GB/586/index.html>

<sup>29</sup> Mckinsey & Company (2019).

<sup>30</sup> State Bank of Pakistan (2018).



72<sup>nd</sup> in 2018 in venture capital deals under the Global Innovation index, doing marginally better than Bangladesh but below India and Sri Lanka.<sup>31</sup>

**Both the public and private sector support the scale-up of the startup ecosystem.** Both the federal and provincial governments support the startup ecosystem. For example, the Government of Punjab established the Punjab Information Technology Board (PITB) under which the technology incubator Plan9 was set up in 2012. Between 2016-18, Ignite, under the purview of MOITT, established five National Incubation Centers under public-private partnership in Islamabad, Lahore, Karachi, Peshawar, and Quetta. The federal government also started approving licenses for private equity and venture capital firms in 2017. As of May 2018, there were two private equity funds and two private equity companies registered with SECP.<sup>32</sup> The private sector has also been playing a crucial role in promoting startups. Since their inception, private sector accelerator and incubator programs, such as Invest2Innovate and Nest I/O, graduated about 191 startups.<sup>33</sup> In partnership with the federal government, Facebook launched its first innovation lab in April 2019. Google Developer Groups and Google Business Groups organize regular events in Pakistan's major cities. Local chapters of global initiatives like Startup Grind, Startup Weekend are also active in Pakistan. The ecosystem is also being strengthened by increased coworking spaces made available by established brands such as Daftarkhwan, CoLab, the Hive, and Kickstart.<sup>34</sup>

**The industry has a stable foundation and the necessary ingredients to take off.** Pakistan produces more than 20,000 engineers and IT graduates each year, most of whom can speak English.<sup>35</sup> The increasing number of freelancers indicates the availability and quality of the IT workforce. There are experienced professionals available to firms at all levels, including programmers, IT managers, and so on. Thirty-one percent of the surveyed firms were in operation for more than 10 years, while 39 percent of firms had 1-5 years of experience indicating a good mixture of experienced and upcoming firms. The necessary infrastructure exists, with 14 IT parks and improved telecom and internet infrastructure.<sup>36</sup>

**Pakistan is a cost-effective outsourcing location compared to other countries in the world.** According to the Kearney Global Services Location Index 2019, Pakistan is the third most financially attractive location for outsourcing IT-enabled services in South Asia, just after Sri Lanka and Bangladesh and fifth in the world, mainly due to low labor cost. The average hourly rate of a software developer is US\$25-30, which is at par with Bangladesh and Sri Lanka but lower than India (Table A1). Pakistan's operational cost in the low value-added BPO segment is 60 percent lower than that of the Philippines, the largest supplier of BPO services in the world.<sup>37</sup>

**The Pakistani diaspora in the IT industry of the United States can be an asset for the sectors' expansion.** In the United States, for example, there are around 13,000 Pakistani origin workers in Silicon Valley,<sup>38</sup> and Pakistan can leverage this strong network. Pakistani-Americans have already played a role in the advancement of the industry, by acting as investors and setting up firms utilizing their networks in the United States. This process can continue to develop the industry. Returning ex-pats can bring technological know-how and management experience that can move the industry forward while the

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<sup>31</sup> Mckinsey & Company (2019), AT Kearney (2017), State Bank of Pakistan (2018), Global Innovation Index (2019).

<sup>32</sup> (State Bank of Pakistan 2018).

<sup>33</sup> Nest I/O launched in 2015 and Invest2Innovate started its accelerator program in 2012. For details, please see: <https://thenestio.com/?p=3983> and <https://invest2innovate.com/about-us/>

<sup>34</sup> Invest2Innovate (2019, Mckinsey & Company (2019).

<sup>35</sup> <https://invest.gov.pk/it-ites#gallery>

<sup>36</sup> Couto and Fernandez-Stark (2019), Ignite (2014), and Government of Pakistan (2018).

<sup>37</sup> AT Kearney (2019) and Couto and Fernandez-Stark (2019).

<sup>38</sup> [Can Pakistan be the next Silicon Valley?](https://www.dawn.com/news/1266069) Dawn, June 27, 2016, <https://www.dawn.com/news/1266069>



diaspora remaining abroad can help connect the local industry to relevant multinationals and potential clients and investors.<sup>39</sup>

**Table 3. E-Government Development Index of Pakistan**

	2014	2018
E-Government rank	158	148
Online services index score	0.32	0.55
Human capital index score	0.33	0.37
Telecommunication infrastructure index score	0.12	0.15

Source: UNDESA, <https://publicadministration.un.org/en/Research/UN-e-Government-Surveys>

**Growing digital consumption in Pakistan holds much promise for the sector.** With a population of more than 212 million in 2018 and increasing internet penetration, the digital market is growing in Pakistan. More than 20 percent of smartphone owners in Pakistan use their devices to purchase goods and services online every month.<sup>40</sup> Daraz, a popular online market place, has more than 15,000 sellers each month, and more than 50 percent of their orders come from locations outside the big cities of Karachi, Lahore, and Islamabad, reflecting the spread of e-commerce in the semi-urban and rural areas.<sup>41</sup>

**Pakistan is also improving on digital e-government services.** Pakistan progressed in the United Nation’s E-Government Development Index, driven mainly by the improvement in the availability of online services (Table 3). Efforts to digitize the government are being observed both at the federal and local level. PITB implemented more than 270 ICT-related projects since FY2011-12, such as the digitization of land records and revenue systems, and launch of an e-Vaccs program to monitor vaccinators through a mobile-based app.<sup>42</sup> Sindh started an online collection of sales taxes.<sup>43</sup> Digitization of sectors such as agriculture, education, energy, and others as envisaged in the government’s Digital Pakistan Policy 2018 can create more opportunities for the local entrepreneurs in the IT industry. Developing solutions for the local market would help firms gain experience and maturity and help them expand globally.

<sup>39</sup> Couto and Fernandez-Stark (2019) and State Bank of Pakistan (2018).

<sup>40</sup> (GSMA 2018).

<sup>41</sup> In the context of the Covid-19 crisis, for example, Daraz launched a program of support to SMEs, with free education and no commission charges to ensure that more SMEs can leverage e-commerce. In particular, the program offers zero commission on sales through their platform, and free training. Pakistan’s changing e-commerce landscape, The Express Tribune, March 22, 2019. <https://tribune.com.pk/story/1934471/2-pakistans-changing-e-commerce-landscape/>

<sup>42</sup> State Bank of Pakistan (2018).

<sup>43</sup> Pakistan Telecommunication Authority (2018).

## II. DIGITAL TRADE POLICY FRAMEWORK IN PAKISTAN

**The spectrum of digital trade policies is broad.** It not only encompasses a wide range of complementary and interrelated “flows” of investments, goods, services, and data, but also factors such as competition policy and IPR. Given the fact that digital technologies are embedded in a wide variety of tradable items (i.e., goods, services, and data), digital trade policies should be formulated broadly (Table 4).<sup>44</sup> Above all, there are many complementarities between these different flows in the digital economy, and hence restricting one part of digital trade would most likely generate ripple effects further down the digital supply chain. An open policy regime for digital trade, therefore, helps countries to reap the full economic benefits through the use of digital technologies brought in by investments and associated digital goods, services, and data.

**Table 4. Digital Policy Framework**

Fiscal restrictions and market access	Establishment restrictions	Data restrictions	Trading restrictions
(A)	(B)	(C)	(D)
<ul style="list-style-type: none"> <li>• Tariffs and trade defense</li> <li>• Taxation and subsidies</li> <li>• Public procurement</li> </ul>	<ul style="list-style-type: none"> <li>• Foreign investment</li> <li>• Intellectual property rights</li> <li>• Competition policy</li> <li>• Business mobility</li> </ul>	<ul style="list-style-type: none"> <li>• Data policies</li> <li>• Intermediary liability</li> <li>• Content access</li> </ul>	<ul style="list-style-type: none"> <li>• Quantitative trade restrictions</li> <li>• Standards</li> <li>• Online sales and transactions</li> </ul>

Source: ECIPE; World Bank (2020).

### A- PAKISTAN POLICY FRAMEWORK

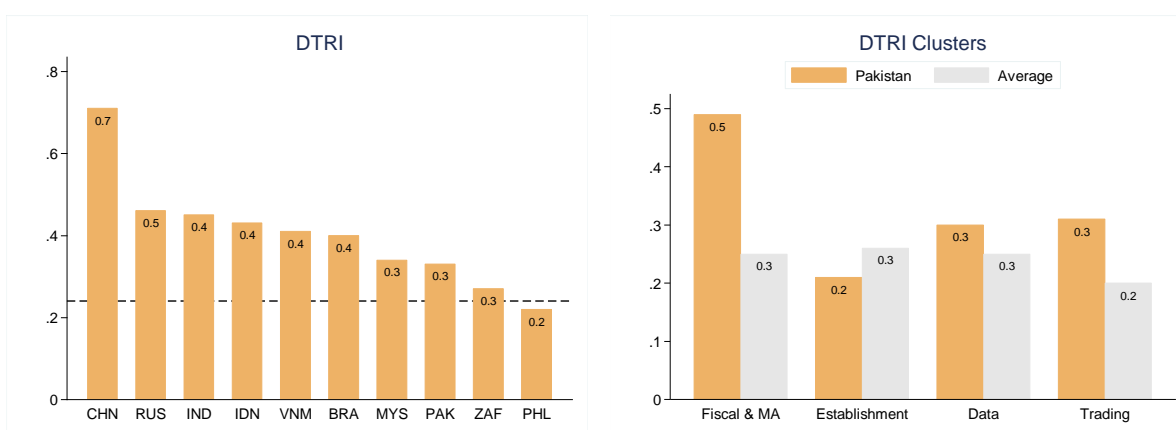
**Pakistan’s digital policy framework is relatively restricted.** The Digital Trade Restrictiveness Index (DTRI) is an indicator that measures applied digital restrictions for ICT goods, digital services, investments, and standards in digital sectors, and the cross-border flow and domestic use of data.<sup>45</sup> Pakistan is somewhat more restrictive than the average level of restrictiveness, marked by the dotted horizontal line in Figure 8, which is based on the full sample of countries, but less restrictive than some of its peers. Countries such as Russia, India, and China are much more restricted in digital trade than Pakistan. Only the Philippines have a level of restrictiveness in digital trade that is below the average.

<sup>44</sup> The DTRI covers a wide range of policy restrictions that increase the cost for the firm, and therefore digital trade. ECIPE’s DTRI follows in large part the set-up of the OECD’s STRI which later evolved into another index, DGSTRI, that covers all trade restrictions that are also covered by ECIPE’s STRI. ECIPE’s DTRI is larger in scope and some of the regulatory measures covered do not necessarily have a direct impact on international trade in services. Some measures affecting data policy may increase costs of digital trade but may also be necessary to address markets failure and achieve legitimate policy objectives, such as consumer protection and privacy. This index identifies elements that increase these costs. Reducing them requires a detailed analysis of the underlying policy objectives and rationale behind their imposition.

<sup>45</sup> It has been developed by the European Centre for International Political Economy (ECIPE) and covers digital trade policies in 64 countries.

**Pakistan’s main digital trade policy obstacles are found in the area of Fiscal Restrictions and Market Access, while the establishment restrictions in digital sectors are relatively low.** The DTRI is composed of four different clusters (**Table 4**). **(A) Fiscal Restrictions:** tariffs and trade defense, taxation and subsidies, and public procurement; **(B) Establishment Restrictions:** FDI restrictions, restrictive IPR measures, competition policy, and business mobility; **(C) Restrictions on Data:** data policies, intermediate liability, and content access policies; and **(D) Trading Restrictions:** quantitative trade restrictions, standards in digital trade, and restrictions related to online sales and transactions (largely e-commerce). Pakistan shows a level of restrictiveness that is substantially higher for fiscal restrictions, which includes market access restrictions on digital goods, as shown in **Figure 8** (right-hand panel). The average level of restrictions in this area across countries is much lower.

**Figure 8. Overall Digital Trade Restrictiveness Index and Clusters A-D (2018)**



Source: author’s calculations; ECIPE

## B- POLICY CLUSTERS ANALYSIS

### *Fiscal Restrictions*

**Pakistan is particularly restrictive in the areas of tariffs and trade defense as well as taxation and subsidies, but not for public procurement for digital sectors.** Pakistan appears in the top 5 list of countries most restricted for tariffs and trade defense, taxation, and subsidies policies, with countries such as Brazil, China, India, Nigeria, and Turkey. Some of these countries are Pakistan’s peers and score equally restrictive. Pakistan still applies an average MFN tariff rate of 9.7 percent on digital products, with peaks of 35 percent. Moreover, tariffs dispersion is high adding to price distortions. Also, imports need to pay two additional duties, the regulatory duty and the additional customs duty, that on average are 0.6 and 3.4 percent, respectively, for this category of products (**Tables A2 and A3**). The country also has an anti-dumping measure in place on imports of phthalic anhydride (an input used to make PVC for cables) from India, Iran, Italy, Thailand, Brazil, China, Indonesia, Republic of Korea, and Hong Kong. Furthermore, Pakistan does not apply its MFN tariff rates on imports from India.

**Restrictions in the areas of tariffs and trade defense, as well as taxation and subsidies, matter a great deal for digital inputs.** Even though digital trade currently tilts toward a focus on digital services, digital goods matter too. The hardware infrastructure, for instance, still consists of items ranging from cables and wires to more complex inputs such as optical fibers, which are all physically delivered. All these inputs are needed for the production of many other digital services. Therefore, access to the best digital input

commodities available by way of an open policy regime will generate a positive knock-on effect on other sectors using digital inputs intensively (Lopez-Gonzalez and Ferencz 2018). Moreover, digital sales and purchases also happen with the help of digital input commodities and services, which are used in sectors such as motor vehicles, computer manufacturing, and electrical equipment. This is particularly relevant in the context of the Covid-19 crisis, when digital inputs are crucial to continue producing while adhering to the social distancing measures imposed by governments.

**IT and ITeS providers face significant challenges regarding the taxation regime.**<sup>46</sup> **There are two related issues on taxation: a) taxation policies; and b) tax administration and practices (governance).** This issue requires urgent attention from the authorities at the central and provincial levels. The private sector, in general, has identified this issue as the most crucial problem it currently faces.<sup>47</sup> In the case of the services sector, services and services providers are taxed at the provincial level, introducing significant distortion due to differences among tax rates. A service may be taxed in one province, but not in another. There are also different criteria among the provinces on when the tax needs to be paid, either at the moment of consumption or where the service rendered/originated. Finally, there are overlaps with central government on certain taxes, which create an unnecessary high taxation burden, a complex administration system, and greater uncertainty for services providers, which, overall, fragment the domestic markets among provinces. This should be tackled as a priority to eliminate uncertainty, avoid fragmentation, and create a harmonized taxation regime which will efficiently generate the required revenues. The first matter to agree among authorities should be to have a common understanding on where the tax is due, to reduce uncertainty and avoid potential double taxation. Dealing with tax authorities costs firms in terms of time and financial resources, and was identified by the private sector as one of the most challenging areas in their business, due, in part, to the complex nature of modern business models required by ICT/digital firms.<sup>48</sup>

### ***Establishment Restrictions***

**Regarding establishment restrictions for digital sectors, Pakistan scores below the average and therefore is less restrictive than many of its peers.** This is, in large part, due to the abolishment of all types of FDI restrictions in digital sectors such as telecommunications and computer services. Also, Pakistan has a friendly regime when it comes to IPR restrictions but still has some restrictive measures in place. For instance, under the Copyright Ordinance of 1962, certain acts are not considered an infringement of copyright. Pakistan has only some copyright exceptions that include fair dealing for purposes of research or private study, criticism, or review. Furthermore, in Pakistan's merger guidelines, the country identifies IPR as an entry barrier for other firms. Pakistan's guidelines hint at the negative effect of IPR on competition in view of increasing the costs for competitors and the quality of competing products. However, this issue is not taken up in the DTRI, as no complaints were found regarding the application process for foreign applicants.

**A combination of economic, political, and other external factors make Pakistan less attractive to foreign IT investors.** Pakistan ranks 37 (out of 50) in AT Kearney's Global Services Location Index 2019, below India (1), Sri Lanka (25) and Bangladesh (32) (Table A1), mainly due to a poor score in the business environment. Macroeconomic instability, together with security considerations, is a key reason for overall low foreign investment, and it is very low in the IT sector (**Figure 9**). Furthermore, there is a security risk

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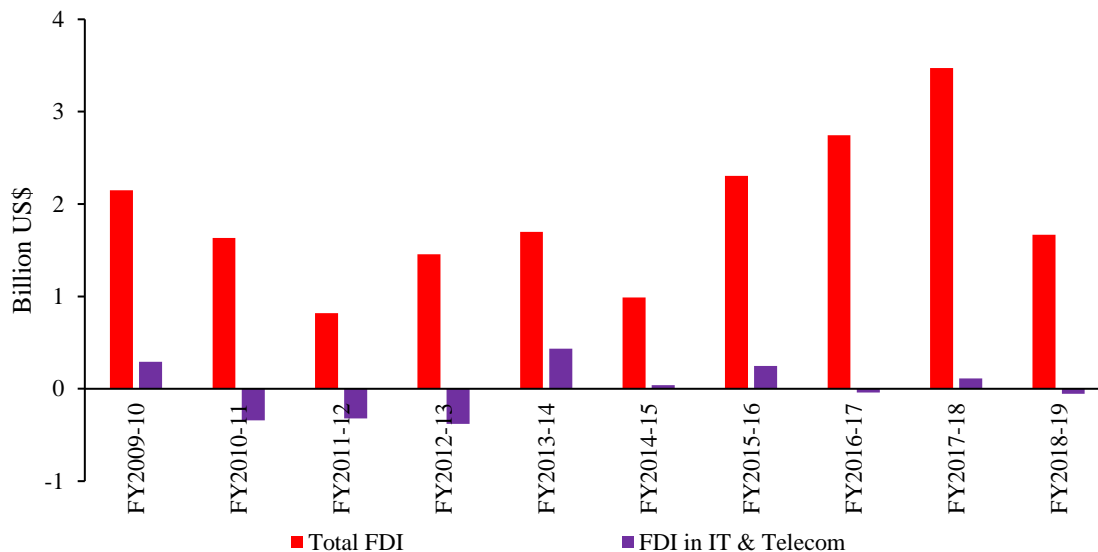
<sup>46</sup> Huria et al. (2019)

<sup>47</sup> OICCI (2017).

<sup>48</sup> State Bank of Pakistan, (2018)

perception that works against Pakistan, thereby making it difficult for Pakistani companies to attract business from abroad (Couto and Fernandez-Stark 2019).<sup>49</sup>

**Figure 9. Net FDI Inflows in Pakistan**



Source: Board of Investment, Pakistan

**Keeping low restrictions on FDI for digital sectors in Pakistan, such as telecommunications and information services, are vital for the country to profit from technology spill-over effects.** International firms willing to invest in Pakistan would be incentivized to share technologies if they face a favorable investment regime. This way, perennial firms in the digital sector can subsequently adopt new technologies. This is already happening in part in Pakistan, albeit weakly. In addition, many goods and services that international firms bring have embedded intellectual property. And as digital trade often implicates IPRs, particularly copyrights and trademarks (Lopez-Gonzalez and Ferencz 2018), rules surrounding intellectual property would have to be set right and not too restrictive. This is particularly relevant for sectors such as entertainment with a high digital content (i.e., books, films, etc.), but also other sectors such as social media, cloud computing, and other technical software-related services.

### *Data restrictions*

**Pakistan is only somewhat more restricted than average regarding data policies, but still holds some restrictions related to content access.** Pakistan's overall policy framework regarding electronic data is relatively open. However, although the country does not have any full data localization requirements, it nonetheless holds some restrictions. While this may change over time, it is not yet explicitly regulated in Pakistani law.

**Data can only be transferred to India if the transferor can justify such a transfer.** Other than that, there are also some other minor restrictions in place in Pakistan. Besides being regulated by contractual terms, data collected by banks, insurers, hospitals, defense establishments, and other "sensitive"

<sup>49</sup> (AT Kearney 2019), (Waheed and Adnan 2019), (Kathuria 2018), (Monge et al. 2019), and (Couto and Fernandez-Stark 2019).

sectors/institutions, cannot be transferred to any individual/body unless it is transferred with the permission of the relevant regulator or similar entities, on a confidential basis. Additionally, in some instances, data cannot be transferred without the consent of the relevant client/customer.

**Pakistan has significantly stricter data rules regarding content access that are comparable with some of its peers, such as Thailand, Indonesia, India, and Russia.** Pakistan appears to control foreign commercial services content to its domestic market, and the government has provided a mandate for filtering legal content. This makes the country above average in terms restrictiveness in this regard and holds back foreign content that can enter Pakistan. This is a result of so-called “shut-down” that regional governments apply for foreign content and foreign online platform providers, which was also reported by UNCTAD (2017).<sup>50</sup> Regarding the intermediate liability obligations that applied to online platforms, Pakistan does not have any burdensome restrictions. It has a Safe Harbor framework that shields them from liability from third parties. The country neither has user identity nor monitor requirements in place.

**An open policy regime regarding data is vital as it underpins the digital economy.** Data as flow has exponentially increased in recent years. Data underpins the digital economy as they are used to optimize supply chain management systems, electronic payment networks, and facilitate workings with contractors and input suppliers. Moreover, many newly emerging sectors, such as cloud computing, digital information services, or online platforms, thrive on the use of and cross-border flow of data. Recent studies have shown that restrictions on data flow hamper trade in services performed online.<sup>51</sup> Moreover, restrictive rules on the domestic use of data, such as burdensome administrative and privacy regulations, hamper the opportunity to reap productivity gains by firms that are reliant on software technologies.<sup>52</sup> Restrictive policies regarding data also appear to hold back the absorption of foreign technologies as a study by Ferracane and van der Marel (2019) shows for a group of Asian countries.

**Pakistan is currently planning to introduce regulatory changes to personal data protection.** While an in-depth analysis of the legislation goes beyond the objectives of this report, a three pillars strategy should be followed. The first pillar should address the legitimate policy objectives pursued by the government. The second pillar should ensure that internationally recognized principles are considered, while a third pillar should encourage international cooperation to allow for the digital economy and trade to grow. Regarding the current proposal, several issues can be pointed out. First, the draft law requires additional clarity to ensure that both the law and its implementation are consistent with accepted principles. For example, the law applies conditions for transfer of critical personal data only, but what is critical remains undefined. Also, the law requires consent for the collection and use of data, but it remains unclear if this requirement will be more burdensome than necessary. Consent is also needed when data is transferred abroad. Finally, to implement data localization requirements, data centers need to be developed. It is unclear if data centers are a viable investment in developing countries due to the difficult requirements necessary for their operation.

**The law should aim to balance objectives.** Second, the law should, on the one hand, aim to achieve the legitimate policy objective, i.e., data and consumer protection, and on the other hand, allow data flow to promote high value-added services activities. In other words, regulations should avoid increasing input costs for firms, ultimately affecting their productivity. This can be achieved by subscribing to general principles broadly accepted internationally, such as the OECD privacy principles guidelines, the Council of Europe Modernised Convention for the Protection of Individuals with Regard to the Processing of Personal Data (Modernized Convention 108), or from the Asia–Pacific Economic Cooperation (APEC)

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<sup>50</sup> <https://unesdoc.unesco.org/ark:/48223/pf0000262943>

<sup>51</sup> (Ferracane and van der Marel 2018).

<sup>52</sup> (Ferracane et al. 2018).



forum. Ultimately, a strong internationally recognized regulatory regime will be required to allow for constructive cooperation between Pakistan and its main trading partners. This will require a delicate balance of share responsibilities from both the data source country and the destination country. Also, it will require increasing levels of convergence on privacy protection requirements set by data source countries and the protection standards offered by the data destination countries.<sup>53</sup>

### ***Trade Restrictions***

**Pakistan upholds some restrictions when it comes to importing digital services and maintains strict standards in digital trade.** Figure 10 shows that Pakistan is more restricted than most other countries regarding the trading restrictions summarized in Cluster D. These restrictions are found in the DTRI's chapters related to quantitative trade restrictions and standards in digital trade. Regarding the former, Pakistan prohibits the importation, sale, distribution, and transmission of films the government deems inconsistent with the country's cultural values. In 2017, the State Bank of Pakistan (SBP) imposed a 100 percent cash margin requirement on the import of certain consumer items, which included mobile phones and reception apparatus. This measure obliges importers to deposit the total amount of the transaction value in a commercial bank before the opening of an import letter of credit.

**Pakistan has also applied some restrictive rules and practices regarding digital product standards in telecommunication that appear to be discriminatory.** Although the technology department of the Ministry of Science and Technology in Pakistan sponsors and encourages public and private organizations in the standardization of products and services according to International Organization for Standardization (ISO), the country still holds discriminatory practices for some digital items from abroad. For instance, as part of Pakistan's product safety certification, the Telecom Act requires that telecom equipment should conform to the standards adopted by the Pakistan Telecommunications Authority (PTA). No terminal equipment can be directly or indirectly connected with the public switched network unless the PTA has approved it. The machines required for testing terminal equipments and network conditions also need to be submitted to the PTA for approval. It is reported that such approval for a local manufacturer costs half as much (5000 PKR, approx. US\$48) than for a foreign one (US\$100). Also, the private sector identified security-related measures as unnecessarily burdensome for the authorization of specific equipment used in the ICT/digital services environment (see **Box 1, below**).

**The quality certification status of the industry needs to improve.** To grow the market potential, firms need to show that they can meet the global standards by obtaining internationally recognized standard certifications and accreditations. These indicate the capability and capacity of IT firms and their ability to deliver quality products and services promptly.<sup>54</sup>

**Although not always applied, Pakistan has some regulatory restrictions and practices regarding encryption standards.** Pakistan neither requires mandatory encryption standards that deviate from the international, nor denies any recognition of international encryption standards. The country nonetheless maintains some restrictive practices. Officially, Pakistan requires entities using encryption and cryptography services to obtain accreditation from the Electronic Certification Accreditation Council, which falls under the Ministry of Information Technology. In practice, this requirement is not consistently enforced. For example, WhatsApp is widely used in Pakistan, despite the company's April 2016

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<sup>53</sup> Mattoo and Metzler (2018) and World Bank (2020).

<sup>54</sup> Government of Pakistan, (2014). Government of Pakistan, (2014). The empirical literature, Gregory, Stanley and Tenev (2009) and Bhattacharjee and Chakrabarti (2015), attributes certifications as a key factor to the success of the Indian software industry. Also see Couto and Fernandez-Stark, (2019) for discussion on the importance of certification in this industry more broadly.

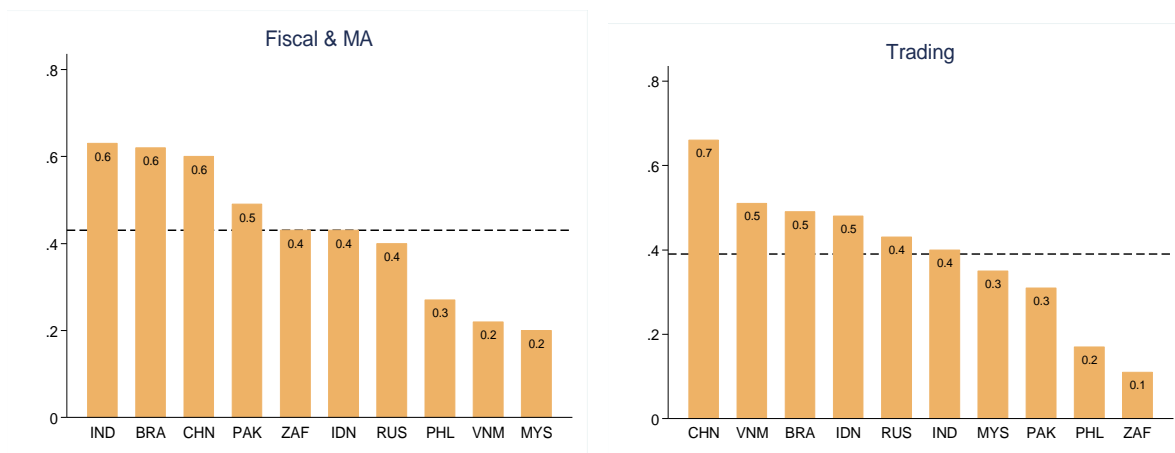
announcement that it would employ end-to-end encryption. In contrast, Research in Motion (RIM), the maker of BlackBerry mobile devices, faced scrutiny from the government regarding its use of encryption. In 2015, the national telecom carriers were ordered to cease offering services that route email through BlackBerry Enterprise Server (BES).

**Maintaining the least burdensome digital standards in Pakistan favors the tradability of goods and services while allowing smaller firms to participate in exporting and importing.** Generally, strict standards for firms to enter the market, or even diverging standards across countries, pose a fixed cost burden for a firm willing to export. Standards for goods and services are set to guarantee quality and achieve legitimate policy objectives that otherwise the market may fail to provide. But standards can also be designed or applied in a way so that it becomes more burdensome than necessary and hold back the presence of exporters in foreign markets (see a study on restrictive SPS measures as trade barrier by Fontagné et al. 2015). If so, restrictive standards in digital sectors in Pakistan will hold back the best available digital goods that, as explained above, are used as inputs into other productive sectors.<sup>55</sup>

### C- PAKISTAN AND PEERS COUNTRIES

**Compared to its direct comparator countries, Pakistan places itself as more restricted than the average only regarding fiscal restrictions in digital trade.** Pakistan scores above the average level of restrictiveness across its peers with regards to fiscal restrictions in digital trade, as shown by the dashed lines in **Figure 10** (left-hand panel). Even though some peers have higher levels of restrictiveness, compared to the Philippines, Vietnam, and Malaysia, Pakistan’s restrictiveness appears high. That is not the case for the other areas of the DTRI. For instance, even though Pakistan has some quantitative restrictions and strict standards in place, on the whole, the country applies a level of restrictiveness that is lower than average (right-hand panel). This conclusion also holds for Pakistan’s policies regarding data and investments.

**Figure 10. Digital Trade Restrictiveness Index Clusters A and D (2018)**



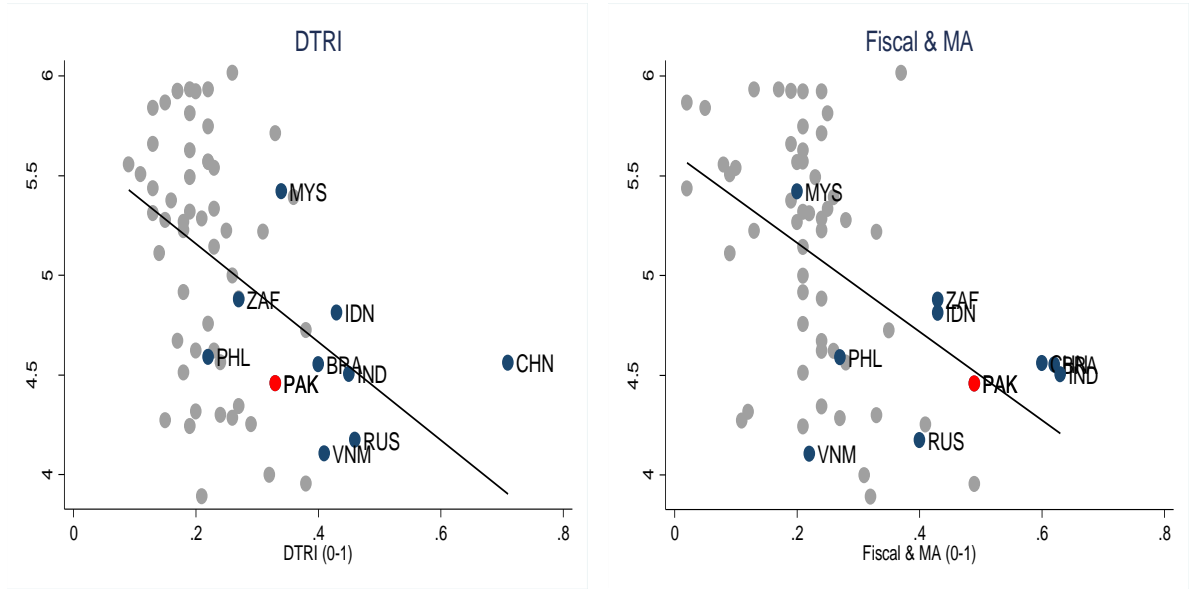
Source: author’s calculations; ECIPE

<sup>55</sup> For example, during interviews with the private sector, it was mentioned that firms could lose their investments and business opportunities due to excessive timeframes or bureaucratic requirements for decisions.



**Restrictive policies are likely to explain, to some extent, Pakistan’s limited success in technology adoption and receiving positive spillovers from investments in the digital sector.** As pointed out in **Figure 11**, restrictive policies are negatively correlated with the extent to which firms adopt new technologies. A higher level of digital trade restrictiveness is associated with lower levels of availability of the latest technologies as well as the capacity of firms to absorb digital technologies and the extent to which technology transfer takes place (left-hand panel). Pakistan is placed below the fitted values line, indicating that its capacity to adopt technologies is lower than what one would expect based on its digital policy framework. This may suggest that other factors also play an important role, such as the strength of local institutions such as standard-setting authorities, regulatory agents dealing with the telecommunications market, or institutions responsible for the innovation ecosystem on which digital developments are dependent, and the availability of good quality skills used in digital sectors (see below for detailed discussion).

**Figure 11. Digital Trade Restrictiveness Index and Technology Adoption (2007-18)**



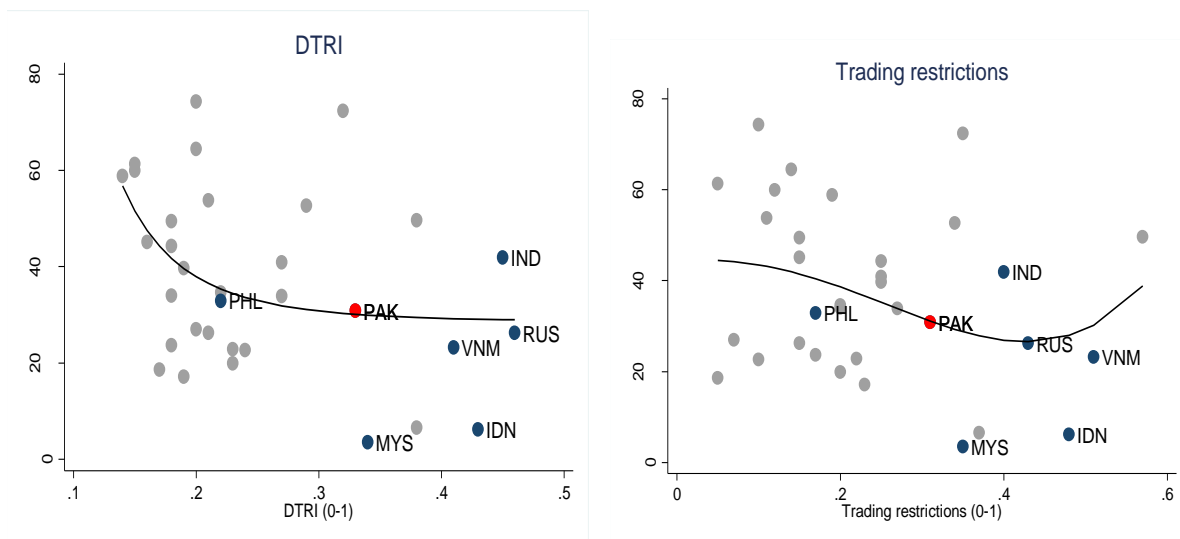
Source: author’s calculations; ECIPE and WEF.

**Reducing fiscal restrictions in digital trade will foster the competitiveness of digital goods and services.** As described above, Pakistan’s success in digital goods trade is more limited than in digital services trade. At the same time, Pakistan is relatively more restricted regarding its tariffs and trade defense, as well as taxation and subsidies, and standards in digital trade. The high level of restrictiveness in this area may, therefore, play a role in the low ability of Pakistani firms to adopt new technologies, as shown in **Figure 11** (right-hand panel). This figure predicts that for Pakistan, lowering trade restrictions may help companies to absorb more modern technologies. However, the variability between high and low technology absorbers in both panels is high, which demonstrates that even though policy restrictions may help, policy restrictiveness is unlikely to be the sole determinant for explaining Pakistan’s limited success in absorbing digital technologies.

**Given Pakistan’s relatively higher level of restrictions in digital trade and technology compared to other non-peer countries, it may also explain why the country has a relatively lower share of firms introducing new goods and services.** Pakistan’s performance regarding the percentage of firms doing innovative activities is in line with some peers but is overall low compared to many other countries (**Figure**

12). Part of the explanation may be again the relatively higher levels of restrictions in digital trade. The panels of **Figure 12** show the share of firms producing new goods and services with the full DTRI (covering the full range of digital trade restrictions) as well as restrictions for Cluster D (Trading restrictions). Again, although other factors may play a role, Pakistan’s fiscal restrictions in digital goods and services, as well as its strict rules regarding digital standards, may help explain lower innovation activities. A similar adverse line is also visible when plotting the index for Cluster C instead, which covers data restrictions in which Pakistan has some limitations.

**Figure 12. Digital Trade Restrictiveness Index and Innovation Activities (2013-18)**



Source: author’s calculations; ECIPE and WB Enterprise Surveys. Note: The fitted values line is a fractional-polynomial prediction plot and is plotted because of the fairly limited number of observations and wide variability of the data. China and Panama are excluded as they form extreme outliers at both ends of the spectrum regarding both variables. Data from the Enterprise Survey reflects the year 2013, which is the latest year available.

## D- POLICY BARRIERS FOR EXPORTERS

**According to the survey conducted among exporting firms the vast majority of exporters, 65 percent, in the IT industry have only a few export markets (less than five).** Less than 15 percent of the firms included in the survey have more than 10 export markets (**Table 5**, column 6). Firms located in Karachi have the larger share of the small number of destination countries, followed by firms located in Quetta and Lahore. Larger firms have a higher number of destination markets. They also have a larger percentage of firms with foreign investment. Whereas in the case of medium and small firms, destination markets are much more concentrated, and the number of firms with foreign ownership is much lower, 11 and 4 percent, respectively. More than half of the firms has exported for less than five years, and almost 80 percent less than 10 years (**Table 5**, column 7). The youngest firms are located in Peshawar, Quetta, and Islamabad. Most exporting firms do not have any foreign ownership or investments in their company, nor do they form part of a bigger foreign parental company in the form of a subsidiary (**Table 5**, columns 4 and 5). This is similar to firms regardless of their location.

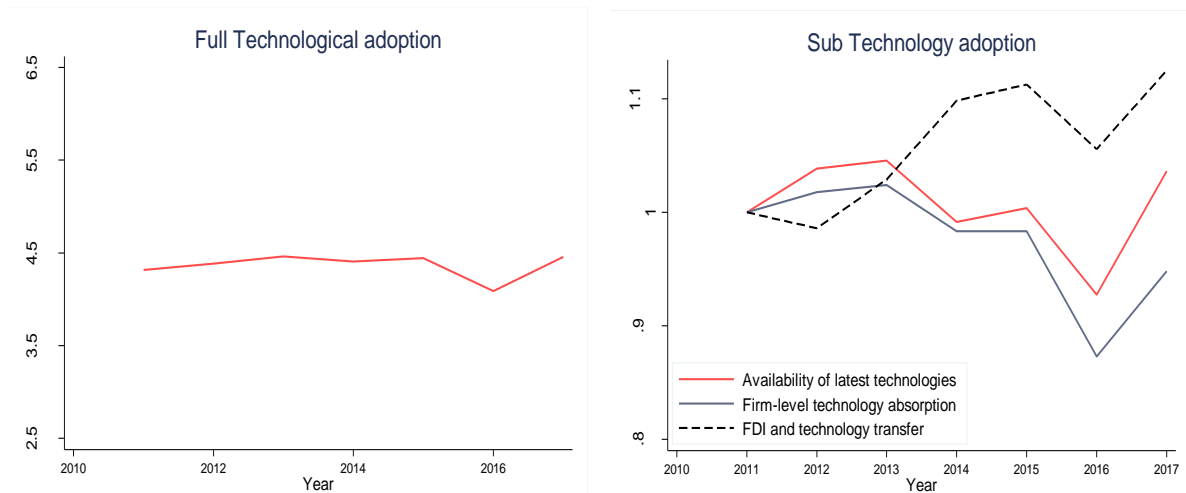
**Table 5. Characteristics of Exporters**

City	Total Exporting Firms: 534	Average Number of Employees	Type of Juridical Person			Foreign ownership / investment %	Exports to fewer than 5 markets %	Less than 5 years exporting %
			Pvt Ltd company %	Sole proprietorship %	Subsidiary of a foreign company %			
Exporters	100	169	45	38	13	10	65	55
Karachi	36	396	43	38	17	13	73	47
Lahore	24	63	43	32	12	12	67	54
Rawalpindi /Islamabad	24	38	55	38	12	9	60	63
Peshawar	3	10	50	31	6	6	50	81
Quetta	3	10	47	47	0	0	71	71
Others (Please specify):	10	29	26	51	15	4	45	58
Small or Single	53	8	30	56	7	4	66	66
Medium	21	23	53	21	15	11	72	56
Large	26	636	68	16	25	22	56	33

Source: World Bank IT Firm's Survey, 2019

**To tap into continued ICT services export growth and to expand exports in ICT goods, foreign investments for Pakistan in digital sectors are of great importance.** FDI is an important vehicle for firms to profit from positive spill-over effects. These spill-over effects enable domestic firms to learn and adapt to new technologies that are being brought in by multinationals – especially in digital sectors. With these new technologies, firms can develop and innovate new goods and services to export. However, FDI in digital sectors is limited in Pakistan (McKenna, Rocha, and Varela 2020). ICT-related investments (mainly in the telecommunications sector) represent a share of 13 percent in total FDI received between 2003 and 2015, and if we include digital-enabled services such as finance, the number only extends to 19 percent. This small share of digital investments may hamper Pakistan's upgrading to more advanced digital services exports and contribute to its decreasing digital goods performance. The WEF reports that although firms are able to absorb new technologies, Pakistan's performance has not improved since 2010. On a scale between 1 (no technology adoption) and 7 (extensive technology adoption), Pakistan's trend is stagnant (**Figure 13**, left-hand panel).

**Figure 13. Technology Adoption Through FDI in Pakistan (2017)**



Source: author’s calculations; WEF. The WEF indicators are derived from its annual survey. The survey is used to measure concepts that are qualitative in nature or for which internationally comparable statistics are not available for enough countries.

Note: The grey line of the technology adoption index from the WEF measure the extent to which firms adopt technologies from abroad or from other sectors and companies. The red line measures the availability of these technologies in the economy. The dashed line indicates the technology adoption from FDI/international companies.

**That said, when disentangling Pakistan’s fairly constant rate of technology adoption by firms and looking at its sub-components, it seems that technology transfer through FDI is actually improving (Figure 13, right-hand panel).** The three sub-indexes that build up the WEF’s full index of technology adoption has been normalized to zoom into Pakistan’s specific trends in technology adoption. At the outset, although there was a small decline in 2016, overall, a positive trend is found regarding the technology spillovers associated with FDI for Pakistan. That cannot be said, however, for all firms in the country. **Figure 13** also shows that firms lack access to the latest technologies, which in Pakistan is also adopted on a limited scale. Yet some improvement on the sub-indicators seems to have taken place in recent years.

**There are also specific obstacles IT services firms in Pakistan face in the foreign market when exporting.** These, in most part, relate to the regulatory requirements that exist in export markets, which may, therefore, form an entry barrier to the market. However, most of the obstacles have a trade facilitation nature. That is, most obstacles in the export markets are related to compliance costs when entering the market, such as work permit regulations or entry visa requirements. The existing visa regimes faced by Pakistani businesspersons and IT professionals abroad is particularly complex. Given the importance of the temporary movement of persons to build relations, and develop and implement projects, the cumbersome and restrictive visa regime discourages their travel to and from Pakistan for business purposes. Furthermore, in addition to these visa regimes, there is a security risk perception that works against Pakistan, making foreigners reluctant to travel to Pakistan, thereby making it difficult for Pakistani companies to attract business from abroad (Couto and Fernandez-Stark 2019). Visa restriction is the single most crucial item identified by Pakistani exporters that report this factor as an obstacle, as shown in **Figures 16**. To tackle this limitation one option for Pakistan is to pursue a multi-prong approach which could combine bilateral arrangements as well negotiations of deep trade agreements which can include provisions to facilitate the temporary movement of businesspersons (Mattoo and Carzaniga 2003; Saez 2013).

**Other severe obstacles in the export market reported by firms are compliance costs, other regulatory requirements of a general nature, and required investment costs that should be made in the export market (see section below).** Regulatory predictability, timeframes, and applicability of regulations in foreign destinations are less of a problem for Pakistani exporters. For exporting IT services firms, senior management dedicate less than 20 percent of their time on compliance with rules and regulations in Pakistan (i.e., more than 50 percent of their respondents), which in fact, on average, represents 20 percent cost burden when expressed as part of their sales.

### III. PAKISTAN’S ENABLING ENVIRONMENT FOR DIGITAL TRADE AND INVESTMENT

**Infrastructure and skills constrain the supply capacity of the digital trade sector.** Although reducing restrictive policies is an important factor in helping Pakistan to increase its digital trade performance, only so much can be done if the enabling environment is subpar. For instance, digital infrastructure is an important factor in creating a thriving and predictable digital trade environment. In that regard, Pakistan’s electricity performance is still lagging in many respects (and digital trade performance and technology is highly dependent on digital infrastructure). The World Bank’s Enterprise Surveys report that around 75 percent of firms identify electricity as a major constraint and that 81 percent of firms experience electrical outages. Moreover, firms report that the average losses due to electrical outages as a percentage of annual sales are around 34 percent. Sixty-one percent of IT firms surveyed identify electricity as a major obstacle to growth.

#### A- HUMAN CAPITAL AND SKILLS ENDOWMENTS

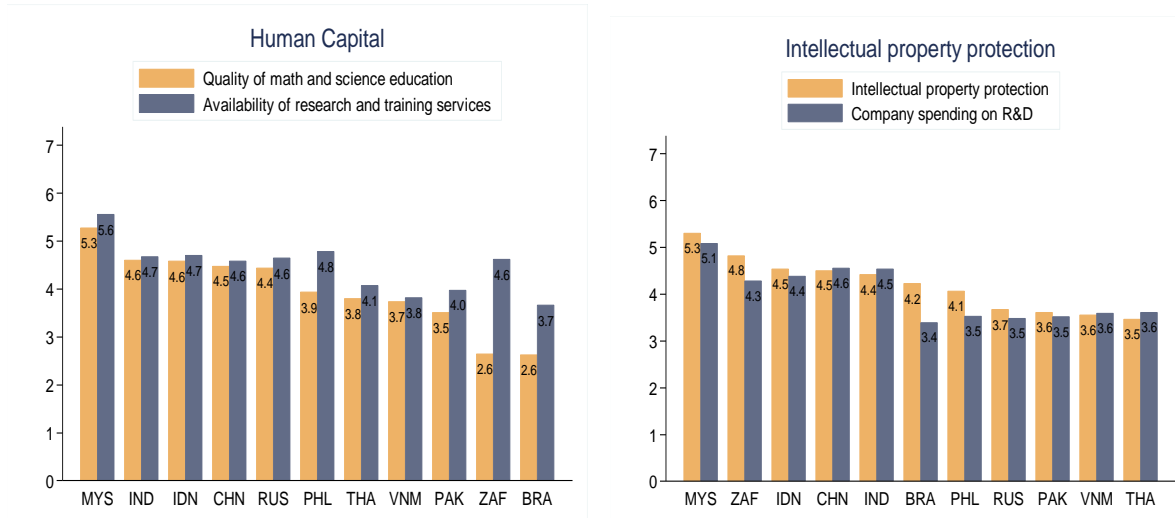
**Improved human capital and intellectual property protection is needed for technology innovations which can help Pakistan in developing novel digital goods and services.** Currently, Pakistan has one of the lowest scores when it comes to quality in mathematics and science education compared to peer countries in **Figure 14** (left-hand panel). Quantitative and science skills are an essential factor in developing and integrating technologies. Although Pakistan is not the worst regarding its general educational attainment, there is a lot to be desired in improving quality of education in science and mathematics, and availability of research and training services.

**Besides human capital, the protection of intellectual property is another element on which Pakistan can make improvements.** On this item, too, the country’s score is relatively low compared to peers (right-hand panel). The low achievement of these enabling factors for Pakistan is strongly correlated with the extent companies spend on R&D, and which most likely explains Pakistan’s lower-than-its-potential position regarding the introduction of new services and goods and, in turn, digital trade. Also, IT firms have identified human capital and IPR as significant obstacles for future growth. For 64 percent of non-exporters and 66 percent of exporter firms this is a major obstacle. For example, among the issues mentioned by firms are long delays in processing requests, implementation/enforcement, and trust/capacity of agencies responsible for management of IPRs (see **Box 1** for examples of the main issues raised during focus group interviews, and **Table 9** below). Looking forward, for both data protection issues and strong IPR protection, management will be critical for the growth and development of digital trade.<sup>56</sup>

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<sup>56</sup> WIPO (2019) compiles compared indicators which illustrate capacity constraints in managing IPRs. For instance, Pakistan has 9 patent examiners, in contrast New Zealand has 46. In the case of trademarks, these figures are 6 and 36 examiners, respectively. In 2018, New Zealand granted 1,740 patents compared with 265 in Pakistan, on average the overall process takes in total 20.6 and 54 months, respectively, including both first office and final office actions.

**Figure 14. Endowment Factors for Digital Trade (2017)**



Source: author's calculations; WEF

**The quality and employability of graduates are not up to the mark.<sup>57</sup>** In general, across industries, employers are dissatisfied with the skills and quality of fresh graduates in Pakistan (Naqeebz Consulting 2018). According to the Government of Pakistan (2014), 23 percent of the surveyed firms reported inadequate quality of graduates as a challenge for industry growth. While graduates from top universities, such as Lahore University of Management Sciences (LUMS), National University of Sciences and Technology (NUST), which are about 1,000 each year, are categorized as 100 percent employable by the industry, the story is different for the lower-ranked institutes. High value-added product development firms find only 10 percent of the graduates from lower-tier universities employable, while it is 50 percent for lower-end software services firms (Couto and Fernandez-Stark 2019). Lack of contemporary programming skills and weak English are identified as major drawbacks, stemming from lack of qualified teachers and modern curriculum at all levels of education (Couto and Fernandez-Stark 2019; SBP 2018; Ignite 2014).

**There are significant differences among exporter and non-exporter firms.** Among exporters, 74 percent of respondents consider shortage of skilled employees in Pakistan as an obstacle to their businesses. Also, among non-exporters, 63 percent consider that skills shortage is an obstacle to their business, and among them 48 percent think it is a severe obstacle (scale 4 and 5 of the responses). Also, among non-exporters there are no significant differences among size of firms (large 62, medium 68, and small 62 percent, respectively). Finally, regarding the differences among cities, firms located in Quetta and Peshawar have the highest percentage of respondents that consider skills shortage as an obstacle, 77 and 75 percent, respectively. (With Karachi and Lahore a significant 59 and 66 percent, respectively.)

<sup>57</sup> According to representatives from the private sector, employable graduates are around 25 percent of the total while the rest require training, additional skills, and certifications.

### **Box 1. ICT Enabling Environment**

During roundtable meetings with services exporters, one group conducted an in-depth interview on the factors inhibiting exports with respect to the enabling environment. Examples of factors as part of the enabling environment are the institutional quality of governments, skilled labor force, or the level of corruption.

The roundtable in Islamabad showed that there is some concern over the extent of seamless data flow in Pakistan, i.e., the stability of data latency. However, this issue is not relevant for most companies as they do not rely on high volumes of data, but for some, such as gaming or cloud computing, it is pertinent. Otherwise, broadband coverage and speed were assessed as good. A further issue raised was the lack of a good workspace. In Lahore, the roundtable showed a concern that the tax authorities provide little transparency as to what rights and obligations there are for firms. More generally, there was frustration about how much bureaucracy one needs to go through before doing business. Moreover, public procurement rules work against new innovative firms: only firms older than 10 years are eligible to bid. In the case of innovative younger firms, bidding firms collaborate but often appropriate their innovative technologies. This could be prevented by setting stronger rules.

On a broader scale, the underlying problem in Pakistan is that intellectual property is not protected enough. Examples of the private sector concerns include: a) while there are laws protecting IPRs implementation and enforcement remain a problem; b) from a user point of view, there is lack of information on the procedures and trust in the system that is responsible for protecting IPRs. Registration procedures are long and non-transparent, for instance, trademarks and copyrights; and c) protection of undisclosed information (trade secrets). In this case, the problem deals with difficulties of protecting against unfair competition, for example, from employees who move to new jobs, and misused commercial information, data, and proprietary information.

In Karachi, the discussion revealed that, first, skills are a problem (see below), then the availability of workspace and the general ease of doing business, and then as a fourth factor, the international payment issues (also see below). Further concerns arose with respect to Pakistan's image abroad. Much work can be done by the government to improve a foreign importer's view on the country, which often prevents them from doing business straight away. Firms in Pakistan should also be more encouraged to adopt technologies, even though they may be foreign.

Several enabling-related factors came out as consistent concerns for exporters across the three cities, including the weakness of the Ministry of Trade to understand the IT sector. Bureaucrats have no proper knowledge of the functioning of digital services firms and their trade. It's unclear how they're taxed, and there is confusion about whether firms in the IT sector belong in the category as telecom companies or as IT services exporters.

Although the skill sets among workers in Pakistan are relatively good, universities would have to make more efforts to prepare students for a job in the IT sector. Not all skills, in particular, the more complex IT skills, match with the needs of digital services firms. Other skills, such as web development, are easier to find. However, given the general level of education, this should not be a major challenge.

The international payment system in Pakistan also raises concerns. Firms have difficulties opening a US\$ account to pay firms or trading partners, who often obligate them to pay in US\$. Besides, cross-border payments are slow and take weeks to send and receive money.

A final issue that was raised is that some exporters, who depend on social media for finding clients abroad, face difficulty in exporting. The Government of Pakistan can shut down social media platforms by blocking content access, which then prevents small exporters doing business.

**Source: Focus group interviews, World Bank Staff.**



## **B- INFRASTRUCTURE AND INPUTS: AVAILABILITY, QUALITY, AND AFFORDABILITY**

**Although the basic infrastructure is available, it needs to improve for the IT sector to reach the next level.** There is a shortage of IT-ready office space in major cities such as Lahore and Islamabad, and insufficient coworking spaces for small companies and freelancers.<sup>58</sup> Although there has been an improvement in the availability of bandwidth, the internet speed of fixed broadband (download speed of 9 Mbps as of October 2019) is the lowest in South Asia (Table A1). In addition, the cost of the internet (monthly broadband subscription) is the highest of South Asian countries (Table A1). The technology parks do not address all the requirements of offshore services companies and are not affordable to small companies.<sup>59</sup> The reliability of power supply is an issue for firms across different sectors (World Bank 2019). Online payment infrastructure is inadequate; around 34.7 percent of firms cite poorly working online payment systems as one of the top three challenges in conducting e-commerce business in Pakistan.<sup>60</sup> The absence of internationally recognized payment gateways, such as PayPal, hampers cross-border payments, creating an additional burden for freelancers as well as entrepreneurs (Couto and Fernandez-Stark 2019).

**The survey conducted among exporters shows that the two most important obstacles identified by firms are the electricity shortages in Pakistan and the general IT-related infrastructure.** The latter includes the country's telecom network market as well as ICT goods that are necessary for producing and exporting IT services. These two factors, in addition to various others, are related to Pakistan's enabling environment. The next two most significant obstacles that firms face in Pakistan are regulatory in nature (see discussion above). These are insufficient IPR protection in Pakistan and the entry of foreign competitors in export markets. The former is something that Pakistan policymakers can change in the short-term domestically. In contrast, a change in the latter would also depend on policymakers in the export markets. Interestingly, other obstacles that could potentially be alleviated with the help of regulatory policies are of a more general nature. Obstacles such as exchange rate fluctuations and information on foreign markets (which forms a critical fixed cost factor for firms to export), as well as access to finance, are not necessarily IT-industry-specific factors. In fact, these are long-standing items that are often mentioned in any survey as a constraint for firms to do business. Finally, other factors mentioned as obstacles to exporting IT services in Pakistan are the lack of affordable workspaces in the country, changing demand patterns, and rising wages. Interestingly, rising wages form a more significant obstacle for the IT sector than shortages of skilled employees in Pakistan.

**Services exports depend on the availability, quality, and affordability of other services.** Services inputs include professional services, utilities, such as electricity, and IT-related infrastructures, such as telecom services and network. **Table 6** summarizes the survey result by showing the share of exporters that assess the particular service in question as poor, in terms of its availability, quality, and affordability. The survey shows that exporting firms suffer from the poor quality of utilities and professional services such as accountants, lawyers, and consultants. For 23 percent of firms in Pakistan, the availability of professional services is considered to be poor. In comparison, 32 and 31 percent of the firms identify the quality and affordability of professional services, respectively, as poor. Interestingly, IT-related infrastructure is more an availability and quality issue rather than an affordability issue. The sheer lack of these IT-infrastructure services, including telecom network services, is evaluated by exporters as problematic.

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<sup>58</sup> Couto and Fernandez-Stark (2019).

<sup>59</sup> Couto and Fernandez-Stark (2019).

<sup>60</sup> Survey results in World Bank – Nextrade, E-Commerce Environment Surveys, data available from authors: [mmolinuevo@worldbank.org](mailto:mmolinuevo@worldbank.org)



**The low affordability of utility services is most likely related to the electricity shortages experienced by firms in Pakistan.** Firms need to cover these shortages by acquiring in-bought generators, which makes electricity more expensive. A relatively higher share of firms responded that the costs of these real estate services are too high compared to their quality. But there are significant differences among provinces as well as among IT firms, as illustrated in **Table 6**. IT infrastructure-related obstacles vary among provinces. For firms located in Lahore, Peshawar, Quetta, and other cities, the availability of IT-related infrastructure is a much more severe obstacle than in Karachi and Rawalpindi. At the same time, quality issues are more severe in Quetta. Affordability related matters, on the other hand, are relatively similar across provinces. Finally, the importance of these obstacles does not significantly differ depending on the size of firms.

**Office/working spaces affordability is a comparatively severe problem.** Among the firms that identify office/working space as poor, affordability is a more significant constraint. Again, there are significant differences across provinces, with Lahore and Rawalpindi/Islamabad identified as having the most severe affordability problems. At the same time, firms located in Quetta consider availability and quality as the main problems. Finally, large firms identify quality and affordability as the most significant problems. **Table 6** shows that among the firms that identified poor utilities as a significant constraint, there are relatively minor differences at the provincial level, except for Quetta and Peshawar. In the case of Lahore, both quality and affordability are relatively more severe problems compared to other major cities. For large firms, availability, quality, and affordability are relatively more important problems than for small and medium-sized firms.

**The quality and affordability of professional services matter relatively more for small and medium-sized firms.** **Table 6** shows that the availability of professional services is perceived as a relatively similar issue for firms, regardless of their size. But for small and medium firms, access to and affordability of professional services, as well as quality-related matters, are relatively more relevant issues compared with large firms. **Table 6** also shows that quality is an important problem for firms operating in Lahore and Rawalpindi/Islamabad. At the same time, the availability of professionals is a significant issue for firms in Quetta and Peshawar.

**Table 6. Infrastructure and Inputs Services**

City	Technology Infrastructure			Office Space			Utilities			Professional Services		
	Availability	Quality	Affordability	Availability	Quality	Affordability	Availability	Quality	Affordability	Availability	Quality	Affordability
Exporters	36.1	37.3	28.3	28.1	27.5	36.1	25.7	30.9	32.0	23.0	31.6	30.1
Karachi	29.5	31.6	28.0	22.8	24.9	33.7	23.3	29.0	30.1	17.1	24.9	30.1
Lahore	39.4	40.9	29.1	29.9	31.5	41.7	25.2	33.9	36.2	23.6	37.8	26.8
Rawalpindi/Islamabad	34.4	40.6	28.9	36.7	26.6	40.6	28.9	28.1	28.1	22.7	35.9	32.8
Peshawar	50.0	37.5	18.8	12.5	25.0	25.0	6.3	12.5	6.3	43.8	25.0	31.3
Quetta	47.1	52.9	29.4	41.2	41.2	35.3	52.9	58.8	47.1	47.1	29.4	35.3
Others (Please specify):	49.1	35.8	28.3	22.6	26.4	24.5	24.5	34.0	41.5	30.2	34.0	30.2
Firm Size												
Small or Single	34.8	36.9	25.2	29.4	24.5	34.8	23.8	28.0	31.6	23.8	33.3	31.2
Medium	37.2	38.1	30.1	29.2	27.4	35.4	23.9	29.2	27.4	22.1	35.4	31.0
Large	38.1	37.4	33.1	24.5	33.8	39.6	30.9	38.1	36.7	22.3	25.2	27.3

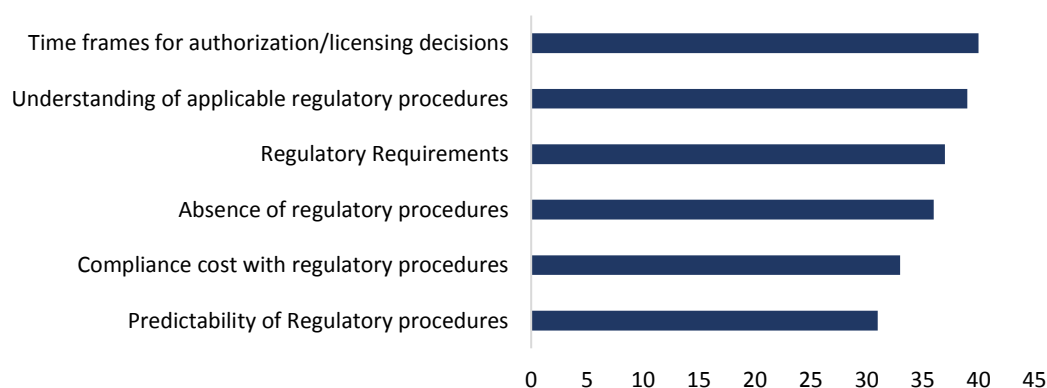
Source: World Bank IT Firm's Survey, 2019

Notes: On a scale of 1 -5, where 1 means "poor" and 5 means "excellent", the answers plotted corresponds to options 1 and 2.

## C- REGULATORY GOVERNANCE AND IT AND ITES FIRMS

**Surveyed firms identified domestic regulatory issues as important constraints to growth.** Regarding the overall regulatory environment, **Figure 15** reports that the obstacles for the current operation of Pakistan’s IT services firms are mainly related to regulatory timeframes and transparency of regulatory rules and requirements, which typically relate to an institutional issue of regulators. Regulatory compliance was also identified by firms as an important constraint. **Table 7** reports the perception of firms regarding compliance-related matters (**Box 2** provides some examples from private sector focus group interviews). Forty percent of non-exporting firms identified understanding regulations and timeframes for decisions as significant constraints, while 37 percent considered regulatory requirements themselves as a significant problem. There are important differences among firms depending on their location. Senior management seems to spend more time dealing with regulatory compliance (33 percent) in Pakistan and it takes up more than 20 percent of their time (about 56 percent of respondents). In terms of costs, compliance represents about 24 percent of total sales for non-exporting firms, which is higher than for exporters. In the case of firms in Peshawar, this percentage reaches about 75, while for Islamabad and Lahore it is 60 and 66 percent, respectively. For medium-sized firms, 64 percent estimate that between 1 and 40 percent of total senior management's time was spent on dealing with regulatory compliance.

**Figure 15. Share of Domestic Firms’ Responses to Selected Obstacles as a Constraint in Pakistan**



Source: World Bank IT Firm Survey, 2019

## **Box 2. Regulatory Environment and Governance: Some Examples**

During focus group interviews performed in Islamabad, Lahore, and Karachi, IT firms provided examples of the constraints and regulatory issues that they confront. Firms confront several challenges in terms of the regulatory environment. Those challenges span a significant number of different topics.

- i. For licenses, the private sector must register with PSEB, SECP, FBR, and SBP. While the registration processes have improved significantly in recent years (online registration has been introduced), the private sector considers that the licensing process is still difficult, and licenses need to be renewed often. The renewal processes are unnecessarily long and require similar documents as for obtaining a de novo license. Firms need to work with lawyers and auditors for this, which increases their operating costs. The timeframes of decision making are very long. A single licensing could facilitate these processes significantly.
- ii. Tax laws are identified by the private sector as one of the most challenging areas. Particularly in the case of export activities, firms confront a large number of difficulties since there is no clarity regarding applicable laws and regulations. For example, it is difficult for taxation authorities to understand IT/ITeS activities and how to interpret tax laws and regulations in the technology environment.
- iii. Foreign exchange regulations are burdensome and complicated. Rules are designed more for the physical world instead of the new business models, which have been created by technological development. Some examples provided during the interviews included:
  - i- Need to facilitate and simplify international transactions according to business need;
  - ii- Entities like PayPal currently do not operate in Pakistan;
  - iii- It takes 6-7 days for international payments to be processed;
  - iv- Intensive paperwork - in many cases hard copies are required to make international payments, and banks are not allowed to hold 35 percent of their bank reserves in foreign currency as per the law.
- iv. Certification procedures are cumbersome. Due to security considerations, the certification of equipment that is required for the operation of the IT/ITeS firms is complex and obsolete. Sometimes decisions are not made for lack of understanding, and business opportunities are lost.
- v. The absence of a regulatory framework is also limiting the growth and development of the industry. For example, the lack of regulations in blockchain is limiting the adoption and potential development of this technology in Pakistan.

**Source: Focus group meeting, World Bank staff.**

**Table 8** provides additional information on the importance of regulatory obstacles according to location and firms' size for exporters in the destination markets. The data provide that, for large firms, regulatory obstacles are relatively more important than for medium and small firms. This can be explained by the fact that larger firms are the biggest exporters and are therefore likely to face these restrictions more than smaller firms. In terms of location, firms in Karachi perceive regulatory obstacles, across all the dimensions examined, as relatively more important than firms in other cities, except in Quetta. In general, compliance costs are perceived as the most onerous regulatory obstacles together with regulatory requirements.

**Table 7. Regulatory Obstacles for Non-exporting Firms**

	Time spent on compliance b)	Understanding of applicable regulatory procedures	Timeframes for authorization / licensing decision	Regulatory requirements	Absence of regulatory requirements	Compliance costs with regulatory requirements a)	Predictability of the regulatory procedures	Percentage of sales spent on compliance (mean) c)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Non-Exporters</b>	<b>56</b>	<b>40</b>	<b>40</b>	<b>37</b>	<b>36</b>	<b>33</b>	<b>31</b>	<b>24</b>
Karachi	54	43	34	34	32	29	26	21
Lahore	66	30	39	34	32	30	30	22
Rawalpindi/Islamabad	60	28	32	16	44	24	16	22
Peshawar	75	25	42	50	25	33	50	28
Quetta	33	70	70	60	60	63	63	29
Others (Please specify):	72	22	33	44	28	33	28	30
Small or Single	55	42	40	40	39	33	34	22
Medium	64	39	34	32	32	32	30	25
Large	54	36	42	34	30	36	26	26

Source: World Bank IT Firm Survey, 2019. Notes: a) Corresponds to senior management's time spent on compliance (less than 40%); b) Corresponds to the percentage of firms that estimates that between a 1 to 40 percent of total senior management's time was spent on dealing with compliance regulations in Pakistan, in the last six months; and c) corresponds to the percentage of sales spend on dealing with compliance with regulations in Pakistan in the last 6 months.

**Figure 16. Share of Exporting Firms Responding to Selected Obstacles as a Constraint in the Export Markets**



Source: World Bank IT Firm Survey, 2019

**For firms focusing on the domestic market in Pakistan (i.e., non-exporting firms), the most significant business obstacles are somewhat different and mostly relate to the domestic enabling environment.** Shortages of electricity are a problem in Pakistan for its IT services firms, but so is economic uncertainty, in addition to corruption.<sup>61</sup> Only after those issues does the broader IT-related infrastructure in Pakistan become an obstacle for domestic firms. In the previous discussion, this latter point was the most important factor for exporters to stay competitive. Given that domestic firms are less competitive in the first place (because they are not as productive to be able to export), they see domestic institutions and utilities as bigger problems than insufficient IPR protection, entry of foreign competitors in foreign markets, or affordable workspaces. Regarding the services inputs that are assessed as poor, it is mainly the affordability of utilities and working space that forms a problem, which is similar in the case of exporting firms. Quality that is assessed as poor is particularly an issue concerning utilities (including its availability) and technology infrastructure.

**Table 8. Regulatory Obstacles in Export Markets**

	Regulatory requirements	Absence of regulatory requirements	Understanding of applicable regulatory procedures	Predictability of the regulatory procedures	Timeframes for authorization/licensing decision	Compliance costs with regulatory requirements
Exporters	39	25	30	30	32	42
Karachi	44	25	34	34	37	47
Lahore	35	27	28	28	29	38
Rawalpindi/ Islamabad	36	24	22	23	31	39
Peshawar	25	6	50	44	19	31
Quetta	59	47	53	53	53	71
Others (Please specify):	38	23	26	25	25	36
Small or Single	37	24	28	30	33	39
Medium	35	27	29	26	33	47
Large	47	27	34	33	32	45

Source: World Bank IT Firm Survey, 2019

**Table 9 shows the importance of the obstacles to growth for non-exporting IT firms.** The importance of IPRs protection for firms located in Peshawar and Islamabad is particularly important, and remains essential for firms in Karachi and Lahore. IPRs protection is important for all firms regardless of size. While IT infrastructure and electricity are important for firms, there are significant differences in firms' perceptions depending on their locations. For 93 percent of firms in Quetta and 64 percent of firms in Karachi, electricity infrastructure is considered an important obstacle to their operation. In comparison, in Lahore, for 33 percent of firms, electricity is an obstacle. In the case of small firms, 66 percent consider electricity-related problems an important problem. Still, for 55 percent of medium and 50 percent of large firms, it is also perceived as an obstacle. In the case of IT infrastructure, for more than 70 percent of firms in Quetta and Islamabad, this issue is considered to be an important obstacle to their business. In comparison, in Karachi and Lahore, 54 and 39 percent of firms, respectively, identify IT infrastructure as an obstacle. For 59 percent of small firms, IT infrastructure is considered an important obstacle, while less than 50 percent of medium and large firms perceive this as an important obstacle.

<sup>61</sup> Interestingly, for IT exporters, economic uncertainty in Pakistan seems to be a much less significant obstacle to their business.

**Table 9. Obstacles to IT and ITeS Firms**

	IPRs protection	Economic uncertainty	Electricity shortage/problems	Exchange rate fluctuations	IT infrastructure	Access to finance	Entry of foreign competitors	Regulatory requirements	Rising wages	Skills	Labor market regulations	Affordable work spaces	Changing demand patterns
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<b>Non-Exporters</b>	<b>64</b>	<b>63</b>	<b>61</b>	<b>59</b>	<b>55</b>	<b>52</b>	<b>51</b>	<b>50</b>	<b>50</b>	<b>48</b>	<b>48</b>	<b>47</b>	<b>40</b>
Karachi	54	55	64	59	52	50	50	41	51	39	41	42	34
Lahore	57	68	33	72	39	50	48	64	35	31	35	54	50
Rawalpindi/Islamabad	83	75	50	57	71	58	54	57	10	67	82	59	38
Peshawar	100	40	43	50	40	86	57	83	57	56	33	29	0
Quetta	84	80	93	50	73	57	42	63	73	74	64	44	59
Others (Please specify):	55	79	64	50	53	33	70	33	57	70	40	67	33
Small or Single	65	70	66	60	59	55	61	52	57	54	59	49	46
Medium	61	53	55	57	45	43	26	34	43	30	18	30	18
Large	63	51	50	56	48	52	38	59	35	48	33	59	38

**Source: World Bank IT Firm Survey, 2019**

Note: On a scale of 1 to 5, where 1 means not an obstacle/issue and 5 means a severe obstacle/issue, can you rate based on how it affects your revenue. Answers included correspond to the share of firms which consider these obstacles as severe (4 and 5).

**Regulatory requirements, rising wages, skills availability, and labor market regulations are also identified as important obstacles by non-exporting IT firms.** For small firms, these are perceived as relatively significant obstacles compared to medium and large firms, except for the case of regulatory requirements, where 59 percent of large firms considered them to be significant obstacles. In terms of location, 83 percent of firms in Peshawar perceive regulatory requirements as important obstacles, while it is 64 percent in Lahore, 63 percent in Quetta and 41 percent in Karachi. Rising wages, skills availability, and labor regulations affect a relatively large percentage of firms in Quetta and Peshawar, compared to other cities, except Islamabad, where 82 percent identify labor regulations as an important obstacle. Finally, for 47 percent of firms, workspace affordability is considered an obstacle, and this is in general the case for all cities, except Peshawar. For large and small firms, this remains an important limitation as well.

**Table 10. Input Services and IT and ITeS**

	Professional Services			Technology Infrastructure			Utilities			Office Space		
	Availability	Quality	Affordability	Availability	Quality	Affordability	Availability	Quality	Affordability	Availability	Quality	Affordability
Non-Exporters	17	27	31	27	29	24	29	34	35	20	19	33
Karachi	14	21	29	24	26	22	29	35	32	17	19	29
Lahore	16	30	39	30	32	23	30	25	48	14	9	32
Rawalpindi/Islamabad	24	36	36	20	32	24	36	36	40	36	28	56
Peshawar	25	33	25	25	25	25	17	33	17	8	17	25
Quetta	17	33	27	43	43	33	40	40	40	27	30	40
Others (Please specify):	17	28	33	33	17	28	11	33	22	33	17	28
Small or Single	19	26	30	27	29	23	29	37	35	19	23	34
Medium	11	23	32	25	27	30	30	20	34	20	11	27
Large	12	32	36	30	30	22	30	36	36	22	16	36

Source: World Bank IT Firm Survey, 2019

**Domestic competitiveness and productivity depend on availability, quality, and affordability of other services required to produce services.** Services inputs include professional services, utilities, such as electricity, and IT-related infrastructures, such as telecom services and network. **Table 10** summarizes the information regarding input services that support non-exporting IT and IT-enabled services. For 17 percent of firms in Pakistan, the availability of professional services is poor, but 27 and 31 percent of the firms identify quality and affordability of professional services as poor. A higher percentage of firms in Lahore and Islamabad identify the quality and affordability of professional services as poor, in contrast with Karachi, where these percentages are lower. More than 30 percent of large firms find that both quality and affordability are poor. For more than a quarter of the non-exporting firms, technology infrastructure is considered to be poor in terms of availability (27 percent), quality (29 percent), and affordability (24 percent). All three aspects of technology infrastructure appear to be major problems for non-exporting firms in Quetta relative to the other cities in Pakistan. The results by firm size provide relatively similar results. Similarly, the quality and affordability of utilities are considered poor by more than a third of non-exporting firms. A larger percentage of firms in Islamabad, Lahore, and Quetta considered the affordability of utilities



as poor compared to other areas, while more than one third of firms, across all sizes, consider affordability of utilities as an issue. Finally, for more than a third of small and large firms, affordability of office space is an issue of concern.

## D- POLICIES TO FOSTER EXPORTS

**IT and IT-enabled service exports have become one of the most successful international activities in recent years.** India's success has been extensively documented, but India is not the only success story among developing countries. Firms in the Philippines and Costa Rica, as well as in Pakistan, are actively participating in the new opportunities opened by new information and communication. The survey explores the reasons why IT firms in Pakistan are not yet engaging in international operations, despite the available opportunities and the success stories in the country. Opinions and views from the private sector are summarized in **Box 3**.

**Table 11 shows that 37 percent of the non-exporting firms prefer to focus on the domestic market.** In the case of non-exporters in Islamabad, about 80 percent prefer to concentrate on the domestic market. Small, medium, and large firms have a relatively similar preference for the domestic market. Among the non-exporters, 35 percent consider they do not have any exportable services as a reason for not engaging in international business. Among non-exporters in Karachi, 41 percent believe that their services are not exportable. Surprisingly, 48 percent of large non-exporters consider that they do not have exportable services. Payment-related concerns explain why many firms do not export; 33 percent of firms are concerned that they may have payment-related issues if they engaged in international business. This concern is more dominant in small firms than medium and large firms. Firms in Lahore have the greatest concerns regarding payments.

**Table 11. Non-exporters: Main Constraints to Exporting Services**

	Lack Exportable Services	Information Constraints	Payment Concerns	Regulatory barriers/ complexity	Export finance to clients	Preference on domestic sales	Concerns protection of IPRs	Export is costly	Visas and work permit	Concerns requirement partnerships with local businesses
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Non-Exporters</b>	<b>35</b>	<b>30</b>	<b>33</b>	<b>30</b>	<b>24</b>	<b>37</b>	<b>18</b>	<b>25</b>	<b>26</b>	<b>20</b>
Karachi	41	31	23	28	18	25	15	21	20	17
Lahore	23	41	48	39	36	39	32	30	36	36
Rawalpindi /Islamabad	20	20	20	4	4	80	12	8	16	20
Peshawar	33	42	50	50	50	50	33	42	50	25
Quetta	57	17	30	30	27	27	13	33	23	13
Others (Please specify):	11	28	72	44	33	56	11	33	44	11
Small or Single	32	31	40	30	24	38	20	21	28	23
Medium	32	27	18	30	16	32	11	34	25	18
Large	48	30	22	30	30	36	18	28	22	14

Source: World Bank IT Firm Survey, 2019

### **Box 3. What are the challenges that limit ICT exports?**

Problems were identified regarding capacity, scale, information constraints, and regulations as some of the causes for difficulties in exporting services by IT organizations.

The participants initiated the discussion by talking about the presence of IT firms in the domestic market. Firstly, there is a sense of comfort to stay in the more familiar domestic market. Doing business outside Pakistan is very expensive since the rupee to dollar conversion rate is fluctuating, which might lead to loss and bankruptcy for smaller firms in some cases. However, the quality and produce of technology in Pakistan are lacking. Specific supply concerns identified relate to both problems with engineers and issues with managers. Also, formal education is lackluster, and certifications are not available at affordable prices. There is a difference between certifications for individuals vs. certifications for organizations and there is a lack of the latter at the national level. It was also noted that there is an adverse impact of the low business volume in Pakistan. The country's IT sector seems to be suffering from a cyclical problem: to increase capacity, organizations need the volume of projects; however, service delivery is lackluster in these projects owing to supply-side problems. There is a general fear regarding how a firm's expansion might hamper the business (lack of awareness and information hinders them as well). The government should play an active role in providing a platform to exhibit the IT industry to the world so that they can gain more business. The government has the PSEB to support IT firms, but firms need to register to export, and there is no proper guidance on how to start.

Foreign exchange regulations are an important constraint. Banks have concerns that receiving transactions from abroad through a third-party bank ends up taking months to process in some cases. Banks do not work on B2B platforms, instead they use P2P; it is all about having that contact who helps get your payments through smoothly.

Firms believe that social media is important for future business development. The government chooses to restrict it, rather than explore it to understand the potential it holds. For example, YouTube was banned for a period of time, and thus Pakistani YouTubers are not doing as well as others around the world, especially due to a lack of experience and exposure. This is a potential market that needs to be tapped into. For the advancement of social media use, there is a sense of fear among social media users in expanding to export and they are unsure about proceeding in the future.

When talking about exporting, physical exports have many complex custom rules and logistics. Yet, in the case of electronic exports, there is a lack of research. There is a need to understand the local dynamics of the destination country. Products exported fail because people do not research and develop their products according to the standards of the specific company. Standards in Pakistan do not translate abroad, an aspect many IT firms choose to ignore, and, eventually, their product seems to fail. The government needs to create an avenue through which IT firms can be more aware of exporting standards.

In Pakistan, there is also a hindrance due to cultural norms. The older generation is not willing to change their ways since they believe that the idea that worked for them is the best way to move ahead, and they do not need to explore other avenues to grow further.

A firm rarely chooses to get patents in Pakistan since the courts are not very cooperative. Instead, people prefer to get them either from Singapore or the USA (global patents). Another critical issue was the one around visas, and how firms need to travel to countries to be able to network with foreign firms. They are required to place representatives in these specific regions, hence they require visas. Pakistanis have approximately 17 countries where they can obtain visas on arrival. In contrast, India has 70-plus, hence the reason for the IT industry flourishing in India at a faster rate than in Pakistan.

Freelancers were also an important topic of discussion. It was noted that freelancers made up almost half of the total IT sector in Pakistan. However, they suffered greatly due to regulatory problems. One of the primary problems identified was the difficulty in sending money out of Pakistan due to remittance taxes.

**Source: Focus group interviews, World Bank staff**

### **State agencies should increase their efforts to provide information on market opportunities abroad.**

Access to information regarding opportunities for exporting, as well as regulatory barriers and complexity of regulations, are two critical explanations for not engaging in export activities, for 30 percent of firms identify these as important reasons for not exporting. Firms located in Lahore, as well as in Peshawar, state high regulatory concerns as reasons for not exporting, while there does not seem to be significant differences among small, medium, and large firms. For almost a quarter of the firms, export finance for clients and the costs of exporting are identified as the reason for not engaging in export activities. Again, this is an important issue for firms in Lahore and Peshawar. Costs for exporting are relatively more important for medium firms compared to small and large firms, while export financing for clients is more important for large firms. Private sector interviewees noted that it was difficult for smaller companies to connect with clients and that companies have no access to information on their needs and requirements. Furthermore, while it is costly to reach out to clients through a representative office, firms consider it necessary to have front offices in the destination countries.

**Internationalization has received the support of the government, but more can be done.** The Pakistan Service Exports Board (PSEB) is the government agency under the Ministry of IT and Telecom responsible for the promotion of the IT industry of Pakistan both locally and globally. The PSEB provides several important services to firms to help them tap into global markets. For example, PSEB membership helps them interact with other agencies and firms. The PSEB site facilitates the process of getting a small company registered and shares information about domestic and international events in which firms could participate. PSEB is also responsible for the registration of IT and BPO firms, which is compulsory for firms to benefit from current and future fiscal and non-fiscal incentives, as well as to allow in and out transfers.<sup>62</sup> And yet, among the exporting firms surveyed, 56 percent are members of PSEB, only 25 percent are members of a chamber of commerce and industry, and only 21 percent are members of PASHA. Membership of non-exporter firms in these entities is much lower. Also, the role of PSEB remains limited and should be significantly strengthened. Private sector representatives interviewed, while valuing PSEB's role, consider that it does not actively promote the industry abroad, limiting its role to sharing information. According to Couto and Fernandez-Stark (2019), PSEB has failed to implement adequate marketing strategies and local support industry mechanisms and needs to articulate and execute initiatives to attract FDI and export promotion. Promotion policies should also be closely coordinated and monitored in collaboration with the Trade Development Authority of Pakistan as well as the private sector.

## **IV- POLICY RECOMMENDATIONS**

**Pakistan's exports of digital goods and services are growing fast and can potentially transform the knowledge content of its export basket.** Important policy decisions are necessary, and the digital trade policy framework needs to be right. Digital trade makes available digital technologies that help to exploit niche markets for new digital exports and to allow for more competition to improve resource allocation. In the current context of the outbreak of the Covid-19 pandemic, the importance of IT and IT-enabled services as crucial inputs to continue producing while preserving social distancing is now more evident and urgent. It is still unknown what the post-Covid-19 business landscape will look like, but IT and IT-enabled services will play an even more prominent role than they do today. This report presents evidence that backs up key recommendations – some already outlined in Pakistan@100 and other recent analytical work such as McKenna, Rocha, and Varela (2020). The ingredients for a successful reform strategy should include interventions in three policy areas: a) regulatory capabilities and governance; b) sector-specific policies; and c) complementary supporting policies.

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<sup>62</sup> Couto and Fernandez-Stark (2019).

## a- REGULATORY CAPABILITIES AND GOVERNANCE

- i. **Create new institutional capabilities and modernize regulatory arrangements.** For example, while firms' registration processes have improved significantly in recent years (e.g. online registration has been introduced), the licensing process is still difficult. Licenses are also required to be renewed regularly. Procedures for renewals are unnecessarily long and require similar documents as for obtaining a de novo license. Firms need to work with lawyers and auditors, which increases their operating costs or discourages formalization and scaling up of small and medium-size firms altogether. Freelancers face significant challenges to open bank accounts due to existing regulations and acceding foreign markets. The new business models created by the new technologies require training public officials to facilitate their understanding of how businesses are organized and operate and to modernize regulations. It will require transforming existing legal requirements for creating firms and supervising firms' operations, updating the taxation system and foreign exchange regulations, and using new technologies. The public and private sectors should jointly organize trainings, agree on course content and requirements, and issue certifications to public officials that attend. The trainings should aim to increase knowledge and understanding of new business models, discussing international management practices in the context of digital technologies, and adopting modern regulatory approaches.
- ii. **Strengthen regulatory governance.** The report finds that the main challenges in regulatory matters in Pakistan are twofold: on the one hand, there are weak proper regulatory procedures in place, regulatory requirements are difficult to understand and, in some cases, unpredictable, regulation enforcement is uneven, and subject to discretion. On the other hand, there are significant capacity gaps among agencies responsible for regulatory matters beyond the poor understanding of business models in the context of the digital economy. These problems should be addressed by a gradual adoption and effective implementation of basic internationally recognized regulatory principles, such as the OECD good regulatory practices, strengthening capacity at the agency levels, including at the provincial level.<sup>63</sup>
- iii. **Invest in data collection.** Policy decisions, incentive programs, and schemes need to be informed and monitored by data. Pakistan needs to establish a more comprehensive framework for data collection at different levels: macro and firm-level data are essential, as well as national and provincial-level data. Data should include domestic variables and precise international transactions to measure the main trends, development, and characteristics of the sector and firms. Similarly, Pakistan lacks detailed firm-level information. The recent empirical literature on trade, including the empirical trade policy research, has moved in the direction of using more and more information at the firm-level for which economic information such as productivity can be analysed. Information would not only include standard variables such as value-added, production, sales, input usage (divided over raw materials, goods, and specific services), but also exports, imports, capital stock, employment (i.e. number of workers), wages, and R&D expenses, etc. This data should be sorted by firm ID, year, location of the firm, and/or firm type. Usually, such firm-level information is based on a firm's balance sheet information, which, in many countries, firms are obliged to provide to national statistical agencies through surveys. It would be essential for Pakistan to set up a team of statisticians and economists to work on collecting such data.

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<sup>63</sup> OECD (2014).

## **b- SECTOR-SPECIFIC POLICIES**

- i. **Accelerate the adoption of digital technologies.** Digital technologies will become more relevant to support government services and policies, including during emergencies. The Covid-19 crisis has forced governments to get closer to citizens and firms while delivering solutions from a distance. Physical interactions between people and public officials have been constrained and digital solutions have been designed across the world to reach out remotely to support businesses and households that are immediately affected by policy responses and the economic slowdown. The Government of Pakistan should accelerate the implementation of e-government solutions and move to a process of automation in government-to-business interactions. While progress has been significant in recent years, for instance, connecting farmers to markets, Pakistan is still lagging on government digitalization.<sup>64</sup> Pakistan should develop policies conducive to an accelerated adoption of innovative digital solutions, in collaboration with the private sector, to improve service delivery in a post-Covid-19 policy environment.
- ii. **Lower tariffs on digital goods and reduce taxes levied on data.** High duties on imports constrain access to high-quality inputs needed in downstream IT-sectors.<sup>65</sup> Pakistan still applies duties on imports of digital products at an average of 13.7 percent, increasing production costs for all sectors in the economy – particularly in a context in which digital technologies can help the economy function to some extent while preserving social distancing. The reduction should be gradual and focus on products included in the WTO’s Information Technology Agreement. On domestic taxation, there are two related issues: a) taxation policies; and b) tax administration and practices (governance). This issue requires urgent attention from the authorities at the central and provincial levels. Pakistan will benefit from simplification and better coordination of tax authorities.
- iii. **Improve human capital related to technology innovations.** The focus should be to fill the skills gaps which are essential for the digital economy and are required by the IT and ITeS industry. First, the Higher Education Commission (HEC) in Pakistan, universities, and other stakeholders should collaborate and agree on a curricular update to tackle the country’s professional and technical needs. Second, the IT industry, on the other hand, needs to better identify and communicate the necessary learning requirements and missing skills, including soft skills. Third, a mechanism to improve the integration of lower-tier universities with industry is also required. One option to speed up the process is to facilitate and encourage hiring coders from the private sector to teach courses in universities. Finally, HEC and universities need to start recognizing credit from online courses (e.g. online coding courses from Coursera and EdX that have the necessary quality accreditation). This will allow students to accelerate upgrading their skills. In the context of the Covid-19 crisis this has become even more relevant and urgent. In the case of Pakistan, there are significant specific skills gaps among computer science engineers and professionals which need to be tackled to ensure the future growth of the sector, including: (i) inability to code in contemporary technology platforms; (ii) weak English skills; (iii) poor comprehension readiness to address foreign clients’ concerns; (iv) inadequate soft skills, namely communication and teamwork; and (v) poor knowledge of corporate culture, e.g. reporting, compliance, escalations, email etiquette, and protocols.<sup>66</sup>

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<sup>64</sup> See World Bank (2016) and UN (2018).

<sup>65</sup> See McKenna, Rocha, and Varela 2020.

<sup>66</sup> Couto and Fernandez-Stark (2018).

- iv. **Strengthen promotion activities.** While the role and contribution to the internationalization of Pakistani firms of the PSEB is recognized, the institution could be strengthened. PSEB should dedicate more effective efforts to support firms' participation in international promotion activities in close coordination with the Trade Development Authority of Pakistan, while maintaining its efforts to facilitate business activities and streamlining procedures and regulations. PSEB is perceived as a relatively weak organization which has not attained the performance expected from businesses and does not strategically use Pakistani representations abroad. PSEB should learn from and adopt good promotion practices from successful experiences including from Costa Rica, India, and the Philippines. Strengthening PSEB promotion activities will require overcoming resources constraints and mobilizing financial resources from interested private sector parties. Also, it requires adopting managerial practices according to promotion activities, establishing and implementing a strategy with clear and measurable indicators, and a monitoring and evaluation framework, and hiring staff with the required capabilities.

### c- COMPLEMENTARY SUPPORTING POLICIES

- i. **Introduce regulatory changes to personal data protection.** The objective of the regulation should, on the one hand, aim to achieve the legitimate policy objective, i.e., data and consumer protection, and on the other hand, allow data flow to promote high value-added services activities. In other words, these regulations should avoid increasing input costs for firms, ultimately affecting their productivity. This can be achieved by subscribing to general principles broadly accepted internationally, such as the OECD privacy principles guidelines, or from the Asia-Pacific Economic Cooperation (APEC) forum. Ultimately, a strong internationally recognized regulatory regime will be required to allow for constructive cooperation between Pakistan and its main trading partners to allow flow of data. This will require a delicate balance of share responsibilities from both the data source country and the destination country. Also, it will require increasing levels of convergence on privacy protection requirements set by data source countries and the protection standards offered by the destination countries.<sup>67</sup>
- ii. **Improve the intellectual property rights (IPR) framework and create trust in the system for digital companies.** Pakistan is already active primarily in information technology outsourcing (ITO) and business process outsourcing (BPO). These services account for 87 percent and 13 percent of Pakistan's total services exports, respectively. However, to sustain growth in this sector and to encourage firms to come up with innovations in the industry, intellectual property needs to be protected adequately. The private sector pointed out the importance of IPRs for their future growth. Seventy-three percent of exporting firms and 64 percent of non-exporting firms surveyed consider that insufficient IPRs in Pakistan are an obstacle for their business. To move up in the IT and digital services value chain, both IPRs and access to commercial data are critical pillars. The agenda on IPRs and privacy concerns in trade agreements will be accentuated with cross-border data flows. At the international level, IPR has long been part of the trade agenda, but data is a new factor determining digital trade. Content providers could restrict the provision of some services to countries where IPRs are inadequately protected. This can increase difficulties in generating exportable content as well as affecting access to imported content.
- iii. **Engage in trade agreements.** Restrictions on cross-border data flow through, for example, data localization requirements, are on the rise. Pakistan's entrepreneurs face a significant limitation to travel to promote their business and develop opportunities. Provisions related to IPRs and

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<sup>67</sup> Mattoo and Metzler (2018), World Bank (2016) and (2020).

consumer, privacy, and data protection have increasingly been included in last generation trade agreements, and the services trade, including through temporary movement of persons, has also been addressed. Pakistan should evaluate a strategy to engage in trade agreements to address its business interests proactively.<sup>68</sup> Regional and bilateral trade agreements are likely to be central in driving connectedness to markets in the future given the existing challenges at the multilateral level.

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<sup>68</sup> Hofmann, Osnago, and Ruta (2017).

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# ANNEX

## DEFINITIONS

**Computer and other services (WDI):** Category of services that is comprised of a broader set of services, namely communications, computer, information, and other services that cover international telecommunications; computer data; news-related service transactions between residents and non-residents; construction services; royalties and license fees; miscellaneous business, professional, and technical services; personal, cultural, and recreational services; manufacturing services on physical inputs owned by others; and maintenance and repair services and government services not included elsewhere. This category of services represents in large part the digital-enabled services, which are services that can be delivered over the internet and/or with the help of ICT and other software.

**Digital goods:** Generic term that refers to ICT goods, commodities, and inputs. In this note digital goods largely refer to goods covered by the WTO's International Technology Agreement (ITA). However, in relation to ECIPE's DTRI this definition is expanded with additional 4 and 6-digit HS codes on the basis of Lee-Makiyama (2011) expanded list of digital goods in Annex 2. They are mainly to be found in 2-digit categories 84, 85, and 90, and on some occasions from categories 38 and 70.

**Digital services:** Generic term that refers to ICT and associated services that are produced and delivered over the internet and/or with the help of ICT and other software. It mainly includes computer, telecoms, some news-related services and information, data services, and various technical services, as well as services provided over digital platforms. It usually excludes business, professional, and technical services; personal, cultural, and recreational services (unless provided over the internet), manufacturing services on physical inputs owned by others, and maintenance and repair services (unless provided over the internet) and government services not included elsewhere.

**Endowments:** A country's factor of production with which it produces goods and services in the economy, such as human capital or physical capital. Other types of endowments that have recently gained increasing attention as additional factors of production, which are marked as important for producing goods and services, are domestic institutions such as the rule of law and digital infrastructure (or digital connectivity) such as a good telecommunications network.

**ICT services (WDI):** Services such as computer and communications services (telecommunications and postal and courier services) and information services (computer data and news-related service transactions). This category of services is the pure ICT services.

**Innovation activities (WB Enterprise Surveys):** The creation of new products or processes by firms. Typically, innovation activities refer to whether firms have developed new products/services that are also new to the main market or introduced any new or significantly improved process.

**Technology adoption (WEF):** The capacity with which an economy can adapt existing technologies. Typically, technology is a broad concept that covers products and processes. Examples of the former are machinery and material; examples of the latter are process and organizations. They contribute to a conducive innovation ecosystem. In many cases, new technologies and their adoption go hand-in-hand with ICT. Generally, two sources of technology adoption are identified in the economy, namely when local firms can invest to bring in technology from abroad or from other sectors or companies, and when a country can exploit spillovers from the FDI of international companies.

**Table A1 Selected ICT indicators in South Asia**

	Bangladesh	India	Nepal	Pakistan	Sri Lanka
<b>Digital literacy and uptake</b>					
ICT development index (rank out of 176, 2017)	147	134	140	148	117
Household with internet access (% , 2017)	19.4	25.4	17	22.1	24.4
Individuals using internet (% , 2017)	15	34.5	34	15.5	34.1
Internet awareness (% of aged 15-65 population)	33	35	46	37	62
Awareness of platforms for buying/selling (% of aged 15-65 internet users)	34	62	20	48	70
E-government development index ( rank out of 193, 2018)	115	96	117	148	94
<b>Internet infrastructure</b>					
International internet bandwidth (Mbit/s, 2017)	577162	11963821	124000	672453	168285
Lit/equipped international bandwidth capacity (Mbit/sec,2017)	9781721	109581022	155000	1053827	na
Fixed broadband internet monthly subscription (US\$,2017)	4.3	6.8	2.9	7.8	3.9
Internet speed (Mbps, November 2019)	25.0	38.0	21.7	9.3	28.7
<b>Freelancing status</b>					
Ranking as supplier of freelancers	2	1	n.a.	3	14
Freelancers in software development ( % of global freelancers)	5	45.3	< 0.1	10.5	0.4
Freelancers in creative and multimedia ( % of global freelancers)	20.6	25	<0.1	11.5	2.4
Freelancers in sales and marketing support ( % of global freelancers)	12.9	40.3	0.1	6.2	0.6
<b>Industry competitiveness</b>					
AT Kearney GSLI (rank out of 50, 2019)	32	1	na	37	25
Hourly rate of software developers (US\$, 2018)	25-35	30-40	25-30	25-35	25-35
Average MFN Tariff on ICT goods import (%, 2018)	10 (2016)	3.6	3.4	5.5	1.6
<b>Industry performance</b>					
ICT services export (million US\$, 2018)	574	58248	288 (2017)	1085	995
Computer services export (million US\$, 2018)	202	55526	n.a.	775	848
<b>Startup ecosystem</b>					
Number of tech hubs	15	>250	12	35	15
Venture capital deals (rank out of 129, 2019)	73	30	n.a.	72	45

Source: International Telecommunication Union (ITU); UNDESA; Oxford Internet Institute;gsma.com;Accelerance; ATKearney;LIRNEasia;WTO;WITS(World Bank); World Intellectual Property Organization(WIPO)

Table A2. Import Duties on Digital Goods.

HS2	HS6	HS6 description	CD	RD SRO 680	ACD SRO 670
28		Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes.	5.50	5.00	2.00
38		Miscellaneous chemical products.	3.00	--	2.00
70		Glass and glassware.	2.00	--	2.00
84		Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof.	2.01	--	2.07
85		Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles.	12.46	10.00	4.05
	853650	<i>Electrical switches</i>	35.00	--	7.00
90		Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof.	11.58	--	3.42
	902920	<i>Speed indicators and tachometers</i>	35.00	--	7.00
<b>Average across all 6-digit tariff lines</b>			<b>9.72</b>	<b>0.58</b>	<b>3.37</b>

Source: Tariffs data

Note: Corresponds to simple average for a list of digital related goods. Complete list Table A3.

**Table A3. Import Duties on Digital Goods.**