Working Paper 09

Energising the Tech Investment Ecosystem in Pakistan

Centre for Digital Transformation

Aliza Amin
Hammad Haider
Ali Khizar
Umar Nadeem

October 2021

TABADLAB

Bismilla hirr Rahman irr Rahim

This version of the Working Paper is for print. It may differ from the final version published for mass consumption.

Energising the Tech Investment Ecosystem in Pakistan
Aliza Amin, Hammad Haider, Ali Khizar, Umar Nadeem
Tabadlab Working Paper 09
ISBN 978-969-7911-13-4

Available from:
Tabadlab
Mezzanine Floor, Beverly Centre, Blue Area, Islamabad, Pakistan, 44000.

Tabadlab Private Limited is an advisory and consulting services firm, and for-profit think tank.
Tel: +92 51 2726668
info@tabadlab.com

Energising the Tech Investment Ecosystem in Pakistan

Aliza Amin
Hammad Haider
Ali Khizar
Umar Nadeem

Contents

Acknowledgments

The research and consultations for this policy paper were conducted by Tabadlab, and made possible through Tabadlab's Centre for Digital Transformation. This report has greatly benefited from the insights of Amer Hashmi, Mudassar Hussain, Aamir Ibrahim, Hasaan Khawar, Kalsoom Lakhani, Asif Peer, Haroon Sharif and Irfan Wahab. Zoya Imran and Alina Khan contributed to the research and editing of the document. The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of Tabadlab Private Limited, nor any of its clients or partners.

List of Abbreviations

AML/CFT	Anti-Money-Laundering/Countering-Financing-of-Terrorism
B2B	Business to Business
CCP	Competition Commission of Pakistan
CDC	Center for Disease Control (& Prevention), US
DIRBS	Device Identification, Registration and Blocking System
EMIs	Electronic Money Institutions
FBR	Federal Board of Revenue
FCY	Foreign Currency
FDI	Foreign Direct Investment
FED	Federal Excise Duty
FIA	Federal Investigation Agency
GDP	Gross Domestic Product
GPS	Global Positioning System
HEC	Higher Education Commission
ICTs	Information and Communication Technologies
IHC	Islamabad High Court
IFIs	International Financial Institutions
ITC	International Trade Center
IPO	Initial Public Offering
IoT	Internet of Things
ITA	Information Technology Agreement
KP	Khyber Pakhtunkhwa
MDM	Mobile Device Manufacturing (Authorization/License)
MoITT	Ministry of Information Technology and Telecom
NADRA	National Database Registration Authority
NFC	Near Field Communication (IT Protocol)
NRI	Network Readiness Index
PBS	Pakistan Bureau of Statistics
PDPA	Personal Data Protection Authority
PSEB	Pakistan Software Export Board
PSOs	Payment Service Operators
PSPs	Payment Service Providers
PTA	Pakistan Telecommunication Authority
P@SHA	Pakistan Software Houses Association
QI	Quality Infrastructure
R&D	Research and Development
SBP	State Bank of Pakistan

SECP	Securities and Exchange Commission of Pakistan
STP	Software Technology Park
STZA	Special Technology Zones Authority
TDAP	Trade Development Authority of Pakistan
UCs	Union Councils
USF	Universal Service Fund
VC	Venture Capital
WFH	Work from Home
WHT	Withholding Tax
3G/4G	Third/Fourth Generation Communication Network Technologies

Executive Summary

Pakistan's economy has been unable to raise living standards for a population that is growing at a higher pace than associated regional averages. Economic growth has been constrained by a range of issues, such as stagnated exports, fiscal and current account deficits and high government borrowing leading to limited private sector credit uptake. Short of radical and irreversible reforms, these structural issues continue to block Pakistan's pathway to transition to an upper-middle-income country.

With a median age of 23 years, Pakistan is witnessing a youth bulge and currently has the youngest population in the country's history. This offers a timed window until 2045 to realise a demographic dividend created by a working age population that is currently almost 1.6 times as large as its dependent population. However, Pakistan fares poorly on most human capital indicators, which necessitates not only adequate social investment in areas such as healthcare and education but also a large and diverse enough economy that productively engages and absorbs this workforce.

Health and economic disruptions caused by Covid-19 have further created a new and unprecedented set of opportunities, defining a new normal in which technology and digital are essential to how we live and interact. This forced adoption highlights a fast-tracking of necessary improvements across a wide array of critical functions and services. Pakistan has experienced promising trends during Covid-19 that point towards an inflexion point, which indicates that a runway for technology's take-off may just be ready. Key highlights during the last year and a half include increased e-commerce and digital transactions, improved broadband penetration, growth in IT exports and a bouquet of education, health and financial services increasingly delivered through digital channels.

Social mobility and economic transformation have eluded Pakistan for most of its history. Elite capture has defined Pakistan's economy, as reiterated repeatedly by voices from Pakistani economists, global development indicators, benchmarking exercises and multilateral diagnostics. The technology sector offers a three-tiered opportunity, unparalleled and unprecedented in scale and scope, for economic transformation, writ large, and for social mobility:

- Technology startups offer the capacity to enable game changing shifts in the structure of elite voice and accountability. Creating a new class of technology entrepreneurs and ensuring their success will be of cardinal importance for policy and politics.
- Applications that leverage technology for increased inclusion of citizens and improved services for citizens will foundationally alter both expectations and performance in the citizen-state relationship.
- Technology has the potential to fundamentally alter how government works in Pakistan and can help fundamentally alter the cost, effectiveness, transparency and efficiency of government.

Factors such as Pakistan's young and digital native demographic, fundamental gaps in reach and adoption of government services, digital data, records and enterprise automation, and a fast-growing connectivity landscape position the technology ecosystem to be ripe for investment. This is evident by the record funding in tech startups that has grown manifold in sectors like fintech, e-commerce, edtech and healthtech.

Due to the vast number of players in the technology universe, this paper defines technology in broad terms to comprise of direct and indirect contributors to the provision and enablement of technology and technology-adjacent business and consumer services. Key categories included are infrastructure and connectivity providers as enablers, device manufacturers, software houses and technology services firms, platforms and service providers.

Pakistan's technology policy landscape is influenced by a range of policy, regulatory and administrative instruments. These broadly fall into two categories:

- Investment regime: policies and regulations that define and govern overarching climate and enabling environment for investors in the tech sector in Pakistan
- Technology regime: policies and regulations that define and govern sector specific issues and affect how the technology space will evolve

The combination of these regimes determines how Pakistan's tech sector is perceived from a growth point of view and thus has a direct impact on investments. While significant progress has been made in recent years to focus on policy evolution and government efforts, more will be required to keep up with the global market. Therefore, this policy suite will require a renewed and transformative approach to achieve its intended outcomes. Short-term fiscal and siloed jurisdictional lenses are limiting adoption of a long-term strategic view of the sector. Participatory processes need to be extended and enriched by a deeper understanding of industry dynamics, issues and realities in order to design policies that delivery impact. While some progress has been achieved under a splintered governance regime, it has created a significant degree of confusion, friction and lost opportunities among investors.

There are three overarching pressure points that compel Pakistani policymakers to initiate reforms and changes that will energize the tech investment ecosystem in Pakistan.

1. Fiscal and monetary pressure on the economy that can only be addressed through increased exports and higher FDI, both of which will be increasingly informed by the technology ecosystem.
2. Widely acknowledged administrative complexity, from complex rules of business to the threat of unfair and unfounded allegations of corruption, prevents risk taking and swift decision making by government officials, a problem that is oft-acknowledged but rarely tackled.
3. Pakistan's young demographic requires a tech-friendly economy in order to receive a kind of growth that the country currently does not offer.

Energising the tech investment ecosystem will require a series of immediate interventions which can improve the direction of, and renew focus on, more longer-term and strategic course-setting.

Immediate interventions should focus on:

- Fixing the investment climate by protect rights of existing investors, strengthening of the STZA model and investing in human capital required to fast-track technology adoption.
- Improve access and connectivity by aligning allocation and deployment of radio-frequency spectrum with market and industry dynamics, curbing predatory pricing behaviour and focusing on rigorous quality standards to enhance user experience.
- Establishing technology as a value and norm through initiation of a comprehensive campaign for "Tech Destination Pakistan", high engagement of diplomatic channels and diaspora, and proactive showcasing of incentives, flagship deals and case studies.

Long-term strategic shifts should:

- Craft a renewed vision to align the system through establishment of an umbrella framework for technology investment policy, development of a roadmap for technology investment in Pakistan and universal consensus on shared priorities at all layers to align competing incentives across public sector agencies.
- Develop the market by investing and attracting international institutions to improve the skills base, promote localisation to boost capacity of domestic technology firms, accelerate digitisation in the government and focus on improving intellectual property rights protection.
- Overhaul governance and capacity by revamping the institutional architecture and creating convergence in the technology mandate, behaviour change exercises in the public sector to embrace the technology world and deepen the performance agreements framework instituted by the Establishment Division.

1 Repositioning Pakistan's Future through Technology

1.1 Chronic Economic Challenges Faced by Pakistan

Growing at an average of 3 percent over the past decade, Pakistan's economy has been unable to raise living standards of a population that is growing at a higher pace than the associated South Asia and Lower-Middle-Income-Country averages.[1] Pakistan's per capita income stood at USD 1,543 in FY21, almost at the same level as in FY16.[2] Gross Domestic Product (GDP) growth continues to exhibit cyclical trends with boom and bust cycles almost every five years and while high growth years glance shimmers of hope, sustainable growth is a far-fetched reality. These cycles force the country to seek emergency rescue from the multilateral and commercial lenders adding to the debt pool which the future generations will inherit to service.

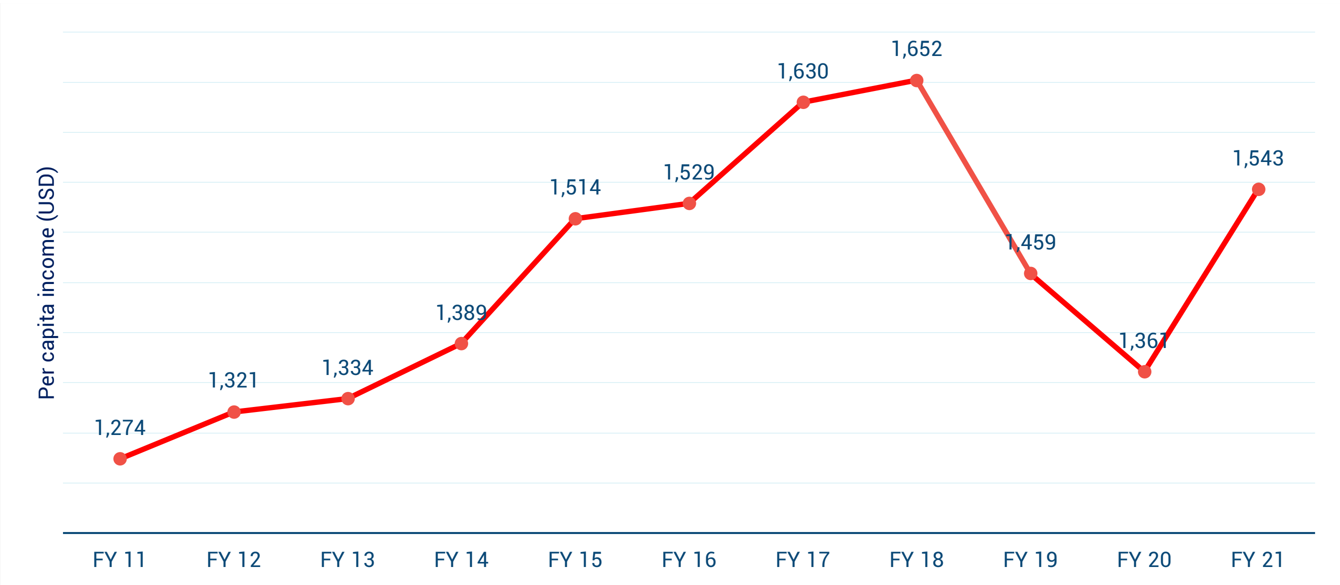


Chart 1: Pakistan's per capita income trend (Source: Ministry of Finance)

Short of radical and irreversible reforms, a host of structural, productivity and competitiveness-related issues continue to block Pakistan's pathway to transition to an upper-middle-income country.

1.1.1 Structural Issues

The Twin Deficits

High rates of GDP growth are not sustainable in Pakistan because the twin deficits – fiscal and current account deficit – run wild and over-heat the economy every four to five years. Large fiscal deficits arise mainly on account of successive inability to raise tax revenues to meet binding obligations (debt and defence), as tax to GDP ratio remains low. Basic operations to run the country's affairs are increasingly reliant on debt. Structural issues like the quasi-fiscal energy circular debt (power and gas) add further strain to the fiscal capabilities available to decision-makers. The current account becomes a problem when local consumption drives imports to high levels amid little uptick in exports. Financing the current account deficit through non-debt-creating inflows like foreign direct investment (FDI) has been a challenge, resulting in foreign debt accumulation.

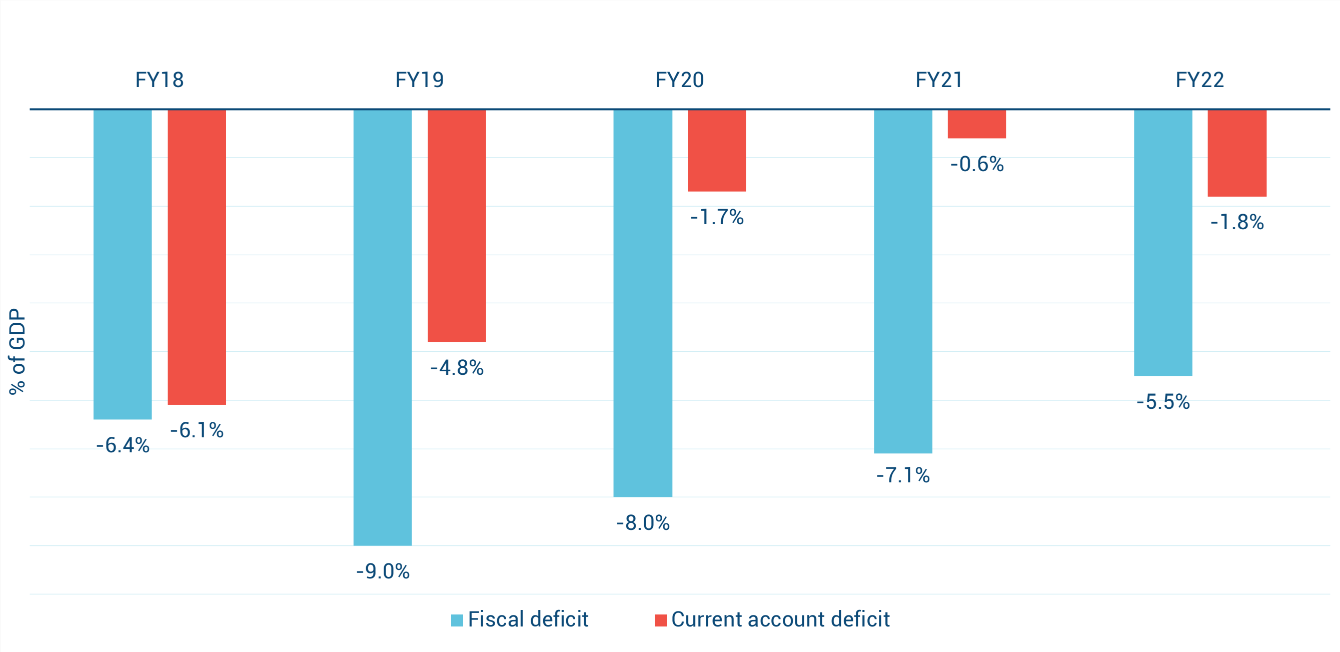


Chart 2: Status of twin deficits in Pakistan as a % of GDP (Source: State Bank of Pakistan, International Monetary Fund)

Access to Credit

Despite a steady growth in banking operations as well as robust corporate governance, Pakistan's banking sector is struggling to meet its basic function of channelling private savings into productive credit. Private sector credit to GDP ratio averaged at 17.4 percent

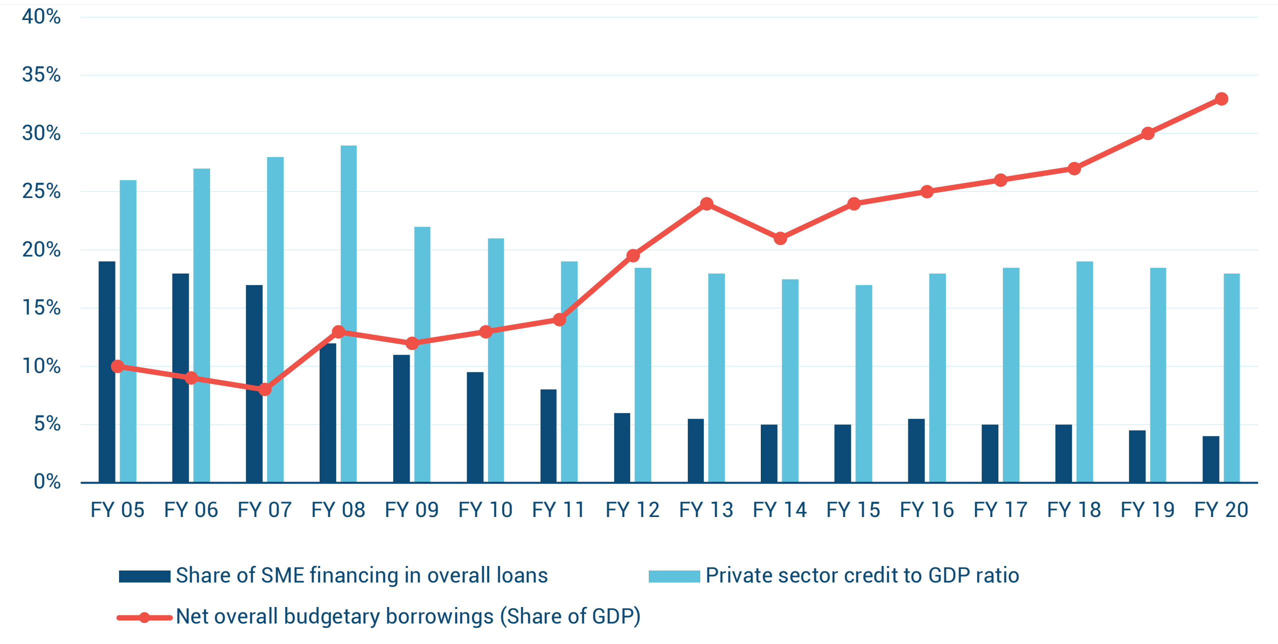


Chart 3: Trends and composition of credit uptake by private and public sector (Source: SBP)

in the 2010-2019 decade, down from 18.5 percent in the 1990-99 decade.[3] In the same period, India increased this ratio from 49 percent to 97 percent, whereas Bangladesh increased this ratio from 16 percent to 44 percent.

Due to deregulation and privatization of financial sector in early 2000's, the private sector credit briefly reached a peak of 27 percent of GDP in 2007-08, but then declined on account of higher government borrowing from domestic banking sources to tackle crippling issues like the energy crisis.

Besides being happily courted by large government borrowing, Pakistan's banking sector is also risk-averse to lending to micro, small and medium enterprises (MSMEs) and consumers. This affects economic opportunities and private sector capital formation. Another disparity is that the existing portfolio of private sector credit is disproportionately tilted towards a heavily subsidised and facilitated manufacturing sector, with farming and services sectors being relatively under-served. The rise of digital payments in Pakistan has given hope to using alternative methodologies to appraise credit-worthiness of a large financially excluded population segment and provide them with bespoke products and services potentially at scale.

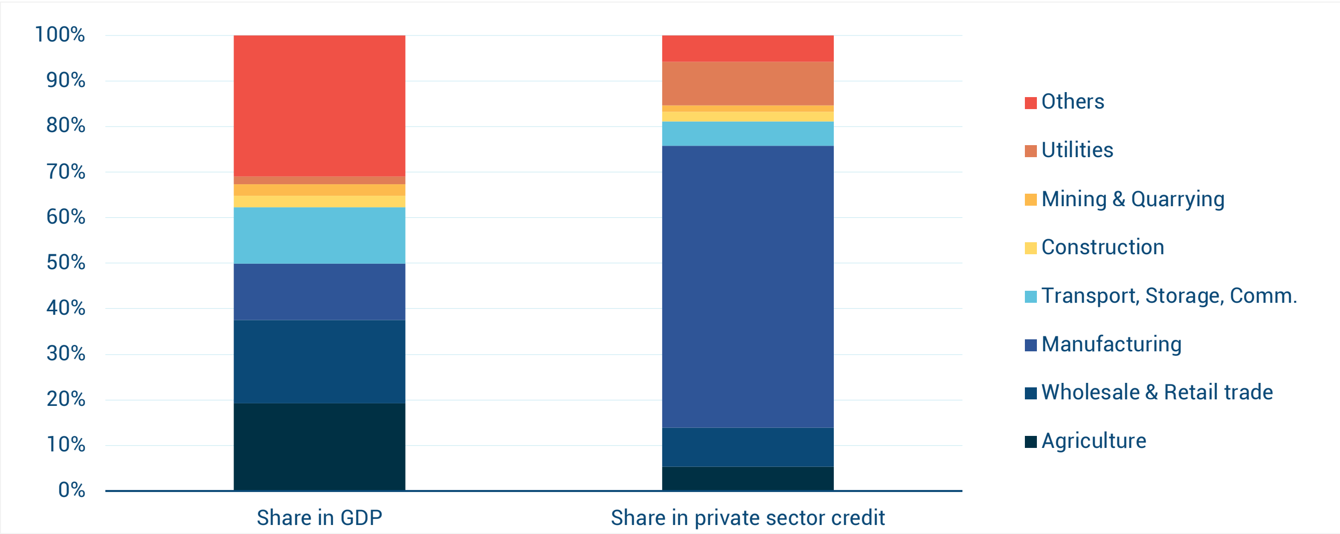


Chart 4: Status of private sector credit and sector mismatch in Pakistan (Source: SBP, Ministry of Finance)

Public Sector's Economic Footprint

The government's footprint in the Pakistani economy – activities directly controlled by the government through annual budgetary expenditures and operations of state-owned enterprises (SOEs)– is estimated to be as large as 44 percent of the GDP.[4] Among the top sectors, government accounts for 78 percent of economic activities in the electricity, oil and gas sectors, 73 percent in transport & communication, 49 percent in health & education, 43 percent in agriculture, 45 percent in finance & insurance, and 12 percent in manufacturing. The public sector's large economic involvement has bred inefficiencies, distorted competition and caused financial losses. Besides, the bloated public sector seems averse to digitalization, which brings more transparency and cuts overheads.

Lack of Export Diversification

Pakistan's export composition has traditionally been skewed towards products like garments and textiles which have barely moved past basic production techniques and standards and do not qualify as sophisticated industrial production. Due to a large agrarian economy, Pakistan has a natural advantage in food-based exports, but commodity mismanagement, limited agro-processing and periodic export bans hamper diversification. Thanks to a growing base of skilled and semi-skilled human resources, Information Technology (IT) and IT-enabled services (ITeS) exports also hold promise, having crossed the USD 2 billion mark in FY21 with significant untapped upside.

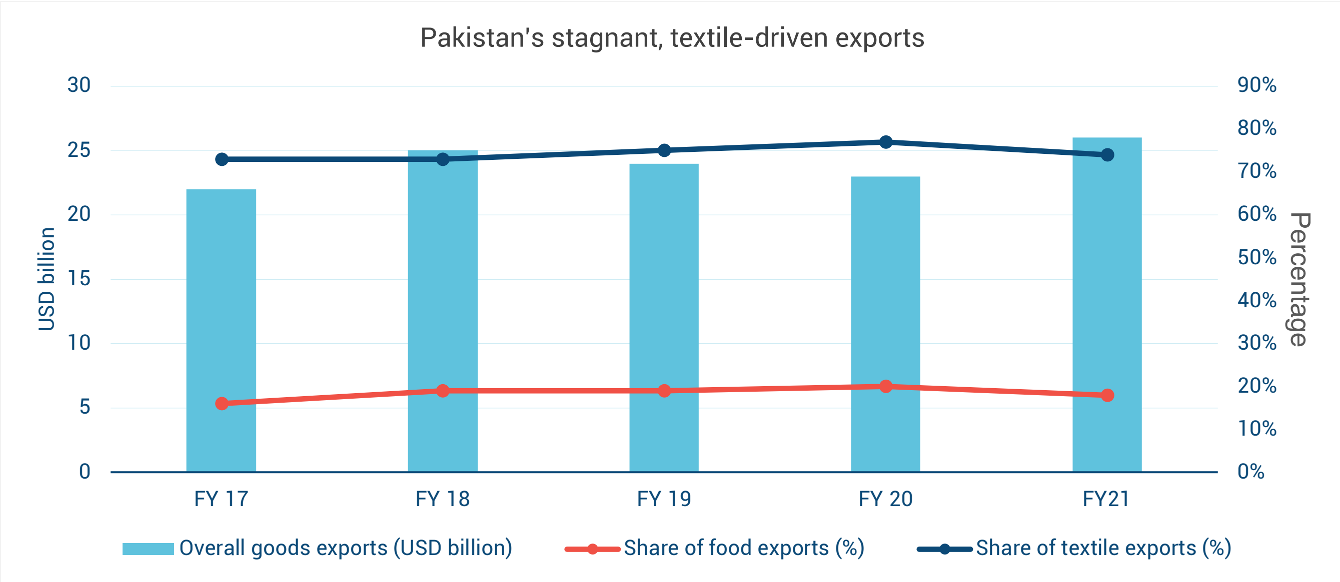


Chart 5: Pakistan's export composition and profile (Source: SBP)

Exchange rate volatility

Another factor impacting businesses operating in Pakistan is the continued depreciation of the local currency, which dilutes returns of foreign investors and sponsors. Calculations shows that since 2000, PKR has depreciated against USD by 211 percent, whereas currencies of India, Bangladesh and Vietnam have slid against the greenback in this period by 64 percent, 57 percent, and 60 percent, respectively. As a result, in years of high depreciation of the Pakistani Rupee, even double-digit local growth translates into negative real growth in foreign currency for foreign investors.

1.1.2 Compromised Competitiveness

Quality Infrastructure

A growing body of literature argues that a country's quality infrastructure (QI) supports economic development by increasing competitiveness.[5] The (QI) comprises, among other things, quality standards (certifications & inspections), accreditation (conformity assessments) and metrology (calibration & measurements). Limited appreciation of the QI ecosystem by Pakistan's businesses and government has contributed to low competitiveness. Businesses treat quality certifications as an unnecessary compliance cost instead of an investment. The results are manifest in both the stagnant market shares of major exports and lower per unit value.

While the government is responsible for setting quality standards and benchmarks, it is also involved in the value chain as most of the QI labs are functioning in the public sector. This creates a conflict of interest and room for rent-seeking. A handful of reputable global private labs are operational in Pakistan, but their inspection, testing and certification services are deemed very expensive by SMEs. Meanwhile, foreign buyers often require external certifications from abroad.

Productivity

Productivity in agricultural, industrial and services sectors are marred by several issues. In the agriculture sector, limited mechanization and outdated practices have resulted in declining yields and limited exportable surplus. Manufacturing entities tend to invest little on automation, modernization and employee training. The services sector, which is dominated by micro and small enterprises, focuses on subsistence methods and low-value domestic segments without any significant investment in adoption of modern business practices to improve output and turnaround times.

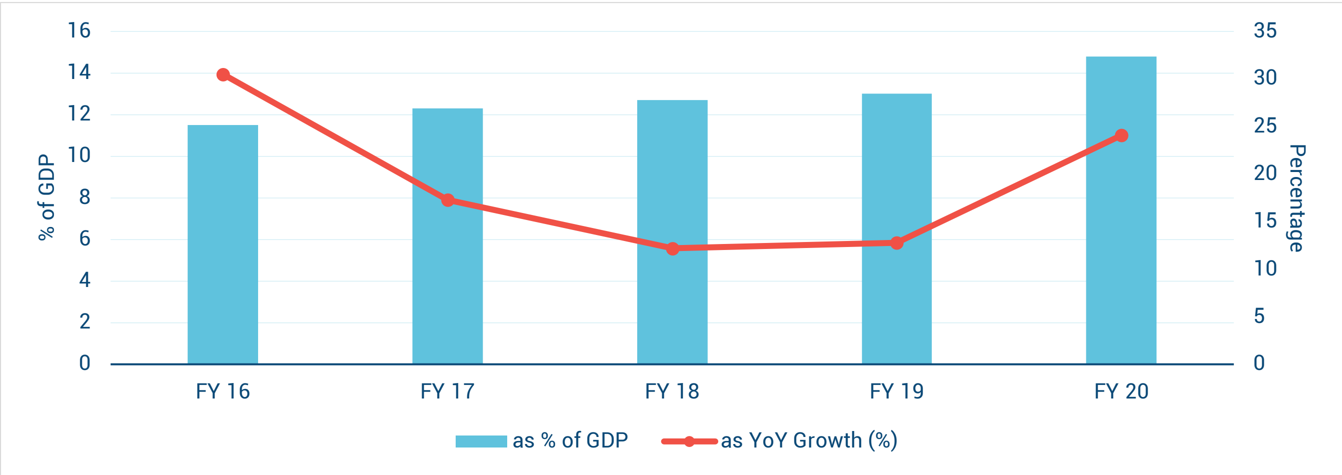


Chart 6: Currency in circulation (Source: SBP

Informal Economy

The economy is predominantly informal in nature, with 73 percent of non-agricultural employment accounted for by informal sector (76% in rural areas; 69% in urban areas). About 33 percent of informal workers in Pakistan work in wholesale & retail trade, 25 percent in manufacturing, and 20 percent in construction. A high degree of informality is a drag on economic growth due to low productivity, limited innovation, barriers to expansion, poor documentation and low tax contribution leading to a strong preference for cash transactions. Undocumented businesses also face difficulties in availing formal credit to expand their business. Informal workers are more vulnerable to wage suppression, discrimination and violation of labour rights than their formal sector counterparts.

1.2 Pakistan's Demographic Dividend and its Economic Potential

The term 'demographic dividend' is applied by economists in the context of achieving rapid economic development based on two core conditions: i) comparatively large portion of working-age population (15 to 64 years of age) than dependent population (under 15 and over 65 years of age) and ii) sustained and effective investments in human capital. The premise is that if an economy is able to gainfully employ the high labour supply, it will improve the country's savings and investment equation, increase female labour participation, lower fertility rates, and thus manage population growth rates. This can potentially lead to a virtuous cycle of better and improved social and economic opportunities.

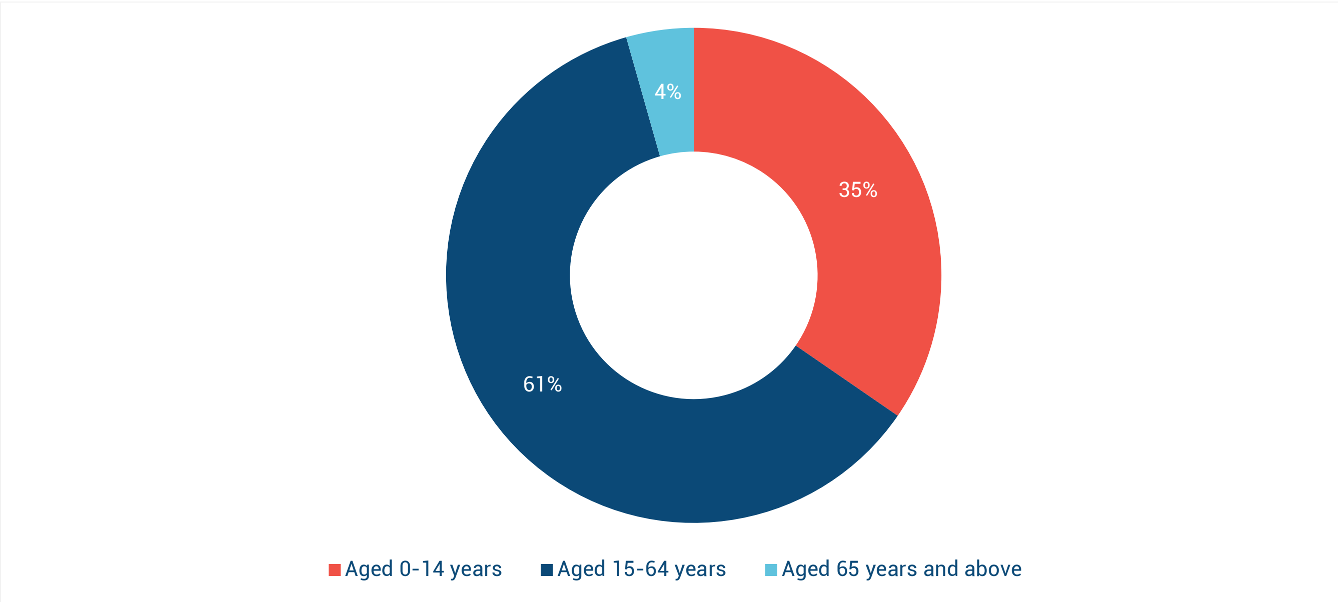


Chart 7: Pakistan's demographic profile (Source: UNFPA)

Pakistan fulfils one condition of the demographic dividend: its working age population is currently almost 1.6 times as large as its dependent population.[6] The country is experiencing a 'youth bulge' – in other words, its most productive years. But it does not necessarily meet the other condition of human capital investment. The window of opportunity of demographic dividend, which had opened up in the year 1990, will last until 2045.[7] The time to capitalise on this window for demographic dividends is running out fast as Pakistan fares poorly on most human capital indicators.[8] It is important to ensure adequate social investment (education, nutrition, healthcare, etc.) early on so that new entrants into the economy possess better education, training and skills than those who had come before them, so as to boost productivity and economic growth.[9]

A large, skilled youth cohort will require productive employment opportunities for the demographic dividend to be realized before age structure starts to reverse course. Over the past two decades, Pakistan's economy has been adversely impacted by terrorist incidents post-9/11, global financial crisis (2008-09), natural disasters (e.g., floods in 2010 and 2011), and chronic power outages. On top of that, frequent boom-and-bust economic cycles curtailed government spending under several IMF programs. Now the Covid-19 pandemic has exacerbated economic inequalities with perhaps generational implications. The biggest challenge facing the economy is to create two to three million new jobs every year for a sustained term so that the demographic dividend does not turn into a possible 'demographic disaster'.

1.3 Covid-19 and the New Digital World

1.3.1 Emerging Global Trends Amid Covid-19

The pandemic has wrought immense hardships with loss of life, erosion of economic value and public health ramifications for the masses at large. However, coping with a new way of life with technology playing a pivotal role in reimagining our daily interactions brings some promise of fast-tracking necessary improvements across a wide array of critical functions and services.

Redefined Ways of Work

One of the defining characteristics of life during the pandemic has been the phenomenon of tele-working, or work from home (WFH). A recent World Bank study across 107 countries showed that WFH incidence during the pandemic was positively correlated with income per capita as well as broadband access.[10] The more economically developed and well-connected a country, the more the prevalence of tele-working (due to larger share of service-sector jobs). As a result, while nearly one third of jobs in high-income countries could be reliably performed from home, less than 5 percent of jobs in developing countries are suitable for tele-working.

Digital Health & Education

As hospitals overflowed with Covid-19 patients, social distancing meant that physicians and patients in both developed and developing contexts have had to resort to online appointments, electronic health records and wearable medical devices and sensors to monitor patient vitals (e.g., heartbeat, temperature, sugar level, etc.) Tele-health activities in February 2021 were 38 times higher than in pre-pandemic month of February 2020, driving significant venture capital investment in this space.[11] This helped in providing medical evacuation and critical care to only those patients that needed it the most. Besides, platforms like Tele Health (pioneered by US CDC) were offered by several developing countries to provide remote health guidance during the pandemic.

The pandemic also disrupted the formal learning environment for more than a billion learners across the world and necessitated adoption of distance and digital education platforms. Edtech attracted more than USD 10 billion in venture capital investment in 2020 alone.[12] Maintaining faculty interest and creating student engagement have been persistent challenges for distance learning models. In developing countries, online learning has exposed digital inequalities as a large portion of their population is offline and with limited access to devices. That's why countries like Argentina, Bangladesh, Pakistan, Bhutan, Costa Rica, Kenya, Malaysia, among several others, decided to offer education lessons through national television.[13]

Smart Applications

Cities that have become adept at leveraging technology to solve urban challenges made the most of smart city applications to manage the pandemic in a better way.[14] By using centralized data from a variety of sources including security cameras, sensors, mobile signals, and other IoT devices, connected cities were able to conduct "contact tracing" to remain ahead of the Covid curve. Besides, digital modes of everyday payments (chip-based cards, mobile wallets, NFC, etc.), contactless ticket services, growing use of electronic bikes, and digitized government services helped enforce social distancing in a better way.

1.3.2 Emerging Digital Trends in Pakistan During Covid-19

Pakistan too experienced a sub-transformation during Covid-19 whereby a number of government and business interactions and use-cases pivoted to a digital-first model and have thus resulted in promising trends which reinforce the significance of the potential technology holds.

Mobile Broadband

The uptake of mobile broadband (3G and 4G) services visibly jumped during the pandemic year. Between June 2020 and June 2021, mobile broadband subscriptions had increased by 19 million (yearly growth of 23 percent) to reach almost 100 million.[15] This is the strongest growth in terms of absolute numbers since the mobile broadband services were rolled out in 2014.

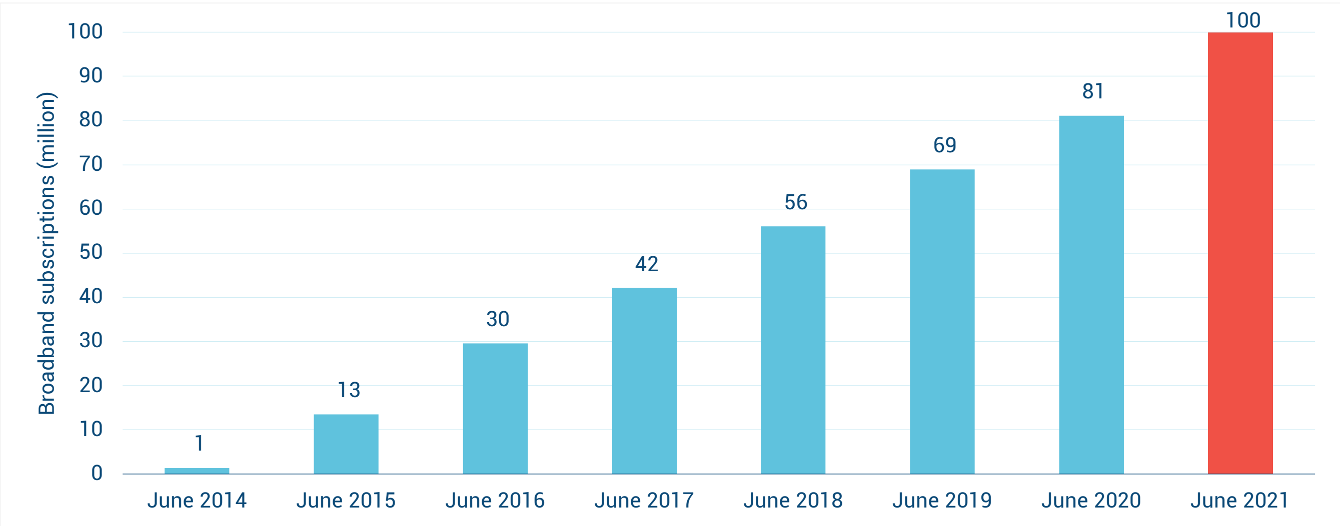


Chart 8: Mobile broadband subscriptions in Pakistan (Source: PTA)

Device Uptake

Latest data also show a remarkable rise in imports of mobile phones. As per State Bank of Pakistan (SBP), handset imports had reached USD 1.97 billion during FY21,[16] the year marked by active pandemic, a growth of 80 percent over the previous year. Market intelligence suggests that more than 30 million phones were imported in FY21, up from 20 million in FY20. Part of this growth is attributed to continued formalization of cell phone imports after the introduction of PTA's DIRBS (Device Identification, Registration and Blocking System) mechanism, and partly attributable to the increasing reliance on digital channels as the primary medium for connectivity, work, commerce, education, entertainment and social interactions.

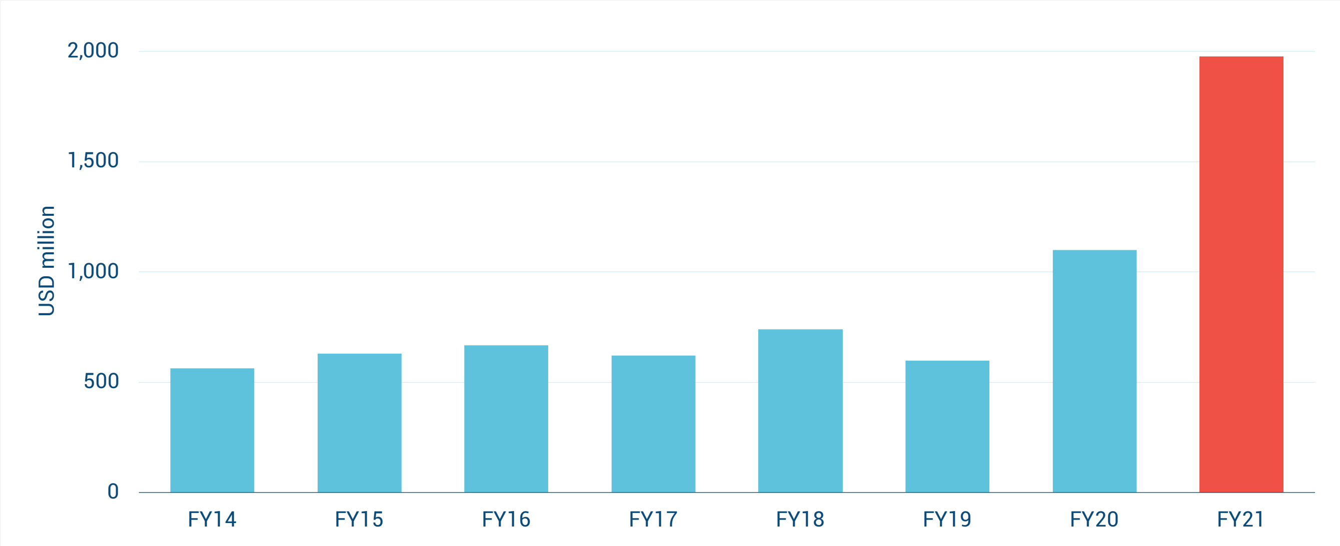


Chart 9: Value of mobile phone imports (Source: SBP)

Digital Payments

Digital payments in the financial services sector also saw a rapid increase during the crisis period. Internet banking transactions reached PKR 1.56 trillion in the Jan-Mar quarter of 2021, up 109 percent compared to the Jan-Mar quarter of 2020.[17] Whereas mobile banking transactions jumped in this analysis period to reach PKR 1.29 trillion.

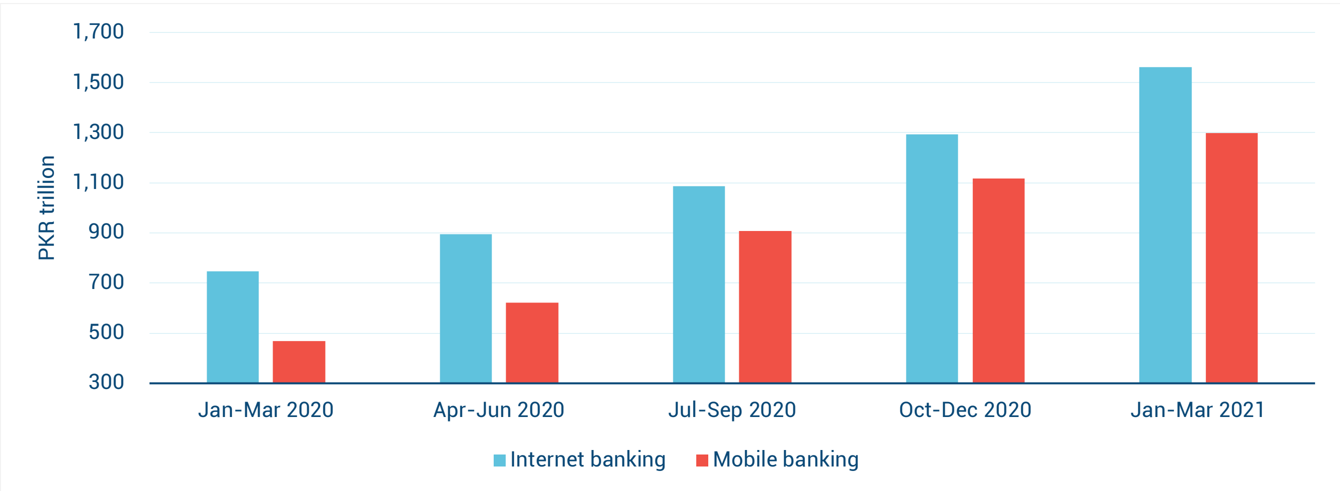


Chart 10: Growth in digital banking transactions (Source: SBP)

Meanwhile, the number of "active" mobile wallets in the branchless banking ecosystem had reached 46 million as of June 2021, up from 27 million as of June 2020.[18] The growth of these wallets, however, is concentrated in urban areas where there is relatively more digital and financial literacy.

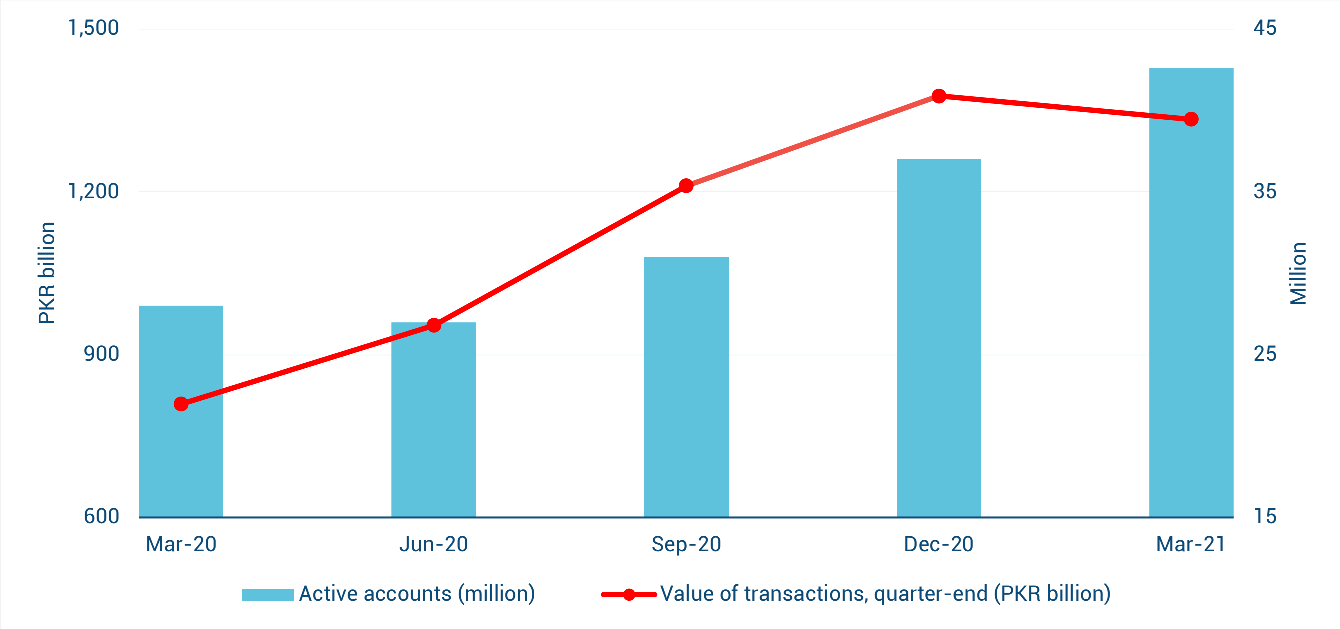


Chart 11: Growth of mobile wallets (Source: SBP)

Similarly, e-commerce transactions registered strong growth as businesses pivoted to online channels to comply with containment protocols and limited mobility due to lockdowns.

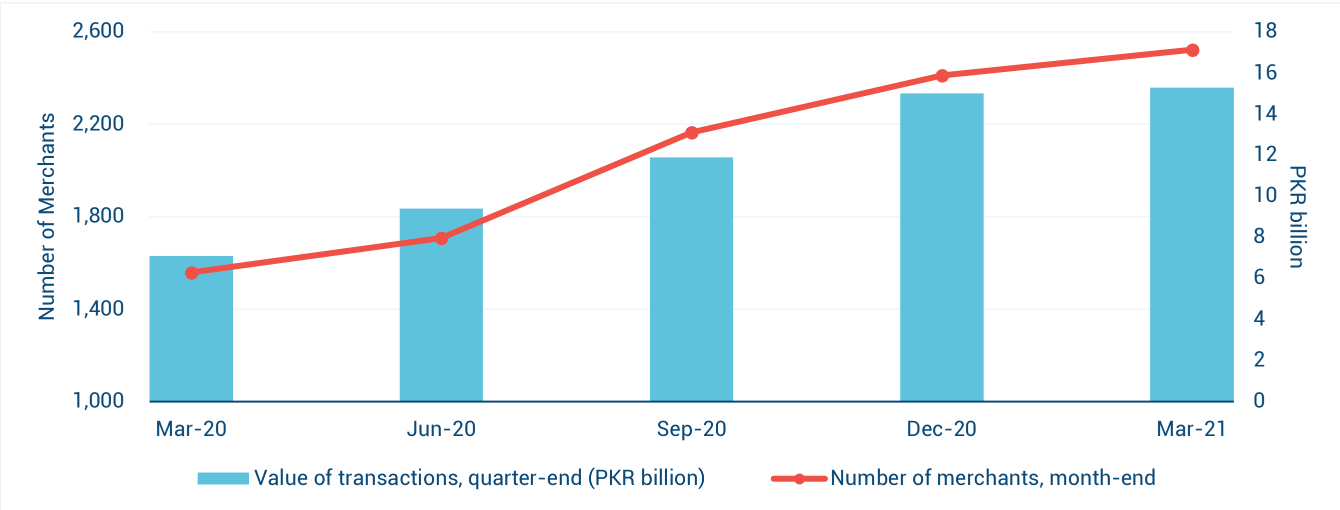


Chart 12: Growth in non-cash e-commerce transactions (Source: SBP)

Growth in IT/ITeS Exports

The IT/ITeS export crossed the USD 2 billion mark during FY21 showing a yearly growth of 47 percent.[19] Within IT exports, the main source of growth was the heavyweight 'computer services' segment, which was buoyed by higher exports of computer software and software consultancy services growing by 31 percent and 36 percent, respectively. Within the 'telecommunication services' segment, exports of call centres and international telephony services also registered double digit growth, by 22 percent and 46 percent, respectively. By staying open during the lockdowns and finding ways to utilize human resource remotely, Pakistani IT firms were successful in materializing fresh export leads during the pandemic. It is also believed that IT exporters repatriated more of their export proceeds to Pakistan during the era of travel restrictions and reduced mobility.

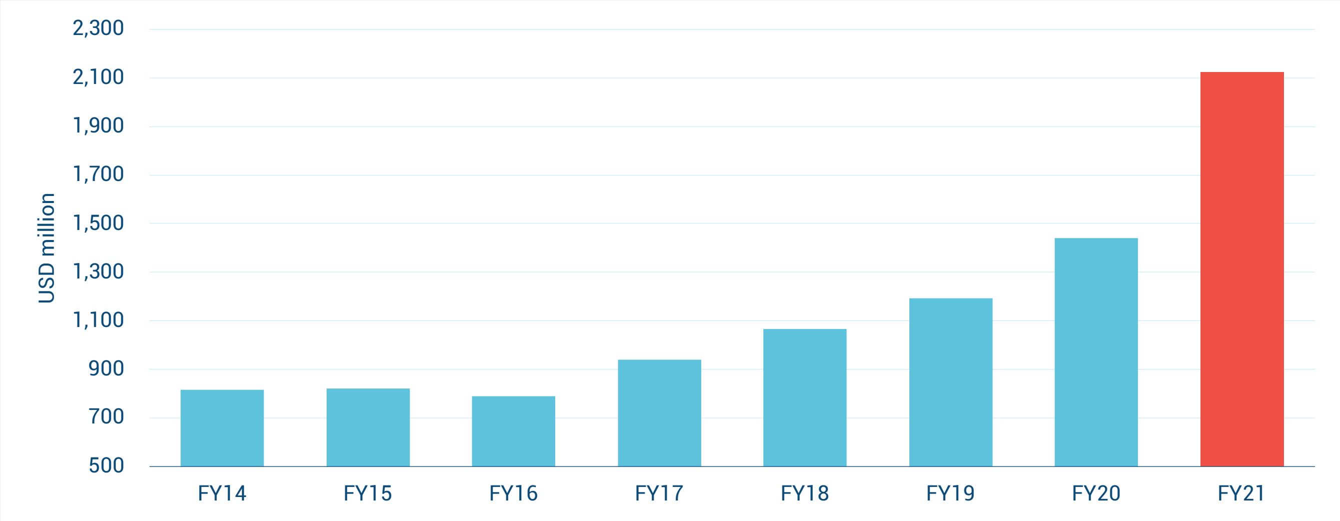


Chart 13: Growth in IT/ITeS exports (Source: SBP)

1.4 The Promise of Technology

1.4.1 The Technology Market Map

As a response to deregulation, privatisation and liberalization of the technology and related sectors, the diverse landscape is dotted with a number of private sector players that have made significant investments and have shaped the market, infrastructure availability and a strong platform base for a growing bouquet of digital services.

The technology universe is vast and diverse and for the purpose of this paper has been defined in broad terms to comprise of direct and indirect contributors to the provision and enablement of technology and technology-adjacent business and consumer services. Key categories included are infrastructure and connectivity providers as enablers, device manufacturers, software houses and technology services firms, platforms and service providers.

Table 1 highlights selected market players and investors in the technology ecosystem.

1.4.2 Start-ups: An Emerging Game-changer

Pakistan's young and digital native demographic, fundamental gaps in reach and adoption in areas like financial inclusion, education and health service delivery, digital data, records and enterprise automation, and a fast-growing connectivity landscape position the technology ecosystem to be ripe for investment. This is evident by the record funding in tech startups that has grown manifold in sectors like fintech, e-commerce, edtech and healthtech.

Investor interest is increasing in Pakistan's accelerating tech space, with startups consistently raising bigger rounds of funding and investments at various stages across sectors. Between 2016 and 2020, Pakistani startups raised at least USD 175 million (disclosed amount) in 142 deals.[20] The trend has further accelerated during the pandemic.

The year 2021 is proving to be the best year thus far.

Sector	Key Players	Major Foreign Investors
Cellular mobile operators	Jazz Ufone Telenor Zong SCO	Veon Group Etisalat Telecom Telenor Group China Mobile -
Fixed broadband providers	PTCL Company Worldcall Telecom NayaTel Trans World Multinet Pakistan	Etisalat Telecom Oman Tel - Orascom Investment Holdings -
Telecom tower services	EDOTCO Pakistan Deodar Limited Engro Enfrashare	EDOTCO Group, Malaysia Veon Group -
Wireless local loop	PTCL Company Wi-tribe Pakistan Wateen Telecom	Etisalat Telecom HB Group Dhabi Group
Telecom infrastructure providers	Pak Datacom TransWorld SCO Fiber Link Limited	- Orascom Investment Holdings -
E-commerce	Daraz.pk OLX Tele Mart Yayvo Dawaai.pk	Alibaba Group Naspers - - 500 Startups
Ride sharing and delivery	Careem Uber Bykea FoodPanda Airlift	Uber Technologies Uber Technologies - Delivery Hero 20VC/Buckley
Software exports	Systems Limited NetSol Pakistan Info Tech	- NetSol Technologies Inc. -
Mobile device manufacturing	Lucky Motor Corp. Air Link Communications Vivo Infinix	Samsung Mobiles Itel, China Vivo Communications, China Infinix Mobile, Hong Kong
Digital financial services	Jazz Cash Finja Easypaisa TPS Tez Financial Services Pay Pro One Load Naya Pay	- Vostok Emerging Finance and others Ant Financial - Flourish Ventures, Accion Venture Lab - - -

Table 1: Mapping of selected segments and key players in the technology universe in Pakistan

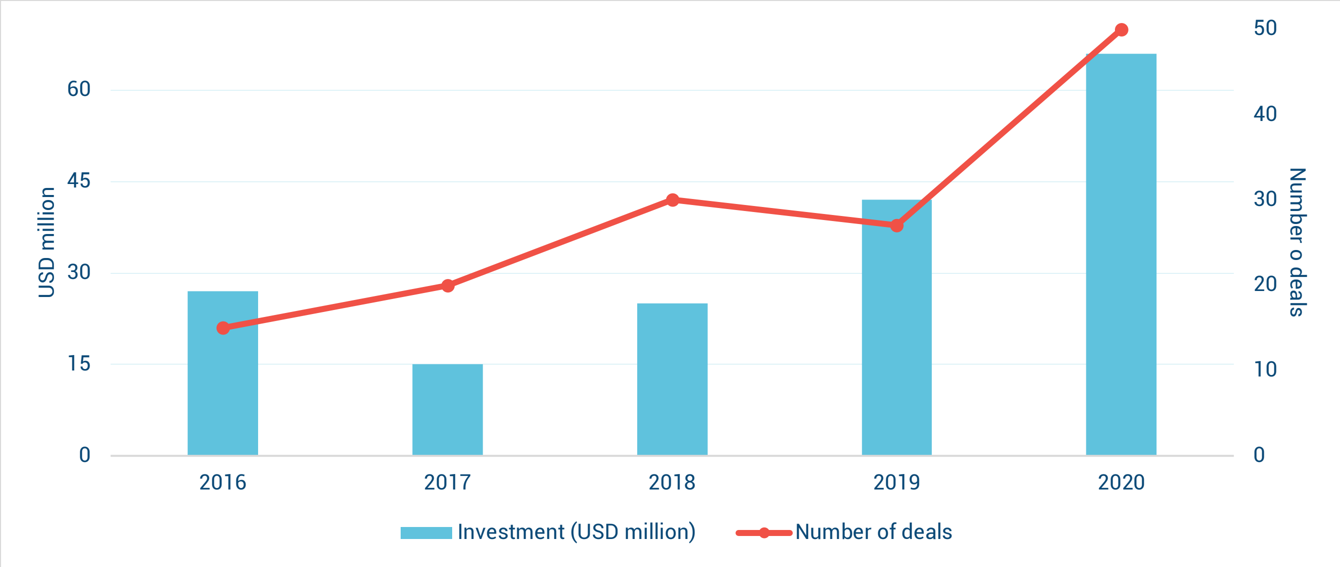


Chart 14: Startup funding in Pakistan (Source: i2i)

As per a 'deal flow tracker' database maintained by Invest2Innovate,[21] there were at least 52 deals made by local startups that raised at least USD 73 million (disclosed amount) during the year 2020. In the first half of 2021 alone, there were at least 33 deals that had cumulatively raised investment of at least USD 85 million. On August 18, Airlift Pakistan, a leading shopping delivery service, announced the largest round of funding raised by a Pakistani startup ever, at USD 85 million.[22]

Pakistani Startups - Top Ten Deals in 2021 (As of August)			
Startup	**Sector**	**Amount Raised**	**Lead Investor**
Airlift	E-commerce	$85 million	20VC, Buckley
Tajir	E-commerce	$17 million	Kleiner Perkins
Dawaai	Healthtech	$8 million	500 Startups
SadaPay	Fintech/finance	$7.2 million	Recharge Capital
Retailo	E-commerce	$6.7 million	Shorooq/Abercross
Bazaar	E-commerce	$6.5 million	GFC, IVC
dTrade	Fintech/finance	$6.4 million	3 Arrows/DeFiance
TAG	Fintech/finance	$5.5 million	QC, LCV
GrocerApp	E-commerce	$5.2 million	Hayaat Global
K Trade	Fintech/finance	$4.5 million	TTB, HOF

Table 2: Top fundraising deals in Pakistan in 2021 (Source: Invest2Innovate, Bloomberg)

This round alone is far above the proceeds raised by any Pakistani firm from its IPO. The size of this deal has drawn keen attention and interest at all levels as it underscores the potential to boost foreign investor interest in this market. In 2021 alone, Pakistani startups have now raised in excess of USD 200 million.

1.4.3 Defining the Pakistani Dream Through Digital

Social mobility and economic transformation have eluded Pakistan for most of its history. Elite capture has defined Pakistan's economy, as reiterated repeatedly by voices from Pakistani economists[23], global development indicator and benchmarking exercises[24] and multilateral diagnostics[25]. The technology sector offers a three-tiered opportunity, unparalleled and unprecedented in scale and scope, for economic transformation, writ large, and for social mobility at the individual, family and community level.

First, technology startups offer the capacity to enable game changing shifts in the structure of elite voice and accountability. Traditional elites in Pakistan have used rents to accumulate ever improving stature and privilege — but startups tend to be founded by non-elites. Even a very small number of unicorns or quasi unicorns would disrupt the profile of the Pakistani elite — creating a new class of technology entrepreneurs that assume cardinal importance for policy and politics.

Second, applications that leverage technology for increased inclusion of citizens and improved services for citizens will foundationally alter both expectations and performance in the citizen-state relationship. Already, first gen applications like the Prime Minister's Citizen Complaint Portal offer insights into how governance needs to adopt and adapt to a tech-savvy citizenry. Technology was central to how government dealt with the challenge of Covid-19. Applications that ease the access to social protection programmes like the Ehsaas and BISP framework will fuel even more innovation in how government used technology for service delivery.

Third, technology has the potential to fundamentally alter how government works in Pakistan, from procurement reform, to transfers and postings, to tax collection, to appropriations—a host of public sector and administrative applications of technology can help fundamentally alter the cost, effectiveness, transparency and efficiency of government.

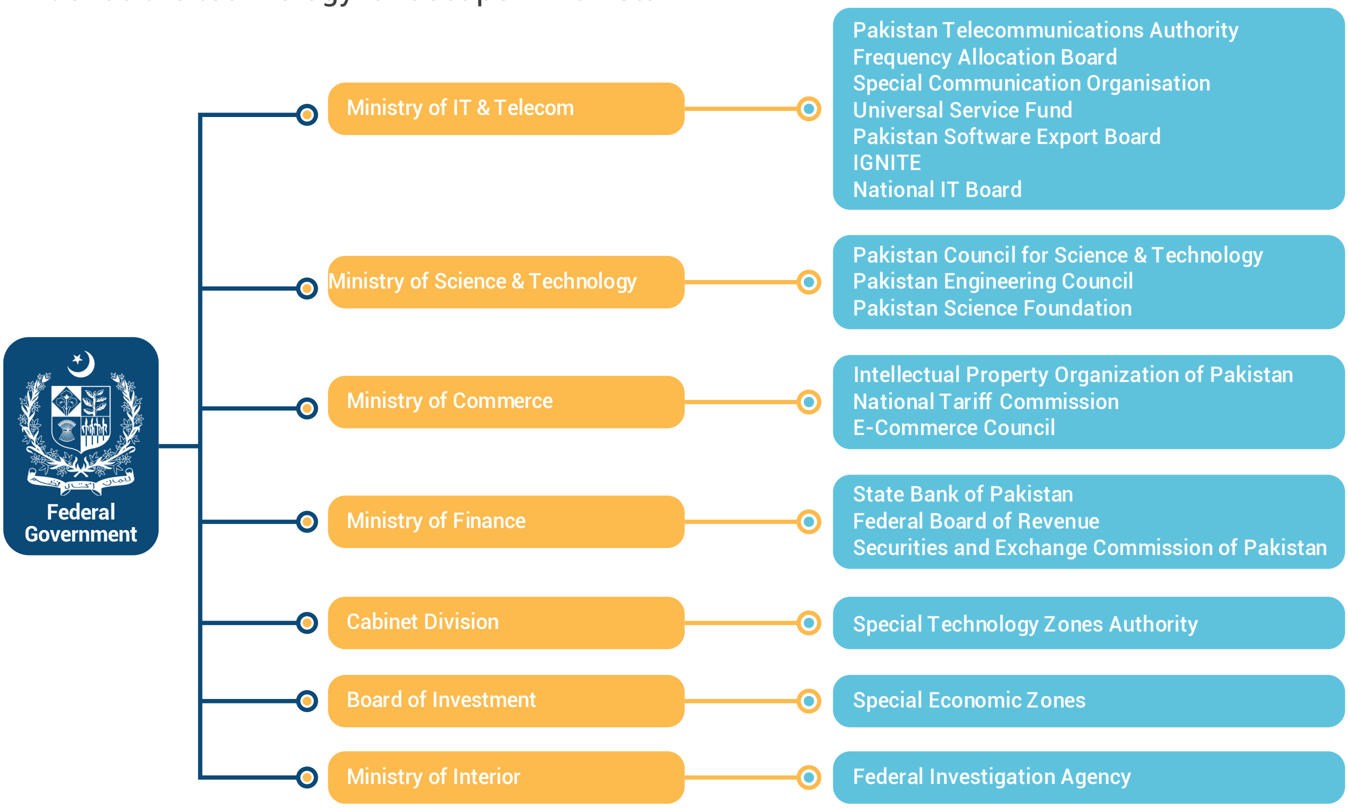
Pakistan's massive demographic dividend window will begin to close in the mid to late 2040s. The youth demographic of today represents the last generational opportunity for structural transformation in Pakistan before this demographic shift kicks in. Democratizing wealth generation and socioeconomic mobility is a shared political priority across a spectrum of leaders and across all Pakistani institutions. Until the average Pakistani can imagine being a generator of wealth, the idea of a Pakistani dream will remain elusive. The only path to substantial asset ownership and social mobility is a tech-first and tech-last public policy regime that prioritizes the growth and spread of digital.

2 Policy Landscape Shaping the Tech Ecosystem in Pakistan

The growing recognition of the transformative potential of technology needs to be evidenced by demonstration of the understanding, prioritisation, and execution of tangible policy actions that convey the political and bureaucratic leaderships' clarity on the technology ecosystem in the country. Oft repeated mantras about the "transition to a knowledge economy" and "the repositioning of Pakistan through a geoeconomics lens" make the role of technology in enabling and driving paradigm shifts even more urgent and essential. Given the vastness of how many ways technology can be prioritized and tackled, it is important to understand the public sector and its role. The organizations and agencies involved in conceiving, developing and implementing technology policy and regulations, are explored below.

2.1 Key stakeholders

The visual below presents a summary of leading and most relevant agencies that influence the technology landscape in Pakistan.



The table summarises key actors, roles and responsibilities, and important policy and regulatory developments that are at various stages in their respective lifecycle.

Actors	Roles and Responsibilities	Major Policies / Regulations / Initiatives
Ministry of IT & Telecom (Operating under Schedule II [Rule 3 (3)], Rules of Business, 1973)	National focal ministry for planning & execution of IT & Telecom-related policies, projects and programs	Cyber Security Policy (2021) Right of Way Directive (2020) Rolling Spectrum Strategy (2020) Digital Pakistan Policy (2018) Policy Directives for Spectrum Auctions Telecommunication Policy (2015) USF and ICT/R&D Fund Policies (2007) Telecom De-regulation Policy (2003) Pakistan IT Policy (2000) *Upcoming: National Broadband Policy, Data Protection Bill, Cloud Policy*
Pakistan Telecommunications Authority (Operating under Telecommunications Reorganization Act 1996)	Regulate and modernize telecom systems and services, auction radio spectrum and ensure consumer protection	NGMS Auction, 2021 Mobile Device Manufacturing Regulations, 2021 Removal and Blocking of Unlawful Online Content Rules, 2020 Rolling Spectrum Strategy, 2020 Critical Data Security Regulations, 2020 Mobile DIRBS Regulations, 2017 NGMS Auction, 2017 NGMS Auction, 2016 Broadband Quality of Service Regulations, 2014 NGMS Auction, 2014 MVNO Regulations, 2012 Quality of Service Regulations, 2011 Consumer Protection Regulations, 2009 Mobile Number Portability Regulations, 2005
Frequency Allocation Board (Operating under Telecom. Reorg. Act)	Allocate radio spectrum to wireless networks in the public and private sectors	Satellite Frequency Guidelines Spectrum Management Guidelines International Collaboration Frameworks
Pakistan Software Export Board (Operating under a Cabinet division notification, June 1995)	Improve business environment for IT companies, build their capacity to compete globally, set up technology parks, etc.	**Major programs** IT Parks and Software Technology Parks Facilitation in visas, remittances and reporting Counselling centre, professional certifications
National IT Board (Merged entity from Pakistan Computer Bureau and Electronic Government Directorate, 2014)	Promote e-governance through design and implementation of IT solutions in public sector departments	**Major projects** Covid-19 Information Platform PM Citizen Portal Digital Portals for Ehsaas, BOI and FIA National Jobs Portal; E-office; Durust Daam E-Office
Universal Service Fund (Operating under USF Rules, 2007)	Promote development of telecom services in un-served and under-served areas	**Major projects** Broadband for Sustainable Development Program Optical Fibre Program ICT for Girls Tele Centres in rural areas
IGNITE National Technology Fund (Under ICT/R&D Fund Rules, 2007)	Create national network of incubators to nourish start-ups and provide funding to promising projects and entities	**Major programs** Ignite Funding program Ignite Incubation program Ignite Training programs Digi Skills

Actors	Roles and Responsibilities	Major Policies / Regulations / Initiatives
Special Technology Zones Authority (Established under STZA Ordinance, 2020)	Provide legislative and institutional support for development of technology sector, innovation & entrepreneurship	Establishment of 14 Special Technology Zones across Pakistan STZA (Qualification and Approval) Rules, 2021
State Bank of Pakistan (Legal authority in digital ecosystem flows from core SBP legislations and Payment System/Electronic Fund Transfer Act)	Regulation of: Branchless banking Electronic banking channels Electronic Money Institutions Payment Systems Operators	National Payment Systems Strategy, 2020 Raast Payment System, 2020 Roshan Digital Account, 2020 National Financial Inclusion Strategy, 2019 Regulations for EMIs and PSOs/PSPs, 2019 Branchless Banking Prudential Regulations, 2008
Federal Investigation Agency (Legal authority comes from Prevention of Electronic Crimes Act, 2016)	Regulate the cyberspace by identifying and curbing online abuse, frauds, identity theft, data theft, online bullying, systemic threats and crimes.	**Expertise** Digital Forensics Information Systems Security Audits Technical Investigations Cybercrime prevention training Awareness Campaigns
Provincial Information Technology Boards (Operating under the jurisdictions of Provincial IT Departments)	Punjab and KP have set up autonomous IT Boards to modernize public service delivery through digitisation, automation and transparent solutions	**Major projects** Dengue Surveillance System (Punjab) Criminal Record Management System (Punjab) Driving License Issuance Management System Citizen Feedback Monitoring System (Punjab) KP Citizen Facilitation Program (KP) BPO spaces for Digital Jobs (KP)
Pakistan Software Houses Association (Under Trade Organisations Act)	P@SHA is an IT industry trade association that is focused on public sector outreach to have policies and incentives to boost software development activities	**Major initiatives** Nest I/O Start-up Incubator P@SHA ICT Awards P@SHA Freelancer Community P@SHA Start-up Community

Table 3: Mapping of key stakeholders and policies that impact the technology sector

2.2 Mapping the Policy Landscape

Pakistan's technology policy landscape is influenced by a range of policy, regulatory and administrative instruments. These broadly fall into two categories:

- Investment regime: policies and regulations that define and govern overarching climate and enabling environment for investors in the tech sector in Pakistan
- Technology regime: policies and regulations that define and govern sector specific issues and affect how the technology space will evolve

The combination of these regimes determines how Pakistan's tech sector is perceived and understood from an opportunity and growth point of view and thus has a direct impact on investments made.

The policy suite ranges from strategic and overarching frameworks to very micro and issue-specific regulations and guidelines that may have unintended overarching and deep-rooted impact and consequences on how Pakistan grows in an ever-evolving and interconnected global and regional context. The technology ecosystem and how it operates across the public and private sector domains is heavily informed by recent policy developments that have and/or may have high impact and relevance to realizing Pakistan's technology dream. These are described below.

Policy	Owner	Highlights / Summary
Digital Pakistan Policy (2018)	Ministry of IT & Telecom	The multi-layered policy aims to create a holistic digital ecosystem by focusing on core infrastructure, digital skilling, digital inclusion, technology adoption, IT jobs and exports. A revision is underway to align with developments since 2018 and reflect strategic priorities.
Regulatory Sandbox (2019)	SECP	These guidelines by the corporate regulator aim to have a framework where innovative products, services and business models can be tested in a controlled environment on a limited scale and time period, especially in areas of tech-driven solutions for financial inclusion, insurance penetration and AML/KYC-related functions of FIs.
E-Commerce Policy (2019)	Ministry of Commerce	Policy formulated to promote e-commerce by improving the enabling conditions for existing and new players, facilitating local and cross-border trade (especially exports) and reducing cost of doing business. The policy identified nine priority areas to support transition to a digital economy.
National Payments Systems Strategy (2019)	State Bank of Pakistan	Aimed at fast-tracking digitization of payments and financial inclusion, the strategy outlines the steps the SBP will be taking towards developing a more effective payments infrastructure and identifies key use cases that will fuel digitization of payments in Pakistan. The most important output of the NPSS was development of Raast (micropayment gateway).
Personal Data Protection Bill (2020)	Ministry of IT & Telecom	The objective is to have an institutional and legal framework to guide the processes of data collection, storage and processing. A special authority, Personal Data Protection Authority, will be set up to enforce rules governing data subjects and data controllers.
Social Media Rules (2020)	Ministry of IT & Telecom	The regulations provide an institutional framework to define what is 'unlawful' content on social media platforms, require major social media companies to have local presence, create local data centres, and cooperate with authorities in curbing unlawful content online.
Cyber Security Policy (2021)	Ministry of IT & Telecom	The policy aims to protect the cyber domain via measures like information-sharing mechanisms, national security standards and processes, risk-based cyber audits, ICT hardware integrity, training and capacity building in public and private sectors.

Policy	Owner	Highlights / Summary
Special Technology Zones Authority Act (2021)	Cabinet Division	The STZA Act passed by both the National Assembly and the Senate as of September 29, 2021, aims to provide institutional and legislative support to attract investment in Pakistan's technology sector. A number of fiscal and non-fiscal incentives are being offered to zone developers and enterprises, including one-window facilitation by the STZA.
Foreign Funding for Startups (2021)	State Bank of Pakistan	The SBP has introduced much-need reforms to boost startup ecosystem by allowing export-based firms (including IT firms) to set up offices abroad without needing SBP approval, letting startups to establish holding companies abroad without SBP approval, and by introducing the concept of 'sweat equity' to facilitate local residents to own shares in a foreign company in return for their non-monetary contributions.
National Broadband Policy (2021) (draft)	Ministry of IT & Telecom	This draft policy specifically aims to deepen the broadband penetration across Pakistan's geography and its use in public and private sector entities, improve speed and quality of broadband, improve local content development and increase availability of digitally-skilled users.
National Freelancing Policy (2021) (draft)	Ministry of IT & Telecom	The draft policy aims to create a facilitation framework so as to increase the number of freelancers in Pakistan and their average earnings, through fiscal incentives, infrastructure support and government help in capacity building.

Table 4: Map of key policies governing the technology landscape in Pakistan

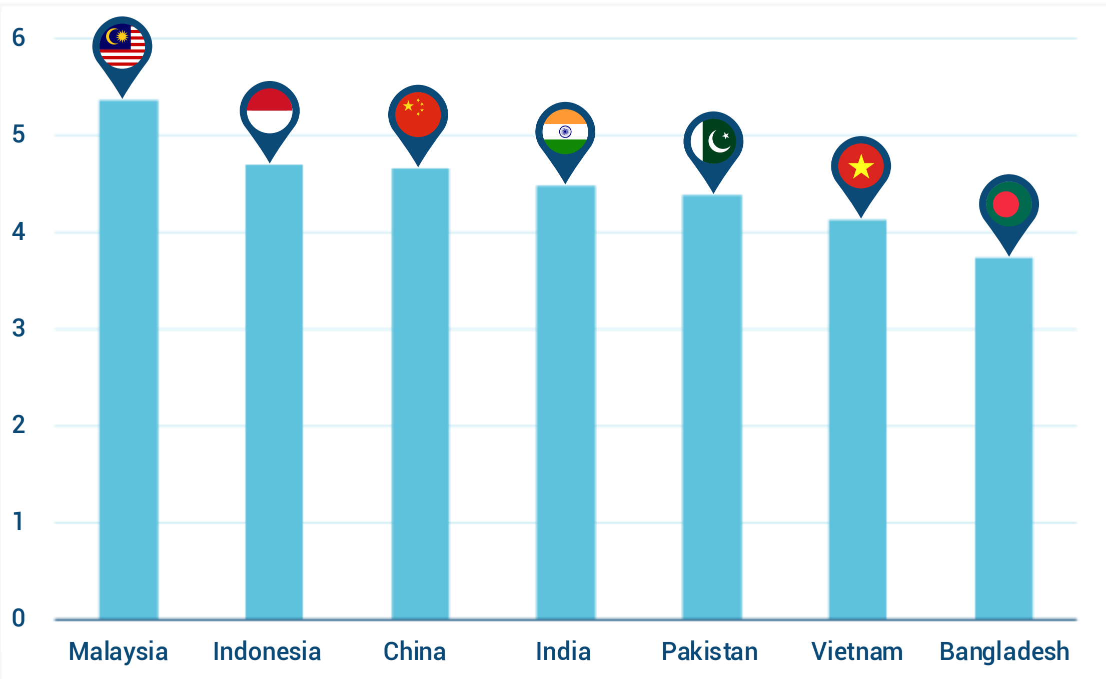


Chart 15: Ranking on FDI and Technology Transfer Index

2.3 Evidence From Other Countries

There is a lot Pakistan's policymaking can learn from the region, especially when the focus is on the right policy choices to boost foreign investment in the technology space. In this regard, the World Bank's Technology Transfer Index is a good proxy to single out regional performers that have been successful in achieving higher technology-related investments in their FDI.[26] The most recent data, available for 2017, show that Pakistan's score on this index was 4.4, in line with the world median, but lower than the Asia-Pacific leaders Singapore (5.9) and Malaysia (5.4), and lower also compared to Japan (5.1), Indonesia (4.7), China (4.6) and India (4.5). Pakistan's score on this count had been on a downward trend, before picking up in recent years, but it is still lower than peak recorded in 2007. The case studies below attempt to highlight approaches followed by regional leaders in technology transfer: Singapore and Malaysia.

Country	Progress	Approach	Flagship Initiatives
Singapore	Top-ranking 'smart city' in the world, as per several indices High degree of technology infrastructure, digital skills and technology adoption among people and businesses Leading high-tech exporter in the world	Used technology-enabled services to resolve urban challenges emanating from high urban density, land scarcity and aging population The city-state took smart city initiatives with its own resources, with the intent to nudge the private sector to follow and innovate on the lines	'Smart Nation and Digital Government Office' pioneered several smart city, IOT-based applications in areas like transportation, healthcare, waste management, energy, etc. Top-level support at the PM office that helps liaise coordination and collaboration among different departments
Malaysia	Emerging technology power in the ASEAN region, with a high concentration of high-tech exports in its overall exports Supportive government policies are helping not just hardware exports, but also bringing in foreign investment in critical areas like cyber-security, cloud computing, AI, big data, IoT, etc.	The government is leading the way. Several 'smart cities' are in the works, not just in the KL region but also in other regions line Penang. The government is working on programs to increase digital skills among the workforce to move up the ladder of technology hardware exports. It is also reducing the cost and expanding access of broadband across the country.	The government's 'Industry4WRD' initiative (2018-25) is aiming to transform manufacturing and services establishments into high-tech entities. During the pandemic, Malaysia received extensive technology FDI, as global shortages and US-China rivalry helped it to attract foreign investment in areas like biotechnology, computing equipment and electronics.

Table 5: Analysis of regional peers and approach to improving FDI in technology

3 Assessing the Tech Policy Response

3.1 A Framework for Assessing the Policy Response

The fast-evolving policy landscape for technology defines not only Pakistan's trajectory and global positioning in technology but also shapes how Pakistan evolves as an economy and society. It is therefore crucial to evaluate the direction the country is headed in and reflect on possible course corrections as government seeks to lay the grounds for a tech powered future for all Pakistanis. We use the criteria below to assess the effectiveness of the existing policy landscape.

Assessment Criteria	Description
Coherence in the Policy Architecture	Given the vast span of verticals, segments and nodes that form the technology ecosystem in Pakistan, it is imperative to have a coherent and cohesive policy architecture that aligns with a national vision and strategy. Having various policies aimed at specific verticals, segments and cross-cutting themes mandates synchronization amongst each policy and regulatory instrument for unified signalling to the market and achievement of outcomes.
Alignment of Priorities and Incentives	Stated priorities and their linkages with the needs and challenges of the sector are key to drive impact. These priorities can only be achieved though alignment of competing incentives across agencies and a clearly articulated roadmap that optimizes pursuit of short and long-term objectives with due focus on improving outcomes in the longer term.
Participatory and Agile Policy Design	Innovation and growth promised by technology is delivered through a delicate balance between public and private actors. It is essential that policymaking takes into account industry views and inputs while ensuring safeguards for the ultimate beneficiaries – Pakistanis. In addition, given the dynamic and hyper-paced global landscape, it is important to devise processes that are agile and responsive to the local and global contexts.
Governance and Capacity for Meticulous Implementation	Robust policymaking not only requires excellence in design but also in the governance structures and capacity of organisations and agencies responsible implementation. Understanding of the technology universe, how it operates and how it affects the world we live in is as critical as the domain knowledge of complex market dynamics and investment transactions.
Impact on Enabling Environment	Pakistan's nascence in technology requires significant investment to source and develop expertise, equipment, infrastructure, market linkages and a nourishing ecosystem. These investments require a conducive and investment-ready enabling and operating environment. Every successive policy effort should aim to strengthen this environment by offering an open, progressive, dynamic and stable policy framework to drive and sustain investments.

Table 6: Criteria for assessing Pakistan's tech policy landscape

3.2 Analysis of Pakistan's Policy Response

Coherence in the Policy Architecture	Transitioning to a knowledge and innovation economy has made it to the vision and long-term positioning set by political leadership for Pakistan. A long list of policy processes (described in Section 3 above) have been initiated to support Pakistan's digital and technology ambition. These policies focus on a range of critical areas that require institutional support e.g. cyber security, data protection, connectivity, female participation, skill development, boosting exports etc.
Medium	**Positive Developments** ▪ Growing recognition and cognizance of the need for a robust policy framework to develop and govern the technology sector ▪ Strong focus on key priority areas and a clear roadmap for introduction of policies ▪ Proactive approach to identification of emerging needs and initiating policymaking processes
The suite of approved and under-development policies will require a renewed and transformative approach to achieve the intended outcomes	**Challenges** ▪ Disconnect between individual policy exercises and the vision of an economic and social transformation ▪ Policies are not placing due attention on understanding Pakistan's lagging position and a clear roadmap of how we need to boost local and international participation in the sector ▪ Focus on control, rather than enablement with safeguards, when it comes to allowing businesses to operate ▪ Weak theories of change can lead to misguided focus and hence sub-optimal achievement of outcomes

E-Commerce growth in Pakistan has been one of the promising developments that is attributed to the e-commerce policy and a keen focus on improving the retail business landscape. While this priority clearly defines a range of targeted actions, social media regulations threaten the viability of such platforms to operate in Pakistan. The increasingly cross-wired nature of e-commerce and social platforms for marketing, promotion and even digital store fronts seems to be completely missing when these policies and their direction, instruments and alignment to growing this critical aspect of the digital economy is considered. Ministry of Commerce and PTA have their own views of how these policies are independent. The real impact of such disconnects will only be evident when the overarching objectives of reforming to a bigger digital economy will be compromised.

Alignment of Priorities and Incentives	Beyond spelling out the core objectives, the policymakers have not attempted to set out immediate, medium-term and long-run priorities across the breadth of policies.
Low	**Positive Developments** ▪ Vision-setting and high priority at the political leadership layer has helped garner support and traction ▪ Steering, advisory and other oversight structures have cross-sectoral representation
Short-term fiscal and siloed jurisdictional lenses are limiting adoption of a long-term strategic view of the sector.	**Challenges** ▪ Short-term priorities to curb fiscal deficit are often prioritised over longer-term strategic policy postures ▪ Host of agencies that should have aligned priorities to support holistic development of the sector pursue jurisdictional preferences that are counter-productive ▪ Better integration, coordination and support between federal and provincial programmes ▪ Adaptive focus to ensure additional attention to lagging provinces / regions

The government has limitations and compulsions – fiscal and security-related – that often collide with the imperatives of market development. On the fiscal side, the cash-strapped exchequer has historically kept higher taxes and duties on telecom and internet usage, despite calls for reduced taxes to increase adoption. By keeping spectrum scarce and high-priced, the government also aims to maximize revenues from spectrum auctions instead of facilitating higher capital spending for operators' network expansion.

What has also cast a negative spotlight is the behavior of successive governments sometimes resorting to shutting down entire online platforms (e.g. from banning YouTube in 2012 to briefly taking down TikTok multiple times across 2020-2021), in the name of maintaining public order or national security.

Overall, it appears that the government's fiscal and security compulsions, as well as the bureaucracy's inherent urge to control the business landscape, are negatively impacting development of the digital ecosystem.

Participatory and Agile Policy Design	The Ministry of IT & Telecom has a tradition of seeking extensive private sector input in forming its policies, rules and regulations. Consultants are often hired from the market to guide the process. In the first phase, draft policies are prepared based on preliminary consultations, following which market's feedback is sought to make necessary amendments, after which the policies go to the federal cabinet for approval.
Medium	
The process of consultations needs to be extended and enriched by a deeper understanding of industry dynamics, issues and realities to design policies that delivery impact.	**Positive Developments** ▪ Defined process for external inputs through consultations and participation in the policymaking stages ▪ Diversity of participation across industry/business, sector experts, rights activists, social and non-profit organisations ▪ Some responsiveness to escalations when policies pose significant risk to the sector **Challenges** ▪ Inputs received and concerns raised during consultations are not always reflected in the policy decisions ▪ Ad-hoc and/or ineffective communication around priorities, constraints and rationale for final decisions ▪ Increasing mistrust between government and industry when repeated consultative processes do not result in a mutually beneficial way forward

To develop practical regulations for e-commerce, which is a cross-cutting sector, the Ministry of Commerce put together working groups from a breadth of segments across digital ecosystem. However, the working-group approach can also succumb to bureaucratic inertia and private-sector competing interests.

Rules and regulations under the Prevention of Electronic Crimes Act (PECA) 2016 have been formulated thrice despite inputs from local and international social platforms, internet service providers, legal professionals and media and rights activists. An adjusted process has been followed every time with some modifications and despite the intervention of the Prime Minister (on request of the Asia Internet Coalition) and adverse decisions in the court of law, the rules stand at a place where they are unacceptable for local and international industry players.

Governance and Capacity for Meticulous Implementation	A splintered governance structure impacts the deep and cross-cutting integration and intersection of technology with other conventional 'sectors.' While most of the technology-related policies have been issued by Ministry of IT & Telecom, stakes of other agencies have increased over time. These include the State Bank of Pakistan (digital financial services, forex and repatriation), the Ministry of Commerce (e-commerce), Ministry of Industries (manufacturing), the Ministry of Science & Technology (standards and R&D in high-tech products), and FBR (taxes and levies). At the agency level, capacity to understand technology verticals and their linkages with strategic priorities will be critical to ensure seamless and effective implementation of approved policies. **Positive Developments** ▪ MoITT has emerged as a de jure lead agency for promoting the Digital Pakistan vision and agenda ▪ Increasing buy-in and acceptance of the role of technology in disrupting the status quo ▪ Upcoming cohorts in the bureaucratic structures are digital-savvy and understand the technology ecosystem **Challenges** ▪ Investors need to follow complex, multi-track and unclear set of processes to secure requisite approvals from different agencies ▪ Conflicting and/or redundant interactions with multiple agencies leads to mixed signal for investors with regards to the policy direction ▪ Decision-makers at the middle tiers require considerable capacity development to drive processes that can keep up with the pace of global and private sector developments ▪ Multiplicity of policies has given rise to fragmentation and complexity in implementation, as different regulatory bodies are unable to collaborate in a proactive manner to achieve results
Low	
While some progress has been achieved under this splintered governance regime, it has created a significant degree of confusion, friction and lost opportunities among investors.	

Investors who are interested in mobile phone manufacturing have to knock on doors of several ministries – from Ministry of Industries to Ministry of IT & Telecom, to regulators like PTA, FBR and SBP, for requisite approvals and authorizations. One-window facilitation does not exist because regulators have their own turfs to protect.

Impact on Enabling Environment	The enabling environment concerns issues like contract enforcement, dispute resolution, intellectual property rights, and consistency in policy landscape.

Medium

Favourable developments in the market have taken place despite and not because of the overall operating environment.

Positive Developments

- Regulatory developments at SECP and SBP particularly related to outward remittances, profit repatriation, holding and equity management have bolstered VC confidence
- Establishment of STZA with a solid mandate and backing from the PM Office delivers an attractive package
- Budding enterprises have developed new business models and help validate opportunities and confidence in local talent and market

Challenges

- Weak contract enforcement, dispute resolution and investor protection measures increase reliance on the already overburdened judicial system
- Accountability structure and processes hinder the type of progressive and market-oriented decision-making that should drive policy and administrative decisions
- Stability and certainty of policy direction increases the risk profile significantly and adds to the macroeconomic exposure especially in terms of currency depreciation

The nature of investment-related issues in the broader economy also permeate into the digital ecosystem. Just as IPPs in the energy sector and Reko Diq saga in the mining sector, the telecoms sector has also seen its fair share of government-investor issues.

For instance, the PTCL-led International Clearing House for LDI telephony ended up in litigation. The PTCL privatization process, despite being the largest privatization deal to date, remains unresolved despite a decade and a half since the transaction was completed. While recent discussions with Government of Pakistan and Etisalat signal towards a renewed approach, the processes for such long-drawn issues are complex and require considerable time and procedural compliance for investors who operate in a dynamic global environment.

Cellular operators recently had to take the government to court over license renewal terms. The lack of participation by three leading mobile network operators in latest spectrum auction can be seen in the background of a challenging regulatory and operating environment in a price-sensitive market in the midst of an inflationary cycle.

4 The Way Forward

Improving the technology investment ecosystem in Pakistan is an effort that will demand a wholesale set of changes in at least two policy verticals: how Pakistan plans and executes investment policy, and how Pakistan approaches the legal, regulatory and policy aspects of technology. At the present time, there is substantial policy overlap, confusion, and incoherence—both within these two verticals, and across efforts to cross pollinate between them.

There are three overarching pressure points that compel Pakistani policymakers to initiate reforms and changes that will energize the tech investment ecosystem in Pakistan.

1. **Fiscal and monetary pressure on the economy** that can only be addressed through increased exports and higher FDI—both are increasingly going to be informed by the technology ecosystem.
2. **Widely acknowledged administrative complexity** from complex rules of business to the threat of unfair and unfounded allegations of corruption—that prevents risk taking and swift decision making by government officials—a problem that is oft-acknowledged but rarely tackled.
3. **Demography**—Pakistan's median age is 23. There is no way for the economy but to become more tech friendly, in order to offer the kind of growth that the country's youth cohort requires.

The single largest window of opportunity to alter the technology investment ecosystem in the country may be offered by the Special Technology Zones Authority (STZA)—which is expected to become legally sanctioned through an act of parliament as early as before the end of September 2021. Once in place, the STZA offers an array of policy fixes that will remove the traditional hinderances to technology investments in Pakistan. But the wider set of problems facing the country cannot be altered by the potential island of excellence that STZA will help establish. One of the challenges for the political and policy leadership in the country will be to ensure that STZA succeeds, but that its success does not become an excuse to shirk the responsibility for wider, wholesale administrative and structural reforms necessary to fix the entire policy matrix as it relates to technology investments.

There are two categories of recommendations that our analysis leads to. A series of immediate, very specific actions and a set of longer-term changes that the system requires. These recommendations are organised against the two-axis structure discussed earlier – improvements and fixes along the investment regime and technology policy axis – both of which are essential to create an outlook that manifests the anchoring role technology can play for Pakistan's propulsion in this decade.

4.1 Priority Recommendations: Immediate Interventions

There are three areas in which some immediate changes can and should be made. The first is the investment climate, the second is the quality of connectivity in the country (the very foundation on which the technology sector will grow), and the third is strategic communications around technology and investment at large.

4.1.1 Fixing the Investment Climate

Recommendation 1 – Protect rights of existing investors

In the quest to lure new investors, it is easy to lose sight of existing investors, who are in a much better position to potentially invest more and more importantly serve as successful case-studies and investment ambassadors for new investors. However, a spate of investor-government disputes, both within telecom sector and outside sectors, have a pattern of ever-pending issues and long-drawn legal disputes. Often adverse decisions in local courts lead to a costly and extended appeals process often resulting in maintenance of status quo. The taxman's opaqueness and high-handedness is also well established and can be correlated to tax performance during the year. To give confidence to existing investors, a starting point for the government should be to take steps in institutionalising a proactive and responsive approach with regards to communication, follow-ups and clarity of processes. This should be supported with avoidance of litigation in local courts by allowing dispute resolution via local and international commercial arbitration channels. While full profit repatriation is allowed, foreign investors will be better able to exercise their right to receive dividends when moving money out of Pakistan is actually seamless.

Recommendation 2 – Strengthen the STZA model

To attract technology-related investments, the STZA model needs to be improved. The fiscal incentives within the zones have the legislative cover, but the zone developers and zone enterprises will face the same issues if the Authority is not empowered to deal with all kinds of regulatory approvals and processes. While the STZA is developing a one-window solution, it will still rely on internal processes and red tape with government agencies. STZA needs to be empowered on the lines of Dubai's DIFC and other such progressive bodies, so that technology investors not only have a unitary interface with the government in a safe and welcoming environment, but also experience efficiency in smooth and speedy processes and high-quality interactions. The Zone Enterprise License issued by STZA should, by default, take care of different regulatory approvals.

STZA will also do well to follow the technology cluster approach, as Pakistan is not suited for all kinds of technology-related investments. Currently, the Authority has identified prospective investment areas in biotechnology, cyber security, block-chain, artificial intelligence, and business process outsourcing. However, the last avenue sounds more realistic, considering the fact that Pakistan's export-oriented IT workforce is mostly trained in IT BPO. Other high-tech avenues cited above will require a different and long-term investment attraction strategy.

Recommendation 3 – Invest in human capital development for technology sector

Human resource is the raw material for IT exports, and Pakistan faces a shortage of this critical input. For each additional USD 1 billion in software exports, Pakistan needs 40,000 software engineers, whereas the current supply of employable IT graduates is about a sixth of that. This situation threatens to compromise further investment in this space as well as the government's target to double IT exports. To bridge the skills gap, in the near term, bodies like PSEB should work with IT companies to develop a strategy to attract foreign remote IT workers to help grow IT exports, train new talent to boost productivity and re-skill existing workers to become better aligned with global demand. Diagnostics to identify local and international demand trends and commissioning of training programmes that are closely aligned with the value-add required for boosting the pool of expertise available for tech enterprises to draw on. This will require a mix of skilling and re-skilling graduates of vocational training and tertiary education programmes. The government should incentivize short-term immersive, intensive and deliverable-based digital skill development courses (on the lines of digital boot camps) to prepare export-facing talent.

4.1.2 Improving Connectivity

Recommendation 1 – Bring changes in how radio-frequency spectrum is offered to the market

The expansion of digital ecosystem is indirectly linked with the market's ability to put more spectrum to use. There is merit in the long-held argument by mobile network operators that they are not left with enough cash flows to roll out data networks after they are made to pay hefty fees to acquire additional spectrum. The government needs to have a long-term approach to market development, instead of prioritizing short-term fiscal imperatives. It is time to introduce reforms in spectrum management, starting with issuing a five-year spectrum auction calendar provides certainty to market players. As for pricing, let the market be the determinant of per MHz price, by allowing spectrum sharing and spectrum trading in the secondary market.

Recommendation 2 – Curb predatory pricing behaviour to improve ROI of telecom operators

At PKR 500 billion annual revenues, Pakistan's telecom market is deemed under-monetized considering the market fundamentals. There is stiff price competition, and there is fear that what happened with voice is also being repeated with data, as ARPU remains stuck at level of Rs223 per month for several years. While safeguarding consumers, the telecoms regulator must provide a balanced approach where they enable the operators to have a decent return on their investments. This will require issuing regulations to curb predatory pricing behaviour by any operator.

Recommendation 3 – Arrest the decline in quality of service

Without a reliable digital foundation, further investment in the ecosystem will be hampered. The quality of voice and data services is noticeably deteriorating, as operators try to re-optimize their existing spectrum to cater higher data traffic at the cost of voice. The operators blame operating challenges (including high spectrum fees), while the regulator seems unable to apply corrective measures. This situation is unsustainable and it will hurt the foundation of digital ecosystem. While the operators need to be accommodated on their genuine demands, the regulator needs to strengthen the existing QoS perimeters and ensure active compliance by penalizing operators whose QoS performance comes below the minimum threshold. A clear precedent in this regard will send a signal to operators to invest more in their networks, and in turn not engage in predatory pricing so that they can monetize their investments better.

4.1.3 Establishing Technology as a Value & Norm

Recommendation 1 – A Campaign for "Tech Destination Pakistan"

The levers of the government and the leading lights of the private sector need to be engaged in a campaign of branding Pakistan as a technology oasis. After all, technology FDI can come with both market-seeking (digitally-connected middle class) and efficiency seeking (thousands of digitally-skilled and wage-competitive people) objectives. Public and private messaging by the Pakistani leadership and Pakistani elites needs to align with the importance of technology as a driver and shaper of the economy and society.

Recommendation 2 – Fixing the Investment Promotion Matrix

The Pakistani state needs to engage in economic diplomacy for IT exporters by using strategic leverage with friendly governments to get Pakistani IT workers more exposure in foreign markets. G2G engagement and bilateral facilitation is essential to unlock export opportunities in markets overseas. The existing structures of the PSEB and the TDAP cannot adequately exploit the opportunities available to Pakistani technology enterprises and entrepreneurs, nor to technology workers—whether located within Pakistan, or those that need to move overseas to service their clients or firms. A focused public sector effort that drives greater investment, increased export of services earnings and widens the footprint of Pakistani talent beyond Pakistan's shores is essential to fix the wider technology investment ecosystem.

Recommendation 3 – Showcase and aggressively promote flagship deals and case studies

Top local IT companies feel that there is need for better job on government's end to showcase local market fundamentals, major deals and success stories in the key markets abroad. It is time to spend both research and marketing dollars to put Pakistan's story out. Roadshows should be arranged in liaison with embassy staff and leading diaspora in leading financial and technology centres of the world.

4.2 Longer Term Recommendations: System-Wide Reforms

4.2.1 Fix the Vision and Align the System

Recommendation 1 – Establish an umbrella framework for technology investment policy

The transformative potential of technology to develop, grow and trickle down will require time and space to operate on a fundamentally different turf. Policies that affect how technology businesses operate in Pakistan will be as important as more general incorporation, compliance and operational regulations. This will require a comprehensive vision and agenda setting exercise to chart out a national plan that is very closely aligned with long-term outcomes and impact and clearly articulated shared goals and responsibilities underpinned with a strong theory of change to ensure success. While the MoITT has successfully taken over as the Digital Pakistan flagbearer, a revamp of the plan is required to deliver a more cohesive, integrated and urgent tech policy suite for the sector.

Recommendation 2 – Develop a roadmap for technology investment in Pakistan

This will require the system to optimise short and long-term priorities to create entrepreneurial thinking and space for impactful decision-making. There is an inherent friction between market development goals of line ministries like the Ministry of IT & Telecom, Commerce and Science & Technology and fiscal imperatives of the Ministry of Finance, FBR and SBP. A clear roadmap, informed by rigorous evidence, of how the technology sector needs to evolve and the series of strategic choices that need to be made along the way should inform successive decisions that will impact outcomes beyond the electoral term. This will also help determine the obvious and intricate linkages between a technology driven digital economy and how new avenues for addressing some of the chronic fiscal pressures can be created in future.

Recommendation 3 – Institute consensus on shared priorities to align competing incentives across public sector agencies

A delicate balance is required for Pakistan to integrate and become a contributing member in the Fourth Industrial Revolution. Competing priorities and incentives like security considerations, dominance and control over enterprises through regulation, maintaining status quo around political economy etc will need to be aligned to allow for a conducive national framework for digital enterprise to invest and grow. We will need to embrace dynamics of the tech realm and understand that Pakistan's lagging position will need to drastically change for us to yield dividends of our demographic profile. A new consensus on priorities and their influence on the policy environment will have to be crafted by aligning interests of political, bureaucratic and businesses stakeholders. Line agencies should then be given clear mandates to ensure that conflict in objectives and outcomes are resolved across the range of existing and upcoming policies.

4.2.2 Market Development

Recommendation 1 – Institute a skills emergency

The skills emergency requires a mix of short-term interventions on a war-footing as well as a strategic reconfiguration of the higher, technical and vocational training streams. Attracting top international universities and education institutes to establish local campuses/partner with local universities and institutes to improve curriculum and standards, align and co-invest with the industry and focus on local and international placements through strong linkages and networks. These efforts will require close alignment and coordination among public and private actors – government agencies and regulators like Higher Education Commission (HEC), National Vocational and Technical Training Commission (NAVTTC) and business and enterprises and build on the momentum established through early efforts in programmes like Hunarmand Jawan.

Recommendation 2 – Promote localisation to boost capacity of domestic firms

A carefully structured localisation plan for Pakistani technology firms especially SMEs should be developed to promote participation in indigenous technology development and procurement. This will lead to increased demand for skilled workforce and corresponding structural shifts in supply. In order to develop capacity, large-scale international firms can partner and form joint ventures to support local partners. These changes will require a mix of structural adjustments in procurement rules and some seeding initiatives where more established firms can help small and/or less mature outfits to collaborate and evolve.

Recommendation 3 – Accelerate digitisation in the government

Digitisation of the public sector is complex undertaking with numerous legislative, administrative, capacity and political economy challenges. However, the sheer scale, scope and interconnectedness of the public sector systems and services offers a catalysing opportunity to not just increase domestic technology spend but also for firms and professionals to engage and grow with this process. Digitisation of the government also creates opportunities for addressing legacy challenges through innovative solutions and offerings and creates opportunities for agile startups and disruptors to offer solutions at scale and/or build on rails that public sector systems offer. Digitisation efforts at all levels in the government should be fast-tracked with triple the speed with legislative cover to ensure irreversible and time-bound transformations that lead to market ripples.

Recommendation 4 – Protect intellectual property rights

The Intellectual Property Organisation-Pakistan needs to have a more visible role in ensuring copyright and trademark protection of existing players and foreign investors in the digital ecosystem. It needs to create a robust feedback mechanism where IPR infringement is instantly reported by aggrieved entities and penalties are instantly enforced and publicized for proven violations.

4.2.3 Overhaul Governance and Capacity

Recommendation 1 – Revamp the Institutional Architecture

The range of agencies (MoITT, PTA, MoST, BOI, SECP, SBP) participating and driving various aspects of how investment flows into Pakistan, quality of interfaces and interactions for investors and the set of policies and regulations they will be subjected to needs to be revamped. The ideal state for this is to have one agency as the investment front which ensures a seamless, consistent and high-quality interface for investors with rapid information exchange and collaboration to resolve investor queries and concerns. While this may require a complex and long-drawn reform process, STZA's one-window will serve to demonstrate as a model for replication. Similarly, for ensuring consistency and coherence across the policy domains, a single lead ministry should be responsible for a well-though of policy architecture and implementation responsibility. This may require a restructuring (merging and dissolution) of redundant and duplicated responsibilities, functions and administrative powers and creating one ministry with relevant divisions to support a unified approach, aligned priorities and associated accountability for results.

Recommendation 2 – Behaviour Change – Understand the Technology World

There is a need to improve the capacity of senior and mid-level bureaucracy, especially among MoITT, BoI, and FBR, to understand the complexity of digital ecosystem and the need for more investment in this space. A mindset change is in order from command and control to facilitation and support, to reduce transaction costs for both established firms and budding startups. While bringing in private sector professions in regulatory leadership roles is one way to address this issue, more long-lasting solution could be to allow lateral entry for local market professional to join mid and senior level bureaucratic tiers, which will create a unique blend of public and private sectors within the government to help develop the technology ecosystem.

Recommendations 3 – Double down and deepen the performance agreements framework instituted by the Establishment Division

The current file-and-sign model of governance impedes progress for the private sector as bureaucrats take cover behind fiduciary responsibilities. The leading relevant ministries and regulatory bodies should have their performance appraisal linked to outcomes on investment, measured by objective criteria of facilitation activities and deal flows. The rules of business may need to be changed in order to achieve a results-oriented governance system.

Endnotes

[1]The World Bank. (2020). *Population growth (annual %) - South Asia, Lower middle income, Pakistan*. https://data.worldbank.org/indicator/SP.POP.GROW?locations=8S-XN-PK&name_desc=false

[2] Ministry of Finance. (2021). *Economic Survey of Pakistan, FY21*. https://www.finance.gov.pk/survey/chapters_21/PES_2020_21.pdf

[3] State Bank of Pakistan. (2021). *The State of Pakistan's Economy. Third Quarterly Report (FY21) – Special Section: Private Credit Bureaus in Pakistan - Enhancing Credit Penetration by Addressing Information Asymmetries*. https://www.sbp.org.pk/reports/quarterly/fy21/Third/Special-Section.pdf

[4] Ul Haque, N., Rafi Ullah, R. (2020). *Estimating the Footprint of Government on the Economy*. Pakistan Institute of Development Economics. https://www.pide.org.pk/pdf/Working%20Paper/WorkingPaper-2020-26.pdf

[5] Harmes-Liedtke, U. & Oteiza, J.J. (2020). *Global Quality Infrastructure Index Report.* https://www.researchgate.net/profile/Ulrich-Harmes-Liedtke/publication/350589103_GLOBAL_QUALITY_INFRASTRUCTURE_INDEX_REPORT_2020_TITLE_Global_Quality_Infrastructure_Index_Report_2020/links/609e7e9792851cfdf332b69c/GLOBAL-QUALITY-INFRASTRUCTURE-INDEX-REPORT-2020-TITLE-Global-Quality-Infrastructure-Index-Report-2020.pdf

[6] United Nations Population Fund. (2021). [Pakistan Data]. https://www.unfpa.org/data/PK

[7] Nayab, D. (2006). *Demographic Dividend or Demographic Threat in Pakistan*. Pakistan Institute of Development Economics. https://pide.org.pk/pdf/Working%20Paper/Demographic%20Dividend%20Final.pdf

[8] World Bank. (2020). *Pakistan: Human Capital Index.* https://databank.worldbank.org/data/download/hci/HCI_2pager_PAK.pdf?cid=GGH_e_hcpexternal_en_ext

[9] Bongaarts, J., Royan, R. & Sathar, Z.A. (2013). *Capturing the Demographic Dividend in Pakistan.* Population Council. https://pakistan.unfpa.org/sites/default/files/pub-pdf/2013_CapturingDemoDivPak_0.pdf

[10] World Bank. (2020). *Who on Earth can Work from Home.* https://documents1.worldbank.org/curated/en/225881596202941026/pdf/Who-on-Earth-Can-Work-from-Home.pdf

[11] Bestsennyy, O., Gilbert, G., Harris, A. & Rost, J. (2021). "Tele-health: A quarter-trillion-dollar post-COVID-19 reality?" *McKinsey.* https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/telehealth-a-quarter-trillion-dollar-post-covid-19-reality

[12] Mascarenhas, N. (2020). "To win post-pandemic, edtech needs to start thinking big." *Tech Crunch*. https://techcrunch.com/2020/12/22/to-win-post-pandemic-edtech-needs-to-start-thinking-big/

[13] World Bank. (2020). “How countries are using edtech to support remote learning during Covid-19.”
https://www.worldbank.org/en/topic/edutech/brief/how-countries-are-using-edtech-to-support-remote-learning-during-the-covid-19-pandemic

[14] IMD. (2020). “Singapore, Helsinki and Zurich triumph in global smart city index.”
https://www.imd.org/news/updates/singapore-helsinki-zurich-triumph-global-smart-city-index/

[15] Pakistan Telecommunication Authority. (2021). [NGMS Subscribers (Annual)]. Telecom Indicators.
https://www.pta.gov.pk/en/telecom-indicators/1#ngms-subscribers

[16] State Bank of Pakistan. (2021). *Import Payments by Commodities and Groups, July to June 2020-21.*
https://www.sbp.org.pk/ecodata/Import_Payments_by_Commodities_and_Groups.pdf

[17] State Bank of Pakistan. (2021). *Payment Systems Review (Quarterly), January to March 2021.*
https://www.sbp.org.pk/psd/pdf/PS-Review-Q3FY21.pdf

[18] State Bank of Pakistan. (2021). *Branchless Banking Statistics, April to June 2021.*
https://www.sbp.org.pk/acd/branchless/Stats/BBSQtr-Apr-Jun-2021.pdf

[19] State Bank of Pakistan. (2021). *Exports and Imports of Goods and Services, July to June 2020-21.*
https://www.sbp.org.pk/ecodata/ExportsImports-Goods.pdf

[20] Data Darbaar. (2020). Yearly Investments
https://datadarbaar.com/

[21] Invest2Innovate. (2021, June 30). Deal Flow Tracker
https://airtable.com/shrsy589UNNLpKHXD/tblFRzINDGrn78ZTd/viwOtx6u0yBwMtW9a?blocks=hide

[22] Kay, C. & Mangi, F. (2021, August 18). *Shopping Delivery Service Raises $85 Million, a Record for Startups in Pakistan.* Bloomberg.
https://www.bloomberg.com/news/articles/2021-08-18/airlift-scores-record-pakistan-startup-funding-as-commerce-booms

[23] Husain, I. (2020). *Pakistan: The Economy of an Elitist State* (2nd ed.). Oxford University Press, Pakistan. https://global.oup.com/academic/product/pakistan-the-economy-of-an-elitist-state-2e-9780199406616?cc=us&lang=en&#

[24] UNDP. (2021, April 6). “Pakistan National Human Development Report (NHDR) 2020. “https://www.pk.undp.org/content/pakistan/en/home/presscenter/pressreleases/2021/undp_s-pakistan-national-human-development-report-on-inequality-.html

[25] Muhula, R. (2019, March). “Pakistan @ 100: Governance and Institutions.” *World Bank.*
https://documents1.worldbank.org/curated/pt/819251552645668502/pdf/Pakistan-at-100-Governance-and-Institutions.pdf

[26] World Bank. (2017). FDI and Technology Transfer Index.
https://govdata360.worldbank.org/indicators/h994af3b6?country=PAK&indicator=717&countries=CHN,IDN,IND,MYS,VNM,BGD&viz=bar_chart&years=2017&indicators=944

Blank Page

TABADLAB

UNDERSTANDING CHANGE

www.tabadlab.com