

Technology

Sector Study



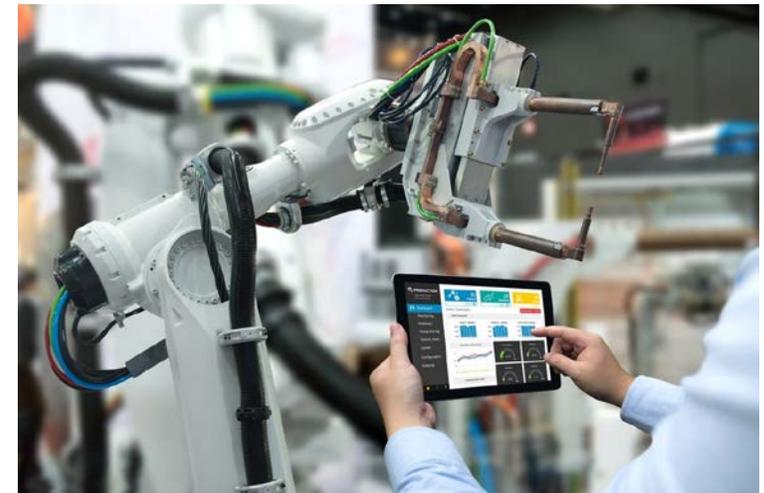
Contents	Page No.
Introduction	1
Global Industry Overview	4
Local Industry Overview	5
Local Start-ups and VC ecosystem	6
Trade of Computer Services	7
Business Risk	8
Finical Risk	10

Contents	Page No.
Ratings Curve	12
Regulatory Framework	13
SWOT Analysis	15
Outlook & Future Prospects	16
Bibliography	17



Introduction

- Technology is defined as the application of scientific knowledge for practical purposes. The world has progressed at a rapid pace in terms of technological advancements in various fields such as engineering, medicine, communication and manufacturing.
- The tech industry encompasses the category of businesses involved in research, development, or distribution of technologically based goods and services. Some examples are the manufacturing of electronics, development of software, computers, or other products and services related to information technology and industrial automation.
- The industry caters to the needs of all businesses (B2B and B2C) including both consumer centric and others. Producers of consumer goods such as computers, mobile devices, home appliances and televisions etc. are continuously aiming to develop new and more technologically advanced features in order to attract customers.
- For businesses (mainly industrial manufacturing), advancements in technology enables them to achieve better quality and higher efficiency. This encompasses industrial and systems automation, software development and communication systems etc. A key aspect of this technology is that it often provides critical information and services that enable businesses to make key strategic decisions. It is also vital for businesses to maintain up to date technology in comparison to their competitors or they may find themselves at a disadvantage or even becoming non-competitive.
- This sector study will particularly focus on systems automation and software segments of the tech industry.

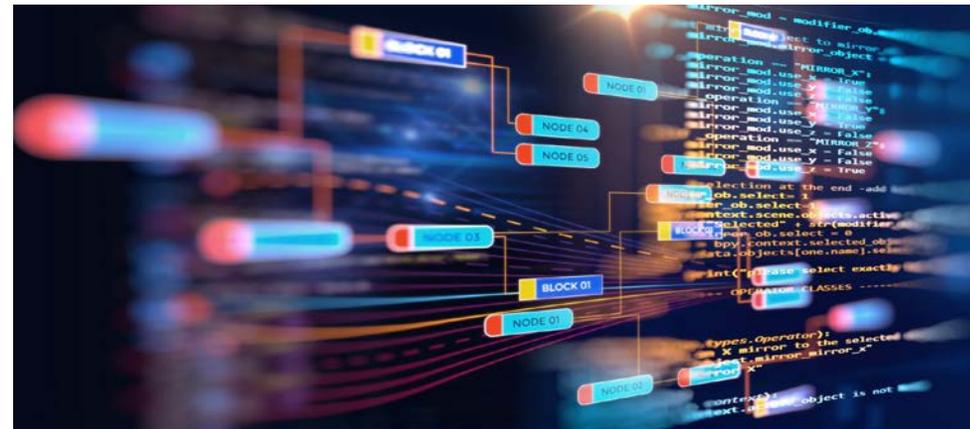


Automation & Process Control

- Automation and process control is used in industrial settings to control the conditions in which a product is made through technology.
- The use of automation and process control in industrial setting allows the advanced systems to make required adjustments within established parameters. It relies on specialized control systems that manage the flow, output and other aspects of an industrial process based on feedback obtained from sensors and data monitoring systems.
- The main advantage of implementing automation and process control is increased efficiency and better quality. Automation and process control minimizes human intervention beyond the monitoring of each system. As a result, steps that would otherwise be time-consuming can be carried out swiftly by the automated system while reducing chances of human error, thus reducing wastages or redundancies. In addition, it also enables repetitive tasks or operations to be carried out efficiently while ensuring compliance with required standards is strictly observed.
- Process control is typically implemented in industries where continuous production occurs. Some examples are:
 - **Pharmaceuticals**: Extreme precision is required when producing medicines as there is no room for even minor errors. Therefore, automation and process control is used to minimize human error and guarantee the safety of medicines produced.
 - **Petrochemicals**: Process control can be used to closely monitor the refining and production process to ensure consistent quality and uninterrupted production.
 - **Food & Beverage**: The food and beverage industry must comply with specific health standards and process control can be used to monitor and adjust the ingredients or required temperature to ensure a high quality output.
 - **Energy**: These systems are used to control power production ensuring adequate supply while monitoring fuel levels, temperature etc. In addition, they are also used to control pressure in oil and gas pipelines to ensure safety and continuous supply.

Software

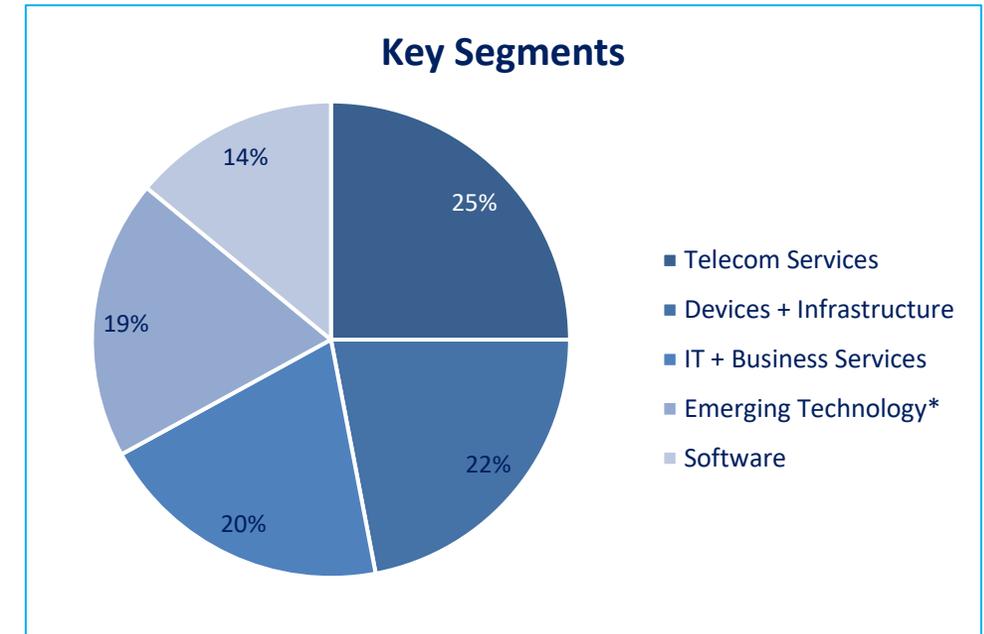
- Software can be defined as a set of instructions or programs that enable a computer to execute specific tasks. It is a generic term used to describe programs that run on PCs, mobile devices and other smart devices. It includes operating systems, diagnostic tools and a variety of applications.
- There are three basic categories of software:
 1. **Programming Software:** a set of tools to aid developers in writing programs. The various tools available are compilers, linkers, debuggers, interpreters and text editors.
 2. **System Software:** serves as a base for application software. System software includes device drivers, operating systems (OSs), compilers, disk formatters, text editors and utilities helping the computer to operate more efficiently.
 3. **Application Software:** is intended to perform certain tasks. Examples of application software include office suites, gaming applications, database systems and educational software.



Technology

Global | Overview

- The market size of the global tech industry, which encompasses hardware, software, services and telecommunication, in terms of spending is estimated to stand at USD~5trn in CY21 as compared to USD~4.8trn in CY20.
- The industry is expected to return to its former annual growth rate of ~5%-6% and its market size is expected to reach USD~5.3trn in CY22.
- The technology industry is led by USA with a market share of ~33%, approximately USD~1.8trn in value terms; Europe is also a major contributor to the technology sector, representing ~20% of total technology spending.
- China has also established itself as a major player in the technology sector as it is closing the gap in traditional technologies (i.e. Software, services and IT infrastructure) while taking the lead in emerging technologies (i.e. robotics and 5G); the overall Asia Pacific region represents ~14% share in the global IT industry.
- The adjacent pie chart shows some of the key segments of the tech industry and their respective shares in the total market size. The largest segment is telecom services which contributes ~25% to the total market followed by devices and infrastructure which accounts for ~22% of the total.



Largest Tech Companies by Market Cap (May '22)

Name	Market Cap (USD bln)
Apple	2,472
Microsoft	1,910
Alphabet (Google)	1,486
Amazon	1,088
Meta (Facebook)	518

* Emerging technology refers to new or developing technology that does not fit into the traditional categories such as Artificial Intelligence (AI) or Internet of Things (IoT).

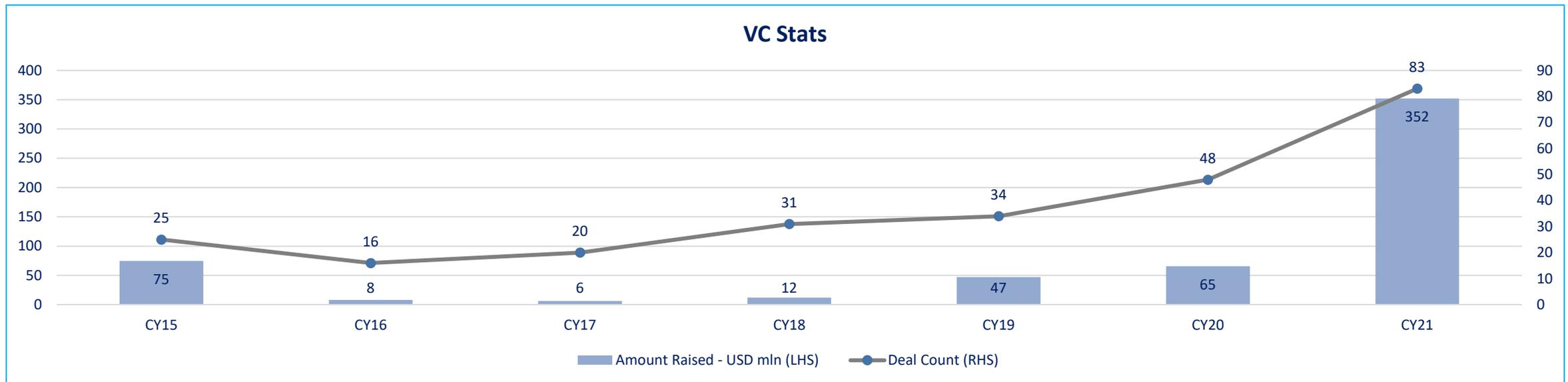
Local | Overview

- Pakistan’s tech industry contributes ~1% to the national GDP and stood at approximately PKR~430bln in FY21 (FY20: PKR~362bln) with the domestic market size for technology products and services estimated to be PKR~163bln in FY20 (FY21: PKR~187bln); meanwhile, during FY21, exports of the total tech industry increased to PKR~267bln (FY20: PKR~175bln).
- The industry comprises of over ~3,000 companies with this number expanding each year. These companies operate in a wide array of areas such as customized software development and Business Process Outsourcing (BPO) services.
- The industry employs over 500,000 professionals, many of whom have expertise in latest and emerging IT products and technologies; in addition, around 25,000 IT graduates and engineers are being produced in the country each year.
- In recent years, the government has increased its focus on the tech industry and recognized the potential for growth and investment that exists; The Ministry of Information Technology & Telecommunication (MoITT), through bodies such as the Pakistan Software Export Board (PSEB), has taken various steps such as the establishment of IT Parks and incubators to promote the industry and provide an enabling ecosystem for businesses and start ups.

Overview	FY20	FY21
Industry Revenues (PKR bln)	362	430
Technology Exports (PKR bln)	175	267
Exports Growth	24%	50%
IT Professionals	~500,000	
IT Graduates per Year	~25,000	
Industry Structure	Competitive	
Regulators	MoITT & PESB	
Association	PASHA	

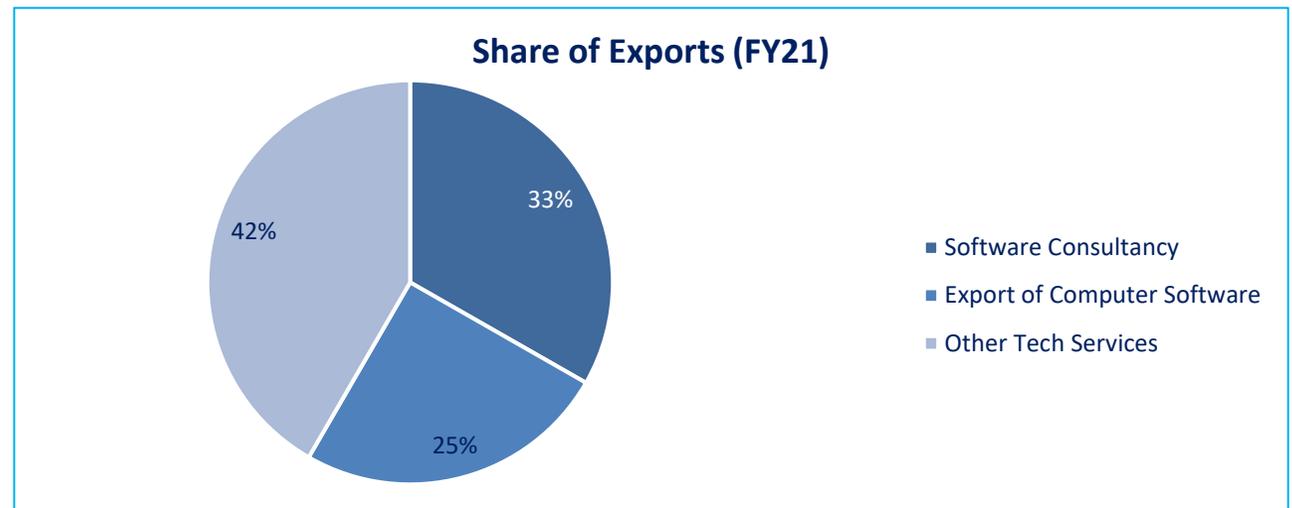
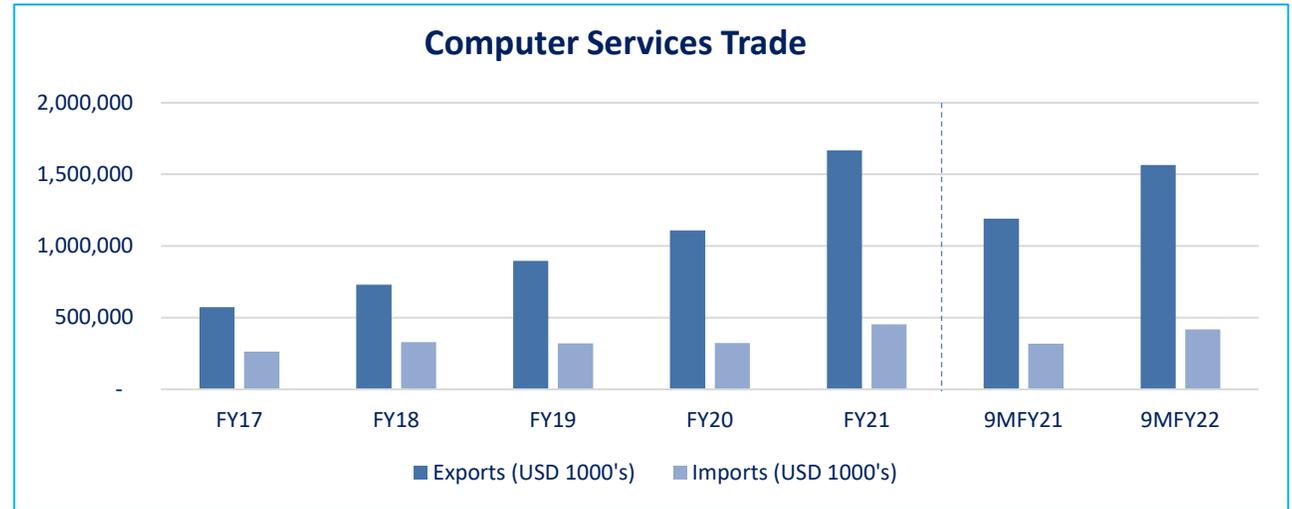
Local | Start-ups and VC ecosystem

- PSEB has established 22 IT Parks in various city centres of the country, with plans to increase the number to 40; they provide essential infrastructure to tech companies at lower costs; in addition, the government has also established a National Incubation Centre to develop and cultivate start ups in the country. Moreover, there are several private incubators operating in the country as well with many having a focus on tech related products and services.
- Technology based start-ups and venture capital (VC) ecosystem in Pakistan have also started gaining traction; since CY15, start-ups have raised over USD~564mln across 255 deals; while there was a consistent rise in fundings, 438% YoY growth in fundings in CY21 proved to be the inflection point as start-ups raised USD~352mln across 83 deals reflecting 2/3rd of the total amounts raised since CY15.
- Since CY15, e-commerce sector raised the highest investments of USD~315mln; followed by fintech start-ups which raised USD~113mln, of which USD~95mln was raised in CY21 alone.



Local | Trade of Computer Services

- The category of computer services encompasses hardware and software consultancy services, trade of computer software and other technological services.
- Since FY17, Pakistan’s exports of computer services has grown with a CAGR of ~35% and stood at PKR~267bln during FY20 (FY19: PKR~175bln); meanwhile, imports of computer services have also grown, albeit at a lower CAGR of 21% since FY17; during FY21, imports stood at PKR~73bln (FY19: PKR~51bln).
- During FY21, the largest contributor to exports at ~33% was software consultancy followed by the export of computer software, which contributed ~25% to total computer service exports.
- During 8MFY22, exports stood at PKR~231bln, exhibiting an increase of ~39% YoY. Meanwhile, imports during the period stood at PKR~64bln, a growth of ~42% from the comparative period.

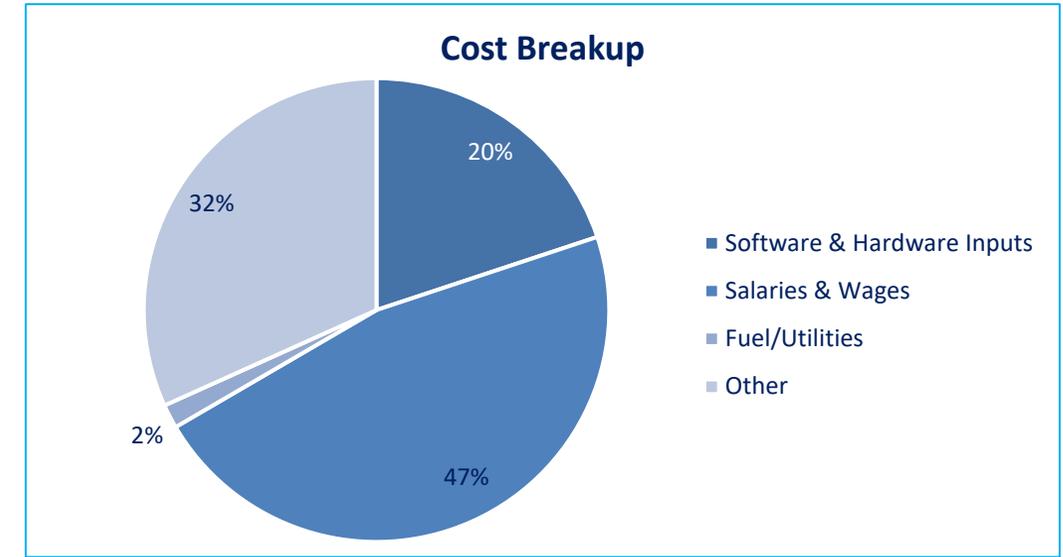
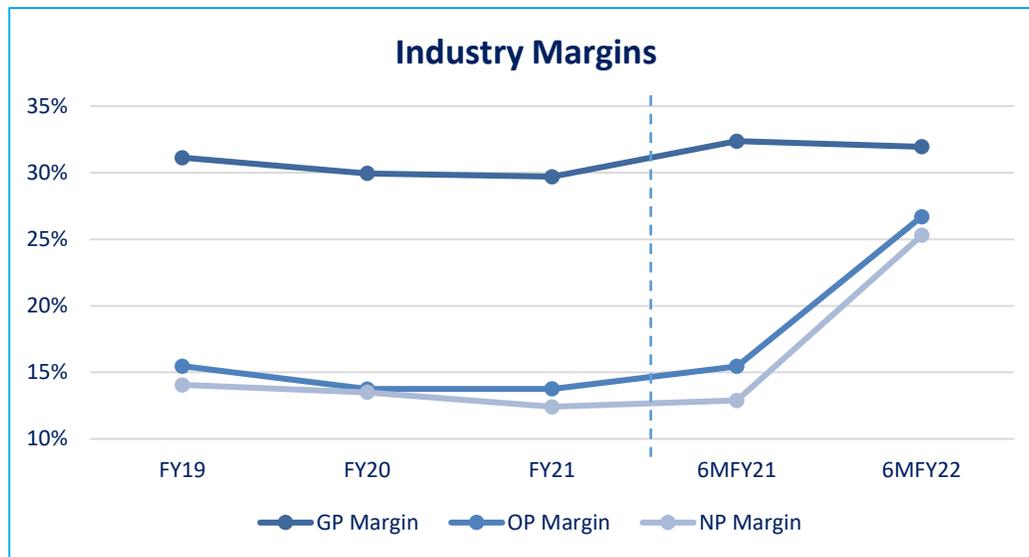


Business Risk

- **Fast Paced Growth:** The tech industry is among the fastest growing industries and new developments and technologies are continuously being introduced. Players must keep pace with new and relevant upgradations in technology or they may lose competitive advantage or even risk becoming obsolete in the long run.
- **B2B Model:** Since many players within the tech industry are involved in providing services to other businesses, their demand depends on conditions in these client industries. If the overall economy, or any client industry or sector is not doing well, it would hamper the creation of new demand for tech players providing services.
- **Digital Literacy:** Mobile phone usage in Pakistan has increased exponentially in recent years and has resulted in increased digital literacy among the population. However, while there may be addition of approximately 25,000 IT graduates each year, this is still a small proportion of Pakistan's total population of over 220 million.
- The majority of population, particularly those residing in rural areas or belonging the low income groups, remain lacking in digital literacy particularly regarding advanced technologies. As a result, this limits or restricts the potential of the domestic tech industry.

Business Risk

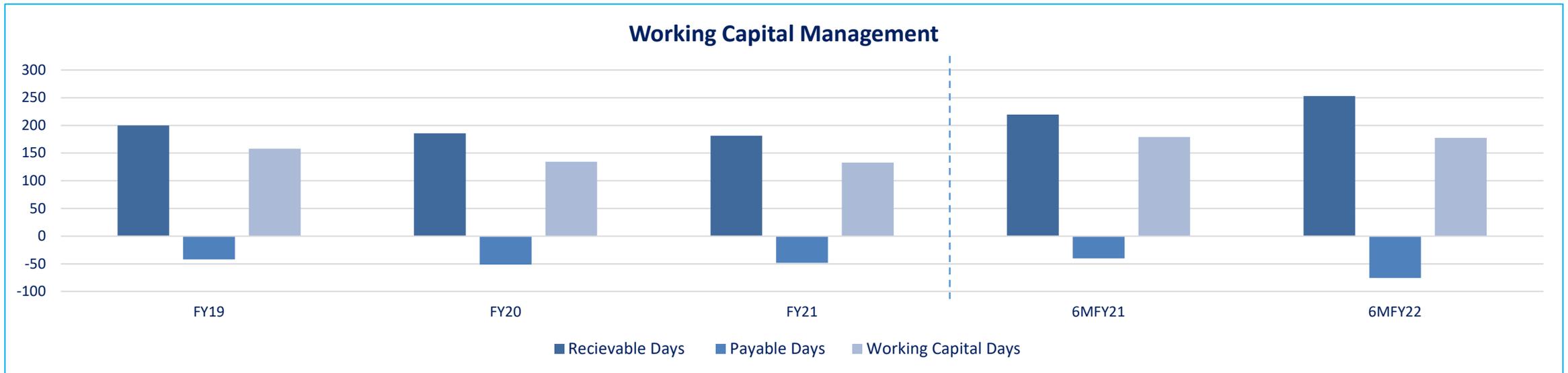
- In recent years, the industry has maintained a high level of gross margin in the range of 30-32% as most players are providing high quality services where they can compete internationally. Meanwhile, operating and net margins have observed a significant increase to ~27% and 25% respectively in 6MFY22 as additional incentives for the industry introduced by the government took effect combined a ~1.9x increase in other income (financial and non-financial), reduced operating costs and improved bottom-line.
- As of May'22 PKR value has depreciated ~22% YoY against the USD; even if exports in USD terms loose momentum, it would have a reduced impact in PKR keeping exports lucrative.
- The largest component of direct costs for the industry is Salaries & Wages which contributes ~47% to total direct costs as the industry has a requirement for technically proficient and skilled labor force; while the second largest component- raw material, contributing ~20% of direct costs, comprises of software and hardware costs.



Note: Margins and cost figures are reflective of 4 listed players

Financial Risk | Working Capital Management

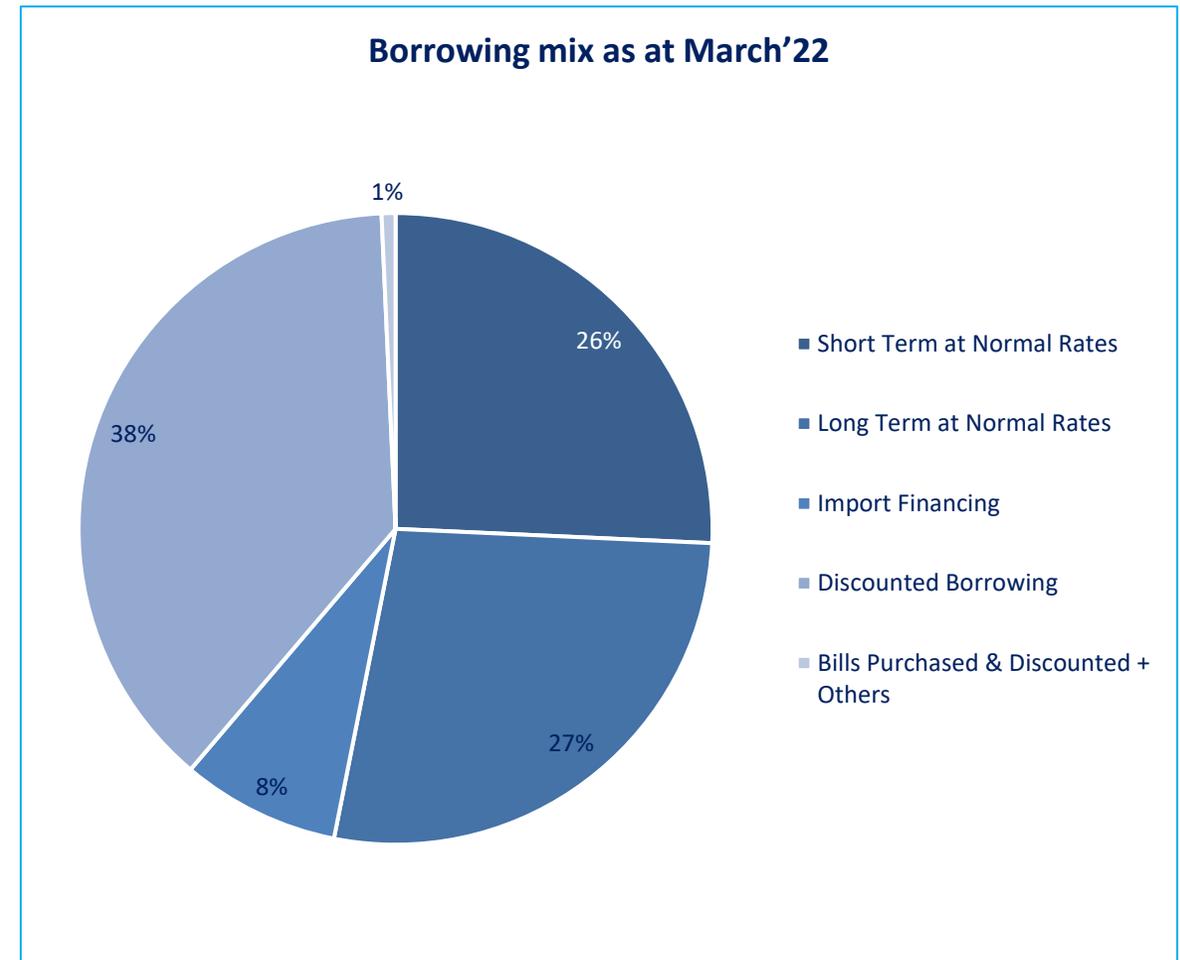
- The industry’s working capital cycle is largely a function of trade receivables and trade payables. Since the industry is a service provider, most players have little or no inventory; meanwhile, revenues are mostly contract based and greater length of contract can lead to increase in trade receivable days.
- The average net working capital cycle of the industry is ~156 days; Net working capital days in December 2021 stood at ~178 days, a significant increase from ~45 days in June 2021.
- There have been some fluctuations in the working capital cycle as in 6MFY22, receivable days increased to ~253 days (6MFY21: ~219 days) and payable days rose to ~76 days (6MFY21: ~40 days) respectively; however the net impact on working capital days remained neutral.



Note: Working capital figures are reflective of 4 listed players

Financial Risk | Borrowing Mix

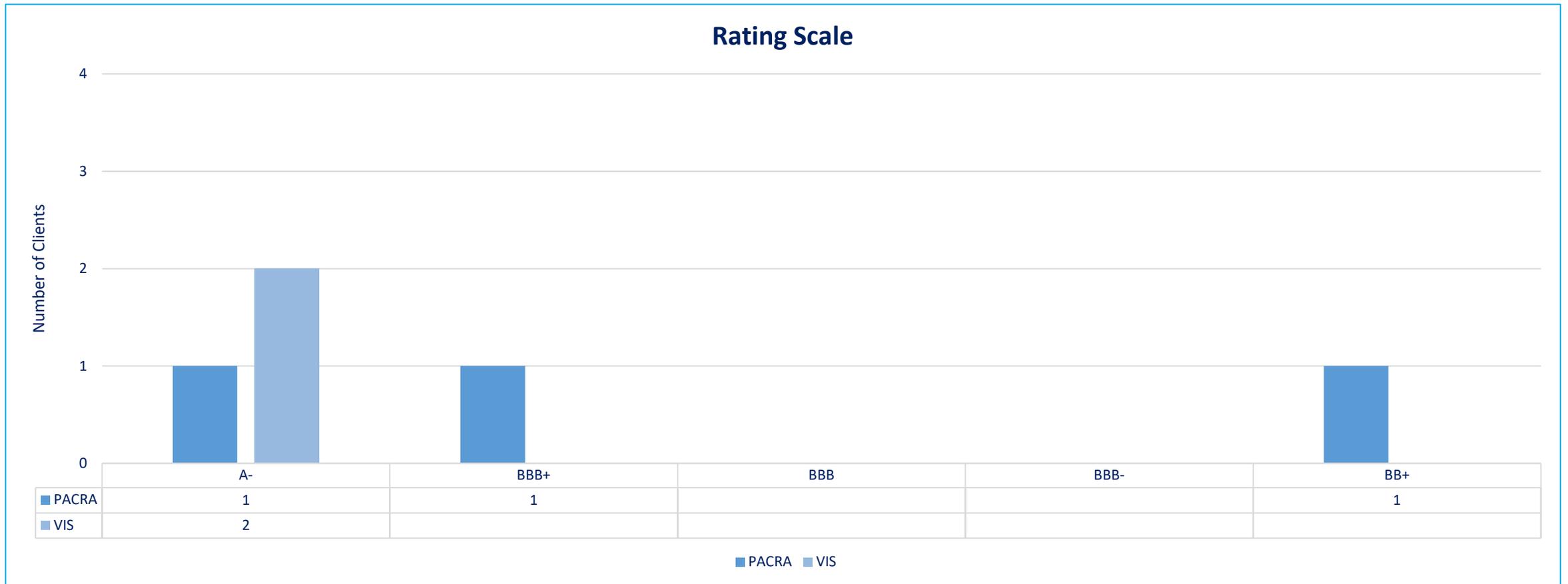
- The industry's total borrowings grew by ~12% and stood at PKR~11,351mln at End-Mar'22, as compared to PKR~10,100mln as at End-Mar'21.
- By End-Mar'22, short term borrowings stood at PKR~2,920mln after declining by ~29% and held a ~26% share in total borrowings mix.
- Long term borrowing also declined by ~6% and stood at PKR~3,109mln representing a ~27% share in the total borrowings mix.
- Import financing although held ~8% share in total sector borrowing, observed the largest increase as it grew by ~178% and stood at PKR~4,324mln.
- Discounted borrowings comprising of TERF and LTFF grew by ~92% and stood at PKR~4,324mln, representing the largest share of ~38% in the industry borrowings.
- While bill purchased & discounted and 'others' represented the smallest share of ~1% in the total borrowing mix and stood at PKR~80mln after decreasing by ~1%.
- At Dec'21, sector gearing stood at a modest ~21%.



Note: Leveraging ratio figure is reflective of 4 listed players

Ratings Curve

- PACRA rates 3 technology companies in A- to BB+ Ratings bandwidth.



Regulatory Framework

- The tech industry is overseen by the Ministry of Information Technology and Telecommunications (MoITT). In CY18, the ministry introduced a Digital Pakistan Policy with a vision to accelerate digitization and expand the knowledge based economy.
- Some of the key objectives highlighted in the policy are promotion of innovation and entrepreneurship through start up incubators, increase in software exports and IT remittances alongside the domestic market, improve digital inclusion by bridging the urban-rural gap and the gender disparity and attract foreign and domestic investment in the industry.
- The regulations implemented in line with these objectives include:
 - Zero income tax on IT exports till CY25
 - Three year tax holiday for tech start ups with no minimum and withholding tax
 - Tax holiday for venture capital funds till CY24
 - 100% equity ownership allowed to foreign investors
 - 100% repatriation of capital and dividends allowed
- In addition, the establishment of IT Parks, Tech Special Economic Zones and National Incubation Centers has vastly improved the ecosystem available for tech companies as these locations are specifically equipped with latest ICT infrastructure and facilities which enable a conducive environment.
- The industry is represented by the Pakistan Software Houses Association for IT and ITES (PASHA). The association lobbies with the government and provides its input on policies and legislation related to the industry.



Regulatory Framework

- Moreover, the government has facilitated freelancers by increasing the monthly limit of receiving payments to \$25,000 through the home remittance channel.
- In FY22 budget, the government has promoted the 2020 Special Technology Zones Ordinance with an objective to establish technology parks, high-tech industrial areas, science and technology zones, knowledge cities and technology incubation zones.
 - Under the Ordinance, the companies operating under the SEZs would be provided 10 year tax breaks from income tax (including minimum tax of section 113), 10 year exemption from sales tax, customs duty and withholding income tax on import.
 - Tax exemptions to venture capitalists on capital gains and dividend income from investments in SEZ company.
 - Total exemption on income of STZA established under the Ordinance.





SWOT Analysis

- Regulatory structure supports local industry and encourages exports.
- Conducive environment due to the presence of IT Parks, Tech SEZs and Start Up Incubators.
- Availability of skilled labor as ~ 25,000 IT professionals enter the workforce each year.
- Relatively lower costs compared to international players



- Service related players are dependent on conditions in client industries and sectors.
- Low level of digital literacy amongst majority of the country's population.

- Ever changing technological platforms and evolving technologies.

- Significant investment incentives have been provided for local and foreign investors.
- Growing urbanization and digital literacy to create demand in the long term.
- Focus on automation in local industry

Outlook: Stable

- The COVID-19 restrictions forced a large number of people towards remote working while also increasing the usage of online transaction and payment systems; this situation created opportunities for the tech industry to provide services to enable businesses to continue their operations.
- The overall sector has posted a robust growth, alongside sector exports, which have also witnessed a phenomenal growth; as they grew with a 5 year (FY17-FY21) CAGR of ~24%; and export growth peaking at ~50% YoY in FY21.
- Pakistan's technology imports grew with a with a 5 year (FY17-FY21) CAGR of ~11% and imports growth peaking at ~41% YoY in FY21; while the net imports growth peaked at ~54% YoY in FY21.
- The industry continues to benefit from favourable government policies which are intended to spur the growth and attract investments in the industry from both domestic and foreign investors.
- However, under the current scenario, the growth momentum seems to have slightly lost momentum, given the recent export numbers as 3QFY22 exports grew by ~21% YoY (3QFY21: 52% YoY) but declined by ~-2% QoQ (2QFY22: ~10.1% QoQ) in USD terms.
- The decision taken by the State Bank of Pakistan (SBP) to increase the policy rate to 13.75% in the last quarter of FY22 will increase the finance costs; which can be expected to put pressure on industry bottom-line, as industry's debt servicing can increase by PKR~452mln.
- As of May'22, the PKR has depreciated by ~22% YoY against the USD. Such massive currency devaluation is expected to keep the export market lucrative for the local tech industry.
- The new government has also vowed to support the local IT industry in terms of both capital and human development, with an emphasis on enhancing export capabilities.

- Pakistan Bureau of Statistics (PBS)
- Pakistan Stock Exchange (PSX)
- State Bank of Pakistan (SBP)
- Federal Board of Revenue (FBR)
- PACRA Database
- Business Recorder
- CompTIA
- <https://www.processindustryinformer.com/process-control-everything-you-need-to-know>
- <https://www.techopedia.com/definition/4356/software>
- Nasdaq
- I2i
- AlBaraka

Research Team	Saniya Tauseef <i>Asst. Manager</i> saniya.tauseef@pacra.com	M. Usman Sarwar <i>Research Analyst</i> usman.sarwar@pacra.com
Contact Number: +92 42 35869504		

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