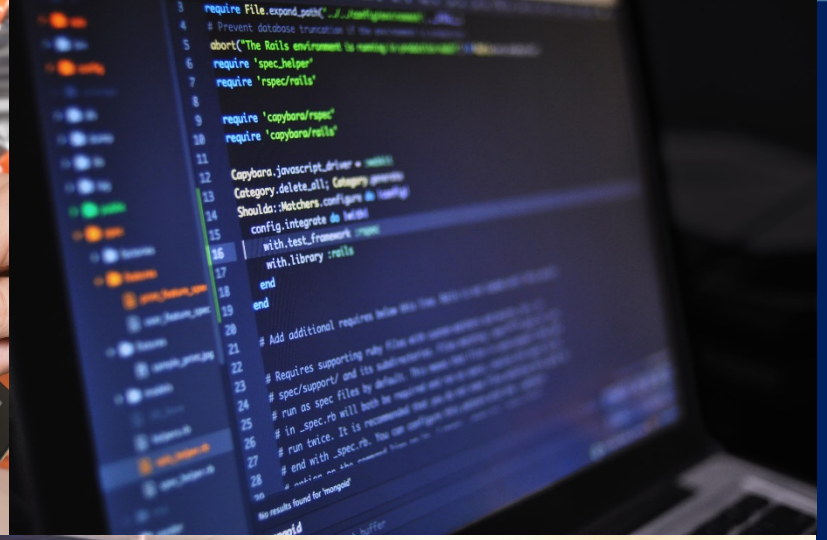

Technology

Sector Study

May 2023

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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 technology industry.

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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.

Source: https://www.processindustryinformer.com/process-control-everything-you-need-to-know

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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:

i. **Programming Software**: A set of tools to aid developers in writing programs. The various tools available are compilers, linkers, debuggers, interpreters and text editors.

ii. **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.

iii. **Application Software**: Intended to perform certain tasks. Examples of application software include office suites, gaming applications, database systems and educational software.

Source: Techopedia

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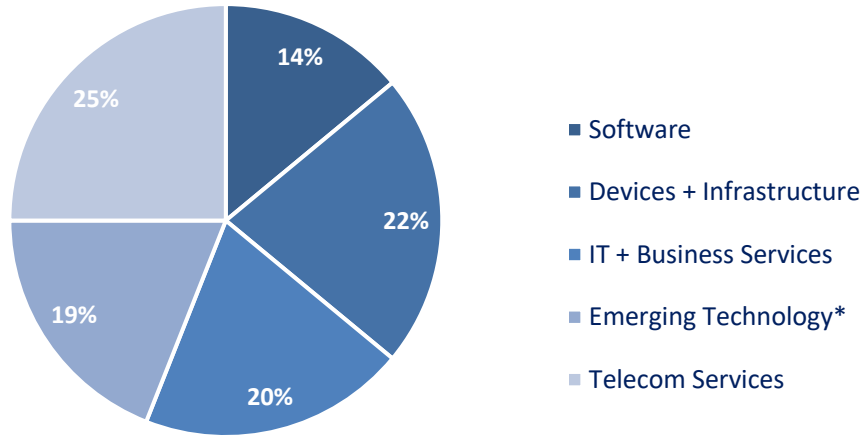
Global | Overview

- 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~5.3trn in CY22 as compared to USD~5trn in CY21.
- The industry is expected to return to its former annual growth rate of ~5%-6% and its market size is expected to reach USD~5.6tln in CY23.
- The technology industry is led by the USA with a market share of ~33%, approximately USD~1.8tln 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 depicts 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.

Key Segments



Largest Tech Companies by Market Cap (May '23)

Name	Market Cap (USD bln)
Apple	2,996
Microsoft	2,370
Alphabet (Google)	1,570
Amazon	1,193
Nvidia	760

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

Source: CompTIA, Nasdaq

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Local | Overview

- Pakistan's technology sector contributes ~1% to the national GDP and stood at approximately PKR~647bln in FY22 (FY21: PKR~485bln), with the domestic market size for technology products and services estimated to be PKR~273bln in FY22 (FY21: PKR~218bln). Meanwhile, during FY22, exports of the total technology industry increased to PKR~374bln (FY21: PKR~267bln).
- 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 enhanced 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	FY21	FY22	9MFY23
Est. Sector Size (PKR bln)	485	647	-
Computer Services Exports (PKR bln)	267	374	377
Market Cap. (PKR bln)	212	163	182
Exports Growth (YoY)	52%	40%	40%
IT Professionals	~500,000		
IT Graduates per Year	~25,000		
Industry Structure	Competitive		
Regulators	MoITT & PESB		
Association	PASHA		

Source: PASHA, PSEB

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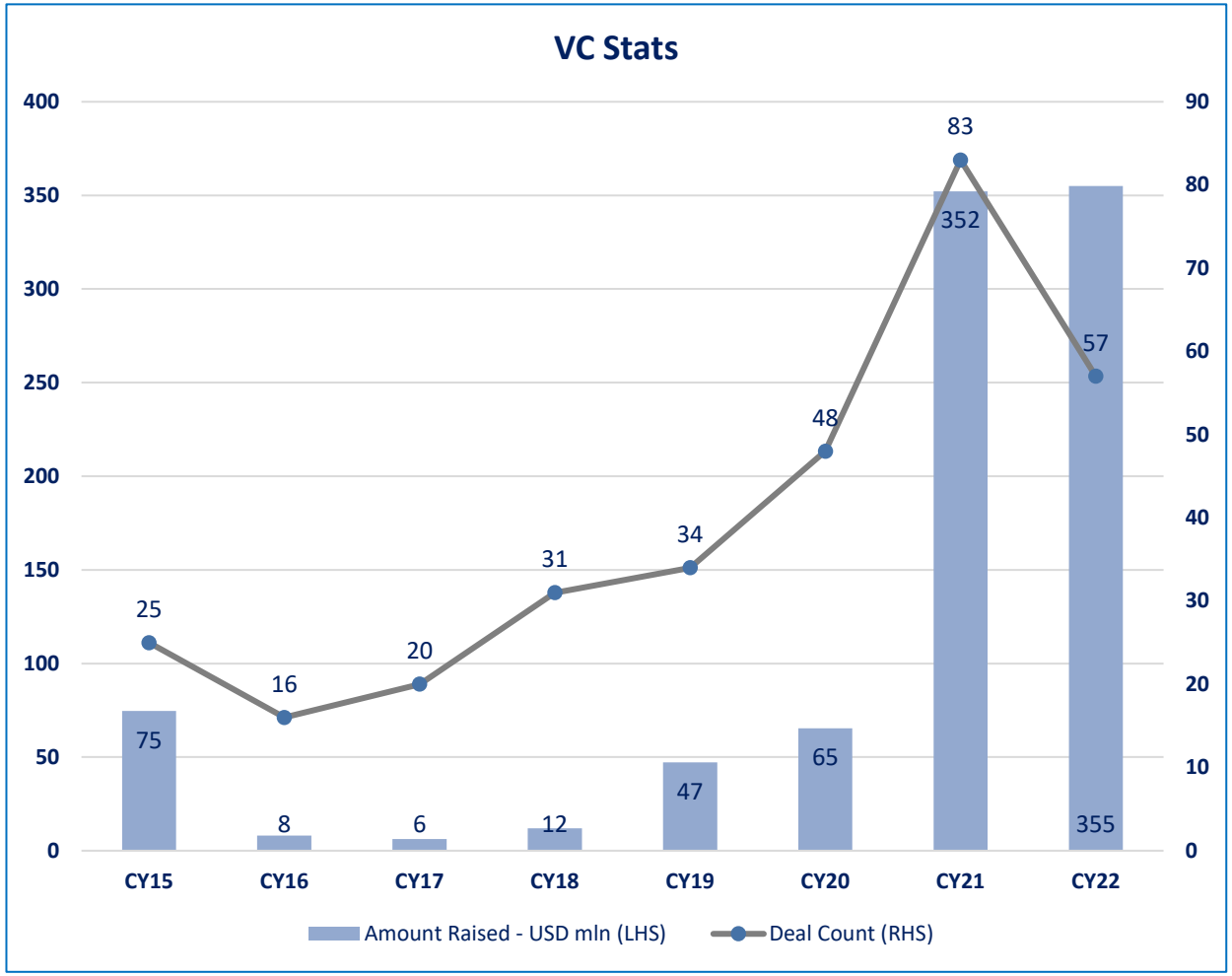
Local | Start-ups and VC ecosystem

- The 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~945mln across 321 deals and more recently, in 1QCY23, 7 Pakistani startups raised USD~23mln, given the adverse state of the economy funding dipped ~86.6% YoY and number of deals dipped ~68.2% YoY.
- During CY15 to CY22, the e-commerce sector raised the highest investments of USD~329mln, followed by fintech start-ups which raised USD~120mln.



Source: i2i

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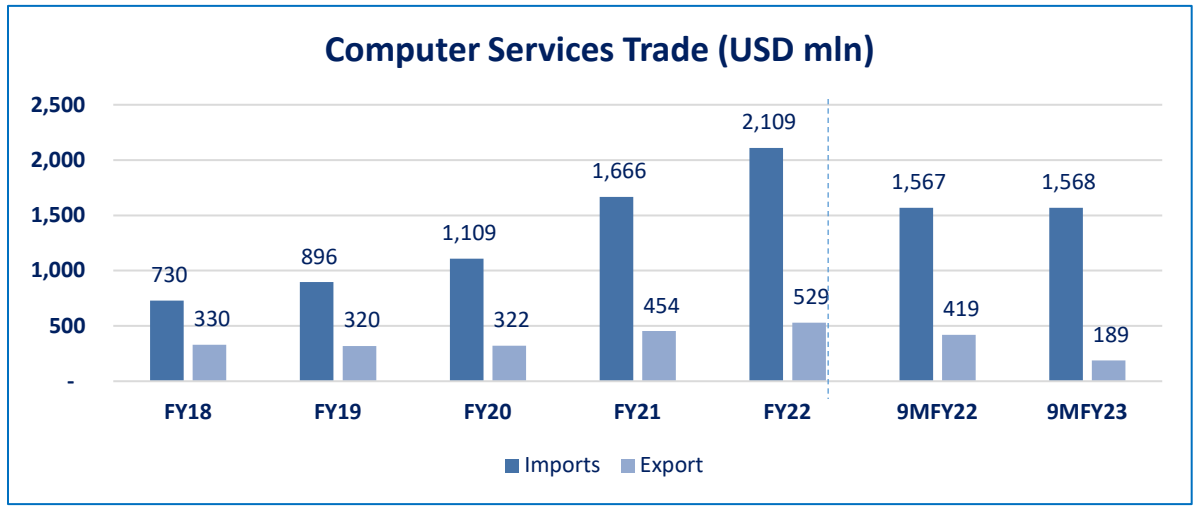
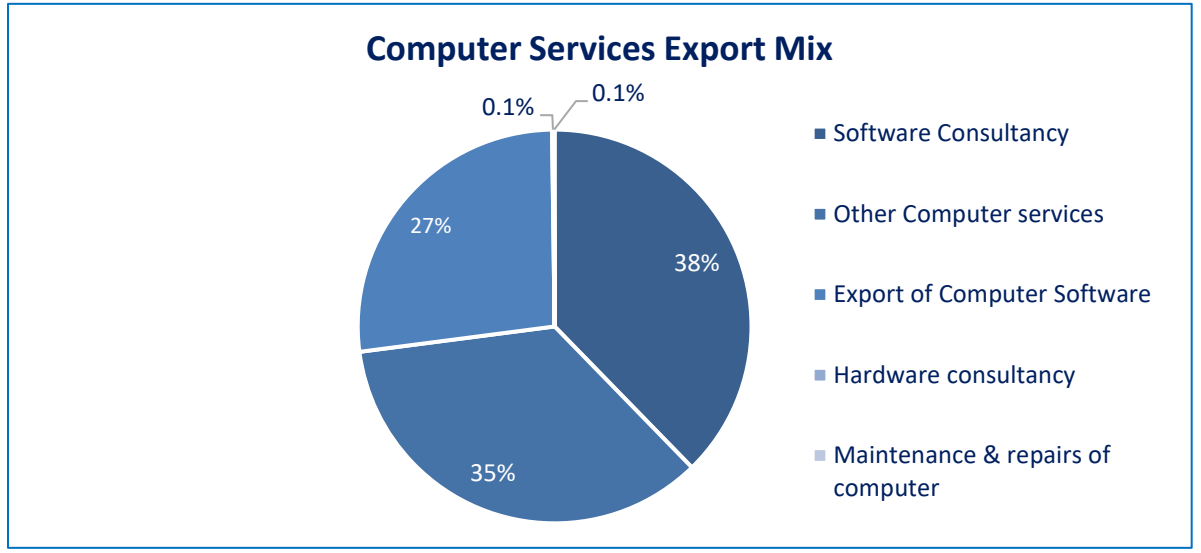
Local | Trade of Computer Services

- The category of computer services encompasses hardware and software consultancy services, trade of computer software and other technological services.
- Since FY18, Pakistan's exports of computer services has grown with a CAGR of ~36% and stood at PKR~374bln during FY22 (FY21: PKR~276bln). Meanwhile, imports of computer services have also grown, albeit at a lower CAGR of ~21% since FY18 and were registered at PKR~94bln (FY21: PKR~73bln).
- During FY22, the largest contributor to exports at ~38% was software consultancy followed by the export of computer software, which contributed ~27% to total computer service exports.
- During 9MFY23, exports stood at PKR~231bln, exhibiting an increase of ~40% YoY. However this growth is attributed to PKR devaluation of ~40% in the same period, as the USD value of exports only grew by 0.1%





Source: PBS

Technology

Business Risk

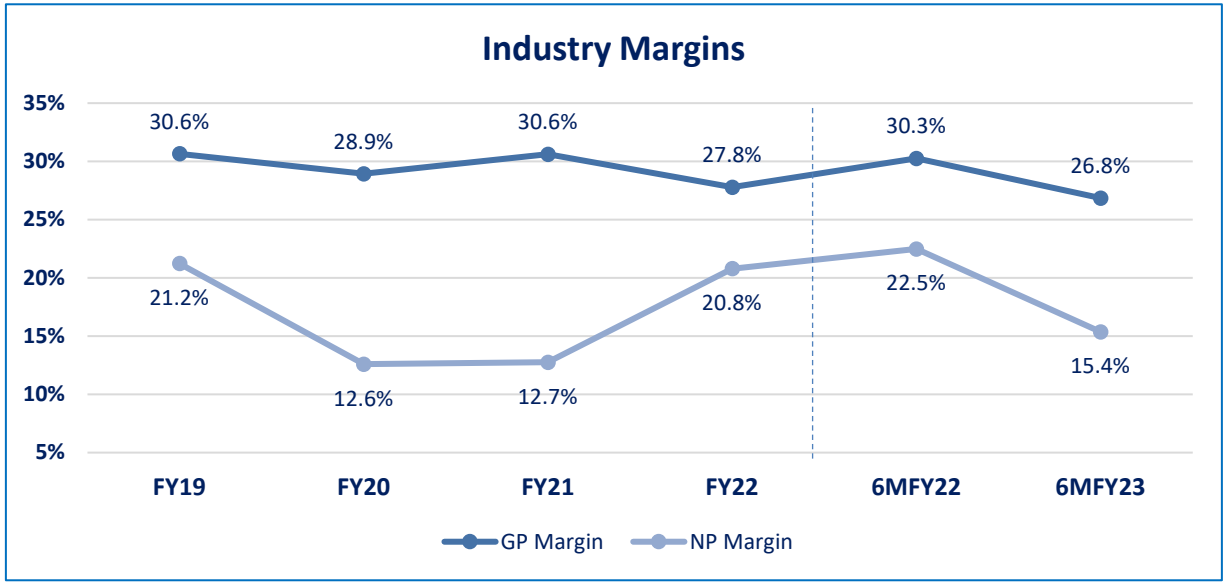
- **Fast Paced Growth:** The tech industry is among the fastest growing industries and new developments and technologies are continuously being introduced. Players must keep pace with new and relevant upgradations in technology or they may lose competitive advantage or even risk becoming obsolete in 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 ~242mln.
- 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.

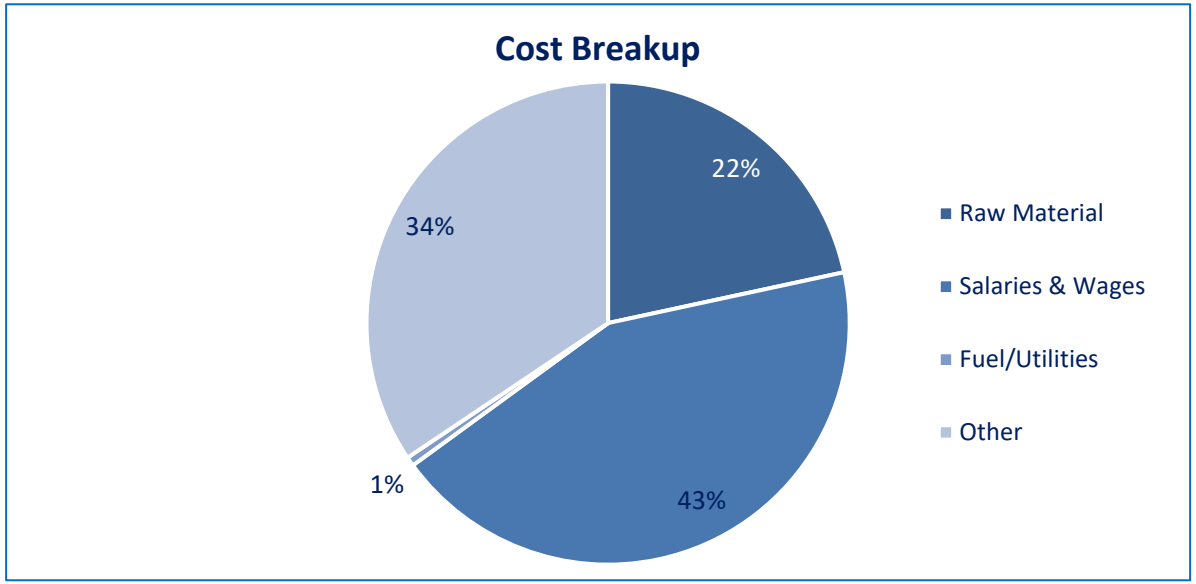
Source: PACRA Database

Technology

Business Risk

- Historically, the sector maintained ~30% gross margins as most players are providing high-quality services where they can compete internationally.
- However, given the macroeconomic vulnerabilities of FY23, the gross margins fell to ~27% in 6MFY23 (6MFY22: ~30%), while higher inflation, interest rates and redaction of tax credits in favor of final tax regime further squeezed the 6MFY23 net margins to ~15% (6MFY22: ~23%).
- With inflation levels hitting hyper ~36.4% in Apr'23, the GDP growth clocking in at ~0.3% in FY23 and historically high MPR at 21% is expected to keep the sector margins in check, while PKR devaluation is expected to provide some respite, as the sector maintains its exports.
- The largest component of direct costs for the industry is Salaries & Wages which contributes ~43% to total direct costs as the industry has a requirement for technically proficient and skilled labor force, while the second largest component, Raw Material, contributed ~22% of direct costs, comprises of software and hardware costs during FY22.



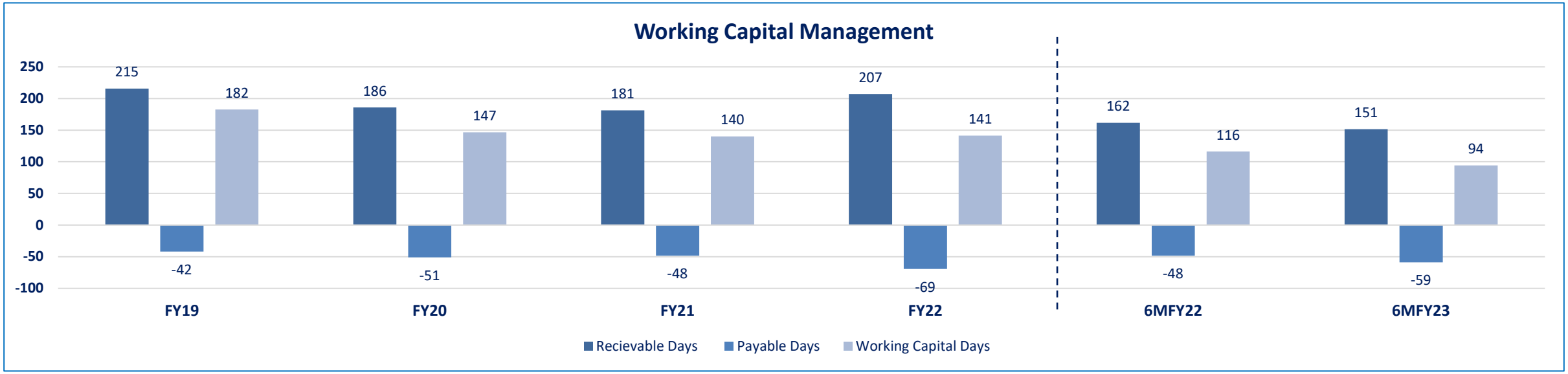


Note: Margins and cost figures are reflective of 4 listed players

Source: PACRA Database

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 a greater length of contract can lead to increase in trade receivable days.
- The average net working capital cycle of the industry is ~150 days. Net working capital days in FY22 stood at ~141 days, similar to ~140 days during SPLY.
- There have been some fluctuations in the working capital cycle seeing as during 6MFY23, receivable days decreased to ~151 days (6MFY22: ~162days) and payable days rose to ~59 days (6MFY22: ~48 days), respectively, brining down working capital days to ~94 (6MFY21: ~116 days).



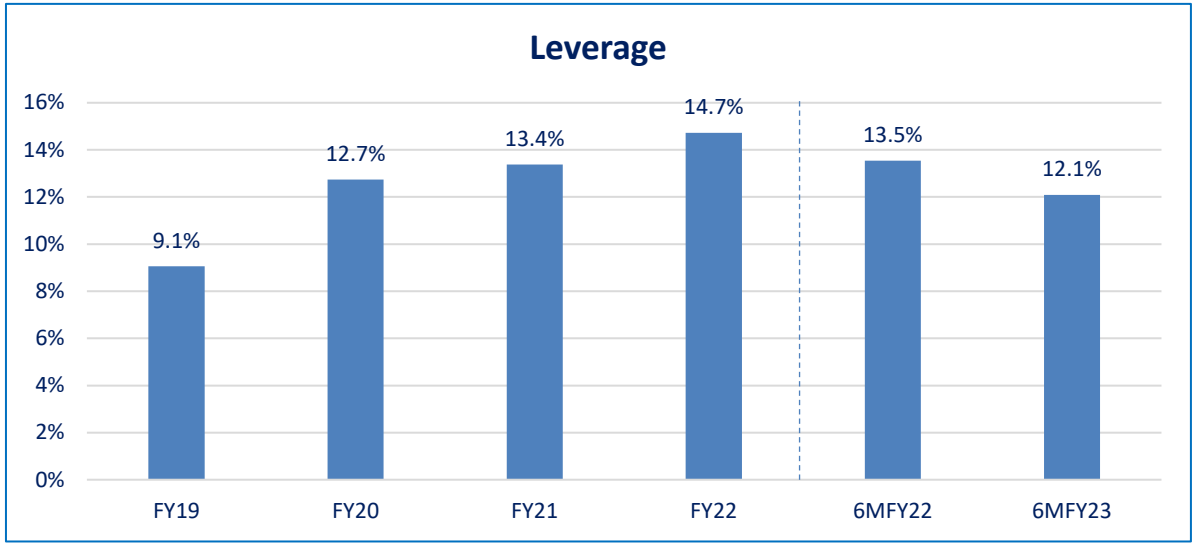
Note: Working capital figures are reflective of 4 listed players

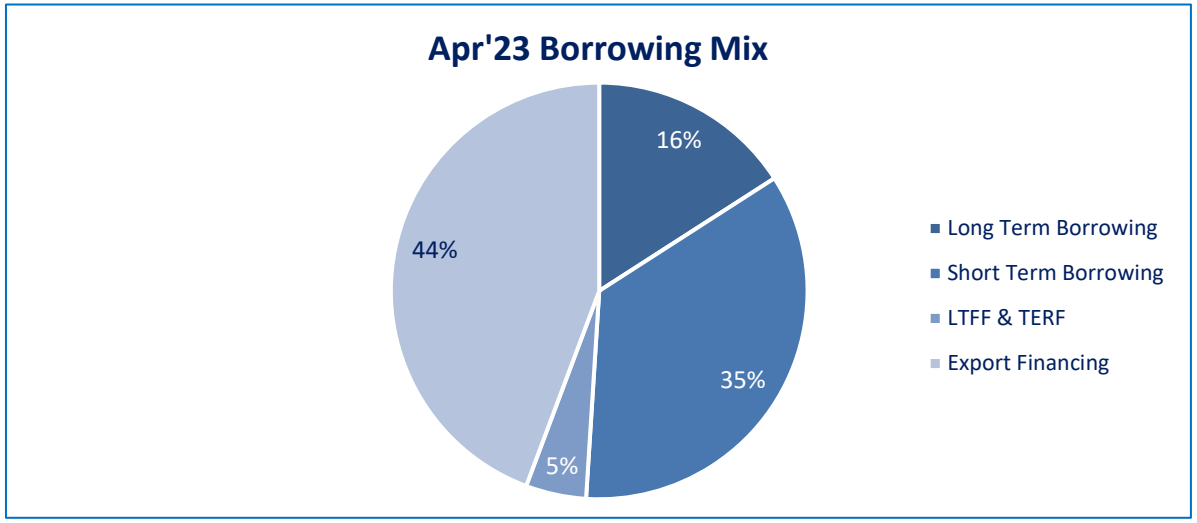
Source: PACRA Database

Technology

Financial Risk | Leverage & Borrowing Mix

- As of 6MFY23 sector's leverage reduced to ~12%, compared to ~15% at End-FY22. This happened on the back of higher earnings retention and reduction in borrowings.
- The sector borrowings stood at PKR~10,012mln in Apr'23 (Apr'22: ~11,012mln) after declining ~10% YoY.
- Long-term borrowings declined ~49% YoY and stood at PKR~1,592mln (Apr'22: PKR~2,128mln) holding a ~16% share in the total borrowings mix.
- Short-term financing held a ~35% share in the borrowings mix and stood at PKR~3,514mln (Apr'22: PKR~3,650mln) after declining ~4% YoY.
- LTFF & TERF declined ~45% YoY and stood at PKR~470mln (Apr'22: PKR~859mln) holding a ~5% share in the borrowings mix.
- SBP's EFS held the largest share of ~44% in the borrowings mix, it grew by ~28% YoY and stood at PKR~4,435mln (Apri22: ~3,465mln).





Note: Leverage ratio figure is reflective of 4 listed players

Source: SBP, Company Financials

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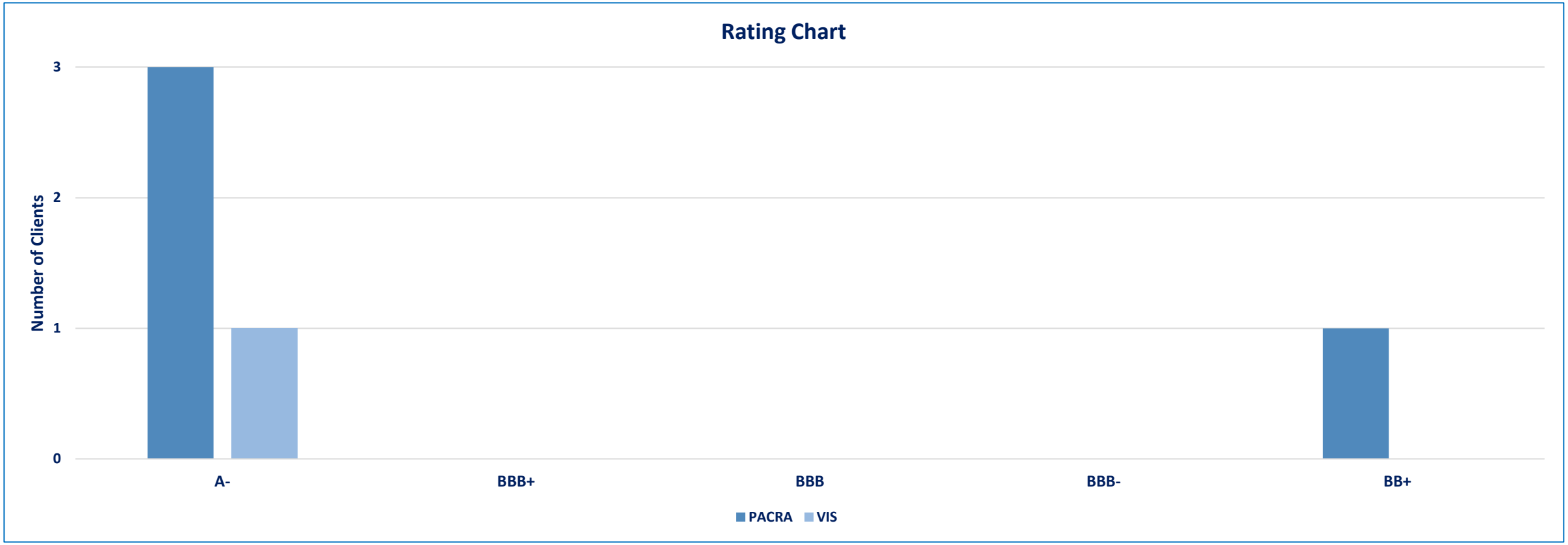
Ratings Chart

- PACRA rates 4 technology companies in A- to BB+ Ratings bandwidth.



Source: PACRA internal database

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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.
- 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.
- 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.
- While through finance act 2022-23, the government implemented a Normal Tax Regime on the industry and rescinded tax exemptions and tax credits.
- Now 0.25% tax on export receipts is applicable on companies register with the PSEB and 1% on companies not register with it. While super tax is also applicable on companies who meet certain benchmarks.
- While tax exemptions to companies operating in the SEZ are still applicable.

Source: MoITT, PASHA, AlBaraka

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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

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Outlook: Stable

- From FY22 onwards, global supply chain disruptions exacerbated by Russia-Ukraine war, propelled global commodity prices to their multi-year/all-time highs. High inflation, monetary tightening and economic slowdowns have become a global theme.

- IMF in its April'23 world economic outlook, estimates global GDP to grow at ~2.8% compared to previous estimate of ~3.6%, while global inflation levels have also been revised up to ~7.0% compared to ~4.8% in the previous estimate.

- Along with the global macro economic vulnerabilities, Pakistan further got hit by a devastating flash flood, socio-political unrest and now a grave foreign exchange shortfall as talks with the IMF remain stalled.

- In FY23, Pakistan April'23 Inflation clocked in at ~36.4 %, PKR depreciated ~54.5% against the USD, with forex reserve covering less than a month of controlled imports. SBP in following its hawkish stance has hiked the monetary policy rate to a restrictive ~21%. GDP is estimated to grow by ~0.3%, as the economy has slowed significantly.

- While the final tax regime, high inflation and interest rates can be reasonably expected to keep the industry margins under pressure going forward. PKR depreciation is expected to keep industry exports competitive, as in 9MFY23 exports in USD term remained unchanged, but grew ~40% in PKR terms.

- While give the low leveraging, on the back of both high earnings retention and decreasing borrowings is also reasonably expected to keep the financial risks at a moderate levels.

TECHNOLOGY | BIBLIOGRAPHY

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