Chemicals

Sector Study

July 2023

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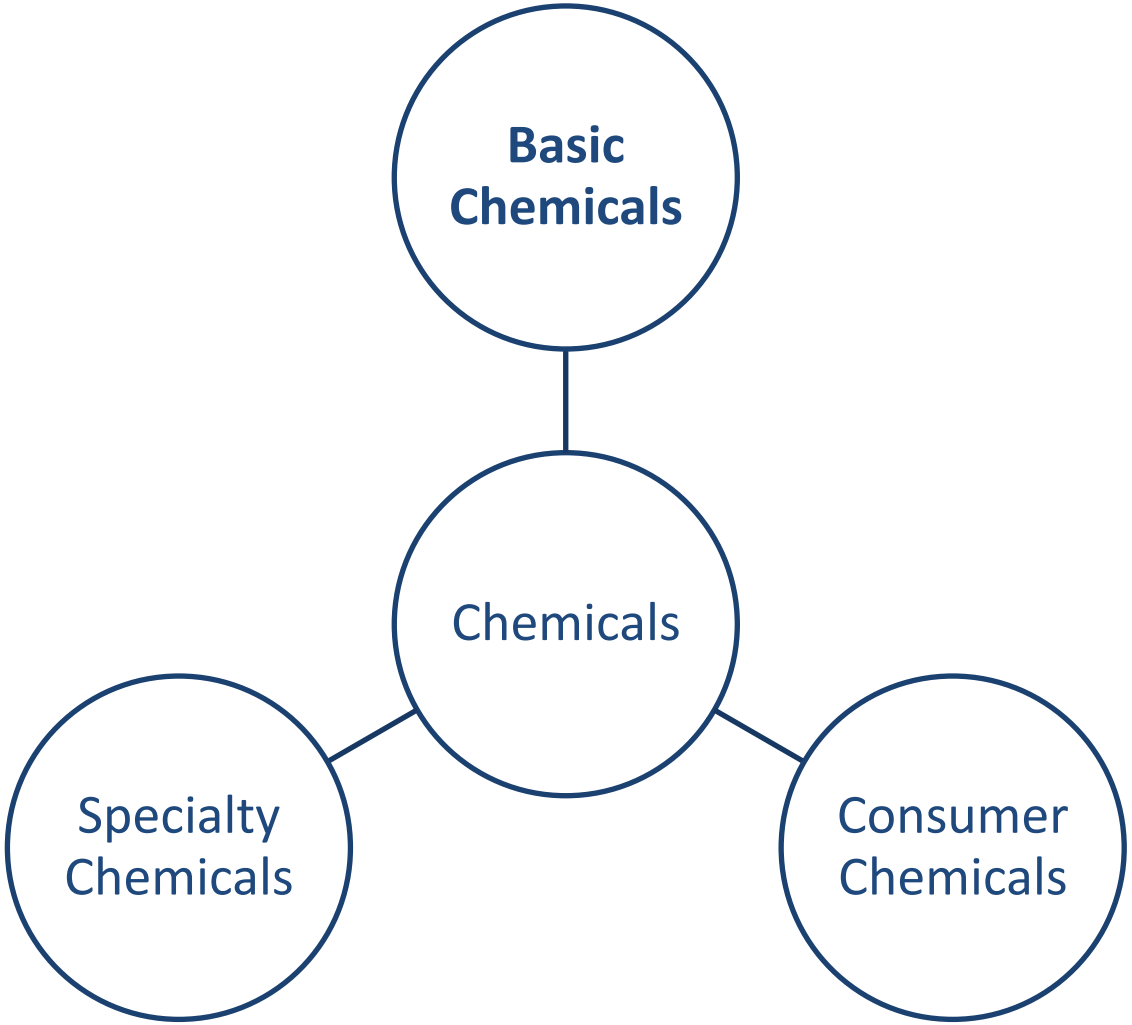
Global | Overview

- Chemical industry is an integral part of global economic landscape as the industry creates immense variety of products, which impinge virtually every aspect of our lives.

- While many of the products from the industry, such as detergents, soaps and perfumes, are purchased directly by the consumer, others are used as vital components in industrial manufacturing of various products and goods.

- Chemical industry products can be divided into three categories:

  - **Basic Chemicals**: It includes petrochemicals, polymers and basic inorganics.
  - **Specialty Chemicals**: This category covers a wide variety of chemicals for crop protection, paints and inks, colorants (dyes and pigments).
  - **Consumer Chemicals:** These are sold directly to the public. They include, for example, detergents, soaps and other toiletries.



Source: ECI

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Global | Top Companies

- The largest chemical manufacturer by revenue is the German manufacturer, BASF. Other top manufacturers predominantly belong to China and the United States. Sinopec and PetroChina are the two top chemical manufacturers from China, while Dow Inc and Exxonmobil belong to the United States of America.
- Saudi Arabia's Sabic is also a contender for one of the top places in the chemical sector, along with Taiwan's Formose Plastics and Korea's LG Chem. Germany is not the only European country included in the top chemical manufacturers.
- Ineos and LyondellBassell are also important players in the chemical sector. Total sales for these 10 companies was USD~493bln during CY22.

Sr No.	Company	Country	Revenue (USD bln)
1	BASF	Germany	93
2	Sinopec	China	66
3	Dow Inc	USA	55
4	Sabic	KSA	43
5	Formose Plastics	Tawian	43
6	Ineos	UK	40
7	Petrochina	China	40
8	LyondellBasell	UK	39
9	LG Chem	Korea	37
10	Exxonmobil	USA	37
	Total Sales		**493**

Source: American Chemical Society

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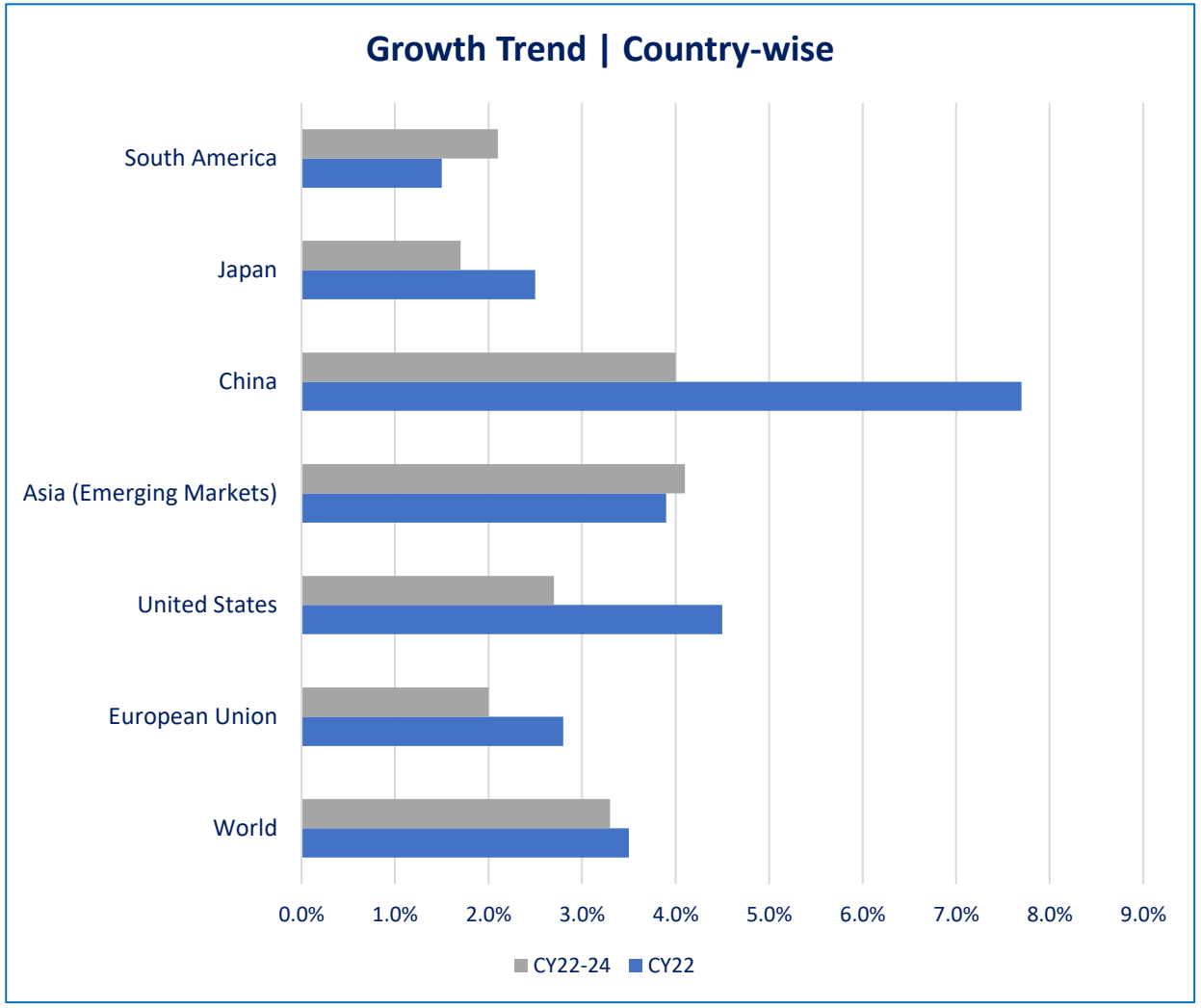
Global | Growth Prospects

- Chemicals industry is one of the fastest growing sectors globally. It has directly contributed more than USD~4.2trn to the global GDP, accounting for more than ~4.4% to the global GDP in CY22.

- China is the world's largest chemical markets which grew by ~7.7% in CY22; however following the recent lockdowns, growth outlook for this market is expected to be at ~4.0% by CY24.

- Demand from electronics and consumer goods market is expected to be weaker; while growth in demand is expected to originate from the automotive sector. Chemical industry growth is expected to be slightly weaker in Asian emerging markets and Japan compared to China because of weaker demand from the West. Asian emerging markets are expected to grow by ~4% and Japan by ~2%.

- The biggest challenge for the global chemical sector to come is of adapting to and integrating the Sustainable Development Goals (SDGs) into their operations. The chemical industry still has many challenges to overcome to reach the SDGs, such as, reducing its carbon footprint and adjusting plastic disposals.



Source: Deloitte, BASF

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Local | Industry Snapshot

- Considering the high linkages of chemical sector with other sectors of the economy, it is considered as one of the most significant sectors of Pakistan.
- Pakistan's reliance on imported chemicals has decreased over time, with a ~36% YoY decrease in 9MFY23. Meanwhile, export of chemicals decreased by ~31% YoY in 9MFY23. The sector is considered as a backbone in the development of forward-linked industries like textile, leather, footwear, furniture, automobile, food and beverages. Chemical products are also used in backward-linked industries such as surfactants, which are used by oil refineries and oil extracting companies.
- The number of listed companies has increased in 9MFY23 and so have members of the Pakistan Chemicals Members Association. As a result, the market capitalization of publicly listed companies has increased by ~3% YoY in 9MFY23.
- Revenue grew by ~28% YoY in FY22 and then declined ~32% YoY in 9MFY23. Growth rate is exclusive of some data from PACRA clients and as a result is not completely representative.
- The average KSE-100 index experienced a ~2% decline during 9MFY23, while the market capitalization of the chemical sector increased by ~3% in 9MFY23. This shows the chemical sector outperforming the market during the said period.

Key Indicators	FY21	FY22	9MFY23
Market Capitalization of Listed Companies (PKR bln)	187	410	421
Revenue (PKR bln)*	239	307	123
Growth	*11.7%*	*28.4%*	*-32%*
Imports (PKR mln)	1,335	2,305	1,459
Exports (PKR mln)	140	232	160
Association	Pakistan Chemicals Members Association		
Members	79	101	100+
Structure	Oligopolistic		
No. of Listed Companies	23	23	25

**Revenue is based on based on PACRA-rated clients and selected listed companies. Data for 9MFY23 was not available for certain PACRA clients. 9MFY23 numbers are prorated on latest available numbers. Exports are inclusive of pharmaceutical products.*

Source: PBS, PSX, PCMA

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Local Overview

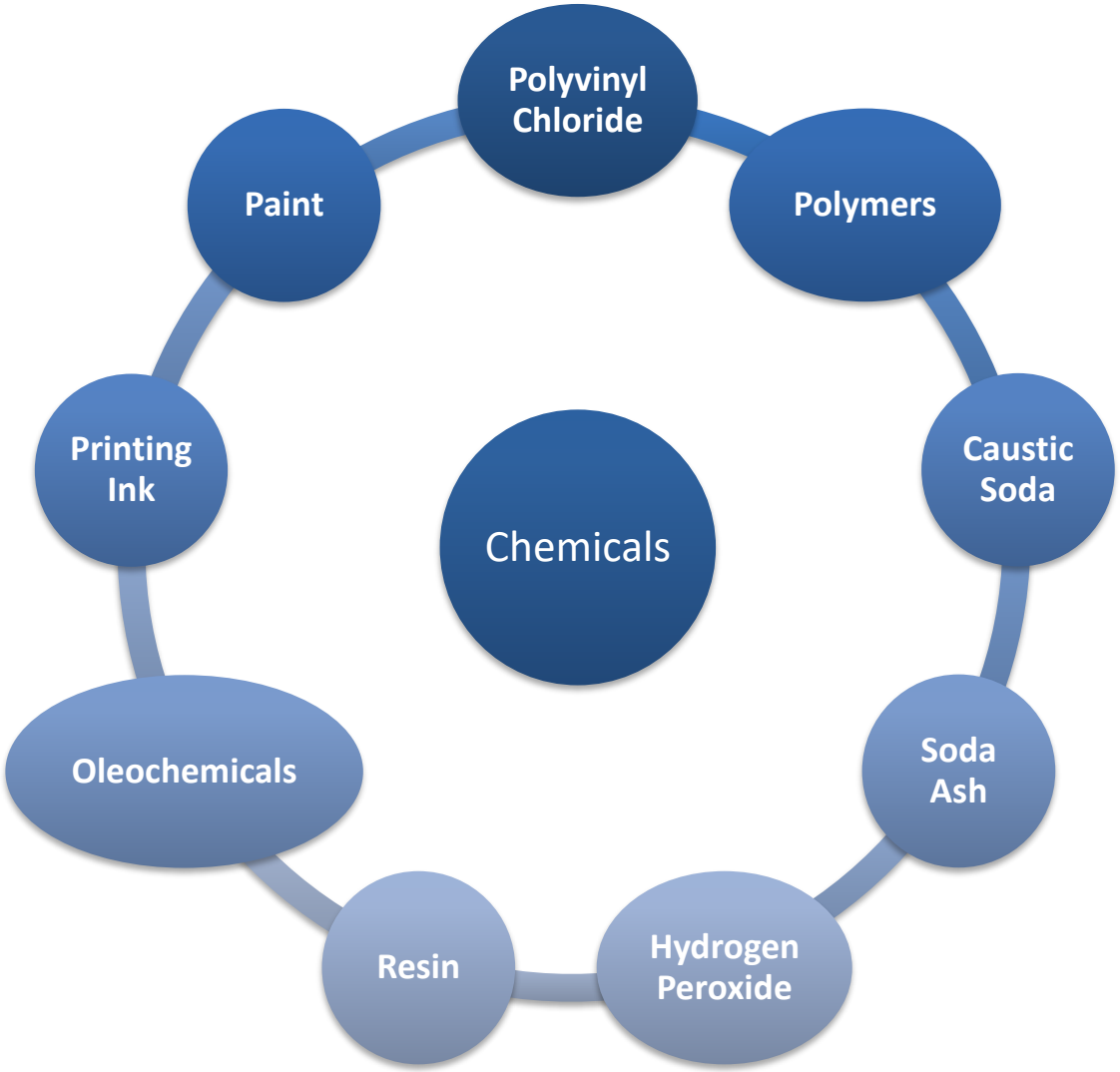
- Pakistan has a gigantic potential for the growth of chemical sector as it is an integral part of our daily lives and industrial progress. Despite this, there are only a few groups focusing on the growth of this sector, therefore, the country still has a big room for development.

- Over the years, the local market has made considerable progress in basic inorganic chemicals like Polyvinyl Chloride, Caustic soda, Soda Ash, Hydrogen peroxide and has expanded their production capacities to cater the market demand.

- Besides providing support to local industries with the readily available basic chemicals, it is an important import substitution as well.

- Although, a variety of chemicals are used in multiple industries, the chemical industry can be broken down into seven main categories based on their type (refer diagram).

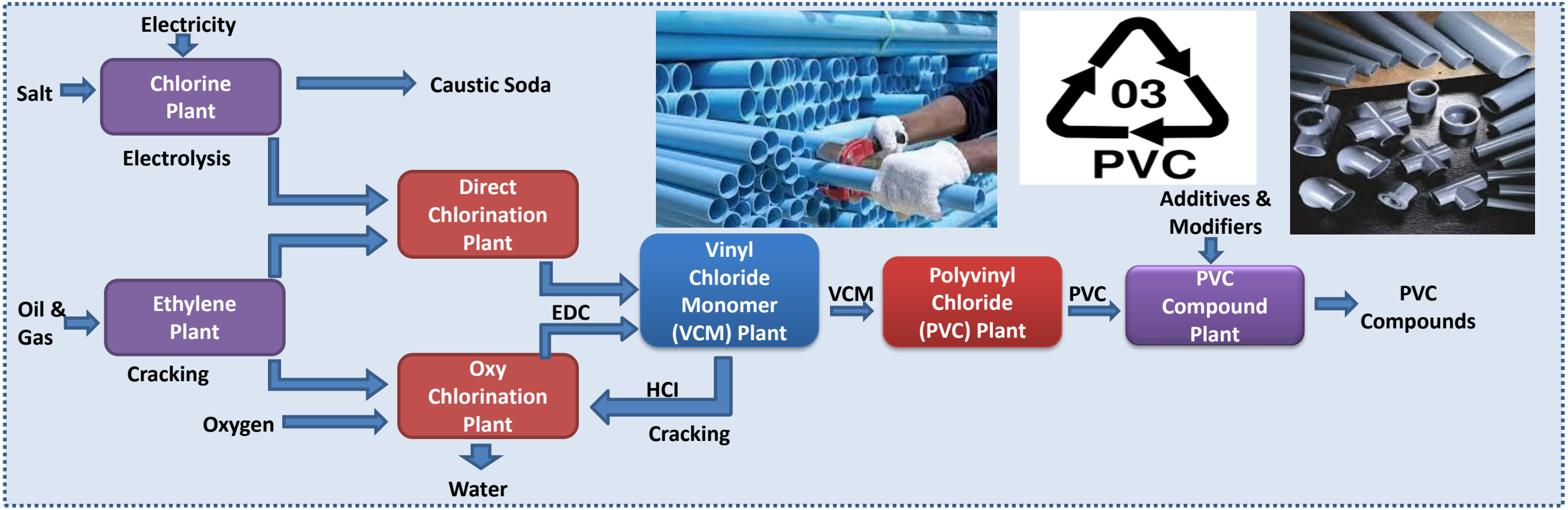
- This sector report covers all the chemicals stated here.



Note: *Three products, namely, chlorine, caustic soda, and soda ash characterize the chlor-alkali market.*

Source: Darson

Polyvinyl Chloride Process (PVC)



- Chlorine is extracted from sea salt via electrolysis and ethylene is derived from hydrocarbon raw materials. These are reacted to produce ethylene dichloride.
- The ethylene dichloride is then decomposed by heating in a high temperature furnace or reactor.
- PVC is made using a process called addition polymerization. This reaction opens the double bonds in the vinyl chloride monomer (VCM) allowing neighbouring molecules to join together creating long chain molecules.

Source: Vinyl.org.au

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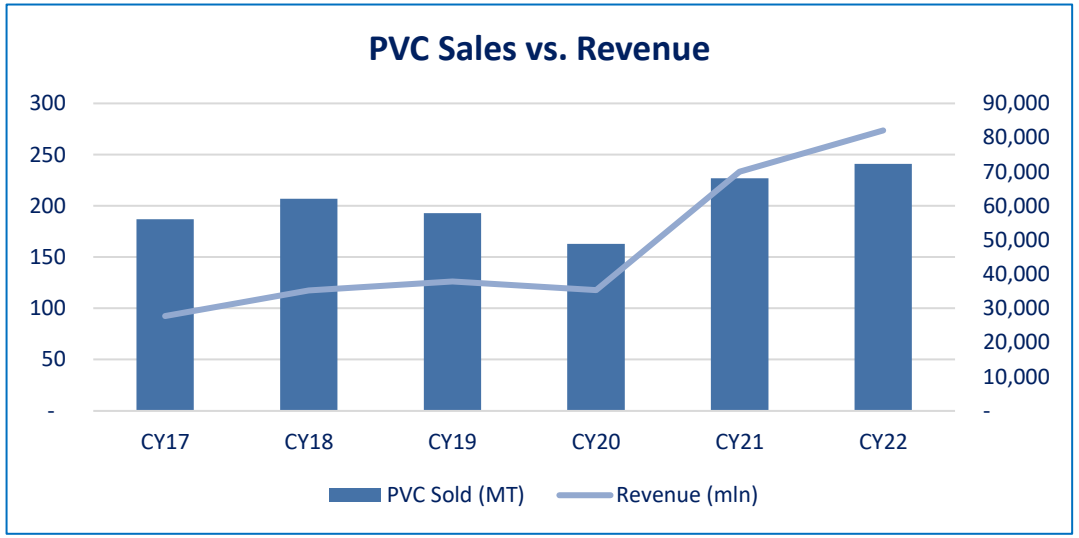
Supply and Demand | PVC

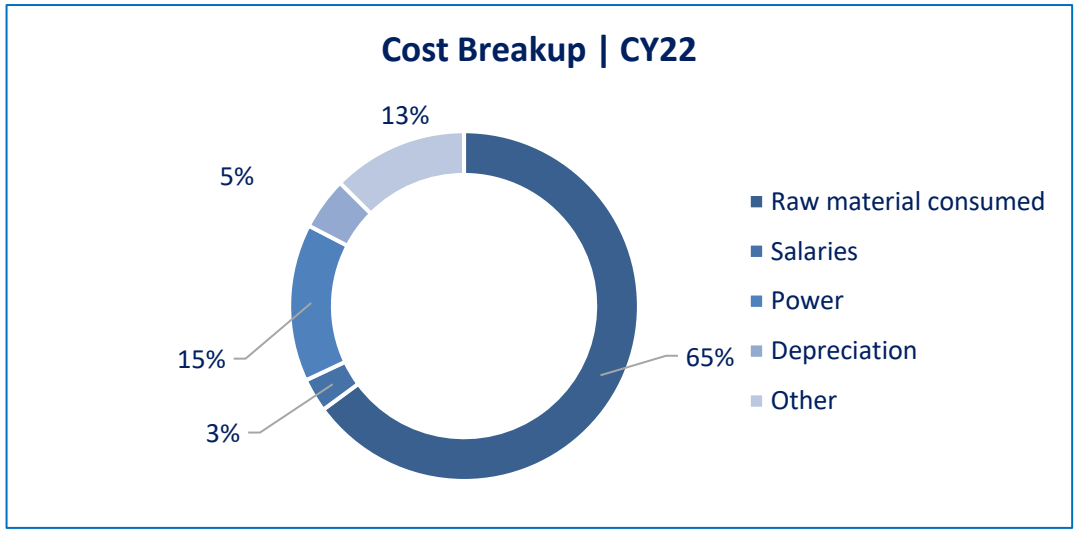
- **Polyvinyl Chloride (PVC):** Engro Polymer & Chemicals Limited (EPCL), a subsidiary of Engro Corporation, is the only producer of PVC in Pakistan. The plant has an annual production capacity of ~295,000MT.

- Two of the critical raw materials, ethylene and EDC (Ethyl Dimethylaminopropyl Carbodiimide), are imported in the country, therefore are subject to exchange rate and international price movements. Raw material accounts for ~65% of the total cost of production. Production of PVC is an energy-intensive manufacturing process requiring high power consumption which constitutes ~15% of its total cost.

- CY22 brought challenges for the domestic PVC market. Declining international PVC prices, accompanied by heavy floods and soaring inflation, all hindered growth of PVC sales. This reflected on sales which exhibited a YoY growth rate of ~6%, significantly decreasing from CY21's YoY growth rate of ~98%.

- During CY22, the overall sales of PVC were recorded at ~241,000MT and accordingly, revenue was recorded at PKR~82,000mln. Revenue exhibited a decline in YoY growth and stood at ~17%, down from ~39% in CY21.



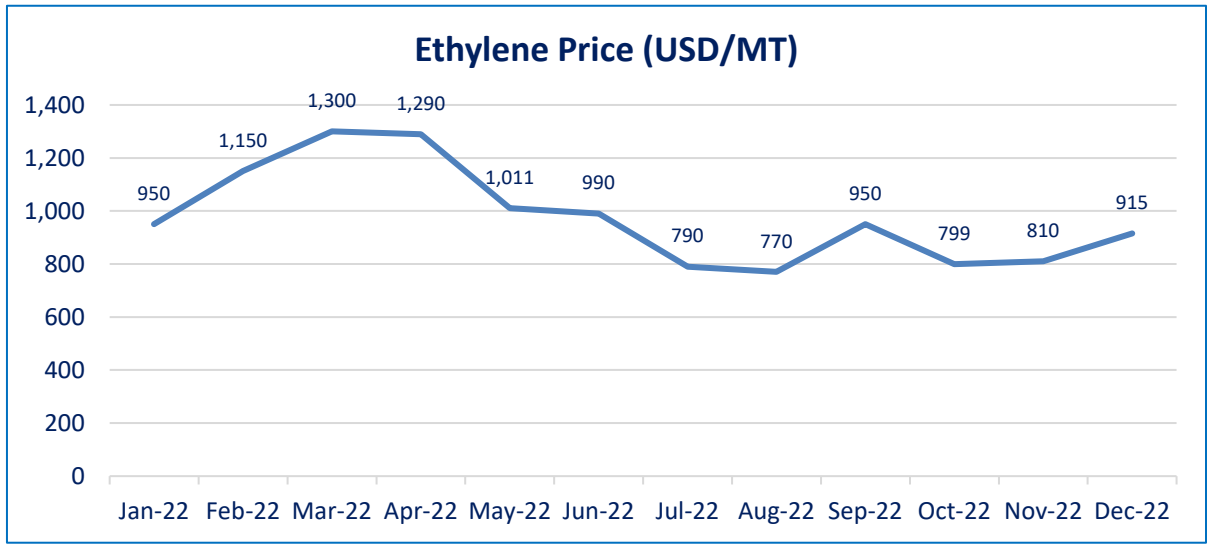


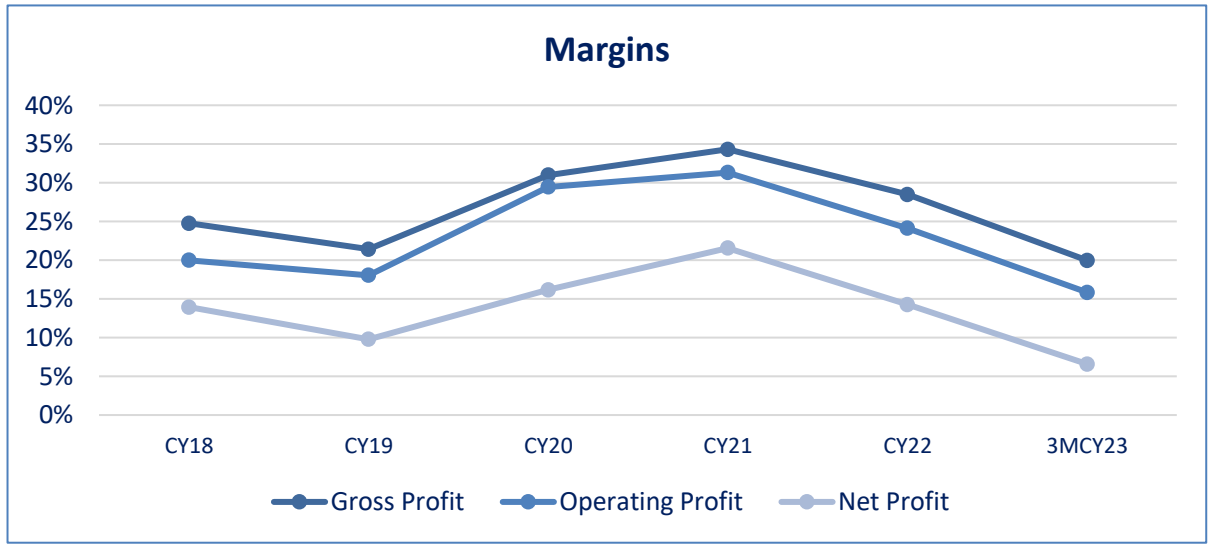
***Note**: PVC sales is of EPCL only.*

Source: PSX, PACRA Internal Database

PVC | Margins

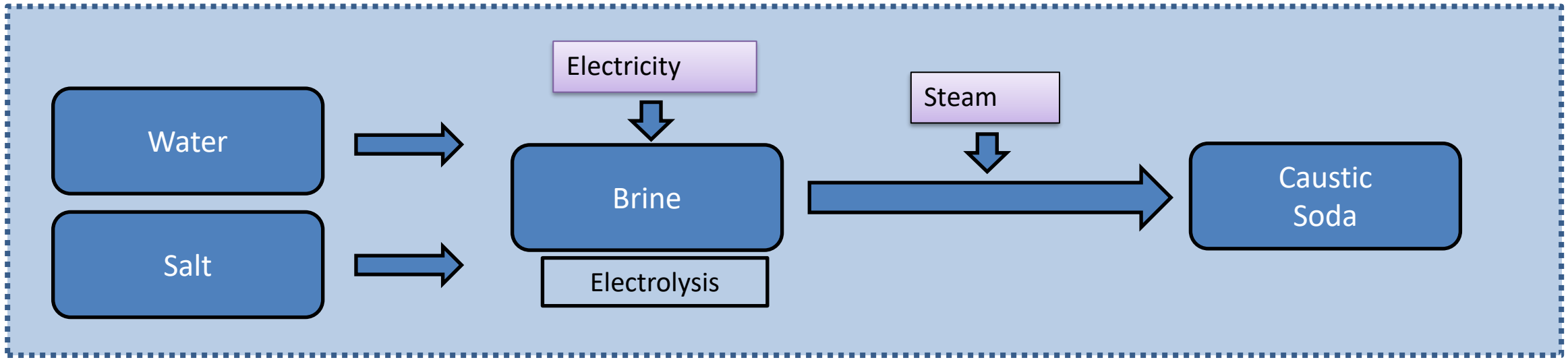
- PVC production depends upon imported ethylene, therefore, its margins are a function of international prices and exchange rate fluctuations. PVC is also imported in the country to fill the supply gap due to production limits. Installation of Naphtha cracking plant will greatly help the local chemical industry. It will also reduce burden on the country's import bill. From this installation, a variety of chemicals can be extracted such as ethylene, propylene, pyrolysis gas and many more.
- Global Ethylene prices fluctuated across CY22, reaching the maximum price of USD~1,300/MT in Mar'22. Due to an increase in post-COVID demand for PVC, its price increased up till 1HCY22. However, due to the onset of recessionary pressures, such as hiked global interest rates and rising inflation, PVC prices fell in the start of 2HCY22 but then rose again in December'22.
- A YoY decline of ~20% in gross profit margin, ~16% in operating profit margin and ~7% in net profit margin has been observed during 3MCY23. These indicators point back at CY22's recessionary pressures and the impact that they continue to have going forward into 3MCY23.





Source: PACRA internal database

Caustic Soda | Process



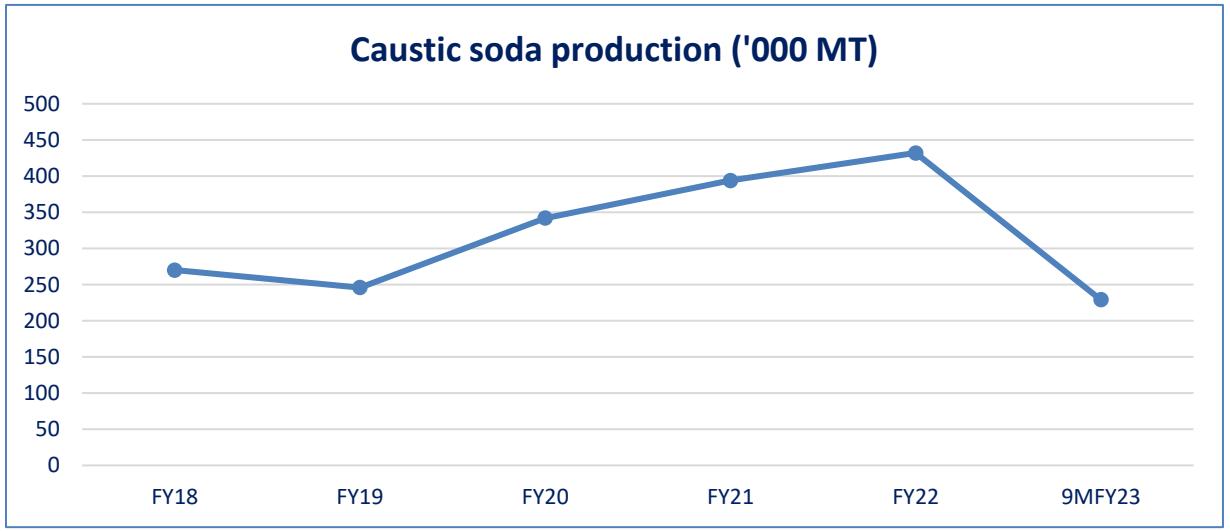
- Nearly all caustic soda is generated by the electrolysis of sodium chloride solution using one of the three cell types: mercury, diaphragm and membrane cells. The electrolysis process produces ~2.25 MT of ~50% caustic soda with each MT of chlorine. The primary raw material is common salt, usually in the form of underground deposits which are brought to the surface as a solution in a pumped high pressure water supply. The sodium chloride solution is often called brine.

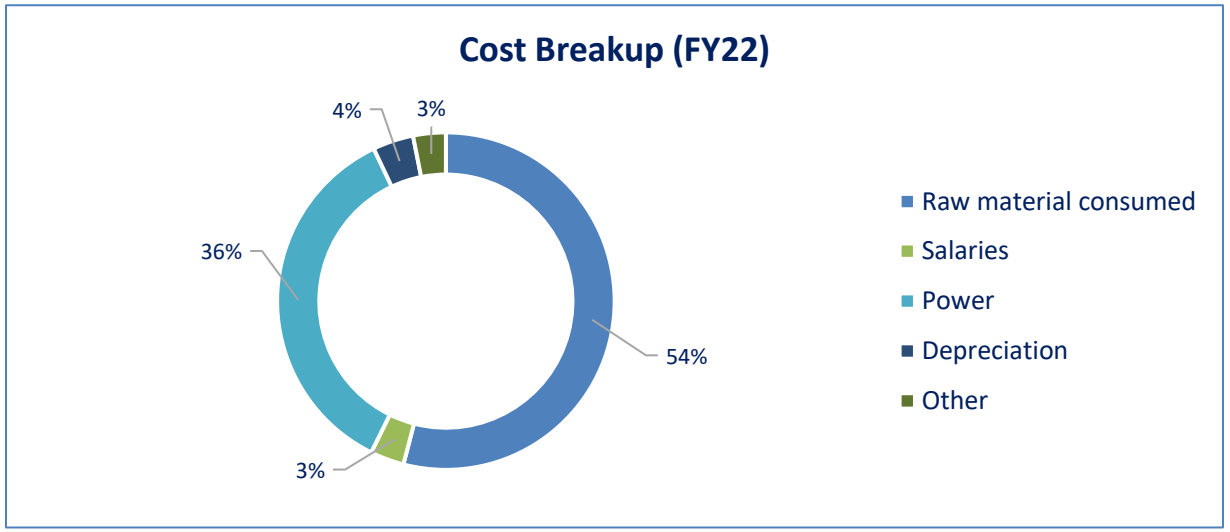
- Electrolysis is carried out by the mercury amalgam, diaphragm cell processes or membrane cell. Diaphragm cells need plenty of thermal energy to concentrate the caustic solutions but can be cheaper than mercury cells when steam costs are low and have relatively cheap construction costs. Use of membrane cells is growing due to lower capital and energy costs and an absence of environmental problems.

Source: Eurochlor.org

Supply and Demand | Caustic Soda

- **Caustic Soda,** in its pure form, is a waxy, white solid. It readily absorbs water and forms aqueous solutions.
- The main raw material used in its production is sodium chloride. Pakistan's own domestic supply of Sodium Chloride was ~432,000MT in FY22, which fell to ~229,000MT in 9MFY23. Import of Caustic Soda accounts for ~37% of the total supply.
- Caustic Soda is widely used in several industries, particularly, textiles, detergents and soaps. The largest cost component for this chemical are raw materials which have a ~54% share of the cost, followed by power used during production which has a ~36% share.
- Caustic Soda production has had a ~10% YoY increase in production in FY22, which is down from 15% in FY21. This growth rate was lower than previous years due to mounting recessionary pressures, such as high inflation. Total production stood at ~431,000MT during FY22.
- Its capacity utilization was ~81% in FY22. Total capacity decreased by ~2% YoY in FY22.





Source: PSX, PBS, PACRA internal Database, TDAP

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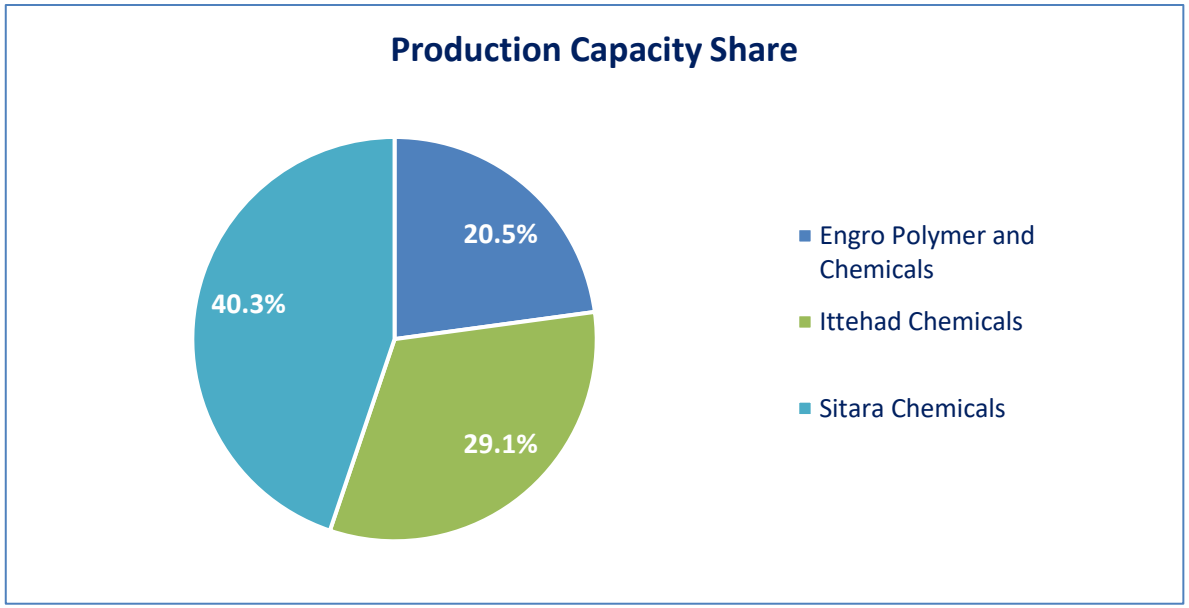
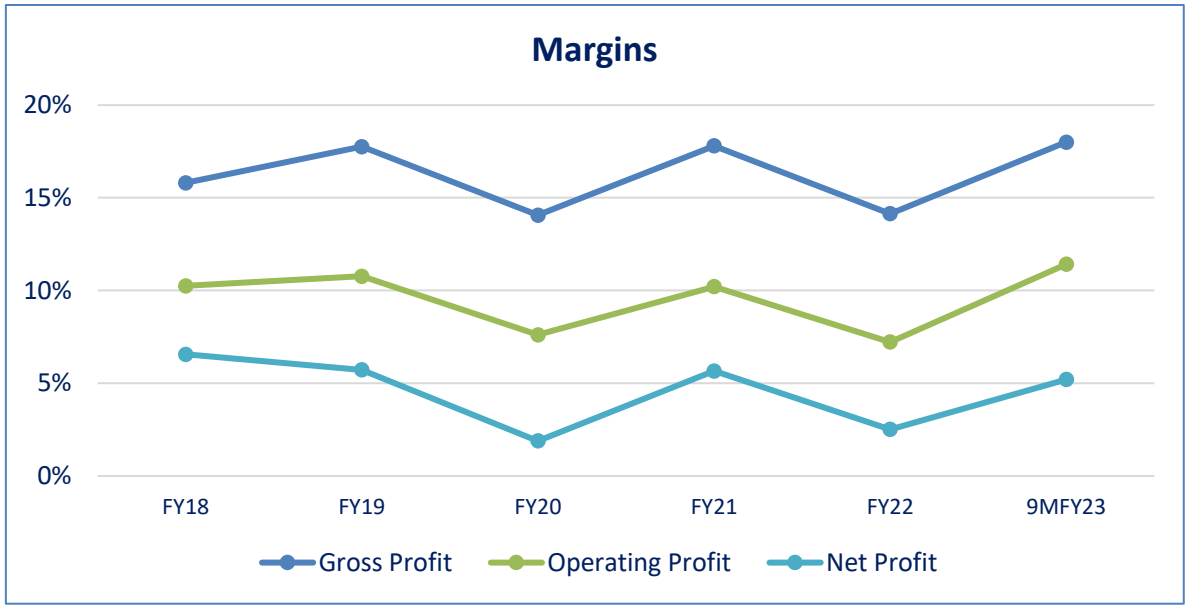
Caustic Soda | Margins

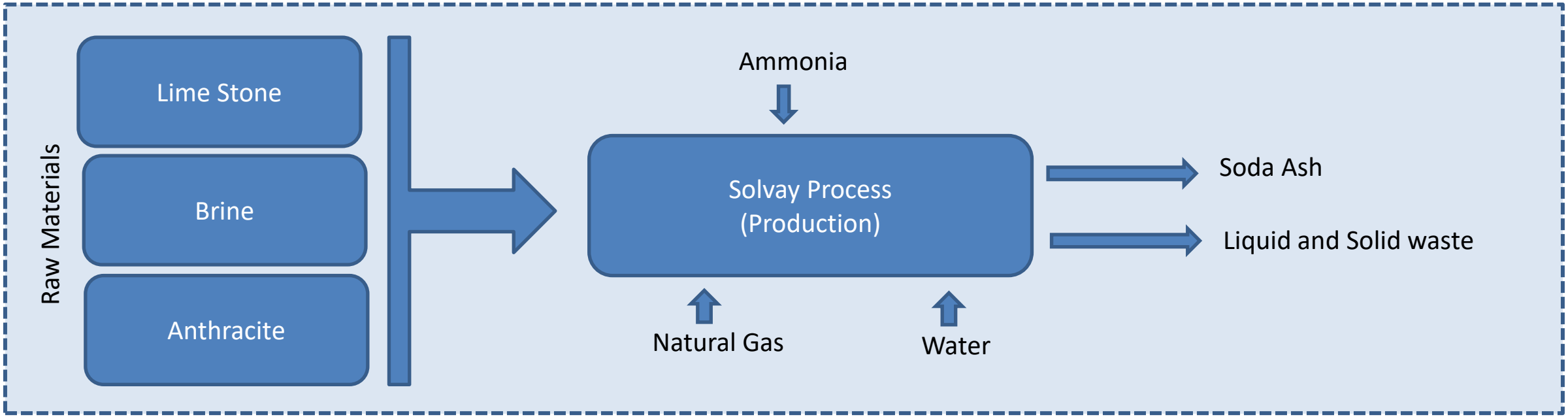
- There are three major local players in caustic soda segment: Engro Polymer, Ittehad Chemicals and Sitara Chemical. The total combined production capacity of all players was recorded at ~604,000MT in FY22, whereas total production during the same period was ~434,000MT, translating into ~72% capacity utilization. There remains unused capacity and the import of caustic soda is negligible.
- All three margins displayed recovery in 9MFY23 after dropping in FY22, with net profit margin at ~5%, an increase of ~3% from FY22. Similarly, gross profit margin stood at ~18% in 9MFY23, also up by ~4% since FY22. Operating profit margin was ~11% in 9MFY23. This was up by ~4% since FY22. Despite international price hikes and domestic inflation, the Caustic Soda segment displayed improvement in profits.
- The capacity also far exceeds the demand for caustic soda in Pakistan resulting in competitiveness and tight margins. Increase in prices by any company to pass on impact of rising cost of production comes at the expense of market share.





Source: PSX, PACRA Internal Database

Soda Ash | Process



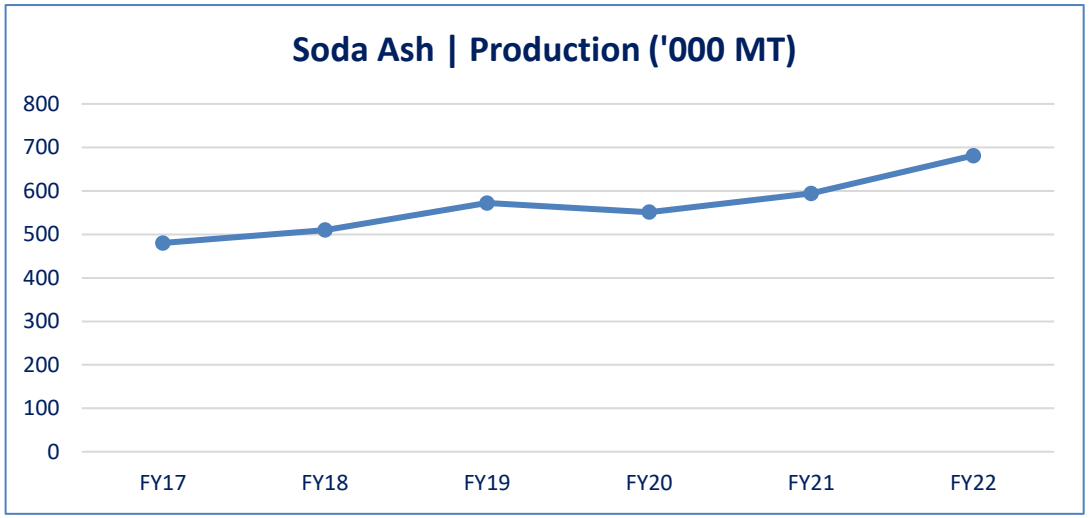
- In the ammonia-soda process, common salt, sodium chloride, is treated with ammonia and then carbon dioxide, under carefully controlled conditions, to form sodium bicarbonate and ammonium chloride. When heated, the bicarbonate yields sodium carbonate (soda ash), the desired product; the ammonium chloride is treated with lime to produce ammonia for reuse and calcium chloride.

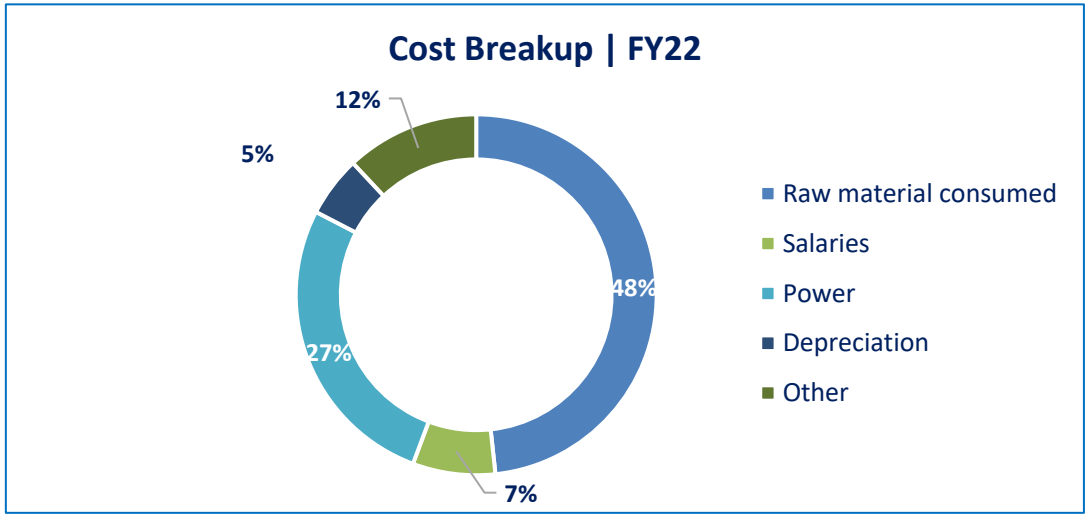
- The ammonia-soda process encountered stiff competition from the older Leblanc process, but it ultimately prevailed because it produced soda ash more cheaply.

Source: elixirpublishers

Supply and Demand | Soda Ash

- **Soda Ash:** It is an anhydrous white powder or granular material that is available in two grades, light and dense. Dense soda ash is an anhydrous substance mostly used in the manufacturing of industrial chemicals. Light soda ash is used as pH regulator in various industrial processes.
- Production of Soda Ash uses raw materials that include sodium chloride (salt), limestone, coal and ammonia.
- Raw materials are the largest component of its cost breakup at ~43%, followed by power at ~27%. Limestone, brine and ammonia are the major raw materials used in Solvay process which are locally available without any hindrances.
- Soda Ash is an essential raw material used in manufacturing of glass, paper, chemicals, detergents and various industrial products. Demand and production remained high during the start of FY22 due to recovering markets post-COVID. Soda Ash production grew by ~15% in FY22, which is a higher growth rate than ~8% in FY21. Total production at the end of FY22 stood at ~681,180 MT.
- There are only two major players in the soda ash segment, ICI chemicals and Olympia chemicals, having a combined capacity of ~672,500MT with ~63% and ~37% shares, respectively.
- The demand outlook remains mixed as certain segments like paper look for import substitution of soda ash, while others like glass will drive growth of this segment.



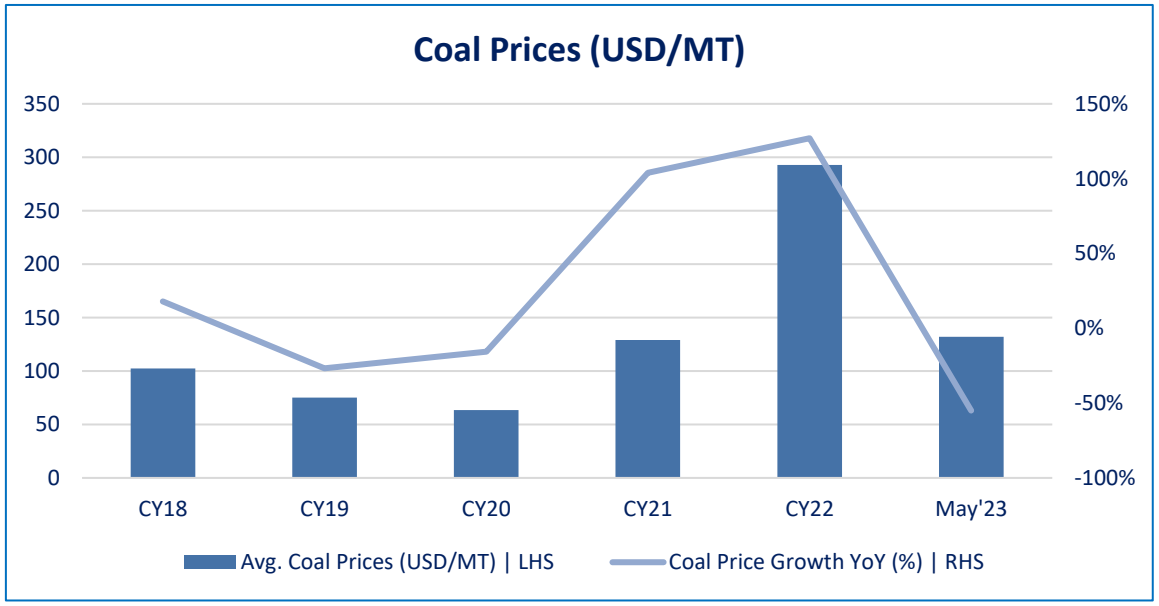


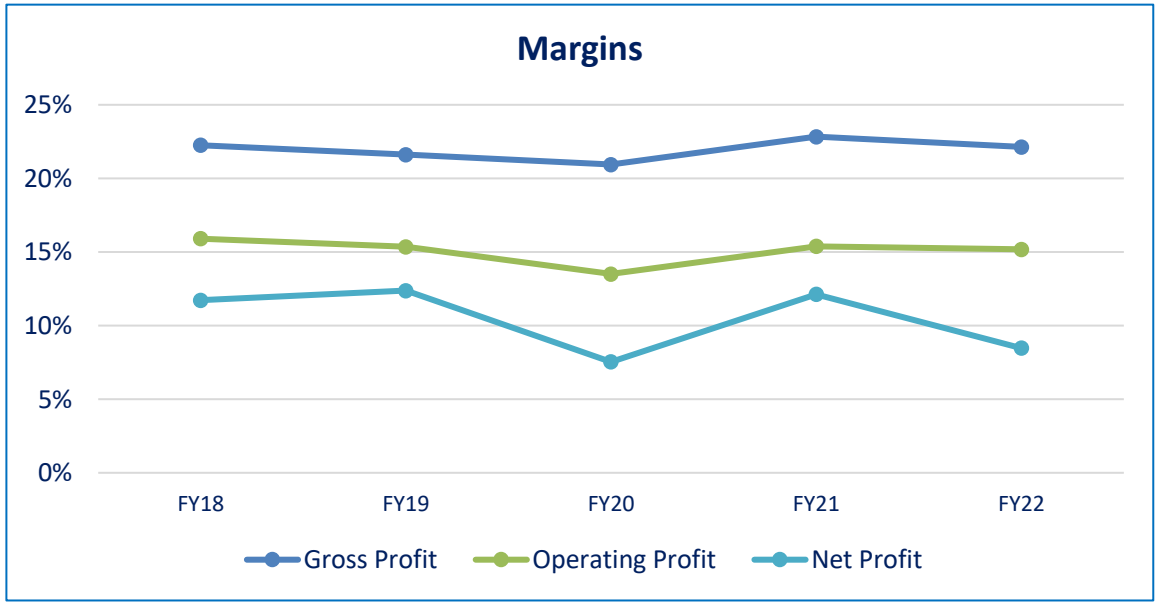
Source: PSX, PACRA Internal Database

Soda Ash | Margins

- Global coal prices increased by ~127% YoY in CY22. This was due to demand-push inflation, resulting from trade restrictions post the Russia-Ukraine conflict. However, during CY23, global coal prices have sharply declined, with a YoY decline of ~55% up till May'23. The reason for this can be attributed to declining demand in the energy sector. Coal demand will decline in the foreseeable future due to reduced demand as winter months pass.

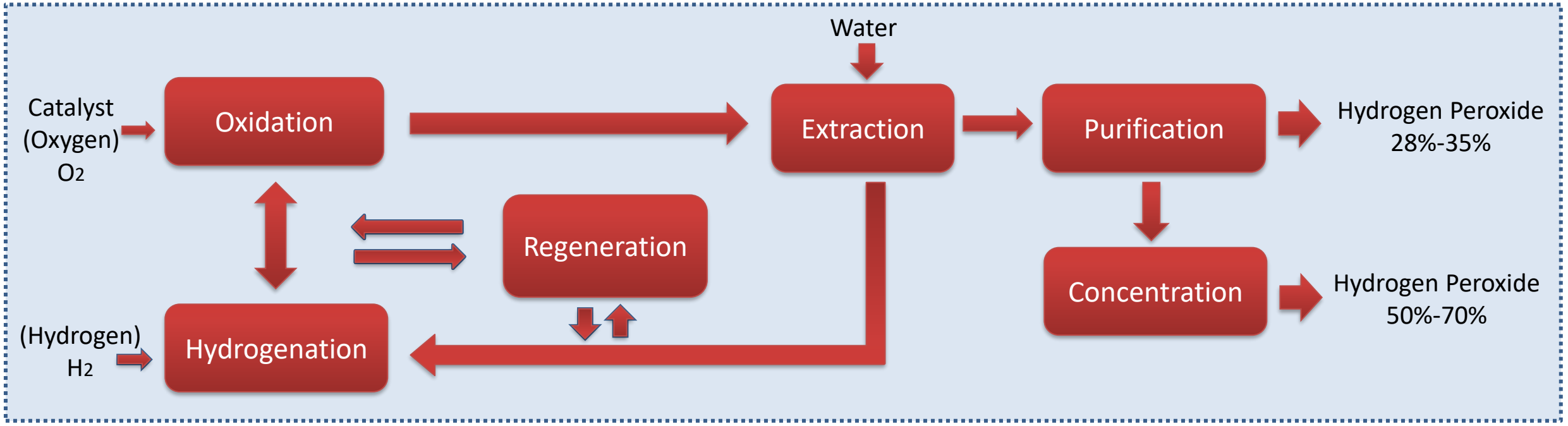
- On the margins side, operating profits remained constant but gross profit and net profit margin declined. Gross profit margin was ~22%, which is a ~1% decline from ~23% in FY21. Net profit margin was ~12% in FY21 and declined to ~8% in FY22. The decline in net profit margin in FY22 was because of higher tax expenses through the 4% Poverty Alleviation Tax and 6% Super Tax levied in FY22 through the Finance Act, 2022. Interest expense also increased by ~38% YoY in FY22.





Source: PSX, World Bank, PACRA Internal Data

Hydrogen Peroxide | Process



- Palladium catalyses the reaction between H2 and anthraquinone to create anthrahydroquinone.
- The palladium catalyst is filtered out of the solution.
- The solution is oxidized by blowing air through the solution, forming the H2O2 (Hydrogen Peroxide).
- The hydrogen peroxide is removed in a liquid-liquid extraction column and concentrated by vacuum distillation.

Source: researchgate

Supply and Demand | Hydrogen Peroxide

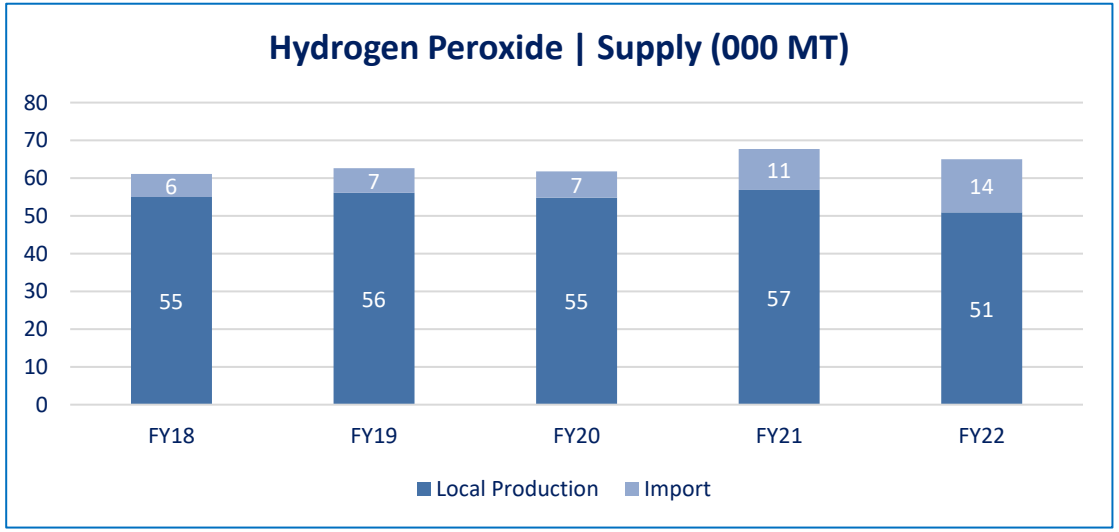
- **Hydrogen Peroxide:** A colorless viscous unstable liquid with strong oxidizing properties. It can, however, act as a reducing agent for strong oxidants. Upon decomposition, it forms water and releases oxygen which makes it an environment-friendly product.

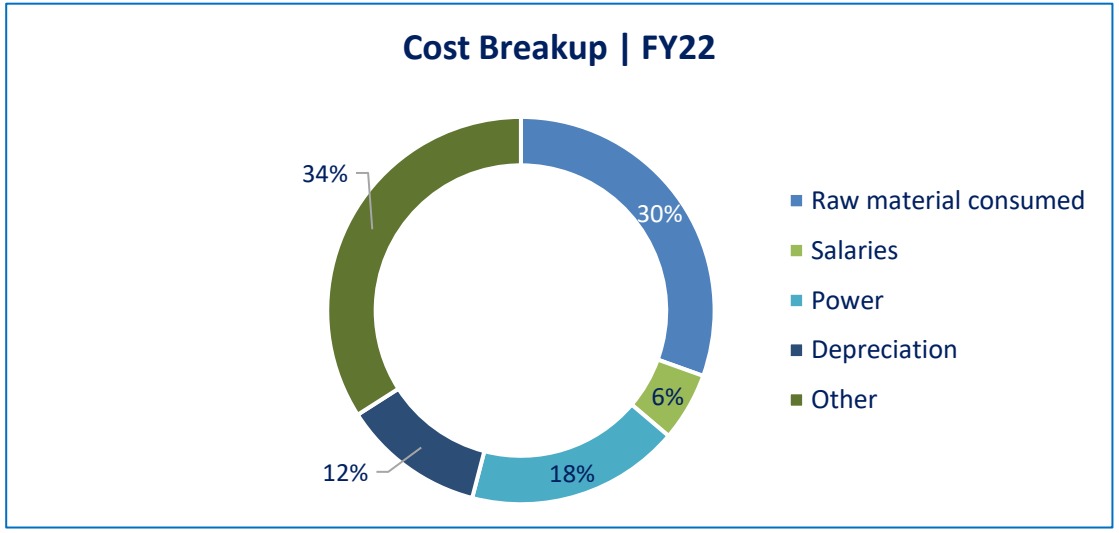
- Cost breakup is dominated by raw material and power expenses, among others. The two basic raw materials are atmospheric in nature, namely hydrogen and oxygen, which can be attained using multiple sources and chemicals.

- Raw materials account for ~30% of the cost, power on average accounts for ~18% of cost of production and others are ~34%. The industry's reliance on gas and electricity as the basic raw materials for the production process generates substantial risk, since prices remain volatile and supply of gas is not assured always.

- Hydrogen peroxide is an important chemical with demand driven from the industrial sector where it is used as an oxidizing, bleaching and sterilizing agent. It is used in a variety of industries including textile, paper/pulp, food packaging and healthcare sectors.

- While local production is higher that imports, the import quantity has increased in FY22. Local production fell by ~10% in FY22, while imports grew by ~30% in FY22.





Source: PSX, PBS, PACRA Internal Database

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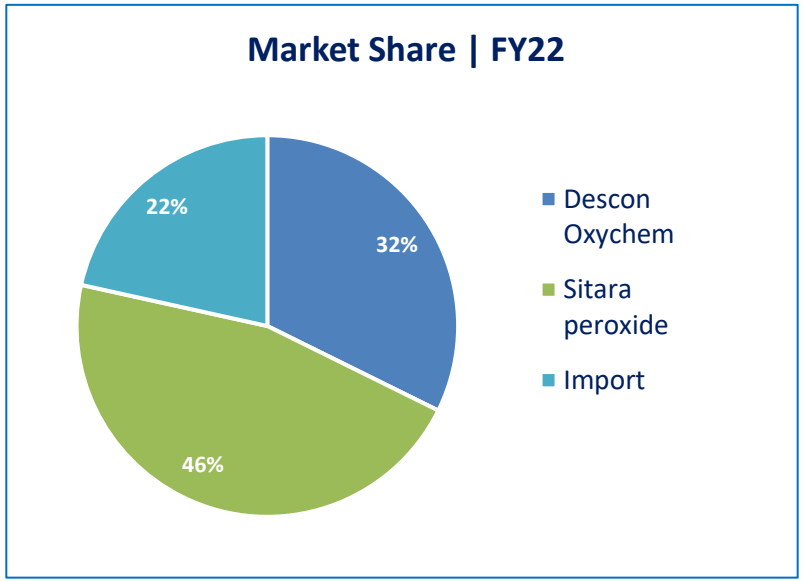
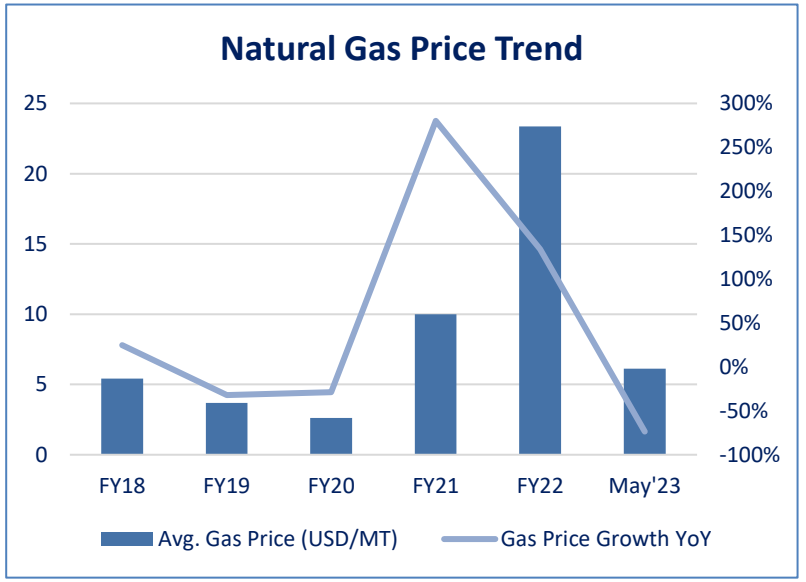
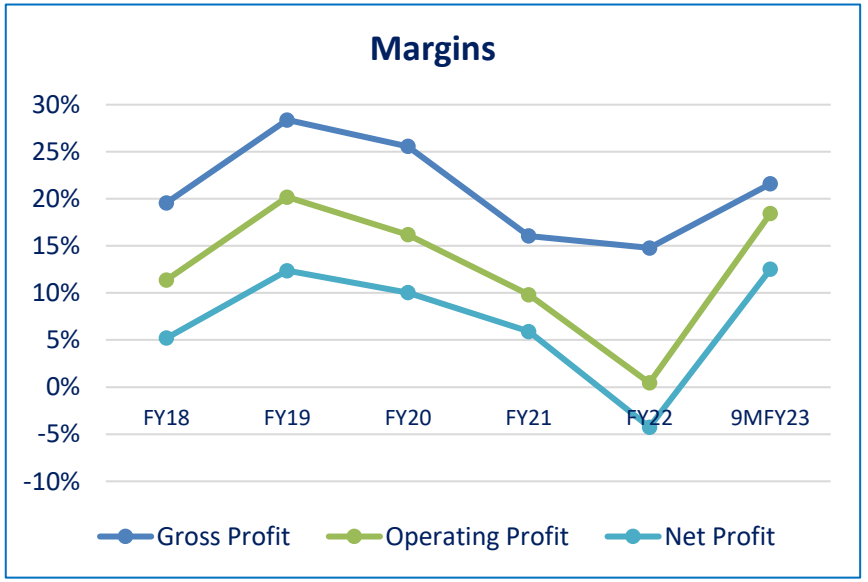
Hydrogen Peroxide | Margins

- There are two players* in the hydrogen peroxide segment; Descon Oxychem Limited (DOL) and Sitara Chemicals Limited (SPL), having a total production capacity of ~51,000MT. During FY22, ~22% of the local demand was met through imports. ~9,536 MT of hydrogen peroxide were imported in FY22.
- Natural gas is an important input for the production of hydrogen peroxide. Its price increased by ~134%, YoY in FY22. This is down from ~280% in FY21. As of May'23, natural gas price stood at USD~74.12/bbl.
- Net profit margin turned negative during FY22 but has been recovering during the first three quarters of FY23. Gross profit margin stood at ~23% during 9MFY23, which is an increase from 15% in FY22. Operating margin was negative during FY22 and then turned positive at ~30% in 9MFY23. Net profit margin was also negative during FY22 but then increased to ~10% in 9MFY23. The increase in operating margin can be attributed to better management of operating costs and the increase in net profit margin to decrease in financing costs.





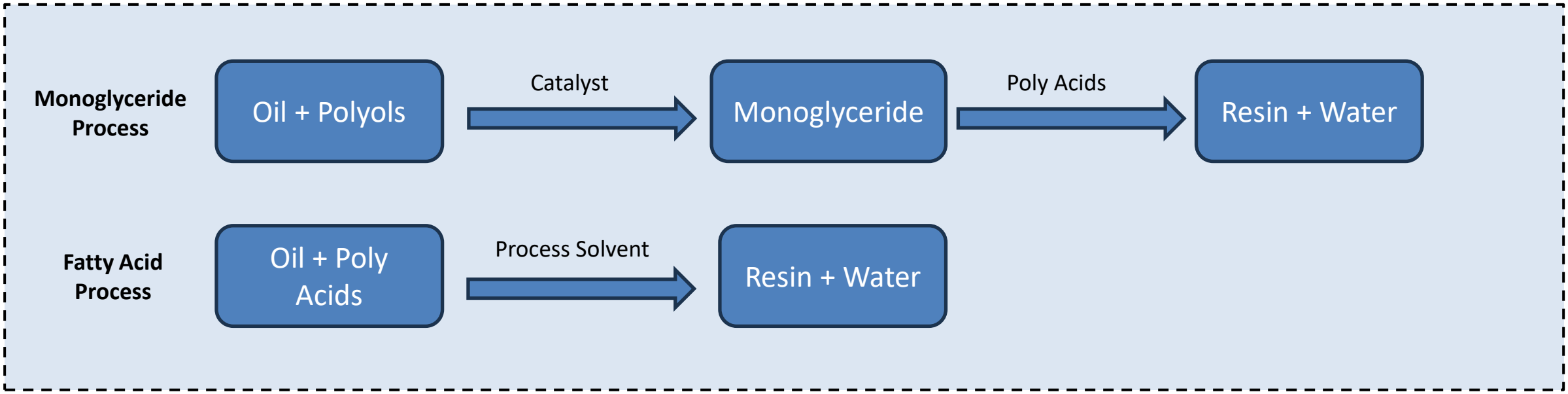


*PACRA-rated.

Source: PBS , PACRA Internal Database

Chemicals

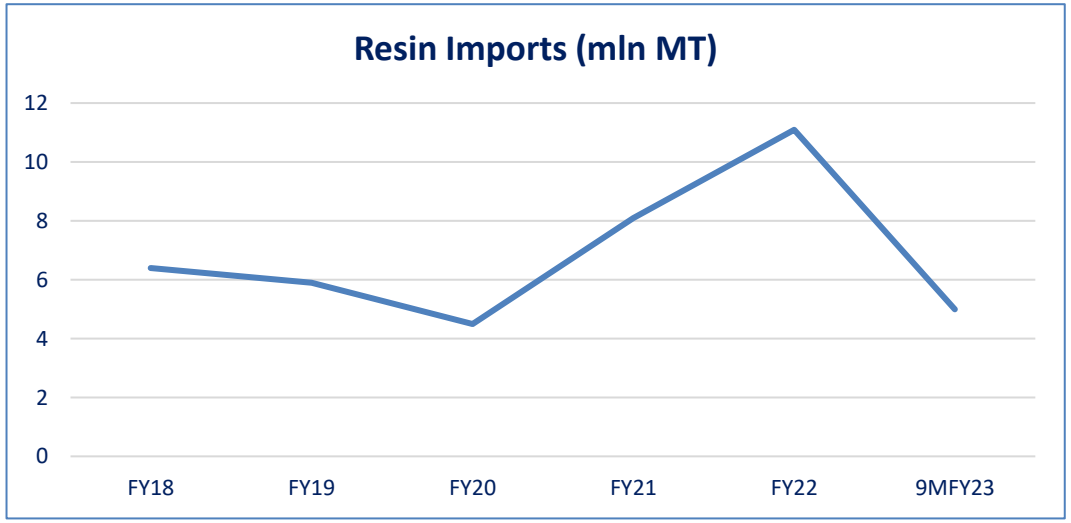
Resin | Process

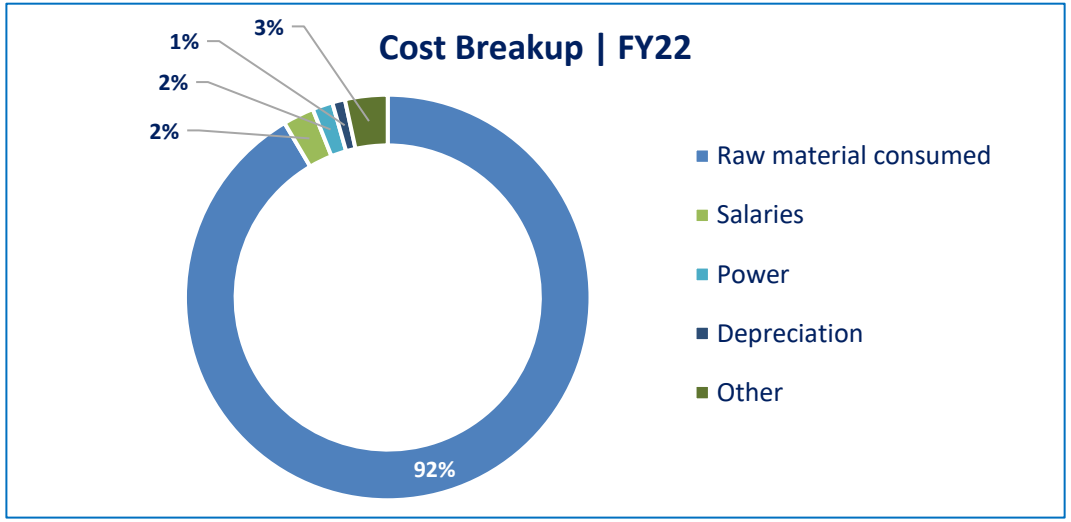


- There are predominantly two processes used to produce resins: the monoglyceride process and the fatty acid process.
- The monoglyceride process first heats oil with polyols and catalysts, this makes the oil polar. In the second step, the monoglyceride formed is reacted with poly acids to form resin and water (a byproduct).
- The fatty acid process completes the production in one step, which reduces the production cycle time. Oil is directly heated with poly acids and a process solvent which results in production of resins.

Supply and Demand | Resins

- **Resin**: Resin includes production of chemical emulsions, which comprise adhesive emulsions, homo polymer, co-polymer cross linking agent, acrylates-based emulsion dispersion, pure acrylates emulsion and styrene modified acrylates emulsion.
- Resins are primarily used in the coating and paint industry and derive their demand widely from textile, paper, construction and wood industry.
- Import of Resin has been increasing YoY. In FY21, ~8.1mln MT of different Resin variations were imported, this amount increased to ~11.1mln MT in FY22. Resin imports have declined to ~5.0mln MT in 9MFY23.
- Raw material holds the biggest portion in the cost of production, accounting for ~92% of the cost breakup. Resins are made up of different grades and quality depending on the specific use for the industry. The raw materials of resins include lignin, polyol, solvent, catalyst, acid anhydride, and multi-epoxy compound. These are mainly oil derivatives with strong linkage to international oil prices. The production capacity of resin segment was ~113,000MT in FY22.
- The growth in resins segment is dependent upon the overall economic growth with major contribution coming from coating and paints, which is expected to grow at ~15% in FY23.





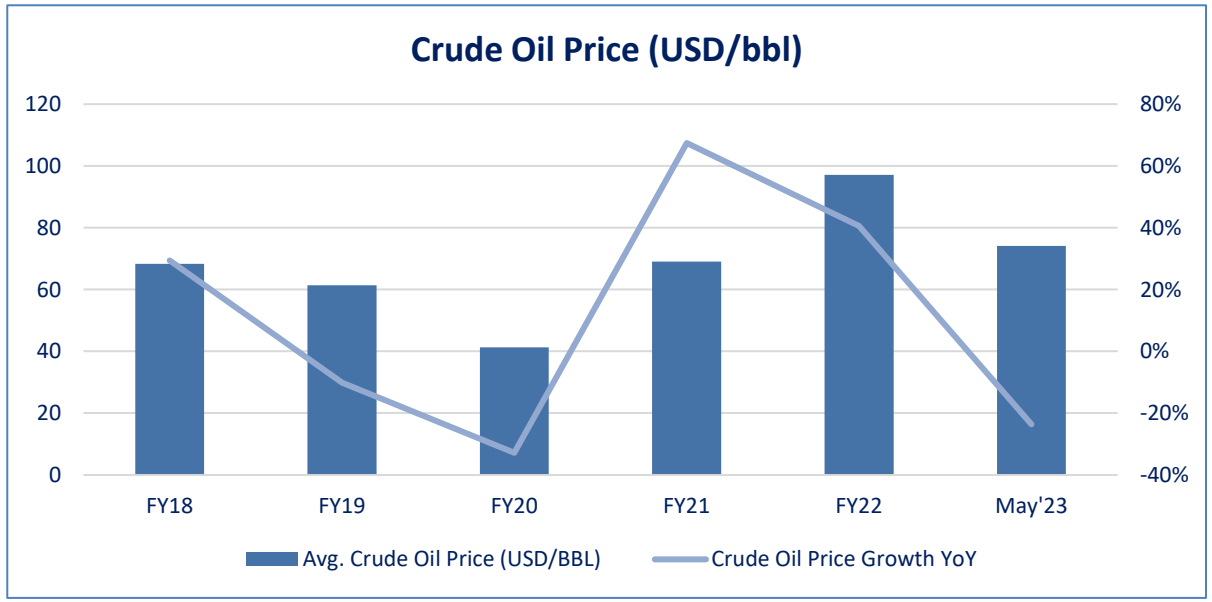
***Note**: Resin import data includes HS codes:13019090, 39073000 & 39111010.*

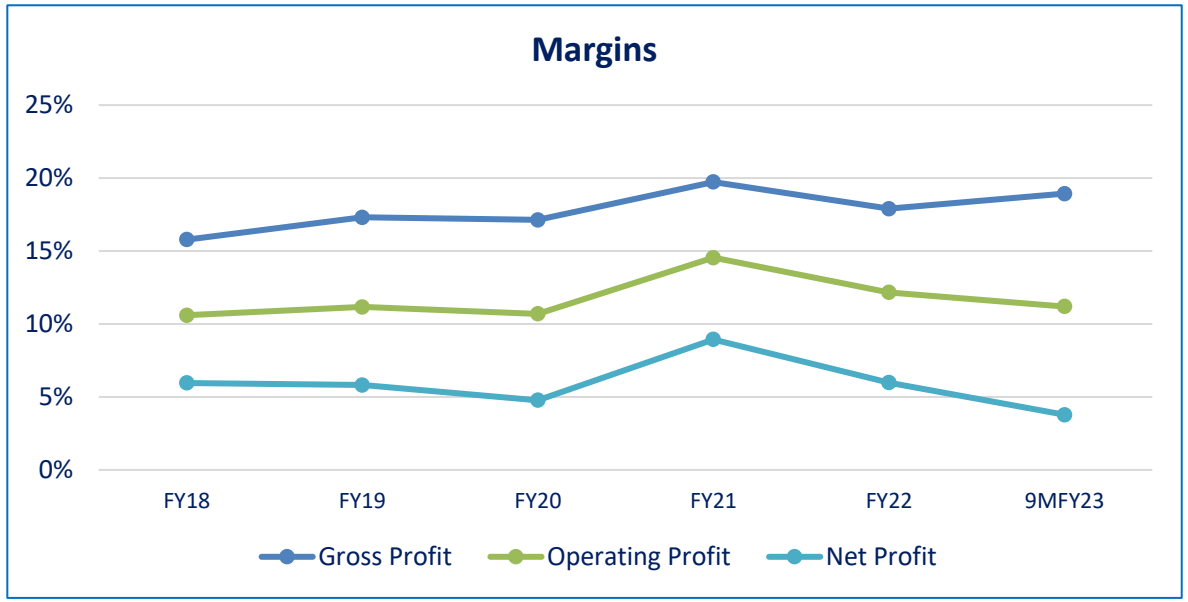
Source: PSX, PACRA Internal Database

Chemicals

Resins | Margins

- Resin manufacturing industry operates in a highly competitive market owing to unsegmented and unorganized small producers who pose threat to large scale manufacturers. The production process consists of mixing different raw materials at certain quantities to make resin of different qualities and grades. Because of simplicity in the production process, the industry is very competitive and margins are relatively on the lower side.
- On average, ~92% of the total cost of production constitutes raw material, which is a YoY increase of ~5%. Since resins is a highly competitive segment, it is difficult for manufacturers to pass on increasing costs to the customers. Oil is a major input for the production of Resin. Global oil prices have decreased YoY by ~24% in May'23. Global prices stood at USD~74.12/bbl as of May'23.
- Gross profit margin increased by ~1% to ~19% in 9MFY23. Operating profit margin fell from ~12% in FY22 to ~11% in 9MFY23. Net profit margin also fell from ~6% in FY22 to ~4% in 9MFY23. Increased tax burden and operating costs led to this trend.

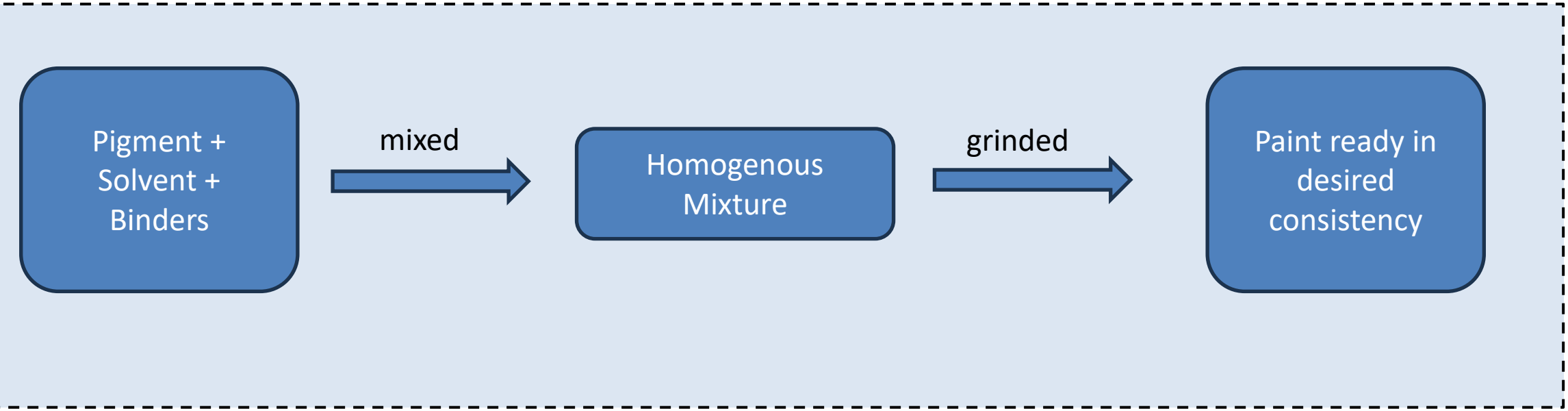




Source: World Bank, PSX, PACRA Internal Database

Chemicals

Paint | Process

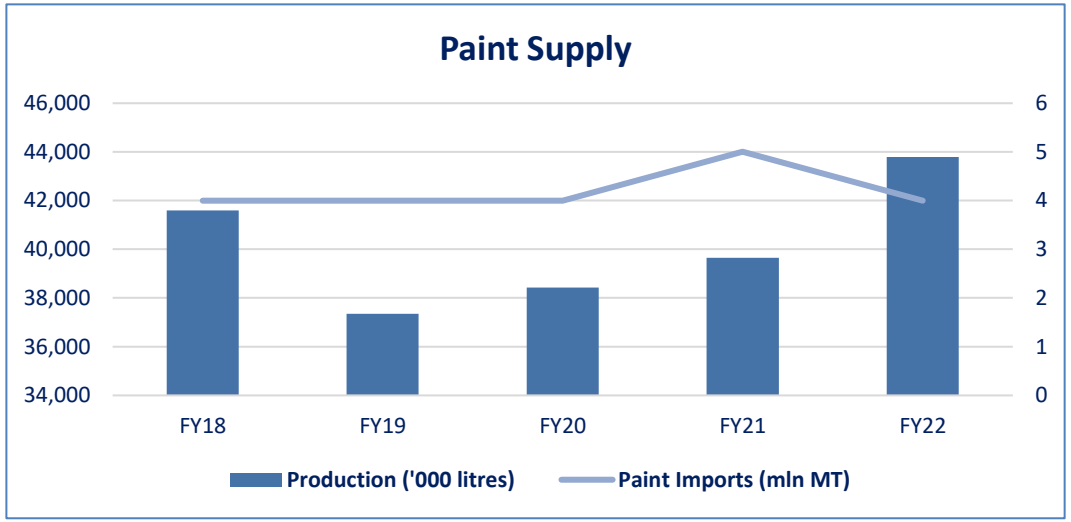


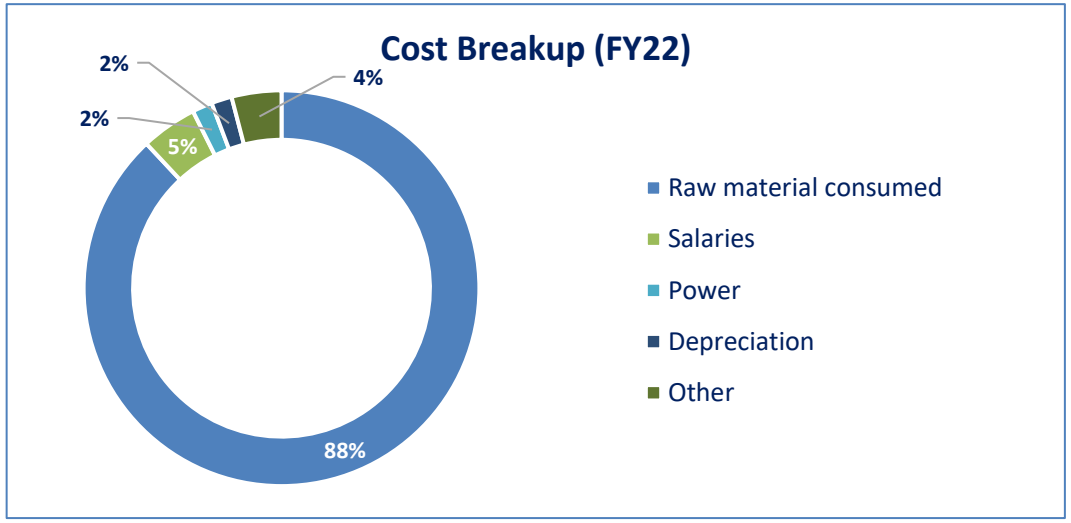
- The manufacturing process for paints is simple but the main details lie in the blend that is desired and the consistency that is needed from a certain type of paint.
- Raw materials include pigment, solvent and binders, which are mixed together in the first step. Quantities of these determine what type of paint is being produced. Once these have been mixed, a homogenous mixture is produced.
- After the homogenous mixture is ready, it is grinded using a mill to bring it to the desired consistency which also varies by the type of paint being produced. This completes the production process for paints.

Source: Katabook

Supply and Demand | Paint

- **Paint**: The paint segment is very diverse and includes a variety of products, such as, resin paints, waterborne paints, solvent paints and epoxy. They are used for a variety of purposes, like decorative or functional. Therefore, the paint segment has links with construction, electronics, automobiles and various other industries.
- The size of the market is PKR~70mln. Some of the main players in the segment include Berger Paints, Master Paint, Diamond Paint and Brighto Paint. Berger Paints holds ~10% market share of revenue in the segment.
- Supply of paint comes from local production and imports. Imports of paint have declined by ~9% YoY in FY22. Paint imports during FY22 amounted to ~4mln MT, which is down from ~5mln MT in FY21.
- Local production of paint has increased YoY by ~10% in FY22. It stood at ~39mln liters (please use the same unit in FY21 and increased to ~43mln liters in FY22. As imports decline and production rises, more of the local demand is being catered to by domestic production.
- Raw materials held the largest share of the cost breakdown at ~88% in FY22, which has increased from ~85% in FY21. The second largest contributor to cost are salaries which made up ~5% of the cost breakup in FY22 and have remained unchanged from FY21.
- The coatings and paint industry of Pakistan is expected to grow at CAGR of ~4% in FY24, which can pave the way for greater domestic production to meet demand, which will also alternatively reduce reliance on imported paint.





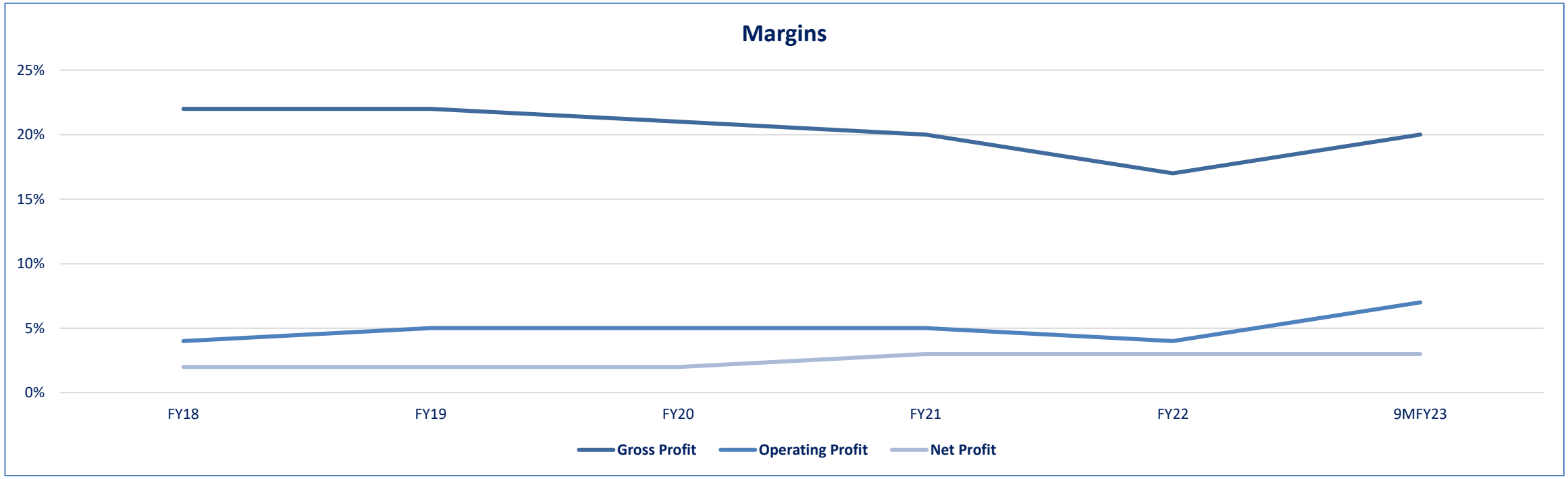
***Note**: Data is based on PACRA-rated clients.*

Source: PBS, PACRA Internal Database

Chemicals

Paint | Margins

- The sector's gross profit margin and operating profit margin exhibited an increasing trend moving from FY22 to 9MFY23. They previously in FY22 due to economic disruption resulting from high inflation, floods, disruption of raw material supply and overall lower demand within the economy.
- Gross profit margins increased YoY by ~18% in 9MFY23 recording at ~17% in FY22 to ~20% in 9MFY23. This is due to rising cost of goods sold, particularly raw materials whose share increased in the cost breakup. Operating profit margin grew YoY by ~75%. It stood at ~4% in FY22 and increased to ~7% in 9MFY23. On the other hand, the net profit margin remained constant between FY22 and 9MFY23 at ~3%.

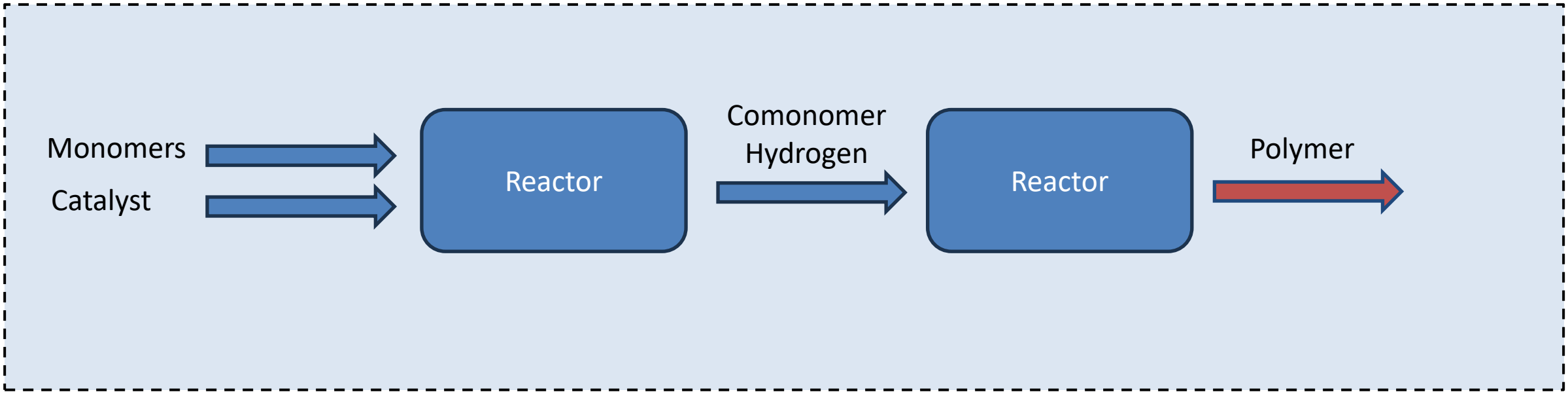


***Note**: Data is based on PACRA-rated clients.*

Source: PACRA Internal Database

Chemicals

Polymer | Process



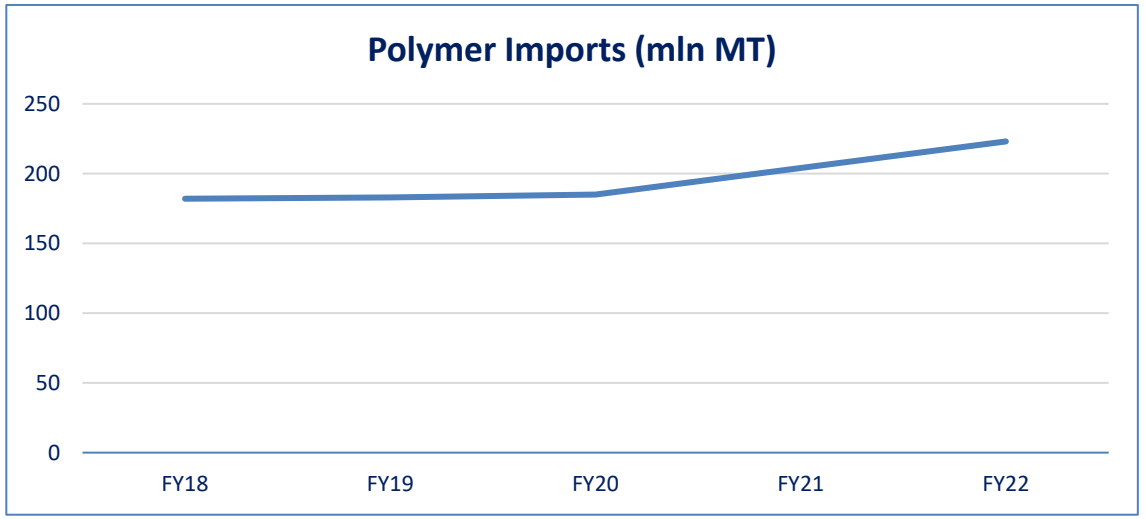
- Outlined above is the production process of polymers. Its primary inputs are monomers and catalysts. Production of polymers is a two step process, where the materials go through two different reactors.
- The first step is to put the monomers and catalyst through a reactor, their reaction produces comonomer hydrogen which is then once again put through a reactor and its reaction produces polymers.

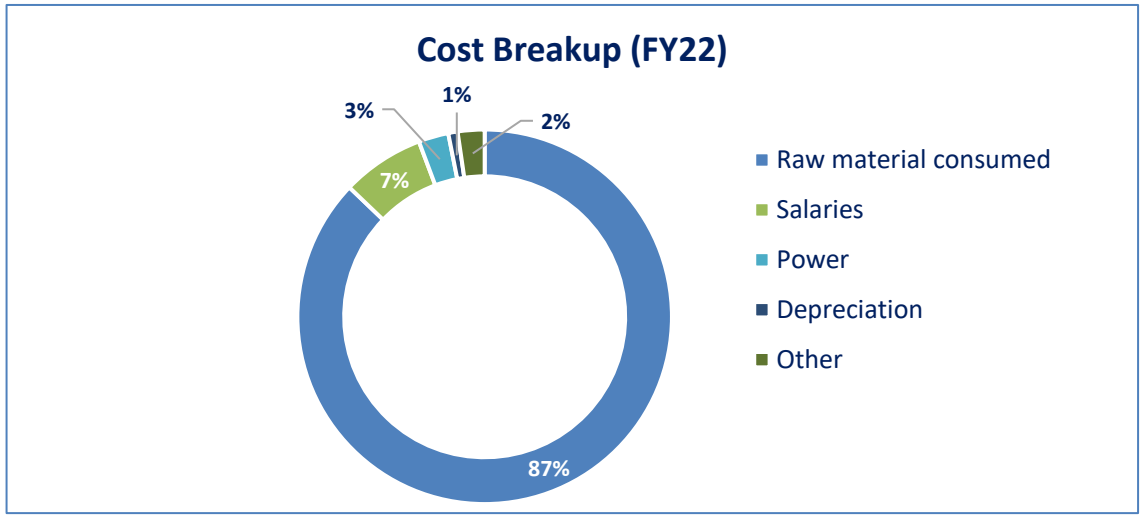
Supply and Cost | Polymer

- **Polymer**: Polymers are used in the manufacturing of a diverse range of products, ranging from plastic bags and packaging to textiles, medical instruments and even cooking appliances. As a result, the demand for polymers comes from a diverse industries. Polymers are also used in football manufacturing, of which Pakistan holds ~90% global market share.

- Polymer imports have exhibited an increasing trend over the years. They increased YoY by ~9% to record at ~223mln MT in FY22 from ~204mln MT in FY21.

- Raw materials hold the largest share of the cost breakdown at ~87% in FY22, which has increased from ~86% in FY21, a YoY increase of ~1%. This is due to the price increase of natural gas and crude oil in FY22. The second largest contributor to cost are salaries which made up ~7% of the cost breakup in FY22. This is a decrease from ~9% in FY21, leading to a YoY ~22% decrease in the contribution of salaries towards cost.





***Note**: Cost numbers are based on data of PACRA clients.*

Source: PBS, PACRA Internal Database

Chemicals

Oleochemical | Process

- Oleochemicals have four different processes, each of which gives a different by-product for different product manufacturing. These process are: hydrolysis, transesterification, saponification and direct hydrogenation.

- The primary inputs for the manufacturing for the processing of oleochemicals are fats and oils. These depend on which type of process is used and by-product is needed.

Source: SpringLinker

Chemicals

Demand and Supply | Oleochemical

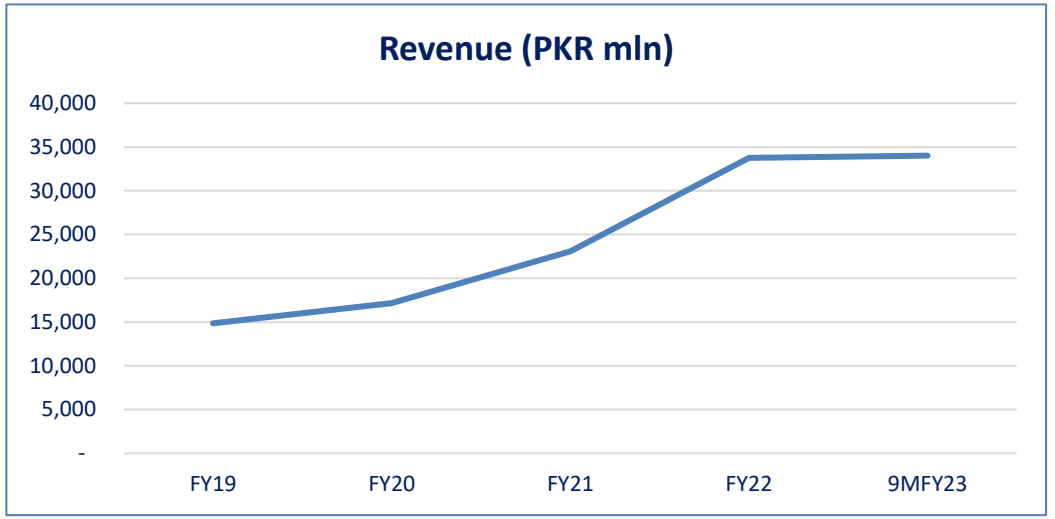
- **Oleochemicals** are used in a wide range of products and therefore, is an important input for the lubricants, plastics, paper, soaps and lotions industries.

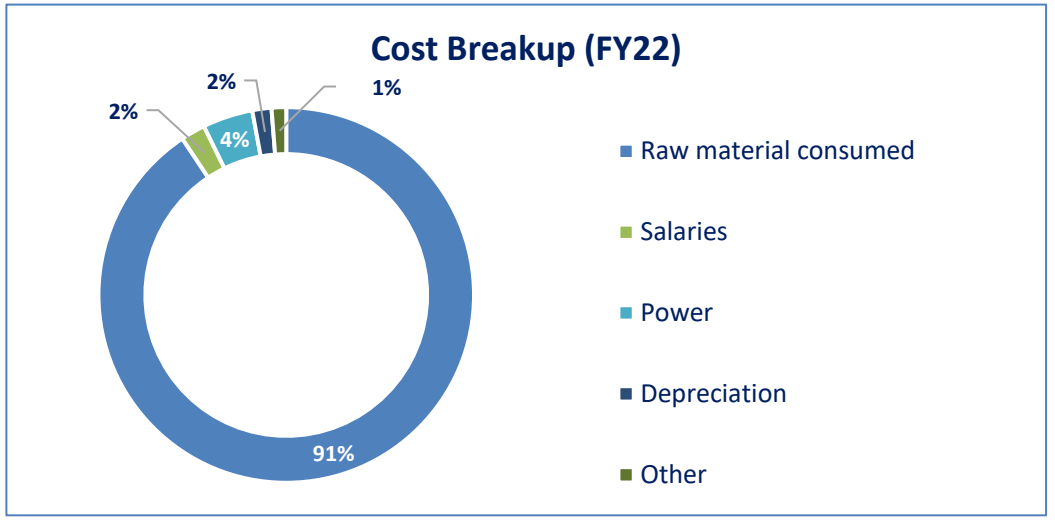
- The total installed capacity of the sector in Pakistan for oleochemical products was ~167,000MT p.a. in FY22. Per capita consumption of soaps has been increasing as general living standards improve in the country and was recorded at ~700mg/capita in FY22. Nimir Chemicals holds majority market share in the oleochemical segment.

- Revenue has been increasing YoY, in 9MFY23 it grew by ~7%. Revenue for FY22 was PKR ~33,786 mln and increased to PKR ~34,024 during 9MFY23.

- Raw materials hold the largest share of the cost breakdown at ~91% in FY22, which is a decrease from ~94% in FY21. A significant portion of raw material for oleochemical manufacturing includes different fats and oils.

- Next to Raw materials is the Power component, which made up ~4% of the cost breakup in FY22. This has remained constant since FY21. Cost of Goods Sold (COGS) of the sector is, therefore, largely dominated by its raw material dynamics.





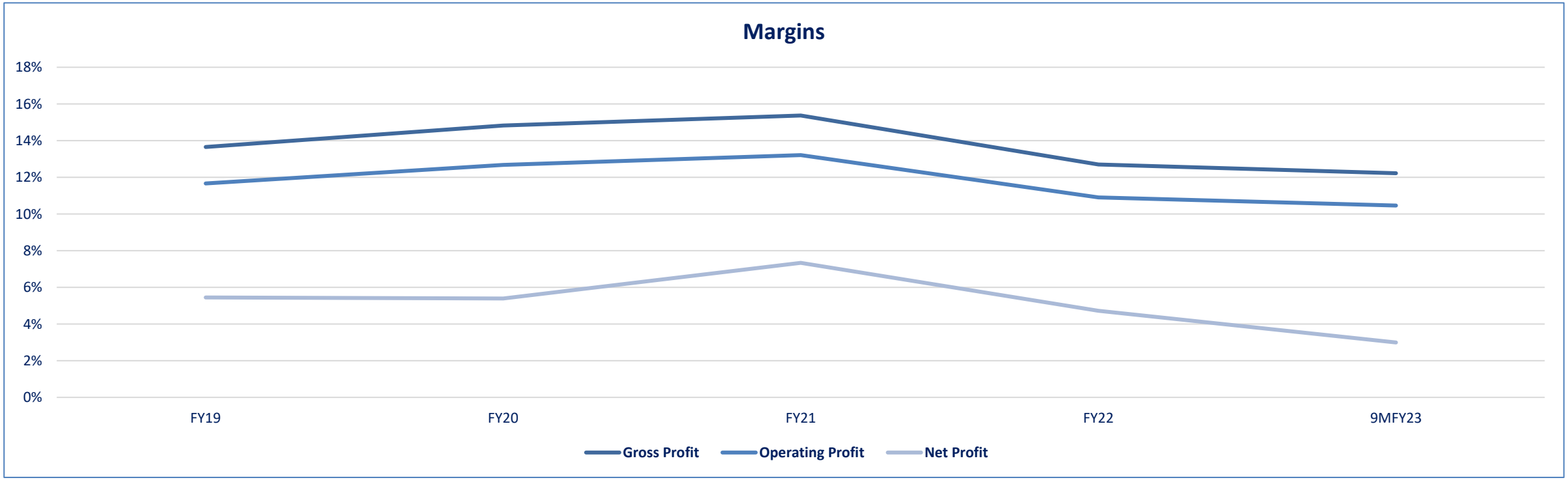
***Note**: Cost numbers are based on data of PACRA clients.*

Source: PACRA Internal Database

Chemicals

Margins | Oleochemical

- The oleochemical segment has largely been characterized by increasing finance cost over the year which has significantly impacted its net profit margins in 9MFY23. Gross profit margins were ~13% in FY22 and decreased to ~12% in 9MFY23. Operating profit margins were ~11% in FY22 and decreased to ~10% in 9MFY23. Net profit margins were ~5% in FY22 and ~3% in 9MFY23. Financing costs grew YoY by ~78%.

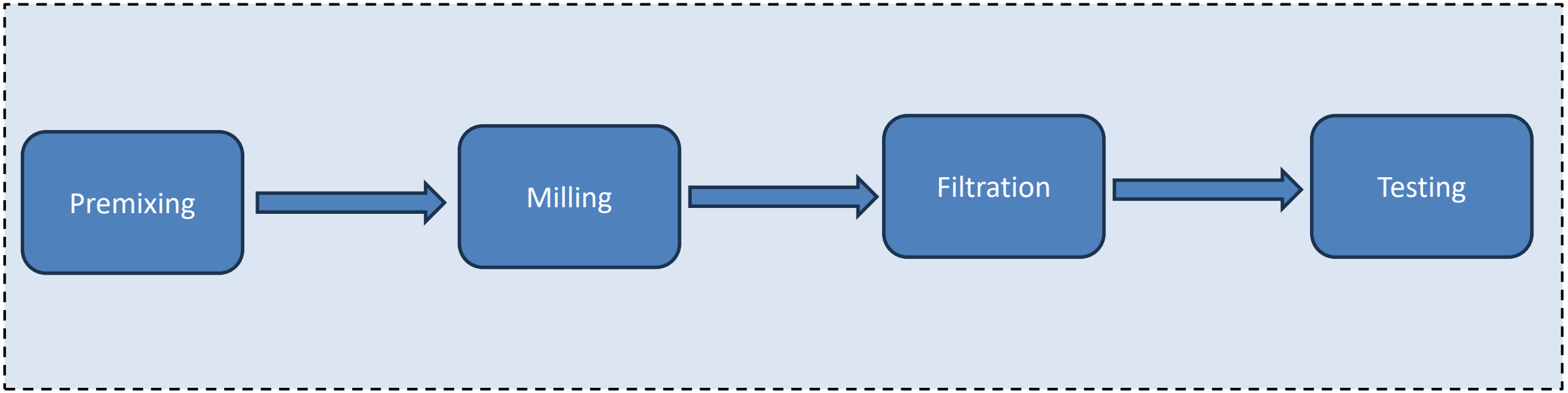


***Note**: Cost numbers are based on data of PACRA clients.*

Source: PACRA Internal Database

Chemicals

Printing Ink | Process



- Premixing: The addition of ingredients like pigments, waxes and driers is done at this stage.
- Milling: The ink is forced into the chamber and the rotating disks move the metal pellets through the ink, breaking the pigment down.
- Filtration: After milling, ink may be put through a series of filtration steps to remove any oversized particles.
- Testing: The finished ink can be tested for a wide variety of properties. Those particularly, tack, fineness of grind (pigment particle size), and water pickup (emulsification rate).

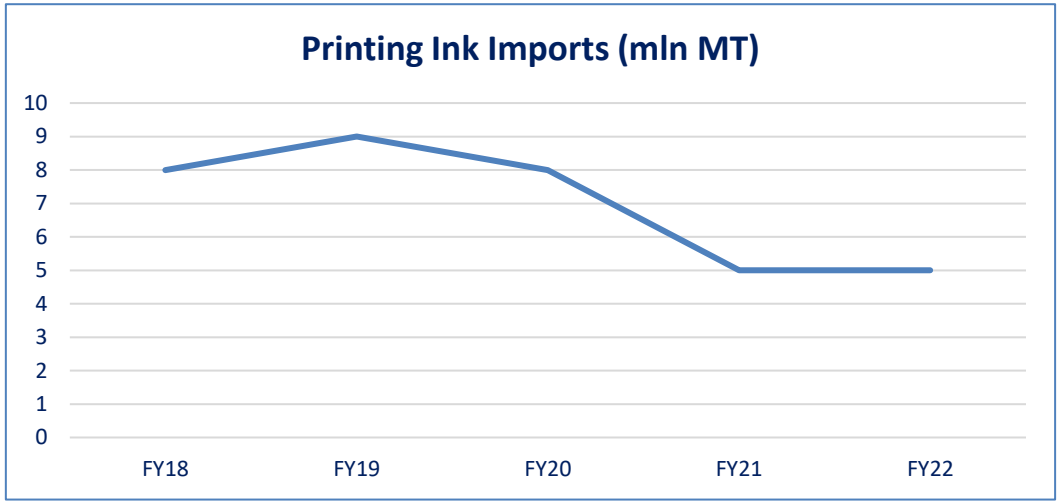
Supply and Demand | Printing Ink

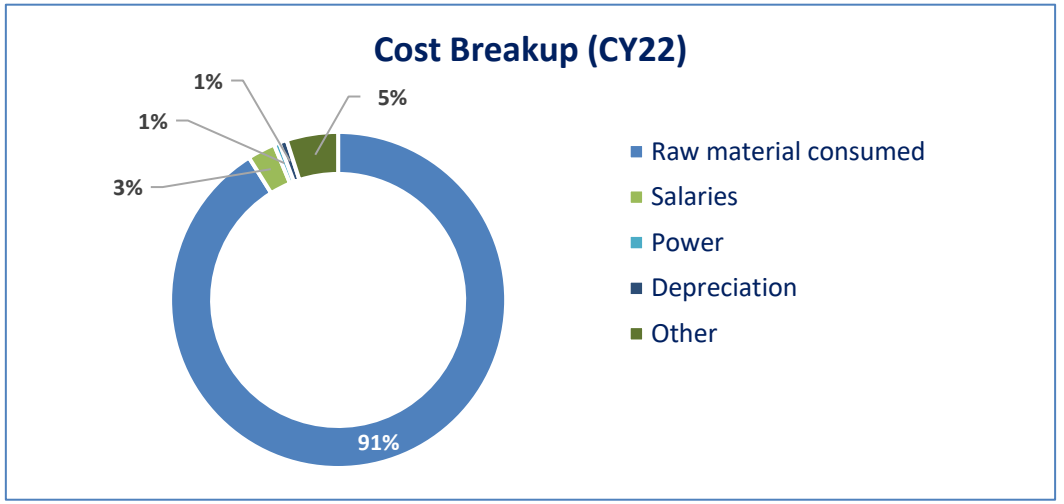
- **Printing Ink** is used by both direct consumers for personal printers as well as commercial users for packaging and branding purposes. Therefore, the use of printing ink spreads across a diverse range of industries.

- The three largest players in the printing ink segment with respect to revenue are: DIC with a ~31% market share, Eastland Industries with a ~10% market share and IPIC with ~9% market share.

- Printing Ink imports have exhibited a decreasing trend over years, however, they remained largely unchanged during FY22, with a minute ~3% YoY decline.

- Raw materials hold the largest share of the breakdown at ~91% in CY22, which has increased from ~89% in CY21, a YoY increase of ~1%. The second largest contributor to cost are salaries which made up ~3% of the cost breakup in CY22, which remained constant across CY21 to CY22.





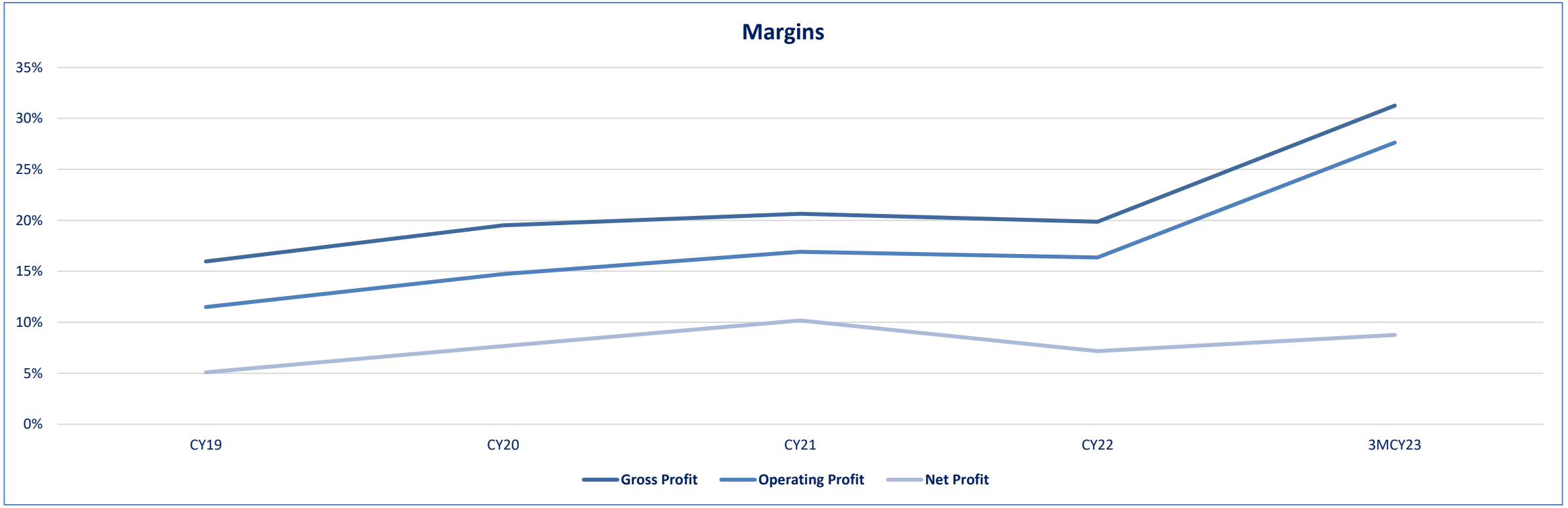
***Note**: Cost and margin numbers are based on data of PACRA clients.*

Source: PACRA Internal Database

Chemicals

Margins | Printing Ink

Gross profit and operating margins in the printing ink segment increased in 9MCY23, however net profit margin did not recover by as much due to high tax expenses. Gross profit margin was ~20% in CY22 and increased to ~31% in 9MCY23. Similarly, operating profit margin was ~16% in CY22 and increased to ~28% in 9MCY23. Net profit margin improved from ~7% in CY22 to ~9% in 9MCY23.

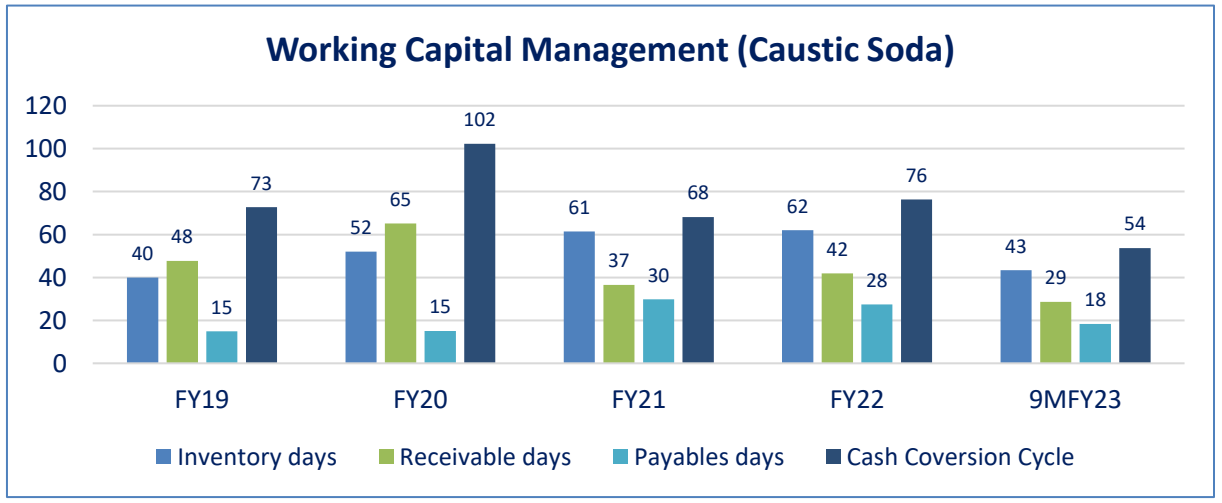


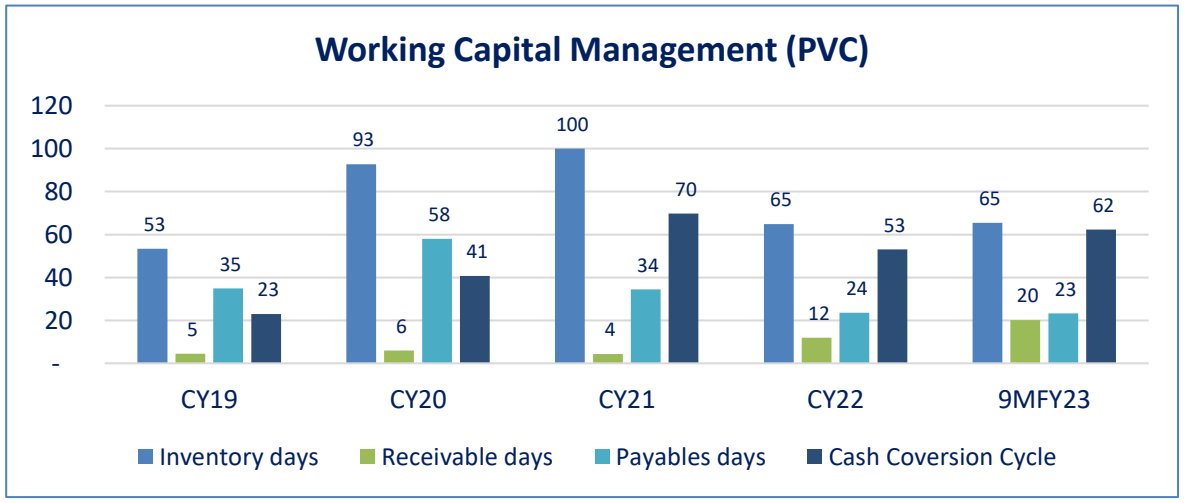
***Note**: Cost and margin numbers are based on data of PACRA clients.*

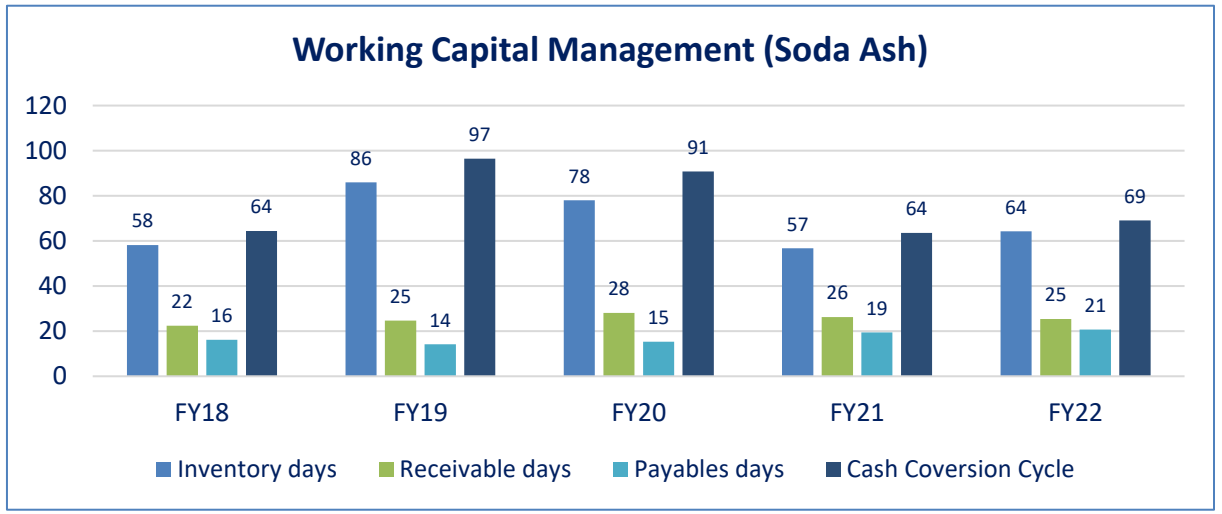
Source: PACRA Internal Database

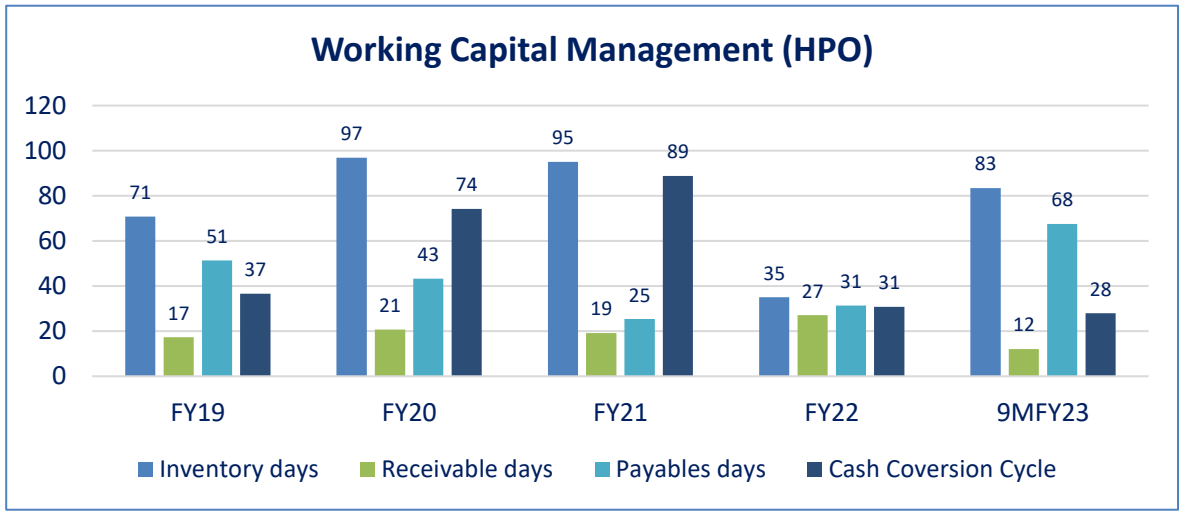
Chemicals

Financial Risk | Working Capital





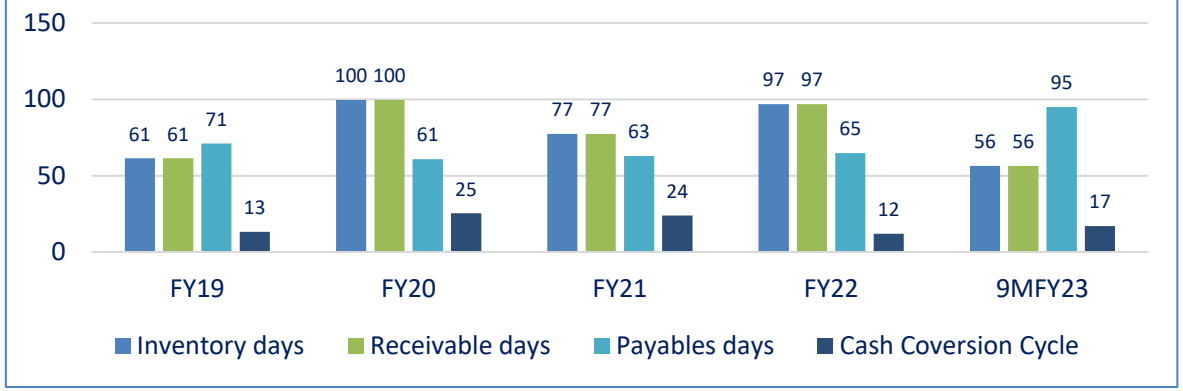




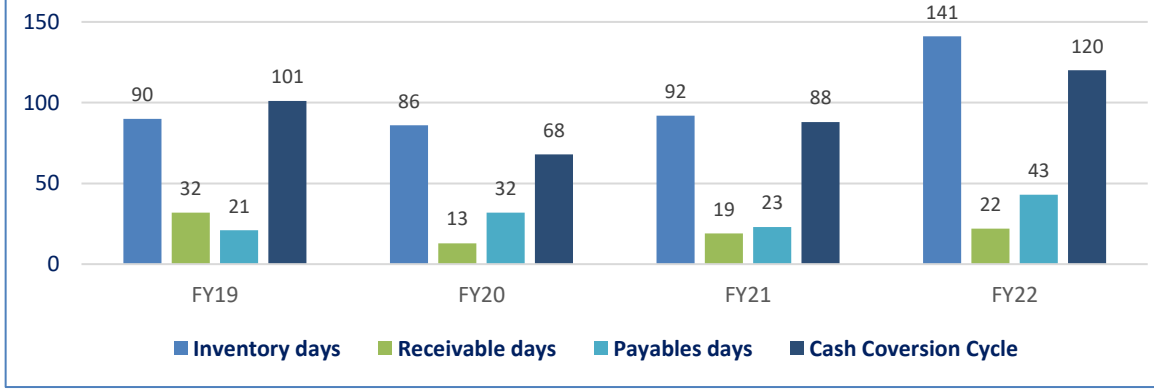
Chemicals

Financial Risk | Working Capital

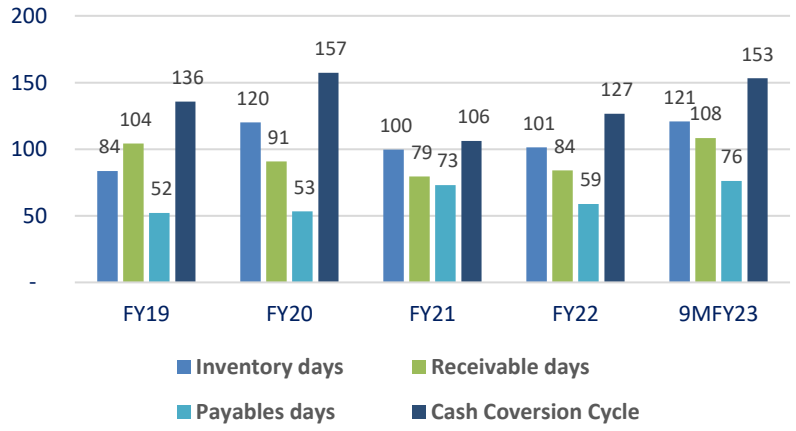
Working Capital Management (Resins)



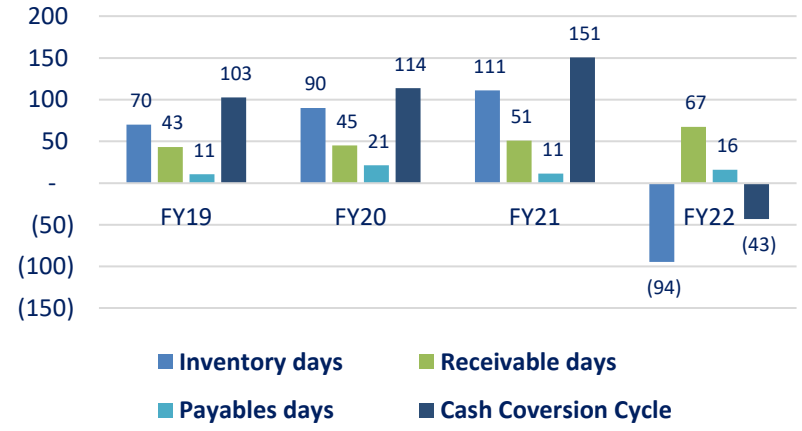
Working Capital (Polymers)



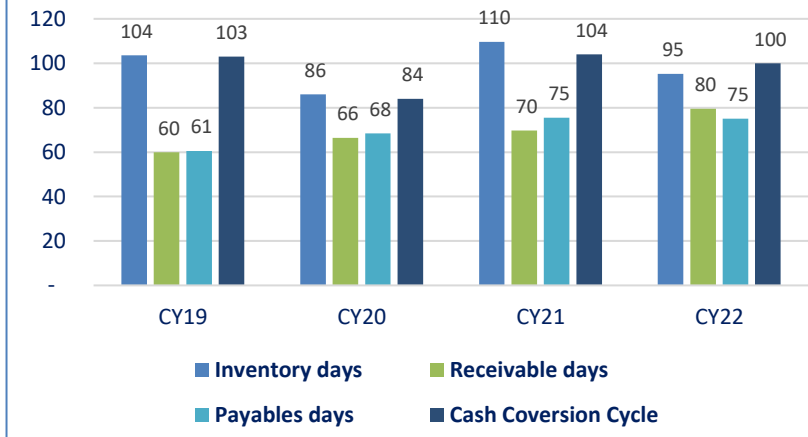
Working Capital (Paint)



Working Capital (Oleochemicals)



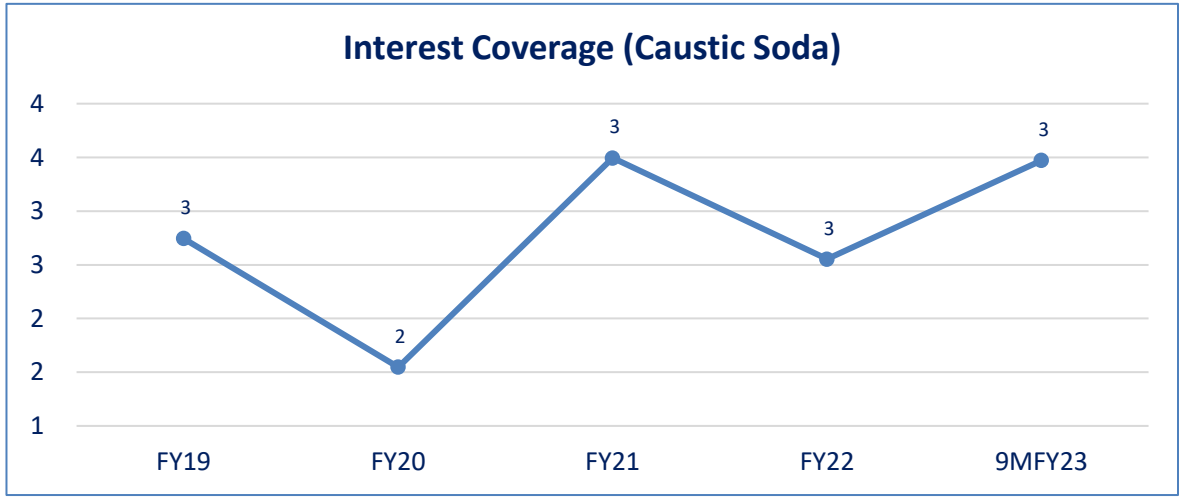
Working Capital (Printing Ink)

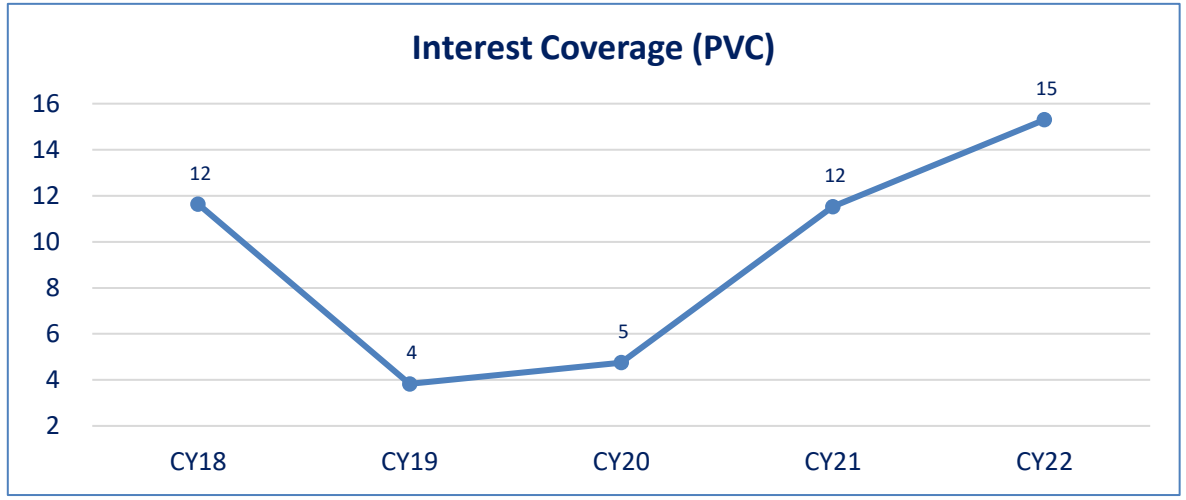


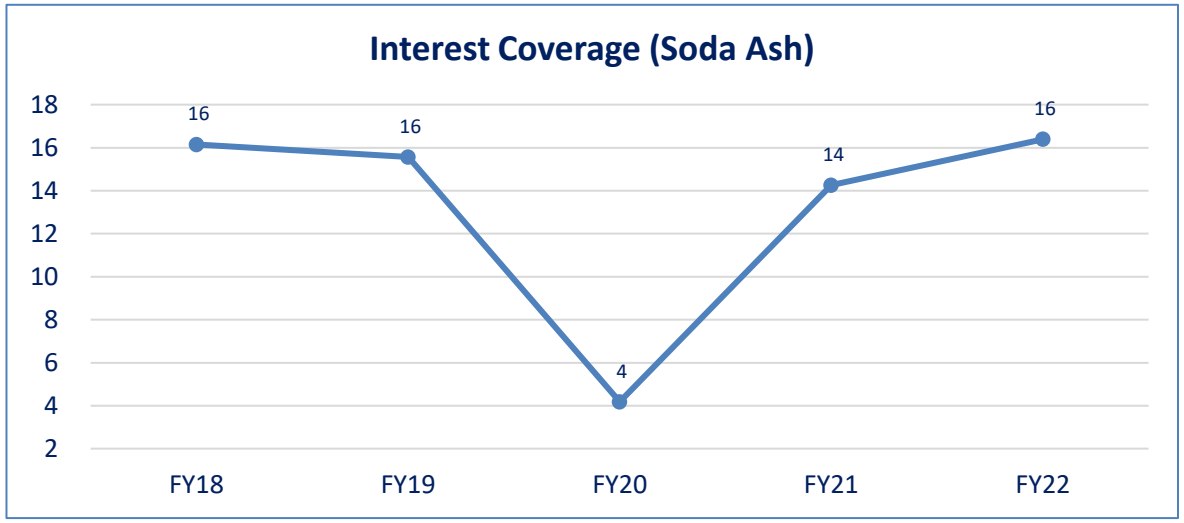
Source: PACRA Internal Database

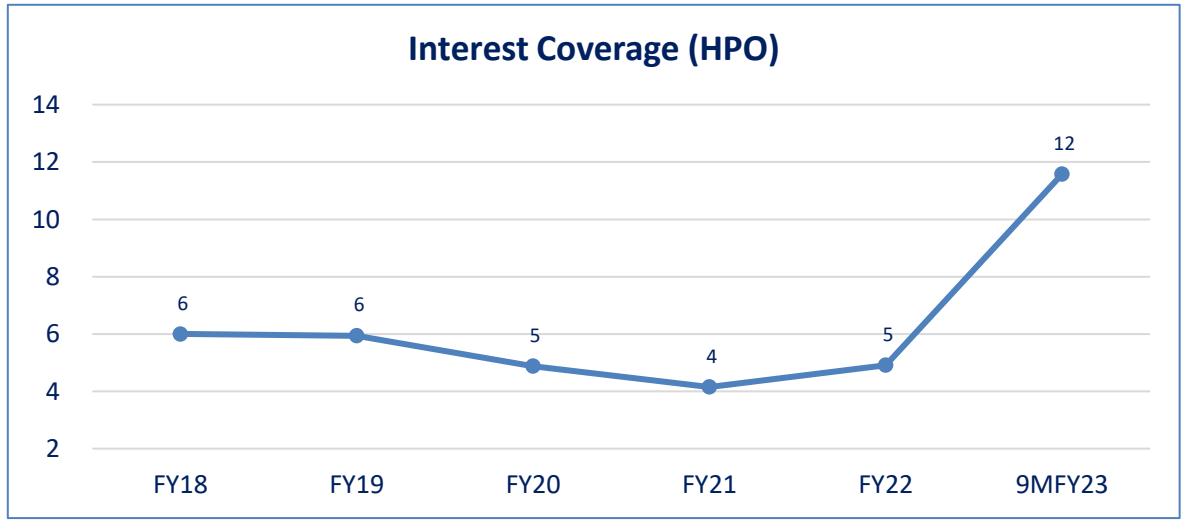
Chemicals

Financial Risk | Interest Coverage





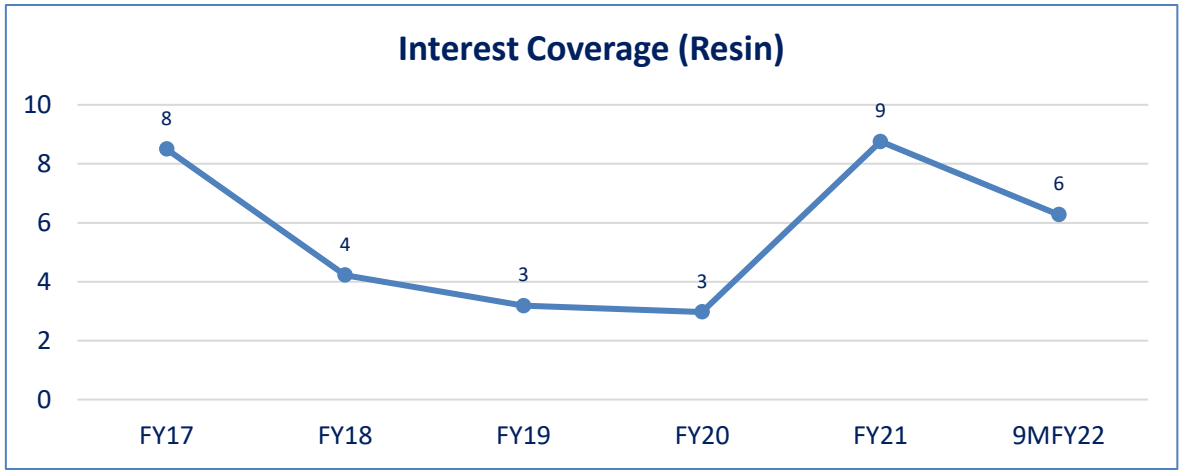


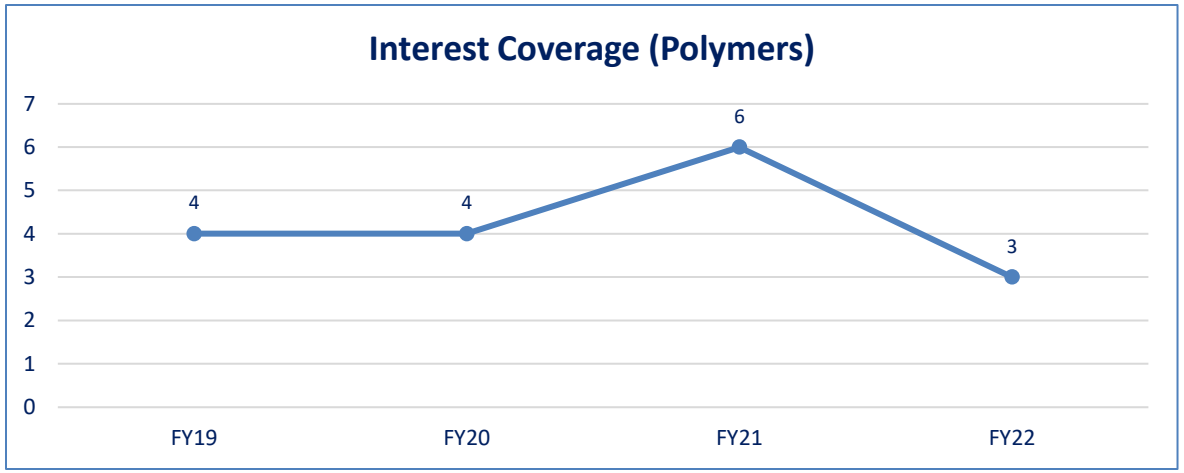


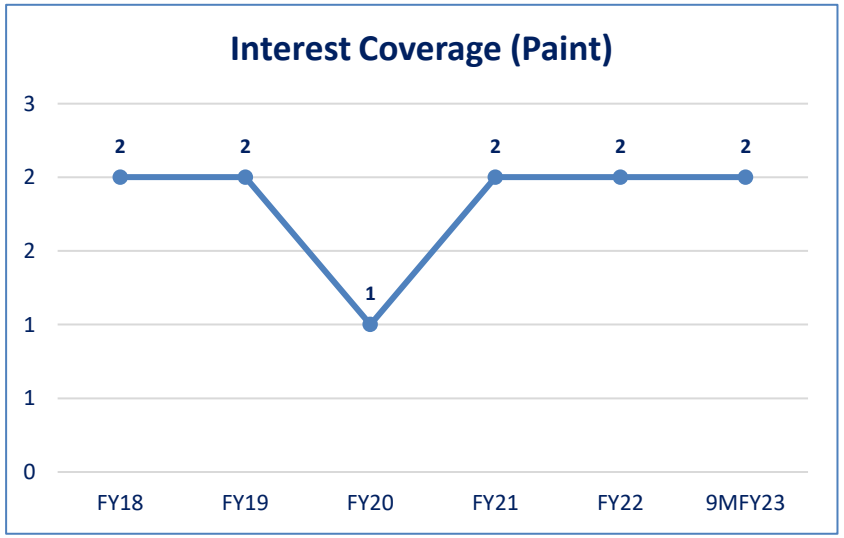
Source: PACRA Internal Database

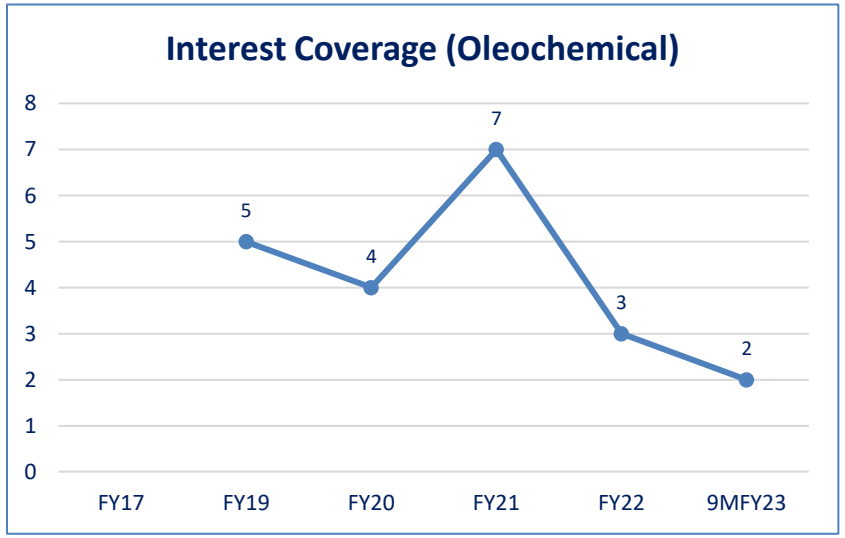
Chemicals

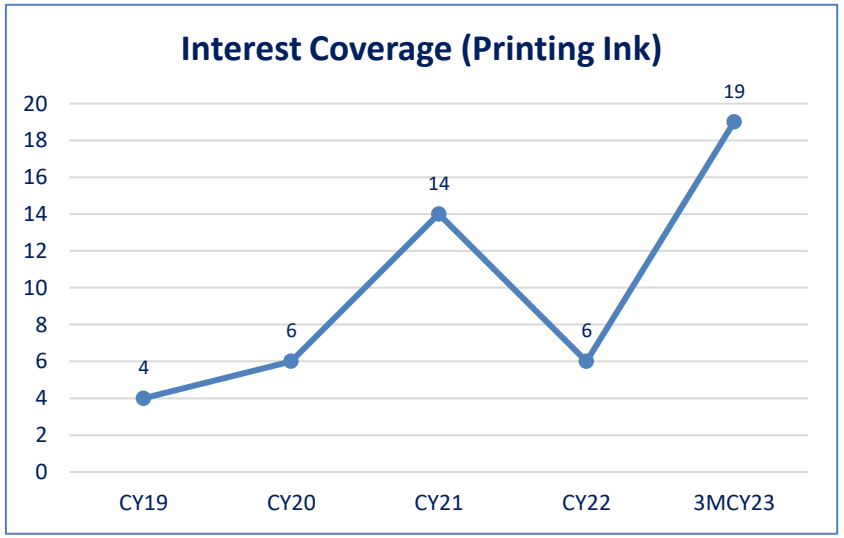
Financial Risk | Interest Coverage







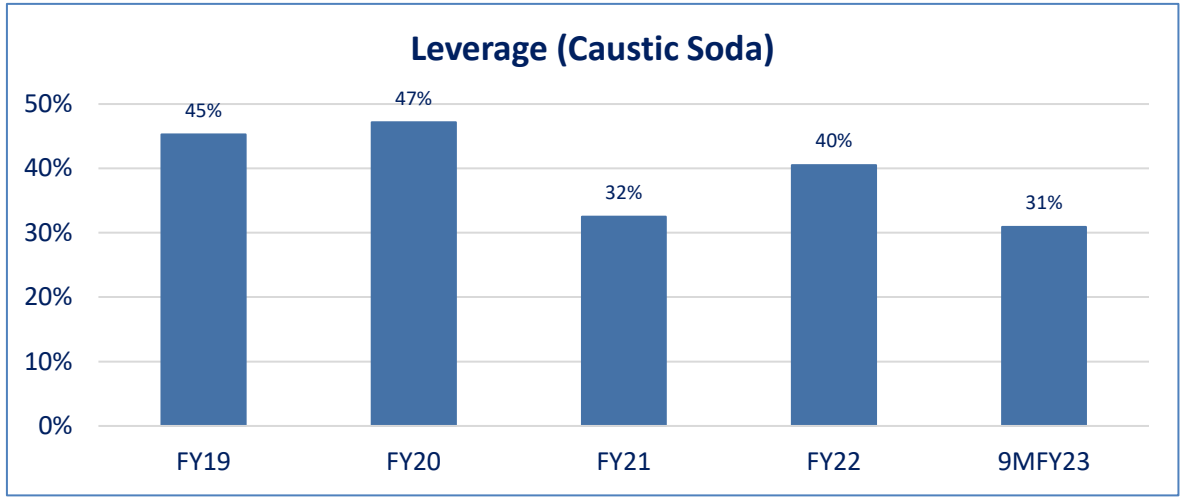


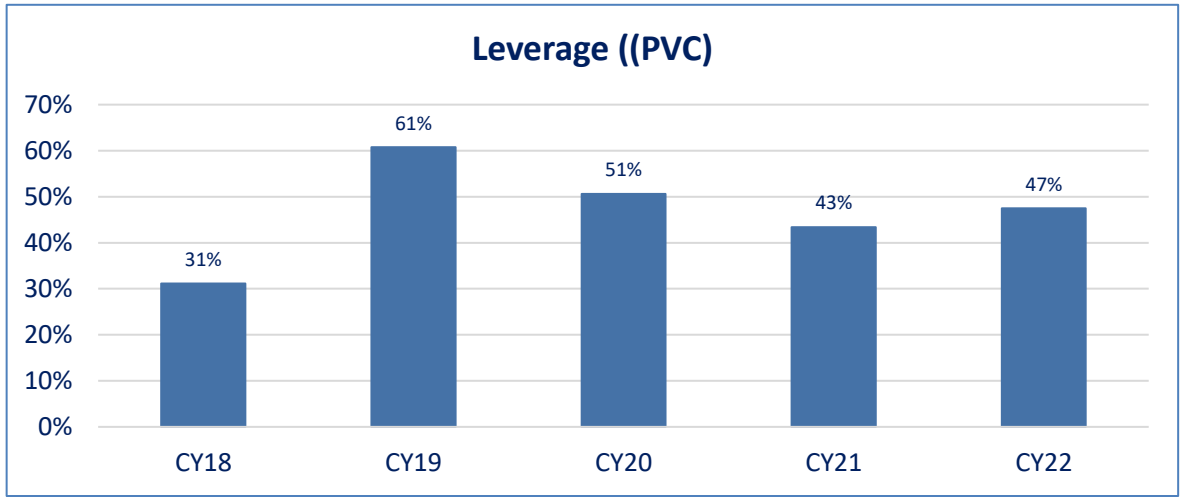


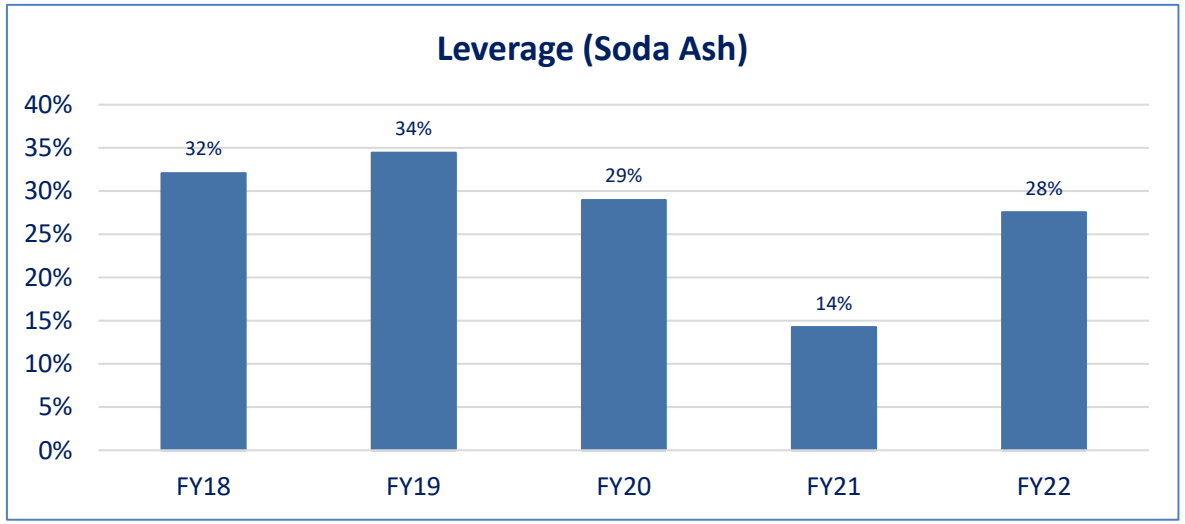
Source: PACRA Internal Database

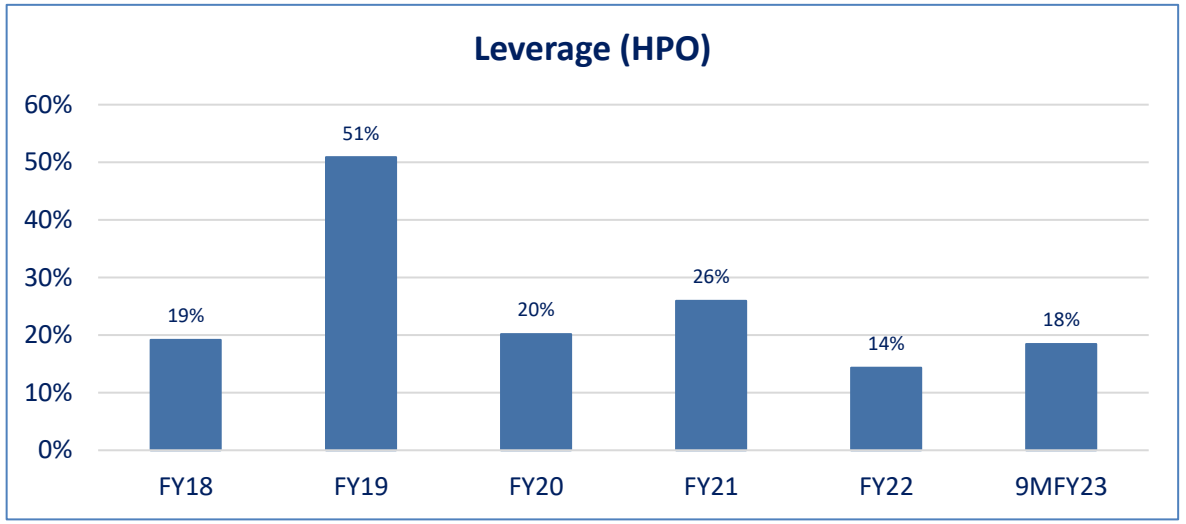
Chemicals

Financial Risk | Leverage Ratio





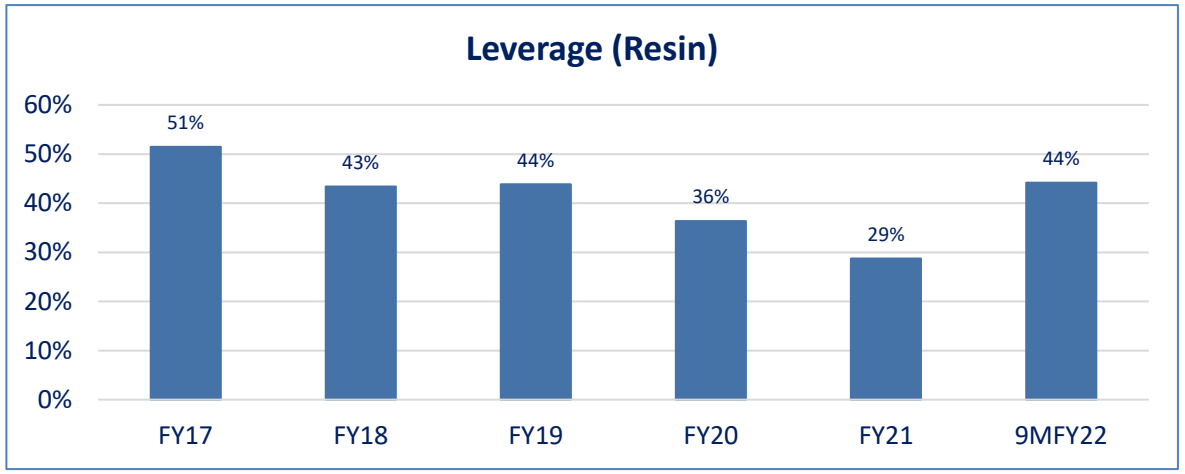


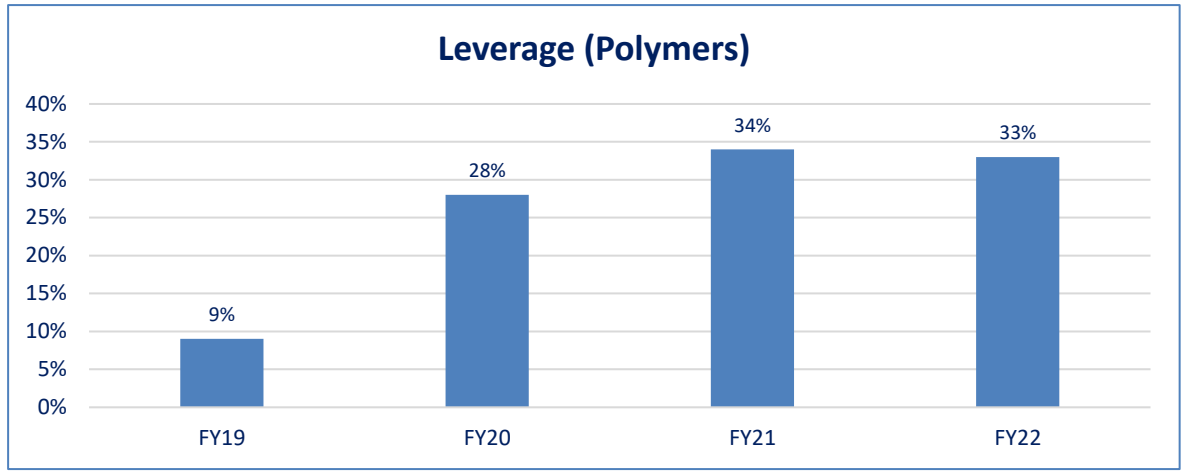


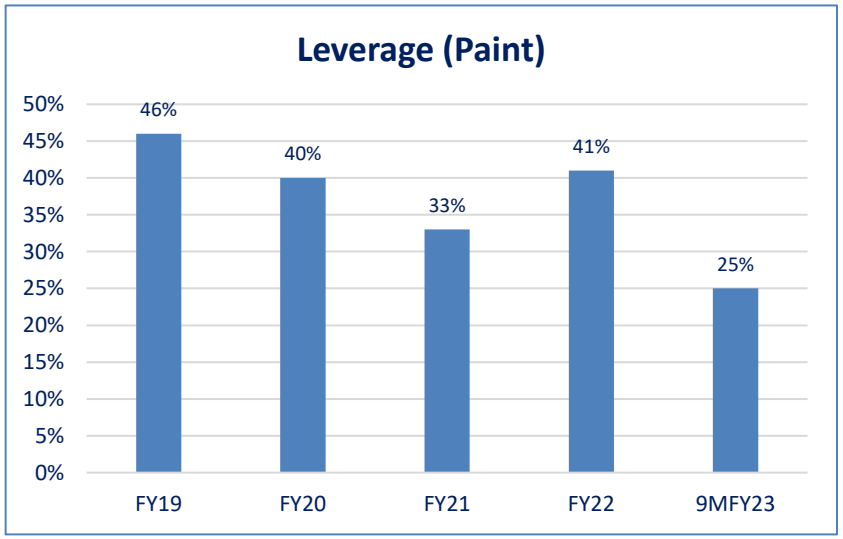
Source: PACRA Internal Database

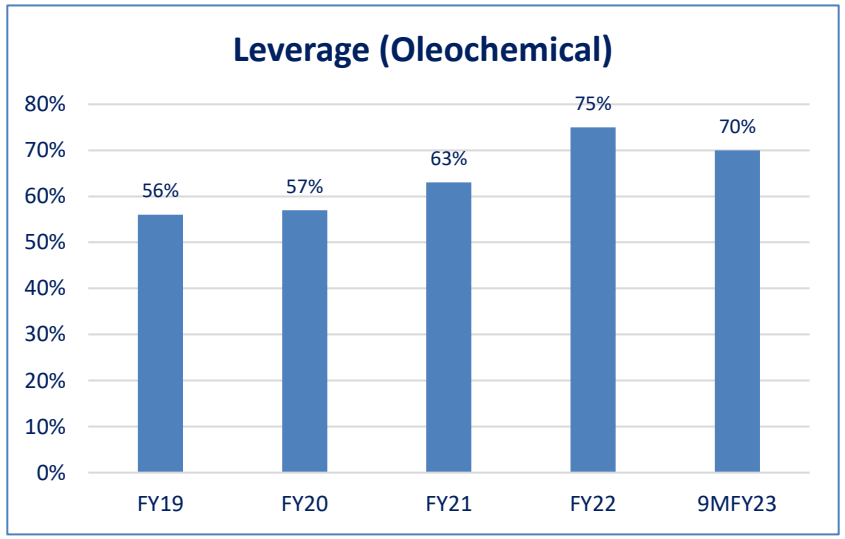
Chemicals

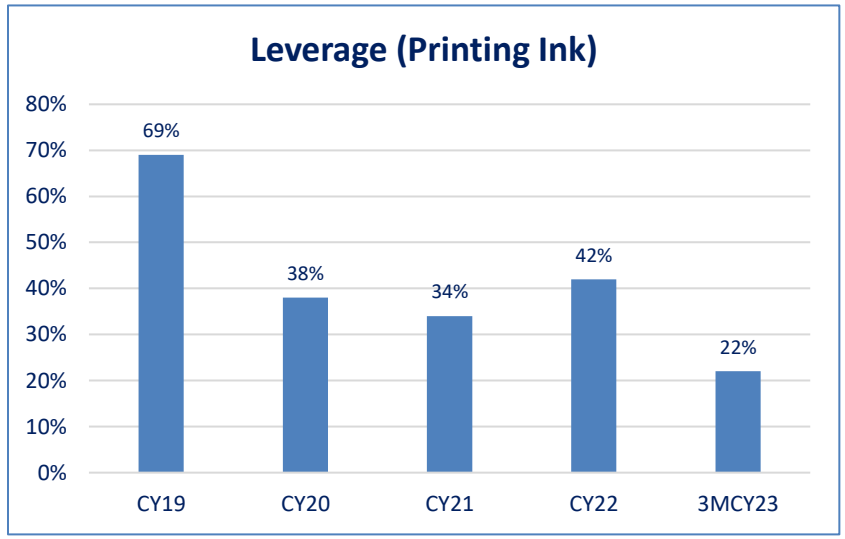
Financial Risk | Leverage Ratio









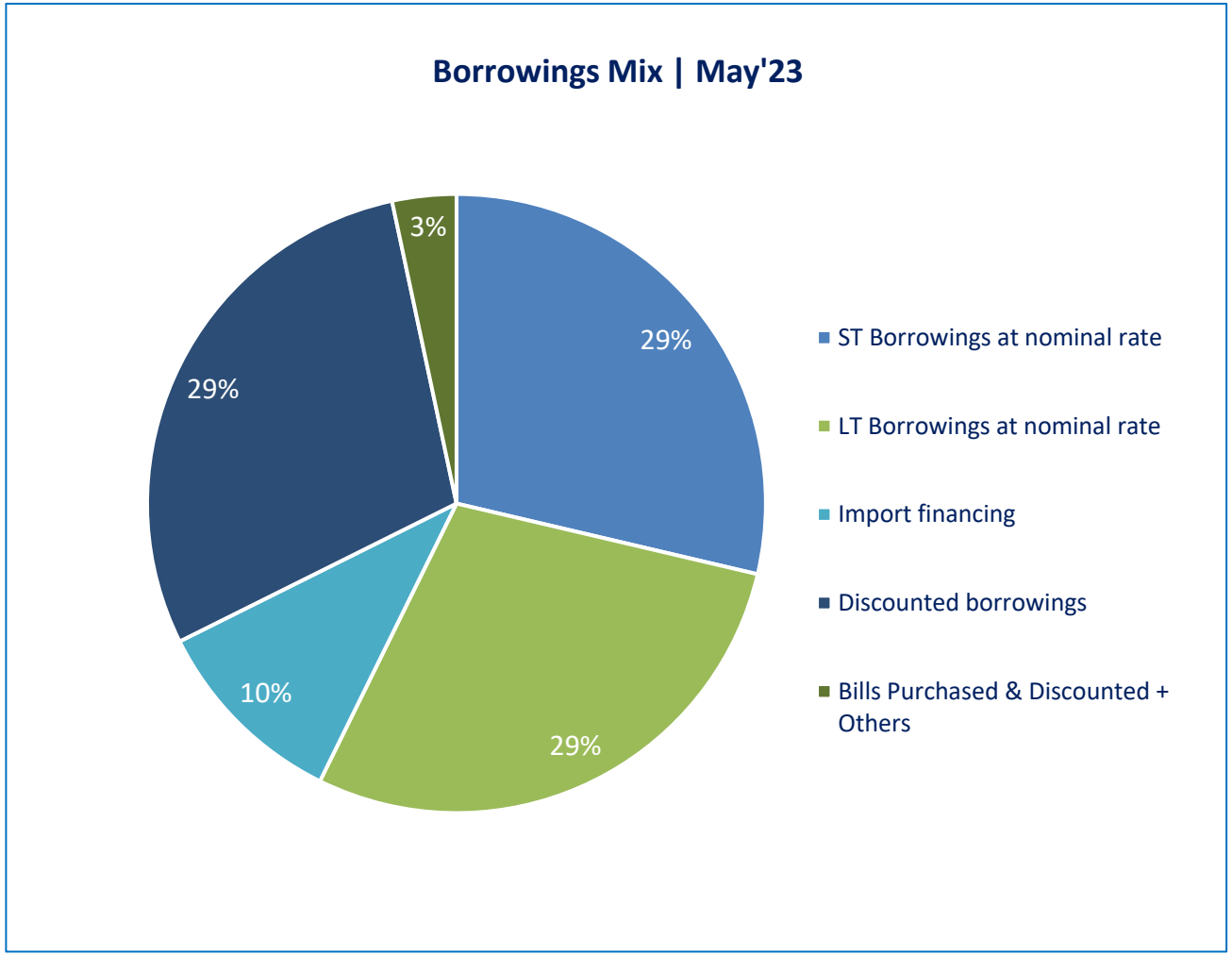


Source: PACRA Internal Database

Chemicals

Financial Risk | Borrowing

- Total sector borrowings stood at PKR~80bln as of May'23 (May'22: PKR~87bln), a decrease of ~8% YoY.
- Long-term borrowings increased by ~59% YoY in May'23 and held a share of ~29%, mainly used to finance expansion projects.
- Considering the high working capital needs, borrowing to finance working capital constituted ~29% of the total sector's borrowings; while decreasing by ~36% YoY in May'23.
- Import financing decreased by ~40% YoY and held a ~10% share in the sector's borrowings mix.
- Discounted borrowings comprised LTFF, TERF and EFS, ~29% of the borrowing book, and grew by ~32% YoY, while bills purchased & discounted and others decreased by ~48% YoY and held a share of ~3% in the mix.



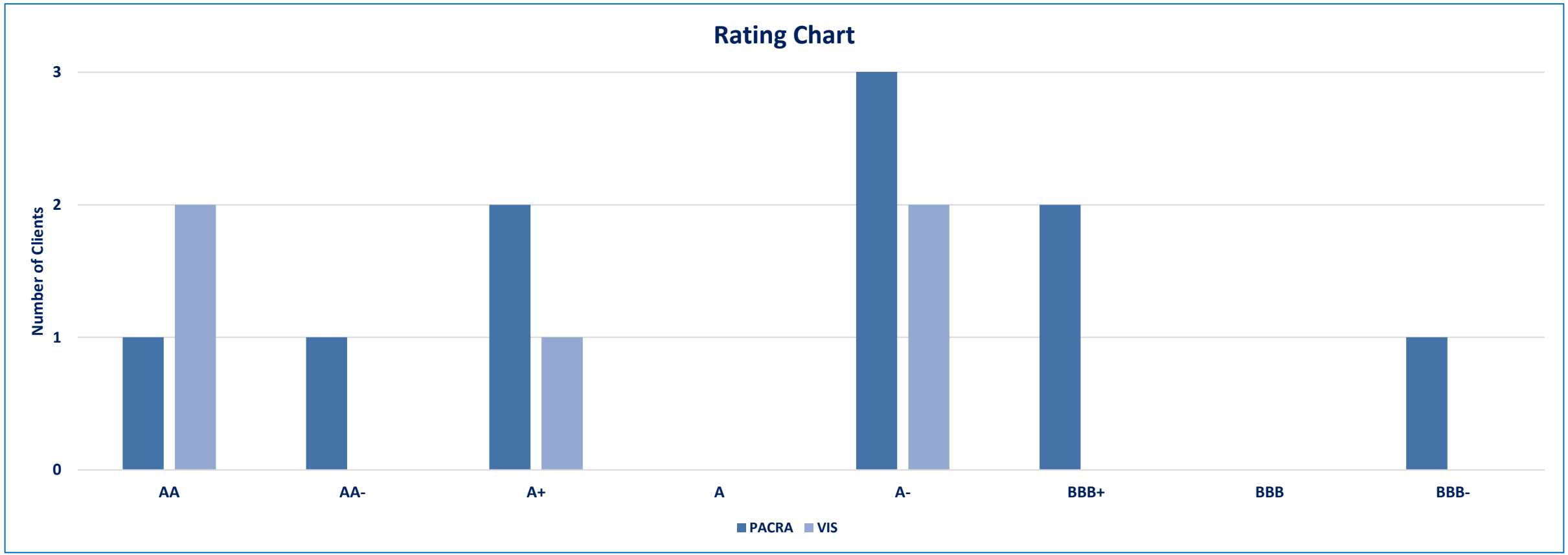
Note: *Calculations based on averages of Soda ash, Caustic Soda, PVC, Hydrogen Peroxide and Resins segments of the industry*

Source: SBP, PACRA Internal Database

Chemicals

Rating Chart

- PACRA rates 12 players of the chemical industry.
- Rating bandwidth of sector is from BBB- to AA.



Source: VIS, PACRA Internal Database

Chemicals

Duties & Taxes

- The taxes and duties imposed on the chemical sector have remained unchanged from FY23 to FY24.
- Apart from these taxes and duties that were applicable to the entire chemical sector, certain chemical manufacturers also had to bear the Super Tax of and Poverty Alleviation Tax.

HSD Code	Product	Custom Duty		Sales Tax		Withholding Tax		Additional Custom Duty		Regulatory Duty	
		FY22	FY23	FY22	FY23	FY22	FY23	FY22	FY23	FY22	FY23
3904.22	Polyvinyl Chloride	20%	20%	17%	17%	2%	2%	7%	2%	0%	0%
2815.11	Caustic Soda	20%	20%	17%	17%	2%	2%	7%	6%	0%	20%
2836.20	Soda Ash	20%	20%	17%	17%	2%	2%	2%	2%	0%	0%
2847	Hydrogen Peroxide	11%	11%	17%	17%	6%	6%	2%	2%	5%	5%
3902.30	Polymer	3%	3%	18%	18%	0%	0%	2%	2%	0%	0%
3208.90	Paint	20%	20%	18%	18%	0%	0%	6%	6%	5%	5%
3215.19	Printing Ink	20%	20%	18%	18%	0%	0%	6%	6%	0%	0%

***Note**: Taxes and duties for the chemical sector have remained unchanged in budget FY24.*

Source: TIP, FBR

Chemicals

Porters 5 Forces Model

POTENTIAL NEW ENTRY

- **PVC** | Low|Capital Intensive
- **Caustic Soda** | Medium |Abundant Raw material, Technical Process
- **Soda Ash** | Low|Capital Intensive, Technical Process
- **HPO** | Medium| Abundant raw material, Technical Process
- **Resin** | High| Local Availability of raw material, Simplicity of production process
- **Paint** | Medium | Big players
- **Oleochemical** | Low | Monopoly
- **Polymer** | High
- **Printing Ink** | Low

BUYER Power

- **PVC** | Low |Single Player
- **Caustic Soda** | High |Capacity greater than demand
- **Soda Ash** | Low
- **HPO** | Low | Two Players
- **Resin** | High | Numerous small Players
- **Paint** | High | Variety
- **Oleochemical** | Low
- **Polymer** | High
- **Printing Ink** | Low

SUBSITITUTES

- **PVC** | Low
- **Caustic Soda** | High |Multiple other products
- **Soda Ash** | Medium| Availability of other products
- **HPO** | Medium
- **Resin** | High
- **Paint** | Low | Expensive substitutes
- **Oleochemical** | High | Multiple products
- **Polymer** | High | Multiple products
- **Printing Ink** | Low

SUPPLIER Power

- **PVC** | High| Imported raw material
- **Caustic Soda** | Low |Local availability of raw materials
- **Soda Ash** | Low |Local availability of raw materials
- **HPO** | Low| Local availability of raw materials
- **Resin** | Low| Easily available
- **Paint** | Low
- **Oleochemical** | High
- **Polymer** | Low
- **Printing Ink** | High

COMPETITIVE RIVALRY

- **PVC** | Low | Single Producer
- **Caustic Soda** | High | Mutiple Producers
- **Soda Ash** | Low |Two Players
- **HPO** | Low |Two Players
- **Resin** | High |Multiple producers
- **Paint** | High
- **Oleochemical** | Low | One producer
- **Polymer** | High
- **Printing Ink** | Low | Three major players

Chemicals

SWOT Analysis

- Steadily increasing demand |All Chemicals
- Sole Producer |PVC, Oleochemical
- Local availability of raw materials|Soda, Ash, Caustic Soda, HPO
- High profit margins| Caustic Soda, HPO
- Ability to pass on increased cost of production |PVC, Soda Ash, HPO, Oleochemical

- Reliance on imported power source|Oil, gas, coal
- Exposure to exchange rate volatility| PVC, Polymer
- Shortage of locally available materials | PVC, Polymer
- Inability to pass on increased cost of production |Caustic Soda, resin
- Tight margins | Soda Ash, PVC, Resins, Printing Ink

- High level of competition | Caustic Soda, Resin, Polymer
- Exchange rate exposure| PVC, Soda Ash, Polymer, Oleochemical
- New entry| Caustic soda, HPO, Resin, Polymer
- Rising energy cost | All chemicals

- Low per capita consumption
- Export market to neighboring countries
- Room for research and development
- Post pandemic revival of demand

Chemicals

Outlook | Stable

- The chemicals sector is essential for production of multiple products which are used in various industries. The demand is highly linked to the economic activity of the country. Pakistan posted a high ~6.1% GDP growth rate in FY22. As FY23 progressed, IMF cut Pakistan's growth rate to a bleak ~0.5% as inflation soared, the Pakistani Rupee rapidly depreciated and subsequently the economy contracted. Amidst high inflation, political uncertainty, floods and other external shocks, Pakistan has posted a meager ~0.29% GDP growth rate in FY23.

- Net profit margin for the PVC segment has declined by ~7% moving from CY22 to 3MCY23. This can be attributed to higher operating costs, finance costs and higher tax expense for the segment. Similar has been the case for the Soda Ash segment, where net profit margin declined YoY by ~8%. Its operating margin dipped due to higher operating expenses and net profit margin dropped because of the Super Tax of ~10% and Poverty Alleviation Tax of ~4%. In the resins segment, gross profit margin improved YoY in 9MFY23 by ~19% because of steady sales but operating and net margins decreased to ~12% and ~14%, respectively. Net profit margins in the Polymer segment declined ~25% YoY in FY22.

- On the other hand, certain chemical segments performed well. Net profit margin increased YoY by ~5% in FY23 for the Caustic Soda segment and ~30% for Hydrogen Peroxide. These segments managed their operating costs better and also decreased borrowings which improved their margins moving from FY22 to 9MFY23. In the Printing Ink segment, net profit margins increased by ~28% YoY in 3MCY23. While in the Paints segment, net profit margins remained constant at ~3% YoY in 9MFY23.

- Majority production processes of the chemicals are energy-intensive for which different manufacturers use different type of energy sources ranging from imported coal to gas and electricity. Since Pakistan is a net importer of oil, gas, coal and allied products, the sector faces considerable production cost pressures amidst PKR devaluation. This is reflected in high share of 'power' in cost breakdowns. However, post-CY22, international prices of commodities like coal (decreased ~55% YoY in May'23), gas (decreased ~208% YoY in May'23) and oil (decreased ~24% YoY in May'23) have sharply declined. This presents an opportunity for the chemical segments that performed low because of high operating costs, to improve their profit margins in FY24.

- Based on the GDP growth target of ~3.5% for FY24, IMF reaching Staff level Agreement on the Stand-By Arrangement, and forecast of declining inflation for the upcoming period, it can be expected that the economy will begin to recover from the shocks of FY23. Since the chemical sector has strong linkages with other sectors of the economy, therefore, as their demand rises, revenue and sales of the chemical sector will also increase.

Source: World Bank, PES, Reuters, IMF, SBP

Bibliography

- PACRA Internal Database
- Pakistan Chemicals Members Association
- Pakistan Bureau of Statistics
- State Bank of Pakistan
- The Economic Survey of Pakistan
- Federal Board of Revenue
- International Council of Chemical Associations
- American Chemical Society
- Badische Anilin und Soda Fabrik
- Pakistan Stock Exchange
- Vinyl.org.au
- Elixir Publishers
- Eurochlor.org
- Pakistan Stock Exchange
- Darson Securities
- Trade Development Authority of Pakistan
- World Bank
- Deloitte

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