



Glass

Sector Study

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What is Glass?

- Glass is a silica-based, non-crystalline amorphous solid material that has broad practical and technological properties as well as imperative function in decorative applications such as windows, tableware, and household appliances. Glass transmits, reflects, and refracts light, all qualities that can be enhanced through cutting and polishing for use in optical lenses, prisms, fine glassware, and optical fibres for high-speed data transmission that uses light.
- **Raw Materials:** The production of glass requires materials such as Silica Sand (Silicon Dioxide), Limestone (calcium carbonate), Soda Ash (sodium carbonate) and waste glass (obtained through recycling of used glass). Soda ash reduces the melting point of sand and thus reduces energy consumption. Meanwhile, limestone acts as a stabilizer which prevents the loss of chemical durability that occurs due to the use of soda ash. Soda-lime glass accounts for ~90% of all manufactured glass.
- **Production Process:** The manufacturing of glass is a relatively straightforward process. The raw materials are combined and heated in a furnace at ~1,500 Celsius (2,732 F). Once the liquid state is achieved, they are either poured on a flat surface to make sheets of glass or poured into molds to make bottles and other containers. Some types of glass containers are also made through the process of 'blowing', where a lump of molten glass is wrapped around an open pipe. Air is blown through the pipe while it is rotated in order to give the glass its shape.
- Different types of glass can have slightly different processes. For example, colored glass is made by adding various chemicals, oven-proof glass is made by adding boron oxide and tempered glass is made by rapidly cooling the molten glass in order to increase its strength.
- Some of the key benefits of soda-lime glass include its affordability, chemical stability, relative strength, and extreme malleable properties. Additionally, it is possible to remelt and resoften soda-lime glass numerous times, making it an ideal material for recycling.

Overview

- Pakistan’s glass manufacturing sector comprises ~5-6 large players and a number of smaller players, competing across various product segments such as float glass, containers and tableware. The sector caters both direct consumers’ demand as well as demand emanating from various industries such as construction, pharmaceuticals and food & beverages.
- Estimated revenue for the glass sector was recorded around PKR~67bln for FY22, a YoY increase of ~46%. In 1QFY23, revenue for the sector recorded at PKR~15.5bln, an increase of ~13.7% compared to SPLY.
- The production of glass plates and sheets has been on a declining trend since FY19, the decline being ~21% during FY19-FY21. However, production increased in FY22 and stood at ~22mln Sq. M, as compared to ~12mln Sq. M in FY21. For 1QFY23, the figure clocked in at ~6,888 th. square meters (1QFY22: 3,778 th. square meters).
- A significant share of the local demand is also met through imports which stood at USD~123mln in FY22, as compared to USD~108mln in FY21. The largest import segments are glass fibres (~31%) and glass containers (~17%). China accounted for ~43% of imports of the former, while for the latter, it made up ~78% of imports. Imports for 1QFY23 were recorded at USD~27.4mln, compared to USD~22.5mln SPLY, an increase of ~22% YoY.
- Meanwhile, exports of glass products has been steadily increasing and stood at USD~42mln in FY22 as compared to USD~27mln in FY21. Float glass accounted for the largest share in exports (~55%). Major export destinations in FY22 for float glass were Sri Lanka (~34%) and Kenya (~11%).

Sector Overview	FY21	FY22	1QFY23
Estimated Revenue (PKR mln)	45,782	66,779	15,546
Production of Glass Plates and Sheets (000 Sq. M)	12,424	22,269	6,888
Glass Imports (USD '000)	108,311	123,522	27,405
Glass Exports (USD '000)	27,203	42,293	10,262
No. of Players	~5-6 large players		
Product Segments	Float Glass, Tableware & Containers		
Industry Association	Pakistan Glass Manufacturers Association		

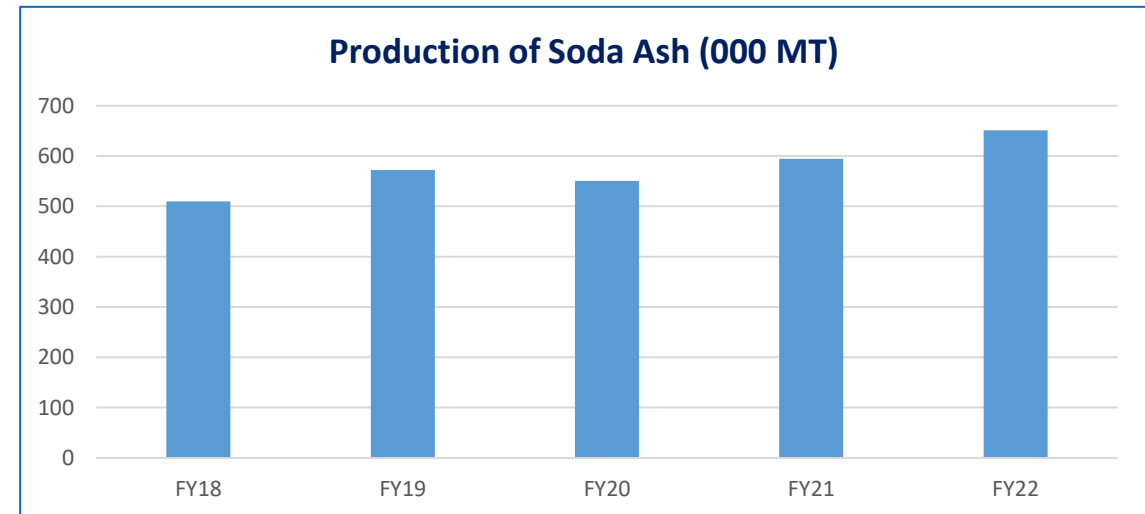
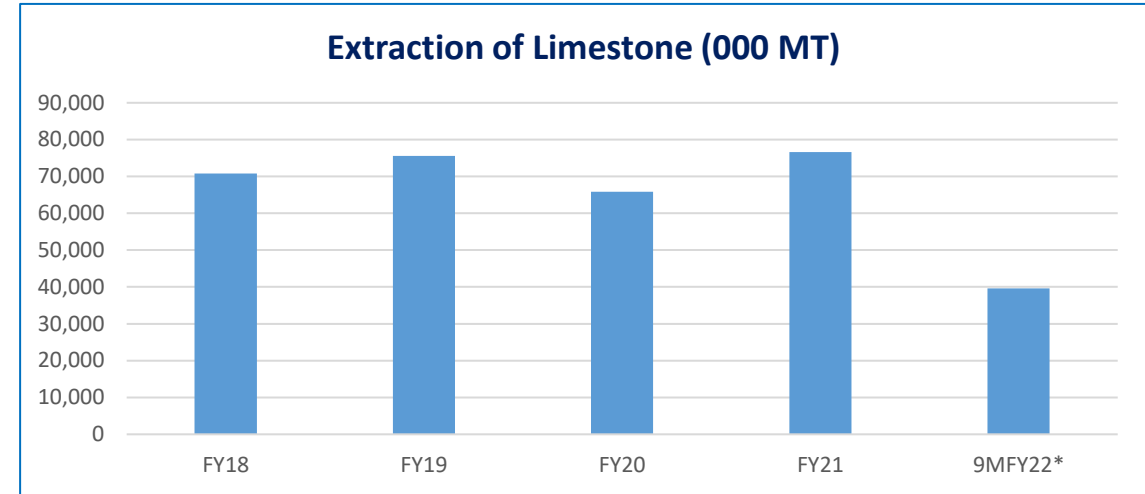
Market Segments and Capacities

Local glass manufacturers are currently operating in three broad categories/segments which can be classified as follows:

- i. **Float Glass:** This type of glass is largely used in construction for windows with different varieties that include clear, tinted and mirrored float glass. There are three main players in this segment, Tariq Glass, Ghani Glass and Ghani Value Glass, with an estimated production capacity of ~1,600tpd.
- ii. **Tableware:** This includes products such as dinner sets, cups and mugs etc. Tariq Glass is the largest players in this segment, with ~70% of total production capacity (~340tpd) while Gunj Glass enjoys ~30% market share (glassware capacity of ~40tpd). The estimated total production capacity of this segment stands at ~380tpd.
- iii. **Containers:** This segment can be further divided into following sub-segments:
 - a. **Food & Beverage Containers:** This includes products such as Pyrex containers and jars for food as well as glass bottles used for carbonated beverages.
 - a. **Pharmaceutical Containers:** This segment includes medicine bottles and containers of different specifications as well as vials, ampoules and tubes (which are converted into ampoules). Ghani Global is the only local manufacturer of tubes, with the remaining demand being met through imports, and occupies a market share of ~54% in this subsegment. In the ampoules sub-segment, there is significant competition with Ghani Global accounting for ~16% of ampoules supply. Other large manufacturers of ampoules include pharmaceutical companies meeting their own requirements such as Sami, Bosch and Indus as well as commercial producers such as Friends Glass and Techno Glass. Ghani's total manufacturing capacity stands at ~22tpd. Meanwhile, Ghani Glass holds a significant market share in medicine bottles sub-segment with a production capacity of ~315tpd.

Raw Materials

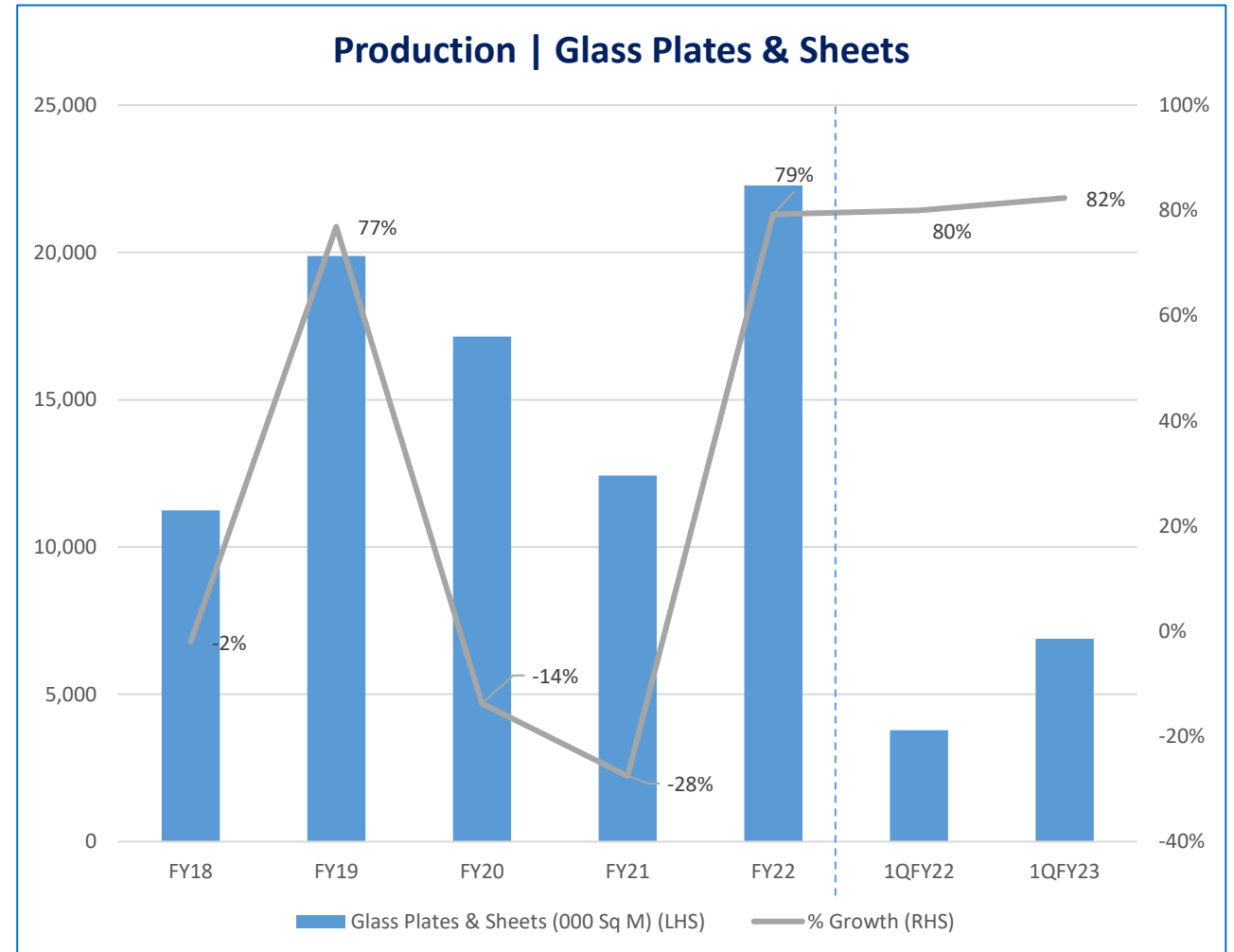
- While the main raw material in the production of glass is silica sand, most types of glass also require limestone and soda ash.
- Both these items are abundantly available in Pakistan due to the presence of a number of limestone mines as well as local production of soda ash.
- However, during FY22, the mining and quarrying sector (~9% share in Industry segment) posted a decline of ~4.4% YoY, as against ~1.2% increase in FY21. This was most likely due to decline in production of limestone (~33%) and marble (~3.4%).
- The extraction of limestone, which is also a key raw material in the cement industry, exhibited an increasing trend up till FY19, growing at a CAGR of ~13% (FY16-19). However, a dip was observed in FY20 likely due to COVID-induced disruptions in industrial activities. During 9MFY22, total limestone extracted amounted to ~39mln MT, a decline of ~33%, compared to same period last year (9MFY21: ~59.3mln MT).
- Production of soda ash has steadily increased in the past five years, with the exception of FY20 which was impacted by COVID-19. During FY22, the local production of soda ash stood at ~650,000 MT, an increase of ~10% as compared to the previous year (FY21: ~590,000 MT).



*Figure is the latest available.

Glass Plates & Sheets Production

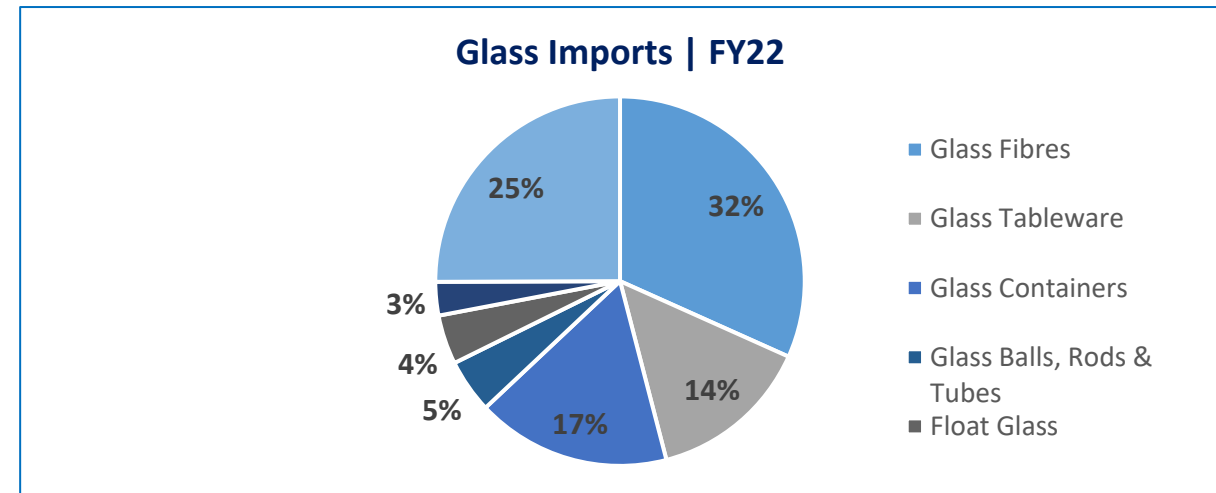
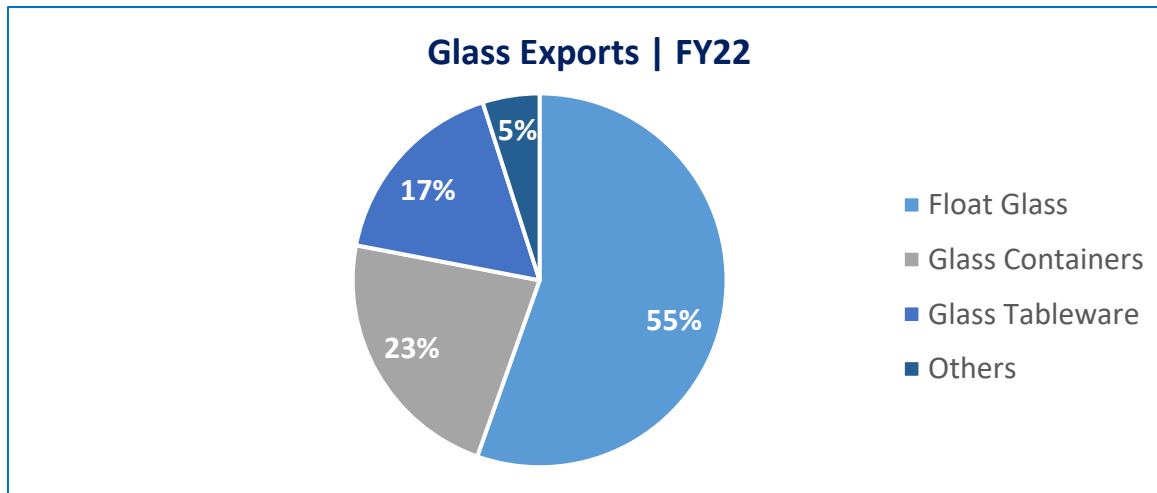
- Local production of glass, although on a decline over the past two years (FY20-21), increased significantly by ~79% in FY22. This was likely due to the capacity expansion by one of the large players in the glass sector.
- The decline during FY21 is more concerning as it occurred despite increase in construction activities during the period which is a major driver of demand. The likely reason for decline in production during FY21 was that some players underwent maintenance and repair activities during the year as well as continued impact of COVID-19 restrictions at the start of the period.
- Production in 1QFY23 clocked in at ~6,888 th. square meters (1QFY22: 3,778 th. square meters), an increase of ~82%.



Glass | Local Industry

Imports & Exports

- Glass exports have followed an upward trajectory since FY18, growing at a CAGR of ~21% during FY18-22. Total exports clocked in at USD~42.3mln, increasing by ~55% YoY, while imports increased by ~14% YoY to touch USD~124mln.
- For 1QFY23, glass imports and exports increased by ~22% and 42% QoQ, respectively. (why are we not showing 1QFY22 in the table?)
- For FY22, float glass made up ~55% of total glass products exports, followed by glass containers (~23%) and glass tableware (~17%).
- Meanwhile, for imports, the largest contributor was glass fibres (~32%) followed by glass containers (~17%) and glass tableware (~14%).



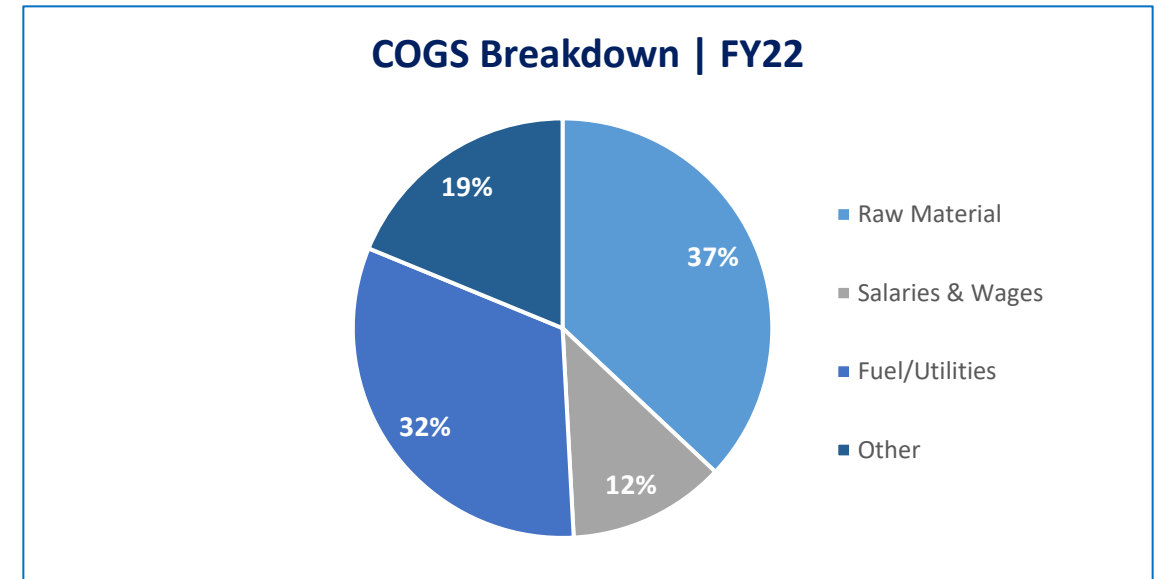
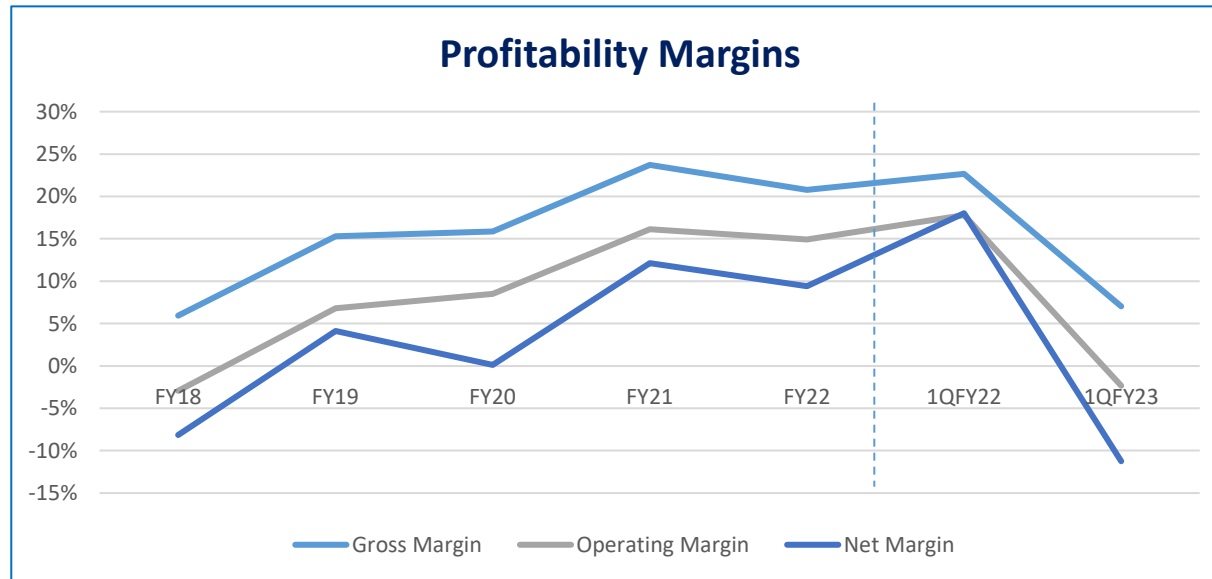
Business Risk

- **Demand Drivers:** The glass sector derives its demand from a number of industries including construction, food & beverages and the pharmaceutical industry. While the food & beverage, as well as pharmaceutical industries, have relatively inelastic demands, they account for smaller segments within the glass sector.
- The largest segment is float glass which derives its demand from the construction industry. Demand from the construction industry can fluctuate depending on overall economic conditions. In addition, the purchasing power of end consumers is also reduced during periods of economic downturn which can reduce demand for some segments such as glass tableware.
- **Significant Energy Consumption:** The production process for manufacturing of glass and glass products consumes a large amount of energy in order to power the furnaces at required temperatures. Fuel and energy account for ~32% of direct costs incurred during the manufacturing process. In addition, the country often faces shortage of fuel, particularly during winter months which can halt or slow down production activities.
- **Competition:** The level of competition varies across different product segments with certain segments such as containers having a significant level of competition. In addition, a significant level of demand is also being catered to by the import segment which increases the competition level.



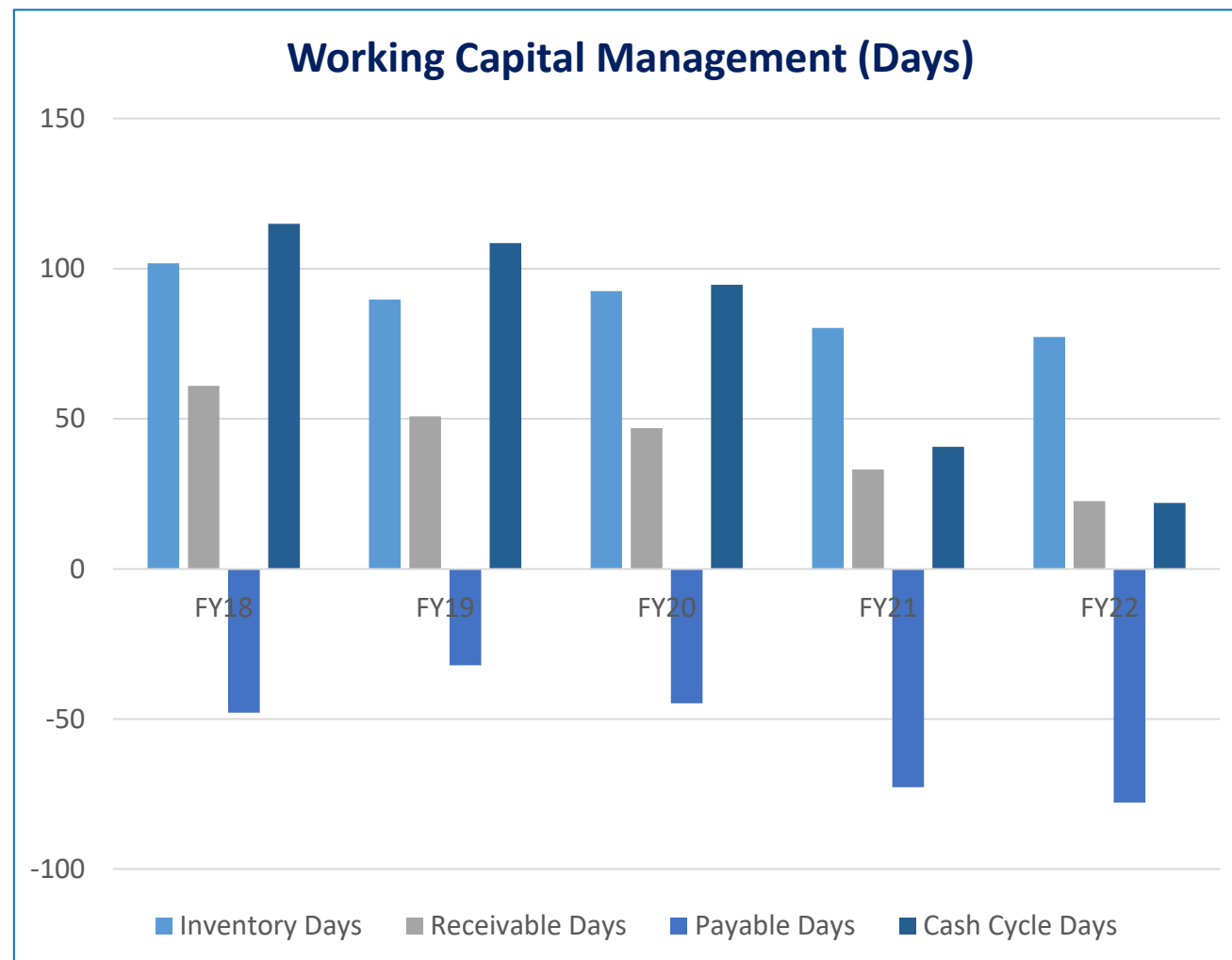
Margins & Cost Structure

- Over the last five years (FY18-22), the sector's average gross margins have stood at ~16% while average net margins have stood at ~9%.
- For FY22, there was a dip in margins, owing largely to increased operational and finance costs, particularly in 2HFY22. Average gross profit margins decreased to ~21% (FY21: ~24%), while a steeper decline was observed in average net profit margins, which declined from ~12% to ~9%. Cost of sales for all major players increased significantly due to expensive RLNG, Furnace Oil and Electricity in FY22.
- For 1QFY23, a pronounced effect was observed across all margins, reflecting the recent slowdown in economic activity due to Aug'22 flash floods in the country. While average gross profit margins declined to ~7% from ~24% in FY22, average net profit margins declined to ~(-11%), which is indicative of high policy rates (~8% YoY rise in FY22) due to government's hawkish stance on inflationary pressures prevalent in the economy.
- The sector's cost structure comprises majorly of raw materials and fuel and utilities expenses. Prices of raw materials shot up due to depreciating currency in FY22 (~14%), while expensive fuel and electricity also contributed significantly to the cost structure.



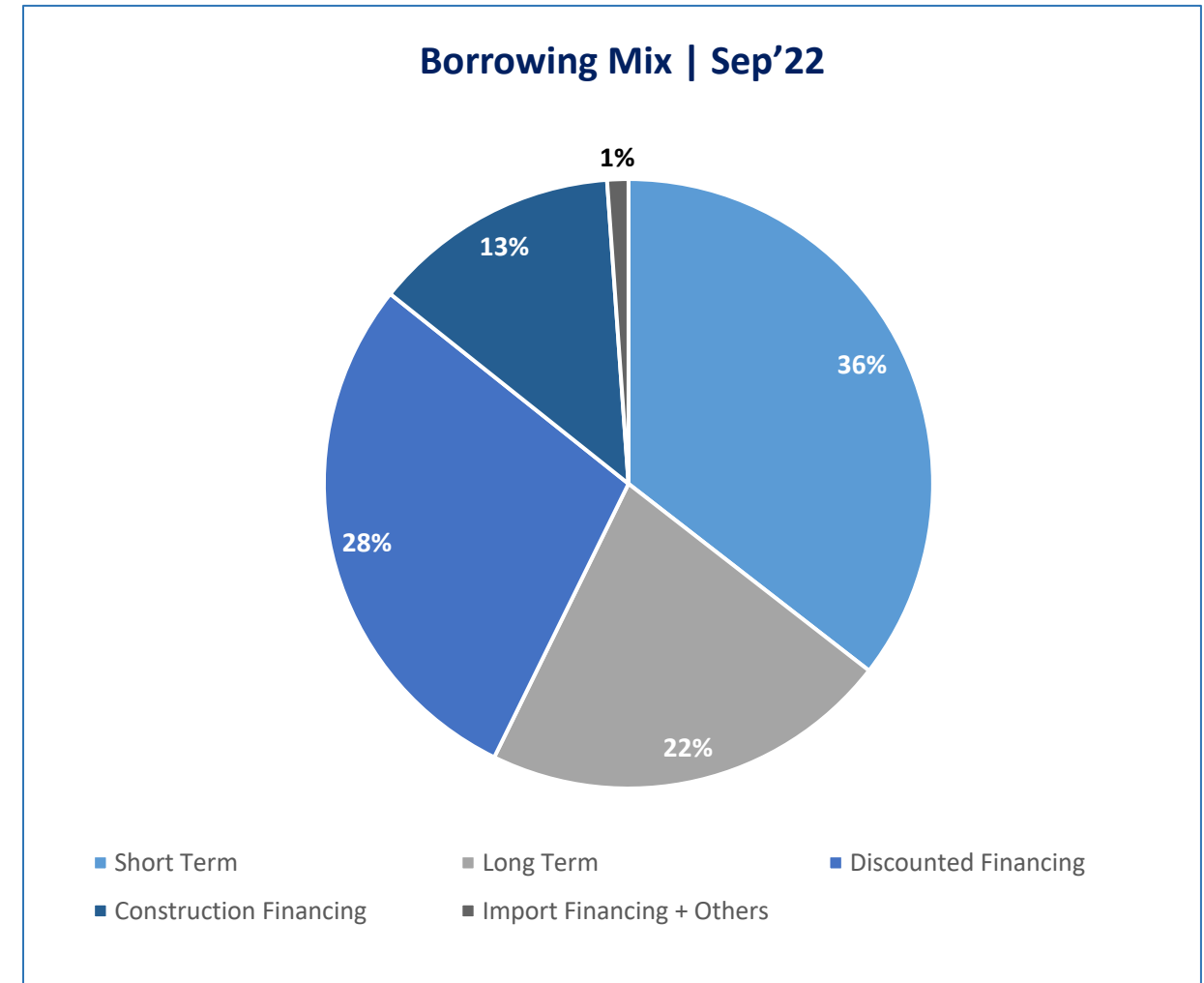
Financial Risk | Working Capital Management

- The sector's working capital is largely a function of inventory and trade receivables. Inventory largely consists of raw material and finished goods with work-in-process making a small contribution.
- However, payable days have also become an important factor since FY21.
- The sector's average working capital cycle ranges from ~75 to ~80 days.
- For FY22, days in inventory declined slightly from ~80 days to ~77 days, showing the major players' ability to market their inventories effectively.
- However, average days payable increased to ~78 days from ~75 days. This increase was reflected in average cash cycle days improving from ~40 days to ~22 days, indicative of the sector's efficiency in generating cash from core business activities.



Financial Risk | Borrowing Mix

- The glass sector's borrowings stood at PKR~12.6bln as at End-Sep'22, as compared to borrowings of PKR~8.6bln as at End-Sep'21, a YoY growth of ~46.5%.
- The largest component within the sector's borrowing mix was short-term borrowing at normal rates which stood at PKR~4.5bln as of Sep-22 and accounted for ~36% of the total borrowing mix.
- In addition, long-term borrowings at normal rates and discounted borrowings, which largely comprise Long Term Finance Facility (LTFF) and Temporary Economic Refinance Facility (TERF), accounted for ~22% and ~28% of total borrowings, respectively.
- The sector's average leveraging is relatively low and debt-to-equity ratio stood at ~28% as of End-June'22, indicating soundness of the sector's capital mix.



Duty Structure

PCT Code	Description	Unit of Measure	Custom Duty	Regulatory Duty
7001	Cullet & Other waste/ scrap of glass	Kg	11%	N.A.
7002	Glass in Balls, Rods or Tubes	Kg	20%	N.A.
7003	Cast and Rolled Glass in Sheets or Profiles etc.	m ²	20%	N.A.
7004	Drawn and Blown Glass in Sheets	m ²	20%	N.A.
7005	Float Glass	m ²	20%	15%
7006	Glass of Bent, Edge worked, Engraved	Kg	20%	15%
7007	Tempered Glass	u	35%	N.A.
7010	Glass Bottles	Kg	20%	20%
7011	Glass Envelopes			
	For electric lighting	Kg	16%	20%
	For cathode-ray tubes	Kg	11%	20%
7013	Glassware (Tableware)	Kg	20%	20%
7015	Glasses of Clock, watch, Spectacle etc	u	11%	N.A.
7016	Glass Paving Blocks, Bricks, Squares	Kg	20%	20%
7017	Laboratory, Hygienic or Pharmaceutical	Kg	3%	N.A.
7018	Glass Bead etc. and Articles NES			
	Precious stones etc	Kg	16%	20%
	Glass microspheres	Kg	3%	20%
	Glass eyes	Kg	11%	20%
7019	Glass Fibers and Articles Thereof (Yar	Kg	0%	N.A.
7020	Articles of Glass NES			
	For industrial purposes	Kg	11%	N.A.
	Other	Kg	20%	N.A.

SWOT Analysis

- Diverse product segments that derive demand from multiple industries
- Ample local production capacity

- Some segments have low level of competition which reduces incentive to increase efficiency
- Regular maintenance of fixed assets (furnaces) reduces production levels



- Slowdown in other industries such as construction, pharmaceuticals or reduced consumer spending power can hamper demand
- Spillover effect of the Russia-Ukraine conflict

- The incentives provided to the construction industry are likely to create demand for float glass
- Opportunity for import substitution

Outlook: Stable

- Pakistan's GDP registered an impressive growth of ~5.97% during FY22 (FY21: ~5.7%). A major demand driver for the glass industry is the construction sector, which contributes ~13.4% to the economy's Industrial segment, and which recorded a growth of ~3.1% in FY22.
- The culmination of a plethora of factors such as improved government spending on infrastructure and housing development, fast-paced commercial activity, growth in packaged food and beverages segment, and increased demand for healthcare contributed positively to development of the glass industry in FY22.
- However, going forward, the SBP forecast for GDP has dropped to ~2% for FY23, due to suppressed demand across major industrial sectors. LSM has already posted a ~0.4% contraction in 1QFY23. In addition, geopolitical tensions in the eurozone have had a negative impact on food and fuel prices across the globe and with ~18% currency devaluation in 2HFY22, the sector has grappled with operational inefficiencies.
- The rising energy costs are a major concern to the glass sector as its manufacturing process is energy-intensive. The rising oil prices in the international markets as well as rising prices of electricity and gas locally are likely to reduce the sector's margins, going forward. High production costs forced one of the well-established market players to temporarily shut down its tableware glass operations located at Kot Abdul Malik (Unit-III).
- The decision taken by the State Bank of Pakistan (SBP) to increase the monetary policy rate from 9.75% to 13.75% (April-May'22) adversely impacted the industry's net margins, due to high finance costs. In Nov'22, the central bank further increased the policy rate from 15% (Jul'22) to ~16%, which could worsen short-term financing for the glass sector, which has exhibited an increase in days payable in FY22.
- Despite facing the prevalent challenges, major sector players have developed a proactive approach to problem-solving and are continually expanding on ways to achieve economies of scale and cost reduction, via expansion projects to maintain and increase production capacity.

- Pakistan Bureau of Statistics (PBS)
- Pakistan Stock Exchange (PSX)
- State Bank of Pakistan (SBP)
- Pakistan Economic Survey
- PACRA Database
- Britannica
- Glass Alliance Europe

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