

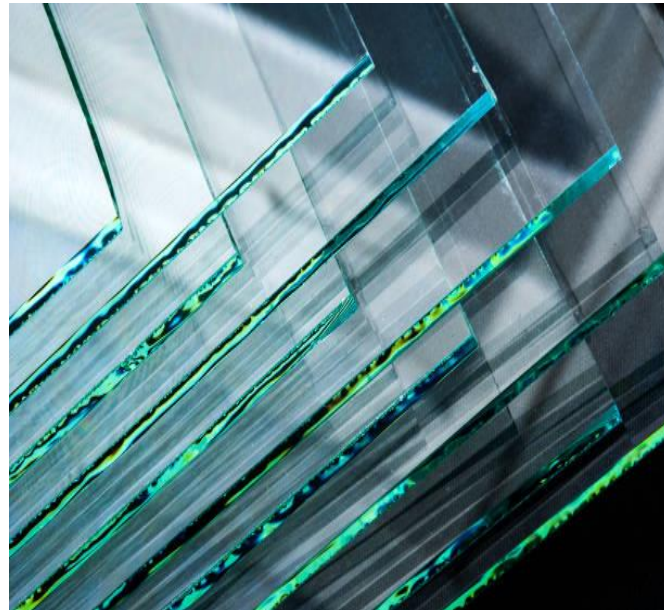


GLASS

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Contents

Contents	Pg.
Introduction	1
Global Overview	2
Local Overview	3
Local Market Segments and Capacities	4
Local Raw Material	5
Local Production	6
Local Imports & Exports	7
Export Destinations	8

Contents	Pg.
Local Business Risk	9
Local Margins & Cost Structure	10
Financial Risk Borrowing Mix	11
Financial Risk Working Capital Management	12
Duty Structure	13
SWOT	14
Outlook	15
Bibliography	16

Glass

Introduction

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. It is also possible to remelt and resoften soda-lime glass numerous times, making it an ideal material for recycling.

Glass

Global | Overview

- The Glass manufacturing market was valued at USD~130.1bln in CY22 and is expected to reach USD~178.1bln by CY30 and grow at a CAGR of ~4% over the forecast period CY23-30.
- Region-wise, growth is anticipated in the glass manufacturing sector in Asia Pacific. The region is defined by the affordable and readily available skilled labor, which makes it the most desirable location for industrial unit development. Over the course of the projection period, it is also anticipated that the growing trend of establishing manufacturing facilities in nations like India will support market expansion.
- China's solid end-use sectors suggest that the country will play a significant role in the regional market. China is home to one of the largest manufacturing centers in the world. In addition, China makes significant investments in electronics as well as most smartphone manufacturers have operations there. China's contribution to the global market is significant because of this. Furthermore, over the projection period, the glass manufacturing industry is anticipated to prosper due to the increasing usage of glass bottles, especially in the beverage packaging sector.
- Some of the difficulties encountered by the Sector include the fact that the first phases of production are extremely resource-intensive and need extended investment cycles. AGC, a world-leading manufacturer of glass, chemicals and high-tech materials, has announced the successful completion of a demonstration test of Glass manufacturing utilizing hydrogen as fuel. This might cut energy costs while also lowering net carbon emissions. Additionally, as compared to plastic, Glass has several benefits including the fact that it is non-reactive, making it suitable for chemicals and other reactive commodities.
- R&D on new and innovative glass manufacturing techniques has been underway for a long time, but an intriguing perspective is that on the electrical and optical properties of building integrated photovoltaic (BIPV) windows with a semi-transparent solar cell. This will enable solar-cell windows, as well as a sustainable and unique potential for an amalgamation of construction, aesthetics and renewable power generation.

Glass

Local | 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 at PKR~75.6bln for FY23, a YoY increase of ~13.2%. In 1QFY23, revenue for the Sector recorded at PKR~20.5bln, an increase of ~32.2% 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 remained steady at ~22.8mln Sq. M, as compared to ~22.3mln Sq. M in FY22. For 1QFY23, the figure clocked in at ~5,857 th. square meters (SPLY: 6,888 th. square meters).
- A significant share of the local demand is also met through imports which stood at USD~75.8mln in FY23, as compared to USD~124mln in FY22. The largest import segments are glass fibers (~30%) and glass containers (~25.3%). Imports for 1QFY24 were recorded at USD~20.5mln, compared to USD~27.4mln SPLY, a decrease of ~25.1% YoY.
- Meanwhile, exports of glass products had seen little change and stood at USD~39mln in FY23 as compared to USD~42mln in FY22. Float glass accounted for the largest share in exports (~70%). Major export destinations in FY23 for float glass were Sri Lanka (~19.5%) and Turkiye (~23.2%).

Sector Snapshot	FY22	FY23	1QFY23	1QFY24
Estimated Revenue (PKR mln)	66,779	75,588	15,526	20,509
Production of Glass Plates and Sheet	22,269	22,759	6,888	5,857
Glass Imports (USD 000)	123,522	75,855	27,405	16,137
Glass Exports (USD 000)	42,293	39,423	10,262	3,288
No. of Players	~5-6 major players			
Market Structure	Oligopoly			
Product Segments	Float Glass, Tableware & Containers			
Industry Association	Pakistan Glass Manufacturers Association (PGMA)			

Glass

Local | Market Segments and Capacities

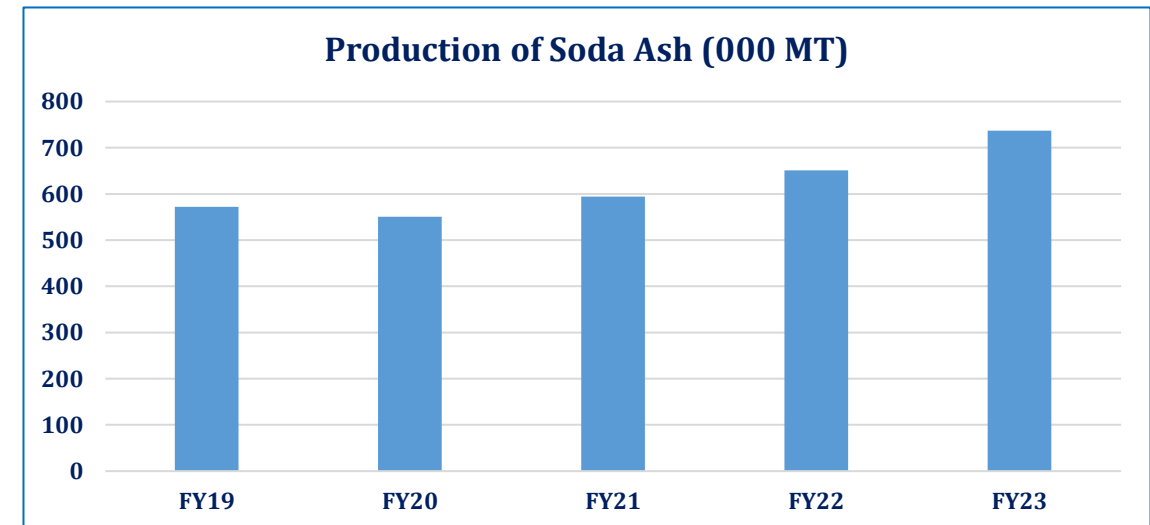
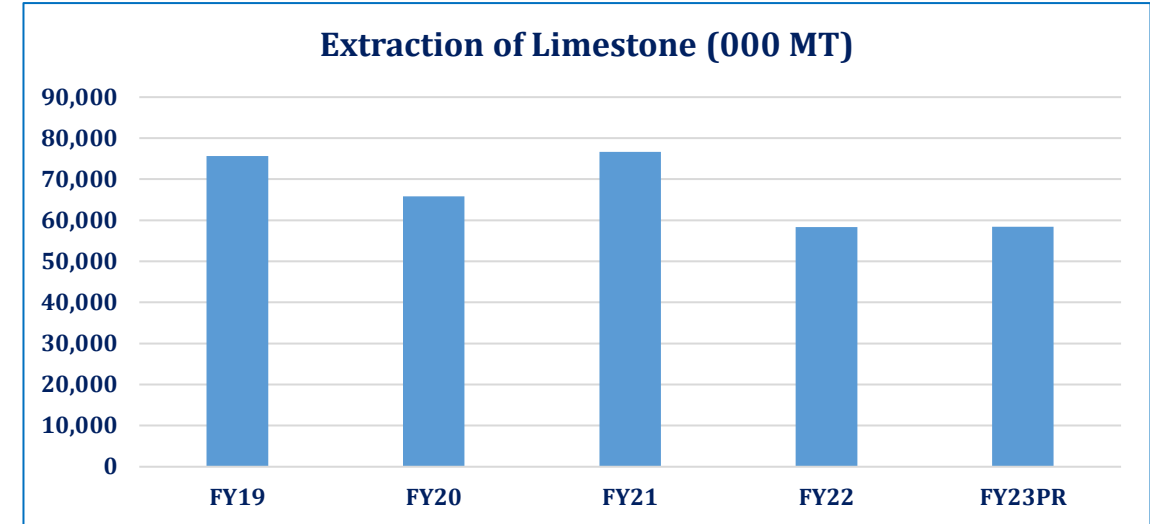
Local glass manufacturers are currently operating in three broad categories/segments which can be classified as follows:

- 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 ~2,266.4tpd.
- 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 (~300tpd) while Gunj Glass enjoys ~30% market share (glassware capacity of ~40tpd). The estimated total production capacity of this segment stands at ~340tpd.
- 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 glass manufactures 0.5mln tons of glass products annually which include beverages, containers and tempered glass among others.

Glass

Local | Raw Material

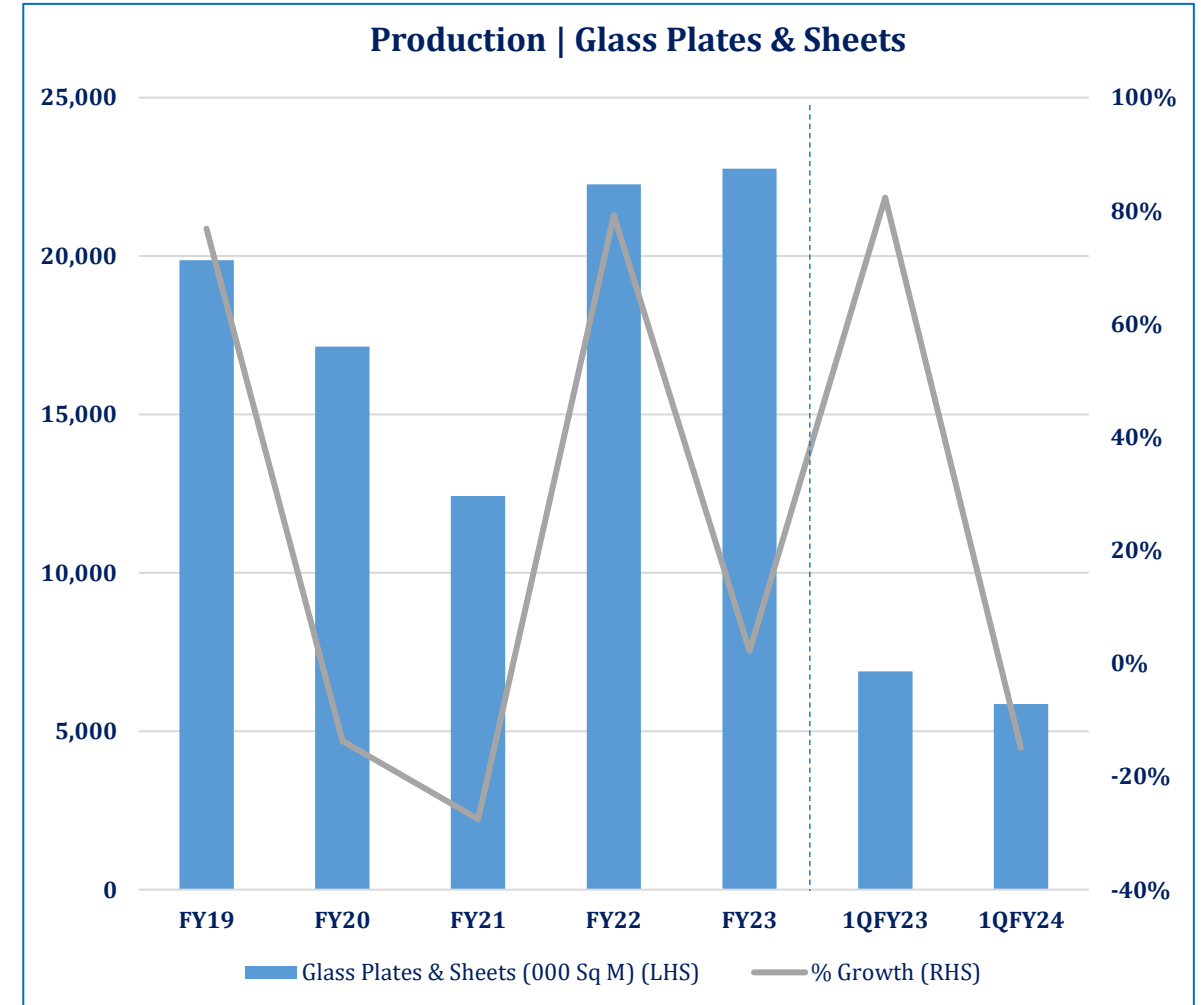
- While the main raw material in the production of glass is silica sand, most types of glass also require limestone (reduces the viscosity, making the liquid glass easier to handle and form into the required shape) and soda ash (to accelerate the fusion of glass).
- During FY23, the mining and quarrying sub-segment, having ~9% share in the Industry segment of the economy, posted a decline of ~4.4% YoY, as against ~7.0% decline in FY22. This was most likely due to slow economic activity alongside the use of redundant technology and damage to road infrastructure as a result of flooding and excessive rains during the year.
- The extraction of limestone, which is also a key raw material in the cement sector, exhibited a shrinking trend, decreasing at a CAGR of ~84.5% over the period FY19-23. During FY23, the total limestone extracted amounted to ~58.3mln MT, an increase of ~0.05%, compared to same period last year (FY22: ~58.4mln 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 FY23, the local production of soda ash stood at ~737,000 MT, an increase of ~13% YoY as compared to the previous year (FY22: ~650,000 MT).



Glass

Local | Production

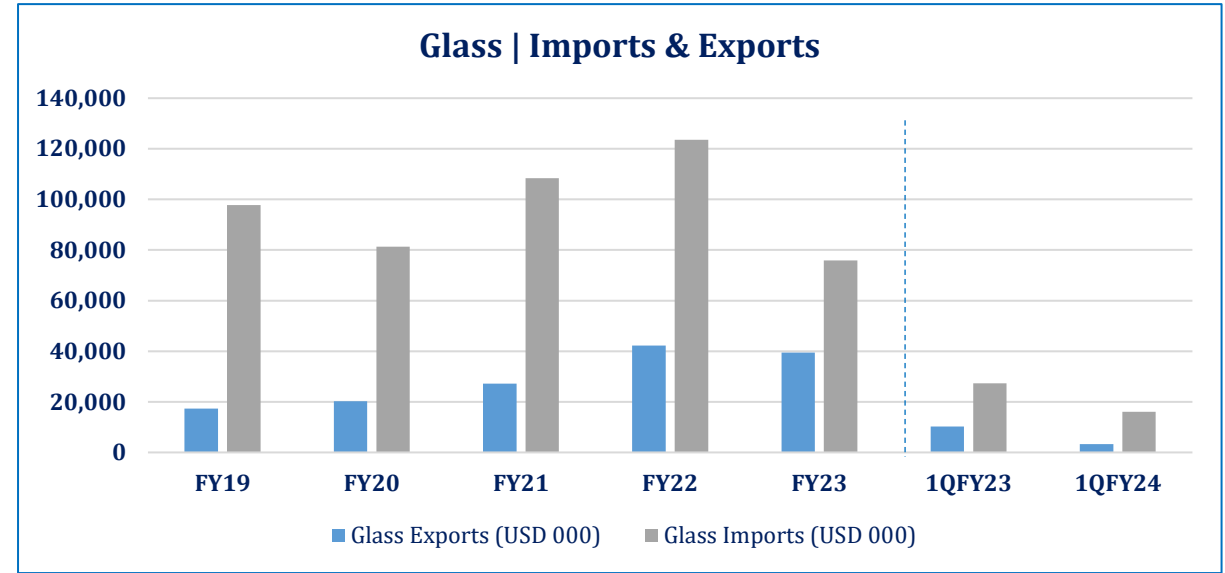
- Local production of glass, as measured against glass plates and sheets produced, exhibited a YoY decline during FY20-21. However, it increased significantly by ~79% YoY in FY22. This was likely due to the capacity expansion by one of the large players in the Glass sector. FY23 recorded a growth rate of just ~2%, having little change in the production capacity.
- Production in 1QFY24 clocked in at ~5,857 th. square meters (1QFY23: 6,888 th. square meters), a decline of ~15% YoY. This could be because of furnace shutdowns for rebuilding purposes, resulting in a significant reduction production.



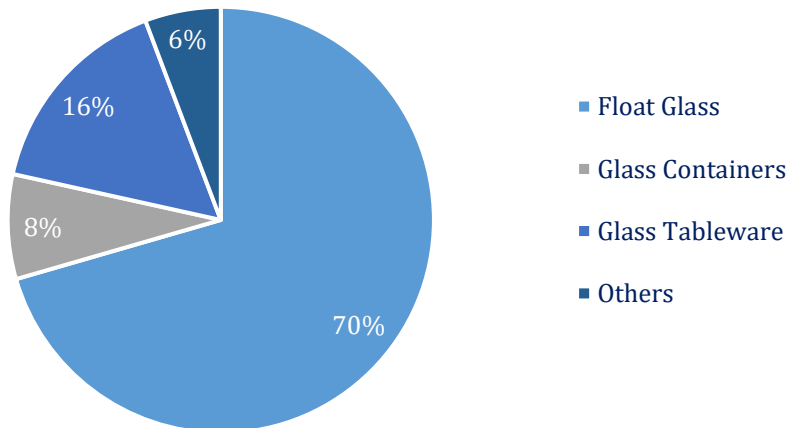
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Local | Imports & Exports

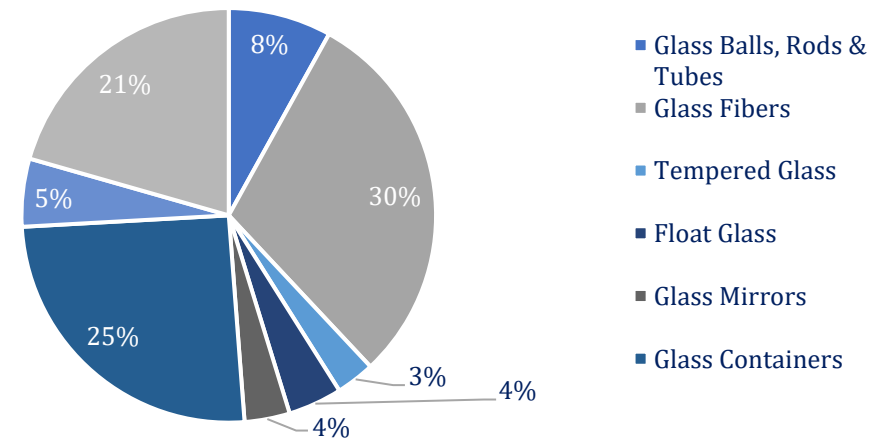
- Glass exports have followed an upward trajectory since FY18, growing at a CAGR of ~18% during FY19-23. Total exports clocked in at USD~39.4mln, declining by ~6.8% YoY, while imports also decreased by ~39% YoY to touch USD~75.8mln.
- For 1QFY24, glass imports and exports declined further by ~41.1% and ~54.4% QoQ, respectively. For FY23, float glass made up ~70.5% of total glass products exports, followed by glass tableware (~15.8%) (~7.9%) and glass containers.
- Meanwhile, for imports, the largest contributor was glass fibres (~30%) followed by glass containers (~25.3%) and glass tableware (~5.3%).



Share of Exports (FY23)



Share of Imports (FY23)

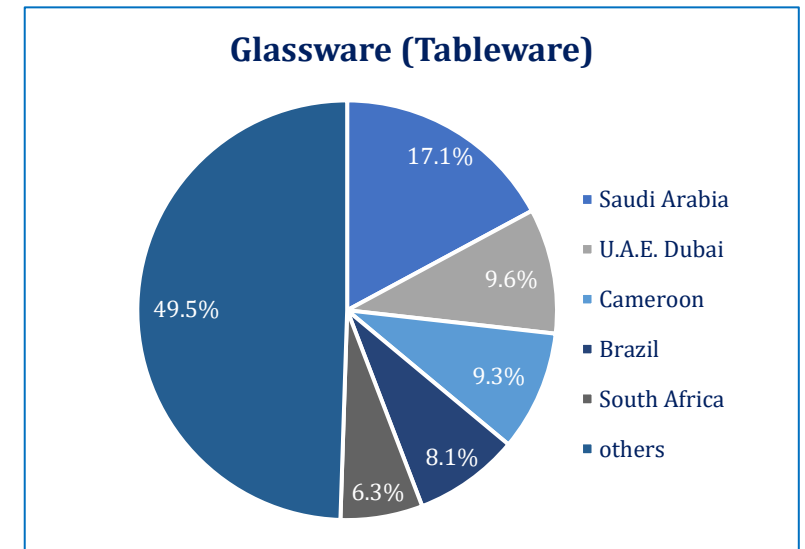
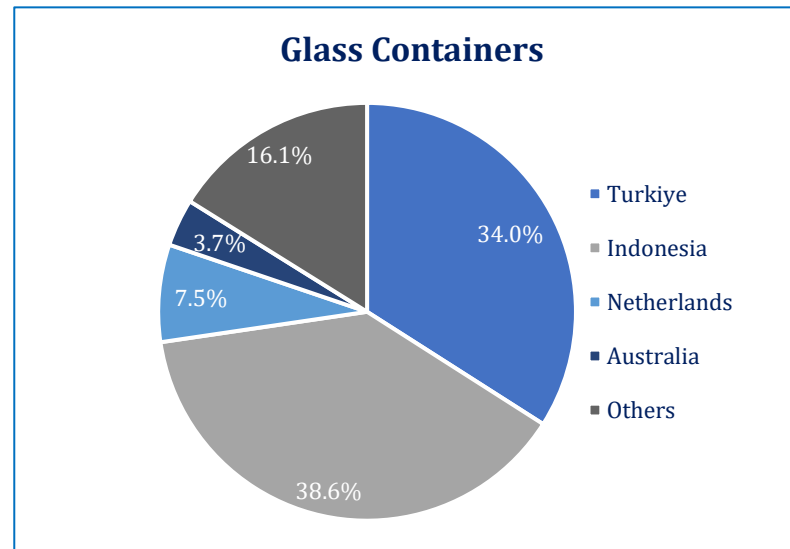
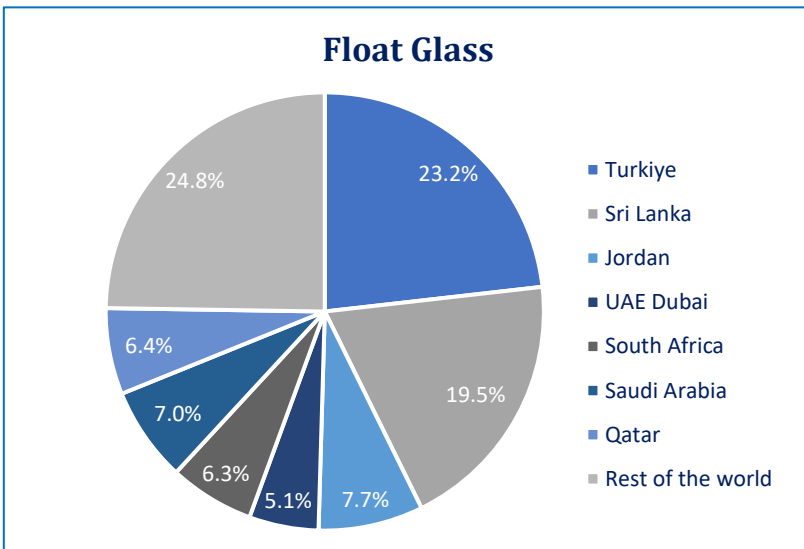


Glass

Export Destinations

Of the glass products, the most significant exports are of the following types -

- i. Float Glass:** In FY23, the total export share of float glass was 70%. Turkiye had the highest individual nation import share from Pakistan (~23.2%, or USD~6.5mln), followed by Sri Lanka (~19.5%, or USD~5.3mln).
- ii. Tableware:** Glassware (or Tableware) exports made up ~16% of total glass exports in FY23. The bulk of exports were made up of smaller shares from various countries rather than any one nation having the largest export proportion. A few of these are Cameroon (~9%, or USD~5.8mln), UAE Dubai (~10%, or USD~6mln) and Saudi Arabia (~17%, or USD~1.1mln).
- iii. Containers:** Glass container exports made up ~8% of total glass exports in FY23. Indonesia had the highest individual nation import share from Pakistan (~38.6%, USD~1.2mln), followed by Turkiye (~34.0%, or USD~1.1mln).



Glass

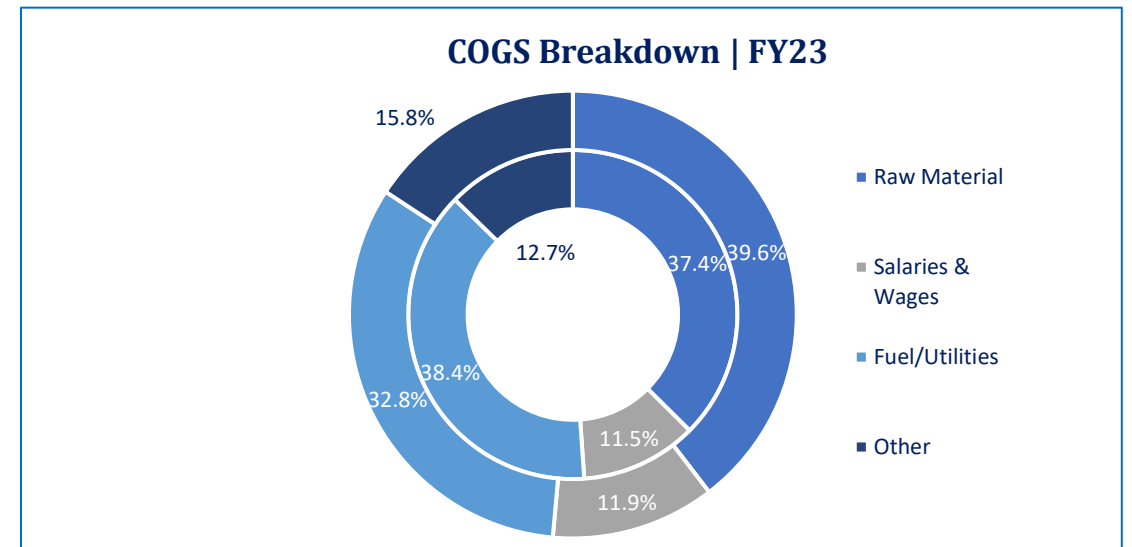
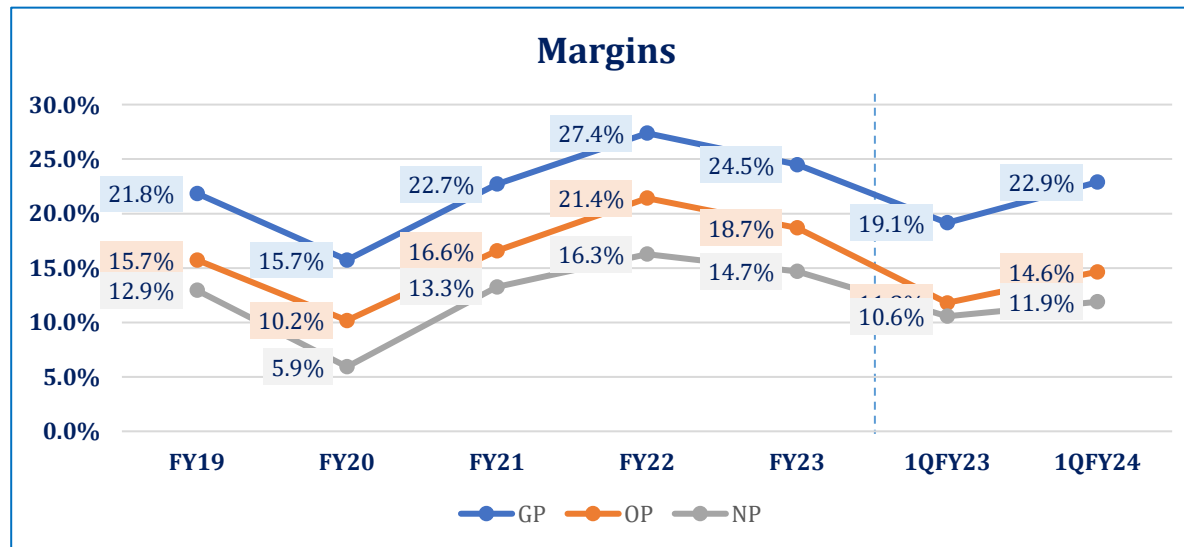
Local | Business Risk

- **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.



Local | Margins & Cost Structure

- Over the last five years (FY19-23), the Sector’s average gross margins have stood at ~22% while average net margins have recorded at ~13%. During FY23, there was a dip in margins, owing largely to economic slowdown which impacted numerous sectors in Pakistan. Average gross profit margins declined to ~24.5% (FY22: ~27.4%), while average net profit margins declined from ~16.3% to ~14.7%. This can be attributed to an increase in cost of sales as well finance costs as for all major players as it increased significantly. This was due to many factors but majorly because of an increase in gas prices that was announced in Jan’23. Moreover, energy price hikes in FY23 also factored in.
- For 1QFY24, an increase was observed for the GP and NP margins across all players. While average gross profit margins increased to ~22.8% from ~19.2% in FY23, average net profit margins increased to ~11.9% from ~10.6%. This was possible through various ways including firms’ effective strategy implementation during the reporting period by partially charging customers for the higher costs. Still, the net profit had not increased too much as finance costs increased as a result of a notable increase in interest rates.
- The Sector’s cost structure majorly comprises raw materials, fuel and utilities expenses. Prices of raw materials shot up due to depreciating currency in FY23, whereby raw material comprised (~39.6%), while expensive fuel and electricity also contributed significantly to the cost structure.

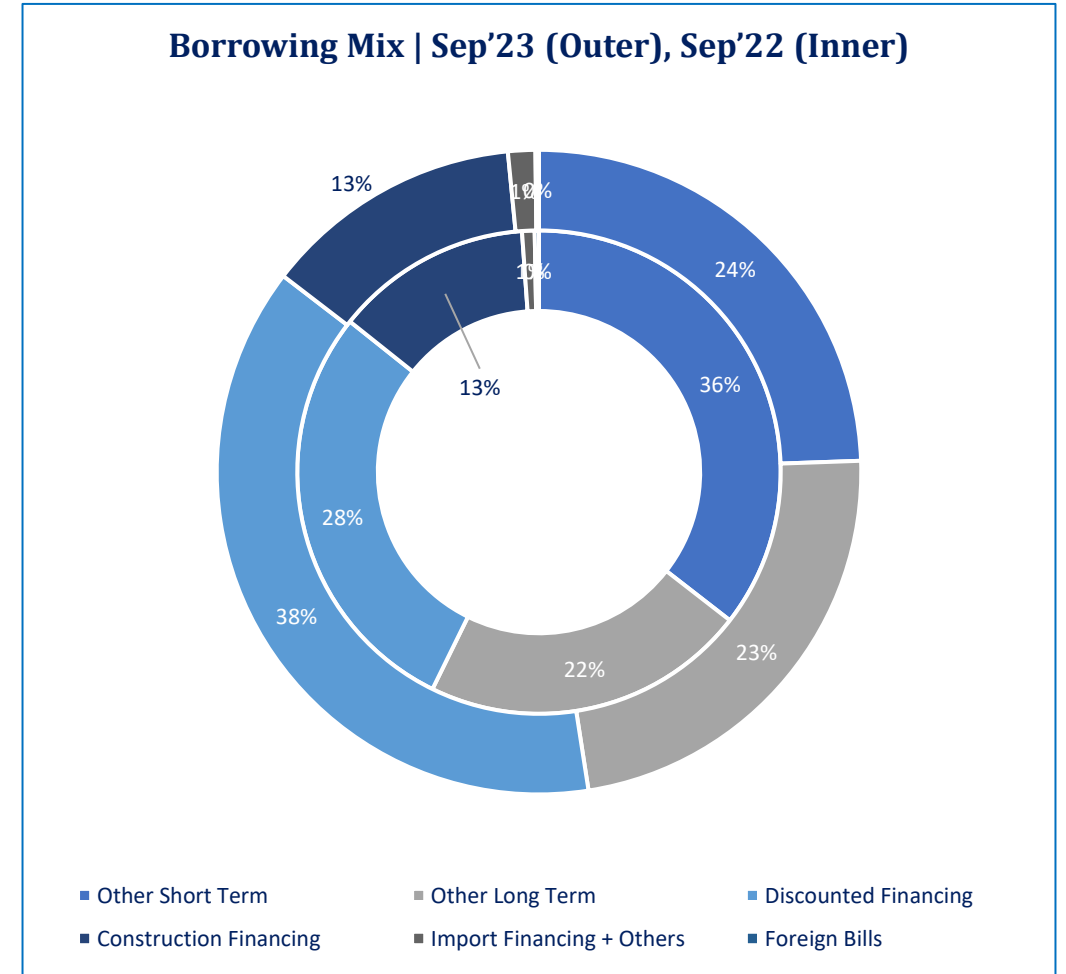


Note: Margins & Cost Structure are reflective of ~5 listed players.

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Financial Risk | Borrowing Mix

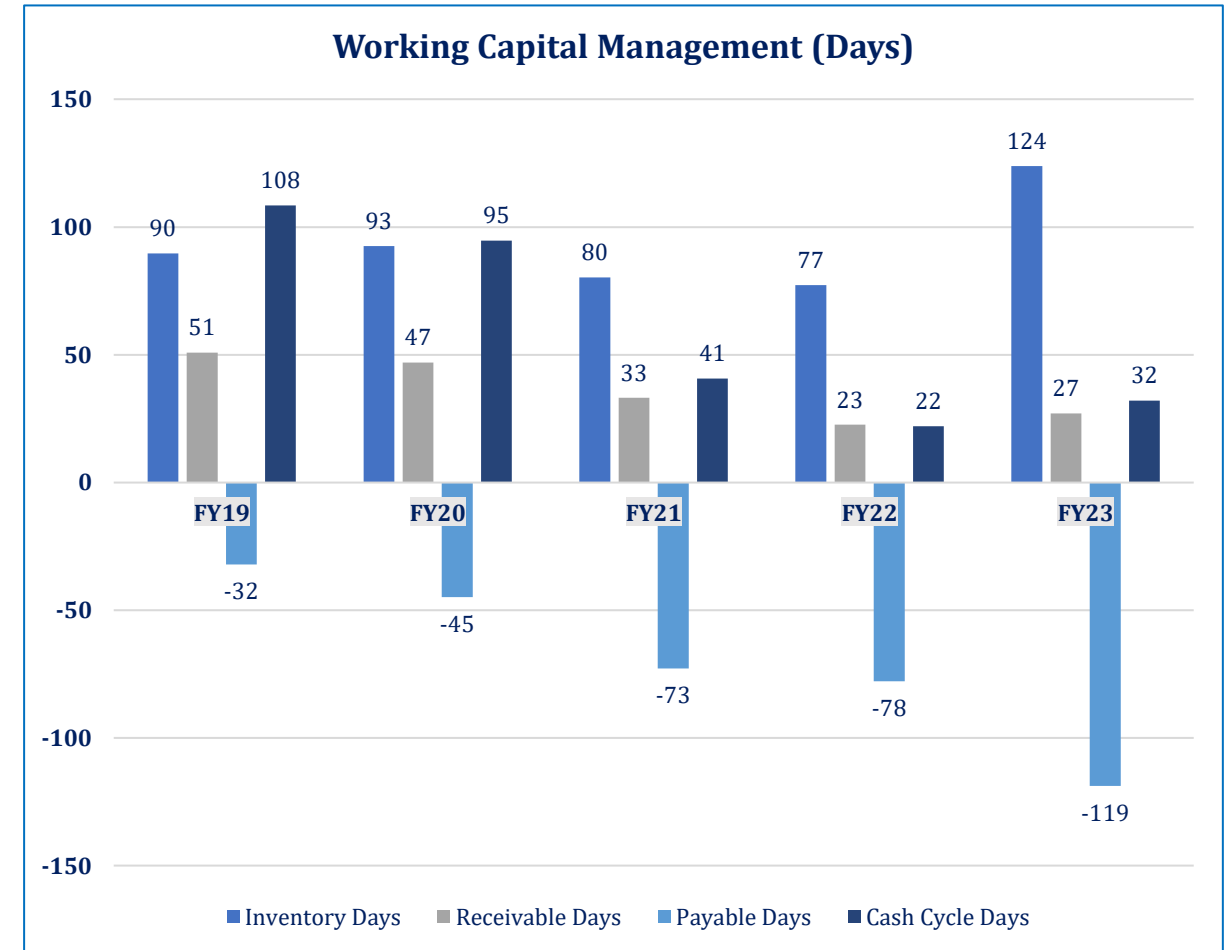
- The Glass sector’s borrowings stood at PKR~9.5bln as at End-Sep’23, as compared to borrowings of PKR~12.6bln of as at End-Sep’22, a YoY decrease of ~24.3%.
- The largest component within the Sector’s borrowing mix was discounted financing which largely comprised of Long-Term Finance Facility (LTFF) (~88.6%) and export finance schemes (~11.4%). Discounted financing at normal rates stood at PKR~3.6bln as of Sep’23 and accounted for ~38% of the total borrowing mix, an increase of ~33.2% from FY22.
- In addition, other short and long-term borrowing (which accounted for other loans required to meet working capital needs) both at normal rates, accounted for ~24% and ~23% of total borrowings, respectively.
- The Sector’s average leveraging is relatively low and debt-to-equity ratio stood at ~35.6% as of End-June’23, indicating soundness of the Sector’s capital mix.



Note: Leveraging figure is reflective of ~5 listed players. Borrowing Mix is reflective of SBP data under the category 'Manufacture of Glass and Glass Products'

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 FY23.
- The Sector’s average working capital cycle typically ranges from ~76 to ~80 days. During FY23, average working capital days stood at ~32 days (SPLY: ~22 days), an increase of ~10 days YoY.
- For FY23, days in inventory increased drastically from ~77 days to ~124 days, showing the major players’ incapacity to market their inventories effectively. This could be due to economic slowdown of FY23, and by extension, lower demand from the demand-driving segments of the economy.
- The average days payable also increased to ~119 days from ~78 days. This likely resulted due to increased cost inflation, along with significant currency depreciation and rising interest rates, and is reflective of Sector players’ low liquidity and increased borrowing.



Glass

Duty Structure

PCT Code	Description	Unit of Measure	Custom Duty 2022	Custom Duty 2023	Regulatory Duty 2022	Regulatory Duty 2023
7001	Cullet & Other waste/ scrap of glass	Kg	11%	11%	N.A.	N.A.
7002	Glass in Balls, Rods or Tubes	Kg	20%	20%	N.A.	N.A.
7003	Cast and Rolled Glass in Sheets or Profiles etc.	m ²	20%	20%	N.A.	N.A.
7004	Drawn and Blown Glass in Sheets	m ²	20%	20%	N.A.	N.A.
7005	Float Glass	m ²	20%	20%	15%	15%
7006	Glass of Bent, Edge worked, Engraved	Kg	20%	20%	15%	30%
7007	Tempered Glass	u	35%	35%	N.A.	N.A.
7010	Glass Bottles	Kg	20%	20%	20%	20%
7011	Glass Envelopes					
	For electric lighting	Kg	16%	16%	20%	20%
	For cathode-ray tubes	Kg	11%	11%	20%	20%
7013	Glassware (Tableware)	Kg	20%	20%	20%	20%
7015	Glasses of Clock, watch, Spectacle etc	u	11%	11%	N.A.	N.A.
7016	Glass Paving Blocks, Bricks, Squares	Kg	20%	20%	20%	20%
7017	Laboratory, Hygienic or Pharmaceutical	Kg	3%	3%	N.A.	N.A.
7018	Glass Bead etc. and Articles NES					
	Precious stones etc	Kg	16%	16%	20%	20%
	Glass microspheres	Kg	3%	3%	20%	20%
	Glass eyes	Kg	11%	11%	20%	20%
7019	Glass Fibers and Articles Thereof (Yar	Kg	0%	0%	N.A.	N.A.
7020	Articles of Glass NES					
	For industrial purposes	Kg	11%	11%	N.A.	N.A.
	Other	Kg	20%	20%	N.A.	N.A.

Glass

SWOT

- 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

Strengths

Weaknesses

- 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

Threats

Opportunities

Outlook: Stable

- Pakistan's economy posted a real GDP growth of ~0.29% (FY22: ~6.1%) in FY23, while the LSM declined by ~10.3% (FY22: ~11.8%), owing majorly to supply-chain disruptions which resulted from SBP-imposed import restrictions and consequent sluggish demand across major industrial sectors of the country. However, as per revised estimated disclosed by NAC, the country had, in fact, experienced a GDP contraction of ~0.17% YoY.
- Pakistan's local production of Glass, as measured against glass plates and sheets produced, clocked in at ~22,759 th. square meters in FY23. The culmination of a plethora of factors in FY22 (improved government spending on infrastructure and housing development, fast-paced commercial activity, growth in packaged food and beverages segment, and increased demand for healthcare) had contributed positively to the growth of Glass sector in FY22. However, due to economic slowdown in FY23, the Sector's production recorded a modest growth rate of just ~2% YoY, having little change in the production capacity. Although local production of glass in FY23 remained stable, the estimated revenue for the Glass sector was recorded at PKR~75.6bln for FY23, a YoY increase of ~13.2%.
- Margins fell during FY23, owing mostly to the economic downturn that hit several industries in Pakistan. Average gross profit margins fell to ~24.5% (~27.4% in FY22), while average net profit margins fell from ~16.3% to ~14.7%. This can be attributed to an increase in cost of sales as well finance costs as for all major players as it increased significantly. This was due to many factors but majorly because of an increase in gas prices that was announced in Jan'23. Moreover, energy price hikes in FY23 also factored in.
- The Sector's cost structure majorly comprises raw materials, fuel and utilities expenses. Prices of raw materials shot up due to depreciating currency in FY23, whereby raw material comprised (~39.6%), while expensive fuel and electricity also contributed significantly to the cost structure.
- Sector's borrowings stood at PKR~9.5bln as at End-Sep'23, as compared to borrowings of PKR~12.6bln of as at End-Sep'22, a YoY decrease of ~24.3%. Total borrowing comprised short-term and long-term borrowing which, at nominal rates, accounted for ~24% and ~23% of total borrowings during the year, respectively.
- With the economy showing early indications of recovery following FY23 (LSM reported ~0.68% growth in 1QFY24), reduced fuel costs, stable interest rates (likely to be revised downward by 2HFY24), and anchored inflationary expectations, the Sector's overall performance is likely to improve in FY24. This can also be hinged on the fact the segments contributing to the growth in LSM during 1QFY24 comprise Food, Cement and Iron & Steel, among others. Furthermore, with the IMF estimating ~2.5% GDP growth in FY23, up from ~-0.5% in FY23, the Sector could likely yield positive outcomes within the upcoming year.

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