

Infomerics Analytics & Research

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Flat No.108, Golf Apartments, Sujan Singh Park New Delhi – 110 003
iar@infomerics.com, Phone: +9111 41410243, 4141 0244,



Industry Report On Façade & Fenestration

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1. Indian Macro Economy an overview

The Indian economy is on a strong wicket and stable footing, demonstrating resilience in the face of geopolitical challenges. The Indian economy has consolidated its post-Covid recovery with policymakers – fiscal and monetary – ensuring economic and financial stability. Nonetheless, change is the only constant for a country with high growth aspirations. For the recovery to be sustained, there has to be heavy lifting on the domestic front because the environment has become extraordinarily difficult to reach agreements on key global issues such as trade, investment and climate. High economic growth in FY24 came on the heels of growth rates of 9.7% and 7.0%, respectively, in the previous two financial years. The headline inflation rate is largely under control, although the inflation rate of some specific food items is elevated. The trade deficit was lower in FY24 than in FY23, and the current account deficit for the year is around 0.7% of GDP. In fact, the current account registered a surplus in the last quarter of the financial year. Foreign exchange reserves are ample. Public investment has sustained capital formation in the last several years even as the private sector shed its balance sheet blues and began investing in FY22. Now, it has to receive the baton from the public sector and sustain the investment momentum in the economy. The signs are encouraging. National income data show that non-financial private-sector capital formation, measured in current prices, expanded vigorously in FY22 and FY23 after a decline in FY21. However, investment in machinery and equipment declined for two consecutive years, FY20 and FY21, before rebounding strongly. Early corporate sector data for FY24 suggest that capital formation in the private sector continued to expand but at a slower rate.

Snapshots on key Economic Indicators: -

Foreign Direct Investment: -

Foreign Direct Investment, the subject of much analysis, has held up. RBI data on India's Balance of Payments shows us that the investment interest of external investors, measured in terms of dollar inflows of new capital, was USD45.8 billion in FY24 compared to USD47.6 billion in FY23. This slight decline is in line with global trends. Reinvestment of earnings remained the same. Repatriation of investment was USD29.3 billion in FY23 and USD44.5 billion in FY24. Many private equity investors took advantage of buoyant equity markets in India and exited profitably. It is a sign of a healthy market environment that offers profitable exits to investors, which will bring newer investments in the years to come. That said, the environment for foreign direct investment to grow in the coming years is not highly favourable for many reasons.

Employment generation:-

It is worth reiterating that job creation happens mainly in the private sector. Second, many (not all) of the issues that influence economic growth, job creation and productivity and the actions to be taken therein are in the domain of state governments. So, in other words, India needs a tripartite compact, more than ever before, to deliver on the higher and rising aspirations of Indians and complete the journey to Viksit Bharat by 2047.

In more than one respect, the action lies with the private sector. In terms of financial performance, the corporate sector has never had it so good. Results of a sample of over 33,000 companies show that, in the three years between FY20 and FY23, the profit before taxes of the Indian corporate sector nearly quadrupled. Further, newspaper headlines told us that the corporate profits-to-GDP ratio rose to a 15-year high in FY24. Business Line reported, “The corporate profit for the Nifty-500 universe was up 30 per cent last fiscal to ₹14.11-lakh crore against ₹10.88 lakh crore in FY23. The nominal GDP grew 9.6 per cent y-o-y to ₹295-lakh crore (₹269-lakh crore)¹”. Hiring and compensation growth hardly kept up with it. But, it is in the interest of the companies to step up hiring and worker compensation.

Between FY19 and FY23, the cumulative growth in private sector non-financial Gross Fixed Capital Formation (GFCF) is 52% in current prices. During the same period, the cumulative growth in general government (which includes states) is 64%. The gap does not appear to be too wide.

Private sector GFCF in machinery and equipment and intellectual property products has grown cumulatively by only 35% in the four years to FY23. Meanwhile, its GFCF in ‘Dwellings, other buildings and structures’ has increased by 105%. This is not a healthy mix. Second, the slow pace of investment in M&E and IP Products will delay India’s quest to raise the manufacturing share of GDP, delay the improvement in India’s manufacturing competitiveness, and create only a smaller number of higher-quality formal jobs than otherwise.

Nonetheless, there is a silver lining in the data. In the two years since FY21, GFCF by the private sector has grown faster. General government GFCF rose a cumulative 42% between FY21 and FY23. Non-Financial Private Sector’s overall GFCF increased by 51%; investment in Machinery and Equipment and Intellectual Property Products increased by 38%. So, the growth in these two critical sub-components of Private Sector GFCF is similar to that of the overall GFCF by the General Government. This is a statistic that bears watching. They should continue to invest. To do so, they need demand visibility. That comes from employment and income growth.

Agriculture can be a growth engine:-

The agriculture sector is one area ripe for and in need of such a pan-India dialogue. Agriculture and farmers matter for a nation. Most countries understand that. India is no exception. India subsidises their water, electricity and fertilisers. The former two are provided virtually free. Their incomes are not taxed. The government offers them a minimum support price (MSP) for 23 selected commodities. Monthly cash support is offered to farmers through the PM-KISAN scheme. Indian governments – national and sub-national – write off their loans. So, governments in India spend enough resources to look after the farmers well. Yet, a case can be made that they can be served better with some re-orientation of existing and new policies.

Unleashing small enterprises:-

Another area where policy intentions have yet to manifest in desired outcomes is with respect to small, medium, and large enterprises. Earlier, several products were reserved for small scale industries. That was phased out as it benefitted neither the small-scale industries nor the overall economy. Recent concerted efforts at formalising them are making progress. Progress is relatively slower on access to finance. Buyers and creditors are shedding old mindsets and practices too slowly for these enterprises to feel the effect. However, these enterprises need maximum relief from the compliance burdens they face. Laws, rules and regulations stretch their finances, abilities and bandwidth, perhaps robbing them of the will to grow.

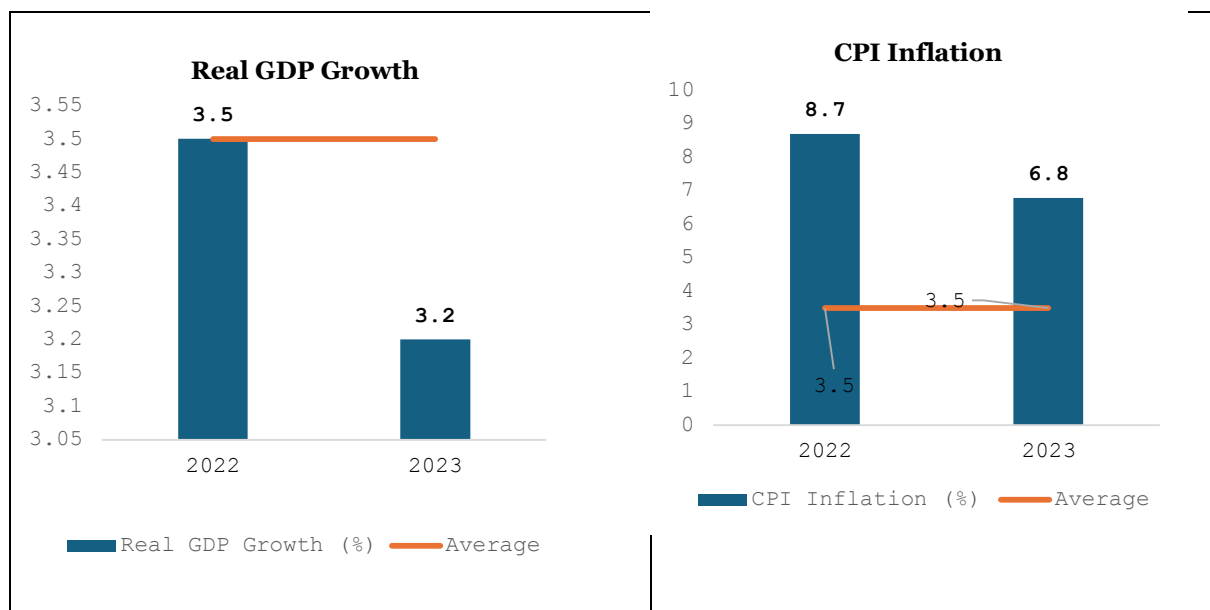
Final words:-

The tripartite compact that this country needs to become a developed nation amidst emerging unprecedented global challenges is for governments to trust and let go, for the private sector to reciprocate the trust with long-term thinking and fair conduct and for the public to take responsibility for their finances and their physical and mental health.

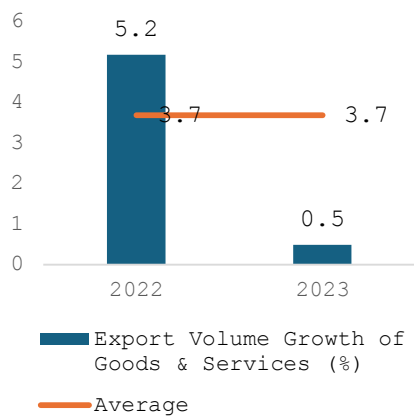
2. An overview on Macro Economy Parameters

GLOBAL ECONOMIC SCENARIO:-

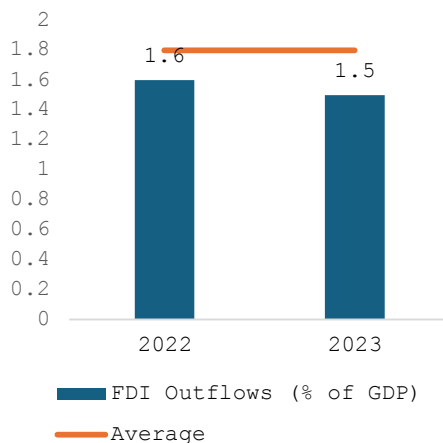
After a year marked by global uncertainties and volatilities, the global economy achieved greater stability in 2023. While uncertainty stemming from adverse geopolitical developments remained elevated, global economic growth was surprisingly robust. As per the World Economic Outlook (WEO), April 2024 of the International Monetary Fund (IMF), the global economy registered a growth of 3.2 per cent in 2023, though marginally lower than in 2022 and average for 2011-19 but higher compared to the projection of 2.8 per cent as per the April 2023 WEO⁵. The context in which the growth of 3.2 per cent in 2023 has been achieved is markedly different compared to the 2011-19 period. Inflationary pressures have been significantly higher on account of the persistence of core inflation. Global trade moderated due to rising geopolitical tensions, cross-border restrictions and slower growth in advanced economies (AEs). The muted trade growth occurred despite the easing of supply chain pressures. Further, geopolitical developments and monetary policy changes across countries resulted in increased caution among investors, culminating in moderation in foreign direct investment (FDI) flows.



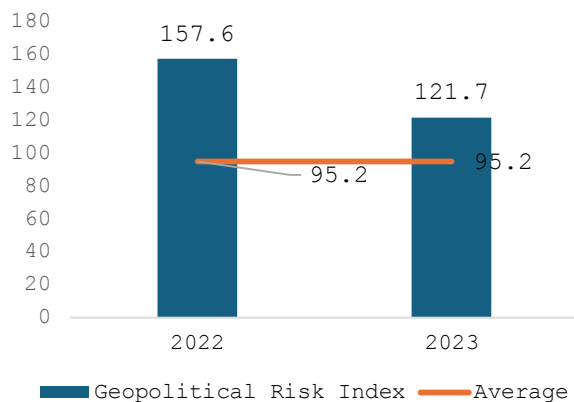
Export Volume Growth of Goods & Services



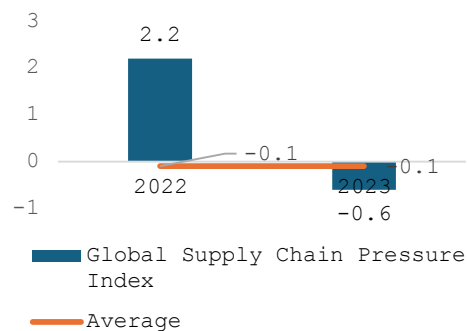
FDI Outflows



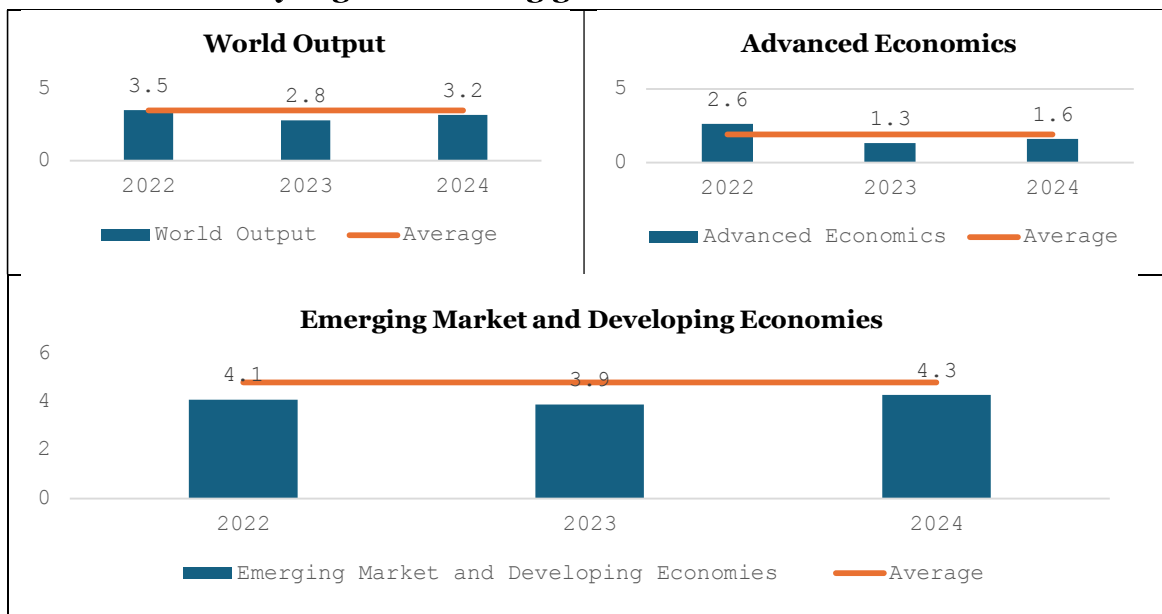
Geopolitical Risk Index



Global Supply Chain Pressure Index Average



Global economy registers strong growth

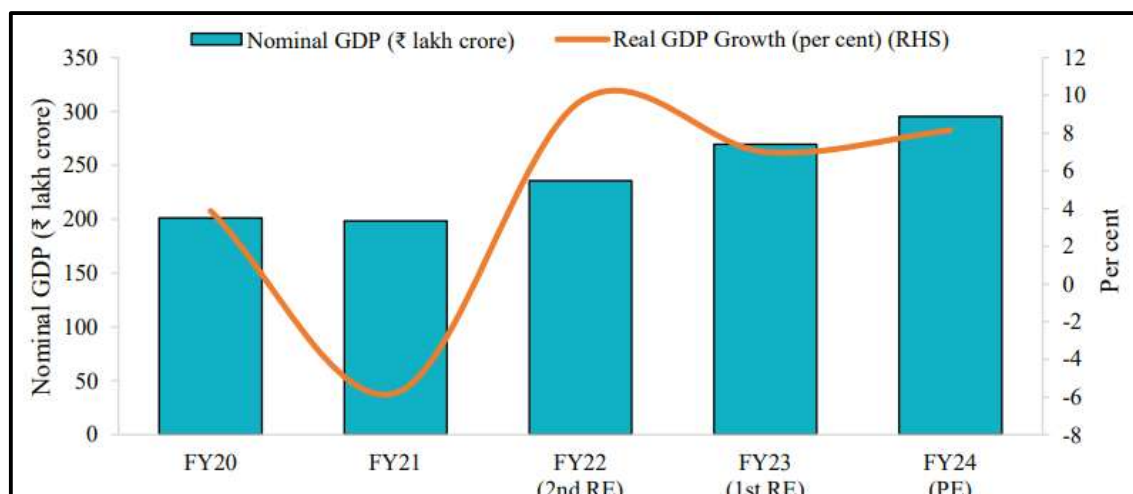


All major economies have surpassed pre-pandemic GDP levels:-

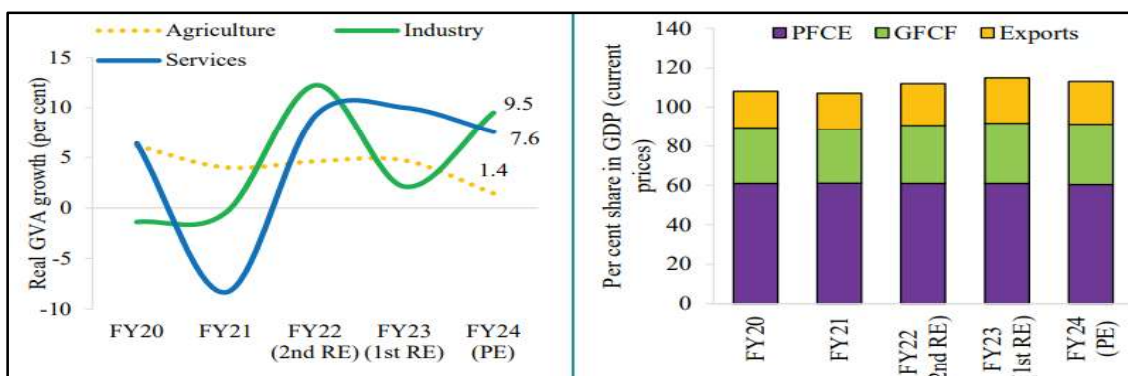
Country	Year in which crossed pre pandemic GDP (constant prices, national currency)	Ratio of GDP (constant prices, national currency) in 2023 to corresponding level in 2019
United States	2021	108
China	2020	120
France	2022	102
Germany	2022	101
United Kingdom	2022	102
Japan	2023	101
India	2021	120
Brazil	2021	107

Domestic Economy:-

India's economy carried forward the momentum it built in FY23 into FY24 despite a gamut of global and external challenges. The focus on maintaining macroeconomic stability ensured that these challenges had minimal impact on India's economy. As a result, India's real GDP grew by 8.2 per cent in FY24, posting growth of over 7 per cent for a third consecutive year, driven by stable consumption demand and steadily improving investment demand. On the supply side, gross value added (GVA) at 2011-12 prices grew by 7.2 per cent in FY24, with growth remaining broad-based. Net taxes at constant (2011-12) prices grew by 19.1 per cent in FY24, aided by reasonably strong tax growth, both at the centre and state levels and rationalisation of subsidy expenditure. This led to the difference between GDP and GVA growth in FY24.



The shares of the agriculture, industry and services sector in overall GVA at current prices were 17.7 per cent, 27.6 per cent and 54.7 per cent respectively in FY24. GVA in the agriculture sector continued to grow, albeit at a slower pace. Erratic weather patterns during the year and an uneven spatial distribution of the monsoon in 2023 impacted overall output. This is reflected in the marginal decline in total foodgrain output for FY24 of 0.3 per cent as per the third advanced estimate of foodgrain production released by the Ministry of Agriculture and Farmers' Welfare (MoAFW).



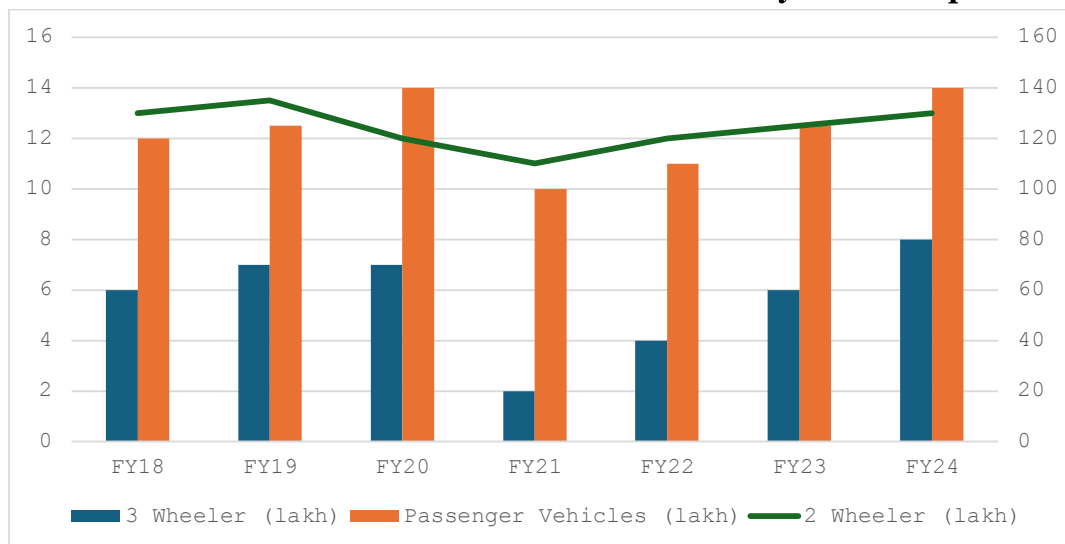
*Gross fixed capital formation (GFCF)**Gross fixed capital formation (PFCE)*

Within the industrial sector, manufacturing GVA shrugged off a disappointing FY23 and grew by 9.9 per cent in FY24. Manufacturing activities benefitted from reduced input prices while catering to stable domestic demand. The input price advantage was reflected in the subdued growth in the Wholesale Price Index (WPI) inflation, which led to a deflator of (-)1.7 per cent for the manufacturing sector during FY24. Manufacturers also passed on the reduction in input prices to consumers, reflected in the sustained decline in the core consumer price inflation. The strength of manufacturing is further corroborated by the strong performance of the HSBC India PMI for manufacturing, which consistently remained well above the threshold value of 50, indicating sustained expansion and stability in India's manufacturing sector. Construction activities displayed increased momentum and registered a growth of 9.9 per cent in FY24 due to the infrastructure buildout and buoyant commercial and residential real estate demand.

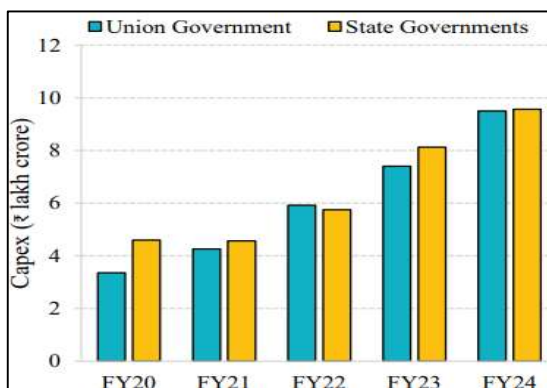
Various high-frequency indicators reflect the growth in the services sector. Both Goods and Services Tax (GST) collections and the issuance of e-way bills, reflecting wholesale and retail trade, demonstrated double-digit growth in FY24. Financial and professional services have been a major driver of growth post the pandemic. Contact-intensive services—prominently trade, transport, real estate and their ancillary services that were impacted the most during the pandemic have emerged much stronger in the post-pandemic period, embedding greater technology and digital content in them and transforming the nature of the service delivery in India. The proliferation of global capability centres (GCCs) has also imparted resilience to India's services exports, giving further thrust to the sector.

On the demand side, private consumption has been a crucial and steadfast cog in the GDP growth. Private final consumption expenditure (PFCE) grew by 4.0 per cent in real terms in FY24. Urban demand conditions remain strong, as reflected in various urban consumption indicators such as domestic passenger vehicle sales²⁰ and air passenger traffic²¹. It is also reported that rural consumption growth has gradually picked up pace during the quarter ending March 2024.²² As per the Federation of Automobile Dealers Associations, two and three-wheeler and passenger vehicle sales also registered an uptick in FY24.

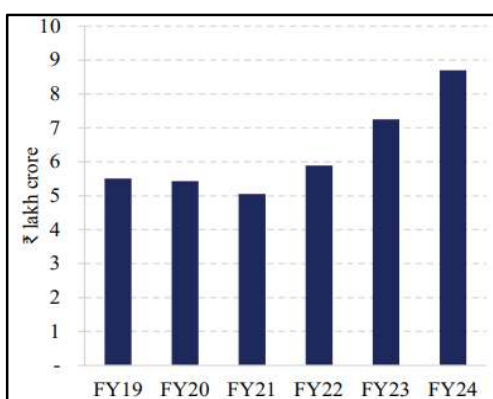
Vehicle sales in rural areas have recovered smartly since the pandemic:-



Greater general government focus on building productive capacities:-



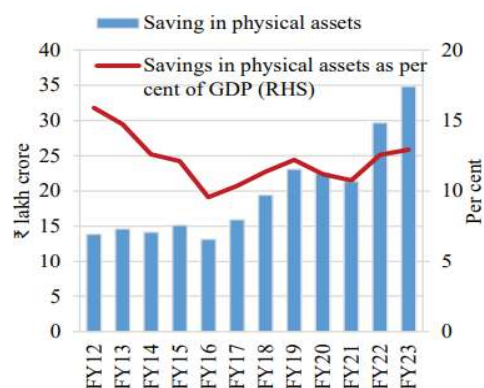
Steadily rising private corporate capex:-



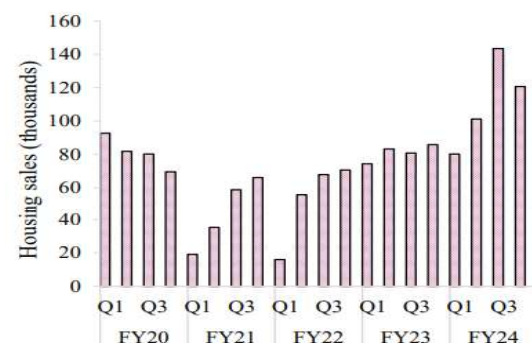
Apart from private corporations, households have also been at the forefront of the capital formation process. The growth in housing sales in cities has been particularly impressive, indicating that urban households are diversifying the deployment of their savings. In 2023, residential real estate sales in India were at their highest since 2013, witnessing a 33 per cent YoY growth, with a total sale of 4.1 lakh units in the top eight cities. As per real estate research firm Proptiger, new supply witnessed an all-time high, with 5.2 lakh units launched in 2023, as against 4.3 lakh units in 2022. The momentum continued in Q1 of 2024, witnessing record breaking sales of 1.2 lakh units, clocking a robust 41 per cent YoY growth. New supply has consistently exceeded one lakh units since Q2 of 2022, underscoring persistent demand-supply dynamics in the housing market.

With cleaner balance sheets and adequate capital buffers, the banking and financial sector is well-positioned to cater to the growing financing needs of investment demand. Credit disbursal by scheduled commercial banks (SCBs) to industrial micro, small and medium enterprises (MSMEs) and services continues to grow in double digits despite a higher base. Similarly, personal loans for housing have surged, corresponding to the increase in housing demand. However, credit offtake by large industries seems to be growing at a lower albeit stable pace. These larger industries seem to be tapping the corporate bond market. Corporate bond issuances in FY24 were up by 70.5 per cent, with private placement remaining the preferred channel for corporates. Outstanding corporate bonds were up by 9.6 per cent (YoY) as of the end of March 2024.

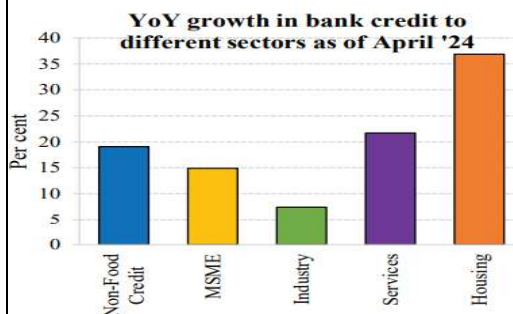
Increased household savings in the form of physical assets



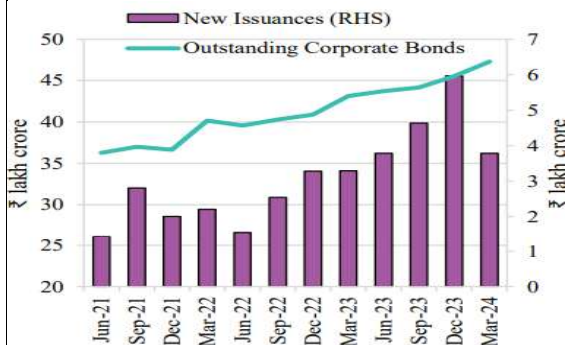
Record housing sales in top 8 cities



SCBs catering to investment demand



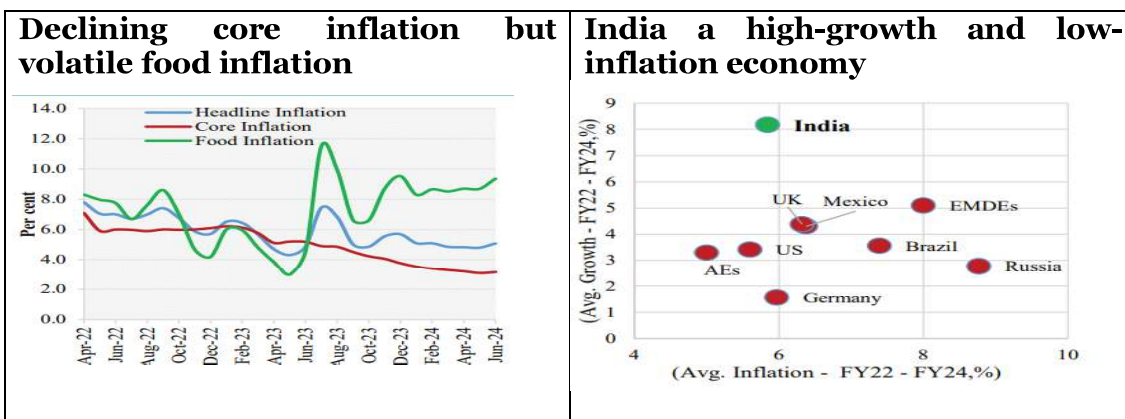
Large corporates tapping corporate bond markets



Global trade growth slowed in 2023, leading to a marginal decline in merchandise exports growth. As merchandise imports slowed more than exports and services trade recorded a larger surplus compared to the year before, the drag exerted by net exports on GDP reduced. The subdued contribution of exports was more than counterbalanced by the pick-up in fixed investment, thereby continuing the trend of domestic stimulus seamlessly replacing external stimuli.

Moderation in inflation pressure:-

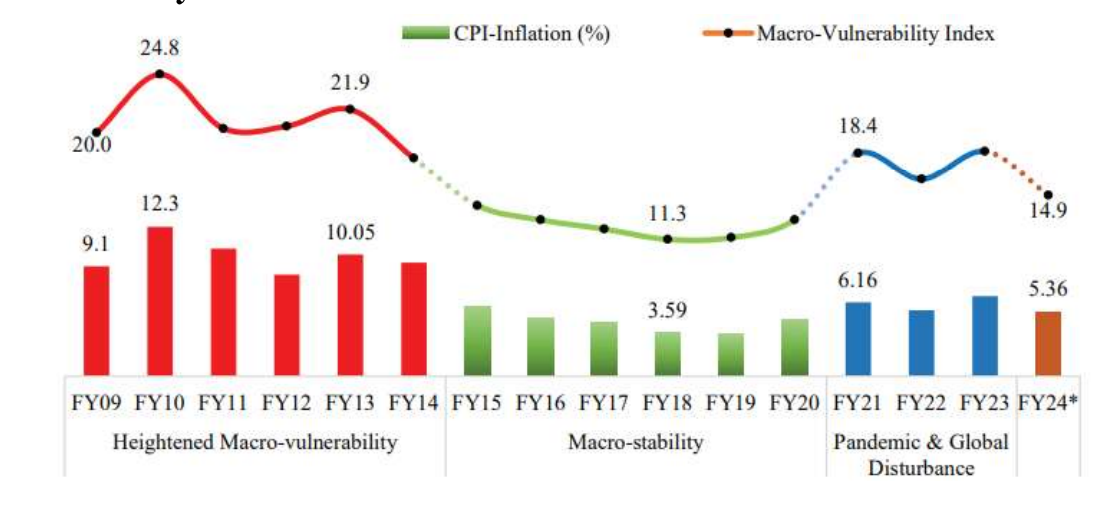
Despite global supply chain disruptions and adverse weather conditions, domestic inflationary pressures moderated in FY24. After averaging 6.7 per cent in FY23, retail inflation declined to 5.4 per cent in FY24. This has been due to the combination of measures undertaken by the Government and the RBI. The Union Government undertook prompt measures such as open market sales, retailing in specified outlets, timely imports, reduced the prices of Liquefied Petroleum Gas (LPG) cylinders and implemented a cut in petrol and diesel prices. The RBI raised policy rates by a cumulative 250 bps between May 2022 and February 2023. It also managed liquidity levels efficiently and maintained consistent and coherent communication with market participants. Even as higher policy rates are transmitted through the system, the RBI continues to support growth with adequate liquidity, thereby ensuring that inflation is headed to the target of 4 per cent on a durable basis. The effects of these measures are reflected in the latest data on CPI inflation – headline CPI inflation of 5.1 per cent in June 2024, and core inflation declined to 3.1 per cent. Consequently, India was the only country amongst its peers to traverse a high-growth and low-inflation path in the period FY22 – FY24 (Chart I.53). This is despite the fact that there were pressures on the food inflation front, driven by adverse weather conditions.



Reduction in macro vulnerability

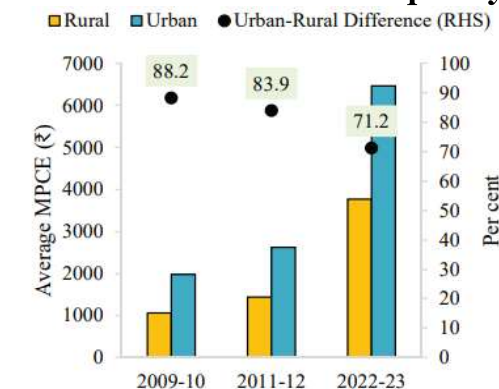
In its pursuit of fiscal consolidation through efficient and prudent fiscal management, the Government continues to stick to the fiscal glide path. The fiscal deficit of the Government is expected to drop to 4.5 per cent of GDP or lower by FY26. This commitment has helped keep the sovereign debt sustainable, thereby keeping sovereign bond yields and spreads in check. All these factors have combined to keep the macroeconomic environment stable and provide a platform for sustainable growth. This is reflected in the downward trajectory of the macroeconomic vulnerability index – an index constructed by combining India's fiscal deficit, CAD and inflation.

A reduction in macro-vulnerability despite increased external uncertainty:-

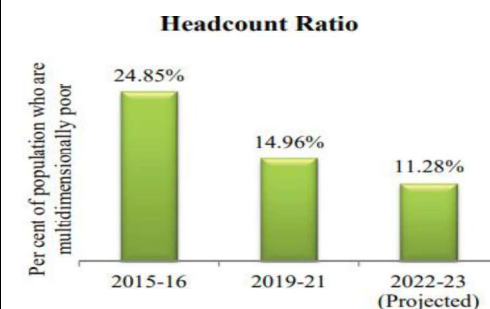


The initiatives in the social sector have also translated into rising consumption spending, as evident from the results of the latest Household Consumption Expenditure Survey (HCES) 2022-23. The HCES throws many reassuring findings on inclusive growth in the past decade. The monthly per capita consumption expenditure (MPCE) in 2022-23 increased in real terms in both rural and urban areas over 2011-12. The difference between rural and urban MPCE also declined in percentage terms.

Reduced rural-urban inequality



Population that is multidimensionally poor has declined



OUTLOOK:-

The Indian economy recovered swiftly from the pandemic, with its real GDP in FY24 being 20 per cent higher than the pre-COVID, FY20 levels. This meant a CAGR of 4.6 per cent from FY20, despite a 5.8 per cent decline in FY21 inflicted by the pandemic. Analysis in this chapter shows that the current GDP level is close to the pre-pandemic trajectory in Q4FY24. During the decade ending FY20, India grew at an average annual rate of 6.6 per cent, more or less reflecting the long-run growth prospects of the economy. This is the background against which we can see the prospects for FY25.

IMF projects the global economy to grow at 3.2 per cent in 2024, with risks being broadly balanced. The average annual global growth was 3.7 per cent during the decade ending FY20. Inflationary pressures have moderated in most economies with declining global commodity prices and easing of supply chain pressures. However, core inflation remains sticky and driven by high service inflation. Many central banks have hinted at the peaking of the interest rate hike cycle. The ECB has already cut the policy rate, while the Fed has hinted at reducing the rate in 2024. If the services inflation across economies moderates faster, that may allow central banks to bring forward the monetary policy easing cycle earlier than currently anticipated. A likely reduction in policy rates by central banks of AEs, especially the Fed, will open the space for central banks of EMEs to follow the lead, bringing down the cost of capital.

On the downside, any escalation of geopolitical conflicts in 2024 may lead to supply dislocations, higher commodity prices, reviving inflationary pressures and stalling monetary policy easing with potential repercussions for capital flows. This can also influence RBI's monetary policy stance. The global trade outlook for 2024 remains positive, with merchandise trade expected to pick up after registering a contraction in volumes in 2023. Conversely, increased fragmentation along geopolitical lines and renewed thrust on protectionism may distort merchandise trade growth, impacting India's external sector. Global financial markets have scaled new heights, with investors betting on global economic expansion. However, any corrections in the elevated financial market valuations may have ramifications for household finances and corporate valuation, negatively impacting growth prospects. Hiring in the information technology sector had slowed down considerably in FY24, and even if hiring does not decline further, it is unlikely to pick up significantly. However, leveraging the initiatives taken by the government and capturing the untapped potential in emerging markets, exports of business, consultancy and IT-enabled services can expand. Despite the core inflation rate being around 3 per cent, the RBI, with one eye on the withdrawal of accommodation and another on the US Fed, has kept interest rates unchanged for quite some time, and the anticipated easing has been delayed.

Domestic growth drivers have supported economic growth in FY24 despite uncertain global economic performance. Improved balance sheets will help the private sector cater to strong investment demand. A note of caution is warranted here. Private capital formation after good growth in the last three years may turn slightly more cautious because of fears of cheaper imports from countries that have excess capacity. While merchandise exports are likely to increase with improving growth prospects in AEs, services exports are also likely to witness a further uptick. A normal rainfall forecast by the India Meteorological Department and the satisfactory spread of the southwest monsoon thus far are likely to improve agriculture sector performance and support the revival of rural demand. However, the monsoon season still has some ways to go. Structural reforms such as the GST and the IBC have also matured and are delivering envisaged results. Considering these factors, the Survey conservatively projects a real GDP growth of 6.5–7 per cent, with risks evenly balanced, cognizant of the fact that the market expectations are on the higher side.

3. An overview of Façade & Fenestration

Facade is an architectural term which literally translates from French to ‘face’ and usually refers to the building exterior. The market has been driven by the increased focus of consumers towards the external appearance of a building. This includes everything from walls to glazing and cladding. It is essentially an overcoat that is attached to the outside of a property to protect it. Along with adding to the aesthetic appeal, it also acts as an insulator against heat, cold, moisture, and noise, and protects the structure from damage.

However, protection isn’t the only role that the facade plays in architecture. In fact, these important exterior elements serve quite a few functions when it comes to ensuring the overall usability of a building.

Application of Façade & Fenestration:-

Protect against the elements

Arguably the most important purpose of a facade is to protect against the elements, mainly the wind, rain and extreme temperatures. Essentially, it must act as a protective shield against the weather and the damage it might do to both the interior and exterior of the building.

This is why it is vital that facades are made from the right materials, as they have to withstand the weather, avoid corrosion and control the climate indoors. They must be strong, sturdy and durable. They need to be able to last for decades and to ensure the longevity of the building.

Ensuring ventilation

As the facade is made up of lots of different elements, it is able to control the natural airflow of a building. This is crucial for a number of reasons. For example, it must allow enough ventilation to ensure comfort for the occupants whilst clearing the air of dust or unwanted particles to keep it clean.

However, the facade and building envelope must be tight enough that it does not allow draughts in or for warm air to escape. This is important for climate control and energy efficiency within the property.

Making the most of natural light

Glazing is one of the most important parts of a facade, and it’s crucial that this is utilised to make the most of natural light. This is why glass is being used in increasing amounts on building envelopes – that and the fact that it is aesthetically pleasing.

Allowing more natural light into the building through glazing is vital as it reduces the amount of artificial light needed and helps to regulate heating and cooling. This can make the building more energy efficient. Natural light has also proven to boost the mood and comfort levels of all those inhabiting the property.

Increasing acoustic insulation

Another important role of the facade is to stop noise pollution. After all, what good would a building be if you could hear the noise of all the people, traffic and extreme weather conditions outside? Therefore, a good facade must reduce the amount of external noise that can get in but also stop internal noise from going out. This makes it a more comforting environment for all inhabitants.

Adding structural support

As a facade is made up of different elements such as glazing, metal framing, cladding, roofing and more, it plays an important role in the overall structure of a building. Again, this is why they must be made from strong, durable materials to reduce the risk of damage to the property.

Although the primary structure will bare most of the weight, elements used in the facade can offer additional support. Other materials may be attached to aspects of the facade to shape the design and boost the structural integrity of the building.

Meaning of Fenestration

In architecture, fenestration refers to the openings in a building's facade, such as doors, skylights, and windows. Functional fenestration considers how doors, windows, and skylights affect a building's practicality. Fenestration in design is concerned with a building's aesthetics. The Functionality of Facade Design

Enhancing Building Performance

The facade plays a crucial role in enhancing the overall performance of a building. By incorporating innovative design elements and materials, architects can improve energy efficiency, ventilation, and natural lighting, thus creating a sustainable built environment.

Sustainable Practices in Facade Design

In recent years, sustainable practices have become integral to facade design. Architects are employing strategies such as green roofs, solar panels, and passive shading systems to minimize environmental impact and reduce energy consumption.

Integration with Building Systems

Modern facade designs seamlessly integrate with building systems, including HVAC, lighting, and security. Using advanced technologies and smart materials, architects can optimize functionality while maintaining aesthetic appeal.

Influence on Architectural Style

The facade design significantly influences the architectural style of a building, reflecting cultural influences, historical context, and contemporary trends. Whether classical, modern, or avant-garde, the facade serves as a canvas for architectural expression.

Utilization of Materials for Aesthetic Appeal

Architects use a diverse range of materials in facade design, including glass, steel, concrete, and natural stone, to achieve desired aesthetic effects. Each material possesses unique properties that contribute to the visual appeal and texture of the facade.

Cultural and Contextual Considerations

Facade designs often incorporate cultural motifs, symbols, and patterns that resonate with the local context and heritage. By honouring cultural traditions and embracing contextual nuances, architects create harmonious and contextually relevant facades.

Exploring the Role of Facade Design:-

Historical Perspectives on Facades

Throughout history, facades have served as expressions of cultural identity, social status, and architectural prowess. From ancient temples to medieval cathedrals, the evolution of facade design reflects humanity's artistic and technological advancements.

Modern Trends and Innovations

In the contemporary architectural landscape, facade design continues to evolve with advancements in materials, technology, and construction techniques. Innovations such as kinetic facades, adaptive shading systems, and parametric design tools are reshaping the possibilities of architectural expression.

Future Directions in Facade Design

Looking ahead, facade design is poised to embrace sustainability, digital fabrication, and interactive technologies. Architects are exploring biomimetic principles, responsive facades, and dynamic building envelopes to create more resilient and adaptable structures.

Key Component:-

Windows and doors have been the oldest and most prominent forms of fenestration components. However, different types of openings have evolved over the last few decades, based on the type and functionality of a building.

Windows:-

Windows are the links to communicate with internal and external spaces and facilitate ventilation, light, and sight. They are also capable of altering the visual aesthetics of the space considering that windows come in different shapes and sizes. They can also become an instrument for reference of scale on the external surfaces to enable assessment of the height and width of the building. At times they are also used as facade modulators based on their size, form, number, placement, and articulation. Their placements in the structure are governed by the internal layout of the space, requirement of light and ventilation. In fact, windows can totally alter the perception of the building, as evident from several monuments built in the ancient times as well as modern structures built recently.

The material used varies from hardwood to aluminium or uPVC. In India, the residential segment has observed a marked shift from the use of hardwood to aluminium and uPVC. This is mainly because of the cost implications in sourcing good quality hardwood in requisite quantities.

Doors:-

Doors are moving structures that provide access to internal spaces. They consist of a panel, with interior and exterior faces, which swings on hinges or slides or spins to permit access. Doors can easily be categorized based on function. While the external doors need to be strong to ensure safety and protection, the internal ones may be slimmer and elegant aimed to add to the ambience and aesthetics of the enclosed space. In high rise residential developments, there are doors for balconies which create a visual link between the external and internal space and becomes an integral part of the structure's elevation. In India, the residential segment has been using flush doors which are factory made. They are pre treated and possess industrially produced door frames and shutters, which gained prominence in mass developments. However, in private and high end homes, use of teak and other forms of high quality hardwood are preferred for door frames, with the shutters being either paneled doors with modern designs or flush doors finished with high end materials.

Vent:-

Ventilation grills, commonly known as vents, are used to introduce ambient air into space thereby controlling the indoor air quality. The pollutants inside are displaced and diluted to provide thermal comfort to the inhabitants.

Skylights:-

A glazed assembly that admits natural light from the roof may be called a skylight or a roof window. Such applications are widely used in industrial, commercial and residential buildings. Real estate developments benefit from such structures and offer a functional solution to provide natural lighting to the indoor spaces and at times may also be openable like a window to permit airflow. Skylights also enhance the building's aesthetics. The direction of placing the skylight has unique functional benefits. If it faces east, the indoor space receives the warmth and light during the morning, while if it faces west, similar benefits are reaped in the afternoon. It is particularly important in buildings facing north to place a skylight in

Curtain walls as sloped glazing systems:-

A curtain wall is the outer covering of a building and is considered to be a non-structural element. Hence, they are light and non-load bearing. However, they can bear the loads due to gravity and wind, which is transferred to the building structure. Since they do not bear any load, they can be made of lightweight material which optimizes cost. Functionally they help to protect the external structure from the outdoor elements and at the same time enhance the structural integrity and aesthetics of the building. The design makes it air and water resistant and ensures that the interior of the building remains airtight. The curtain walls are available in three main systems such as face-sealed, water-managed, and pressure-equalized. Face-sealed walls provide perfect sealing between units of the wall and frame. Water-managed systems include moisture drains to prevent the intrusion of water in the building. The pressure-equalized system blocks all forces while keeping the building's interior completely airtight.

Owing to their low weight, they offer an affordable option for protecting the building exteriors and enhancing the aesthetics. It is also capable of resisting the air and water infiltrations, which makes the interiors energy efficient. It is a versatile system which protects and offers an energy efficient, and pleasing appearance to the building.

Storefronts:-

Storefronts are the facades of a retail store that are located on the street level of a commercial building. These have large display windows to attract the visual attention of the passers-by towards the merchandise or special offers. In the case of commercial buildings, they are substantially altered keeping the other architectural elements intact. The storefronts have evolved as a concept from being awnings or bay windows in the earlier days to include glass and steel being extensively used in the present. A considerable amount of thought and detailed study is made these days on the design, material and the lighting used in the shopfronts.

Louvers:-

Louvers are a system of cladding on the surface of the buildings which are primarily meant to allow airflow and light while keeping sunshine and moisture at bay. They are usually an arrangement of parallel, horizontal blades, slats, laths, slips of glass, wood or other material designed to regulate airflow and light. In the past, louver systems were often made of wood. However, most modern louvers are now built using materials such as aluminium, metal, glass, copper, stainless steel, among others.

Major stakeholders:-

The concept of structural glazing and glass as a building envelope material was widely accepted in western countries since 1940-50s whereas the concept of curtain walls reached India by mid-80s and early 90s only. The first building in the nation with a curtain wall was constructed in New Delhi in the mid-80s. The curtain wall concept as a building envelope was a modern technology then reserved exclusively for high-end developments. Evolution in construction techniques and materials changed the image of the buildings altogether.

The facade and fenestration industry evolved gradually over the period of time and with an increasing focus on aesthetics, functionality, quality, durability, efficiency, building performance, sustainability, and brand value, multiple stakeholders have emerged, and the industry has grown by leaps and bounds. Major stakeholders of the fenestration industry can be broadly classified into four categories as listed below:

Product manufacturers	Architect & Engineers	Consultants	Governing bodies
Frame material wise <ul style="list-style-type: none"> • Wood • Aluminium • uPVC Glass manufacturers Fixture and sealant manufacturers	Architects Civil Engineers Structural Engineers	Façade consultants Building energy consultants	National level authorities

Case Study: -

Examples of iconic buildings with innovative facade and fenestration systems.

Krusha Bhawan, Odisha:-

Krusha Bhawan, designed by Studio Lotus, is a government facility that re-imagines the relationship between the State and its People. It celebrates local context, craftsmanship, and sustainability as a vital part of social infrastructure. The façade consists of a brick-louvered screen expressing itself in the pattern of local weaves, its colors representing the local diversity of the region which acts as a solar shading device.

72 Screens, Jaipur

72 Screens, designed by Sanjay Puri Architects, is a sculptural 6-level office building enveloped in folded plates of perforated screens or Jaali. It reflects the rich Rajasthan heritage designed to cater to the blistering heat of Jaipur. These lightweight screens are made of Glass Fiber Reinforced Concrete, sometimes called GFRC or GRC, an interesting composite having high strength alkali-resistant glass fiber embedded in a cementitious mix.

Hexalace, Mohali

Hexalace, designed by Studio Ardet, is an open-plan commercial building made primarily for leasing purposes. Due to the occurrence of extreme heat, the architects created a 3-inch thick semi-permeable concrete layer with hexagonal cut-out sections, that is used as a shading element. Hexagonal metal frames are horizontally layered on the concrete which doubles up as a balcony fence. The main curtain wall has been recessed to leave pockets of air between the screen and the main building to subsequently reduce heat gain.

Temenos, New Delhi

Temenos, designed by Studio Lotus, is a new-age commercial complex in Delhi's Lajpat Nagar. It is designed to become a 'jewel' in the city-skyline. The façade is inspired by origami-folds, a double-skin of perforated aluminum panels rendered in rich champagne color. The perforations have been carefully calibrated to cut-out solar glare and dampen external noise to create a tranquil indoor user-experience.

Hive House, Surat

Hive House, designed by Openideas Architects, is conceived as an intelligent and sustainable family home. The form of the house is inspired by the profession of the client who is engaged in the production of machinery for the diamond industry. The geometry of the solar-sensor based façade is influenced by hexagonal structural patterns found in nature.

Cybertecture Egg, Mumbai

Cybertecture Egg, designed by James Law Cybertecture International, is a 13-floor office building unlike any other. This parametrically designed building brings together iconic architecture, environmental design, intelligent systems, and new engineering to create an awe-inspiring landmark for the city. An innovative column-less steel diagrid shell structure incorporated with passive solar design to decrease heat gain and lower energy loads cool the building envelope. An elevated garden also moderates temperatures to assist with cooling.

Moving Landscapes, Ahmedabad

Moving Landscapes, designed by Matharoo Associates, is a house built for a successful real-estate developer and his family. With the touch of a button, this house transforms itself from an 'impregnable shell' into a glass pavilion, allowing

occupants to vary the amount of light, ventilation, and privacy in their home. Sliding and spinning walls animate the façade of this house. 1'6" mm thick Bidaser stone panels pivot in alternate directions or back and forth in some areas to protect the inner layer of glass and concrete.

Sources:- <https://www.re-thinkingthefuture.com/rtf-fresh-perspectives/a1881-10-buildings-with-fascinating-facades-in-india/>

4. Present Market scenario

Global Façade Market:-

The global facade market is estimated at \$246.96 billion in 2024. The market is expected to reach USD 315.11 billion by 2029, growing at a CAGR of 5% during the forecast period. North America is the fastest-growing market, while the Asia-Pacific region holds the largest market share. India is part of the Asia-Pacific region, which is experiencing significant growth in construction projects, with a focus on external wall beautification and energy efficiency. Rapid urbanization in India is driving demand for facade installations. India, along with Japan, is actively adopting facade greening techniques to reach sustainability targets. The green office concept is promoting facade greening technology in India.

The market is expected to grow at a considerable rate over the forecast period. This growth can be attributed to rising customer spending power, primarily in China, Japan, India, Brazil, and GCC countries, along with the need to provide a secure work environment to employees. Furthermore, the use of metal composite materials offers a durable, harmonious, and modern appearance to the building. Increasing usage of such composite materials to build facades is projected to provide an upthrust to the market over the coming years.

Modernization and urbanization are playing a vital role in the growth of the market. Several factors, including waterproofing, fabrication, durability, and resistance to extreme climate, come to play during the construction of facades. Changing perceptions of consumers and increasing focus on the exterior appearance of a building are anticipated to boost the growth of the market. Rising disposable income is leading to increased investments in renovations, which in turn is estimated to augment the market. Growing investments for the advancement in the residential and commercial construction industry in developed countries such as the U.S. can stoke the growth of the market.

The target market is also characterized by a high level of mergers & acquisitions by the leading players. Companies are strategically joining forces to strengthen their market positions, expand product portfolios, and leverage synergies in technology and expertise. This high level of M&A activity reflects a competitive landscape where firms seek to enhance their capabilities and offer more comprehensive solutions to meet the evolving demands of the architectural and construction sectors.

The facade market is facing increased regulatory scrutiny globally, with a focus on ensuring compliance with safety, environmental, and energy efficiency standards.

Regulatory authorities are placing a heightened emphasis on the fire safety of facade systems, particularly in the aftermath of high-profile incidents. Additionally, environmental regulations are pushing for more sustainable and energy-efficient solutions, impacting the choice of materials and construction practices in facade design. Companies in the facade market are navigating a complex regulatory landscape, adapting their products and processes to meet evolving standards and ensure the safety and sustainability of building exteriors.

Indian Façade Market:-

The Indian facade market was valued at approx. USD 2.2 billion in 2023. The market is projected to reach around USD 4 billion by 2028. This growth projection is supported by the increasing demand for modern and sustainable building solutions. The compound annual growth rate (CAGR) is estimated to be between 8.3% from 2022 to 2028. This significant projected growth rate reflects the rising investments in infrastructure and real estate, alongside technological advancements in building materials and design. Rapid urbanization in India is a major driver, with cities expanding and new urban centers being developed. This leads to a higher demand for residential, commercial, and industrial buildings, which in turn fuels the facade market. Large-scale infrastructure projects, including airports, metro systems, and smart cities, are increasing the need for advanced facade solutions. There is a growing emphasis on sustainable building. The Indian Construction Market is expected to register a CAGR greater than 10% during the forecast period (2022 - 2027). As COVID-19 expanded across the country in April 2020, the face of the Indian construction industry, which was already battling with its practices. Facades play a crucial role in improving a building's energy efficiency by providing insulation, reducing heat gain, and allowing for natural light. Government incentives for green buildings, such as tax benefits and faster project approvals, encourage the adoption of energy-efficient facades. This aligns with India's broader goals of reducing carbon emissions and promoting sustainable development. The architecture and construction industries are also carrying out major R & D operations to develop sustainable and eco-friendly facades that absorb solar energy, creating a new source of energy generation in residential and commercial buildings. These ecofriendly façades are expected to drive the façade market in the coming years as they are seeing increased demand from prospective consumers.

5. Growth drivers & Challenges

Growth Drivers:-

The growth of the Indian facade market share is primarily driven by rapid urbanization and a surge in infrastructure development activities within residential, commercial, and industrial sectors. With the increasing need for modern, energy-efficient buildings, facades have become essential in providing thermal insulation, reducing energy consumption and enhancing aesthetic appeal. For instance, in September 2024, VOX India launched Fronto V Black panels, a cutting-edge solution for facades and ceilings. Combining robust durability, weather resistance, and authentic wood aesthetics, these maintenance-free panels offer easy installation and enhanced thermal efficiency, redefining modern architectural design.

Technological advancements in facade materials and systems also play a significant role in market expansion. Innovative solutions like ventilated facades and dynamic glazing are gaining immense popularity, providing improved durability and performance. Additionally, growing awareness of green building certifications and energy-saving regulations is encouraging developers to integrate advanced facade solutions into new projects. For instance, the Confederation of Real Estate Developers Association of India (Credai) collaborated with the Indian Green Building Council (IGBC) to develop 1,000 certified green projects by 2026 and 4,000 by 2030, adopting IGBC Green and Net Zero building ratings.

Key Challenges of the Façade & Fenestration Industry:

Traditionally, the facade and fenestration industry in India relied heavily on the unorganized sector, often working with local fabricators (commonly referred to as "र" or "fabricators") to construct building facades. However, this approach frequently led to challenges, including a lack of quality control, expertise gaps, cost and time overruns, and inconsistencies in design and execution. These issues underscored the limitations of the unorganized sector, prompting a significant shift towards the organized market. In 2023, the construction and real estate industries in India saw significant advancements, particularly with the evolution of regulatory frameworks and heightened expectations for building safety and performance. The need for high-quality, innovative, and precisely engineered facade solutions has driven this transition, as more developers and builders recognize the value of partnering with organized partners. Moreover, the rapid growth of skyscrapers, commercial spaces, and other modern infrastructure projects has further emphasized the importance of well-designed facades. These structures often serve as the face of the building, playing a crucial role in attracting clients and investors. As a result, the industry has experienced substantial growth in recent years, fueled by the demand for aesthetically pleasing, energy-efficient, and durable façade systems.

In line with this, our commitment to innovation has led to the inclusion of solar facades in our product portfolio, a ground-breaking solution that not only enhances the aesthetic appeal of buildings but also contributes to the green revolution. These solar facades integrate energy efficiency into the building's exterior, aligning with the growing demand for sustainable construction practices. The Indian government, through various initiatives and budgetary allocations, has underscored the importance of infrastructure development and safety standards. For instance, the increased focus on sustainability and energy efficiency in building codes mirrors our own commitment to innovation in facade and fenestration design. Our adherence to stringent standards and practices ensures that every project we undertake not only meets but exceeds industry expectations.

Industry Trend:-

India Facade Market Trends:

Rising Adoption of Energy-Efficient Facades

The Indian facade market is witnessing a significant shift toward energy-efficient solutions due to growing environmental awareness and stricter building regulations. Double-glazed glass, ventilated facades, and dynamic shading systems are becoming preferred choices among developers to reduce energy consumption and enhance thermal performance. The push for green building certifications is further driving the adoption of these technologies. For instance, in September 2024, rat Studio unveiled the Head Field Office in Noida, featuring a parametric facade with Tweening Arches, dynamic vertical fins, energy efficiency, advanced lighting systems, and environmental responsiveness, blending sustainability and modern design into an architectural landmark. In addition, as India progresses toward net-zero energy goals, demand for innovative, sustainable facades is expected to surge, particularly in urban centers with high-density construction.

Integration of Smart Technologies

The integration of smart technologies in facades is an emerging trend in India, driven by the need for intelligent building management systems. Smart facades equipped with sensors and IoT-enabled features offer automated shading, climate control, and energy monitoring capabilities. These advancements not only enhance building functionality but also align with India's growing emphasis on digital transformation in infrastructure. For instance, in June 2023, Design Forum International collaborated with the Government of Odisha to design the Odisha Mining Corporation project, featuring AI-powered kinetic facades, dynamic projections, and flexible spaces,

blending corporate, commercial, and recreational functions to showcase Odisha's technological and architectural advancements. The incorporation of AI and machine learning into facade systems is paving the way for adaptive designs that respond to real-time environmental conditions, making buildings more efficient and responsive.

Increased Use of Advanced Materials

- Commercial
- Industrial
- Residential

The commercial sector is the leading end-user segment as per the India facade market forecast, propelled by the rapid development of office spaces, retail outlets, hotels, and shopping malls. Modern commercial buildings increasingly incorporate advanced facade solutions for enhanced aesthetics, energy efficiency, and sustainability. Features such as natural light optimization, thermal insulation, and noise reduction make facades indispensable in creating functional and visually appealing commercial spaces. With urbanization accelerating and demand for high-rise buildings growing, developers are prioritizing innovative facade systems that meet green building standards. This segment's dominance is further reinforced by corporate investments in sustainable infrastructure and urban expansion projects.

- South India
- North India
- West and Central India
- East and North East-India

South India is the leading regional segment as per the India facade market trends, driven by rapid urbanization, industrialization, and extensive construction activities across major cities. The region's robust IT, commercial, and residential infrastructure development fuels demand for innovative and sustainable facade solutions. For instance, in March 2024, Chennai Metro Rail Limited and Tamil Nadu Industrial Development Corporation (TIDCO) announced a ₹688 crore, 27-story, 10 lakh sq. ft. iconic building near Chennai Central Railway Station to accommodate public sector offices, commercial enterprises, and IT companies. Developers increasingly adopt energy-efficient materials, including glass and ventilated facades, to meet rising environmental and aesthetic standards. With expanding high-rise projects and green building certifications gaining traction, South India remains a key contributor to the country's facade market growth.

6. Growth prospects in Real Estate sector

Supported by a growing economy, the real estate sector in India has transitioned significantly. India's real estate sector has forward and backward linkages with approximately 250 ancillary industries, and it is one of the highest employment generators after the agriculture sector, accounting for 18% of the total employment. In terms of output, the market size of India's real estate sector is currently estimated at USD 482 bn 5 contributing 7.3% to the total economic output . By 2034, India's real estate sector is expected to expand to USD 1.5 tn contributing 10.5% to the total economic output. Factors such as growing residential demand, increase in need for contemporary office space, expanding hospitality, retail sector etc to cater to the growing consumption needs of the growing population with increased income levels, are adding an impetus to real estate sector in India. Furthermore, expanding e-commerce is catalysing the demand for warehousing and storage facilities in India providing a thrust to the industry. Additionally, in recent years, the growing use of telecommunication services has necessitated the need for data centres or data storage facilities in India. From a government policy perspective, various initiatives such as focus on affordable housing, smart city measures, tax deductions on housing loans etc have enabled investment opportunities in the real estate sector in India.

Trends In India's Residential Market:-

India's residential market has undergone significant changes over the last few decades. From the early 2000s, the residential market has experienced periods of growth and decline owing to various factors such as the global and domestic economic conditions, government policies, with the most recent being the COVID-19 pandemic. Global events such as the 2008-09 GFC along with structural shifts in India's domestic economy due to demonetization, implementation of GST and RERA, and the NBFC crisis, besides the onset of the COVID-19 pandemic in 2020, were some of the key events which dampened the growth of the housing market in India. Policy interventions like RERA strengthened India's real estate sector, making it more transparent and consumer centric. Currently, buoyed by stronger economic momentum, wealth creation and consumer's aspiration towards home purchase, the residential real estate sector in India is experiencing an upcycle.

Growing demand for luxury housing: Thus far, India has been largely categorised as a low-middle income country. Therefore, the housing demand for most of the last two decades was concentrated in the affordable (under INR 5 mn) and mid segment housing (between INR 5-10 mn). However, in the last few years, there has been a considerable shift in the ticket size of the housing demand, with growing income levels primarily driven by generation of high salaried jobs emerging from the IT/ITeS, BFSI and other service sectors. While the mid-segment housing market continues to dominate the demand, there has been a growing demand for luxury housing (above INR 10 mn). In 2018, across the top 8 cities in India luxury housing comprised 16% of the total sales. In 2023, the share of this segment significantly increased to 34%, a substantial growth 6 from 16% in 2018. Going forward, factors such as the growing economy, salary growth from the high paying services sector and growth in the numbers of HNIs and UHNIs, will continue to raise demand for luxury housing in India.

Estimating Residential Demand for 2034

India's population is expected to surge to 1.55 bn by 2034 with an estimated 42.5% of the population residing in urban centres. Additionally, there is a scope for the existing rural and small towns to transform into mini-urban towns. The burgeoning urban population will generate the demand for housing in India, especially in the cities. As per our estimates, to accommodate the urban population, urban cities in India will require an addition of 78 mn housing units by between 2024-34. The changing income profiles and the demand for housing will emerge across all the segments. By 2034, a significant share of the population will be concentrated in the lower middle and the upper middle-income categories. Thus, the housing demand will be concentrated in the affordable segment and will gradually inch towards mid segment. Additionally, the share of HNIs and UHNIs households in India which will likely increase from the existing 3% to 9% by 2034 will generate a significant demand for luxury housing in India. In terms of market value, the estimated residential demand has a potential to generate an additional output equivalent of USD 906 bn in the next ten years.

Commercial Real Estate (CRE)

In recent years, India's commercial real estate market has grown stronger with increasing global occupier interest and the rise of small and medium real estate land developers,, attracting institutional investments. Over the last few years, government initiatives such as the establishment of special economic zones (SEZs), software technology parks (STP), and export-oriented units (EOU) have significantly supported India's CRE.

Currently, the CRE and primarily the office sector globally is under stress due to the adoption and continuation of remote work post COVID-19 pandemic, dimming the office leasing activities. However, the CRE market in India continues to outperform. In 2023, the top 8 cities in India registered office 8 transaction volume of 60 mn sq ft. Growth in the IT/BPM sectors, influx of global capability centres (GCCs), revival of India facing businesses, rise in flexible and co-working spaces are the key factors enabling transactions in India's office market. While the tech sector driven by the growth in artificial intelligence, data science etc will drive the demand for office space, the GCCs will potentially drive the office market in the next decade. By 2030, there will be an estimated 2400 GCCs across India as India emerges as global technology and services 9 hub. Assuming a similar pace of growth, the number of GCCs in India may scale up to 2880 by 2034.

Supported by the aforementioned growth indicators, the stock of office real estate in India has significantly grown in the last few years. In 2008, the top 8 cities in India cumulatively accounted for 278 mn sq ft office stock; which has now increased to 900+ mn sq ft. The expansion of office stock is not limited to Tier 1 cities alone. In the last few years, Tier 2 and 3 cities in India have also witnessed a rapidly rising demand and supply for office real estate in India. Factors such as business expansion, low costs, infrastructure development, rise of IT and the service industry, and availability of talent are some of key drivers of growth in office stock in Tier 2 & 3 cities. These factors along with increase in formal workforce in India will generate the demand for adequate volume of office space in India. To accommodate the burgeoning economic activity and formal employment, an estimated 2.7 bn sq ft of office space will be cumulatively required by 2034, i.e. an additional requirement of 1.7 bn sq ft in the next decade. As the sector scales up, the potential revenue generation from India's office real estate is estimated to be USD 125 bn in 2034.

Interrelationship between Real estate and Façade Fenestration:-

Indian façade and fenestration industry is directly linked to the construction and real-estate industry's performance. In India, the real estate sector is growing with a CAGR of 30%, making it an opportune market for investment currently. By 2040, it is predicted that the Indian real estate market will grow to Rs. 65,000 crore (US\$ 9.30 billion) from Rs. 12,000 crore (US\$ 1.72 billion) in 2019. The real estate sector in India is expected to reach a market size of US\$ 1 trillion by 2030 from US\$ 120 billion in 2017 and contribute 13% to the country's GDP by 2025. Retail, hospitality, and commercial real estate are also growing significantly, providing the much-needed infrastructure for India's growing needs.

As per ICRA estimates (an Indian independent and professional investment information and credit rating agency), Indian firms are expected to raise more than Rs. 3.5 trillion (US\$ 48 billion) through infrastructure and real estate investment trusts in 2022, as compared with raised funds worth US\$ 29 billion to date.

7. Key players Competitive landscape

Name of the Company	Description
Innovators Façade Systems Limited	<p>The design, fabrication, and installation of facade systems in residential spaces must create an atmosphere of wholesomeness, homeliness, and security. These systems should be engineered for optimal thermal, light, and acoustic insulation, as well as durability. The Company is honoured to partner with the 89-floor mega residential tower, World View in Mumbai, along with many other residential projects.</p> <p>Over the past decades, Innovators has consistently emerged as the preferred partner for the Airports, Hotels, Malls, Convention Centres etc. Architects, project owners, and government bodies have endorsed our strong commitment to excellence in engineering, fabrication, and installation of all types of facade-oriented products. These projects proudly showcase the resolute infrastructural development of India's ever-growing economy.</p>
Aluwind Architectural Limited	<p>It offers a comprehensive range of aluminium products tailored to meet the diverse needs of architects, consultants, builders, institutions, and corporations.</p> <p>Product portfolio includes:</p> <p>Windows: A wide variety of windows, including sliding windows, casement windows, and fixed windows, designed to enhance natural light and ventilation.</p> <p>Doors: High-quality doors, including entrance doors, internal doors, and sliding doors that combine aesthetics and functionality.</p> <p>Curtain Walls: Modern curtain wall systems that offer a sleek and contemporary appearance while</p>

providing excellent insulation and soundproofing.

Cladding: Exterior cladding solutions that enhance the building's appearance and provide protection against the elements.

Glazing Systems: Customized glazing systems that incorporate glass into various architectural elements, such as skylights, partitions, and facades.

Financial Parameters:-

(Rs.in Crs)

	Innovators Façade Systems Limited		Aluwind Architectural Limited	
FY	2022-23	2023-24		
Sale	180.97	215.10	48.87	83.43
EBITDA	19.13	31.93	4.75	11.81
PAT	8.45	15.17	3.60	10.23
Net Worth	111.93	127.09	2.70	7.54
EPS (in Rs.)	4.48	8.04	0.17	0.25
			10.81	4.13

Company's Holding:-

Company	Innovators Façade Systems Limited	Aluwind Architectural Limited
Promoters	63.71%	72.13%
FIIS	0.00%	0.00%
DII	0.00%	0.00%
Government	0.00%	0.00%
Public	36.29%	27.87%
No of Share Holders	1568	928.00

8. SWOT Analysis and Future outlook of the Industry

Strengths

- **Technological Advancements:**
 - Use of advanced materials like smart glass, nanomaterials, and energy-efficient coatings.
 - Integration of Building Information Modeling (BIM) for precise design and installation.
- **Growing Demand for Energy-Efficient Solutions:**
 - Facades and fenestration systems play a critical role in reducing energy consumption in buildings.
 - Increasing adoption of double/triple glazing, low-E coatings, and thermal breaks.
- **Aesthetic and Functional Value:**
 - Facades enhance the visual appeal of buildings while providing functionality (e.g., weather resistance, insulation).
- **Strong Market Players:**
 - Presence of well-established companies with global reach (e.g., Permasteelisa, Schüco, Jeld-Wen).
- **Sustainability Focus:**
 - Growing use of eco-friendly and recyclable materials (e.g., aluminum, uPVC, recycled glass).
 - Alignment with green building certifications like LEED and BREEAM.

Weakness

- **High Initial Costs:**
 - Advanced facade systems and energy-efficient fenestration solutions can be expensive, limiting adoption in cost-sensitive markets.
- **Complex Installation and Maintenance:**
 - Facade systems require skilled labor and specialized equipment for installation and maintenance.
- **Dependence on Construction Industry:**
 - The industry is highly dependent on the growth of the construction sector, which can be cyclical and vulnerable to economic downturns.

- **Regulatory Challenges:**

- Compliance with varying building codes and standards across regions can be complex and costly.

- **Limited Awareness in Emerging Markets:**

- In some regions, there is limited awareness of the benefits of advanced facade and fenestration systems.

Opportunities

- **Rising Demand for Green Buildings:**

- Increasing focus on sustainability and energy efficiency in construction creates opportunities for innovative facade and fenestration solutions.

- **Urbanization and Infrastructure Development:**

- Rapid urbanization in emerging markets (e.g., Asia-Pacific, Middle East) drives demand for modern building systems.

- **Technological Innovations:**

- Development of smart facades (e.g., self-cleaning glass, photovoltaic-integrated facades) and dynamic fenestration systems.

- **Government Incentives:**

- Subsidies and incentives for energy-efficient buildings in many countries.

- **Retrofitting and Renovation:**

- Growing market for upgrading existing buildings with energy-efficient facades and fenestration systems.

- **Integration of Renewable Energy:**

- Opportunities to integrate solar panels and other renewable energy systems into facades.

Threats

- **Economic Downturns:**

- The industry is vulnerable to economic slowdowns, which can reduce construction activity and demand.

- **Supply Chain Disruptions:**

- Dependence on raw materials like aluminum, glass, and steel makes the industry susceptible to supply chain issues and price fluctuations.

- **Intense Competition:**

- High competition among global and regional players can lead to price wars and reduced profit margins.
- **Stringent Regulations:**
 - Increasingly strict building codes and environmental regulations can increase compliance costs.
- **Skilled Labor Shortage:**
 - Lack of skilled labor for installation and maintenance of advanced facade systems in some regions.
- **Climate Change Risks:**
 - Extreme weather events can impact construction timelines and increase costs.

Future Outlook:-

The façade & fenestration market in India is poised for substantial growth driven by urbanization, infrastructure development, and increasing emphasis on sustainability and energy efficiency. Innovations in materials, technologies, and design will play a crucial role in meeting these demands, while regulatory support and market incentives will further accelerate adoption.

Best Regards,

T.G Uday Associate Director,

M/s Infomerics Analytics & Research Pvt Ltd

Date: 10/03/2025

Place: -Delhi

