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India the next manufacturing hub for defence equipment?

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The unveiling of a humanoid robot on Tesla's AI Day

In most cases, FIIs have stock positions on international financial markets. Because of the robust inflow of cash as a result, the companies that FIIs invest in typically have enhanced capital structures. As a result....

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Climbing interest rates and Inflation shaping markets

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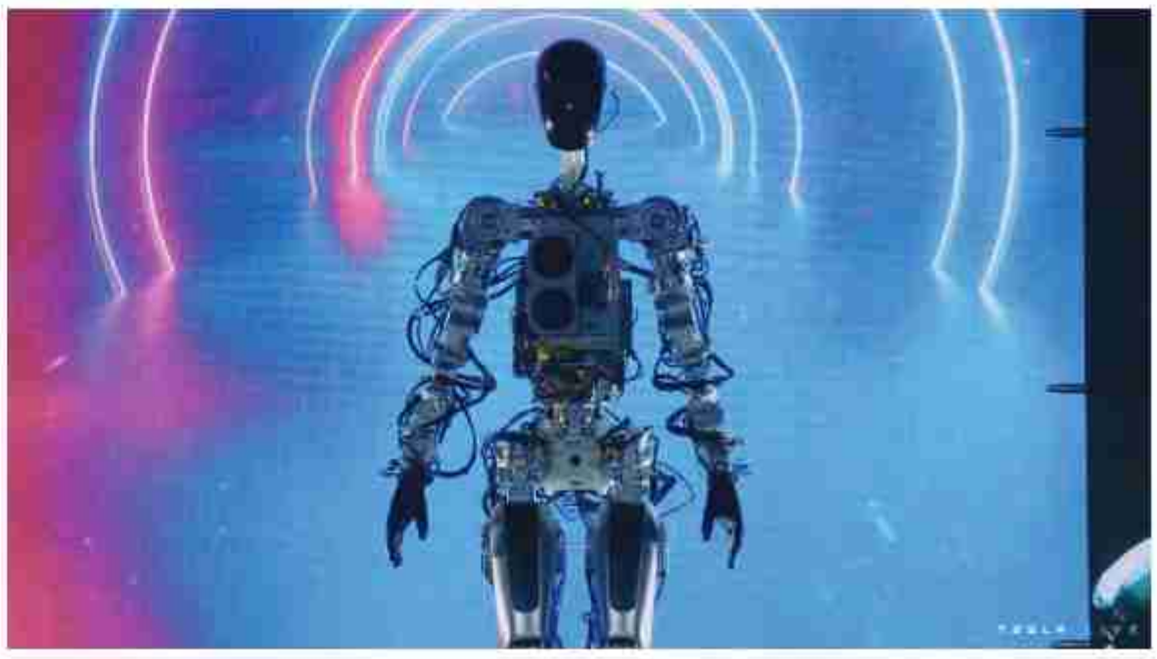


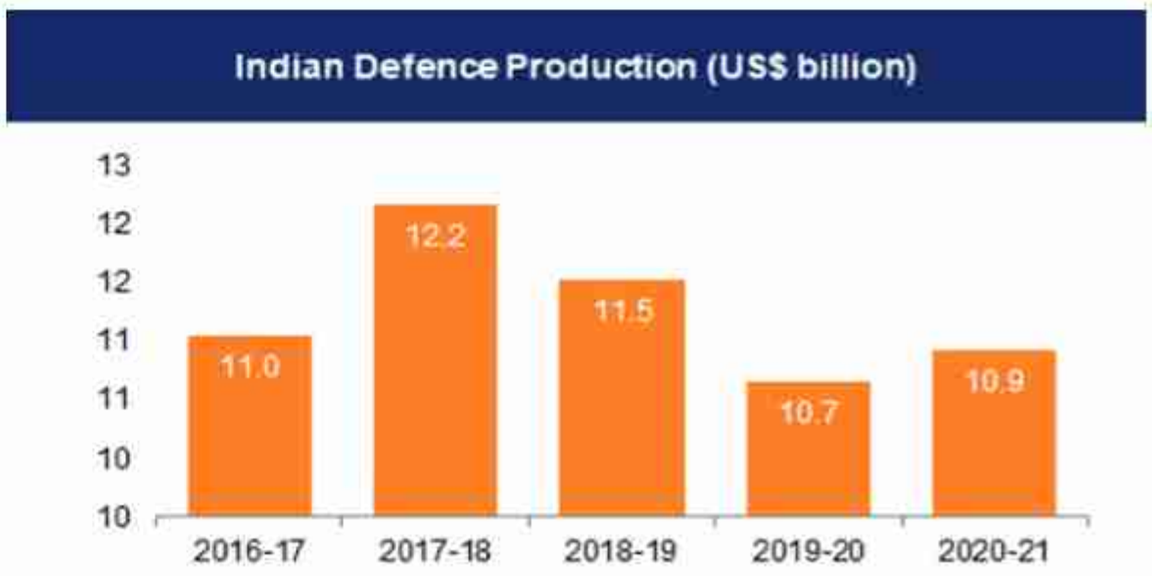
INDIA:
The next manufacturing hub for defence equipment

India's defence exports has grown six times in the previous 5-6 years and Made in India defence equipment and services are provided to more than 75 countries.

Introduction

Self-reliance in defence has been the cornerstone of India's defence production policy. The recent call for "ATMA NIRBHAR BHARAT" has provided further impetus to realise the goal of self-reliance. Over the years, transparent and streamlined Procurement Procedures, Production Policies and 'Make in India' initiatives have provided significant stimulus to demand for indigenous products. Indian Defence industry, primarily catering to the needs of the armed forces, has evolved with diversified product mix and market. Propelled by the recent successes in exports, India is set to realize its potential as an emerging defence manufacturing hub. In an effort to promote "Make in India" in the defence industry, the government has given 107 licences totalling 584 permits for the manufacture of weapons to 358 private businesses. This might potentially increase the total FDI influx into the defence industry, with a significant percentage of that FDI perhaps going toward the establishment of production facilities and a corresponding increase in employment. Since they can now own a controlling position, more established international corporations are sharing their technology, which has increased the amount of FDI chances in India.

The new age Indian economy heavily depends on the defence industrial sector. The market is probably going to grow faster as national security worries increase. India has seen a rise in demand for defence components as a result of the continuing territorial conflicts. India has been one of the biggest importers of defence equipment over the past five years in order to get a technological edge over neighbouring nations like China and Pakistan. The government has made a number of steps to promote "Make in India" operations through policy support efforts in order to modernise its armed forces and lessen reliance on external sources for defence purchases.



Sector-wise composition and breakdown of defence services in defence budget

The defence sector is predominantly dominated by state owned enterprises. However with the emerging government policies and subsides, private players such as Hindustan Aeronautics Ltd. (HAL),Mahindra ,TATA advanced Systems LIMITED, Reliance Naval and Engineering Limited, Kalyani Group – Bharat Forge, L&T India – Defence and Aerospace , Hinduja Group – Ashok Leyland Defence , Adani Aero Defence Systems & Technologies Ltd are all set to ace the defence sector.

Market Size

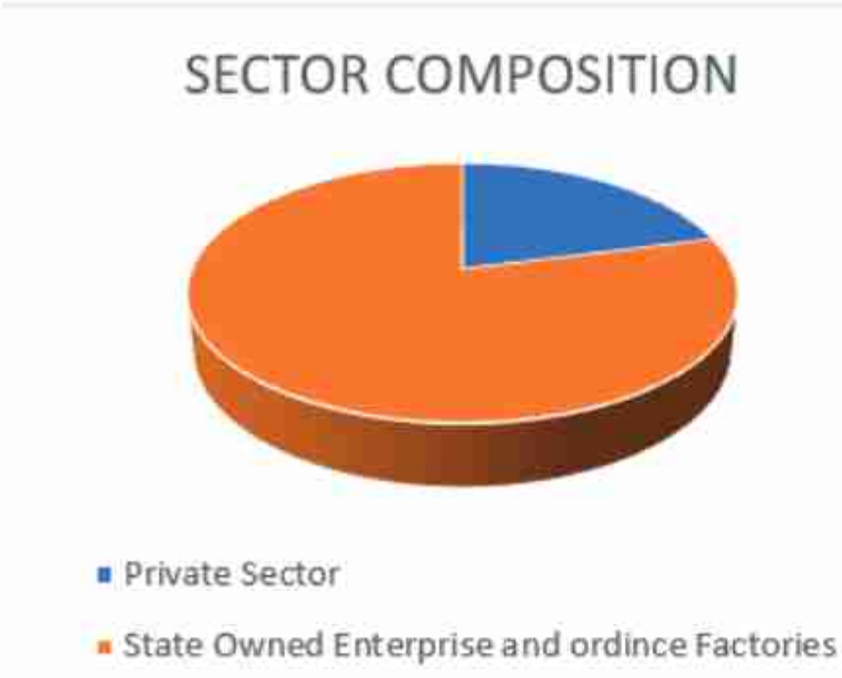
The Indian government has set a US $25 billion goal for defence production by 2025. Within the next five years, India hopes to export military equipment worth Rs. 35,000 crore. In terms of top defence exporters globally as of 2019, India was placed 19th after shipping defence goods to 42 nations. India's defence exports are mainly to countries like the US, the Philippines and other countries in South-East Asia, the Middle East and Africa. The Indian defence ecosystem is spreading its arms overseas as military exports have jumped by 334% in the last five years.

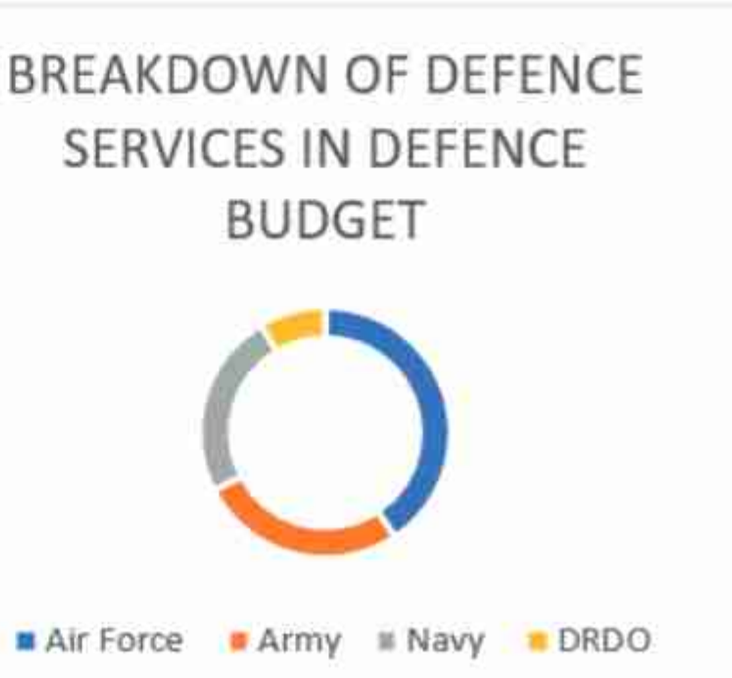
Defence export deal of india - The BrahMos Deal

The BrahMos deal is special, as it is the first export order for the missile which is a joint product between India and Russia and also the biggest defence export contract of the country. BrahMos is a joint venture between India's Defence Research and Development Organisation (DRDO) and Russia's NPO Mashinostroyeniya. The missile derives its name from the river Brahmaputra in India and Moskva rivers in Russia. This deal adds impetus to meet the ambitious target set by the Government to achieve a manufacturing turnover of $25 billion in aerospace and defence goods and services by 2025.

The supersonic missile has been developed with several versions planned, including a lighter longer range system. Other countries in South-East Asia including Vietnam and Indonesia have also expressed their interest in buying BrahMos from India.

It is important to note that India has already signed a deal worth 375 $ million with Philippines to supply BrahMos missiles and the first deliveries of the BrahMos supersonic cruise missiles will begin in 2023.





Boost to India's Defence Export Plans

The BrahMos order is the first major military export by India

The supersonic missile has been developed jointly with Russia, with several versions planned, including a lighter longer-range system that can be launched from aircraft and submarines

Other countries in Southeast Asia, including Vietnam and Indonesia, have also expressed their interest in buying BrahMos from India

India has been promoting the missile system to several nations in the neighbourhood, including the UAE

Data on export of military equipment (2017-2021)

Year	Value in crore (Rs)
2017-2018	4,682
2018-2019	10,746
2019-2020	9,116
2020-2021	8,435
2021-2022	11,607

Policies to promote defence manufacturing

Foreign Direct Investment (FDI)

India wants to develop the technical capacity and economies of scale necessary for its defence sector to generate over US$25 billion in revenue from the sale of military items and services by 2025. The government has allowed 100% foreign direct investment (FDI) in the defence sector to support this expansion. FDI above 49% is only permitted through the government route on a case-by-case basis, especially if it is likely to lead to access to sensitive innovation and technology. Up to 49% stake has been allowed under the automatic method. The government wants to further relax regula tions to permit FDI up to 74% using the automatic method in order to attract investors.

As a result, leading private defence, naval, and aviation manufacturers from India and overseas as well as those governed by the governments of India and other countries have recently extended their operations in the nation. These investments, made through joint ventures and acquisitions, serve the entire world market in addition to India. These investments have been motivated by a large pool of trained labour and research and development (R&D) skills, favourable market accesses, and the simple accessibility of various supporting infrastructure and resources, in addition to the prospect of revenue growth from India's massive economy. Therefore, it is a good time to invest in India's defence, navy, and aviation industries.

Department of Industrial Policy and Promotion (DIPP) and Defence Public Sector Undertaking (DPSU)

In order to promote domestic defence manufacture over imports, the Department of Industrial Policy and Promotion (DIPP), which is part of the Ministry of Commerce and Industry, has published and changed a number of policies ,to level the playing field for private competitors, these include ending preferential treatment for India's eight Defence Public Sector Undertakings (DPSUs). Additionally, to support domestic manufacturing, import tariff exemptions in the defence sector have been eliminated and exchange rate protection has been extended to the private sector on par with the DPSUs.

Defence Procurement Procedure (DPP)

To increase the potential for investment, a significant number of parts and components, as well as castings and forgings, among others, have been left out of the scope of industrial licencing for defence products. An enhanced acquisition category called "Buy Indian IDMM" (indigenously designed , developed, and manufactured) was added to the Defence Procurement Procedure (DPP) of April 2016 in order to increase sales in the industry. For a product to fall under this category, it must have at least 40% indigenous content if it was designed in India, or at least 60% indigenous content if it wasn't.

Other collaborations and Initiatives

The government's "Make in India" policy has also inspired a number of collaborations between foreign and domestic industries. The partnership between Russia and India for the AK-203 assault rifles and Frigates, the partnership between Boeing and Mahindra and HAL for the production of F/A-18 Super Hornet fighters, and the partnership between Hinduja Group, Ashok Leyland, and Elbit Systems, Adani defence aerospace, reliance defence for the purchase of military vehicles are some of the most significant partnerships in recent history.

- The two defence corridors, one each in Tamil Nadu and Uttar Pradesh, offer plug & play support to the corridor's businesses, including FOEMs (Foreign Original Equipment Manufacturers). The two state governments announced the provision of customised incentive packages that will be offered to investors under the Aerospace & Defence Policy. These packages may include GST-based sales refunds, stamp duty concessions on land allotment, electricity tax exemptions, capital subsidies and training subsidies for training workers. Both defence corridors are estimated to collectively procure investments worth Rs. 24,000 crore (US$ 3 billion) by 2024-25
- The Ministry of Defence organises webinars with Friendly Foreign Countries (FFCs) through Indian embassies abroad and industry organisations, with active involvement from Indian defence businesses, under the aegis of Department of Defence Production . So far, 27 FFCs have attended the webinars.

Relaxations in Policies

- Licensing relaxation: Measures announced to boost exports since 2014 include simplified defence industrial licensing, relaxation of export controls and grant of no-objection certificates.
- Lines of Credit: Specific incentives were introduced under the foreign trade policy and the Ministry of External Affairs has facilitated Lines of Credit for countries to import defence product.

-Aarya Rawool

- Policy boost: The Defence Ministry has also issued a draft Defence Production & Export Promotion Policy 2020.
- Indigenization lists: the domestic front, to boost indigenous manufacturing, the Government had issued two "positive indigenization lists" consisting of 209 items that cannot be imported.
- Budgetary allocation: In addition, a percentage of the capital outlay of the defence budget has been reserved for procurement from domestic industry.

CONCLUSION

The Indian defence sector which is the second largest armed force in the world offers a promising growth journey ahead. With collaborative efforts, India has taken several policy initiatives in the past few years to amplify its indigenous design, development, and manufacture of defence equipment, to make world-class military apparatus. The government intends to enhance domestic defence manufacturing by further reducing the percentage of defence and military goods imported. India's proactive approach towards foreign mutual trade and rising joint agreements with other countries such as Kazakhstan, Russia and the US for joint Defence manufacturing and for strengthening defence ties offers huge growth opportunities in India. Defence manufacturing and collaboration has indeed become a key tool for achieving many crucial foreign policy goals. The Indian government has implemented a number of changes over the last few years to support a strong defence industry ecosystem with dynamism in the domestic design, development and manufacturing of defence equipment. By carving these new horizons of defence innovation, India is surely leading the way to becoming the largest global defence manufacturer !

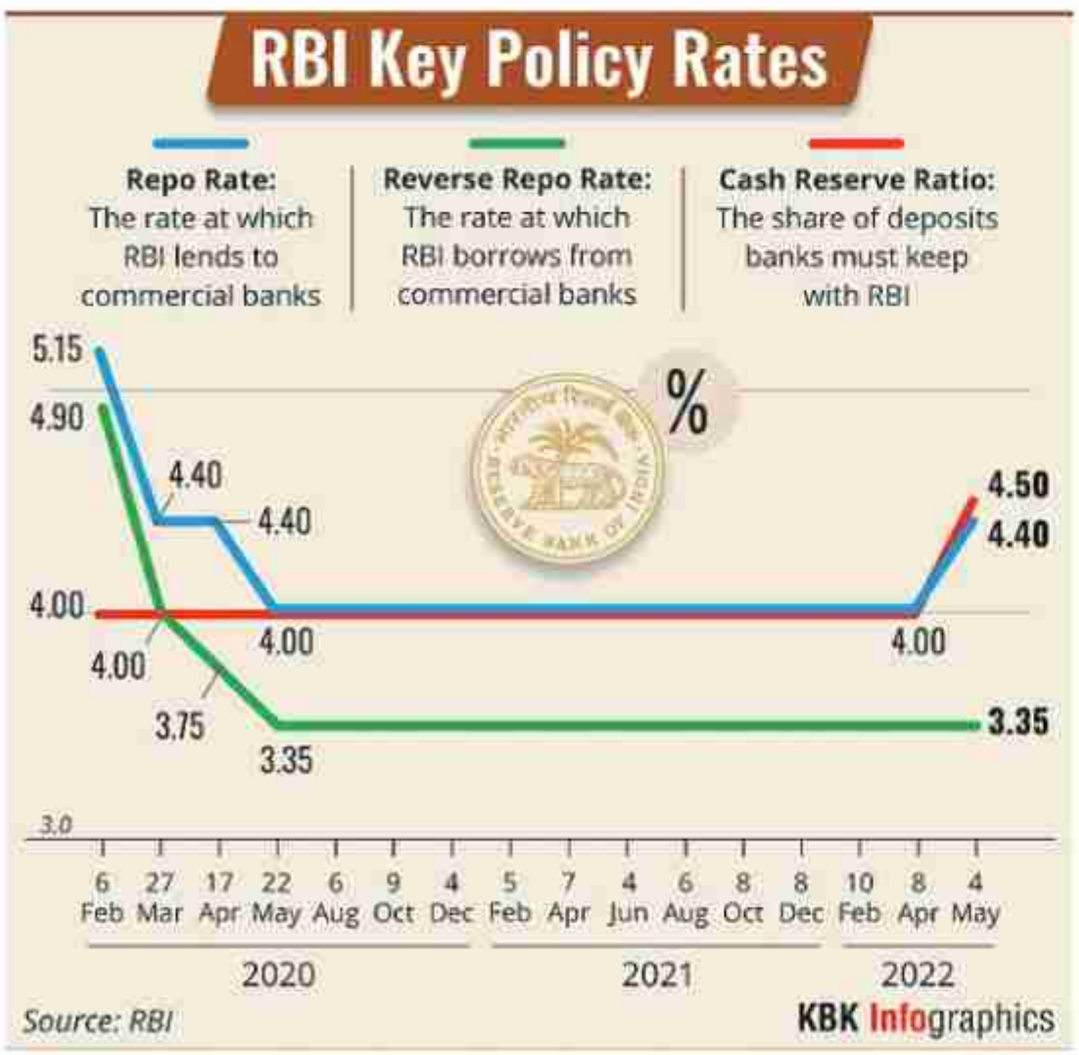
Climbing interest rates and inflation reshaping markets

Introduction

Recent events have led to much speculation about a global recession in the near future, and many financial experts are predicting that such a recession is likely. Experts, Investors, bankers, and entrepreneurs have been talking about the looming recession for months.

To combat the recession due to rising inflation, Central banks across the world are increasing interest rates. The US Federal Reserve hiked interest rates by 75 basis points or 0.75 percentage points on 16th June, which is the biggest hike since 1994. The Reserve Bank of India hiked the key interest rate by 50 bps to 4.9%, on June 8th.

Have a look at the change in interest from 2020-22:



Change in interest rates helps in controlling the money supply in an economy.

When there is a rise in interest rates by the central bank of a country the cost of borrowing rises. Due to this rise, borrowing becomes expensive. Hence, borrowing decreases, and so does the money supply in the economy.

Thus when the pandemic struck, the RBI decreased the repo rate making acquisition and repayment of loans cheaper for the common man.

A rise in interest rates will impact many sectors of the Indian economy. Some of these include Automobile, Agriculture, Consumer, Real estate, NBFC, Infrastructure, and Healthcare sector.

Automobile sector

The automobile sector in India is already facing myriads of problems and an interest hike is going to be a painful 'add-on'. A surge in fuel prices, a lack of chips, and supply chain issues brought on by the pandemic are all serious issues for this industry. Due to the hike in rates Auto sector customers are likely to pay more. The hike is also more likely to make mortgages more expensive as the rise will lead to a decrease in liquidity.

The two-vehicle segment is expected to suffer more as compared to other segments because of the low sales in rural areas, vehicle price hikes, and fuel costs.

There will be an impact on loans as major automobile customers depend on EMIs. Due to cost, the tenure of the loan is likely to increase.

Agricultural Sector

The agricultural sector is one of the most capital-intensive sectors. The change in interest rate directly affects the profitability of the sector. This happens because the agriculture sector is mainly influenced by borrowing, spending, and investing.

The impact of the Agriculture sector can be on inventories/fixed assets, and investment decisions like buying new farmland or machinery. For example, the decision of a farmer whether to invest or not depends on the return of investment and the prevailing interest rate in the market.

If the rate of return on investment is higher than the interest rate then he/she is more likely to invest in a new venture. Whereas if the rate of return on investment is lower than the rate of interest then he/she is more likely to not invest. Therefore, due to the recent hike, farmers are more likely to not start a new venture or project.

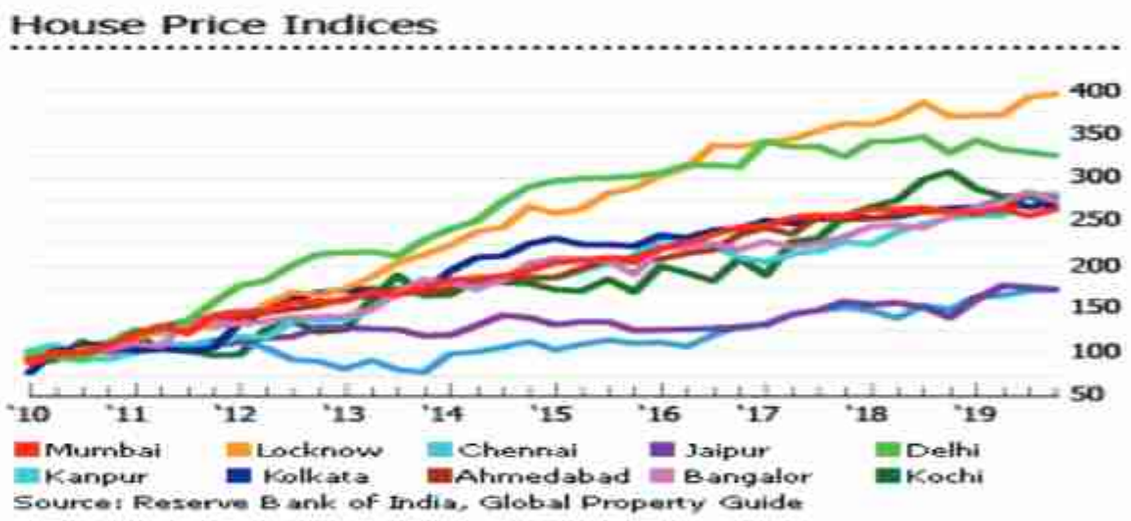
Higher interest expenses reduce the profitability of farms and agri-businesses, discourage investment and decrease farmland values. A strategy for avoiding losses caused by an expected increase in interest rates may be to lock in a fixed-rate loan when the interest rates are lower.

Real Estate

A hike in interest rates has majorly two impacts on the Real estate sector. First, the impact on mortgages, and second, capital flow.

A hike in interest rates makes mortgage rates rise and buying a house becomes less affordable. An increase of a 1% interest rate can increase monthly payments drastically. Simply said, it has an impact on both the buyer and the seller of the property since it makes it harder to sell the property because there are fewer buyers who can afford it.

Interest rates also impact capital flow. When rates rise capital availability becomes tight and the capital provider lends less, thus decreasing the liquidity in the market.



The housing prices in major cities of India are already rising and a hike in interest rates can make the real estate market situation worse.

Financial Sector

Historically, the financial sector has been poised to benefit from rising interest rates. This is due to expansion in interest margin thus creating more profits. Also, the increased economic activity that caused the rate hike generally means more loan demand.

From the below graphical representation, Investing in banking stock in the initial month of a hike in interest rate gives a stellar return. But at the end of the cycle, the demand for credit rises, the limited ability of banks comes into play and higher cost is passed on to the customers.

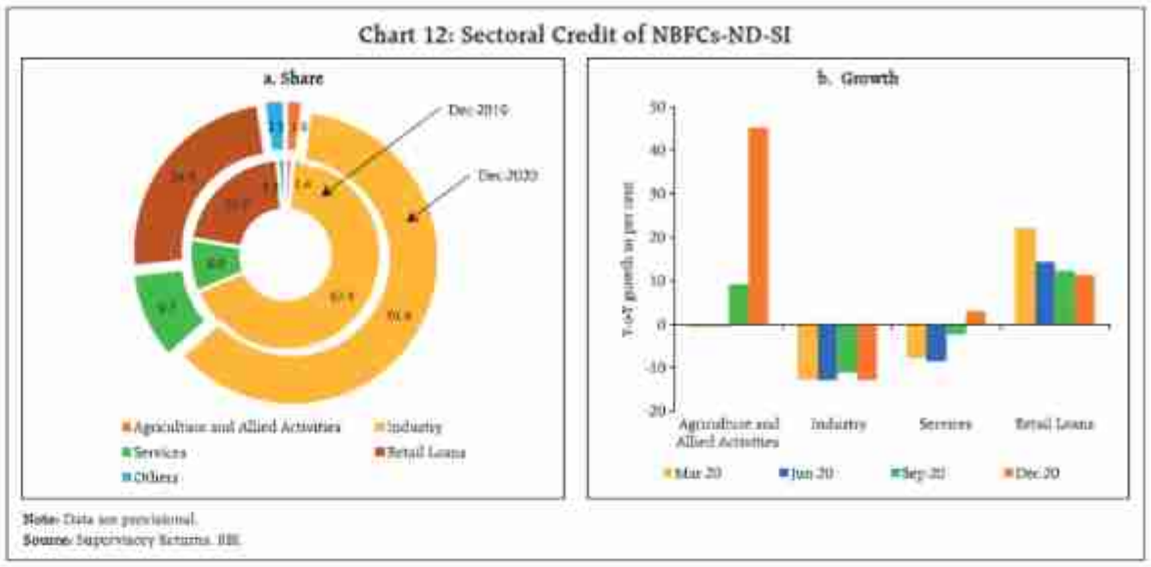
NBFC

NBFC or Non-banking financial companies can be the worst-hit sector. Due to the recent interest hikes, the borrowing cost for NBFC is likely to rise by 85-105 basis points (bps) this fiscal.

According to a Crisil rating analysis of NBFCs, Rs 15 lakh crore of debt, or 65 percent of outstanding debt as of March 31, 2022, is due for repricing this fiscal owing to interest reset or maturity. Another Rs 3 lakh crore of incremental debt is likely to be raised to support expected growth in lending. However, overall profitability is expected to remain steadily cushioned by a reduction in credit costs, Crisil said.If the RBI announced another tranche of hike in interest rate by 75 bps then totals are expected to increase this fiscal to 165 bps.

The NBFCs have given loans and borrowing to other sectors as well. Agriculture and Industry are the major chunks of NBFCs' share.

Due to the hike in interest rates, the impact on NBFC can be seen in Agriculture and Industry sectors too.



Infrastructure

Record inflation is pushing central banks to increase interest rates. Rising interest rates pose a threat to the projects of Renewable energy. Upgrading grids and power facilities, and building new capacity is expensive. The rise in rates raises the cost and reduces the flow of cheap capital and due to this, the projects are likely to be delayed. The hikes can also push the Road and Railway sector to freeze local borrowing for rolling stock requirements and expansion. This happened last time when the world was facing the consequences of the Great Recession.

Communication sectors tend to see a boost as volatility in the market drives investors toward stabler options. India's telcos like Airtel, and Vi, are not likely to face a major impact of rising interest rates, according to JP Morgan. The report published by JP Morgan said, as Bharti's airtel 29% of debt is USD, which is payable in dollars. "Our analysis suggests that 1% depreciation in INR vs. USD would drive Bharti's interest, costs higher by 20bps and impact earnings by 10bps," the report added.

	RELIANCE	AIRTEL	VODAFONE
DEBT	230027	117619	96435
EQUITY	424584	77144	9001
RATIO	0.54	1.52	10.71

Whereas for Vi only 9% of its total debt is floating rate debt. Though the floating rate debt is low the debt-equity ratio is negative, this means the company has interest rates on its debts that are greater than the return on investment, and thus interest cost is high for Vi.

Why are hikes in interest rates good for the long-term economy?

As the aggregate demand is strong in an economy, supply chain constraints are lasting longer than expected and due to this, there is a rise in the prices of goods and commodities. To combat this rise in prices, central banks are raising the rates of interest to cool down the prices. A higher interest rate reduces demand and reduced demand lowers inflation.

If the rising inflation is not controlled by the central banks, the people of the country have to face the consequences of it. The cost of borrowing, currency losing its value, and the cost of living goes up and the long-term suffers badly. The hike is painful in the short term but in the long term, the economy of the country will be healthy.

Mitigating the impact of hikes in interest rates

There are various strategies to mitigate the impact of hiking interest rates. Some of these include buying interest rates futures, selling long-term bonds, or changing their bond portfolios from long-term to short-term bonds.

The other method includes purchasing precious metals before the rate begins rising. Precious metals' value rises as interest rates move higher, which means investors can purchase them as a hedge against higher rates.

Certain types of equities also tend to rise as interest rates rise. The stocks issued by banks, insurance, and payroll processing firms tend to do better when interest rates are on the rise.

Conclusion

The interest rate hike has become a global phenomenon. Central banks of major economies are on a run to control inflation in their respective countries. Due to this hike sectors of the economy get hit, positively and negatively. Every sector will have its own set of impacts. In some, it will be major, like the NBFC sector and in some sectors, it can be less, like the telecom, and financial sectors.

-Sai Kharade

The unveiling of a humanoid robot on the Tesla's AI day.

Recently we have come across about the real nature of AI, and it's truly gotten us to appreciate the "artificial" in artificial intelligence, as you wouldn't expect a natural intelligence to make these mistakes due to having a more "well-rounded" and general structure.

Modern AI is like if you took an abstraction of one very specific part in the brain and tried to make it do all the things that are normally handled by multiple parts of the brain working together.When people talk about code writing itself they have the wrong idea. It's simply the program rewriting its variables and assignments which is something that happens in much of all programming. The difference with AI is that it's goal orientated, and will reach it's goal given the parameters we set for it. The wider and more open the parameters, the weirder the outcomes.

Tesla AI Day 2022 :

Tesla AI Day 2022 was celebrated on Friday,30th September, to demonstrate how far the company's autonomous robot and vehicle research has come. The event gave the first look of the Optimus robot strolling around the stage, updates on self-driving software and a first look of the Dojo hardware powering Tesla's AI research.The working version of the Optimus was unveiled after a loft delay.

It weighs 73kg, packs a 2.3kWh battery and uses third-party actuators to walk around and wave under its own power. Also the upcoming Optimus version a sleeker model with metal casing covering its torso and limbs with Tesla-built actuators.

Additionally, Tesla engineers explained how they have sped up the car's decision making capabilities from weighing options in milliseconds to 100 microseconds, which is ten times faster. The team showed how FSD's(Full Self Driving) tech sees the world around Tesla's mapped in 3D geometry and makes choices based on what is around them.

Tesla is starting to build a massive, custom-built stack of hardware called Dojo to train its AI on all the video its cars are picking up and beaming back to the company. To get the performance the AI team needs to churn through a 30 Petabyte footage vault, whereas Tesla went dense with its hardware. Tesla would certainly have its hands full building Dojo and integrating it to train their own AI but in response to a question from an AI Day audience member, Musk said the company probably won't sell their custom cabinets as a business. Moreover, it is possible that Tesla sells compute time on a Dojo instead, much like Amazon Web Service, Musk therorised.

The BD (Boston Dynamics) Credits:

Anyone who's even followed Boston Dynamics (BD) for over 10 years from its early prototypes of Atlas (see Pet Man) testing, knows that what Tesla just pulled off

in like one year is actually very impressive and farther along than where BD was in its first year.

There's a lot of people who haven't followed BD back in it's early stages, but are mistakenly comparing what it took them over 10 -15 years to accomplish, as they were working with a clumsy version that was constantly tethered, bulky, heavy, loud and always falling over.

People who keep comparing Optimus' prototype to Boston Dynamics Atlas and other robots, to be fair, actually need to go back and compare Optimus to those other prototypes that were in their first year of development.

Those robots on 4 legs are used to carry stuff, but humans have to put it on them. BD Robot Spot at spaceX is carrying gas measuring equipment, but a human has to remotely control it where to go, or it has to follow a preprogrammed path, it does not do that by itself.

BD are missing the AI and neural net software that can be trained and improved quickly over time. The AI in the Tesla Bot is the most important difference in my opinion, if Tesla can get that right, the hardware will follow.

In doing that fair comparison Optimus prototype is actually more impressive, more advanced, lighter, less bulky, has Tesla AI, and however briefly did walk on its own on stage untethered (in the first year), unlike early Boston Dynamics (Pet Man) that preceded Atlas. Furthermore, not bad in one year.

Tesla has just started and already can show this incredible progress, it is mindblowing!

Another very important point is these BD robots are ridiculously expensive, and not scalable to millions of robots produced per year and is also not BD's goal. I believe that Spot dog robot is already 2 or 3 times more expensive than what Tesla has in mind.

The public perception:

What Tesla has done in only a year has simply blown our minds.The expectations of visualizing a future hardware and an example of possible hands and body designs that were non functional. Instead we saw a walking robot that actually was amazingly dexterous and moved with a slow but steady controlled walk. Then we came across pictures of it working and gripping items it moved in a factory. And finally we saw how it visualized the world using software based on the FSD program.

Its observed that Tesla is developing. Most won't grasp this but it's a revolution in robotics. Companies like Boston Dynamics have spent years getting a walking robot that can certainly perform programed movements but little else.

Here Tesla has a robot that can recognize items, move freely around, and actually perform a non programed task. It will be a while before the world digests all of this.

-Hrishita Gavhane

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