INDIAN INSTITUTE OF TECHNOLOGY, PATNA
FINANCIAL ECONOMICS - HS301 REPORT

The influence of economic cycles on employment, workforce productivity, and innovation: Study Of Manufacturing Industries

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Introduction :

The slowing down of growth in the Indian economy, particularly in the industrial sector, has raised significant economic cycle indicators. For India, the interest in business cycle research is relatively new. However, industrialized economies have witnessed economic cycles for many decades. There have been numerous ups and downs. Consequently, most of the research on business cycles has been addressed from the point of view of advanced industrialized countries. Theories that explain business cycles are also located in the context of market economies. In general, both the theory and empirical evidence on economic cycles originate in advanced industrialized market economies. To approach the study of business cycles in India, the researcher must first ask some basic questions. The first and most important of these are: does the Indian economy witness economic cycles? If the answer is yes, does this question need to be followed by other questions such as the cycles' patterns? What are the explanations of these cycles? How can they be predicted, can monetary and fiscal policy impact them, etc.?

What is the Economic Cycle?

The upward or downward movement of GDP or gross domestic product around an extended duration of growth is called an economic cycle. It is also termed a business cycle or trade cycle. This fluctuation between growth and degrowth is natural, and part of the business cycle's boom and decline phase.

Stages of Economic Cycle: Multiple factors like income of people, economic factors, etc. are considered and help determine different people's stages in different stages of the cycle.

1. Expansion: The expansion phase of the economic cycle, as the name suggests, is the growth phase. In this stage, the expansion of the economy takes place and the production rate increases. Since both of them directly affect each other, it is evident that the other will rise if one increases. Since its expansion phase everywhere, it also pushes the interest rates low and encourages people to invest. Ideally, the growth rate should be double-digit, and the interest rate is a single digit.

2. Peak: The peak phase in the economic cycle is characterized by a max out in the economy's growth. The growth in the peak is maxed out and does not grow beyond a further limit. Economic growth is the highest, and it is an indication that there will be no further rise in its growth. Prices have increased to their limit, and in some cases, people's spending capacities also go up. This is because the income of people is also at its peak.

3. Recession: Soon after the peak phase, the phase of recession follows. Things start to go downhill at a slower but consistent pace. Its steady

decline in almost everything characterizes the recession phase. This phase is precisely opposite to that of the growth phase. The investment slows down, and so does the flow of capital in the market. The positive factors of the economy, including growth, slows down, and the descent begins.

4. Recovery: As the name suggests, the recovery phase, which follows that trough, slow growth, starts. There is a turnaround of the graph from the earlier phase, and the recovery of the economy is steady. Since the prices are at their lowest and could not go any further lower, the demand slowly starts to pick up, affecting the supply positively. It is also seen that investment and unemployment slowly start to pick up, which ultimately increases productivity. Since the employment resumes, this also positively affects bankers, and investment slowly picks up. Recovery takes a very long time, depending on the recession that has taken place. However, once the recovery phase is completed, this slowly turns into the growth phase and continues the cycle.

Causes of Economic Cycle

1. Population: Population affects the economic cycle directly because an increase or decrease in population affects the demand and supply ratio, directly responsible and a primary affecter of the economic cycle. The more the number of people, the more will be the demand, and more has to be the supply and vice versa. Not only the population but the growth of the population rate affects the economic cycle. This can be seen from the vast difference between developing and developed countries.

2. Demand: Sometimes, there may be a rising demand without population growth because of other factors. For example, there would be a rise in an umbrella's sales due to weather changes like excessive rain. In this case, the population is the same, but natural calamity is the one which affects. This is why demand is directly responsible for causing an economic cycle.

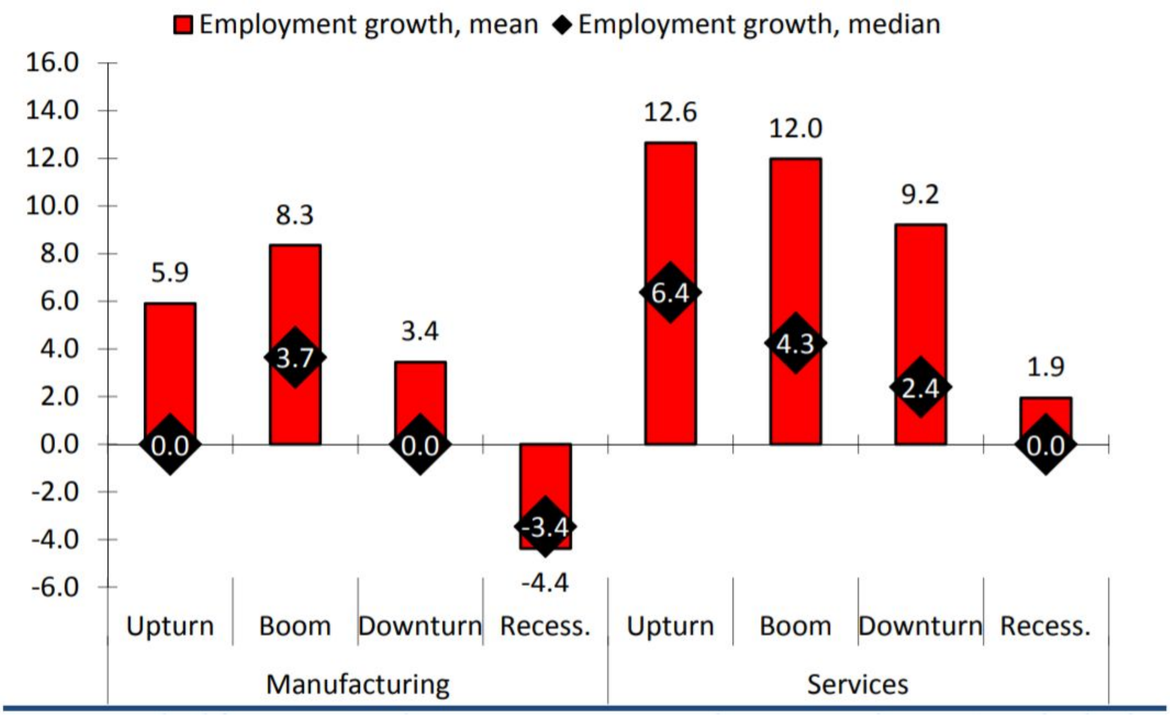
3. Government Policies: This can be considered perhaps as the primary cause of the economic cycle. Change in the policy of the government impacts directly on the economic cycle. If the government introduces a new policy that a particular product cannot be sold in India, then it affects the sales of that product, and in turn, this affects the inventory of the product

4. Interest Rates: One of the critical factors which affect the economic cycle is government interest rates. Suppose there is a rise in the interest rate that discourages investors from investing. In that case, there is hardly any growth seen in the economic cycle. On the other hand, if the interest rates are low, more investments will come forward, increasing the opportunities and growing the economy

Influence of economic cycles on employment:

In the first stage, when the economy is expanding, businesses can grow, so they are more willing to hire workers. In economic contraction, businesses must deal with reduced revenues and may have to lay off their workers. Even if a particular business has not seen any recent decreases in revenue but expects that revenue will decrease in the future due to a general economic slump, it may start laying off workers preemptively. It has also been observed that an economy with higher average unemployment but lower volatility levels may be in better shape than an economy with a lower intermediate unemployment level and higher levels of unemployment volatility. This volatility in unemployment comes as a direct result of volatility in the business cycle.

Figure 5.1: Employment growth in European firms in different phases of the business cycle, 1998-2010



As one would expect, mean employment growth is highest in phases of economic boom and stages of an upswing in manufacturing and services. Notably, the mean value of economic growth in a recession is negative to the manufacturing sector. In contrast, it is still positive for firms in the services sector. This could indicate that the service sector has been less affected by the crisis. Always, it could also be a sign of higher rigidity of employment in services compared to manufacturing. Additionally, the growth rates are overall more heightened in the services sector than in manufacturing.

Influence of economic cycles on productivity:

Taking the example of European countries where the production industry contributes significantly to their economy. The table contains cross-correlations between the cyclical components of GDP at constant prices in 2010 and the manufacturing industry's production in selected EU countries.

Country	Production in manufacturing		Country	Production in manufacturing	
	Cross correlation coefficient	Time		Cross correlation coefficient	Time
Austria	0.9508	t	Italy	0.9559	t
Belgium	0.8482	t	Latvia	0.7838	t-2
Czech Republic	0.8495	t-1	Luxemburg	0.5425	t
Denmark	0.8373	t+1	Netherlands	0.8079	t-1
Estonia	0.8741	t-1	Poland	0.7449	t
Finland	0.9431	t	Portugal	0.5032	t

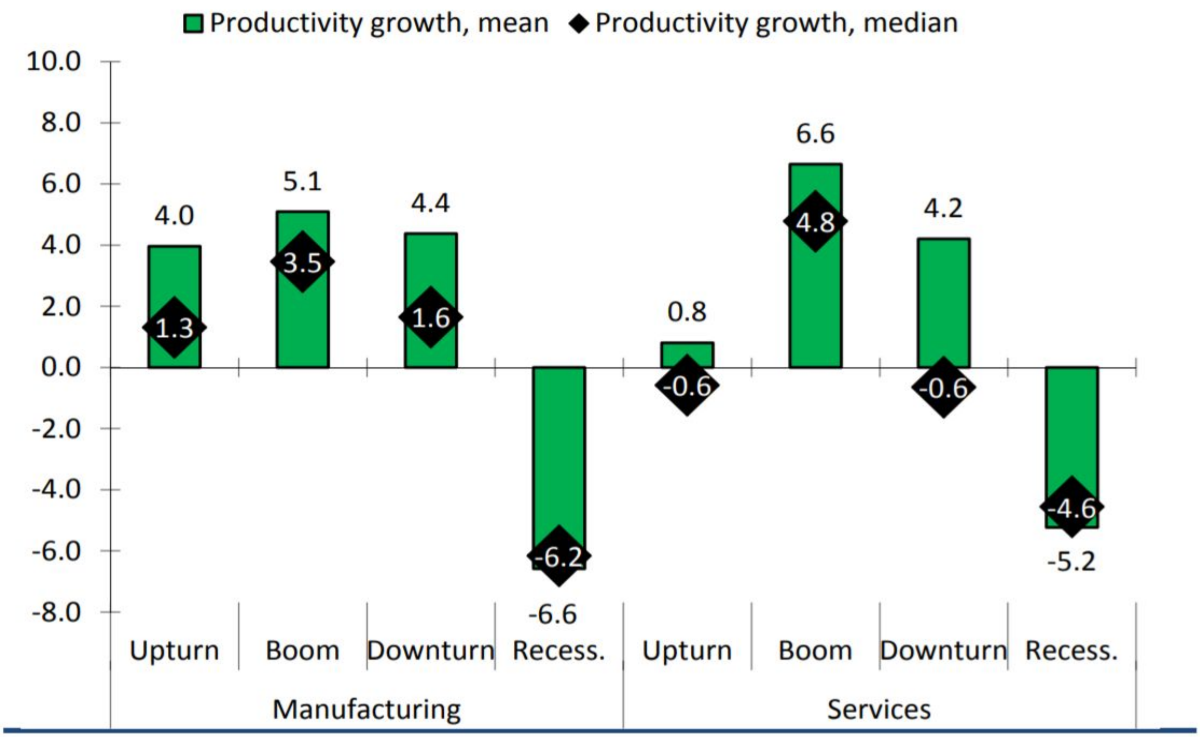
In these countries, the manufacturing industry's price level is stable. It does not respond to changes in the economy's cyclical development. An important cyclical indicator is the revenue indicator. High cross-correlation values for this indicator for the manufacturing industry only confirm the cyclical behavior of the industry. Entrepreneurs need to know when growth occurs or decline in their revenues depending on the country's economic development. The cross-correlation results showed that sales are a parallel indicator in most countries, with almost a change in the economic situation and a change in sales and vice versa. Monthly monitoring of the indicators would probably indicate that sales are one to two months ahead of GDP development.

What Is Cross-Correlation?

Cross-correlation is a measurement that tracks the movements of two or more sets of time series data relative to one another. It is used to compare multiple time series and objectively determine how well they match up with each other and, in particular, at what point the best match occurs. Cross-correlation may also reveal any periodicities in the data.

Cross-correlation is used to track the similarities in the movement of two factors over time. Stock investors use it to determine the degree to which two stocks move in tandem. Portfolio diversification requires selecting stocks and other assets that move in opposite directions to hedge losses.

Figure 5.5: Real productivity growth in European firms in different phases of the business cycle



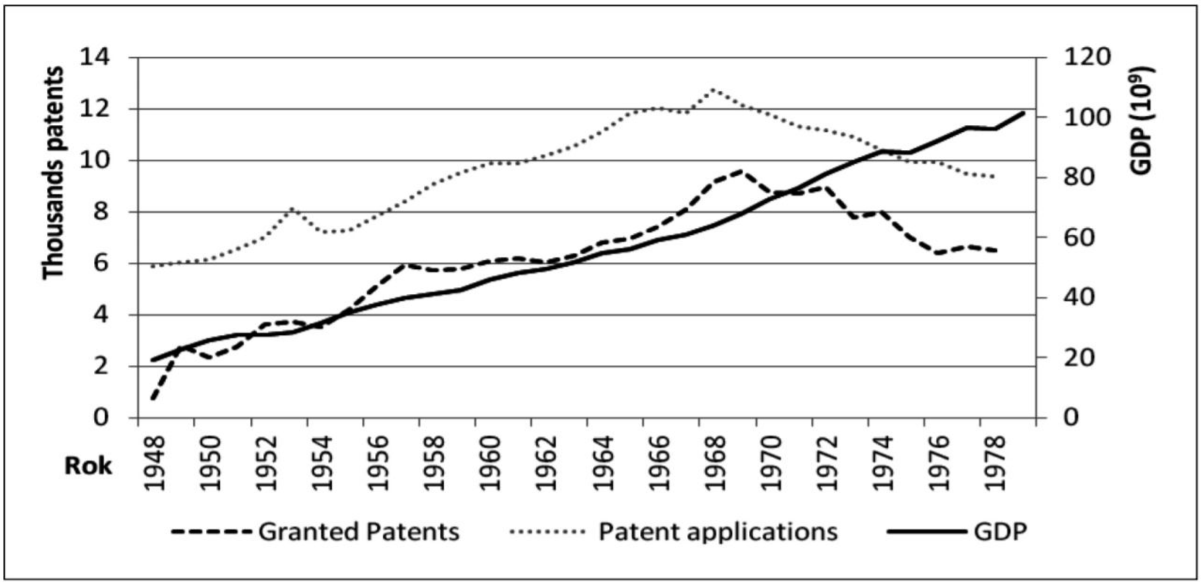
When we account for price changes and look at real productivity growth rates, we confirm a clear pro-cyclical evolution of productivity. We can see that during times of economic downturn, a productivity loss is accepted to reduce redundancies. The graph further demonstrates that mean and median productivity growth is very similar for European manufacturing and services over most business cycles, except for upturn phases.

Influence of economic cycles on innovation:

The real innovation activity theory says that innovations can be a positive supply shock that starts economic growth. The goal of the crisis is eliminating ineffective enterprises and releasing sources for effective enterprises. Empirical research proves that there exists a long-term relationship between economic development and innovation outputs. It also proves that this is a complex relation, which cannot be easily grasped by econometrics.

The presented results do not provide a definite explanation for the relation between innovation activity and the business cycle course. The researched cases show the existence of a long-term relationship only in the period of 1948-1979. Based on the results, we do not dismiss the business cycle's hypothesis influencing innovation activity.

Fig. 3: **Austria in 1948-1979, time series of outputs and patent applications**

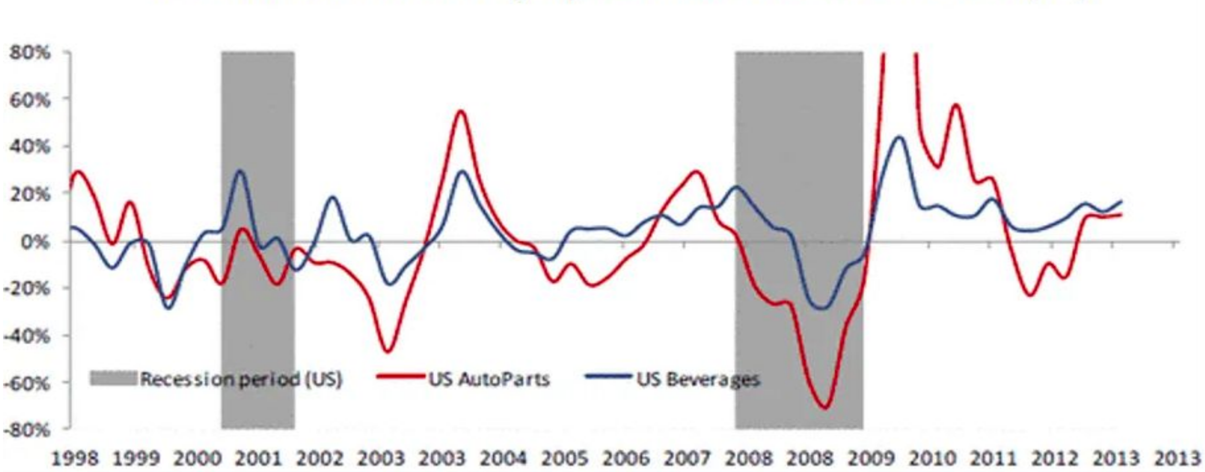


Source: Bolt and Luiten van Zanden (2013), WIPO (2012)

What Is a Cyclical Industry?

Industries that are more sensitive towards the business cycle than others and are known as cyclic industries. For such industries, the revenues are generally higher in periods of economic prosperity. They are lower in periods of economic downturn. This is because the downturns in the cycle force consumers to prioritize expenses and potentially spare some costs that are not essential. Industries involved in producing durable goods, such as raw materials and heavy equipment, tend to be cyclical. Consumer discretionary goods also are highly sensitive to the business cycle because discretionary expenses are more comfortable to cut from a consumer's budget during challenging times rather than essential costs. Auto, textile, steel, and luxury goods are some manufacturing industries that fall into this category.

US Automobile vs. Beverages performance /Recession Periods (US)



Companies that operate in a cyclical industry see their performance deteriorate more significantly than companies that operate in a non-cyclical sector. The graph above compares the performance of the automobile sector and beverage sector for over 15 years. We can see that the automobile sector performed significantly weaker than the beverage sector during the financial crisis. This graph indicates that US companies operated in non-cyclical industries took a hit during the 2008 Global Financial Crisis, but not to the extent of companies that operated in cyclical industries.

Manufacturing

Manufacturing has emerged as one of the high growth sectors in India. The 'Make in India' program was launched to place India on the world map as a manufacturing hub and give global recognition to the Indian economy. The Covid-19 outbreak has exposed the vulnerabilities of complex global supply chains built on technology and manufacturing principles. The current situation has forced markets around the globe to either alter or reset their supply chains. This situation is an opportunity for India to position itself as a manufacturing destination in the medium term.

Factors like strong macroeconomic fundamentals, growth and demand potential, continued availability of skilled labor, etc., have led to its development. Manufacturing companies from the USA, Korea, and Japan are already engaged in discussions with various Indian authorities to enter India.

There is a huge demand due to the increasing middle-class population. Both domestic and foreign investment have been increasing. Due to an increasing share of the young working population, there will be a large workforce over the next 2-3 decades. Initiatives like 'Make in India' and production incentive schemes also support the growth of this sector.

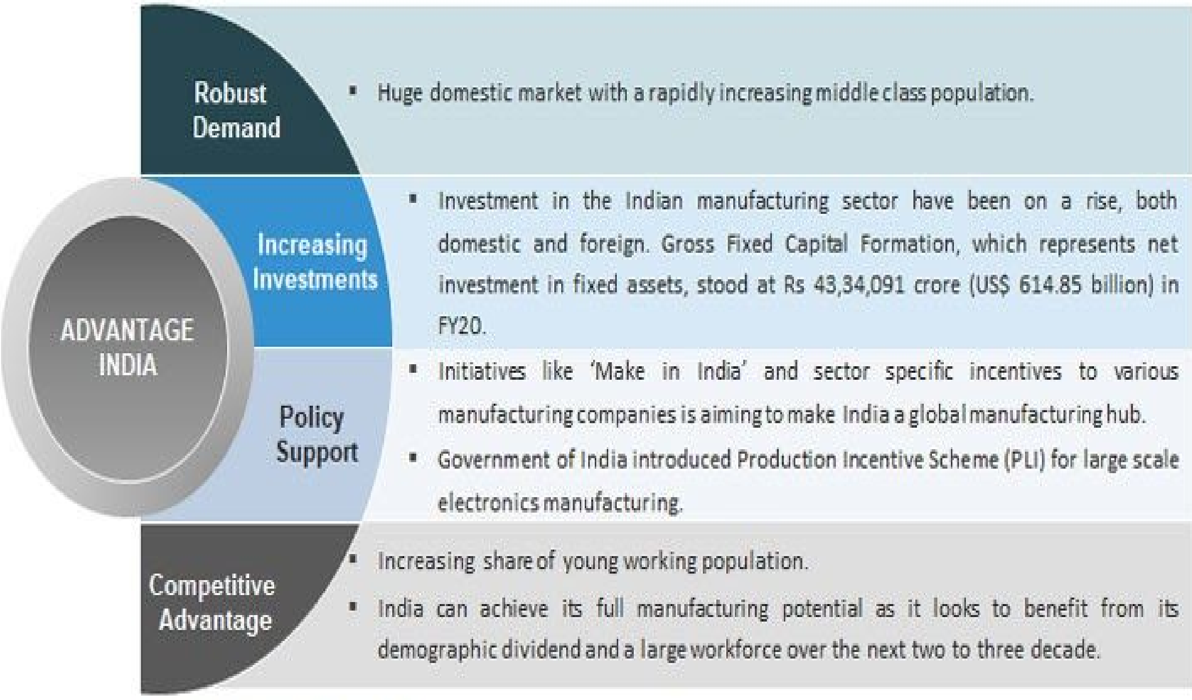
Why is Manufacturing essential for economic growth?

The manufacturing sector's importance for a country's overall infrastructure for innovation cannot be highlighted enough. Even in advanced countries, where manufacturing production is supposed to be on the decline, the bulk of invention happens in the manufacturing sector.

The strong relationship between industrialization and economic development is that the manufacturing sector is the driver of productivity growth. This, in turn, is the lifeblood of technological development.

Every economic activity stimulates another economic activity. So, just as manufacturing stimulates the provision of services, services stimulate manufacturing production. However, evidence shows that manufacturing has a more potent "multiplier effect" than services. In France, for example, 29% of the manufacturing workforce contributes indirectly to the production of non-manufacturing output. Only 13% of the services workforce contributes indirectly to the production of non-services output.

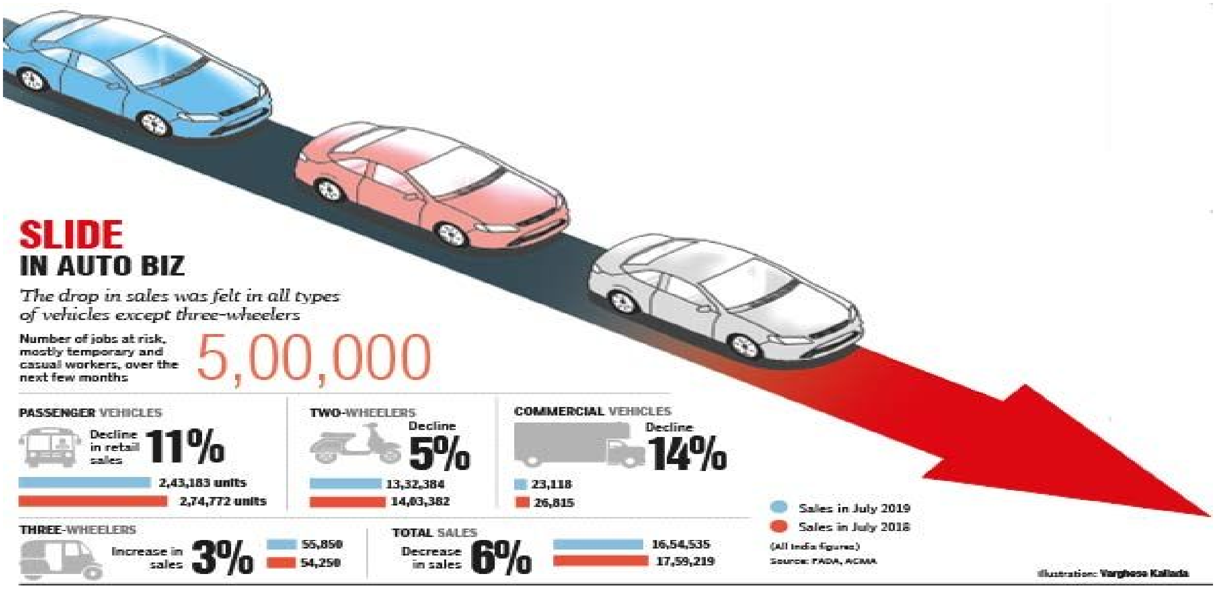
With the advent of the fourth industrial revolution – technological breakthroughs associated with things like artificial intelligence, robotics, IoT, autonomous vehicles, etc. – there is a growing fear that manufacturing will become less reliant on human labor. Nevertheless, evidence suggests that the share of current jobs in OECD countries that stand at risk of automation is only 6-12%. In developing countries, this number is found to be even lower, at 2-8%. So, while it is true that some services are increasingly contributing to economy-wide productivity growth, these services cannot thrive without a vibrant manufacturing sector.



Note: PE – Provisional Estimate

Indian Auto Sector Crisis 2019

The automobile sector is one of the largest employers in the country. It accounts for around 5-7% of GDP, employing about 40 million people. The prolonged demand slowdown during the pre covid recession period resulted in production and job cuts in the sector. According to the latest figures, original equipment manufacturers (OEMs) removed about 15,000 temporary workers in two to three months. A lack of working capital amid low demand led to the closure of nearly 300 dealerships across the country. This led to over two lakh people losing their jobs.



Probable Reasons for the crisis:

As growth was high in the last decade, it may have led to saturation in demand, difficulty in loan availability from banks for general people. The possible emergence of electric vehicles leads to reluctance to buy diesel-petrol cars, though this may be discarded as no real infrastructure for charging is available today in India. More importance is given to experiences rather than material things, e.g., someone may like to travel rather than buying a car.

Current Scenario and Future Prospects :

Covid-19 Pandemic has had a multiplier effect on the sector already in a slowdown. Some Recovery has begun though levels are still well below compared to last year. Manufacturers expect the recovery trend to remain healthy as inquiries and bookings are rising fast. While Covid-19 has impacted urban areas more, Rural India is witnessing a faster recovery. A big part of the recovery in demand is from people who want to avoid public transport and have their vehicles mainly due to safety concerns. India is expected to be the world's third-largest automotive market in terms of volume by 2026. The $118 bn Automobile industry is expected to reach $300 bn by 2026. The sector currently manufactures 26 million vehicles, including Passenger Vehicles, Commercial Vehicles, Three Wheelers, Two Wheelers, and Quadricycles, in April-March 2020, of which 4.7 million are exported. India holds a strong position in the international heavy vehicles arena. It is the largest tractor manufacturer, second-largest bus manufacturer, and third largest heavy trucks manufacturer globally.

- The EV industry will create five crore direct and indirect jobs by 2030.
- In April-March 2020, overall automobile exports registered a growth of 2.95%.
- Passenger vehicle exports marginally increased by 0.17%. Two-wheeler exports registered a growth of 7.30% in April-March 2020 over the same period last year.

- The sector attracted $24.5 bn FDI from April 2000 - June 2020, accounting for 5.1% of the total FDI inflows.

So, it can be concluded that if the current challenging times are adequately negotiated, there is a high chance that this industry will become a significant part of the growth of the Indian Economy.

Countering Recessions :

Following are some methods that can be adopted to reduce the drastic effects of recessions:

- **Do not crash the company**
  Since a recession usually comes with lowering sales, less cash is available to companies for funding operations. Thus, portfolios usually run out of money. Surviving a recession should involve efficient deft financial management.

- **Deleverage before a downturn**
  It is expected that more debt requires more cash to make interest and principal payments; when a recession hits and less cash inflow is there due to a lowering in demands, it puts the portfolio at the risk of defaulting.

- **Follow Decentralization**
  During the Great Recession, it was observed that decentralization was associated with relatively better performance for firms or establishments facing the most stringent environment during the crisis.
  Since decentralized firms delegated decision making further down the hierarchy, they were better able to adapt to changing conditions. The recession introduces a lot of uncertainty and turbulence.
  One way to tackle recession is better decision making since carefully

thinking about the organizational structure is the best way to cope with uncertainty.

- **Look beyond Layoffs**
  Some layoffs are inevitable during a downturn. However, the companies that emerged from the crisis in the healthiest shape relied less on layoffs to cut costs and leaned more on operational improvements.
  More innovative options can be introduced :
  - **Hour reductions**
    Hour reduction occurs when an employee voluntarily restricts their working hours and gets paid for a specified time. It becomes an excellent alternative to layoff to save money and allows the worker to remain employed.
  - **Performance Pay**
    It is a salary paid system based on positioning the individual, or team, on their pay band according to how well they perform.
  - **Furlough**
    A furlough is "A temporary layoff from work". it is temporary reconstructing, whereas layoffs involve permanent termination. Furloughed employees often still receive health insurance and other employee benefits, while laid-off employees do not.

- **Invest In Technology**
  Downturns appear to encourage the adoption of new technologies. Firms invest in the IT sector during recessions because their opportunity cost is lower. Other reasons also favor investing in technology like, Technology can make the business more transparent, more flexible, more efficient.
  According to Katy George, a senior partner at McKinsey, the first reason to prioritize digital transformation ahead of or during a downturn is that improved analytics can help management better understand the business, how the recession is affecting it, and where there is potential for operational improvements.
  The second reason is that digital technology can help cut costs. Companies should prioritize “self-funding” transformation projects that pay off quickly.
  The third reason is that IT investments make companies more agile and, therefore, better handle the uncertainty and rapid change that come with a recession.
  Companies that have already invested in digital technology, analytics, and agile business practices may better understand the threat they face and respond more quickly.

Conclusion :

The economic cycle's central idea that the economy has regular and periodic waves–a cycle–lasting for several years has few adherents today. Perhaps such cycles never existed, or maybe they once did but no longer do because the government now plays a large and active role in the economy.
However, the economic-cycle approach remains useful because it is an easy way to introduce several macroeconomic topics, including the adjustment process central to macroeconomics. It also provides a transition from our examination of monetary theories to an introduction to Keynesian economics (Keynesian economics are various macroeconomic theories about how the economic output is strongly influenced by aggregate demand.), a very different way of viewing macroeconomics.

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