Research Proposal

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Overview of Thesis

Industrial engineers address the efficient utilization of resources to produce quality, as well as cost competitive goods and services in a healthy and efficient work environment. Industrial engineering covers a broad-spectrum including production planning and control, manufacturing systems and processes, facilities design, human factors, occupational safety, quality control, systems reliability, and systems analysis and design with a strong emphasis on advanced computing.

The objectives of my Ph.D. in Industrial Engineering program are to provide the knowledge and develop the skills that find the relation between the GDP growth of India and the automobile industry.

Motivation and Problem Statements

Constraints to industrial growth

- **Inadequate infrastructure:** Physical infrastructure in India suffers from substantial deficit in terms of capacities as well as efficiencies. Lack of quality of industrial infrastructure has resulted in high logistics cost and has in turn affected cost competitiveness of Indian goods in global markets.
- **Restrictive labour laws:** The tenor of labour laws has been overly protective of labour force in the formal sector.
- **Complicated business environment:** A complex multi-layered tax system, which with its high compliance costs and its cascading effects adversely affects competitiveness of manufacturing in India.
- **Slow technology adoption:** Inefficient technologies led to low productivity and higher costs adding to the disadvantage of Indian products in international markets.
- **Inadequate expenditure on R&D and Innovation:** Public investments have been constrained by the demands from other public service demands and private investment is not forthcoming as these involve long gestation periods and uncertain returns.
- The policy aims to harness existing strengths in sectors like **automobiles and auto-components,** electronics, new and renewable energy, banking, software and tourism.
- The policy also aims to create globally scaled-up and commercially viable sectors such as waste management, medical devices, renewable energy, green technologies, financial services to achieve competitiveness.

Literature Review

The Indian automobile industry is growing remarkably after 1991 following India's growing openness, income of the people, the arrival of new and existing models, easy availability of finance at relatively low rate of interest, and price discounts offered by the dealers and manufacturers. Although the automobile demand depends on number factors, this study attempts to explore the interactions between India's automobile sales and the hike in fuel prices, lending rate, and GDP per capita in the automobile industry in India. Hence, this study has applied the cointegration and the vector error correction models to analyse the possible causal relations between the variables mentioned above. The results find the evidence of a positive and long-run relationship between automobile sales and GDP per-capita and the remaining variables have the inverse relationship with automobile demand. As we can clearly see, the higher GDP leads to higher volume of automobile sales. However, interest rate, and fuel price have a negative relationship with both passenger and commercial vehicles sales. Each of these factors plays a key role in determining the level of auto demand. The passenger and commercial vehicles demand model estimation through unit root test found that they have long-term, positive equilibrium relationship with the GDP per-capita. The error correction term is negative and statistically significant. This study may suggest that if the Government may help by mandating higher fuel efficiencies for vehicles and provide facilities for improving credit availability and reducing dependence on foreign oil that may trigger the demand for sales in Indian automobile industry.

Data collection

The data pertaining to the dependent variable consists of automobile sales in India. Whereas, the independent variables include Gross Domestic Product (GDP), Interest rate, wholesale price indices of automobiles and all commodities and wholesale price indices of fuel, power, light and lubricants. Data on automobile production and sales can be taken from the two automotive associations, namely Society of Indian Automobile Manufacturers (SIAM) and Automotive Component Manufacturers Association (ACMA). The wholesale price indices of automobiles and all commodities can collect from the Ministry of Statistics and Programme Implementation.

Research Methodology

Qualitative Research

Conclusion

India became the fourth largest auto market in 2019 displacing Germany with about 3.99 million units sold in the passenger and commercial vehicles categories. India is expected to displace Japan as the third largest auto market by 2023

The two wheelers segment dominates the market in terms of volume owing to a growing middle class and a young population. Moreover, the growing interest of the companies in exploring the rural markets further aided the growth of the sector.

India is also a prominent auto exporter and has strong export growth expectations for the near future. In addition, several initiatives by the Government of India and major automobile players in the Indian market is expected to make India a leader in the two-wheeler and four-wheeler market in the world by 2025.

The automobile industry is supported by various factors such as availability of skilled labour at low cost, robust R&D centers, and low-cost steel production. The industry also provides great opportunities for investment and direct and indirect employment to skilled and unskilled labour.

Indian automotive industry (including component manufacturing) is expected to reach Rs. 16.16-18.18 trillion by 2026.

In this study I will research how automotive industries can support to increase the GDP of India.

Research Deadlines - expecting to complete the research by 2024