

Pre-Owned ICE car market: A boon to Middle income groups in times of transition to EVs & Sustainability.

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Abstract:

The current study aims to evaluate if middle-income households could make use of the used car resale market as a viable option during the switch to EVs and sustainability. Convenience sampling is used to gather data from 112 respondents, and techniques like SPSS and regression analysis are then used to better understand the results. The findings indicate a positive relationship between used cars and the transitional period. The availability of replacement parts, after-sales support, model, shape, engine capacity, and other criteria are positively correlated with the transition phase, with cost and regulatory restrictions having a significant impact. There are several challenges and unknowns in the used ICE vehicle market, including as inconsistent pricing, a lack of trustworthy models, and concerns about the environmental impact of operating older ICE cars. To keep older cars working efficiently and safely for a longer period of time, a network of specialists and service providers that specialize in maintaining and repairing them is used.

Introduction:

India is the most populous nation in the world, with more than 1.30 billion people, and its economy is growing faster than most wealthy nations. This is a strong feature that has drawn a lot of interest from the automobile industry. There is a rapid growth in the sales of cars in past decade. Now the trends are moving towards electric cars. In this transformational phase, there is a decline in demand for new petrol & diesel cars. Sustainability is a key concept here that is pulling the interest of people towards adoption of electric vehicles. Sustainability includes reducing carbon emissions, conserving natural resources, promoting alternative fuels, and improving vehicle efficiency.

India is promoting the adoption of EVs as a means of reducing carbon emissions from vehicles. The government has launched several schemes to support the production and sale of EVs, including subsidies for buyers, tax incentives for manufacturers, and infrastructure development for charging stations. India is a developing market for global car industry titans. Along with buying a home, buying a car is typically the second most important and expensive decision

people make. For car manufacturers, first-time car buyers present an opportunity to build a strong brand image that will undoubtedly be reflected in the years to come.

The concept of "buying behavior" has evolved through time and is essential to displaying. Recognizing consumer purchasing behavior is important since it plays a crucial role in the process of acquiring goods. Because a car purchase implies an aberrant condition of social and mental connection, customer behavior can be rather unexpected. All external influences as well as the customer's own mentality are combined to form consumer purchasing behavior. Customers' expectations are always shifting; thus, it is imperative for businesses to consistently update and enhance their services to meet changing client demands. The market is now extremely competitive and serves as a source of knowledge for businesses to improve their goods and services. In order to understand the market and customer behavior inside and out, research is the only available instrument.

The trade-in vehicle market has been present in the Indian auto market for a long time, but due to the risky and chaotic nature of buying used cars without a warranty and the lack of accreditation for trade-in vehicles, the pre-claimed car industry has not been able to grow into a sizable portion of the automotive industry. In India, the competition between previously owned cars and new cars has reached its zenith. Since the Car sellers have given them a warranty and guaranteed their condition, all of these Pre-claimed

Cars are typically referred to as "Confirmed Used Cars." Unique Car makers have predetermined locations and entered the Pre-claimed Car. Business banks support this recycling industry as well.

Considering the transformation of automobile industry from Petrol/Diesel/CNG vehicles to electric vehicles, the demand for new petrol & diesel cars are Falling day by day. In this time of transmission, the optimum utilization of existing vehicles is important in order to meet the goals of sustainability. Rather than discarding the existing Petrol/Diesel/CNG vehicles without optimal utilization, it can be used further till electric cars take over completely. The growth of the middle-income group in India and the shift towards electric vehicles is leading to a decrease in demand for new petrol and diesel cars. However, the demand for pre-owned vehicles remains high. By opting for pre-owned vehicles, people can fulfill their dream of owning a car while also reducing waste and promoting the 5Rs principle. Refurbishing existing petrol and diesel vehicles is a cost-effective solution for both buyers and sellers. This also serves the purpose of 5Rs (refuse, reduce, reuse, repurpose, and recycle) and further can be refurbished at good price to both parties.

Objective:

To understand if pre-Owned car market is a boon to middle income groups in times of transition to EVs from traditional ICE car market in achieving sustainability goals.

Problem Statement:

As the world shifts towards sustainability and electric vehicles (EVs), there is a growing concern for the fate of the pre-owned internal combustion engine (ICE) car market. Even if the demand for EVs is growing, a sizeable percentage of middle-class groups still rely on ICE automobiles for their everyday journeys. The used ICE vehicle market has emerged as a possible windfall for middle-class individuals who cannot afford to buy new EVs as the switch to EVs continues to gain traction. But the market for used ICE cars faces a number of obstacles and uncertainties, including a lack of price uniformity, a shortage of dependable models, and worries about the environmental effects of driving older ICE automobiles. While acknowledging the difficulties and unknowns involved, this problem statement aims to investigate the possibilities of the used ICE vehicle market as a feasible choice for middle-income groups throughout the transition to EVs and sustainability.

Literature review:***Policies taken to consideration:***

- The Indian government's ***FAME 1*** program, which stands for "Faster Use and Manufacturing of (Hybrid &) Electric Vehicles in India," was introduced in 2015 with the intention of fostering the adoption and production of electric and hybrid vehicles in India. To promote the usage of electric vehicles, the program provides a range of incentives and subsidies to manufacturers, consumers, and governmental bodies. The program's goals are to encourage ecologically friendly transportation options, lessen reliance on fossil fuels, and assist India's ecosystem for electric mobility. FAME 1 was initially funded with a budget of Rs. 895 crores (about US\$ 120 million).
 - The ***FAME 2*** program's objectives are to offer financial incentives to electric car producers and purchasers and to build the required infrastructure to facilitate the expansion of electric mobility in India. The program also intends to promote the creation of domestic technologies for electric car components. The program's second phase, known as FAME 2, started in March 2019 and lasts until March 2023.
- In June 2021, the FAME-2 India plan was updated based on lessons learned during the Covid-19 epidemic and feedback from industry and users. The new strategy aims to accelerate the spread of EVs by cutting upfront expenses. The plan has been extended for another two years, until March 31, 2024.
- The ***2021 vehicle scrappage policy*** will assist in identifying automobiles that are unfit for use on public roads. As the name implies, under the new scrappage policy, outdated and unfit automobiles that pollute the environment and do other harm will be destroyed. As soon as the car registration

period is over, the vehicle junk policy will start. The car will go through a fitness test after a predetermined amount of time. A car is only regarded as suitable for 15 years, according to national motor vehicle laws. When a car is above 15 years old, it starts to pollute the environment more than a brand-new car. Older than 15- and 20-year-old commercial and passenger vehicles will be scrapped.

- The **Delhi Electric Vehicle Policy** was launched by the Delhi government in August 2020 with the aim of promoting the adoption of electric vehicles (EVs) in the city. The policy is aimed at reducing air pollution, promoting sustainable transportation, and creating job opportunities in the EV sector.

The key features of the Delhi Electric Vehicle Policy include:

- i. Financial incentives: The policy provides financial incentives to consumers to encourage them to purchase electric vehicles. This includes a purchase incentive of up to Rs. 1.5 lakh for electric cars and up to Rs. 30,000 for electric two-wheelers. Additionally, the policy provides incentives for scrapping old, polluting vehicles and replacing them with EVs.
- ii. Charging infrastructure: The policy aims to set up a robust network of charging infrastructure across the city, including charging stations at every 3 km. The government will also provide

subsidies for setting up home charging infrastructure for EV owners.

- iii. Exemption from road tax and registration fees: Electric vehicles will be exempt from road tax and registration fees in Delhi.
- iv. Low-interest loans: The policy provides for low-interest loans for EV buyers, as well as subsidies for EV manufacturers to set up production units in Delhi.
- v. Awareness and skill development: The policy includes initiatives to create awareness among the public about the benefits of EVs and to train mechanics and technicians in the maintenance and repair of electric vehicles.
- vi. The Delhi Electric Vehicle Policy is a significant step towards promoting the adoption of electric vehicles in the city and reducing air pollution. It is expected to create jobs in the EV sector and contribute to the growth of a sustainable transportation system.

- In India, the 2020 **National Electric Mobility Mission Plan (NEMMP)** was unveiled. National energy security, reducing the negative effects of transportation on the environment, and expanding local manufacturing capacity are the main goals of the NEMMP. The National Council for Electric Mobility approved the NEMMP 2020, the organization's mission statement, on August 29, 2012. It lays out goals and the joint government-industry vision for realizing the enormous potential

for a full range of effective and environmentally friendly electric vehicle technologies by that year.

The key objectives of the NEMMP include:

- i. Promoting the manufacturing and sale of electric vehicles: The NEMMP aims to create a conducive environment for the manufacturing and sale of electric vehicles in India. This includes providing financial incentives for EV manufacturers and buyers, setting up charging infrastructure, and creating awareness about the benefits of EVs.
- ii. Setting up charging infrastructure: The NEMMP aims to set up a network of charging infrastructure across the country to support the adoption of EVs. This includes setting up charging stations at public places, highways, and residential areas.
- iii. Research and development: The NEMMP aims to promote research and development in the field of EVs to improve technology and reduce costs. This includes providing funding for R&D projects and encouraging collaboration between industry and academia.
- iv. Skill development: The NEMMP aims to create a skilled workforce in the EV sector by providing training and certification programs for technicians, mechanics, and other professionals.
- v. Promoting the use of renewable energy: The NEMMP aims to promote the use of renewable energy sources for charging EVs. This includes setting up solar-powered charging stations and providing incentives for using renewable energy for charging EVs.

Buying Behavioral intention of pre-owned cars:

According to Ajzen and Fishbein (1977), the behavioral intention (BI) is a measure of how strongly a person intends to engage in a specific behavior. Psychological factors have an impact on people's desire to drive cleaner cars, according to research (Kahn, 2007; Ozaki & Sevastyanova, 2011; Peters, Gutscher, & Scholz, 2011). These factors, which include environmental concern, specific viewpoints, as well as societal and individual standards, have an impact on intentions for the adoption of cleaner automobiles.

The owner's usage and assessment of an EV (i.e., attitude) affects the adoption intention. They also consider the opinions of others while making purchases (i.e., the subjective norm).

Social Influence:

Peer pressure, neighbors, and cultural impact are all examples of social influence. Before taking any action, people seek the approval of their friends and relatives. Consumers seek social acceptance by buying products that are judged acceptable by powerful people (Venkatesh & Davis, 2000; Nysveen, 2005). Consumers base their decisions on the opinions of their family, friends, and relatives. Thus, social influence causes people to take a specific activity. 2014 (Chen & Tung). Axsen, Orlebar, and Skippon (2013) assert that the influence of other people's behaviours on a person's decisions within their social network is crucial to the transmission of EV. According to 2016 research by

Rasouli and Timmermans, social networks have a significant impact on how people are adopted.

It seems that the way buying intents are quantified is substantially to blame for the poor predictive performance of buying intention scales. Using a variety of verbal intention descriptions, respondents are required to indicate their likelihood of purchasing on intentions scales. Scales range from basic three-point alternatives with "yes," "no," or "don't know" to nine-point semantic differentials (Klein & Lansing 1955; Tobin 1959; Heard 1970). A five-point scale with the options "definitely/probably won't purchase," "maybe," and "probably/definitely will buy" is the most typical. (Pickering & Greatedorex 1980).

Mullet and Karson (1985) suggested that one way to analyze purchasing behavior was to weight intentions data using probabilities derived from historical purchase rates gathered from a consumer diary panel. It is unclear and appears random how the odds are determined and connected to goals. Moreover, this approach does not get rid of the inherent error that comes with gathering data with good intentions. Morrison (1979) provides a mathematical model to convert intents into more precise estimates, but he also notes that this is a less preferable choice than enhanced empirical measurement approaches.

277 consumers from the premium, medium, and compact automotive classes were examined by Goyal and Aggarwal (2008). They found through factor analysis and correlation that the most important factors

impacting consumer choices in the luxury automotive industry are horse power, model, baggage capacity, and accessories. The availability of crucial factors like that of spare parts, post-sales service, engine capacity, and other factors were the most important factors in the medium category, whereas post-sales service and pricing were the most important factors in the Small vehicle sector. The name of the brand, mileage, and price were found to be the three main factors affecting purchase decisions by Kaushik and Kaushik (2008) using cross tabulation and multidimensional scaling. The firm's salesman paid attention to how friends and family affected people.

Sustainability and Used Cars:

An EV car consumes little amount of damaging energy and has a less environmental effect. A sustainable material is used to construct an eco-friendly automobile. For an automobile to be sustainable, it must adhere to specific standards. These include its carbon emissions, engine performance, service frequency, and seat material. The sustainability of a vehicle is also determined by other aspects like its regenerative energy systems and the capacity to recycle worn-out parts. Due of the labor-intensive manufacturing process and high energy requirements, cars cannot be sustained in their current form. The different benefits of an automobile should be evaluated, including its effects on society, the economy, and the environment. If technology is the sole thing being evaluated, other aspects like the vehicle's life cycle should also be taken into account.

For instance, the effort necessary to create an automobile should be considered both throughout its usage and at the end of its useful life. To establish a car's sustainability, a thorough investigation is necessary. The process involves measuring life cycle of vehicle in various aspects.

According to Bhatia, Awasthi (2022) The used automobile market may benefit from ESG (Environmental, Social, and Governance) investing by concentrating on businesses who are dedicated to minimizing their environmental effect. Companies that specialize in hybrid or electric automobiles, as well as those that have integrated sustainable practices into their supply chain and production procedures may fall under this category. Investors can also search for businesses that place a high priority on social responsibility, such as those that pay their employees fairly and offer benefits, or those that have programs in place to support diversity and inclusion. Investors might look for businesses that have high ethical standards and open reporting procedures when it comes to governance. Companies that prioritize shareholder participation and have a defined process for resolving possible conflicts of interest might fall under this category.

Sustainability in supply chain should be more transparent and traceable. Sustainability, in our opinion, is essential to both the health of our planet and the long-term success and profitability of our business. (Wang and others 2022) We want to share our sustainability objectives and accomplishments with all

of our key constituencies, including our staff, clients, investors, and the general public, through this page.2018 (Horak & Poljanec) We pledge to set quantifiable objectives, evaluate our performance in reaching them, and continuously monitor and improve our sustainable practices.

ESG investing in pre-owned car market:

As the globe progresses towards more sustainable future, companies in a variety of sectors are looking at methods to become more ecologically responsible. One such industry is the automotive sector, which has seen a rise in sustainable ESG investing in pre-owned cars (Dincă et al., 2022)

This practice involves taking into account environmental, social, and governance (ESG) criteria when investing in pre-owned cars. (Șerban et al., 2022). Apart from the positive impact on the environment, this practice has theoretical and practical implications for companies to remain sustainable in the future. Investors are increasingly interested in companies that prioritize environmentally conscious practices, and sustainable ESG investing in pre-owned cars can help the automotive industry meet those expectations (An ESG Perspective on the Automotive Industry | Western Asset, n.d). Furthermore, the strategy has become a crucial factor for the improvement and raise of the automotive industry, especially in regards to pre-owned cars. (Allam & Sharifi, 2022) The end-of-life vehicle strategy, which ensures proper disposal and recycling of pre-owned

cars to minimize the environmental impact on sustainability, is also gaining traction in the industry.

Furthermore, pre-owned cars often come at a lower price point than new cars, making them an affordable option for those looking to reduce their carbon footprint. (Lau et al., 2022) However, it is important to note that price prediction and the sustainability aspects should also be taken into consideration when choosing a pre-owned car. Car sharing and bike sharing programs can also contribute to this transition by reducing vehicle miles traveled, decreasing private vehicle ownership, and having positive effects on the environment (Lin, 2022) and overall public health.

Research Methodology:

The current study's goal is to investigate the link between the used automotive resale market and sustainability using a linear regression model and accounting for the mediating component known as the "transition phase." Primary data is collected from 112 respondents, further interpreted by using tools like SPSS, regression analysis.

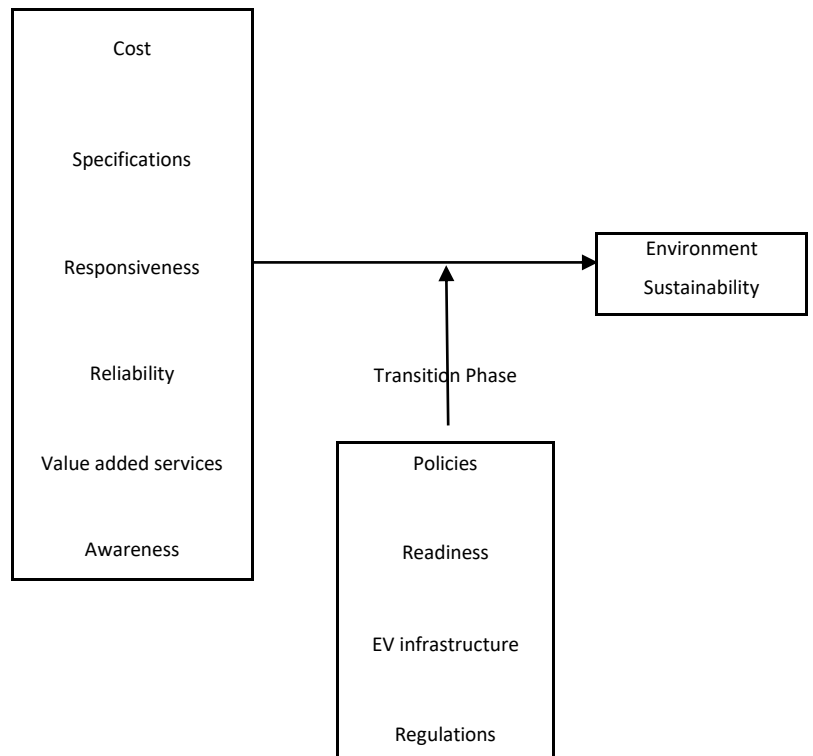
Secondary data will also be used to support the statements and draw conclusions.

R.H-1: *There exists direct impact on environment & sustainability based on pre-owned cars buying behavior.*

R.H-2: *There exists a positive relationship between Transition phase and pre-owned cars.*

R.H-3: *The relationship between environment & sustainability based on pre-owned cars buying behavior is mediated by Transition phase.*

Buying Behavior of customer in achieving sale of pre-owned vehicle



Findings:

The data is collected from 112 respondents by using convenience sampling. The demographics are shown below.

| Age | No. of respondents | Annual CTC (LPA) | No. of respondents |
|---------|--------------------|------------------|--------------------|
| 18 - 22 | 16 | 2.5 - 5.0 | 61 |
| 23 - 27 | 74 | 5 - 7.5 | 23 |
| 28 - 32 | 7 | 7.5 - 10.0 | 12 |
| 33 - 37 | 9 | 10.0 + | 16 |
| 38+ | 6 | | |

Data Analysis:

According to Cronbach alpha's Reliability Statistics,

Cronbach's Alpha N of Items is **0.7143**

This indicates that the data is reliable.

Model

X : BB (Buying behavior of pre-owned vehicles)

Y : ES (Environmental sustainability)

M : TP (Transition phase)

Sample size: 112

R.H-1: *There exists direct impact on environment & sustainability based on pre-owned cars buying behavior.*

In times of transition to electric vehicles, when people buy more pre-owned cars, the demand for new cars decreases. Increased production of new ICE cars can lead to more carbon emissions and other environmental impacts associated with the manufacturing process.

OUTCOME VARIABLE: ES

Model Summary

| R | R-sq | MSE | F | df1 | df2 | p |
|---|------|-----|---|-----|-----|---|
|---|------|-----|---|-----|-----|---|

.244 .060 .551 6.081 1.000 96.000 .015

Model

| | Coeff | se | t | p | LLCI | ULCI |
|----------|-------|------|-------|------|------|-------|
| constant | 1.982 | .644 | 3.079 | .003 | .704 | 3.260 |
| BB | .413 | .168 | 2.466 | .015 | .081 | .746 |

R.H-2: *There exists a positive relationship between Transition phase and pre-owned cars*

There is a beneficial association between used automobiles and the period of transition to electric vehicles (EVs). There will probably be increasing demand for used electric vehicles as more drivers switch to EVs. This is due to the fact that EV technology is still in its infancy and that many individuals would not be able to afford the hefty cost of brand-new EVs. More used electric vehicles may become available for purchase as the market for them expands. This is due to the possibility that early adopters of electric cars may decide to sell their EVs in order to buy a different kind of vehicle or exchange in their older models for newer ones. As a result, there could be more used EVs available, which would be beneficial for used car sales.

OUTCOME VARIABLE: TP

Model Summary

| R | R-sq | MSE | F | df1 | df2 | p |
|------|------|------|------|-------|--------|------|
| .032 | .001 | .563 | .097 | 1.000 | 96.000 | .756 |

Model

| | Coeff | se | t | p | LLCI | ULCI |
|----------|-------|------|-------|------|-------|-------|
| constant | 3.571 | .651 | 5.488 | .000 | 2.279 | 4.862 |
| BB | .053 | .169 | .311 | .756 | -.283 | .389 |

R.H-3: *The relationship between environment & sustainability based on pre-owned cars buying behavior is mediated by Transition phase*

The transition to electric vehicles (EVs) is thought to mediate a link between the environment and sustainability based on pre-owned automobile purchase behavior.

| Total effect of X on Y | | | | | |
|------------------------|------|-------|------|------|------|
| Effect | se | t | p | LLCI | ULCI |
| .413 | .168 | 2.466 | .015 | .081 | .746 |

| Direct effect of X on Y | | | | | |
|-------------------------|------|-------|------|------|------|
| Effect | se | t | p | LLCI | ULCI |
| .379 | .126 | 3.004 | .003 | .128 | .629 |

| Indirect effect(s) of X on Y: | | | | |
|-------------------------------|---------|-----------|-----------|------|
| Effect | Boot SE | Boot LLCI | Boot ULCI | |
| TP | .035 | .133 | -.259 | .267 |

People may be more likely to choose used vehicles, especially electric vehicles (EVs), as a more environmentally friendly alternative as they become more conscious of how transportation affects the environment. Because EVs may become more accessible and cheaper to a larger variety of customers, which in turn may raise demand for used EVs, the period of transition to EVs may serve as a mediator in this connection.

Discussion:

Many individuals are now more interested in secondhand automobiles because of the high price of

brand-new car. New automobiles are frequently less environmentally friendly than used ones. Used automobiles are more alluring than new ones financially. After very limited period of usage by the primary owner, an automobile might cost as low as half of its initial cost due to the quick depreciation of a vehicle. Additionally, purchasing a used automobile may be quite advantageous because it enables consumers to purchase a very dependable vehicle at a lesser price. The upkeep of a car's features is one of the most crucial considerations for anyone looking to purchase a used vehicle.

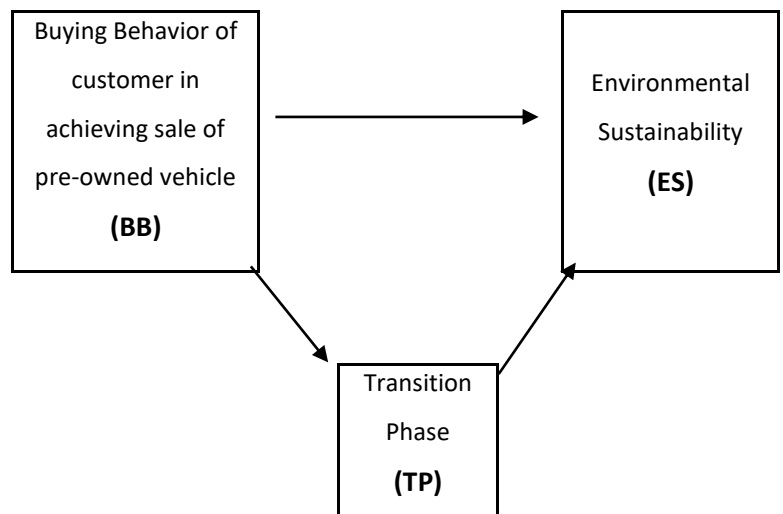
In India, the pre-owned vehicle industry has benefited middle-class families by giving them access to reasonably priced and dependable transportation. Owning a car has become a necessity for many Indians due to growing wages and rising aspirations. New automobiles may be pricey, too, and not everyone can afford to buy a brand-new car. The market for used cars fills that need. It makes it possible for customers to purchase an automobile that is still in good shape but has already lost some of its worth. Additionally, purchasing a used automobile may be a step in the direction of sustainability since it lessens the demand for new car manufacture, which has a negative influence on the environment. Instead, than aiding in the creation of new automobiles, buyers may recycle an existing product by purchasing a used car. A network of technicians and service providers who specialize in maintaining and repairing older vehicles has also grown as a result of the pre-owned automobile

industry, which helps to keep these vehicles operating effectively and safely for a longer length of time.

It's crucial to remember, though, that not all used automobiles are made equal. Before making a purchase, buyers must exercise due diligence and investigate the history and state of the vehicle. They should also confirm the legitimacy of the vendor and the legitimacy and transparency of the transaction. Additionally, as the market for used cars has grown in popularity, instances of fraud and scams have surfaced. As a result, purchasers should exercise caution and diligence. In conclusion, middle-income households in India now have access to reasonably priced and dependable transportation thanks to the pre-owned automobile industry. It also advances sustainability since it lessens the demand for new automobile production and encourages resource efficiency with current resources. To guarantee they receive a decent price and a dependable automobile, they must, however, proceed with prudence and due research.

When buying a used automobile, buyers should also take the scarcity of microchips into account. This scarcity, which impacts several microscopic components, is a global problem. Numerous factories shut down after the COVID-19 outbreak rocked the world. Automakers were unable to make up for the missed manufacturing time since there weren't enough orders. The backlog grew as a result of the unexpected rise in demand for consumer gadgets. The demand

for new automobiles increased as soon as the automotive sector began to recover. People wishing to purchase a new automobile may have to think about other possibilities due to the lack of microchips. Most modern vehicles need several microchips to operate



properly. Additionally, new autos have a unique set of negative environmental repercussions. Concerns about the depletion of natural resources and the creation of new vehicles have been for a while, especially considering climate change.

Conclusion:

During the transition to electric cars (EVs) and sustainability, the used ICE (internal combustion engine) automobile market might be considered as a godsend to the middle-income classes. This is due to the fact that previously owned ICE automobiles can provide a cost-effective substitute for brand-new electric vehicles, which are still prohibitively expensive for many middle-class households.

It is vital to recognize that not everyone can afford the most cutting-edge electric vehicles, even if switching to sustainable transportation is crucial for reducing the effects of climate change. For people who require a vehicle for mobility but cannot yet afford an EV, used ICE automobiles might provide a more affordable choice.

The direct effect of buying behavior of customer in achieving sale of pre-owned vehicle (BB) on environmental sustainability (ES) is 37.9% and indirect effect is 3.5%. The combined effect is 41.3%. This indicates there is a future scope for the study, and requires more factors to draw conclusion.

The usage of ICE cars should be reduced to the greatest extent practicable because they continue to contribute to air pollution and climate change. Therefore, while the market for used ICE cars may provide middle-class households a temporary solution while making the switch to sustainable means of transportation, efforts should still be made to encourage the adoption of EVs and other sustainable forms of transportation.

Future Scope:

In the short to medium term, it is anticipated that the pre-owned ICE (internal combustion engine) automobile industry will continue to be considerable, especially as the globe moves towards electric cars (EVs) and sustainability. Middle-class groups who may not be able to afford the high upfront cost of new

EVs are expected to benefit from the market for used ICE cars. Governments all over the globe have been setting lofty goals to phase out ICE automobiles and promote EVs in response to the growing concern for sustainability. However, the switch to EVs will be slow and take some time, particularly in poorer nations where the infrastructure is still being built. In such a situation, used ICE automobiles will be essential in giving a significant segment of population accessible, inexpensive mobility alternatives, especially in nations with inadequate or inaccessible public transportation.

In rural and distant places where EVs would not be a feasible answer owing to a lack of charging infrastructure, the used ICE vehicle industry will also continue to grow. In addition, a lot of individuals are still unwilling to move to EVs owing to worries about maintenance expenses, range anxiety, and battery life. While they wait for EV technology to develop, these people will have the opportunity to buy a dependable and reasonably priced automobile from the used ICE car market. In conclusion, while the globe shifts towards EVs and sustainability, the used ICE vehicle industry is expected to continue to be an important participant in the near to medium term. It will provide a big portion of society access to inexpensive mobility solutions, especially in developing nations and rural places where EVs would not be practicable. Additionally, the market for used ICE cars will serve as a transitional vehicle for people who are hesitant to transfer to EVs by giving them a cost-effective and dependable alternative until EV technology is more developed.

Limitations:

- Limited sample size: A short research period may make it difficult to enroll all potential participants, which may reduce the analysis's statistical power.
- Limited capacity to control for confounding factors: Confounding factors, such as changes in the environment or participant behavior, which might impact the validity of the results, may not be possible to be controlled for in short-term research.
- Since the study is done on the transition phase and lacks in existing works, it is difficult to get secondary data and is associated with the existing government policies.

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Appendix:

| Factor | Variables | Questions |
|---|----------------------|--|
| Buying Behavior of customer in achieving sale of pre-owned vehicle (BB) | Cost | Do you believe that pre-owned cars are a good option for middle income groups in India? |
| | | Does the cost of a car plays a main role in deciding to buy it. |
| | | You think Pre-owned cars are reasonably priced in the market |
| | Specifications | How important is it to you that the pre-owned car you purchase is from a reputable source? |
| | | How important is it to you that pre-owned cars come with a warranty or guarantee of some sort? |
| | Responsiveness | You find it comfortable driving a pre-owned petrol/diesel car |
| | | How much do you agree with the statement: "Buying a pre-owned car is a more cost-effective option than buying a new car"? |
| | Reliability | The working condition of car plays a main role in deciding to purchase ? |
| | | The brand name of the car is vital in deciding the purchasing decision. |
| | | You are satisfied with the transparency of information regarding the condition of pre-owned cars |
| | Value added services | Associating value added services can increase the demand for pre-owned cars. |
| | | The availability of after-sales service for pre-owned vehicles is critical. |
| | | How much do you agree with the statement: "The Indian government should implement more regulations to ensure the quality of pre-owned cars sold in India"? |
| | Awareness | How likely are you to recommend a pre-owned car to a friend or family member ? |
| | | Have you ever considered buying a pre-owned car ? |
| | | How much do you agree with the statement: "There is a stigma associated with buying pre-owned cars in India"? |
| Transition Phase (TP) | Policies | How important is it to you that the government offers incentives and support for the adoption of electric vehicles? |
| | | How concerned are you about the environmental impact of transportation in India? |
| | Readiness | How likely you consider purchasing an electric vehicle in the next 5 years ? |
| | | How confident are you in the reliability and performance of electric vehicles? |
| | EV infrastructure | How concerned are you about the availability of charging infrastructure for electric vehicles in your area? |
| | | How important is it to you that electric vehicles have a long driving range? |
| | Regulations | How effective do you think the current government policies and regulations are in promoting the adoption of electric vehicles in India? |
| | | How much do you agree with the statement: "The Indian government should provide financial incentives to people who buy electric vehicles"? |
| Environmental Sustainability (ES) | | How much do you agree with the statement: "Buying a pre-owned car is a more environmentally-friendly option than buying a new car"? |
| | | To what extent do you think the Indian government's policies and initiatives are helping to promote the adoption of EVs for environmental sustainability? |
| | | The promotion and adoption of EVs can contribute to achieving India's environmental sustainability goals? |
| | | To what extent do you agree that electric vehicles (EVs) are more environmentally sustainable than traditional gasoline or diesel vehicles? |