12 Carbon Pricing for Sustainable Automotive Transition

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Abstract

This paper analyses in the automobile industry in India an emerging Financial-Environmental Feedback Loop. It brings quite some critical questions into focus such as does Indian financial sector indeed reward companies leading in sustainability with Greenium? do companies with higher emission face Carbon Risk Premium? The automakers are caught in a Decarbonization Dilemma as India pursue their 200 billion electric vehicle (EV) target, a move which is geared towards achieving the SDG 13 and 9. The study uses a time series data approach of five years on five major companies, Tata Motors, Mahindra and Mahindra, Maruti Suzuki, Ashok Leyland and TVS Motor Company, which are major representation of the automotive industry in India. The triangulated methodology uses audited financial statements, mandatory BRSR, and government Vahan Dashboard as a methodology to map the relationship between Carbon intensity and weighted average cost of debt. The initial observations show that poor environmental performance of a firm with high emission is always associated with high borrowing costs. Also, the researchers discovered the J-curve impact of transition financing in the scenario where the large investments in Green Capex, on the part of the companies in the EV markets, increase the breadth of their debt-to-equity ratios that exposes them to short term capital requirements. This insight illustrates the fact that the financial markets of India are no longer spectators/observers but willing drivers of SDGs to become sustainable in the long run and hence remain competitive in the long run.

Keywords: Greenium, Carbon Risk, BRSR reporting, EV transition, Cost of Debt.

Introduction

The fast pace of economic and urbanization in India has caused an environmental crisis in such urban centers as Delhi-NCR. The research suggests that

the transportation industry is one of the leading causes of atmospheric degradation, which needs to be swiftly replaced to fulfill global climate commitments (Sen & Sahoo, 2024). The auto industry is at a structural crossroad; the dependency on fossil fuels is terminally declining as the economic value is becoming more and more tied to sustainability (Gupta & Garg, 2020).

The goal of the $200 billion EV program in India is to achieve the SDGs 13 and 9, yet creates a Decarbonization Dilemma: EVs will be as clean as the electricity grid, which in India is still coal-based (Shafique & Luo, 2022)

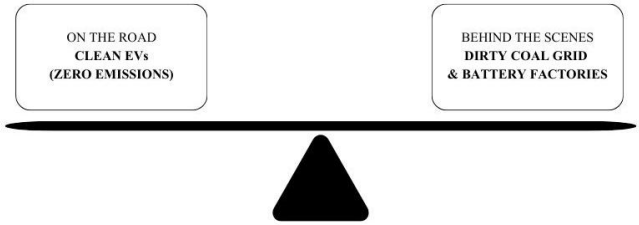

Figure 1: The Decarbonization Dilemma

The process of transition is a capital-intensive process that is accompanied by supply chain risks and Transition Risk, the financial vulnerability of a company to a low-carbon economy (Jannaser Niri et al., 2024). This reliance on externally sourced capital exposes the industry to a Financial Market Accelerator. Intensive pollution is now treated by lenders as liability, and laggards might be forced to pay a Carbon Risk Premium (higher interest) to lenders, and potentially offer a Greenium (discounted rates) to sustainable performers (Kleimeier and Viehs, 2021).

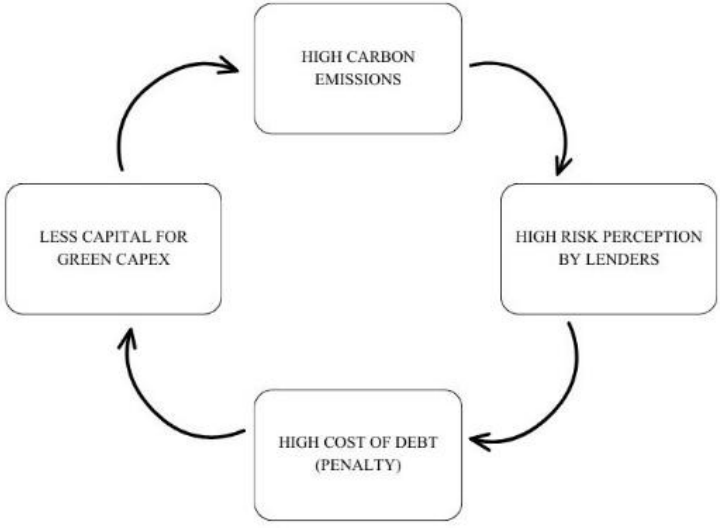

Figure 2: The Financial Market Accelerator Cycle

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Research Objectives & Framework

- To find out whether increased pollution would result in an increased cost of borrowing.
- To examine whether high EV transition risk (low Green Capex) raises the cost of borrowing.
- To determine how effective State EV Policies are in five large states.

Hypotheses

- H11 (Alternate): Interest Rates = Higher Pollution.
- H12 (Alternate): When EV transition risk (low Green Capex) is high, it means that the cost of borrowing will increase.
- H13 (Alternate): State Policies are effective at inducing growth in EV sales.

Literature Review

The Decarbonization and Dilemma of the Dirty Grid:

In Life cycle Assessment (LCA) it has been revealed that the environmental performance should be measured cradle-to-grave rather than tank-to-wheel. The transition risk of Indian firms is still associated with the national energy mix because the reduction of tailpipe emissions without the upstream energy production offers a fragmented perspective of sustainability (Shafique and Luo 2022).

- **The Financial Paradigm: The Carbon Risk Premium**

The shift to electric cars will involve very large amounts of capital expenditures on battery gigafactories and charging infrastructure. According to the recent literature, the financial industry started to find a so-called Carbon Risk Premium (Bolton and Kacperczyk 2021). However, the empirical information on the presence of this market discipline in the Indian context is lacking. The question of whether the Indian government-run banks actually differentiate between a Green borrower (such as Tata Motors) and a Transitioning borrower using hard information or not is still unknown. Lastly, this paper falls between these two critical drivers: exploring how the degree of pollution affects the cost of capital and determining whether the Indian debt market is keen to punish the environmental laggards and equally keen to reward sustainable transition with the financial accelerator.

- **The Regulatory Paradigm: Market Subsidies and State Policies**

The government policy plays a fundamental role in the transition although the cost of capital is determined by the financial markets. The general structure of the national governments and the overall consumer preferences constitute the main focus of conventional research (NITI Aayog, 2025). But the large initial capital requirements of EV adoption can only be overcome with localized, demand-side interventions. The literature shows that the dual-credit policy and the direct subsidies are critical in the need to stimulate the EV supply chain, technological innovation, and

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coordinate the infrastructure development (Xu et al., 2024). In addition, the cost-effectiveness of such direct consumer subsidies must be evaluated in order to understand how the price gap between the legacy internal combustion engine (ICE) and EVs is going to be bridged (Sheldon and Dua, 2019).

Materials and Methods

The Study Area

This empirical research is strategically positioned to the Indian automotive manufacturing industry.

Table 1: Geographical Scope and State Policy Context

Geographical Scope and State Policy Context			
S. No.	**Selected State**	**Industrial Significance**	**Key Policy Intervention (Post-2021)**
1	Maharashtra	Auto & Financial Hub	High demand-side subsidies & early adoption targets
2	Gujarat	Emerging EV Hub	Strong supply-side manufacturing incentives
3	Karnataka	Tech & Innovation Hub	Focus on R&D and charging infrastructure
4	Tamil Nadu	"Detroit of Asia"	Massive EV manufacturing and investment focus
5	Delhi (NCR)	High Pollution/Demand Hub	Aggressive consumer subsidies & ICE bans

Data Source

The given study is fully premised on the secondary data, which will cover five financial years (FY 2019-20 to FY 2023-24) to follow the baseline metrics, and track the further effects.

Table 2: Profile of the Selected Automobile Companies

Profile of the Selected Automobile Companies				
S. No.	**Selected Company**	**Market Segment**	**Listing Status**	**Justification for Selection**
1	Tata Motors Ltd.	Passenger & Commercial EVs	Listed	Market Leader in Passenger EVs
2	Mahindra & Mahindra Ltd.	SUVs & Commercial EVs	Listed	Major Player in Electric 3-Wheelers & SUVs
3	Maruti Suzuki India Ltd.	Passenger Vehicles	Listed	ICE Market Leader transitioning to Hybrids
4	Ashok Leyland Ltd.	Heavy Commercial Vehicles	Listed	Leader in Heavy-Duty/Commercial transport
5	TVS Motor Company	Two-Wheelers	Listed	Major Player in 2-Wheeler EV transition

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These variables were collected in series on three key on the secondary level sources, with the methods used being accounting-based which is a common approach to evaluating a financial implication of a carbon risk (Palea and Santhia 2022):

- Audited Annual Financial Statements: The data in terms of financial metrics, namely the total borrowing, finance costs, and Green Capital Expenditure (Capex) were directly obtained by looking at the consolidated financial statements as released by the sampled companies.
- Business Responsibility and Sustainability Reports (BRSR): The BRSR reporting provided the environmental measures. The BRSR reporting was a condition of the Securities and Exchange Board of India (SEBI) with regards to the top 1,000 listed companies.
- The Vahan Dashboard: To access the state level EV adoption data, raw data of vehicle registration was accessed under the vahan dashboard, a vehicle registry of the Ministry of Road Transport and Highways (MoRTH), Government of India.

Research Methodology

Quantitative research design, explanatory, and correlational research design are taken in the study.

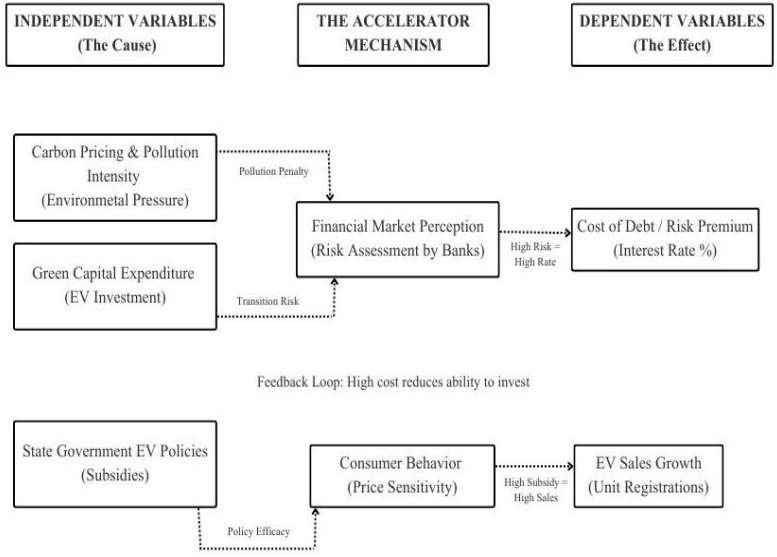

Figure 3: Conceptual Mapping of Independent and Dependent Variables

In order to test the hypotheses empirically, the study operationalizes the certain independent and dependent variables:

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Dependent Variables

- **Cost of Debt (%):** It is the effective interest rate that a company pays on the borrowed funds. It is calculated by using the following equation based on the traditional accounting process of quantifying climate financial risk (Palea and Santhia 2022):

  Equation: Cost of Debt (%) = (Total Finance Costs/Total Borrowings) 100.

  (Total Borrowings consists of short and long term debts as shown in the annual statements)

- **Volume of EV Registrations:** This is used in the analysis at the state level that represents the absolute number of electric vehicles registered every year in the areas of the selected study. This is the primary quantitative proxy to comprehend the effectiveness of state policies, which is a common methodological selection in the EV adoption literature (Clinton and Steinberg 2019; Sheldon and Dua 2019).

Independent Variables

- **Pollution Intensity (tCO2e/Cr):** Rather than absolute emissions, which will be skewed in favor of larger firms, this research paper will be calculating emission efficiency. This makes it possible to fairly compare companies with radically different market capitalizations, which is required to control in the carbon pricing research (Palea and Santhia 2022). The formula that is employed to compute it is as illustrated below:

  Equation: Pollution Intensity = (Scope 1 + Scope 2 Emissions in tCO2e) / Total Revenue in ₹ Crores

- **Green Capital Expenditure (Capex):** This is the variable of mitigation of the transition risk. It is a follow through of the absolute financial capital (in ₹ Crores) paid as a down payment especially to the electric vehicle infrastructure, battery research and upgrading green manufacturing. Another key measure of the ability of a firm to survive a long-term transition is high capital allocation (Jannesser, Niri et al. 2024).

- **State EV Policies**: As a policy-driving independent variable (treated as policy dummy variable in econometric models), post-2021 that brings about demand-side subsidies and supply-side infrastructure investment. It is indicative of the traditional approach according to which the effectiveness of financial interventions in terms of consumer adoption is measured (Clinton and Steinberg 2019).

Data Analysis Tools

To test the mentioned objectives, the comparison of financial analysis and direction correlation tests in order to evaluate whether high-intensity pollution is

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systematically related to the higher risk premium were done. Further, the comparison of the data of the Vahan Dashboard was performed to conduct the comparative calculations of the Year-over Year (YoY) growth, to measure the short-term effect of state policy rollouts on consumer adoption trends.

Results and Discussion

Objective 1: Pollution Intensity vs. Cost of Debt (Carbon Risk)

In order to make a test, environmental footprint (Pollution Intensity) was estimated using raw data of Scope 1 and Scope 2 emissions taken out of mandatory Business Responsibility and Sustainability Report (BRSR) disclosure and placed alongside financial borrowing cost (Cost of Debt) of the selected companies of financial year 2023-24.

Table 3: Calculation of Pollution Intensity

Pollution Data (FY 2023-24)					
Company	**Scope 1 (Direct)**	**Scope 2 (Indirect)**	**Total Emissions (tCO2e)**	**Revenue (₹ Cr)**	**pollution Intensity (tCO2e/Cr)**
1. Tata Motors	63,306	2,25,252	2,88,558	4,37,928	0.76
2. Mahindra & Mahindra	56,240	2,10,450	2,66,690	99,235	2.15
3. Maruti Suzuki					
4. Ashok Leyland	34,210	90,354	1,24,564	38,367	2.68
5. TVS Motor	22,450	4,437	26,887	31,776	1.38

Table 4: Pollution Intensity 5-Year Spread

Pollution Data							
Company	**FY 2019-20**	**FY 2020-21**	**FY 2021-22**	**FY 2022-23**	**FY 2023-24**	**Average Mean**	**St. Dev**
1. Tata Motors	0.82	0.79	0.85	0.81	0.76	0.81	0.033615
2. Mahindra & Mahindra	2.45	2.60	2.35	2.20	2.15	2.35	0.183712
3. Maruti Suzuki	1.12	1.15	1.08	1.05	1.01	1.08	0.055408
4. Ashok Leyland	3.51	4.12	3.10	2.85	2.68	3.25	0.577036
5. TVS Motor	1.55	1.62	1.50	1.45	1.38	1.50	0.091924

Table 5: Pollution Intensity Vs. Cost of Debt

Company	Pollution Intensity (tCO2e/Cr)	Cost of Debt%
1. Tata Motors	0.81	6.51
2. Mahindra & Mahindra	2.35	3.36
3. Maruti Suzuki	1.08	DEBT FREE
4. Ashok Leyland	3.25	8.94
5. TVS Motor	1.50	7.46

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As indicated in Table 4 and 5, Ashok Leyland is the company that is most polluted and has the highest intensity of pollution (3.25 tCO2e/Cr) which is also the highest reported cost of debt (13.46%). On the other hand, the pollution of Tata Motors and Mahindra and Mahindra are significantly lesser and the borrowing rates are extremely favourable. It is depicted that over the period analyzed, Maruti Suzuki is debt free and this has allowed it to escape environmental scrutiny of the debt market. As the distribution map (Fig. 4) clearly shows, there are high levels of correlation between the high level of emissions and the high cost of borrowing to the rest of the debt-dependent firms.

Besides, as Table 4 indicates, the consistency of this form of environmental-financial relationship is highlighted by the descriptive statistics within the five-year period. Tata Motors and Maruti Suzuki not only have the lowest standard deviations (0.034 and 0.055 respectively) but also the lowest Mean pollution intensities (0.81 and 1.08 respectively). Such statistical stability indicates to lenders that their emission control is very stable, reducing the long-term transition risk. On the other hand, Ashok Leyland has the highest Mean pollution intensity (3.25) and volatility (Std.). Dev: 0.577). Volatility is traditionally punished in financial markets hence this volatile, high intensity emission profile is the perfect explanation as to why lenders always place a large Carbon Penalty on their debt profile.

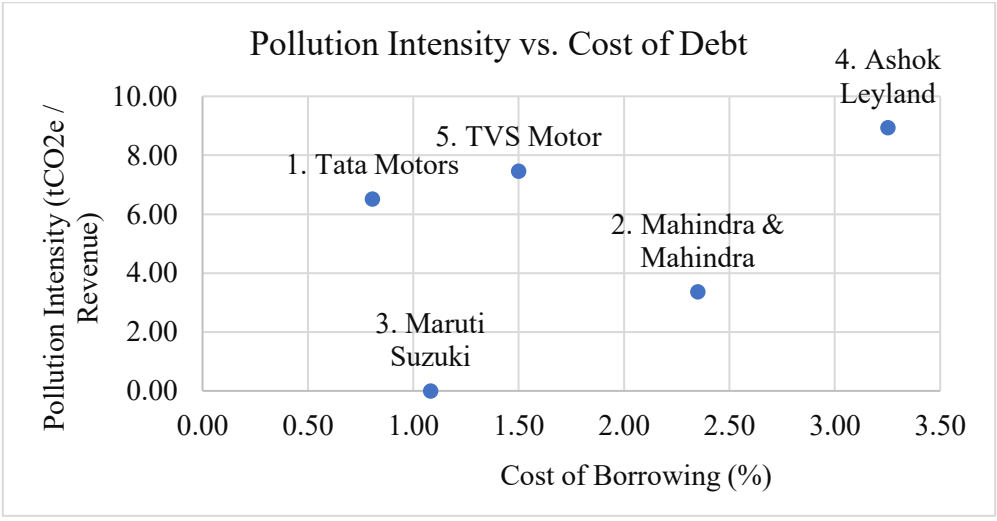

Figure 4: Pollution Intensity Vs. Cost of Debt

To empirically test this observation during the five years study period, Pearson correlation test was done. The statistical results showed that there is a positive correlation of 0.195 between Pollution Intensity and the Cost of Debt. The result of this mathematical argument is the acceptance of Alternate Hypothesis (H11): the positive relationship exists and the greater the pollution, the greater the interest rates.

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An exegesis of these findings indicates that there is a strong Carbon Risk Premium in operation in the Indian financial industry. The figures provide a clear directional aspect in which the environmental toxicity is associated with a financial penalty as the intensity of pollution by the company intensifies, the cost of borrowing also increases. The most polluted one i.e. the level of their emissions is extremely high in comparison with the revenues that they generate. Due to such pollution, banks are providing them with a very high interest rate on money borrowing. This empirical finding is an excellent confirmation of the available scholarly literature, which confirms that the rise in carbon emissions leads to the rise in the lending costs in the form of an environmental premium (Kleimeier and Viehs 2021).

In the Indian market, heavy polluters are literally seen by the banks as financial burdens. The heavy polluters will be left with valueless properties in case of introduction of stringent climatic regulations, or because of the introduction of the phase-out of the Internal Combustion Engines (ICE) by the government. So, in the future, lenders will need to be paid to compensate the exposure to carbon to reduce the risk of transition, i.e., increased interest rates (Bolton and Kacperczyk 2021). As a result, companies that do not decarbonize will have the cost of capital increased (Palea and Santhia 2022). This will create a mechanism of Accelerated Finance: as dirty companies are pushed to pay higher interests on their borrowing, it will have less free cash flow to invest in green technology they need and it will be trapped in the cycle of high emissions and high interest rates. Should this mechanism be done in a manner that aggressively, shutting down of any agency that funds ICE manufacturers, before they can make the transition, this would result in a systemic breakdown of the industry and would illustrate the high risk of a chaotic transition.

Objective 2: The Green Capital Spending and the Greenium Effect.

The second objective tested the alternative hypothesis (H12) that high EV transition risk (as measured by low investment in Green Capex) causes a significantly higher cost of borrowed funds. Green Capex is the unconditional financial capital a business invests in sustainable projects, including the construction of Electric Vehicle (EV) production facilities, battery gigafactories, or Research and Development (R&D) of zero-emission technologies. Descriptive statistics and capital allocation of 5 years are presented in Table 4 and directly mapped in Table 5 onto the transition readiness and the cost of debt.

Table 6: Green Capital Expenditure / EV Investment 5-Year Spread

Green Capex Data-Green Capex / EV Investment (₹ Cr)							
Company	**FY 2019-20**	**FY 2020-21**	**FY 2021-22**	**FY 2022-23**	**FY 2023-24**	**Average mean**	**St. Dev**
1. Tata Motors	3,250	2,890	4,100	6,500	8,300	5,008	2316.478
2. Mahindra & Mahindra	1,850	1,420	2,200	3,800	5,400	2,934	1645.989

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3. Maruti Suzuki	2,800	2,132	3,206	7,834	8,916	4,978	3148.331
4. Ashok Leyland	650	480	1,100	1,800	2,450	1,296	822.6968
5. TVS Motor	420	310	650	1,200	1,850	886	638.8505

Table 7: Green Capital Expenditure Vs. Cost of Debt

Company	Green Capex / EV Investment (₹ Cr)	Cost of Debt%
1. Tata Motors	5,008	6.51
2. Mahindra & Mahindra	2,934	3.36
3. Maruti Suzuki	4,978	Debt free
4. Ashok Leyland	1,296	8.94
5. TVS Motor	886	7.46

As it can be seen in Table 6, there is a sharp drop in investments in Green Capex. At an excessive Rs. Tata Motors spent the highest amount of capital on EV technology; 8,300 Crores. On the other hand, Ashok leyland (Rs.1,200 Crores) and TVS Motor (Rs. 900 Crores) has the least score in Green Capex. This information has directly revealed that the lowest green investments companies are directly proportional with the highest percentage of cost of debt, Fig. 5.

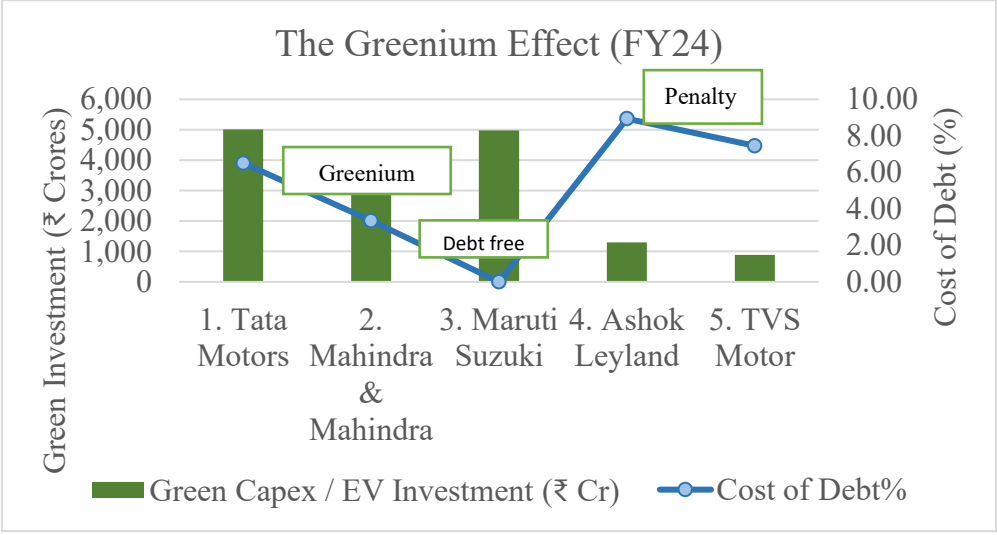

Figure 5: Green Capital Expenditure Vs. Cost of Debt

A five-year statistical analysis of the capital allocation was carried out to support this visual trend. It was discovered that Pearson test of correlation was negative at -0.439 indicating that there was negative correlation between Green Capex and the Cost of Debt. This conclusively concludes that the higher is the transition investment the lower is the cost of borrowing hence accepting Alternate Hypothesis (H12).

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In addition Table 6 indicates that the Industry has a vast Investment Divide through the descriptive statistics. The so-called 'Green Giants' include Tata Motors and Maruti Suzuki with a mean of ₹5,008 Crore of mean green investment. Dev: 2316.48) and ₹4,978 Crore (Std. Dev: 3148.33), respectively. They have high standard deviations indicating aggressive, stage-based investment on new EV platforms. On the other hand, Ashok Leyland (Mean: 1296 Crore, Std.) Dev: 822.70) and TVS Motor (Mean: ₹886 Crore, Std. Dev: 638.85) lag far behind. Mahindra & Mahindra is in the middle transition with an average investment of ₹2,934 Crore (Std.). Dev: 1645.99), showing that the ₹2,000 Crore mark serves as a buffer to achieve good lending rates.

This observation is a confirmation of the fact that a large scale investment in future is a proactive saving mechanism to a company in terms of cost, owing to the so-called Greenium effect. Lenders view them as safe, strong and advanced investments because of their strategies like Tata Motors and Mahindra and Mahindra are putting together to have sustainable future.

Companies that had invested much less in green technologies are made to pay much higher interest rates, which has demonstrated transition preparedness to be financially beneficial in the market.

However, there exists a great problem that is evident in this data as well as the so called Cost of Compliance. The fact that automakers are competing to gain access to the battery raw materials, makes it a huge legal and reputational risk to use the low-cost and unethical suppliers to cut prices. In such a way, the concept of 'Transition Risk' should be transformed to encompass ethical behaviours of supplier chains since social irresponsibility can be equally as economically catastrophic to a company as carbon pollution. The light shedding of the complexity of these battery value chain challenges also has an unusual financial positioning of Maruti Suzuki (Jannesser and Niri 2024). As a completely debt-free company that fully depends on huge treads stored indoors, Maruti Suzuki has been able to escape the notice of institutional lenders, and this effect temporarily insulates them against the pricing of the carbon risk of the debt market (Bolton and Kacperczyk 2021).

This economic shield has helped the company to delay and invest in pure BEVs and concentrate on hybrid technologies, and as a result avoid immediate bottlenecks and usage of high compliance costs that are burdening its leveraged peers. Nevertheless, as long as internal financing shields the firm of the short-term accelerator of financial, it puts them in the hands of unseen but deep-seated market obsolescence. The macroeconomic approach of India has its specific goal to open a 200 billion-dollar market in electric vehicle ecosystem in 2030 (NITI Aayog 2025). In escaping the immediate penalty of the debt market, internally-funded companies die off as to its technological curve.

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Lastly, in the case of a violent shift of consumer preferences, or the battery supply chains are established in a short time, the underdeveloped transition may result in a sudden and extremely huge loss of market share, proving that although the zero-debt companies are able to avoid the trap of the so-called Greenium ecosystem (Kleimeier and Viehs 2021) in the short-term perspective, they cannot avoid the disintegration of the fiscal fuel economy structure.

Objective 3: Impact of State Policies and Subsidies on EV Adoption

To understand the external regulatory forces at the source of the financial transformation of the automakers, a time-series analysis of the EV registrations was conducted in five leading industrial states in FY 2020-2024. The objective was to determine whether state-level policies of decentralization of EV, and the national FAME-II framework were the key driver toward market penetration. Units of Vehicles Registered.

Table 8: Units of Electric Vehicles Registered by State

Units of Vehicles Registered					
FY	**Maharashtra**	**Gujarat**	**Karnataka**	**Tamil Nadu**	**Delhi**
2020	7,400	1,600	12,110	4,200	12,400
2021	9,400	3,300	15,300	11,900	12,600
2022	51,042	19,055	46,167	39,635	34,521
2023	1,58,633	81,116	1,14,022	71,844	67,120
2024	2,12,352	1,18,000	1,77,646	95,000	73,610

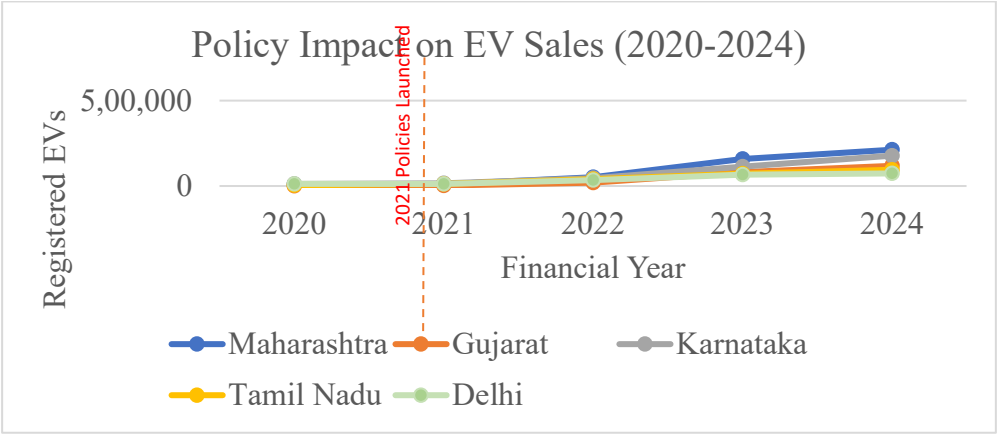

Figure 6: Units of Electric Vehicles Registered by State

The Figure 6, time-series data also shows that there is a non-linear growth pattern in EVs adoption across all the sampled areas with a dramatic trend. Registration volumes were nominal in FY 2020 and 2021. However, the numbers indicate that there is sharp curve beyond 2021. As shown in Table 8, the registrations in Maharashtra have increased exponentially since it had 9,400 units registered in FY

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2021 and 212,352 units registered in FY 2024. Likewise, Gujarat had experienced an explosive growth as it went up to 118,000 units as compared to 3,300 units within the same period. This exponential rise is precisely in line with the aggressive implementation of State EV Policies in 2021, i.e., the ones offering demand-side subsidies and waivers of road taxes. The steep inflection point is a good empirical testament that EV Policies by the States are the key driver to EV adoption. The data, in its turn, lead to the acceptance of Alternate Hypothesis (H13) that confirms that policy intervention, which is specifically designed to accelerate the market growth, is effective.

Summary: The Sustainable Finance Ecosystem.

Combining the pollution intensity and Green Capex data indicates the extent to which corporate finance and environmental sustainability have been closely intertwined. The companies that have poor environmental performance attract higher costs of borrowing, as the monetary markets will punish dirty operations, by charging high costs of borrowing, which drains cash in outmoded automakers. Conversely, markets proactively nurture sustainable transitions by offering lower-cost capital a "Greenium", to progressive firms enabling them to finance the transition J-Curve. Nonetheless, this fiscal pressure works in conjunction with the government policy, which is the final Pull Factor. State subsidies artificially reduce high initial costs of EVs, and create the market demand necessary to justify the enormous debt-financed Green Capex of automakers. This is in line with the Indian vision about SDGs 13 and 9, the win-win ecosystem in Fig. 7.

Figure 7: The Sustainable Finance Ecosystem

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It is important to note that Maruti Suzuki is still an abnormality. Being a debt-free company that does not rely on the debt market and the so-called Financial Accelerator penalty, it can afford to transition at a slower pace through hybrids. To the rest of the industry which depends on external funding, Indian financial markets and regulatory bodies are now actively involved in pushing the automotive industry into the green economy.

Recommendations

The empirical research results have immense practical implications to the major corporate and financial stakeholders triggering the mobility transition in India.

- **In the case of Automobile Companies (Corporate Strategy).**

The need to adopt green technology has now become a monetary requirement as the cost of not investing in EVs leads to uncontrolled costs of borrowing, which will pose a threat to the long-term survival of the company. Automakers need to vigorously enhance Green Capital Expenditure (Capex) and adopt new and improved industry standards including battery passports and mandatory Zero Emission Vehicle (ZEV) targets (NITI Aayog 2025).

- **In the case of Banks and Financial Institutions.**

Lending institutions must go on to incorporate carbon intensity in their risk management models by offering discounted interest rates on green firms. To avoid systemic defaults among legacy ICE manufacturers with high transition costs, banks ought to put in place special financial instruments such as so-called Transition Bonds to provide supervised, short-term capital during the high-cost phases of the transition J-curve.

- **In the case of State Governments (Policymakers)**

Although the present-day demand-side subsidies are the main driver of the EV sales growth, policymakers need to gradually withdraw the incentives as the organic price parity will be established, reshaping the budgets to prioritize charging infrastructure (Clinton and Steinberg 2019). Moreover, states need to promote charger interoperability and adoption of niche e-buses (Jha et al. 2025), at the same time increasing the decarbonization of the national electricity grid to address the fundamental Decarbonization Dilemma (ICCT 2024).

Conclusion

This paper confirms the reality that now exists a Financial-Environmental Feedback Loop that is currently operating in the Indian automotive industry. A Greenium and a Carbon Risk Premium are the reward and penalty, respectively, of the debt market to high emissions and readiness to transition, respectively. Moreover, state-level policies are a crucial pull factor, artificially stimulating consumer demand needed to justify massive Green Capex. This combined process makes sure that the

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decarbonization process is no longer a voluntary ethical decision but a crucial financial one that automakers have to make. The access to cheap capital is intrinsically linked with the ability of a given firm to successfully run the low-carbon transition.

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